passion
for precision

fraisa

SpheroCarb – diamond-coated ball nose end mill for cutting hard metals

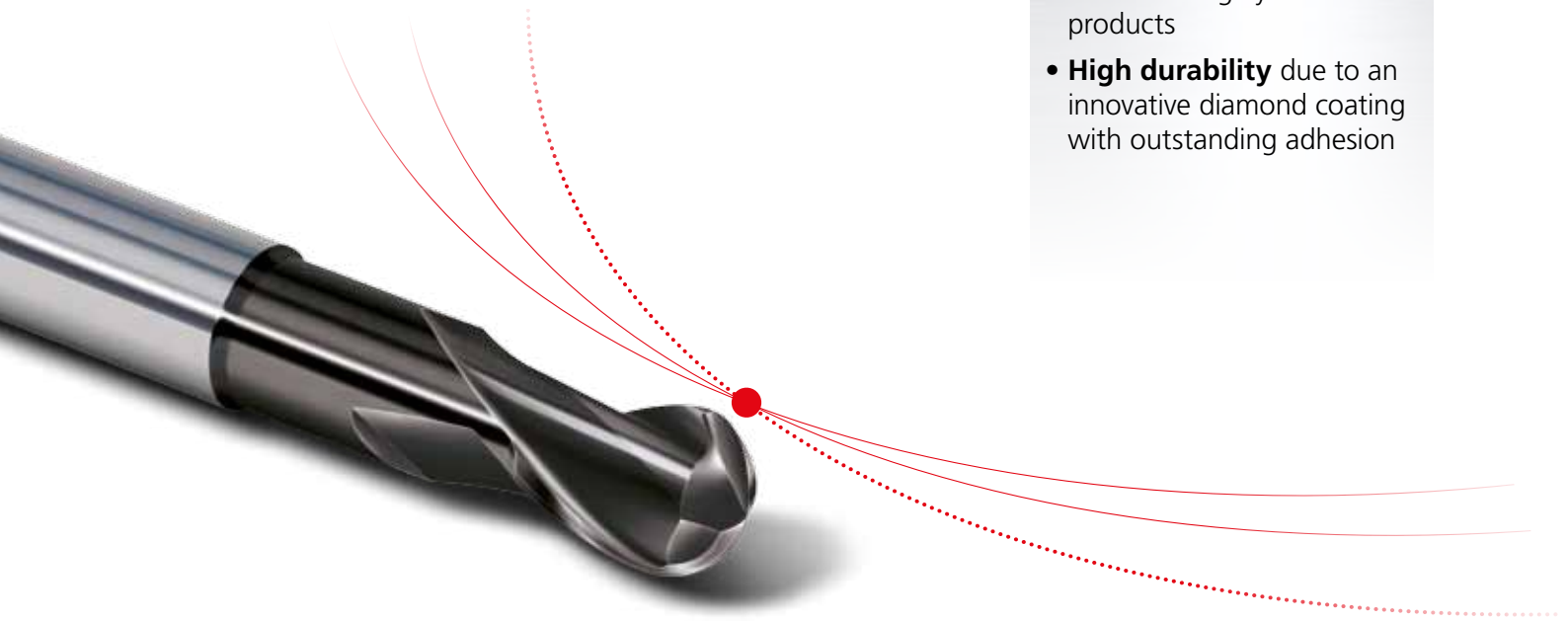
Diamond-coated ball nose end mills for the all-round processing of hard metals and technical ceramics

SpheroCarb is the ball nose end mill of choice when it comes to finishing hard metals. **SpheroCarb** can profitably replace the eroding of hard metals with milling in many applications, saving both time and money. Thanks to an innovative diamond-coating process, for the first time, **SpheroCarb** tools for processing hard metals can now be produced at economically viable prices.

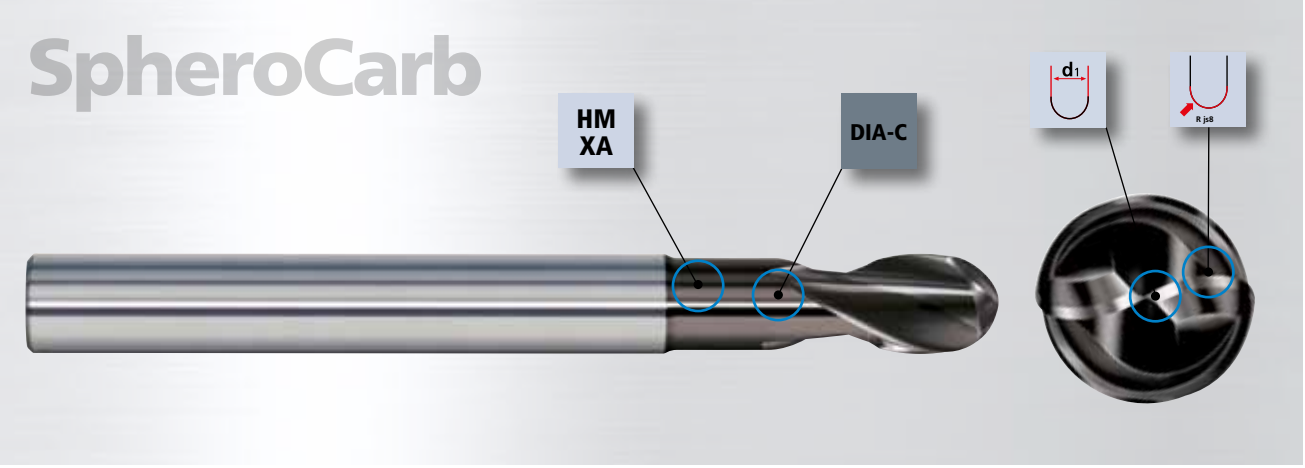
Their primary applications are high-performance finishing. SpheroCarb can process a wide variety of hard metals ranging **from HV 900 to 1,600.**

The advantages:

- **Lower tool costs** by replacing alternative production technologies such as eroding
- **High degree of flexibility,** suitable for both 3-axis and 5-axis machinery
- **Shorter throughput times,** as electrodes no longer need to be produced
- **Improved component quality,** better surfaces, higher dimensional accuracy compared with EDM processing
- **New materials,** suitable for all technical ceramics and other highly abrasive products
- **High durability** due to an innovative diamond coating with outstanding adhesion



The new SpheroCarb for all-round application when processing hard metals



Ball nose end mill with high-precision diameter tolerance

- Ball nose end mill with high-precision radius and diameter tolerance

DIA-C **Diamond C-coating**

- High-purity, fine crystalline diamond coating that is adapted to the connection zone of the substrate

HM XA **"XA" hard metal**

- Excellent supporting effect around the cutting edge for extremely hard metals reduces the danger of chipping and improves processing reliability

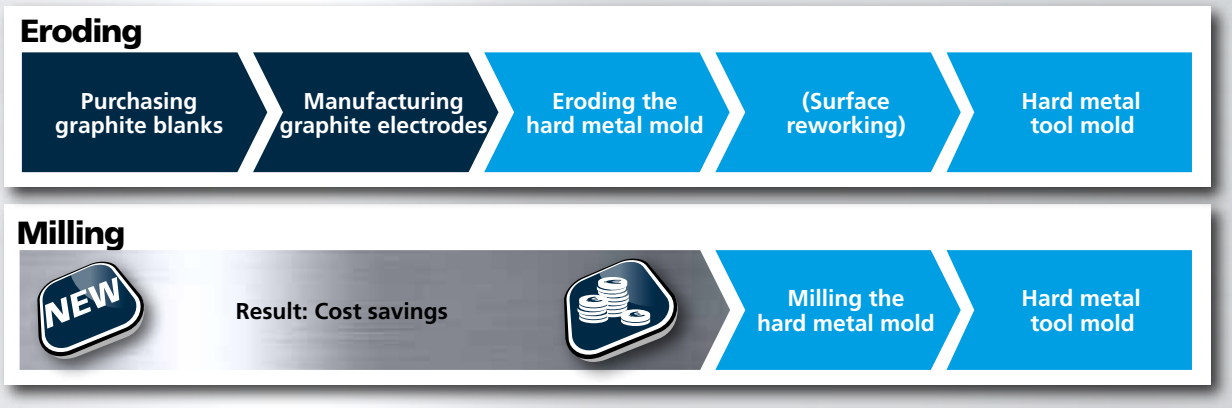
Special diamond coating

The newly developed **SpheroCarb** tool group is highly suitable for processing hard metals up to 1,600 HV. Even oxidic- and nitride-based technical ceramics, such as silicon nitride or corundum, can be processed using this tool.

Compared with conventional diamond coatings, the special-purpose **SpheroCarb** diamond coating exhibits unparalleled adhesion on the hard metal substrate.

Al	Cu	CuZn		C		HM	HM		
Aluminium Cast	Copper	Brass		Graphite		< 1200 HV	< 1600 HV		**ZrO2** (Zirconium oxide) **Si3N4** (Silicon nitride) **Al2O3** (Aluminium oxide)

Milling instead of eroding



Lower tool costs

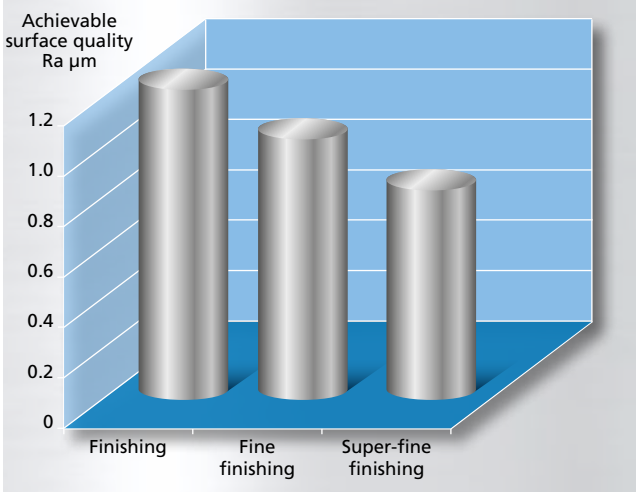
The outstanding hardness of the diamond coating minimizes wear, even during long periods of use. The high degree of cutting edge stability reduces the risk of tool breakage so that even extremely hard metals can be processed, significantly reducing tool costs and replacing elaborate, expensive manufacturing processes such as eroding. The innovation not only means that eroding is no longer necessary, it also saves on the expensive, painstaking manufacturing of eroding electrodes.

Cutting data recommendation for hard metal finishing for 1,100 HV hardness grade					
D1	**Vc, max [m/min]**	**n [1/min]**	**Vf [mm/min]**	**ap [mm]**	**ae [mm]**
1	400	60 000	200	0.05	0.05
2	400	60 000	200	0.1	0.1
3	400	40 000	200	0.15	0.15
4	400	30 000	200	0.2	0.2
5	400	25 000	200	0.25	0.25
6	400	20 000	200	0.3	0.3
8	400	15 000	200	0.3	0.3
10	400	12 500	200	0.3	0.3
12	400	10 000	200	0.3	0.3

Improved component precision

The extremely high-precision ball with a tolerance of ±0.007 enables exact finishing and outstanding surface quality. The special layer structure and the resulting excellent wear behavior are a guarantee for first-class surface finishing quality.

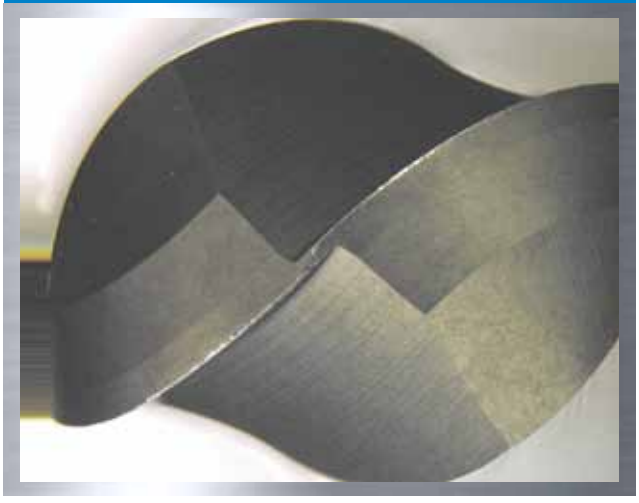
Surface qualities achievable with SpheroCarb ball nose end mills



Highly durable

The high endurance and wear resistance of the diamond coating make for long tool life of over 60 minutes. Moreover, the diamond coating exhibits very good adhesion properties, avoiding flaking and maintaining the precise cutting geometry. On the functional free areas, this method continues to produce outstanding component quality surfaces, even after longer periods of use.

SpheroCarb after 98 minutes in hard metal (1,150 HV), finishing with n = 20,000 rpm, vf = 210 mm/min., ap = ae = 0.3 mm

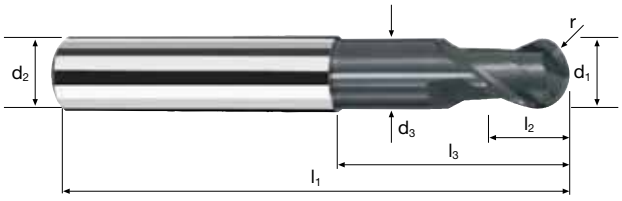


Ball nose end mills SpheroCarb

Tolerance r js8 (±), 3xd

HSS | Favora® | Base-X | X-Generation X

HM XA | λ 30° γ-10°



new!

Al Aluminium Cast | **Cu** Copper | **CuZn** Brass | **C** Graphite | **HM** < 1200 HV | **HM** < 1600 HV

ZrO2 (Zirconium oxide)
Si3N4 (Silicon nitride)
Al2O3 (Aluminium oxide)

Example: **Order-N°.** Coating **B** | Article-N°. **5580** | ø-Code **.100**

ø Code	d1 ±	d2 h6	d3	l1	l2	l3	r js8	α	z	DIA-C B5580
.100	1.0	6	0.95	57	1.5	3.0	0.50	11.8°	2	●
.120	1.5	6	1.40	57	2.0	4.5	0.75	10.3°	2	●
.140	2.0	6	1.90	57	3.0	6.0	1.00	9.0°	2	●
.160	2.5	6	2.30	57	3.5	7.5	1.25	7.6°	2	●
.180	3.0	6	2.80	57	4.0	9.0	1.50	6.4°	2	●
.220	4.0	6	3.70	57	5.0	12.0	2.00	4.0°	2	●
.260	5.0	6	4.60	57	6.0	15.0	2.50	2.0°	2	●
.300	6.0	6	5.50	57	7.0	20.0	3.00	0.0°	2	●
.391	8.0	8	7.40	63	9.0	26.0	4.00	0.0°	2	●
.450	10.0	10	9.20	72	11.0	31.0	5.00	0.0°	2	●
.501	12.0	12	11.00	83	13.0	37.0	6.00	0.0°	2	●

Where is it possible to ask questions concerning the product?

If you have any question, please send an email to **mail.ch@fraisa.com**. You may also directly contact our local customer consultant.

The FRAISA application engineers will be happy to advise you.

For further information, please refer to **fraisa.com**

Here, you will be provided with further information on the FRAISA Group.

The fastest way to our E-Shop can be found here.

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