



## NEXT GENERATION CUTTING TOOLS

### "SWISSCERAMILL™"

BSQ TECH GmbH and A&L Tool AG are launching the SWISSceramill brand, an innovative and revolutionary milling tool based on advanced ceramic zirconium oxide, which enables maximum tool life on aluminium, copper, brass, PEEK and various plastics. Tool life of at least a factor of 10 is the standard.

Switzerland is an important location for us, which is why everything is developed and manufactured in Switzerland.

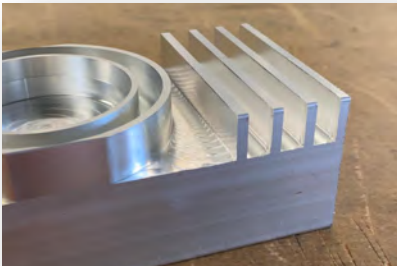
Your biggest advantages are time reduction, increased productivity and better dimensional and surface quality, thanks to higher feeds, higher infeeds and special cutting geometries.

Made in Switzerland



## SWISSCERAMILL – SUGGESTED INDUSTRIES

SWISSCERAMILL is successfully used in various industries.



Contract manufacturing



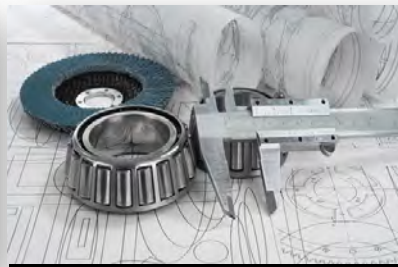
Watch industry



Juvelery industry



Impeller manufacturing



Machine industry



Aviation industry



Automotiv industry



Aluminiumcasting industry



Medtech industry



rim manufacturing



Electrode manufacturing

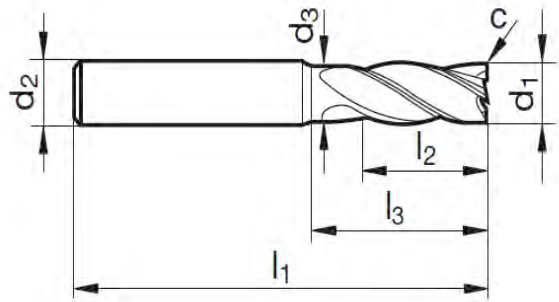
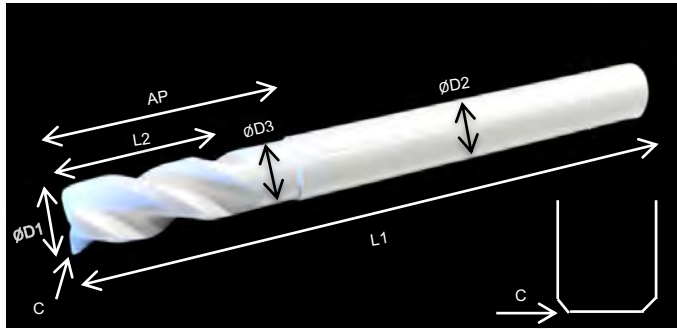


Mass production of parts

## SWISSCERAMILL CERAMIC END MILLS - ALUMINIUM LINE CERAMIC END MILL WITH CORNER CHAMFER

Developed for processing aluminium, brass, copper, various plastics.  
Exceptional wear resistance, long life and better surface finishes.

**ON STOCK**



ØD1 (0/-0.04)	ØD2 (h6)	Ø D3	L1	C (45°)	Ø D3	AP	Z flutes	Vc (m/min)	HSC fz (mm)	HSC (mm)	HPC fz (mm)	HPC (mm)	Article- number
ø 4	4	8	50	0.15	3.8	14	3	300 -1200	0.06 – 0.15	ap=8 ae=0.1-1.5	0.05 – 0.08	ap=0.5-6.0 ae=4.0	1000.0400.03
ø 6	6	13	60	0.2	5.5	21	3	300 -1200	0.08 – 0.2	ap=12 ae=0.1-2.0	0.06 – 0.1	ap=0.5-9.0 ae=6.0	1000.0600.03
ø 8	8	16	63	0.2	7.5	27	3	300 -1200	0.08 – 0.2	ap=16 ae=0.1-3.0	0.06 – 0.12	ap=1.0-12.0 ae=8	1000.0800.03
ø 10	10	22	72	0.3	9.5	32	3	300 -1200	0.08 – 0.2	ap=22 ae=0.1-4.0	0.06 – 0.12	ap=1.0-15.0 ae=10	1000.1000.03
ø 12	12	26	83	0.3	11.5	38	3	300 -1200	0.08 – 0.2	ap=26 ae=0.1-5.0	0.06 – 0.15	ap=1.0-16.0 ae=12	1000.1200.03
ø 16	16	32	92	0.4	15.5	44	3	300 -1200	0.08 – 0.2	ap=32 ae=0.1-7.0	0.08 – 0.15	ap=1.0-20.0 ae=16	1000.1600.03
ø 18	20	38	100	0.5	17.5	54	3	300 -1200	0.08 – 0.2	ap=38 ae=0.1-8.0	0.08 – 0.15	ap=1.0-25.0 ae=18	1000.1800.03
ø 20	20	38	100	0.5	19.5	54	3	300 -1200	0.08 – 0.2	ap=38 ae=0.1-8.0	0.08 – 0.15	ap=1.0-25.0 ae=18	1000.2000.03

High pressure cooling or minimum quantity lubrication necessary.

The cutting values given are recommendations at the beginning at launch. You need to start with the lowest (fz) value and steadily adjust to your machine and application.

The regrind service is 40% of the purchase price

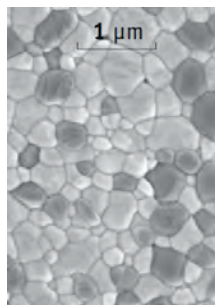
We generally recommend an order of 2 pieces or more

Dimension for ø1mm to ø3mm on request.

Special dimensions can be manufactured on request at extra cost

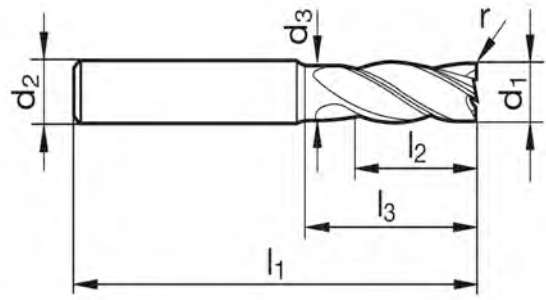
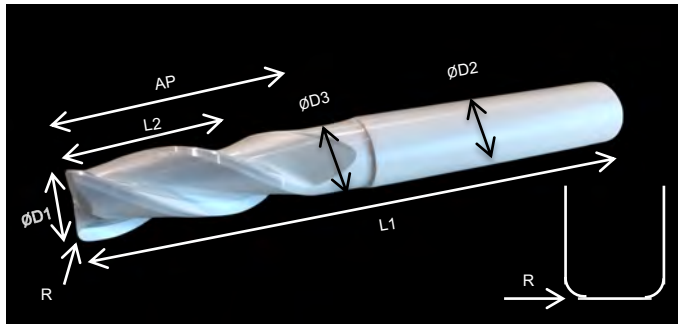
### Zirconia ceramic

- Best suited for non-ferrous materials
- Aluminium, brass, copper, plastic
- Ra 0.2-0.4 in the finishing process
- Polished cutting edges
- Grain size 0.3µm
- 2000 MPa Bending strength
- \*Different materials require different cutting parameters



## SWISSCERAMILL CERAMIC END MILLS - ALUMINIUM LINE CERAMIC END MILL WITH CORNER RADIUS

Developed for processing aluminium, brass, copper, various plastics.  
Exceptional wear resistance, long life and better surface finishes.



ØD1 (0/-0.04)	ØD2 (h6)	Ø D3	L1	R radius	L2	AP	Z flutes	Vc (m/min)	HSC fz (mm)	HSC (mm)	HPC fz (mm)	HPC (mm)	Article- number
ø 4	4	8	50	0.5	<b>4</b>	14	3	300-1200	0.06 – 0.15	ap=8 ae=0.1-1.5	0.05 – 0.08	ap=0.5-6.0 ae=4.0	1001.0400.03
ø 6	6	5.5	60	0.5	<b>6</b>	21	3	300-1200	0.08 – 0.2	ap=12 ae=0.1-2.0	0.06 – 0.1	ap=0.5-9.0 ae=6.0	1001.0600.03
ø 8	8	7.5	63	0.5	<b>8</b>	27	3	300-1200	0.08 – 0.2	ap=16 ae=0.1-3.0	0.06 – 0.12	ap=1.0-12.0 ae=8	1001.0800.03
ø 10	10	9.5	72	1.0	<b>10</b>	32	3	300-1200	0.08 – 0.2	ap=22 ae=0.1-4.0	0.06 – 0.12	ap=1.0-15.0 ae=10	1001.1000.03
ø 12	12	11.5	83	1.0	<b>13</b>	38	3	300-1200	0.08 – 0.2	ap=26 ae=0.1-5.0	0.06 – 0.15	ap=1.0-16.0 ae=12	1001.1200.03
ø 16	16	15.5	92	1.0	<b>16</b>	44	3	300-1200	0.08 – 0.2	ap=32 ae=0.1-7.0	0.08 – 0.15	ap=1.0-20.0 ae=16	1001.1600.03
ø 18	18	19.5	100	2.0	<b>19</b>	54	3	300-1200	0.08 – 0.2	ap=38 ae=0.1-8.0	0.08 – 0.15	ap=1.0-25.0 ae=18	1001.1800.03
ø 20	20	19.5	100	2.0	<b>19</b>	54	3	300-1200	0.08 – 0.2	ap=38 ae=0.1-8.0	0.08 – 0.15	ap=1.0-25.0 ae=18	1001.2000.03

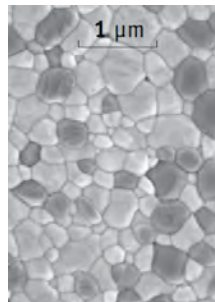
High pressure cooling or minimum quantity lubrication necessary.  
The cutting values given are recommendations at the beginning at launch. You need to start with the lowest (fz) value and steadily adjust to your machine and application.  
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### Zirconia ceramic

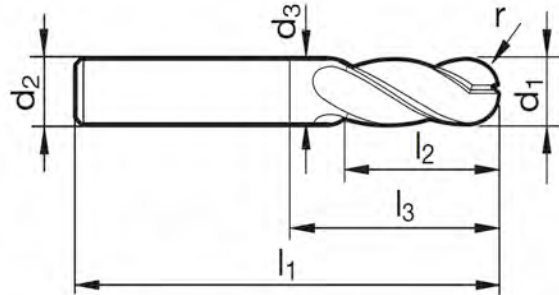
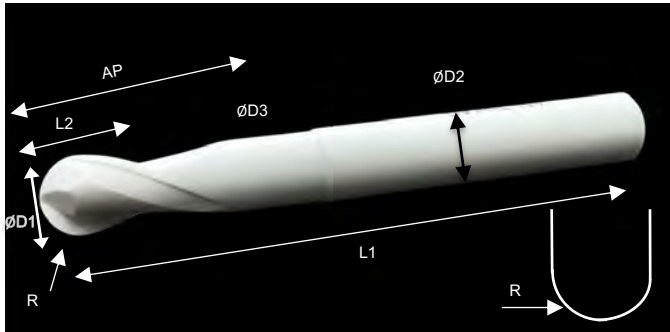
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## SWISSCERAMILL CERAMIC END MILLS - ALUMINIUM LINE CERAMIC END MILL BALL NOSE

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ØD1 (0/-0.04)	ØD2 (h6)	Ø D3	L1	R radius	L2	AP	Z flutes	Vc (m/min)	HSC fz (mm)	HSC (mm)	Article- number
ø 4	4	8	50	2.0	<b>4</b>	14	<b>2</b>	300 -1200	0.06 – 0.10	ap=8 ae=0.1-1.5	1002.0400.02
ø 6	6	5.5	60	3.0	<b>6</b>	21	<b>2</b>	300 -1200	0.08 – 0.2	ap=12 ae=0.1-2.0	1002.0600.02
ø 8	8	7.5	63	4.0	<b>8</b>	27	<b>2</b>	300 -1200	0.08 – 0.2	ap=16 ae=0.1-3.0	1002.0800.02
ø 10	10	9.5	72	5.0	<b>10</b>	32	<b>2</b>	300 -1200	0.08 – 0.2	ap=22 ae=0.1-4.0	1002.1000.02
ø 12	12	11.5	83	6.0	<b>13</b>	38	<b>2</b>	300 -1200	0.08 – 0.2	ap=26 ae=0.1-5.0	1002.1200.02
ø 16	16	15.5	92	8.0	<b>16</b>	44	<b>2</b>	300 -1200	0.08 – 0.2	ap=32 ae=0.1-7.0	1002.1600.02
ø 18	18	19.5	100	9.0	<b>19</b>	54	<b>2</b>	300 -1200	0.08 – 0.2	ap=38 ae=0.1-8.0	1002.1800.02
ø 20	20	19.5	100	10.0	<b>19</b>	54	<b>2</b>	300 -1200	0.08 – 0.2	ap=38 ae=0.1-8.0	1002.2000.02

High pressure cooling or minimum quantity lubrication necessary.

The cutting values given are recommendations at the beginning at launch. You need to start with the lowest (fz) value and steadily adjust to your machine and application.

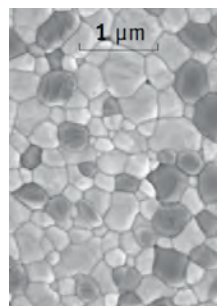
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## SWISSCERAMILL CERAMIC END MILL TECHNOLOGY

### THESE ARE YOUR ADVANTAGES

1. Maximum precision ON SERIES PRODUCTION → LESS THAN 0.002mm
2. Maximum performance → higher feeds
3. Maximum tool life → 10x higher life time
4. Maximum surface quality → Ra 0.4 until Ra0.05 (LIKE POLISHED)
5. Maximum process stability → VERY STABLE for large series
6. NEW AND UNIQUE TECHNOLOGY IS WORLDWIDE
7. HIGHER PERFORMANCE THAN TUNGSTEN CARBIDE TOOLS
8. EASY HANDLING AND NO ADDED KNOWLEDGE NEEDED
9. VERY SHARP CUTTING EDGES GRINDED AND POLISHED
10. NO COATING IS NECESSARY
11. REGRINDING SERVICE IS GUARANTEED
12. LOW SPINDLE LOAD UNTIL 75% LESS TO TUNGSTEN CARBIDE TOOLS

The result of all advantage ARE THE RESULT OF ALL ADVANTAGES ARE FOLLOW

1. TO SAVE TIME IN PRODUCTION
2. TO GET HIGHER MASS AND SURFACE QUALITY
3. TO CREATE SOLUTIONS IN THE PRODUCTION



## SWISSCERAMILL CERAMIC END MILLS

### General information

Ceramic end mills of the Aluminiumline and Goldline have been developed to achieve longer tool life on non-ferrous metals, light metals, precious metals and plastics. Through special ceramic materials and special grinding processes, we are now able to achieve tool lives of at least 10x up to 20x compared to carbides. Numerous tests with customers prove it impressively.

We can produce all geometries and shapes in end mills, torus mills, half round mills and special mills.  
As standard we produce end mills from  $\varnothing 1$  -  $\varnothing 20$ mm.

#### Which end mill shapes can be produced?

- end mills
- torus cutter
- Half-round cutters
- Special cutters according to DXF

#### For which materials are the ceramic end mills suitable?

- Aluminium, Copper, Brass, All plastics, PEEK, All non-ferrous metals
- Gold, Silver, Platinum

#### Which sizes can be produced?

- $\varnothing 1$  -  $\varnothing 3$ mm to order Special tools
- $\varnothing 6$  -  $12$ mm standard immediately available (our recommendation at the beginning)
- $\varnothing 16$  -  $\varnothing 20$ mm to order

#### What quantities can be produced?

- From 1 piece only for the standard product  $\varnothing 4$ mm to  $\varnothing 12$ mm possible.
- Others and prototypes from at least 2 pieces
- Small series from 10 pieces
- Series from 50 pieces

#### Which cutting parameters can be set in HPC milling? HIGH PERFORMANCE CUTTING

- HPC milling machines are very suitable
- $V_c$ = see cutting data recommendation
- $F_z$ = see cutting data recommendation
- $A_p$ = see cutting data recommendation
- $A_e$ = see cutting data recommendation
- Roughing and finishing possible with the same tool.

High pressure internal cooling is very important!

#### Which cutting parameters can be set in HSC milling? HIGH SPEED CUTTING

- HSC milling machines are very suitable
- $V_c$ = see cutting data recommendation
- $F_z$ = see cutting data recommendation
- $A_p$ = see cutting data recommendation
- $A_e$ = see cutting data recommendation
- Roughing and finishing possible with the same tool.

High pressure internal cooling is very important!

#### What is the ideal clamping method for ceramic cutters?

- YES → Shrink fit chucks, hydrodynamic chucks, power chucks, powRgrip, precision collet chucks
- NO → Weldon chuck and imprecise collet chuck

#### Where can I order?

- Order by e-mail at  
info@bsq-tech.com
- Orders by phone at  
+41 76 343 39 41

## CONTACT

### Headquarters in Switzerland

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