



HOFMANN & VRATNY — CATALOGUE 2019/2020

SHAPING TOMORROW

WELCOME TO HOFMANN & VRATNY

| PERFECT TITANIUM. | DEBURR STEEL.

| HARD MACHINING. | PROCESS STAINLESS STEEL.

| CONQUER INCONEL. | MASTER ABRASIVE.

| CUT PLASTIC.

CATALOGUE 2019/2020

HOFMANN & VRATNY **EN**





THE RIGHT MILLING CUTTER. AT ALL TIMES.

Welcome to Hofmann & Vratny. As the leading manufacturer of solid carbide milling cutters, we enable companies throughout the world to manufacture their products.

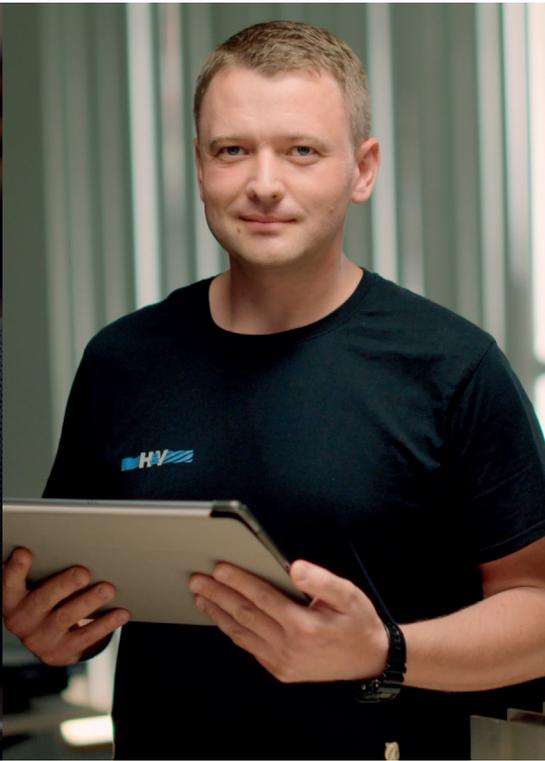
Every day, our strong team works on our collective goal of producing the best milling cutters in the world. Companies from the medical industry, semiconductor industry, machine and plant construction, aviation, aerospace engineering and, not least, the automotive industry have been using our milling cutters for many years now. Quality - Made in Bavaria.

The success of our company is built on innovation, a culture of cooperation, open dealings on an equal footing and many years of successful and trustful collaboration with our business partners. You can count on us, our milling cutters and our irrepressible drive to shape the future of the industry together. To us, that means shaping tomorrow.

Andreas Vratny

Zdenek Vratny

Marius
Heinemann-Grüder



8.000
H&V
PRODUCTS

2 Mio.
MILLING CUT-
TERS PER YEAR



**"OUR MILLING CUTTERS ARE THE
EPITOME OF PRECISION AND
RELIABILITY AT A GLOBAL LEVEL."**

— Andreas Vratny,
Managing Partner



**"PEOPLE ARE AT THE
HEART OF EVERYTHING
WE DO."**

— Marius Heinemann-Grüder,
Managing Director



Our shared values define us as a team and serve as the basis for our actions.

INNOVATION

QUALITY

TRADITION

TRUST

REGIONALITY

FAMILIARITY

Our strong code of conduct reflects what we stand for as a company: Innovative, high-quality products that customers can always rely on, created in a familial environment with a strong connection to our Bavarian roots.

STRONG PRINCIPLES.

Values that empower us: We know that strong principles are the foundation for sustainable success. We define ourselves on a daily basis through our work and the values that each of us has internalised.



REGIONALITY

As a bavarian company, we are proud of our homeland. We are committed, deeply rooted in the region, and support especially local associations and projects.

3

COMPANY
SITES

43

YEARS OF
EXPERIENCE

120

MOTIVATED
EMPLOYEES

WE DEFINE CHANGE. EVERY DAY.

01

TRADITION

For more than four decades now, we have been developing and producing solid carbide milling cutters at our facilities in Bavaria, Germany. Alongside a fully automated and digital production, a multitude of innovations and new concepts, you will still find traditional values, classical grinding craftsmanship and intergenerational work on our sites.

02

TRUST

We make fair dealings and respectful collaboration a matter of course, within the company, as well as with business partners like suppliers or distributors. You can count on us.

QUALITY
INNOVATION
TRADITION
TRUST
REGIONALITY
FAMILIARITY



Efficient research and rapid integration of new developments.

03

SUSTAINABLE AND SOCIALLY AWARE

We take our responsibility to the environment and society seriously. We stand for a sustainable production by implementing energy-friendly and resource-saving work methods. Furthermore, we support a large number of social projects including funding agencies, animal shelters and facilities for people with disabilities.

04

HUMAN-CENTRIC

We firmly believe that the best product can only be produced by the best staff. Our employees are at the core of everything we do.



01

STRATEGIC CHOICE OF MATERIAL

Using our decades of experience and extensive portfolio, we choose the optimal carbide for the milling cutters based on the material to be machined and its machining process.

02

DEVELOPING THE GEOMETRY

The experts in our development department develop various milling cutter geometries and conduct extensive tests to choose the perfect shape.

03

SELECTING THE RIGHT COATING

We work together with our partner organisations to find the ideal coating for each application. Often, we use exclusive developments and even completely new kinds of coatings that we conduct research for.

04

EXTENSIVE TEST AND DEVELOPMENT PHASE

After passing our stringent internal inspection and extensive testing in our high-tech R&D centre, the milling cutters are tested in practice under actual conditions with selected customers.



We want to actively shape the future of the industry and push the whole sector forward. With that in mind, it is vital to us to constantly question the status quo and take new paths. We demand a lot of ourselves and our products, and always strive for improvement.

INNOVATION

Strong cooperation enables us to develop the best product. We drive the development of new carbides and innovative coatings together with our partners. United, we test new kinds of materials in order to develop the optimal machining concepts in the next stage.

COOPERATION



THE WAY WE WORK AT H&V.

Our Promise: To ensure our milling cutters meet our standards and the standards of our customers at all times, we deploy a comprehensive manufacturing process that guarantees outstanding quality every step of the way.

THE RIGHT MILLING CUTTER. FOR EVERY APPLICATION.

Our services: First and foremost, we want our milling cutters to enable our customers to work just the way they want. Therefore, we offer a service portfolio based on their requirements.



**"INNOVATION IS
OUR TOP PRIORITY."**

— Anton Voglsinger,
Milling Technician, Research and Development



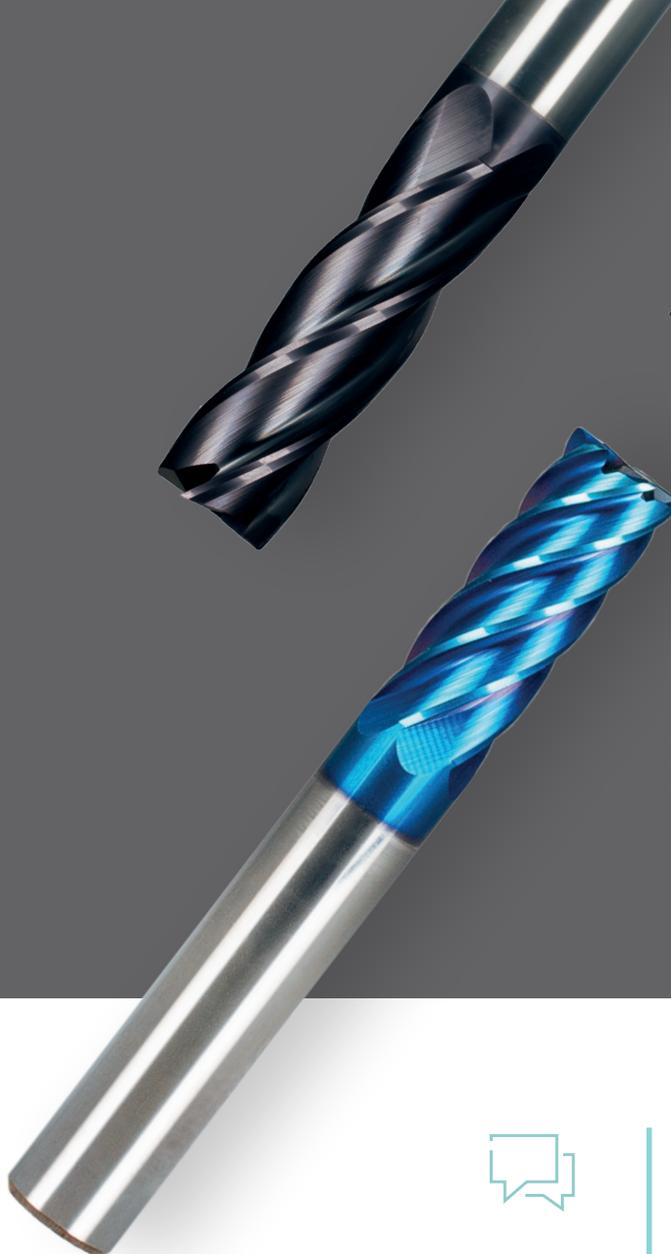
PRIVATE LABELLING

As a private label customer, you can benefit from our many years of experience. At H&V, you get more than just a milling cutter with your name and logo. We work with you to devise complete product ranges, processes and value-added services that you can pass on to your customers directly.



CUSTOM PRODUCTION

We work with you hand in hand to develop a product that is individually tailored to your application and meets your wishes and requirements by 100 percent.



REGRINDING SERVICE

At our Regrinding Centre, we apply genuine regrinding to achieve long-term precision and durability for pre-used milling cutters.



TRAINING

We are happy to share our experience and offer our partners' application technicians and sales staff an extensive range of training.



TECHNICAL CONSULTING

We gladly support you in challenges related to our milling cutters and their utilisation in a wide variety of machining scenarios.



QUALITY ASSURANCE

As a high volume manufacturer, we make sure that all the milling cutters of a series meet the same quality standards. We ensure this by using both conventional procedures and modern analysis tools and measuring methods.

PRODUCT LINES

Our solid carbide milling cutters are as diverse as their fields of application. Price-sensitive, high-quality or specialised for extreme applications. Our 3-line product range provides the perfect high-precision milling cutter for all areas of application and customer groups.

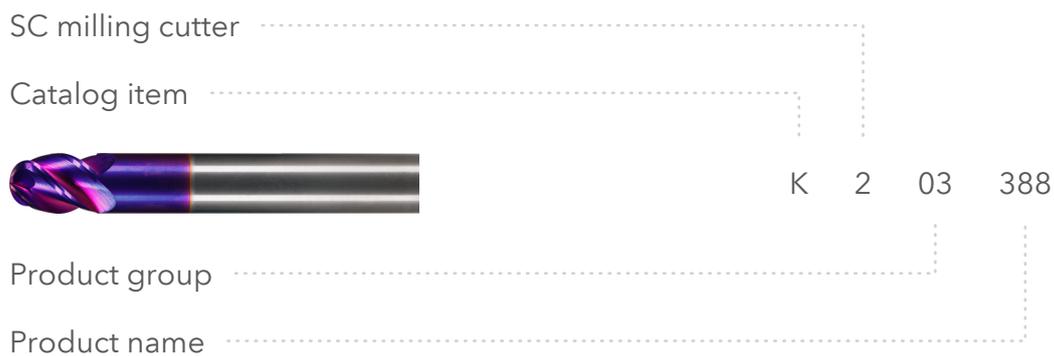
	 Basic	 Premium	 Expert
Description	Solid quality milling cutters for price-sensitive applications.	High-quality premium milling cutters. Suitable for several applications.	High-performance milling cutters for specially customised applications.
Carbide	Premium	Premium	Performance
Polished section and surface quality	Optimised	Optimised	Best possible
Coating	None / Premium	None / Premium	None / Performance
Quality assurance	✓	✓	✓
Narrow tolerance and concentricity	✓	✓	✓
Use for serial production	✓	✓	✓
Regrinding	✓	✓	✓
Suited to modern milling techniques		✓	✓
Developed in real application conditions		✓	✓
Maximum cutting performance		✓	✓
Best of its kind		✓	✓
Made for extreme conditions			✓
Optimised for a material group			✓

✓ Applies to all items in this product line.

✓ Part of the products of this line share these characteristics.

NUMBERING SYSTEM

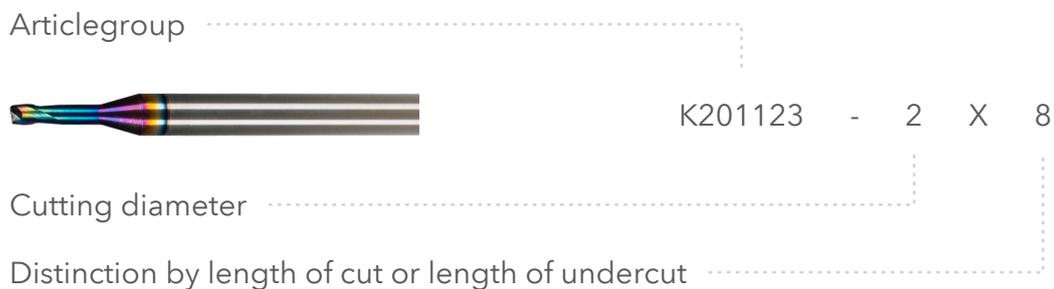
ARTICLEGROUP



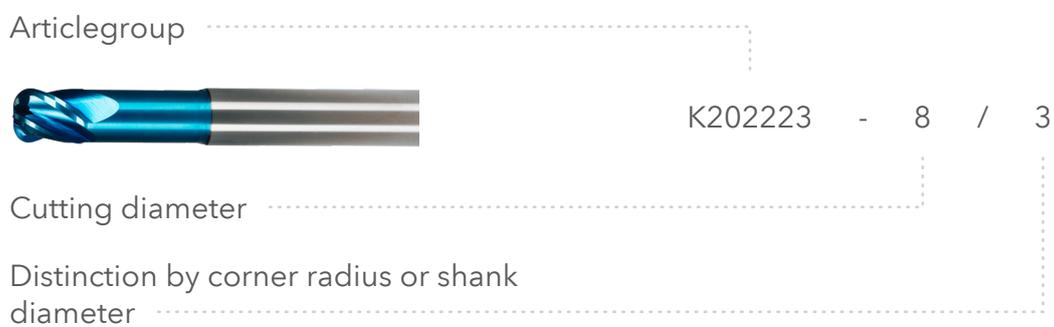
MILLING CUTTERS



MILLING CUTTERS DISTINGUISHED BY LENGTH



MILLING CUTTERS WITH ADDITIONAL DISTINGUISHING FEATURE



SPECIAL FEATURES

 HA No Weldon	 HB Weldon HB	 ETC Extended Trochoidal Cutting
 HSC High Speed Cutting	 HPC High Performance Cutting	 MTC Multi-Task Cutting
 UNI Universal machining	 Engraving	 Unequal tooth pitch
 Coolant duct system	 Multipass milling	 Trimming
 Chip breaking	 Full slot	 Forward and backward deburring
 Serrated edge	 Deburring	 Corner rounding
 2xD 2xD	 3xD 3xD	 4xD 4xD
 5xD 5xD	 Dynamic helical pitch	

MATERIAL

	Page		Page		Page
 Steel	46 - 170	 Hardened steel	172 - 220	 Non-ferrous materials	222 - 282
 Stainless steel (VA)	284 - 368	 Castings	370 - 455	 Abrasive material	456 - 459
 Inconel	460 - 468	 Titanium	470 - 478		

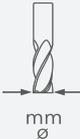
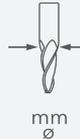
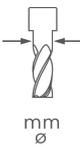
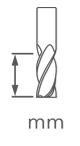
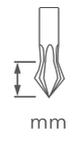
PRODUCT GROUPS

	Page		Page		Page
01 End mill cutter	21 - 30	02 Torus cutter	31 - 33	03 Full radius cutter	35 - 37
04 Form cutter	39 - 40	05 Chamfer cutter	41	06 Roughing cutter	43
07 Face torus cutter	45				

COOLING

 Dry	 Air-cooled	 Oil
 Water ^{min}	 Water ^{max}	

PROPERTIES

 Cutting diameter mm ∅	 Small cutting diameter mm ∅	 Large cutting diameter mm ∅
 Undercut diameter mm ∅	 Length of cut mm	 Total bezel length mm
 Length of undercut mm	 Total length mm	 Shank diameter mm ∅
 Number of cutting edges #	 Corner radius R mm	 Corner bezel 45° mm
 Programming radius mm	 Maximum cutting depth mm max	 Helical pitch °

COATINGS

Our coatings are optimised in unison with the cutters' geometry by testing in both an extensive internal procedure and under the customers real application conditions. The selection is perfectly matched to the respective field of application.

TiN- α	TiN Alpha	TiSiN- α	TiSiN Alpha	TiAlN- α	TiAlN Alpha
Diamond- α	Diamond Alpha	TAC- α	TAC Alpha	ZrCn- α	ZrCrN Alpha
TiCn- α	TiCN Alpha				

TABLE OF CONTENTS

The table of contents shows all possible areas of application for each milling cutter as colors. Each milling cutter is listed once per main application in the catalog under the corresponding page number. Applications marked with an asterisk (*) are non-main applications and are not listed separately in the catalog.

APPLICATION TABLE

The values given in the application table are only guidelines. These values depend largely on the individual application parameters.

ILLUSTRATIONS

All illustrated technical drawings and photographs are exemplary. Deviations from the original product in color and dimensions are possible.



MADE BAVARIA

Our milling cutters are used by companies all over the world. Still they all have the same origin: Our production sites in Bavaria, Germany.

As a traditional company, we are proud of our strong connection to the region. Ever since we were founded, we have been firmly tied to our homeland, and our team works on producing the best milling cutters in the world in a familial environment. Genuine quality work, the highest-quality craftsmanship and a strong promotion and retention of our talent: This is what Made in Bavaria means to us.

EIN RIA



END MILL CUTTER



K201001
SC end mill cutter

224



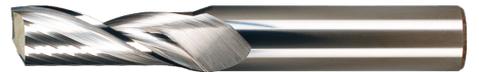
K201012
SC end mill cutter

225



K201021
SC end mill cutter

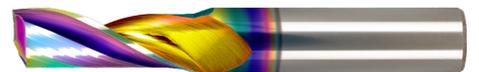
226



K201022
SC end mill cutter TAC

NEW

227



K201031
SC end mill cutter short

48 * 286 372



K201032
SC end mill cutter short

48 * 286 372



K201033
SC end mill cutter short TiAlN

50 * 288 374



K201034
SC end mill cutter short TiAlN

50 * 288 374



K201051
SC end mill cutter

52 * 290 376



K201052
SC end mill cutter

52 * 290 376




HA UNI  

K201053
SC end mill cutter TiAlN

53 228 291 377




HB UNI  

K201054
SC end mill cutter TiAlN

53 228 291 377




HA UNI  

K201071
SC end mill cutter short

54 * 292 378




HA UNI  

K201081
SC end mill cutter

55 * 293 379




HA HSC  

K201122
SC micro end mill cutter TiSiN HSC

* 174 * *




HA HSC  

K201123
SC micro end mill cutter TAC HSC

229 *




HA HSC HPC MTC  

K201133
SC end mill cutter short TAC HSC / MTC / HPC

231 *




HA HSC HPC MTC  

K201143
SC end mill cutter long TAC HSC / MTC / HPC

232 *




HA MTC UNI  

K201161
SC end mill cutter short MTC

56 * 294 380




HB MTC UNI  

K201162
SC end mill cutter short MTC

56 * 294 380



Premium

HA HPC MTC UNI

K201163
SC end mill cutter short TiAlN MTC / HPC

57 295 381



Premium

HB HPC MTC UNI

K201164
SC end mill cutter short TiAlN MTC / HPC

57 295 381



Premium

HA MTC UNI

K201181
SC end mill cutter long MTC

58 * 296 382



Premium

HB MTC UNI

K201182
SC end mill cutter long MTC

58 * 296 382



Premium

HA HPC MTC UNI

K201183
SC end mill cutter long TiAlN MTC / HPC

59 297 383



Premium

HB HPC MTC UNI

K201184
SC end mill cutter long TiAlN MTC / HPC

59 297 383



Basic

HA UNI

K201251
SC mini end mill cutter 30°

NEW

60 * 298 384



Basic

HB UNI

K201252
SC mini end mill cutter 30°

NEW

60 * 298 384



Basic

HA UNI

K201253
SC mini end mill cutter 30° TiAlN

NEW

62 * 300 386



Basic

HB UNI

K201254
SC mini end mill cutter 30° TiAlN

NEW

62 * 300 386

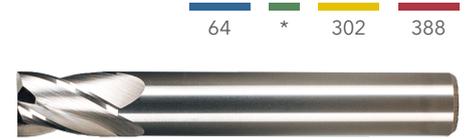


B
Basic

HA UNI

K201271
SC mini end mill cutter 45°

NEW

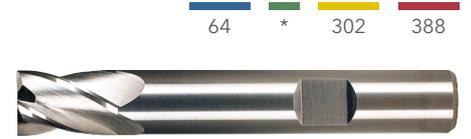


B
Basic

HB UNI

K201272
SC mini end mill cutter 45°

NEW

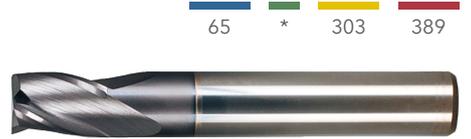


B
Basic

HA UNI

K201273
SC mini end mill cutter 45° TiAlN

NEW

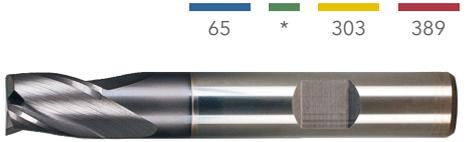


B
Basic

HB UNI

K201274
SC mini end mill cutter 45° TiAlN

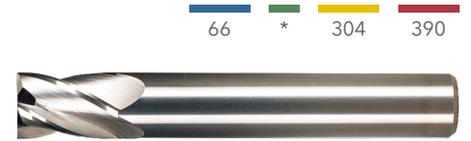
NEW



P
Premium

HA MTC UNI

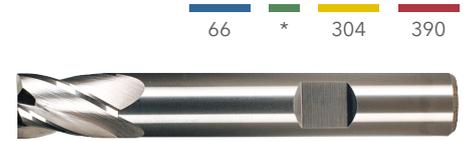
K201291
SC end mill cutter short MTC



P
Premium

HB MTC UNI

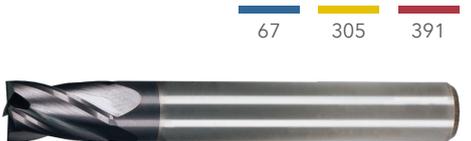
K201292
SC end mill cutter short MTC



P
Premium

HA HPC MTC UNI

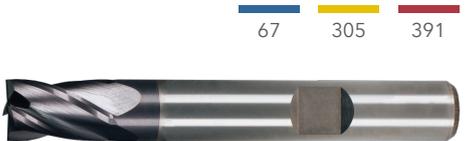
K201293
SC end mill cutter short TiAlN MTC / HPC



P
Premium

HB HPC MTC UNI

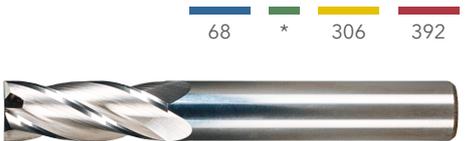
K201294
SC end mill cutter short TiAlN MTC / HPC



P
Premium

HA MTC UNI

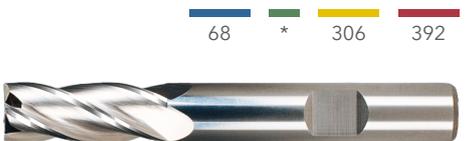
K201311
SC end mill cutter long MTC



P
Premium

HB MTC UNI

K201312
SC end mill cutter long MTC



Premium HA HPC MTC UNI  

K201313
SC end mill cutter long TiAlN MTC / HPC

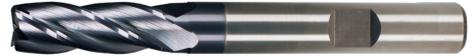
69 307 393



Premium HB HPC MTC UNI  

K201314
SC end mill cutter long TiAlN MTC / HPC

69 307 393



Premium HA MTC UNI  

K201341
SC end mill cutter overlong MTC

70 * 308 *



Premium HB MTC UNI  

K201342
SC end mill cutter overlong MTC

70 * 308 *



Premium HA ETC HPC MTC UNI  

K201343
SC end mill cutter overlong MTC / ETC / HPC

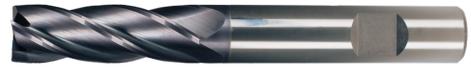
71 309 *



Premium HB ETC HPC MTC UNI  

K201344
SC end mill cutter overlong MTC / ETC / HPC

71 309 *



Premium HA MTC UNI  

K201401
SC end mill cutter short MTC

72 * 310 394



Premium HB MTC UNI  

K201402
SC end mill cutter short MTC

72 * 310 394



Premium HA ETC HPC MTC  

K201403
SC end mill cutter short TiAlN MTC / ETC / HPC

73 311 395



Premium HB ETC HPC MTC UNI  

K201404
SC end mill cutter short TiAlN MTC / ETC / HPC

73 311 395



Premium

HA MTC UNI

K201411
SC end mill cutter long MTC

74 * 312 396



Premium

HB MTC UNI

K201412
SC end mill cutter long MTC

74 * 312 396



Premium

HA ETC HPC MTC UNI

K201413
SC end mill cutter long TiAlN MTC / ETC / HPC

75 313 397



Premium

HB ETC HPC MTC UNI

K201414
SC end mill cutter long TiAlN MTC / ETC / HPC

75 313 397



Expert

HA HPC

K201523
SC end mill cutter TiSiN HPC

76 179



Expert

HA ETC HPC

K201533
SC end mill cutter long TiSiN HPC / ETC

* 180



Expert

HA

K201573
SC banana end mill cutter Diamond

233 458



Expert

HA

K201577
SC banana end mill cutter long Diamond

234 459



Premium

HA UNI

K201581
SC end mill cutter short

77 * 314 398



Premium

HB UNI

K201582
SC end mill cutter short

77 * 314 398





K201583
SC end mill cutter short TiAlN

78 * * 315 399



K201584
SC end mill cutter short TiAlN

78 * * 315 399



K201591
SC end mill cutter

79 * 316 400



K201592
SC end mill cutter

79 * 316 400



K201593
SC end mill cutter TiAlN

80 * * 317 401



K201594
SC end mill cutter TiAlN

80 * * 317 401



K201601
SC end mill cutter overlong

81 * 318 *



K201602
SC end mill cutter overlong

81 * 318 *



K201603
SC end mill cutter overlong TiAlN

82 * * *



K201604
SC end mill cutter overlong TiAlN

82 * * *



B
Basic

HA UNI

K201673
SC mini end mill cutter 45° TiAlN

83 * 319 402



B
Basic

HB UNI

K201674
SC mini end mill cutter 45° TiAlN

83 * 319 402



B
Basic

HA UNI

K201677
SC mini end mill cutter 30° TiAlN

84 * 320 403



B
Basic

HB UNI

K201678
SC mini end mill cutter 30° TiAlN

84 * 320 403



E
Expert

HB ETC HPC ≠

K201688
SC end mill cutter short TiSiN ETC / HPC

NEW

472



E
Expert

HB ETC HPC ≠

K201693
SC end mill cutter long TiSiN ETC / HPC

NEW

473



E
Expert

HB ETC HPC MTC UNI ≠

K201719
SC end mill cutter short TiSiN ETC / HPC / MTC

NEW

85 * 404



E
Expert

HB ETC HPC MTC UNI ≠

K201724
SC end mill cutter long TiSiN ETC / HPC / MTC

NEW

86 * 405



E
Expert

HB ETC HPC MTC UNI ≠

K201729
SC end mill cutter long TiSiN ETC / HPC / MTC

NEW

87 * 406



E
Expert

HB ETC UNI ≠ 2xD

K201734
SC end mill cutter 2xD TiSiN ETC

NEW

88 *



Expert **HB** **ETC** **UNI** **≠**   **3xD**

K201739
SC end mill cutter 3xD TiSiN ETC

NEW  89 *

Expert **HB** **ETC** **UNI** **≠**   **4xD**

K201744
SC end mill cutter 4xD TiSiN ETC

NEW  90 *

Expert **HB** **ETC** **UNI** **≠**   **5xD**

K201749
SC end mill cutter 5xD TiSiN ETC

NEW  91 *

Expert **HB** **ETC** **HPC** **MTC** **≠**  

K201754
SC end mill cutter TiSiN ETC / HPC / MTC

NEW  * 321

Expert **HB** **ETC** **HPC** **≠** 

K201759
SC end mill cutter short TiSiN ETC / HPC

NEW  462

Expert **HB** **ETC** **HPC** **≠** 

K201764
SC end mill cutter TiSiN ETC / HPC

NEW  463

Expert **HA** **ETC** **HPC** **≠**   

K201768
SC end mill cutter TAC ETC / HPC

NEW  235

Expert **HA** **ETC** **HPC** **≠**   

K201773
SC end mill cutter long TAC ETC / HPC

NEW  236

Expert **HA** **ETC** **HPC** **≠**  

K201776
SC end mill cutter TAC ETC / HPC

NEW  237

Expert **HA** **ETC** **HPC** **≠**  

K201779
SC end mill cutter long TAC ETC / HPC

NEW  238

Expert  **HB ETC HPC MTC ≠**   

K201784
SC end mill cutter long TiSiN ETC / HPC / MTC

92 322



Expert  **HB ETC MTC ≠**   

K201789
SC end mill cutter long TiSiN ETC / MTC

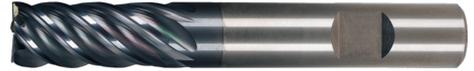
93 323



Expert  **HB ETC ≠**   **2xD** 

K201794
SC end mill cutter 2xD TiSiN ETC

* 324



Expert  **HB ETC ≠**   **3xD** 

K201799
SC end mill cutter 3xD TiSiN ETC

* 325



Expert  **HB ETC ≠**  **2xD**

K201804
SC end mill cutter 2xD TiSiN ETC

* 326



Expert  **HB ETC ≠**  **3xD**

K201809
SC end mill cutter 3xD TiSiN ETC

* 327



Expert  **HA ETC HSC HPC**  

K201813
SC end mill cutter TAC ETC / HPC / HSC

239



Premium  **HA HSC HPC MTC**  

K201816
SC end mill cutter HSC / MTC / HPC

240



TORUS CUTTER


HA HSC




K202001
SC torus cutter short HSC



241


HB HSC




K202002
SC torus cutter short HSC



241


HA HSC




K202003
SC torus cutter short TiN HSC



242


HB HSC




K202004
SC torus cutter short TiN HSC



242


HA HSC




K202005
SC torus cutter TAC HSC



243


HA HSC




K202011
SC torus cutter overlong HSC



244


HB HSC




K202012
SC torus cutter overlong HSC



244


HA HSC




K202013
SC torus cutter overlong TiN HSC



245


HB HSC




K202014
SC torus cutter overlong TiN HSC



245


HA HSC




K202015
SC torus cutter long TAC HSC



246

Expert HA HSC   

K202082
SC micro torus cutter TiSiN HSC

94 181 247 *



Expert HA HSC   

K202092
SC micro torus cutter TiSiN HSC

96 183 249 *



Expert HA HSC   

K202102
SC micro torus cutter TiSiN HSC

98 185 251 *



Expert HA HSC   

K202112
SC micro torus cutter TiSiN HSC

100 187 253 *



Premium HA HSC HPC  

K202143
SC torus cutter short TiAlN HSC / HPC

101 328 407



Premium HA HSC HPC  

K202153
SC torus cutter long TiAlN HSC / HPC

103 330 409



Premium HA HSC UNI   

K202163
SC torus cutter short TiAlN HSC

105 188 332 411



Premium HA HSC UNI   

K202173
SC torus cutter long TiAlN HSC

107 190 334 413



Premium HA HSC UNI   

K202202
SC torus cutter overlong TiAlN HSC

109 192 336 415



Expert HA HSC HPC \neq   

K202223
SC torus cutter short TiAlN HSC / HPC

110 193




HA HSC HPC ≠   

K202233
SC torus cutter long TiAlN HSC / HPC

112 195




HA HPC   

K202253
SC torus cutter TiSiN HPC

114 197




HA ETC HPC   

K202293
SC torus cutter short TiSiN HPC / ETC

* 199




HA ETC HPC   

K202303
SC torus cutter long TiSiN HPC / ETC

* 200




HA ETC HPC   

K202307
SC torus cutter overlong TiSiN HPC / ETC

* 201




HB ETC HPC MTC ≠  

K202414
SC torus cutter TiSiN ETC / MTC / HPC

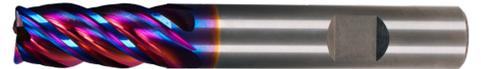
464




HB ETC HPC ≠   

K202424
SC torus cutter long TiSiN ETC / HPC

474




HB ETC HSC HPC MTC UNI ≠   

K202509
SC torus cutter long TiSiN ETC / HPC / HSC / MTC

NEW

116 * 416



FULL RADIUS CUTTER

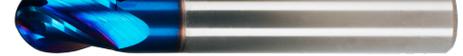
 Premium	   	
	K203001 SC full radius cutter HSC	118 * 337 418
 Premium	   	
	K203003 SC full radius cutter TiAlN HSC	119 * 338 419
 Premium	    	
	K203033 SC full radius cutter short TiAlN HPC / HSC	120 202 * 339 420
 Premium	    	
	K203063 SC full radius cutter overlong TiAlN HPC / HSC	122 204 * 341 422
 Premium	  	
	K203081 SC full radius cutter short	123 * 342 423
 Premium	   	
	K203083 SC full radius cutter short TiAlN HSC	124 * 343 424
 Premium	  	
	K203091 SC full radius cutter overlong	125 * 344 425
 Premium	   	
	K203093 SC full radius cutter overlong TiAlN HSC	126 * 345 426
 Expert	   	
	K203103 SC full radius cutter short TiSiN HPC / HSC	127 205
 Expert	   	
	K203143 SC full radius cutter overlong TiSiN HPC / HSC	129 207

 Expert	<div style="display: flex; gap: 5px;"> <div style="border: 1px solid black; padding: 2px;">HA</div> <div style="border: 1px solid black; padding: 2px;">HSC</div> <div style="border: 1px solid black; padding: 2px;"></div> </div>	<div style="display: flex; gap: 20px;"> 130 208 254 * </div>
	<p>K203206 SC micro full radius cutter short TiSiN HSC</p>	

 Expert	<div style="display: flex; gap: 5px;"> <div style="border: 1px solid black; padding: 2px;">HA</div> <div style="border: 1px solid black; padding: 2px;">HSC</div> <div style="border: 1px solid black; padding: 2px;"></div> </div>	<div style="display: flex; gap: 20px;"> 133 211 257 * </div>
	<p>K203212 SC micro full radius cutter long TiSiN HSC</p>	

 Premium	<div style="display: flex; gap: 5px;"> <div style="border: 1px solid black; padding: 2px;">HA</div> <div style="border: 1px solid black; padding: 2px;">HSC</div> <div style="border: 1px solid black; padding: 2px;">HPC</div> <div style="border: 1px solid black; padding: 2px;">MTC</div> <div style="border: 1px solid black; padding: 2px;">UNI</div> <div style="border: 1px solid black; padding: 2px;"></div> <div style="border: 1px solid black; padding: 2px;"></div> </div>	<div style="display: flex; gap: 20px;"> 135 259 346 427 * </div>
	<p>K203253 SC full radius cutter short TiAlN MTC / HSC / HPC</p>	

 Premium	<div style="display: flex; gap: 5px;"> <div style="border: 1px solid black; padding: 2px;">HA</div> <div style="border: 1px solid black; padding: 2px;">HSC</div> <div style="border: 1px solid black; padding: 2px;">HPC</div> <div style="border: 1px solid black; padding: 2px;">MTC</div> <div style="border: 1px solid black; padding: 2px;">UNI</div> <div style="border: 1px solid black; padding: 2px;"></div> <div style="border: 1px solid black; padding: 2px;"></div> </div>	<div style="display: flex; gap: 20px;"> 136 260 347 428 * </div>
	<p>K203263 SC full radius cutter long TiAlN MTC / HSC / HPC</p>	

 Expert	<div style="display: flex; gap: 5px;"> <div style="border: 1px solid black; padding: 2px;">HA</div> <div style="border: 1px solid black; padding: 2px;">HSC</div> <div style="border: 1px solid black; padding: 2px;">HPC</div> <div style="border: 1px solid black; padding: 2px;"></div> </div>	<div style="display: flex; gap: 20px;"> 137 213 </div>
	<p>K203333 SC full radius cutter short TiAlN HPC / HSC</p>	

 Expert	<div style="display: flex; gap: 5px;"> <div style="border: 1px solid black; padding: 2px;">HA</div> <div style="border: 1px solid black; padding: 2px;">HSC</div> <div style="border: 1px solid black; padding: 2px;">HPC</div> <div style="border: 1px solid black; padding: 2px;"></div> </div>	<div style="display: flex; gap: 20px;"> 138 214 </div>
	<p>K203343 SC full radius cutter long TiAlN HPC / HSC</p>	

 Basic	<div style="display: flex; gap: 5px;"> <div style="border: 1px solid black; padding: 2px;">HA</div> <div style="border: 1px solid black; padding: 2px;">HSC</div> <div style="border: 1px solid black; padding: 2px;">UNI</div> <div style="border: 1px solid black; padding: 2px;"></div> </div>	<div style="display: flex; gap: 20px;"> 139 215 </div>
	<p>K203373 SC mini full radius cutter TiSiN HSC</p>	

 Expert	<div style="display: flex; gap: 5px;"> <div style="border: 1px solid black; padding: 2px;">HA</div> <div style="border: 1px solid black; padding: 2px;">HSC</div> <div style="border: 1px solid black; padding: 2px;">HPC</div> <div style="border: 1px solid black; padding: 2px;"></div> </div>	<div style="display: flex; gap: 20px;"> 475 </div>
	<p>K203383 SC full radius cutter short TiSiN HPC / HSC</p>	

 Expert	<div style="display: flex; gap: 5px;"> <div style="border: 1px solid black; padding: 2px;">HA</div> <div style="border: 1px solid black; padding: 2px;">HSC</div> <div style="border: 1px solid black; padding: 2px;">HPC</div> <div style="border: 1px solid black; padding: 2px;"></div> </div>	<div style="display: flex; gap: 20px;"> 476 </div>
	<p>K203388 SC full radius cutter long TiSiN HPC / HSC</p>	

 Expert	<div style="display: flex; gap: 5px;"> <div style="border: 1px solid black; padding: 2px;">HA</div> <div style="border: 1px solid black; padding: 2px;">HSC</div> <div style="border: 1px solid black; padding: 2px;">HPC</div> <div style="border: 1px solid black; padding: 2px;"></div> </div>	<div style="display: flex; gap: 20px;"> 465 </div>
	<p>K203393 SC full radius cutter short TiSiN HPC / HSC</p>	



HA HSC HPC 

K203398
SC full radius cutter long TiSiN HPC / HSC



466



HA HSC HPC 

K203413
SC full radius cutter short TiSiN HPC / HSC



140 348 429



HA HSC HPC 

K203418
SC full radius cutter long TiSiN HPC / HSC



141 349 430



FORM CUTTER

 Premium	<div style="display: flex; gap: 5px;"> <div style="border: 1px solid black; padding: 2px;">HA</div> <div style="border: 1px solid black; padding: 2px;">UNI</div> </div>	K204001 SC conical engraving cutter 60°	<div style="display: flex; gap: 20px;"> 142 261 350 431 </div>	
 Premium	<div style="display: flex; gap: 5px;"> <div style="border: 1px solid black; padding: 2px;">HA</div> <div style="border: 1px solid black; padding: 2px;">UNI</div> </div>	K204011 SC conical finishing cutter 0.5°	<div style="display: flex; gap: 20px;"> 143 262 * 432 </div>	
 Premium	<div style="display: flex; gap: 5px;"> <div style="border: 1px solid black; padding: 2px;">HA</div> <div style="border: 1px solid black; padding: 2px;">UNI</div> </div>	K204013 SC conical finishing cutter 0.5° TiAlN	<div style="display: flex; gap: 20px;"> 144 263 351 433 </div>	
 Premium	<div style="display: flex; gap: 5px;"> <div style="border: 1px solid black; padding: 2px;">HA</div> <div style="border: 1px solid black; padding: 2px;">UNI</div> </div>	K204021 SC conical finishing cutter 1°	<div style="display: flex; gap: 20px;"> 145 264 * 434 </div>	
 Premium	<div style="display: flex; gap: 5px;"> <div style="border: 1px solid black; padding: 2px;">HA</div> <div style="border: 1px solid black; padding: 2px;">UNI</div> </div>	K204023 SC conical finishing cutter 1° TiAlN	<div style="display: flex; gap: 20px;"> 146 265 352 435 </div>	
 Premium	<div style="display: flex; gap: 5px;"> <div style="border: 1px solid black; padding: 2px;">HA</div> <div style="border: 1px solid black; padding: 2px;">UNI</div> </div>	K204031 SC conical finishing cutter 1.5°	<div style="display: flex; gap: 20px;"> 147 266 * 436 </div>	
 Premium	<div style="display: flex; gap: 5px;"> <div style="border: 1px solid black; padding: 2px;">HA</div> <div style="border: 1px solid black; padding: 2px;">UNI</div> </div>	K204033 SC conical finishing cutter 1.5° TiAlN	<div style="display: flex; gap: 20px;"> 148 267 353 437 </div>	
 Premium	<div style="display: flex; gap: 5px;"> <div style="border: 1px solid black; padding: 2px;">HA</div> <div style="border: 1px solid black; padding: 2px;">UNI</div> </div>	K204041 SC conical finishing cutter 2°	<div style="display: flex; gap: 20px;"> 149 268 * 438 </div>	
 Premium	<div style="display: flex; gap: 5px;"> <div style="border: 1px solid black; padding: 2px;">HA</div> <div style="border: 1px solid black; padding: 2px;">UNI</div> </div>	K204043 SC conical finishing cutter 2° TiAlN	<div style="display: flex; gap: 20px;"> 150 269 354 439 </div>	
 Premium	<div style="display: flex; gap: 5px;"> <div style="border: 1px solid black; padding: 2px;">HA</div> <div style="border: 1px solid black; padding: 2px;">UNI</div> </div>	K204051 SC conical finishing cutter 2.5°	<div style="display: flex; gap: 20px;"> 151 270 * 440 </div>	



HA UNI

K204053
SC conical finishing cutter 2.5° TiAlN

152 271 355 441



HA UNI

K204061
SC conical finishing cutter 3°

153 272 * 442



HA UNI

K204063
SC conical finishing cutter 3° TiAlN

154 273 356 443



HA UNI

K204071
SC conical finishing cutter 4°

155 274 * 444



HA UNI

K204073
SC conical finishing cutter 4° TiAlN

156 275 357 445



HA UNI

K204081
SC conical finishing cutter 5°

157 276 * 446



HA UNI

K204083
SC conical finishing cutter 5° TiAlN

158 277 358 447



HA UNI

K204092
SC forward and backward corner rounding cutter TiAlN

159 278 * 448



HA UNI

K204106
SC corner rounding cutter TiAlN

160 279 359 449 * *



HA

K204108
SC corner rounding cutter TiSiN

216 360



CHAMFER CUTTER

 Expert	<div style="display: flex; gap: 5px;"> <div style="border: 1px solid black; padding: 2px;">HA</div> <div style="border: 1px solid black; padding: 2px;"></div> </div>	K205153 SC deburrer 60° TiSiN	<div style="display: flex; gap: 20px;"> 161 217 </div>	
 Expert	<div style="display: flex; gap: 5px;"> <div style="border: 1px solid black; padding: 2px;">HB</div> <div style="border: 1px solid black; padding: 2px;"></div> </div>	K205154 SC deburrer 60° TiSiN	<div style="display: flex; gap: 20px;"> 161 217 </div>	
 Expert	<div style="display: flex; gap: 5px;"> <div style="border: 1px solid black; padding: 2px;">HA</div> <div style="border: 1px solid black; padding: 2px;"></div> </div>	K205163 SC deburrer 90° TiSiN	<div style="display: flex; gap: 20px;"> 162 218 </div>	
 Expert	<div style="display: flex; gap: 5px;"> <div style="border: 1px solid black; padding: 2px;">HB</div> <div style="border: 1px solid black; padding: 2px;"></div> </div>	K205164 SC deburrer 90° TiSiN	<div style="display: flex; gap: 20px;"> 162 218 </div>	
 Premium	<div style="display: flex; gap: 5px;"> <div style="border: 1px solid black; padding: 2px;">HA</div> <div style="border: 1px solid black; padding: 2px;">UNI</div> <div style="border: 1px solid black; padding: 2px;"></div> </div>	K205173 SC deburrer 60° TiAlN	<div style="display: flex; gap: 20px;"> 163 280 361 450 * * </div>	
 Premium	<div style="display: flex; gap: 5px;"> <div style="border: 1px solid black; padding: 2px;">HB</div> <div style="border: 1px solid black; padding: 2px;">UNI</div> <div style="border: 1px solid black; padding: 2px;"></div> </div>	K205174 SC deburrer 60° TiAlN	<div style="display: flex; gap: 20px;"> 163 280 361 450 * * </div>	
 Premium	<div style="display: flex; gap: 5px;"> <div style="border: 1px solid black; padding: 2px;">HA</div> <div style="border: 1px solid black; padding: 2px;">UNI</div> <div style="border: 1px solid black; padding: 2px;"></div> </div>	K205183 SC deburrer 90° TiAlN	<div style="display: flex; gap: 20px;"> 164 281 362 451 * * </div>	
 Premium	<div style="display: flex; gap: 5px;"> <div style="border: 1px solid black; padding: 2px;">HB</div> <div style="border: 1px solid black; padding: 2px;">UNI</div> <div style="border: 1px solid black; padding: 2px;"></div> </div>	K205184 SC deburrer 90° TiAlN	<div style="display: flex; gap: 20px;"> 164 281 362 451 * * </div>	
 Basic	<div style="display: flex; gap: 5px;"> <div style="border: 1px solid black; padding: 2px;">HA</div> <div style="border: 1px solid black; padding: 2px;">UNI</div> <div style="border: 1px solid black; padding: 2px;"></div> </div>	K205193 SC forward and backward deburrer TiAlN	<div style="display: flex; gap: 20px;"> 165 282 363 452 * * </div>	

ROUGHING CUTTER



K206083
SC roughing cutter short TiAlN MTC

166 364 453 *



K206084
SC roughing cutter short TiAlN MTC

166 364 453 *



K206093
SC roughing cutter long TiAlN MTC

167 * 454 *



K206094
SC roughing cutter long TiAlN MTC

167 * 454 *



K206113
SC roughing cutter long TiAlN MTC

168 365 455 *



K206114
SC roughing cutter long TiAlN MTC

168 365 455 *



K206123
SC roughing cutter long TiAlN MTC

* 366

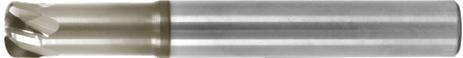
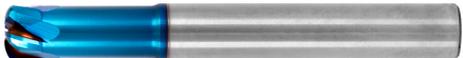


K206124
SC roughing cutter long TiAlN MTC

* 366



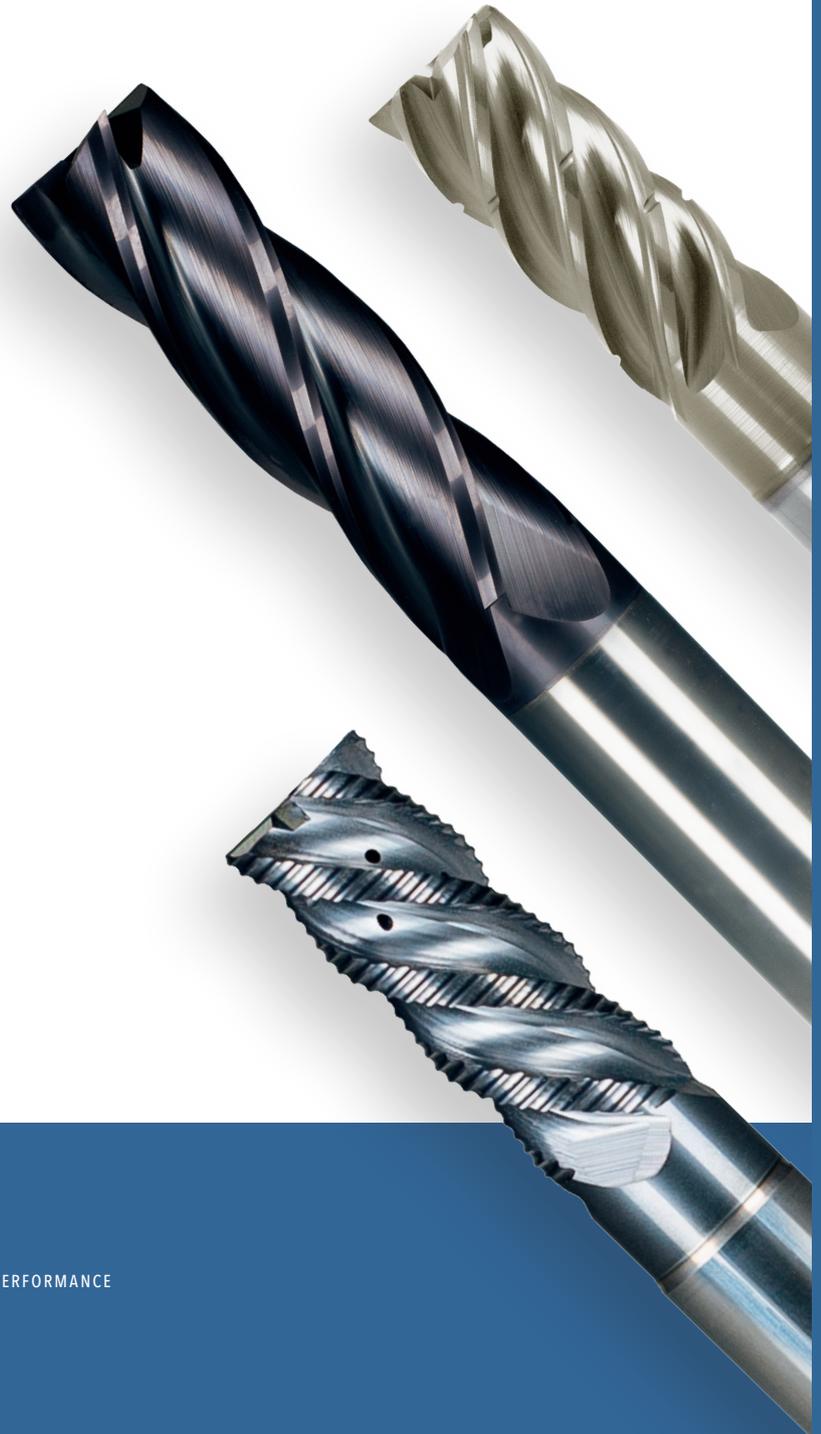
FACE TORUS CUTTER

 Expert	<div style="display: flex; gap: 5px;"> <div style="border: 1px solid black; padding: 2px;">HA</div> <div style="border: 1px solid black; padding: 2px;">HSC</div> <div style="border: 1px solid black; padding: 2px;">UNI</div> <div style="border: 1px solid black; padding: 2px;"></div> </div>	<div style="background-color: #004a87; color: white; padding: 5px; text-align: center; font-weight: bold;">NEW</div>	<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="width: 100%;"></div> <div style="text-align: right;"> 169 367 </div> </div> 
K207003 SC face torus cutter TiSiN HSC			
 Expert	<div style="display: flex; gap: 5px;"> <div style="border: 1px solid black; padding: 2px;">HA</div> <div style="border: 1px solid black; padding: 2px;">HSC</div> <div style="border: 1px solid black; padding: 2px;">UNI</div> <div style="border: 1px solid black; padding: 2px;"></div> </div>	<div style="background-color: #004a87; color: white; padding: 5px; text-align: center; font-weight: bold;">NEW</div>	<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="width: 100%;"></div> <div style="text-align: right;"> 170 368 </div> </div> 
K207008 SC face torus cutter long TiSiN HSC			
 Expert	<div style="display: flex; gap: 5px;"> <div style="border: 1px solid black; padding: 2px;">HA</div> <div style="border: 1px solid black; padding: 2px;">HSC</div> <div style="border: 1px solid black; padding: 2px;"></div> </div>	<div style="background-color: #004a87; color: white; padding: 5px; text-align: center; font-weight: bold;">NEW</div>	<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="width: 100%;"></div> <div style="text-align: right;"> 219 </div> </div> 
K207013 SC face torus cutter TiSiN HSC			
 Expert	<div style="display: flex; gap: 5px;"> <div style="border: 1px solid black; padding: 2px;">HA</div> <div style="border: 1px solid black; padding: 2px;">HSC</div> <div style="border: 1px solid black; padding: 2px;"></div> </div>	<div style="background-color: #004a87; color: white; padding: 5px; text-align: center; font-weight: bold;">NEW</div>	<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="width: 100%;"></div> <div style="text-align: right;"> 220 </div> </div> 
K207018 SC face torus cutter long TiSiN HSC			
 Expert	<div style="display: flex; gap: 5px;"> <div style="border: 1px solid black; padding: 2px;">HA</div> <div style="border: 1px solid black; padding: 2px;">HSC</div> <div style="border: 1px solid black; padding: 2px;"></div> </div>	<div style="background-color: #004a87; color: white; padding: 5px; text-align: center; font-weight: bold;">NEW</div>	<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="width: 100%;"></div> <div style="text-align: right;"> 477 </div> </div> 
K207033 SC face torus cutter TiSiN HSC			
 Expert	<div style="display: flex; gap: 5px;"> <div style="border: 1px solid black; padding: 2px;">HA</div> <div style="border: 1px solid black; padding: 2px;">HSC</div> <div style="border: 1px solid black; padding: 2px;"></div> </div>	<div style="background-color: #004a87; color: white; padding: 5px; text-align: center; font-weight: bold;">NEW</div>	<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="width: 100%;"></div> <div style="text-align: right;"> 478 </div> </div> 
K207038 SC face torus cutter long TiSiN HSC			
 Expert	<div style="display: flex; gap: 5px;"> <div style="border: 1px solid black; padding: 2px;">HA</div> <div style="border: 1px solid black; padding: 2px;">HSC</div> <div style="border: 1px solid black; padding: 2px;"></div> </div>	<div style="background-color: #004a87; color: white; padding: 5px; text-align: center; font-weight: bold;">NEW</div>	<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="width: 100%;"></div> <div style="text-align: right;"> 467 </div> </div> 
K207043 SC face torus cutter TiSiN HSC			
 Expert	<div style="display: flex; gap: 5px;"> <div style="border: 1px solid black; padding: 2px;">HA</div> <div style="border: 1px solid black; padding: 2px;">HSC</div> <div style="border: 1px solid black; padding: 2px;"></div> </div>	<div style="background-color: #004a87; color: white; padding: 5px; text-align: center; font-weight: bold;">NEW</div>	<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="width: 100%;"></div> <div style="text-align: right;"> 468 </div> </div> 
K207048 SC face torus cutter long TiSiN HSC			

HOFMANN & VRATNY — MAXIMUM CUTTING PERFORMANCE

STEEL





HOFMANN & VRATNY — MAXIMUM CUTTING PERFORMANCE

STEEL

Many steel alloys have been established on the market over the last decades. We have always adapted our milling cutters to the new alloys and thus always ensure an efficient machining result.

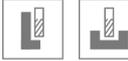
Maximum cutting performance with maximum material removal. We offer milling cutters for almost every steel available on the market, including unalloyed, low-alloyed, high-alloyed and

powder metallurgical steels. In this area, our three-line product range offers the best cutter for every application and budget.

Cooling 

Tolerance e8

Coating -

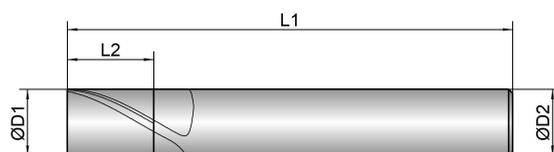
HA HB UNI 



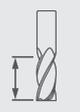
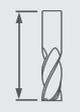
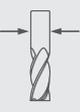
HA K201031



HB K201032



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
60	40	30					45	60	140							

K201031	K201032	D1  mm ø	L2  mm	L1  mm	D2  mm ø	z  #	 °
0,25/3	-	0.25	0.5	38.0	3.0	2	30
0,3/3	-	0.3	1.0	38.0	3.0	2	30
0,35/3	-	0.35	1.0	38.0	3.0	2	30
0,4/3	-	0.4	1.0	38.0	3.0	2	30
0,5/3	-	0.5	1.5	38.0	3.0	2	30
0,6/3	-	0.6	1.5	38.0	3.0	2	30
0,7/3	-	0.7	2.0	38.0	3.0	2	30
0,8/3	-	0.8	2.0	38.0	3.0	2	30
0,9/3	-	0.9	2.5	38.0	3.0	2	30
1/3	-	1.0	3.0	50.0	3.0	2	30
1,1/3	-	1.1	3.0	50.0	3.0	2	30
1,2/3	-	1.2	4.0	50.0	3.0	2	30
1,4/3	-	1.4	4.0	50.0	3.0	2	30

K201031	K201032	D1  mm ∅	L2  mm	L1  mm	D2  mm ∅	z  #	 °
1,5/6	1,5	1.5	3.0	54.0	6.0	2	30
1,5/3	-	1.5	4.0	50.0	3.0	2	30
1,6/3	-	1.6	4.0	50.0	3.0	2	30
1,8/3	-	1.8	5.0	50.0	3.0	2	30
2/6	2	2.0	4.0	54.0	6.0	2	30
2/3	-	2.0	5.0	50.0	3.0	2	30
2,5/3	-	2.5	6.0	50.0	3.0	2	30
3/6	3	3.0	6.0	54.0	6.0	2	30
4/6	4	4.0	7.0	54.0	6.0	2	30
5/6	5	5.0	8.0	54.0	6.0	2	30
6/6	6	6.0	10.0	54.0	6.0	2	30
8/8	8	8.0	12.0	59.0	8.0	2	30
10/10	10	10.0	13.0	67.0	10.0	2	30
12/12	12	12.0	16.0	74.0	12.0	2	30
14/14	14	14.0	16.0	75.0	14.0	2	30
16/16	16	16.0	20.0	83.0	16.0	2	30
18/18	18	18.0	20.0	85.0	18.0	2	30
20/20	20	20.0	25.0	93.0	20.0	2	30

Cooling

Tolerance e8

Coating TiAlN- α

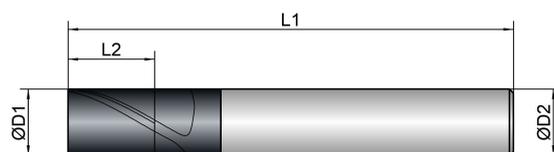
HA HB UNI



HA K201033



HB K201034



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
120	100	80					80	100	280							

K201033	K201034	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	 °
0,25/3	-	0.25	0.5	38.0	3.0	2	30
0,3/3	-	0.3	1.0	38.0	3.0	2	30
0,35/3	-	0.35	1.0	38.0	3.0	2	30
0,4/3	-	0.4	1.0	38.0	3.0	2	30
0,5/3	-	0.5	1.5	38.0	3.0	2	30
0,6/3	-	0.6	1.5	38.0	3.0	2	30
0,7/3	-	0.7	2.0	38.0	3.0	2	30
0,8/3	-	0.8	2.0	38.0	3.0	2	30
0,9/3	-	0.9	2.5	38.0	3.0	2	30
1/3	-	1.0	3.0	50.0	3.0	2	30
1,1/3	-	1.1	3.0	50.0	3.0	2	30
1,2/3	-	1.2	4.0	50.0	3.0	2	30
1,4/3	-	1.4	4.0	50.0	3.0	2	30

K201033	K201034	D1  mm ∅	L2  mm	L1  mm	D2  mm ∅	z  #	 °
1,5/6	1,5	1.5	3.0	54.0	6.0	2	30
1,5/3	-	1.5	4.0	50.0	3.0	2	30
1,6/3	-	1.6	4.0	50.0	3.0	2	30
1,8/3	-	1.8	5.0	50.0	3.0	2	30
2/6	2	2.0	4.0	54.0	6.0	2	30
2/3	-	2.0	5.0	50.0	3.0	2	30
2,5/3	-	2.5	6.0	50.0	3.0	2	30
3/6	3	3.0	6.0	54.0	6.0	2	30
4/6	4	4.0	7.0	54.0	6.0	2	30
5/6	5	5.0	8.0	54.0	6.0	2	30
6/6	6	6.0	10.0	54.0	6.0	2	30
8/8	8	8.0	12.0	59.0	8.0	2	30
10/10	10	10.0	13.0	67.0	10.0	2	30
12/12	12	12.0	16.0	74.0	12.0	2	30
14/14	14	14.0	16.0	75.0	14.0	2	30
16/16	16	16.0	20.0	83.0	16.0	2	30
18/18	18	18.0	20.0	85.0	18.0	2	30
20/20	20	20.0	25.0	93.0	20.0	2	30

Cooling

Tolerance e8

Coating -

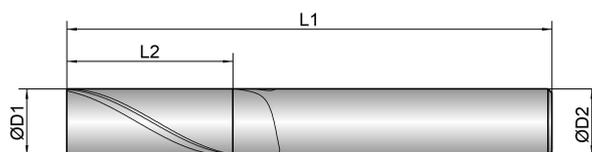
HA HB UNI



HA K201051



HB K201052



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
60	40	30					45	60	140							

K201051	K201052	D1	L2	L1	D2	z	°
		mm Ø	mm	mm	mm Ø	#	
1	1	1.0	4.0	58.0	6.0	2	30
1,5	1,5	1.5	6.0	58.0	6.0	2	30
2	2	2.0	7.0	58.0	6.0	2	30
3	3	3.0	10.0	58.0	6.0	2	30
4	4	4.0	13.0	58.0	6.0	2	30
5	5	5.0	15.0	58.0	6.0	2	30
6	6	6.0	16.0	58.0	6.0	2	30
8	8	8.0	22.0	70.0	8.0	2	30
10	10	10.0	25.0	73.0	10.0	2	30
12	12	12.0	26.0	84.0	12.0	2	30
14	14	14.0	26.0	84.0	14.0	2	30
16	16	16.0	30.0	93.0	16.0	2	30
18	18	18.0	30.0	93.0	18.0	2	30
20	20	20.0	40.0	104.0	20.0	2	30

Cooling

Tolerance e8

Coating TiAlN- α

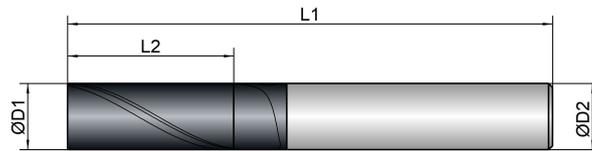
HA HB UNI



HA K201053



HB K201054



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
100	80	60					80	100	180							

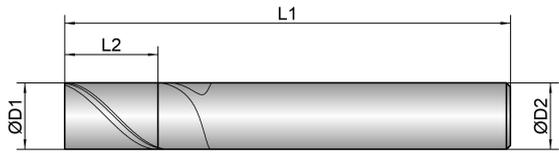
K201053	K201054	D1	L2	L1	D2	z	
		mm Ø	mm	mm	mm Ø	#	
1	1	1.0	4.0	58.0	6.0	2	30
1,5	1,5	1.5	6.0	58.0	6.0	2	30
2	2	2.0	7.0	58.0	6.0	2	30
3	3	3.0	10.0	58.0	6.0	2	30
4	4	4.0	13.0	58.0	6.0	2	30
5	5	5.0	15.0	58.0	6.0	2	30
6	6	6.0	16.0	58.0	6.0	2	30
8	8	8.0	22.0	70.0	8.0	2	30
10	10	10.0	25.0	73.0	10.0	2	30
12	12	12.0	26.0	84.0	12.0	2	30
14	14	14.0	26.0	84.0	14.0	2	30
16	16	16.0	30.0	93.0	16.0	2	30
18	18	18.0	30.0	93.0	18.0	2	30
20	20	20.0	40.0	104.0	20.0	2	30

Cooling

Tolerance e8

Coating -

HA UNI



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
60	40	30					45	60	140							

K201071	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	 °
2	2.0	4.0	32.0	2.0	2	45
3	3.0	6.0	32.0	3.0	2	45
4	4.0	7.0	36.0	4.0	2	45
5	5.0	8.0	54.0	6.0	2	45
6	6.0	10.0	54.0	6.0	2	45
7	7.0	12.0	59.0	8.0	2	45
8	8.0	12.0	59.0	8.0	2	45
9	9.0	14.0	67.0	10.0	2	45
10	10.0	14.0	67.0	10.0	2	45
12	12.0	16.0	73.0	12.0	2	45
14	14.0	18.0	75.0	14.0	2	45
16	16.0	20.0	83.0	16.0	2	45
18	18.0	20.0	85.0	18.0	2	45
20	20.0	25.0	93.0	20.0	2	45

Cooling 

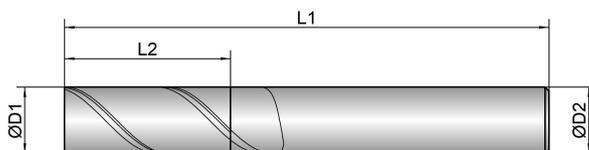
Tolerance e8

Coating -

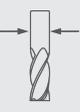
HA UNI  



HA K201081



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
60	40	30					45	60	140							

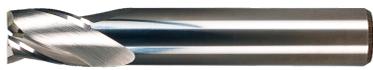
K201081	D1  mm ø	L2  mm	L1  mm	D2  mm ø	z  #	 °
2	2.0	7.0	32.0	2.0	2	45
3	3.0	10.0	38.0	3.0	2	45
4	4.0	13.0	40.0	4.0	2	45
5	5.0	15.0	58.0	6.0	2	45
6	6.0	16.0	58.0	6.0	2	45
7	7.0	20.0	70.0	8.0	2	45
8	8.0	22.0	70.0	8.0	2	45
9	9.0	22.0	73.0	10.0	2	45
10	10.0	25.0	73.0	10.0	2	45
12	12.0	28.0	84.0	12.0	2	45
14	14.0	30.0	84.0	14.0	2	45
16	16.0	35.0	93.0	16.0	2	45
18	18.0	35.0	101.0	18.0	2	45
20	20.0	40.0	104.0	20.0	2	45

Cooling

Tolerance e8

Coating -

HA HB MTC UNI



HA K201161



HB K201162



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
60	40	30					45	60	140							

K201161	K201162	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	 °
1,5	1,5	1.5	3.0	54.0	6.0	3	30
2	2	2.0	4.0	54.0	6.0	3	30
3	3	3.0	6.0	54.0	6.0	3	30
4	4	4.0	7.0	54.0	6.0	3	30
5	5	5.0	8.0	54.0	6.0	3	30
6	6	6.0	10.0	54.0	6.0	3	30
8	8	8.0	12.0	59.0	8.0	3	30
10	10	10.0	13.0	67.0	10.0	3	30
12	12	12.0	16.0	74.0	12.0	3	30
14	14	14.0	16.0	75.0	14.0	3	30
16	16	16.0	20.0	83.0	16.0	3	30
18	18	18.0	20.0	85.0	18.0	3	30
20	20	20.0	25.0	93.0	20.0	3	30

Cooling

Tolerance e8

Coating TiAlN- α

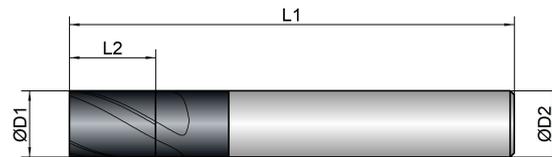
HA HB HPC MTC UNI



HA K201163



HB K201164



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
220	190	160					80	160								

K201163	K201164	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	 °
1,5	1,5	1.5	3.0	54.0	6.0	3	30
2	2	2.0	4.0	54.0	6.0	3	30
3	3	3.0	6.0	54.0	6.0	3	30
4	4	4.0	7.0	54.0	6.0	3	30
5	5	5.0	8.0	54.0	6.0	3	30
6	6	6.0	10.0	54.0	6.0	3	30
8	8	8.0	12.0	59.0	8.0	3	30
10	10	10.0	13.0	67.0	10.0	3	30
12	12	12.0	16.0	74.0	12.0	3	30
14	14	14.0	16.0	75.0	14.0	3	30
16	16	16.0	20.0	83.0	16.0	3	30
18	18	18.0	20.0	85.0	18.0	3	30
20	20	20.0	25.0	93.0	20.0	3	30

Cooling

Tolerance e8

Coating -

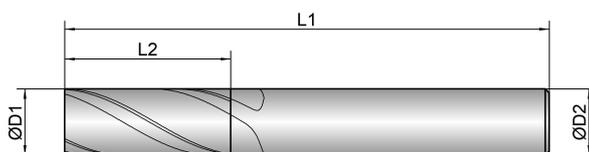
HA HB MTC UNI



HA K201181



HB K201182



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
60	40	30					45	60	140							

K201181	K201182	D1	L2	L1	D2	z	°
		mm Ø	mm	mm	mm Ø	#	
1	1	1.0	4.0	58.0	6.0	3	30
1,5	1,5	1.5	6.0	58.0	6.0	3	30
2	2	2.0	7.0	58.0	6.0	3	30
3	3	3.0	10.0	58.0	6.0	3	30
4	4	4.0	13.0	58.0	6.0	3	30
5	5	5.0	15.0	58.0	6.0	3	30
6	6	6.0	16.0	58.0	6.0	3	30
8	8	8.0	22.0	70.0	8.0	3	30
10	10	10.0	25.0	73.0	10.0	3	30
12	12	12.0	26.0	84.0	12.0	3	30
14	14	14.0	26.0	84.0	14.0	3	30
16	16	16.0	32.0	93.0	16.0	3	30
18	18	18.0	32.0	93.0	18.0	3	30
20	20	20.0	40.0	104.0	20.0	3	30

Cooling

Tolerance e8

Coating TiAlN- α

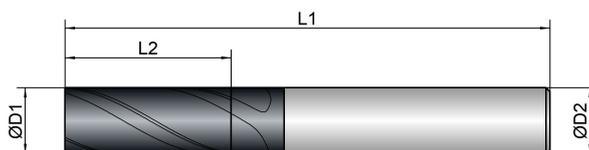
HA HB HPC MTC UNI



HA K201183



HB K201184



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
220	190	160					80	160								

K201183	K201184	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	 °
1	1	1.0	4.0	58.0	6.0	3	30
1,5	1,5	1.5	6.0	58.0	6.0	3	30
2	2	2.0	7.0	58.0	6.0	3	30
3	3	3.0	10.0	58.0	6.0	3	30
4	4	4.0	13.0	58.0	6.0	3	30
5	5	5.0	15.0	58.0	6.0	3	30
6	6	6.0	16.0	58.0	6.0	3	30
8	8	8.0	22.0	70.0	8.0	3	30
10	10	10.0	25.0	73.0	10.0	3	30
12	12	12.0	26.0	84.0	12.0	3	30
14	14	14.0	26.0	84.0	14.0	3	30
16	16	16.0	32.0	93.0	16.0	3	30
18	18	18.0	32.0	93.0	18.0	3	30
20	20	20.0	40.0	104.0	20.0	3	30

Cooling

Tolerance e8

Coating -

HA HB UNI

NEW

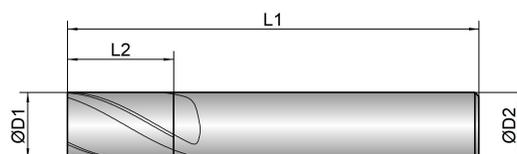
Basic



HA K201251



HB K201252



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
80	55	40					60	70	210							

K201251	K201252	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	 °
1	1	1.0	2.0	45.0	6.0	3	30
1,2	1,2	1.2	2.0	45.0	6.0	3	30
1,5	1,5	1.5	3.0	45.0	6.0	3	30
1,8	1,8	1.8	3.0	45.0	6.0	3	30
2	2	2.0	4.0	45.0	6.0	3	30
2,5	2,5	2.5	4.0	45.0	6.0	3	30
2,8	2,8	2.8	6.0	45.0	6.0	3	30
3	3	3.0	6.0	45.0	6.0	3	30
3,5	3,5	3.5	6.0	45.0	6.0	3	30
3,8	3,8	3.8	7.0	45.0	6.0	3	30
4	4	4.0	7.0	45.0	6.0	3	30
4,5	4,5	4.5	7.0	45.0	6.0	3	30
4,75	4,75	4.75	8.0	45.0	6.0	3	30

K201251	K201252	D1  mm ∅	L2  mm	L1  mm	D2  mm ∅	z  #	 °
5	5	5.0	8.0	45.0	6.0	3	30
5,5	5,5	5.5	8.0	45.0	6.0	3	30
5,75	5,75	5.75	10.0	45.0	6.0	3	30
6	6	6.0	10.0	45.0	6.0	3	30
6,75	6,75	6.75	10.0	55.0	8.0	3	30
7	7	7.0	12.0	55.0	8.0	3	30
7,75	7,75	7.75	12.0	55.0	8.0	3	30
8	8	8.0	13.0	55.0	8.0	3	30
8,7	8,7	8.7	14.0	55.0	10.0	3	30
9	9	9.0	14.0	55.0	10.0	3	30
9,7	9,7	9.7	16.0	55.0	10.0	3	30
10	10	10.0	16.0	55.0	10.0	3	30

Cooling

Tolerance e8

Coating TiAlN- α

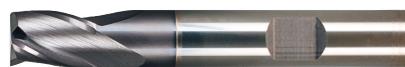
HA HB UNI

NEW

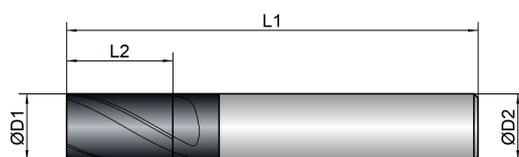
Basic



HA K201253



HB K201254



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
110	75	65					85	95	290							

K201253	K201254	D1	L2	L1	D2	z	°
		mm	mm	mm	mm	#	
1	1	1.0	2.0	45.0	6.0	3	30
1,2	1,2	1.2	2.0	45.0	6.0	3	30
1,5	1,5	1.5	3.0	45.0	6.0	3	30
1,8	1,8	1.8	3.0	45.0	6.0	3	30
2	2	2.0	4.0	45.0	6.0	3	30
2,5	2,5	2.5	4.0	45.0	6.0	3	30
2,8	2,8	2.8	6.0	45.0	6.0	3	30
3	3	3.0	6.0	45.0	6.0	3	30
3,5	3,5	3.5	6.0	45.0	6.0	3	30
3,8	3,8	3.8	7.0	45.0	6.0	3	30
4	4	4.0	7.0	45.0	6.0	3	30
4,5	4,5	4.5	7.0	45.0	6.0	3	30
4,75	4,75	4.75	8.0	45.0	6.0	3	30

K201253	K201254	D1  mm ∅	L2  mm	L1  mm	D2  mm ∅	z  #	 °
5	5	5.0	8.0	45.0	6.0	3	30
5,5	5,5	5.5	8.0	45.0	6.0	3	30
5,75	5,75	5.75	10.0	45.0	6.0	3	30
6	6	6.0	10.0	45.0	6.0	3	30
6,75	6,75	6.75	10.0	55.0	8.0	3	30
7	7	7.0	12.0	55.0	8.0	3	30
7,75	7,75	7.75	12.0	55.0	8.0	3	30
8	8	8.0	13.0	55.0	8.0	3	30
8,7	8,7	8.7	14.0	55.0	10.0	3	30
9	9	9.0	14.0	55.0	10.0	3	30
9,7	9,7	9.7	16.0	55.0	10.0	3	30
10	10	10.0	16.0	55.0	10.0	3	30

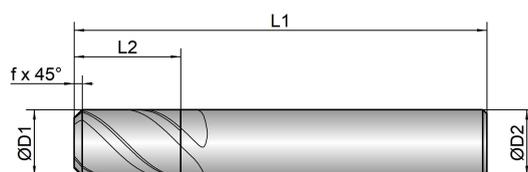
Cooling	
Tolerance	e8
Coating	-



HA K201271



HB K201272



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
70	45	30					60	65	200	160						

K201271	K201272	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	45° mm	 °
1/6	1/6	1.0	2.0	45.0	6.0	3	0.02	45
1,5/6	1,5/6	1.5	3.0	45.0	6.0	3	0.03	45
2/6	2/6	2.0	4.0	45.0	6.0	3	0.03	45
2,5/6	2,5/6	2.5	5.0	45.0	6.0	3	0.03	45
3/6	3/6	3.0	6.0	45.0	6.0	3	0.03	45
3,5/6	3,5/6	3.5	6.0	45.0	6.0	3	0.03	45
4/6	4/6	4.0	7.0	45.0	6.0	3	0.04	45
4,5/6	4,5/6	4.5	8.0	45.0	6.0	3	0.04	45
5/6	5/6	5.0	8.0	45.0	6.0	3	0.04	45
5,5/6	5,5/6	5.5	8.0	45.0	6.0	3	0.04	45
6/6	6/6	6.0	10.0	45.0	6.0	3	0.04	45
8/8	8/8	8.0	13.0	55.0	8.0	3	0.05	45
10/10	10/10	10.0	16.0	55.0	10.0	3	0.05	45

Cooling

Tolerance e8

Coating TiAlN- α

HA HB UNI

NEW

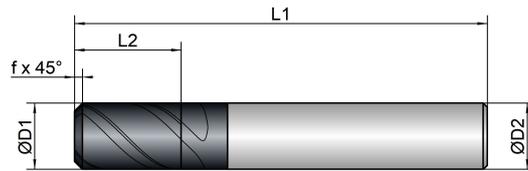
Basic



HA K201273



HB K201274



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
100	70	50					90	85	290	200						

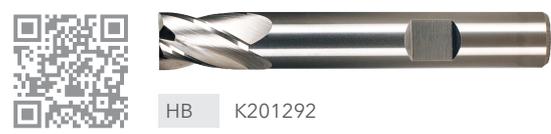
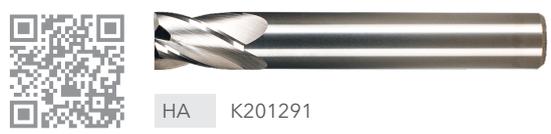
K201273	K201274	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	45° mm	 °
1/6	1/6	1.0	2.0	45.0	6.0	3	0.02	45
1,5/6	1,5/6	1.5	3.0	45.0	6.0	3	0.03	45
2/6	2/6	2.0	4.0	45.0	6.0	3	0.03	45
2,5/6	2,5/6	2.5	5.0	45.0	6.0	3	0.03	45
3/6	3/6	3.0	6.0	45.0	6.0	3	0.03	45
3,5/6	3,5/6	3.5	6.0	45.0	6.0	3	0.03	45
4/6	4/6	4.0	7.0	45.0	6.0	3	0.04	45
4,5/6	4,5/6	4.5	8.0	45.0	6.0	3	0.04	45
5/6	5/6	5.0	8.0	45.0	6.0	3	0.04	45
5,5/6	5,5/6	5.5	8.0	45.0	6.0	3	0.04	45
6/6	6/6	6.0	10.0	45.0	6.0	3	0.04	45
8/8	8/8	8.0	13.0	55.0	8.0	3	0.05	45
10/10	10/10	10.0	16.0	55.0	10.0	3	0.05	45

Cooling

Tolerance e8

Coating -

HA HB MTC UNI



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
60	40	30					45	60	140							

K201291	K201292	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	 °
1,5/3	-	1.5	3.0	38.0	3.0	4	30
2/6	2	2.0	4.0	54.0	6.0	4	30
2/3	-	2.0	4.0	38.0	3.0	4	30
2,5/3	-	2.5	4.0	38.0	3.0	4	30
3/6	3	3.0	6.0	54.0	6.0	4	30
3/3	-	3.0	6.0	38.0	3.0	4	30
4/6	4	4.0	7.0	54.0	6.0	4	30
5/6	5	5.0	8.0	54.0	6.0	4	30
6/6	6	6.0	10.0	54.0	6.0	4	30
8/8	8	8.0	12.0	59.0	8.0	4	30
10/10	10	10.0	14.0	67.0	10.0	4	30
12/12	12	12.0	16.0	74.0	12.0	4	30
14/14	14	14.0	18.0	75.0	14.0	4	30
16/16	16	16.0	22.0	83.0	16.0	4	30
18/18	18	18.0	20.0	80.0	18.0	4	30
20/20	20	20.0	25.0	93.0	20.0	4	30

Cooling 

Tolerance e8

Coating TiAlN- α

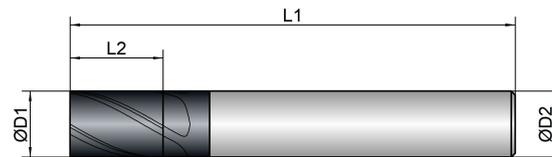
HA HB HPC MTC UNI 



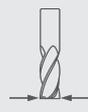
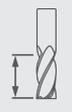
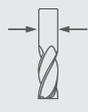
HA K201293



HB K201294



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
220	190	160					80	160								

K201293	K201294	D1	L2	L1	D2	z	
		 mm ø	 mm	 mm	 mm ø	 #	
1,5/3	-	1.5	3.0	38.0	3.0	4	30
2/6	2	2.0	4.0	54.0	6.0	4	30
2/3	-	2.0	4.0	38.0	3.0	4	30
2,5/3	-	2.5	4.0	38.0	3.0	4	30
3/6	3	3.0	6.0	54.0	6.0	4	30
3/3	-	3.0	6.0	38.0	3.0	4	30
4/6	4	4.0	7.0	54.0	6.0	4	30
5/6	5	5.0	8.0	54.0	6.0	4	30
6/6	6	6.0	10.0	54.0	6.0	4	30
8/8	8	8.0	12.0	59.0	8.0	4	30
10/10	10	10.0	14.0	67.0	10.0	4	30
12/12	12	12.0	16.0	74.0	12.0	4	30
14/14	14	14.0	18.0	75.0	14.0	4	30
16/16	16	16.0	22.0	83.0	16.0	4	30
18/18	18	18.0	20.0	80.0	18.0	4	30
20/20	20	20.0	25.0	93.0	20.0	4	30

Cooling

Tolerance e8

Coating -

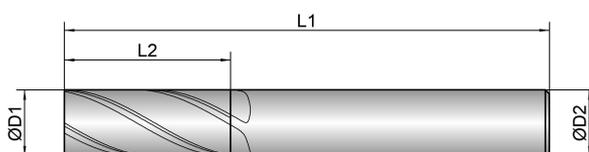
HA HB MTC UNI



HA K201311



HB K201312



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
60	40	30					45	60	140							

K201311	K201312	D1	L2	L1	D2	z	°
		mm Ø	mm	mm	mm Ø	#	
2/6	2	2.0	7.0	58.0	6.0	4	30
2/2	-	2.0	7.0	38.0	2.0	4	30
3/6	3	3.0	10.0	58.0	6.0	4	30
3/3	-	3.0	10.0	38.0	3.0	4	30
4/6	4	4.0	13.0	58.0	6.0	4	30
4/4	-	4.0	13.0	50.0	4.0	4	30
5/6	5	5.0	15.0	58.0	6.0	4	30
5/5	-	5.0	15.0	50.0	5.0	4	30
6/6	6	6.0	16.0	58.0	6.0	4	30
7/8	7	7.0	19.0	64.0	8.0	4	30
8/8	8	8.0	22.0	70.0	8.0	4	30
9/10	9	9.0	23.0	73.0	10.0	4	30
10/10	10	10.0	25.0	73.0	10.0	4	30
11/12	11	11.0	26.0	84.0	12.0	4	30
12/12	12	12.0	28.0	84.0	12.0	4	30
14/14	14	14.0	30.0	84.0	14.0	4	30
16/16	16	16.0	35.0	93.0	16.0	4	30
18/18	18	18.0	35.0	93.0	18.0	4	30
20/20	20	20.0	40.0	104.0	20.0	4	30

Cooling

Tolerance e8

Coating TiAlN- α

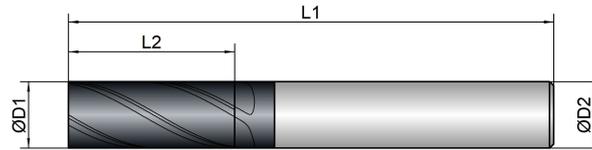
HA HB HPC MTC UNI



HA K201313



HB K201314



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
220	190	160					80	160								

K201313	K201314	D1	L2	L1	D2	z	°
		mm \varnothing	mm	mm	mm \varnothing	#	
2/6	2	2.0	7.0	58.0	6.0	4	30
2/2	-	2.0	7.0	38.0	2.0	4	30
3/6	3	3.0	10.0	58.0	6.0	4	30
3/3	-	3.0	10.0	38.0	3.0	4	30
4/6	4	4.0	13.0	58.0	6.0	4	30
4/4	-	4.0	13.0	50.0	4.0	4	30
5/6	5	5.0	15.0	58.0	6.0	4	30
5/5	-	5.0	15.0	50.0	5.0	4	30
6/6	6	6.0	16.0	58.0	6.0	4	30
7/8	7	7.0	19.0	64.0	8.0	4	30
8/8	8	8.0	22.0	70.0	8.0	4	30
9/10	9	9.0	23.0	73.0	10.0	4	30
10/10	10	10.0	25.0	73.0	10.0	4	30
11/12	11	11.0	26.0	84.0	12.0	4	30
12/12	12	12.0	28.0	84.0	12.0	4	30
14/14	14	14.0	30.0	84.0	14.0	4	30
16/16	16	16.0	35.0	93.0	16.0	4	30
18/18	18	18.0	35.0	93.0	18.0	4	30
20/20	20	20.0	40.0	104.0	20.0	4	30

Cooling

Tolerance e8

Coating -

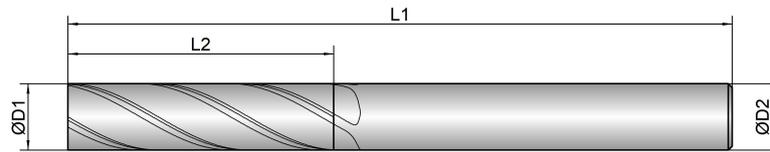
HA HB MTC UNI



HA K201341



HB K201342



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
45	35	25					35	55	110							

K201341	K201342	D1	L2	L1	D2	z	°
		mm ø	mm	mm	mm ø	#	
3X16	-	3.0	16.0	75.0	3.0	4	30
4X16	-	4.0	16.0	75.0	4.0	4	30
4X20	-	4.0	20.0	100.0	4.0	4	30
5X20	-	5.0	20.0	75.0	5.0	4	30
5X25	-	5.0	25.0	100.0	5.0	4	30
6X24	6X24	6.0	24.0	80.0	6.0	4	30
6X30	6X30	6.0	30.0	100.0	6.0	4	30
8X32	8X32	8.0	32.0	100.0	8.0	4	30
8X40	8X40	8.0	40.0	120.0	8.0	4	30
10X40	10X40	10.0	40.0	100.0	10.0	4	30
10X50	10X50	10.0	50.0	120.0	10.0	4	30
12X48	12X48	12.0	48.0	120.0	12.0	4	30
12X60	12X60	12.0	60.0	150.0	12.0	4	30
14X45	14X45	14.0	45.0	100.0	14.0	4	30
14X56	14X56	14.0	56.0	150.0	14.0	4	30
16X50	16X50	16.0	50.0	125.0	16.0	4	30
16X65	16X65	16.0	65.0	150.0	16.0	4	30
18X55	18X55	18.0	55.0	130.0	18.0	4	30
18X72	18X72	18.0	72.0	150.0	18.0	4	30
20X60	20X60	20.0	60.0	135.0	20.0	4	30
20X80	20X80	20.0	80.0	150.0	20.0	4	30
25X75	25X75	25.0	75.0	150.0	25.0	4	30

Cooling

Tolerance e8

Coating TiAlN- α

HA HB ETC HPC

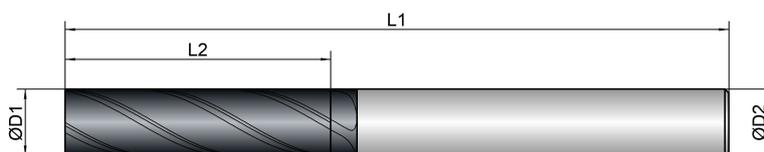
MTC UNI



HA K201343



HB K201344



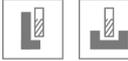
Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
90	75	65					45								30	

K201343	K201344	D1 mm Ø	L2 mm	L1 mm	D2 mm Ø	z #	 °
3X16	-	3.0	16.0	75.0	3.0	4	30
4X16	-	4.0	16.0	75.0	4.0	4	30
4X20	-	4.0	20.0	100.0	4.0	4	30
5X20	-	5.0	20.0	75.0	5.0	4	30
5X25	-	5.0	25.0	100.0	5.0	4	30
6X24	6X24	6.0	24.0	80.0	6.0	4	30
6X30	6X30	6.0	30.0	100.0	6.0	4	30
8X32	8X32	8.0	32.0	100.0	8.0	4	30
8X40	8X40	8.0	40.0	120.0	8.0	4	30
10X40	10X40	10.0	40.0	100.0	10.0	4	30
10X50	10X50	10.0	50.0	120.0	10.0	4	30
12X48	12X48	12.0	48.0	120.0	12.0	4	30
12X60	12X60	12.0	60.0	150.0	12.0	4	30
14X45	14X45	14.0	45.0	100.0	14.0	4	30
14X56	14X56	14.0	56.0	150.0	14.0	4	30
16X50	16X50	16.0	50.0	125.0	16.0	4	30
16X65	16X65	16.0	65.0	150.0	16.0	4	30
18X55	18X55	18.0	55.0	130.0	18.0	4	30
18X72	18X72	18.0	72.0	150.0	18.0	4	30
20X60	20X60	20.0	60.0	135.0	20.0	4	30
20X80	20X80	20.0	80.0	150.0	20.0	4	30
25X75	25X75	25.0	75.0	150.0	25.0	4	30

Cooling 

Tolerance e8

Coating -

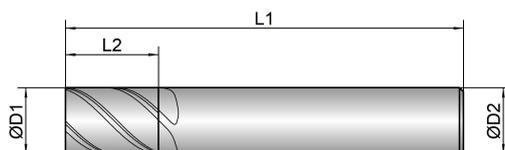
HA HB MTC UNI 



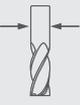
HA K201401



HB K201402



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
60	40	30					45	60	140							

K201401	K201402	D1  mm Ø	L2  mm	L1  mm	D2  mm Ø	z  #	 °
3	3	3.0	6.0	54.0	6.0	4	45
4	4	4.0	7.0	54.0	6.0	4	45
5	5	5.0	8.0	54.0	6.0	4	45
6	6	6.0	10.0	54.0	6.0	4	45
8	8	8.0	12.0	59.0	8.0	4	45
10	10	10.0	14.0	60.0	10.0	4	45
12	12	12.0	16.0	70.0	12.0	4	45
14	14	14.0	18.0	70.0	14.0	4	45
16	16	16.0	20.0	80.0	16.0	4	45
18	18	18.0	20.0	80.0	18.0	4	45
20	20	20.0	25.0	85.0	20.0	4	45

Cooling

Tolerance e8

Coating TiCn- α

HA HB ETC HPC

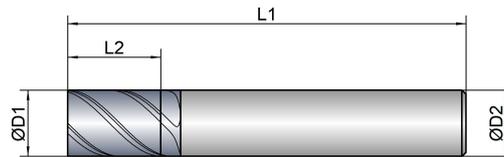
MTC UNI



HA K201403



HB K201404



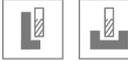
Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
220	190	160					80	160								

K201403	K201404	D1	L2	L1	D2	z	°
		mm \varnothing	mm	mm	mm \varnothing	#	
3	3	3.0	6.0	54.0	6.0	4	45
4	4	4.0	7.0	54.0	6.0	4	45
5	5	5.0	8.0	54.0	6.0	4	45
6	6	6.0	10.0	54.0	6.0	4	45
8	8	8.0	12.0	59.0	8.0	4	45
10	10	10.0	14.0	60.0	10.0	4	45
12	12	12.0	16.0	70.0	12.0	4	45
14	14	14.0	18.0	70.0	14.0	4	45
16	16	16.0	20.0	80.0	16.0	4	45
18	18	18.0	20.0	80.0	18.0	4	45
20	20	20.0	25.0	85.0	20.0	4	45

Cooling 

Tolerance e8

Coating -

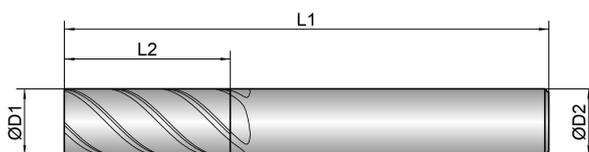
HA HB MTC UNI 



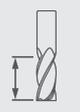
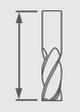
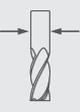
HA K201411



HB K201412



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
60	40	30					45	60	140							

K201411	K201412	D1	L2	L1	D2	z	°
		 mm ø	 mm	 mm	 mm ø	 #	
3	3	3.0	10.0	58.0	6.0	4	45
4	4	4.0	13.0	58.0	6.0	4	45
5	5	5.0	15.0	58.0	6.0	4	45
6	6	6.0	16.0	58.0	6.0	4	45
8	8	8.0	22.0	64.0	8.0	4	45
10	10	10.0	25.0	73.0	10.0	4	45
12	12	12.0	28.0	84.0	12.0	4	45
14	14	14.0	30.0	84.0	14.0	4	45
16	16	16.0	36.0	93.0	16.0	4	45
18	18	18.0	36.0	93.0	18.0	4	45
20	20	20.0	41.0	104.0	20.0	4	45
25	25	25.0	50.0	125.0	25.0	4	45

Cooling

Tolerance e8

Coating TiCn- α

HA HB ETC HPC

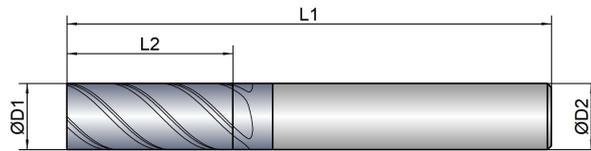
MTC UNI



HA K201413



HB K201414



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
220	190	160					80	160								

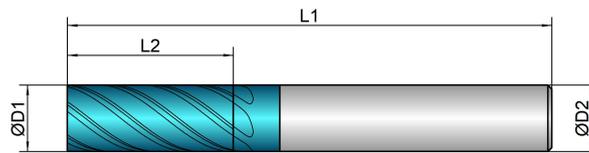
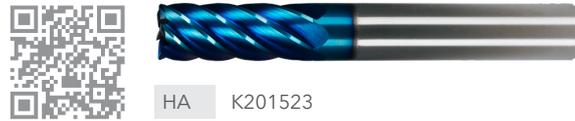
K201413	K201414	D1	L2	L1	D2	z	
		 mm ø	 mm	 mm	 mm ø	 #	
3	3	3.0	10.0	58.0	6.0	4	45
4	4	4.0	13.0	58.0	6.0	4	45
5	5	5.0	15.0	58.0	6.0	4	45
6	6	6.0	16.0	58.0	6.0	4	45
8	8	8.0	22.0	64.0	8.0	4	45
10	10	10.0	25.0	73.0	10.0	4	45
12	12	12.0	28.0	84.0	12.0	4	45
14	14	14.0	30.0	84.0	14.0	4	45
16	16	16.0	36.0	93.0	16.0	4	45
18	18	18.0	36.0	93.0	18.0	4	45
20	20	20.0	41.0	104.0	20.0	4	45
25	25	25.0	50.0	125.0	25.0	4	45

Cooling 

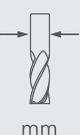
Tolerance e8

Coating TiSiN- α

HA HPC 

Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
		180	175	150	105	90										

K201523	D1  mm ø	L2  mm	L1  mm	D2  mm ø	z  #	 °
2X8	2.0	8.0	58.0	6.0	4	37.5
3X12	3.0	12.0	58.0	6.0	4	37.5
4X13	4.0	13.0	58.0	6.0	4	37.5
5X15	5.0	15.0	58.0	6.0	6	37.5
6X16	6.0	16.0	58.0	6.0	6	37.5
8X22	8.0	22.0	70.0	8.0	6	37.5
10X25	10.0	25.0	73.0	10.0	6	37.5
12X28	12.0	28.0	84.0	12.0	6	37.5
14X30	14.0	30.0	84.0	14.0	6	37.5
16X36	16.0	36.0	93.0	16.0	8	37.5
18X36	18.0	36.0	93.0	18.0	10	37.5
20X41	20.0	41.0	104.0	20.0	10	37.5

Cooling

Tolerance e8

Coating -

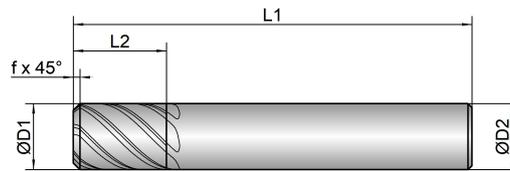
HA HB UNI



HA K201581



HB K201582



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
70	40	30					45	60	150							

K201581	K201582	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	 mm	 °
5	5	5.0	8.0	54.0	6.0	6	0.02	45
6	6	6.0	10.0	54.0	6.0	6	0.03	45
7	7	7.0	12.0	59.0	8.0	6	0.04	45
8	8	8.0	12.0	59.0	8.0	6	0.04	45
9	9	9.0	14.0	60.0	10.0	6	0.04	45
10	10	10.0	14.0	60.0	10.0	6	0.05	45
12	12	12.0	16.0	70.0	12.0	6	0.05	45
14	14	14.0	18.0	70.0	14.0	6	0.06	45
16	16	16.0	20.0	80.0	16.0	6	0.06	45
18	18	18.0	20.0	80.0	18.0	8	0.07	45
20	20	20.0	25.0	85.0	20.0	8	0.07	45

Cooling 

Tolerance e8

Coating TiAlN- α

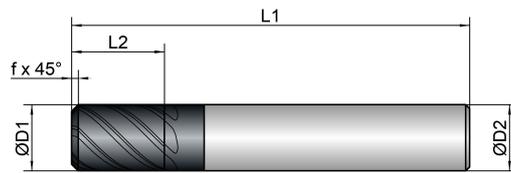
HA HB UNI 



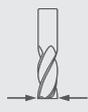
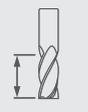
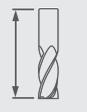
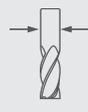
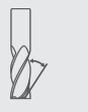
HA K201583



HB K201584



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC		Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite		
170	100	90	70				95	125	600							

K201583	K201584	D1  mm ∅	L2  mm	L1  mm	D2  mm ∅	z  #	 mm	 °
5	5	5.0	8.0	54.0	6.0	6	0.02	45
6	6	6.0	10.0	54.0	6.0	6	0.03	45
7	7	7.0	12.0	59.0	8.0	6	0.04	45
8	8	8.0	12.0	59.0	8.0	6	0.04	45
9	9	9.0	14.0	60.0	10.0	6	0.04	45
10	10	10.0	14.0	60.0	10.0	6	0.05	45
12	12	12.0	16.0	70.0	12.0	6	0.05	45
14	14	14.0	18.0	70.0	14.0	6	0.06	45
16	16	16.0	20.0	80.0	16.0	6	0.06	45
18	18	18.0	20.0	80.0	18.0	8	0.07	45
20	20	20.0	25.0	85.0	20.0	8	0.07	45

Cooling

Tolerance e8

Coating -

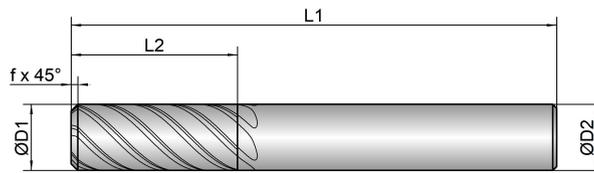
HA HB UNI



HA K201591



HB K201592



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC		Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite		
60	40	30					40	60	140							

K201591	K201592	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	 mm	 °
5	5	5.0	13.0	58.0	6.0	6	0.02	45
6	6	6.0	16.0	58.0	6.0	6	0.03	45
7	7	7.0	22.0	70.0	8.0	6	0.04	45
8	8	8.0	22.0	70.0	8.0	6	0.04	45
9	9	9.0	25.0	73.0	10.0	6	0.04	45
10	10	10.0	25.0	73.0	10.0	6	0.05	45
12	12	12.0	28.0	84.0	12.0	6	0.05	45
14	14	14.0	30.0	84.0	14.0	6	0.06	45
16	16	16.0	35.0	93.0	16.0	6	0.06	45
18	18	18.0	35.0	93.0	18.0	8	0.07	45
20	20	20.0	40.0	100.0	20.0	8	0.07	45
25	25	25.0	55.0	125.0	25.0	8	0.08	45

Cooling	
Tolerance	e8
Coating	TiAlN- α

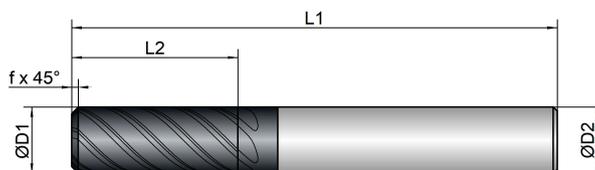
HA	HB	UNI		
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HA K201593



HB K201594



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
175	100	90	65				95	125	600							

K201593	K201594	D1	L2	L1	D2	z	45° mm	 °
		 mm ∅	 mm	 mm	 mm ∅	 #		
5	5	5.0	13.0	58.0	6.0	6	0.02	45
6	6	6.0	16.0	58.0	6.0	6	0.03	45
7	7	7.0	22.0	70.0	8.0	6	0.04	45
8	8	8.0	22.0	70.0	8.0	6	0.04	45
9	9	9.0	25.0	73.0	10.0	6	0.04	45
10	10	10.0	25.0	73.0	10.0	6	0.05	45
12	12	12.0	28.0	84.0	12.0	6	0.05	45
14	14	14.0	30.0	84.0	14.0	6	0.06	45
16	16	16.0	35.0	93.0	16.0	6	0.06	45
18	18	18.0	35.0	93.0	18.0	8	0.07	45
20	20	20.0	40.0	100.0	20.0	8	0.07	45
25	25	25.0	55.0	125.0	25.0	8	0.08	45

Cooling

Tolerance e8

Coating -

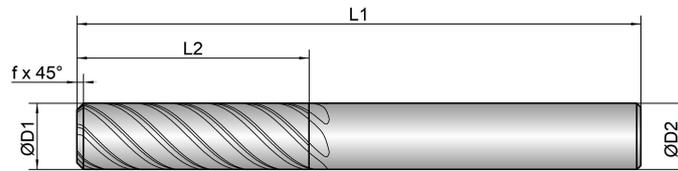
HA HB UNI



HA K201601



HB K201602



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
45	35	25					35	55	110							

K201601	K201602	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	 mm	 °
6X21	6X21	6.0	21.0	65.0	6.0	6	0.03	45
7X25	7X25	7.0	25.0	75.0	8.0	6	0.04	45
8X28	8X28	8.0	28.0	75.0	8.0	6	0.04	45
9X30	9X30	9.0	30.0	85.0	10.0	6	0.04	45
10X35	10X35	10.0	35.0	85.0	10.0	6	0.05	45
12X45	12X45	12.0	45.0	100.0	12.0	6	0.05	45
16X50	16X50	16.0	50.0	110.0	16.0	6	0.06	45
16X65	16X65	16.0	65.0	125.0	16.0	6	0.06	45
20X55	20X55	20.0	55.0	115.0	20.0	8	0.07	45
20X70	20X70	20.0	70.0	135.0	20.0	8	0.07	45
25X75	25X75	25.0	75.0	150.0	25.0	8	0.08	45
32X125	32X125	32.0	125.0	215.0	32.0	9	0.10	45

Cooling

Tolerance e8

Coating TiAlN- α

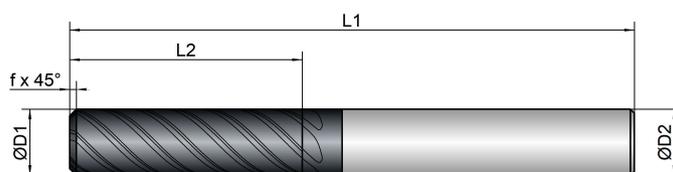
HA HB UNI



HA K201603



HB K201604



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC		Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite		
110	95	85	60				80	170								

K201603	K201604	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	 mm	 °
6X21	6X21	6.0	21.0	65.0	6.0	6	0.03	45
7X25	7X25	7.0	25.0	75.0	8.0	6	0.04	45
8X28	8X28	8.0	28.0	75.0	8.0	6	0.04	45
9X30	9X30	9.0	30.0	85.0	10.0	6	0.04	45
10X35	10X35	10.0	35.0	85.0	10.0	6	0.05	45
12X45	12X45	12.0	45.0	100.0	12.0	6	0.05	45
16X50	16X50	16.0	50.0	110.0	16.0	6	0.06	45
16X65	16X65	16.0	65.0	125.0	16.0	6	0.06	45
20X55	20X55	20.0	55.0	115.0	20.0	8	0.07	45
20X70	20X70	20.0	70.0	135.0	20.0	8	0.07	45
25X75	25X75	25.0	75.0	150.0	25.0	8	0.08	45
32X125	32X125	32.0	125.0	215.0	32.0	9	0.10	45

Cooling 

Tolerance e8

Coating TiAlN- α

HA HB UNI 



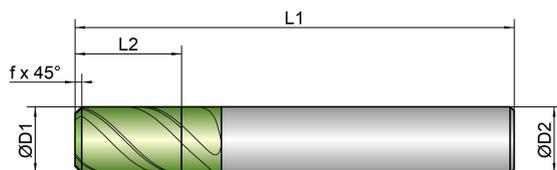
Basic



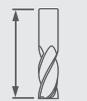
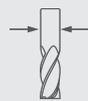
HA K201673



HB K201674



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
100	70	50					90	85	290	200						

K201673	K201674	D1  mm ø	L2  mm	L1  mm	D2  mm ø	z  #	 mm	 °
1	-	1.0	2.0	38.0	3.0	3	0.02	45
1,2	-	1.2	2.0	38.0	3.0	3	0.02	45
1,5	-	1.5	3.0	38.0	3.0	3	0.025	45
2	2	2.0	4.0	50.0	6.0	3	0.03	45
2,5	2,5	2.5	5.0	50.0	6.0	3	0.03	45
3	3	3.0	6.0	50.0	6.0	3	0.03	45
4	4	4.0	7.0	50.0	6.0	3	0.04	45
4,5	4,5	4.5	8.0	50.0	6.0	3	0.04	45
5	5	5.0	8.0	50.0	6.0	3	0.04	45
5,5	5,5	5.5	8.0	50.0	6.0	3	0.04	45
5,75	5,75	5.75	10.0	50.0	6.0	3	0.04	45
6	6	6.0	10.0	50.0	6.0	3	0.04	45
7	7	7.0	12.0	55.0	8.0	3	0.045	45
7,75	7,75	7.75	12.0	55.0	8.0	3	0.05	45
8	8	8.0	13.0	55.0	8.0	3	0.05	45
9	9	9.0	14.0	66.0	10.0	3	0.05	45
9,7	9,7	9.7	16.0	66.0	10.0	3	0.05	45
10	10	10.0	16.0	66.0	10.0	3	0.05	45
12	12	12.0	16.0	73.0	12.0	3	0.05	45
14	14	14.0	16.0	83.0	14.0	3	0.06	45
16	16	16.0	18.0	80.0	16.0	3	0.06	45

Cooling

Tolerance e8

Coating TiAlN- α

HA HB UNI

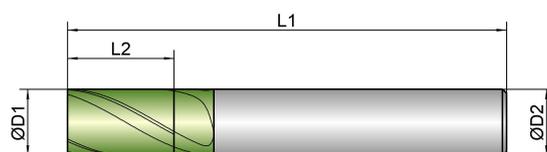
Basic



HA K201677



HB K201678

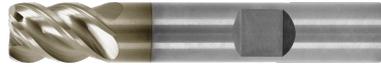


Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
110	75	65					85	95	290							

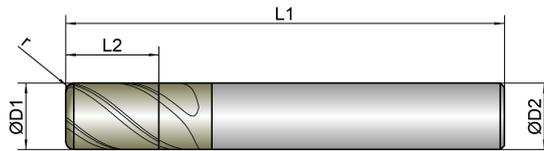
K201677	K201678	D1 mm Ø	L2 mm	L1 mm	D2 mm Ø	z #	 °
1	-	1.0	2.0	38.0	3.0	3	30
1,2	-	1.2	2.0	38.0	3.0	3	30
1,5	-	1.5	3.0	38.0	3.0	3	30
2	2	2.0	4.0	50.0	6.0	3	30
2,5	2,5	2.5	5.0	50.0	6.0	3	30
3	3	3.0	6.0	50.0	6.0	3	30
4	4	4.0	7.0	50.0	6.0	3	30
4,5	4,5	4.5	8.0	50.0	6.0	3	30
5	5	5.0	8.0	50.0	6.0	3	30
5,5	5,5	5.5	8.0	50.0	6.0	3	30
5,75	5,75	5.75	10.0	50.0	6.0	3	30
6	6	6.0	10.0	50.0	6.0	3	30
7	7	7.0	12.0	55.0	8.0	3	30
7,75	7,75	7.75	12.0	55.0	8.0	3	30
8	8	8.0	13.0	55.0	8.0	3	30
9	9	9.0	14.0	66.0	10.0	3	30
9,7	9,7	9.7	16.0	66.0	10.0	3	30
10	10	10.0	16.0	66.0	10.0	3	30
12	12	12.0	16.0	73.0	12.0	3	30
14	14	14.0	16.0	83.0	14.0	3	30
16	16	16.0	18.0	80.0	16.0	3	30

Cooling	
Tolerance	e8
Coating	TiSiN- α

HB	ETC	HPC	MTC	NEW	
UNI	\neq				



HB K201719



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
230	185	150					75	260								

K201719	D1 mm Ø	L2 mm	L1 mm	D2 mm Ø	z #	r mm	 °
3	3.0	6.0	54.0	6.0	4	0.10	40
4	4.0	8.0	54.0	6.0	4	0.10	40
5	5.0	9.0	54.0	6.0	4	0.20	40
6	6.0	10.0	54.0	6.0	4	0.20	40
8	8.0	12.0	58.0	8.0	4	0.20	40
10	10.0	14.0	66.0	10.0	4	0.20	40
12	12.0	16.0	73.0	12.0	4	0.20	40
16	16.0	22.0	82.0	16.0	4	0.30	40
20	20.0	26.0	92.0	20.0	4	0.30	40

Cooling 

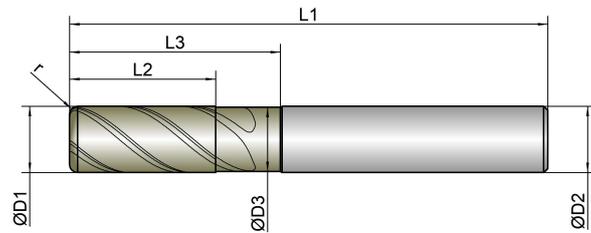
Tolerance e8

Coating TiSiN- α

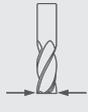
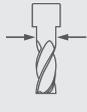
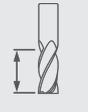
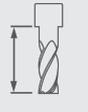
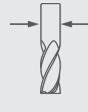
HB ETC HPC MTC

UNI \neq 

NEW 



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
230	185	150					260	75								

K201724	D1  mm \varnothing	D3  mm \varnothing	L2  mm	L3  mm	L1  mm	D2  mm \varnothing	z  #	r  mm	 °
3	3.0	2.8	8.0	13.0	57.0	6.0	4	0.10	40
4	4.0	3.8	11.0	17.0	57.0	6.0	4	0.10	40
5	5.0	4.8	13.0	20.0	57.0	6.0	4	0.20	40
6	6.0	5.8	13.0	20.0	57.0	6.0	4	0.20	40
8	8.0	7.7	19.0	25.0	63.0	8.0	4	0.20	40
10	10.0	9.7	22.0	32.0	72.0	10.0	4	0.20	40
12	12.0	11.6	26.0	38.0	83.0	12.0	4	0.20	40
16	16.0	15.5	32.0	44.0	92.0	16.0	4	0.30	40
20	20.0	19.5	41.0	54.0	104.0	20.0	4	0.30	40

Cooling

Tolerance e8

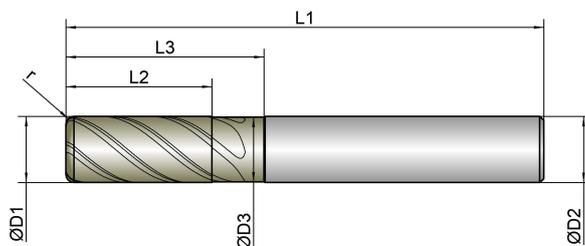
Coating TiSiN- α

HB ETC HPC MTC UNI ≠

NEW



HB K201729



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
230	185	150					75	260								

K201729	D1 mm ∅	D3 mm ∅	L2 mm	L3 mm	L1 mm	D2 mm ∅	z #	r mm	 °
6	6.0	5.8	13.0	19.0	57.0	6.0	5	0.15	40
8	8.0	7.8	19.0	25.0	63.0	8.0	5	0.20	40
10	10.0	9.8	22.0	30.0	72.0	10.0	5	0.20	40
12	12.0	11.8	26.0	36.0	83.0	12.0	5	0.20	40
16	16.0	15.8	32.0	42.0	92.0	16.0	5	0.30	40
20	20.0	19.8	41.0	52.0	104.0	20.0	5	0.30	40

Cooling

Tolerance e8

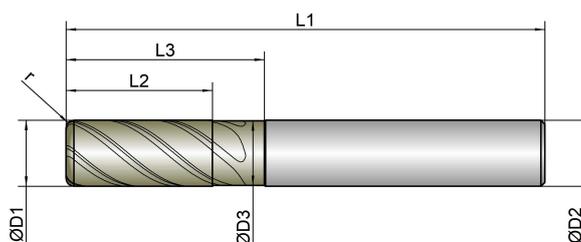
Coating TiSiN- α

HB ETC UNI \neq

NEW



HB K201734



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
320	240	160					190									

	D1	D3	L2	L3	L1	D2	z	r	
K201734	mm ø	mm ø	mm	mm	mm	mm ø	#	mm	°
6	6.0	5.8	13.0	19.0	57.0	6.0	5	0.15	40
8	8.0	7.8	19.0	25.0	63.0	8.0	5	0.20	40
10	10.0	9.8	22.0	30.0	72.0	10.0	5	0.20	40
12	12.0	11.8	26.0	36.0	83.0	12.0	5	0.20	40
16	16.0	15.8	32.0	42.0	92.0	16.0	5	0.30	40
20	20.0	19.8	41.0	52.0	104.0	20.0	5	0.30	40

Cooling 

Tolerance e8

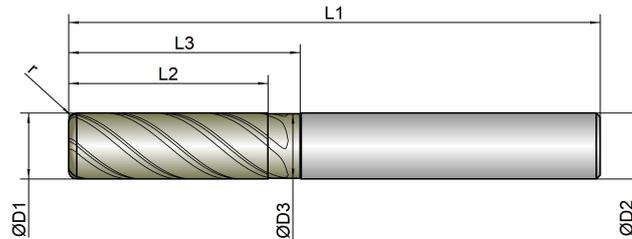
Coating TiSiN- α

HB ETC UNI \neq  3xD

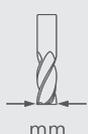
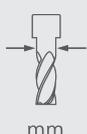
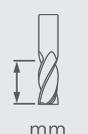
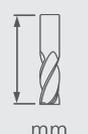
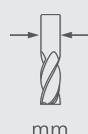
NEW 



HB K201739



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
320	260	140					190									

	D1	D3	L2	L3	L1	D2	z	r	
K201739	 mm ø	 mm ø	 mm	 mm	 mm	 mm ø	 #	 mm	 °
6	6.0	5.8	18.0	25.0	65.0	6.0	5	0.15	40
8	8.0	7.8	24.0	30.0	70.0	8.0	5	0.20	40
10	10.0	9.8	30.0	35.0	80.0	10.0	5	0.20	40
12	12.0	11.8	36.0	45.0	93.0	12.0	5	0.20	40
16	16.0	15.8	48.0	55.0	110.0	16.0	5	0.30	40
20	20.0	19.8	60.0	70.0	125.0	20.0	5	0.30	40

Cooling 

Tolerance e8

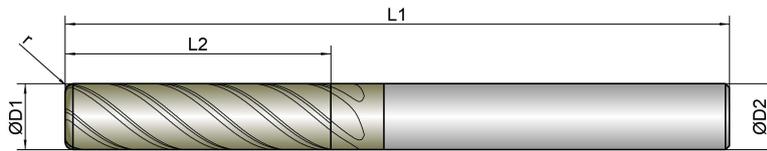
Coating TiSiN- α

HB ETC UNI \neq  4xD

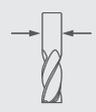
NEW




HB K201744



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
310	230	150					180									

K201744	D1  mm ø	L2  mm	L1  mm	D2  mm ø	z  #	r  mm	 °
6	6.0	24.0	68.0	6.0	5	0.15	40
8	8.0	32.0	75.0	8.0	5	0.20	40
10	10.0	40.0	90.0	10.0	5	0.20	40
12	12.0	48.0	100.0	12.0	5	0.20	40
16	16.0	64.0	125.0	16.0	5	0.30	40
20	20.0	80.0	150.0	20.0	5	0.30	40

Cooling 

Tolerance e8

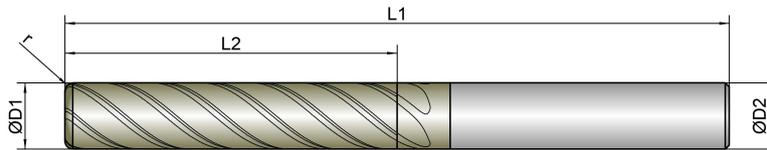
Coating TiSiN- α

HB ETC UNI \neq 

5xD **NEW**  Expert



HB K201749



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
290	210	120					150									

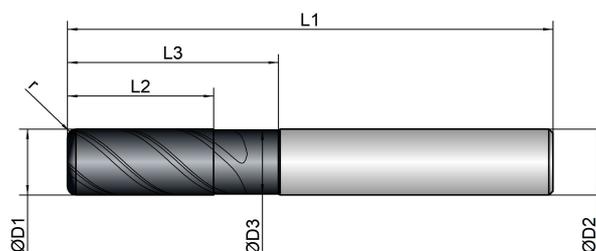
K201749	D1  mm ø	L2  mm	L1  mm	D2  mm ø	z  #	r  mm	 °
8	8.0	40.0	90.0	8.0	5	0.20	40
10	10.0	50.0	100.0	10.0	5	0.20	40
12	12.0	60.0	119.0	12.0	5	0.20	40
16	16.0	80.0	136.0	16.0	5	0.30	40
20	20.0	100.0	160.0	20.0	5	0.30	40

Cooling	 
Tolerance	e8
Coating	TiSiN- α

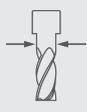
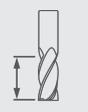
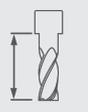
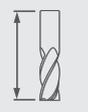
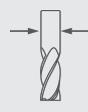
HB	ETC	HPC	MTC	
				



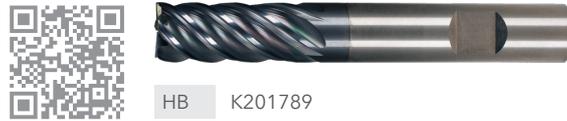
HB K201784



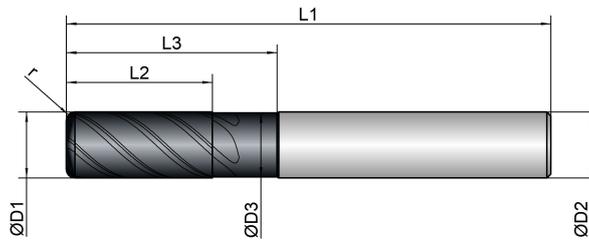
Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
	185	175					100									

K201784	D1  mm ∅	D3  mm ∅	L2  mm	L3  mm	L1  mm	D2  mm ∅	z  #	r  mm	 °
3/0,1	3.0	2.8	8.0	20.0	58.0	6.0	4	0.10	42.5
4/0,2	4.0	3.8	11.0	20.0	58.0	6.0	4	0.20	42.5
5/0,2	5.0	4.8	13.0	20.0	58.0	6.0	4	0.20	42.5
6/0,2	6.0	5.8	13.0	20.0	58.0	6.0	4	0.20	42.5
8/0,3	8.0	7.7	19.0	25.0	63.0	8.0	4	0.30	42.5
10/0,3	10.0	9.7	22.0	32.0	73.0	10.0	4	0.30	42.5
12/0,3	12.0	11.6	26.0	38.0	84.0	12.0	4	0.30	42.5
16/0,5	16.0	15.5	32.0	44.0	92.0	16.0	4	0.50	42.5
20/0,5	20.0	19.5	38.0	54.0	104.0	20.0	4	0.50	42.5
25/0,5	25.0	24.5	45.0	65.0	125.0	25.0	4	0.50	42.5

Cooling	
Tolerance	e8
Coating	TiSiN- α



HB K201789



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
	185	175					115									

	D1	D3	L2	L3	L1	D2	z	r	
K201789	mm Ø	mm Ø	mm	mm	mm	mm Ø	#	mm	°
6/0,2	6.0	5.8	13.0	20.0	58.0	6.0	5	0.20	42.5
8/0,3	8.0	7.7	19.0	25.0	63.0	8.0	5	0.30	42.5
10/0,3	10.0	9.7	22.0	32.0	73.0	10.0	5	0.30	42.5
12/0,3	12.0	11.6	26.0	38.0	84.0	12.0	5	0.30	42.5
16/0,5	16.0	15.5	32.0	44.0	92.0	16.0	5	0.50	42.5
20/0,5	20.0	19.5	38.0	54.0	104.0	20.0	5	0.50	42.5
25/0,5	25.0	24.5	45.0	65.0	125.0	25.0	5	0.50	42.5

Cooling 

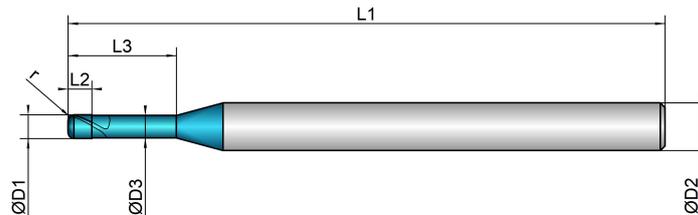
Tolerance 0-0,01

Coating TiSiN- α

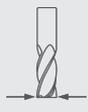
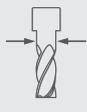
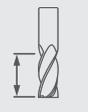
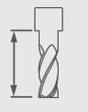
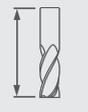
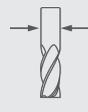
HA HSC 

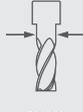
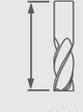
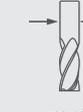
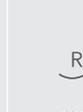



HA K202082



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
225	210	200	125	75	55	40	100		150							

	D1	D3	L2	L3	L1	D2	z	r	
K202082	 mm ø	 mm ø	 mm	 mm	 mm	 mm ø	 #	 mm	 °
0,4X1	0.4	0.38	0.4	1.0	50.0	4.0	2	0.10	30
0,4X1,5	0.4	0.38	0.4	1.5	50.0	4.0	2	0.10	30
0,4X2	0.4	0.38	0.4	2.0	50.0	4.0	2	0.10	30
0,4X3	0.4	0.38	0.4	3.0	50.0	4.0	2	0.10	30
0,4X4	0.4	0.38	0.4	4.0	50.0	4.0	2	0.10	30
0,5X1	0.5	0.48	0.5	1.0	50.0	4.0	2	0.10	30
0,5X2	0.5	0.48	0.5	2.0	50.0	4.0	2	0.10	30
0,5X3	0.5	0.48	0.5	3.0	50.0	4.0	2	0.10	30
0,5X4	0.5	0.48	0.5	4.0	50.0	4.0	2	0.10	30
0,5X5	0.5	0.48	0.5	5.0	50.0	4.0	2	0.10	30
0,5X6	0.5	0.48	0.5	6.0	50.0	4.0	2	0.10	30
0,6X2	0.6	0.58	0.6	2.0	50.0	4.0	2	0.10	30
0,6X3	0.6	0.58	0.6	3.0	50.0	4.0	2	0.10	30
0,6X4	0.6	0.58	0.6	4.0	50.0	4.0	2	0.10	30

K202082	 mm ∅	 mm ∅	 mm	 mm	 mm	 mm ∅	 #	 mm	 °
0,6X6	0.6	0.58	0.6	6.0	50.0	4.0	2	0.10	30
0,6X8	0.6	0.58	0.6	8.0	50.0	4.0	2	0.10	30
0,7X4	0.7	0.68	0.7	4.0	50.0	4.0	2	0.10	30
0,7X6	0.7	0.68	0.7	6.0	50.0	4.0	2	0.10	30
0,8X4	0.8	0.78	0.8	4.0	50.0	4.0	2	0.10	30
0,8X6	0.8	0.78	0.8	6.0	50.0	4.0	2	0.10	30
1X2	1.0	0.95	1.0	2.0	50.0	4.0	2	0.10	30
1X4	1.0	0.95	1.0	4.0	50.0	4.0	2	0.10	30
1X6	1.0	0.95	1.0	6.0	50.0	4.0	2	0.10	30
1X8	1.0	0.95	1.0	8.0	50.0	4.0	2	0.10	30
1X10	1.0	0.95	1.0	10.0	50.0	4.0	2	0.10	30
1X12	1.0	0.95	1.0	12.0	54.0	4.0	2	0.10	30
1X16	1.0	0.95	1.0	16.0	60.0	4.0	2	0.10	30
1X20	1.0	0.95	1.0	20.0	60.0	4.0	2	0.10	30
2X4	2.0	1.91	2.0	4.0	50.0	4.0	2	0.10	30
2X6	2.0	1.91	2.0	6.0	50.0	4.0	2	0.10	30
2X8	2.0	1.91	2.0	8.0	50.0	4.0	2	0.10	30
2X10	2.0	1.91	2.0	10.0	50.0	4.0	2	0.10	30
2X12	2.0	1.91	2.0	12.0	54.0	4.0	2	0.10	30
2X16	2.0	1.91	2.0	16.0	54.0	4.0	2	0.10	30
2X20	2.0	1.91	2.0	20.0	60.0	4.0	2	0.10	30
2X26	2.0	1.91	2.0	26.0	70.0	4.0	2	0.10	30

Cooling

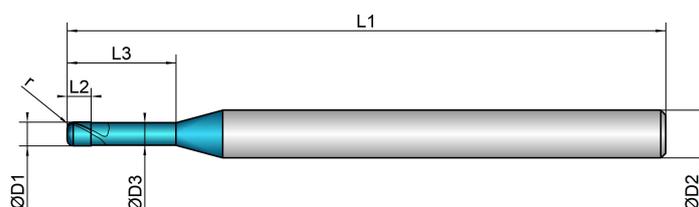
Tolerance 0-0,01

Coating TiSiN- α

HA HSC

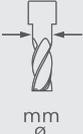


HA K202092



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
225	210	200	125	75	55	40	100		150							

K202092	D1 mm ∅	D3 mm ∅	L2 mm	L3 mm	L1 mm	D2 mm ∅	z #	r mm	 °
0,8X4	0.8	0.78	0.8	4.0	50.0	4.0	2	0.20	30
0,8X6	0.8	0.78	0.8	6.0	50.0	4.0	2	0.20	30
1X2	1.0	0.95	1.0	2.0	50.0	4.0	2	0.20	30
1X4	1.0	0.95	1.0	4.0	50.0	4.0	2	0.20	30
1X6	1.0	0.95	1.0	6.0	50.0	4.0	2	0.20	30
1X8	1.0	0.95	1.0	8.0	50.0	4.0	2	0.20	30
1X10	1.0	0.95	1.0	10.0	50.0	4.0	2	0.20	30
1X12	1.0	0.95	1.0	12.0	54.0	4.0	2	0.20	30
1X16	1.0	0.95	1.0	16.0	60.0	4.0	2	0.20	30
1X20	1.0	0.95	1.0	20.0	60.0	4.0	2	0.20	30
1,2X6	1.2	1.14	1.2	6.0	50.0	4.0	2	0.20	30
1,2X12	1.2	1.14	1.2	12.0	54.0	4.0	2	0.20	30

K202092	 mm ∅	 mm ∅	 mm	 mm	 mm	 mm ∅	 #	 mm	 °
1,2X20	1.2	1.14	1.2	20.0	60.0	4.0	2	0.20	30
1,5X4	1.5	1.44	1.5	4.0	50.0	4.0	2	0.20	30
1,5X6	1.5	1.44	1.5	6.0	50.0	4.0	2	0.20	30
1,5X8	1.5	1.44	1.5	8.0	50.0	4.0	2	0.20	30
1,5X10	1.5	1.44	1.5	10.0	50.0	4.0	2	0.20	30
1,5X12	1.5	1.44	1.5	12.0	54.0	4.0	2	0.20	30
1,5X16	1.5	1.44	1.5	16.0	54.0	4.0	2	0.20	30
1,5X20	1.5	1.44	1.5	20.0	60.0	4.0	2	0.20	30
2X4	2.0	1.91	2.0	4.0	50.0	4.0	2	0.20	30
2X6	2.0	1.91	2.0	6.0	50.0	4.0	2	0.20	30
2X8	2.0	1.91	2.0	8.0	50.0	4.0	2	0.20	30
2X10	2.0	1.91	2.0	10.0	50.0	4.0	2	0.20	30
2X12	2.0	1.91	2.0	12.0	54.0	4.0	2	0.20	30
2X16	2.0	1.91	2.0	16.0	54.0	4.0	2	0.20	30
2X20	2.0	1.91	2.0	20.0	60.0	4.0	2	0.20	30
2X26	2.0	1.91	2.0	26.0	70.0	4.0	2	0.20	30

Cooling

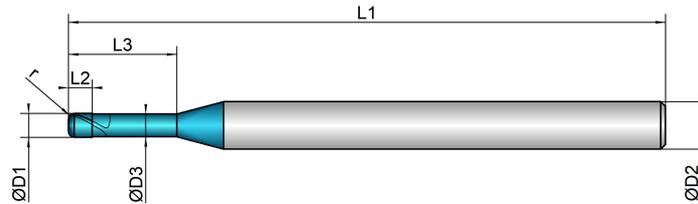
Tolerance 0-0,01

Coating TiSiN- α

HA HSC

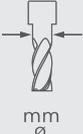


HA K202102



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
225	210	200	125	75	55	40	100		150							

K202102	D1 mm ∅	D3 mm ∅	L2 mm	L3 mm	L1 mm	D2 mm ∅	z #	r mm	 °
1X2	1.0	0.95	1.0	2.0	50.0	4.0	2	0.30	30
1X4	1.0	0.95	1.0	4.0	50.0	4.0	2	0.30	30
1X6	1.0	0.95	1.0	6.0	50.0	4.0	2	0.30	30
1X8	1.0	0.95	1.0	8.0	50.0	4.0	2	0.30	30
1X10	1.0	0.95	1.0	10.0	50.0	4.0	2	0.30	30
1X12	1.0	0.95	1.0	12.0	54.0	4.0	2	0.30	30
1X16	1.0	0.95	1.0	16.0	60.0	4.0	2	0.30	30
1X20	1.0	0.95	1.0	20.0	60.0	4.0	2	0.30	30
1,2X6	1.2	1.14	1.2	6.0	50.0	4.0	2	0.30	30
1,2X12	1.2	1.14	1.2	12.0	54.0	4.0	2	0.30	30
1,2X20	1.2	1.14	1.2	20.0	60.0	4.0	2	0.30	30
1,5X4	1.5	1.44	1.5	4.0	50.0	4.0	2	0.30	30
1,5X6	1.5	1.44	1.5	6.0	50.0	4.0	2	0.30	30

K202102	 D1 mm ∅	 D3 mm ∅	 L2 mm	 L3 mm	 L1 mm	 D2 mm ∅	 z #	 r mm	 °
1,5X8	1.5	1.44	1.5	8.0	50.0	4.0	2	0.30	30
1,5X10	1.5	1.44	1.5	10.0	50.0	4.0	2	0.30	30
1,5X12	1.5	1.44	1.5	12.0	54.0	4.0	2	0.30	30
1,5X16	1.5	1.44	1.5	16.0	54.0	4.0	2	0.30	30
1,5X20	1.5	1.44	1.5	20.0	60.0	4.0	2	0.30	30
2X4	2.0	1.91	2.0	4.0	50.0	4.0	2	0.30	30
2X6	2.0	1.91	2.0	6.0	50.0	4.0	2	0.30	30
2X8	2.0	1.91	2.0	8.0	50.0	4.0	2	0.30	30
2X10	2.0	1.91	2.0	10.0	50.0	4.0	2	0.30	30
2X12	2.0	1.91	2.0	12.0	54.0	4.0	2	0.30	30
2X16	2.0	1.91	2.0	16.0	54.0	4.0	2	0.30	30
2X20	2.0	1.91	2.0	20.0	60.0	4.0	2	0.30	30
2X26	2.0	1.91	2.0	26.0	70.0	4.0	2	0.30	30
2,5X10	2.5	2.41	2.5	10.0	50.0	4.0	2	0.30	30
2,5X12	2.5	2.41	2.5	12.0	60.0	4.0	2	0.30	30
2,5X30	2.5	2.41	2.5	30.0	70.0	4.0	2	0.30	30
3X10	3.0	2.92	4.5	10.0	50.0	4.0	2	0.30	30
3X12	3.0	2.92	4.5	12.0	50.0	4.0	2	0.30	30
3X30	3.0	2.92	4.5	30.0	70.0	4.0	2	0.30	30

Cooling 

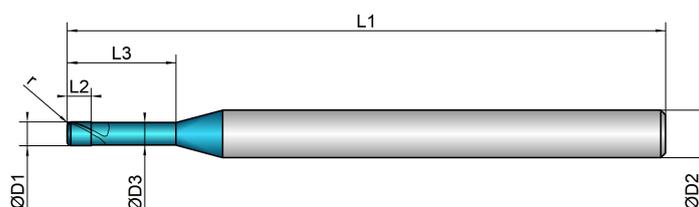
Tolerance 0-0,01

Coating TiSiN- α

HA HSC 



HA K202112



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
225	210	200	125	75	55	40	100		150							

K202112	D1 mm Ø	D3 mm Ø	L2 mm	L3 mm	L1 mm	D2 mm Ø	z #	r mm	°
1,5X4	1.5	1.44	1.5	4.0	50.0	4.0	2	0.50	30
1,5X6	1.5	1.44	1.5	6.0	50.0	4.0	2	0.50	30
1,5X8	1.5	1.44	1.5	8.0	50.0	4.0	2	0.50	30
1,5X10	1.5	1.44	1.5	10.0	50.0	4.0	2	0.50	30
1,5X12	1.5	1.44	1.5	12.0	54.0	4.0	2	0.50	30
1,5X16	1.5	1.44	1.5	16.0	54.0	4.0	2	0.50	30
1,5X20	1.5	1.44	1.5	20.0	60.0	4.0	2	0.50	30
2X4	2.0	1.91	2.0	4.0	50.0	4.0	2	0.50	30
2X6	2.0	1.91	2.0	6.0	50.0	4.0	2	0.50	30
2X8	2.0	1.91	2.0	8.0	50.0	4.0	2	0.50	30
2X10	2.0	1.91	2.0	10.0	50.0	4.0	2	0.50	30
2X12	2.0	1.91	2.0	12.0	54.0	4.0	2	0.50	30
2X16	2.0	1.91	2.0	16.0	54.0	4.0	2	0.50	30
2X20	2.0	1.91	2.0	20.0	60.0	4.0	2	0.50	30
2X26	2.0	1.91	2.0	26.0	70.0	4.0	2	0.50	30
2,5X10	2.5	2.41	2.5	10.0	50.0	4.0	2	0.50	30
2,5X12	2.5	2.41	2.5	12.0	60.0	4.0	2	0.50	30
2,5X30	2.5	2.41	2.5	30.0	70.0	4.0	2	0.50	30
3X10	3.0	2.92	4.5	10.0	50.0	4.0	2	0.50	30
3X12	3.0	2.92	4.5	12.0	50.0	4.0	2	0.50	30
3X30	3.0	2.92	4.5	30.0	70.0	4.0	2	0.50	30

Cooling

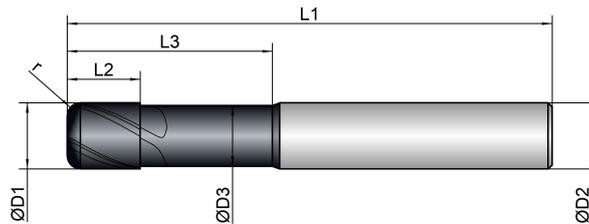
Tolerance e8

Coating TiAlN- α

HA HSC HPC

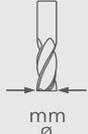
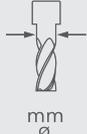


HA K202143



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
110	80						90	100								

K202143	D1 mm ø	D3 mm ø	L2 mm	L3 mm	L1 mm	D2 mm ø	z #	r mm	 °
1/0,1	1.0	0.85	1.5	10.0	50.0	3.0	4	0.10	30
1/0,2	1.0	0.85	1.5	10.0	50.0	3.0	4	0.20	30
2/0,2	2.0	1.8	2.5	12.0	50.0	3.0	4	0.20	30
2/0,3	2.0	1.8	2.5	12.0	50.0	3.0	4	0.30	30
2/0,5	2.0	1.8	2.5	12.0	50.0	3.0	4	0.50	30
3/0,3	3.0	2.7	4.0	14.0	50.0	3.0	4	0.30	30
3/0,5	3.0	2.7	4.0	14.0	50.0	3.0	4	0.50	30
3/1	3.0	2.7	4.0	14.0	50.0	3.0	4	1.00	30
4/0,4	4.0	3.7	5.0	16.0	50.0	4.0	4	0.40	30
4/0,5	4.0	3.7	5.0	16.0	50.0	4.0	4	0.50	30
4/1	4.0	3.7	5.0	16.0	50.0	4.0	4	1.00	30
5/0,5	5.0	4.6	6.0	18.0	54.0	5.0	4	0.50	30
5/1	5.0	4.6	6.0	18.0	54.0	5.0	4	1.00	30

K202143	 mm ∅	 mm ∅	 mm	 mm	 mm	 mm ∅	 #	 mm	 °
6/0,5	6.0	5.5	7.0	21.0	58.0	6.0	4	0.50	30
6/1	6.0	5.5	7.0	21.0	58.0	6.0	4	1.00	30
6/1,5	6.0	5.5	7.0	21.0	58.0	6.0	4	1.50	30
8/0,5	8.0	7.4	9.0	27.0	64.0	8.0	4	0.50	30
8/1	8.0	7.4	9.0	27.0	64.0	8.0	4	1.00	30
8/1,5	8.0	7.4	9.0	27.0	64.0	8.0	4	1.50	30
8/2	8.0	7.4	9.0	27.0	64.0	8.0	4	2.00	30
10/0,5	10.0	9.2	11.0	32.0	73.0	10.0	4	0.50	30
10/1	10.0	9.2	11.0	32.0	73.0	10.0	4	1.00	30
10/1,5	10.0	9.2	11.0	32.0	73.0	10.0	4	1.50	30
10/2	10.0	9.2	11.0	32.0	73.0	10.0	4	2.00	30
12/0,5	12.0	11.0	12.0	38.0	84.0	12.0	4	0.50	30
12/1	12.0	11.0	12.0	38.0	84.0	12.0	4	1.00	30
12/1,5	12.0	11.0	12.0	38.0	84.0	12.0	4	1.50	30
12/2	12.0	11.0	12.0	38.0	84.0	12.0	4	2.00	30
12/5	12.0	11.0	12.0	38.0	84.0	12.0	4	5.00	30
16/1	16.0	15.0	16.0	44.0	93.0	16.0	4	1.00	30
16/2	16.0	15.0	16.0	44.0	93.0	16.0	4	2.00	30
16/6	16.0	15.0	16.0	44.0	93.0	16.0	4	6.00	30
20/1	20.0	18.5	20.0	55.0	104.0	20.0	4	1.00	30
20/2,5	20.0	18.5	20.0	55.0	104.0	20.0	4	2.50	30

Cooling

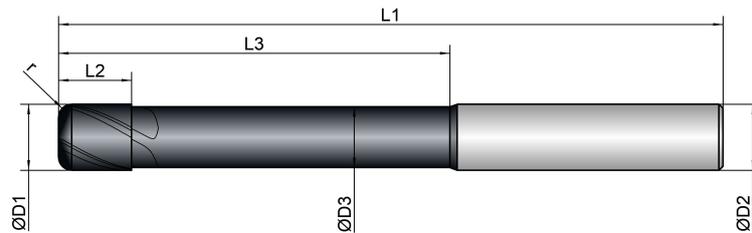
Tolerance e8

Coating TiAlN- α

HA HSC HPC

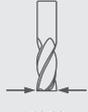
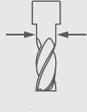
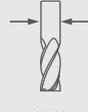


HA K202153



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
110	80						90	100								

K202153	D1 mm Ø	D3 mm Ø	L2 mm	L3 mm	L1 mm	D2 mm Ø	z #	r mm	 °
1/0,1	1.0	0.85	1.5	20.0	75.0	3.0	4	0.10	30
1/0,2	1.0	0.85	1.5	20.0	75.0	3.0	4	0.20	30
2/0,2	2.0	1.8	2.5	25.0	75.0	3.0	4	0.20	30
2/0,3	2.0	1.8	2.5	25.0	75.0	3.0	4	0.30	30
2/0,5	2.0	1.8	2.5	25.0	75.0	3.0	4	0.50	30
3/0,3	3.0	2.7	4.0	32.0	75.0	3.0	4	0.30	30
3/0,5	3.0	2.7	4.0	32.0	75.0	3.0	4	0.50	30
3/1	3.0	2.7	4.0	32.0	75.0	3.0	4	1.00	30
4/0,4	4.0	3.7	5.0	36.0	75.0	4.0	4	0.40	30
4/0,5	4.0	3.7	5.0	36.0	75.0	4.0	4	0.50	30
4/1	4.0	3.7	5.0	36.0	75.0	4.0	4	1.00	30
5/0,5	5.0	4.6	6.0	40.0	75.0	5.0	4	0.50	30
5/1	5.0	4.6	6.0	40.0	75.0	5.0	4	1.00	30

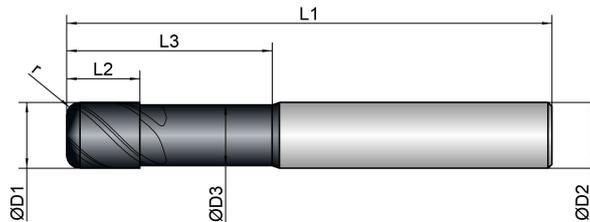
	 D1 mm ∅	 D3 mm ∅	 L2 mm	 L3 mm	 L1 mm	 D2 mm ∅	 z #	 r mm	 °
K202153									
5,95/0,5	5.95	5.5	7.0	44.0	80.0	6.0	4	0.50	30
6/0,5	6.0	5.5	7.0	44.0	80.0	6.0	4	0.50	30
6/1	6.0	5.5	7.0	44.0	80.0	6.0	4	1.00	30
6/1,5	6.0	5.5	7.0	44.0	80.0	6.0	4	1.50	30
7,95/0,5	7.95	7.4	9.0	54.0	100.0	8.0	4	0.50	30
8/0,5	8.0	7.4	9.0	54.0	100.0	8.0	4	0.50	30
8/1	8.0	7.4	9.0	54.0	100.0	8.0	4	1.00	30
8/1,5	8.0	7.4	9.0	54.0	100.0	8.0	4	1.50	30
8/2	8.0	7.4	9.0	54.0	100.0	8.0	4	2.00	30
9,95/0,5	9.95	9.2	11.0	60.0	100.0	10.0	4	0.50	30
10/0,5	10.0	9.2	11.0	60.0	100.0	10.0	4	0.50	30
10/1	10.0	9.2	11.0	60.0	100.0	10.0	4	1.00	30
10/1,5	10.0	9.2	11.0	60.0	100.0	10.0	4	1.50	30
10/2	10.0	9.2	11.0	60.0	100.0	10.0	4	2.00	30
12/0,5	12.0	11.0	12.0	75.0	120.0	12.0	4	0.50	30
12/1	12.0	11.0	12.0	75.0	120.0	12.0	4	1.00	30
12/1,5	12.0	11.0	12.0	75.0	120.0	12.0	4	1.50	30
12/2	12.0	11.0	12.0	75.0	120.0	12.0	4	2.00	30
12/5	12.0	11.0	12.0	75.0	120.0	12.0	4	5.00	30
16/1	16.0	15.0	16.0	92.0	150.0	16.0	4	1.00	30
16/2	16.0	15.0	16.0	92.0	150.0	16.0	4	2.00	30
16/6	16.0	15.0	16.0	92.0	150.0	16.0	4	6.00	30
20/1	20.0	18.5	20.0	92.0	150.0	20.0	4	1.00	30
20/2,5	20.0	18.5	20.0	92.0	150.0	20.0	4	2.50	30

Cooling 

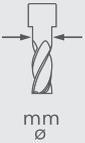
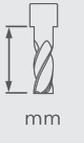
Tolerance e8

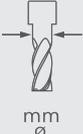
Coating TiAlN- α

HA HSC UNI 



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
120	80	70	40	35			85	95								

K202163	D1  mm \varnothing	D3  mm \varnothing	L2  mm	L3  mm	L1  mm	D2  mm \varnothing	z  #	r  mm	 °
3/0,3	3.0	2.7	4.0	14.0	50.0	3.0	4	0.30	45
3/0,5	3.0	2.7	4.0	14.0	50.0	3.0	4	0.50	45
3/1	3.0	2.7	4.0	14.0	50.0	3.0	4	1.00	45
4/0,4	4.0	3.7	5.0	16.0	50.0	4.0	4	0.40	45
4/0,5	4.0	3.7	5.0	16.0	50.0	4.0	4	0.50	45
4/1	4.0	3.7	5.0	16.0	50.0	4.0	4	1.00	45
5/0,5	5.0	4.6	6.0	18.0	54.0	5.0	4	0.50	45
5/1	5.0	4.6	6.0	18.0	54.0	5.0	4	1.00	45
6/0,5	6.0	5.5	7.0	21.0	58.0	6.0	4	0.50	45
6/1	6.0	5.5	7.0	21.0	58.0	6.0	4	1.00	45
6/1,5	6.0	5.5	7.0	21.0	58.0	6.0	4	1.50	45
8/0,5	8.0	7.4	9.0	27.0	64.0	8.0	4	0.50	45

K202163	 D1 mm ∅	 D3 mm ∅	 L2 mm	 L3 mm	 L1 mm	 D2 mm ∅	 z #	 r mm	 °
8/1	8.0	7.4	9.0	27.0	64.0	8.0	4	1.00	45
8/1,5	8.0	7.4	9.0	27.0	64.0	8.0	4	1.50	45
8/2	8.0	7.4	9.0	27.0	64.0	8.0	4	2.00	45
10/0,5	10.0	9.2	11.0	32.0	73.0	10.0	4	0.50	45
10/1	10.0	9.2	11.0	32.0	73.0	10.0	4	1.00	45
10/1,5	10.0	9.2	11.0	32.0	73.0	10.0	4	1.50	45
10/2	10.0	9.2	11.0	32.0	73.0	10.0	4	2.00	45
12/0,5	12.0	11.0	12.0	38.0	84.0	12.0	4	0.50	45
12/1	12.0	11.0	12.0	38.0	84.0	12.0	4	1.00	45
12/1,5	12.0	11.0	12.0	38.0	84.0	12.0	4	1.50	45
12/2	12.0	11.0	12.0	38.0	84.0	12.0	4	2.00	45
16/1	16.0	15.0	16.0	44.0	93.0	16.0	4	1.00	45
16/2	16.0	15.0	16.0	44.0	93.0	16.0	4	2.00	45
20/1	20.0	18.5	20.0	50.0	104.0	20.0	4	1.00	45
20/2,5	20.0	18.5	20.0	50.0	104.0	20.0	4	2.50	45

Cooling

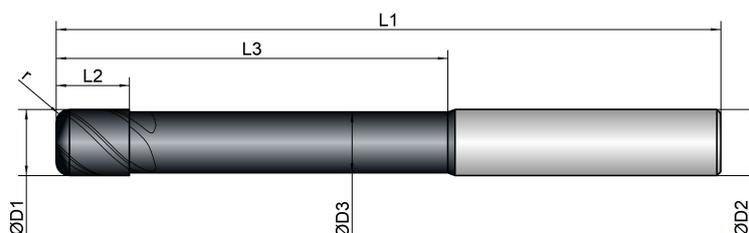
Tolerance e8

Coating TiAlN- α

HA HSC UNI

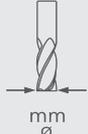
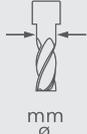


HA K202173



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
120	80	70	40	35			85	95								

K202173	D1 mm ø	D3 mm ø	L2 mm	L3 mm	L1 mm	D2 mm ø	z #	r mm	 °
3/0,3	3.0	2.7	4.0	32.0	75.0	3.0	4	0.30	45
3/0,5	3.0	2.7	4.0	32.0	75.0	3.0	4	0.50	45
3/1	3.0	2.7	4.0	32.0	75.0	3.0	4	1.00	45
4/0,4	4.0	3.7	5.0	36.0	75.0	4.0	4	0.40	45
4/0,5	4.0	3.7	5.0	36.0	75.0	4.0	4	0.50	45
4/1	4.0	3.7	5.0	36.0	75.0	4.0	4	1.00	45
5/0,5	5.0	4.6	6.0	40.0	75.0	5.0	4	0.50	45
5/1	5.0	4.6	6.0	40.0	75.0	5.0	4	1.00	45
6/0,5	6.0	5.5	7.0	44.0	80.0	6.0	4	0.50	45
6/1	6.0	5.5	7.0	44.0	80.0	6.0	4	1.00	45
6/1,5	6.0	5.5	7.0	44.0	80.0	6.0	4	1.50	45
8/0,5	8.0	7.4	9.0	54.0	100.0	8.0	4	0.50	45

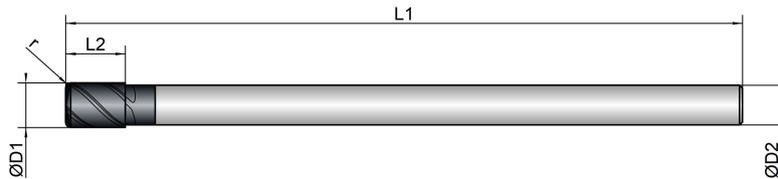
K202173	 mm ∅	 mm ∅	 mm	 mm	 mm	 mm ∅	 #	 mm	 °
8/1	8.0	7.4	9.0	54.0	100.0	8.0	4	1.00	45
8/1,5	8.0	7.4	9.0	54.0	100.0	8.0	4	1.50	45
8/2	8.0	7.4	9.0	54.0	100.0	8.0	4	2.00	45
10/0,5	10.0	9.2	11.0	60.0	100.0	10.0	4	0.50	45
10/1	10.0	9.2	11.0	60.0	100.0	10.0	4	1.00	45
10/1,5	10.0	9.2	11.0	60.0	100.0	10.0	4	1.50	45
10/2	10.0	9.2	11.0	60.0	100.0	10.0	4	2.00	45
12/0,5	12.0	11.0	12.0	75.0	120.0	12.0	4	0.50	45
12/1	12.0	11.0	12.0	75.0	120.0	12.0	4	1.00	45
12/1,5	12.0	11.0	12.0	75.0	120.0	12.0	4	1.50	45
12/2	12.0	11.0	12.0	75.0	120.0	12.0	4	2.00	45
16/1	16.0	15.0	16.0	92.0	150.0	16.0	4	1.00	45
16/2	16.0	15.0	16.0	92.0	150.0	16.0	4	2.00	45
20/1	20.0	18.5	20.0	92.0	150.0	20.0	4	1.00	45
20/2,5	20.0	18.5	20.0	92.0	150.0	20.0	4	2.50	45

Cooling	
Tolerance	e8
Coating	TiAlN- α

HA HSC UNI




HA K202202



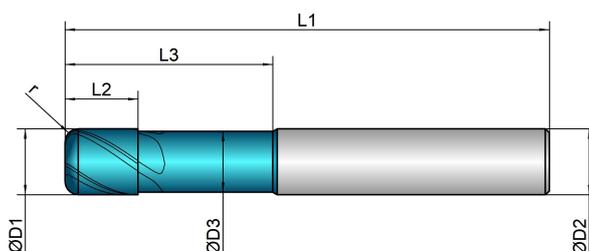
Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
75	55	50	28	23			65	70								

K202202	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	r mm	 °
7/0,5	7.0	9.0	121.0	6.0	4	0.50	45
7/1	7.0	9.0	121.0	6.0	4	1.00	45
7/1,5	7.0	9.0	121.0	6.0	4	1.50	45
9/0,5	9.0	12.0	136.0	8.0	4	0.50	45
9/1	9.0	12.0	136.0	8.0	4	1.00	45
9/1,5	9.0	12.0	136.0	8.0	4	1.50	45
11/1	11.0	15.0	150.0	10.0	4	1.00	45
11/1,5	11.0	15.0	150.0	10.0	4	1.50	45
11/2	11.0	15.0	150.0	10.0	4	2.00	45
13/1	13.0	18.0	160.0	12.0	4	1.00	45
13/1,5	13.0	18.0	160.0	12.0	4	1.50	45
13/2	13.0	18.0	160.0	12.0	4	2.00	45
15/1	15.0	21.0	160.0	14.0	4	1.00	45
15/1,5	15.0	21.0	160.0	14.0	4	1.50	45
15/2	15.0	21.0	160.0	14.0	4	2.00	45
17/1	17.0	24.0	180.0	16.0	4	1.00	45
17/1,5	17.0	24.0	180.0	16.0	4	1.50	45
17/2	17.0	24.0	180.0	16.0	4	2.00	45
17/3	17.0	24.0	180.0	16.0	4	3.00	45

Cooling	
Tolerance	e8
Coating	TiSiN- α

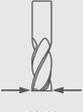
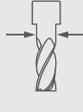
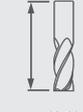
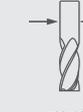
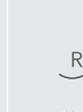


HA K202223



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
		210	175	155	120	90										

K202223	D1 mm \varnothing	D3 mm \varnothing	L2 mm	L3 mm	L1 mm	D2 mm \varnothing	z #	r mm	\circ
1/0,1	1.0	0.85	1.5	10.0	50.0	3.0	4	0.10	35
1/0,2	1.0	0.85	1.5	10.0	50.0	3.0	4	0.20	35
2/0,2	2.0	1.8	2.5	12.0	50.0	3.0	4	0.20	35
2/0,3	2.0	1.8	2.5	12.0	50.0	3.0	4	0.30	35
2/0,5	2.0	1.8	2.5	12.0	50.0	3.0	4	0.50	35
3/0,25	3.0	2.7	4.0	14.0	50.0	3.0	4	0.25	35
3/0,3	3.0	2.7	4.0	14.0	50.0	3.0	4	0.30	35
3/0,5	3.0	2.7	4.0	14.0	50.0	3.0	4	0.50	35
3/1	3.0	2.7	4.0	14.0	50.0	3.0	4	1.00	35
4/0,2	4.0	3.7	5.0	16.0	50.0	4.0	4	0.20	35
4/0,25	4.0	3.7	5.0	16.0	50.0	4.0	4	0.25	35
4/0,4	4.0	3.7	5.0	16.0	50.0	4.0	4	0.40	35
4/0,5	4.0	3.7	5.0	16.0	50.0	4.0	4	0.50	35
4/1	4.0	3.7	5.0	16.0	50.0	4.0	4	1.00	35
5/0,25	5.0	4.6	6.0	18.0	54.0	5.0	4	0.25	35
5/0,5	5.0	4.6	6.0	18.0	54.0	5.0	4	0.50	35

K202223	 mm ∅	 mm ∅	 mm	 mm	 mm	 mm ∅	 #	 mm	 °
5/1	5.0	4.6	6.0	18.0	54.0	5.0	4	1.00	35
6/0,25	6.0	5.5	7.0	21.0	58.0	6.0	4	0.25	35
6/0,5	6.0	5.5	7.0	21.0	58.0	6.0	4	0.50	35
6/0,8	6.0	5.5	7.0	21.0	58.0	6.0	4	0.80	35
6/1	6.0	5.5	7.0	21.0	58.0	6.0	4	1.00	35
6/1,5	6.0	5.5	7.0	21.0	58.0	6.0	4	1.50	35
6/2	6.0	5.5	7.0	21.0	58.0	6.0	4	2.00	35
8/0,25	8.0	7.4	9.0	27.0	64.0	8.0	4	0.25	35
8/0,5	8.0	7.4	9.0	27.0	64.0	8.0	4	0.50	35
8/0,8	8.0	7.4	9.0	27.0	64.0	8.0	4	0.80	35
8/1	8.0	7.4	9.0	27.0	64.0	8.0	4	1.00	35
8/1,5	8.0	7.4	9.0	27.0	64.0	8.0	4	1.50	35
8/2	8.0	7.4	9.0	27.0	64.0	8.0	4	2.00	35
8/2,5	8.0	7.4	9.0	27.0	64.0	8.0	4	2.50	35
8/3	8.0	7.4	9.0	27.0	64.0	8.0	4	3.00	35
10/0,25	10.0	9.2	11.0	32.0	73.0	10.0	4	0.25	35
10/0,5	10.0	9.2	11.0	32.0	73.0	10.0	4	0.50	35
10/0,8	10.0	9.2	11.0	32.0	73.0	10.0	4	0.80	35
10/1	10.0	9.2	11.0	32.0	73.0	10.0	4	1.00	35
10/1,5	10.0	9.2	11.0	32.0	73.0	10.0	4	1.50	35
10/2	10.0	9.2	11.0	32.0	73.0	10.0	4	2.00	35
10/3	10.0	9.2	11.0	32.0	73.0	10.0	4	3.00	35
10/3,5	10.0	9.2	11.0	32.0	73.0	10.0	4	3.50	35
12/0,5	12.0	9.2	12.0	38.0	84.0	12.0	4	0.50	35
12/1	12.0	9.2	12.0	38.0	84.0	12.0	4	1.00	35
12/1,5	12.0	9.2	12.0	38.0	84.0	12.0	4	1.50	35
12/2	12.0	9.2	12.0	38.0	84.0	12.0	4	2.00	35
12/3	12.0	9.2	12.0	38.0	84.0	12.0	4	3.00	35
16/1	16.0	15.0	16.0	44.0	93.0	16.0	4	1.00	35
16/2	16.0	15.0	16.0	44.0	93.0	16.0	4	2.00	35
16/3	16.0	15.0	16.0	44.0	93.0	16.0	4	3.00	35
20/1	20.0	18.5	20.0	55.0	104.0	20.0	4	1.00	35
20/2,5	20.0	18.5	20.0	55.0	104.0	20.0	4	2.50	35

Cooling 

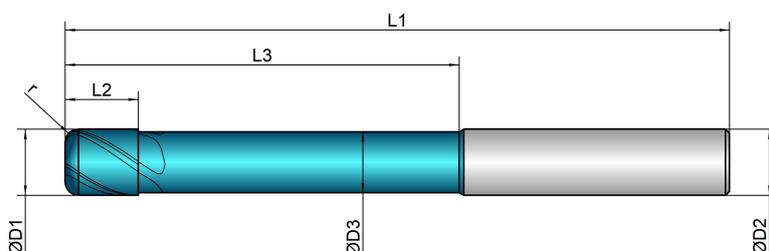
Tolerance e8

Coating TiSiN- α

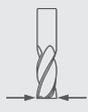
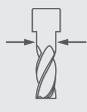
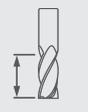
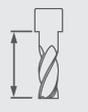
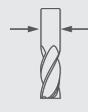
HA HSC HPC \neq 

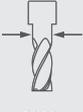
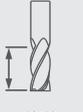
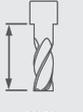
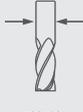


HA K202233



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
		210	175	155	120	90										

K202233	D1  mm Ø	D3  mm Ø	L2  mm	L3  mm	L1  mm	D2  mm Ø	z  #	r  mm	 °
1/0,1	1.0	0.85	1.5	20.0	75.0	3.0	4	0.10	35
1/0,2	1.0	0.85	1.5	20.0	75.0	3.0	4	0.20	35
2/0,2	2.0	1.8	2.5	25.0	75.0	3.0	4	0.20	35
2/0,3	2.0	1.8	2.5	25.0	75.0	3.0	4	0.30	35
2/0,5	2.0	1.8	2.5	25.0	75.0	3.0	4	0.50	35
3/0,25	3.0	2.7	4.0	32.0	75.0	3.0	4	0.25	35
3/0,3	3.0	2.7	4.0	32.0	75.0	3.0	4	0.30	35
3/0,5	3.0	2.7	4.0	32.0	75.0	3.0	4	0.50	35
3/1	3.0	2.7	4.0	32.0	75.0	3.0	4	1.00	35
4/0,2	4.0	3.7	5.0	36.0	75.0	4.0	4	0.20	35
4/0,25	4.0	3.7	5.0	36.0	75.0	4.0	4	0.25	35
4/0,4	4.0	3.7	5.0	36.0	75.0	4.0	4	0.40	35
4/0,5	4.0	3.7	5.0	36.0	75.0	4.0	4	0.50	35
4/1	4.0	3.7	5.0	36.0	75.0	4.0	4	1.00	35
5/0,25	5.0	4.6	6.0	40.0	75.0	5.0	4	0.25	35

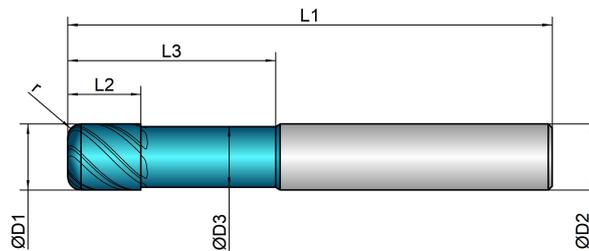
K202233	 mm ∅	 mm ∅	 mm	 mm	 mm	 mm ∅	 #	 mm	 °
5/0,5	5.0	4.6	6.0	40.0	75.0	5.0	4	0.50	35
5/1	5.0	4.6	6.0	40.0	75.0	5.0	4	1.00	35
6/0,25	6.0	5.5	7.0	44.0	80.0	6.0	4	0.25	35
6/0,5	6.0	5.5	7.0	44.0	80.0	6.0	4	0.50	35
6/1	6.0	5.5	7.0	44.0	80.0	6.0	4	1.00	35
6/1,5	6.0	5.5	7.0	44.0	80.0	6.0	4	1.50	35
8/0,25	8.0	7.4	9.0	54.0	100.0	8.0	4	0.25	35
8/0,5	8.0	7.4	9.0	54.0	100.0	8.0	4	0.50	35
8/0,8	8.0	7.4	9.0	54.0	100.0	8.0	4	0.80	35
8/1	8.0	7.4	9.0	54.0	100.0	8.0	4	1.00	35
8/1,5	8.0	7.4	9.0	54.0	100.0	8.0	4	1.50	35
8/2	8.0	7.4	9.0	54.0	100.0	8.0	4	2.00	35
8/3	8.0	7.4	9.0	54.0	100.0	8.0	4	3.00	35
10/0,25	10.0	9.2	11.0	60.0	100.0	10.0	4	0.25	35
10/0,5	10.0	9.2	11.0	60.0	100.0	10.0	4	0.50	35
10/0,8	10.0	9.2	11.0	60.0	100.0	10.0	4	0.80	35
10/1	10.0	9.2	11.0	60.0	100.0	10.0	4	1.00	35
10/1,5	10.0	9.2	11.0	60.0	100.0	10.0	4	1.50	35
10/2	10.0	9.2	11.0	60.0	100.0	10.0	4	2.00	35
10/3	10.0	9.2	11.0	60.0	100.0	10.0	4	3.00	35
12/0,5	12.0	11.0	12.0	75.0	120.0	12.0	4	0.50	35
12/1	12.0	11.0	12.0	75.0	120.0	12.0	4	1.00	35
12/1,5	12.0	11.0	12.0	75.0	120.0	12.0	4	1.50	35
12/2	12.0	11.0	12.0	75.0	120.0	12.0	4	2.00	35
12/3	12.0	11.0	12.0	75.0	120.0	12.0	4	3.00	35
16/1	16.0	15.0	16.0	92.0	150.0	16.0	4	1.00	35
16/2	16.0	15.0	16.0	92.0	150.0	16.0	4	2.00	35
16/3	16.0	15.0	16.0	92.0	150.0	16.0	4	3.00	35
20/1	20.0	18.5	20.0	92.0	150.0	20.0	4	1.00	35
20/2,5	20.0	18.5	20.0	92.0	150.0	20.0	4	2.50	35

Cooling	
Tolerance	e8
Coating	TiSiN- α

HA

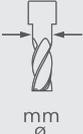
HPC

Expert



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
		205	175	160	100	65										

K202253	D1 mm ø	D3 mm ø	L2 mm	L3 mm	L1 mm	D2 mm ø	z #	r mm	 °
3/0,3	3.0	2.7	4.0	14.0	50.0	3.0	4	0.30	45
3/0,5	3.0	2.7	4.0	14.0	50.0	3.0	4	0.50	45
3/1	3.0	2.7	4.0	14.0	50.0	3.0	4	1.00	45
4/0,4	4.0	3.7	5.0	16.0	50.0	4.0	4	0.40	45
4/0,5	4.0	3.7	5.0	16.0	50.0	4.0	4	0.50	45
4/1	4.0	3.7	5.0	16.0	50.0	4.0	4	1.00	45
5/0,5	5.0	4.6	6.0	18.0	54.0	5.0	4	0.50	45
5/1	5.0	4.6	6.0	18.0	54.0	5.0	4	1.00	45
6/0,5	6.0	5.5	7.0	21.0	58.0	6.0	6	0.50	45
6/0,8	6.0	5.5	7.0	21.0	58.0	6.0	6	0.80	45
6/1	6.0	5.5	7.0	21.0	58.0	6.0	6	1.00	45
6/1,5	6.0	5.5	7.0	21.0	58.0	6.0	6	1.50	45
8/0,5	8.0	7.4	9.0	27.0	64.0	8.0	6	0.50	45

K202253	 mm ∅	 mm ∅	 mm	 mm	 mm	 mm ∅	 #	 mm	 °
8/0,8	8.0	7.4	9.0	27.0	64.0	8.0	6	0.80	45
8/1	8.0	7.4	9.0	27.0	64.0	8.0	6	1.00	45
8/1,5	8.0	7.4	9.0	27.0	64.0	8.0	6	1.50	45
8/2	8.0	7.4	9.0	27.0	64.0	8.0	6	2.00	45
8/3	8.0	7.4	9.0	27.0	64.0	8.0	6	3.00	45
10/0,5	10.0	9.2	11.0	32.0	73.0	10.0	6	0.50	45
10/0,8	10.0	9.2	11.0	32.0	73.0	10.0	6	0.80	45
10/1	10.0	9.2	11.0	32.0	73.0	10.0	6	1.00	45
10/1,5	10.0	9.2	11.0	32.0	73.0	10.0	6	1.50	45
10/2	10.0	9.2	11.0	32.0	73.0	10.0	6	2.00	45
10/3	10.0	9.2	11.0	32.0	73.0	10.0	6	3.00	45
12/0,5	12.0	11.0	12.0	38.0	84.0	12.0	6	0.50	45
12/1	12.0	11.0	12.0	38.0	84.0	12.0	6	1.00	45
12/1,5	12.0	11.0	12.0	38.0	84.0	12.0	6	1.50	45
12/2	12.0	11.0	12.0	38.0	84.0	12.0	6	2.00	45
12/3	12.0	11.0	12.0	38.0	84.0	12.0	6	3.00	45
16/1	16.0	15.0	16.0	44.0	93.0	16.0	6	1.00	45
16/2	16.0	15.0	16.0	44.0	93.0	16.0	6	2.00	45
16/3	16.0	15.0	16.0	44.0	93.0	16.0	6	3.00	45
20/1	20.0	18.5	20.0	50.0	104.0	20.0	6	1.00	45
20/2,5	20.0	18.5	20.0	50.0	104.0	20.0	6	2.50	45

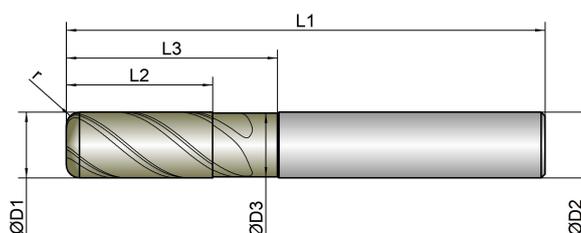
Cooling	
Tolerance	e8
Coating	TiSiN- α

HB	ETC	HSC	HPC	MTC
UNI	\neq			

NEW

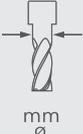


HB K202509



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
230	185	150					75	260								

K202509	D1 mm Ø	D3 mm Ø	L2 mm	L3 mm	L1 mm	D2 mm Ø	z #	r mm	 °
6/0,5	6.0	5.8	13.0	20.0	57.0	6.0	4	0.50	40
6/1	6.0	5.8	13.0	20.0	57.0	6.0	4	1.00	40
6/1,5	6.0	5.8	13.0	20.0	57.0	6.0	4	1.50	40
8/0,5	8.0	7.7	19.0	25.0	63.0	8.0	4	0.50	40
8/1	8.0	7.7	19.0	25.0	63.0	8.0	4	1.00	40
8/2	8.0	7.7	19.0	25.0	63.0	8.0	4	2.00	40
8/3	8.0	7.7	19.0	25.0	63.0	8.0	4	3.00	40
10/0,5	10.0	9.7	22.0	32.0	72.0	10.0	4	0.50	40
10/1	10.0	9.7	22.0	32.0	72.0	10.0	4	1.00	40
10/2	10.0	9.7	22.0	32.0	72.0	10.0	4	2.00	40
10/3	10.0	9.7	22.0	32.0	72.0	10.0	4	3.00	40
12/0,5	12.0	11.6	26.0	38.0	83.0	12.0	4	0.50	40

K202509	 D1 mm ∅	 D3 mm ∅	 L2 mm	 L3 mm	 L1 mm	 D2 mm ∅	 z #	 r mm	 °
12/1	12.0	11.6	26.0	38.0	83.0	12.0	4	1.00	40
12/2	12.0	11.6	26.0	38.0	83.0	12.0	4	2.00	40
12/3	12.0	11.6	26.0	38.0	83.0	12.0	4	3.00	40
16/0,5	16.0	15.5	32.0	44.0	92.0	16.0	4	0.50	40
16/1	16.0	15.5	32.0	44.0	92.0	16.0	4	1.00	40
16/2	16.0	15.5	32.0	44.0	92.0	16.0	4	2.00	40
16/3	16.0	15.5	32.0	44.0	92.0	16.0	4	3.00	40
20/1	20.0	19.5	41.0	54.0	104.0	20.0	4	1.00	40
20/2	20.0	19.5	41.0	54.0	104.0	20.0	4	2.00	40
20/3	20.0	19.5	41.0	54.0	104.0	20.0	4	3.00	40
20/4	20.0	19.5	41.0	54.0	104.0	20.0	4	4.00	40

Cooling 

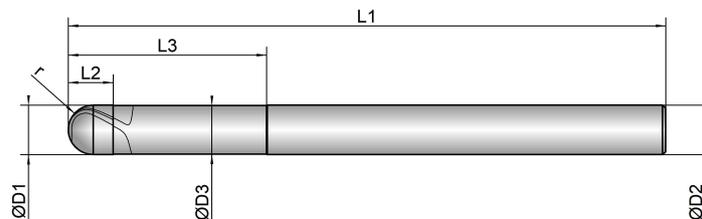
Tolerance f7

Coating -

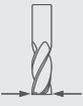
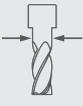
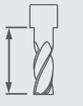
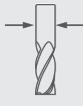
HA HSC UNI 



HA K203001



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
80	50						45	75	190	170	240					

K203001	D1  mm Ø	D3  mm Ø	L2  mm	L3  mm	L1  mm	D2  mm Ø	z  #	r  mm	 °
1/6	1.0	0.9	2.0	6.0	100.0	6.0	2	0.50	30
2/6	2.0	1.8	3.0	8.0	100.0	6.0	2	1.00	30
3/6	3.0	2.8	4.0	12.0	100.0	6.0	2	1.50	30
4/6	4.0	3.8	5.0	16.0	100.0	6.0	2	2.00	30
5/6	5.0	4.8	6.0	20.0	100.0	6.0	2	2.50	30
6/6	6.0	5.8	6.0	25.0	100.0	6.0	2	3.00	30
6/8	6.0	5.8	6.0	25.0	100.0	8.0	2	3.00	30
8/8	8.0	7.8	7.0	32.0	100.0	8.0	2	4.00	30
8/10	8.0	7.8	7.0	32.0	120.0	10.0	2	4.00	30
10/10	10.0	9.8	9.0	40.0	120.0	10.0	2	5.00	30
10/12	10.0	9.8	9.0	40.0	160.0	12.0	2	5.00	30
12/12	12.0	11.8	11.0	50.0	160.0	12.0	2	6.00	30
12/16	12.0	11.8	11.0	50.0	200.0	16.0	2	6.00	30
16/16	16.0	15.5	14.0	60.0	200.0	16.0	2	8.00	30

Cooling

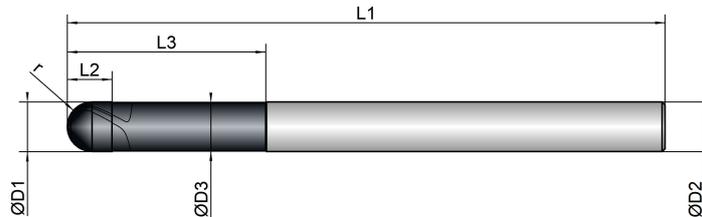
Tolerance f7

Coating TiAlN- α

HA HSC UNI



HA K203003



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
400	290	210					210	580	360	330						

K203003	D1 mm ø	D3 mm ø	L2 mm	L3 mm	L1 mm	D2 mm ø	z #	r mm	 °
1/6	1.0	0.9	2.0	6.0	100.0	6.0	2	0.50	30
2/6	2.0	1.8	3.0	8.0	100.0	6.0	2	1.00	30
3/6	3.0	2.8	4.0	12.0	100.0	6.0	2	1.50	30
4/6	4.0	3.8	5.0	16.0	100.0	6.0	2	2.00	30
5/6	5.0	4.8	6.0	20.0	100.0	6.0	2	2.50	30
6/6	6.0	5.8	6.0	25.0	100.0	6.0	2	3.00	30
6/8	6.0	5.8	6.0	25.0	100.0	8.0	2	3.00	30
8/8	8.0	7.8	7.0	32.0	100.0	8.0	2	4.00	30
8/10	8.0	7.8	7.0	32.0	120.0	10.0	2	4.00	30
10/10	10.0	9.8	9.0	40.0	120.0	10.0	2	5.00	30
10/12	10.0	9.8	9.0	40.0	160.0	12.0	2	5.00	30
12/12	12.0	11.8	11.0	50.0	160.0	12.0	2	6.00	30
12/16	12.0	11.8	11.0	50.0	200.0	16.0	2	6.00	30
16/16	16.0	15.5	14.0	60.0	200.0	16.0	2	8.00	30

Cooling

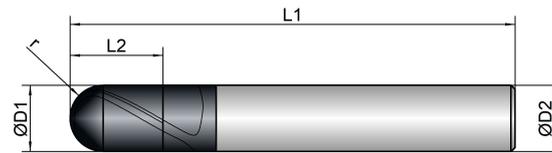
Tolerance f8

Coating TiAlN- α

HA HSC HPC UNI



HA K203033



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
420	290	220	165	150			225	615								

K203033	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	r mm	 °
0,1/3	0.1	0.2	38.0	3.0	2	0.05	30
0,15/3	0.15	0.3	38.0	3.0	2	0.075	30
0,2/3	0.2	0.4	38.0	3.0	2	0.10	30
0,25/3	0.25	0.5	38.0	3.0	2	0.125	30
0,3/3	0.3	1.0	38.0	3.0	2	0.15	30
0,35/3	0.35	1.0	38.0	3.0	2	0.175	30
0,4/3	0.4	1.0	38.0	3.0	2	0.20	30
0,5/3	0.5	1.5	38.0	3.0	2	0.25	30
0,5/6	0.5	1.5	54.0	6.0	2	0.25	30
0,6/3	0.6	1.5	38.0	3.0	2	0.30	30
0,7/3	0.7	2.0	38.0	3.0	2	0.35	30
0,8/3	0.8	2.0	38.0	3.0	2	0.40	30
0,9/3	0.9	2.5	38.0	3.0	2	0.45	30
1/3	1.0	2.0	50.0	3.0	2	0.50	30
1/6	1.0	2.0	54.0	6.0	2	0.50	30

	 D1 mm \varnothing	 L2 mm	 L1 mm	 D2 mm \varnothing	 z #	 r mm	 °
K203033							
1,1/3	1.1	3.0	50.0	3.0	2	0.55	30
1,2/3	1.2	3.0	50.0	3.0	2	0.60	30
1,4/3	1.4	3.0	50.0	3.0	2	0.70	30
1,5/3	1.5	3.0	50.0	3.0	2	0.75	30
1,5/6	1.5	3.0	54.0	6.0	2	0.75	30
1,6/3	1.6	4.0	50.0	3.0	2	0.80	30
1,8/3	1.8	4.0	50.0	3.0	2	0.90	30
2/3	2.0	4.0	50.0	3.0	2	1.00	30
2/6	2.0	4.0	54.0	6.0	2	1.00	30
2,5/3	2.5	5.0	50.0	3.0	2	1.25	30
2,5/6	2.5	5.0	54.0	6.0	2	1.25	30
3/3	3.0	6.0	50.0	3.0	2	1.50	30
3/6	3.0	6.0	54.0	6.0	2	1.50	30
4/4	4.0	7.0	54.0	4.0	2	2.00	30
4/6	4.0	7.0	54.0	6.0	2	2.00	30
5/5	5.0	8.0	54.0	5.0	2	2.50	30
5/6	5.0	8.0	54.0	6.0	2	2.50	30
6/6	6.0	10.0	54.0	6.0	2	3.00	30
7/8	7.0	12.0	59.0	8.0	2	3.50	30
8/8	8.0	12.0	59.0	8.0	2	4.00	30
10/10	10.0	14.0	67.0	10.0	2	5.00	30
12/12	12.0	16.0	73.0	12.0	2	6.00	30
14/14	14.0	16.0	75.0	14.0	2	7.00	30
16/16	16.0	20.0	83.0	16.0	2	8.00	30
18/18	18.0	22.0	93.0	18.0	2	9.00	30
20/20	20.0	25.0	93.0	20.0	2	10.00	30

Cooling

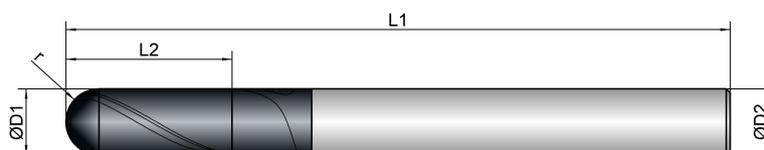
Tolerance f8

Coating TiAlN- α

HA HSC HPC UNI



HA K203063



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
350	240	180	135	125			180	500			695					

K203063	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	r mm	 °
0,5/3	0.5	1.5	75.0	3.0	2	0.25	30
0,5/6	0.5	1.5	80.0	6.0	2	0.25	30
1/3	1.0	3.0	75.0	3.0	2	0.50	30
1/6	1.0	3.0	80.0	6.0	2	0.50	30
1,5/3	1.5	4.0	75.0	3.0	2	0.75	30
1,5/6	1.5	4.0	80.0	6.0	2	0.75	30
2/3	2.0	6.0	75.0	3.0	2	1.00	30
2/6	2.0	6.0	80.0	6.0	2	1.00	30
2,5/3	2.5	8.0	75.0	3.0	2	1.25	30
2,5/6	2.5	8.0	80.0	6.0	2	1.25	30
3/3	3.0	10.0	75.0	3.0	2	1.50	30
3/6	3.0	10.0	80.0	6.0	2	1.50	30
4/4	4.0	13.0	75.0	4.0	2	2.00	30
4/6	4.0	13.0	80.0	6.0	2	2.00	30
5/5	5.0	14.0	75.0	5.0	2	2.50	30
5/6	5.0	14.0	100.0	6.0	2	2.50	30
6/6	6.0	16.0	100.0	6.0	2	3.00	30
8/8	8.0	22.0	100.0	8.0	2	4.00	30
10/10	10.0	25.0	100.0	10.0	2	5.00	30
12/12	12.0	26.0	100.0	12.0	2	6.00	30
14/14	14.0	26.0	100.0	14.0	2	7.00	30
16/16	16.0	30.0	150.0	16.0	2	8.00	30
20/20	20.0	40.0	150.0	20.0	2	10.00	30

Cooling 

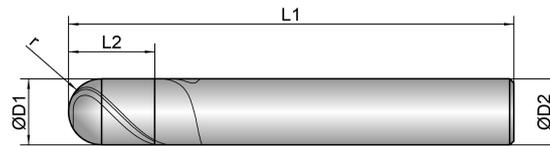
Tolerance f8

Coating -

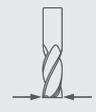
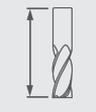
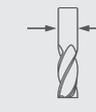
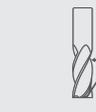
HA UNI  



HA K203081



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
70	50						45	75	190	160	240					

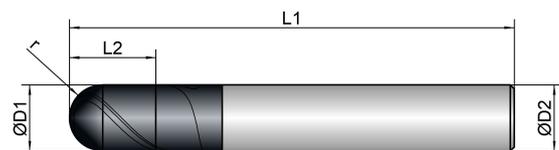
K203081	D1  mm ø	L2  mm	L1  mm	D2  mm ø	z  #	r  mm	 °
3	3.0	6.0	50.0	3.0	2	1.50	45
4	4.0	7.0	54.0	4.0	2	2.00	45
5	5.0	8.0	54.0	5.0	2	2.50	45
6	6.0	10.0	54.0	6.0	2	3.00	45
8	8.0	12.0	59.0	8.0	2	4.00	45
10	10.0	13.0	67.0	10.0	2	5.00	45
12	12.0	16.0	74.0	12.0	2	6.00	45
14	14.0	16.0	75.0	14.0	2	7.00	45
16	16.0	20.0	83.0	16.0	2	8.00	45
20	20.0	25.0	93.0	20.0	2	10.00	45

Cooling 

Tolerance f8

Coating TiAlN- α

HA HSC UNI 



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
140	80	75					85	130	360	330	400					

K203083	D1  mm ø	L2  mm	L1  mm	D2  mm ø	z  #	r  mm	 °
3	3.0	6.0	50.0	3.0	2	1.50	45
4	4.0	7.0	54.0	4.0	2	2.00	45
5	5.0	8.0	54.0	5.0	2	2.50	45
6	6.0	10.0	54.0	6.0	2	3.00	45
8	8.0	12.0	59.0	8.0	2	4.00	45
10	10.0	13.0	67.0	10.0	2	5.00	45
12	12.0	16.0	74.0	12.0	2	6.00	45
14	14.0	16.0	75.0	14.0	2	7.00	45
16	16.0	20.0	83.0	16.0	2	8.00	45
20	20.0	25.0	93.0	20.0	2	10.00	45

Cooling 

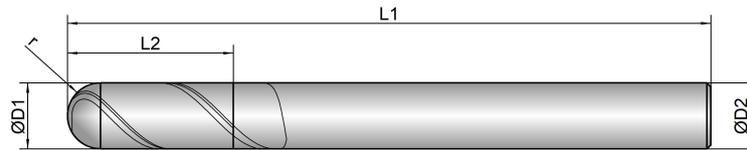
Tolerance f8

Coating -

HA UNI  



HA K203091



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
60	40						35	65	170	140	220					

K203091	D1  mm ø	L2  mm	L1  mm	D2  mm ø	z  #	r  mm	 °
3	3.0	10.0	75.0	3.0	2	1.50	45
4	4.0	13.0	75.0	4.0	2	2.00	45
5	5.0	15.0	75.0	5.0	2	2.50	45
6	6.0	16.0	100.0	6.0	2	3.00	45
8	8.0	22.0	100.0	8.0	2	4.00	45
10	10.0	25.0	100.0	10.0	2	5.00	45
12	12.0	26.0	100.0	12.0	2	6.00	45
14	14.0	26.0	100.0	14.0	2	7.00	45
16	16.0	30.0	150.0	16.0	2	8.00	45
20	20.0	40.0	150.0	20.0	2	10.00	45

Cooling

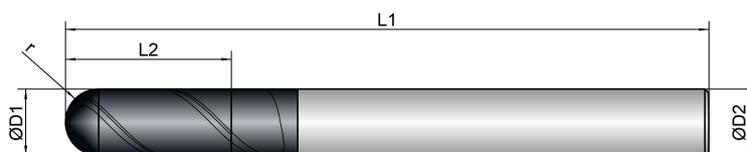
Tolerance f8

Coating TiAlN- α

HA HSC UNI



HA K203093



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
110	70	65					75	120	340	310		380				

K203093	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	r mm	 °
3	3.0	10.0	75.0	3.0	2	1.50	45
4	4.0	13.0	75.0	4.0	2	2.00	45
5	5.0	15.0	75.0	5.0	2	2.50	45
6	6.0	16.0	100.0	6.0	2	3.00	45
8	8.0	22.0	100.0	8.0	2	4.00	45
10	10.0	25.0	100.0	10.0	2	5.00	45
12	12.0	26.0	100.0	12.0	2	6.00	45
14	14.0	26.0	100.0	14.0	2	7.00	45
16	16.0	30.0	150.0	16.0	2	8.00	45
20	20.0	40.0	150.0	20.0	2	10.00	45

Cooling 

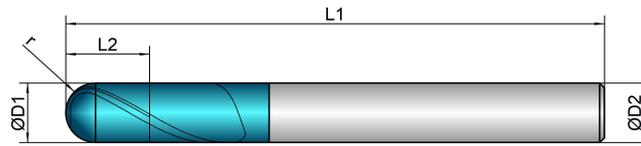
Tolerance f8

Coating TiSiN- α

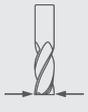
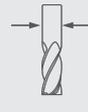
HA HSC HPC 




HA K203103



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
		210	180	160	110	85										

K203103	D1  mm Ø	L2  mm	L1  mm	D2  mm Ø	z  #	r  mm	 °
0,1/3	0.1	0.2	38.0	3.0	2	0.05	30
0,15/3	0.15	0.3	38.0	3.0	2	0.075	30
0,2/3	0.2	0.4	38.0	3.0	2	0.10	30
0,25/3	0.25	0.5	38.0	3.0	2	0.125	30
0,3/3	0.3	1.0	38.0	3.0	2	0.15	30
0,35/3	0.35	1.0	38.0	3.0	2	0.175	30
0,4/3	0.4	1.0	38.0	3.0	2	0.20	30
0,5/3	0.5	1.5	38.0	3.0	2	0.25	30
0,5/6	0.5	1.5	54.0	6.0	2	0.25	30
0,6/3	0.6	1.5	38.0	3.0	2	0.30	30
0,7/3	0.7	2.0	38.0	3.0	2	0.35	30
0,8/3	0.8	2.0	38.0	3.0	2	0.40	30
0,9/3	0.9	2.5	38.0	3.0	2	0.45	30
1/3	1.0	2.0	50.0	3.0	2	0.50	30
1/6	1.0	2.0	54.0	6.0	2	0.50	30

	 D1 mm \varnothing	 L2 mm	 L1 mm	 D2 mm \varnothing	 z #	 r mm	 °
K203103							
1,1/3	1.1	3.0	50.0	3.0	2	0.55	30
1,2/3	1.2	3.0	50.0	3.0	2	0.60	30
1,4/3	1.4	3.0	50.0	3.0	2	0.70	30
1,5/3	1.5	3.0	50.0	3.0	2	0.75	30
1,5/6	1.5	3.0	54.0	6.0	2	0.75	30
1,6/3	1.6	4.0	50.0	3.0	2	0.80	30
1,8/3	1.8	4.0	50.0	3.0	2	0.90	30
2/3	2.0	4.0	50.0	3.0	2	1.00	30
2/6	2.0	4.0	54.0	6.0	2	1.00	30
2,5/3	2.5	5.0	50.0	3.0	2	1.25	30
2,5/6	2.5	5.0	54.0	6.0	2	1.25	30
3/3	3.0	6.0	50.0	3.0	2	1.50	30
3/6	3.0	6.0	54.0	6.0	2	1.50	30
4/4	4.0	7.0	54.0	4.0	2	2.00	30
4/6	4.0	7.0	54.0	6.0	2	2.00	30
5/5	5.0	8.0	54.0	5.0	2	2.50	30
5/6	5.0	8.0	54.0	6.0	2	2.50	30
6/6	6.0	10.0	54.0	6.0	2	3.00	30
8/8	8.0	12.0	59.0	8.0	2	4.00	30
10/10	10.0	14.0	67.0	10.0	2	5.00	30
12/12	12.0	16.0	74.0	12.0	2	6.00	30
14/14	14.0	18.0	75.0	14.0	2	7.00	30
16/16	16.0	22.0	83.0	16.0	2	8.00	30
20/20	20.0	26.0	93.0	20.0	2	10.00	30

Cooling	
Tolerance	f8
Coating	TiSiN- α

HA

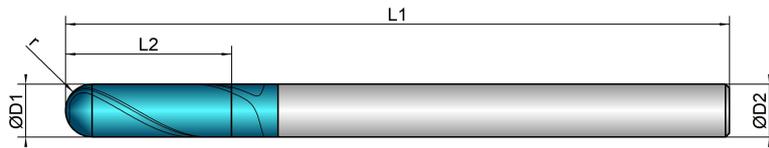
HSC

HPC

Expert



HA K203143



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
		200	175	155	95	80										

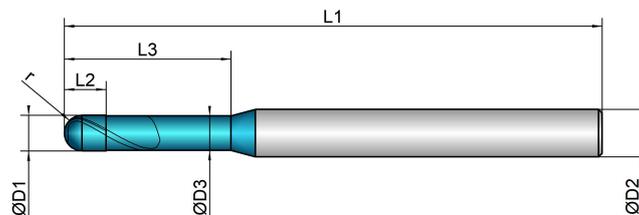
K203143	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	r mm	 °
0,5/3	0.5	1.5	75.0	3.0	2	0.25	30
0,5/6	0.5	1.5	80.0	6.0	2	0.25	30
1/3	1.0	3.0	75.0	3.0	2	0.50	30
1/6	1.0	3.0	80.0	6.0	2	0.50	30
1,5/3	1.5	4.0	75.0	3.0	2	0.75	30
1,5/6	1.5	4.0	80.0	6.0	2	0.75	30
2/3	2.0	6.0	75.0	3.0	2	1.00	30
2/6	2.0	6.0	80.0	6.0	2	1.00	30
2,5/3	2.5	8.0	75.0	3.0	2	1.25	30
2,5/6	2.5	8.0	80.0	6.0	2	1.25	30
3/3	3.0	10.0	75.0	3.0	2	1.50	30
3/6	3.0	10.0	80.0	6.0	2	1.50	30
4/4	4.0	13.0	75.0	4.0	2	2.00	30
4/6	4.0	13.0	80.0	6.0	2	2.00	30
5/5	5.0	14.0	75.0	5.0	2	2.50	30
5/6	5.0	14.0	100.0	6.0	2	2.50	30
6/6	6.0	16.0	100.0	6.0	2	3.00	30
8/8	8.0	22.0	100.0	8.0	2	4.00	30
10/10	10.0	25.0	100.0	10.0	2	5.00	30
12/12	12.0	26.0	100.0	12.0	2	6.00	30
14/14	14.0	26.0	100.0	14.0	2	7.00	30
16/16	16.0	30.0	150.0	16.0	2	8.00	30
20/20	20.0	40.0	150.0	20.0	2	10.00	30

Cooling	
Tolerance	0-0,01
Coating	TiSiN- α

HA HSC

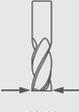
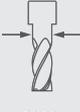
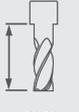
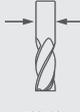


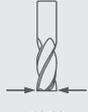
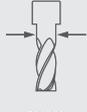
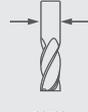
HA K203206



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
220	210	195	125	75	60	45	100		150							

K203206	D1 mm ø	D3 mm ø	L2 mm	L3 mm	L1 mm	D2 mm ø	z #	r mm	 °
0,2X0,3	0.2	0.17	0.16	0.3	45.0	4.0	2	0.10	30
0,2X0,5	0.2	0.17	0.16	0.5	45.0	4.0	2	0.10	30
0,2X0,75	0.2	0.17	0.16	0.75	45.0	4.0	2	0.10	30
0,2X1	0.2	0.17	0.16	1.0	45.0	4.0	2	0.10	30
0,2X1,25	0.2	0.17	0.16	1.25	45.0	4.0	2	0.10	30
0,2X1,5	0.2	0.17	0.16	1.5	45.0	4.0	2	0.10	30
0,2X1,75	0.2	0.17	0.16	1.75	45.0	4.0	2	0.10	30
0,2X2	0.2	0.17	0.16	2.0	45.0	4.0	2	0.10	30
0,2X2,5	0.2	0.17	0.16	2.5	45.0	4.0	2	0.10	30
0,2X3	0.2	0.17	0.16	3.0	45.0	4.0	2	0.10	30
0,3X0,5	0.3	0.27	0.24	0.5	45.0	4.0	2	0.15	30
0,3X0,75	0.3	0.27	0.24	0.75	45.0	4.0	2	0.15	30
0,3X1	0.3	0.27	0.24	1.0	45.0	4.0	2	0.15	30
0,3X1,25	0.3	0.27	0.24	1.25	45.0	4.0	2	0.15	30
0,3X1,5	0.3	0.27	0.24	1.5	45.0	4.0	2	0.15	30
0,4X0,5	0.4	0.34	0.32	0.5	45.0	4.0	2	0.20	30
0,4X0,75	0.4	0.34	0.32	0.75	45.0	4.0	2	0.20	30
0,4X1	0.4	0.34	0.32	1.0	45.0	4.0	2	0.20	30
0,4X1,5	0.4	0.34	0.32	1.5	45.0	4.0	2	0.20	30

K203206	 mm ∅	 mm ∅	 mm	 mm	 mm	 mm ∅	 #	 mm	 °
0,4X2	0.4	0.34	0.32	2.0	45.0	4.0	2	0.20	30
0,4X2,5	0.4	0.34	0.32	2.5	45.0	4.0	2	0.20	30
0,4X3	0.4	0.34	0.32	3.0	45.0	4.0	2	0.20	30
0,4X3,5	0.4	0.34	0.32	3.5	45.0	4.0	2	0.20	30
0,4X4	0.4	0.34	0.32	4.0	45.0	4.0	2	0.20	30
0,4X4,5	0.4	0.34	0.32	4.5	45.0	4.0	2	0.20	30
0,4X5	0.4	0.34	0.32	5.0	45.0	4.0	2	0.20	30
0,4X5,5	0.4	0.34	0.32	5.5	45.0	4.0	2	0.20	30
0,4X6	0.4	0.34	0.32	6.0	45.0	4.0	2	0.20	30
0,5X1	0.5	0.47	0.4	1.0	45.0	4.0	2	0.25	30
0,5X1,5	0.5	0.47	0.4	1.5	45.0	4.0	2	0.25	30
0,5X2	0.5	0.47	0.4	2.0	45.0	4.0	2	0.25	30
0,5X2,5	0.5	0.47	0.4	2.5	45.0	4.0	2	0.25	30
0,5X3	0.5	0.47	0.4	3.0	45.0	4.0	2	0.25	30
0,5X3,5	0.5	0.47	0.4	3.5	45.0	4.0	2	0.25	30
0,5X4	0.5	0.47	0.4	4.0	45.0	4.0	2	0.25	30
0,5X4,5	0.5	0.47	0.4	4.5	45.0	4.0	2	0.25	30
0,5X5	0.5	0.47	0.4	5.0	45.0	4.0	2	0.25	30
0,5X5,5	0.5	0.47	0.4	5.5	45.0	4.0	2	0.25	30
0,5X6	0.5	0.47	0.4	6.0	45.0	4.0	2	0.25	30
0,5X7	0.5	0.47	0.4	7.0	45.0	4.0	2	0.25	30
0,5X8	0.5	0.47	0.4	8.0	45.0	4.0	2	0.25	30
0,5X9	0.5	0.47	0.4	9.0	45.0	4.0	2	0.25	30
0,6X1	0.6	0.57	0.48	1.0	45.0	4.0	2	0.30	30
0,6X2	0.6	0.57	0.48	2.0	45.0	4.0	2	0.30	30
0,6X3	0.6	0.57	0.48	3.0	45.0	4.0	2	0.30	30
0,6X4	0.6	0.57	0.48	4.0	45.0	4.0	2	0.30	30
0,6X5	0.6	0.57	0.48	5.0	45.0	4.0	2	0.30	30
0,6X6	0.6	0.57	0.48	6.0	45.0	4.0	2	0.30	30
0,6X8	0.6	0.57	0.48	8.0	45.0	4.0	2	0.30	30
0,8X2	0.8	0.77	0.64	2.0	45.0	4.0	2	0.40	30
0,8X3	0.8	0.77	0.64	3.0	45.0	4.0	2	0.40	30
0,8X4	0.8	0.77	0.64	4.0	45.0	4.0	2	0.40	30
0,8X5	0.8	0.77	0.64	5.0	45.0	4.0	2	0.40	30
0,8X6	0.8	0.77	0.64	6.0	45.0	4.0	2	0.40	30
0,8X7	0.8	0.77	0.64	7.0	45.0	4.0	2	0.40	30
0,8X8	0.8	0.77	0.64	8.0	45.0	4.0	2	0.40	30
0,8X9	0.8	0.77	0.64	9.0	45.0	4.0	2	0.40	30
1X2,5	1.0	0.96	0.8	2.5	45.0	4.0	2	0.50	30
1X3	1.0	0.96	0.8	3.0	45.0	4.0	2	0.50	30

	 D1 mm ∅	 D3 mm ∅	 L2 mm	 L3 mm	 L1 mm	 D2 mm ∅	 z #	 r mm	 °
K203206									
1X4	1.0	0.96	0.8	4.0	45.0	4.0	2	0.50	30
1X5	1.0	0.96	0.8	5.0	45.0	4.0	2	0.50	30
1X6	1.0	0.96	0.8	6.0	45.0	4.0	2	0.50	30
1X7	1.0	0.96	0.8	7.0	45.0	4.0	2	0.50	30
1X8	1.0	0.96	0.8	8.0	45.0	4.0	2	0.50	30
1X9	1.0	0.96	0.8	9.0	45.0	4.0	2	0.50	30
1X10	1.0	0.96	0.8	10.0	45.0	4.0	2	0.50	30
1X12	1.0	0.96	0.8	12.0	45.0	4.0	2	0.50	30
1,2X6	1.2	1.16	0.96	6.0	45.0	4.0	2	0.60	30
1,2X8	1.2	1.16	0.96	8.0	45.0	4.0	2	0.60	30
1,2X10	1.2	1.16	0.96	10.0	45.0	4.0	2	0.60	30
1,2X12	1.2	1.16	0.96	12.0	45.0	4.0	2	0.60	30
1,4X8	1.4	1.34	1.12	8.0	45.0	4.0	2	0.70	30
1,4X12	1.4	1.34	1.12	12.0	45.0	4.0	2	0.70	30
1,5X3	1.5	1.44	1.2	3.0	45.0	4.0	2	0.75	30
1,5X4	1.5	1.44	1.2	4.0	45.0	4.0	2	0.75	30
1,5X6	1.5	1.44	1.2	6.0	45.0	4.0	2	0.75	30
1,5X8	1.5	1.44	1.2	8.0	45.0	4.0	2	0.75	30
1,5X10	1.5	1.44	1.2	10.0	45.0	4.0	2	0.75	30
1,5X12	1.5	1.44	1.2	12.0	45.0	4.0	2	0.75	30
1,6X8	1.6	1.54	1.28	8.0	45.0	4.0	2	0.80	30
1,6X12	1.6	1.54	1.28	12.0	45.0	4.0	2	0.80	30
1,8X8	1.8	1.74	1.44	8.0	45.0	4.0	2	0.90	30
1,8X12	1.8	1.74	1.44	12.0	45.0	4.0	2	0.90	30
2X3	2.0	1.94	1.6	3.0	45.0	4.0	2	1.00	30
2X4	2.0	1.94	1.6	4.0	45.0	4.0	2	1.00	30
2X6	2.0	1.94	1.6	6.0	45.0	4.0	2	1.00	30
2X8	2.0	1.94	1.6	8.0	45.0	4.0	2	1.00	30
2X10	2.0	1.94	1.6	10.0	45.0	4.0	2	1.00	30
2X12	2.0	1.94	1.6	12.0	45.0	4.0	2	1.00	30
2,5X10	2.5	2.41	2.0	10.0	45.0	4.0	2	1.25	30
3X8	3.0	2.92	3.5	8.0	45.0	4.0	2	1.50	30
3X10	3.0	2.92	3.5	10.0	45.0	4.0	2	1.50	30
3X12	3.0	2.92	3.5	12.0	45.0	4.0	2	1.50	30
3X16	3.0	2.92	3.5	16.0	45.0	4.0	2	1.50	30

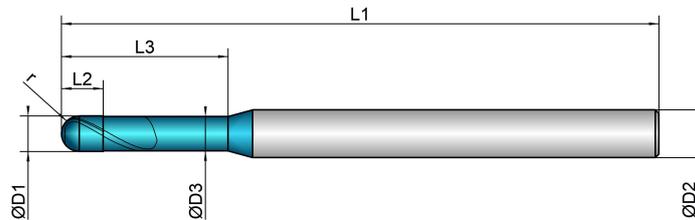
Cooling	
Tolerance	0-0,01
Coating	TiSiN- α

HA

HSC

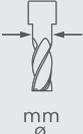


HA K203212



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
220	210	195	125	75	60	45	100		150							

	D1	D3	L2	L3	L1	D2	z	r	
K203212									
	mm ∅	mm ∅	mm	mm	mm	mm ∅	#	mm	°
0,3X1,75	0.3	0.27	0.24	1.75	50.0	4.0	2	0.15	30
0,3X2	0.3	0.27	0.24	2.0	50.0	4.0	2	0.15	30
0,3X2,25	0.3	0.27	0.24	2.25	50.0	4.0	2	0.15	30
0,3X2,5	0.3	0.27	0.24	2.5	50.0	4.0	2	0.15	30
0,3X2,75	0.3	0.27	0.24	2.75	50.0	4.0	2	0.15	30
0,3X3	0.3	0.27	0.24	3.0	50.0	4.0	2	0.15	30
0,3X3,5	0.3	0.27	0.24	3.5	50.0	4.0	2	0.15	30
0,3X4	0.3	0.27	0.24	4.0	50.0	4.0	2	0.15	30
0,3X4,5	0.3	0.27	0.24	4.5	50.0	4.0	2	0.15	30
0,5X10	0.5	0.47	0.4	10.0	50.0	4.0	2	0.25	30
0,6X10	0.6	0.57	0.48	10.0	50.0	4.0	2	0.30	30
0,6X12	0.6	0.57	0.48	12.0	50.0	4.0	2	0.30	30

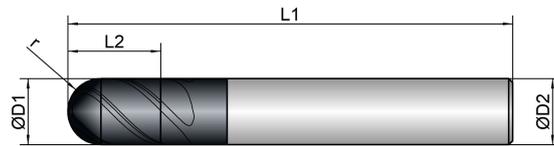
K203212	 mm ∅	 mm ∅	 mm	 mm	 mm	 mm ∅	 #	 mm	 °
0,8X10	0.8	0.77	0.64	10.0	50.0	4.0	2	0.40	30
1X14	1.0	0.96	0.8	14.0	50.0	4.0	2	0.50	30
1X16	1.0	0.96	0.8	16.0	50.0	4.0	2	0.50	30
1,2X14	1.2	1.16	0.96	14.0	50.0	4.0	2	0.60	30
1,2X16	1.2	1.16	0.96	16.0	50.0	4.0	2	0.60	30
1,4X16	1.4	1.34	1.12	16.0	50.0	4.0	2	0.70	30
1,5X14	1.5	1.44	1.2	14.0	50.0	4.0	2	0.75	30
1,5X16	1.5	1.44	1.2	16.0	50.0	4.0	2	0.75	30
1,6X16	1.6	1.54	1.28	16.0	50.0	4.0	2	0.80	30
1,8X16	1.8	1.74	1.44	16.0	50.0	4.0	2	0.90	30
2X14	2.0	1.94	1.6	14.0	50.0	4.0	2	1.00	30
2X16	2.0	1.94	1.6	16.0	50.0	4.0	2	1.00	30
2,5X15	2.5	2.41	2.0	15.0	50.0	4.0	2	1.25	30
3X16	3.0	2.92	3.5	16.0	50.0	4.0	2	1.50	30

Cooling	
Tolerance	f8
Coating	TiAlN- α

HA	HSC	HPC	MTC	UNI	
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HA K203253



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
210	150	140					90	360	400						50	

K203253	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	r mm	 °
3	3.0	5.0	50.0	3.0	4	1.50	45
4	4.0	8.0	54.0	4.0	4	2.00	45
5	5.0	9.0	54.0	5.0	4	2.50	45
6	6.0	10.0	54.0	6.0	4	3.00	45
8	8.0	12.0	59.0	8.0	4	4.00	45
10	10.0	14.0	67.0	10.0	4	5.00	45
12	12.0	16.0	74.0	12.0	4	6.00	45
14	14.0	18.0	75.0	14.0	4	7.00	45
16	16.0	22.0	83.0	16.0	4	8.00	45
20	20.0	26.0	93.0	20.0	4	10.00	45

Cooling

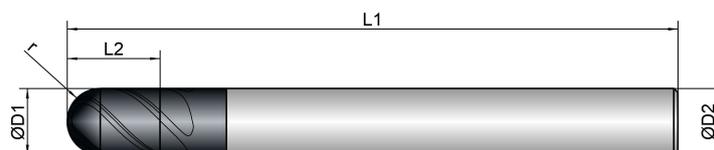
Tolerance f8

Coating TiAlN- α

HA HSC HPC MTC UNI



HA K203263



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
190	130	120					80	340	380							40

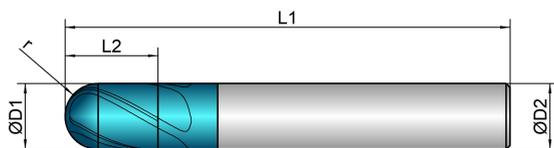
K203263	D1 mm Ø	L2 mm	L1 mm	D2 mm Ø	z #	r mm	 °
3	3.0	5.0	75.0	3.0	4	1.50	45
4	4.0	8.0	75.0	4.0	4	2.00	45
5	5.0	9.0	75.0	5.0	4	2.50	45
6	6.0	10.0	100.0	6.0	4	3.00	45
8	8.0	12.0	100.0	8.0	4	4.00	45
10	10.0	14.0	100.0	10.0	4	5.00	45
12	12.0	16.0	100.0	12.0	4	6.00	45
14	14.0	18.0	100.0	14.0	4	7.00	45
16	16.0	22.0	150.0	16.0	4	8.00	45
20	20.0	26.0	150.0	20.0	4	10.00	45

Cooling	
Tolerance	f8
Coating	TiSiN- α

HA HSC HPC



HA K203333



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
		200	175	155	110	85										

K203333	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	r mm	 °
2/3	2.0	4.0	50.0	3.0	4	1.00	30
2/6	2.0	4.0	54.0	6.0	4	1.00	30
2,5/6	2.5	5.0	54.0	6.0	4	1.25	30
3/3	3.0	5.0	50.0	3.0	4	1.50	30
3/6	3.0	5.0	54.0	6.0	4	1.50	30
4/4	4.0	8.0	54.0	4.0	4	2.00	30
4/6	4.0	8.0	54.0	6.0	4	2.00	30
5/5	5.0	9.0	54.0	5.0	4	2.50	30
5/6	5.0	9.0	54.0	6.0	4	2.50	30
6/6	6.0	10.0	54.0	6.0	4	3.00	30
7/8	7.0	12.0	59.0	8.0	4	3.50	30
8/8	8.0	12.0	59.0	8.0	4	4.00	30
9/10	9.0	14.0	67.0	10.0	4	4.50	30
10/10	10.0	14.0	67.0	10.0	4	5.00	30
12/12	12.0	16.0	74.0	12.0	4	6.00	30
14/14	14.0	18.0	75.0	14.0	4	7.00	30
16/16	16.0	22.0	83.0	16.0	4	8.00	30
20/20	20.0	26.0	93.0	20.0	4	10.00	30

Cooling	
Tolerance	f8
Coating	TiSiN- α

HA

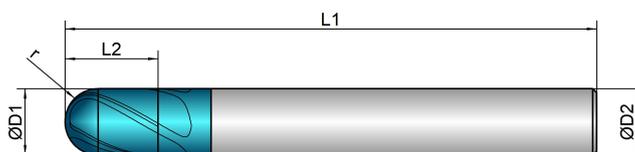
HSC

HPC

Expert



HA K203343



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
		200	175	155	110	85										

K203343	D1 mm Ø	L2 mm	L1 mm	D2 mm Ø	z #	r mm	 °
2/3	2.0	4.0	75.0	3.0	4	1.00	30
2/6	2.0	4.0	80.0	6.0	4	1.00	30
2,5/6	2.5	5.0	80.0	6.0	4	1.25	30
3/3	3.0	5.0	75.0	3.0	4	1.50	30
3/6	3.0	5.0	80.0	6.0	4	1.50	30
4/4	4.0	8.0	75.0	4.0	4	2.00	30
4/6	4.0	8.0	80.0	6.0	4	2.00	30
5/5	5.0	9.0	75.0	5.0	4	2.50	30
5/6	5.0	9.0	100.0	6.0	4	2.50	30
6/6	6.0	10.0	100.0	6.0	4	3.00	30
8/8	8.0	12.0	100.0	8.0	4	4.00	30
10/10	10.0	14.0	100.0	10.0	4	5.00	30
12/12	12.0	16.0	100.0	12.0	4	6.00	30
14/14	14.0	18.0	100.0	14.0	4	7.00	30
16/16	16.0	22.0	150.0	16.0	4	8.00	30
20/20	20.0	26.0	150.0	20.0	4	10.00	30

Cooling

Tolerance f8

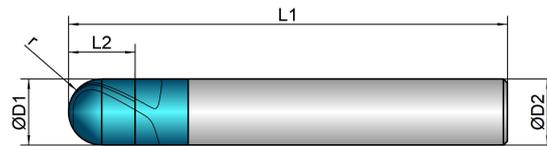
Coating TiSiN- α

HA HSC UNI

Basic



HA K203373



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
		200	175	155	115	95										

K203373	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	r mm	 °
0,5	0.5	0.5	50.0	4.0	2	0.25	30
1	1.0	1.0	50.0	4.0	2	0.50	30
1,5	1.5	1.5	50.0	4.0	2	0.75	30
2	2.0	2.0	50.0	4.0	2	1.00	30
2,5	2.5	2.5	50.0	4.0	2	1.25	30
3	3.0	3.0	50.0	6.0	2	1.50	30
4	4.0	4.0	50.0	6.0	2	2.00	30
5	5.0	5.0	50.0	6.0	2	2.50	30
6	6.0	6.0	50.0	6.0	2	3.00	30
8	8.0	8.0	59.0	8.0	2	4.00	30
10	10.0	10.0	66.0	10.0	2	5.00	30
12	12.0	12.0	73.0	12.0	2	6.00	30

Cooling

Tolerance f8

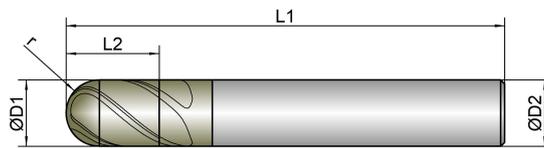
Coating TiSiN- α

HA HSC HPC

NEW



HA K203413



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
200	160	150					100	350								

K203413	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	r mm	 °
3	3.0	5.0	54.0	6.0	4	1.50	40
4	4.0	8.0	54.0	6.0	4	2.00	40
5	5.0	9.0	54.0	6.0	4	2.50	40
6	6.0	10.0	54.0	6.0	4	3.00	40
8	8.0	12.0	58.0	8.0	4	4.00	40
10	10.0	14.0	66.0	10.0	4	5.00	40
12	12.0	16.0	73.0	12.0	4	6.00	40
16	16.0	22.0	82.0	16.0	4	8.00	40

Cooling 

Tolerance f8

Coating TiSiN- α

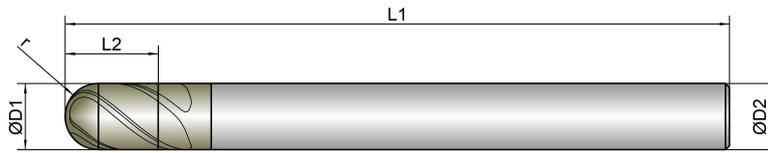
HA HSC HPC 

NEW

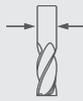
 Expert



HA K203418



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
190	150	140					90	340								

K203418	D1  mm ø	L2  mm	L1  mm	D2  mm ø	z  #	r  mm	 °
3	3.0	5.0	83.0	6.0	4	1.50	40
4	4.0	8.0	83.0	6.0	4	2.00	40
5	5.0	9.0	83.0	6.0	4	2.50	40
6	6.0	10.0	83.0	6.0	4	3.00	40
8	8.0	12.0	100.0	8.0	4	4.00	40
10	10.0	14.0	100.0	10.0	4	5.00	40
12	12.0	16.0	100.0	12.0	4	6.00	40
16	16.0	22.0	150.0	16.0	4	8.00	40

SC conical engraving cutter 60° | K204001

Cooling 

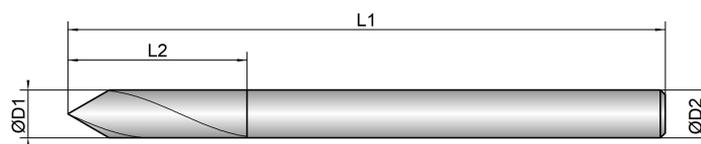
Tolerance -

Coating -

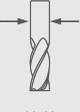
HA UNI



HA K204001



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
60	35						40	55	200	●						

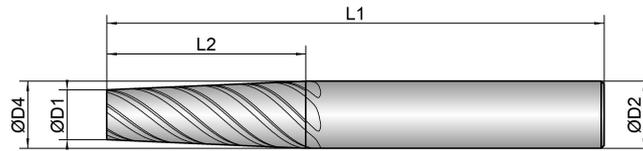
K204001	D1  mm ∅	L2  mm	L1  mm	D2  mm ∅	z  #	 °
3	3.0	15.0	50.0	3.0	1	30
4	4.0	18.0	50.0	4.0	1	30
6	6.0	20.0	54.0	6.0	1	30

Cooling 

Tolerance -

Coating -

HA UNI 



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
●	●						●	●	●							

K204011	D1  mm ø	D4  mm ø	L2  mm	L1  mm	D2  mm ø	z  #	 °
2X10	2	3	10.0	50.0	3.0	4	30
2,5X10	2.5	3	10.0	50.0	3.0	4	30
2,5X20	2.5	4	20.0	60.0	4.0	4	30
3X20	3	4	20.0	60.0	4.0	4	30
4X20	4	5	20.0	60.0	5.0	4	30
5X30	5	6	30.0	75.0	6.0	6	45
6X30	6	8	30.0	75.0	8.0	6	45
8X30	8	10	30.0	80.0	10.0	6	45
10X30	10	12	30.0	85.0	12.0	6	45
12X30	12	14	30.0	85.0	14.0	6	45
12X50	12	14	50.0	110.0	14.0	6	45
16X60	16	18	60.0	120.0	18.0	6	45

Cooling 

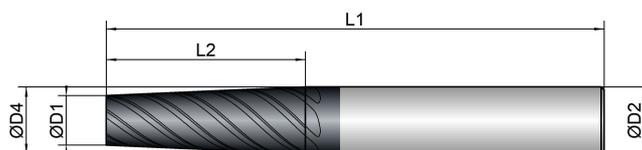
Tolerance -

Coating TiAlN- α

HA UNI



HA K204013



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
●	●	●					●	●	●							

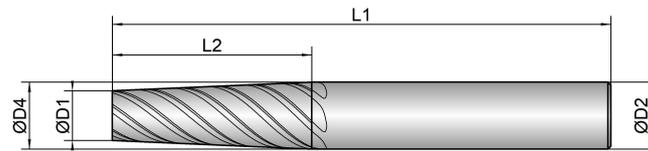
K204013	D1  mm ø	D4  mm ø	L2  mm	L1  mm	D2  mm ø	z  #	 °
2X10	2	3	10.0	50.0	3.0	4	30
2,5X10	2.5	3	10.0	50.0	3.0	4	30
2,5X20	2.5	4	20.0	60.0	4.0	4	30
3X20	3	4	20.0	60.0	4.0	4	30
4X20	4	5	20.0	60.0	5.0	4	30
5X30	5	6	30.0	75.0	6.0	6	45
6X30	6	8	30.0	75.0	8.0	6	45
8X30	8	10	30.0	80.0	10.0	6	45
10X30	10	12	30.0	85.0	12.0	6	45
12X30	12	14	30.0	85.0	14.0	6	45
12X50	12	14	50.0	110.0	14.0	6	45
16X60	16	18	60.0	120.0	18.0	6	45

Cooling 

Tolerance -

Coating -

HA UNI 



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
●	●						●	●	●							

K204021	D1  mm ∅	D4  mm ∅	L2  mm	L1  mm	D2  mm ∅	z  #	 °
2X10	2	3	10.0	50.0	3.0	4	30
2,5X10	2.5	3	10.0	50.0	3.0	4	45
2,5X20	2.5	4	20.0	60.0	4.0	4	30
3X20	3	4	20.0	60.0	4.0	4	30
3,5X20	3.5	5	20.0	60.0	5.0	4	30
4X20	4	5	20.0	60.0	5.0	4	30
4,5X20	4.5	6	20.0	65.0	6.0	6	45
5X25	5	6	25.0	70.0	6.0	6	45
6X30	6	8	30.0	75.0	8.0	6	45
8X30	8	10	30.0	80.0	10.0	6	45
10X30	10	12	30.0	85.0	12.0	6	45
12X30	12	14	30.0	85.0	14.0	6	45
12X50	12	14	50.0	110.0	14.0	6	45
16X55	16	18	55.0	115.0	18.0	6	45

Cooling

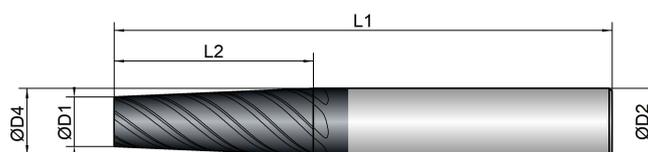
Tolerance -

Coating TiAlN- α

HA UNI



HA K204023



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
●	●	●					●	●	●							

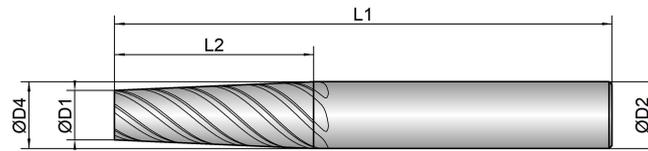
K204023	D1 mm ø	D4 mm ø	L2 mm	L1 mm	D2 mm ø	z #	 °
2X10	2	3	10.0	50.0	3.0	4	30
2,5X10	2.5	3	10.0	50.0	3.0	4	45
2,5X20	2.5	4	20.0	60.0	4.0	4	30
3X20	3	4	20.0	60.0	4.0	4	30
3,5X20	3.5	5	20.0	60.0	5.0	4	30
4X20	4	5	20.0	60.0	5.0	4	30
4,5X20	4.5	6	20.0	65.0	6.0	6	45
5X25	5	6	25.0	70.0	6.0	6	45
6X30	6	8	30.0	75.0	8.0	6	45
8X30	8	10	30.0	80.0	10.0	6	45
10X30	10	12	30.0	85.0	12.0	6	45
12X30	12	14	30.0	85.0	14.0	6	45
12X50	12	14	50.0	110.0	14.0	6	45
16X55	16	18	55.0	115.0	18.0	6	45

Cooling 

Tolerance -

Coating -

HA UNI 



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
●	●						●	●	●							

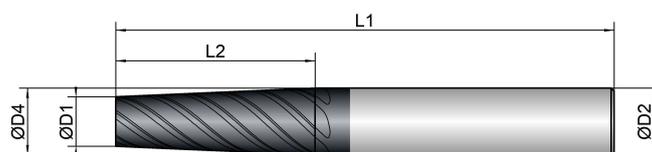
K204031	D1  mm ∅	D4  mm ∅	L2  mm	L1  mm	D2  mm ∅	z  #	 °
2X10	2	3	10.0	50.0	3.0	4	30
2,5X10	2.5	4	10.0	50.0	4.0	4	30
2,5X20	2.5	4	20.0	60.0	4.0	4	30
3X20	3	4	20.0	60.0	4.0	4	30
3,5X20	3.5	5	20.0	60.0	5.0	4	30
4X20	4	5	20.0	60.0	5.0	4	30
4,5X20	4.5	6	20.0	65.0	6.0	4	30
5X30	5	8	30.0	75.0	8.0	6	45
6X30	6	8	30.0	75.0	8.0	6	45
8X30	8	10	30.0	80.0	10.0	6	45
10X30	10	12	30.0	85.0	12.0	6	45
12X30	12	14	30.0	85.0	14.0	6	45
12X50	12	16	50.0	110.0	16.0	6	45
16X60	16	20	60.0	126.0	20.0	6	45

Cooling 

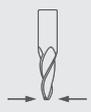
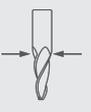
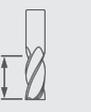
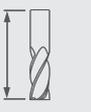
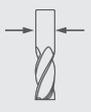
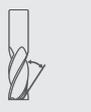
Tolerance -

Coating TiAlN- α

HA UNI



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
●	●	●					●	●	●							

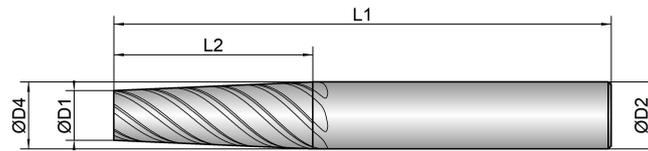
K204033	D1  mm ∅	D4  mm ∅	L2  mm	L1  mm	D2  mm ∅	z  #	 °
2X10	2	3	10.0	50.0	3.0	4	30
2,5X10	2.5	4	10.0	50.0	4.0	4	30
2,5X20	2.5	4	20.0	60.0	4.0	4	30
3X20	3	4	20.0	60.0	4.0	4	30
3,5X20	3.5	5	20.0	60.0	5.0	4	30
4X20	4	5	20.0	60.0	5.0	4	30
4,5X20	4.5	6	20.0	65.0	6.0	4	30
5X30	5	8	30.0	75.0	8.0	6	45
6X30	6	8	30.0	75.0	8.0	6	45
8X30	8	10	30.0	80.0	10.0	6	45
10X30	10	12	30.0	85.0	12.0	6	45
12X30	12	14	30.0	85.0	14.0	6	45
12X50	12	16	50.0	110.0	16.0	6	45
16X60	16	20	60.0	126.0	20.0	6	45

Cooling 

Tolerance -

Coating -

HA UNI 



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
●	●						●	●	●							

K204041	D1  mm ∅	D4  mm ∅	L2  mm	L1  mm	D2  mm ∅	z  #	 °
2X10	2	3	10.0	50.0	3.0	4	30
2,5X10	2.5	4	10.0	50.0	4.0	4	30
2,5X20	2.5	4	20.0	60.0	4.0	4	30
3X20	3	5	20.0	60.0	5.0	4	30
3,5X20	3.5	5	20.0	60.0	5.0	4	30
4X20	4	6	20.0	65.0	6.0	4	30
4,5X30	4.5	8	30.0	75.0	8.0	4	30
5X30	5	8	30.0	75.0	8.0	6	45
6X28	6	8	28.0	75.0	8.0	6	45
8X28	8	10	28.0	75.0	10.0	6	45
10X28	10	12	28.0	85.0	12.0	6	45
12X28	12	14	28.0	85.0	14.0	6	45
12X50	12	16	50.0	110.0	16.0	6	45
16X55	16	20	55.0	115.0	20.0	6	45

Cooling 

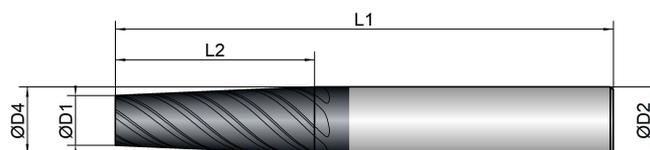
Tolerance -

Coating TiAlN- α

HA UNI



HA K204043



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
●	●	●					●	●	●							

K204043	D1  mm ∅	D4  mm ∅	L2  mm	L1  mm	D2  mm ∅	z  #	 °
2X10	2	3	10.0	50.0	3.0	4	30
2,5X10	2.5	4	10.0	50.0	4.0	4	30
2,5X20	2.5	4	20.0	60.0	4.0	4	30
3X20	3	5	20.0	60.0	5.0	4	30
3,5X20	3.5	5	20.0	60.0	5.0	4	30
4X20	4	6	20.0	65.0	6.0	4	30
4,5X30	4.5	8	30.0	75.0	8.0	4	30
5X30	5	8	30.0	75.0	8.0	6	45
6X28	6	8	28.0	75.0	8.0	6	45
8X28	8	10	28.0	75.0	10.0	6	45
10X28	10	12	28.0	85.0	12.0	6	45
12X28	12	14	28.0	85.0	14.0	6	45
12X50	12	16	50.0	110.0	16.0	6	45
16X55	16	20	55.0	115.0	20.0	6	45

Cooling 

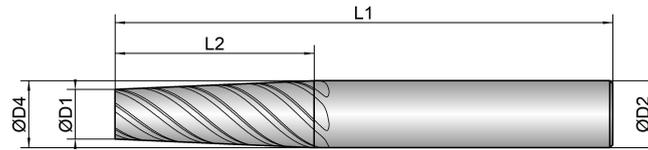
Tolerance -

Coating -

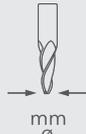
HA UNI



HA K204051



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
●	●						●	●	●							

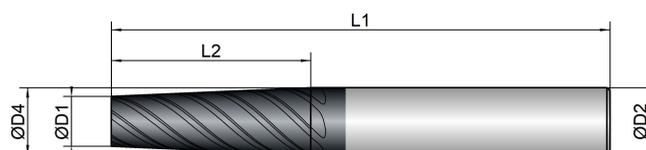
K204051	D1  mm ∅	D4  mm ∅	L2  mm	L1  mm	D2  mm ∅	z  #	 °
2X15	2	4	15.0	50.0	4.0	4	30
2,5X20	2.5	5	20.0	60.0	5.0	4	30
3X20	3	5	20.0	60.0	5.0	4	30
4X20	4	6	20.0	65.0	6.0	4	30
5X30	5	8	30.0	75.0	8.0	6	45
6X30	6	10	30.0	80.0	10.0	6	45
8X30	8	12	30.0	85.0	12.0	6	45
10X40	10	14	40.0	100.0	14.0	6	45

Cooling 

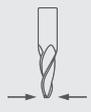
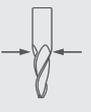
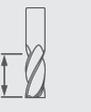
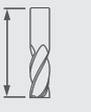
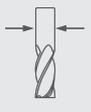
Tolerance -

Coating TiAlN- α

HA UNI



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
●	●	●					●	●	●							

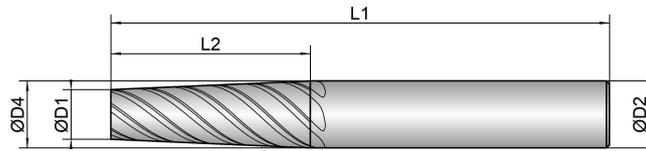
	D1  mm ø	D4  mm ø	L2  mm	L1  mm	D2  mm ø	z  #	 °
K204053							
2X15	2	4	15.0	50.0	4.0	4	30
2,5X20	2.5	5	20.0	60.0	5.0	4	30
3X20	3	5	20.0	60.0	5.0	4	30
4X20	4	6	20.0	65.0	6.0	4	30
5X30	5	8	30.0	75.0	8.0	6	45
6X30	6	10	30.0	80.0	10.0	6	45
8X30	8	12	30.0	85.0	12.0	6	45
10X40	10	14	40.0	100.0	14.0	6	45

Cooling

Tolerance -

Coating -

HA UNI



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
●	●						●	●	●							

K204061	D1 mm ø	D4 mm ø	L2 mm	L1 mm	D2 mm ø	z #	 °
2X10	2	4	10.0	50.0	4.0	4	30
2,5X10	2.5	4	10.0	50.0	4.0	4	30
2,5X20	2.5	6	20.0	65.0	6.0	4	30
3X25	3	6	25.0	70.0	6.0	4	30
3X30	3	8	30.0	75.0	8.0	4	30
3X40	3	8	40.0	85.0	8.0	4	30
4X25	4	8	25.0	70.0	8.0	6	45
4X30	4	8	30.0	75.0	8.0	6	45
5X40	5	10	40.0	90.0	10.0	6	45
6X30	6	10	30.0	80.0	10.0	6	45
8X30	8	12	30.0	84.0	12.0	6	45
8X50	8	14	50.0	110.0	14.0	6	45
10X30	10	14	30.0	84.0	14.0	6	45
10X50	10	16	50.0	110.0	16.0	6	45
12X30	12	16	30.0	90.0	16.0	6	45
12X50	12	18	50.0	110.0	18.0	6	45

Cooling 

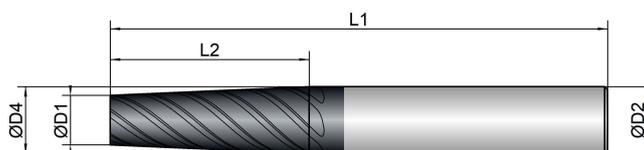
Tolerance -

Coating TiAlN- α

HA UNI



HA K204063



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
●	●	●					●	●	●							

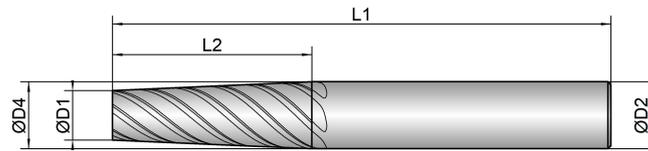
K204063	D1  mm ∅	D4  mm ∅	L2  mm	L1  mm	D2  mm ∅	z  #	 °
2X10	2	4	10.0	50.0	4.0	4	30
2,5X10	2.5	4	10.0	50.0	4.0	4	30
2,5X20	2.5	6	20.0	65.0	6.0	4	30
3X25	3	6	25.0	70.0	6.0	4	30
3X30	3	8	30.0	75.0	8.0	4	30
3X40	3	8	40.0	85.0	8.0	4	30
4X25	4	8	25.0	70.0	8.0	6	45
4X30	4	8	30.0	75.0	8.0	6	45
5X40	5	10	40.0	90.0	10.0	6	45
6X30	6	10	30.0	80.0	10.0	6	45
8X30	8	12	30.0	84.0	12.0	6	45
8X50	8	14	50.0	110.0	14.0	6	45
10X30	10	14	30.0	84.0	14.0	6	45
10X50	10	16	50.0	110.0	16.0	6	45
12X30	12	16	30.0	90.0	16.0	6	45
12X50	12	18	50.0	110.0	18.0	6	45

Cooling 

Tolerance -

Coating -

HA UNI 



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
●	●						●	●	●							

K204071	D1  mm ∅	D4  mm ∅	L2  mm	L1  mm	D2  mm ∅	z  #	 °
2,5X25	2.5	6	25.0	65.0	6.0	4	30
3X20	3	6	20.0	65.0	6.0	4	30
3,5X25	3.5	8	25.0	70.0	8.0	4	30
4X28	4	8	28.0	70.0	8.0	6	37
5X30	5	10	30.0	85.0	10.0	6	37
5X45	5	12	45.0	100.0	12.0	6	37
6X30	6	12	30.0	84.0	12.0	6	45
6X50	6	14	50.0	110.0	14.0	6	45
8X30	8	14	30.0	84.0	14.0	6	45
8X50	8	16	50.0	110.0	16.0	6	45
10X30	10	16	30.0	93.0	16.0	6	45
10X50	10	18	50.0	114.0	18.0	6	45

Cooling 

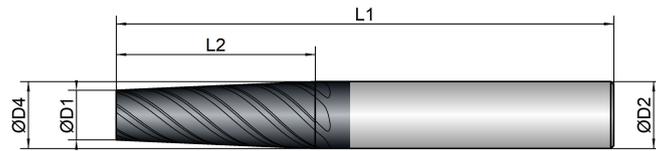
Tolerance -

Coating TiAlN- α

HA UNI 



HA K204073



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
●	●	●					●	●	●							

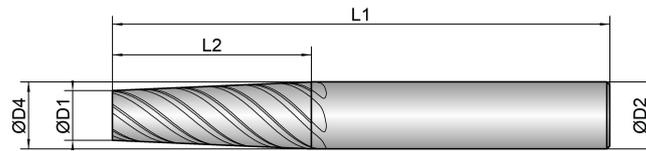
K204073	D1  mm ∅	D4  mm ∅	L2  mm	L1  mm	D2  mm ∅	z  #	 °
2,5X25	2.5	6	25.0	65.0	6.0	4	30
3X20	3	6	20.0	65.0	6.0	4	30
3,5X25	3.5	8	25.0	70.0	8.0	4	30
4X28	4	8	28.0	70.0	8.0	6	45
5X30	5	10	30.0	85.0	10.0	6	45
5X45	5	12	45.0	100.0	12.0	6	45
6X30	6	12	30.0	84.0	12.0	6	45
6X50	6	14	50.0	110.0	14.0	6	45
8X30	8	14	30.0	84.0	14.0	6	45
8X50	8	16	50.0	110.0	16.0	6	45
10X30	10	16	30.0	93.0	16.0	6	45
10X50	10	18	50.0	114.0	18.0	6	45

Cooling

Tolerance -

Coating -

HA UNI



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
●	●	●					●	●	●							

K204081	D1 mm ∅	D4 mm ∅	L2 mm	L1 mm	D2 mm ∅	z #	 °
2,5X20	2.5	6	20.0	65.0	6.0	4	30
3X28	3	8	28.0	70.0	8.0	4	30
3,5X30	3.5	10	30.0	80.0	10.0	4	30
4X30	4	10	30.0	80.0	10.0	6	45
4,5X30	4.5	10	30.0	80.0	10.0	6	45
5X30	5	12	30.0	84.0	12.0	6	45
5X40	5	12	40.0	100.0	12.0	6	45
6X30	6	12	30.0	93.0	12.0	6	45
6X55	6	16	55.0	110.0	16.0	6	45
8X30	8	14	30.0	90.0	14.0	6	45
8X50	8	18	50.0	114.0	18.0	6	45
10X30	10	16	30.0	93.0	16.0	6	45
10X55	10	20	55.0	115.0	20.0	6	45
12X30	12	18	30.0	93.0	18.0	6	45
12X45	12	20	45.0	100.0	20.0	6	45

Cooling

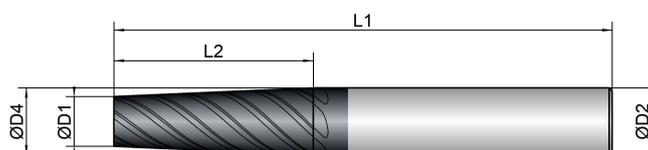
Tolerance -

Coating TiAlN- α

HA UNI



HA K204083



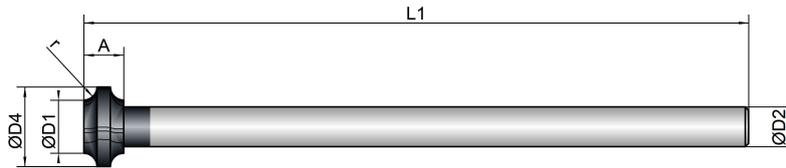
Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
●	●	●					●	●	●							

	D1 mm ∅	D4 mm ∅	L2 mm	L1 mm	D2 mm ∅	z #	 °
K204083							
2,5X20	2.5	6	20.0	65.0	6.0	4	30
3X28	3	8	28.0	70.0	8.0	4	30
3,5X30	3.5	10	30.0	80.0	10.0	4	30
4X30	4	10	30.0	80.0	10.0	6	45
4,5X30	4.5	10	30.0	80.0	10.0	6	45
5X30	5	12	30.0	84.0	12.0	6	45
5X40	5	12	40.0	100.0	12.0	6	45
6X30	6	12	30.0	93.0	12.0	6	45
6X55	6	16	55.0	110.0	16.0	6	45
8X30	8	14	30.0	90.0	14.0	6	45
8X50	8	18	50.0	114.0	18.0	6	45
10X30	10	16	30.0	93.0	16.0	6	45
10X55	10	20	55.0	115.0	20.0	6	45
12X30	12	18	30.0	93.0	18.0	6	45
12X45	12	20	45.0	100.0	20.0	6	45

Cooling	
Tolerance	0-0,01
Coating	TiAlN- α



HA K204092



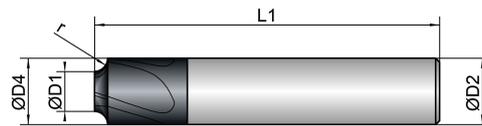
Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
60	40						35	40	120							

	r	D1	D4	A	L1	D2	z
	R						
	mm	mm Ø	mm Ø	mm	mm	mm Ø	#
K204092							
5,6/0,2	0.20	5.6	6	2.0	75.0	4.0	4
7,6/0,2	0.20	7.6	8	2.0	100.0	6.0	4
5,4/0,3	0.30	5.4	6	2.0	75.0	4.0	4
7,4/0,3	0.30	7.4	8	2.0	100.0	6.0	4
5,2/0,4	0.40	5.2	6	2.0	75.0	4.0	4
7,2/0,4	0.40	7.2	8	2.0	100.0	6.0	4
5/0,5	0.50	5	6	2.0	75.0	4.0	4
7/0,5	0.50	7	8	2.0	100.0	6.0	4
8,4/0,8	0.80	8.4	10	4.0	100.0	6.0	4
8/1	1.00	8	10	4.0	100.0	6.0	4
7,6/1,2	1.20	7.6	10	5.0	100.0	6.0	4
7/1,5	1.50	7	10	5.0	100.0	6.0	4
8,4/1,8	1.80	8.4	12	6.0	100.0	6.0	4
8/2	2.00	8	12	7.0	100.0	6.0	4
7/2,5	2.50	7	12	8.0	100.0	6.0	4

Cooling	
Tolerance	0-0,01
Coating	TiAlN- α



HA K204106



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
170	100						85	125	400				25			45

K204106	r	D1	D4	L1	D2	z
	$\overset{R}{\curvearrowright}$ mm	 mm ø	 mm ø	 mm	 mm ø	 #
3,6/0,2	0.20	3.6	4	50.0	4.0	4
3,4/0,3	0.30	3.4	4	50.0	4.0	4
3,2/0,4	0.40	3.2	4	50.0	4.0	4
3/0,5	0.50	3	4	50.0	4.0	4
4,8/0,6	0.60	4.8	6	50.0	6.0	4
4,4/0,8	0.80	4.4	6	50.0	6.0	4
4/1	1.00	4	6	50.0	6.0	4
5/1,5	1.50	5	8	55.0	10.0	4
6/2	2.00	6	10	66.0	10.0	4
7/2,5	2.50	7	12	75.0	12.0	4
6/3	3.00	6	12	75.0	12.0	4
9/3,5	3.50	9	16	80.0	16.0	4
8/4	4.00	8	16	80.0	16.0	4
7/4,5	4.50	7	16	80.0	16.0	4
10/5	5.00	10	20	80.0	20.0	4
8/6	6.00	8	20	80.0	20.0	4
9/8	8.00	9	25	100.0	25.0	4
5/10	10.00	5	25	100.0	25.0	4

Cooling

Tolerance -

Coating TiSiN- α

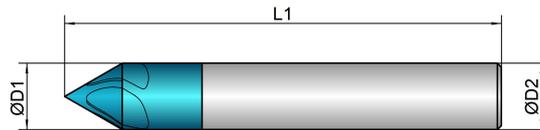
HA HB



HA K205153



HB K205154



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
		65	50	45	40	35										

K205153	K205154	D1	L1	D2	z
		mm ø	mm	mm ø	#
3	-	3.0	50.0	3.0	3
4	-	4.0	50.0	4.0	4
6	6	6.0	50.0	6.0	4
8	8	8.0	59.0	8.0	4
10	10	10.0	66.0	10.0	4
12	12	12.0	73.0	12.0	4

Cooling  

Tolerance -

Coating TiSiN- α

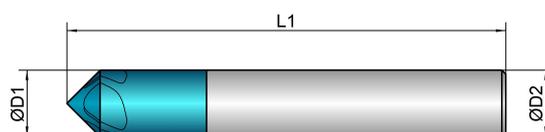
HA HB 



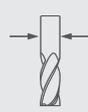

HA K205163



HB K205164



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
		65	50	45	40	35										

K205163	K205164	D1	L1	D2	z
		 mm ø	 mm	 mm ø	 #
3	-	3.0	50.0	3.0	3
4	-	4.0	50.0	4.0	4
6	6	6.0	50.0	6.0	4
8	8	8.0	59.0	8.0	4
10	10	10.0	66.0	10.0	4
12	12	12.0	73.0	12.0	4

Cooling 

Tolerance -

Coating TiAlN- α

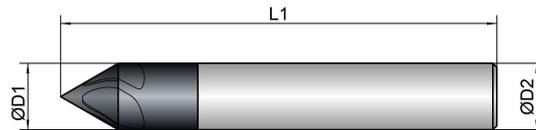
HA HB UNI 



HA K205173



HB K205174



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
110	85	65					80	90	280	250	●		30			40

K205173	K205174	D1	L1	D2	z
		 mm ø	 mm	 mm ø	 #
3	-	3.0	50.0	3.0	3
4	-	4.0	50.0	4.0	4
6	6	6.0	50.0	6.0	4
8	8	8.0	59.0	8.0	4
10	10	10.0	66.0	10.0	4
12	12	12.0	73.0	12.0	4

Cooling 

Tolerance -

Coating TiAlN- α

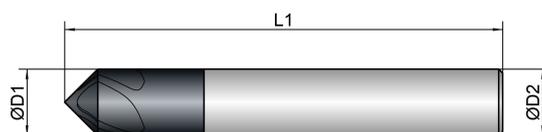
HA HB UNI 



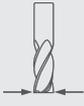
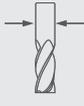
HA K205183



HB K205184



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
110	85	65					80	90	280	250	●		30			40

K205183	K205184	D1	L1	D2	z
		 mm ø	 mm	 mm ø	 #
3	-	3.0	50.0	3.0	3
4	-	4.0	50.0	4.0	4
6	6	6.0	50.0	6.0	4
8	8	8.0	59.0	8.0	4
10	10	10.0	66.0	10.0	4
12	12	12.0	73.0	12.0	4

Cooling 

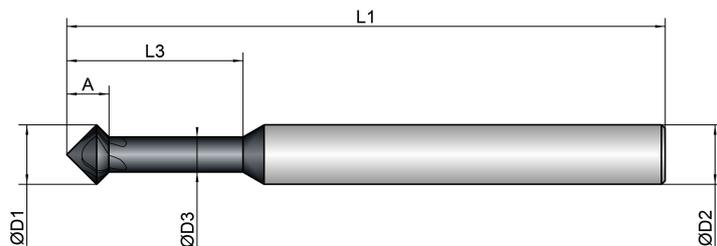
Tolerance -

Coating TiAlN- α

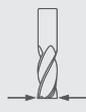
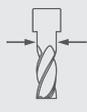
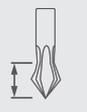
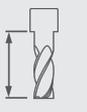
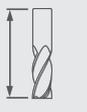
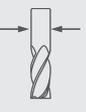
HA UNI  
Basic



HA K205193



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
70	45						40	38	120				25			35

	D1	D3	A	L3	L1	D2	z
							
	mm Ø	mm Ø	mm	mm	mm	mm Ø	#
K205193							
3	3.0	2.2	2.0	10.0	50.0	4.0	4
4	4.0	2.9	2.5	10.0	50.0	4.0	4
5	5.0	3.9	3.0	15.0	65.0	6.0	4
6	6.0	3.9	4.0	15.0	65.0	6.0	4
8	8.0	5.9	2.5	20.0	70.0	8.0	4
10	10.0	5.9	4.0	23.0	73.0	10.0	4
12	12.0	5.9	6.0	23.0	75.0	12.0	4

Cooling

Tolerance d11

Coating TiAlN- α

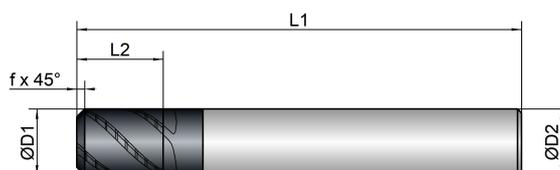
HA HB MTC UNI



HA K206083



HB K206084



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
175	150	125					60	125							40	

K206083	K206084	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	 mm	 °
6	6	6.0	8.0	54.0	6.0	4	0.15	45
8	8	8.0	11.0	59.0	8.0	4	0.20	45
10	10	10.0	13.0	67.0	10.0	4	0.20	45
12	12	12.0	16.0	74.0	12.0	4	0.25	45
14	14	14.0	16.0	75.0	14.0	4	0.25	45
16	16	16.0	19.0	83.0	16.0	5	0.35	45
18	18	18.0	19.0	80.0	18.0	5	0.35	45
20	20	20.0	19.0	93.0	20.0	5	0.40	45

Cooling 

Tolerance d11

Coating TiAlN- α

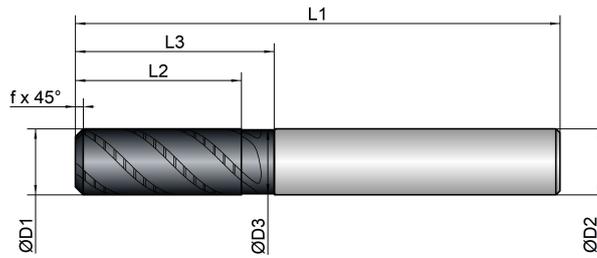
HA HB MTC UNI 



HA K206093



HB K206094



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
175	150	125					60	125							40	

K206093	K206094	D1	D3	L2	L3	L1	D2	z	45°	
		mm Ø	mm Ø	mm	mm	mm	mm Ø	#		
6	6	6.0	5.8	16.0	21.0	58.0	6.0	4	0.15	45
8	8	8.0	7.7	22.0	27.0	70.0	8.0	4	0.20	45
10	10	10.0	9.7	25.0	30.0	73.0	10.0	4	0.20	45
12	12	12.0	11.6	28.0	38.0	84.0	12.0	4	0.25	45
14	14	14.0	13.6	30.0	40.0	84.0	14.0	4	0.25	45
16	16	16.0	15.5	36.0	45.0	93.0	16.0	5	0.35	45
18	18	18.0	17.5	36.0	45.0	93.0	18.0	5	0.35	45
20	20	20.0	19.5	41.0	55.0	104.0	20.0	5	0.40	45
25	25	25.0	24.0	50.0	65.0	125.0	25.0	5	0.50	45

Cooling	
Tolerance	d11
Coating	TiAlN- α

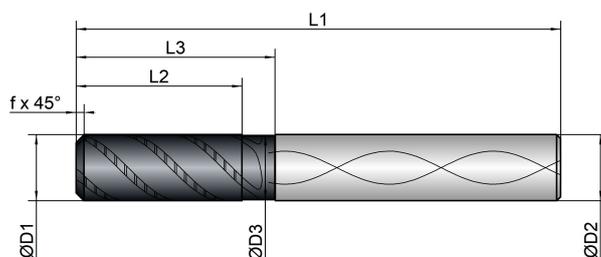
HA	HB	MTC	UNI		
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HA K206113



HB K206114



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
200	170	150					70	150								40

K206113	K206114	D1	D3	L2	L3	L1	D2	z	45°	
		mm Ø	mm Ø	mm	mm	mm	mm Ø	#		
6	6	6.0	5.8	16.0	21.0	58.0	6.0	4	0.15	45
8	8	8.0	7.7	22.0	27.0	70.0	8.0	4	0.20	45
10	10	10.0	9.7	25.0	30.0	73.0	10.0	4	0.20	45
12	12	12.0	11.6	28.0	38.0	84.0	12.0	4	0.25	45
14	14	14.0	13.6	30.0	40.0	84.0	14.0	4	0.25	45
16	16	16.0	15.5	36.0	45.0	93.0	16.0	5	0.35	45
18	18	18.0	17.5	36.0	45.0	93.0	18.0	5	0.35	45
20	20	20.0	19.5	41.0	55.0	104.0	20.0	5	0.40	45

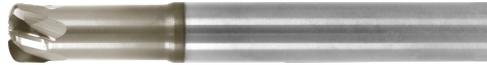
Cooling

Tolerance h9

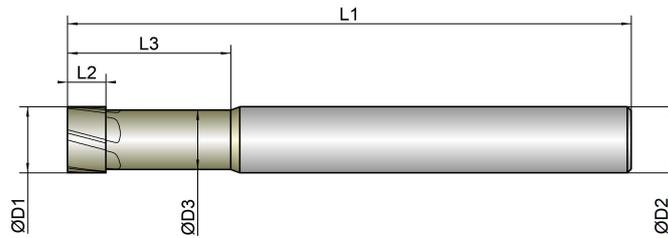
Coating TiSiN- α

HA HSC UNI

NEW



HA K207003



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
150	145	135					100									

K207003	D1 mm ∅	D3 mm ∅	L2 mm	L3 mm	L1 mm	D2 mm ∅	z #	 mm	 mm max	 °
2	2.0	1.7	1.5	13.0	54.0	6.0	2	0.3	0.15	15
3	3.0	2.7	1.5	15.0	54.0	6.0	2	0.3	0.20	15
4	4.0	3.6	2.5	16.0	57.0	6.0	2	0.5	0.25	15
5	5.0	4.6	3.5	18.0	65.0	6.0	4	0.5	0.35	15
6	6.0	5.2	3.5	20.0	65.0	6.0	4	1.0	0.40	15
8	8.0	7.0	4.8	24.0	70.0	8.0	5	1.5	0.50	15
10	10.0	9.0	5.8	26.0	85.0	10.0	5	2.0	0.75	15
12	12.0	11.0	6.8	30.0	93.0	12.0	5	2.0	0.80	15
16	16.0	14.5	8.8	35.0	100.0	16.0	5	2.5	1.00	15

Cooling

Tolerance h9

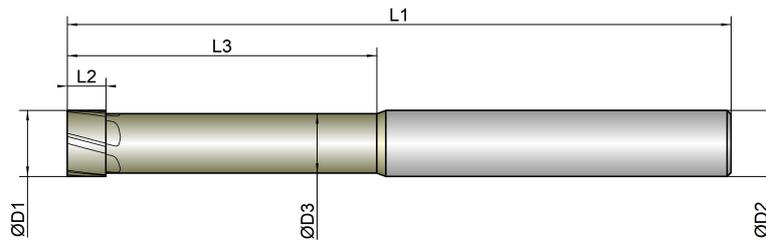
Coating TiSiN- α

HA HSC UNI

NEW



HA K207008



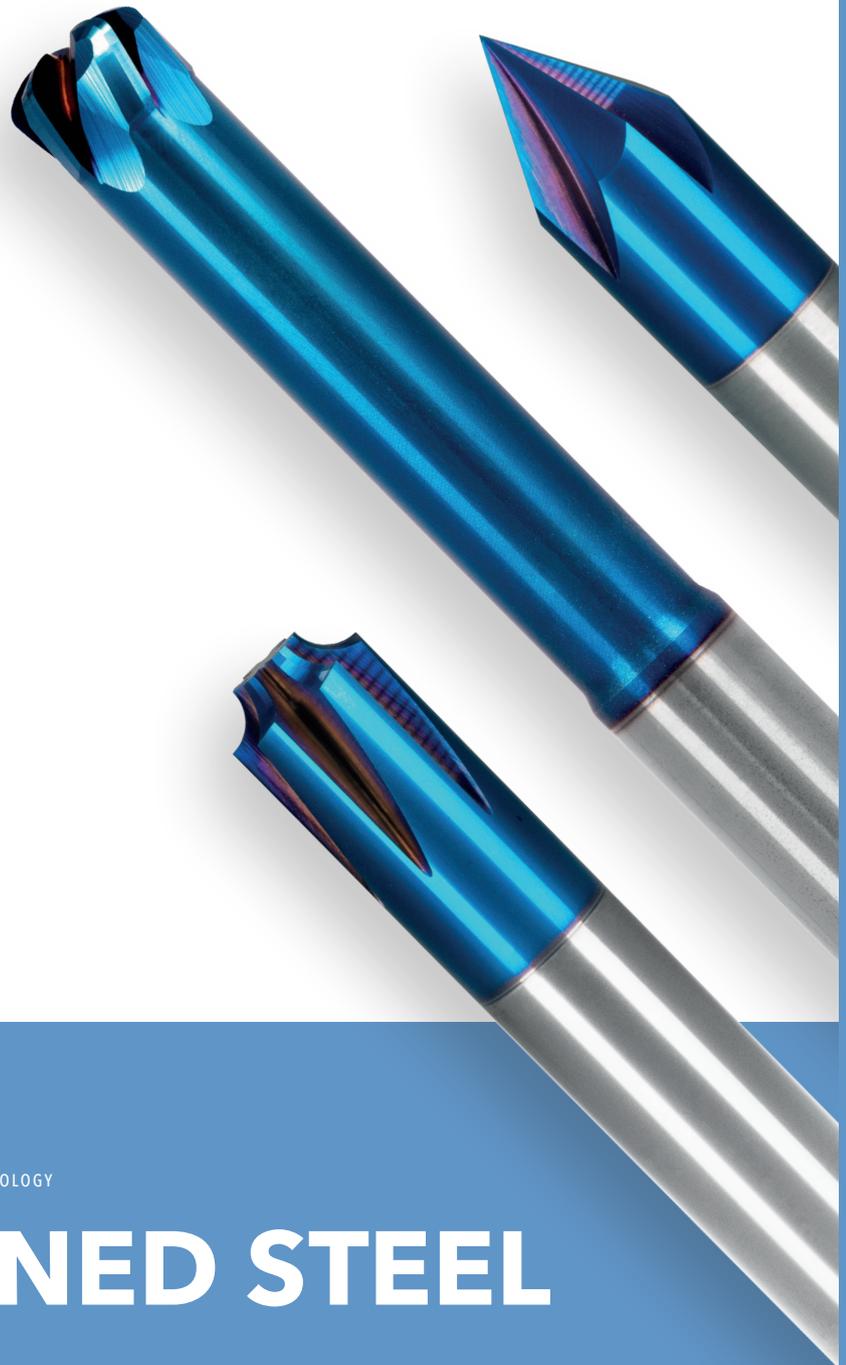
Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
130	125	115					80									

K207008	D1 mm ø	D3 mm ø	L2 mm	L3 mm	L1 mm	D2 mm ø	z #	 mm	 mm max	 °
2	2.0	1.7	1.5	18.0	75.0	6.0	2	0.3	0.15	15
3	3.0	2.7	1.5	20.0	75.0	6.0	2	0.3	0.20	15
4	4.0	3.6	2.5	24.0	83.0	6.0	2	0.5	0.25	15
5	5.0	4.6	3.5	28.0	100.0	6.0	4	0.5	0.35	15
6	6.0	5.2	3.5	28.0	100.0	6.0	4	1.0	0.40	15
8	8.0	7.0	4.8	40.0	100.0	8.0	5	1.5	0.50	15
10	10.0	9.0	5.8	48.0	100.0	10.0	5	2.0	0.75	15
12	12.0	11.0	6.8	56.0	119.0	12.0	5	2.0	0.80	15
16	16.0	14.5	8.8	65.0	150.0	16.0	5	2.5	1.00	15

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Precise technology for the most demanding applications. Our range of hard machining products covers a broad spectrum of geometries and almost all areas of application.

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tive, aviation and aerospace industries. The fact that we allow customers to choose the most suitable carbide has been instrumental in our success. We use the latest manufacturing processes, coating processes and measuring processes to produce high-precision milling cutters with outstanding quality and minimal tolerances.

Cooling	 
Tolerance	0-0,01
Coating	TiSiN- α

HA

HSC

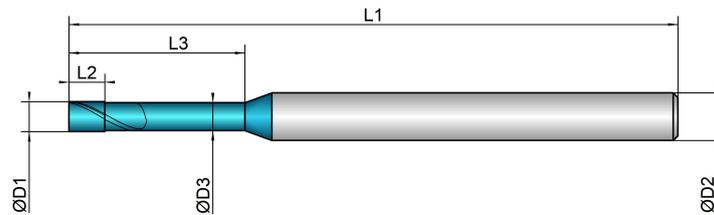




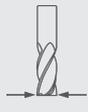
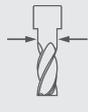
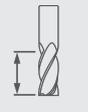
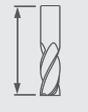
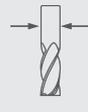
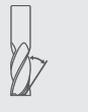

Expert



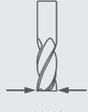
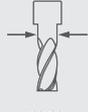
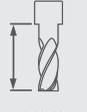
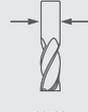
HA K201122



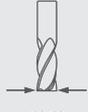
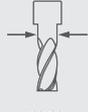
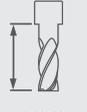
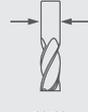
Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
		200	150	100	60	45	90			145						

K201122	D1  mm ø	D3  mm ø	L2  mm	L3  mm	L1  mm	D2  mm ø	z  #	 °
0,2X0,5	0.2	0.18	0.3	0.5	45.0	4.0	2	30
0,2X1	0.2	0.18	0.3	1.0	45.0	4.0	2	30
0,2X1,5	0.2	0.18	0.3	1.5	45.0	4.0	2	30
0,3X1	0.3	0.28	0.4	1.0	45.0	4.0	2	30
0,3X2	0.3	0.28	0.4	2.0	45.0	4.0	2	30
0,3X3	0.3	0.28	0.4	3.0	45.0	4.0	2	30
0,3X6	0.3	0.28	0.4	6.0	45.0	4.0	2	30
0,3X9	0.3	0.28	0.4	9.0	45.0	4.0	2	30
0,4X2	0.4	0.38	0.6	2.0	45.0	4.0	2	30
0,4X3	0.4	0.38	0.6	3.0	45.0	4.0	2	30
0,4X4	0.4	0.38	0.6	4.0	45.0	4.0	2	30
0,4X5	0.4	0.38	0.6	5.0	45.0	4.0	2	30
0,4X8	0.4	0.38	0.6	8.0	45.0	4.0	2	30
0,4X12	0.4	0.38	0.6	12.0	45.0	4.0	2	30
0,5X2	0.5	0.48	0.7	2.0	45.0	4.0	2	30

K201122	 mm ∅	 mm ∅	 mm	 mm	 mm	 mm ∅	 #	 °
0,5X4	0.5	0.48	0.7	4.0	45.0	4.0	2	30
0,5X6	0.5	0.48	0.7	6.0	45.0	4.0	2	30
0,5X8	0.5	0.48	0.7	8.0	45.0	4.0	2	30
0,5X10	0.5	0.48	0.7	10.0	50.0	4.0	2	30
0,5X15	0.5	0.48	0.7	15.0	50.0	4.0	2	30
0,6X2	0.6	0.58	0.9	2.0	45.0	4.0	2	30
0,6X4	0.6	0.58	0.9	4.0	45.0	4.0	2	30
0,6X6	0.6	0.58	0.9	6.0	45.0	4.0	2	30
0,6X8	0.6	0.58	0.9	8.0	45.0	4.0	2	30
0,6X10	0.6	0.58	0.9	10.0	45.0	4.0	2	30
0,6X12	0.6	0.58	0.9	12.0	50.0	4.0	2	30
0,6X18	0.6	0.58	0.9	18.0	50.0	4.0	2	30
0,7X2	0.7	0.68	1.0	2.0	45.0	4.0	2	30
0,7X4	0.7	0.68	1.0	4.0	45.0	4.0	2	30
0,7X6	0.7	0.68	1.0	6.0	45.0	4.0	2	30
0,7X8	0.7	0.68	1.0	8.0	45.0	4.0	2	30
0,7X10	0.7	0.68	1.0	10.0	50.0	4.0	2	30
0,8X4	0.8	0.78	1.2	4.0	45.0	4.0	2	30
0,8X6	0.8	0.78	1.2	6.0	45.0	4.0	2	30
0,8X8	0.8	0.78	1.2	8.0	45.0	4.0	2	30
0,8X10	0.8	0.78	1.2	10.0	50.0	4.0	2	30
0,8X12	0.8	0.78	1.2	12.0	50.0	4.0	2	30
0,8X16	0.8	0.78	1.2	16.0	50.0	4.0	2	30
0,8X24	0.8	0.78	1.2	24.0	60.0	4.0	2	30
0,9X4	0.9	0.88	1.3	4.0	45.0	4.0	2	30
0,9X6	0.9	0.88	1.3	6.0	45.0	4.0	2	30
0,9X8	0.9	0.88	1.3	8.0	45.0	4.0	2	30
0,9X10	0.9	0.88	1.3	10.0	45.0	4.0	2	30
0,9X15	0.9	0.88	1.3	15.0	50.0	4.0	2	30
1X4	1.0	0.95	1.5	4.0	45.0	4.0	2	30

K201122	 mm ø	 mm ø	 mm	 mm	 mm	 mm ø	 #	 °
1X6	1.0	0.95	1.5	6.0	45.0	4.0	2	30
1X8	1.0	0.95	1.5	8.0	45.0	4.0	2	30
1X10	1.0	0.95	1.5	10.0	45.0	4.0	2	30
1X12	1.0	0.95	1.5	12.0	45.0	4.0	2	30
1X14	1.0	0.95	1.5	14.0	45.0	4.0	2	30
1X16	1.0	0.95	1.5	16.0	50.0	4.0	2	30
1X20	1.0	0.95	1.5	20.0	54.0	4.0	2	30
1X25	1.0	0.95	1.5	25.0	70.0	4.0	2	30
1X30	1.0	0.95	1.5	30.0	70.0	4.0	2	30
1,2X6	1.2	1.14	1.8	6.0	45.0	4.0	2	30
1,2X8	1.2	1.14	1.8	8.0	45.0	4.0	2	30
1,2X10	1.2	1.14	1.8	10.0	45.0	4.0	2	30
1,2X12	1.2	1.14	1.8	12.0	45.0	4.0	2	30
1,2X16	1.2	1.14	1.8	16.0	50.0	4.0	2	30
1,2X20	1.2	1.14	1.8	20.0	60.0	4.0	2	30
1,4X6	1.4	1.34	2.1	6.0	45.0	4.0	2	30
1,4X8	1.4	1.34	2.1	8.0	45.0	4.0	2	30
1,4X10	1.4	1.34	2.1	10.0	45.0	4.0	2	30
1,4X12	1.4	1.34	2.1	12.0	45.0	4.0	2	30
1,4X14	1.4	1.34	2.1	14.0	45.0	4.0	2	30
1,4X16	1.4	1.34	2.1	16.0	50.0	4.0	2	30
1,4X22	1.4	1.34	2.1	22.0	54.0	4.0	2	30
1,5X6	1.5	1.44	2.3	6.0	45.0	4.0	2	30
1,5X8	1.5	1.44	2.3	8.0	45.0	4.0	2	30
1,5X10	1.5	1.44	2.3	10.0	45.0	4.0	2	30
1,5X12	1.5	1.44	2.3	12.0	45.0	4.0	2	30
1,5X14	1.5	1.44	2.3	14.0	50.0	4.0	2	30
1,5X16	1.5	1.44	2.3	16.0	50.0	4.0	2	30
1,5X18	1.5	1.44	2.3	18.0	54.0	4.0	2	30
1,5X20	1.5	1.44	2.3	20.0	54.0	4.0	2	30

K201122	 mm ∅	 mm ∅	 mm	 mm	 mm	 mm ∅	 #	 °
1,5X25	1.5	1.44	2.3	25.0	70.0	4.0	2	30
1,5X30	1.5	1.44	2.3	30.0	70.0	4.0	2	30
1,5X35	1.5	1.44	2.3	35.0	70.0	4.0	2	30
1,5X40	1.5	1.44	2.3	40.0	80.0	4.0	2	30
1,5X45	1.5	1.44	2.3	45.0	80.0	4.0	2	30
1,6X6	1.6	1.51	2.4	6.0	45.0	4.0	2	30
1,6X8	1.6	1.51	2.4	8.0	45.0	4.0	2	30
1,6X10	1.6	1.51	2.4	10.0	45.0	4.0	2	30
1,6X12	1.6	1.51	2.4	12.0	45.0	4.0	2	30
1,6X14	1.6	1.51	2.4	14.0	50.0	4.0	2	30
1,6X16	1.6	1.51	2.4	16.0	50.0	4.0	2	30
1,6X18	1.6	1.51	2.4	18.0	54.0	4.0	2	30
1,6X20	1.6	1.51	2.4	20.0	54.0	4.0	2	30
1,6X26	1.6	1.51	2.4	26.0	60.0	4.0	2	30
1,8X6	1.8	1.71	2.7	6.0	45.0	4.0	2	30
1,8X8	1.8	1.71	2.7	8.0	45.0	4.0	2	30
1,8X10	1.8	1.71	2.7	10.0	45.0	4.0	2	30
1,8X12	1.8	1.71	2.7	12.0	45.0	4.0	2	30
1,8X14	1.8	1.71	2.7	14.0	50.0	4.0	2	30
1,8X16	1.8	1.71	2.7	16.0	50.0	4.0	2	30
1,8X18	1.8	1.71	2.7	18.0	54.0	4.0	2	30
1,8X20	1.8	1.71	2.7	20.0	54.0	4.0	2	30
1,8X25	1.8	1.71	2.7	25.0	60.0	4.0	2	30
2X6	2.0	1.91	3.0	6.0	45.0	4.0	2	30
2X8	2.0	1.91	3.0	8.0	45.0	4.0	2	30
2X10	2.0	1.91	3.0	10.0	45.0	4.0	2	30
2X12	2.0	1.91	3.0	12.0	45.0	4.0	2	30
2X14	2.0	1.91	3.0	14.0	50.0	4.0	2	30
2X16	2.0	1.91	3.0	16.0	50.0	4.0	2	30
2X18	2.0	1.91	3.0	18.0	54.0	4.0	2	30

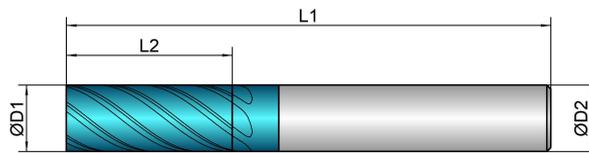
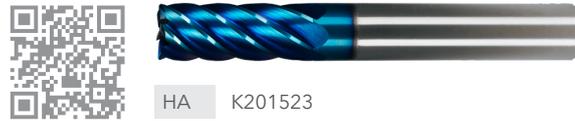
K201122	 mm ø	 mm ø	 mm	 mm	 mm	 mm ø	 #	 °
2X20	2.0	1.91	3.0	20.0	54.0	4.0	2	30
2X25	2.0	1.91	3.0	25.0	60.0	4.0	2	30
2X30	2.0	1.91	3.0	30.0	70.0	4.0	2	30
2X35	2.0	1.91	3.0	35.0	80.0	4.0	2	30
2X40	2.0	1.91	3.0	40.0	90.0	4.0	2	30
2X50	2.0	1.91	3.0	50.0	100.0	4.0	2	30
2X60	2.0	1.91	3.0	60.0	110.0	4.0	2	30
2,5X8	2.5	2.41	3.7	8.0	45.0	4.0	2	30
2,5X10	2.5	2.41	3.7	10.0	45.0	4.0	2	30
2,5X12	2.5	2.41	3.7	12.0	45.0	4.0	2	30
2,5X14	2.5	2.41	3.7	14.0	50.0	4.0	2	30
2,5X16	2.5	2.41	3.7	16.0	50.0	4.0	2	30
2,5X18	2.5	2.41	3.7	18.0	54.0	4.0	2	30
2,5X20	2.5	2.41	3.7	20.0	54.0	4.0	2	30
2,5X25	2.5	2.41	3.7	25.0	60.0	4.0	2	30
2,5X30	2.5	2.41	3.7	30.0	70.0	4.0	2	30
2,5X40	2.5	2.41	3.7	40.0	90.0	4.0	2	30
2,5X50	2.5	2.41	3.7	50.0	100.0	4.0	2	30
3X8	3.0	2.92	4.5	8.0	45.0	4.0	2	30
3X12	3.0	2.92	4.5	12.0	45.0	4.0	2	30
3X16	3.0	2.92	4.5	16.0	50.0	4.0	2	30
3X20	3.0	2.92	4.5	20.0	54.0	4.0	2	30

Cooling	
Tolerance	e8
Coating	TiSiN- α

HA

HPC

Expert



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
		180	175	150	105	90										

K201523	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	 °
2X8	2.0	8.0	58.0	6.0	4	37.5
3X12	3.0	12.0	58.0	6.0	4	37.5
4X13	4.0	13.0	58.0	6.0	4	37.5
5X15	5.0	15.0	58.0	6.0	6	37.5
6X16	6.0	16.0	58.0	6.0	6	37.5
8X22	8.0	22.0	70.0	8.0	6	37.5
10X25	10.0	25.0	73.0	10.0	6	37.5
12X28	12.0	28.0	84.0	12.0	6	37.5
14X30	14.0	30.0	84.0	14.0	6	37.5
16X36	16.0	36.0	93.0	16.0	8	37.5
18X36	18.0	36.0	93.0	18.0	10	37.5
20X41	20.0	41.0	104.0	20.0	10	37.5

Cooling 

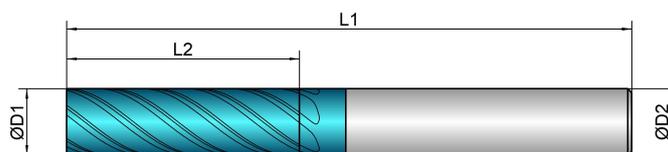
Tolerance e8

Coating TiSiN- α

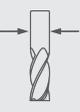
HA ETC HPC 



HA K201533



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
		180	175	150	110	40										

K201533	D1  mm ø	L2  mm	L1  mm	D2  mm ø	z  #	 °
6X21	6.0	21.0	65.0	6.0	6	37.5
8X28	8.0	28.0	75.0	8.0	6	37.5
10X35	10.0	35.0	85.0	10.0	6	37.5
12X45	12.0	45.0	100.0	12.0	6	37.5
14X45	14.0	45.0	100.0	14.0	6	37.5
16X50	16.0	50.0	110.0	16.0	8	37.5
16X65	16.0	65.0	125.0	16.0	8	37.5
18X54	18.0	54.0	114.0	18.0	10	37.5
20X55	20.0	55.0	126.0	20.0	10	37.5
20X70	20.0	70.0	135.0	20.0	10	37.5
20X75	20.0	75.0	135.0	20.0	10	37.5
25X75	25.0	75.0	150.0	25.0	10	37.5

Cooling	
Tolerance	0-0,01
Coating	TiSiN- α

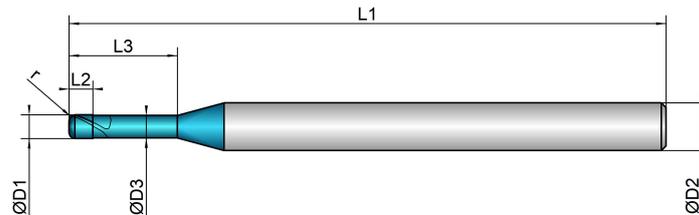
HA

HSC

Expert

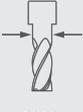
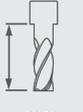
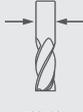


HA K202082



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
225	210	200	125	75	55	40	100		150							

	D1	D3	L2	L3	L1	D2	z	r	
K202082	mm Ø	mm Ø	mm	mm	mm	mm Ø	#	mm	°
0,4X1	0.4	0.38	0.4	1.0	50.0	4.0	2	0.10	30
0,4X1,5	0.4	0.38	0.4	1.5	50.0	4.0	2	0.10	30
0,4X2	0.4	0.38	0.4	2.0	50.0	4.0	2	0.10	30
0,4X3	0.4	0.38	0.4	3.0	50.0	4.0	2	0.10	30
0,4X4	0.4	0.38	0.4	4.0	50.0	4.0	2	0.10	30
0,5X1	0.5	0.48	0.5	1.0	50.0	4.0	2	0.10	30
0,5X2	0.5	0.48	0.5	2.0	50.0	4.0	2	0.10	30
0,5X3	0.5	0.48	0.5	3.0	50.0	4.0	2	0.10	30
0,5X4	0.5	0.48	0.5	4.0	50.0	4.0	2	0.10	30
0,5X5	0.5	0.48	0.5	5.0	50.0	4.0	2	0.10	30
0,5X6	0.5	0.48	0.5	6.0	50.0	4.0	2	0.10	30
0,6X2	0.6	0.58	0.6	2.0	50.0	4.0	2	0.10	30
0,6X3	0.6	0.58	0.6	3.0	50.0	4.0	2	0.10	30
0,6X4	0.6	0.58	0.6	4.0	50.0	4.0	2	0.10	30

	 D1 mm ∅	 D3 mm ∅	 L2 mm	 L3 mm	 L1 mm	 D2 mm ∅	 z #	 r mm	 °
K202082									
0,6X6	0.6	0.58	0.6	6.0	50.0	4.0	2	0.10	30
0,6X8	0.6	0.58	0.6	8.0	50.0	4.0	2	0.10	30
0,7X4	0.7	0.68	0.7	4.0	50.0	4.0	2	0.10	30
0,7X6	0.7	0.68	0.7	6.0	50.0	4.0	2	0.10	30
0,8X4	0.8	0.78	0.8	4.0	50.0	4.0	2	0.10	30
0,8X6	0.8	0.78	0.8	6.0	50.0	4.0	2	0.10	30
1X2	1.0	0.95	1.0	2.0	50.0	4.0	2	0.10	30
1X4	1.0	0.95	1.0	4.0	50.0	4.0	2	0.10	30
1X6	1.0	0.95	1.0	6.0	50.0	4.0	2	0.10	30
1X8	1.0	0.95	1.0	8.0	50.0	4.0	2	0.10	30
1X10	1.0	0.95	1.0	10.0	50.0	4.0	2	0.10	30
1X12	1.0	0.95	1.0	12.0	54.0	4.0	2	0.10	30
1X16	1.0	0.95	1.0	16.0	60.0	4.0	2	0.10	30
1X20	1.0	0.95	1.0	20.0	60.0	4.0	2	0.10	30
2X4	2.0	1.91	2.0	4.0	50.0	4.0	2	0.10	30
2X6	2.0	1.91	2.0	6.0	50.0	4.0	2	0.10	30
2X8	2.0	1.91	2.0	8.0	50.0	4.0	2	0.10	30
2X10	2.0	1.91	2.0	10.0	50.0	4.0	2	0.10	30
2X12	2.0	1.91	2.0	12.0	54.0	4.0	2	0.10	30
2X16	2.0	1.91	2.0	16.0	54.0	4.0	2	0.10	30
2X20	2.0	1.91	2.0	20.0	60.0	4.0	2	0.10	30
2X26	2.0	1.91	2.0	26.0	70.0	4.0	2	0.10	30

Cooling

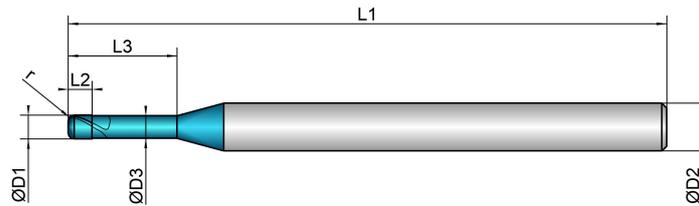
Tolerance 0-0,01

Coating TiSiN- α

HA HSC

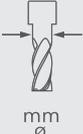


HA K202092



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
225	210	200	125	75	55	40	100		150							

K202092	D1 mm Ø	D3 mm Ø	L2 mm	L3 mm	L1 mm	D2 mm Ø	z #	r mm	 °
0,8X4	0.8	0.78	0.8	4.0	50.0	4.0	2	0.20	30
0,8X6	0.8	0.78	0.8	6.0	50.0	4.0	2	0.20	30
1X2	1.0	0.95	1.0	2.0	50.0	4.0	2	0.20	30
1X4	1.0	0.95	1.0	4.0	50.0	4.0	2	0.20	30
1X6	1.0	0.95	1.0	6.0	50.0	4.0	2	0.20	30
1X8	1.0	0.95	1.0	8.0	50.0	4.0	2	0.20	30
1X10	1.0	0.95	1.0	10.0	50.0	4.0	2	0.20	30
1X12	1.0	0.95	1.0	12.0	54.0	4.0	2	0.20	30
1X16	1.0	0.95	1.0	16.0	60.0	4.0	2	0.20	30
1X20	1.0	0.95	1.0	20.0	60.0	4.0	2	0.20	30
1,2X6	1.2	1.14	1.2	6.0	50.0	4.0	2	0.20	30
1,2X12	1.2	1.14	1.2	12.0	54.0	4.0	2	0.20	30

K202092	 mm ∅	 mm ∅	 mm	 mm	 mm	 mm ∅	 #	 mm	 °
1,2X20	1.2	1.14	1.2	20.0	60.0	4.0	2	0.20	30
1,5X4	1.5	1.44	1.5	4.0	50.0	4.0	2	0.20	30
1,5X6	1.5	1.44	1.5	6.0	50.0	4.0	2	0.20	30
1,5X8	1.5	1.44	1.5	8.0	50.0	4.0	2	0.20	30
1,5X10	1.5	1.44	1.5	10.0	50.0	4.0	2	0.20	30
1,5X12	1.5	1.44	1.5	12.0	54.0	4.0	2	0.20	30
1,5X16	1.5	1.44	1.5	16.0	54.0	4.0	2	0.20	30
1,5X20	1.5	1.44	1.5	20.0	60.0	4.0	2	0.20	30
2X4	2.0	1.91	2.0	4.0	50.0	4.0	2	0.20	30
2X6	2.0	1.91	2.0	6.0	50.0	4.0	2	0.20	30
2X8	2.0	1.91	2.0	8.0	50.0	4.0	2	0.20	30
2X10	2.0	1.91	2.0	10.0	50.0	4.0	2	0.20	30
2X12	2.0	1.91	2.0	12.0	54.0	4.0	2	0.20	30
2X16	2.0	1.91	2.0	16.0	54.0	4.0	2	0.20	30
2X20	2.0	1.91	2.0	20.0	60.0	4.0	2	0.20	30
2X26	2.0	1.91	2.0	26.0	70.0	4.0	2	0.20	30

Cooling

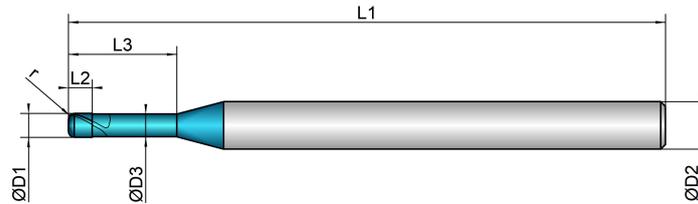
Tolerance 0-0,01

Coating TiSiN- α

HA HSC

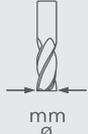
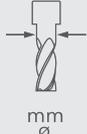


HA K202102



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
225	210	200	125	75	55	40	100		150							

K202102	D1 mm \varnothing	D3 mm \varnothing	L2 mm	L3 mm	L1 mm	D2 mm \varnothing	z #	r mm	 °
1X2	1.0	0.95	1.0	2.0	50.0	4.0	2	0.30	30
1X4	1.0	0.95	1.0	4.0	50.0	4.0	2	0.30	30
1X6	1.0	0.95	1.0	6.0	50.0	4.0	2	0.30	30
1X8	1.0	0.95	1.0	8.0	50.0	4.0	2	0.30	30
1X10	1.0	0.95	1.0	10.0	50.0	4.0	2	0.30	30
1X12	1.0	0.95	1.0	12.0	54.0	4.0	2	0.30	30
1X16	1.0	0.95	1.0	16.0	60.0	4.0	2	0.30	30
1X20	1.0	0.95	1.0	20.0	60.0	4.0	2	0.30	30
1,2X6	1.2	1.14	1.2	6.0	50.0	4.0	2	0.30	30
1,2X12	1.2	1.14	1.2	12.0	54.0	4.0	2	0.30	30
1,2X20	1.2	1.14	1.2	20.0	60.0	4.0	2	0.30	30
1,5X4	1.5	1.44	1.5	4.0	50.0	4.0	2	0.30	30
1,5X6	1.5	1.44	1.5	6.0	50.0	4.0	2	0.30	30

									
K202102	mm ∅	mm ∅	mm	mm	mm	mm ∅	#	mm	°
1,5X8	1.5	1.44	1.5	8.0	50.0	4.0	2	0.30	30
1,5X10	1.5	1.44	1.5	10.0	50.0	4.0	2	0.30	30
1,5X12	1.5	1.44	1.5	12.0	54.0	4.0	2	0.30	30
1,5X16	1.5	1.44	1.5	16.0	54.0	4.0	2	0.30	30
1,5X20	1.5	1.44	1.5	20.0	60.0	4.0	2	0.30	30
2X4	2.0	1.91	2.0	4.0	50.0	4.0	2	0.30	30
2X6	2.0	1.91	2.0	6.0	50.0	4.0	2	0.30	30
2X8	2.0	1.91	2.0	8.0	50.0	4.0	2	0.30	30
2X10	2.0	1.91	2.0	10.0	50.0	4.0	2	0.30	30
2X12	2.0	1.91	2.0	12.0	54.0	4.0	2	0.30	30
2X16	2.0	1.91	2.0	16.0	54.0	4.0	2	0.30	30
2X20	2.0	1.91	2.0	20.0	60.0	4.0	2	0.30	30
2X26	2.0	1.91	2.0	26.0	70.0	4.0	2	0.30	30
2,5X10	2.5	2.41	2.5	10.0	50.0	4.0	2	0.30	30
2,5X12	2.5	2.41	2.5	12.0	60.0	4.0	2	0.30	30
2,5X30	2.5	2.41	2.5	30.0	70.0	4.0	2	0.30	30
3X10	3.0	2.92	4.5	10.0	50.0	4.0	2	0.30	30
3X12	3.0	2.92	4.5	12.0	50.0	4.0	2	0.30	30
3X30	3.0	2.92	4.5	30.0	70.0	4.0	2	0.30	30

Cooling	
Tolerance	0-0,01
Coating	TiSiN- α

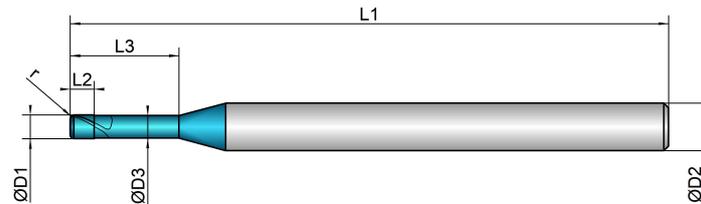
HA

HSC

Expert



HA K202112



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
225	210	200	125	75	55	40	100		150							

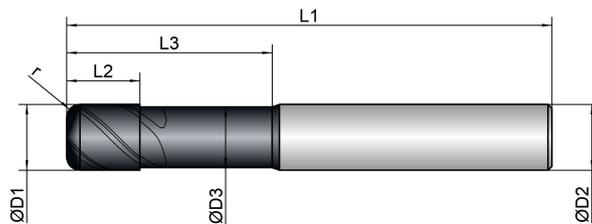
K202112	D1 mm ∅	D3 mm ∅	L2 mm	L3 mm	L1 mm	D2 mm ∅	z #	r mm	 °
1,5X4	1.5	1.44	1.5	4.0	50.0	4.0	2	0.50	30
1,5X6	1.5	1.44	1.5	6.0	50.0	4.0	2	0.50	30
1,5X8	1.5	1.44	1.5	8.0	50.0	4.0	2	0.50	30
1,5X10	1.5	1.44	1.5	10.0	50.0	4.0	2	0.50	30
1,5X12	1.5	1.44	1.5	12.0	54.0	4.0	2	0.50	30
1,5X16	1.5	1.44	1.5	16.0	54.0	4.0	2	0.50	30
1,5X20	1.5	1.44	1.5	20.0	60.0	4.0	2	0.50	30
2X4	2.0	1.91	2.0	4.0	50.0	4.0	2	0.50	30
2X6	2.0	1.91	2.0	6.0	50.0	4.0	2	0.50	30
2X8	2.0	1.91	2.0	8.0	50.0	4.0	2	0.50	30
2X10	2.0	1.91	2.0	10.0	50.0	4.0	2	0.50	30
2X12	2.0	1.91	2.0	12.0	54.0	4.0	2	0.50	30
2X16	2.0	1.91	2.0	16.0	54.0	4.0	2	0.50	30
2X20	2.0	1.91	2.0	20.0	60.0	4.0	2	0.50	30
2X26	2.0	1.91	2.0	26.0	70.0	4.0	2	0.50	30
2,5X10	2.5	2.41	2.5	10.0	50.0	4.0	2	0.50	30
2,5X12	2.5	2.41	2.5	12.0	60.0	4.0	2	0.50	30
2,5X30	2.5	2.41	2.5	30.0	70.0	4.0	2	0.50	30
3X10	3.0	2.92	4.5	10.0	50.0	4.0	2	0.50	30
3X12	3.0	2.92	4.5	12.0	50.0	4.0	2	0.50	30
3X30	3.0	2.92	4.5	30.0	70.0	4.0	2	0.50	30

Cooling

Tolerance e8

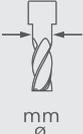
Coating TiAlN- α

HA HSC UNI



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
120	80	70	40	35			85	95								

K202163	D1 mm \varnothing	D3 mm \varnothing	L2 mm	L3 mm	L1 mm	D2 mm \varnothing	z #	r mm	 °
3/0,3	3.0	2.7	4.0	14.0	50.0	3.0	4	0.30	45
3/0,5	3.0	2.7	4.0	14.0	50.0	3.0	4	0.50	45
3/1	3.0	2.7	4.0	14.0	50.0	3.0	4	1.00	45
4/0,4	4.0	3.7	5.0	16.0	50.0	4.0	4	0.40	45
4/0,5	4.0	3.7	5.0	16.0	50.0	4.0	4	0.50	45
4/1	4.0	3.7	5.0	16.0	50.0	4.0	4	1.00	45
5/0,5	5.0	4.6	6.0	18.0	54.0	5.0	4	0.50	45
5/1	5.0	4.6	6.0	18.0	54.0	5.0	4	1.00	45
6/0,5	6.0	5.5	7.0	21.0	58.0	6.0	4	0.50	45
6/1	6.0	5.5	7.0	21.0	58.0	6.0	4	1.00	45
6/1,5	6.0	5.5	7.0	21.0	58.0	6.0	4	1.50	45
8/0,5	8.0	7.4	9.0	27.0	64.0	8.0	4	0.50	45

K202163	 D1 mm ∅	 D3 mm ∅	 L2 mm	 L3 mm	 L1 mm	 D2 mm ∅	 z #	 r mm	 °
8/1	8.0	7.4	9.0	27.0	64.0	8.0	4	1.00	45
8/1,5	8.0	7.4	9.0	27.0	64.0	8.0	4	1.50	45
8/2	8.0	7.4	9.0	27.0	64.0	8.0	4	2.00	45
10/0,5	10.0	9.2	11.0	32.0	73.0	10.0	4	0.50	45
10/1	10.0	9.2	11.0	32.0	73.0	10.0	4	1.00	45
10/1,5	10.0	9.2	11.0	32.0	73.0	10.0	4	1.50	45
10/2	10.0	9.2	11.0	32.0	73.0	10.0	4	2.00	45
12/0,5	12.0	11.0	12.0	38.0	84.0	12.0	4	0.50	45
12/1	12.0	11.0	12.0	38.0	84.0	12.0	4	1.00	45
12/1,5	12.0	11.0	12.0	38.0	84.0	12.0	4	1.50	45
12/2	12.0	11.0	12.0	38.0	84.0	12.0	4	2.00	45
16/1	16.0	15.0	16.0	44.0	93.0	16.0	4	1.00	45
16/2	16.0	15.0	16.0	44.0	93.0	16.0	4	2.00	45
20/1	20.0	18.5	20.0	50.0	104.0	20.0	4	1.00	45
20/2,5	20.0	18.5	20.0	50.0	104.0	20.0	4	2.50	45

SC torus cutter long TiAlN HSC | K202173

Cooling

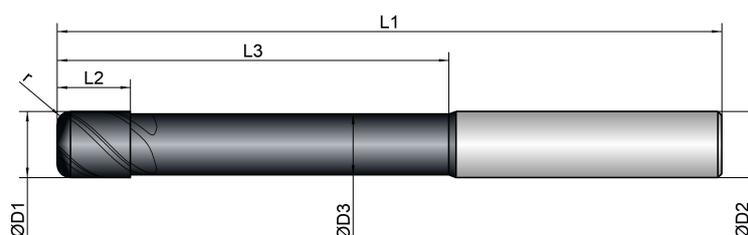
Tolerance e8

Coating TiAlN- α

HA HSC UNI

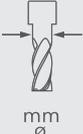


HA K202173



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
120	80	70	40	35			85	95								

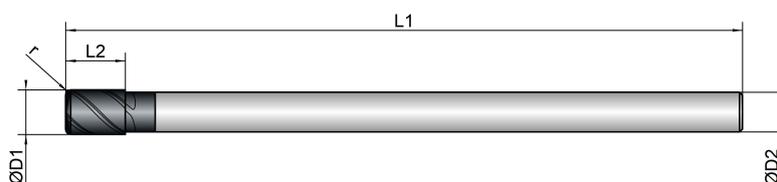
K202173	D1 mm \varnothing	D3 mm \varnothing	L2 mm	L3 mm	L1 mm	D2 mm \varnothing	z #	r mm	 °
3/0,3	3.0	2.7	4.0	32.0	75.0	3.0	4	0.30	45
3/0,5	3.0	2.7	4.0	32.0	75.0	3.0	4	0.50	45
3/1	3.0	2.7	4.0	32.0	75.0	3.0	4	1.00	45
4/0,4	4.0	3.7	5.0	36.0	75.0	4.0	4	0.40	45
4/0,5	4.0	3.7	5.0	36.0	75.0	4.0	4	0.50	45
4/1	4.0	3.7	5.0	36.0	75.0	4.0	4	1.00	45
5/0,5	5.0	4.6	6.0	40.0	75.0	5.0	4	0.50	45
5/1	5.0	4.6	6.0	40.0	75.0	5.0	4	1.00	45
6/0,5	6.0	5.5	7.0	44.0	80.0	6.0	4	0.50	45
6/1	6.0	5.5	7.0	44.0	80.0	6.0	4	1.00	45
6/1,5	6.0	5.5	7.0	44.0	80.0	6.0	4	1.50	45
8/0,5	8.0	7.4	9.0	54.0	100.0	8.0	4	0.50	45

K202173	 D1 mm ∅	 D3 mm ∅	 L2 mm	 L3 mm	 L1 mm	 D2 mm ∅	 z #	 r mm	 °
8/1	8.0	7.4	9.0	54.0	100.0	8.0	4	1.00	45
8/1,5	8.0	7.4	9.0	54.0	100.0	8.0	4	1.50	45
8/2	8.0	7.4	9.0	54.0	100.0	8.0	4	2.00	45
10/0,5	10.0	9.2	11.0	60.0	100.0	10.0	4	0.50	45
10/1	10.0	9.2	11.0	60.0	100.0	10.0	4	1.00	45
10/1,5	10.0	9.2	11.0	60.0	100.0	10.0	4	1.50	45
10/2	10.0	9.2	11.0	60.0	100.0	10.0	4	2.00	45
12/0,5	12.0	11.0	12.0	75.0	120.0	12.0	4	0.50	45
12/1	12.0	11.0	12.0	75.0	120.0	12.0	4	1.00	45
12/1,5	12.0	11.0	12.0	75.0	120.0	12.0	4	1.50	45
12/2	12.0	11.0	12.0	75.0	120.0	12.0	4	2.00	45
16/1	16.0	15.0	16.0	92.0	150.0	16.0	4	1.00	45
16/2	16.0	15.0	16.0	92.0	150.0	16.0	4	2.00	45
20/1	20.0	18.5	20.0	92.0	150.0	20.0	4	1.00	45
20/2,5	20.0	18.5	20.0	92.0	150.0	20.0	4	2.50	45

Cooling	
Tolerance	e8
Coating	TiAlN- α



HA K202202



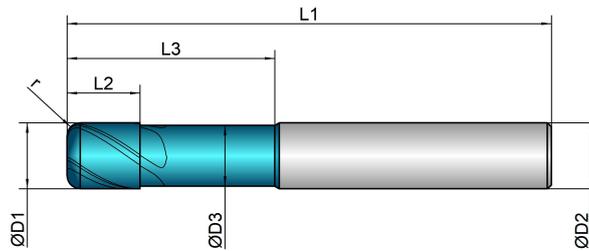
Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
75	55	50	28	23			65	70								

K202202	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	r mm	 °
7/0,5	7.0	9.0	121.0	6.0	4	0.50	45
7/1	7.0	9.0	121.0	6.0	4	1.00	45
7/1,5	7.0	9.0	121.0	6.0	4	1.50	45
9/0,5	9.0	12.0	136.0	8.0	4	0.50	45
9/1	9.0	12.0	136.0	8.0	4	1.00	45
9/1,5	9.0	12.0	136.0	8.0	4	1.50	45
11/1	11.0	15.0	150.0	10.0	4	1.00	45
11/1,5	11.0	15.0	150.0	10.0	4	1.50	45
11/2	11.0	15.0	150.0	10.0	4	2.00	45
13/1	13.0	18.0	160.0	12.0	4	1.00	45
13/1,5	13.0	18.0	160.0	12.0	4	1.50	45
13/2	13.0	18.0	160.0	12.0	4	2.00	45
15/1	15.0	21.0	160.0	14.0	4	1.00	45
15/1,5	15.0	21.0	160.0	14.0	4	1.50	45
15/2	15.0	21.0	160.0	14.0	4	2.00	45
17/1	17.0	24.0	180.0	16.0	4	1.00	45
17/1,5	17.0	24.0	180.0	16.0	4	1.50	45
17/2	17.0	24.0	180.0	16.0	4	2.00	45
17/3	17.0	24.0	180.0	16.0	4	3.00	45

Cooling	
Tolerance	e8
Coating	TiSiN- α



HA K202223



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
		210	175	155	120	90										

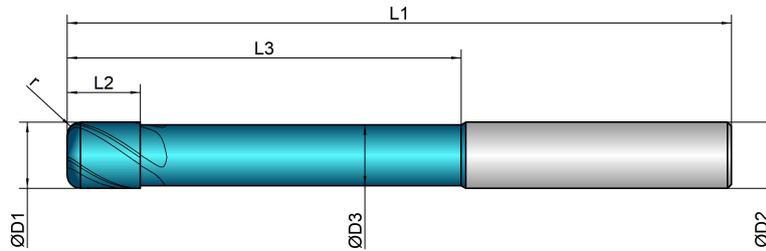
K202223	D1 mm \varnothing	D3 mm \varnothing	L2 mm	L3 mm	L1 mm	D2 mm \varnothing	z #	r mm	\circ
1/0,1	1.0	0.85	1.5	10.0	50.0	3.0	4	0.10	35
1/0,2	1.0	0.85	1.5	10.0	50.0	3.0	4	0.20	35
2/0,2	2.0	1.8	2.5	12.0	50.0	3.0	4	0.20	35
2/0,3	2.0	1.8	2.5	12.0	50.0	3.0	4	0.30	35
2/0,5	2.0	1.8	2.5	12.0	50.0	3.0	4	0.50	35
3/0,25	3.0	2.7	4.0	14.0	50.0	3.0	4	0.25	35
3/0,3	3.0	2.7	4.0	14.0	50.0	3.0	4	0.30	35
3/0,5	3.0	2.7	4.0	14.0	50.0	3.0	4	0.50	35
3/1	3.0	2.7	4.0	14.0	50.0	3.0	4	1.00	35
4/0,2	4.0	3.7	5.0	16.0	50.0	4.0	4	0.20	35
4/0,25	4.0	3.7	5.0	16.0	50.0	4.0	4	0.25	35
4/0,4	4.0	3.7	5.0	16.0	50.0	4.0	4	0.40	35
4/0,5	4.0	3.7	5.0	16.0	50.0	4.0	4	0.50	35
4/1	4.0	3.7	5.0	16.0	50.0	4.0	4	1.00	35
5/0,25	5.0	4.6	6.0	18.0	54.0	5.0	4	0.25	35
5/0,5	5.0	4.6	6.0	18.0	54.0	5.0	4	0.50	35

									
K202223	mm ∅	mm ∅	mm	mm	mm	mm ∅	#	mm	°
5/1	5.0	4.6	6.0	18.0	54.0	5.0	4	1.00	35
6/0,25	6.0	5.5	7.0	21.0	58.0	6.0	4	0.25	35
6/0,5	6.0	5.5	7.0	21.0	58.0	6.0	4	0.50	35
6/0,8	6.0	5.5	7.0	21.0	58.0	6.0	4	0.80	35
6/1	6.0	5.5	7.0	21.0	58.0	6.0	4	1.00	35
6/1,5	6.0	5.5	7.0	21.0	58.0	6.0	4	1.50	35
6/2	6.0	5.5	7.0	21.0	58.0	6.0	4	2.00	35
8/0,25	8.0	7.4	9.0	27.0	64.0	8.0	4	0.25	35
8/0,5	8.0	7.4	9.0	27.0	64.0	8.0	4	0.50	35
8/0,8	8.0	7.4	9.0	27.0	64.0	8.0	4	0.80	35
8/1	8.0	7.4	9.0	27.0	64.0	8.0	4	1.00	35
8/1,5	8.0	7.4	9.0	27.0	64.0	8.0	4	1.50	35
8/2	8.0	7.4	9.0	27.0	64.0	8.0	4	2.00	35
8/2,5	8.0	7.4	9.0	27.0	64.0	8.0	4	2.50	35
8/3	8.0	7.4	9.0	27.0	64.0	8.0	4	3.00	35
10/0,25	10.0	9.2	11.0	32.0	73.0	10.0	4	0.25	35
10/0,5	10.0	9.2	11.0	32.0	73.0	10.0	4	0.50	35
10/0,8	10.0	9.2	11.0	32.0	73.0	10.0	4	0.80	35
10/1	10.0	9.2	11.0	32.0	73.0	10.0	4	1.00	35
10/1,5	10.0	9.2	11.0	32.0	73.0	10.0	4	1.50	35
10/2	10.0	9.2	11.0	32.0	73.0	10.0	4	2.00	35
10/3	10.0	9.2	11.0	32.0	73.0	10.0	4	3.00	35
10/3,5	10.0	9.2	11.0	32.0	73.0	10.0	4	3.50	35
12/0,5	12.0	9.2	12.0	38.0	84.0	12.0	4	0.50	35
12/1	12.0	9.2	12.0	38.0	84.0	12.0	4	1.00	35
12/1,5	12.0	9.2	12.0	38.0	84.0	12.0	4	1.50	35
12/2	12.0	9.2	12.0	38.0	84.0	12.0	4	2.00	35
12/3	12.0	9.2	12.0	38.0	84.0	12.0	4	3.00	35
16/1	16.0	15.0	16.0	44.0	93.0	16.0	4	1.00	35
16/2	16.0	15.0	16.0	44.0	93.0	16.0	4	2.00	35
16/3	16.0	15.0	16.0	44.0	93.0	16.0	4	3.00	35
20/1	20.0	18.5	20.0	55.0	104.0	20.0	4	1.00	35
20/2,5	20.0	18.5	20.0	55.0	104.0	20.0	4	2.50	35

Cooling	
Tolerance	e8
Coating	TiSiN- α

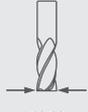
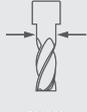
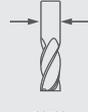


HA K202233



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
		210	175	155	120	90										

K202233	D1 mm Ø	D3 mm Ø	L2 mm	L3 mm	L1 mm	D2 mm Ø	z #	r mm	°
1/0,1	1.0	0.85	1.5	20.0	75.0	3.0	4	0.10	35
1/0,2	1.0	0.85	1.5	20.0	75.0	3.0	4	0.20	35
2/0,2	2.0	1.8	2.5	25.0	75.0	3.0	4	0.20	35
2/0,3	2.0	1.8	2.5	25.0	75.0	3.0	4	0.30	35
2/0,5	2.0	1.8	2.5	25.0	75.0	3.0	4	0.50	35
3/0,25	3.0	2.7	4.0	32.0	75.0	3.0	4	0.25	35
3/0,3	3.0	2.7	4.0	32.0	75.0	3.0	4	0.30	35
3/0,5	3.0	2.7	4.0	32.0	75.0	3.0	4	0.50	35
3/1	3.0	2.7	4.0	32.0	75.0	3.0	4	1.00	35
4/0,2	4.0	3.7	5.0	36.0	75.0	4.0	4	0.20	35
4/0,25	4.0	3.7	5.0	36.0	75.0	4.0	4	0.25	35
4/0,4	4.0	3.7	5.0	36.0	75.0	4.0	4	0.40	35
4/0,5	4.0	3.7	5.0	36.0	75.0	4.0	4	0.50	35
4/1	4.0	3.7	5.0	36.0	75.0	4.0	4	1.00	35
5/0,25	5.0	4.6	6.0	40.0	75.0	5.0	4	0.25	35

K202233	 D1 mm ∅	 D3 mm ∅	 L2 mm	 L3 mm	 L1 mm	 D2 mm ∅	 z #	 r mm	 °
5/0,5	5.0	4.6	6.0	40.0	75.0	5.0	4	0.50	35
5/1	5.0	4.6	6.0	40.0	75.0	5.0	4	1.00	35
6/0,25	6.0	5.5	7.0	44.0	80.0	6.0	4	0.25	35
6/0,5	6.0	5.5	7.0	44.0	80.0	6.0	4	0.50	35
6/1	6.0	5.5	7.0	44.0	80.0	6.0	4	1.00	35
6/1,5	6.0	5.5	7.0	44.0	80.0	6.0	4	1.50	35
8/0,25	8.0	7.4	9.0	54.0	100.0	8.0	4	0.25	35
8/0,5	8.0	7.4	9.0	54.0	100.0	8.0	4	0.50	35
8/0,8	8.0	7.4	9.0	54.0	100.0	8.0	4	0.80	35
8/1	8.0	7.4	9.0	54.0	100.0	8.0	4	1.00	35
8/1,5	8.0	7.4	9.0	54.0	100.0	8.0	4	1.50	35
8/2	8.0	7.4	9.0	54.0	100.0	8.0	4	2.00	35
8/3	8.0	7.4	9.0	54.0	100.0	8.0	4	3.00	35
10/0,25	10.0	9.2	11.0	60.0	100.0	10.0	4	0.25	35
10/0,5	10.0	9.2	11.0	60.0	100.0	10.0	4	0.50	35
10/0,8	10.0	9.2	11.0	60.0	100.0	10.0	4	0.80	35
10/1	10.0	9.2	11.0	60.0	100.0	10.0	4	1.00	35
10/1,5	10.0	9.2	11.0	60.0	100.0	10.0	4	1.50	35
10/2	10.0	9.2	11.0	60.0	100.0	10.0	4	2.00	35
10/3	10.0	9.2	11.0	60.0	100.0	10.0	4	3.00	35
12/0,5	12.0	11.0	12.0	75.0	120.0	12.0	4	0.50	35
12/1	12.0	11.0	12.0	75.0	120.0	12.0	4	1.00	35
12/1,5	12.0	11.0	12.0	75.0	120.0	12.0	4	1.50	35
12/2	12.0	11.0	12.0	75.0	120.0	12.0	4	2.00	35
12/3	12.0	11.0	12.0	75.0	120.0	12.0	4	3.00	35
16/1	16.0	15.0	16.0	92.0	150.0	16.0	4	1.00	35
16/2	16.0	15.0	16.0	92.0	150.0	16.0	4	2.00	35
16/3	16.0	15.0	16.0	92.0	150.0	16.0	4	3.00	35
20/1	20.0	18.5	20.0	92.0	150.0	20.0	4	1.00	35
20/2,5	20.0	18.5	20.0	92.0	150.0	20.0	4	2.50	35

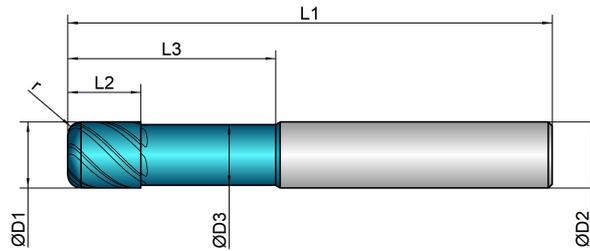
Cooling	
Tolerance	e8
Coating	TiSiN- α

HA

HPC

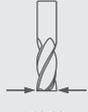
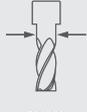
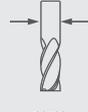


HA K202253



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
		205	175	160	100	65										

K202253	D1 mm ø	D3 mm ø	L2 mm	L3 mm	L1 mm	D2 mm ø	z #	r mm	 °
3/0,3	3.0	2.7	4.0	14.0	50.0	3.0	4	0.30	45
3/0,5	3.0	2.7	4.0	14.0	50.0	3.0	4	0.50	45
3/1	3.0	2.7	4.0	14.0	50.0	3.0	4	1.00	45
4/0,4	4.0	3.7	5.0	16.0	50.0	4.0	4	0.40	45
4/0,5	4.0	3.7	5.0	16.0	50.0	4.0	4	0.50	45
4/1	4.0	3.7	5.0	16.0	50.0	4.0	4	1.00	45
5/0,5	5.0	4.6	6.0	18.0	54.0	5.0	4	0.50	45
5/1	5.0	4.6	6.0	18.0	54.0	5.0	4	1.00	45
6/0,5	6.0	5.5	7.0	21.0	58.0	6.0	6	0.50	45
6/0,8	6.0	5.5	7.0	21.0	58.0	6.0	6	0.80	45
6/1	6.0	5.5	7.0	21.0	58.0	6.0	6	1.00	45
6/1,5	6.0	5.5	7.0	21.0	58.0	6.0	6	1.50	45
8/0,5	8.0	7.4	9.0	27.0	64.0	8.0	6	0.50	45

K202253	 mm ∅	 mm ∅	 mm	 mm	 mm	 mm ∅	 #	 mm	 °
8/0,8	8.0	7.4	9.0	27.0	64.0	8.0	6	0.80	45
8/1	8.0	7.4	9.0	27.0	64.0	8.0	6	1.00	45
8/1,5	8.0	7.4	9.0	27.0	64.0	8.0	6	1.50	45
8/2	8.0	7.4	9.0	27.0	64.0	8.0	6	2.00	45
8/3	8.0	7.4	9.0	27.0	64.0	8.0	6	3.00	45
10/0,5	10.0	9.2	11.0	32.0	73.0	10.0	6	0.50	45
10/0,8	10.0	9.2	11.0	32.0	73.0	10.0	6	0.80	45
10/1	10.0	9.2	11.0	32.0	73.0	10.0	6	1.00	45
10/1,5	10.0	9.2	11.0	32.0	73.0	10.0	6	1.50	45
10/2	10.0	9.2	11.0	32.0	73.0	10.0	6	2.00	45
10/3	10.0	9.2	11.0	32.0	73.0	10.0	6	3.00	45
12/0,5	12.0	11.0	12.0	38.0	84.0	12.0	6	0.50	45
12/1	12.0	11.0	12.0	38.0	84.0	12.0	6	1.00	45
12/1,5	12.0	11.0	12.0	38.0	84.0	12.0	6	1.50	45
12/2	12.0	11.0	12.0	38.0	84.0	12.0	6	2.00	45
12/3	12.0	11.0	12.0	38.0	84.0	12.0	6	3.00	45
16/1	16.0	15.0	16.0	44.0	93.0	16.0	6	1.00	45
16/2	16.0	15.0	16.0	44.0	93.0	16.0	6	2.00	45
16/3	16.0	15.0	16.0	44.0	93.0	16.0	6	3.00	45
20/1	20.0	18.5	20.0	50.0	104.0	20.0	6	1.00	45
20/2,5	20.0	18.5	20.0	50.0	104.0	20.0	6	2.50	45

Cooling	
Tolerance	e8
Coating	TiSiN- α

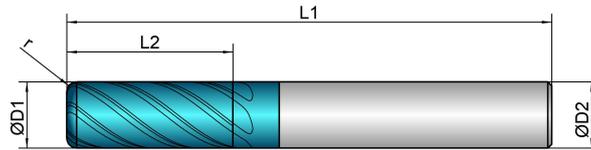
HA

ETC

HPC



HA K202293



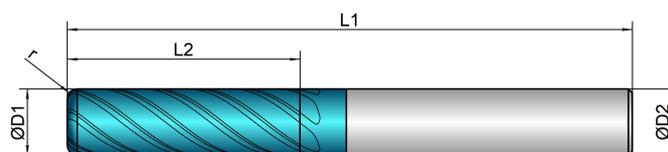
Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
		180	180	150	95	70										

	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	r mm	 °
K202293							
5/0,5	5.0	15.0	58.0	6.0	6	0.50	37.5
5/1	5.0	15.0	58.0	6.0	6	1.00	37.5
6/0,5	6.0	16.0	58.0	6.0	6	0.50	37.5
6/1	6.0	16.0	58.0	6.0	6	1.00	37.5
8/0,5	8.0	22.0	70.0	8.0	6	0.50	37.5
8/1	8.0	22.0	70.0	8.0	6	1.00	37.5
10/0,5	10.0	25.0	73.0	10.0	6	0.50	37.5
10/1	10.0	25.0	73.0	10.0	6	1.00	37.5
10/1,5	10.0	25.0	73.0	10.0	6	1.50	37.5
12/0,5	12.0	28.0	84.0	12.0	6	0.50	37.5
12/1	12.0	28.0	84.0	12.0	6	1.00	37.5
12/1,5	12.0	28.0	84.0	12.0	6	1.50	37.5
14/1	14.0	30.0	84.0	14.0	6	1.00	37.5
16/1	16.0	36.0	93.0	16.0	8	1.00	37.5
16/2	16.0	36.0	93.0	16.0	8	2.00	37.5
18/1	18.0	36.0	93.0	18.0	10	1.00	37.5
20/1	20.0	41.0	104.0	20.0	10	1.00	37.5
20/2	20.0	41.0	104.0	20.0	10	2.00	37.5

Cooling	
Tolerance	e8
Coating	TiSiN- α



HA K202303



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
		160	160	130	85	60										

K202303	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	r mm	 °
6/0,5	6.0	21.0	65.0	6.0	6	0.50	37.5
6/1	6.0	21.0	65.0	6.0	6	1.00	37.5
8/0,5	8.0	28.0	75.0	8.0	6	0.50	37.5
8/1	8.0	28.0	75.0	8.0	6	1.00	37.5
10/0,5	10.0	35.0	85.0	10.0	6	0.50	37.5
10/1	10.0	35.0	85.0	10.0	6	1.00	37.5
10/1,5	10.0	35.0	85.0	10.0	6	1.50	37.5
12/0,5	12.0	45.0	100.0	12.0	6	0.50	37.5
12/1	12.0	45.0	100.0	12.0	6	1.00	37.5
12/1,5	12.0	45.0	100.0	12.0	6	1.50	37.5
14/1	14.0	45.0	100.0	14.0	6	1.00	37.5
16/1	16.0	50.0	110.0	16.0	8	1.00	37.5
16/2	16.0	50.0	110.0	16.0	8	2.00	37.5
18/1	18.0	54.0	114.0	18.0	10	1.00	37.5
20/1	20.0	55.0	126.0	20.0	10	1.00	37.5
20/2	20.0	55.0	126.0	20.0	10	2.00	37.5

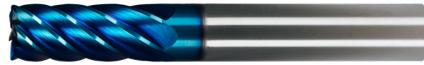
Cooling	
Tolerance	e8
Coating	TiSiN- α

HA

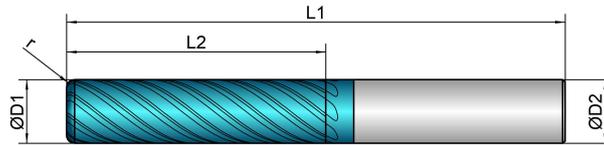
ETC

HPC

Expert



HA K202307



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
		160	160	130	85	60										

K202307	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	r mm	 °
16/1	16.0	65.0	125.0	16.0	8	1.00	37.5
16/2	16.0	65.0	125.0	16.0	8	2.00	37.5
20/1	20.0	70.0	135.0	20.0	10	1.00	37.5
20/2	20.0	70.0	135.0	20.0	10	2.00	37.5

Cooling 

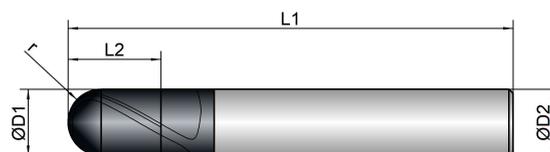
Tolerance f8

Coating TiAlN- α

HA HSC HPC UNI 



HA K203033



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
420	290	220	165	150			225	615								

K203033	D1  mm ø	L2  mm	L1  mm	D2  mm ø	z  #	r  mm	 °
0,1/3	0.1	0.2	38.0	3.0	2	0.05	30
0,15/3	0.15	0.3	38.0	3.0	2	0.075	30
0,2/3	0.2	0.4	38.0	3.0	2	0.10	30
0,25/3	0.25	0.5	38.0	3.0	2	0.125	30
0,3/3	0.3	1.0	38.0	3.0	2	0.15	30
0,35/3	0.35	1.0	38.0	3.0	2	0.175	30
0,4/3	0.4	1.0	38.0	3.0	2	0.20	30
0,5/3	0.5	1.5	38.0	3.0	2	0.25	30
0,5/6	0.5	1.5	54.0	6.0	2	0.25	30
0,6/3	0.6	1.5	38.0	3.0	2	0.30	30
0,7/3	0.7	2.0	38.0	3.0	2	0.35	30
0,8/3	0.8	2.0	38.0	3.0	2	0.40	30
0,9/3	0.9	2.5	38.0	3.0	2	0.45	30
1/3	1.0	2.0	50.0	3.0	2	0.50	30
1/6	1.0	2.0	54.0	6.0	2	0.50	30

	 D1 mm \varnothing	 L2 mm	 L1 mm	 D2 mm \varnothing	 z #	 r mm	 °
K203033							
1,1/3	1.1	3.0	50.0	3.0	2	0.55	30
1,2/3	1.2	3.0	50.0	3.0	2	0.60	30
1,4/3	1.4	3.0	50.0	3.0	2	0.70	30
1,5/3	1.5	3.0	50.0	3.0	2	0.75	30
1,5/6	1.5	3.0	54.0	6.0	2	0.75	30
1,6/3	1.6	4.0	50.0	3.0	2	0.80	30
1,8/3	1.8	4.0	50.0	3.0	2	0.90	30
2/3	2.0	4.0	50.0	3.0	2	1.00	30
2/6	2.0	4.0	54.0	6.0	2	1.00	30
2,5/3	2.5	5.0	50.0	3.0	2	1.25	30
2,5/6	2.5	5.0	54.0	6.0	2	1.25	30
3/3	3.0	6.0	50.0	3.0	2	1.50	30
3/6	3.0	6.0	54.0	6.0	2	1.50	30
4/4	4.0	7.0	54.0	4.0	2	2.00	30
4/6	4.0	7.0	54.0	6.0	2	2.00	30
5/5	5.0	8.0	54.0	5.0	2	2.50	30
5/6	5.0	8.0	54.0	6.0	2	2.50	30
6/6	6.0	10.0	54.0	6.0	2	3.00	30
7/8	7.0	12.0	59.0	8.0	2	3.50	30
8/8	8.0	12.0	59.0	8.0	2	4.00	30
10/10	10.0	14.0	67.0	10.0	2	5.00	30
12/12	12.0	16.0	73.0	12.0	2	6.00	30
14/14	14.0	16.0	75.0	14.0	2	7.00	30
16/16	16.0	20.0	83.0	16.0	2	8.00	30
18/18	18.0	22.0	93.0	18.0	2	9.00	30
20/20	20.0	25.0	93.0	20.0	2	10.00	30

Cooling

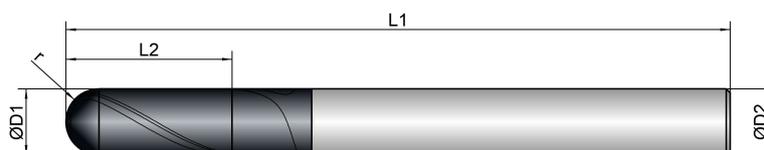
Tolerance f8

Coating TiAlN- α

HA HSC HPC UNI



HA K203063



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
350	240	180	135	125			180	500			695					

K203063	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	r mm	 °
0,5/3	0.5	1.5	75.0	3.0	2	0.25	30
0,5/6	0.5	1.5	80.0	6.0	2	0.25	30
1/3	1.0	3.0	75.0	3.0	2	0.50	30
1/6	1.0	3.0	80.0	6.0	2	0.50	30
1,5/3	1.5	4.0	75.0	3.0	2	0.75	30
1,5/6	1.5	4.0	80.0	6.0	2	0.75	30
2/3	2.0	6.0	75.0	3.0	2	1.00	30
2/6	2.0	6.0	80.0	6.0	2	1.00	30
2,5/3	2.5	8.0	75.0	3.0	2	1.25	30
2,5/6	2.5	8.0	80.0	6.0	2	1.25	30
3/3	3.0	10.0	75.0	3.0	2	1.50	30
3/6	3.0	10.0	80.0	6.0	2	1.50	30
4/4	4.0	13.0	75.0	4.0	2	2.00	30
4/6	4.0	13.0	80.0	6.0	2	2.00	30
5/5	5.0	14.0	75.0	5.0	2	2.50	30
5/6	5.0	14.0	100.0	6.0	2	2.50	30
6/6	6.0	16.0	100.0	6.0	2	3.00	30
8/8	8.0	22.0	100.0	8.0	2	4.00	30
10/10	10.0	25.0	100.0	10.0	2	5.00	30
12/12	12.0	26.0	100.0	12.0	2	6.00	30
14/14	14.0	26.0	100.0	14.0	2	7.00	30
16/16	16.0	30.0	150.0	16.0	2	8.00	30
20/20	20.0	40.0	150.0	20.0	2	10.00	30

Cooling	
Tolerance	f8
Coating	TiSiN- α

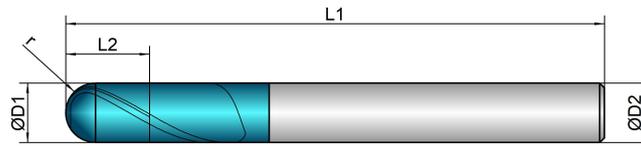
HA

HSC

HPC



HA K203103



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
		210	180	160	110	85										

K203103	D1 mm Ø	L2 mm	L1 mm	D2 mm Ø	z #	r mm	 °
0,1/3	0.1	0.2	38.0	3.0	2	0.05	30
0,15/3	0.15	0.3	38.0	3.0	2	0.075	30
0,2/3	0.2	0.4	38.0	3.0	2	0.10	30
0,25/3	0.25	0.5	38.0	3.0	2	0.125	30
0,3/3	0.3	1.0	38.0	3.0	2	0.15	30
0,35/3	0.35	1.0	38.0	3.0	2	0.175	30
0,4/3	0.4	1.0	38.0	3.0	2	0.20	30
0,5/3	0.5	1.5	38.0	3.0	2	0.25	30
0,5/6	0.5	1.5	54.0	6.0	2	0.25	30
0,6/3	0.6	1.5	38.0	3.0	2	0.30	30
0,7/3	0.7	2.0	38.0	3.0	2	0.35	30
0,8/3	0.8	2.0	38.0	3.0	2	0.40	30
0,9/3	0.9	2.5	38.0	3.0	2	0.45	30
1/3	1.0	2.0	50.0	3.0	2	0.50	30
1/6	1.0	2.0	54.0	6.0	2	0.50	30

	 D1 mm \varnothing	 L2 mm	 L1 mm	 D2 mm \varnothing	 z #	 r mm	 °
K203103							
1,1/3	1.1	3.0	50.0	3.0	2	0.55	30
1,2/3	1.2	3.0	50.0	3.0	2	0.60	30
1,4/3	1.4	3.0	50.0	3.0	2	0.70	30
1,5/3	1.5	3.0	50.0	3.0	2	0.75	30
1,5/6	1.5	3.0	54.0	6.0	2	0.75	30
1,6/3	1.6	4.0	50.0	3.0	2	0.80	30
1,8/3	1.8	4.0	50.0	3.0	2	0.90	30
2/3	2.0	4.0	50.0	3.0	2	1.00	30
2/6	2.0	4.0	54.0	6.0	2	1.00	30
2,5/3	2.5	5.0	50.0	3.0	2	1.25	30
2,5/6	2.5	5.0	54.0	6.0	2	1.25	30
3/3	3.0	6.0	50.0	3.0	2	1.50	30
3/6	3.0	6.0	54.0	6.0	2	1.50	30
4/4	4.0	7.0	54.0	4.0	2	2.00	30
4/6	4.0	7.0	54.0	6.0	2	2.00	30
5/5	5.0	8.0	54.0	5.0	2	2.50	30
5/6	5.0	8.0	54.0	6.0	2	2.50	30
6/6	6.0	10.0	54.0	6.0	2	3.00	30
8/8	8.0	12.0	59.0	8.0	2	4.00	30
10/10	10.0	14.0	67.0	10.0	2	5.00	30
12/12	12.0	16.0	74.0	12.0	2	6.00	30
14/14	14.0	18.0	75.0	14.0	2	7.00	30
16/16	16.0	22.0	83.0	16.0	2	8.00	30
20/20	20.0	26.0	93.0	20.0	2	10.00	30

Cooling

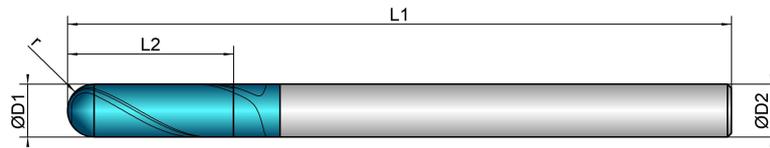
Tolerance f8

Coating TiSiN- α

HA HSC HPC



HA K203143



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
		200	175	155	95	80										

K203143	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	r mm	 °
0,5/3	0.5	1.5	75.0	3.0	2	0.25	30
0,5/6	0.5	1.5	80.0	6.0	2	0.25	30
1/3	1.0	3.0	75.0	3.0	2	0.50	30
1/6	1.0	3.0	80.0	6.0	2	0.50	30
1,5/3	1.5	4.0	75.0	3.0	2	0.75	30
1,5/6	1.5	4.0	80.0	6.0	2	0.75	30
2/3	2.0	6.0	75.0	3.0	2	1.00	30
2/6	2.0	6.0	80.0	6.0	2	1.00	30
2,5/3	2.5	8.0	75.0	3.0	2	1.25	30
2,5/6	2.5	8.0	80.0	6.0	2	1.25	30
3/3	3.0	10.0	75.0	3.0	2	1.50	30
3/6	3.0	10.0	80.0	6.0	2	1.50	30
4/4	4.0	13.0	75.0	4.0	2	2.00	30
4/6	4.0	13.0	80.0	6.0	2	2.00	30
5/5	5.0	14.0	75.0	5.0	2	2.50	30
5/6	5.0	14.0	100.0	6.0	2	2.50	30
6/6	6.0	16.0	100.0	6.0	2	3.00	30
8/8	8.0	22.0	100.0	8.0	2	4.00	30
10/10	10.0	25.0	100.0	10.0	2	5.00	30
12/12	12.0	26.0	100.0	12.0	2	6.00	30
14/14	14.0	26.0	100.0	14.0	2	7.00	30
16/16	16.0	30.0	150.0	16.0	2	8.00	30
20/20	20.0	40.0	150.0	20.0	2	10.00	30

Cooling

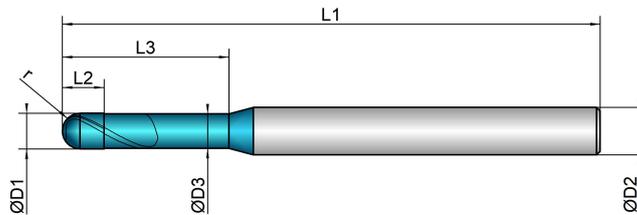
Tolerance 0-0,01

Coating TiSiN- α

HA HSC

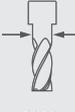
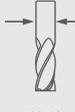


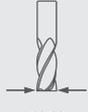
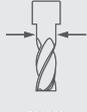
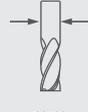
HA K203206



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
220	210	195	125	75	60	45	100		150							

K203206	D1 mm ø	D3 mm ø	L2 mm	L3 mm	L1 mm	D2 mm ø	z #	r mm	 °
0,2X0,3	0.2	0.17	0.16	0.3	45.0	4.0	2	0.10	30
0,2X0,5	0.2	0.17	0.16	0.5	45.0	4.0	2	0.10	30
0,2X0,75	0.2	0.17	0.16	0.75	45.0	4.0	2	0.10	30
0,2X1	0.2	0.17	0.16	1.0	45.0	4.0	2	0.10	30
0,2X1,25	0.2	0.17	0.16	1.25	45.0	4.0	2	0.10	30
0,2X1,5	0.2	0.17	0.16	1.5	45.0	4.0	2	0.10	30
0,2X1,75	0.2	0.17	0.16	1.75	45.0	4.0	2	0.10	30
0,2X2	0.2	0.17	0.16	2.0	45.0	4.0	2	0.10	30
0,2X2,5	0.2	0.17	0.16	2.5	45.0	4.0	2	0.10	30
0,2X3	0.2	0.17	0.16	3.0	45.0	4.0	2	0.10	30
0,3X0,5	0.3	0.27	0.24	0.5	45.0	4.0	2	0.15	30
0,3X0,75	0.3	0.27	0.24	0.75	45.0	4.0	2	0.15	30
0,3X1	0.3	0.27	0.24	1.0	45.0	4.0	2	0.15	30
0,3X1,25	0.3	0.27	0.24	1.25	45.0	4.0	2	0.15	30
0,3X1,5	0.3	0.27	0.24	1.5	45.0	4.0	2	0.15	30
0,4X0,5	0.4	0.34	0.32	0.5	45.0	4.0	2	0.20	30
0,4X0,75	0.4	0.34	0.32	0.75	45.0	4.0	2	0.20	30
0,4X1	0.4	0.34	0.32	1.0	45.0	4.0	2	0.20	30
0,4X1,5	0.4	0.34	0.32	1.5	45.0	4.0	2	0.20	30

	 D1 mm ∅	 D3 mm ∅	 L2 mm	 L3 mm	 L1 mm	 D2 mm ∅	 z #	 r mm	 °
K203206									
0,4X2	0.4	0.34	0.32	2.0	45.0	4.0	2	0.20	30
0,4X2,5	0.4	0.34	0.32	2.5	45.0	4.0	2	0.20	30
0,4X3	0.4	0.34	0.32	3.0	45.0	4.0	2	0.20	30
0,4X3,5	0.4	0.34	0.32	3.5	45.0	4.0	2	0.20	30
0,4X4	0.4	0.34	0.32	4.0	45.0	4.0	2	0.20	30
0,4X4,5	0.4	0.34	0.32	4.5	45.0	4.0	2	0.20	30
0,4X5	0.4	0.34	0.32	5.0	45.0	4.0	2	0.20	30
0,4X5,5	0.4	0.34	0.32	5.5	45.0	4.0	2	0.20	30
0,4X6	0.4	0.34	0.32	6.0	45.0	4.0	2	0.20	30
0,5X1	0.5	0.47	0.4	1.0	45.0	4.0	2	0.25	30
0,5X1,5	0.5	0.47	0.4	1.5	45.0	4.0	2	0.25	30
0,5X2	0.5	0.47	0.4	2.0	45.0	4.0	2	0.25	30
0,5X2,5	0.5	0.47	0.4	2.5	45.0	4.0	2	0.25	30
0,5X3	0.5	0.47	0.4	3.0	45.0	4.0	2	0.25	30
0,5X3,5	0.5	0.47	0.4	3.5	45.0	4.0	2	0.25	30
0,5X4	0.5	0.47	0.4	4.0	45.0	4.0	2	0.25	30
0,5X4,5	0.5	0.47	0.4	4.5	45.0	4.0	2	0.25	30
0,5X5	0.5	0.47	0.4	5.0	45.0	4.0	2	0.25	30
0,5X5,5	0.5	0.47	0.4	5.5	45.0	4.0	2	0.25	30
0,5X6	0.5	0.47	0.4	6.0	45.0	4.0	2	0.25	30
0,5X7	0.5	0.47	0.4	7.0	45.0	4.0	2	0.25	30
0,5X8	0.5	0.47	0.4	8.0	45.0	4.0	2	0.25	30
0,5X9	0.5	0.47	0.4	9.0	45.0	4.0	2	0.25	30
0,6X1	0.6	0.57	0.48	1.0	45.0	4.0	2	0.30	30
0,6X2	0.6	0.57	0.48	2.0	45.0	4.0	2	0.30	30
0,6X3	0.6	0.57	0.48	3.0	45.0	4.0	2	0.30	30
0,6X4	0.6	0.57	0.48	4.0	45.0	4.0	2	0.30	30
0,6X5	0.6	0.57	0.48	5.0	45.0	4.0	2	0.30	30
0,6X6	0.6	0.57	0.48	6.0	45.0	4.0	2	0.30	30
0,6X8	0.6	0.57	0.48	8.0	45.0	4.0	2	0.30	30
0,8X2	0.8	0.77	0.64	2.0	45.0	4.0	2	0.40	30
0,8X3	0.8	0.77	0.64	3.0	45.0	4.0	2	0.40	30
0,8X4	0.8	0.77	0.64	4.0	45.0	4.0	2	0.40	30
0,8X5	0.8	0.77	0.64	5.0	45.0	4.0	2	0.40	30
0,8X6	0.8	0.77	0.64	6.0	45.0	4.0	2	0.40	30
0,8X7	0.8	0.77	0.64	7.0	45.0	4.0	2	0.40	30
0,8X8	0.8	0.77	0.64	8.0	45.0	4.0	2	0.40	30
0,8X9	0.8	0.77	0.64	9.0	45.0	4.0	2	0.40	30
1X2,5	1.0	0.96	0.8	2.5	45.0	4.0	2	0.50	30
1X3	1.0	0.96	0.8	3.0	45.0	4.0	2	0.50	30

	 D1 mm ∅	 D3 mm ∅	 L2 mm	 L3 mm	 L1 mm	 D2 mm ∅	 z #	 r mm	 °
K203206									
1X4	1.0	0.96	0.8	4.0	45.0	4.0	2	0.50	30
1X5	1.0	0.96	0.8	5.0	45.0	4.0	2	0.50	30
1X6	1.0	0.96	0.8	6.0	45.0	4.0	2	0.50	30
1X7	1.0	0.96	0.8	7.0	45.0	4.0	2	0.50	30
1X8	1.0	0.96	0.8	8.0	45.0	4.0	2	0.50	30
1X9	1.0	0.96	0.8	9.0	45.0	4.0	2	0.50	30
1X10	1.0	0.96	0.8	10.0	45.0	4.0	2	0.50	30
1X12	1.0	0.96	0.8	12.0	45.0	4.0	2	0.50	30
1,2X6	1.2	1.16	0.96	6.0	45.0	4.0	2	0.60	30
1,2X8	1.2	1.16	0.96	8.0	45.0	4.0	2	0.60	30
1,2X10	1.2	1.16	0.96	10.0	45.0	4.0	2	0.60	30
1,2X12	1.2	1.16	0.96	12.0	45.0	4.0	2	0.60	30
1,4X8	1.4	1.34	1.12	8.0	45.0	4.0	2	0.70	30
1,4X12	1.4	1.34	1.12	12.0	45.0	4.0	2	0.70	30
1,5X3	1.5	1.44	1.2	3.0	45.0	4.0	2	0.75	30
1,5X4	1.5	1.44	1.2	4.0	45.0	4.0	2	0.75	30
1,5X6	1.5	1.44	1.2	6.0	45.0	4.0	2	0.75	30
1,5X8	1.5	1.44	1.2	8.0	45.0	4.0	2	0.75	30
1,5X10	1.5	1.44	1.2	10.0	45.0	4.0	2	0.75	30
1,5X12	1.5	1.44	1.2	12.0	45.0	4.0	2	0.75	30
1,6X8	1.6	1.54	1.28	8.0	45.0	4.0	2	0.80	30
1,6X12	1.6	1.54	1.28	12.0	45.0	4.0	2	0.80	30
1,8X8	1.8	1.74	1.44	8.0	45.0	4.0	2	0.90	30
1,8X12	1.8	1.74	1.44	12.0	45.0	4.0	2	0.90	30
2X3	2.0	1.94	1.6	3.0	45.0	4.0	2	1.00	30
2X4	2.0	1.94	1.6	4.0	45.0	4.0	2	1.00	30
2X6	2.0	1.94	1.6	6.0	45.0	4.0	2	1.00	30
2X8	2.0	1.94	1.6	8.0	45.0	4.0	2	1.00	30
2X10	2.0	1.94	1.6	10.0	45.0	4.0	2	1.00	30
2X12	2.0	1.94	1.6	12.0	45.0	4.0	2	1.00	30
2,5X10	2.5	2.41	2.0	10.0	45.0	4.0	2	1.25	30
3X8	3.0	2.92	3.5	8.0	45.0	4.0	2	1.50	30
3X10	3.0	2.92	3.5	10.0	45.0	4.0	2	1.50	30
3X12	3.0	2.92	3.5	12.0	45.0	4.0	2	1.50	30
3X16	3.0	2.92	3.5	16.0	45.0	4.0	2	1.50	30

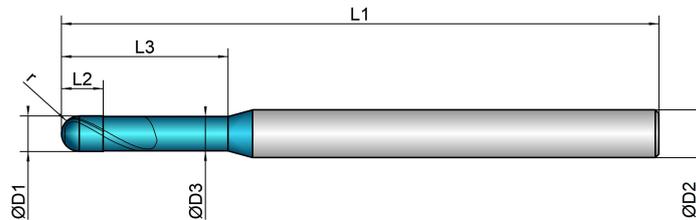
Cooling	
Tolerance	0-0,01
Coating	TiSiN- α

HA

HSC

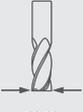
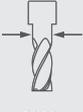
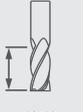
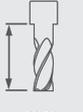
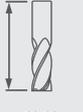
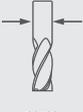


HA K203212



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
220	210	195	125	75	60	45	100									

	D1	D3	L2	L3	L1	D2	z	r	
K203212									
	mm ∅	mm ∅	mm	mm	mm	mm ∅	#	mm	°
0,3X1,75	0.3	0.27	0.24	1.75	50.0	4.0	2	0.15	30
0,3X2	0.3	0.27	0.24	2.0	50.0	4.0	2	0.15	30
0,3X2,25	0.3	0.27	0.24	2.25	50.0	4.0	2	0.15	30
0,3X2,5	0.3	0.27	0.24	2.5	50.0	4.0	2	0.15	30
0,3X2,75	0.3	0.27	0.24	2.75	50.0	4.0	2	0.15	30
0,3X3	0.3	0.27	0.24	3.0	50.0	4.0	2	0.15	30
0,3X3,5	0.3	0.27	0.24	3.5	50.0	4.0	2	0.15	30
0,3X4	0.3	0.27	0.24	4.0	50.0	4.0	2	0.15	30
0,3X4,5	0.3	0.27	0.24	4.5	50.0	4.0	2	0.15	30
0,5X10	0.5	0.47	0.4	10.0	50.0	4.0	2	0.25	30
0,6X10	0.6	0.57	0.48	10.0	50.0	4.0	2	0.30	30
0,6X12	0.6	0.57	0.48	12.0	50.0	4.0	2	0.30	30

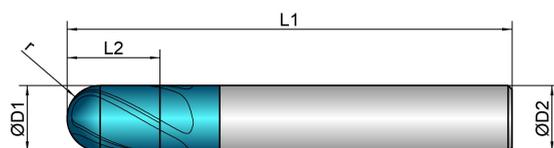
	 D1 mm ∅	 D3 mm ∅	 L2 mm	 L3 mm	 L1 mm	 D2 mm ∅	 z #	 r mm	 °
K203212									
0,8X10	0.8	0.77	0.64	10.0	50.0	4.0	2	0.40	30
1X14	1.0	0.96	0.8	14.0	50.0	4.0	2	0.50	30
1X16	1.0	0.96	0.8	16.0	50.0	4.0	2	0.50	30
1,2X14	1.2	1.16	0.96	14.0	50.0	4.0	2	0.60	30
1,2X16	1.2	1.16	0.96	16.0	50.0	4.0	2	0.60	30
1,4X16	1.4	1.34	1.12	16.0	50.0	4.0	2	0.70	30
1,5X14	1.5	1.44	1.2	14.0	50.0	4.0	2	0.75	30
1,5X16	1.5	1.44	1.2	16.0	50.0	4.0	2	0.75	30
1,6X16	1.6	1.54	1.28	16.0	50.0	4.0	2	0.80	30
1,8X16	1.8	1.74	1.44	16.0	50.0	4.0	2	0.90	30
2X14	2.0	1.94	1.6	14.0	50.0	4.0	2	1.00	30
2X16	2.0	1.94	1.6	16.0	50.0	4.0	2	1.00	30
2,5X15	2.5	2.41	2.0	15.0	50.0	4.0	2	1.25	30
3X16	3.0	2.92	3.5	16.0	50.0	4.0	2	1.50	30

Cooling	
Tolerance	f8
Coating	TiSiN- α

HA HSC HPC



HA K203333



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
		200	175	155	110	85										

K203333	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	r mm	 °
2/3	2.0	4.0	50.0	3.0	4	1.00	30
2/6	2.0	4.0	54.0	6.0	4	1.00	30
2,5/6	2.5	5.0	54.0	6.0	4	1.25	30
3/3	3.0	5.0	50.0	3.0	4	1.50	30
3/6	3.0	5.0	54.0	6.0	4	1.50	30
4/4	4.0	8.0	54.0	4.0	4	2.00	30
4/6	4.0	8.0	54.0	6.0	4	2.00	30
5/5	5.0	9.0	54.0	5.0	4	2.50	30
5/6	5.0	9.0	54.0	6.0	4	2.50	30
6/6	6.0	10.0	54.0	6.0	4	3.00	30
7/8	7.0	12.0	59.0	8.0	4	3.50	30
8/8	8.0	12.0	59.0	8.0	4	4.00	30
9/10	9.0	14.0	67.0	10.0	4	4.50	30
10/10	10.0	14.0	67.0	10.0	4	5.00	30
12/12	12.0	16.0	74.0	12.0	4	6.00	30
14/14	14.0	18.0	75.0	14.0	4	7.00	30
16/16	16.0	22.0	83.0	16.0	4	8.00	30
20/20	20.0	26.0	93.0	20.0	4	10.00	30

Cooling	
Tolerance	f8
Coating	TiSiN- α

HA

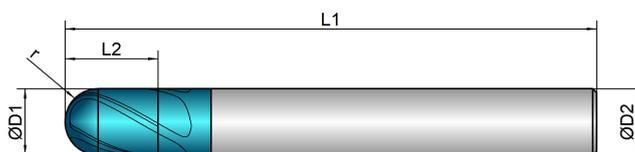
HSC

HPC

Expert



HA K203343



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
		200	175	155	110	85										

K203343	D1 mm Ø	L2 mm	L1 mm	D2 mm Ø	z #	r mm	 °
2/3	2.0	4.0	75.0	3.0	4	1.00	30
2/6	2.0	4.0	80.0	6.0	4	1.00	30
2,5/6	2.5	5.0	80.0	6.0	4	1.25	30
3/3	3.0	5.0	75.0	3.0	4	1.50	30
3/6	3.0	5.0	80.0	6.0	4	1.50	30
4/4	4.0	8.0	75.0	4.0	4	2.00	30
4/6	4.0	8.0	80.0	6.0	4	2.00	30
5/5	5.0	9.0	75.0	5.0	4	2.50	30
5/6	5.0	9.0	100.0	6.0	4	2.50	30
6/6	6.0	10.0	100.0	6.0	4	3.00	30
8/8	8.0	12.0	100.0	8.0	4	4.00	30
10/10	10.0	14.0	100.0	10.0	4	5.00	30
12/12	12.0	16.0	100.0	12.0	4	6.00	30
14/14	14.0	18.0	100.0	14.0	4	7.00	30
16/16	16.0	22.0	150.0	16.0	4	8.00	30
20/20	20.0	26.0	150.0	20.0	4	10.00	30

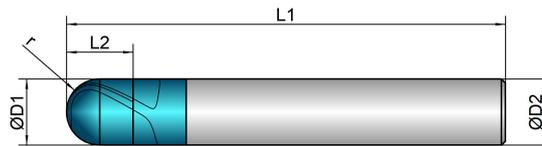
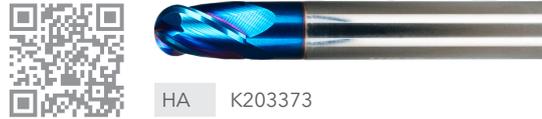
Cooling

Tolerance f8

Coating TiSiN- α

HA HSC UNI

Basic



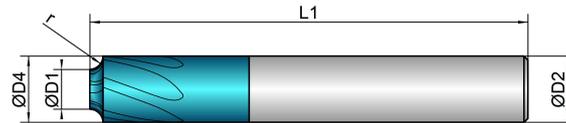
Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
		200	175	155	115	95										

K203373	D1 mm Ø	L2 mm	L1 mm	D2 mm Ø	z #	r mm	 °
0,5	0.5	0.5	50.0	4.0	2	0.25	30
1	1.0	1.0	50.0	4.0	2	0.50	30
1,5	1.5	1.5	50.0	4.0	2	0.75	30
2	2.0	2.0	50.0	4.0	2	1.00	30
2,5	2.5	2.5	50.0	4.0	2	1.25	30
3	3.0	3.0	50.0	6.0	2	1.50	30
4	4.0	4.0	50.0	6.0	2	2.00	30
5	5.0	5.0	50.0	6.0	2	2.50	30
6	6.0	6.0	50.0	6.0	2	3.00	30
8	8.0	8.0	59.0	8.0	2	4.00	30
10	10.0	10.0	66.0	10.0	2	5.00	30
12	12.0	12.0	73.0	12.0	2	6.00	30

Cooling	
Tolerance	0-0,01
Coating	TiSiN- α



HA K204108



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
			50	45	40	30	95									

	r	D1	D4	L1	D2	z
K204108	R mm	 mm \emptyset	 mm \emptyset	 mm	 mm \emptyset	 #
3,6/0,2	0.20	3.6	4	50.0	4.0	6
3,4/0,3	0.30	3.4	4	50.0	4.0	6
3,2/0,4	0.40	3.2	4	50.0	4.0	6
3/0,5	0.50	3	4	50.0	4.0	6
4,8/0,6	0.60	4.8	6	50.0	6.0	6
4,4/0,8	0.80	4.4	6	50.0	6.0	6
4/1	1.00	4	6	50.0	6.0	6
5/1,5	1.50	5	8	55.0	10.0	6
6/2	2.00	6	10	66.0	10.0	6
7/2,5	2.50	7	12	73.0	12.0	6
6/3	3.00	6	12	73.0	12.0	6
9/3,5	3.50	9	16	80.0	16.0	6
8/4	4.00	8	16	80.0	16.0	6
7/4,5	4.50	7	16	80.0	16.0	6
10/5	5.00	10	20	93.0	20.0	6
8/6	6.00	8	20	93.0	20.0	6
9/8	8.00	9	25	100.0	25.0	6
5/10	10.00	5	25	100.0	25.0	6

Cooling  

Tolerance -

Coating TiSiN- α

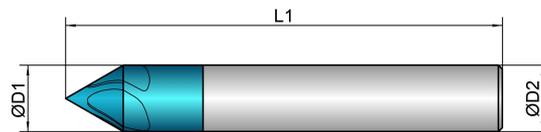
HA HB  



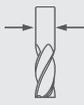
HA K205153



HB K205154



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
		65	50	45	40	35										

K205153	K205154	D1	L1	D2	z
		 mm ø	 mm	 mm ø	 #
3	-	3.0	50.0	3.0	3
4	-	4.0	50.0	4.0	4
6	6	6.0	50.0	6.0	4
8	8	8.0	59.0	8.0	4
10	10	10.0	66.0	10.0	4
12	12	12.0	73.0	12.0	4

Cooling  

Tolerance -

Coating TiSiN- α

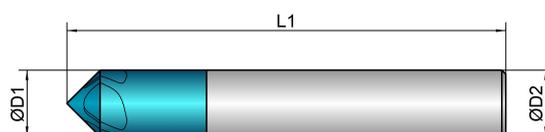
HA HB 




HA K205163



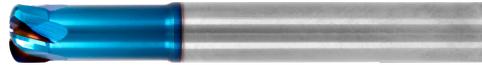
HB K205164



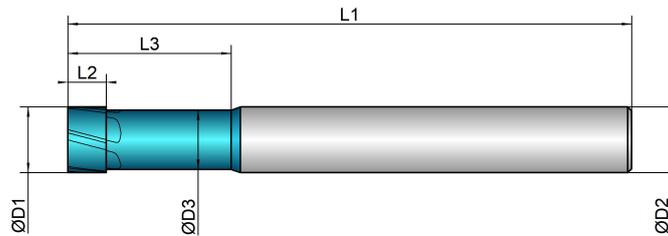
Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
		65	50	45	40	35										

K205163	K205164	D1	L1	D2	z
		 mm ø	 mm	 mm ø	 #
3	-	3.0	50.0	3.0	3
4	-	4.0	50.0	4.0	4
6	6	6.0	50.0	6.0	4
8	8	8.0	59.0	8.0	4
10	10	10.0	66.0	10.0	4
12	12	12.0	73.0	12.0	4

Cooling	
Tolerance	h9
Coating	TiSiN- α



HA K207013



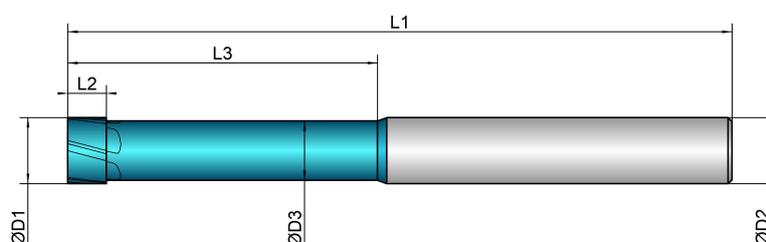
Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
			160	120	90											

K207013	D1 mm ∅	D3 mm ∅	L2 mm	L3 mm	L1 mm	D2 mm ∅	z #	mm	mm max	°
2	2.0	1.7	1.5	13.0	54.0	6.0	2	0.3	0.06	15
3	3.0	2.7	1.5	15.0	54.0	6.0	2	0.3	0.10	15
4	4.0	3.6	2.5	16.0	57.0	6.0	2	0.5	0.15	15
5	5.0	4.6	3.5	18.0	65.0	6.0	4	0.5	0.17	15
6	6.0	5.2	3.5	20.0	65.0	6.0	4	1.0	0.20	15
8	8.0	7.0	4.8	24.0	70.0	8.0	5	1.5	0.25	15
10	10.0	9.0	5.8	26.0	85.0	10.0	5	2.0	0.30	15
12	12.0	11.0	6.8	30.0	93.0	12.0	5	2.0	0.40	15
16	16.0	14.5	8.8	35.0	100.0	16.0	5	2.5	0.50	15

Cooling	
Tolerance	h9
Coating	TiSiN- α



HA K207018



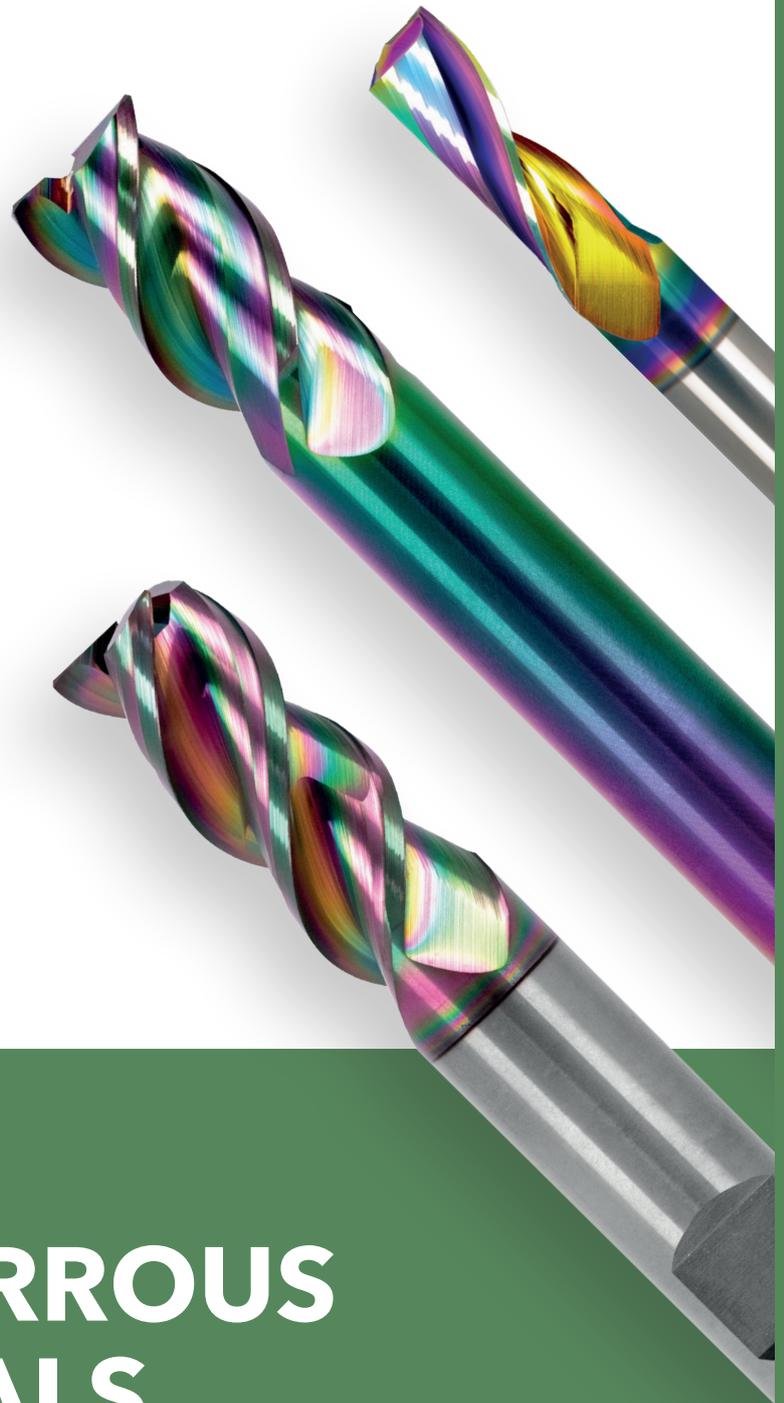
Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
			140	100	80											

K207018	D1 mm \varnothing	D3 mm \varnothing	L2 mm	L3 mm	L1 mm	D2 mm \varnothing	z #	mm	mm max	°
2	2.0	1.7	1.5	18.0	75.0	6.0	2	0.3	0.06	15
3	3.0	2.7	1.5	20.0	75.0	6.0	2	0.3	0.10	15
4	4.0	3.6	2.5	24.0	83.0	6.0	2	0.5	0.15	15
5	5.0	4.6	3.5	28.0	100.0	6.0	4	0.5	0.17	15
6	6.0	5.2	3.5	28.0	100.0	6.0	4	1.0	0.20	15
8	8.0	7.0	4.8	40.0	100.0	8.0	5	1.5	0.25	15
10	10.0	9.0	5.8	48.0	100.0	10.0	5	2.0	0.30	15
12	12.0	11.0	6.8	56.0	119.0	12.0	5	2.0	0.40	15
16	16.0	14.5	8.8	65.0	150.0	16.0	5	2.5	0.50	15

HOFMANN & VRATNY — SHARP CUTTING

NON-FERROUS MATERIALS





HOFMANN & VRATNY — SHARP CUTTING

NON-FERROUS MATERIALS

Non-ferrous materials are very versatile and range from aluminium to plastic to multi-layered materials. Over the years, we have developed a wide range of products for these application areas to enable potentially easily machinable materials to be safely processed.

Sharp cutting-edges for soft materials.

In spite of their easy machinability, these materials impose extra requirements on the milling cutters due to their application as composite material or their

tendency to adhere. The versatility of the non-ferrous materials is covered by a wide range of milling cutters from our three-line product range.

SC end mill cutter | K201001

Cooling

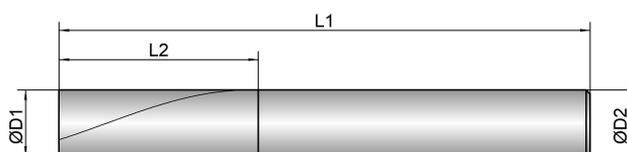
Tolerance h10

Coating -

HA



HA K201001



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
								150			200					

K201001	D1 mm Ø	L2 mm	L1 mm	D2 mm Ø	z #	 °
1,5	1.5	10.0	50.0	3.0	1	20
2	2.0	10.0	50.0	3.0	1	20
3	3.0	12.0	50.0	3.0	1	20
4	4.0	15.0	60.0	4.0	1	20
5	5.0	17.0	60.0	5.0	1	20
6	6.0	20.0	65.0	6.0	1	20
8	8.0	22.0	64.0	8.0	1	20
10	10.0	30.0	80.0	10.0	1	20
12	12.0	35.0	84.0	12.0	1	20

Cooling

Tolerance h10

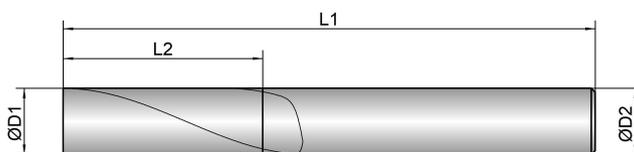
Coating -

HA

Premium



HA K201012



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
								160			200					

K201012	D1 mm ∅	L2 mm	L1 mm	D2 mm ∅	z #	 °
1,5	1.5	10.0	50.0	3.0	1	23
2	2.0	10.0	50.0	3.0	1	23
3	3.0	12.0	50.0	3.0	1	23
4	4.0	15.0	60.0	4.0	1	23
5	5.0	17.0	60.0	5.0	1	23
6	6.0	20.0	65.0	6.0	1	23
8	8.0	22.0	64.0	8.0	1	23
10	10.0	30.0	80.0	10.0	1	23
12	12.0	35.0	84.0	12.0	1	23

SC end mill cutter | K201021

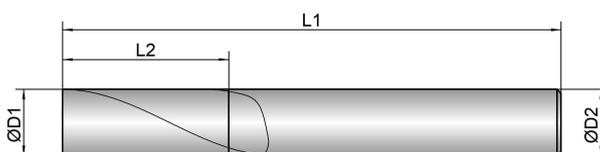
Cooling

Tolerance h10

Coating -

HA

Premium



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
								140			180					

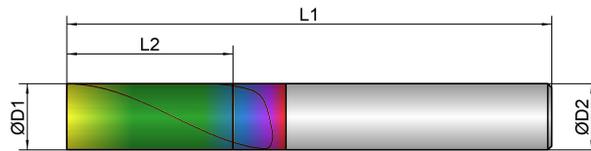
K201021	D1 mm Ø	L2 mm	L1 mm	D2 mm Ø	z #	 °
1,5	1.5	6.0	50.0	3.0	1	26
2	2.0	8.0	50.0	3.0	1	26
3	3.0	12.0	50.0	3.0	1	26
4	4.0	15.0	60.0	4.0	1	26
5	5.0	17.0	60.0	5.0	1	26
6	6.0	20.0	65.0	6.0	1	26
8	8.0	22.0	64.0	8.0	1	26
10	10.0	25.0	75.0	10.0	1	26
12	12.0	30.0	80.0	12.0	1	26

Cooling	
Tolerance	h10
Coating	TAC- α

HA

NEW

Expert



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
								430			480					

K201022	D1 mm ∅	L2 mm	L1 mm	D2 mm ∅	z #	 °
1	1.0	4.0	50.0	3.0	1	30
1,5	1.5	6.0	50.0	3.0	1	30
2	2.0	8.0	50.0	3.0	1	30
3	3.0	12.0	50.0	3.0	1	30
4	4.0	15.0	54.0	4.0	1	30
5	5.0	17.0	54.0	5.0	1	30
6	6.0	20.0	65.0	6.0	1	30
8	8.0	22.0	63.0	8.0	1	30
10	10.0	25.0	72.0	10.0	1	30
12	12.0	30.0	83.0	12.0	1	30

Cooling 

Tolerance e8

Coating TiAlN- α

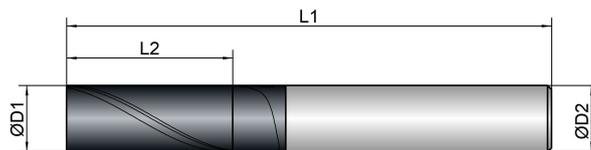
HA HB UNI 



HA K201053



HB K201054



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
100	80	60					80	100	180							

K201053	K201054	D1  mm Ø	L2  mm	L1  mm	D2  mm Ø	z  #	 °
1	1	1.0	4.0	58.0	6.0	2	30
1,5	1,5	1.5	6.0	58.0	6.0	2	30
2	2	2.0	7.0	58.0	6.0	2	30
3	3	3.0	10.0	58.0	6.0	2	30
4	4	4.0	13.0	58.0	6.0	2	30
5	5	5.0	15.0	58.0	6.0	2	30
6	6	6.0	16.0	58.0	6.0	2	30
8	8	8.0	22.0	70.0	8.0	2	30
10	10	10.0	25.0	73.0	10.0	2	30
12	12	12.0	26.0	84.0	12.0	2	30
14	14	14.0	26.0	84.0	14.0	2	30
16	16	16.0	30.0	93.0	16.0	2	30
18	18	18.0	30.0	93.0	18.0	2	30
20	20	20.0	40.0	104.0	20.0	2	30

Cooling

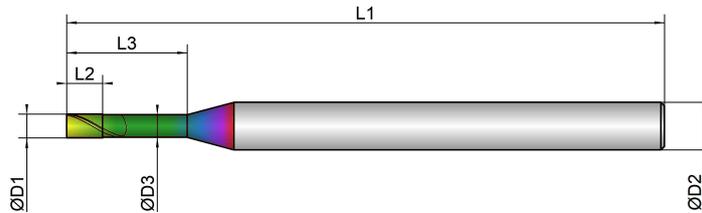
Tolerance 0-0,01

Coating TAC- α

HA HSC



HA K201123



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
								500	180			200	350			

K201123	D1 mm Ø	D3 mm Ø	L2 mm	L3 mm	L1 mm	D2 mm Ø	z #	 °
0,2X0,5	0.2	0.18	0.3	0.5	45.0	4.0	2	30
0,2X1	0.2	0.18	0.3	1.0	45.0	4.0	2	30
0,2X1,5	0.2	0.18	0.3	1.5	45.0	4.0	2	30
0,3X1	0.3	0.28	0.4	1.0	45.0	4.0	2	30
0,3X2	0.3	0.28	0.4	2.0	45.0	4.0	2	30
0,4X2	0.4	0.38	0.6	2.0	45.0	4.0	2	30
0,4X3	0.4	0.38	0.6	3.0	45.0	4.0	2	30
0,5X2	0.5	0.48	0.7	2.0	45.0	4.0	2	30
0,5X4	0.5	0.48	0.7	4.0	45.0	4.0	2	30
0,5X6	0.5	0.48	0.7	6.0	45.0	4.0	2	30
0,6X2	0.6	0.58	0.9	2.0	45.0	4.0	2	30
0,6X4	0.6	0.58	0.9	4.0	45.0	4.0	2	30
0,6X6	0.6	0.58	0.9	6.0	45.0	4.0	2	30
0,7X2	0.7	0.68	1.0	2.0	45.0	4.0	2	30
0,7X4	0.7	0.68	1.0	4.0	45.0	4.0	2	30
0,8X4	0.8	0.78	1.2	4.0	45.0	4.0	2	30
0,8X6	0.8	0.78	1.2	6.0	45.0	4.0	2	30
0,8X8	0.8	0.78	1.2	8.0	45.0	4.0	2	30
1X4	1.0	0.95	1.5	4.0	45.0	4.0	2	30
1X6	1.0	0.95	1.5	6.0	45.0	4.0	2	30
1X8	1.0	0.95	1.5	8.0	45.0	4.0	2	30

K201123	D1	D3	L2	L3	L1	D2	z	°
	 mm ∅	 mm ∅	 mm	 mm	 mm	 mm ∅	 #	
1X10	1.0	0.95	1.5	10.0	45.0	4.0	2	30
1X12	1.0	0.95	1.5	12.0	45.0	4.0	2	30
1X14	1.0	0.95	1.5	14.0	45.0	4.0	2	30
1X16	1.0	0.95	1.5	16.0	50.0	4.0	2	30
1X25	1.0	0.95	1.5	25.0	70.0	4.0	2	30
1,2X6	1.2	1.14	1.8	6.0	45.0	4.0	2	30
1,2X8	1.2	1.14	1.8	8.0	45.0	4.0	2	30
1,2X10	1.2	1.14	1.8	10.0	45.0	4.0	2	30
1,4X6	1.4	1.34	2.1	6.0	45.0	4.0	2	30
1,4X8	1.4	1.34	2.1	8.0	45.0	4.0	2	30
1,5X6	1.5	1.44	2.3	6.0	45.0	4.0	2	30
1,5X8	1.5	1.44	2.3	8.0	45.0	4.0	2	30
1,5X10	1.5	1.44	2.3	10.0	45.0	4.0	2	30
1,5X12	1.5	1.44	2.3	12.0	45.0	4.0	2	30
1,5X14	1.5	1.44	2.3	14.0	50.0	4.0	2	30
1,5X16	1.5	1.44	2.3	16.0	50.0	4.0	2	30
1,5X20	1.5	1.44	2.3	20.0	54.0	4.0	2	30
1,5X25	1.5	1.44	2.3	25.0	70.0	4.0	2	30
1,6X6	1.6	1.51	2.4	6.0	45.0	4.0	2	30
1,6X10	1.6	1.51	2.4	10.0	45.0	4.0	2	30
1,8X6	1.8	1.71	2.7	6.0	45.0	4.0	2	30
1,8X8	1.8	1.71	2.7	8.0	45.0	4.0	2	30
1,8X10	1.8	1.71	2.7	10.0	45.0	4.0	2	30
2X6	2.0	1.91	3.0	6.0	45.0	4.0	2	30
2X8	2.0	1.91	3.0	8.0	45.0	4.0	2	30
2X10	2.0	1.91	3.0	10.0	45.0	4.0	2	30
2X12	2.0	1.91	3.0	12.0	45.0	4.0	2	30
2X14	2.0	1.91	3.0	14.0	50.0	4.0	2	30
2X16	2.0	1.91	3.0	16.0	50.0	4.0	2	30
2X20	2.0	1.91	3.0	20.0	54.0	4.0	2	30
2X25	2.0	1.91	3.0	25.0	60.0	4.0	2	30
2X30	2.0	1.91	3.0	30.0	70.0	4.0	2	30
2X35	2.0	1.91	3.0	35.0	80.0	4.0	2	30
2,5X8	2.5	2.41	3.7	8.0	45.0	4.0	2	30
2,5X12	2.5	2.41	3.7	12.0	45.0	4.0	2	30
2,5X16	2.5	2.41	3.7	16.0	50.0	4.0	2	30
2,5X20	2.5	2.41	3.7	20.0	54.0	4.0	2	30
2,5X25	2.5	2.41	3.7	25.0	60.0	4.0	2	30
2,5X30	2.5	2.41	3.7	30.0	70.0	4.0	2	30

Cooling

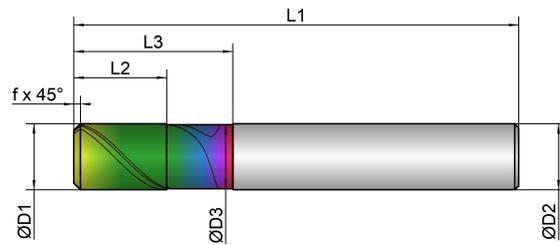
Tolerance e8

Coating TAC- α

HA HSC HPC MTC



HA K201133



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
								520					140	290		

K201133	D1 mm ø	D3 mm ø	L2 mm	L3 mm	L1 mm	D2 mm ø	z #	 mm	 °
2	2.0	1.9	5.0	10.0	54.0	6.0	2	0.05	45
3	3.0	2.9	5.0	12.0	54.0	6.0	2	0.10	45
4	4.0	3.9	8.0	15.0	54.0	6.0	2	0.10	45
5	5.0	4.9	9.0	16.0	54.0	6.0	2	0.10	45
6	6.0	5.9	10.0	17.0	54.0	6.0	2	0.10	45
8	8.0	7.7	12.0	20.0	59.0	8.0	2	0.10	45
10	10.0	9.7	14.0	24.0	67.0	10.0	2	0.10	45
11	11.0	10.7	15.0	25.0	74.0	12.0	2	0.10	45
12	12.0	11.7	16.0	26.0	74.0	12.0	2	0.10	45
14	14.0	13.7	18.0	28.0	75.0	14.0	2	0.10	45
16	16.0	15.5	22.0	32.0	83.0	16.0	2	0.10	45
20	20.0	19.5	26.0	40.0	83.0	20.0	2	0.10	45

Cooling

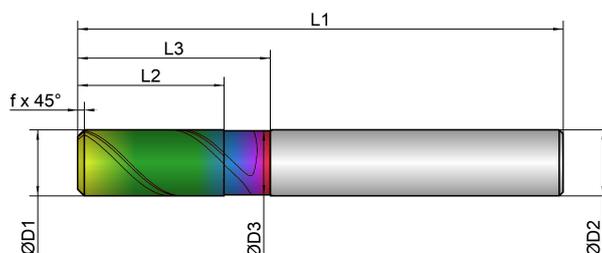
Tolerance e8

Coating TAC- α

HA HSC HPC MTC



HA K201143



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
								520					140	290		

K201143	D1 mm ∅	D3 mm ∅	L2 mm	L3 mm	L1 mm	D2 mm ∅	z #	 mm	 °
2	2.0	1.9	8.0	16.0	58.0	6.0	2	0.05	45
3	3.0	2.9	8.0	18.0	58.0	6.0	2	0.10	45
4	4.0	3.9	11.0	18.0	58.0	6.0	2	0.10	45
5	5.0	4.9	13.0	20.0	58.0	6.0	2	0.10	45
6	6.0	5.9	13.0	20.0	58.0	6.0	2	0.10	45
8	8.0	7.7	19.0	26.0	64.0	8.0	2	0.10	45
10	10.0	9.7	22.0	29.0	73.0	10.0	2	0.10	45
11	11.0	10.7	24.0	34.0	84.0	12.0	2	0.10	45
12	12.0	11.7	26.0	36.0	84.0	12.0	2	0.10	45
14	14.0	13.7	26.0	36.0	84.0	14.0	2	0.10	45
16	16.0	15.5	32.0	42.0	93.0	16.0	2	0.10	45
18	18.0	17.5	32.0	42.0	93.0	18.0	2	0.10	45
20	20.0	19.5	38.0	52.0	104.0	20.0	2	0.10	45

Cooling	 
Tolerance	h10
Coating	Diamond- α

HA



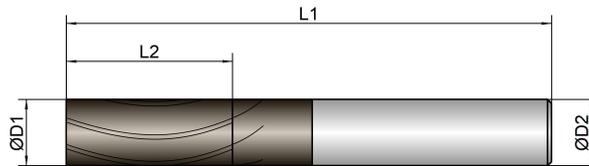




Expert



HA K201573



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
											210	200	350			

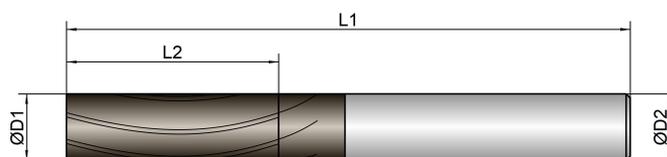
K201573	D1	L2	L1	D2	z
	 mm ∅	 mm	 mm	 mm ∅	 #
6	6.0	16.0	58.0	6.0	4
8	8.0	22.0	70.0	8.0	6
10	10.0	25.0	73.0	10.0	6
12	12.0	28.0	84.0	12.0	6

Cooling	 
Tolerance	h10
Coating	Diamond- α

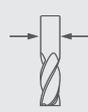
HA   



HA K201577



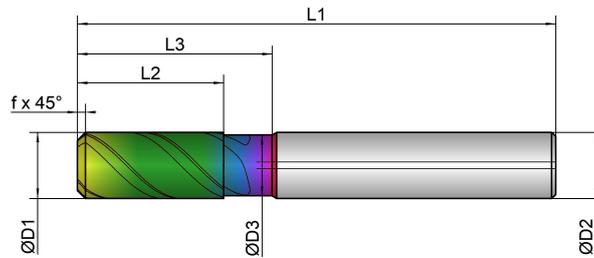
Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
											350		210	200		

K201577	D1  mm Ø	L2  mm	L1  mm	D2  mm Ø	z  #
6	6.0	21.0	65.0	6.0	4
8	8.0	28.0	85.0	8.0	6
10	10.0	32.0	85.0	10.0	6
12	12.0	36.0	93.0	12.0	6

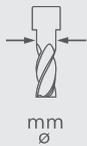
Cooling	
Tolerance	e8
Coating	TAC- α

HA ETC HPC \neq   

NEW 
Expert



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
								480			500					

K201768	D1  mm \varnothing	D3  mm \varnothing	L2  mm	L3  mm	L1  mm	D2  mm \varnothing	z  #	 mm	 °
5	5.0	4.7	13.0	18.0	57.0	6.0	3	0.10	45
6	6.0	5.7	13.0	18.0	57.0	6.0	3	0.20	45
8	8.0	7.4	21.0	25.0	63.0	8.0	3	0.20	45
10	10.0	9.2	22.0	30.0	72.0	10.0	3	0.20	45
12	12.0	11.0	26.0	36.0	83.0	12.0	3	0.20	45
16	16.0	15.0	36.0	42.0	92.0	16.0	3	0.20	45
20	20.0	19.0	41.0	52.0	104.0	20.0	3	0.20	45

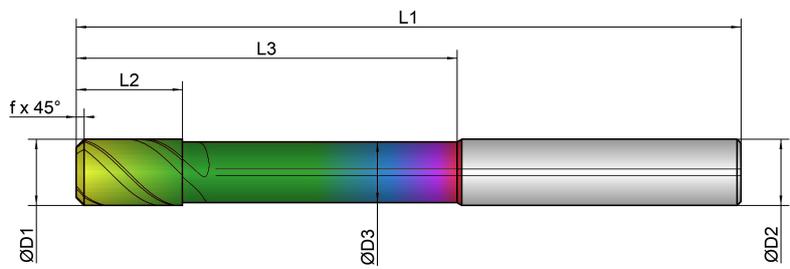
Cooling	
Tolerance	e8
Coating	TAC- α

HA ETC HPC \neq   

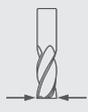
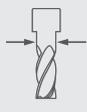
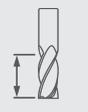
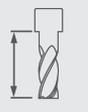
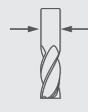
NEW  Expert



HA K201773



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
								260			270					

	D1	D3	L2	L3	L1	D2	z		
K201773	 mm ø	 mm ø	 mm	 mm	 mm	 mm ø	 #	 mm	 °
5	5.0	4.7	8.0	30.0	83.0	6.0	3	0.10	45
6	6.0	5.7	10.0	42.0	83.0	6.0	3	0.20	45
8	8.0	7.4	13.0	62.0	100.0	8.0	3	0.20	45
10	10.0	9.2	16.0	58.0	100.0	10.0	3	0.20	45
12	12.0	11.0	19.0	73.0	119.0	12.0	3	0.20	45
16	16.0	15.0	25.0	100.0	150.0	16.0	3	0.20	45
20	20.0	19.0	32.0	98.0	150.0	20.0	3	0.20	45

Cooling

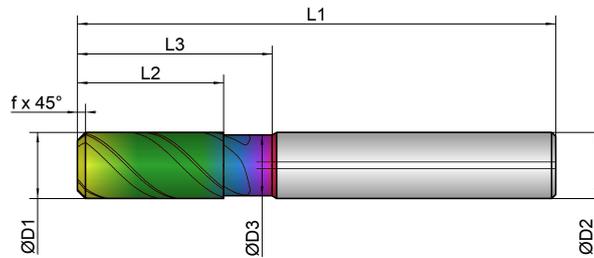
Tolerance e8

Coating TAC- α

HA ETC HPC \neq

NEW

Expert



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
								480			500					

K201776	D1 mm ø	D3 mm ø	L2 mm	L3 mm	L1 mm	D2 mm ø	z #	 mm	 °
3	3.0	2.7	8.0	12.0	57.0	6.0	3	0.10	40
4	4.0	3.7	11.0	18.0	57.0	6.0	3	0.10	40
5	5.0	4.7	13.0	18.0	57.0	6.0	3	0.10	40
6	6.0	5.7	13.0	18.0	57.0	6.0	3	0.20	40
8	8.0	7.4	21.0	25.0	63.0	8.0	3	0.20	40
10	10.0	9.2	22.0	30.0	72.0	10.0	3	0.20	40
12	12.0	11.0	26.0	36.0	83.0	12.0	3	0.20	40
16	16.0	15.0	36.0	42.0	92.0	16.0	3	0.20	40
20	20.0	19.0	41.0	52.0	104.0	20.0	3	0.20	40

Cooling 

Tolerance e8

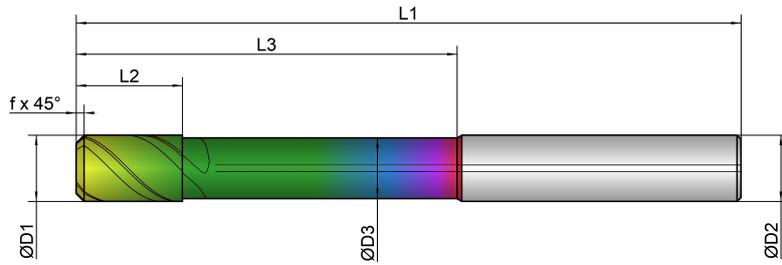
Coating TAC- α

HA ETC HPC \neq 

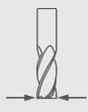
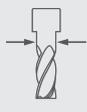
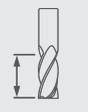
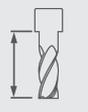
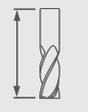
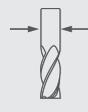
NEW 



HA K201779



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
								260			270					

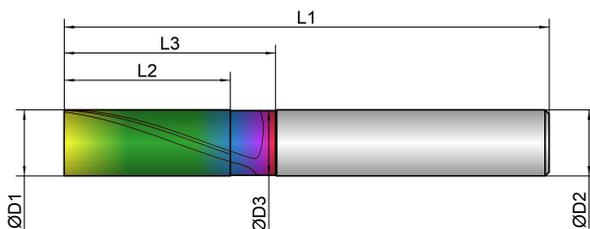
K201779	D1  mm \varnothing	D3  mm \varnothing	L2  mm	L3  mm	L1  mm	D2  mm \varnothing	z  #	 mm	 °
3	3.0	2.7	5.0	18.0	83.0	6.0	3	0.10	40
4	4.0	3.7	6.5	24.0	83.0	6.0	3	0.10	40
5	5.0	4.7	8.0	30.0	83.0	6.0	3	0.10	40
6	6.0	5.7	10.0	42.0	83.0	6.0	3	0.20	40
8	8.0	7.4	13.0	62.0	100.0	8.0	3	0.20	40
10	10.0	9.2	16.0	58.0	100.0	10.0	3	0.20	40
12	12.0	11.0	19.0	73.0	119.0	12.0	3	0.20	40
16	16.0	15.0	25.0	100.0	150.0	16.0	3	0.20	40
20	20.0	19.0	32.0	98.0	150.0	20.0	3	0.20	40

Cooling

Tolerance e8

Coating TAC- α

HA ETC HSC HPC



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC		Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite		
								450			425					

K201813	D1 mm ∅	D3 mm ∅	L2 mm	L3 mm	L1 mm	D2 mm ∅	z #	 °
1	1.0	0.9	5.0	8.0	50.0	3.0	2	20
2	2.0	1.85	8.0	11.0	50.0	3.0	2	20
3	3.0	2.8	11.0	14.0	50.0	3.0	2	20
4	4.0	3.8	13.0	16.0	54.0	4.0	2	20
5	5.0	4.8	15.0	18.0	54.0	5.0	2	20
6	6.0	5.8	16.0	21.0	65.0	6.0	2	20
8	8.0	7.8	22.0	27.0	70.0	8.0	2	20
10	10.0	9.8	25.0	32.0	73.0	10.0	2	20
12	12.0	11.8	28.0	38.0	84.0	12.0	3	20
14	14.0	13.8	30.0	42.0	84.0	14.0	3	20
16	16.0	15.8	36.0	44.0	93.0	16.0	3	20
20	20.0	19.8	41.0	54.0	104.0	20.0	3	20

Cooling

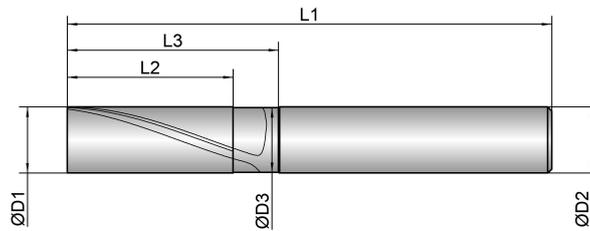
Tolerance d11

Coating -

HA HSC HPC MTC



HA K201816



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
									250		280					

K201816	D1 mm ø	D3 mm ø	L2 mm	L3 mm	L1 mm	D2 mm ø	z #	 °
4	4.0	3.8	13.0	16.0	54.0	4.0	2	20
5	5.0	4.8	15.0	18.0	54.0	5.0	2	20
6	6.0	5.8	16.0	21.0	65.0	6.0	2	20
8	8.0	7.8	22.0	27.0	70.0	8.0	2	20
10	10.0	9.8	25.0	32.0	73.0	10.0	2	20
12	12.0	11.8	28.0	38.0	84.0	12.0	3	20
14	14.0	13.8	30.0	42.0	84.0	14.0	3	20
16	16.0	15.8	36.0	44.0	93.0	16.0	3	20
20	20.0	19.8	41.0	54.0	104.0	20.0	3	20

Cooling

Tolerance e8

Coating -

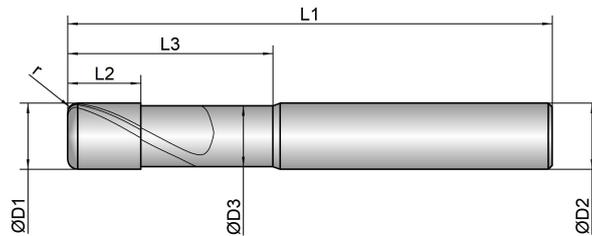
HA HB HSC



HA K202001



HB K202002



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
									160			200				

K202001	K202002	D1 mm ∅	D3 mm ∅	L2 mm	L3 mm	L1 mm	D2 mm ∅	z #	r mm	∅
3/0,3	-	3.0	2.7	4.0	14.0	50.0	3.0	2	0.30	30
4/0,3	-	4.0	3.7	5.0	16.0	50.0	4.0	2	0.30	30
5/0,3	-	5.0	4.6	6.0	18.0	54.0	5.0	2	0.30	30
6/0,3	6/0,3	6.0	5.5	7.0	21.0	58.0	6.0	2	0.30	30
6/1	6/1	6.0	5.5	7.0	21.0	58.0	6.0	2	1.00	30
6/2	6/2	6.0	5.5	7.0	21.0	58.0	6.0	2	2.00	30
8/0,3	8/0,3	8.0	7.4	9.0	27.0	64.0	8.0	2	0.30	30
8/1	8/1	8.0	7.4	9.0	27.0	64.0	8.0	2	1.00	30
8/2	8/2	8.0	7.4	9.0	27.0	64.0	8.0	2	2.00	30
10/0,3	10/0,3	10.0	9.2	11.0	32.0	73.0	10.0	2	0.30	30
10/1,5	10/1,5	10.0	9.2	11.0	32.0	73.0	10.0	2	1.50	30
10/3	10/3	10.0	9.2	11.0	32.0	73.0	10.0	2	3.00	30
12/0,5	12/0,5	12.0	11.0	12.0	38.0	84.0	12.0	2	0.50	30
12/1,5	12/1,5	12.0	11.0	12.0	38.0	84.0	12.0	2	1.50	30
12/4	12/4	12.0	11.0	12.0	38.0	84.0	12.0	2	4.00	30
16/1	16/1	16.0	15.0	16.0	44.0	93.0	16.0	2	1.00	30
16/2	16/2	16.0	15.0	16.0	44.0	93.0	16.0	2	2.00	30
16/5	16/5	16.0	15.0	16.0	44.0	93.0	16.0	2	5.00	30

Cooling

Tolerance e8

Coating TiN- α

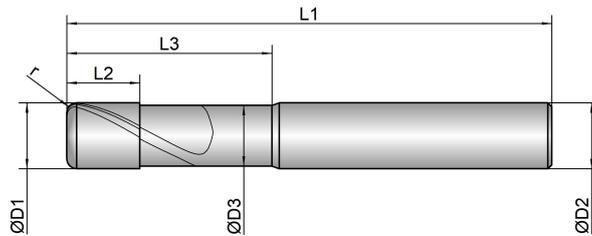
HA HB HSC



HA K202003



HB K202004



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
									320			350				

K202003	K202004	D1 mm ∅	D3 mm ∅	L2 mm	L3 mm	L1 mm	D2 mm ∅	z #	r mm	 °
3/0,3	-	3.0	2.7	4.0	14.0	50.0	3.0	2	0.30	30
4/0,3	-	4.0	3.7	5.0	16.0	50.0	4.0	2	0.30	30
5/0,3	-	5.0	4.6	6.0	18.0	54.0	5.0	2	0.30	30
6/0,3	6/0,3	6.0	5.5	7.0	21.0	58.0	6.0	2	0.30	30
6/1	6/1	6.0	5.5	7.0	21.0	58.0	6.0	2	1.00	30
6/2	6/2	6.0	5.5	7.0	21.0	58.0	6.0	2	2.00	30
8/0,3	8/0,3	8.0	7.4	9.0	27.0	64.0	8.0	2	0.30	30
8/1	8/1	8.0	7.4	9.0	27.0	64.0	8.0	2	1.00	30
8/2	8/2	8.0	7.4	9.0	27.0	64.0	8.0	2	2.00	30
10/0,3	10/0,3	10.0	9.2	11.0	32.0	73.0	10.0	2	0.30	30
10/1,5	10/1,5	10.0	9.2	11.0	32.0	73.0	10.0	2	1.50	30
10/3	10/3	10.0	9.2	11.0	32.0	73.0	10.0	2	3.00	30
12/0,5	12/0,5	12.0	11.0	12.0	38.0	84.0	12.0	2	0.50	30
12/1,5	12/1,5	12.0	11.0	12.0	38.0	84.0	12.0	2	1.50	30
12/4	12/4	12.0	11.0	12.0	38.0	84.0	12.0	2	4.00	30
16/1	16/1	16.0	15.0	16.0	44.0	93.0	16.0	2	1.00	30
16/2	16/2	16.0	15.0	16.0	44.0	93.0	16.0	2	2.00	30
16/5	16/5	16.0	15.0	16.0	44.0	93.0	16.0	2	5.00	30

Cooling 

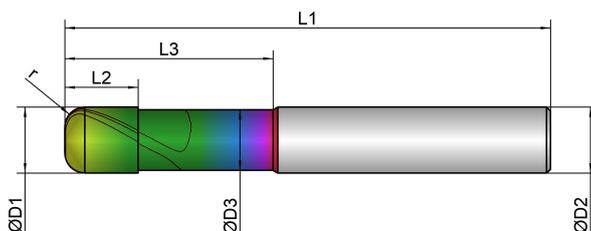
Tolerance e8

Coating TAC- α

HA HSC 




HA K202005



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
								320			350					

K202005	D1 mm ∅	D3 mm ∅	L2 mm	L3 mm	L1 mm	D2 mm ∅	z #	r mm	 °
3/0,3	3.0	2.7	4.0	14.0	50.0	3.0	2	0.30	30
4/0,3	4.0	3.7	5.0	16.0	50.0	4.0	2	0.30	30
5/0,3	5.0	4.6	6.0	18.0	54.0	5.0	2	0.30	30
6/0,3	6.0	5.5	7.0	21.0	58.0	6.0	2	0.30	30
6/1	6.0	5.5	7.0	21.0	58.0	6.0	2	1.00	30
6/2	6.0	5.5	7.0	21.0	58.0	6.0	2	2.00	30
8/0,3	8.0	7.4	9.0	27.0	64.0	8.0	2	0.30	30
8/1	8.0	7.4	9.0	27.0	64.0	8.0	2	1.00	30
8/2	8.0	7.4	9.0	27.0	64.0	8.0	2	2.00	30
10/0,3	10.0	9.2	11.0	32.0	73.0	10.0	2	0.30	30
10/1,5	10.0	9.2	11.0	32.0	73.0	10.0	2	1.50	30
10/3	10.0	9.2	11.0	32.0	73.0	10.0	2	3.00	30
12/1,5	12.0	11.0	12.0	38.0	84.0	12.0	2	1.50	30
12/4	12.0	11.0	12.0	38.0	84.0	12.0	2	4.00	30
16/2	16.0	15.0	16.0	44.0	93.0	16.0	2	2.00	30
16/5	16.0	15.0	16.0	44.0	93.0	16.0	2	5.00	30

Cooling

Tolerance e8

Coating -

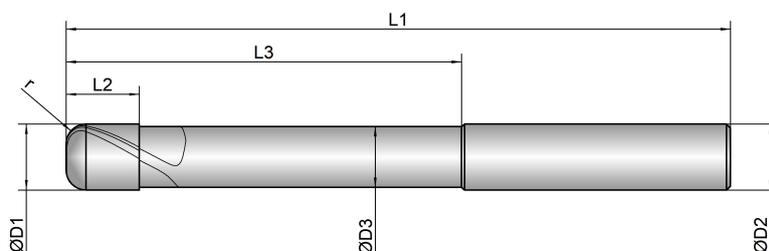
HA HB HSC



HA K202011



HB K202012



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
								160			200					

K202011	K202012	D1	D3	L2	L3	L1	D2	z	r	°
		mm Ø	mm Ø	mm	mm	mm	mm Ø	#	mm	
3/0,3	-	3.0	2.7	4.0	32.0	75.0	3.0	2	0.30	30
4/0,3	-	4.0	3.7	5.0	36.0	75.0	4.0	2	0.30	30
5/0,3	-	5.0	4.6	6.0	40.0	75.0	5.0	2	0.30	30
6/0,3	6/0,3	6.0	5.5	7.0	44.0	80.0	6.0	2	0.30	30
6/1	6/1	6.0	5.5	7.0	44.0	80.0	6.0	2	1.00	30
6/2	6/2	6.0	5.5	7.0	44.0	80.0	6.0	2	2.00	30
8/0,3	8/0,3	8.0	7.4	9.0	54.0	100.0	8.0	2	0.30	30
8/1	8/1	8.0	7.4	9.0	54.0	100.0	8.0	2	1.00	30
8/2	8/2	8.0	7.4	9.0	54.0	100.0	8.0	2	2.00	30
10/0,3	10/0,3	10.0	9.2	11.0	60.0	100.0	10.0	2	0.30	30
10/1,5	10/1,5	10.0	9.2	11.0	60.0	100.0	10.0	2	1.50	30
10/3	10/3	10.0	9.2	11.0	60.0	100.0	10.0	2	3.00	30
12/0,5	12/0,5	12.0	11.0	12.0	75.0	120.0	12.0	2	0.50	30
12/1,5	12/1,5	12.0	11.0	12.0	75.0	120.0	12.0	2	1.50	30
12/4	12/4	12.0	11.0	12.0	75.0	120.0	12.0	2	4.00	30
16/1	16/1	16.0	15.0	16.0	92.0	150.0	16.0	2	1.00	30
16/2	16/2	16.0	15.0	16.0	92.0	150.0	16.0	2	2.00	30
16/5	16/5	16.0	15.0	16.0	92.0	150.0	16.0	2	5.00	30

Cooling

Tolerance e8

Coating TiN- α

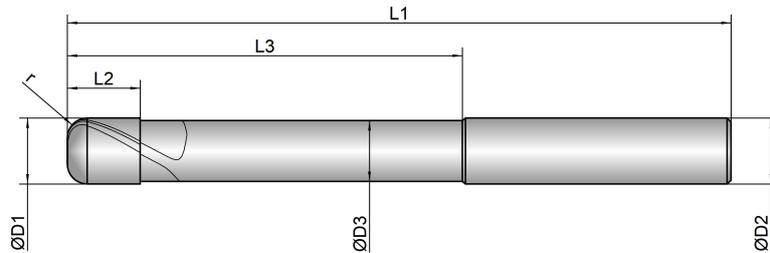
HA HB HSC



HA K202013



HB K202014



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
								320			350					

K202013	K202014	D1	D3	L2	L3	L1	D2	z	r	°
		mm ∅	mm ∅	mm	mm	mm	mm ∅	#	mm	
3/0,3	-	3.0	2.7	4.0	32.0	75.0	3.0	2	0.30	30
4/0,3	-	4.0	3.7	5.0	36.0	75.0	4.0	2	0.30	30
5/0,3	-	5.0	4.6	6.0	40.0	75.0	5.0	2	0.30	30
6/0,3	6/0,3	6.0	5.5	7.0	44.0	80.0	6.0	2	0.30	30
6/1	6/1	6.0	5.5	7.0	44.0	80.0	6.0	2	1.00	30
6/2	6/2	6.0	5.5	7.0	44.0	80.0	6.0	2	2.00	30
8/0,3	8/0,3	8.0	7.4	9.0	54.0	100.0	8.0	2	0.30	30
8/1	8/1	8.0	7.4	9.0	54.0	100.0	8.0	2	1.00	30
8/2	8/2	8.0	7.4	9.0	54.0	100.0	8.0	2	2.00	30
10/0,3	10/0,3	10.0	9.2	11.0	60.0	100.0	10.0	2	0.30	30
10/1,5	10/1,5	10.0	9.2	11.0	60.0	100.0	10.0	2	1.50	30
10/3	10/3	10.0	9.2	11.0	60.0	100.0	10.0	2	3.00	30
12/0,5	12/0,5	12.0	11.0	12.0	75.0	120.0	12.0	2	0.50	30
12/1,5	12/1,5	12.0	11.0	12.0	75.0	120.0	12.0	2	1.50	30
12/4	12/4	12.0	11.0	12.0	75.0	120.0	12.0	2	4.00	30
16/1	16/1	16.0	15.0	16.0	92.0	150.0	16.0	2	1.00	30
16/2	16/2	16.0	15.0	16.0	92.0	150.0	16.0	2	2.00	30
16/5	16/5	16.0	15.0	16.0	92.0	150.0	16.0	2	5.00	30

Cooling

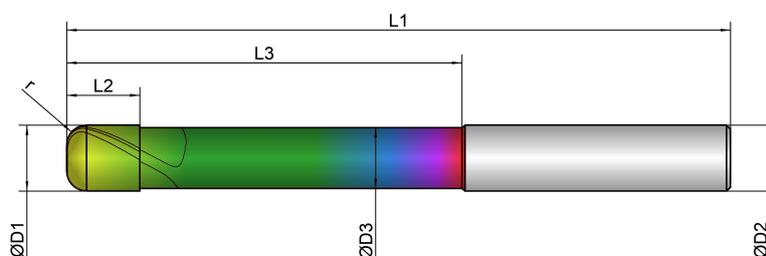
Tolerance e8

Coating TAC- α

HA HSC



HA K202015



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
								180			220					

	D1	D3	L2	L3	L1	D2	z	r	
K202015	mm ∅	mm ∅	mm	mm	mm	mm ∅	#	mm	°
3/0,3	3.0	2.7	4.0	32.0	75.0	3.0	2	0.30	30
4/0,3	4.0	3.7	5.0	36.0	75.0	4.0	2	0.30	30
5/0,3	5.0	4.6	6.0	40.0	75.0	5.0	2	0.30	30
6/0,3	6.0	5.5	7.0	44.0	80.0	6.0	2	0.30	30
6/1	6.0	5.5	7.0	44.0	80.0	6.0	2	1.00	30
6/2	6.0	5.5	7.0	44.0	80.0	6.0	2	2.00	30
8/0,3	8.0	7.4	9.0	54.0	100.0	8.0	2	0.30	30
8/1	8.0	7.4	9.0	54.0	100.0	8.0	2	1.00	30
8/2	8.0	7.4	9.0	54.0	100.0	8.0	2	2.00	30
10/0,3	10.0	9.2	11.0	60.0	100.0	10.0	2	0.30	30
10/1,5	10.0	9.2	11.0	60.0	100.0	10.0	2	1.50	30
10/3	10.0	9.2	11.0	60.0	100.0	10.0	2	3.00	30
12/1,5	12.0	11.0	12.0	75.0	120.0	12.0	2	1.50	30
12/4	12.0	11.0	12.0	75.0	120.0	12.0	2	4.00	30
16/2	16.0	15.0	16.0	92.0	150.0	16.0	2	2.00	30
16/5	16.0	15.0	16.0	92.0	150.0	16.0	2	5.00	30

Cooling 

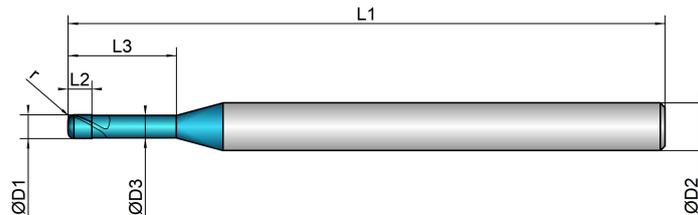
Tolerance 0-0,01

Coating TiSiN- α

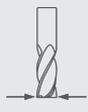
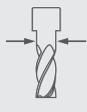
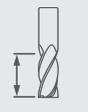
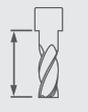
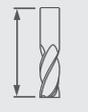
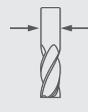
HA HSC 

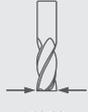
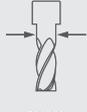
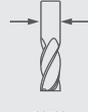



HA K202082



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
225	210	200	125	75	55	40	100		150							

K202082	D1  mm ø	D3  mm ø	L2  mm	L3  mm	L1  mm	D2  mm ø	z  #	r  mm	 °
0,4X1	0.4	0.38	0.4	1.0	50.0	4.0	2	0.10	30
0,4X1,5	0.4	0.38	0.4	1.5	50.0	4.0	2	0.10	30
0,4X2	0.4	0.38	0.4	2.0	50.0	4.0	2	0.10	30
0,4X3	0.4	0.38	0.4	3.0	50.0	4.0	2	0.10	30
0,4X4	0.4	0.38	0.4	4.0	50.0	4.0	2	0.10	30
0,5X1	0.5	0.48	0.5	1.0	50.0	4.0	2	0.10	30
0,5X2	0.5	0.48	0.5	2.0	50.0	4.0	2	0.10	30
0,5X3	0.5	0.48	0.5	3.0	50.0	4.0	2	0.10	30
0,5X4	0.5	0.48	0.5	4.0	50.0	4.0	2	0.10	30
0,5X5	0.5	0.48	0.5	5.0	50.0	4.0	2	0.10	30
0,5X6	0.5	0.48	0.5	6.0	50.0	4.0	2	0.10	30
0,6X2	0.6	0.58	0.6	2.0	50.0	4.0	2	0.10	30
0,6X3	0.6	0.58	0.6	3.0	50.0	4.0	2	0.10	30
0,6X4	0.6	0.58	0.6	4.0	50.0	4.0	2	0.10	30

									
K202082	mm ∅	mm ∅	mm	mm	mm	mm ∅	#	mm	°
0,6X6	0.6	0.58	0.6	6.0	50.0	4.0	2	0.10	30
0,6X8	0.6	0.58	0.6	8.0	50.0	4.0	2	0.10	30
0,7X4	0.7	0.68	0.7	4.0	50.0	4.0	2	0.10	30
0,7X6	0.7	0.68	0.7	6.0	50.0	4.0	2	0.10	30
0,8X4	0.8	0.78	0.8	4.0	50.0	4.0	2	0.10	30
0,8X6	0.8	0.78	0.8	6.0	50.0	4.0	2	0.10	30
1X2	1.0	0.95	1.0	2.0	50.0	4.0	2	0.10	30
1X4	1.0	0.95	1.0	4.0	50.0	4.0	2	0.10	30
1X6	1.0	0.95	1.0	6.0	50.0	4.0	2	0.10	30
1X8	1.0	0.95	1.0	8.0	50.0	4.0	2	0.10	30
1X10	1.0	0.95	1.0	10.0	50.0	4.0	2	0.10	30
1X12	1.0	0.95	1.0	12.0	54.0	4.0	2	0.10	30
1X16	1.0	0.95	1.0	16.0	60.0	4.0	2	0.10	30
1X20	1.0	0.95	1.0	20.0	60.0	4.0	2	0.10	30
2X4	2.0	1.91	2.0	4.0	50.0	4.0	2	0.10	30
2X6	2.0	1.91	2.0	6.0	50.0	4.0	2	0.10	30
2X8	2.0	1.91	2.0	8.0	50.0	4.0	2	0.10	30
2X10	2.0	1.91	2.0	10.0	50.0	4.0	2	0.10	30
2X12	2.0	1.91	2.0	12.0	54.0	4.0	2	0.10	30
2X16	2.0	1.91	2.0	16.0	54.0	4.0	2	0.10	30
2X20	2.0	1.91	2.0	20.0	60.0	4.0	2	0.10	30
2X26	2.0	1.91	2.0	26.0	70.0	4.0	2	0.10	30

Cooling	
Tolerance	0-0,01
Coating	TiSiN- α

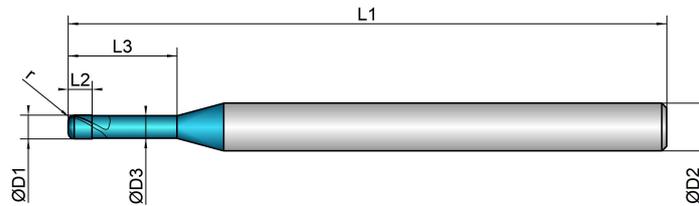
HA

HSC

Expert

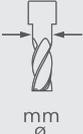


HA K202092



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
225	210	200	125	75	55	40	100		150							

K202092	D1 mm Ø	D3 mm Ø	L2 mm	L3 mm	L1 mm	D2 mm Ø	z #	r mm	 °
0,8X4	0.8	0.78	0.8	4.0	50.0	4.0	2	0.20	30
0,8X6	0.8	0.78	0.8	6.0	50.0	4.0	2	0.20	30
1X2	1.0	0.95	1.0	2.0	50.0	4.0	2	0.20	30
1X4	1.0	0.95	1.0	4.0	50.0	4.0	2	0.20	30
1X6	1.0	0.95	1.0	6.0	50.0	4.0	2	0.20	30
1X8	1.0	0.95	1.0	8.0	50.0	4.0	2	0.20	30
1X10	1.0	0.95	1.0	10.0	50.0	4.0	2	0.20	30
1X12	1.0	0.95	1.0	12.0	54.0	4.0	2	0.20	30
1X16	1.0	0.95	1.0	16.0	60.0	4.0	2	0.20	30
1X20	1.0	0.95	1.0	20.0	60.0	4.0	2	0.20	30
1,2X6	1.2	1.14	1.2	6.0	50.0	4.0	2	0.20	30
1,2X12	1.2	1.14	1.2	12.0	54.0	4.0	2	0.20	30

K202092	 mm ∅	 mm ∅	 mm	 mm	 mm	 mm ∅	 #	 mm	 °
1,2X20	1.2	1.14	1.2	20.0	60.0	4.0	2	0.20	30
1,5X4	1.5	1.44	1.5	4.0	50.0	4.0	2	0.20	30
1,5X6	1.5	1.44	1.5	6.0	50.0	4.0	2	0.20	30
1,5X8	1.5	1.44	1.5	8.0	50.0	4.0	2	0.20	30
1,5X10	1.5	1.44	1.5	10.0	50.0	4.0	2	0.20	30
1,5X12	1.5	1.44	1.5	12.0	54.0	4.0	2	0.20	30
1,5X16	1.5	1.44	1.5	16.0	54.0	4.0	2	0.20	30
1,5X20	1.5	1.44	1.5	20.0	60.0	4.0	2	0.20	30
2X4	2.0	1.91	2.0	4.0	50.0	4.0	2	0.20	30
2X6	2.0	1.91	2.0	6.0	50.0	4.0	2	0.20	30
2X8	2.0	1.91	2.0	8.0	50.0	4.0	2	0.20	30
2X10	2.0	1.91	2.0	10.0	50.0	4.0	2	0.20	30
2X12	2.0	1.91	2.0	12.0	54.0	4.0	2	0.20	30
2X16	2.0	1.91	2.0	16.0	54.0	4.0	2	0.20	30
2X20	2.0	1.91	2.0	20.0	60.0	4.0	2	0.20	30
2X26	2.0	1.91	2.0	26.0	70.0	4.0	2	0.20	30

Cooling 

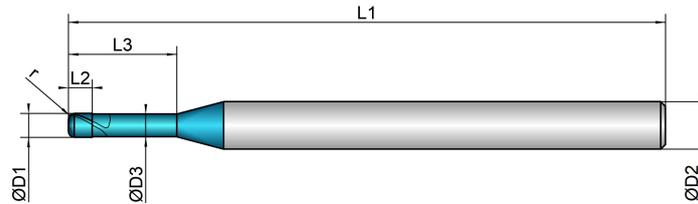
Tolerance 0-0,01

Coating TiSiN- α

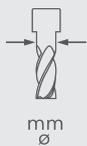
HA HSC 

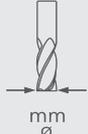
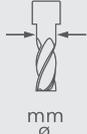



HA K202102



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
225	210	200	125	75	55	40	100		150							

K202102	D1  mm \varnothing	D3  mm \varnothing	L2  mm	L3  mm	L1  mm	D2  mm \varnothing	z  #	r  mm	 °
1X2	1.0	0.95	1.0	2.0	50.0	4.0	2	0.30	30
1X4	1.0	0.95	1.0	4.0	50.0	4.0	2	0.30	30
1X6	1.0	0.95	1.0	6.0	50.0	4.0	2	0.30	30
1X8	1.0	0.95	1.0	8.0	50.0	4.0	2	0.30	30
1X10	1.0	0.95	1.0	10.0	50.0	4.0	2	0.30	30
1X12	1.0	0.95	1.0	12.0	54.0	4.0	2	0.30	30
1X16	1.0	0.95	1.0	16.0	60.0	4.0	2	0.30	30
1X20	1.0	0.95	1.0	20.0	60.0	4.0	2	0.30	30
1,2X6	1.2	1.14	1.2	6.0	50.0	4.0	2	0.30	30
1,2X12	1.2	1.14	1.2	12.0	54.0	4.0	2	0.30	30
1,2X20	1.2	1.14	1.2	20.0	60.0	4.0	2	0.30	30
1,5X4	1.5	1.44	1.5	4.0	50.0	4.0	2	0.30	30
1,5X6	1.5	1.44	1.5	6.0	50.0	4.0	2	0.30	30

K202102	 D1 mm ∅	 D3 mm ∅	 L2 mm	 L3 mm	 L1 mm	 D2 mm ∅	 z #	 r mm	 °
1,5X8	1.5	1.44	1.5	8.0	50.0	4.0	2	0.30	30
1,5X10	1.5	1.44	1.5	10.0	50.0	4.0	2	0.30	30
1,5X12	1.5	1.44	1.5	12.0	54.0	4.0	2	0.30	30
1,5X16	1.5	1.44	1.5	16.0	54.0	4.0	2	0.30	30
1,5X20	1.5	1.44	1.5	20.0	60.0	4.0	2	0.30	30
2X4	2.0	1.91	2.0	4.0	50.0	4.0	2	0.30	30
2X6	2.0	1.91	2.0	6.0	50.0	4.0	2	0.30	30
2X8	2.0	1.91	2.0	8.0	50.0	4.0	2	0.30	30
2X10	2.0	1.91	2.0	10.0	50.0	4.0	2	0.30	30
2X12	2.0	1.91	2.0	12.0	54.0	4.0	2	0.30	30
2X16	2.0	1.91	2.0	16.0	54.0	4.0	2	0.30	30
2X20	2.0	1.91	2.0	20.0	60.0	4.0	2	0.30	30
2X26	2.0	1.91	2.0	26.0	70.0	4.0	2	0.30	30
2,5X10	2.5	2.41	2.5	10.0	50.0	4.0	2	0.30	30
2,5X12	2.5	2.41	2.5	12.0	60.0	4.0	2	0.30	30
2,5X30	2.5	2.41	2.5	30.0	70.0	4.0	2	0.30	30
3X10	3.0	2.92	4.5	10.0	50.0	4.0	2	0.30	30
3X12	3.0	2.92	4.5	12.0	50.0	4.0	2	0.30	30
3X30	3.0	2.92	4.5	30.0	70.0	4.0	2	0.30	30

Cooling	
Tolerance	0-0,01
Coating	TiSiN- α

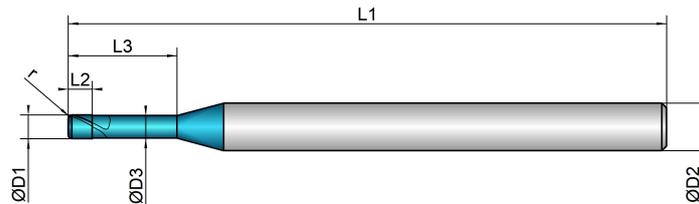
HA

HSC

Expert



HA K202112



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
225	210	200	125	75	55	40	100		150							

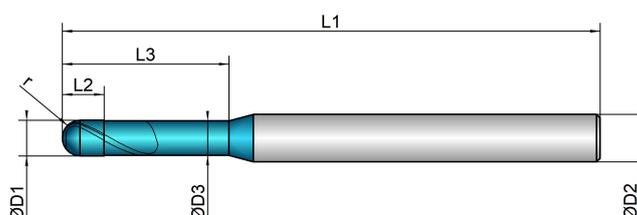
K202112	D1 mm Ø	D3 mm Ø	L2 mm	L3 mm	L1 mm	D2 mm Ø	z #	r mm	 °
1,5X4	1.5	1.44	1.5	4.0	50.0	4.0	2	0.50	30
1,5X6	1.5	1.44	1.5	6.0	50.0	4.0	2	0.50	30
1,5X8	1.5	1.44	1.5	8.0	50.0	4.0	2	0.50	30
1,5X10	1.5	1.44	1.5	10.0	50.0	4.0	2	0.50	30
1,5X12	1.5	1.44	1.5	12.0	54.0	4.0	2	0.50	30
1,5X16	1.5	1.44	1.5	16.0	54.0	4.0	2	0.50	30
1,5X20	1.5	1.44	1.5	20.0	60.0	4.0	2	0.50	30
2X4	2.0	1.91	2.0	4.0	50.0	4.0	2	0.50	30
2X6	2.0	1.91	2.0	6.0	50.0	4.0	2	0.50	30
2X8	2.0	1.91	2.0	8.0	50.0	4.0	2	0.50	30
2X10	2.0	1.91	2.0	10.0	50.0	4.0	2	0.50	30
2X12	2.0	1.91	2.0	12.0	54.0	4.0	2	0.50	30
2X16	2.0	1.91	2.0	16.0	54.0	4.0	2	0.50	30
2X20	2.0	1.91	2.0	20.0	60.0	4.0	2	0.50	30
2X26	2.0	1.91	2.0	26.0	70.0	4.0	2	0.50	30
2,5X10	2.5	2.41	2.5	10.0	50.0	4.0	2	0.50	30
2,5X12	2.5	2.41	2.5	12.0	60.0	4.0	2	0.50	30
2,5X30	2.5	2.41	2.5	30.0	70.0	4.0	2	0.50	30
3X10	3.0	2.92	4.5	10.0	50.0	4.0	2	0.50	30
3X12	3.0	2.92	4.5	12.0	50.0	4.0	2	0.50	30
3X30	3.0	2.92	4.5	30.0	70.0	4.0	2	0.50	30

Cooling	
Tolerance	0-0,01
Coating	TiSiN- α

HA HSC

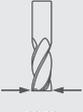
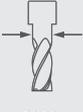
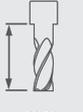
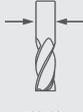


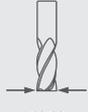
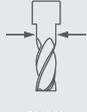
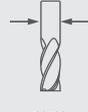
HA K203206



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
220	210	195	125	75	60	45	100		150							

K203206	D1 mm ø	D3 mm ø	L2 mm	L3 mm	L1 mm	D2 mm ø	z #	r mm	 °
0,2X0,3	0.2	0.17	0.16	0.3	45.0	4.0	2	0.10	30
0,2X0,5	0.2	0.17	0.16	0.5	45.0	4.0	2	0.10	30
0,2X0,75	0.2	0.17	0.16	0.75	45.0	4.0	2	0.10	30
0,2X1	0.2	0.17	0.16	1.0	45.0	4.0	2	0.10	30
0,2X1,25	0.2	0.17	0.16	1.25	45.0	4.0	2	0.10	30
0,2X1,5	0.2	0.17	0.16	1.5	45.0	4.0	2	0.10	30
0,2X1,75	0.2	0.17	0.16	1.75	45.0	4.0	2	0.10	30
0,2X2	0.2	0.17	0.16	2.0	45.0	4.0	2	0.10	30
0,2X2,5	0.2	0.17	0.16	2.5	45.0	4.0	2	0.10	30
0,2X3	0.2	0.17	0.16	3.0	45.0	4.0	2	0.10	30
0,3X0,5	0.3	0.27	0.24	0.5	45.0	4.0	2	0.15	30
0,3X0,75	0.3	0.27	0.24	0.75	45.0	4.0	2	0.15	30
0,3X1	0.3	0.27	0.24	1.0	45.0	4.0	2	0.15	30
0,3X1,25	0.3	0.27	0.24	1.25	45.0	4.0	2	0.15	30
0,3X1,5	0.3	0.27	0.24	1.5	45.0	4.0	2	0.15	30
0,4X0,5	0.4	0.34	0.32	0.5	45.0	4.0	2	0.20	30
0,4X0,75	0.4	0.34	0.32	0.75	45.0	4.0	2	0.20	30
0,4X1	0.4	0.34	0.32	1.0	45.0	4.0	2	0.20	30
0,4X1,5	0.4	0.34	0.32	1.5	45.0	4.0	2	0.20	30

	 D1 mm ∅	 D3 mm ∅	 L2 mm	 L3 mm	 L1 mm	 D2 mm ∅	 z #	 r mm	 °
K203206									
0,4X2	0.4	0.34	0.32	2.0	45.0	4.0	2	0.20	30
0,4X2,5	0.4	0.34	0.32	2.5	45.0	4.0	2	0.20	30
0,4X3	0.4	0.34	0.32	3.0	45.0	4.0	2	0.20	30
0,4X3,5	0.4	0.34	0.32	3.5	45.0	4.0	2	0.20	30
0,4X4	0.4	0.34	0.32	4.0	45.0	4.0	2	0.20	30
0,4X4,5	0.4	0.34	0.32	4.5	45.0	4.0	2	0.20	30
0,4X5	0.4	0.34	0.32	5.0	45.0	4.0	2	0.20	30
0,4X5,5	0.4	0.34	0.32	5.5	45.0	4.0	2	0.20	30
0,4X6	0.4	0.34	0.32	6.0	45.0	4.0	2	0.20	30
0,5X1	0.5	0.47	0.4	1.0	45.0	4.0	2	0.25	30
0,5X1,5	0.5	0.47	0.4	1.5	45.0	4.0	2	0.25	30
0,5X2	0.5	0.47	0.4	2.0	45.0	4.0	2	0.25	30
0,5X2,5	0.5	0.47	0.4	2.5	45.0	4.0	2	0.25	30
0,5X3	0.5	0.47	0.4	3.0	45.0	4.0	2	0.25	30
0,5X3,5	0.5	0.47	0.4	3.5	45.0	4.0	2	0.25	30
0,5X4	0.5	0.47	0.4	4.0	45.0	4.0	2	0.25	30
0,5X4,5	0.5	0.47	0.4	4.5	45.0	4.0	2	0.25	30
0,5X5	0.5	0.47	0.4	5.0	45.0	4.0	2	0.25	30
0,5X5,5	0.5	0.47	0.4	5.5	45.0	4.0	2	0.25	30
0,5X6	0.5	0.47	0.4	6.0	45.0	4.0	2	0.25	30
0,5X7	0.5	0.47	0.4	7.0	45.0	4.0	2	0.25	30
0,5X8	0.5	0.47	0.4	8.0	45.0	4.0	2	0.25	30
0,5X9	0.5	0.47	0.4	9.0	45.0	4.0	2	0.25	30
0,6X1	0.6	0.57	0.48	1.0	45.0	4.0	2	0.30	30
0,6X2	0.6	0.57	0.48	2.0	45.0	4.0	2	0.30	30
0,6X3	0.6	0.57	0.48	3.0	45.0	4.0	2	0.30	30
0,6X4	0.6	0.57	0.48	4.0	45.0	4.0	2	0.30	30
0,6X5	0.6	0.57	0.48	5.0	45.0	4.0	2	0.30	30
0,6X6	0.6	0.57	0.48	6.0	45.0	4.0	2	0.30	30
0,6X8	0.6	0.57	0.48	8.0	45.0	4.0	2	0.30	30
0,8X2	0.8	0.77	0.64	2.0	45.0	4.0	2	0.40	30
0,8X3	0.8	0.77	0.64	3.0	45.0	4.0	2	0.40	30
0,8X4	0.8	0.77	0.64	4.0	45.0	4.0	2	0.40	30
0,8X5	0.8	0.77	0.64	5.0	45.0	4.0	2	0.40	30
0,8X6	0.8	0.77	0.64	6.0	45.0	4.0	2	0.40	30
0,8X7	0.8	0.77	0.64	7.0	45.0	4.0	2	0.40	30
0,8X8	0.8	0.77	0.64	8.0	45.0	4.0	2	0.40	30
0,8X9	0.8	0.77	0.64	9.0	45.0	4.0	2	0.40	30
1X2,5	1.0	0.96	0.8	2.5	45.0	4.0	2	0.50	30
1X3	1.0	0.96	0.8	3.0	45.0	4.0	2	0.50	30

	 D1 mm ∅	 D3 mm ∅	 L2 mm	 L3 mm	 L1 mm	 D2 mm ∅	 z #	 r mm	 °
K203206									
1X4	1.0	0.96	0.8	4.0	45.0	4.0	2	0.50	30
1X5	1.0	0.96	0.8	5.0	45.0	4.0	2	0.50	30
1X6	1.0	0.96	0.8	6.0	45.0	4.0	2	0.50	30
1X7	1.0	0.96	0.8	7.0	45.0	4.0	2	0.50	30
1X8	1.0	0.96	0.8	8.0	45.0	4.0	2	0.50	30
1X9	1.0	0.96	0.8	9.0	45.0	4.0	2	0.50	30
1X10	1.0	0.96	0.8	10.0	45.0	4.0	2	0.50	30
1X12	1.0	0.96	0.8	12.0	45.0	4.0	2	0.50	30
1,2X6	1.2	1.16	0.96	6.0	45.0	4.0	2	0.60	30
1,2X8	1.2	1.16	0.96	8.0	45.0	4.0	2	0.60	30
1,2X10	1.2	1.16	0.96	10.0	45.0	4.0	2	0.60	30
1,2X12	1.2	1.16	0.96	12.0	45.0	4.0	2	0.60	30
1,4X8	1.4	1.34	1.12	8.0	45.0	4.0	2	0.70	30
1,4X12	1.4	1.34	1.12	12.0	45.0	4.0	2	0.70	30
1,5X3	1.5	1.44	1.2	3.0	45.0	4.0	2	0.75	30
1,5X4	1.5	1.44	1.2	4.0	45.0	4.0	2	0.75	30
1,5X6	1.5	1.44	1.2	6.0	45.0	4.0	2	0.75	30
1,5X8	1.5	1.44	1.2	8.0	45.0	4.0	2	0.75	30
1,5X10	1.5	1.44	1.2	10.0	45.0	4.0	2	0.75	30
1,5X12	1.5	1.44	1.2	12.0	45.0	4.0	2	0.75	30
1,6X8	1.6	1.54	1.28	8.0	45.0	4.0	2	0.80	30
1,6X12	1.6	1.54	1.28	12.0	45.0	4.0	2	0.80	30
1,8X8	1.8	1.74	1.44	8.0	45.0	4.0	2	0.90	30
1,8X12	1.8	1.74	1.44	12.0	45.0	4.0	2	0.90	30
2X3	2.0	1.94	1.6	3.0	45.0	4.0	2	1.00	30
2X4	2.0	1.94	1.6	4.0	45.0	4.0	2	1.00	30
2X6	2.0	1.94	1.6	6.0	45.0	4.0	2	1.00	30
2X8	2.0	1.94	1.6	8.0	45.0	4.0	2	1.00	30
2X10	2.0	1.94	1.6	10.0	45.0	4.0	2	1.00	30
2X12	2.0	1.94	1.6	12.0	45.0	4.0	2	1.00	30
2,5X10	2.5	2.41	2.0	10.0	45.0	4.0	2	1.25	30
3X8	3.0	2.92	3.5	8.0	45.0	4.0	2	1.50	30
3X10	3.0	2.92	3.5	10.0	45.0	4.0	2	1.50	30
3X12	3.0	2.92	3.5	12.0	45.0	4.0	2	1.50	30
3X16	3.0	2.92	3.5	16.0	45.0	4.0	2	1.50	30

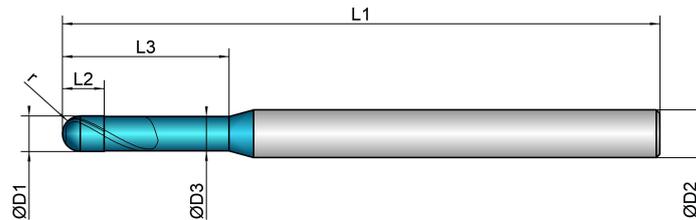
Cooling	
Tolerance	0-0,01
Coating	TiSiN- α

HA

HSC

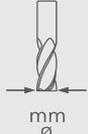
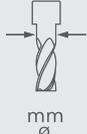


HA K203212



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
220	210	195	125	75	60	45	100		150							

	D1	D3	L2	L3	L1	D2	z	r	
K203212									
	mm ∅	mm ∅	mm	mm	mm	mm ∅	#	mm	°
0,3X1,75	0.3	0.27	0.24	1.75	50.0	4.0	2	0.15	30
0,3X2	0.3	0.27	0.24	2.0	50.0	4.0	2	0.15	30
0,3X2,25	0.3	0.27	0.24	2.25	50.0	4.0	2	0.15	30
0,3X2,5	0.3	0.27	0.24	2.5	50.0	4.0	2	0.15	30
0,3X2,75	0.3	0.27	0.24	2.75	50.0	4.0	2	0.15	30
0,3X3	0.3	0.27	0.24	3.0	50.0	4.0	2	0.15	30
0,3X3,5	0.3	0.27	0.24	3.5	50.0	4.0	2	0.15	30
0,3X4	0.3	0.27	0.24	4.0	50.0	4.0	2	0.15	30
0,3X4,5	0.3	0.27	0.24	4.5	50.0	4.0	2	0.15	30
0,5X10	0.5	0.47	0.4	10.0	50.0	4.0	2	0.25	30
0,6X10	0.6	0.57	0.48	10.0	50.0	4.0	2	0.30	30
0,6X12	0.6	0.57	0.48	12.0	50.0	4.0	2	0.30	30

K203212	 mm ∅	 mm ∅	 mm	 mm	 mm	 mm ∅	 #	 mm	 °
0,8X10	0.8	0.77	0.64	10.0	50.0	4.0	2	0.40	30
1X14	1.0	0.96	0.8	14.0	50.0	4.0	2	0.50	30
1X16	1.0	0.96	0.8	16.0	50.0	4.0	2	0.50	30
1,2X14	1.2	1.16	0.96	14.0	50.0	4.0	2	0.60	30
1,2X16	1.2	1.16	0.96	16.0	50.0	4.0	2	0.60	30
1,4X16	1.4	1.34	1.12	16.0	50.0	4.0	2	0.70	30
1,5X14	1.5	1.44	1.2	14.0	50.0	4.0	2	0.75	30
1,5X16	1.5	1.44	1.2	16.0	50.0	4.0	2	0.75	30
1,6X16	1.6	1.54	1.28	16.0	50.0	4.0	2	0.80	30
1,8X16	1.8	1.74	1.44	16.0	50.0	4.0	2	0.90	30
2X14	2.0	1.94	1.6	14.0	50.0	4.0	2	1.00	30
2X16	2.0	1.94	1.6	16.0	50.0	4.0	2	1.00	30
2,5X15	2.5	2.41	2.0	15.0	50.0	4.0	2	1.25	30
3X16	3.0	2.92	3.5	16.0	50.0	4.0	2	1.50	30

Cooling

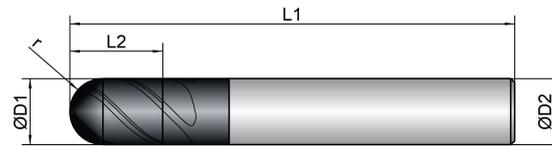
Tolerance f8

Coating TiAlN- α

HA HSC HPC MTC UNI



HA K203253



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
210	150	140					90	360	400						50	

K203253	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	r mm	 °
3	3.0	5.0	50.0	3.0	4	1.50	45
4	4.0	8.0	54.0	4.0	4	2.00	45
5	5.0	9.0	54.0	5.0	4	2.50	45
6	6.0	10.0	54.0	6.0	4	3.00	45
8	8.0	12.0	59.0	8.0	4	4.00	45
10	10.0	14.0	67.0	10.0	4	5.00	45
12	12.0	16.0	74.0	12.0	4	6.00	45
14	14.0	18.0	75.0	14.0	4	7.00	45
16	16.0	22.0	83.0	16.0	4	8.00	45
20	20.0	26.0	93.0	20.0	4	10.00	45

Cooling

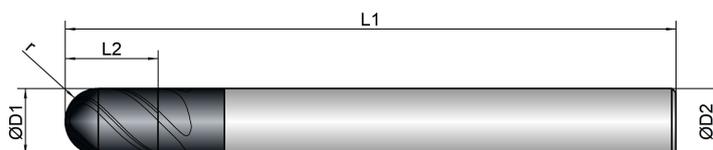
Tolerance f8

Coating TiAlN- α

HA HSC HPC MTC UNI



HA K203263



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
190	130	120					80	340	380							40

K203263	D1 mm Ø	L2 mm	L1 mm	D2 mm Ø	z #	r mm	 °
3	3.0	5.0	75.0	3.0	4	1.50	45
4	4.0	8.0	75.0	4.0	4	2.00	45
5	5.0	9.0	75.0	5.0	4	2.50	45
6	6.0	10.0	100.0	6.0	4	3.00	45
8	8.0	12.0	100.0	8.0	4	4.00	45
10	10.0	14.0	100.0	10.0	4	5.00	45
12	12.0	16.0	100.0	12.0	4	6.00	45
14	14.0	18.0	100.0	14.0	4	7.00	45
16	16.0	22.0	150.0	16.0	4	8.00	45
20	20.0	26.0	150.0	20.0	4	10.00	45

Cooling

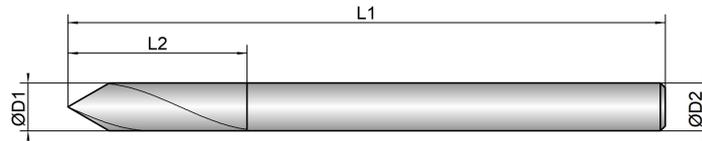
Tolerance -

Coating -

HA UNI



HA K204001



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
60	35						40	55	200	●						

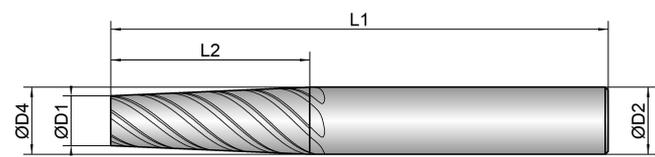
K204001	D1 mm ∅	L2 mm	L1 mm	D2 mm ∅	z #	 °
3	3.0	15.0	50.0	3.0	1	30
4	4.0	18.0	50.0	4.0	1	30
6	6.0	20.0	54.0	6.0	1	30

Cooling 

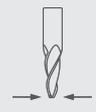
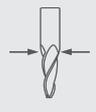
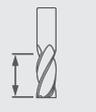
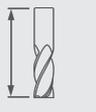
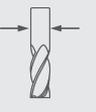
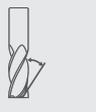
Tolerance -

Coating -

HA UNI 



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC		Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite		
●	●						●	●	●							

K204011	D1  mm ø	D4  mm ø	L2  mm	L1  mm	D2  mm ø	z  #	 °
2X10	2	3	10.0	50.0	3.0	4	30
2,5X10	2.5	3	10.0	50.0	3.0	4	30
2,5X20	2.5	4	20.0	60.0	4.0	4	30
3X20	3	4	20.0	60.0	4.0	4	30
4X20	4	5	20.0	60.0	5.0	4	30
5X30	5	6	30.0	75.0	6.0	6	45
6X30	6	8	30.0	75.0	8.0	6	45
8X30	8	10	30.0	80.0	10.0	6	45
10X30	10	12	30.0	85.0	12.0	6	45
12X30	12	14	30.0	85.0	14.0	6	45
12X50	12	14	50.0	110.0	14.0	6	45
16X60	16	18	60.0	120.0	18.0	6	45

Cooling 

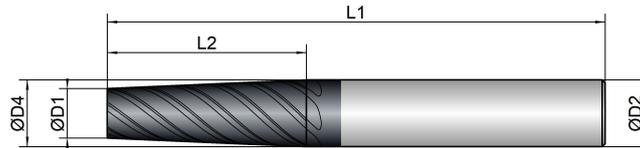
Tolerance -

Coating TiAlN- α

HA UNI 



HA K204013



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
●	●	●					●	●	●							

K204013	D1  mm ø	D4  mm ø	L2  mm	L1  mm	D2  mm ø	z  #	 °
2X10	2	3	10.0	50.0	3.0	4	30
2,5X10	2.5	3	10.0	50.0	3.0	4	30
2,5X20	2.5	4	20.0	60.0	4.0	4	30
3X20	3	4	20.0	60.0	4.0	4	30
4X20	4	5	20.0	60.0	5.0	4	30
5X30	5	6	30.0	75.0	6.0	6	45
6X30	6	8	30.0	75.0	8.0	6	45
8X30	8	10	30.0	80.0	10.0	6	45
10X30	10	12	30.0	85.0	12.0	6	45
12X30	12	14	30.0	85.0	14.0	6	45
12X50	12	14	50.0	110.0	14.0	6	45
16X60	16	18	60.0	120.0	18.0	6	45

Cooling

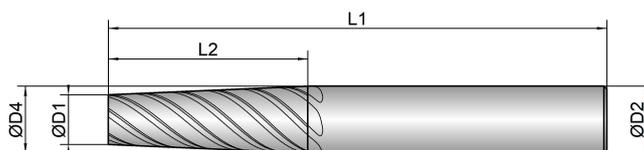
Tolerance -

Coating -

HA UNI



HA K204021



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
●	●						●	●	●							

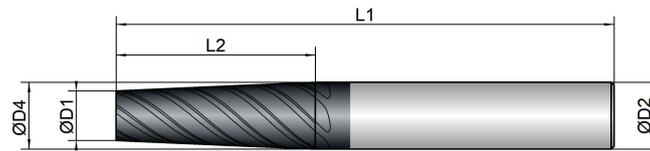
K204021	D1 mm ø	D4 mm ø	L2 mm	L1 mm	D2 mm ø	z #	 °
2X10	2	3	10.0	50.0	3.0	4	30
2,5X10	2.5	3	10.0	50.0	3.0	4	45
2,5X20	2.5	4	20.0	60.0	4.0	4	30
3X20	3	4	20.0	60.0	4.0	4	30
3,5X20	3.5	5	20.0	60.0	5.0	4	30
4X20	4	5	20.0	60.0	5.0	4	30
4,5X20	4.5	6	20.0	65.0	6.0	6	45
5X25	5	6	25.0	70.0	6.0	6	45
6X30	6	8	30.0	75.0	8.0	6	45
8X30	8	10	30.0	80.0	10.0	6	45
10X30	10	12	30.0	85.0	12.0	6	45
12X30	12	14	30.0	85.0	14.0	6	45
12X50	12	14	50.0	110.0	14.0	6	45
16X55	16	18	55.0	115.0	18.0	6	45

Cooling 

Tolerance -

Coating TiAlN- α

HA UNI 



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
●	●	●					●	●	●							

K204023	D1  mm ∅	D4  mm ∅	L2  mm	L1  mm	D2  mm ∅	z  #	 °
2X10	2	3	10.0	50.0	3.0	4	30
2,5X10	2.5	3	10.0	50.0	3.0	4	45
2,5X20	2.5	4	20.0	60.0	4.0	4	30
3X20	3	4	20.0	60.0	4.0	4	30
3,5X20	3.5	5	20.0	60.0	5.0	4	30
4X20	4	5	20.0	60.0	5.0	4	30
4,5X20	4.5	6	20.0	65.0	6.0	6	45
5X25	5	6	25.0	70.0	6.0	6	45
6X30	6	8	30.0	75.0	8.0	6	45
8X30	8	10	30.0	80.0	10.0	6	45
10X30	10	12	30.0	85.0	12.0	6	45
12X30	12	14	30.0	85.0	14.0	6	45
12X50	12	14	50.0	110.0	14.0	6	45
16X55	16	18	55.0	115.0	18.0	6	45

Cooling

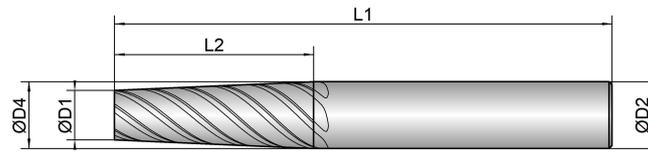
Tolerance -

Coating -

HA UNI



HA K204031



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
●	●						●	●	●							

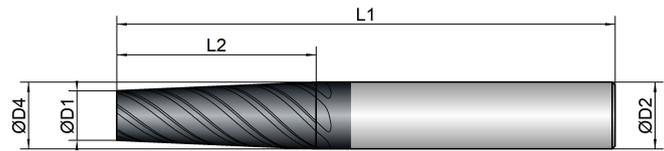
K204031	D1 mm ø	D4 mm ø	L2 mm	L1 mm	D2 mm ø	z #	 °
2X10	2	3	10.0	50.0	3.0	4	30
2,5X10	2.5	4	10.0	50.0	4.0	4	30
2,5X20	2.5	4	20.0	60.0	4.0	4	30
3X20	3	4	20.0	60.0	4.0	4	30
3,5X20	3.5	5	20.0	60.0	5.0	4	30
4X20	4	5	20.0	60.0	5.0	4	30
4,5X20	4.5	6	20.0	65.0	6.0	4	30
5X30	5	8	30.0	75.0	8.0	6	45
6X30	6	8	30.0	75.0	8.0	6	45
8X30	8	10	30.0	80.0	10.0	6	45
10X30	10	12	30.0	85.0	12.0	6	45
12X30	12	14	30.0	85.0	14.0	6	45
12X50	12	16	50.0	110.0	16.0	6	45
16X60	16	20	60.0	126.0	20.0	6	45

Cooling 

Tolerance -

Coating TiAlN- α

HA UNI 



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
●	●	●					●	●	●							

K204033	D1  mm ∅	D4  mm ∅	L2  mm	L1  mm	D2  mm ∅	z  #	 °
2X10	2	3	10.0	50.0	3.0	4	30
2,5X10	2.5	4	10.0	50.0	4.0	4	30
2,5X20	2.5	4	20.0	60.0	4.0	4	30
3X20	3	4	20.0	60.0	4.0	4	30
3,5X20	3.5	5	20.0	60.0	5.0	4	30
4X20	4	5	20.0	60.0	5.0	4	30
4,5X20	4.5	6	20.0	65.0	6.0	4	30
5X30	5	8	30.0	75.0	8.0	6	45
6X30	6	8	30.0	75.0	8.0	6	45
8X30	8	10	30.0	80.0	10.0	6	45
10X30	10	12	30.0	85.0	12.0	6	45
12X30	12	14	30.0	85.0	14.0	6	45
12X50	12	16	50.0	110.0	16.0	6	45
16X60	16	20	60.0	126.0	20.0	6	45

Cooling

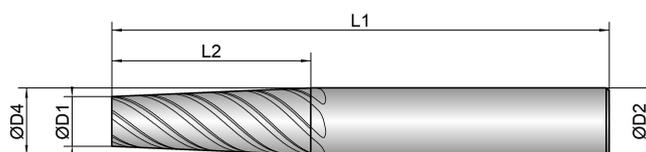
Tolerance -

Coating -

HA UNI



HA K204041



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
●	●						●	●	●							

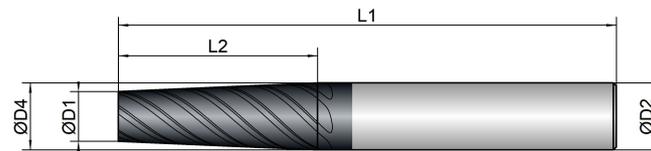
K204041	D1 mm ∅	D4 mm ∅	L2 mm	L1 mm	D2 mm ∅	z #	 °
2X10	2	3	10.0	50.0	3.0	4	30
2,5X10	2.5	4	10.0	50.0	4.0	4	30
2,5X20	2.5	4	20.0	60.0	4.0	4	30
3X20	3	5	20.0	60.0	5.0	4	30
3,5X20	3.5	5	20.0	60.0	5.0	4	30
4X20	4	6	20.0	65.0	6.0	4	30
4,5X30	4.5	8	30.0	75.0	8.0	4	30
5X30	5	8	30.0	75.0	8.0	6	45
6X28	6	8	28.0	75.0	8.0	6	45
8X28	8	10	28.0	75.0	10.0	6	45
10X28	10	12	28.0	85.0	12.0	6	45
12X28	12	14	28.0	85.0	14.0	6	45
12X50	12	16	50.0	110.0	16.0	6	45
16X55	16	20	55.0	115.0	20.0	6	45

Cooling

Tolerance -

Coating TiAlN- α

HA UNI



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
●	●	●					●	●	●							

K204043	D1 mm ∅	D4 mm ∅	L2 mm	L1 mm	D2 mm ∅	z #	 °
2X10	2	3	10.0	50.0	3.0	4	30
2,5X10	2.5	4	10.0	50.0	4.0	4	30
2,5X20	2.5	4	20.0	60.0	4.0	4	30
3X20	3	5	20.0	60.0	5.0	4	30
3,5X20	3.5	5	20.0	60.0	5.0	4	30
4X20	4	6	20.0	65.0	6.0	4	30
4,5X30	4.5	8	30.0	75.0	8.0	4	30
5X30	5	8	30.0	75.0	8.0	6	45
6X28	6	8	28.0	75.0	8.0	6	45
8X28	8	10	28.0	75.0	10.0	6	45
10X28	10	12	28.0	85.0	12.0	6	45
12X28	12	14	28.0	85.0	14.0	6	45
12X50	12	16	50.0	110.0	16.0	6	45
16X55	16	20	55.0	115.0	20.0	6	45

SC conical finishing cutter 2.5° | K204051

Cooling 

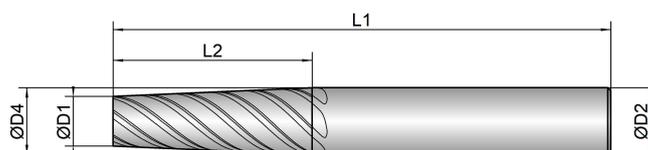
Tolerance -

Coating -

HA UNI



HA K204051



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
●	●						●	●	●							

	D1  mm ∅	D4  mm ∅	L2  mm	L1  mm	D2  mm ∅	z  #	 °
K204051							
2X15	2	4	15.0	50.0	4.0	4	30
2,5X20	2.5	5	20.0	60.0	5.0	4	30
3X20	3	5	20.0	60.0	5.0	4	30
4X20	4	6	20.0	65.0	6.0	4	30
5X30	5	8	30.0	75.0	8.0	6	45
6X30	6	10	30.0	80.0	10.0	6	45
8X30	8	12	30.0	85.0	12.0	6	45
10X40	10	14	40.0	100.0	14.0	6	45

Cooling 

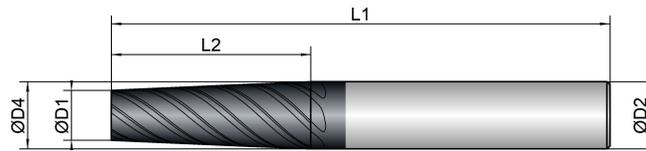
Tolerance -

Coating TiAlN- α

HA UNI 



HA K204053



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
●	●	●					●	●	●							

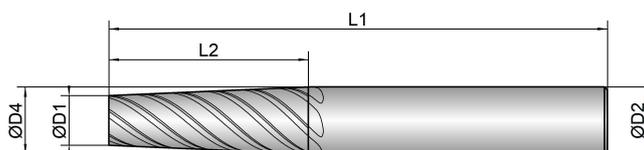
K204053	D1  mm ø	D4  mm ø	L2  mm	L1  mm	D2  mm ø	z  #	 °
2X15	2	4	15.0	50.0	4.0	4	30
2,5X20	2.5	5	20.0	60.0	5.0	4	30
3X20	3	5	20.0	60.0	5.0	4	30
4X20	4	6	20.0	65.0	6.0	4	30
5X30	5	8	30.0	75.0	8.0	6	45
6X30	6	10	30.0	80.0	10.0	6	45
8X30	8	12	30.0	85.0	12.0	6	45
10X40	10	14	40.0	100.0	14.0	6	45

Cooling 

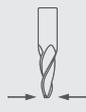
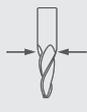
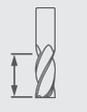
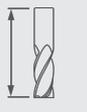
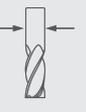
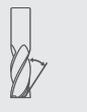
Tolerance -

Coating -

HA UNI



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
●	●						●	●	●							

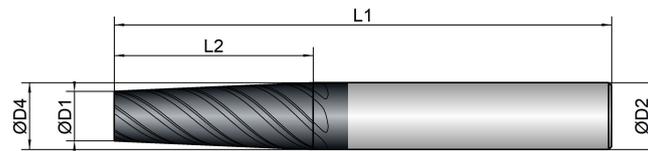
K204061	D1  mm ø	D4  mm ø	L2  mm	L1  mm	D2  mm ø	z  #	 °
2X10	2	4	10.0	50.0	4.0	4	30
2,5X10	2.5	4	10.0	50.0	4.0	4	30
2,5X20	2.5	6	20.0	65.0	6.0	4	30
3X25	3	6	25.0	70.0	6.0	4	30
3X30	3	8	30.0	75.0	8.0	4	30
3X40	3	8	40.0	85.0	8.0	4	30
4X25	4	8	25.0	70.0	8.0	6	45
4X30	4	8	30.0	75.0	8.0	6	45
5X40	5	10	40.0	90.0	10.0	6	45
6X30	6	10	30.0	80.0	10.0	6	45
8X30	8	12	30.0	84.0	12.0	6	45
8X50	8	14	50.0	110.0	14.0	6	45
10X30	10	14	30.0	84.0	14.0	6	45
10X50	10	16	50.0	110.0	16.0	6	45
12X30	12	16	30.0	90.0	16.0	6	45
12X50	12	18	50.0	110.0	18.0	6	45

Cooling 

Tolerance -

Coating TiAlN- α

HA UNI 



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
●	●	●					●	●	●							

K204063	D1  mm ∅	D4  mm ∅	L2  mm	L1  mm	D2  mm ∅	z  #	 °
2X10	2	4	10.0	50.0	4.0	4	30
2,5X10	2.5	4	10.0	50.0	4.0	4	30
2,5X20	2.5	6	20.0	65.0	6.0	4	30
3X25	3	6	25.0	70.0	6.0	4	30
3X30	3	8	30.0	75.0	8.0	4	30
3X40	3	8	40.0	85.0	8.0	4	30
4X25	4	8	25.0	70.0	8.0	6	45
4X30	4	8	30.0	75.0	8.0	6	45
5X40	5	10	40.0	90.0	10.0	6	45
6X30	6	10	30.0	80.0	10.0	6	45
8X30	8	12	30.0	84.0	12.0	6	45
8X50	8	14	50.0	110.0	14.0	6	45
10X30	10	14	30.0	84.0	14.0	6	45
10X50	10	16	50.0	110.0	16.0	6	45
12X30	12	16	30.0	90.0	16.0	6	45
12X50	12	18	50.0	110.0	18.0	6	45

Cooling 

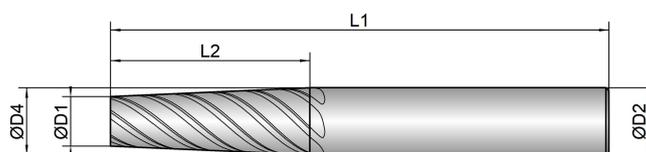
Tolerance -

Coating -

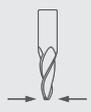
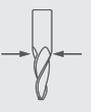
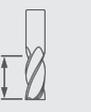
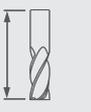
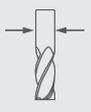
HA UNI



HA K204071



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
●	●						●	●	●							

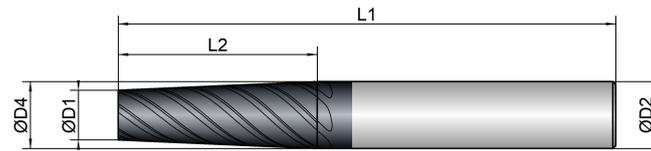
K204071	D1  mm ∅	D4  mm ∅	L2  mm	L1  mm	D2  mm ∅	z  #	 °
2,5X25	2.5	6	25.0	65.0	6.0	4	30
3X20	3	6	20.0	65.0	6.0	4	30
3,5X25	3.5	8	25.0	70.0	8.0	4	30
4X28	4	8	28.0	70.0	8.0	6	37
5X30	5	10	30.0	85.0	10.0	6	37
5X45	5	12	45.0	100.0	12.0	6	37
6X30	6	12	30.0	84.0	12.0	6	45
6X50	6	14	50.0	110.0	14.0	6	45
8X30	8	14	30.0	84.0	14.0	6	45
8X50	8	16	50.0	110.0	16.0	6	45
10X30	10	16	30.0	93.0	16.0	6	45
10X50	10	18	50.0	114.0	18.0	6	45

Cooling 

Tolerance -

Coating TiAlN- α

HA UNI 



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
●	●	●					●	●	●							

K204073	D1  mm ∅	D4  mm ∅	L2  mm	L1  mm	D2  mm ∅	z  #	 °
2,5X25	2.5	6	25.0	65.0	6.0	4	30
3X20	3	6	20.0	65.0	6.0	4	30
3,5X25	3.5	8	25.0	70.0	8.0	4	30
4X28	4	8	28.0	70.0	8.0	6	45
5X30	5	10	30.0	85.0	10.0	6	45
5X45	5	12	45.0	100.0	12.0	6	45
6X30	6	12	30.0	84.0	12.0	6	45
6X50	6	14	50.0	110.0	14.0	6	45
8X30	8	14	30.0	84.0	14.0	6	45
8X50	8	16	50.0	110.0	16.0	6	45
10X30	10	16	30.0	93.0	16.0	6	45
10X50	10	18	50.0	114.0	18.0	6	45

Cooling 

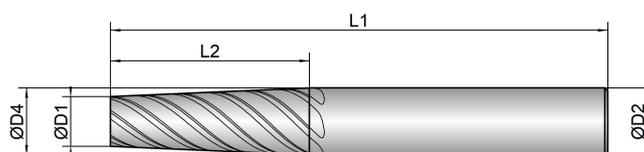
Tolerance -

Coating -

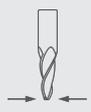
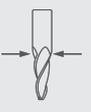
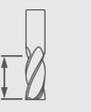
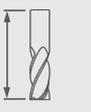
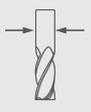
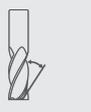
HA UNI



HA K204081



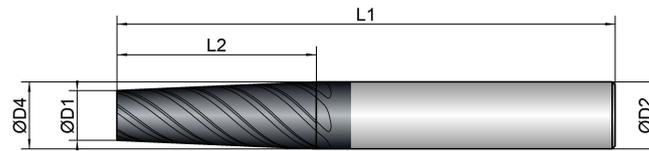
Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
●	●	●					●	●	●							

	D1  mm ∅	D4  mm ∅	L2  mm	L1  mm	D2  mm ∅	z  #	 °
K204081							
2,5X20	2.5	6	20.0	65.0	6.0	4	30
3X28	3	8	28.0	70.0	8.0	4	30
3,5X30	3.5	10	30.0	80.0	10.0	4	30
4X30	4	10	30.0	80.0	10.0	6	45
4,5X30	4.5	10	30.0	80.0	10.0	6	45
5X30	5	12	30.0	84.0	12.0	6	45
5X40	5	12	40.0	100.0	12.0	6	45
6X30	6	12	30.0	93.0	12.0	6	45
6X55	6	16	55.0	110.0	16.0	6	45
8X30	8	14	30.0	90.0	14.0	6	45
8X50	8	18	50.0	114.0	18.0	6	45
10X30	10	16	30.0	93.0	16.0	6	45
10X55	10	20	55.0	115.0	20.0	6	45
12X30	12	18	30.0	93.0	18.0	6	45
12X45	12	20	45.0	100.0	20.0	6	45

Cooling	
Tolerance	-
Coating	TiAlN- α



HA K204083



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
●	●	●					●	●	●							

	D1 mm ∅	D4 mm ∅	L2 mm	L1 mm	D2 mm ∅	z #	 °
K204083							
2,5X20	2.5	6	20.0	65.0	6.0	4	30
3X28	3	8	28.0	70.0	8.0	4	30
3,5X30	3.5	10	30.0	80.0	10.0	4	30
4X30	4	10	30.0	80.0	10.0	6	45
4,5X30	4.5	10	30.0	80.0	10.0	6	45
5X30	5	12	30.0	84.0	12.0	6	45
5X40	5	12	40.0	100.0	12.0	6	45
6X30	6	12	30.0	93.0	12.0	6	45
6X55	6	16	55.0	110.0	16.0	6	45
8X30	8	14	30.0	90.0	14.0	6	45
8X50	8	18	50.0	114.0	18.0	6	45
10X30	10	16	30.0	93.0	16.0	6	45
10X55	10	20	55.0	115.0	20.0	6	45
12X30	12	18	30.0	93.0	18.0	6	45
12X45	12	20	45.0	100.0	20.0	6	45

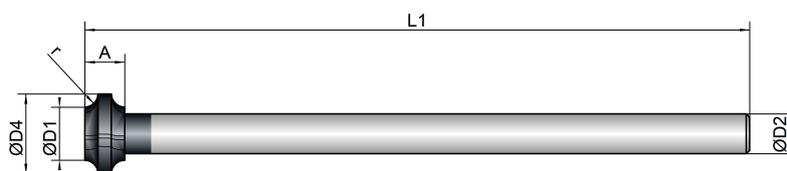
Cooling	
Tolerance	0-0,01
Coating	TiAlN- α

HA

UNI



HA K204092



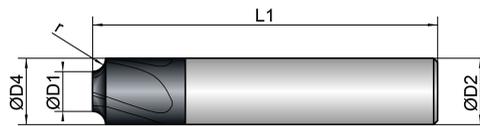
Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
60	40						35	40	120							

	r	D1	D4	A	L1	D2	z
K204092	R mm	 mm Ø	 mm Ø	 mm	 mm	 mm Ø	 #
5,6/0,2	0.20	5.6	6	2.0	75.0	4.0	4
7,6/0,2	0.20	7.6	8	2.0	100.0	6.0	4
5,4/0,3	0.30	5.4	6	2.0	75.0	4.0	4
7,4/0,3	0.30	7.4	8	2.0	100.0	6.0	4
5,2/0,4	0.40	5.2	6	2.0	75.0	4.0	4
7,2/0,4	0.40	7.2	8	2.0	100.0	6.0	4
5/0,5	0.50	5	6	2.0	75.0	4.0	4
7/0,5	0.50	7	8	2.0	100.0	6.0	4
8,4/0,8	0.80	8.4	10	4.0	100.0	6.0	4
8/1	1.00	8	10	4.0	100.0	6.0	4
7,6/1,2	1.20	7.6	10	5.0	100.0	6.0	4
7/1,5	1.50	7	10	5.0	100.0	6.0	4
8,4/1,8	1.80	8.4	12	6.0	100.0	6.0	4
8/2	2.00	8	12	7.0	100.0	6.0	4
7/2,5	2.50	7	12	8.0	100.0	6.0	4

Cooling	
Tolerance	0-0,01
Coating	TiAlN- α



HA K204106



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
170	100						85	125	400				25			45

K204106	r	D1	D4	L1	D2	z
	mm	mm Ø	mm Ø	mm	mm Ø	#
3,6/0,2	0.20	3.6	4	50.0	4.0	4
3,4/0,3	0.30	3.4	4	50.0	4.0	4
3,2/0,4	0.40	3.2	4	50.0	4.0	4
3/0,5	0.50	3	4	50.0	4.0	4
4,8/0,6	0.60	4.8	6	50.0	6.0	4
4,4/0,8	0.80	4.4	6	50.0	6.0	4
4/1	1.00	4	6	50.0	6.0	4
5/1,5	1.50	5	8	55.0	10.0	4
6/2	2.00	6	10	66.0	10.0	4
7/2,5	2.50	7	12	75.0	12.0	4
6/3	3.00	6	12	75.0	12.0	4
9/3,5	3.50	9	16	80.0	16.0	4
8/4	4.00	8	16	80.0	16.0	4
7/4,5	4.50	7	16	80.0	16.0	4
10/5	5.00	10	20	80.0	20.0	4
8/6	6.00	8	20	80.0	20.0	4
9/8	8.00	9	25	100.0	25.0	4
5/10	10.00	5	25	100.0	25.0	4

Cooling 

Tolerance -

Coating TiAlN- α

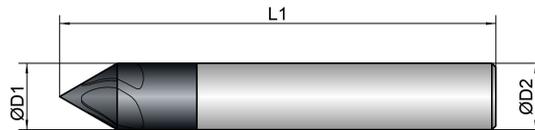
HA HB UNI 



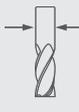
HA K205173



HB K205174



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
110	85	65					80	90	280	250	●		30			40

K205173	K205174	D1	L1	D2	z
		 mm ø	 mm	 mm ø	 #
3	-	3.0	50.0	3.0	3
4	-	4.0	50.0	4.0	4
6	6	6.0	50.0	6.0	4
8	8	8.0	59.0	8.0	4
10	10	10.0	66.0	10.0	4
12	12	12.0	73.0	12.0	4

Cooling 

Tolerance -

Coating TiAlN- α

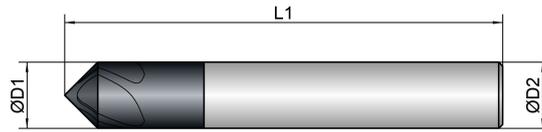
HA HB UNI 



HA K205183



HB K205184



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
110	85	65					80	90	280	250	●		30			40

K205183	K205184	D1	L1	D2	z
		 mm ø	 mm	 mm ø	 #
3	-	3.0	50.0	3.0	3
4	-	4.0	50.0	4.0	4
6	6	6.0	50.0	6.0	4
8	8	8.0	59.0	8.0	4
10	10	10.0	66.0	10.0	4
12	12	12.0	73.0	12.0	4

Cooling	
Tolerance	-
Coating	TiAlN- α

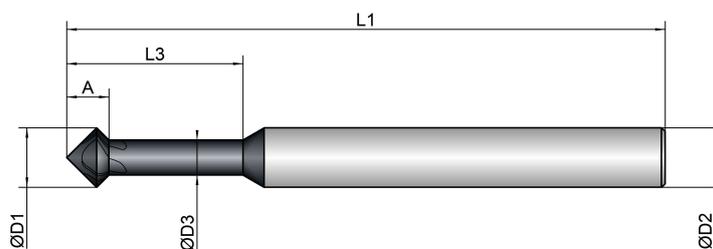
HA

UNI

Basic



HA K205193

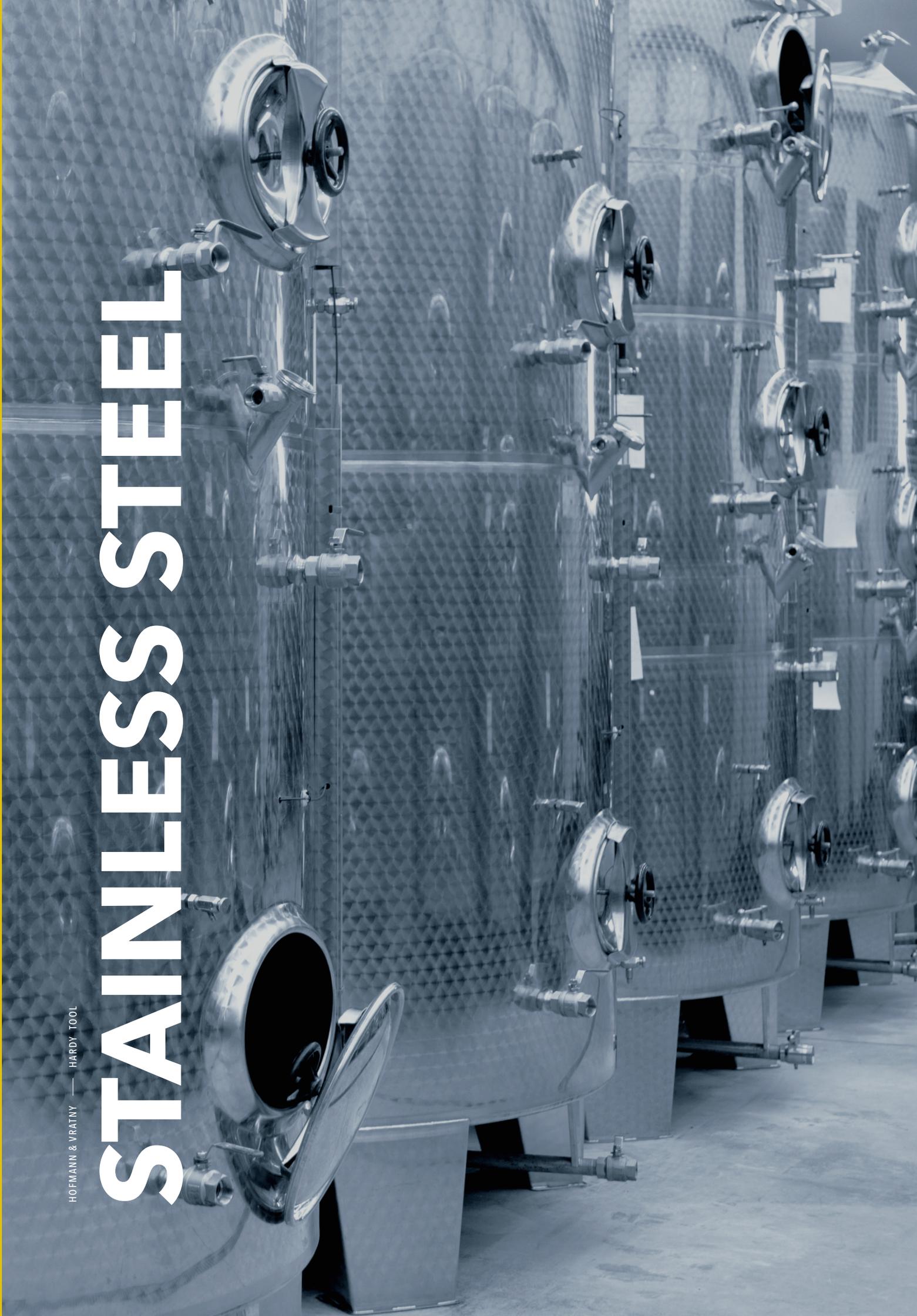


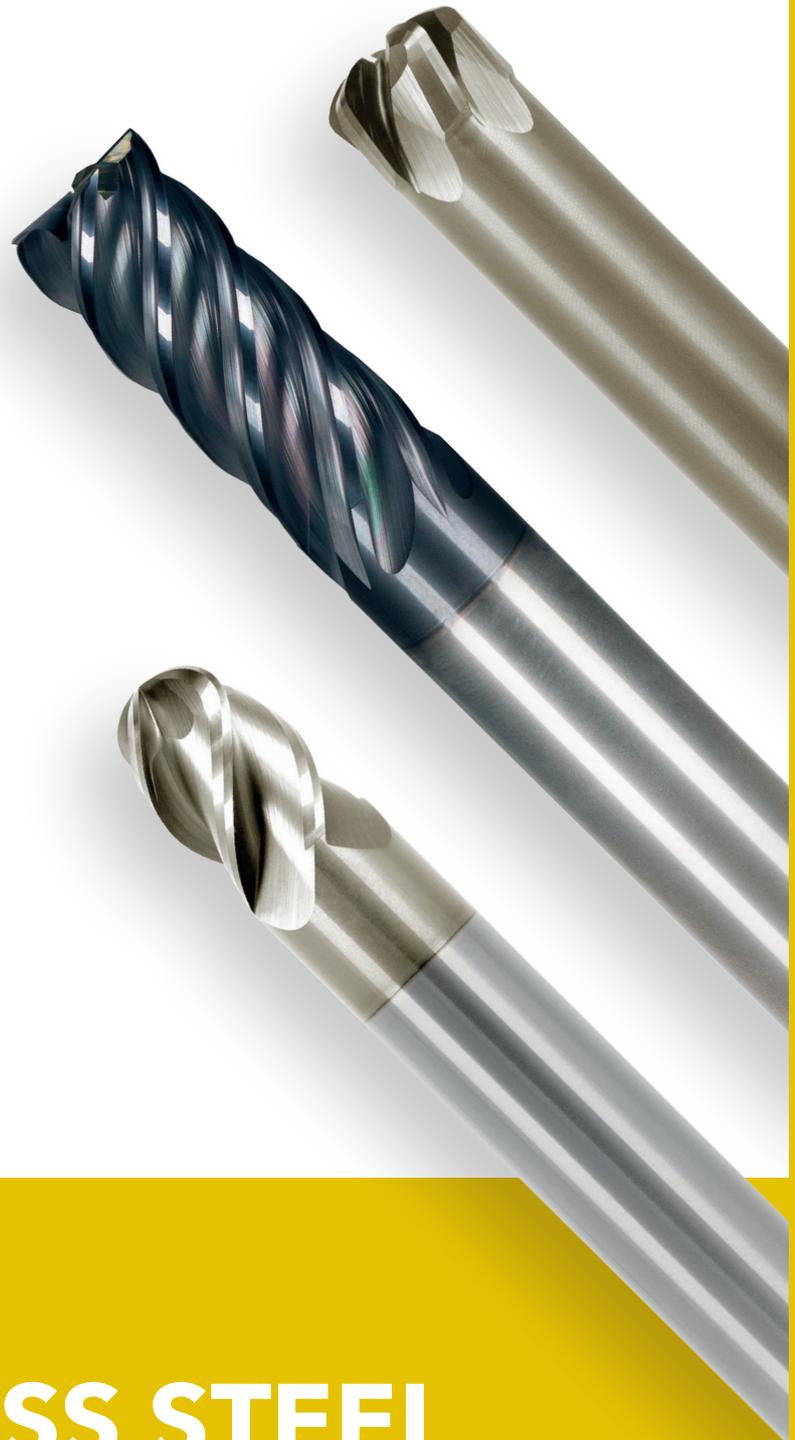
Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
70	45						40	38	120				25			35

	D1	D3	A	L3	L1	D2	z
K205193	mm ø	mm ø	mm	mm	mm	mm ø	#
3	3.0	2.2	2.0	10.0	50.0	4.0	4
4	4.0	2.9	2.5	10.0	50.0	4.0	4
5	5.0	3.9	3.0	15.0	65.0	6.0	4
6	6.0	3.9	4.0	15.0	65.0	6.0	4
8	8.0	5.9	2.5	20.0	70.0	8.0	4
10	10.0	5.9	4.0	23.0	73.0	10.0	4
12	12.0	5.9	6.0	23.0	75.0	12.0	4

HOTMANN & VRATNY — HARDY TOOL

STAINLESS STEEL





HOFMANN & VRATNY — HARDY TOOL

STAINLESS STEEL

Stainless steel is attractive because of its corrosion and acid resistance. However, it is also tough and tends to “seize up”. This presents a challenge during the machining process, but we are ready to rise to the challenge and have been doing so for many years now.

A hardy tool for a hardy material.

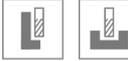
Stainless steel is extremely popular in industry due to its special properties. We offer you tried and tested milling cutters from all three product lines to machine these extremely tough materials.

Well-known companies in the medical industry have relied on our proven quality for a long time.

Cooling 

Tolerance e8

Coating -

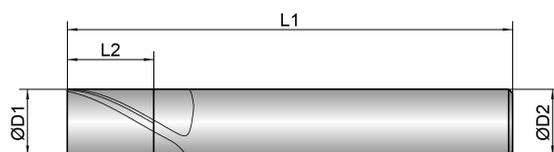
HA HB UNI 



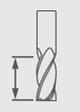
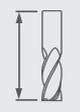
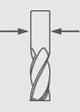
HA K201031



HB K201032



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
60	40	30					45	60	140							

K201031	K201032	D1  mm ø	L2  mm	L1  mm	D2  mm ø	z  #	 °
0,25/3	-	0.25	0.5	38.0	3.0	2	30
0,3/3	-	0.3	1.0	38.0	3.0	2	30
0,35/3	-	0.35	1.0	38.0	3.0	2	30
0,4/3	-	0.4	1.0	38.0	3.0	2	30
0,5/3	-	0.5	1.5	38.0	3.0	2	30
0,6/3	-	0.6	1.5	38.0	3.0	2	30
0,7/3	-	0.7	2.0	38.0	3.0	2	30
0,8/3	-	0.8	2.0	38.0	3.0	2	30
0,9/3	-	0.9	2.5	38.0	3.0	2	30
1/3	-	1.0	3.0	50.0	3.0	2	30
1,1/3	-	1.1	3.0	50.0	3.0	2	30
1,2/3	-	1.2	4.0	50.0	3.0	2	30
1,4/3	-	1.4	4.0	50.0	3.0	2	30

K201031	K201032	D1  mm ∅	L2  mm	L1  mm	D2  mm ∅	z  #	 °
1,5/6	1,5	1.5	3.0	54.0	6.0	2	30
1,5/3	-	1.5	4.0	50.0	3.0	2	30
1,6/3	-	1.6	4.0	50.0	3.0	2	30
1,8/3	-	1.8	5.0	50.0	3.0	2	30
2/6	2	2.0	4.0	54.0	6.0	2	30
2/3	-	2.0	5.0	50.0	3.0	2	30
2,5/3	-	2.5	6.0	50.0	3.0	2	30
3/6	3	3.0	6.0	54.0	6.0	2	30
4/6	4	4.0	7.0	54.0	6.0	2	30
5/6	5	5.0	8.0	54.0	6.0	2	30
6/6	6	6.0	10.0	54.0	6.0	2	30
8/8	8	8.0	12.0	59.0	8.0	2	30
10/10	10	10.0	13.0	67.0	10.0	2	30
12/12	12	12.0	16.0	74.0	12.0	2	30
14/14	14	14.0	16.0	75.0	14.0	2	30
16/16	16	16.0	20.0	83.0	16.0	2	30
18/18	18	18.0	20.0	85.0	18.0	2	30
20/20	20	20.0	25.0	93.0	20.0	2	30

Cooling 

Tolerance e8

Coating TiAlN- α

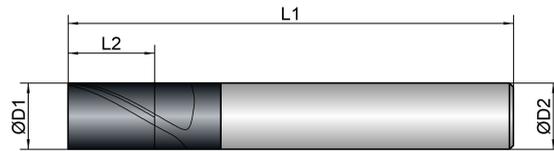
HA HB UNI 



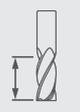
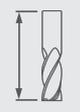
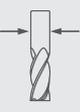
HA K201033



HB K201034



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
120	100	80					80	100	280							

K201033	K201034	D1  mm ø	L2  mm	L1  mm	D2  mm ø	z  #	 °
0,25/3	-	0.25	0.5	38.0	3.0	2	30
0,3/3	-	0.3	1.0	38.0	3.0	2	30
0,35/3	-	0.35	1.0	38.0	3.0	2	30
0,4/3	-	0.4	1.0	38.0	3.0	2	30
0,5/3	-	0.5	1.5	38.0	3.0	2	30
0,6/3	-	0.6	1.5	38.0	3.0	2	30
0,7/3	-	0.7	2.0	38.0	3.0	2	30
0,8/3	-	0.8	2.0	38.0	3.0	2	30
0,9/3	-	0.9	2.5	38.0	3.0	2	30
1/3	-	1.0	3.0	50.0	3.0	2	30
1,1/3	-	1.1	3.0	50.0	3.0	2	30
1,2/3	-	1.2	4.0	50.0	3.0	2	30
1,4/3	-	1.4	4.0	50.0	3.0	2	30

K201033	K201034	D1  mm ∅	L2  mm	L1  mm	D2  mm ∅	z  #	 °
1,5/6	1,5	1.5	3.0	54.0	6.0	2	30
1,5/3	-	1.5	4.0	50.0	3.0	2	30
1,6/3	-	1.6	4.0	50.0	3.0	2	30
1,8/3	-	1.8	5.0	50.0	3.0	2	30
2/6	2	2.0	4.0	54.0	6.0	2	30
2/3	-	2.0	5.0	50.0	3.0	2	30
2,5/3	-	2.5	6.0	50.0	3.0	2	30
3/6	3	3.0	6.0	54.0	6.0	2	30
4/6	4	4.0	7.0	54.0	6.0	2	30
5/6	5	5.0	8.0	54.0	6.0	2	30
6/6	6	6.0	10.0	54.0	6.0	2	30
8/8	8	8.0	12.0	59.0	8.0	2	30
10/10	10	10.0	13.0	67.0	10.0	2	30
12/12	12	12.0	16.0	74.0	12.0	2	30
14/14	14	14.0	16.0	75.0	14.0	2	30
16/16	16	16.0	20.0	83.0	16.0	2	30
18/18	18	18.0	20.0	85.0	18.0	2	30
20/20	20	20.0	25.0	93.0	20.0	2	30

Cooling

Tolerance e8

Coating -

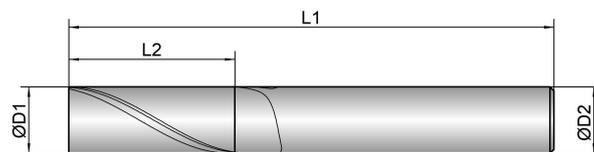
HA HB UNI



HA K201051



HB K201052



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
60	40	30					45	60	140							

K201051	K201052	D1	L2	L1	D2	z	°
		mm Ø	mm	mm	mm Ø	#	
1	1	1.0	4.0	58.0	6.0	2	30
1,5	1,5	1.5	6.0	58.0	6.0	2	30
2	2	2.0	7.0	58.0	6.0	2	30
3	3	3.0	10.0	58.0	6.0	2	30
4	4	4.0	13.0	58.0	6.0	2	30
5	5	5.0	15.0	58.0	6.0	2	30
6	6	6.0	16.0	58.0	6.0	2	30
8	8	8.0	22.0	70.0	8.0	2	30
10	10	10.0	25.0	73.0	10.0	2	30
12	12	12.0	26.0	84.0	12.0	2	30
14	14	14.0	26.0	84.0	14.0	2	30
16	16	16.0	30.0	93.0	16.0	2	30
18	18	18.0	30.0	93.0	18.0	2	30
20	20	20.0	40.0	104.0	20.0	2	30

Cooling 

Tolerance e8

Coating TiAlN- α

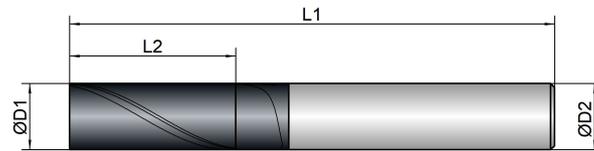
HA HB UNI  



HA K201053



HB K201054



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
100	80	60					80	100	180							

K201053	K201054	D1	L2	L1	D2	z	
		 mm ø	 mm	 mm	 mm ø	 #	
1	1	1.0	4.0	58.0	6.0	2	30
1,5	1,5	1.5	6.0	58.0	6.0	2	30
2	2	2.0	7.0	58.0	6.0	2	30
3	3	3.0	10.0	58.0	6.0	2	30
4	4	4.0	13.0	58.0	6.0	2	30
5	5	5.0	15.0	58.0	6.0	2	30
6	6	6.0	16.0	58.0	6.0	2	30
8	8	8.0	22.0	70.0	8.0	2	30
10	10	10.0	25.0	73.0	10.0	2	30
12	12	12.0	26.0	84.0	12.0	2	30
14	14	14.0	26.0	84.0	14.0	2	30
16	16	16.0	30.0	93.0	16.0	2	30
18	18	18.0	30.0	93.0	18.0	2	30
20	20	20.0	40.0	104.0	20.0	2	30

Cooling

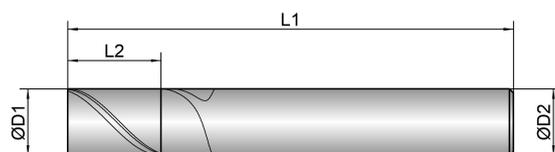
Tolerance e8

Coating -

HA UNI



HA K201071



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
60	40	30					45	60	140							

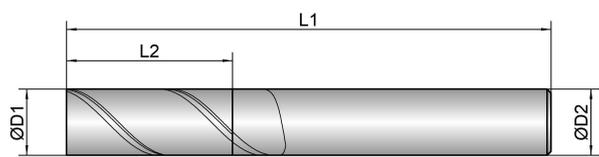
K201071	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	 °
2	2.0	4.0	32.0	2.0	2	45
3	3.0	6.0	32.0	3.0	2	45
4	4.0	7.0	36.0	4.0	2	45
5	5.0	8.0	54.0	6.0	2	45
6	6.0	10.0	54.0	6.0	2	45
7	7.0	12.0	59.0	8.0	2	45
8	8.0	12.0	59.0	8.0	2	45
9	9.0	14.0	67.0	10.0	2	45
10	10.0	14.0	67.0	10.0	2	45
12	12.0	16.0	73.0	12.0	2	45
14	14.0	18.0	75.0	14.0	2	45
16	16.0	20.0	83.0	16.0	2	45
18	18.0	20.0	85.0	18.0	2	45
20	20.0	25.0	93.0	20.0	2	45

Cooling 

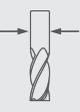
Tolerance e8

Coating -

HA UNI  



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
60	40	30					45	60	140							

K201081	D1  mm ø	L2  mm	L1  mm	D2  mm ø	z  #	 °
2	2.0	7.0	32.0	2.0	2	45
3	3.0	10.0	38.0	3.0	2	45
4	4.0	13.0	40.0	4.0	2	45
5	5.0	15.0	58.0	6.0	2	45
6	6.0	16.0	58.0	6.0	2	45
7	7.0	20.0	70.0	8.0	2	45
8	8.0	22.0	70.0	8.0	2	45
9	9.0	22.0	73.0	10.0	2	45
10	10.0	25.0	73.0	10.0	2	45
12	12.0	28.0	84.0	12.0	2	45
14	14.0	30.0	84.0	14.0	2	45
16	16.0	35.0	93.0	16.0	2	45
18	18.0	35.0	101.0	18.0	2	45
20	20.0	40.0	104.0	20.0	2	45

Cooling

Tolerance e8

Coating -

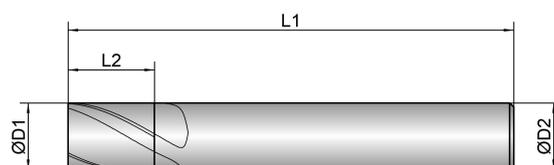
HA HB MTC UNI



HA K201161



HB K201162



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
60	40	30					45	60	140							

K201161	K201162	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	 °
1,5	1,5	1.5	3.0	54.0	6.0	3	30
2	2	2.0	4.0	54.0	6.0	3	30
3	3	3.0	6.0	54.0	6.0	3	30
4	4	4.0	7.0	54.0	6.0	3	30
5	5	5.0	8.0	54.0	6.0	3	30
6	6	6.0	10.0	54.0	6.0	3	30
8	8	8.0	12.0	59.0	8.0	3	30
10	10	10.0	13.0	67.0	10.0	3	30
12	12	12.0	16.0	74.0	12.0	3	30
14	14	14.0	16.0	75.0	14.0	3	30
16	16	16.0	20.0	83.0	16.0	3	30
18	18	18.0	20.0	85.0	18.0	3	30
20	20	20.0	25.0	93.0	20.0	3	30

Cooling

Tolerance e8

Coating TiAlN- α

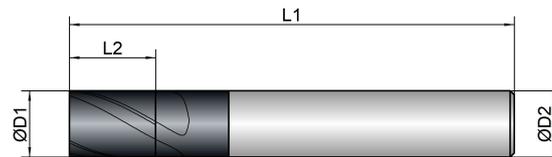
HA HB HPC MTC UNI



HA K201163



HB K201164



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
220	190	160					80	160								

K201163	K201164	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	 °
1,5	1,5	1.5	3.0	54.0	6.0	3	30
2	2	2.0	4.0	54.0	6.0	3	30
3	3	3.0	6.0	54.0	6.0	3	30
4	4	4.0	7.0	54.0	6.0	3	30
5	5	5.0	8.0	54.0	6.0	3	30
6	6	6.0	10.0	54.0	6.0	3	30
8	8	8.0	12.0	59.0	8.0	3	30
10	10	10.0	13.0	67.0	10.0	3	30
12	12	12.0	16.0	74.0	12.0	3	30
14	14	14.0	16.0	75.0	14.0	3	30
16	16	16.0	20.0	83.0	16.0	3	30
18	18	18.0	20.0	85.0	18.0	3	30
20	20	20.0	25.0	93.0	20.0	3	30

Cooling

Tolerance e8

Coating -

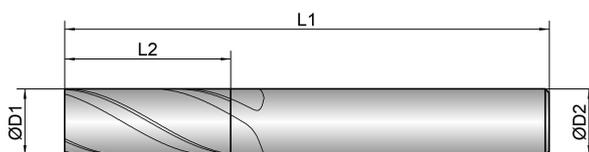
HA HB MTC UNI



HA K201181



HB K201182



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
60	40	30					45	60	140							

K201181	K201182	D1	L2	L1	D2	z	
		mm ø	mm	mm	mm ø	#	°
1	1	1.0	4.0	58.0	6.0	3	30
1,5	1,5	1.5	6.0	58.0	6.0	3	30
2	2	2.0	7.0	58.0	6.0	3	30
3	3	3.0	10.0	58.0	6.0	3	30
4	4	4.0	13.0	58.0	6.0	3	30
5	5	5.0	15.0	58.0	6.0	3	30
6	6	6.0	16.0	58.0	6.0	3	30
8	8	8.0	22.0	70.0	8.0	3	30
10	10	10.0	25.0	73.0	10.0	3	30
12	12	12.0	26.0	84.0	12.0	3	30
14	14	14.0	26.0	84.0	14.0	3	30
16	16	16.0	32.0	93.0	16.0	3	30
18	18	18.0	32.0	93.0	18.0	3	30
20	20	20.0	40.0	104.0	20.0	3	30

Cooling

Tolerance e8

Coating TiAlN- α

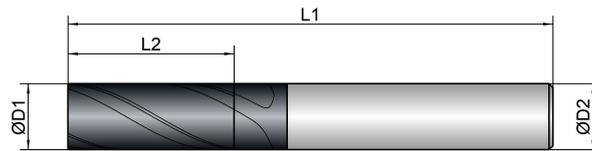
HA HB HPC MTC UNI



HA K201183



HB K201184



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
220	190	160					80	160								

K201183	K201184	D1	L2	L1	D2	z	
		 mm ø	 mm	 mm	 mm ø	#	
1	1	1.0	4.0	58.0	6.0	3	30
1,5	1,5	1.5	6.0	58.0	6.0	3	30
2	2	2.0	7.0	58.0	6.0	3	30
3	3	3.0	10.0	58.0	6.0	3	30
4	4	4.0	13.0	58.0	6.0	3	30
5	5	5.0	15.0	58.0	6.0	3	30
6	6	6.0	16.0	58.0	6.0	3	30
8	8	8.0	22.0	70.0	8.0	3	30
10	10	10.0	25.0	73.0	10.0	3	30
12	12	12.0	26.0	84.0	12.0	3	30
14	14	14.0	26.0	84.0	14.0	3	30
16	16	16.0	32.0	93.0	16.0	3	30
18	18	18.0	32.0	93.0	18.0	3	30
20	20	20.0	40.0	104.0	20.0	3	30

Cooling

Tolerance e8

Coating -

HA HB UNI

NEW

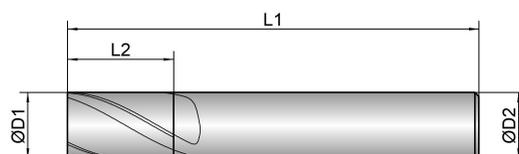
Basic



HA K201251



HB K201252



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
80	55	40					60	70	210							

K201251	K201252	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	 °
1	1	1.0	2.0	45.0	6.0	3	30
1,2	1,2	1.2	2.0	45.0	6.0	3	30
1,5	1,5	1.5	3.0	45.0	6.0	3	30
1,8	1,8	1.8	3.0	45.0	6.0	3	30
2	2	2.0	4.0	45.0	6.0	3	30
2,5	2,5	2.5	4.0	45.0	6.0	3	30
2,8	2,8	2.8	6.0	45.0	6.0	3	30
3	3	3.0	6.0	45.0	6.0	3	30
3,5	3,5	3.5	6.0	45.0	6.0	3	30
3,8	3,8	3.8	7.0	45.0	6.0	3	30
4	4	4.0	7.0	45.0	6.0	3	30
4,5	4,5	4.5	7.0	45.0	6.0	3	30
4,75	4,75	4.75	8.0	45.0	6.0	3	30

K201251	K201252	D1  mm ∅	L2  mm	L1  mm	D2  mm ∅	z  #	 °
5	5	5.0	8.0	45.0	6.0	3	30
5,5	5,5	5.5	8.0	45.0	6.0	3	30
5,75	5,75	5.75	10.0	45.0	6.0	3	30
6	6	6.0	10.0	45.0	6.0	3	30
6,75	6,75	6.75	10.0	55.0	8.0	3	30
7	7	7.0	12.0	55.0	8.0	3	30
7,75	7,75	7.75	12.0	55.0	8.0	3	30
8	8	8.0	13.0	55.0	8.0	3	30
8,7	8,7	8.7	14.0	55.0	10.0	3	30
9	9	9.0	14.0	55.0	10.0	3	30
9,7	9,7	9.7	16.0	55.0	10.0	3	30
10	10	10.0	16.0	55.0	10.0	3	30

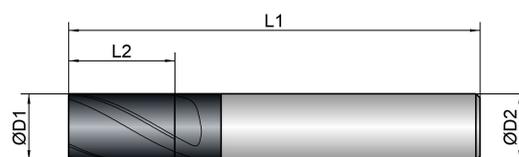
Cooling	
Tolerance	e8
Coating	TiAlN- α



HA K201253



HB K201254



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
110	75	65					85	95	290							

K201253	K201254	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	 °
1	1	1.0	2.0	45.0	6.0	3	30
1,2	1,2	1.2	2.0	45.0	6.0	3	30
1,5	1,5	1.5	3.0	45.0	6.0	3	30
1,8	1,8	1.8	3.0	45.0	6.0	3	30
2	2	2.0	4.0	45.0	6.0	3	30
2,5	2,5	2.5	4.0	45.0	6.0	3	30
2,8	2,8	2.8	6.0	45.0	6.0	3	30
3	3	3.0	6.0	45.0	6.0	3	30
3,5	3,5	3.5	6.0	45.0	6.0	3	30
3,8	3,8	3.8	7.0	45.0	6.0	3	30
4	4	4.0	7.0	45.0	6.0	3	30
4,5	4,5	4.5	7.0	45.0	6.0	3	30
4,75	4,75	4.75	8.0	45.0	6.0	3	30

K201253	K201254	D1  mm ∅	L2  mm	L1  mm	D2  mm ∅	z  #	 °
5	5	5.0	8.0	45.0	6.0	3	30
5,5	5,5	5.5	8.0	45.0	6.0	3	30
5,75	5,75	5.75	10.0	45.0	6.0	3	30
6	6	6.0	10.0	45.0	6.0	3	30
6,75	6,75	6.75	10.0	55.0	8.0	3	30
7	7	7.0	12.0	55.0	8.0	3	30
7,75	7,75	7.75	12.0	55.0	8.0	3	30
8	8	8.0	13.0	55.0	8.0	3	30
8,7	8,7	8.7	14.0	55.0	10.0	3	30
9	9	9.0	14.0	55.0	10.0	3	30
9,7	9,7	9.7	16.0	55.0	10.0	3	30
10	10	10.0	16.0	55.0	10.0	3	30

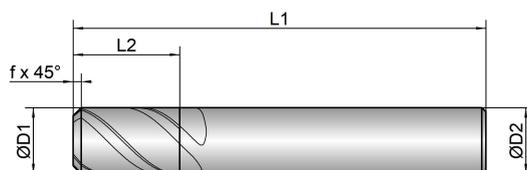
Cooling	
Tolerance	e8
Coating	-



HA K201271



HB K201272



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
70	45	30					60	65	200	160						

K201271	K201272	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	45° mm	 °
1/6	1/6	1.0	2.0	45.0	6.0	3	0.02	45
1,5/6	1,5/6	1.5	3.0	45.0	6.0	3	0.03	45
2/6	2/6	2.0	4.0	45.0	6.0	3	0.03	45
2,5/6	2,5/6	2.5	5.0	45.0	6.0	3	0.03	45
3/6	3/6	3.0	6.0	45.0	6.0	3	0.03	45
3,5/6	3,5/6	3.5	6.0	45.0	6.0	3	0.03	45
4/6	4/6	4.0	7.0	45.0	6.0	3	0.04	45
4,5/6	4,5/6	4.5	8.0	45.0	6.0	3	0.04	45
5/6	5/6	5.0	8.0	45.0	6.0	3	0.04	45
5,5/6	5,5/6	5.5	8.0	45.0	6.0	3	0.04	45
6/6	6/6	6.0	10.0	45.0	6.0	3	0.04	45
8/8	8/8	8.0	13.0	55.0	8.0	3	0.05	45
10/10	10/10	10.0	16.0	55.0	10.0	3	0.05	45

Cooling

Tolerance e8

Coating TiAlN- α

HA HB UNI

NEW

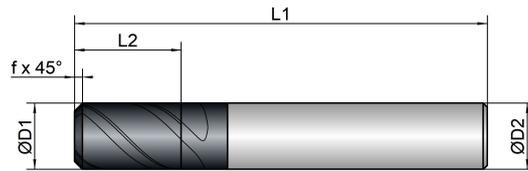
Basic



HA K201273



HB K201274



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
100	70	50					90	85	290	200						

K201273	K201274	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	 mm	 °
1/6	1/6	1.0	2.0	45.0	6.0	3	0.02	45
1,5/6	1,5/6	1.5	3.0	45.0	6.0	3	0.03	45
2/6	2/6	2.0	4.0	45.0	6.0	3	0.03	45
2,5/6	2,5/6	2.5	5.0	45.0	6.0	3	0.03	45
3/6	3/6	3.0	6.0	45.0	6.0	3	0.03	45
3,5/6	3,5/6	3.5	6.0	45.0	6.0	3	0.03	45
4/6	4/6	4.0	7.0	45.0	6.0	3	0.04	45
4,5/6	4,5/6	4.5	8.0	45.0	6.0	3	0.04	45
5/6	5/6	5.0	8.0	45.0	6.0	3	0.04	45
5,5/6	5,5/6	5.5	8.0	45.0	6.0	3	0.04	45
6/6	6/6	6.0	10.0	45.0	6.0	3	0.04	45
8/8	8/8	8.0	13.0	55.0	8.0	3	0.05	45
10/10	10/10	10.0	16.0	55.0	10.0	3	0.05	45

Cooling

Tolerance e8

Coating -

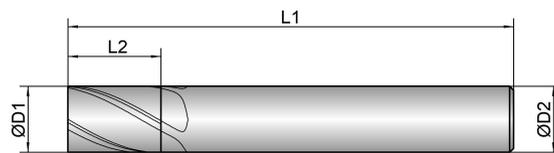
HA HB MTC UNI



HA K201291



HB K201292



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
60	40	30					45	60	140							

K201291	K201292	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	 °
1,5/3	-	1.5	3.0	38.0	3.0	4	30
2/6	2	2.0	4.0	54.0	6.0	4	30
2/3	-	2.0	4.0	38.0	3.0	4	30
2,5/3	-	2.5	4.0	38.0	3.0	4	30
3/6	3	3.0	6.0	54.0	6.0	4	30
3/3	-	3.0	6.0	38.0	3.0	4	30
4/6	4	4.0	7.0	54.0	6.0	4	30
5/6	5	5.0	8.0	54.0	6.0	4	30
6/6	6	6.0	10.0	54.0	6.0	4	30
8/8	8	8.0	12.0	59.0	8.0	4	30
10/10	10	10.0	14.0	67.0	10.0	4	30
12/12	12	12.0	16.0	74.0	12.0	4	30
14/14	14	14.0	18.0	75.0	14.0	4	30
16/16	16	16.0	22.0	83.0	16.0	4	30
18/18	18	18.0	20.0	80.0	18.0	4	30
20/20	20	20.0	25.0	93.0	20.0	4	30

Cooling

Tolerance e8

Coating TiAlN- α

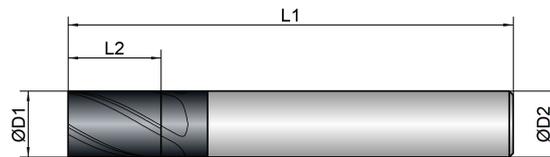
HA HB HPC MTC UNI



HA K201293



HB K201294



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
220	190	160					80	160								

K201293	K201294	D1	L2	L1	D2	z	°
		mm Ø	mm	mm	mm Ø	#	
1,5/3	-	1.5	3.0	38.0	3.0	4	30
2/6	2	2.0	4.0	54.0	6.0	4	30
2/3	-	2.0	4.0	38.0	3.0	4	30
2,5/3	-	2.5	4.0	38.0	3.0	4	30
3/6	3	3.0	6.0	54.0	6.0	4	30
3/3	-	3.0	6.0	38.0	3.0	4	30
4/6	4	4.0	7.0	54.0	6.0	4	30
5/6	5	5.0	8.0	54.0	6.0	4	30
6/6	6	6.0	10.0	54.0	6.0	4	30
8/8	8	8.0	12.0	59.0	8.0	4	30
10/10	10	10.0	14.0	67.0	10.0	4	30
12/12	12	12.0	16.0	74.0	12.0	4	30
14/14	14	14.0	18.0	75.0	14.0	4	30
16/16	16	16.0	22.0	83.0	16.0	4	30
18/18	18	18.0	20.0	80.0	18.0	4	30
20/20	20	20.0	25.0	93.0	20.0	4	30

Cooling

Tolerance e8

Coating -

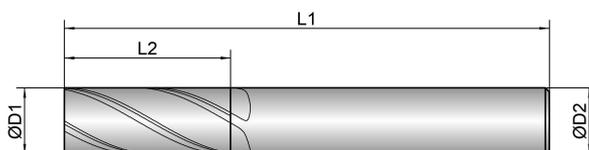
HA HB MTC UNI



HA K201311



HB K201312



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
60	40	30					45	60	140							

K201311	K201312	D1	L2	L1	D2	z	°
		mm Ø	mm	mm	mm Ø	#	
2/6	2	2.0	7.0	58.0	6.0	4	30
2/2	-	2.0	7.0	38.0	2.0	4	30
3/6	3	3.0	10.0	58.0	6.0	4	30
3/3	-	3.0	10.0	38.0	3.0	4	30
4/6	4	4.0	13.0	58.0	6.0	4	30
4/4	-	4.0	13.0	50.0	4.0	4	30
5/6	5	5.0	15.0	58.0	6.0	4	30
5/5	-	5.0	15.0	50.0	5.0	4	30
6/6	6	6.0	16.0	58.0	6.0	4	30
7/8	7	7.0	19.0	64.0	8.0	4	30
8/8	8	8.0	22.0	70.0	8.0	4	30
9/10	9	9.0	23.0	73.0	10.0	4	30
10/10	10	10.0	25.0	73.0	10.0	4	30
11/12	11	11.0	26.0	84.0	12.0	4	30
12/12	12	12.0	28.0	84.0	12.0	4	30
14/14	14	14.0	30.0	84.0	14.0	4	30
16/16	16	16.0	35.0	93.0	16.0	4	30
18/18	18	18.0	35.0	93.0	18.0	4	30
20/20	20	20.0	40.0	104.0	20.0	4	30

Cooling

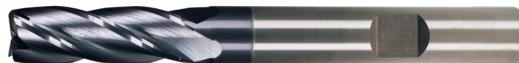
Tolerance e8

Coating TiAlN- α

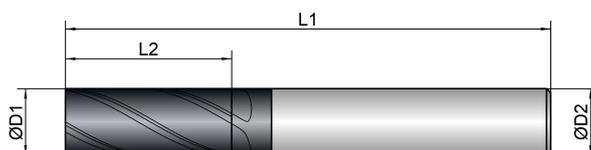
HA HB HPC MTC UNI



HA K201313



HB K201314



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
220	190	160					80	160								

K201313	K201314	D1	L2	L1	D2	z	°
		mm \varnothing	mm	mm	mm \varnothing	#	
2/6	2	2.0	7.0	58.0	6.0	4	30
2/2	-	2.0	7.0	38.0	2.0	4	30
3/6	3	3.0	10.0	58.0	6.0	4	30
3/3	-	3.0	10.0	38.0	3.0	4	30
4/6	4	4.0	13.0	58.0	6.0	4	30
4/4	-	4.0	13.0	50.0	4.0	4	30
5/6	5	5.0	15.0	58.0	6.0	4	30
5/5	-	5.0	15.0	50.0	5.0	4	30
6/6	6	6.0	16.0	58.0	6.0	4	30
7/8	7	7.0	19.0	64.0	8.0	4	30
8/8	8	8.0	22.0	70.0	8.0	4	30
9/10	9	9.0	23.0	73.0	10.0	4	30
10/10	10	10.0	25.0	73.0	10.0	4	30
11/12	11	11.0	26.0	84.0	12.0	4	30
12/12	12	12.0	28.0	84.0	12.0	4	30
14/14	14	14.0	30.0	84.0	14.0	4	30
16/16	16	16.0	35.0	93.0	16.0	4	30
18/18	18	18.0	35.0	93.0	18.0	4	30
20/20	20	20.0	40.0	104.0	20.0	4	30

Cooling

Tolerance e8

Coating -

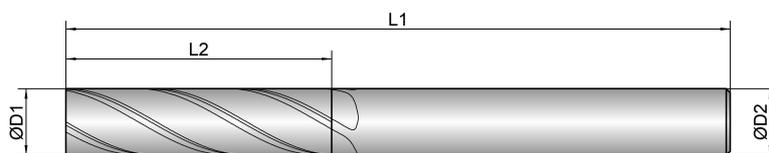
HA HB MTC UNI



HA K201341



HB K201342



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
45	35	25					35	55	110							

K201341	K201342	D1	L2	L1	D2	z	°
		mm ø	mm	mm	mm ø	#	
3X16	-	3.0	16.0	75.0	3.0	4	30
4X16	-	4.0	16.0	75.0	4.0	4	30
4X20	-	4.0	20.0	100.0	4.0	4	30
5X20	-	5.0	20.0	75.0	5.0	4	30
5X25	-	5.0	25.0	100.0	5.0	4	30
6X24	6X24	6.0	24.0	80.0	6.0	4	30
6X30	6X30	6.0	30.0	100.0	6.0	4	30
8X32	8X32	8.0	32.0	100.0	8.0	4	30
8X40	8X40	8.0	40.0	120.0	8.0	4	30
10X40	10X40	10.0	40.0	100.0	10.0	4	30
10X50	10X50	10.0	50.0	120.0	10.0	4	30
12X48	12X48	12.0	48.0	120.0	12.0	4	30
12X60	12X60	12.0	60.0	150.0	12.0	4	30
14X45	14X45	14.0	45.0	100.0	14.0	4	30
14X56	14X56	14.0	56.0	150.0	14.0	4	30
16X50	16X50	16.0	50.0	125.0	16.0	4	30
16X65	16X65	16.0	65.0	150.0	16.0	4	30
18X55	18X55	18.0	55.0	130.0	18.0	4	30
18X72	18X72	18.0	72.0	150.0	18.0	4	30
20X60	20X60	20.0	60.0	135.0	20.0	4	30
20X80	20X80	20.0	80.0	150.0	20.0	4	30
25X75	25X75	25.0	75.0	150.0	25.0	4	30

Cooling

Tolerance e8

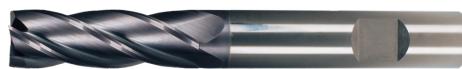
Coating TiAlN- α

HA HB ETC HPC

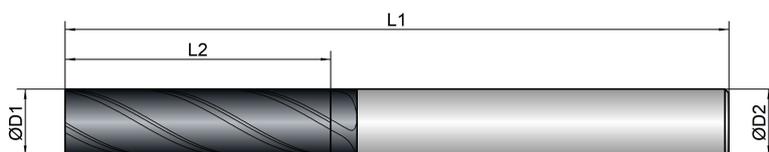
MTC UNI



HA K201343



HB K201344



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
90	75	65					45								30	

K201343	K201344	D1 mm Ø	L2 mm	L1 mm	D2 mm Ø	z #	 °
3X16	-	3.0	16.0	75.0	3.0	4	30
4X16	-	4.0	16.0	75.0	4.0	4	30
4X20	-	4.0	20.0	100.0	4.0	4	30
5X20	-	5.0	20.0	75.0	5.0	4	30
5X25	-	5.0	25.0	100.0	5.0	4	30
6X24	6X24	6.0	24.0	80.0	6.0	4	30
6X30	6X30	6.0	30.0	100.0	6.0	4	30
8X32	8X32	8.0	32.0	100.0	8.0	4	30
8X40	8X40	8.0	40.0	120.0	8.0	4	30
10X40	10X40	10.0	40.0	100.0	10.0	4	30
10X50	10X50	10.0	50.0	120.0	10.0	4	30
12X48	12X48	12.0	48.0	120.0	12.0	4	30
12X60	12X60	12.0	60.0	150.0	12.0	4	30
14X45	14X45	14.0	45.0	100.0	14.0	4	30
14X56	14X56	14.0	56.0	150.0	14.0	4	30
16X50	16X50	16.0	50.0	125.0	16.0	4	30
16X65	16X65	16.0	65.0	150.0	16.0	4	30
18X55	18X55	18.0	55.0	130.0	18.0	4	30
18X72	18X72	18.0	72.0	150.0	18.0	4	30
20X60	20X60	20.0	60.0	135.0	20.0	4	30
20X80	20X80	20.0	80.0	150.0	20.0	4	30
25X75	25X75	25.0	75.0	150.0	25.0	4	30

Cooling

Tolerance e8

Coating -

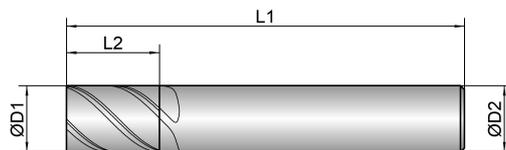
HA HB MTC UNI



HA K201401



HB K201402



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
60	40	30					45	60	140							

K201401	K201402	D1	L2	L1	D2	z	°
		mm Ø	mm	mm	mm Ø	#	
3	3	3.0	6.0	54.0	6.0	4	45
4	4	4.0	7.0	54.0	6.0	4	45
5	5	5.0	8.0	54.0	6.0	4	45
6	6	6.0	10.0	54.0	6.0	4	45
8	8	8.0	12.0	59.0	8.0	4	45
10	10	10.0	14.0	60.0	10.0	4	45
12	12	12.0	16.0	70.0	12.0	4	45
14	14	14.0	18.0	70.0	14.0	4	45
16	16	16.0	20.0	80.0	16.0	4	45
18	18	18.0	20.0	80.0	18.0	4	45
20	20	20.0	25.0	85.0	20.0	4	45

Cooling 

Tolerance e8

Coating TiCn- α

HA HB ETC HPC

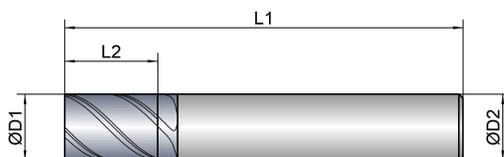
MTC UNI 



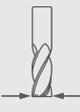
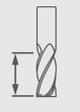
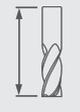
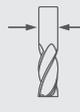

HA K201403



HB K201404



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
220	190	160					80	160								

K201403	K201404	D1	L2	L1	D2	z	°
		 mm ø	 mm	 mm	 mm ø	 #	
3	3	3.0	6.0	54.0	6.0	4	45
4	4	4.0	7.0	54.0	6.0	4	45
5	5	5.0	8.0	54.0	6.0	4	45
6	6	6.0	10.0	54.0	6.0	4	45
8	8	8.0	12.0	59.0	8.0	4	45
10	10	10.0	14.0	60.0	10.0	4	45
12	12	12.0	16.0	70.0	12.0	4	45
14	14	14.0	18.0	70.0	14.0	4	45
16	16	16.0	20.0	80.0	16.0	4	45
18	18	18.0	20.0	80.0	18.0	4	45
20	20	20.0	25.0	85.0	20.0	4	45

Cooling

Tolerance e8

Coating -

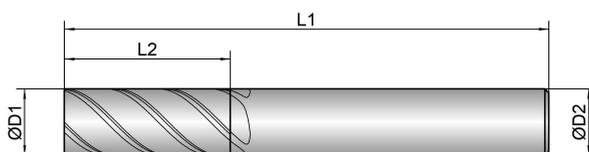
HA HB MTC UNI



HA K201411



HB K201412



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
60	40	30					45	60	140							

K201411	K201412	D1	L2	L1	D2	z	°
		mm Ø	mm	mm	mm Ø	#	
3	3	3.0	10.0	58.0	6.0	4	45
4	4	4.0	13.0	58.0	6.0	4	45
5	5	5.0	15.0	58.0	6.0	4	45
6	6	6.0	16.0	58.0	6.0	4	45
8	8	8.0	22.0	64.0	8.0	4	45
10	10	10.0	25.0	73.0	10.0	4	45
12	12	12.0	28.0	84.0	12.0	4	45
14	14	14.0	30.0	84.0	14.0	4	45
16	16	16.0	36.0	93.0	16.0	4	45
18	18	18.0	36.0	93.0	18.0	4	45
20	20	20.0	41.0	104.0	20.0	4	45
25	25	25.0	50.0	125.0	25.0	4	45

Cooling

Tolerance e8

Coating TiCn- α

HA HB ETC HPC

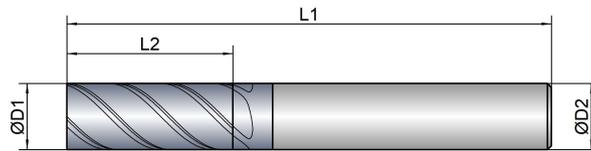
MTC UNI



HA K201413



HB K201414



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
220	190	160					80	160								

K201413	K201414	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	 °
3	3	3.0	10.0	58.0	6.0	4	45
4	4	4.0	13.0	58.0	6.0	4	45
5	5	5.0	15.0	58.0	6.0	4	45
6	6	6.0	16.0	58.0	6.0	4	45
8	8	8.0	22.0	64.0	8.0	4	45
10	10	10.0	25.0	73.0	10.0	4	45
12	12	12.0	28.0	84.0	12.0	4	45
14	14	14.0	30.0	84.0	14.0	4	45
16	16	16.0	36.0	93.0	16.0	4	45
18	18	18.0	36.0	93.0	18.0	4	45
20	20	20.0	41.0	104.0	20.0	4	45
25	25	25.0	50.0	125.0	25.0	4	45

Cooling 

Tolerance e8

Coating -

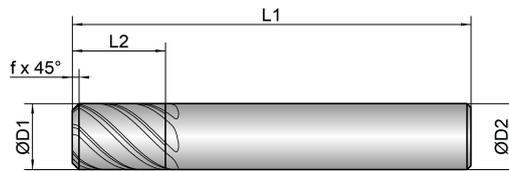
HA HB UNI 



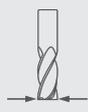
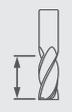
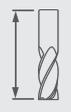
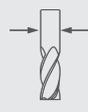
HA K201581



HB K201582



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC		Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite		
70	40	30					45	60	150							

K201581	K201582	D1  mm ø	L2  mm	L1  mm	D2  mm ø	z  #	 mm	 °
5	5	5.0	8.0	54.0	6.0	6	0.02	45
6	6	6.0	10.0	54.0	6.0	6	0.03	45
7	7	7.0	12.0	59.0	8.0	6	0.04	45
8	8	8.0	12.0	59.0	8.0	6	0.04	45
9	9	9.0	14.0	60.0	10.0	6	0.04	45
10	10	10.0	14.0	60.0	10.0	6	0.05	45
12	12	12.0	16.0	70.0	12.0	6	0.05	45
14	14	14.0	18.0	70.0	14.0	6	0.06	45
16	16	16.0	20.0	80.0	16.0	6	0.06	45
18	18	18.0	20.0	80.0	18.0	8	0.07	45
20	20	20.0	25.0	85.0	20.0	8	0.07	45

Cooling 

Tolerance e8

Coating TiAlN- α

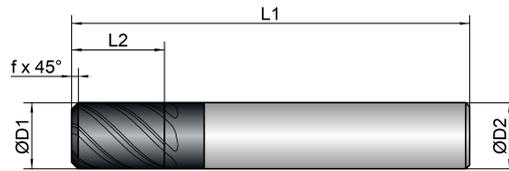
HA HB UNI 



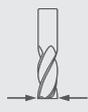
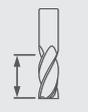
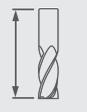
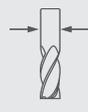
HA K201583



HB K201584



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
170	100	90	70				95	125	600							

K201583	K201584	D1  mm ø	L2  mm	L1  mm	D2  mm ø	z  #	 mm	 °
5	5	5.0	8.0	54.0	6.0	6	0.02	45
6	6	6.0	10.0	54.0	6.0	6	0.03	45
7	7	7.0	12.0	59.0	8.0	6	0.04	45
8	8	8.0	12.0	59.0	8.0	6	0.04	45
9	9	9.0	14.0	60.0	10.0	6	0.04	45
10	10	10.0	14.0	60.0	10.0	6	0.05	45
12	12	12.0	16.0	70.0	12.0	6	0.05	45
14	14	14.0	18.0	70.0	14.0	6	0.06	45
16	16	16.0	20.0	80.0	16.0	6	0.06	45
18	18	18.0	20.0	80.0	18.0	8	0.07	45
20	20	20.0	25.0	85.0	20.0	8	0.07	45

Cooling

Tolerance e8

Coating -

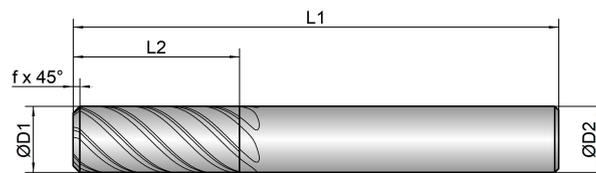
HA HB UNI



HA K201591



HB K201592



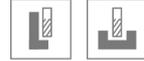
Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
60	40	30					40	60	140							

K201591	K201592	D1	L2	L1	D2	z	45°	°
		mm ∅	mm	mm	mm ∅	#		
5	5	5.0	13.0	58.0	6.0	6	0.02	45
6	6	6.0	16.0	58.0	6.0	6	0.03	45
7	7	7.0	22.0	70.0	8.0	6	0.04	45
8	8	8.0	22.0	70.0	8.0	6	0.04	45
9	9	9.0	25.0	73.0	10.0	6	0.04	45
10	10	10.0	25.0	73.0	10.0	6	0.05	45
12	12	12.0	28.0	84.0	12.0	6	0.05	45
14	14	14.0	30.0	84.0	14.0	6	0.06	45
16	16	16.0	35.0	93.0	16.0	6	0.06	45
18	18	18.0	35.0	93.0	18.0	8	0.07	45
20	20	20.0	40.0	100.0	20.0	8	0.07	45
25	25	25.0	55.0	125.0	25.0	8	0.08	45

Cooling 

Tolerance e8

Coating TiAlN- α

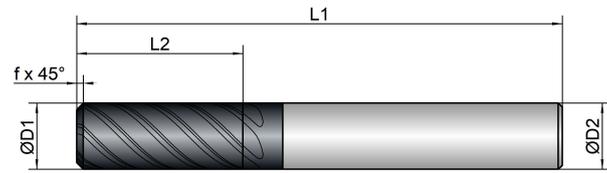
HA HB UNI  



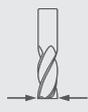
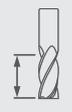
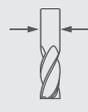
HA K201593



HB K201594



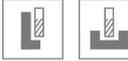
Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
175	100	90	65				95	125	600							

K201593	K201594	D1  mm ø	L2  mm	L1  mm	D2  mm ø	z  #	 mm	 °
5	5	5.0	13.0	58.0	6.0	6	0.02	45
6	6	6.0	16.0	58.0	6.0	6	0.03	45
7	7	7.0	22.0	70.0	8.0	6	0.04	45
8	8	8.0	22.0	70.0	8.0	6	0.04	45
9	9	9.0	25.0	73.0	10.0	6	0.04	45
10	10	10.0	25.0	73.0	10.0	6	0.05	45
12	12	12.0	28.0	84.0	12.0	6	0.05	45
14	14	14.0	30.0	84.0	14.0	6	0.06	45
16	16	16.0	35.0	93.0	16.0	6	0.06	45
18	18	18.0	35.0	93.0	18.0	8	0.07	45
20	20	20.0	40.0	100.0	20.0	8	0.07	45
25	25	25.0	55.0	125.0	25.0	8	0.08	45

Cooling 

Tolerance e8

Coating -

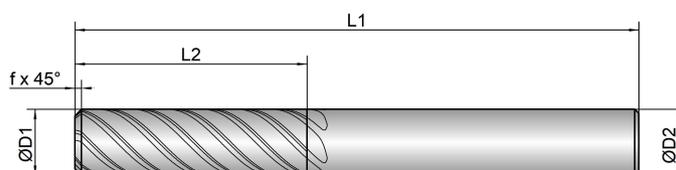
HA HB UNI 



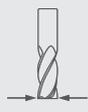
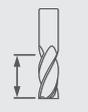
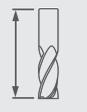
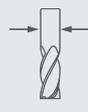
HA K201601



HB K201602



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
45	35	25					35	55	110							

K201601	K201602	D1  mm ø	L2  mm	L1  mm	D2  mm ø	z  #	 mm	 °
6X21	6X21	6.0	21.0	65.0	6.0	6	0.03	45
7X25	7X25	7.0	25.0	75.0	8.0	6	0.04	45
8X28	8X28	8.0	28.0	75.0	8.0	6	0.04	45
9X30	9X30	9.0	30.0	85.0	10.0	6	0.04	45
10X35	10X35	10.0	35.0	85.0	10.0	6	0.05	45
12X45	12X45	12.0	45.0	100.0	12.0	6	0.05	45
16X50	16X50	16.0	50.0	110.0	16.0	6	0.06	45
16X65	16X65	16.0	65.0	125.0	16.0	6	0.06	45
20X55	20X55	20.0	55.0	115.0	20.0	8	0.07	45
20X70	20X70	20.0	70.0	135.0	20.0	8	0.07	45
25X75	25X75	25.0	75.0	150.0	25.0	8	0.08	45
32X125	32X125	32.0	125.0	215.0	32.0	9	0.10	45

Cooling

Tolerance e8

Coating TiAlN- α

HA HB UNI

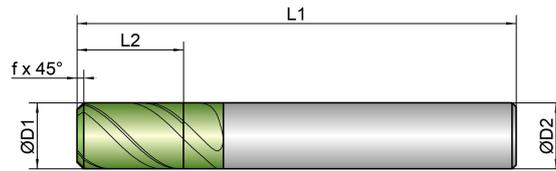
Basic



HA K201673



HB K201674



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
100	70	50					90	85	290	200						

K201673	K201674	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	 mm	 °
1	-	1.0	2.0	38.0	3.0	3	0.02	45
1,2	-	1.2	2.0	38.0	3.0	3	0.02	45
1,5	-	1.5	3.0	38.0	3.0	3	0.025	45
2	2	2.0	4.0	50.0	6.0	3	0.03	45
2,5	2,5	2.5	5.0	50.0	6.0	3	0.03	45
3	3	3.0	6.0	50.0	6.0	3	0.03	45
4	4	4.0	7.0	50.0	6.0	3	0.04	45
4,5	4,5	4.5	8.0	50.0	6.0	3	0.04	45
5	5	5.0	8.0	50.0	6.0	3	0.04	45
5,5	5,5	5.5	8.0	50.0	6.0	3	0.04	45
5,75	5,75	5.75	10.0	50.0	6.0	3	0.04	45
6	6	6.0	10.0	50.0	6.0	3	0.04	45
7	7	7.0	12.0	55.0	8.0	3	0.045	45
7,75	7,75	7.75	12.0	55.0	8.0	3	0.05	45
8	8	8.0	13.0	55.0	8.0	3	0.05	45
9	9	9.0	14.0	66.0	10.0	3	0.05	45
9,7	9,7	9.7	16.0	66.0	10.0	3	0.05	45
10	10	10.0	16.0	66.0	10.0	3	0.05	45
12	12	12.0	16.0	73.0	12.0	3	0.05	45
14	14	14.0	16.0	83.0	14.0	3	0.06	45
16	16	16.0	18.0	80.0	16.0	3	0.06	45

Cooling

Tolerance e8

Coating TiAlN- α

HA HB UNI

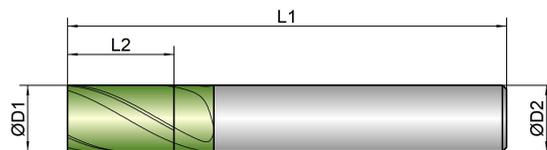
Basic



HA K201677



HB K201678



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
110	75	65					85	95	290							

K201677	K201678	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	 °
1	-	1.0	2.0	38.0	3.0	3	30
1,2	-	1.2	2.0	38.0	3.0	3	30
1,5	-	1.5	3.0	38.0	3.0	3	30
2	2	2.0	4.0	50.0	6.0	3	30
2,5	2,5	2.5	5.0	50.0	6.0	3	30
3	3	3.0	6.0	50.0	6.0	3	30
4	4	4.0	7.0	50.0	6.0	3	30
4,5	4,5	4.5	8.0	50.0	6.0	3	30
5	5	5.0	8.0	50.0	6.0	3	30
5,5	5,5	5.5	8.0	50.0	6.0	3	30
5,75	5,75	5.75	10.0	50.0	6.0	3	30
6	6	6.0	10.0	50.0	6.0	3	30
7	7	7.0	12.0	55.0	8.0	3	30
7,75	7,75	7.75	12.0	55.0	8.0	3	30
8	8	8.0	13.0	55.0	8.0	3	30
9	9	9.0	14.0	66.0	10.0	3	30
9,7	9,7	9.7	16.0	66.0	10.0	3	30
10	10	10.0	16.0	66.0	10.0	3	30
12	12	12.0	16.0	73.0	12.0	3	30
14	14	14.0	16.0	83.0	14.0	3	30
16	16	16.0	18.0	80.0	16.0	3	30

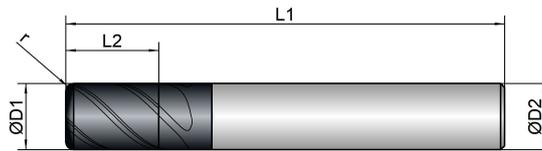
Cooling	
Tolerance	e8
Coating	TiSiN- α

HB ETC HPC MTC \neq 

NEW 



HB K201754



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
	185	175					100									

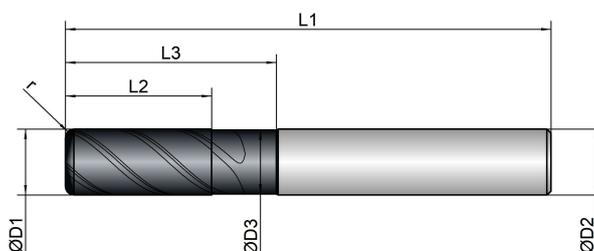
K201754	D1  mm ø	L2  mm	L1  mm	D2  mm ø	z  #	r  mm	 °
3	3.0	6.0	54.0	6.0	4	0.10	45
4	4.0	8.0	54.0	6.0	4	0.10	45
5	5.0	9.0	54.0	6.0	4	0.20	45
6	6.0	10.0	54.0	6.0	4	0.20	45
8	8.0	12.0	58.0	8.0	4	0.20	45
10	10.0	14.0	66.0	10.0	4	0.20	45
12	12.0	16.0	73.0	12.0	4	0.20	45
16	16.0	22.0	82.0	16.0	4	0.30	45
20	20.0	26.0	92.0	20.0	4	0.30	45

Cooling	 
Tolerance	e8
Coating	TiSiN- α

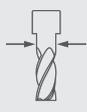
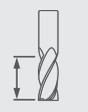
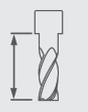
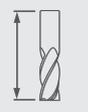
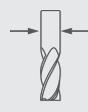
HB	ETC	HPC	MTC	
				



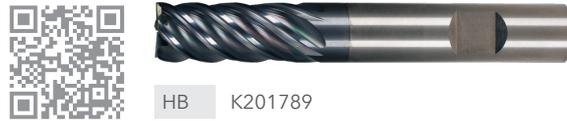
HB K201784



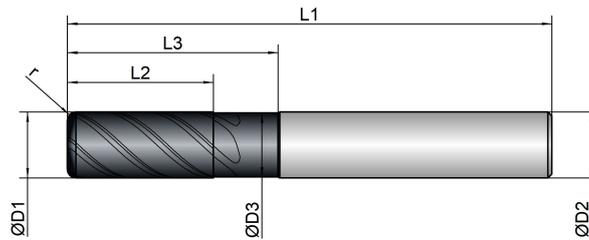
Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
	185	175					100									

K201784	D1  mm ∅	D3  mm ∅	L2  mm	L3  mm	L1  mm	D2  mm ∅	z  #	r  mm	 °
3/0,1	3.0	2.8	8.0	20.0	58.0	6.0	4	0.10	42.5
4/0,2	4.0	3.8	11.0	20.0	58.0	6.0	4	0.20	42.5
5/0,2	5.0	4.8	13.0	20.0	58.0	6.0	4	0.20	42.5
6/0,2	6.0	5.8	13.0	20.0	58.0	6.0	4	0.20	42.5
8/0,3	8.0	7.7	19.0	25.0	63.0	8.0	4	0.30	42.5
10/0,3	10.0	9.7	22.0	32.0	73.0	10.0	4	0.30	42.5
12/0,3	12.0	11.6	26.0	38.0	84.0	12.0	4	0.30	42.5
16/0,5	16.0	15.5	32.0	44.0	92.0	16.0	4	0.50	42.5
20/0,5	20.0	19.5	38.0	54.0	104.0	20.0	4	0.50	42.5
25/0,5	25.0	24.5	45.0	65.0	125.0	25.0	4	0.50	42.5

Cooling	
Tolerance	e8
Coating	TiSiN- α



HB K201789



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
	185	175					115									

	D1	D3	L2	L3	L1	D2	z	r	
K201789	mm Ø	mm Ø	mm	mm	mm	mm Ø	#	mm	°
6/0,2	6.0	5.8	13.0	20.0	58.0	6.0	5	0.20	42.5
8/0,3	8.0	7.7	19.0	25.0	63.0	8.0	5	0.30	42.5
10/0,3	10.0	9.7	22.0	32.0	73.0	10.0	5	0.30	42.5
12/0,3	12.0	11.6	26.0	38.0	84.0	12.0	5	0.30	42.5
16/0,5	16.0	15.5	32.0	44.0	92.0	16.0	5	0.50	42.5
20/0,5	20.0	19.5	38.0	54.0	104.0	20.0	5	0.50	42.5
25/0,5	25.0	24.5	45.0	65.0	125.0	25.0	5	0.50	42.5

Cooling

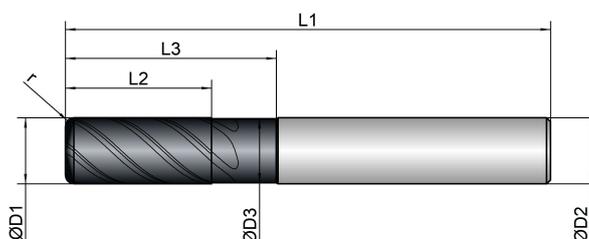
Tolerance e8

Coating TiSiN- α

HB ETC \neq



HB K201794



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
	230	180					200									

	D1	D3	L2	L3	L1	D2	z	r	
K201794	mm Ø	mm Ø	mm	mm	mm	mm Ø	#	mm	°
6/0,2	6.0	5.8	13.0	20.0	58.0	6.0	5	0.20	42.5
8/0,3	8.0	7.7	19.0	25.0	63.0	8.0	5	0.30	42.5
10/0,3	10.0	9.7	22.0	32.0	73.0	10.0	5	0.30	42.5
12/0,3	12.0	11.6	26.0	38.0	84.0	12.0	5	0.30	42.5
16/0,5	16.0	15.5	32.0	44.0	92.0	16.0	5	0.50	42.5
20/0,5	20.0	19.5	38.0	54.0	104.0	20.0	5	0.50	42.5

Cooling 

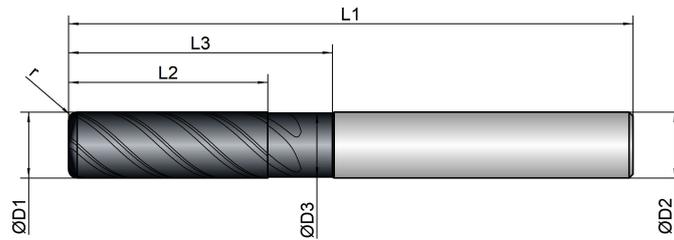
Tolerance e8

Coating TiSiN- α

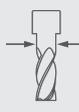
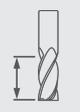
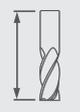
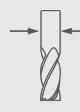
HB ETC \neq  3xD  



HB K201799



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
	230	180					200									

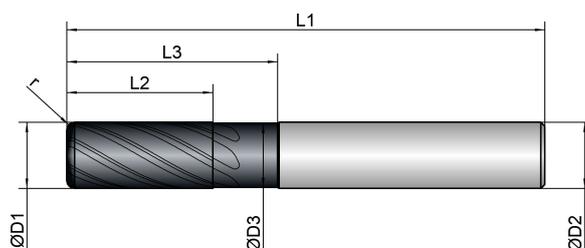
	D1	D3	L2	L3	L1	D2	z	r	
K201799	 mm Ø	 mm Ø	 mm	 mm	 mm	 mm Ø	 #	 mm	 °
6/0,2	6.0	5.8	18.0	25.0	65.0	6.0	5	0.20	42.5
8/0,3	8.0	7.7	24.0	32.0	70.0	8.0	5	0.30	42.5
10/0,3	10.0	9.7	30.0	40.0	85.0	10.0	5	0.30	42.5
12/0,3	12.0	11.6	36.0	46.0	100.0	12.0	5	0.30	42.5
16/0,5	16.0	15.5	48.0	58.0	110.0	16.0	5	0.50	42.5
20/0,5	20.0	19.5	60.0	70.0	126.0	20.0	5	0.50	42.5

Cooling 

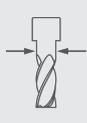
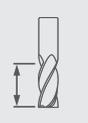
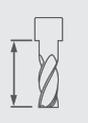
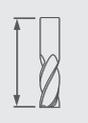
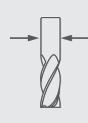
Tolerance e8

Coating TiSiN- α

HB ETC \neq  2xD



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
	240	210					220									

	D1	D3	L2	L3	L1	D2	z	r	
K201804	 mm Ø	 mm Ø	 mm	 mm	 mm	 mm Ø	 #	 mm	 °
6/0,15	6.0	5.8	13.0	20.0	57.0	6.0	7	0.15	42.5
8/0,15	8.0	7.7	19.0	25.0	63.0	8.0	7	0.15	42.5
10/0,2	10.0	9.7	22.0	32.0	72.0	10.0	7	0.20	42.5
12/0,2	12.0	11.6	26.0	38.0	83.0	12.0	7	0.20	42.5
16/0,3	16.0	15.5	32.0	44.0	92.0	16.0	7	0.30	42.5
20/0,3	20.0	19.5	38.0	54.0	104.0	20.0	7	0.30	42.5

Cooling 

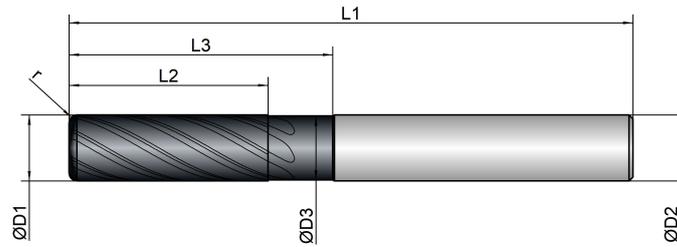
Tolerance e8

Coating TiSiN- α

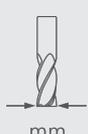
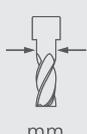
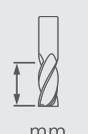
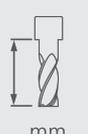
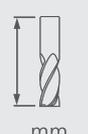
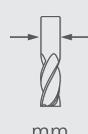
HB ETC \neq  3xD 



HB K201809



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
	240	210					220									

	D1	D3	L2	L3	L1	D2	z	r	
									
K201809	mm Ø	mm Ø	mm	mm	mm	mm Ø	#	mm	°
6/0,15	6.0	5.8	18.0	25.0	65.0	6.0	7	0.15	42.5
8/0,15	8.0	7.7	24.0	32.0	70.0	8.0	7	0.15	42.5
10/0,2	10.0	9.7	30.0	40.0	85.0	10.0	7	0.20	42.5
12/0,2	12.0	11.6	36.0	46.0	100.0	12.0	7	0.20	42.5
16/0,3	16.0	15.5	48.0	58.0	110.0	16.0	7	0.30	42.5
20/0,3	20.0	19.5	60.0	70.0	125.0	20.0	7	0.30	42.5

Cooling

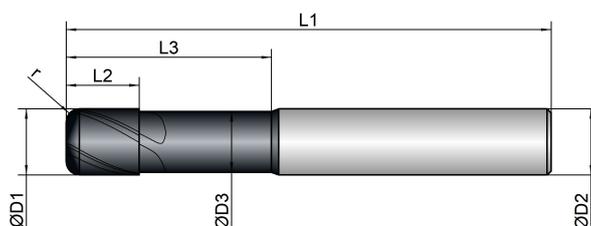
Tolerance e8

Coating TiAlN- α

HA HSC HPC

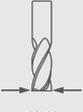
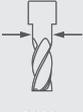
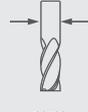


HA K202143



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
110	80						90	100								

K202143	D1 mm \varnothing	D3 mm \varnothing	L2 mm	L3 mm	L1 mm	D2 mm \varnothing	z #	r mm	 °
1/0,1	1.0	0.85	1.5	10.0	50.0	3.0	4	0.10	30
1/0,2	1.0	0.85	1.5	10.0	50.0	3.0	4	0.20	30
2/0,2	2.0	1.8	2.5	12.0	50.0	3.0	4	0.20	30
2/0,3	2.0	1.8	2.5	12.0	50.0	3.0	4	0.30	30
2/0,5	2.0	1.8	2.5	12.0	50.0	3.0	4	0.50	30
3/0,3	3.0	2.7	4.0	14.0	50.0	3.0	4	0.30	30
3/0,5	3.0	2.7	4.0	14.0	50.0	3.0	4	0.50	30
3/1	3.0	2.7	4.0	14.0	50.0	3.0	4	1.00	30
4/0,4	4.0	3.7	5.0	16.0	50.0	4.0	4	0.40	30
4/0,5	4.0	3.7	5.0	16.0	50.0	4.0	4	0.50	30
4/1	4.0	3.7	5.0	16.0	50.0	4.0	4	1.00	30
5/0,5	5.0	4.6	6.0	18.0	54.0	5.0	4	0.50	30
5/1	5.0	4.6	6.0	18.0	54.0	5.0	4	1.00	30

K202143	 D1 mm ∅	 D3 mm ∅	 L2 mm	 L3 mm	 L1 mm	 D2 mm ∅	 z #	 r mm	 °
6/0,5	6.0	5.5	7.0	21.0	58.0	6.0	4	0.50	30
6/1	6.0	5.5	7.0	21.0	58.0	6.0	4	1.00	30
6/1,5	6.0	5.5	7.0	21.0	58.0	6.0	4	1.50	30
8/0,5	8.0	7.4	9.0	27.0	64.0	8.0	4	0.50	30
8/1	8.0	7.4	9.0	27.0	64.0	8.0	4	1.00	30
8/1,5	8.0	7.4	9.0	27.0	64.0	8.0	4	1.50	30
8/2	8.0	7.4	9.0	27.0	64.0	8.0	4	2.00	30
10/0,5	10.0	9.2	11.0	32.0	73.0	10.0	4	0.50	30
10/1	10.0	9.2	11.0	32.0	73.0	10.0	4	1.00	30
10/1,5	10.0	9.2	11.0	32.0	73.0	10.0	4	1.50	30
10/2	10.0	9.2	11.0	32.0	73.0	10.0	4	2.00	30
12/0,5	12.0	11.0	12.0	38.0	84.0	12.0	4	0.50	30
12/1	12.0	11.0	12.0	38.0	84.0	12.0	4	1.00	30
12/1,5	12.0	11.0	12.0	38.0	84.0	12.0	4	1.50	30
12/2	12.0	11.0	12.0	38.0	84.0	12.0	4	2.00	30
12/5	12.0	11.0	12.0	38.0	84.0	12.0	4	5.00	30
16/1	16.0	15.0	16.0	44.0	93.0	16.0	4	1.00	30
16/2	16.0	15.0	16.0	44.0	93.0	16.0	4	2.00	30
16/6	16.0	15.0	16.0	44.0	93.0	16.0	4	6.00	30
20/1	20.0	18.5	20.0	55.0	104.0	20.0	4	1.00	30
20/2,5	20.0	18.5	20.0	55.0	104.0	20.0	4	2.50	30

Cooling

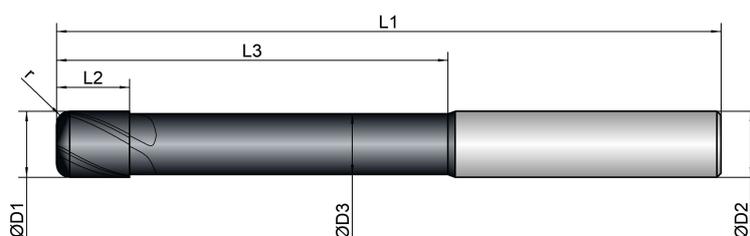
Tolerance e8

Coating TiAlN- α

HA HSC HPC

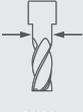
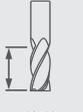
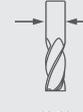


HA K202153



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
110	80						90	100								

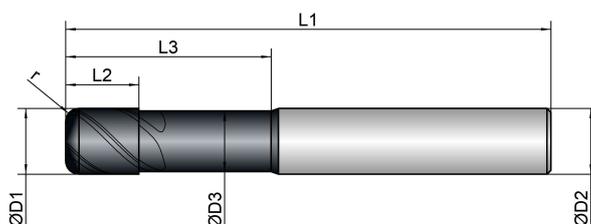
K202153	D1 mm Ø	D3 mm Ø	L2 mm	L3 mm	L1 mm	D2 mm Ø	z #	r mm	 °
1/0,1	1.0	0.85	1.5	20.0	75.0	3.0	4	0.10	30
1/0,2	1.0	0.85	1.5	20.0	75.0	3.0	4	0.20	30
2/0,2	2.0	1.8	2.5	25.0	75.0	3.0	4	0.20	30
2/0,3	2.0	1.8	2.5	25.0	75.0	3.0	4	0.30	30
2/0,5	2.0	1.8	2.5	25.0	75.0	3.0	4	0.50	30
3/0,3	3.0	2.7	4.0	32.0	75.0	3.0	4	0.30	30
3/0,5	3.0	2.7	4.0	32.0	75.0	3.0	4	0.50	30
3/1	3.0	2.7	4.0	32.0	75.0	3.0	4	1.00	30
4/0,4	4.0	3.7	5.0	36.0	75.0	4.0	4	0.40	30
4/0,5	4.0	3.7	5.0	36.0	75.0	4.0	4	0.50	30
4/1	4.0	3.7	5.0	36.0	75.0	4.0	4	1.00	30
5/0,5	5.0	4.6	6.0	40.0	75.0	5.0	4	0.50	30
5/1	5.0	4.6	6.0	40.0	75.0	5.0	4	1.00	30

K202153	 mm ∅	 mm ∅	 mm	 mm	 mm	 mm ∅	 #	 mm	 °
5,95/0,5	5.95	5.5	7.0	44.0	80.0	6.0	4	0.50	30
6/0,5	6.0	5.5	7.0	44.0	80.0	6.0	4	0.50	30
6/1	6.0	5.5	7.0	44.0	80.0	6.0	4	1.00	30
6/1,5	6.0	5.5	7.0	44.0	80.0	6.0	4	1.50	30
7,95/0,5	7.95	7.4	9.0	54.0	100.0	8.0	4	0.50	30
8/0,5	8.0	7.4	9.0	54.0	100.0	8.0	4	0.50	30
8/1	8.0	7.4	9.0	54.0	100.0	8.0	4	1.00	30
8/1,5	8.0	7.4	9.0	54.0	100.0	8.0	4	1.50	30
8/2	8.0	7.4	9.0	54.0	100.0	8.0	4	2.00	30
9,95/0,5	9.95	9.2	11.0	60.0	100.0	10.0	4	0.50	30
10/0,5	10.0	9.2	11.0	60.0	100.0	10.0	4	0.50	30
10/1	10.0	9.2	11.0	60.0	100.0	10.0	4	1.00	30
10/1,5	10.0	9.2	11.0	60.0	100.0	10.0	4	1.50	30
10/2	10.0	9.2	11.0	60.0	100.0	10.0	4	2.00	30
12/0,5	12.0	11.0	12.0	75.0	120.0	12.0	4	0.50	30
12/1	12.0	11.0	12.0	75.0	120.0	12.0	4	1.00	30
12/1,5	12.0	11.0	12.0	75.0	120.0	12.0	4	1.50	30
12/2	12.0	11.0	12.0	75.0	120.0	12.0	4	2.00	30
12/5	12.0	11.0	12.0	75.0	120.0	12.0	4	5.00	30
16/1	16.0	15.0	16.0	92.0	150.0	16.0	4	1.00	30
16/2	16.0	15.0	16.0	92.0	150.0	16.0	4	2.00	30
16/6	16.0	15.0	16.0	92.0	150.0	16.0	4	6.00	30
20/1	20.0	18.5	20.0	92.0	150.0	20.0	4	1.00	30
20/2,5	20.0	18.5	20.0	92.0	150.0	20.0	4	2.50	30

Cooling	
Tolerance	e8
Coating	TiAlN- α

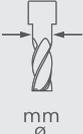


HA K202163



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
120	80	70	40	35			85	95								

K202163	D1 mm ø	D3 mm ø	L2 mm	L3 mm	L1 mm	D2 mm ø	z #	r mm	 °
3/0,3	3.0	2.7	4.0	14.0	50.0	3.0	4	0.30	45
3/0,5	3.0	2.7	4.0	14.0	50.0	3.0	4	0.50	45
3/1	3.0	2.7	4.0	14.0	50.0	3.0	4	1.00	45
4/0,4	4.0	3.7	5.0	16.0	50.0	4.0	4	0.40	45
4/0,5	4.0	3.7	5.0	16.0	50.0	4.0	4	0.50	45
4/1	4.0	3.7	5.0	16.0	50.0	4.0	4	1.00	45
5/0,5	5.0	4.6	6.0	18.0	54.0	5.0	4	0.50	45
5/1	5.0	4.6	6.0	18.0	54.0	5.0	4	1.00	45
6/0,5	6.0	5.5	7.0	21.0	58.0	6.0	4	0.50	45
6/1	6.0	5.5	7.0	21.0	58.0	6.0	4	1.00	45
6/1,5	6.0	5.5	7.0	21.0	58.0	6.0	4	1.50	45
8/0,5	8.0	7.4	9.0	27.0	64.0	8.0	4	0.50	45

K202163	 D1 mm ∅	 D3 mm ∅	 L2 mm	 L3 mm	 L1 mm	 D2 mm ∅	 z #	 r mm	 °
8/1	8.0	7.4	9.0	27.0	64.0	8.0	4	1.00	45
8/1,5	8.0	7.4	9.0	27.0	64.0	8.0	4	1.50	45
8/2	8.0	7.4	9.0	27.0	64.0	8.0	4	2.00	45
10/0,5	10.0	9.2	11.0	32.0	73.0	10.0	4	0.50	45
10/1	10.0	9.2	11.0	32.0	73.0	10.0	4	1.00	45
10/1,5	10.0	9.2	11.0	32.0	73.0	10.0	4	1.50	45
10/2	10.0	9.2	11.0	32.0	73.0	10.0	4	2.00	45
12/0,5	12.0	11.0	12.0	38.0	84.0	12.0	4	0.50	45
12/1	12.0	11.0	12.0	38.0	84.0	12.0	4	1.00	45
12/1,5	12.0	11.0	12.0	38.0	84.0	12.0	4	1.50	45
12/2	12.0	11.0	12.0	38.0	84.0	12.0	4	2.00	45
16/1	16.0	15.0	16.0	44.0	93.0	16.0	4	1.00	45
16/2	16.0	15.0	16.0	44.0	93.0	16.0	4	2.00	45
20/1	20.0	18.5	20.0	50.0	104.0	20.0	4	1.00	45
20/2,5	20.0	18.5	20.0	50.0	104.0	20.0	4	2.50	45

Cooling

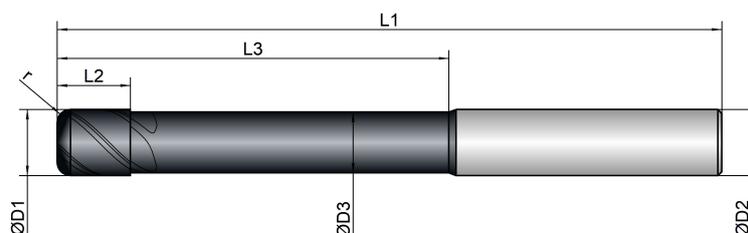
Tolerance e8

Coating TiAlN- α

HA HSC UNI

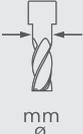


HA K202173



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
120	80	70	40	35			85	95								

K202173	D1 mm ∅	D3 mm ∅	L2 mm	L3 mm	L1 mm	D2 mm ∅	z #	r mm	 °
3/0,3	3.0	2.7	4.0	32.0	75.0	3.0	4	0.30	45
3/0,5	3.0	2.7	4.0	32.0	75.0	3.0	4	0.50	45
3/1	3.0	2.7	4.0	32.0	75.0	3.0	4	1.00	45
4/0,4	4.0	3.7	5.0	36.0	75.0	4.0	4	0.40	45
4/0,5	4.0	3.7	5.0	36.0	75.0	4.0	4	0.50	45
4/1	4.0	3.7	5.0	36.0	75.0	4.0	4	1.00	45
5/0,5	5.0	4.6	6.0	40.0	75.0	5.0	4	0.50	45
5/1	5.0	4.6	6.0	40.0	75.0	5.0	4	1.00	45
6/0,5	6.0	5.5	7.0	44.0	80.0	6.0	4	0.50	45
6/1	6.0	5.5	7.0	44.0	80.0	6.0	4	1.00	45
6/1,5	6.0	5.5	7.0	44.0	80.0	6.0	4	1.50	45
8/0,5	8.0	7.4	9.0	54.0	100.0	8.0	4	0.50	45

K202173	 D1 mm ∅	 D3 mm ∅	 L2 mm	 L3 mm	 L1 mm	 D2 mm ∅	 z #	 r mm	 °
8/1	8.0	7.4	9.0	54.0	100.0	8.0	4	1.00	45
8/1,5	8.0	7.4	9.0	54.0	100.0	8.0	4	1.50	45
8/2	8.0	7.4	9.0	54.0	100.0	8.0	4	2.00	45
10/0,5	10.0	9.2	11.0	60.0	100.0	10.0	4	0.50	45
10/1	10.0	9.2	11.0	60.0	100.0	10.0	4	1.00	45
10/1,5	10.0	9.2	11.0	60.0	100.0	10.0	4	1.50	45
10/2	10.0	9.2	11.0	60.0	100.0	10.0	4	2.00	45
12/0,5	12.0	11.0	12.0	75.0	120.0	12.0	4	0.50	45
12/1	12.0	11.0	12.0	75.0	120.0	12.0	4	1.00	45
12/1,5	12.0	11.0	12.0	75.0	120.0	12.0	4	1.50	45
12/2	12.0	11.0	12.0	75.0	120.0	12.0	4	2.00	45
16/1	16.0	15.0	16.0	92.0	150.0	16.0	4	1.00	45
16/2	16.0	15.0	16.0	92.0	150.0	16.0	4	2.00	45
20/1	20.0	18.5	20.0	92.0	150.0	20.0	4	1.00	45
20/2,5	20.0	18.5	20.0	92.0	150.0	20.0	4	2.50	45

Cooling

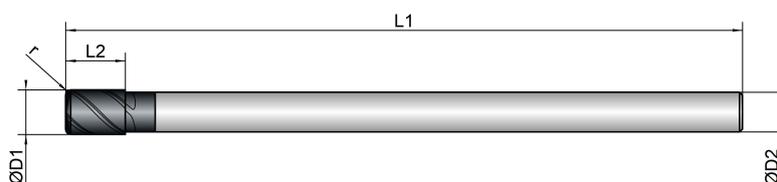
Tolerance e8

Coating TiAlN- α

HA HSC UNI



HA K202202



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
75	55	50	28	23			65	70								

K202202	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	r mm	 °
7/0,5	7.0	9.0	121.0	6.0	4	0.50	45
7/1	7.0	9.0	121.0	6.0	4	1.00	45
7/1,5	7.0	9.0	121.0	6.0	4	1.50	45
9/0,5	9.0	12.0	136.0	8.0	4	0.50	45
9/1	9.0	12.0	136.0	8.0	4	1.00	45
9/1,5	9.0	12.0	136.0	8.0	4	1.50	45
11/1	11.0	15.0	150.0	10.0	4	1.00	45
11/1,5	11.0	15.0	150.0	10.0	4	1.50	45
11/2	11.0	15.0	150.0	10.0	4	2.00	45
13/1	13.0	18.0	160.0	12.0	4	1.00	45
13/1,5	13.0	18.0	160.0	12.0	4	1.50	45
13/2	13.0	18.0	160.0	12.0	4	2.00	45
15/1	15.0	21.0	160.0	14.0	4	1.00	45
15/1,5	15.0	21.0	160.0	14.0	4	1.50	45
15/2	15.0	21.0	160.0	14.0	4	2.00	45
17/1	17.0	24.0	180.0	16.0	4	1.00	45
17/1,5	17.0	24.0	180.0	16.0	4	1.50	45
17/2	17.0	24.0	180.0	16.0	4	2.00	45
17/3	17.0	24.0	180.0	16.0	4	3.00	45

Cooling 

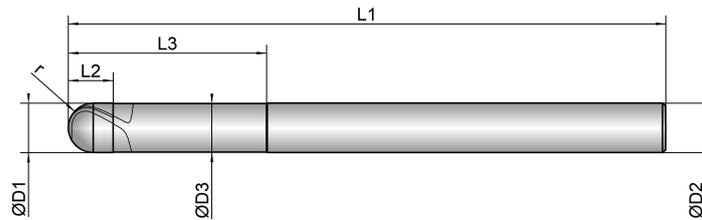
Tolerance f7

Coating -

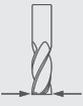
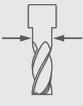
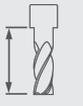
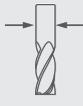
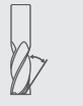
HA HSC UNI 




HA K203001



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
80	50						45	75	190	170	240					

K203001	D1  mm Ø	D3  mm Ø	L2  mm	L3  mm	L1  mm	D2  mm Ø	z  #	r  mm	 °
1/6	1.0	0.9	2.0	6.0	100.0	6.0	2	0.50	30
2/6	2.0	1.8	3.0	8.0	100.0	6.0	2	1.00	30
3/6	3.0	2.8	4.0	12.0	100.0	6.0	2	1.50	30
4/6	4.0	3.8	5.0	16.0	100.0	6.0	2	2.00	30
5/6	5.0	4.8	6.0	20.0	100.0	6.0	2	2.50	30
6/6	6.0	5.8	6.0	25.0	100.0	6.0	2	3.00	30
6/8	6.0	5.8	6.0	25.0	100.0	8.0	2	3.00	30
8/8	8.0	7.8	7.0	32.0	100.0	8.0	2	4.00	30
8/10	8.0	7.8	7.0	32.0	120.0	10.0	2	4.00	30
10/10	10.0	9.8	9.0	40.0	120.0	10.0	2	5.00	30
10/12	10.0	9.8	9.0	40.0	160.0	12.0	2	5.00	30
12/12	12.0	11.8	11.0	50.0	160.0	12.0	2	6.00	30
12/16	12.0	11.8	11.0	50.0	200.0	16.0	2	6.00	30
16/16	16.0	15.5	14.0	60.0	200.0	16.0	2	8.00	30

Cooling

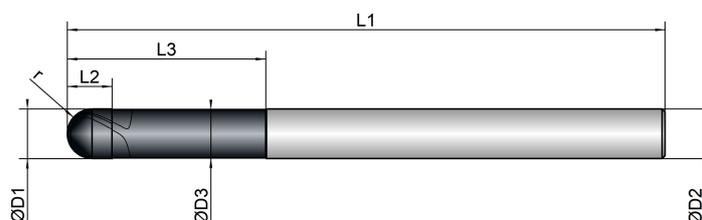
Tolerance f7

Coating TiAlN- α

HA HSC UNI



HA K203003



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
400	290	210					210	580	360	330						

K203003	D1 mm ø	D3 mm ø	L2 mm	L3 mm	L1 mm	D2 mm ø	z #	r mm	 °
1/6	1.0	0.9	2.0	6.0	100.0	6.0	2	0.50	30
2/6	2.0	1.8	3.0	8.0	100.0	6.0	2	1.00	30
3/6	3.0	2.8	4.0	12.0	100.0	6.0	2	1.50	30
4/6	4.0	3.8	5.0	16.0	100.0	6.0	2	2.00	30
5/6	5.0	4.8	6.0	20.0	100.0	6.0	2	2.50	30
6/6	6.0	5.8	6.0	25.0	100.0	6.0	2	3.00	30
6/8	6.0	5.8	6.0	25.0	100.0	8.0	2	3.00	30
8/8	8.0	7.8	7.0	32.0	100.0	8.0	2	4.00	30
8/10	8.0	7.8	7.0	32.0	120.0	10.0	2	4.00	30
10/10	10.0	9.8	9.0	40.0	120.0	10.0	2	5.00	30
10/12	10.0	9.8	9.0	40.0	160.0	12.0	2	5.00	30
12/12	12.0	11.8	11.0	50.0	160.0	12.0	2	6.00	30
12/16	12.0	11.8	11.0	50.0	200.0	16.0	2	6.00	30
16/16	16.0	15.5	14.0	60.0	200.0	16.0	2	8.00	30

Cooling

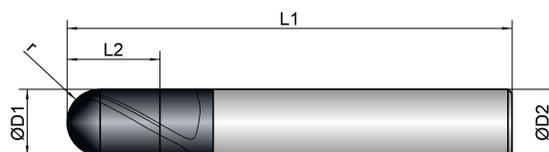
Tolerance f8

Coating TiAlN- α

HA HSC HPC UNI



HA K203033



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
420	290	220	165	150			225	615								

K203033	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	r mm	 °
0,1/3	0.1	0.2	38.0	3.0	2	0.05	30
0,15/3	0.15	0.3	38.0	3.0	2	0.075	30
0,2/3	0.2	0.4	38.0	3.0	2	0.10	30
0,25/3	0.25	0.5	38.0	3.0	2	0.125	30
0,3/3	0.3	1.0	38.0	3.0	2	0.15	30
0,35/3	0.35	1.0	38.0	3.0	2	0.175	30
0,4/3	0.4	1.0	38.0	3.0	2	0.20	30
0,5/3	0.5	1.5	38.0	3.0	2	0.25	30
0,5/6	0.5	1.5	54.0	6.0	2	0.25	30
0,6/3	0.6	1.5	38.0	3.0	2	0.30	30
0,7/3	0.7	2.0	38.0	3.0	2	0.35	30
0,8/3	0.8	2.0	38.0	3.0	2	0.40	30
0,9/3	0.9	2.5	38.0	3.0	2	0.45	30
1/3	1.0	2.0	50.0	3.0	2	0.50	30
1/6	1.0	2.0	54.0	6.0	2	0.50	30

	 D1 mm \varnothing	 L2 mm	 L1 mm	 D2 mm \varnothing	 z #	 r mm	 °
K203033							
1,1/3	1.1	3.0	50.0	3.0	2	0.55	30
1,2/3	1.2	3.0	50.0	3.0	2	0.60	30
1,4/3	1.4	3.0	50.0	3.0	2	0.70	30
1,5/3	1.5	3.0	50.0	3.0	2	0.75	30
1,5/6	1.5	3.0	54.0	6.0	2	0.75	30
1,6/3	1.6	4.0	50.0	3.0	2	0.80	30
1,8/3	1.8	4.0	50.0	3.0	2	0.90	30
2/3	2.0	4.0	50.0	3.0	2	1.00	30
2/6	2.0	4.0	54.0	6.0	2	1.00	30
2,5/3	2.5	5.0	50.0	3.0	2	1.25	30
2,5/6	2.5	5.0	54.0	6.0	2	1.25	30
3/3	3.0	6.0	50.0	3.0	2	1.50	30
3/6	3.0	6.0	54.0	6.0	2	1.50	30
4/4	4.0	7.0	54.0	4.0	2	2.00	30
4/6	4.0	7.0	54.0	6.0	2	2.00	30
5/5	5.0	8.0	54.0	5.0	2	2.50	30
5/6	5.0	8.0	54.0	6.0	2	2.50	30
6/6	6.0	10.0	54.0	6.0	2	3.00	30
7/8	7.0	12.0	59.0	8.0	2	3.50	30
8/8	8.0	12.0	59.0	8.0	2	4.00	30
10/10	10.0	14.0	67.0	10.0	2	5.00	30
12/12	12.0	16.0	73.0	12.0	2	6.00	30
14/14	14.0	16.0	75.0	14.0	2	7.00	30
16/16	16.0	20.0	83.0	16.0	2	8.00	30
18/18	18.0	22.0	93.0	18.0	2	9.00	30
20/20	20.0	25.0	93.0	20.0	2	10.00	30

Cooling

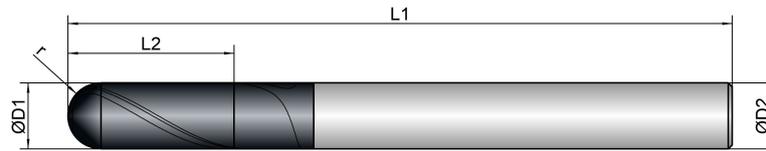
Tolerance f8

Coating TiAlN- α

HA HSC HPC UNI



HA K203063



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
350	240	180	135	125			180	500			695					

K203063	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	r mm	 °
0,5/3	0.5	1.5	75.0	3.0	2	0.25	30
0,5/6	0.5	1.5	80.0	6.0	2	0.25	30
1/3	1.0	3.0	75.0	3.0	2	0.50	30
1/6	1.0	3.0	80.0	6.0	2	0.50	30
1,5/3	1.5	4.0	75.0	3.0	2	0.75	30
1,5/6	1.5	4.0	80.0	6.0	2	0.75	30
2/3	2.0	6.0	75.0	3.0	2	1.00	30
2/6	2.0	6.0	80.0	6.0	2	1.00	30
2,5/3	2.5	8.0	75.0	3.0	2	1.25	30
2,5/6	2.5	8.0	80.0	6.0	2	1.25	30
3/3	3.0	10.0	75.0	3.0	2	1.50	30
3/6	3.0	10.0	80.0	6.0	2	1.50	30
4/4	4.0	13.0	75.0	4.0	2	2.00	30
4/6	4.0	13.0	80.0	6.0	2	2.00	30
5/5	5.0	14.0	75.0	5.0	2	2.50	30
5/6	5.0	14.0	100.0	6.0	2	2.50	30
6/6	6.0	16.0	100.0	6.0	2	3.00	30
8/8	8.0	22.0	100.0	8.0	2	4.00	30
10/10	10.0	25.0	100.0	10.0	2	5.00	30
12/12	12.0	26.0	100.0	12.0	2	6.00	30
14/14	14.0	26.0	100.0	14.0	2	7.00	30
16/16	16.0	30.0	150.0	16.0	2	8.00	30
20/20	20.0	40.0	150.0	20.0	2	10.00	30

Cooling 

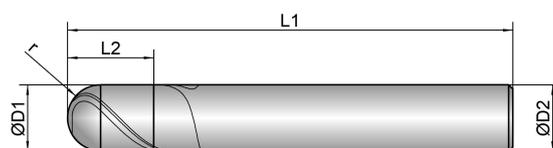
Tolerance f8

Coating -

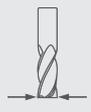
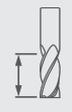
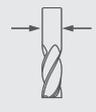
HA UNI  



HA K203081

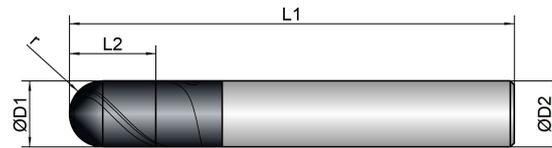


Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
70	50						45	75	190	160	240					

K203081	D1  mm Ø	L2  mm	L1  mm	D2  mm Ø	z  #	r  mm	 °
3	3.0	6.0	50.0	3.0	2	1.50	45
4	4.0	7.0	54.0	4.0	2	2.00	45
5	5.0	8.0	54.0	5.0	2	2.50	45
6	6.0	10.0	54.0	6.0	2	3.00	45
8	8.0	12.0	59.0	8.0	2	4.00	45
10	10.0	13.0	67.0	10.0	2	5.00	45
12	12.0	16.0	74.0	12.0	2	6.00	45
14	14.0	16.0	75.0	14.0	2	7.00	45
16	16.0	20.0	83.0	16.0	2	8.00	45
20	20.0	25.0	93.0	20.0	2	10.00	45

Cooling	
Tolerance	f8
Coating	TiAlN- α

HA	HSC	UNI	
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Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
140	80	75					85	130	360	330	400					

K203083	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	r mm	 °
3	3.0	6.0	50.0	3.0	2	1.50	45
4	4.0	7.0	54.0	4.0	2	2.00	45
5	5.0	8.0	54.0	5.0	2	2.50	45
6	6.0	10.0	54.0	6.0	2	3.00	45
8	8.0	12.0	59.0	8.0	2	4.00	45
10	10.0	13.0	67.0	10.0	2	5.00	45
12	12.0	16.0	74.0	12.0	2	6.00	45
14	14.0	16.0	75.0	14.0	2	7.00	45
16	16.0	20.0	83.0	16.0	2	8.00	45
20	20.0	25.0	93.0	20.0	2	10.00	45

Cooling 

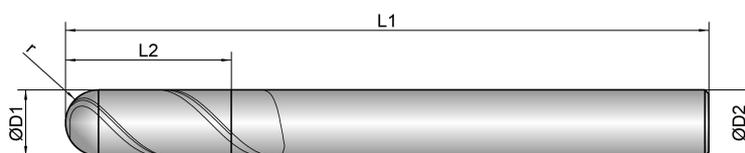
Tolerance f8

Coating -

HA UNI 



HA K203091



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
60	40						35	65	170	140	220					

K203091	D1  mm ø	L2  mm	L1  mm	D2  mm ø	z  #	r  mm	 °
3	3.0	10.0	75.0	3.0	2	1.50	45
4	4.0	13.0	75.0	4.0	2	2.00	45
5	5.0	15.0	75.0	5.0	2	2.50	45
6	6.0	16.0	100.0	6.0	2	3.00	45
8	8.0	22.0	100.0	8.0	2	4.00	45
10	10.0	25.0	100.0	10.0	2	5.00	45
12	12.0	26.0	100.0	12.0	2	6.00	45
14	14.0	26.0	100.0	14.0	2	7.00	45
16	16.0	30.0	150.0	16.0	2	8.00	45
20	20.0	40.0	150.0	20.0	2	10.00	45

Cooling

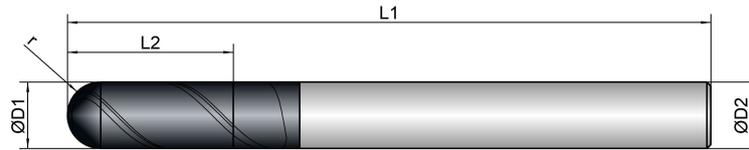
Tolerance f8

Coating TiAlN- α

HA HSC UNI



HA K203093



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
110	70	65					75	120	340	310		380				

K203093	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	r mm	 °
3	3.0	10.0	75.0	3.0	2	1.50	45
4	4.0	13.0	75.0	4.0	2	2.00	45
5	5.0	15.0	75.0	5.0	2	2.50	45
6	6.0	16.0	100.0	6.0	2	3.00	45
8	8.0	22.0	100.0	8.0	2	4.00	45
10	10.0	25.0	100.0	10.0	2	5.00	45
12	12.0	26.0	100.0	12.0	2	6.00	45
14	14.0	26.0	100.0	14.0	2	7.00	45
16	16.0	30.0	150.0	16.0	2	8.00	45
20	20.0	40.0	150.0	20.0	2	10.00	45

Cooling

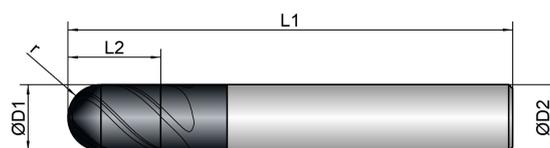
Tolerance f8

Coating TiAlN- α

HA HSC HPC MTC UNI



HA K203253



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
210	150	140					90	360	400						50	

K203253	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	r mm	 °
3	3.0	5.0	50.0	3.0	4	1.50	45
4	4.0	8.0	54.0	4.0	4	2.00	45
5	5.0	9.0	54.0	5.0	4	2.50	45
6	6.0	10.0	54.0	6.0	4	3.00	45
8	8.0	12.0	59.0	8.0	4	4.00	45
10	10.0	14.0	67.0	10.0	4	5.00	45
12	12.0	16.0	74.0	12.0	4	6.00	45
14	14.0	18.0	75.0	14.0	4	7.00	45
16	16.0	22.0	83.0	16.0	4	8.00	45
20	20.0	26.0	93.0	20.0	4	10.00	45

Cooling

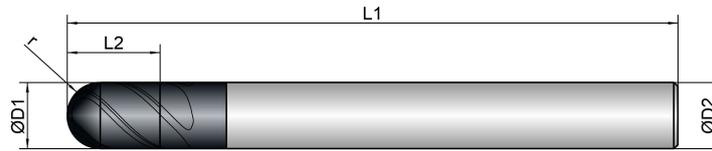
Tolerance f8

Coating TiAlN- α

HA HSC HPC MTC UNI



HA K203263



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
190	130	120					80	340	380							40

K203263	D1 mm Ø	L2 mm	L1 mm	D2 mm Ø	z #	r mm	 °
3	3.0	5.0	75.0	3.0	4	1.50	45
4	4.0	8.0	75.0	4.0	4	2.00	45
5	5.0	9.0	75.0	5.0	4	2.50	45
6	6.0	10.0	100.0	6.0	4	3.00	45
8	8.0	12.0	100.0	8.0	4	4.00	45
10	10.0	14.0	100.0	10.0	4	5.00	45
12	12.0	16.0	100.0	12.0	4	6.00	45
14	14.0	18.0	100.0	14.0	4	7.00	45
16	16.0	22.0	150.0	16.0	4	8.00	45
20	20.0	26.0	150.0	20.0	4	10.00	45

Cooling

Tolerance f8

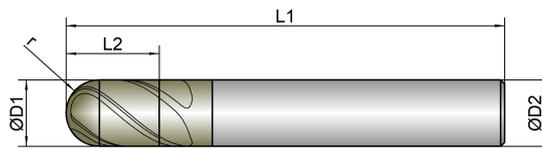
Coating TiSiN- α

HA HSC HPC

NEW



HA K203413



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
200	160	150					100	350								

K203413	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	r mm	 °
3	3.0	5.0	54.0	6.0	4	1.50	40
4	4.0	8.0	54.0	6.0	4	2.00	40
5	5.0	9.0	54.0	6.0	4	2.50	40
6	6.0	10.0	54.0	6.0	4	3.00	40
8	8.0	12.0	58.0	8.0	4	4.00	40
10	10.0	14.0	66.0	10.0	4	5.00	40
12	12.0	16.0	73.0	12.0	4	6.00	40
16	16.0	22.0	82.0	16.0	4	8.00	40

Cooling 

Tolerance f8

Coating TiSiN- α

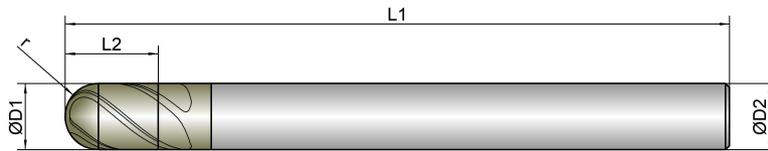
HA HSC HPC 

NEW

Expert 



HA K203418



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
190	150	140					90	340								

K203418	D1  mm ø	L2  mm	L1  mm	D2  mm ø	z  #	r  mm	 °
3	3.0	5.0	83.0	6.0	4	1.50	40
4	4.0	8.0	83.0	6.0	4	2.00	40
5	5.0	9.0	83.0	6.0	4	2.50	40
6	6.0	10.0	83.0	6.0	4	3.00	40
8	8.0	12.0	100.0	8.0	4	4.00	40
10	10.0	14.0	100.0	10.0	4	5.00	40
12	12.0	16.0	100.0	12.0	4	6.00	40
16	16.0	22.0	150.0	16.0	4	8.00	40

SC conical engraving cutter 60° | K204001

Cooling

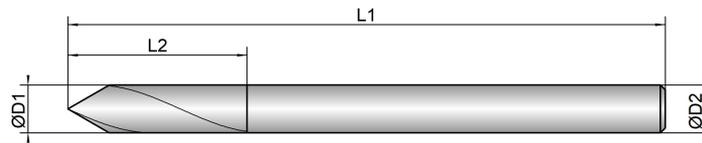
Tolerance -

Coating -

HA UNI



HA K204001



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
60	35						40	55	200	●						

K204001	D1 mm ∅	L2 mm	L1 mm	D2 mm ∅	z #	 °
3	3.0	15.0	50.0	3.0	1	30
4	4.0	18.0	50.0	4.0	1	30
6	6.0	20.0	54.0	6.0	1	30

Cooling 

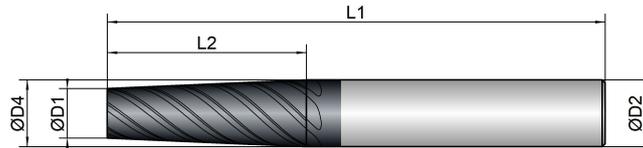
Tolerance -

Coating TiAlN- α

HA UNI 



HA K204013



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
●	●	●					●	●	●							

K204013	D1  mm ∅	D4  mm ∅	L2  mm	L1  mm	D2  mm ∅	z  #	 °
2X10	2	3	10.0	50.0	3.0	4	30
2,5X10	2.5	3	10.0	50.0	3.0	4	30
2,5X20	2.5	4	20.0	60.0	4.0	4	30
3X20	3	4	20.0	60.0	4.0	4	30
4X20	4	5	20.0	60.0	5.0	4	30
5X30	5	6	30.0	75.0	6.0	6	45
6X30	6	8	30.0	75.0	8.0	6	45
8X30	8	10	30.0	80.0	10.0	6	45
10X30	10	12	30.0	85.0	12.0	6	45
12X30	12	14	30.0	85.0	14.0	6	45
12X50	12	14	50.0	110.0	14.0	6	45
16X60	16	18	60.0	120.0	18.0	6	45

Cooling 

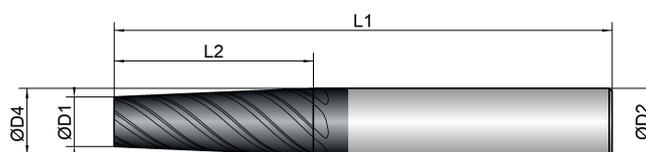
Tolerance -

Coating TiAlN- α

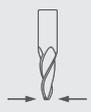
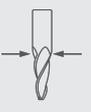
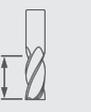
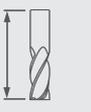
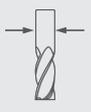
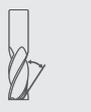
HA UNI



HA K204023



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
●	●	●					●	●	●							

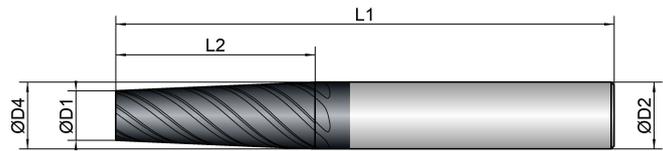
K204023	D1  mm ∅	D4  mm ∅	L2  mm	L1  mm	D2  mm ∅	z  #	 °
2X10	2	3	10.0	50.0	3.0	4	30
2,5X10	2.5	3	10.0	50.0	3.0	4	45
2,5X20	2.5	4	20.0	60.0	4.0	4	30
3X20	3	4	20.0	60.0	4.0	4	30
3,5X20	3.5	5	20.0	60.0	5.0	4	30
4X20	4	5	20.0	60.0	5.0	4	30
4,5X20	4.5	6	20.0	65.0	6.0	6	45
5X25	5	6	25.0	70.0	6.0	6	45
6X30	6	8	30.0	75.0	8.0	6	45
8X30	8	10	30.0	80.0	10.0	6	45
10X30	10	12	30.0	85.0	12.0	6	45
12X30	12	14	30.0	85.0	14.0	6	45
12X50	12	14	50.0	110.0	14.0	6	45
16X55	16	18	55.0	115.0	18.0	6	45

Cooling 

Tolerance -

Coating TiAlN- α

HA UNI 



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
●	●	●					●	●	●							

K204033	D1  mm ∅	D4  mm ∅	L2  mm	L1  mm	D2  mm ∅	z  #	 °
2X10	2	3	10.0	50.0	3.0	4	30
2,5X10	2.5	4	10.0	50.0	4.0	4	30
2,5X20	2.5	4	20.0	60.0	4.0	4	30
3X20	3	4	20.0	60.0	4.0	4	30
3,5X20	3.5	5	20.0	60.0	5.0	4	30
4X20	4	5	20.0	60.0	5.0	4	30
4,5X20	4.5	6	20.0	65.0	6.0	4	30
5X30	5	8	30.0	75.0	8.0	6	45
6X30	6	8	30.0	75.0	8.0	6	45
8X30	8	10	30.0	80.0	10.0	6	45
10X30	10	12	30.0	85.0	12.0	6	45
12X30	12	14	30.0	85.0	14.0	6	45
12X50	12	16	50.0	110.0	16.0	6	45
16X60	16	20	60.0	126.0	20.0	6	45

Cooling 

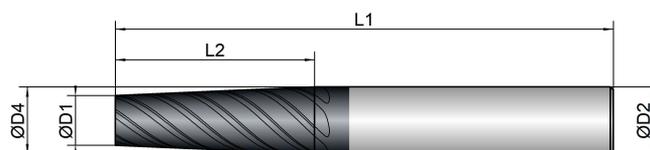
Tolerance -

Coating TiAlN- α

HA UNI



HA K204043



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
●	●	●					●	●	●							

K204043	D1  mm ∅	D4  mm ∅	L2  mm	L1  mm	D2  mm ∅	z  #	 °
2X10	2	3	10.0	50.0	3.0	4	30
2,5X10	2.5	4	10.0	50.0	4.0	4	30
2,5X20	2.5	4	20.0	60.0	4.0	4	30
3X20	3	5	20.0	60.0	5.0	4	30
3,5X20	3.5	5	20.0	60.0	5.0	4	30
4X20	4	6	20.0	65.0	6.0	4	30
4,5X30	4.5	8	30.0	75.0	8.0	4	30
5X30	5	8	30.0	75.0	8.0	6	45
6X28	6	8	28.0	75.0	8.0	6	45
8X28	8	10	28.0	75.0	10.0	6	45
10X28	10	12	28.0	85.0	12.0	6	45
12X28	12	14	28.0	85.0	14.0	6	45
12X50	12	16	50.0	110.0	16.0	6	45
16X55	16	20	55.0	115.0	20.0	6	45

Cooling 

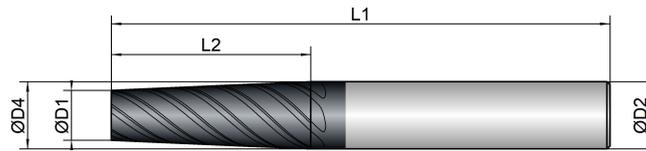
Tolerance -

Coating TiAlN- α

HA UNI 



HA K204053



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
●	●	●					●	●	●							

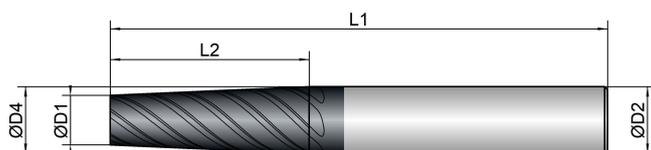
	D1  mm ø	D4  mm ø	L2  mm	L1  mm	D2  mm ø	z  #	 °
K204053							
2X15	2	4	15.0	50.0	4.0	4	30
2,5X20	2.5	5	20.0	60.0	5.0	4	30
3X20	3	5	20.0	60.0	5.0	4	30
4X20	4	6	20.0	65.0	6.0	4	30
5X30	5	8	30.0	75.0	8.0	6	45
6X30	6	10	30.0	80.0	10.0	6	45
8X30	8	12	30.0	85.0	12.0	6	45
10X40	10	14	40.0	100.0	14.0	6	45

Cooling 

Tolerance -

Coating TiAlN- α

HA UNI 



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
●	●	●					●	●	●							

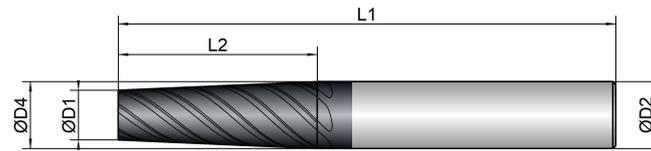
K204063	D1  mm ∅	D4  mm ∅	L2  mm	L1  mm	D2  mm ∅	z  #	 °
2X10	2	4	10.0	50.0	4.0	4	30
2,5X10	2.5	4	10.0	50.0	4.0	4	30
2,5X20	2.5	6	20.0	65.0	6.0	4	30
3X25	3	6	25.0	70.0	6.0	4	30
3X30	3	8	30.0	75.0	8.0	4	30
3X40	3	8	40.0	85.0	8.0	4	30
4X25	4	8	25.0	70.0	8.0	6	45
4X30	4	8	30.0	75.0	8.0	6	45
5X40	5	10	40.0	90.0	10.0	6	45
6X30	6	10	30.0	80.0	10.0	6	45
8X30	8	12	30.0	84.0	12.0	6	45
8X50	8	14	50.0	110.0	14.0	6	45
10X30	10	14	30.0	84.0	14.0	6	45
10X50	10	16	50.0	110.0	16.0	6	45
12X30	12	16	30.0	90.0	16.0	6	45
12X50	12	18	50.0	110.0	18.0	6	45

Cooling	
Tolerance	-
Coating	TiAlN- α

HA UNI



HA K204073



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
●	●	●					●	●	●							

K204073	D1 mm ∅	D4 mm ∅	L2 mm	L1 mm	D2 mm ∅	z #	 °
2,5X25	2.5	6	25.0	65.0	6.0	4	30
3X20	3	6	20.0	65.0	6.0	4	30
3,5X25	3.5	8	25.0	70.0	8.0	4	30
4X28	4	8	28.0	70.0	8.0	6	45
5X30	5	10	30.0	85.0	10.0	6	45
5X45	5	12	45.0	100.0	12.0	6	45
6X30	6	12	30.0	84.0	12.0	6	45
6X50	6	14	50.0	110.0	14.0	6	45
8X30	8	14	30.0	84.0	14.0	6	45
8X50	8	16	50.0	110.0	16.0	6	45
10X30	10	16	30.0	93.0	16.0	6	45
10X50	10	18	50.0	114.0	18.0	6	45

Cooling 

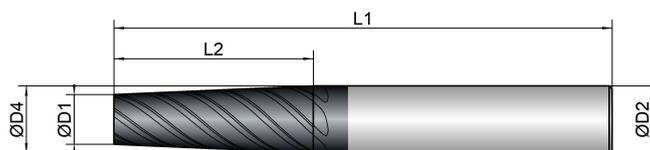
Tolerance -

Coating TiAlN- α

HA UNI 



HA K204083



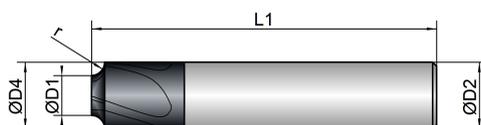
Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
●	●	●					●	●	●							

	D1  mm ∅	D4  mm ∅	L2  mm	L1  mm	D2  mm ∅	z  #	 °
K204083							
2,5X20	2.5	6	20.0	65.0	6.0	4	30
3X28	3	8	28.0	70.0	8.0	4	30
3,5X30	3.5	10	30.0	80.0	10.0	4	30
4X30	4	10	30.0	80.0	10.0	6	45
4,5X30	4.5	10	30.0	80.0	10.0	6	45
5X30	5	12	30.0	84.0	12.0	6	45
5X40	5	12	40.0	100.0	12.0	6	45
6X30	6	12	30.0	93.0	12.0	6	45
6X55	6	16	55.0	110.0	16.0	6	45
8X30	8	14	30.0	90.0	14.0	6	45
8X50	8	18	50.0	114.0	18.0	6	45
10X30	10	16	30.0	93.0	16.0	6	45
10X55	10	20	55.0	115.0	20.0	6	45
12X30	12	18	30.0	93.0	18.0	6	45
12X45	12	20	45.0	100.0	20.0	6	45

Cooling	
Tolerance	0-0,01
Coating	TiAlN- α



HA K204106



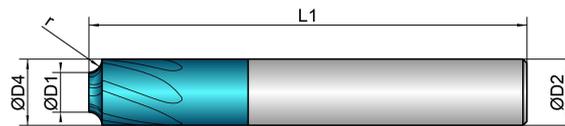
Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
170	100						85	125	400				25			45

K204106	r	D1	D4	L1	D2	z
	mm	mm Ø	mm Ø	mm	mm Ø	#
3,6/0,2	0.20	3.6	4	50.0	4.0	4
3,4/0,3	0.30	3.4	4	50.0	4.0	4
3,2/0,4	0.40	3.2	4	50.0	4.0	4
3/0,5	0.50	3	4	50.0	4.0	4
4,8/0,6	0.60	4.8	6	50.0	6.0	4
4,4/0,8	0.80	4.4	6	50.0	6.0	4
4/1	1.00	4	6	50.0	6.0	4
5/1,5	1.50	5	8	55.0	10.0	4
6/2	2.00	6	10	66.0	10.0	4
7/2,5	2.50	7	12	75.0	12.0	4
6/3	3.00	6	12	75.0	12.0	4
9/3,5	3.50	9	16	80.0	16.0	4
8/4	4.00	8	16	80.0	16.0	4
7/4,5	4.50	7	16	80.0	16.0	4
10/5	5.00	10	20	80.0	20.0	4
8/6	6.00	8	20	80.0	20.0	4
9/8	8.00	9	25	100.0	25.0	4
5/10	10.00	5	25	100.0	25.0	4

Cooling	
Tolerance	0-0,01
Coating	TiSiN- α



HA K204108



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
			50	45	40	30	95									

K204108	r R mm	D1 mm ø	D4 mm ø	L1 mm	D2 mm ø	z #
3,6/0,2	0.20	3.6	4	50.0	4.0	6
3,4/0,3	0.30	3.4	4	50.0	4.0	6
3,2/0,4	0.40	3.2	4	50.0	4.0	6
3/0,5	0.50	3	4	50.0	4.0	6
4,8/0,6	0.60	4.8	6	50.0	6.0	6
4,4/0,8	0.80	4.4	6	50.0	6.0	6
4/1	1.00	4	6	50.0	6.0	6
5/1,5	1.50	5	8	55.0	10.0	6
6/2	2.00	6	10	66.0	10.0	6
7/2,5	2.50	7	12	73.0	12.0	6
6/3	3.00	6	12	73.0	12.0	6
9/3,5	3.50	9	16	80.0	16.0	6
8/4	4.00	8	16	80.0	16.0	6
7/4,5	4.50	7	16	80.0	16.0	6
10/5	5.00	10	20	93.0	20.0	6
8/6	6.00	8	20	93.0	20.0	6
9/8	8.00	9	25	100.0	25.0	6
5/10	10.00	5	25	100.0	25.0	6

Cooling

Tolerance -

Coating TiAlN- α

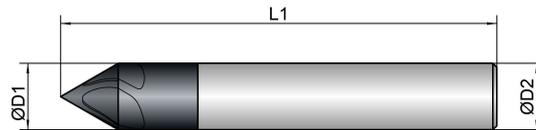
HA HB UNI



HA K205173



HB K205174



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
110	85	65					80	90	280	250	●		30			40

K205173	K205174	D1	L1	D2	z
		mm ø	mm	mm ø	#
3	-	3.0	50.0	3.0	3
4	-	4.0	50.0	4.0	4
6	6	6.0	50.0	6.0	4
8	8	8.0	59.0	8.0	4
10	10	10.0	66.0	10.0	4
12	12	12.0	73.0	12.0	4

Cooling 

Tolerance -

Coating TiAlN- α

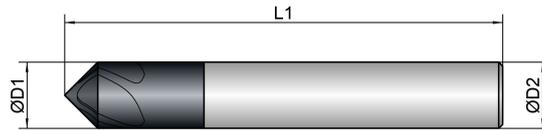
HA HB UNI 



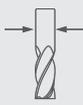
HA K205183



HB K205184



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
110	85	65					80	90	280	250	●		30			40

K205183	K205184	D1	L1	D2	z
		 mm ø	 mm	 mm ø	 #
3	-	3.0	50.0	3.0	3
4	-	4.0	50.0	4.0	4
6	6	6.0	50.0	6.0	4
8	8	8.0	59.0	8.0	4
10	10	10.0	66.0	10.0	4
12	12	12.0	73.0	12.0	4

Cooling	
Tolerance	-
Coating	TiAlN- α

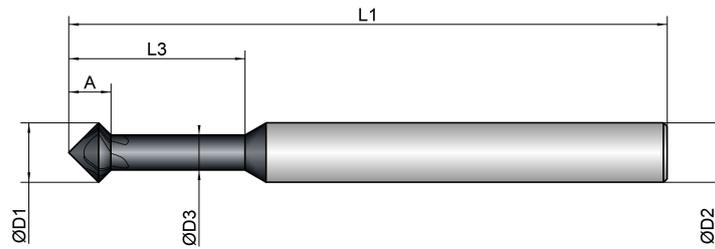
HA

UNI

Basic



HA K205193



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
70	45						40	38	120				25			35

	D1	D3	A	L3	L1	D2	z
K205193	mm ø	mm ø	mm	mm	mm	mm ø	#
3	3.0	2.2	2.0	10.0	50.0	4.0	4
4	4.0	2.9	2.5	10.0	50.0	4.0	4
5	5.0	3.9	3.0	15.0	65.0	6.0	4
6	6.0	3.9	4.0	15.0	65.0	6.0	4
8	8.0	5.9	2.5	20.0	70.0	8.0	4
10	10.0	5.9	4.0	23.0	73.0	10.0	4
12	12.0	5.9	6.0	23.0	75.0	12.0	4

Cooling 

Tolerance d11

Coating TiAlN- α

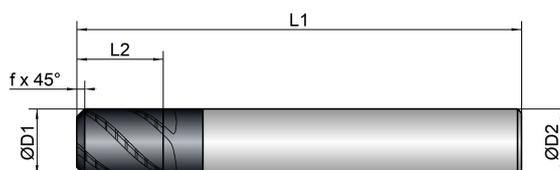
HA HB MTC UNI 



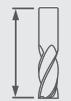
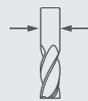
HA K206083



HB K206084



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
175	150	125					60	125							40	

K206083	K206084	D1  mm ø	L2  mm	L1  mm	D2  mm ø	z  #	 mm	 °
6	6	6.0	8.0	54.0	6.0	4	0.15	45
8	8	8.0	11.0	59.0	8.0	4	0.20	45
10	10	10.0	13.0	67.0	10.0	4	0.20	45
12	12	12.0	16.0	74.0	12.0	4	0.25	45
14	14	14.0	16.0	75.0	14.0	4	0.25	45
16	16	16.0	19.0	83.0	16.0	5	0.35	45
18	18	18.0	19.0	80.0	18.0	5	0.35	45
20	20	20.0	19.0	93.0	20.0	5	0.40	45

Cooling

Tolerance d11

Coating TiAlN- α

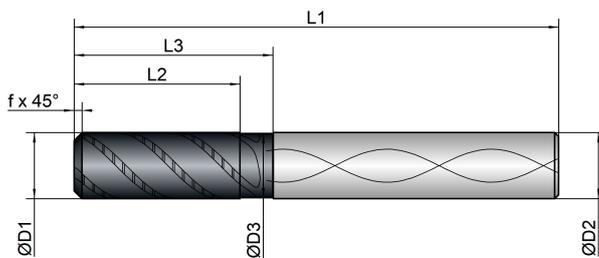
HA HB MTC UNI



HA K206113



HB K206114



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
200	170	150					70	150								40

K206113	K206114	D1	D3	L2	L3	L1	D2	z	45°	°
		mm Ø	mm Ø	mm	mm	mm	mm Ø	#		
6	6	6.0	5.8	16.0	21.0	58.0	6.0	4	0.15	45
8	8	8.0	7.7	22.0	27.0	70.0	8.0	4	0.20	45
10	10	10.0	9.7	25.0	30.0	73.0	10.0	4	0.20	45
12	12	12.0	11.6	28.0	38.0	84.0	12.0	4	0.25	45
14	14	14.0	13.6	30.0	40.0	84.0	14.0	4	0.25	45
16	16	16.0	15.5	36.0	45.0	93.0	16.0	5	0.35	45
18	18	18.0	17.5	36.0	45.0	93.0	18.0	5	0.35	45
20	20	20.0	19.5	41.0	55.0	104.0	20.0	5	0.40	45

Cooling

Tolerance d11

Coating TiAlN- α

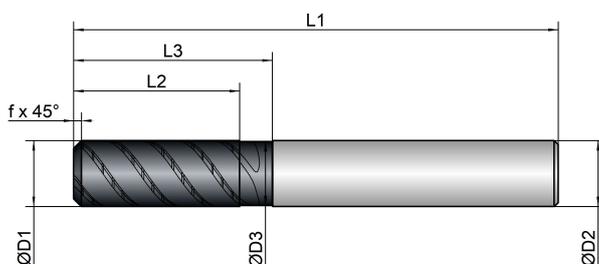
HA HB MTC



HA K206123



HB K206124



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
175	150						90									

K206123	K206124	D1	D3	L2	L3	L1	D2	z	45°	°
		mm ø	mm ø	mm	mm	mm	mm ø	#		
6	6	6.0	5.8	16.0	21.0	58.0	6.0	4	0.15	55
8	8	8.0	7.7	22.0	27.0	70.0	8.0	4	0.20	55
10	10	10.0	9.7	25.0	30.0	73.0	10.0	4	0.20	55
12	12	12.0	11.6	28.0	38.0	84.0	12.0	4	0.25	55
14	14	14.0	13.6	30.0	40.0	84.0	14.0	4	0.30	55
16	16	16.0	15.5	36.0	45.0	93.0	16.0	5	0.35	55
18	18	18.0	17.5	36.0	45.0	93.0	18.0	5	0.40	55
20	20	20.0	19.5	41.0	55.0	104.0	20.0	5	0.40	55
25	25	25.0	24.0	50.0	65.0	125.0	25.0	5	0.50	55

Cooling

Tolerance h9

Coating TiSiN- α

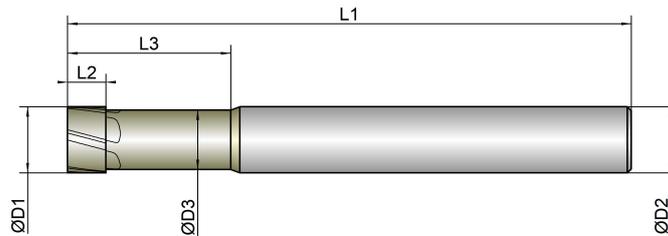
HA HSC UNI

NEW

Expert



HA K207003



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
150	145	135					100									

K207003	D1 mm ∅	D3 mm ∅	L2 mm	L3 mm	L1 mm	D2 mm ∅	z #	 mm	 mm max	 °
2	2.0	1.7	1.5	13.0	54.0	6.0	2	0.3	0.15	15
3	3.0	2.7	1.5	15.0	54.0	6.0	2	0.3	0.20	15
4	4.0	3.6	2.5	16.0	57.0	6.0	2	0.5	0.25	15
5	5.0	4.6	3.5	18.0	65.0	6.0	4	0.5	0.35	15
6	6.0	5.2	3.5	20.0	65.0	6.0	4	1.0	0.40	15
8	8.0	7.0	4.8	24.0	70.0	8.0	5	1.5	0.50	15
10	10.0	9.0	5.8	26.0	85.0	10.0	5	2.0	0.75	15
12	12.0	11.0	6.8	30.0	93.0	12.0	5	2.0	0.80	15
16	16.0	14.5	8.8	35.0	100.0	16.0	5	2.5	1.00	15

Cooling

Tolerance h9

Coating TiSiN- α

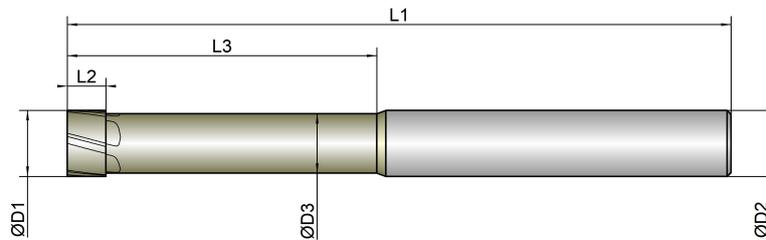
HA HSC UNI

NEW

Expert



HA K207008



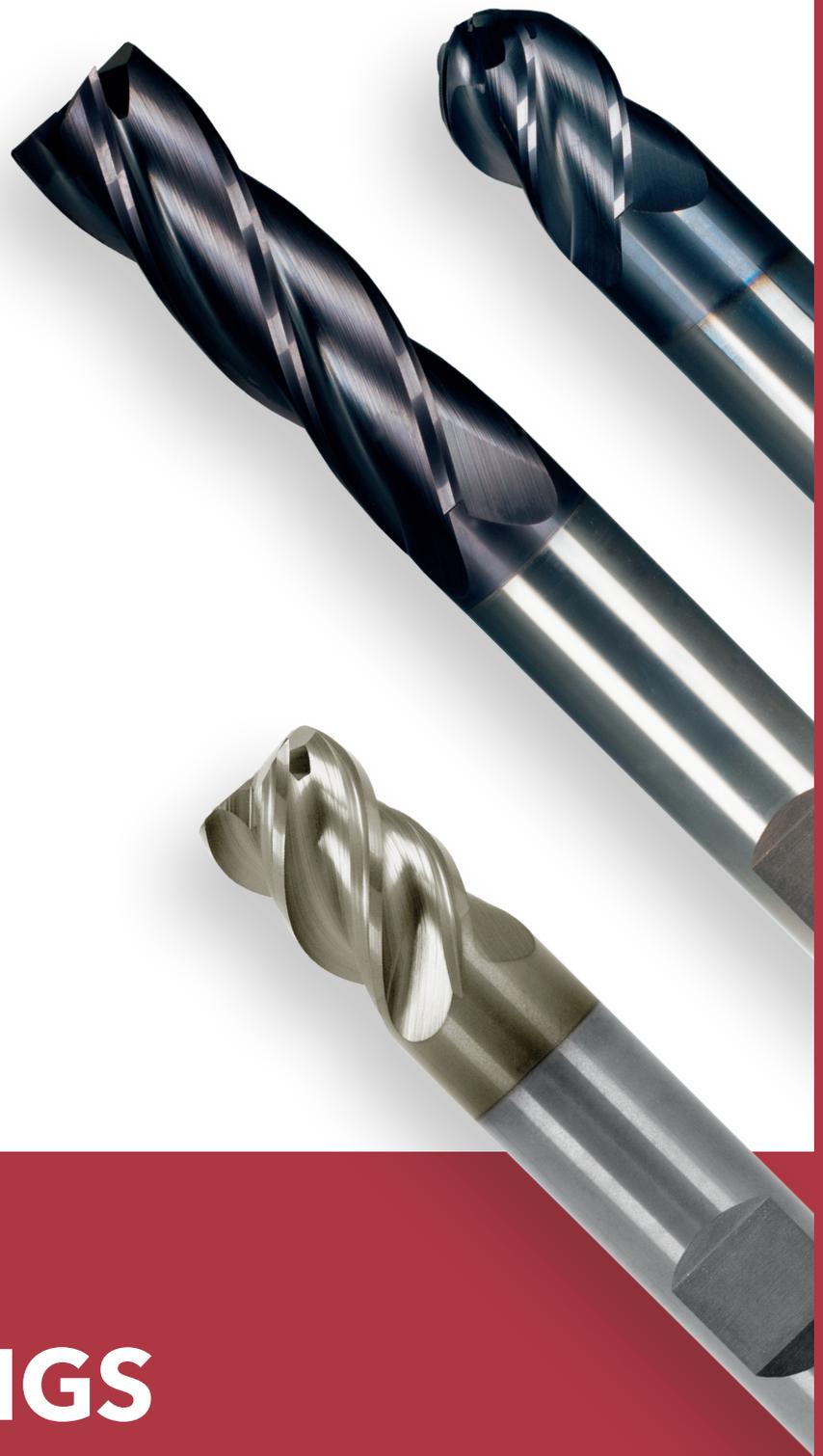
Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
130	125	115					80									

K207008	D1 mm ø	D3 mm ø	L2 mm	L3 mm	L1 mm	D2 mm ø	z #	 mm	 mm max	 °
2	2.0	1.7	1.5	18.0	75.0	6.0	2	0.3	0.15	15
3	3.0	2.7	1.5	20.0	75.0	6.0	2	0.3	0.20	15
4	4.0	3.6	2.5	24.0	83.0	6.0	2	0.5	0.25	15
5	5.0	4.6	3.5	28.0	100.0	6.0	4	0.5	0.35	15
6	6.0	5.2	3.5	28.0	100.0	6.0	4	1.0	0.40	15
8	8.0	7.0	4.8	40.0	100.0	8.0	5	1.5	0.50	15
10	10.0	9.0	5.8	48.0	100.0	10.0	5	2.0	0.75	15
12	12.0	11.0	6.8	56.0	119.0	12.0	5	2.0	0.80	15
16	16.0	14.5	8.8	65.0	150.0	16.0	5	2.5	1.00	15

HOTMANN & VRATNY — SAFE MACHINING

CASTINGS





HOFMANN & VRATNY — SAFE MACHINING

CASTINGS

Casting materials are distinguished by their unequal structure in the machining process and the resulting alternating loads on the milling cutter. Our optimal tooth pitch ensures safe processing, even with unstable components.

Strong in all stress situations. In our extensive 3-line product range, you will find a wide range

of milling cutters, which are ideally suited for machining all casting materials.

Cooling

Tolerance e8

Coating -

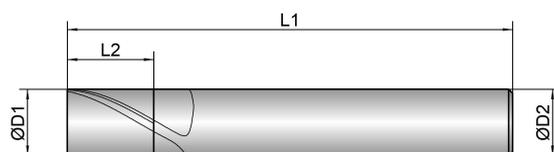
HA HB UNI



HA K201031



HB K201032



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
60	40	30					45	60	140							

K201031	K201032	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	 °
0,25/3	-	0.25	0.5	38.0	3.0	2	30
0,3/3	-	0.3	1.0	38.0	3.0	2	30
0,35/3	-	0.35	1.0	38.0	3.0	2	30
0,4/3	-	0.4	1.0	38.0	3.0	2	30
0,5/3	-	0.5	1.5	38.0	3.0	2	30
0,6/3	-	0.6	1.5	38.0	3.0	2	30
0,7/3	-	0.7	2.0	38.0	3.0	2	30
0,8/3	-	0.8	2.0	38.0	3.0	2	30
0,9/3	-	0.9	2.5	38.0	3.0	2	30
1/3	-	1.0	3.0	50.0	3.0	2	30
1,1/3	-	1.1	3.0	50.0	3.0	2	30
1,2/3	-	1.2	4.0	50.0	3.0	2	30
1,4/3	-	1.4	4.0	50.0	3.0	2	30

K201031	K201032	D1  mm ∅	L2  mm	L1  mm	D2  mm ∅	z  #	 °
1,5/6	1,5	1.5	3.0	54.0	6.0	2	30
1,5/3	-	1.5	4.0	50.0	3.0	2	30
1,6/3	-	1.6	4.0	50.0	3.0	2	30
1,8/3	-	1.8	5.0	50.0	3.0	2	30
2/6	2	2.0	4.0	54.0	6.0	2	30
2/3	-	2.0	5.0	50.0	3.0	2	30
2,5/3	-	2.5	6.0	50.0	3.0	2	30
3/6	3	3.0	6.0	54.0	6.0	2	30
4/6	4	4.0	7.0	54.0	6.0	2	30
5/6	5	5.0	8.0	54.0	6.0	2	30
6/6	6	6.0	10.0	54.0	6.0	2	30
8/8	8	8.0	12.0	59.0	8.0	2	30
10/10	10	10.0	13.0	67.0	10.0	2	30
12/12	12	12.0	16.0	74.0	12.0	2	30
14/14	14	14.0	16.0	75.0	14.0	2	30
16/16	16	16.0	20.0	83.0	16.0	2	30
18/18	18	18.0	20.0	85.0	18.0	2	30
20/20	20	20.0	25.0	93.0	20.0	2	30

Cooling

Tolerance e8

Coating TiAlN- α

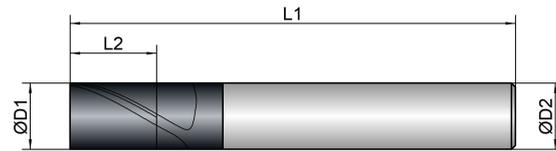
HA HB UNI



HA K201033



HB K201034



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
120	100	80					80	100	280							

K201033	K201034	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	 °
0,25/3	-	0.25	0.5	38.0	3.0	2	30
0,3/3	-	0.3	1.0	38.0	3.0	2	30
0,35/3	-	0.35	1.0	38.0	3.0	2	30
0,4/3	-	0.4	1.0	38.0	3.0	2	30
0,5/3	-	0.5	1.5	38.0	3.0	2	30
0,6/3	-	0.6	1.5	38.0	3.0	2	30
0,7/3	-	0.7	2.0	38.0	3.0	2	30
0,8/3	-	0.8	2.0	38.0	3.0	2	30
0,9/3	-	0.9	2.5	38.0	3.0	2	30
1/3	-	1.0	3.0	50.0	3.0	2	30
1,1/3	-	1.1	3.0	50.0	3.0	2	30
1,2/3	-	1.2	4.0	50.0	3.0	2	30
1,4/3	-	1.4	4.0	50.0	3.0	2	30

K201033	K201034	D1  mm ∅	L2  mm	L1  mm	D2  mm ∅	z  #	 °
1,5/6	1,5	1.5	3.0	54.0	6.0	2	30
1,5/3	-	1.5	4.0	50.0	3.0	2	30
1,6/3	-	1.6	4.0	50.0	3.0	2	30
1,8/3	-	1.8	5.0	50.0	3.0	2	30
2/6	2	2.0	4.0	54.0	6.0	2	30
2/3	-	2.0	5.0	50.0	3.0	2	30
2,5/3	-	2.5	6.0	50.0	3.0	2	30
3/6	3	3.0	6.0	54.0	6.0	2	30
4/6	4	4.0	7.0	54.0	6.0	2	30
5/6	5	5.0	8.0	54.0	6.0	2	30
6/6	6	6.0	10.0	54.0	6.0	2	30
8/8	8	8.0	12.0	59.0	8.0	2	30
10/10	10	10.0	13.0	67.0	10.0	2	30
12/12	12	12.0	16.0	74.0	12.0	2	30
14/14	14	14.0	16.0	75.0	14.0	2	30
16/16	16	16.0	20.0	83.0	16.0	2	30
18/18	18	18.0	20.0	85.0	18.0	2	30
20/20	20	20.0	25.0	93.0	20.0	2	30

Cooling

Tolerance e8

Coating -

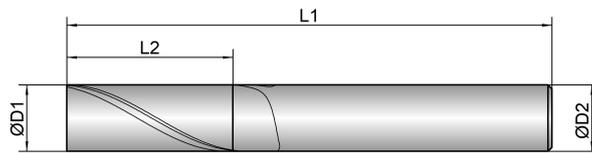
HA HB UNI



HA K201051



HB K201052



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
60	40	30					45	60	140							

K201051	K201052	D1	L2	L1	D2	z	°
		mm ø	mm	mm	mm ø	#	
1	1	1.0	4.0	58.0	6.0	2	30
1,5	1,5	1.5	6.0	58.0	6.0	2	30
2	2	2.0	7.0	58.0	6.0	2	30
3	3	3.0	10.0	58.0	6.0	2	30
4	4	4.0	13.0	58.0	6.0	2	30
5	5	5.0	15.0	58.0	6.0	2	30
6	6	6.0	16.0	58.0	6.0	2	30
8	8	8.0	22.0	70.0	8.0	2	30
10	10	10.0	25.0	73.0	10.0	2	30
12	12	12.0	26.0	84.0	12.0	2	30
14	14	14.0	26.0	84.0	14.0	2	30
16	16	16.0	30.0	93.0	16.0	2	30
18	18	18.0	30.0	93.0	18.0	2	30
20	20	20.0	40.0	104.0	20.0	2	30

Cooling

Tolerance e8

Coating TiAlN- α

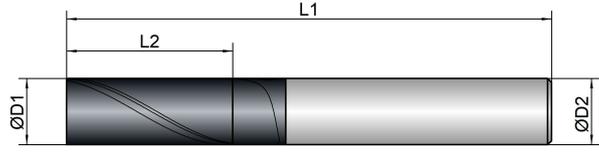
HA HB UNI



HA K201053



HB K201054



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
100	80	60					80	100	180							

K201053	K201054	D1	L2	L1	D2	z	°
		mm Ø	mm	mm	mm Ø	#	
1	1	1.0	4.0	58.0	6.0	2	30
1,5	1,5	1.5	6.0	58.0	6.0	2	30
2	2	2.0	7.0	58.0	6.0	2	30
3	3	3.0	10.0	58.0	6.0	2	30
4	4	4.0	13.0	58.0	6.0	2	30
5	5	5.0	15.0	58.0	6.0	2	30
6	6	6.0	16.0	58.0	6.0	2	30
8	8	8.0	22.0	70.0	8.0	2	30
10	10	10.0	25.0	73.0	10.0	2	30
12	12	12.0	26.0	84.0	12.0	2	30
14	14	14.0	26.0	84.0	14.0	2	30
16	16	16.0	30.0	93.0	16.0	2	30
18	18	18.0	30.0	93.0	18.0	2	30
20	20	20.0	40.0	104.0	20.0	2	30

Cooling

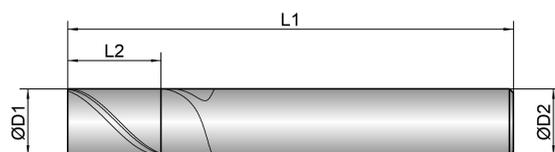
Tolerance e8

Coating -

HA UNI



HA K201071



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
60	40	30					45	60	140							

K201071	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	 °
2	2.0	4.0	32.0	2.0	2	45
3	3.0	6.0	32.0	3.0	2	45
4	4.0	7.0	36.0	4.0	2	45
5	5.0	8.0	54.0	6.0	2	45
6	6.0	10.0	54.0	6.0	2	45
7	7.0	12.0	59.0	8.0	2	45
8	8.0	12.0	59.0	8.0	2	45
9	9.0	14.0	67.0	10.0	2	45
10	10.0	14.0	67.0	10.0	2	45
12	12.0	16.0	73.0	12.0	2	45
14	14.0	18.0	75.0	14.0	2	45
16	16.0	20.0	83.0	16.0	2	45
18	18.0	20.0	85.0	18.0	2	45
20	20.0	25.0	93.0	20.0	2	45

Cooling

Tolerance e8

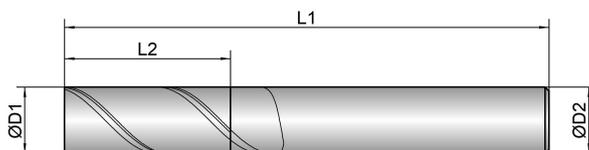
Coating -

HA UNI

Premium



HA K201081



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
60	40	30					45	60	140							

K201081	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	 °
2	2.0	7.0	32.0	2.0	2	45
3	3.0	10.0	38.0	3.0	2	45
4	4.0	13.0	40.0	4.0	2	45
5	5.0	15.0	58.0	6.0	2	45
6	6.0	16.0	58.0	6.0	2	45
7	7.0	20.0	70.0	8.0	2	45
8	8.0	22.0	70.0	8.0	2	45
9	9.0	22.0	73.0	10.0	2	45
10	10.0	25.0	73.0	10.0	2	45
12	12.0	28.0	84.0	12.0	2	45
14	14.0	30.0	84.0	14.0	2	45
16	16.0	35.0	93.0	16.0	2	45
18	18.0	35.0	101.0	18.0	2	45
20	20.0	40.0	104.0	20.0	2	45

Cooling

Tolerance e8

Coating -

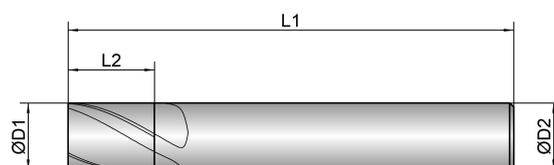
HA HB MTC UNI



HA K201161



HB K201162



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
60	40	30					45	60	140							

K201161	K201162	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	 °
1,5	1,5	1.5	3.0	54.0	6.0	3	30
2	2	2.0	4.0	54.0	6.0	3	30
3	3	3.0	6.0	54.0	6.0	3	30
4	4	4.0	7.0	54.0	6.0	3	30
5	5	5.0	8.0	54.0	6.0	3	30
6	6	6.0	10.0	54.0	6.0	3	30
8	8	8.0	12.0	59.0	8.0	3	30
10	10	10.0	13.0	67.0	10.0	3	30
12	12	12.0	16.0	74.0	12.0	3	30
14	14	14.0	16.0	75.0	14.0	3	30
16	16	16.0	20.0	83.0	16.0	3	30
18	18	18.0	20.0	85.0	18.0	3	30
20	20	20.0	25.0	93.0	20.0	3	30

Cooling 

Tolerance e8

Coating TiAlN- α

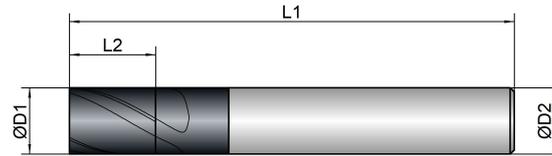
HA HB HPC MTC UNI 



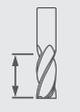
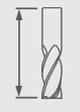
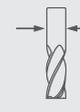
HA K201163



HB K201164



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
220	190	160					80	160								

K201163	K201164	D1  mm ø	L2  mm	L1  mm	D2  mm ø	z  #	 °
1,5	1,5	1.5	3.0	54.0	6.0	3	30
2	2	2.0	4.0	54.0	6.0	3	30
3	3	3.0	6.0	54.0	6.0	3	30
4	4	4.0	7.0	54.0	6.0	3	30
5	5	5.0	8.0	54.0	6.0	3	30
6	6	6.0	10.0	54.0	6.0	3	30
8	8	8.0	12.0	59.0	8.0	3	30
10	10	10.0	13.0	67.0	10.0	3	30
12	12	12.0	16.0	74.0	12.0	3	30
14	14	14.0	16.0	75.0	14.0	3	30
16	16	16.0	20.0	83.0	16.0	3	30
18	18	18.0	20.0	85.0	18.0	3	30
20	20	20.0	25.0	93.0	20.0	3	30

Cooling

Tolerance e8

Coating -

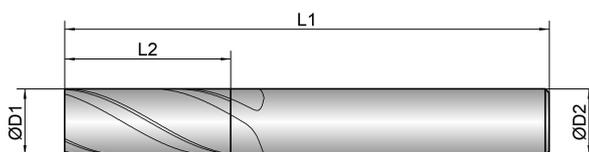
HA HB MTC UNI



HA K201181



HB K201182



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
60	40	30					45	60	140							

K201181	K201182	D1	L2	L1	D2	z	
		 mm ø	 mm	 mm	 mm ø	 #	
1	1	1.0	4.0	58.0	6.0	3	30
1,5	1,5	1.5	6.0	58.0	6.0	3	30
2	2	2.0	7.0	58.0	6.0	3	30
3	3	3.0	10.0	58.0	6.0	3	30
4	4	4.0	13.0	58.0	6.0	3	30
5	5	5.0	15.0	58.0	6.0	3	30
6	6	6.0	16.0	58.0	6.0	3	30
8	8	8.0	22.0	70.0	8.0	3	30
10	10	10.0	25.0	73.0	10.0	3	30
12	12	12.0	26.0	84.0	12.0	3	30
14	14	14.0	26.0	84.0	14.0	3	30
16	16	16.0	32.0	93.0	16.0	3	30
18	18	18.0	32.0	93.0	18.0	3	30
20	20	20.0	40.0	104.0	20.0	3	30

Cooling

Tolerance e8

Coating TiAlN- α

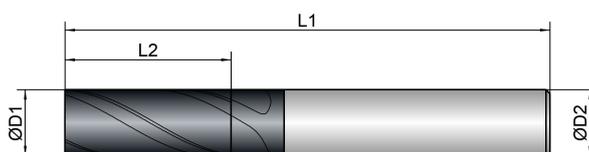
HA HB HPC MTC UNI



HA K201183



HB K201184



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
220	190	160					80	160								

K201183	K201184	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	 °
1	1	1.0	4.0	58.0	6.0	3	30
1,5	1,5	1.5	6.0	58.0	6.0	3	30
2	2	2.0	7.0	58.0	6.0	3	30
3	3	3.0	10.0	58.0	6.0	3	30
4	4	4.0	13.0	58.0	6.0	3	30
5	5	5.0	15.0	58.0	6.0	3	30
6	6	6.0	16.0	58.0	6.0	3	30
8	8	8.0	22.0	70.0	8.0	3	30
10	10	10.0	25.0	73.0	10.0	3	30
12	12	12.0	26.0	84.0	12.0	3	30
14	14	14.0	26.0	84.0	14.0	3	30
16	16	16.0	32.0	93.0	16.0	3	30
18	18	18.0	32.0	93.0	18.0	3	30
20	20	20.0	40.0	104.0	20.0	3	30

Cooling

Tolerance e8

Coating -

HA HB UNI

NEW

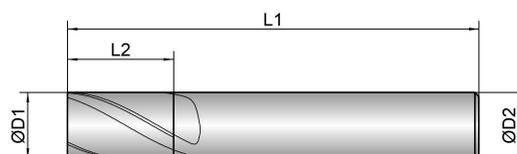
Basic



HA K201251



HB K201252



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
80	55	40					60	70	210							

K201251	K201252	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	 °
1	1	1.0	2.0	45.0	6.0	3	30
1,2	1,2	1.2	2.0	45.0	6.0	3	30
1,5	1,5	1.5	3.0	45.0	6.0	3	30
1,8	1,8	1.8	3.0	45.0	6.0	3	30
2	2	2.0	4.0	45.0	6.0	3	30
2,5	2,5	2.5	4.0	45.0	6.0	3	30
2,8	2,8	2.8	6.0	45.0	6.0	3	30
3	3	3.0	6.0	45.0	6.0	3	30
3,5	3,5	3.5	6.0	45.0	6.0	3	30
3,8	3,8	3.8	7.0	45.0	6.0	3	30
4	4	4.0	7.0	45.0	6.0	3	30
4,5	4,5	4.5	7.0	45.0	6.0	3	30
4,75	4,75	4.75	8.0	45.0	6.0	3	30

K201251	K201252	D1  mm ∅	L2  mm	L1  mm	D2  mm ∅	z  #	 °
5	5	5.0	8.0	45.0	6.0	3	30
5,5	5,5	5.5	8.0	45.0	6.0	3	30
5,75	5,75	5.75	10.0	45.0	6.0	3	30
6	6	6.0	10.0	45.0	6.0	3	30
6,75	6,75	6.75	10.0	55.0	8.0	3	30
7	7	7.0	12.0	55.0	8.0	3	30
7,75	7,75	7.75	12.0	55.0	8.0	3	30
8	8	8.0	13.0	55.0	8.0	3	30
8,7	8,7	8.7	14.0	55.0	10.0	3	30
9	9	9.0	14.0	55.0	10.0	3	30
9,7	9,7	9.7	16.0	55.0	10.0	3	30
10	10	10.0	16.0	55.0	10.0	3	30

Cooling 

Tolerance e8

Coating TiAlN- α

HA HB UNI 

NEW

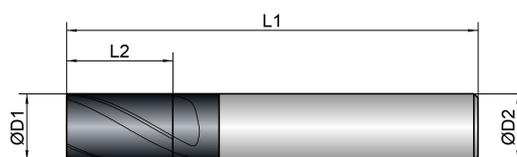

Basic



HA K201253



HB K201254



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
110	75	65					85	95	290							

K201253	K201254	D1  mm ø	L2  mm	L1  mm	D2  mm ø	z  #	 °
1	1	1.0	2.0	45.0	6.0	3	30
1,2	1,2	1.2	2.0	45.0	6.0	3	30
1,5	1,5	1.5	3.0	45.0	6.0	3	30
1,8	1,8	1.8	3.0	45.0	6.0	3	30
2	2	2.0	4.0	45.0	6.0	3	30
2,5	2,5	2.5	4.0	45.0	6.0	3	30
2,8	2,8	2.8	6.0	45.0	6.0	3	30
3	3	3.0	6.0	45.0	6.0	3	30
3,5	3,5	3.5	6.0	45.0	6.0	3	30
3,8	3,8	3.8	7.0	45.0	6.0	3	30
4	4	4.0	7.0	45.0	6.0	3	30
4,5	4,5	4.5	7.0	45.0	6.0	3	30
4,75	4,75	4.75	8.0	45.0	6.0	3	30

K201253	K201254	D1  mm ∅	L2  mm	L1  mm	D2  mm ∅	z  #	 °
5	5	5.0	8.0	45.0	6.0	3	30
5,5	5,5	5.5	8.0	45.0	6.0	3	30
5,75	5,75	5.75	10.0	45.0	6.0	3	30
6	6	6.0	10.0	45.0	6.0	3	30
6,75	6,75	6.75	10.0	55.0	8.0	3	30
7	7	7.0	12.0	55.0	8.0	3	30
7,75	7,75	7.75	12.0	55.0	8.0	3	30
8	8	8.0	13.0	55.0	8.0	3	30
8,7	8,7	8.7	14.0	55.0	10.0	3	30
9	9	9.0	14.0	55.0	10.0	3	30
9,7	9,7	9.7	16.0	55.0	10.0	3	30
10	10	10.0	16.0	55.0	10.0	3	30

Cooling

Tolerance e8

Coating -

HA HB UNI

NEW

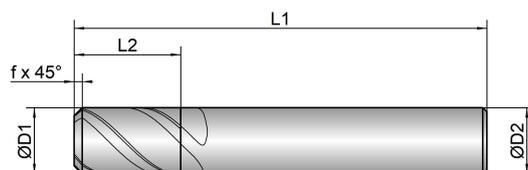
Basic



HA K201271



HB K201272



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
70	45	30					60	65	200	160						

K201271	K201272	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	45° mm	 °
1/6	1/6	1.0	2.0	45.0	6.0	3	0.02	45
1,5/6	1,5/6	1.5	3.0	45.0	6.0	3	0.03	45
2/6	2/6	2.0	4.0	45.0	6.0	3	0.03	45
2,5/6	2,5/6	2.5	5.0	45.0	6.0	3	0.03	45
3/6	3/6	3.0	6.0	45.0	6.0	3	0.03	45
3,5/6	3,5/6	3.5	6.0	45.0	6.0	3	0.03	45
4/6	4/6	4.0	7.0	45.0	6.0	3	0.04	45
4,5/6	4,5/6	4.5	8.0	45.0	6.0	3	0.04	45
5/6	5/6	5.0	8.0	45.0	6.0	3	0.04	45
5,5/6	5,5/6	5.5	8.0	45.0	6.0	3	0.04	45
6/6	6/6	6.0	10.0	45.0	6.0	3	0.04	45
8/8	8/8	8.0	13.0	55.0	8.0	3	0.05	45
10/10	10/10	10.0	16.0	55.0	10.0	3	0.05	45

Cooling

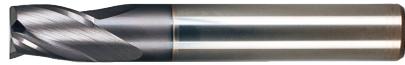
Tolerance e8

Coating TiAlN- α

HA HB UNI

NEW

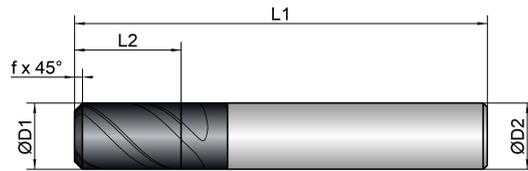
Basic



HA K201273



HB K201274



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
100	70	50					90	85	290	200						

K201273	K201274	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	45° mm	 °
1/6	1/6	1.0	2.0	45.0	6.0	3	0.02	45
1,5/6	1,5/6	1.5	3.0	45.0	6.0	3	0.03	45
2/6	2/6	2.0	4.0	45.0	6.0	3	0.03	45
2,5/6	2,5/6	2.5	5.0	45.0	6.0	3	0.03	45
3/6	3/6	3.0	6.0	45.0	6.0	3	0.03	45
3,5/6	3,5/6	3.5	6.0	45.0	6.0	3	0.03	45
4/6	4/6	4.0	7.0	45.0	6.0	3	0.04	45
4,5/6	4,5/6	4.5	8.0	45.0	6.0	3	0.04	45
5/6	5/6	5.0	8.0	45.0	6.0	3	0.04	45
5,5/6	5,5/6	5.5	8.0	45.0	6.0	3	0.04	45
6/6	6/6	6.0	10.0	45.0	6.0	3	0.04	45
8/8	8/8	8.0	13.0	55.0	8.0	3	0.05	45
10/10	10/10	10.0	16.0	55.0	10.0	3	0.05	45

Cooling

Tolerance e8

Coating -

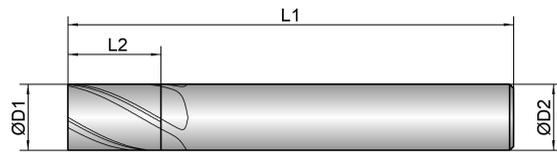
HA HB MTC UNI



HA K201291



HB K201292



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
60	40	30					45	60	140							

K201291	K201292	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	 °
1,5/3	-	1.5	3.0	38.0	3.0	4	30
2/6	2	2.0	4.0	54.0	6.0	4	30
2/3	-	2.0	4.0	38.0	3.0	4	30
2,5/3	-	2.5	4.0	38.0	3.0	4	30
3/6	3	3.0	6.0	54.0	6.0	4	30
3/3	-	3.0	6.0	38.0	3.0	4	30
4/6	4	4.0	7.0	54.0	6.0	4	30
5/6	5	5.0	8.0	54.0	6.0	4	30
6/6	6	6.0	10.0	54.0	6.0	4	30
8/8	8	8.0	12.0	59.0	8.0	4	30
10/10	10	10.0	14.0	67.0	10.0	4	30
12/12	12	12.0	16.0	74.0	12.0	4	30
14/14	14	14.0	18.0	75.0	14.0	4	30
16/16	16	16.0	22.0	83.0	16.0	4	30
18/18	18	18.0	20.0	80.0	18.0	4	30
20/20	20	20.0	25.0	93.0	20.0	4	30

Cooling

Tolerance e8

Coating TiAlN- α

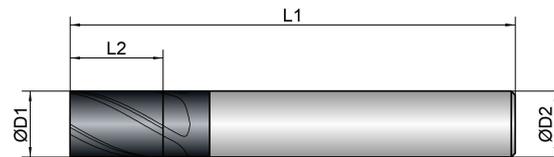
HA HB HPC MTC UNI



HA K201293



HB K201294



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
220	190	160					80	160								

K201293	K201294	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	 °
1,5/3	-	1.5	3.0	38.0	3.0	4	30
2/6	2	2.0	4.0	54.0	6.0	4	30
2/3	-	2.0	4.0	38.0	3.0	4	30
2,5/3	-	2.5	4.0	38.0	3.0	4	30
3/6	3	3.0	6.0	54.0	6.0	4	30
3/3	-	3.0	6.0	38.0	3.0	4	30
4/6	4	4.0	7.0	54.0	6.0	4	30
5/6	5	5.0	8.0	54.0	6.0	4	30
6/6	6	6.0	10.0	54.0	6.0	4	30
8/8	8	8.0	12.0	59.0	8.0	4	30
10/10	10	10.0	14.0	67.0	10.0	4	30
12/12	12	12.0	16.0	74.0	12.0	4	30
14/14	14	14.0	18.0	75.0	14.0	4	30
16/16	16	16.0	22.0	83.0	16.0	4	30
18/18	18	18.0	20.0	80.0	18.0	4	30
20/20	20	20.0	25.0	93.0	20.0	4	30

Cooling

Tolerance e8

Coating -

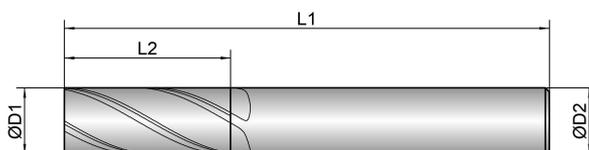
HA HB MTC UNI



HA K201311



HB K201312



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
60	40	30					45	60	140							

K201311	K201312	D1	L2	L1	D2	z	°
		mm Ø	mm	mm	mm Ø	#	
2/6	2	2.0	7.0	58.0	6.0	4	30
2/2	-	2.0	7.0	38.0	2.0	4	30
3/6	3	3.0	10.0	58.0	6.0	4	30
3/3	-	3.0	10.0	38.0	3.0	4	30
4/6	4	4.0	13.0	58.0	6.0	4	30
4/4	-	4.0	13.0	50.0	4.0	4	30
5/6	5	5.0	15.0	58.0	6.0	4	30
5/5	-	5.0	15.0	50.0	5.0	4	30
6/6	6	6.0	16.0	58.0	6.0	4	30
7/8	7	7.0	19.0	64.0	8.0	4	30
8/8	8	8.0	22.0	70.0	8.0	4	30
9/10	9	9.0	23.0	73.0	10.0	4	30
10/10	10	10.0	25.0	73.0	10.0	4	30
11/12	11	11.0	26.0	84.0	12.0	4	30
12/12	12	12.0	28.0	84.0	12.0	4	30
14/14	14	14.0	30.0	84.0	14.0	4	30
16/16	16	16.0	35.0	93.0	16.0	4	30
18/18	18	18.0	35.0	93.0	18.0	4	30
20/20	20	20.0	40.0	104.0	20.0	4	30

Cooling

Tolerance e8

Coating TiAlN- α

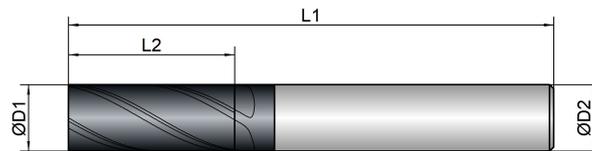
HA HB HPC MTC UNI



HA K201313



HB K201314



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
220	190	160					80	160								

K201313	K201314	D1	L2	L1	D2	z	°
		mm \varnothing	mm	mm	mm \varnothing	#	
2/6	2	2.0	7.0	58.0	6.0	4	30
2/2	-	2.0	7.0	38.0	2.0	4	30
3/6	3	3.0	10.0	58.0	6.0	4	30
3/3	-	3.0	10.0	38.0	3.0	4	30
4/6	4	4.0	13.0	58.0	6.0	4	30
4/4	-	4.0	13.0	50.0	4.0	4	30
5/6	5	5.0	15.0	58.0	6.0	4	30
5/5	-	5.0	15.0	50.0	5.0	4	30
6/6	6	6.0	16.0	58.0	6.0	4	30
7/8	7	7.0	19.0	64.0	8.0	4	30
8/8	8	8.0	22.0	70.0	8.0	4	30
9/10	9	9.0	23.0	73.0	10.0	4	30
10/10	10	10.0	25.0	73.0	10.0	4	30
11/12	11	11.0	26.0	84.0	12.0	4	30
12/12	12	12.0	28.0	84.0	12.0	4	30
14/14	14	14.0	30.0	84.0	14.0	4	30
16/16	16	16.0	35.0	93.0	16.0	4	30
18/18	18	18.0	35.0	93.0	18.0	4	30
20/20	20	20.0	40.0	104.0	20.0	4	30

Cooling

Tolerance e8

Coating -

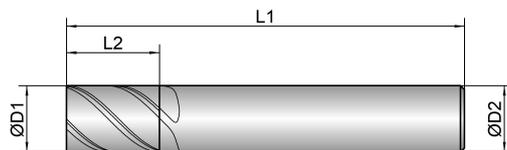
HA HB MTC UNI



HA K201401



HB K201402



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
60	40	30					45	60	140							

K201401	K201402	D1	L2	L1	D2	z	°
		mm Ø	mm	mm	mm Ø	#	
3	3	3.0	6.0	54.0	6.0	4	45
4	4	4.0	7.0	54.0	6.0	4	45
5	5	5.0	8.0	54.0	6.0	4	45
6	6	6.0	10.0	54.0	6.0	4	45
8	8	8.0	12.0	59.0	8.0	4	45
10	10	10.0	14.0	60.0	10.0	4	45
12	12	12.0	16.0	70.0	12.0	4	45
14	14	14.0	18.0	70.0	14.0	4	45
16	16	16.0	20.0	80.0	16.0	4	45
18	18	18.0	20.0	80.0	18.0	4	45
20	20	20.0	25.0	85.0	20.0	4	45

Cooling 

Tolerance e8

Coating TiCn- α

HA HB ETC HPC

MTC UNI 



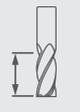
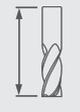

HA K201403



HB K201404



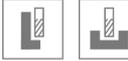
Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
220	190	160					80	160								

K201403	K201404	D1	L2	L1	D2	z	°
		 mm ø	 mm	 mm	 mm ø	 #	
3	3	3.0	6.0	54.0	6.0	4	45
4	4	4.0	7.0	54.0	6.0	4	45
5	5	5.0	8.0	54.0	6.0	4	45
6	6	6.0	10.0	54.0	6.0	4	45
8	8	8.0	12.0	59.0	8.0	4	45
10	10	10.0	14.0	60.0	10.0	4	45
12	12	12.0	16.0	70.0	12.0	4	45
14	14	14.0	18.0	70.0	14.0	4	45
16	16	16.0	20.0	80.0	16.0	4	45
18	18	18.0	20.0	80.0	18.0	4	45
20	20	20.0	25.0	85.0	20.0	4	45

Cooling 

Tolerance e8

Coating -

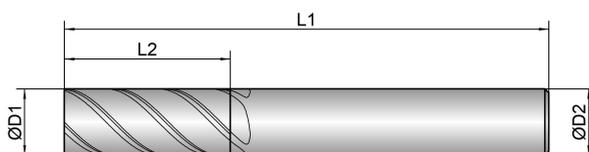
HA HB MTC UNI 



HA K201411



HB K201412



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
60	40	30					45	60	140							

K201411	K201412	D1	L2	L1	D2	z	°
		mm Ø	mm	mm	mm Ø	#	
3	3	3.0	10.0	58.0	6.0	4	45
4	4	4.0	13.0	58.0	6.0	4	45
5	5	5.0	15.0	58.0	6.0	4	45
6	6	6.0	16.0	58.0	6.0	4	45
8	8	8.0	22.0	64.0	8.0	4	45
10	10	10.0	25.0	73.0	10.0	4	45
12	12	12.0	28.0	84.0	12.0	4	45
14	14	14.0	30.0	84.0	14.0	4	45
16	16	16.0	36.0	93.0	16.0	4	45
18	18	18.0	36.0	93.0	18.0	4	45
20	20	20.0	41.0	104.0	20.0	4	45
25	25	25.0	50.0	125.0	25.0	4	45

Cooling

Tolerance e8

Coating TiCn- α

HA HB ETC HPC

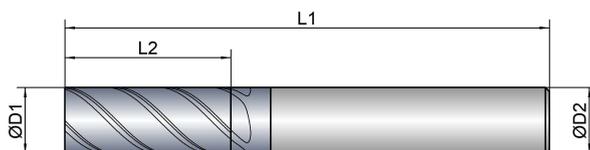
MTC UNI



HA K201413



HB K201414



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
220	190	160					80	160								

K201413	K201414	D1 mm Ø	L2 mm	L1 mm	D2 mm Ø	z #	 °
3	3	3.0	10.0	58.0	6.0	4	45
4	4	4.0	13.0	58.0	6.0	4	45
5	5	5.0	15.0	58.0	6.0	4	45
6	6	6.0	16.0	58.0	6.0	4	45
8	8	8.0	22.0	64.0	8.0	4	45
10	10	10.0	25.0	73.0	10.0	4	45
12	12	12.0	28.0	84.0	12.0	4	45
14	14	14.0	30.0	84.0	14.0	4	45
16	16	16.0	36.0	93.0	16.0	4	45
18	18	18.0	36.0	93.0	18.0	4	45
20	20	20.0	41.0	104.0	20.0	4	45
25	25	25.0	50.0	125.0	25.0	4	45

Cooling 

Tolerance e8

Coating -

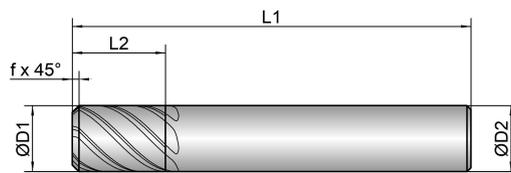
HA HB UNI 



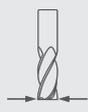
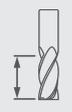
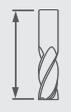
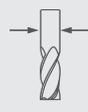
HA K201581



HB K201582



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
70	40	30					45	60	150							

K201581	K201582	D1  mm ø	L2  mm	L1  mm	D2  mm ø	z  #	 mm	 °
5	5	5.0	8.0	54.0	6.0	6	0.02	45
6	6	6.0	10.0	54.0	6.0	6	0.03	45
7	7	7.0	12.0	59.0	8.0	6	0.04	45
8	8	8.0	12.0	59.0	8.0	6	0.04	45
9	9	9.0	14.0	60.0	10.0	6	0.04	45
10	10	10.0	14.0	60.0	10.0	6	0.05	45
12	12	12.0	16.0	70.0	12.0	6	0.05	45
14	14	14.0	18.0	70.0	14.0	6	0.06	45
16	16	16.0	20.0	80.0	16.0	6	0.06	45
18	18	18.0	20.0	80.0	18.0	8	0.07	45
20	20	20.0	25.0	85.0	20.0	8	0.07	45

Cooling

Tolerance e8

Coating TiAlN- α

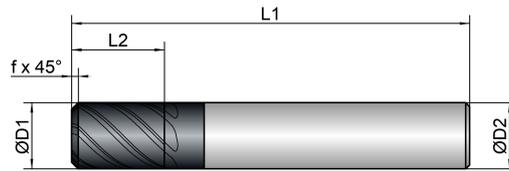
HA HB UNI



HA K201583



HB K201584



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
170	100	90	70				95	125	600							

K201583	K201584	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	 mm	 °
5	5	5.0	8.0	54.0	6.0	6	0.02	45
6	6	6.0	10.0	54.0	6.0	6	0.03	45
7	7	7.0	12.0	59.0	8.0	6	0.04	45
8	8	8.0	12.0	59.0	8.0	6	0.04	45
9	9	9.0	14.0	60.0	10.0	6	0.04	45
10	10	10.0	14.0	60.0	10.0	6	0.05	45
12	12	12.0	16.0	70.0	12.0	6	0.05	45
14	14	14.0	18.0	70.0	14.0	6	0.06	45
16	16	16.0	20.0	80.0	16.0	6	0.06	45
18	18	18.0	20.0	80.0	18.0	8	0.07	45
20	20	20.0	25.0	85.0	20.0	8	0.07	45

Cooling 

Tolerance e8

Coating -

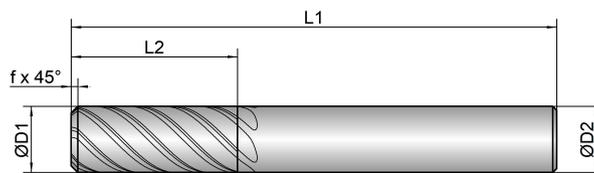
HA HB UNI 



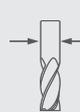
HA K201591



HB K201592



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
60	40	30					40	60	140							

K201591	K201592	D1	L2	L1	D2	z	45° mm	 °
		 mm ø	 mm	 mm	 mm ø	 #		
5	5	5.0	13.0	58.0	6.0	6	0.02	45
6	6	6.0	16.0	58.0	6.0	6	0.03	45
7	7	7.0	22.0	70.0	8.0	6	0.04	45
8	8	8.0	22.0	70.0	8.0	6	0.04	45
9	9	9.0	25.0	73.0	10.0	6	0.04	45
10	10	10.0	25.0	73.0	10.0	6	0.05	45
12	12	12.0	28.0	84.0	12.0	6	0.05	45
14	14	14.0	30.0	84.0	14.0	6	0.06	45
16	16	16.0	35.0	93.0	16.0	6	0.06	45
18	18	18.0	35.0	93.0	18.0	8	0.07	45
20	20	20.0	40.0	100.0	20.0	8	0.07	45
25	25	25.0	55.0	125.0	25.0	8	0.08	45

Cooling 

Tolerance e8

Coating TiAlN- α

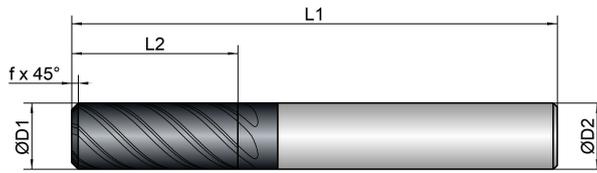
HA HB UNI  



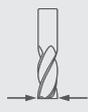
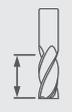
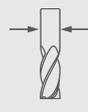
HA K201593



HB K201594



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
175	100	90	65				95	125	600							

K201593	K201594	D1  mm ø	L2  mm	L1  mm	D2  mm ø	z  #	 mm	 °
5	5	5.0	13.0	58.0	6.0	6	0.02	45
6	6	6.0	16.0	58.0	6.0	6	0.03	45
7	7	7.0	22.0	70.0	8.0	6	0.04	45
8	8	8.0	22.0	70.0	8.0	6	0.04	45
9	9	9.0	25.0	73.0	10.0	6	0.04	45
10	10	10.0	25.0	73.0	10.0	6	0.05	45
12	12	12.0	28.0	84.0	12.0	6	0.05	45
14	14	14.0	30.0	84.0	14.0	6	0.06	45
16	16	16.0	35.0	93.0	16.0	6	0.06	45
18	18	18.0	35.0	93.0	18.0	8	0.07	45
20	20	20.0	40.0	100.0	20.0	8	0.07	45
25	25	25.0	55.0	125.0	25.0	8	0.08	45

Cooling

Tolerance e8

Coating TiAlN- α

HA HB UNI

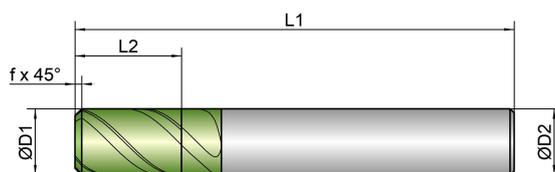
Basic



HA K201673



HB K201674



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
100	70	50					90	85	290	200						

K201673	K201674	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	 mm	 °
1	-	1.0	2.0	38.0	3.0	3	0.02	45
1,2	-	1.2	2.0	38.0	3.0	3	0.02	45
1,5	-	1.5	3.0	38.0	3.0	3	0.025	45
2	2	2.0	4.0	50.0	6.0	3	0.03	45
2,5	2,5	2.5	5.0	50.0	6.0	3	0.03	45
3	3	3.0	6.0	50.0	6.0	3	0.03	45
4	4	4.0	7.0	50.0	6.0	3	0.04	45
4,5	4,5	4.5	8.0	50.0	6.0	3	0.04	45
5	5	5.0	8.0	50.0	6.0	3	0.04	45
5,5	5,5	5.5	8.0	50.0	6.0	3	0.04	45
5,75	5,75	5.75	10.0	50.0	6.0	3	0.04	45
6	6	6.0	10.0	50.0	6.0	3	0.04	45
7	7	7.0	12.0	55.0	8.0	3	0.045	45
7,75	7,75	7.75	12.0	55.0	8.0	3	0.05	45
8	8	8.0	13.0	55.0	8.0	3	0.05	45
9	9	9.0	14.0	66.0	10.0	3	0.05	45
9,7	9,7	9.7	16.0	66.0	10.0	3	0.05	45
10	10	10.0	16.0	66.0	10.0	3	0.05	45
12	12	12.0	16.0	73.0	12.0	3	0.05	45
14	14	14.0	16.0	83.0	14.0	3	0.06	45
16	16	16.0	18.0	80.0	16.0	3	0.06	45

Cooling

Tolerance e8

Coating TiAlN- α

HA HB UNI

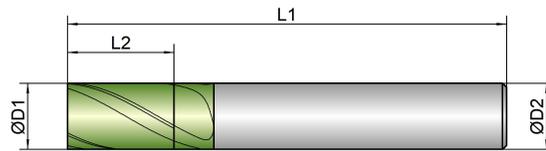
Basic



HA K201677



HB K201678

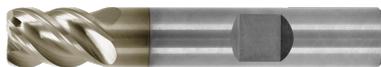


Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
110	75	65					85	95	290							

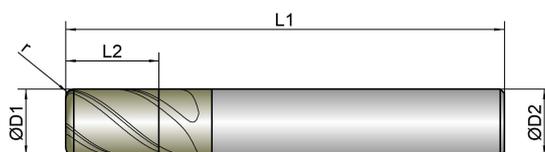
K201677	K201678	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	 °
1	-	1.0	2.0	38.0	3.0	3	30
1,2	-	1.2	2.0	38.0	3.0	3	30
1,5	-	1.5	3.0	38.0	3.0	3	30
2	2	2.0	4.0	50.0	6.0	3	30
2,5	2,5	2.5	5.0	50.0	6.0	3	30
3	3	3.0	6.0	50.0	6.0	3	30
4	4	4.0	7.0	50.0	6.0	3	30
4,5	4,5	4.5	8.0	50.0	6.0	3	30
5	5	5.0	8.0	50.0	6.0	3	30
5,5	5,5	5.5	8.0	50.0	6.0	3	30
5,75	5,75	5.75	10.0	50.0	6.0	3	30
6	6	6.0	10.0	50.0	6.0	3	30
7	7	7.0	12.0	55.0	8.0	3	30
7,75	7,75	7.75	12.0	55.0	8.0	3	30
8	8	8.0	13.0	55.0	8.0	3	30
9	9	9.0	14.0	66.0	10.0	3	30
9,7	9,7	9.7	16.0	66.0	10.0	3	30
10	10	10.0	16.0	66.0	10.0	3	30
12	12	12.0	16.0	73.0	12.0	3	30
14	14	14.0	16.0	83.0	14.0	3	30
16	16	16.0	18.0	80.0	16.0	3	30

Cooling	
Tolerance	e8
Coating	TiSiN- α

HB	ETC	HPC	MTC	NEW	
UNI	\neq				



HB K201719



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
230	185	150					75	260								

K201719	D1 mm \varnothing	L2 mm	L1 mm	D2 mm \varnothing	z #	r mm	 °
3	3.0	6.0	54.0	6.0	4	0.10	40
4	4.0	8.0	54.0	6.0	4	0.10	40
5	5.0	9.0	54.0	6.0	4	0.20	40
6	6.0	10.0	54.0	6.0	4	0.20	40
8	8.0	12.0	58.0	8.0	4	0.20	40
10	10.0	14.0	66.0	10.0	4	0.20	40
12	12.0	16.0	73.0	12.0	4	0.20	40
16	16.0	22.0	82.0	16.0	4	0.30	40
20	20.0	26.0	92.0	20.0	4	0.30	40

Cooling 

Tolerance e8

Coating TiSiN- α

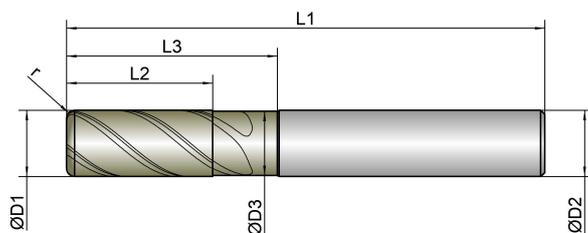
HB ETC HPC MTC

UNI \neq 

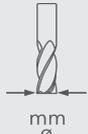
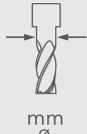
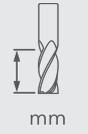
NEW 



HB K201724



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
230	185	150					260	75								

K201724	D1  mm \varnothing	D3  mm \varnothing	L2  mm	L3  mm	L1  mm	D2  mm \varnothing	z  #	r  mm	 °
3	3.0	2.8	8.0	13.0	57.0	6.0	4	0.10	40
4	4.0	3.8	11.0	17.0	57.0	6.0	4	0.10	40
5	5.0	4.8	13.0	20.0	57.0	6.0	4	0.20	40
6	6.0	5.8	13.0	20.0	57.0	6.0	4	0.20	40
8	8.0	7.7	19.0	25.0	63.0	8.0	4	0.20	40
10	10.0	9.7	22.0	32.0	72.0	10.0	4	0.20	40
12	12.0	11.6	26.0	38.0	83.0	12.0	4	0.20	40
16	16.0	15.5	32.0	44.0	92.0	16.0	4	0.30	40
20	20.0	19.5	41.0	54.0	104.0	20.0	4	0.30	40

Cooling 

Tolerance e8

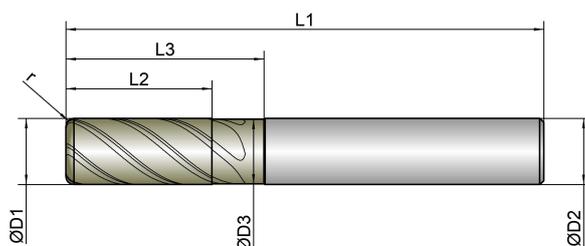
Coating TiSiN- α

HB ETC HPC MTC UNI ≠ 

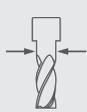
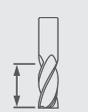
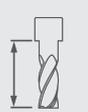
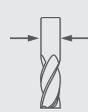
NEW 
Expert



HB K201729



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
230	185	150					75	260								

	D1	D3	L2	L3	L1	D2	z	r	
K201729	 mm ∅	 mm ∅	 mm	 mm	 mm	 mm ∅	 #	 mm	 °
6	6.0	5.8	13.0	19.0	57.0	6.0	5	0.15	40
8	8.0	7.8	19.0	25.0	63.0	8.0	5	0.20	40
10	10.0	9.8	22.0	30.0	72.0	10.0	5	0.20	40
12	12.0	11.8	26.0	36.0	83.0	12.0	5	0.20	40
16	16.0	15.8	32.0	42.0	92.0	16.0	5	0.30	40
20	20.0	19.8	41.0	52.0	104.0	20.0	5	0.30	40

Cooling 

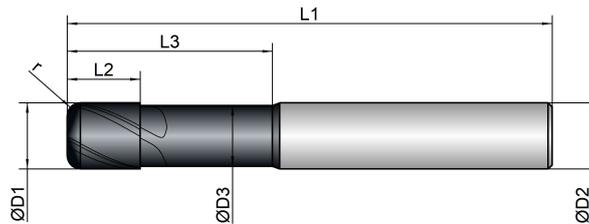
Tolerance e8

Coating TiAlN- α

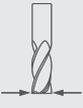
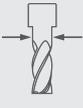
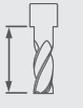
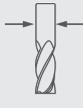
HA HSC HPC 

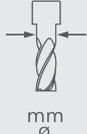



HA K202143



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
110	80						90	100								

K202143	D1  mm \varnothing	D3  mm \varnothing	L2  mm	L3  mm	L1  mm	D2  mm \varnothing	z  #	r  mm	 °
1/0,1	1.0	0.85	1.5	10.0	50.0	3.0	4	0.10	30
1/0,2	1.0	0.85	1.5	10.0	50.0	3.0	4	0.20	30
2/0,2	2.0	1.8	2.5	12.0	50.0	3.0	4	0.20	30
2/0,3	2.0	1.8	2.5	12.0	50.0	3.0	4	0.30	30
2/0,5	2.0	1.8	2.5	12.0	50.0	3.0	4	0.50	30
3/0,3	3.0	2.7	4.0	14.0	50.0	3.0	4	0.30	30
3/0,5	3.0	2.7	4.0	14.0	50.0	3.0	4	0.50	30
3/1	3.0	2.7	4.0	14.0	50.0	3.0	4	1.00	30
4/0,4	4.0	3.7	5.0	16.0	50.0	4.0	4	0.40	30
4/0,5	4.0	3.7	5.0	16.0	50.0	4.0	4	0.50	30
4/1	4.0	3.7	5.0	16.0	50.0	4.0	4	1.00	30
5/0,5	5.0	4.6	6.0	18.0	54.0	5.0	4	0.50	30
5/1	5.0	4.6	6.0	18.0	54.0	5.0	4	1.00	30

K202143	 mm ∅	 mm ∅	 mm	 mm	 mm	 mm ∅	 #	 mm	 °
6/0,5	6.0	5.5	7.0	21.0	58.0	6.0	4	0.50	30
6/1	6.0	5.5	7.0	21.0	58.0	6.0	4	1.00	30
6/1,5	6.0	5.5	7.0	21.0	58.0	6.0	4	1.50	30
8/0,5	8.0	7.4	9.0	27.0	64.0	8.0	4	0.50	30
8/1	8.0	7.4	9.0	27.0	64.0	8.0	4	1.00	30
8/1,5	8.0	7.4	9.0	27.0	64.0	8.0	4	1.50	30
8/2	8.0	7.4	9.0	27.0	64.0	8.0	4	2.00	30
10/0,5	10.0	9.2	11.0	32.0	73.0	10.0	4	0.50	30
10/1	10.0	9.2	11.0	32.0	73.0	10.0	4	1.00	30
10/1,5	10.0	9.2	11.0	32.0	73.0	10.0	4	1.50	30
10/2	10.0	9.2	11.0	32.0	73.0	10.0	4	2.00	30
12/0,5	12.0	11.0	12.0	38.0	84.0	12.0	4	0.50	30
12/1	12.0	11.0	12.0	38.0	84.0	12.0	4	1.00	30
12/1,5	12.0	11.0	12.0	38.0	84.0	12.0	4	1.50	30
12/2	12.0	11.0	12.0	38.0	84.0	12.0	4	2.00	30
12/5	12.0	11.0	12.0	38.0	84.0	12.0	4	5.00	30
16/1	16.0	15.0	16.0	44.0	93.0	16.0	4	1.00	30
16/2	16.0	15.0	16.0	44.0	93.0	16.0	4	2.00	30
16/6	16.0	15.0	16.0	44.0	93.0	16.0	4	6.00	30
20/1	20.0	18.5	20.0	55.0	104.0	20.0	4	1.00	30
20/2,5	20.0	18.5	20.0	55.0	104.0	20.0	4	2.50	30

Cooling

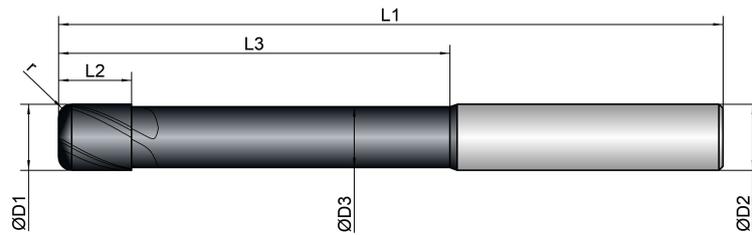
Tolerance e8

Coating TiAlN- α

HA HSC HPC

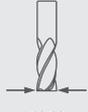
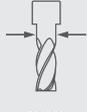
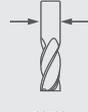


HA K202153

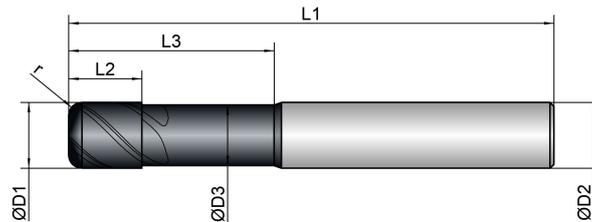


Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
110	80						90	100								

K202153	D1 mm Ø	D3 mm Ø	L2 mm	L3 mm	L1 mm	D2 mm Ø	z #	r mm	 °
1/0,1	1.0	0.85	1.5	20.0	75.0	3.0	4	0.10	30
1/0,2	1.0	0.85	1.5	20.0	75.0	3.0	4	0.20	30
2/0,2	2.0	1.8	2.5	25.0	75.0	3.0	4	0.20	30
2/0,3	2.0	1.8	2.5	25.0	75.0	3.0	4	0.30	30
2/0,5	2.0	1.8	2.5	25.0	75.0	3.0	4	0.50	30
3/0,3	3.0	2.7	4.0	32.0	75.0	3.0	4	0.30	30
3/0,5	3.0	2.7	4.0	32.0	75.0	3.0	4	0.50	30
3/1	3.0	2.7	4.0	32.0	75.0	3.0	4	1.00	30
4/0,4	4.0	3.7	5.0	36.0	75.0	4.0	4	0.40	30
4/0,5	4.0	3.7	5.0	36.0	75.0	4.0	4	0.50	30
4/1	4.0	3.7	5.0	36.0	75.0	4.0	4	1.00	30
5/0,5	5.0	4.6	6.0	40.0	75.0	5.0	4	0.50	30
5/1	5.0	4.6	6.0	40.0	75.0	5.0	4	1.00	30

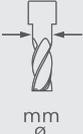
	 D1 mm ∅	 D3 mm ∅	 L2 mm	 L3 mm	 L1 mm	 D2 mm ∅	 z #	 r mm	 °
K202153									
5,95/0,5	5.95	5.5	7.0	44.0	80.0	6.0	4	0.50	30
6/0,5	6.0	5.5	7.0	44.0	80.0	6.0	4	0.50	30
6/1	6.0	5.5	7.0	44.0	80.0	6.0	4	1.00	30
6/1,5	6.0	5.5	7.0	44.0	80.0	6.0	4	1.50	30
7,95/0,5	7.95	7.4	9.0	54.0	100.0	8.0	4	0.50	30
8/0,5	8.0	7.4	9.0	54.0	100.0	8.0	4	0.50	30
8/1	8.0	7.4	9.0	54.0	100.0	8.0	4	1.00	30
8/1,5	8.0	7.4	9.0	54.0	100.0	8.0	4	1.50	30
8/2	8.0	7.4	9.0	54.0	100.0	8.0	4	2.00	30
9,95/0,5	9.95	9.2	11.0	60.0	100.0	10.0	4	0.50	30
10/0,5	10.0	9.2	11.0	60.0	100.0	10.0	4	0.50	30
10/1	10.0	9.2	11.0	60.0	100.0	10.0	4	1.00	30
10/1,5	10.0	9.2	11.0	60.0	100.0	10.0	4	1.50	30
10/2	10.0	9.2	11.0	60.0	100.0	10.0	4	2.00	30
12/0,5	12.0	11.0	12.0	75.0	120.0	12.0	4	0.50	30
12/1	12.0	11.0	12.0	75.0	120.0	12.0	4	1.00	30
12/1,5	12.0	11.0	12.0	75.0	120.0	12.0	4	1.50	30
12/2	12.0	11.0	12.0	75.0	120.0	12.0	4	2.00	30
12/5	12.0	11.0	12.0	75.0	120.0	12.0	4	5.00	30
16/1	16.0	15.0	16.0	92.0	150.0	16.0	4	1.00	30
16/2	16.0	15.0	16.0	92.0	150.0	16.0	4	2.00	30
16/6	16.0	15.0	16.0	92.0	150.0	16.0	4	6.00	30
20/1	20.0	18.5	20.0	92.0	150.0	20.0	4	1.00	30
20/2,5	20.0	18.5	20.0	92.0	150.0	20.0	4	2.50	30

Cooling	
Tolerance	e8
Coating	TiAlN- α



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
120	80	70	40	35			85	95								

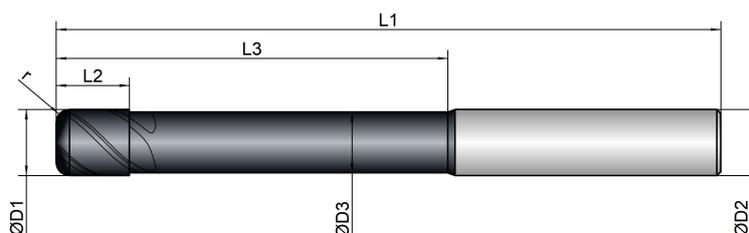
K202163	D1 mm ø	D3 mm ø	L2 mm	L3 mm	L1 mm	D2 mm ø	z #	r mm	 °
3/0,3	3.0	2.7	4.0	14.0	50.0	3.0	4	0.30	45
3/0,5	3.0	2.7	4.0	14.0	50.0	3.0	4	0.50	45
3/1	3.0	2.7	4.0	14.0	50.0	3.0	4	1.00	45
4/0,4	4.0	3.7	5.0	16.0	50.0	4.0	4	0.40	45
4/0,5	4.0	3.7	5.0	16.0	50.0	4.0	4	0.50	45
4/1	4.0	3.7	5.0	16.0	50.0	4.0	4	1.00	45
5/0,5	5.0	4.6	6.0	18.0	54.0	5.0	4	0.50	45
5/1	5.0	4.6	6.0	18.0	54.0	5.0	4	1.00	45
6/0,5	6.0	5.5	7.0	21.0	58.0	6.0	4	0.50	45
6/1	6.0	5.5	7.0	21.0	58.0	6.0	4	1.00	45
6/1,5	6.0	5.5	7.0	21.0	58.0	6.0	4	1.50	45
8/0,5	8.0	7.4	9.0	27.0	64.0	8.0	4	0.50	45

	 D1 mm ∅	 D3 mm ∅	 L2 mm	 L3 mm	 L1 mm	 D2 mm ∅	 z #	 r mm	 °
K202163									
8/1	8.0	7.4	9.0	27.0	64.0	8.0	4	1.00	45
8/1,5	8.0	7.4	9.0	27.0	64.0	8.0	4	1.50	45
8/2	8.0	7.4	9.0	27.0	64.0	8.0	4	2.00	45
10/0,5	10.0	9.2	11.0	32.0	73.0	10.0	4	0.50	45
10/1	10.0	9.2	11.0	32.0	73.0	10.0	4	1.00	45
10/1,5	10.0	9.2	11.0	32.0	73.0	10.0	4	1.50	45
10/2	10.0	9.2	11.0	32.0	73.0	10.0	4	2.00	45
12/0,5	12.0	11.0	12.0	38.0	84.0	12.0	4	0.50	45
12/1	12.0	11.0	12.0	38.0	84.0	12.0	4	1.00	45
12/1,5	12.0	11.0	12.0	38.0	84.0	12.0	4	1.50	45
12/2	12.0	11.0	12.0	38.0	84.0	12.0	4	2.00	45
16/1	16.0	15.0	16.0	44.0	93.0	16.0	4	1.00	45
16/2	16.0	15.0	16.0	44.0	93.0	16.0	4	2.00	45
20/1	20.0	18.5	20.0	50.0	104.0	20.0	4	1.00	45
20/2,5	20.0	18.5	20.0	50.0	104.0	20.0	4	2.50	45

Cooling	
Tolerance	e8
Coating	TiAlN- α

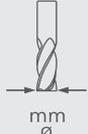


HA K202173



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
120	80	70	40	35			85	95								

K202173	D1 mm ø	D3 mm ø	L2 mm	L3 mm	L1 mm	D2 mm ø	z #	r mm	 °
3/0,3	3.0	2.7	4.0	32.0	75.0	3.0	4	0.30	45
3/0,5	3.0	2.7	4.0	32.0	75.0	3.0	4	0.50	45
3/1	3.0	2.7	4.0	32.0	75.0	3.0	4	1.00	45
4/0,4	4.0	3.7	5.0	36.0	75.0	4.0	4	0.40	45
4/0,5	4.0	3.7	5.0	36.0	75.0	4.0	4	0.50	45
4/1	4.0	3.7	5.0	36.0	75.0	4.0	4	1.00	45
5/0,5	5.0	4.6	6.0	40.0	75.0	5.0	4	0.50	45
5/1	5.0	4.6	6.0	40.0	75.0	5.0	4	1.00	45
6/0,5	6.0	5.5	7.0	44.0	80.0	6.0	4	0.50	45
6/1	6.0	5.5	7.0	44.0	80.0	6.0	4	1.00	45
6/1,5	6.0	5.5	7.0	44.0	80.0	6.0	4	1.50	45
8/0,5	8.0	7.4	9.0	54.0	100.0	8.0	4	0.50	45

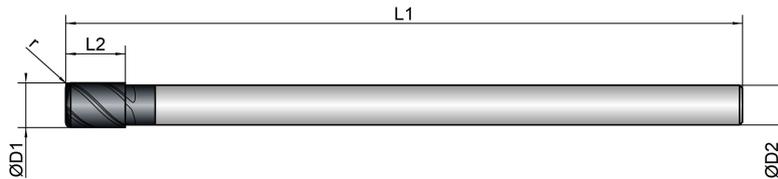
K202173	 mm ∅	 mm ∅	 mm	 mm	 mm	 mm ∅	 #	 mm	 °
8/1	8.0	7.4	9.0	54.0	100.0	8.0	4	1.00	45
8/1,5	8.0	7.4	9.0	54.0	100.0	8.0	4	1.50	45
8/2	8.0	7.4	9.0	54.0	100.0	8.0	4	2.00	45
10/0,5	10.0	9.2	11.0	60.0	100.0	10.0	4	0.50	45
10/1	10.0	9.2	11.0	60.0	100.0	10.0	4	1.00	45
10/1,5	10.0	9.2	11.0	60.0	100.0	10.0	4	1.50	45
10/2	10.0	9.2	11.0	60.0	100.0	10.0	4	2.00	45
12/0,5	12.0	11.0	12.0	75.0	120.0	12.0	4	0.50	45
12/1	12.0	11.0	12.0	75.0	120.0	12.0	4	1.00	45
12/1,5	12.0	11.0	12.0	75.0	120.0	12.0	4	1.50	45
12/2	12.0	11.0	12.0	75.0	120.0	12.0	4	2.00	45
16/1	16.0	15.0	16.0	92.0	150.0	16.0	4	1.00	45
16/2	16.0	15.0	16.0	92.0	150.0	16.0	4	2.00	45
20/1	20.0	18.5	20.0	92.0	150.0	20.0	4	1.00	45
20/2,5	20.0	18.5	20.0	92.0	150.0	20.0	4	2.50	45

Cooling	
Tolerance	e8
Coating	TiAlN- α

HA HSC UNI



HA K202202



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
75	55	50	28	23			65	70								

K202202	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	r mm	 °
7/0,5	7.0	9.0	121.0	6.0	4	0.50	45
7/1	7.0	9.0	121.0	6.0	4	1.00	45
7/1,5	7.0	9.0	121.0	6.0	4	1.50	45
9/0,5	9.0	12.0	136.0	8.0	4	0.50	45
9/1	9.0	12.0	136.0	8.0	4	1.00	45
9/1,5	9.0	12.0	136.0	8.0	4	1.50	45
11/1	11.0	15.0	150.0	10.0	4	1.00	45
11/1,5	11.0	15.0	150.0	10.0	4	1.50	45
11/2	11.0	15.0	150.0	10.0	4	2.00	45
13/1	13.0	18.0	160.0	12.0	4	1.00	45
13/1,5	13.0	18.0	160.0	12.0	4	1.50	45
13/2	13.0	18.0	160.0	12.0	4	2.00	45
15/1	15.0	21.0	160.0	14.0	4	1.00	45
15/1,5	15.0	21.0	160.0	14.0	4	1.50	45
15/2	15.0	21.0	160.0	14.0	4	2.00	45
17/1	17.0	24.0	180.0	16.0	4	1.00	45
17/1,5	17.0	24.0	180.0	16.0	4	1.50	45
17/2	17.0	24.0	180.0	16.0	4	2.00	45
17/3	17.0	24.0	180.0	16.0	4	3.00	45

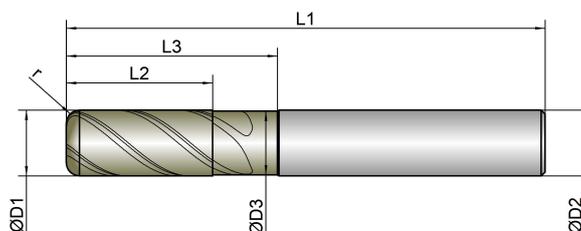
Cooling	
Tolerance	e8
Coating	TiSiN- α

HB	ETC	HSC	HPC	MTC
UNI	\neq			

NEW

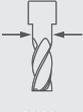
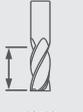
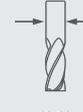


HB K202509



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
230	185	150					75	260								

K202509	D1 mm Ø	D3 mm Ø	L2 mm	L3 mm	L1 mm	D2 mm Ø	z #	r mm	 °
6/0,5	6.0	5.8	13.0	20.0	57.0	6.0	4	0.50	40
6/1	6.0	5.8	13.0	20.0	57.0	6.0	4	1.00	40
6/1,5	6.0	5.8	13.0	20.0	57.0	6.0	4	1.50	40
8/0,5	8.0	7.7	19.0	25.0	63.0	8.0	4	0.50	40
8/1	8.0	7.7	19.0	25.0	63.0	8.0	4	1.00	40
8/2	8.0	7.7	19.0	25.0	63.0	8.0	4	2.00	40
8/3	8.0	7.7	19.0	25.0	63.0	8.0	4	3.00	40
10/0,5	10.0	9.7	22.0	32.0	72.0	10.0	4	0.50	40
10/1	10.0	9.7	22.0	32.0	72.0	10.0	4	1.00	40
10/2	10.0	9.7	22.0	32.0	72.0	10.0	4	2.00	40
10/3	10.0	9.7	22.0	32.0	72.0	10.0	4	3.00	40
12/0,5	12.0	11.6	26.0	38.0	83.0	12.0	4	0.50	40

K202509	 D1 mm ∅	 D3 mm ∅	 L2 mm	 L3 mm	 L1 mm	 D2 mm ∅	 z #	 r mm	 °
12/1	12.0	11.6	26.0	38.0	83.0	12.0	4	1.00	40
12/2	12.0	11.6	26.0	38.0	83.0	12.0	4	2.00	40
12/3	12.0	11.6	26.0	38.0	83.0	12.0	4	3.00	40
16/0,5	16.0	15.5	32.0	44.0	92.0	16.0	4	0.50	40
16/1	16.0	15.5	32.0	44.0	92.0	16.0	4	1.00	40
16/2	16.0	15.5	32.0	44.0	92.0	16.0	4	2.00	40
16/3	16.0	15.5	32.0	44.0	92.0	16.0	4	3.00	40
20/1	20.0	19.5	41.0	54.0	104.0	20.0	4	1.00	40
20/2	20.0	19.5	41.0	54.0	104.0	20.0	4	2.00	40
20/3	20.0	19.5	41.0	54.0	104.0	20.0	4	3.00	40
20/4	20.0	19.5	41.0	54.0	104.0	20.0	4	4.00	40

Cooling 

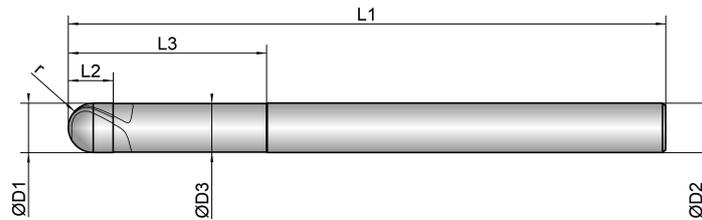
Tolerance f7

Coating -

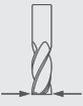
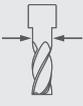
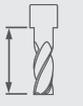
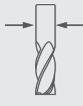
HA HSC UNI 



HA K203001



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
80	50						45	75	190	170	240					

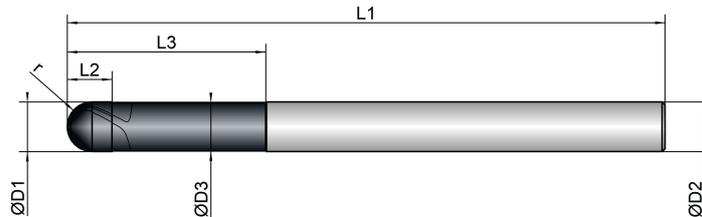
K203001	D1  mm Ø	D3  mm Ø	L2  mm	L3  mm	L1  mm	D2  mm Ø	z  #	r  mm	 °
1/6	1.0	0.9	2.0	6.0	100.0	6.0	2	0.50	30
2/6	2.0	1.8	3.0	8.0	100.0	6.0	2	1.00	30
3/6	3.0	2.8	4.0	12.0	100.0	6.0	2	1.50	30
4/6	4.0	3.8	5.0	16.0	100.0	6.0	2	2.00	30
5/6	5.0	4.8	6.0	20.0	100.0	6.0	2	2.50	30
6/6	6.0	5.8	6.0	25.0	100.0	6.0	2	3.00	30
6/8	6.0	5.8	6.0	25.0	100.0	8.0	2	3.00	30
8/8	8.0	7.8	7.0	32.0	100.0	8.0	2	4.00	30
8/10	8.0	7.8	7.0	32.0	120.0	10.0	2	4.00	30
10/10	10.0	9.8	9.0	40.0	120.0	10.0	2	5.00	30
10/12	10.0	9.8	9.0	40.0	160.0	12.0	2	5.00	30
12/12	12.0	11.8	11.0	50.0	160.0	12.0	2	6.00	30
12/16	12.0	11.8	11.0	50.0	200.0	16.0	2	6.00	30
16/16	16.0	15.5	14.0	60.0	200.0	16.0	2	8.00	30

Cooling	
Tolerance	f7
Coating	TiAlN- α

HA	HSC	UNI	
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HA K203003



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
400	290	210					210	580	360	330						

K203003	D1 mm ø	D3 mm ø	L2 mm	L3 mm	L1 mm	D2 mm ø	z #	r mm	 °
1/6	1.0	0.9	2.0	6.0	100.0	6.0	2	0.50	30
2/6	2.0	1.8	3.0	8.0	100.0	6.0	2	1.00	30
3/6	3.0	2.8	4.0	12.0	100.0	6.0	2	1.50	30
4/6	4.0	3.8	5.0	16.0	100.0	6.0	2	2.00	30
5/6	5.0	4.8	6.0	20.0	100.0	6.0	2	2.50	30
6/6	6.0	5.8	6.0	25.0	100.0	6.0	2	3.00	30
6/8	6.0	5.8	6.0	25.0	100.0	8.0	2	3.00	30
8/8	8.0	7.8	7.0	32.0	100.0	8.0	2	4.00	30
8/10	8.0	7.8	7.0	32.0	120.0	10.0	2	4.00	30
10/10	10.0	9.8	9.0	40.0	120.0	10.0	2	5.00	30
10/12	10.0	9.8	9.0	40.0	160.0	12.0	2	5.00	30
12/12	12.0	11.8	11.0	50.0	160.0	12.0	2	6.00	30
12/16	12.0	11.8	11.0	50.0	200.0	16.0	2	6.00	30
16/16	16.0	15.5	14.0	60.0	200.0	16.0	2	8.00	30

Cooling 

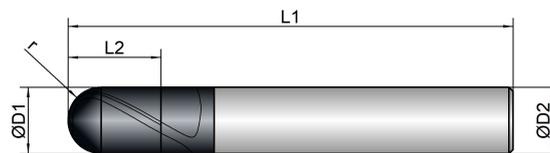
Tolerance f8

Coating TiAlN- α

HA HSC HPC UNI 



HA K203033



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
420	290	220	165	150			225	615								

K203033	D1  mm ø	L2  mm	L1  mm	D2  mm ø	z  #	r  mm	 °
0,1/3	0.1	0.2	38.0	3.0	2	0.05	30
0,15/3	0.15	0.3	38.0	3.0	2	0.075	30
0,2/3	0.2	0.4	38.0	3.0	2	0.10	30
0,25/3	0.25	0.5	38.0	3.0	2	0.125	30
0,3/3	0.3	1.0	38.0	3.0	2	0.15	30
0,35/3	0.35	1.0	38.0	3.0	2	0.175	30
0,4/3	0.4	1.0	38.0	3.0	2	0.20	30
0,5/3	0.5	1.5	38.0	3.0	2	0.25	30
0,5/6	0.5	1.5	54.0	6.0	2	0.25	30
0,6/3	0.6	1.5	38.0	3.0	2	0.30	30
0,7/3	0.7	2.0	38.0	3.0	2	0.35	30
0,8/3	0.8	2.0	38.0	3.0	2	0.40	30
0,9/3	0.9	2.5	38.0	3.0	2	0.45	30
1/3	1.0	2.0	50.0	3.0	2	0.50	30
1/6	1.0	2.0	54.0	6.0	2	0.50	30

	 D1 mm \varnothing	 L2 mm	 L1 mm	 D2 mm \varnothing	 z #	 r mm	 °
K203033							
1,1/3	1.1	3.0	50.0	3.0	2	0.55	30
1,2/3	1.2	3.0	50.0	3.0	2	0.60	30
1,4/3	1.4	3.0	50.0	3.0	2	0.70	30
1,5/3	1.5	3.0	50.0	3.0	2	0.75	30
1,5/6	1.5	3.0	54.0	6.0	2	0.75	30
1,6/3	1.6	4.0	50.0	3.0	2	0.80	30
1,8/3	1.8	4.0	50.0	3.0	2	0.90	30
2/3	2.0	4.0	50.0	3.0	2	1.00	30
2/6	2.0	4.0	54.0	6.0	2	1.00	30
2,5/3	2.5	5.0	50.0	3.0	2	1.25	30
2,5/6	2.5	5.0	54.0	6.0	2	1.25	30
3/3	3.0	6.0	50.0	3.0	2	1.50	30
3/6	3.0	6.0	54.0	6.0	2	1.50	30
4/4	4.0	7.0	54.0	4.0	2	2.00	30
4/6	4.0	7.0	54.0	6.0	2	2.00	30
5/5	5.0	8.0	54.0	5.0	2	2.50	30
5/6	5.0	8.0	54.0	6.0	2	2.50	30
6/6	6.0	10.0	54.0	6.0	2	3.00	30
7/8	7.0	12.0	59.0	8.0	2	3.50	30
8/8	8.0	12.0	59.0	8.0	2	4.00	30
10/10	10.0	14.0	67.0	10.0	2	5.00	30
12/12	12.0	16.0	73.0	12.0	2	6.00	30
14/14	14.0	16.0	75.0	14.0	2	7.00	30
16/16	16.0	20.0	83.0	16.0	2	8.00	30
18/18	18.0	22.0	93.0	18.0	2	9.00	30
20/20	20.0	25.0	93.0	20.0	2	10.00	30

Cooling

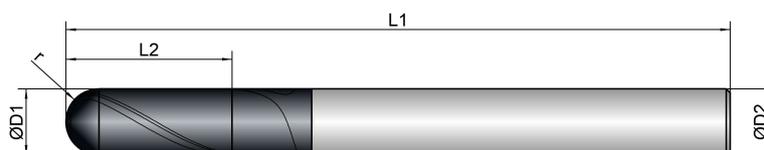
Tolerance f8

Coating TiAlN- α

HA HSC HPC UNI



HA K203063



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
350	240	180	135	125			180	500			695					

K203063	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	r mm	 °
0,5/3	0.5	1.5	75.0	3.0	2	0.25	30
0,5/6	0.5	1.5	80.0	6.0	2	0.25	30
1/3	1.0	3.0	75.0	3.0	2	0.50	30
1/6	1.0	3.0	80.0	6.0	2	0.50	30
1,5/3	1.5	4.0	75.0	3.0	2	0.75	30
1,5/6	1.5	4.0	80.0	6.0	2	0.75	30
2/3	2.0	6.0	75.0	3.0	2	1.00	30
2/6	2.0	6.0	80.0	6.0	2	1.00	30
2,5/3	2.5	8.0	75.0	3.0	2	1.25	30
2,5/6	2.5	8.0	80.0	6.0	2	1.25	30
3/3	3.0	10.0	75.0	3.0	2	1.50	30
3/6	3.0	10.0	80.0	6.0	2	1.50	30
4/4	4.0	13.0	75.0	4.0	2	2.00	30
4/6	4.0	13.0	80.0	6.0	2	2.00	30
5/5	5.0	14.0	75.0	5.0	2	2.50	30
5/6	5.0	14.0	100.0	6.0	2	2.50	30
6/6	6.0	16.0	100.0	6.0	2	3.00	30
8/8	8.0	22.0	100.0	8.0	2	4.00	30
10/10	10.0	25.0	100.0	10.0	2	5.00	30
12/12	12.0	26.0	100.0	12.0	2	6.00	30
14/14	14.0	26.0	100.0	14.0	2	7.00	30
16/16	16.0	30.0	150.0	16.0	2	8.00	30
20/20	20.0	40.0	150.0	20.0	2	10.00	30

Cooling 

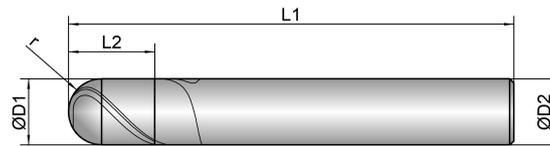
Tolerance f8

Coating -

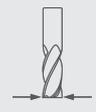
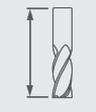
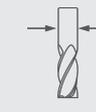
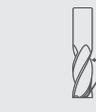
HA UNI  



HA K203081



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
70	50						45	75	190	160	240					

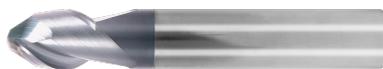
K203081	D1  mm ø	L2  mm	L1  mm	D2  mm ø	z  #	r  mm	 °
3	3.0	6.0	50.0	3.0	2	1.50	45
4	4.0	7.0	54.0	4.0	2	2.00	45
5	5.0	8.0	54.0	5.0	2	2.50	45
6	6.0	10.0	54.0	6.0	2	3.00	45
8	8.0	12.0	59.0	8.0	2	4.00	45
10	10.0	13.0	67.0	10.0	2	5.00	45
12	12.0	16.0	74.0	12.0	2	6.00	45
14	14.0	16.0	75.0	14.0	2	7.00	45
16	16.0	20.0	83.0	16.0	2	8.00	45
20	20.0	25.0	93.0	20.0	2	10.00	45

Cooling

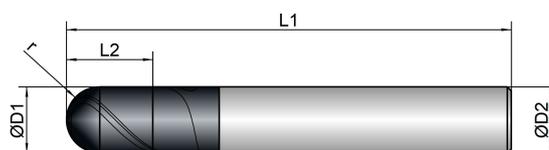
Tolerance f8

Coating TiAlN- α

HA HSC UNI



HA K203083



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
140	80	75					85	130	360	330	400					

K203083	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	r mm	 °
3	3.0	6.0	50.0	3.0	2	1.50	45
4	4.0	7.0	54.0	4.0	2	2.00	45
5	5.0	8.0	54.0	5.0	2	2.50	45
6	6.0	10.0	54.0	6.0	2	3.00	45
8	8.0	12.0	59.0	8.0	2	4.00	45
10	10.0	13.0	67.0	10.0	2	5.00	45
12	12.0	16.0	74.0	12.0	2	6.00	45
14	14.0	16.0	75.0	14.0	2	7.00	45
16	16.0	20.0	83.0	16.0	2	8.00	45
20	20.0	25.0	93.0	20.0	2	10.00	45

Cooling 

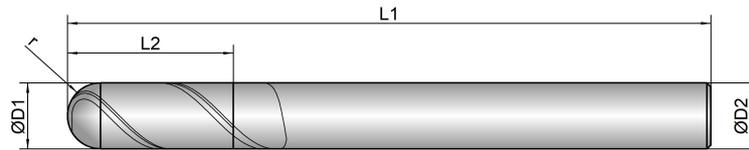
Tolerance f8

Coating -

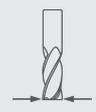
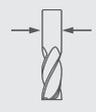
HA UNI  



HA K203091



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
60	40						35	65	170	140	220					

K203091	D1  mm ø	L2  mm	L1  mm	D2  mm ø	z  #	r  mm	 °
3	3.0	10.0	75.0	3.0	2	1.50	45
4	4.0	13.0	75.0	4.0	2	2.00	45
5	5.0	15.0	75.0	5.0	2	2.50	45
6	6.0	16.0	100.0	6.0	2	3.00	45
8	8.0	22.0	100.0	8.0	2	4.00	45
10	10.0	25.0	100.0	10.0	2	5.00	45
12	12.0	26.0	100.0	12.0	2	6.00	45
14	14.0	26.0	100.0	14.0	2	7.00	45
16	16.0	30.0	150.0	16.0	2	8.00	45
20	20.0	40.0	150.0	20.0	2	10.00	45

Cooling

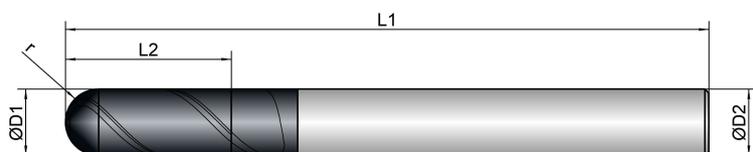
Tolerance f8

Coating TiAlN- α

HA HSC UNI



HA K203093



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
110	70	65					75	120	340	310		380				

K203093	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	r mm	 °
3	3.0	10.0	75.0	3.0	2	1.50	45
4	4.0	13.0	75.0	4.0	2	2.00	45
5	5.0	15.0	75.0	5.0	2	2.50	45
6	6.0	16.0	100.0	6.0	2	3.00	45
8	8.0	22.0	100.0	8.0	2	4.00	45
10	10.0	25.0	100.0	10.0	2	5.00	45
12	12.0	26.0	100.0	12.0	2	6.00	45
14	14.0	26.0	100.0	14.0	2	7.00	45
16	16.0	30.0	150.0	16.0	2	8.00	45
20	20.0	40.0	150.0	20.0	2	10.00	45

Cooling

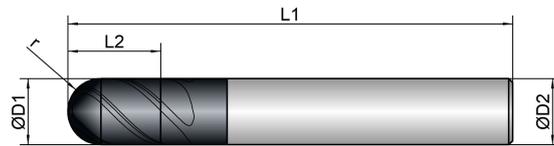
Tolerance f8

Coating TiAlN- α

HA HSC HPC MTC UNI



HA K203253



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
210	150	140					90	360	400						50	

K203253	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	r mm	 °
3	3.0	5.0	50.0	3.0	4	1.50	45
4	4.0	8.0	54.0	4.0	4	2.00	45
5	5.0	9.0	54.0	5.0	4	2.50	45
6	6.0	10.0	54.0	6.0	4	3.00	45
8	8.0	12.0	59.0	8.0	4	4.00	45
10	10.0	14.0	67.0	10.0	4	5.00	45
12	12.0	16.0	74.0	12.0	4	6.00	45
14	14.0	18.0	75.0	14.0	4	7.00	45
16	16.0	22.0	83.0	16.0	4	8.00	45
20	20.0	26.0	93.0	20.0	4	10.00	45

Cooling	
Tolerance	f8
Coating	TiAlN- α

HA	HSC	HPC	MTC	UNI		
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HA K203263



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
190	130	120					80	340	380							40

K203263	D1 mm Ø	L2 mm	L1 mm	D2 mm Ø	z #	r mm	 °
3	3.0	5.0	75.0	3.0	4	1.50	45
4	4.0	8.0	75.0	4.0	4	2.00	45
5	5.0	9.0	75.0	5.0	4	2.50	45
6	6.0	10.0	100.0	6.0	4	3.00	45
8	8.0	12.0	100.0	8.0	4	4.00	45
10	10.0	14.0	100.0	10.0	4	5.00	45
12	12.0	16.0	100.0	12.0	4	6.00	45
14	14.0	18.0	100.0	14.0	4	7.00	45
16	16.0	22.0	150.0	16.0	4	8.00	45
20	20.0	26.0	150.0	20.0	4	10.00	45

Cooling	
Tolerance	f8
Coating	TiSiN- α

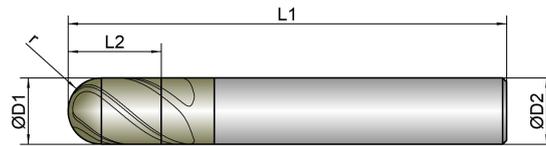
HA HSC HPC

NEW

Expert



HA K203413



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
200	160	150					100	350								

K203413	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	r mm	 °
3	3.0	5.0	54.0	6.0	4	1.50	40
4	4.0	8.0	54.0	6.0	4	2.00	40
5	5.0	9.0	54.0	6.0	4	2.50	40
6	6.0	10.0	54.0	6.0	4	3.00	40
8	8.0	12.0	58.0	8.0	4	4.00	40
10	10.0	14.0	66.0	10.0	4	5.00	40
12	12.0	16.0	73.0	12.0	4	6.00	40
16	16.0	22.0	82.0	16.0	4	8.00	40

Cooling

Tolerance f8

Coating TiSiN- α

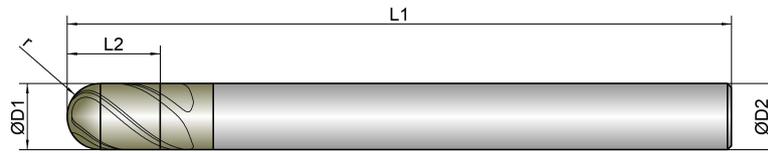
HA HSC HPC

NEW

Expert



HA K203418



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
190	150	140					90	340								

K203418	D1 mm ø	L2 mm	L1 mm	D2 mm ø	z #	r mm	 °
3	3.0	5.0	83.0	6.0	4	1.50	40
4	4.0	8.0	83.0	6.0	4	2.00	40
5	5.0	9.0	83.0	6.0	4	2.50	40
6	6.0	10.0	83.0	6.0	4	3.00	40
8	8.0	12.0	100.0	8.0	4	4.00	40
10	10.0	14.0	100.0	10.0	4	5.00	40
12	12.0	16.0	100.0	12.0	4	6.00	40
16	16.0	22.0	150.0	16.0	4	8.00	40

Cooling

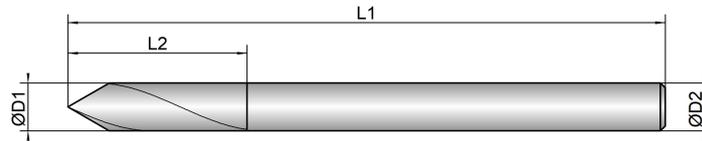
Tolerance -

Coating -

HA UNI



HA K204001



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
60	35						40	55	200	●						

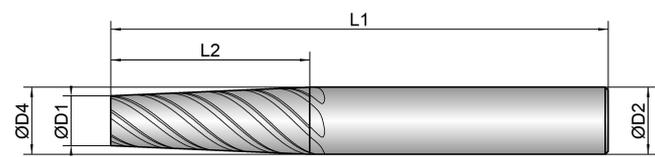
K204001	D1 mm ∅	L2 mm	L1 mm	D2 mm ∅	z #	 °
3	3.0	15.0	50.0	3.0	1	30
4	4.0	18.0	50.0	4.0	1	30
6	6.0	20.0	54.0	6.0	1	30

Cooling 

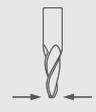
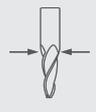
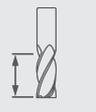
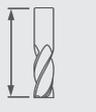
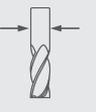
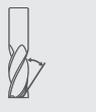
Tolerance -

Coating -

HA UNI 



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC		Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite		
●	●						●	●	●							

	D1  mm ø	D4  mm ø	L2  mm	L1  mm	D2  mm ø	z  #	 °
K204011							
2X10	2	3	10.0	50.0	3.0	4	30
2,5X10	2.5	3	10.0	50.0	3.0	4	30
2,5X20	2.5	4	20.0	60.0	4.0	4	30
3X20	3	4	20.0	60.0	4.0	4	30
4X20	4	5	20.0	60.0	5.0	4	30
5X30	5	6	30.0	75.0	6.0	6	45
6X30	6	8	30.0	75.0	8.0	6	45
8X30	8	10	30.0	80.0	10.0	6	45
10X30	10	12	30.0	85.0	12.0	6	45
12X30	12	14	30.0	85.0	14.0	6	45
12X50	12	14	50.0	110.0	14.0	6	45
16X60	16	18	60.0	120.0	18.0	6	45

Cooling 

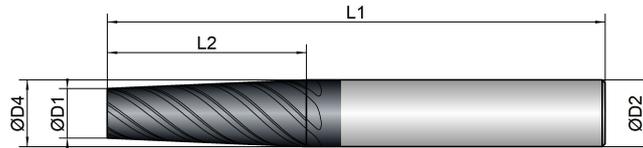
Tolerance -

Coating TiAlN- α

HA UNI 



HA K204013



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
●	●	●					●	●	●							

K204013	D1  mm Ø	D4  mm Ø	L2  mm	L1  mm	D2  mm Ø	z  #	 °
2X10	2	3	10.0	50.0	3.0	4	30
2,5X10	2.5	3	10.0	50.0	3.0	4	30
2,5X20	2.5	4	20.0	60.0	4.0	4	30
3X20	3	4	20.0	60.0	4.0	4	30
4X20	4	5	20.0	60.0	5.0	4	30
5X30	5	6	30.0	75.0	6.0	6	45
6X30	6	8	30.0	75.0	8.0	6	45
8X30	8	10	30.0	80.0	10.0	6	45
10X30	10	12	30.0	85.0	12.0	6	45
12X30	12	14	30.0	85.0	14.0	6	45
12X50	12	14	50.0	110.0	14.0	6	45
16X60	16	18	60.0	120.0	18.0	6	45

Cooling

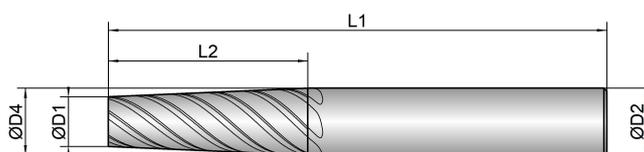
Tolerance -

Coating -

HA UNI



HA K204021



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
●	●						●	●	●							

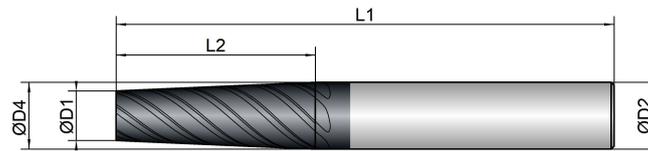
K204021	D1 mm ø	D4 mm ø	L2 mm	L1 mm	D2 mm ø	z #	 °
2X10	2	3	10.0	50.0	3.0	4	30
2,5X10	2.5	3	10.0	50.0	3.0	4	45
2,5X20	2.5	4	20.0	60.0	4.0	4	30
3X20	3	4	20.0	60.0	4.0	4	30
3,5X20	3.5	5	20.0	60.0	5.0	4	30
4X20	4	5	20.0	60.0	5.0	4	30
4,5X20	4.5	6	20.0	65.0	6.0	6	45
5X25	5	6	25.0	70.0	6.0	6	45
6X30	6	8	30.0	75.0	8.0	6	45
8X30	8	10	30.0	80.0	10.0	6	45
10X30	10	12	30.0	85.0	12.0	6	45
12X30	12	14	30.0	85.0	14.0	6	45
12X50	12	14	50.0	110.0	14.0	6	45
16X55	16	18	55.0	115.0	18.0	6	45

Cooling 

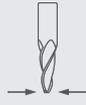
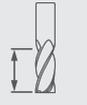
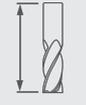
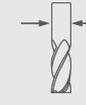
Tolerance -

Coating TiAlN- α

HA UNI 



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
●	●	●					●	●	●							

K204023	D1  mm ∅	D4  mm ∅	L2  mm	L1  mm	D2  mm ∅	z  #	 °
2X10	2	3	10.0	50.0	3.0	4	30
2,5X10	2.5	3	10.0	50.0	3.0	4	45
2,5X20	2.5	4	20.0	60.0	4.0	4	30
3X20	3	4	20.0	60.0	4.0	4	30
3,5X20	3.5	5	20.0	60.0	5.0	4	30
4X20	4	5	20.0	60.0	5.0	4	30
4,5X20	4.5	6	20.0	65.0	6.0	6	45
5X25	5	6	25.0	70.0	6.0	6	45
6X30	6	8	30.0	75.0	8.0	6	45
8X30	8	10	30.0	80.0	10.0	6	45
10X30	10	12	30.0	85.0	12.0	6	45
12X30	12	14	30.0	85.0	14.0	6	45
12X50	12	14	50.0	110.0	14.0	6	45
16X55	16	18	55.0	115.0	18.0	6	45

SC conical finishing cutter 1.5° | K204031

Cooling

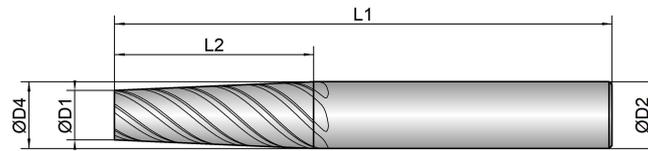
Tolerance -

Coating -

HA UNI



HA K204031



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
●	●						●	●	●							

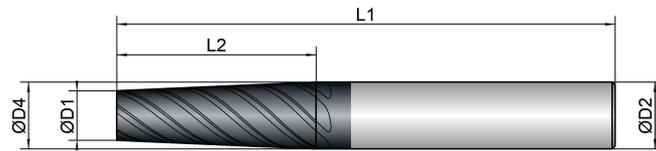
K204031	D1 mm ∅	D4 mm ∅	L2 mm	L1 mm	D2 mm ∅	z #	 °
2X10	2	3	10.0	50.0	3.0	4	30
2,5X10	2.5	4	10.0	50.0	4.0	4	30
2,5X20	2.5	4	20.0	60.0	4.0	4	30
3X20	3	4	20.0	60.0	4.0	4	30
3,5X20	3.5	5	20.0	60.0	5.0	4	30
4X20	4	5	20.0	60.0	5.0	4	30
4,5X20	4.5	6	20.0	65.0	6.0	4	30
5X30	5	8	30.0	75.0	8.0	6	45
6X30	6	8	30.0	75.0	8.0	6	45
8X30	8	10	30.0	80.0	10.0	6	45
10X30	10	12	30.0	85.0	12.0	6	45
12X30	12	14	30.0	85.0	14.0	6	45
12X50	12	16	50.0	110.0	16.0	6	45
16X60	16	20	60.0	126.0	20.0	6	45

Cooling 

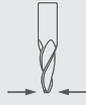
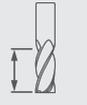
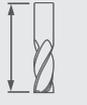
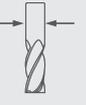
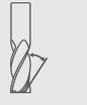
Tolerance -

Coating TiAlN- α

HA UNI 



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
●	●	●					●	●	●							

K204033	D1  mm ø	D4  mm ø	L2  mm	L1  mm	D2  mm ø	z  #	 °
2X10	2	3	10.0	50.0	3.0	4	30
2,5X10	2.5	4	10.0	50.0	4.0	4	30
2,5X20	2.5	4	20.0	60.0	4.0	4	30
3X20	3	4	20.0	60.0	4.0	4	30
3,5X20	3.5	5	20.0	60.0	5.0	4	30
4X20	4	5	20.0	60.0	5.0	4	30
4,5X20	4.5	6	20.0	65.0	6.0	4	30
5X30	5	8	30.0	75.0	8.0	6	45
6X30	6	8	30.0	75.0	8.0	6	45
8X30	8	10	30.0	80.0	10.0	6	45
10X30	10	12	30.0	85.0	12.0	6	45
12X30	12	14	30.0	85.0	14.0	6	45
12X50	12	16	50.0	110.0	16.0	6	45
16X60	16	20	60.0	126.0	20.0	6	45

Cooling 

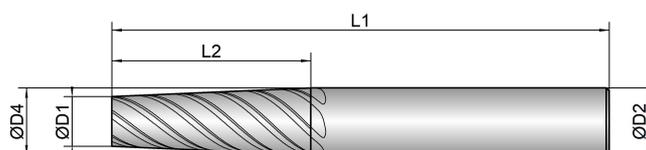
Tolerance -

Coating -

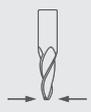
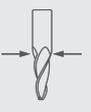
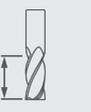
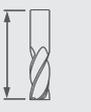
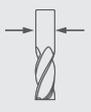
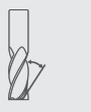
HA UNI



HA K204041



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
●	●						●	●	●							

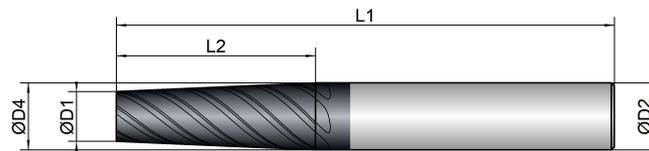
K204041	D1  mm ∅	D4  mm ∅	L2  mm	L1  mm	D2  mm ∅	z  #	 °
2X10	2	3	10.0	50.0	3.0	4	30
2,5X10	2.5	4	10.0	50.0	4.0	4	30
2,5X20	2.5	4	20.0	60.0	4.0	4	30
3X20	3	5	20.0	60.0	5.0	4	30
3,5X20	3.5	5	20.0	60.0	5.0	4	30
4X20	4	6	20.0	65.0	6.0	4	30
4,5X30	4.5	8	30.0	75.0	8.0	4	30
5X30	5	8	30.0	75.0	8.0	6	45
6X28	6	8	28.0	75.0	8.0	6	45
8X28	8	10	28.0	75.0	10.0	6	45
10X28	10	12	28.0	85.0	12.0	6	45
12X28	12	14	28.0	85.0	14.0	6	45
12X50	12	16	50.0	110.0	16.0	6	45
16X55	16	20	55.0	115.0	20.0	6	45

Cooling

Tolerance -

Coating TiAlN- α

HA UNI



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
●	●	●					●	●	●							

K204043	D1 mm ∅	D4 mm ∅	L2 mm	L1 mm	D2 mm ∅	z #	 °
2X10	2	3	10.0	50.0	3.0	4	30
2,5X10	2.5	4	10.0	50.0	4.0	4	30
2,5X20	2.5	4	20.0	60.0	4.0	4	30
3X20	3	5	20.0	60.0	5.0	4	30
3,5X20	3.5	5	20.0	60.0	5.0	4	30
4X20	4	6	20.0	65.0	6.0	4	30
4,5X30	4.5	8	30.0	75.0	8.0	4	30
5X30	5	8	30.0	75.0	8.0	6	45
6X28	6	8	28.0	75.0	8.0	6	45
8X28	8	10	28.0	75.0	10.0	6	45
10X28	10	12	28.0	85.0	12.0	6	45
12X28	12	14	28.0	85.0	14.0	6	45
12X50	12	16	50.0	110.0	16.0	6	45
16X55	16	20	55.0	115.0	20.0	6	45

SC conical finishing cutter 2.5° | K204051

Cooling

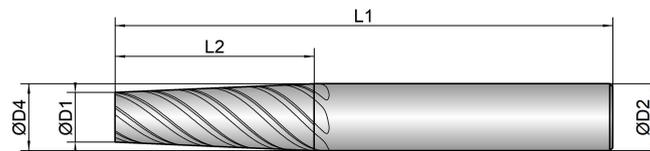
Tolerance -

Coating -

HA UNI



HA K204051



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
●	●						●	●	●							

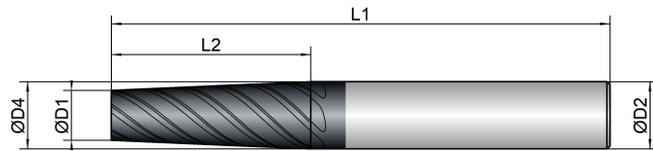
K204051	D1 mm ∅	D4 mm ∅	L2 mm	L1 mm	D2 mm ∅	z #	 °
2X15	2	4	15.0	50.0	4.0	4	30
2,5X20	2.5	5	20.0	60.0	5.0	4	30
3X20	3	5	20.0	60.0	5.0	4	30
4X20	4	6	20.0	65.0	6.0	4	30
5X30	5	8	30.0	75.0	8.0	6	45
6X30	6	10	30.0	80.0	10.0	6	45
8X30	8	12	30.0	85.0	12.0	6	45
10X40	10	14	40.0	100.0	14.0	6	45

Cooling 

Tolerance -

Coating TiAlN- α

HA UNI 



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
●	●	●					●	●	●							

K204053	D1  mm ø	D4  mm ø	L2  mm	L1  mm	D2  mm ø	z  #	 °
2X15	2	4	15.0	50.0	4.0	4	30
2,5X20	2.5	5	20.0	60.0	5.0	4	30
3X20	3	5	20.0	60.0	5.0	4	30
4X20	4	6	20.0	65.0	6.0	4	30
5X30	5	8	30.0	75.0	8.0	6	45
6X30	6	10	30.0	80.0	10.0	6	45
8X30	8	12	30.0	85.0	12.0	6	45
10X40	10	14	40.0	100.0	14.0	6	45

Cooling

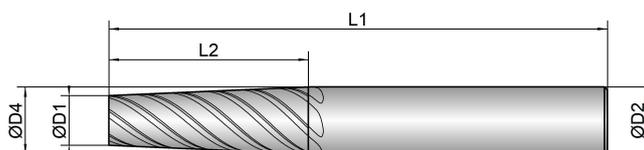
Tolerance -

Coating -

HA UNI



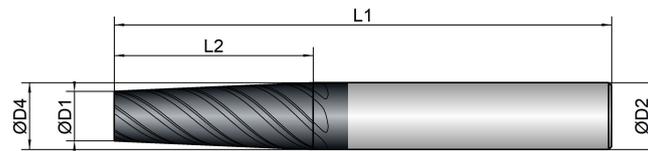
HA K204061



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
●	●						●	●	●							

K204061	D1 mm ø	D4 mm ø	L2 mm	L1 mm	D2 mm ø	z #	
2X10	2	4	10.0	50.0	4.0	4	30
2,5X10	2.5	4	10.0	50.0	4.0	4	30
2,5X20	2.5	6	20.0	65.0	6.0	4	30
3X25	3	6	25.0	70.0	6.0	4	30
3X30	3	8	30.0	75.0	8.0	4	30
3X40	3	8	40.0	85.0	8.0	4	30
4X25	4	8	25.0	70.0	8.0	6	45
4X30	4	8	30.0	75.0	8.0	6	45
5X40	5	10	40.0	90.0	10.0	6	45
6X30	6	10	30.0	80.0	10.0	6	45
8X30	8	12	30.0	84.0	12.0	6	45
8X50	8	14	50.0	110.0	14.0	6	45
10X30	10	14	30.0	84.0	14.0	6	45
10X50	10	16	50.0	110.0	16.0	6	45
12X30	12	16	30.0	90.0	16.0	6	45
12X50	12	18	50.0	110.0	18.0	6	45

Cooling	
Tolerance	-
Coating	TiAlN- α



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
●	●	●					●	●	●							

K204063	D1 mm ∅	D4 mm ∅	L2 mm	L1 mm	D2 mm ∅	z #	 °
2X10	2	4	10.0	50.0	4.0	4	30
2,5X10	2.5	4	10.0	50.0	4.0	4	30
2,5X20	2.5	6	20.0	65.0	6.0	4	30
3X25	3	6	25.0	70.0	6.0	4	30
3X30	3	8	30.0	75.0	8.0	4	30
3X40	3	8	40.0	85.0	8.0	4	30
4X25	4	8	25.0	70.0	8.0	6	45
4X30	4	8	30.0	75.0	8.0	6	45
5X40	5	10	40.0	90.0	10.0	6	45
6X30	6	10	30.0	80.0	10.0	6	45
8X30	8	12	30.0	84.0	12.0	6	45
8X50	8	14	50.0	110.0	14.0	6	45
10X30	10	14	30.0	84.0	14.0	6	45
10X50	10	16	50.0	110.0	16.0	6	45
12X30	12	16	30.0	90.0	16.0	6	45
12X50	12	18	50.0	110.0	18.0	6	45

Cooling

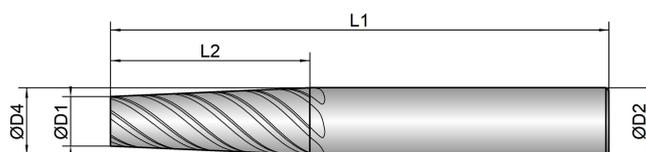
Tolerance -

Coating -

HA UNI



HA K204071



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
●	●						●	●	●							

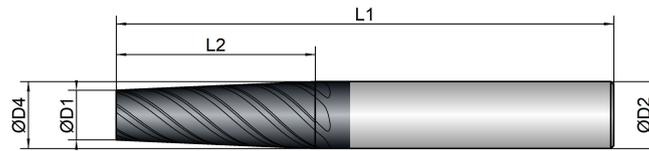
K204071	D1 mm ø	D4 mm ø	L2 mm	L1 mm	D2 mm ø	z #	 °
2,5X25	2.5	6	25.0	65.0	6.0	4	30
3X20	3	6	20.0	65.0	6.0	4	30
3,5X25	3.5	8	25.0	70.0	8.0	4	30
4X28	4	8	28.0	70.0	8.0	6	37
5X30	5	10	30.0	85.0	10.0	6	37
5X45	5	12	45.0	100.0	12.0	6	37
6X30	6	12	30.0	84.0	12.0	6	45
6X50	6	14	50.0	110.0	14.0	6	45
8X30	8	14	30.0	84.0	14.0	6	45
8X50	8	16	50.0	110.0	16.0	6	45
10X30	10	16	30.0	93.0	16.0	6	45
10X50	10	18	50.0	114.0	18.0	6	45

Cooling

Tolerance -

Coating TiAlN- α

HA UNI



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
●	●	●					●	●	●							

K204073	D1 mm Ø	D4 mm Ø	L2 mm	L1 mm	D2 mm Ø	z #	 °
2,5X25	2.5	6	25.0	65.0	6.0	4	30
3X20	3	6	20.0	65.0	6.0	4	30
3,5X25	3.5	8	25.0	70.0	8.0	4	30
4X28	4	8	28.0	70.0	8.0	6	45
5X30	5	10	30.0	85.0	10.0	6	45
5X45	5	12	45.0	100.0	12.0	6	45
6X30	6	12	30.0	84.0	12.0	6	45
6X50	6	14	50.0	110.0	14.0	6	45
8X30	8	14	30.0	84.0	14.0	6	45
8X50	8	16	50.0	110.0	16.0	6	45
10X30	10	16	30.0	93.0	16.0	6	45
10X50	10	18	50.0	114.0	18.0	6	45

Cooling

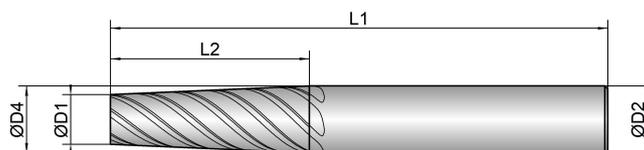
Tolerance -

Coating -

HA UNI



HA K204081



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
●	●	●					●	●	●							

	D1 mm ∅	D4 mm ∅	L2 mm	L1 mm	D2 mm ∅	z #	 °
K204081							
2,5X20	2.5	6	20.0	65.0	6.0	4	30
3X28	3	8	28.0	70.0	8.0	4	30
3,5X30	3.5	10	30.0	80.0	10.0	4	30
4X30	4	10	30.0	80.0	10.0	6	45
4,5X30	4.5	10	30.0	80.0	10.0	6	45
5X30	5	12	30.0	84.0	12.0	6	45
5X40	5	12	40.0	100.0	12.0	6	45
6X30	6	12	30.0	93.0	12.0	6	45
6X55	6	16	55.0	110.0	16.0	6	45
8X30	8	14	30.0	90.0	14.0	6	45
8X50	8	18	50.0	114.0	18.0	6	45
10X30	10	16	30.0	93.0	16.0	6	45
10X55	10	20	55.0	115.0	20.0	6	45
12X30	12	18	30.0	93.0	18.0	6	45
12X45	12	20	45.0	100.0	20.0	6	45

Cooling

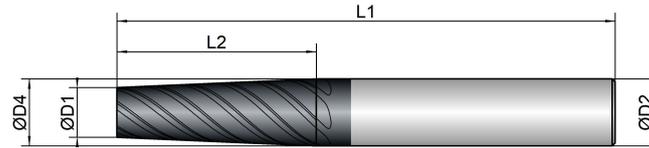
Tolerance -

Coating TiAlN- α

HA UNI



HA K204083



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
●	●	●					●	●	●							

	D1 mm ∅	D4 mm ∅	L2 mm	L1 mm	D2 mm ∅	z #	 °
K204083							
2,5X20	2.5	6	20.0	65.0	6.0	4	30
3X28	3	8	28.0	70.0	8.0	4	30
3,5X30	3.5	10	30.0	80.0	10.0	4	30
4X30	4	10	30.0	80.0	10.0	6	45
4,5X30	4.5	10	30.0	80.0	10.0	6	45
5X30	5	12	30.0	84.0	12.0	6	45
5X40	5	12	40.0	100.0	12.0	6	45
6X30	6	12	30.0	93.0	12.0	6	45
6X55	6	16	55.0	110.0	16.0	6	45
8X30	8	14	30.0	90.0	14.0	6	45
8X50	8	18	50.0	114.0	18.0	6	45
10X30	10	16	30.0	93.0	16.0	6	45
10X55	10	20	55.0	115.0	20.0	6	45
12X30	12	18	30.0	93.0	18.0	6	45
12X45	12	20	45.0	100.0	20.0	6	45

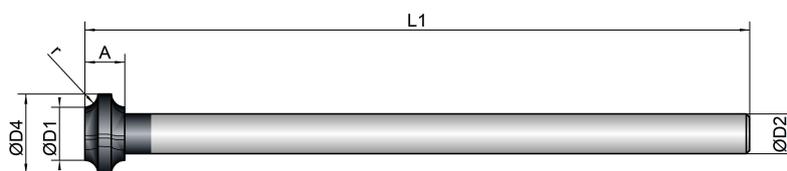
Cooling	
Tolerance	0-0,01
Coating	TiAlN- α

HA

UNI



HA K204092



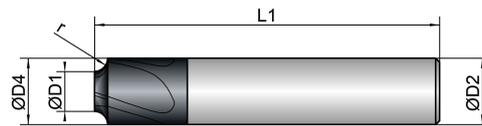
Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
60	40						35	40	120							

	r	D1	D4	A	L1	D2	z
K204092	R mm	 mm Ø	 mm Ø	 mm	 mm	 mm Ø	 #
5,6/0,2	0.20	5.6	6	2.0	75.0	4.0	4
7,6/0,2	0.20	7.6	8	2.0	100.0	6.0	4
5,4/0,3	0.30	5.4	6	2.0	75.0	4.0	4
7,4/0,3	0.30	7.4	8	2.0	100.0	6.0	4
5,2/0,4	0.40	5.2	6	2.0	75.0	4.0	4
7,2/0,4	0.40	7.2	8	2.0	100.0	6.0	4
5/0,5	0.50	5	6	2.0	75.0	4.0	4
7/0,5	0.50	7	8	2.0	100.0	6.0	4
8,4/0,8	0.80	8.4	10	4.0	100.0	6.0	4
8/1	1.00	8	10	4.0	100.0	6.0	4
7,6/1,2	1.20	7.6	10	5.0	100.0	6.0	4
7/1,5	1.50	7	10	5.0	100.0	6.0	4
8,4/1,8	1.80	8.4	12	6.0	100.0	6.0	4
8/2	2.00	8	12	7.0	100.0	6.0	4
7/2,5	2.50	7	12	8.0	100.0	6.0	4

Cooling	
Tolerance	0-0,01
Coating	TiAlN- α



HA K204106



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
170	100						85	125	400				25			45

K204106	r	D1	D4	L1	D2	z
	mm	mm Ø	mm Ø	mm	mm Ø	#
3,6/0,2	0.20	3.6	4	50.0	4.0	4
3,4/0,3	0.30	3.4	4	50.0	4.0	4
3,2/0,4	0.40	3.2	4	50.0	4.0	4
3/0,5	0.50	3	4	50.0	4.0	4
4,8/0,6	0.60	4.8	6	50.0	6.0	4
4,4/0,8	0.80	4.4	6	50.0	6.0	4
4/1	1.00	4	6	50.0	6.0	4
5/1,5	1.50	5	8	55.0	10.0	4
6/2	2.00	6	10	66.0	10.0	4
7/2,5	2.50	7	12	75.0	12.0	4
6/3	3.00	6	12	75.0	12.0	4
9/3,5	3.50	9	16	80.0	16.0	4
8/4	4.00	8	16	80.0	16.0	4
7/4,5	4.50	7	16	80.0	16.0	4
10/5	5.00	10	20	80.0	20.0	4
8/6	6.00	8	20	80.0	20.0	4
9/8	8.00	9	25	100.0	25.0	4
5/10	10.00	5	25	100.0	25.0	4

Cooling 

Tolerance -

Coating TiAlN- α

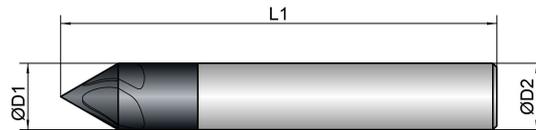
HA HB UNI 



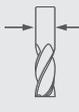
HA K205173



HB K205174



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC		Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite		
110	85	65					80	90	280	250	●		30		40	

K205173	K205174	D1  mm ø	L1  mm	D2  mm ø	z  #
3	-	3.0	50.0	3.0	3
4	-	4.0	50.0	4.0	4
6	6	6.0	50.0	6.0	4
8	8	8.0	59.0	8.0	4
10	10	10.0	66.0	10.0	4
12	12	12.0	73.0	12.0	4

Cooling 

Tolerance -

Coating TiAlN- α

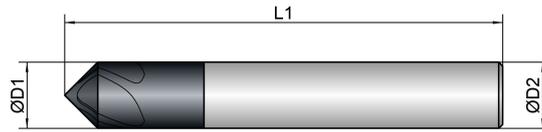
HA HB UNI 



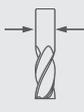
HA K205183



HB K205184



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
110	85	65					80	90	280	250	●		30			40

K205183	K205184	D1	L1	D2	z
		 mm ø	 mm	 mm ø	 #
3	-	3.0	50.0	3.0	3
4	-	4.0	50.0	4.0	4
6	6	6.0	50.0	6.0	4
8	8	8.0	59.0	8.0	4
10	10	10.0	66.0	10.0	4
12	12	12.0	73.0	12.0	4

Cooling	
Tolerance	-
Coating	TiAlN- α

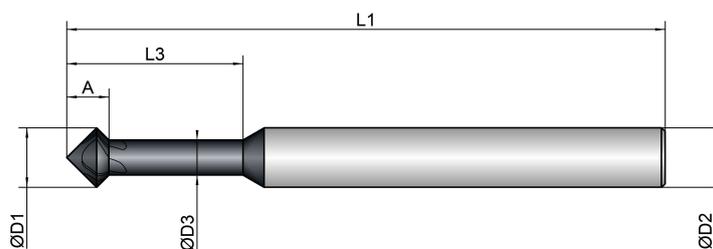
HA

UNI

Basic



HA K205193



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
70	45						40	38	120				25			35

	D1 mm ø	D3 mm ø	A mm	L3 mm	L1 mm	D2 mm ø	z #
K205193							
3	3.0	2.2	2.0	10.0	50.0	4.0	4
4	4.0	2.9	2.5	10.0	50.0	4.0	4
5	5.0	3.9	3.0	15.0	65.0	6.0	4
6	6.0	3.9	4.0	15.0	65.0	6.0	4
8	8.0	5.9	2.5	20.0	70.0	8.0	4
10	10.0	5.9	4.0	23.0	73.0	10.0	4
12	12.0	5.9	6.0	23.0	75.0	12.0	4

Cooling 

Tolerance d11

Coating TiAlN- α

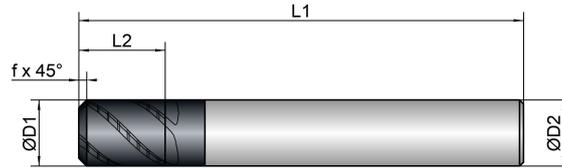
HA HB MTC UNI 



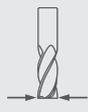
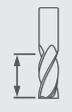
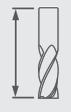
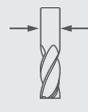
HA K206083



HB K206084



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
175	150	125					60	125							40	

K206083	K206084	D1  mm ø	L2  mm	L1  mm	D2  mm ø	z  #	 mm	 °
6	6	6.0	8.0	54.0	6.0	4	0.15	45
8	8	8.0	11.0	59.0	8.0	4	0.20	45
10	10	10.0	13.0	67.0	10.0	4	0.20	45
12	12	12.0	16.0	74.0	12.0	4	0.25	45
14	14	14.0	16.0	75.0	14.0	4	0.25	45
16	16	16.0	19.0	83.0	16.0	5	0.35	45
18	18	18.0	19.0	80.0	18.0	5	0.35	45
20	20	20.0	19.0	93.0	20.0	5	0.40	45

Cooling 

Tolerance d11

Coating TiAlN- α

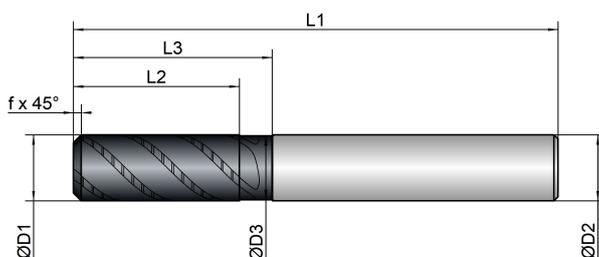
HA HB MTC UNI 



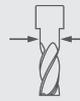
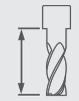
HA K206093



HB K206094



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
175	150	125					60	125							40	

K206093	K206094	D1	D3	L2	L3	L1	D2	z	45°	
		 mm ø	 mm ø	 mm	 mm	 mm	 mm ø	 #		
6	6	6.0	5.8	16.0	21.0	58.0	6.0	4	0.15	45
8	8	8.0	7.7	22.0	27.0	70.0	8.0	4	0.20	45
10	10	10.0	9.7	25.0	30.0	73.0	10.0	4	0.20	45
12	12	12.0	11.6	28.0	38.0	84.0	12.0	4	0.25	45
14	14	14.0	13.6	30.0	40.0	84.0	14.0	4	0.25	45
16	16	16.0	15.5	36.0	45.0	93.0	16.0	5	0.35	45
18	18	18.0	17.5	36.0	45.0	93.0	18.0	5	0.35	45
20	20	20.0	19.5	41.0	55.0	104.0	20.0	5	0.40	45
25	25	25.0	24.0	50.0	65.0	125.0	25.0	5	0.50	45

Cooling

Tolerance d11

Coating TiAlN- α

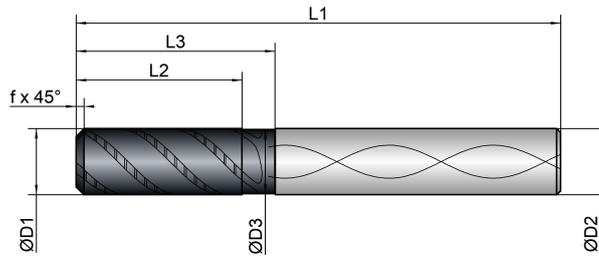
HA HB MTC UNI



HA K206113



HB K206114



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
200	170	150					70	150								40

K206113	K206114	D1	D3	L2	L3	L1	D2	z	45°	°
		mm Ø	mm Ø	mm	mm	mm	mm Ø	#		
6	6	6.0	5.8	16.0	21.0	58.0	6.0	4	0.15	45
8	8	8.0	7.7	22.0	27.0	70.0	8.0	4	0.20	45
10	10	10.0	9.7	25.0	30.0	73.0	10.0	4	0.20	45
12	12	12.0	11.6	28.0	38.0	84.0	12.0	4	0.25	45
14	14	14.0	13.6	30.0	40.0	84.0	14.0	4	0.25	45
16	16	16.0	15.5	36.0	45.0	93.0	16.0	5	0.35	45
18	18	18.0	17.5	36.0	45.0	93.0	18.0	5	0.35	45
20	20	20.0	19.5	41.0	55.0	104.0	20.0	5	0.40	45

HOTMANN & VRATNY — PATENTED QUALITY

ABRASIVE MATERIAL





HOFMANN & VRATNY — PATENTED QUALITY

ABRASIVE MATERIAL

As a pioneer in using solid carbide milling cutters to machine GFRP and CFRP, we can draw on our in-depth knowledge and years of experience. We offer patented solutions that can simplify tasks for both you and your customers.

Patented quality down to the last detail. Composites such as CFRP and GFRP are now a staple of the industry.

However, machining these materials is still a challenge. Our patented solid carbide ba-

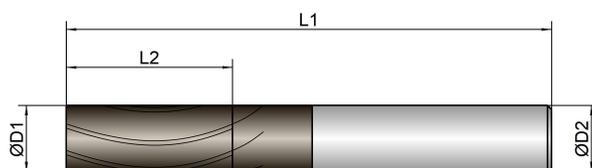
nana milling cutters are used to efficiently machine carbon parts all over the world. The special geometry ensures that the workpiece has perfectly clean edges after machining.

Cooling	 
Tolerance	h10
Coating	Diamond- α

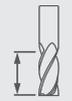
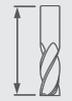
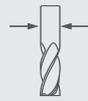
HA   



HA K201573



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
											210	200	350			

	D1  mm Ø	L2  mm	L1  mm	D2  mm Ø	z  #
K201573					
6	6.0	16.0	58.0	6.0	4
8	8.0	22.0	70.0	8.0	6
10	10.0	25.0	73.0	10.0	6
12	12.0	28.0	84.0	12.0	6

Cooling	 
Tolerance	h10
Coating	Diamond- α

HA

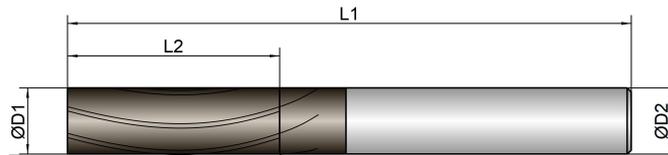




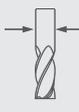

Expert



HA K201577



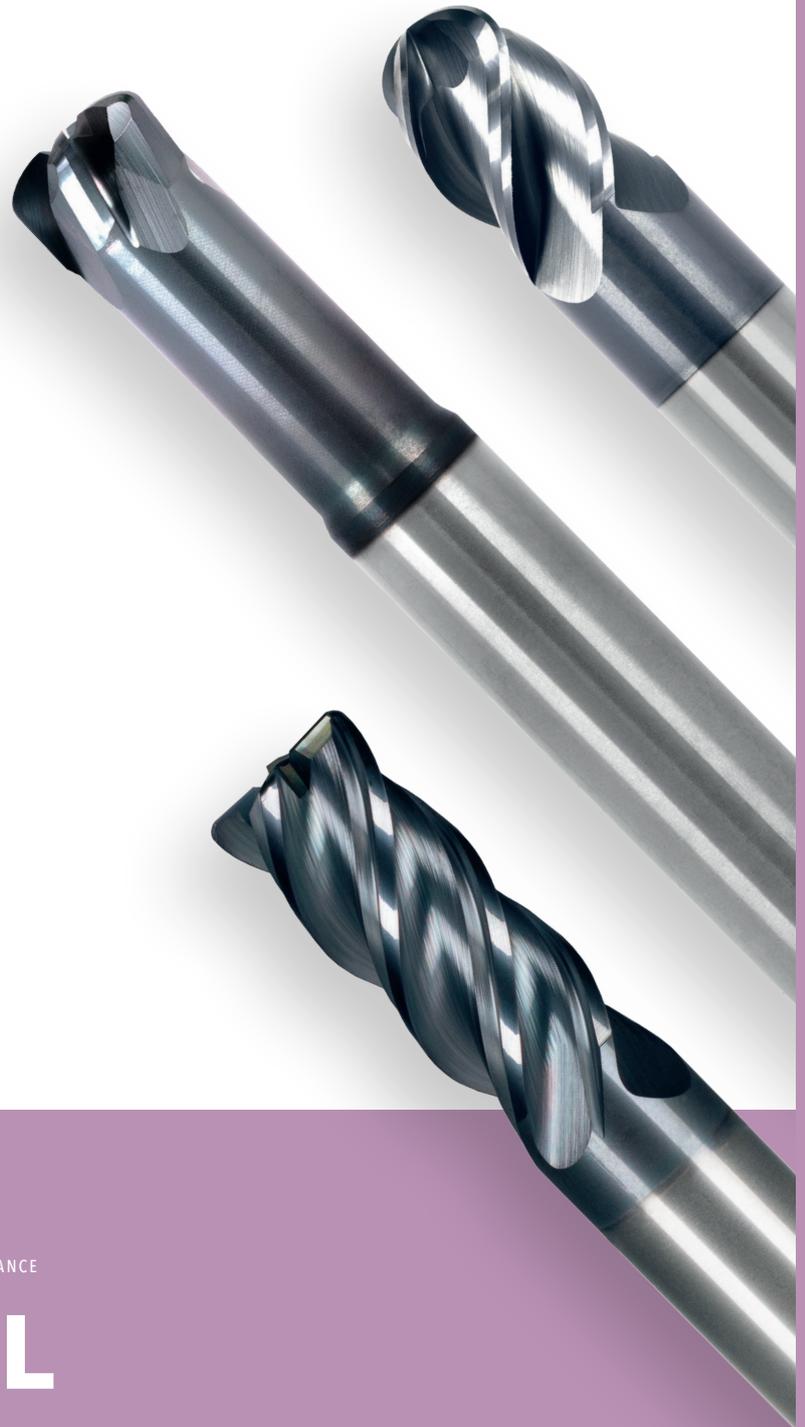
Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
											350	210	200			

K201577	D1  mm Ø	L2  mm	L1  mm	D2  mm Ø	z  #
6	6.0	21.0	65.0	6.0	4
8	8.0	28.0	85.0	8.0	6
10	10.0	32.0	85.0	10.0	6
12	12.0	36.0	93.0	12.0	6

HOTMANN & VRATNY — IMPECCABLE PERFORMANCE

INCONEL





HOFMANN & VRATNY — IMPECCABLE PERFORMANCE

INCONEL

Inconel is a material developed for special requirements. It is used in components under extreme load, such as in turbine construction. Milling cutters machining Inconel therefore need to withstand even higher loads.

Optimal geometry for impeccable performance. Due to the extreme changes in the structure when cutting Inconel, an ingenious adjustment of the cutter geometry is necessary to cover all eventualities.

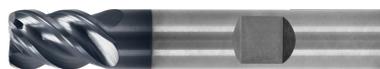
Our development department took on this challenge and the result is no less than our Inconel Expert Line, in which a cold weld (built-up edges) is completely prevented.

Cooling	
Tolerance	e8
Coating	TiSiN- α

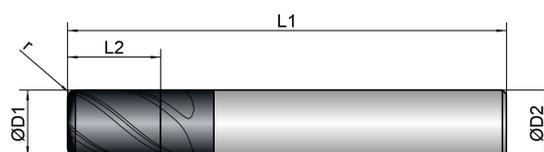
HB ETC HPC ≠ 

NEW

Expert



HB K201759



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
													35			

K201759	D1  mm ø	L2  mm	L1  mm	D2  mm ø	z  #	r  mm	 °
4	4.0	8.0	54.0	6.0	4	0.10	40
5	5.0	9.0	54.0	6.0	4	0.20	40
6	6.0	10.0	54.0	6.0	4	0.20	40
8	8.0	12.0	58.0	8.0	4	0.20	40
10	10.0	14.0	66.0	10.0	4	0.20	40
12	12.0	16.0	73.0	12.0	4	0.20	40
16	16.0	22.0	82.0	16.0	4	0.30	40
20	20.0	26.0	92.0	20.0	4	0.30	40

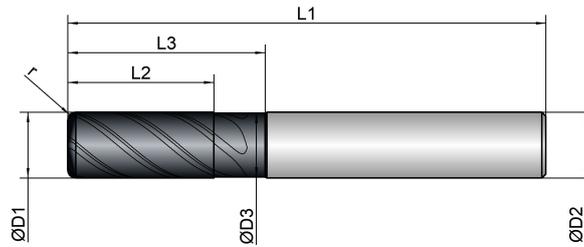
Cooling	
Tolerance	e8
Coating	TiSiN- α

HB ETC HPC ≠ 

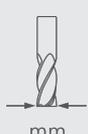
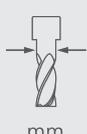
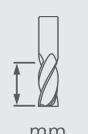
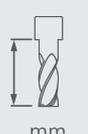
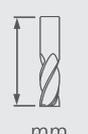
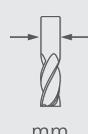
NEW 
Expert



HB K201764



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
													35			

	D1	D3	L2	L3	L1	D2	z	r	
K201764	 mm ø	 mm ø	 mm	 mm	 mm	 mm ø	 #	 mm	 °
6	6.0	5.8	13.0	19.0	57.0	6.0	5	0.10	40
8	8.0	7.7	19.0	25.0	63.0	8.0	5	0.20	40
10	10.0	9.7	22.0	30.0	72.0	10.0	5	0.20	40
12	12.0	11.6	26.0	36.0	83.0	12.0	5	0.20	40
16	16.0	15.5	36.0	42.0	92.0	16.0	5	0.30	40
20	20.0	19.5	41.0	52.0	104.0	20.0	5	0.30	40

Cooling	
Tolerance	e8
Coating	TiSiN- α

HB

ETC

HPC

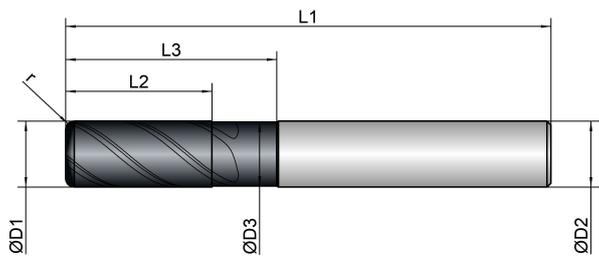
MTC

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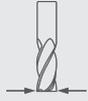
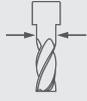
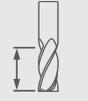
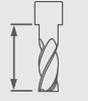
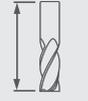
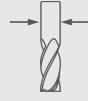





Expert



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
													35			

K202414	D1  mm ∅	D3  mm ∅	L2  mm	L3  mm	L1  mm	D2  mm ∅	z  #	r  mm	 °
4/0,3	4.0	3.8	11.0	20.0	58.0	6.0	4	0.30	40
4/1	4.0	3.8	11.0	20.0	58.0	6.0	4	1.00	40
5/0,3	5.0	4.8	13.0	20.0	58.0	6.0	4	0.30	40
5/1	5.0	4.8	13.0	20.0	58.0	6.0	4	1.00	40
6/0,3	6.0	5.8	13.0	20.0	58.0	6.0	4	0.30	40
6/1	6.0	5.8	13.0	20.0	58.0	6.0	4	1.00	40
8/0,3	8.0	7.7	19.0	25.0	63.0	8.0	4	0.30	40
8/1	8.0	7.7	19.0	25.0	63.0	8.0	4	1.00	40
10/0,3	10.0	9.7	22.0	32.0	73.0	10.0	4	0.30	40
10/1	10.0	9.7	22.0	32.0	73.0	10.0	4	1.00	40
10/2	10.0	9.7	22.0	32.0	73.0	10.0	4	2.00	40
12/0,3	12.0	11.6	26.0	38.0	85.0	12.0	4	0.30	40
12/1	12.0	11.6	26.0	38.0	85.0	12.0	4	1.00	40
12/2	12.0	11.6	26.0	38.0	85.0	12.0	4	2.00	40
16/0,3	16.0	15.5	32.0	44.0	93.0	16.0	4	0.30	40
16/1	16.0	15.5	32.0	44.0	93.0	16.0	4	1.00	40
16/2	16.0	15.5	32.0	44.0	93.0	16.0	4	2.00	40
20/0,3	20.0	19.5	38.0	54.0	104.0	20.0	4	0.30	40
20/1	20.0	19.5	38.0	54.0	104.0	20.0	4	1.00	40
20/2	20.0	19.5	38.0	54.0	104.0	20.0	4	2.00	40

Cooling	
Tolerance	f8
Coating	TiSiN- α

HA

HSC

HPC

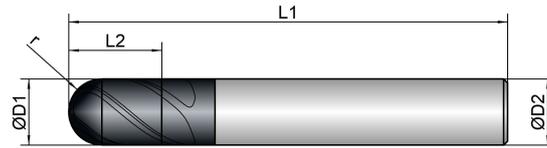


NEW

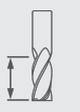
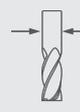

Expert



HA K203393



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
													40			

K203393	D1  mm ø	L2  mm	L1  mm	D2  mm ø	z  #	r  mm	 °
2	2.0	4.0	54.0	6.0	4	1.00	40
3	3.0	5.0	54.0	6.0	4	1.50	40
4	4.0	8.0	54.0	6.0	4	2.00	40
5	5.0	9.0	54.0	6.0	4	2.50	40
6	6.0	10.0	54.0	6.0	4	3.00	40
8	8.0	12.0	58.0	8.0	4	4.00	40
10	10.0	14.0	66.0	10.0	4	5.00	40
12	12.0	16.0	73.0	12.0	4	6.00	40
16	16.0	20.0	82.0	16.0	4	8.00	40

Cooling	
Tolerance	f8
Coating	TiSiN- α

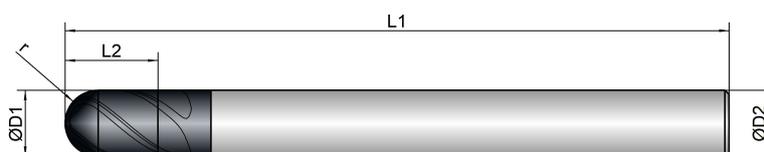
HA HSC HPC 

NEW

Expert



HA K203398



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
													35			

K203398	D1  mm Ø	L2  mm	L1  mm	D2  mm Ø	z  #	r  mm	 °
2	2.0	4.0	83.0	6.0	4	1.00	40
3	3.0	5.0	83.0	6.0	4	1.50	40
4	4.0	8.0	83.0	6.0	4	2.00	40
5	5.0	9.0	83.0	6.0	4	2.50	40
6	6.0	10.0	83.0	6.0	4	3.00	40
8	8.0	12.0	100.0	8.0	4	4.00	40
10	10.0	14.0	100.0	10.0	4	5.00	40
12	12.0	16.0	100.0	12.0	4	6.00	40
16	16.0	20.0	100.0	16.0	4	8.00	40

Cooling	
Tolerance	h9
Coating	TiSiN- α

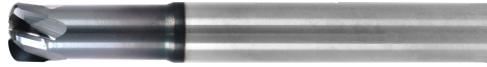
HA

HSC

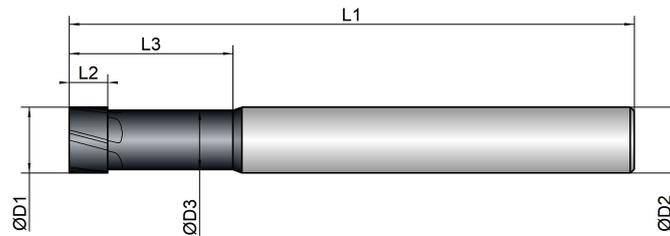


NEW

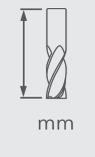

Expert



HA K207043



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
													55			

K207043	D1  mm ∅	D3  mm ∅	L2  mm	L3  mm	L1  mm	D2  mm ∅	z  #	 mm	 mm max	 °
2	2.0	1.7	1.5	13.0	54.0	6.0	2	0.3	0.06	15
3	3.0	2.7	1.5	15.0	54.0	6.0	2	0.3	0.10	15
4	4.0	3.6	2.5	16.0	57.0	6.0	2	0.5	0.15	15
5	5.0	4.6	3.5	18.0	68.0	6.0	4	0.5	0.17	15
6	6.0	5.2	3.5	20.0	68.0	6.0	4	1.0	0.20	15
8	8.0	7.0	4.8	24.0	70.0	8.0	5	1.5	0.25	15
10	10.0	9.0	5.8	26.0	85.0	10.0	5	2.0	0.30	15
12	12.0	11.0	6.8	30.0	93.0	12.0	5	2.0	0.40	15
16	16.0	14.5	8.8	35.0	100.0	16.0	5	2.5	0.50	15

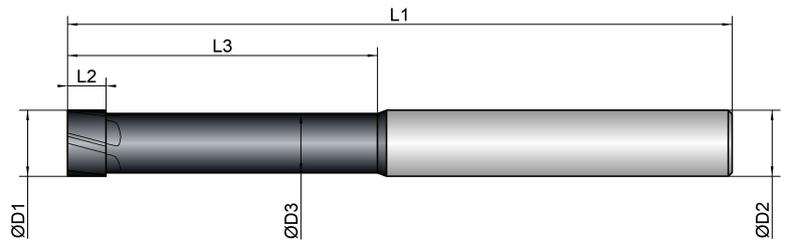
Cooling	
Tolerance	h9
Coating	TiSiN- α

HA HSC 

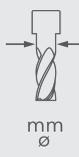
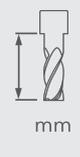
NEW 
Expert



HA K207048



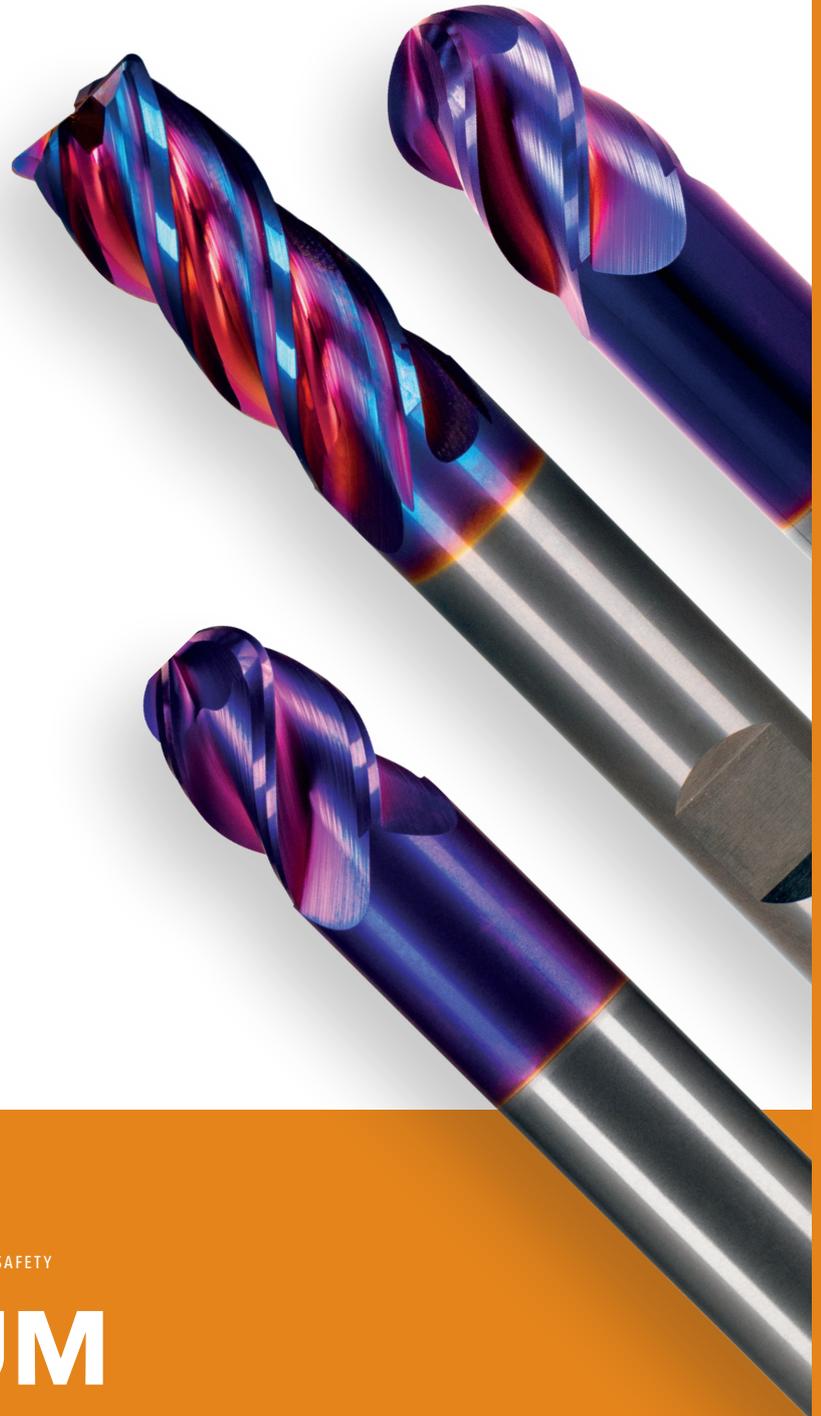
Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
													50			

K207048	D1  mm ø	D3  mm ø	L2  mm	L3  mm	L1  mm	D2  mm ø	z  #	 mm	 mm max	 °
2	2.0	1.7	1.5	18.0	75.0	6.0	2	0.3	0.06	15
3	3.0	2.7	1.5	20.0	75.0	6.0	2	0.3	0.10	15
4	4.0	3.6	2.5	24.0	83.0	6.0	2	0.5	0.15	15
5	5.0	4.6	3.5	28.0	100.0	6.0	4	0.5	0.17	15
6	6.0	5.2	3.5	28.0	100.0	6.0	4	1.0	0.20	15
8	8.0	7.0	4.8	40.0	100.0	8.0	5	1.5	0.25	15
10	10.0	9.0	5.8	48.0	100.0	10.0	5	2.0	0.30	15
12	12.0	11.0	6.8	56.0	119.0	12.0	5	2.0	0.40	15
16	16.0	14.5	8.8	65.0	150.0	16.0	5	2.5	0.50	15

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Titanium is one of the most widely used materials in medical technology and the aerospace industry. It is gaining importance throughout the entire industry. Working with titanium is simply not comparable with any other material group.

Perfectly coordinated milling cutters for maximum process safety. The difficult titanium machining process requires specially tailored carbides, as well as optimised, state-of-the-art multi-layer coating and, last but not least, the per-

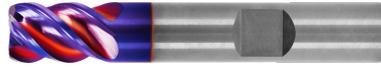
fect geometry. Our Expert Line titanium milling cutters give you the highest level of process reliability and maximum production service life.

Cooling	
Tolerance	e8
Coating	TiSiN- α

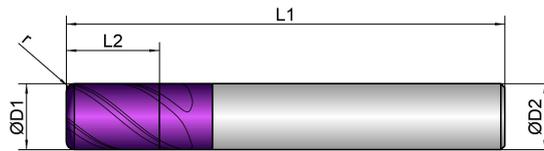
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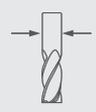
NEW

HB K201688



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
																80

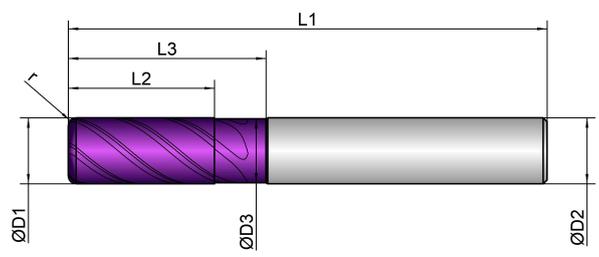
K201688	D1  mm ø	L2  mm	L1  mm	D2  mm ø	z  #	r  mm	 °
4	4.0	8.0	54.0	6.0	4	0.10	40
5	5.0	9.0	54.0	6.0	4	0.20	40
6	6.0	10.0	54.0	6.0	4	0.20	40
8	8.0	12.0	58.0	8.0	4	0.20	40
10	10.0	14.0	66.0	10.0	4	0.20	40
12	12.0	16.0	73.0	12.0	4	0.20	40
16	16.0	22.0	82.0	16.0	4	0.30	40
20	20.0	26.0	92.0	20.0	4	0.30	40

Cooling	
Tolerance	e8
Coating	TiSiN- α

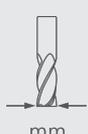
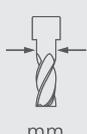
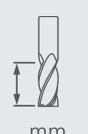
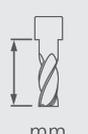
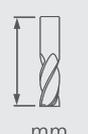
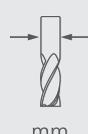
HB	ETC	HPC	\neq		
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NEW

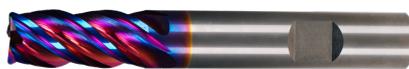




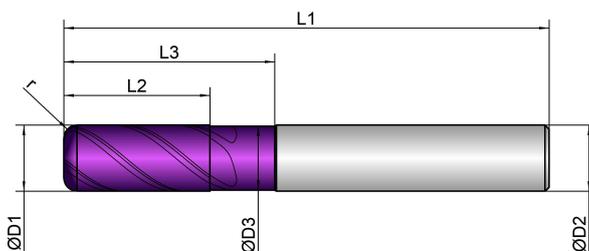
Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
																80

	D1	D3	L2	L3	L1	D2	z	r	
K201693	 mm ø	 mm ø	 mm	 mm	 mm	 mm ø	 #	 mm	 °
6	6.0	5.8	13.0	19.0	57.0	6.0	5	0.10	40
8	8.0	7.7	19.0	25.0	63.0	8.0	5	0.20	40
10	10.0	9.7	22.0	30.0	72.0	10.0	5	0.20	40
12	12.0	11.6	26.0	36.0	83.0	12.0	5	0.20	40
16	16.0	15.5	36.0	42.0	92.0	16.0	5	0.30	40
20	20.0	19.5	41.0	52.0	104.0	20.0	5	0.30	40

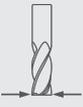
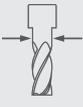
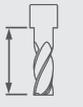
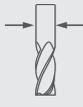
Cooling	
Tolerance	e8
Coating	TiSiN- α



HB K202424



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
																80

K202424	D1  mm Ø	D3  mm Ø	L2  mm	L3  mm	L1  mm	D2  mm Ø	z  #	r  mm	 °
4/0,3	4.0	3.8	11.0	20.0	58.0	6.0	4	0.30	40
4/1	4.0	3.8	11.0	20.0	58.0	6.0	4	1.00	40
5/0,3	5.0	4.8	13.0	20.0	58.0	6.0	4	0.30	40
5/1	5.0	4.8	13.0	20.0	58.0	6.0	4	1.00	40
6/0,3	6.0	5.8	13.0	20.0	58.0	6.0	4	0.30	40
6/1	6.0	5.8	13.0	20.0	58.0	6.0	4	1.00	40
8/0,3	8.0	7.7	19.0	25.0	63.0	8.0	4	0.30	40
8/1	8.0	7.7	19.0	25.0	63.0	8.0	4	1.00	40
10/0,3	10.0	9.7	22.0	32.0	73.0	10.0	4	0.30	40
10/1	10.0	9.7	22.0	32.0	73.0	10.0	4	1.00	40
10/2	10.0	9.7	22.0	32.0	73.0	10.0	4	2.00	40
12/0,3	12.0	11.6	26.0	38.0	85.0	12.0	4	0.30	40
12/1	12.0	11.6	26.0	38.0	85.0	12.0	4	1.00	40
12/2	12.0	11.6	26.0	38.0	85.0	12.0	4	2.00	40
16/0,3	16.0	15.5	32.0	44.0	93.0	16.0	4	0.30	40
16/1	16.0	15.5	32.0	44.0	93.0	16.0	4	1.00	40
16/2	16.0	15.5	32.0	44.0	93.0	16.0	4	2.00	40
20/0,3	20.0	19.5	38.0	54.0	104.0	20.0	4	0.30	40
20/1	20.0	19.5	38.0	54.0	104.0	20.0	4	1.00	40
20/2	20.0	19.5	38.0	54.0	104.0	20.0	4	2.00	40

Cooling	
Tolerance	f8
Coating	TiSiN- α

HA

HSC

HPC

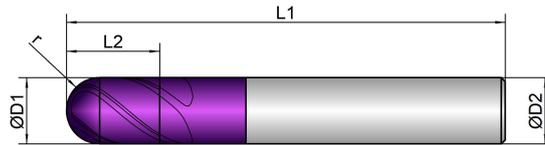


NEW


Expert



HA K203383



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
																60

K203383	D1  mm ø	L2  mm	L1  mm	D2  mm ø	z  #	r  mm	 °
2	2.0	4.0	54.0	6.0	4	1.00	40
3	3.0	5.0	54.0	6.0	4	1.50	40
4	4.0	8.0	54.0	6.0	4	2.00	40
5	5.0	9.0	54.0	6.0	4	2.50	40
6	6.0	10.0	54.0	6.0	4	3.00	40
8	8.0	12.0	58.0	8.0	4	4.00	40
10	10.0	14.0	66.0	10.0	4	5.00	40
12	12.0	16.0	73.0	12.0	4	6.00	40
16	16.0	20.0	82.0	16.0	4	8.00	40

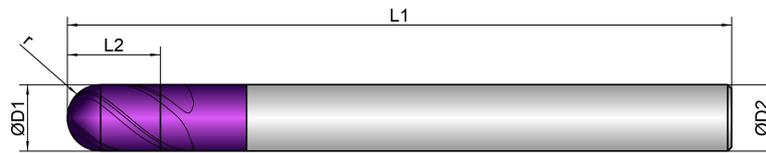
Cooling	
Tolerance	f8
Coating	TiSiN- α

HA HSC HPC 

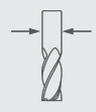
NEW 



HA K203388



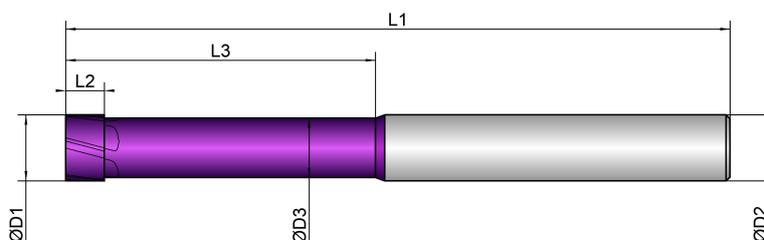
Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
																50

K203388	D1  mm Ø	L2  mm	L1  mm	D2  mm Ø	z  #	r  mm	 °
2	2.0	4.0	83.0	6.0	4	1.00	40
3	3.0	5.0	83.0	6.0	4	1.50	40
4	4.0	8.0	83.0	6.0	4	2.00	40
5	5.0	9.0	83.0	6.0	4	2.50	40
6	6.0	10.0	83.0	6.0	4	3.00	40
8	8.0	12.0	100.0	8.0	4	4.00	40
10	10.0	14.0	100.0	10.0	4	5.00	40
12	12.0	16.0	100.0	12.0	4	6.00	40
16	16.0	20.0	100.0	16.0	4	8.00	40

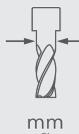
Cooling	
Tolerance	h9
Coating	TiSiN- α



HA K207038



Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
															100	

K207038	D1  mm ∅	D3  mm ∅	L2  mm	L3  mm	L1  mm	D2  mm ∅	z  #	 mm	 mm max	 °
2	2.0	1.7	1.5	18.0	75.0	6.0	2	0.3	0.15	15
3	3.0	2.7	1.5	20.0	75.0	6.0	2	0.3	0.20	15
4	4.0	3.6	2.5	24.0	83.0	6.0	2	0.5	0.25	15
5	5.0	4.6	3.5	28.0	100.0	6.0	4	0.5	0.35	15
6	6.0	5.2	3.5	28.0	100.0	6.0	4	1.0	0.40	15
8	8.0	7.0	4.8	40.0	100.0	8.0	5	1.5	0.50	15
10	10.0	9.0	5.8	48.0	100.0	10.0	5	2.0	0.75	15
12	12.0	11.0	6.8	56.0	119.0	12.0	5	2.0	0.80	15
16	16.0	14.5	8.8	65.0	150.0	16.0	5	2.5	1.00	15

GENERAL TERMS OF SALE

§ 1 Scope

1. These General Terms of Sale apply to all business relationships between Hofmann & Vratny OHG (hereinafter referred to as "Hofmann & Vratny") and its customers (hereinafter referred to individually as the "Ordering Party" and collectively as the "Ordering Parties").
2. These General Terms of Sale only apply to Ordering Parties that are entrepreneurs pursuant to §§ 14 and 310 para. 1 of the BGB (Civil Code of Germany), legal entities under public law, and/or special funds under public law.
3. The scope of application of these General Terms of Sale includes, but is not limited to, contracts regarding the sale and/or delivery of chattels (hereinafter referred to as "Goods") regardless of whether they are produced by Hofmann & Vratny or procured from suppliers (§§ 433 and 651 of the BGB). Unless agreed upon otherwise, the version of these General Terms of Sale applicable at the time the Ordering Party places an order and in any case the most recent version of these General Terms of Sale provided to the Ordering Party in writing in the form of a master agreement also shall apply to similar contracts made at a later date without Hofmann & Vratny being required to make reference to them in every individual case.
4. These General Terms of Sale shall apply exclusively. Any of the Ordering Party's terms of sale which contradict or deviate from these General Terms of Sale shall not be accepted. These General Terms of Sale also shall apply if and when Hofmann & Vratny executes a delivery despite having knowledge of the Ordering Party's terms of sale which contradict or deviate from these General Terms of Sale.
5. If Hofmann & Vratny and the Ordering Party have entered into any individual agreements, such individual agreements shall prevail over these General Terms of Sale. The content of such individual agreements only can be substantiated by a written contract or by written confirmation from Hofmann & Vratny.
6. All legal declarations and notifications required to be made by the Ordering Party vis-à-vis Hofmann & Vratny after a contract has been signed (e.g., regarding deadlines, notices of defects, rescission or reduction) shall be made in writing to be effective.
7. All references to applicable laws shall be for the purpose of clarification only. Unless amended in or excluded from these General Terms of Sale, laws shall apply even without express reference.

§ 2 Offers and Acceptance

1. All offers made by Hofmann & Vratny shall be subject to change and shall be non-binding including if and when images, drawings, technical documentation, calculations, other documents or product descriptions (hereinafter referred to as "Documents") of whatever nature have been provided to the Ordering Party.
2. All orders for Goods placed by the Ordering Party shall constitute binding offers. Unless stated otherwise in the respective order, Hofmann & Vratny shall be entitled to accept an offer within two weeks after receipt of said offer.
3. Hofmann & Vratny shall accept offers in writing (e.g., in the form of an order confirmation) or by delivering the respective Goods to the Ordering Party.
4. All proprietary rights and copyrights to Documents shall remain with Hofmann & Vratny. Documents marked as confidential shall be forwarded to third parties only with the express written consent of Hofmann & Vratny.

§ 3 Delivery Deadlines and Default of Delivery

1. Delivery deadlines shall be agreed upon by Hofmann & Vratny and the individual Ordering Party or shall be specified by Hofmann & Vratny upon acceptance of the order or in the order confirmation.

2. Hofmann & Vratny's compliance with delivery obligations shall be conditional upon the Ordering Party's on-time and proper compliance with the Ordering Party's obligations including, but not limited to, the provision of the papers, permits and approvals required to be provided by the Ordering Party and the receipt by Hofmann & Vratny of the agreed-upon down payment, if any. In the event of delays, the delivery time shall be extended reasonably.

3. If Hofmann & Vratny is unable to meet any binding delivery deadlines for reasons beyond the control of Hofmann & Vratny (non-availability of services), the Ordering Party shall be notified without undue delay and shall be provided with an estimated new delivery deadline. If the agreed upon Goods do not become available before the new deadline expires, Hofmann & Vratny shall be entitled to rescind the contract in whole or in part and shall reimburse the Ordering Party without undue delay for any and all consideration paid up to that time. For the fulfillment of this clause, non-availability of services shall include, but shall not be limited to, delayed delivery from any of Hofmann & Vratny's suppliers, reasons beyond the control of Hofmann & Vratny or its suppliers, or if Hofmann & Vratny is not responsible for procuring the Goods.

4. If failure to comply with a delivery deadline is due to an act of God, industrial dispute or other event beyond the control of Hofmann & Vratny, the delivery time shall be extended reasonably. The same shall apply if and when any such act of God, industrial dispute or other event has arisen at any of Hofmann & Vratny's sub-suppliers which event can be demonstrated to have had an impact on compliance with the delivery deadline. Hofmann & Vratny shall notify the Ordering Party of such circumstances without undue delay. Events also shall be deemed to be beyond Hofmann & Vratny's control if and when they occur during a delay. In this case, the delay shall be deemed to be suspended for the duration of the respective event.

5. The beginning of a period of delivery default shall be in accordance with the law, but shall in any case require a reminder issued by the Ordering Party.

6. If a contract regarding stand-by delivery has been signed, Hofmann & Vratny shall deliver and invoice the Goods no later than 12 months after the date of such contract (hereinafter referred to as the "Recall Period"), even if the Ordering Party has failed to recall the Goods by that time. After the Recall Period has expired, Hofmann & Vratny can notify the Ordering Party of Hofmann & Vratny's readiness to deliver and can request that the Ordering Party recall the Goods within a reasonable period of time. If the Ordering Party fails to recall the Goods within such period, Hofmann & Vratny shall be entitled to demand an additional lumpsum compensation for warehousing costs (hereinafter referred to as the "Warehousing Allowance"). The Warehousing Allowance shall be 0.5% of the net value of the purchased Goods for every full week. The Ordering Party shall be free to prove that Hofmann & Vratny did not incur any damages or that any damages incurred were lower than the Warehousing Allowance. If the Ordering Party fails to recall the Goods within the Recall Period determined by Hofmann & Vratny, Hofmann & Vratny shall be entitled to dispose of the Goods as Hofmann & Vratny sees fit. The statutory provisions regarding rescission shall remain unaffected.

§ 4 Delivery and Default of Acceptance

1. Unless agreed upon otherwise, all deliveries shall be ex works, that is, the place of performance for deliveries and for all subsequent actions. Unless agreed upon otherwise, upon request and at the expense of the Ordering Party the Goods shall be delivered to another destination (hereinafter referred to as "Sales Involving the Carriage of Goods"). Unless agreed upon otherwise, Hofmann & Vratny shall be entitled to determine the shipment method (including, but not limited to, the forwarder, the type of shipment and the packaging).

2. Partial deliveries shall be admissible, provided the Ordering Party reasonably can be expected to accept them.

3. Delivered Goods shall be accepted by the Ordering Party even if the delivered Goods have minor defects provided the Ordering Party reasonably can be expected

to accept such Goods.

4. The risk of accidental destruction and/or deterioration of the Goods shall transfer to the Ordering Party no later than upon surrender of the Goods. In the case of Sales Involving the Carriage of Goods, the risk of accidental destruction and/or deterioration of the Goods and the risk of delay shall transfer to the Ordering Party no later than at the time of delivery of the Goods to the forwarder, carrier, or any other person designated to execute shipment of the Goods. Delivery shall be deemed to have been effected even if the Ordering Party is in default of acceptance.

5. If the Ordering Party is in default of acceptance or fails to cooperate or if delivery is delayed for other reasons for which the Ordering Party is responsible, Hofmann & Vratny shall be entitled to demand reimbursement for the damages incurred in connection therewith including additional expenses (e.g., warehousing costs).

§ 5 Terms of Payment

1. Unless agreed upon otherwise in individual cases, Hofmann & Vratny's prices plus statutory sales tax valid at the time the contract is signed shall apply. The prices indicated in Hofmann & Vratny's catalogs are non-binding and subject to change and/or correction.

2. Unless agreed upon otherwise, in the case of Sales Involving the Carriage of Goods the Ordering Party shall bear the costs of packaging and transportation ex works and the costs, if any, for transportation insurance if such insurance is requested by the Ordering Party. All customs and other fees, taxes and other public charges also shall be borne by the Ordering Party unless agreed upon otherwise. Ownership of the packaging for transportation and otherwise pursuant to the Verpackungsordnung (Packaging Ordinance of Germany) shall transfer to the Ordering Party and such packaging shall not be returned to Hofmann & Vratny. Pallets shall be exempt from this rule.

3. Unless agreed upon otherwise in the order confirmation, the purchase price plus statutory sales tax shall be due and payable without any deductions within 14 days after the date of invoicing and delivery or acceptance of the Goods. However, Hofmann & Vratny reserves the right to make full or partial deliveries against cash in advance at any time including during an ongoing business relationship. The assertion of such right shall be communicated no later than at the time the order confirmation is issued. The Ordering Party shall be deemed to be in default of payment upon the expiration of the aforementioned payment deadline. The applicable rate of interest on the purchase price of the Goods shall become payable during the default period. The right to assert claims for more substantial compensation shall be reserved.

4. The Ordering Party's rights of set-off and retention shall be limited to the extent the Ordering Party's claim is determined in a court of law or is undisputed. The Ordering Party's rights based on defects in the purchased Goods (see § 7 hereof) shall remain unaffected.

5. After the contract has been signed, if there is evidence that Hofmann & Vratny's claim to the purchase price will be compromised due to lack of performance on the part of the Ordering Party, Hofmann & Vratny shall be entitled to refuse performance pursuant to the applicable laws and, after setting a deadline, if applicable, shall be entitled to rescind the contract. In the case of contracts regarding the production of customized items, Hofmann & Vratny shall be entitled to rescind the contract immediately and the laws regarding the expendability of setting deadlines shall remain unaffected.

§ 6 Retention of Title

1. Until all pending and future receivables in connection with the business relationship between Hofmann & Vratny and the Ordering Party are paid in full, Hofmann & Vratny shall retain ownership of the Goods. If the Ordering Party violates the contract including, but not limited to, default of payment, Hofmann & Vratny shall be entitled to rescind the contract pursuant to the applicable laws and to demand the surrender of the Goods.

2. Goods subject to retention of title shall not be pledged or assigned as collateral before the Ordering Party has paid in full. The Ordering Party shall notify Hofmann &

Vratny in writing without undue delay in the event of a filing for commencement of insolvency proceedings or if third parties gain access (e.g., seizures) to Goods belonging to Hofmann & Vratny.

3. If the Ordering Party violates the contract including, but not limited to, by failing to pay the purchase price when due, Hofmann & Vratny shall be entitled to rescind the contract pursuant to the applicable laws and to demand the surrender of the Goods due to the retention of title and the rescission.

4. Until further notice, the Ordering Party shall be entitled to resell/and or process in the ordinary course of business any Goods subject to retention of title. In this case, the provisions below also shall apply.

a) The retention of title shall include title to the full value of work products resulting from processing, mixing or combining the Goods, in which case Hofmann & Vratny shall be deemed to be the manufacturer. If and when third-party goods are processed, mixed or combined and such third parties retain ownership, Hofmann & Vratny shall acquire coownership pro rata of the invoiced value of work products so processed, mixed or combined. In all other cases, the creation of work products shall be subject to the same provisions as the delivered Goods subject to retention of title.

b) The Ordering Party hereby agrees to assign to Hofmann & Vratny as collateral any and all receivables against third parties resulting from the resale of the Goods or work results in full or in the amount of Hofmann & Vratny's estimated share of co-ownership pursuant to a) above, and Hofmann & Vratny hereby accepts such assignment. The Ordering Party's obligations under § 6 2) hereof also shall apply with respect to the receivables assigned.

c) In addition to Hofmann & Vratny, the Ordering Party shall remain authorized to collect receivables. Hofmann & Vratny undertakes to refrain from collecting receivables as long as the Ordering Party meets its payment obligations vis-à-vis Hofmann & Vratny and does not fail to perform and Hofmann & Vratny does not assert its retention of title by asserting a right under § 6 3) hereof. Otherwise, Hofmann & Vratny shall be entitled to demand that the Ordering Party inform Hofmann & Vratny of such receivables assigned and of the names of the debtors, provide Hofmann & Vratny with all the information required for collecting such receivables and the pertinent documents, and inform the debtors (third parties) of the assignment. In addition, in this case Hofmann & Vratny shall be entitled to revoke the Ordering Party's authorization to resell and/or process Goods which are subject to retention of title.

5. Upon request of the Ordering Party, Hofmann & Vratny shall release the collateral to which Hofmann & Vratny is entitled insofar as the realizable value of such collateral exceeds the receivables to be collateralized by more than 10 percent. Hofmann & Vratny shall be free in its decision regarding which collateral to release.

§ 7 Liability for Defects and Claims for Defects

1. Unless agreed upon otherwise herein, the Ordering Party's rights based on defects in quality and in title shall be subject to the applicable laws.

2. The assertion of claims by the Ordering Party regarding defects shall be conditional upon the Ordering Party's meeting of its statutory duty to inspect and to give notice of defects (§§ 377 and 381 of the HGB (Commercial Code of Germany)). If a defect in the Goods becomes apparent during or after inspection, the Ordering Party shall give written notice to Hofmann & Vratny without undue delay. Such notice shall be deemed to have been given without undue delay if it is given within two weeks and is transmitted before the end of such period. Regardless of the Ordering Party's duty to inspect and to give notice of defects, the Ordering Party shall give written notice of obvious defects within two weeks after delivery, which notice shall be deemed to have been given in a timely manner if it is transmitted before the end of such period. If the Ordering Party fails to inspect the Goods properly and/or to give proper notice of any defects, Hofmann & Vratny shall not assume liability for any defects for which no notice was given.

3. If any of the Goods are defective, Hofmann & Vratny shall be free to offer supplementary action to remedy the defect or defects (supplementary remedy) or to deliver defect-free Goods (replacement) to the Ordering Party.

It is Hofmann & Vratny's right to refuse to offer supplementary action under the applicable laws shall remain unaffected. The requirement for Hofmann & Vratny to provide any supplementary action owed shall be conditional upon the Ordering Party's paying of the purchase price when due. However, the Ordering Party shall be entitled to retain a reasonable portion of the purchase price pro rata in consideration of the defect. The Ordering Party shall give Hofmann & Vratny the time and the opportunity to provide the supplementary action owed including, but not limited to, providing Hofmann & Vratny the opportunity to inspect the Goods which are subject to complaint. If Hofmann & Vratny opts to replace the Goods, the Ordering Party shall return the defective Goods to Hofmann & Vratny in accordance with the applicable laws. Supplementary action shall not include the de-installation of defective Goods or installation of new Goods, provided Hofmann & Vratny originally was not obligated to install the Goods.

4. Any and all expenses incurred in connection with inspections and supplementary action including, but not limited to, transportation, road, labor and material costs shall be borne by Hofmann & Vratny if a defect actually is present. However, if the Ordering Party's demand for remedy of a defect is proven to be invalid, Hofmann & Vratny shall be entitled to demand reimbursement from the Ordering Party for any costs incurred therewith.

5. If the costs of supplementary remedy would be disproportionately high, the Ordering Party shall not be entitled to claim remedy of defects.

6. The Ordering Party's claims for damages or reimbursement for wasted expenses shall be limited by the provisions of § 9 below and shall be excluded in all other cases.

7. The statute of limitations for claims for defects shall be one year after the transfer of risk. This rule shall not apply if and when § 438 para. 3 of the BGB (malice) stipulates longer terms.

§ 8 Other Liabilities

1. Unless agreed upon otherwise in these General Terms of Sale and in the provisions below, Hofmann & Vratny's liability for breach of contractual and non-contractual obligations shall be in accordance with the applicable laws.

2. Hofmann & Vratny's liability for damages, regardless of the legal reasons and of whether or not they are known, shall include intent and gross negligence. In the event of minor negligence, Hofmann & Vratny's liability shall be limited to damages resulting from harm to life, body or health and/or for damages resulting from the not-insignificant breach of a material contractual obligation, that is, an obligation which must be met to make the proper fulfillment of the contract possible and the meeting of which the Ordering Party relies upon and can rely upon on a regular basis. In this case, however, Hofmann & Vratny's liability shall be limited to reimbursement of the foreseeable damages typical in such cases.

3. The limitation of liability under § 8 2) hereof shall not apply if and when Hofmann & Vratny is found to have failed to disclose a defect maliciously or has assumed a guarantee for the quality of the Goods and for the Ordering Party's claims under the Produkthaftungsgesetz (Product Liability Act of Germany).

4. The Ordering Party can rescind or cancel a contract due to a breach of obligation other than a breach based on a defect only if and when Hofmann & Vratny is responsible for such breach of obligation. The Ordering Party shall not have an unrestricted right to terminate a contract. All other cases shall be subject to the applicable laws and legal consequences.

§ 9 Applicable Law and Jurisdiction

1. These General Terms of Sale and all legal relationships between Hofmann & Vratny and the Ordering Party shall be subject to the laws of the Federal Republic of Germany under exclusion of the provisions of international private law. The CISG shall not apply.

2. These General Terms of Sale and all disputes arising directly or indirectly from the contractual relationship between Hofmann & Vratny and the Ordering Party shall be subject to the exclusive jurisdiction of Aßling if the Ordering Party is a businessperson. However, Hofmann & Vratny shall be entitled to sue the Ordering Party at the place of performance (see § 4 hereof) or at the Ordering Party's general jurisdiction.

Hofmann & Vratny OHG
January 2019

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HOFMANN & VRATNY CATALOGUE 2019/2020

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CATALOGUE 2019/2020

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