

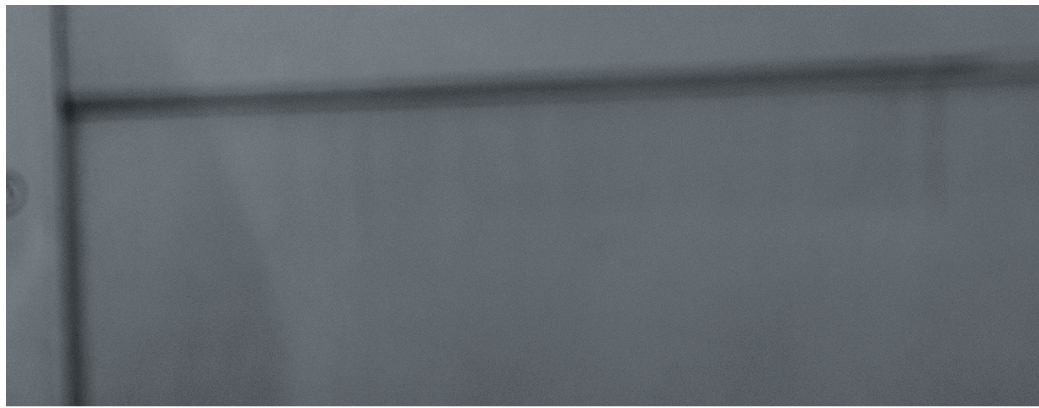
HOFMANN & VRATNY — SC MILLING CUTTERS EN

NON-FERROUS MATERIALS



16
SC EXPERT
NON-FERROUS
MATERIAL
MILLING CUTTERS





3

PRODUCTION
SITES

43

YEARS OF
EXPERIENCE

120

MOTIVATED
EMPLOYEES

NON-FERROUS MATERIALS

DER EXPERTE FÜR NE-WERKSTOFFE.

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.

In spite of their easy machinability, non-ferrous materials make extra demands on the cutting tools due to their application as composite material or their tendency to adhesion. The versatility of the non-ferrous materials is covered by a wide range of milling cutters from our three-line product range.

PROCESS RELIABILITY QUALITY ECONOMIC EFFICIENCY

The H&V Expert non-ferrous materials range has been designed and developed specifically to meet the requirements of non-ferrous material cutting. Specially selected cemented carbide, polished chip spaces, proven geometries and a leading TAC layer form the perfect symbiosis for safe processing of non-ferrous materials. Extremely sharp cutters with a special edge preparation ensure safe machining processes in this segment.

Mini end mill cutters are suitable for the materials aluminium (long-chipping, short-chipping or with high silicon content > 10%), thermosetting plastics and thermoplastics.

ERIALS



FACE

Adapted for reliable ramping and helical immersion.

BLADES

Special unequal tooth pitch and edge preparation to prevent a tendency to adhere, extremely sharp cutting edges.



COATING

TAC layer with extra smooth finish specially for cutting non-ferrous materials.

HELICAL PITCH

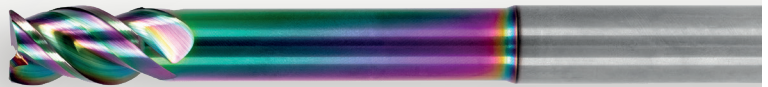
Variable helical pitch for soft cutting even in long-chipping materials.

CHIP SPACES

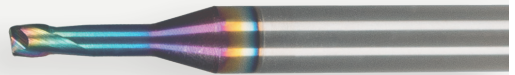
Adapted to extreme chip volume, polished to achieve perfect drainage of the chips.

H&V EXPERTS FOR NON-FERROUS MATERIALS

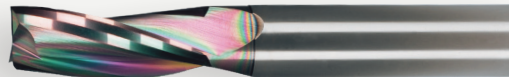
SC END MILL CUTTERS



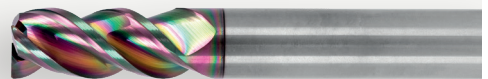
K201773 | K201779



K201123



K201813



K201768 | K201776

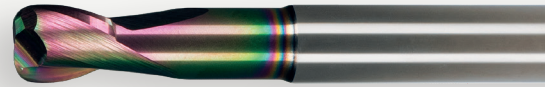


K201022

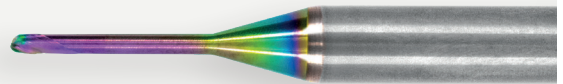
**SC
TORUS
CUTTERS**



K202015

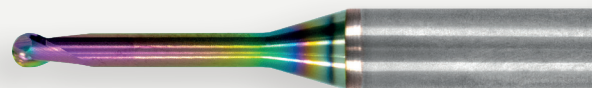


K202005



K202077 | K202083
K202093 | K202103
K202113

**SC
FULL RADIUS
CUTTERS**




K203207 | K203213

NUMBERING SYSTEM

ARTICLEGROUP

SC milling cutter - - - - -

Catalog item - - - - -



K 2 03 388

Product group - - - - -

Product name - - - - -

MILLING CUTTERS

Articlegroup - - - - -




K201673 - 16

Cutting diameter - - - - -

MILLING CUTTERS DISTINGUISHED BY LENGTH

Articlegroup - - - - -




K201123 - 2 X 8

Cutting diameter - - - - -

Distinction by length of cut or length of undercut - - - - -

MILLING CUTTERS WITH ADDITIONAL DISTINGUISHING FEATURE

Articlegroup - - - - -



K202223 - 8 / 3

Cutting diameter - - - - -

Distinction by corner radius or shank diameter - - - - -

MADE IN BAVARIA

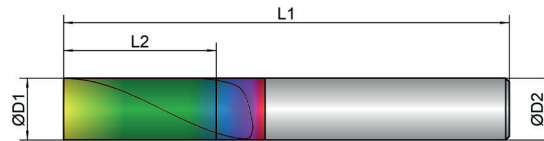
Our milling cutters are used by companies all over the world. Still they all have the same origin: Our production sites in Bavaria, Germany.

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.



SC end mill cutter TAC | K201022

| | |
|-----------|---------------|
| Cooling | |
| Tolerance | h10 |
| Coating | TAC- 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 | |
| | | | | | | | | 430 | | | 480 | | | | | |

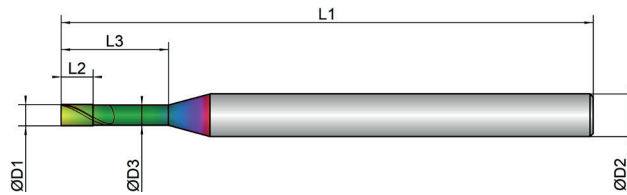
| K201022 | D1 mm Ø | L2 mm | L1 mm | D2 mm Ø | z # | ° |
|---------|-------------------|--------------|--------------|-------------------|------------|-------|
| 1 | 1.0 | 4.0 | 50.0 | 3.0 | 1 | 30 |
| 1,5 | 1.5 | 6.0 | 50.0 | 3.0 | 1 | 30 |
| 2 | 2.0 | 8.0 | 50.0 | 3.0 | 1 | 30 |
| 3 | 3.0 | 12.0 | 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 | 0-0,01 |
| Coating | TAC- α |

HA HSC












HA K201123

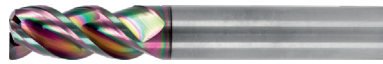


| Steel | | | Hardened steel | | | | Stainless steel (VA) | Castings | Non-ferrous materials | | | | Inconel | Abrasive material | | Titanium |
|------------|-------------|-------------|----------------|----------|----------|----------|----------------------|----------|-----------------------|--------|----|----------|---------|-------------------|----------|----------|
| < 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 | |

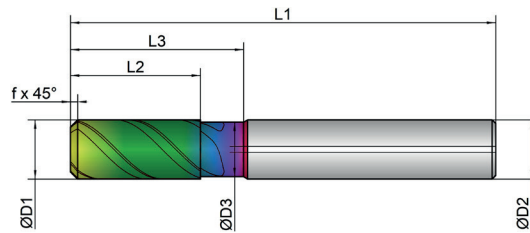
| K201123 | D1 mm Ø | D3 mm Ø | L2 mm | L3 mm | L1 mm | D2 mm Ø | z # | ° |
|---------|-------------------|-------------------|--------------|--------------|--------------|-------------------|------------|-------|
| 0,2X0,5 | 0.2 | 0.18 | 0.3 | 0.5 | 45.0 | 4.0 | 2 | 30 |
| 0,2X1 | 0.2 | 0.18 | 0.3 | 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 |  |  |  |  |  |  |  |  |
|---------|---|---|---|---|---|---|---|---|
| | 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 K201768



| Steel | | | Hardened steel | | | | Stainless steel (VA) | Castings | Non-ferrous materials | | | | Inconel | Abrasive material | | Titanium |
|------------|-------------|-------------|----------------|----------|----------|----------|----------------------|----------|-----------------------|--------|----|----------|---------|-------------------|----------|----------|
| < 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 | | | | |

| | D1 | D3 | L2 | L3 | L1 | D2 | z | | |
|---------|---|---|---|---|---|--|---|---|---|
| K201768 |  |  |  |  |  |  |  |  |  |
| | mm ∅ | mm ∅ | mm | mm | mm | mm ∅ | # | 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 |

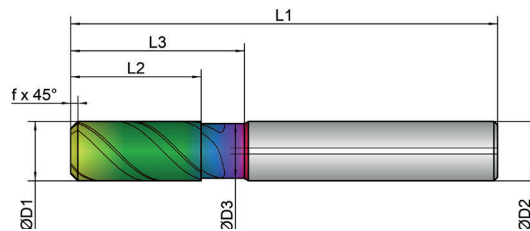
| | |
|-----------|---------------|
| Cooling | |
| Tolerance | e8 |
| Coating | TAC- α |

| | | | | |
|----|-----|-----|--------|--|
| HA | ETC | HPC | \neq | |
|----|-----|-----|--------|--|

NEW



HA K201776



| Steel | | | Hardened steel | | | | Stainless steel (VA) | Castings | Non-ferrous materials | | | | Inconel | Abrasive material | | Titanium |
|------------|-------------|-------------|----------------|----------|----------|----------|----------------------|----------|-----------------------|----|----------|--|-------------|-------------------|--|----------|
| < 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 \varnothing | D3 mm \varnothing | L2 mm | L3 mm | L1 mm | D2 mm \varnothing | 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 |

SC end mill cutter long TAC ETC / HPC | K201779

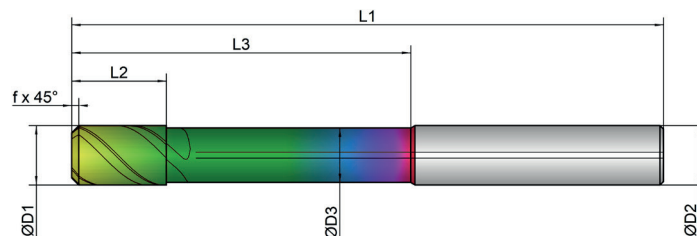
| | |
|-----------|---------------|
| Cooling | |
| Tolerance | e8 |
| Coating | TAC- α |

| | | | | |
|----|-----|-----|--------|--|
| 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 | | | | |

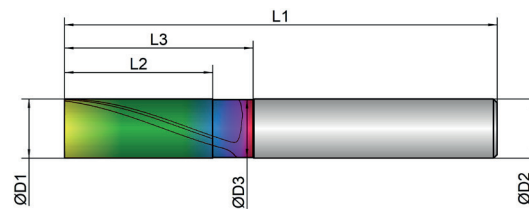
| K201779 | D1 mm \varnothing | D3 mm \varnothing | L2 mm | L3 mm | L1 mm | D2 mm \varnothing | z # | mm | ° |
|---------|-------------------------------|-------------------------------|--------------|--------------|--------------|-------------------------------|------------|--------|-------|
| 3 | 3.0 | 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 | | |
|----|-----|-----|-----|--|--|



HA K201813



| Steel | | | Hardened steel | | | | Stainless steel (VA) | Castings | Non-ferrous materials | | | | Inconel | Abrasive material | | Titanium |
|------------|-------------|-------------|----------------|----------|----------|----------|----------------------|----------|-----------------------|--------|-----|----------|---------|-------------------|----------|----------|
| < 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

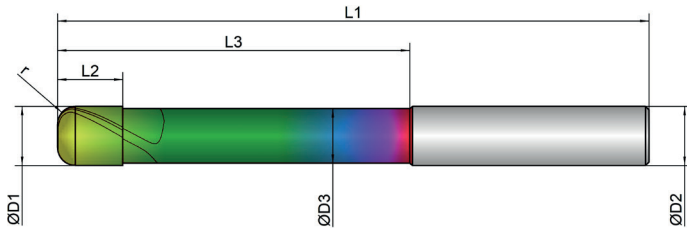
Tolerance e8

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 | | | | | |

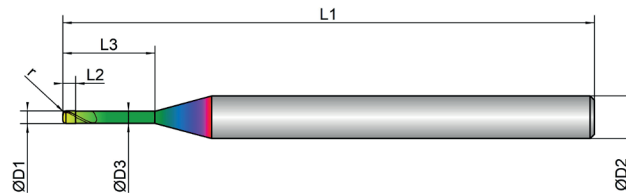
| | D1 | D3 | L2 | L3 | L1 | D2 | z | r | |
|---------|---------|---------|------|------|-------|---------|---|------|----|
| K202015 | mm Ø | mm Ø | mm | mm | mm | mm Ø | # | mm | ° |
| 3/0,3 | 3.0 | 2.7 | 4.0 | 32.0 | 75.0 | 3.0 | 2 | 0.30 | 30 |
| 4/0,3 | 4.0 | 3.7 | 5.0 | 36.0 | 75.0 | 4.0 | 2 | 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 | 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 |

SC micro torus cutter TAC HSC | K202077

| | |
|-----------|---------------|
| Cooling | |
| Tolerance | d04 |
| Coating | TAC- α |

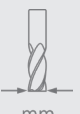




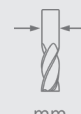





HA K202077



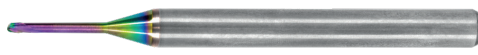
| Steel | | | Hardened steel | | | | Stainless steel (VA) | Castings | Non-ferrous materials | | | | Inconel | Abrasive material | | Titanium |
|------------|-------------|-------------|----------------|----------|----------|----------|----------------------|----------|-----------------------|--------|----|----------|---------|-------------------|----------|----------|
| < 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 | | |

| | D1 | D3 | L2 | L3 | L1 | D2 | z | r | |
|---------|---------|---------|-----|-----|------|---------|---|------|----|
| K202077 | mm Ø | mm Ø | mm | mm | mm | mm Ø | # | mm | ° |
| 0,2X0,5 | 0.2 | 0.18 | 0.2 | 0.5 | 50.0 | 4.0 | 2 | 0.05 | 30 |
| 0,2X1 | 0.2 | 0.18 | 0.2 | 1.0 | 50.0 | 4.0 | 2 | 0.05 | 30 |
| 0,2X2 | 0.2 | 0.18 | 0.2 | 2.0 | 50.0 | 4.0 | 2 | 0.05 | 30 |
| 0,2X3 | 0.2 | 0.18 | 0.2 | 3.0 | 50.0 | 4.0 | 2 | 0.05 | 30 |
| 0,3X1 | 0.3 | 0.28 | 0.3 | 1.0 | 50.0 | 4.0 | 2 | 0.05 | 30 |
| 0,3X2 | 0.3 | 0.28 | 0.3 | 2.0 | 50.0 | 4.0 | 2 | 0.05 | 30 |
| 0,3X3 | 0.3 | 0.28 | 0.3 | 3.0 | 50.0 | 4.0 | 2 | 0.05 | 30 |
| 0,3X4 | 0.3 | 0.28 | 0.3 | 4.0 | 50.0 | 4.0 | 2 | 0.05 | 30 |
| 0,3X6 | 0.3 | 0.28 | 0.3 | 6.0 | 50.0 | 4.0 | 2 | 0.05 | 30 |
| 0,4X1 | 0.4 | 0.38 | 0.4 | 1.0 | 50.0 | 4.0 | 2 | 0.05 | 30 |
| 0,4X2 | 0.4 | 0.38 | 0.4 | 2.0 | 50.0 | 4.0 | 2 | 0.05 | 30 |
| 0,4X3 | 0.4 | 0.38 | 0.4 | 3.0 | 50.0 | 4.0 | 2 | 0.05 | 30 |

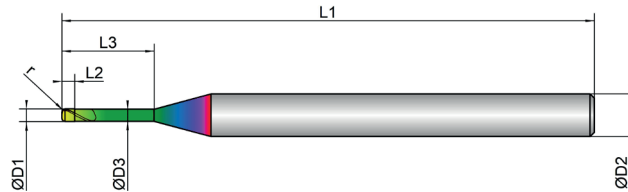
| K202077 |  mm ∅ |  mm ∅ |  mm |  mm |  mm |  mm ∅ |  # |  mm |  ° |
|---------|--|--|---|---|---|---|--|---|--|
| 0,4X4 | 0.4 | 0.38 | 0.4 | 4.0 | 50.0 | 4.0 | 2 | 0.05 | 30 |
| 0,4X6 | 0.4 | 0.38 | 0.4 | 6.0 | 50.0 | 4.0 | 2 | 0.05 | 30 |
| 0,4X8 | 0.4 | 0.38 | 0.4 | 8.0 | 50.0 | 4.0 | 2 | 0.05 | 30 |
| 0,5X1 | 0.5 | 0.48 | 0.5 | 1.0 | 50.0 | 4.0 | 2 | 0.05 | 30 |
| 0,5X2 | 0.5 | 0.48 | 0.5 | 2.0 | 50.0 | 4.0 | 2 | 0.05 | 30 |
| 0,5X3 | 0.5 | 0.48 | 0.5 | 3.0 | 50.0 | 4.0 | 2 | 0.05 | 30 |
| 0,5X4 | 0.5 | 0.48 | 0.5 | 4.0 | 50.0 | 4.0 | 2 | 0.05 | 30 |
| 0,5X6 | 0.5 | 0.48 | 0.5 | 6.0 | 50.0 | 4.0 | 2 | 0.05 | 30 |
| 0,5X8 | 0.5 | 0.48 | 0.5 | 8.0 | 50.0 | 4.0 | 2 | 0.05 | 30 |
| 0,5X10 | 0.5 | 0.48 | 0.5 | 10.0 | 50.0 | 4.0 | 2 | 0.05 | 30 |
| 0,6X3 | 0.6 | 0.58 | 0.6 | 3.0 | 50.0 | 4.0 | 2 | 0.05 | 30 |
| 0,6X4 | 0.6 | 0.58 | 0.6 | 4.0 | 50.0 | 4.0 | 2 | 0.05 | 30 |
| 0,6X6 | 0.6 | 0.58 | 0.6 | 6.0 | 50.0 | 4.0 | 2 | 0.05 | 30 |
| 0,6X8 | 0.6 | 0.58 | 0.6 | 8.0 | 50.0 | 4.0 | 2 | 0.05 | 30 |
| 0,6X10 | 0.6 | 0.58 | 0.6 | 10.0 | 50.0 | 4.0 | 2 | 0.05 | 30 |

SC micro torus cutter TAC HSC | K202083

| | |
|-----------|---------------|
| Cooling | |
| Tolerance | d04 |
| Coating | TAC- α |

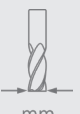




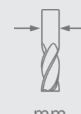





HA K202083












| Steel | | | Hardened steel | | | | Stainless steel (VA) | Castings | Non-ferrous materials | | | | Inconel | Abrasive material | | Titanium |
|------------|-------------|-------------|----------------|----------|----------|----------|----------------------|----------|-----------------------|----|----------|--|-------------|-------------------|--|----------|
| < 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 | | | | 350 | 200 | | |

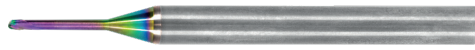
| K202083 | D1 mm Ø | D3 mm Ø | L2 mm | L3 mm | L1 mm | D2 mm Ø | z # | r mm | ° |
|---------|-------------------|-------------------|--------------|--------------|--------------|-------------------|------------|-------------|-------|
| 0,4X1 | 0.4 | 0.38 | 0.4 | 1.0 | 50.0 | 4.0 | 2 | 0.10 | 30 |
| 0,4X2 | 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 |
| 0,4X6 | 0.4 | 0.38 | 0.4 | 6.0 | 50.0 | 4.0 | 2 | 0.10 | 30 |
| 0,4X8 | 0.4 | 0.38 | 0.4 | 8.0 | 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 |
| 0,5X6 | 0.5 | 0.48 | 0.5 | 6.0 | 50.0 | 4.0 | 2 | 0.10 | 30 |
| 0,5X8 | 0.5 | 0.48 | 0.5 | 8.0 | 50.0 | 4.0 | 2 | 0.10 | 30 |
| 0,5X10 | 0.5 | 0.48 | 0.5 | 10.0 | 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 |

| K202083 |  mm ∅ |  mm ∅ |  mm |  mm |  mm |  mm ∅ |  # |  mm |  ° |
|---------|--|--|---|---|---|---|--|---|--|
| 0,6X4 | 0.6 | 0.58 | 0.6 | 4.0 | 50.0 | 4.0 | 2 | 0.10 | 30 |
| 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 |
| 0,6X10 | 0.6 | 0.58 | 0.6 | 10.0 | 50.0 | 4.0 | 2 | 0.10 | 30 |
| 0,8X2 | 0.8 | 0.78 | 0.8 | 2.0 | 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 |
| 0,8X8 | 0.8 | 0.78 | 0.8 | 8.0 | 50.0 | 4.0 | 2 | 0.10 | 30 |
| 0,8X10 | 0.8 | 0.78 | 0.8 | 10.0 | 50.0 | 4.0 | 2 | 0.10 | 30 |
| 0,8X12 | 0.8 | 0.78 | 0.8 | 12.0 | 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 |
| 1X3 | 1.0 | 0.95 | 1.0 | 3.0 | 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 |
| 1X5 | 1.0 | 0.95 | 1.0 | 5.0 | 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 |
| 1X15 | 1.0 | 0.95 | 1.0 | 15.0 | 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 |
| 1X25 | 1.0 | 0.95 | 1.0 | 25.0 | 70.0 | 4.0 | 2 | 0.10 | 30 |
| 1X30 | 1.0 | 0.95 | 1.0 | 30.0 | 70.0 | 4.0 | 2 | 0.10 | 30 |
| 1,2X5 | 1.2 | 1.14 | 1.2 | 5.0 | 50.0 | 4.0 | 2 | 0.10 | 30 |
| 1,2X10 | 1.2 | 1.14 | 1.2 | 10.0 | 50.0 | 4.0 | 2 | 0.10 | 30 |
| 1,2X15 | 1.2 | 1.14 | 1.2 | 15.0 | 54.0 | 4.0 | 2 | 0.10 | 30 |
| 1,2X20 | 1.2 | 1.14 | 1.2 | 20.0 | 60.0 | 4.0 | 2 | 0.10 | 30 |
| 1,5X4 | 1.5 | 1.44 | 1.5 | 4.0 | 50.0 | 4.0 | 2 | 0.10 | 30 |
| 1,5X6 | 1.5 | 1.44 | 1.5 | 6.0 | 50.0 | 4.0 | 2 | 0.10 | 30 |

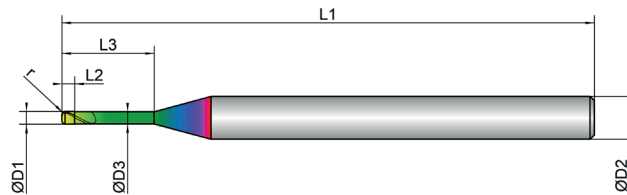
SC micro torus cutter TAC HSC | K202083

| K202083 |  D1 mm ∅ |  D3 mm ∅ |  L2 mm |  L3 mm |  L1 mm |  D2 mm ∅ |  z # |  r mm R |  ° |
|---------|--|--|---|---|---|--|---|---|--|
| 1,5X8 | 1,5 | 1,44 | 1,5 | 8,0 | 50,0 | 4,0 | 2 | 0,10 | 30 |
| 1,5X10 | 1,5 | 1,44 | 1,5 | 10,0 | 50,0 | 4,0 | 2 | 0,10 | 30 |
| 1,5X12 | 1,5 | 1,44 | 1,5 | 12,0 | 54,0 | 4,0 | 2 | 0,10 | 30 |
| 1,5X15 | 1,5 | 1,44 | 1,5 | 15,0 | 54,0 | 4,0 | 2 | 0,10 | 30 |
| 1,5X20 | 1,5 | 1,44 | 1,5 | 20,0 | 60,0 | 4,0 | 2 | 0,10 | 30 |
| 1,5X25 | 1,5 | 1,44 | 1,5 | 25,0 | 60,0 | 4,0 | 2 | 0,10 | 30 |
| 1,5X30 | 1,5 | 1,44 | 1,5 | 30,0 | 70,0 | 4,0 | 2 | 0,10 | 30 |
| 1,8X8 | 1,8 | 1,74 | 1,8 | 8,0 | 50,0 | 4,0 | 2 | 0,10 | 30 |
| 1,8X10 | 1,8 | 1,74 | 1,8 | 10,0 | 50,0 | 4,0 | 2 | 0,10 | 30 |
| 1,8X15 | 1,8 | 1,74 | 1,8 | 15,0 | 50,0 | 4,0 | 2 | 0,10 | 30 |
| 1,8X20 | 1,8 | 1,74 | 1,8 | 20,0 | 54,0 | 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 |
| 2X15 | 2,0 | 1,91 | 2,0 | 15,0 | 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 |
| 2X25 | 2,0 | 1,91 | 2,0 | 25,0 | 70,0 | 4,0 | 2 | 0,10 | 30 |
| 2X30 | 2,0 | 1,91 | 2,0 | 30,0 | 70,0 | 4,0 | 2 | 0,10 | 30 |
| 2X35 | 2,0 | 1,91 | 2,0 | 35,0 | 80,0 | 4,0 | 2 | 0,10 | 30 |
| 2X40 | 2,0 | 1,91 | 2,0 | 40,0 | 80,0 | 4,0 | 2 | 0,10 | 30 |

| | |
|-----------|---------------|
| Cooling | |
| Tolerance | d04 |
| Coating | TAC- α |












HA K202093

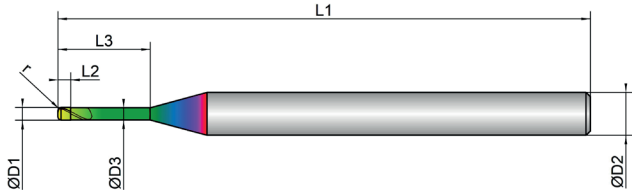
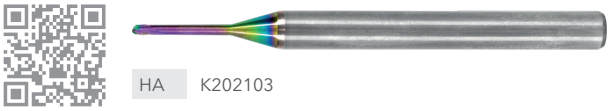


| Steel | | | Hardened steel | | | | Stainless steel (VA) | Castings | Non-ferrous materials | | | | Inconel | Abrasive material | | Titanium |
|------------|-------------|-------------|----------------|----------|----------|----------|----------------------|----------|-----------------------|--------|----|----------|---------|-------------------|----------|----------|
| < 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 | |

| K202093 | D1 mm | D3 mm | L2 mm | L3 mm | L1 mm | D2 mm | z # | r mm | |
|---------|--------------|--------------|--------------|--------------|--------------|--------------|------------|-------------|----|
| 0,8X2 | 0.8 | 0.78 | 0.8 | 2.0 | 50.0 | 4.0 | 2 | 0.20 | 30 |
| 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 |
| 0,8X8 | 0.8 | 0.78 | 0.8 | 8.0 | 50.0 | 4.0 | 2 | 0.20 | 30 |
| 0,8X10 | 0.8 | 0.78 | 0.8 | 10.0 | 50.0 | 4.0 | 2 | 0.20 | 30 |
| 0,8X12 | 0.8 | 0.78 | 0.8 | 12.0 | 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 |
| 1X3 | 1.0 | 0.95 | 1.0 | 3.0 | 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 |
| 1X5 | 1.0 | 0.95 | 1.0 | 5.0 | 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 |
| 1X15 | 1.0 | 0.95 | 1.0 | 15.0 | 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 |
| 1X25 | 1.0 | 0.95 | 1.0 | 25.0 | 70.0 | 4.0 | 2 | 0.20 | 30 |
| 1X30 | 1.0 | 0.95 | 1.0 | 30.0 | 70.0 | 4.0 | 2 | 0.20 | 30 |
| 1,2X5 | 1.2 | 1.14 | 1.2 | 5.0 | 50.0 | 4.0 | 2 | 0.20 | 30 |
| 1,2X10 | 1.2 | 1.14 | 1.2 | 10.0 | 50.0 | 4.0 | 2 | 0.20 | 30 |
| 1,2X15 | 1.2 | 1.14 | 1.2 | 15.0 | 54.0 | 4.0 | 2 | 0.20 | 30 |










| K202093 |  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 |
| 1,5X15 | 1.5 | 1.44 | 1.5 | 15.0 | 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 |
| 1,5X25 | 1.5 | 1.44 | 1.5 | 25.0 | 60.0 | 4.0 | 2 | 0.20 | 30 |
| 1,5X30 | 1.5 | 1.44 | 1.5 | 30.0 | 70.0 | 4.0 | 2 | 0.20 | 30 |
| 1,8X8 | 1.8 | 1.74 | 1.8 | 8.0 | 50.0 | 4.0 | 2 | 0.20 | 30 |
| 1,8X10 | 1.8 | 1.74 | 1.8 | 10.0 | 50.0 | 4.0 | 2 | 0.20 | 30 |
| 1,8X15 | 1.8 | 1.74 | 1.8 | 15.0 | 50.0 | 4.0 | 2 | 0.20 | 30 |
| 1,8X20 | 1.8 | 1.74 | 1.8 | 20.0 | 54.0 | 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 |
| 2X15 | 2.0 | 1.91 | 2.0 | 15.0 | 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 |
| 2X25 | 2.0 | 1.91 | 2.0 | 25.0 | 70.0 | 4.0 | 2 | 0.20 | 30 |
| 2X30 | 2.0 | 1.91 | 2.0 | 30.0 | 70.0 | 4.0 | 2 | 0.20 | 30 |
| 2X35 | 2.0 | 1.91 | 2.0 | 35.0 | 80.0 | 4.0 | 2 | 0.20 | 30 |
| 2X40 | 2.0 | 1.91 | 2.0 | 40.0 | 80.0 | 4.0 | 2 | 0.20 | 30 |
| 2,5X15 | 2.5 | 2.41 | 2.5 | 15.0 | 54.0 | 4.0 | 2 | 0.20 | 30 |
| 2,5X20 | 2.5 | 2.41 | 2.5 | 20.0 | 54.0 | 4.0 | 2 | 0.20 | 30 |
| 2,5X25 | 2.5 | 2.41 | 2.5 | 25.0 | 60.0 | 4.0 | 2 | 0.20 | 30 |
| 2,5X30 | 2.5 | 2.41 | 2.5 | 30.0 | 70.0 | 4.0 | 2 | 0.20 | 30 |
| 3X6 | 3.0 | 2.91 | 4.5 | 6.0 | 50.0 | 4.0 | 2 | 0.20 | 30 |
| 3X8 | 3.0 | 2.91 | 4.5 | 8.0 | 50.0 | 4.0 | 2 | 0.20 | 30 |
| 3X10 | 3.0 | 2.91 | 4.5 | 10.0 | 50.0 | 4.0 | 2 | 0.20 | 30 |
| 3X12 | 3.0 | 2.91 | 4.5 | 12.0 | 50.0 | 4.0 | 2 | 0.20 | 30 |
| 3X15 | 3.0 | 2.91 | 4.5 | 15.0 | 54.0 | 4.0 | 2 | 0.20 | 30 |
| 3X20 | 3.0 | 2.91 | 4.5 | 20.0 | 54.0 | 4.0 | 2 | 0.20 | 30 |
| 3X25 | 3.0 | 2.91 | 4.5 | 25.0 | 60.0 | 4.0 | 2 | 0.20 | 30 |
| 3X30 | 3.0 | 2.91 | 4.5 | 30.0 | 70.0 | 4.0 | 2 | 0.20 | 30 |
| 3X35 | 3.0 | 2.91 | 4.5 | 35.0 | 80.0 | 4.0 | 2 | 0.20 | 30 |
| 3X40 | 3.0 | 2.91 | 4.5 | 40.0 | 80.0 | 4.0 | 2 | 0.20 | 30 |
| 3X45 | 3.0 | 2.91 | 4.5 | 45.0 | 90.0 | 4.0 | 2 | 0.20 | 30 |

| | |
|-----------|---------------|
| Cooling | |
| Tolerance | d04 |
| Coating | TAC- α |

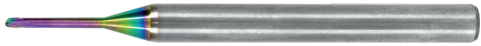


| Steel | | | Hardened steel | | | | Stainless steel (VA) | Castings | Non-ferrous materials | | | | Inconel | Abrasive material | | Titanium |
|------------|-------------|-------------|----------------|----------|----------|----------|----------------------|----------|-----------------------|--------|----|----------|---------|-------------------|----------|----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

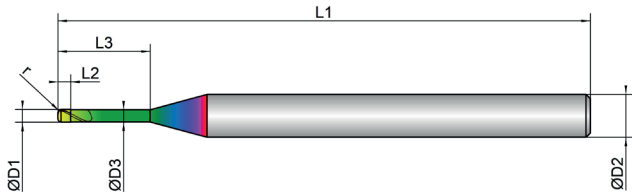
| | D1 | D3 | L2 | L3 | L1 | D2 | z | r | |
|---------|------------------|------------------|-----|------|------|------------------|---|------|---------|
| K202103 | mm \varnothing | mm \varnothing | mm | mm | mm | mm \varnothing | # | mm | \circ |
| 1X2 | 1.0 | 0.95 | 1.0 | 2.0 | 50.0 | 4.0 | 2 | 0.30 | 30 |
| 1X3 | 1.0 | 0.95 | 1.0 | 3.0 | 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 |
| 1X5 | 1.0 | 0.95 | 1.0 | 5.0 | 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 |
| 1X15 | 1.0 | 0.95 | 1.0 | 15.0 | 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 |
| 1X25 | 1.0 | 0.95 | 1.0 | 25.0 | 70.0 | 4.0 | 2 | 0.30 | 30 |
| 1X30 | 1.0 | 0.95 | 1.0 | 30.0 | 70.0 | 4.0 | 2 | 0.30 | 30 |
| 1,2X5 | 1.2 | 1.14 | 1.2 | 5.0 | 50.0 | 4.0 | 2 | 0.30 | 30 |
| 1,2X10 | 1.2 | 1.14 | 1.2 | 10.0 | 50.0 | 4.0 | 2 | 0.30 | 30 |
| 1,2X15 | 1.2 | 1.14 | 1.2 | 15.0 | 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 |
| 1,5X8 | 1.5 | 1.44 | 1.5 | 8.0 | 50.0 | 4.0 | 2 | 0.30 | 30 |

| |  |  |  |  |  |  |  |  |  |
|---------|---|---|---|---|---|--|---|---|---|
| K202103 | mm ∅ | mm ∅ | mm | mm | mm | mm ∅ | # | mm | ° |
| 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 |
| 1,5X15 | 1.5 | 1.44 | 1.5 | 15.0 | 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 |
| 1,5X25 | 1.5 | 1.44 | 1.5 | 25.0 | 60.0 | 4.0 | 2 | 0.30 | 30 |
| 1,5X30 | 1.5 | 1.44 | 1.5 | 30.0 | 70.0 | 4.0 | 2 | 0.30 | 30 |
| 1,8X8 | 1.8 | 1.74 | 1.8 | 8.0 | 50.0 | 4.0 | 2 | 0.30 | 30 |
| 1,8X10 | 1.8 | 1.74 | 1.8 | 10.0 | 50.0 | 4.0 | 2 | 0.30 | 30 |
| 1,8X15 | 1.8 | 1.74 | 1.8 | 15.0 | 50.0 | 4.0 | 2 | 0.30 | 30 |
| 1,8X20 | 1.8 | 1.74 | 1.8 | 20.0 | 54.0 | 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 |
| 2X15 | 2.0 | 1.91 | 2.0 | 15.0 | 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 |
| 2X25 | 2.0 | 1.91 | 2.0 | 25.0 | 70.0 | 4.0 | 2 | 0.30 | 30 |
| 2X30 | 2.0 | 1.91 | 2.0 | 30.0 | 70.0 | 4.0 | 2 | 0.30 | 30 |
| 2X35 | 2.0 | 1.91 | 2.0 | 35.0 | 80.0 | 4.0 | 2 | 0.30 | 30 |
| 2X40 | 2.0 | 1.91 | 2.0 | 40.0 | 80.0 | 4.0 | 2 | 0.30 | 30 |
| 2,5X15 | 2.5 | 2.41 | 2.5 | 15.0 | 54.0 | 4.0 | 2 | 0.30 | 30 |
| 2,5X20 | 2.5 | 2.41 | 2.5 | 20.0 | 54.0 | 4.0 | 2 | 0.30 | 30 |
| 2,5X25 | 2.5 | 2.41 | 2.5 | 25.0 | 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 |
| 3X6 | 3.0 | 2.91 | 4.5 | 6.0 | 50.0 | 4.0 | 2 | 0.30 | 30 |
| 3X8 | 3.0 | 2.91 | 4.5 | 8.0 | 50.0 | 4.0 | 2 | 0.30 | 30 |
| 3X10 | 3.0 | 2.91 | 4.5 | 10.0 | 50.0 | 4.0 | 2 | 0.30 | 30 |
| 3X12 | 3.0 | 2.91 | 4.5 | 12.0 | 50.0 | 4.0 | 2 | 0.30 | 30 |
| 3X15 | 3.0 | 2.91 | 4.5 | 15.0 | 54.0 | 4.0 | 2 | 0.30 | 30 |
| 3X20 | 3.0 | 2.91 | 4.5 | 20.0 | 54.0 | 4.0 | 2 | 0.30 | 30 |
| 3X25 | 3.0 | 2.91 | 4.5 | 25.0 | 60.0 | 4.0 | 2 | 0.30 | 30 |
| 3X30 | 3.0 | 2.91 | 4.5 | 30.0 | 70.0 | 4.0 | 2 | 0.30 | 30 |
| 3X35 | 3.0 | 2.91 | 4.5 | 35.0 | 80.0 | 4.0 | 2 | 0.30 | 30 |
| 3X40 | 3.0 | 2.91 | 4.5 | 40.0 | 80.0 | 4.0 | 2 | 0.30 | 30 |
| 3X45 | 3.0 | 2.91 | 4.5 | 45.0 | 90.0 | 4.0 | 2 | 0.30 | 30 |

| | |
|-----------|---------------|
| Cooling | |
| Tolerance | d04 |
| Coating | TAC- α |












HA K202113



| Steel | | | Hardened steel | | | | Stainless steel (VA) | Castings | Non-ferrous materials | | | | Inconel | Abrasive material | | Titanium |
|------------|-------------|-------------|----------------|----------|----------|----------|----------------------|----------|-----------------------|--------|----|----------|---------|-------------------|----------|----------|
| < 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 | | |

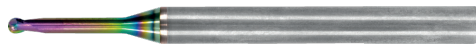
| | D1 | D3 | L2 | L3 | L1 | D2 | z | r | |
|---------|---------|---------|-----|------|------|---------|---|------|----|
| | | | | | | | | | |
| K202113 | mm ∅ | mm ∅ | mm | mm | mm | mm ∅ | # | mm | ° |
| 1,5X4 | 1.5 | 1.44 | 1.5 | 4.0 | 50.0 | 4.0 | 2 | 0.50 | 30 |
| 1,5X6 | 1.5 | 1.44 | 1.5 | 6.0 | 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 |
| 1,5X15 | 1.5 | 1.44 | 1.5 | 15.0 | 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 |
| 1,5X25 | 1.5 | 1.44 | 1.5 | 25.0 | 60.0 | 4.0 | 2 | 0.50 | 30 |
| 1,5X30 | 1.5 | 1.44 | 1.5 | 30.0 | 70.0 | 4.0 | 2 | 0.50 | 30 |
| 1,8X8 | 1.8 | 1.74 | 1.8 | 8.0 | 50.0 | 4.0 | 2 | 0.50 | 30 |
| 1,8X10 | 1.8 | 1.74 | 1.8 | 10.0 | 50.0 | 4.0 | 2 | 0.50 | 30 |
| 1,8X15 | 1.8 | 1.74 | 1.8 | 15.0 | 50.0 | 4.0 | 2 | 0.50 | 30 |
| 1,8X20 | 1.8 | 1.74 | 1.8 | 20.0 | 54.0 | 4.0 | 2 | 0.50 | 30 |
| 2X4 | 2.0 | 1.91 | 2.0 | 4.0 | 50.0 | 4.0 | 2 | 0.50 | 30 |

SC micro torus cutter TAC HSC | K202113

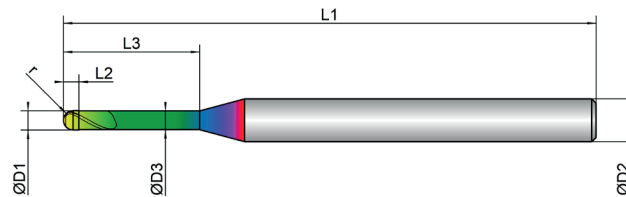
| K202113 |  mm ∅ |  mm ∅ |  mm |  mm |  mm |  mm ∅ |  # |  mm |  ° |
|---------|--|--|---|---|---|---|--|---|--|
| 2X6 | 2.0 | 1.91 | 2.0 | 6.0 | 50.0 | 4.0 | 2 | 0.50 | 30 |
| 2X8 | 2.0 | 1.91 | 2.0 | 8.0 | 50.0 | 4.0 | 2 | 0.50 | 30 |
| 2X10 | 2.0 | 1.91 | 2.0 | 10.0 | 50.0 | 4.0 | 2 | 0.50 | 30 |
| 2X12 | 2.0 | 1.91 | 2.0 | 12.0 | 54.0 | 4.0 | 2 | 0.50 | 30 |
| 2X15 | 2.0 | 1.91 | 2.0 | 15.0 | 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 |
| 2X25 | 2.0 | 1.91 | 2.0 | 25.0 | 70.0 | 4.0 | 2 | 0.50 | 30 |
| 2X30 | 2.0 | 1.91 | 2.0 | 30.0 | 70.0 | 4.0 | 2 | 0.50 | 30 |
| 2X35 | 2.0 | 1.91 | 2.0 | 35.0 | 80.0 | 4.0 | 2 | 0.50 | 30 |
| 2X40 | 2.0 | 1.91 | 2.0 | 40.0 | 80.0 | 4.0 | 2 | 0.50 | 30 |
| 2,5X12 | 2.5 | 2.41 | 2.5 | 12.0 | 60.0 | 4.0 | 2 | 0.50 | 30 |
| 2,5X15 | 2.5 | 2.41 | 2.5 | 15.0 | 54.0 | 4.0 | 2 | 0.50 | 30 |
| 2,5X20 | 2.5 | 2.41 | 2.5 | 20.0 | 54.0 | 4.0 | 2 | 0.50 | 30 |
| 2,5X25 | 2.5 | 2.41 | 2.5 | 25.0 | 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 |
| 3X6 | 3.0 | 2.91 | 4.5 | 6.0 | 50.0 | 4.0 | 2 | 0.50 | 30 |
| 3X8 | 3.0 | 2.91 | 4.5 | 8.0 | 50.0 | 4.0 | 2 | 0.50 | 30 |
| 3X10 | 3.0 | 2.91 | 4.5 | 10.0 | 50.0 | 4.0 | 2 | 0.50 | 30 |
| 3X12 | 3.0 | 2.91 | 4.5 | 12.0 | 50.0 | 4.0 | 2 | 0.50 | 30 |
| 3X15 | 3.0 | 2.91 | 4.5 | 15.0 | 54.0 | 4.0 | 2 | 0.50 | 30 |
| 3X20 | 3.0 | 2.91 | 4.5 | 20.0 | 54.0 | 4.0 | 2 | 0.50 | 30 |
| 3X25 | 3.0 | 2.91 | 4.5 | 25.0 | 60.0 | 4.0 | 2 | 0.50 | 30 |
| 3X30 | 3.0 | 2.91 | 4.5 | 30.0 | 70.0 | 4.0 | 2 | 0.50 | 30 |
| 3X35 | 3.0 | 2.91 | 4.5 | 35.0 | 80.0 | 4.0 | 2 | 0.50 | 30 |
| 3X40 | 3.0 | 2.91 | 4.5 | 40.0 | 80.0 | 4.0 | 2 | 0.50 | 30 |
| 3X45 | 3.0 | 2.91 | 4.5 | 45.0 | 90.0 | 4.0 | 2 | 0.50 | 30 |

| | |
|-----------|---------------|
| Cooling | |
| Tolerance | d04 |
| Coating | TAC- α |

HA HSC **NEW**












HA K203207

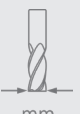




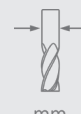





| Steel | | | Hardened steel | | | | Stainless steel (VA) | Castings | Non-ferrous materials | | | | Inconel | Abrasive material | | Titanium |
|------------|-------------|-------------|----------------|----------|----------|----------|----------------------|----------|-----------------------|--------|----|----------|---------|-------------------|----------|----------|
| < 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 | |

| | D1 | D3 | L2 | L3 | L1 | D2 | z | r | |
|------------|-----|------|------|-----|------|-----|---|------|----|
| K203207 | mm | mm | mm | mm | mm | mm | # | mm | ° |
| 0,1X0,3/45 | 0.1 | 0.08 | 0.08 | 0.3 | 45.0 | 4.0 | 2 | 0.05 | 30 |
| 0,1X0,5/45 | 0.1 | 0.08 | 0.08 | 0.5 | 45.0 | 4.0 | 2 | 0.05 | 30 |
| 0,1X1/45 | 0.1 | 0.08 | 0.08 | 1.0 | 45.0 | 4.0 | 2 | 0.05 | 30 |
| 0,2X0,5/45 | 0.2 | 0.17 | 0.16 | 0.5 | 45.0 | 4.0 | 2 | 0.10 | 30 |
| 0,2X1/45 | 0.2 | 0.17 | 0.16 | 1.0 | 45.0 | 4.0 | 2 | 0.10 | 30 |
| 0,2X2/45 | 0.2 | 0.17 | 0.16 | 2.0 | 45.0 | 4.0 | 2 | 0.10 | 30 |
| 0,2X3/45 | 0.2 | 0.17 | 0.16 | 3.0 | 45.0 | 4.0 | 2 | 0.10 | 30 |
| 0,3X0,5/45 | 0.3 | 0.27 | 0.24 | 0.5 | 45.0 | 4.0 | 2 | 0.15 | 30 |
| 0,3X1/45 | 0.3 | 0.27 | 0.24 | 1.0 | 45.0 | 4.0 | 2 | 0.15 | 30 |
| 0,3X2/45 | 0.3 | 0.27 | 0.24 | 2.0 | 45.0 | 4.0 | 2 | 0.15 | 30 |
| 0,3X3/45 | 0.3 | 0.27 | 0.24 | 3.0 | 45.0 | 4.0 | 2 | 0.15 | 30 |
| 0,3X4/45 | 0.3 | 0.27 | 0.24 | 4.0 | 45.0 | 4.0 | 2 | 0.15 | 30 |
| 0,3X6/45 | 0.3 | 0.27 | 0.24 | 6.0 | 45.0 | 4.0 | 2 | 0.15 | 30 |
| 0,4X1/45 | 0.4 | 0.37 | 0.32 | 1.0 | 45.0 | 4.0 | 2 | 0.20 | 30 |

SC micro full radius cutter short TiSiN HSC | K203207

| |  |  |  |  |  |  |  |  |  |
|------------|---|---|---|---|---|--|---|---|---|
| K203207 | mm ∅ | mm ∅ | mm | mm | mm | mm ∅ | # | mm | ° |
| 0,4X2/45 | 0.4 | 0.37 | 0.32 | 2.0 | 45.0 | 4.0 | 2 | 0.20 | 30 |
| 0,4X3/45 | 0.4 | 0.37 | 0.32 | 3.0 | 45.0 | 4.0 | 2 | 0.20 | 30 |
| 0,4X4/45 | 0.4 | 0.37 | 0.32 | 4.0 | 45.0 | 4.0 | 2 | 0.20 | 30 |
| 0,4X6/45 | 0.4 | 0.37 | 0.32 | 6.0 | 45.0 | 4.0 | 2 | 0.20 | 30 |
| 0,4X8/45 | 0.4 | 0.37 | 0.32 | 8.0 | 45.0 | 4.0 | 2 | 0.20 | 30 |
| 0,5X1/45 | 0.5 | 0.47 | 0.4 | 1.0 | 45.0 | 4.0 | 2 | 0.25 | 30 |
| 0,5X1,5/45 | 0.5 | 0.47 | 0.4 | 1.5 | 45.0 | 4.0 | 2 | 0.25 | 30 |
| 0,5X2/45 | 0.5 | 0.47 | 0.4 | 2.0 | 45.0 | 4.0 | 2 | 0.25 | 30 |
| 0,5X3/45 | 0.5 | 0.47 | 0.4 | 3.0 | 45.0 | 4.0 | 2 | 0.25 | 30 |
| 0,5X4/45 | 0.5 | 0.47 | 0.4 | 4.0 | 45.0 | 4.0 | 2 | 0.25 | 30 |
| 0,5X6/45 | 0.5 | 0.47 | 0.4 | 6.0 | 45.0 | 4.0 | 2 | 0.25 | 30 |
| 0,5X8/45 | 0.5 | 0.47 | 0.4 | 8.0 | 45.0 | 4.0 | 2 | 0.25 | 30 |
| 0,6X2/45 | 0.6 | 0.57 | 0.48 | 2.0 | 45.0 | 4.0 | 2 | 0.30 | 30 |
| 0,6X3/45 | 0.6 | 0.57 | 0.48 | 3.0 | 45.0 | 4.0 | 2 | 0.30 | 30 |
| 0,6X4/45 | 0.6 | 0.57 | 0.48 | 4.0 | 45.0 | 4.0 | 2 | 0.30 | 30 |
| 0,6X6/45 | 0.6 | 0.57 | 0.48 | 6.0 | 45.0 | 4.0 | 2 | 0.30 | 30 |
| 0,6X8/45 | 0.6 | 0.57 | 0.48 | 8.0 | 45.0 | 4.0 | 2 | 0.30 | 30 |
| 0,8X2/45 | 0.8 | 0.77 | 0.64 | 2.0 | 45.0 | 4.0 | 2 | 0.40 | 30 |
| 0,8X3/45 | 0.8 | 0.77 | 0.64 | 3.0 | 45.0 | 4.0 | 2 | 0.40 | 30 |
| 0,8X4/45 | 0.8 | 0.77 | 0.64 | 4.0 | 45.0 | 4.0 | 2 | 0.40 | 30 |
| 0,8X6/45 | 0.8 | 0.77 | 0.64 | 6.0 | 45.0 | 4.0 | 2 | 0.40 | 30 |
| 0,8X8/45 | 0.8 | 0.77 | 0.64 | 8.0 | 45.0 | 4.0 | 2 | 0.40 | 30 |
| 1X2/45 | 1.0 | 0.96 | 0.8 | 2.0 | 45.0 | 4.0 | 2 | 0.50 | 30 |
| 1X3/45 | 1.0 | 0.96 | 0.8 | 3.0 | 45.0 | 4.0 | 2 | 0.50 | 30 |
| 1X4/45 | 1.0 | 0.96 | 0.8 | 4.0 | 45.0 | 4.0 | 2 | 0.50 | 30 |
| 1X5/45 | 1.0 | 0.96 | 0.8 | 5.0 | 45.0 | 4.0 | 2 | 0.50 | 30 |
| 1X6/45 | 1.0 | 0.96 | 0.8 | 6.0 | 45.0 | 4.0 | 2 | 0.50 | 30 |
| 1X8/45 | 1.0 | 0.96 | 0.8 | 8.0 | 45.0 | 4.0 | 2 | 0.50 | 30 |

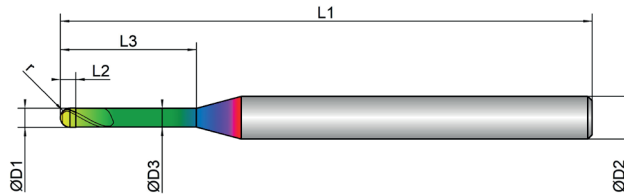
| K203207 |  mm ∅ |  mm ∅ |  mm |  mm |  mm |  mm ∅ |  # |  mm |  ° |
|-----------|--|--|---|---|---|---|--|---|--|
| 1X10/50 | 1.0 | 0.96 | 0.8 | 10.0 | 50.0 | 4.0 | 2 | 0.50 | 30 |
| 1X12/50 | 1.0 | 0.96 | 0.8 | 12.0 | 50.0 | 4.0 | 2 | 0.50 | 30 |
| 1,2X3/45 | 1.2 | 1.16 | 0.96 | 3.0 | 45.0 | 4.0 | 2 | 0.60 | 30 |
| 1,2X4/45 | 1.2 | 1.16 | 0.96 | 4.0 | 45.0 | 4.0 | 2 | 0.60 | 30 |
| 1,2X6/45 | 1.2 | 1.16 | 0.96 | 6.0 | 45.0 | 4.0 | 2 | 0.60 | 30 |
| 1,2X8/45 | 1.2 | 1.16 | 0.96 | 8.0 | 45.0 | 4.0 | 2 | 0.60 | 30 |
| 1,2X10/45 | 1.2 | 1.16 | 0.96 | 10.0 | 45.0 | 4.0 | 2 | 0.60 | 30 |
| 1,2X12/50 | 1.2 | 1.16 | 0.96 | 12.0 | 50.0 | 4.0 | 2 | 0.60 | 30 |
| 1,2X20/54 | 1.2 | 1.16 | 0.96 | 20.0 | 54.0 | 4.0 | 2 | 0.60 | 30 |
| 1,5X3/45 | 1.5 | 1.44 | 1.2 | 3.0 | 45.0 | 4.0 | 2 | 0.75 | 30 |
| 1,5X4/45 | 1.5 | 1.44 | 1.2 | 4.0 | 45.0 | 4.0 | 2 | 0.75 | 30 |
| 1,5X6/45 | 1.5 | 1.44 | 1.2 | 6.0 | 45.0 | 4.0 | 2 | 0.75 | 30 |
| 1,5X8/45 | 1.5 | 1.44 | 1.2 | 8.0 | 45.0 | 4.0 | 2 | 0.75 | 30 |
| 1,5X10/45 | 1.5 | 1.44 | 1.2 | 10.0 | 45.0 | 4.0 | 2 | 0.75 | 30 |
| 1,5X12/50 | 1.5 | 1.44 | 1.2 | 12.0 | 50.0 | 4.0 | 2 | 0.75 | 30 |
| 1,8X8/45 | 1.8 | 1.74 | 1.44 | 8.0 | 45.0 | 4.0 | 2 | 0.90 | 30 |
| 1,8X10/45 | 1.8 | 1.74 | 1.44 | 10.0 | 45.0 | 4.0 | 2 | 0.90 | 30 |
| 1,8X12/50 | 1.8 | 1.74 | 1.44 | 12.0 | 50.0 | 4.0 | 2 | 0.90 | 30 |
| 2X4/45 | 2.0 | 1.94 | 1.6 | 4.0 | 45.0 | 4.0 | 2 | 1.00 | 30 |
| 2X6/45 | 2.0 | 1.94 | 1.6 | 6.0 | 45.0 | 4.0 | 2 | 1.00 | 30 |
| 2X8/45 | 2.0 | 1.94 | 1.6 | 8.0 | 45.0 | 4.0 | 2 | 1.00 | 30 |
| 2X10/45 | 2.0 | 1.94 | 1.6 | 10.0 | 45.0 | 4.0 | 2 | 1.00 | 30 |
| 2X12/45 | 2.0 | 1.94 | 1.6 | 12.0 | 45.0 | 4.0 | 2 | 1.00 | 30 |
| 3X6/45 | 3.0 | 2.92 | 3.5 | 6.0 | 45.0 | 4.0 | 2 | 1.50 | 30 |
| 3X8/45 | 3.0 | 2.92 | 3.5 | 8.0 | 45.0 | 4.0 | 2 | 1.50 | 30 |
| 3X10/45 | 3.0 | 2.92 | 3.5 | 10.0 | 45.0 | 4.0 | 2 | 1.50 | 30 |
| 3X12/45 | 3.0 | 2.92 | 3.5 | 12.0 | 45.0 | 4.0 | 2 | 1.50 | 30 |

SC micro full radius cutter long TiSiN HSC | K203213

| | |
|-----------|---------------|
| Cooling | |
| Tolerance | d04 |
| Coating | TAC- α |


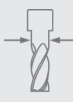









HA K203213

















| Steel | | | Hardened steel | | | | Stainless steel (VA) | Castings | Non-ferrous materials | | | | Inconel | Abrasive material | | Titanium |
|------------|-------------|-------------|----------------|----------|----------|----------|----------------------|----------|-----------------------|--------|----|----------|---------|-------------------|----------|----------|
| < 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 | |

| | D1 | D3 | L2 | L3 | L1 | D2 | z | r | |
|-----------|---------|---------|------|------|------|---------|---|------|----|
| K203213 | mm ø | mm ø | mm | mm | mm | mm ø | # | mm | ° |
| 0,5X10/50 | 0.5 | 0.47 | 0.4 | 10.0 | 50.0 | 4.0 | 2 | 0.25 | 30 |
| 0,6X10/50 | 0.6 | 0.57 | 0.48 | 10.0 | 50.0 | 4.0 | 2 | 0.30 | 30 |
| 0,8X10/50 | 0.8 | 0.77 | 0.64 | 10.0 | 50.0 | 4.0 | 2 | 0.40 | 30 |
| 0,8X12/50 | 0.8 | 0.77 | 0.64 | 12.0 | 50.0 | 4.0 | 2 | 0.40 | 30 |
| 1X15/50 | 1.0 | 0.96 | 0.8 | 15.0 | 50.0 | 4.0 | 2 | 0.50 | 30 |
| 1X20/60 | 1.0 | 0.96 | 0.8 | 20.0 | 60.0 | 4.0 | 2 | 0.50 | 30 |
| 1X25/60 | 1.0 | 0.96 | 0.8 | 25.0 | 60.0 | 4.0 | 2 | 0.50 | 30 |
| 1X30/70 | 1.0 | 0.96 | 0.8 | 30.0 | 70.0 | 4.0 | 2 | 0.50 | 30 |
| 1,2X15/54 | 1.2 | 1.16 | 0.96 | 15.0 | 54.0 | 4.0 | 2 | 0.60 | 30 |
| 1,5X15/50 | 1.5 | 1.44 | 1.2 | 15.0 | 50.0 | 4.0 | 2 | 0.75 | 30 |
| 1,5X20/60 | 1.5 | 1.44 | 1.2 | 20.0 | 60.0 | 4.0 | 2 | 0.75 | 30 |
| 1,5X25/60 | 1.5 | 1.44 | 1.2 | 25.0 | 60.0 | 4.0 | 2 | 0.75 | 30 |
| 1,5X30/70 | 1.5 | 1.44 | 1.2 | 30.0 | 70.0 | 4.0 | 2 | 0.75 | 30 |













| K203213 |  mm ∅ |  mm ∅ |  mm |  mm |  mm |  mm ∅ |  # |  mm |  ° |
|-----------|--|--|---|---|---|---|--|---|--|
| 1,8X15/50 | 1.8 | 1.74 | 1.44 | 15.0 | 50.0 | 4.0 | 2 | 0.90 | 30 |
| 1,8X20/54 | 1.8 | 1.74 | 1.44 | 20.0 | 54.0 | 4.0 | 2 | 0.90 | 30 |
| 2X12/50 | 2.0 | 1.94 | 1.6 | 12.0 | 50.0 | 4.0 | 2 | 1.00 | 30 |
| 2X15/50 | 2.0 | 1.94 | 1.6 | 15.0 | 50.0 | 4.0 | 2 | 1.00 | 30 |
| 2X20/60 | 2.0 | 1.94 | 1.6 | 20.0 | 60.0 | 4.0 | 2 | 1.00 | 30 |
| 2X25/60 | 2.0 | 1.94 | 1.6 | 25.0 | 60.0 | 4.0 | 2 | 1.00 | 30 |
| 2X30/70 | 2.0 | 1.94 | 1.6 | 30.0 | 70.0 | 4.0 | 2 | 1.00 | 30 |
| 2X35/80 | 2.0 | 1.94 | 1.6 | 35.0 | 80.0 | 4.0 | 2 | 1.00 | 30 |
| 2X40/80 | 2.0 | 1.94 | 1.6 | 40.0 | 80.0 | 4.0 | 2 | 1.00 | 30 |
| 2,5X15/50 | 2.5 | 2.41 | 2.0 | 15.0 | 50.0 | 4.0 | 2 | 1.25 | 30 |
| 2,5X20/54 | 2.5 | 2.41 | 2.0 | 20.0 | 54.0 | 4.0 | 2 | 1.25 | 30 |
| 2,5X25/60 | 2.5 | 2.41 | 2.0 | 25.0 | 60.0 | 4.0 | 2 | 1.25 | 30 |
| 2,5X30/70 | 2.5 | 2.41 | 2.0 | 30.0 | 70.0 | 4.0 | 2 | 1.25 | 30 |
| 3X15/50 | 3.0 | 2.92 | 3.5 | 15.0 | 50.0 | 4.0 | 2 | 1.50 | 30 |
| 3X20/54 | 3.0 | 2.92 | 3.5 | 20.0 | 54.0 | 4.0 | 2 | 1.50 | 30 |
| 3X25/60 | 3.0 | 2.92 | 3.5 | 25.0 | 60.0 | 4.0 | 2 | 1.50 | 30 |
| 3X30/70 | 3.0 | 2.92 | 3.5 | 30.0 | 70.0 | 4.0 | 2 | 1.50 | 30 |
| 3X35/70 | 3.0 | 2.92 | 3.5 | 35.0 | 70.0 | 4.0 | 2 | 1.50 | 30 |
| 3X40/80 | 3.0 | 2.92 | 3.5 | 40.0 | 80.0 | 4.0 | 2 | 1.50 | 30 |
| 3X45/80 | 3.0 | 2.92 | 3.5 | 45.0 | 80.0 | 4.0 | 2 | 1.50 | 30 |

LEGEND






PROPERTIES

| | | |
|---|--|--|
|  Cutting diameter |  Small cutting diameter |  Large cutting diameter |
|  Undercut diameter |  Length of cut |  Tool bezel length |
|  Length of undercut |  Total length |  Shank diameter |
|  Number of cutting edges |  Corner radius |  Corner bezel |
|  Programming radius |  Maximum cutting depth |  Helical pitch |

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 | |

COOLING

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

COATINGS

Our coatings are optimised in unison with the cutters' geometry by testing in both an extensive internal procedure and under the customer's 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 | | | | |

PRODUCT GROUPS

| | | | | | |
|----|-------------------|----|----------------|----|--------------------|
| 01 | End mill cutter | 02 | Torus cutter | 03 | Full radius cutter |
| 04 | Form cutter | 05 | Chamfer cutter | 06 | Roughing cutter |
| 07 | Face torus cutter | | | | |

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.



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