Round Tool Materials

2024 **EN**

CTU13L

High-performance grade for machining hardened steel and aluminium alloys

CERATIZIT is a high-technology engineering group specialised in cutting tools and hard material solutions.

Tooling a Sustainable Future

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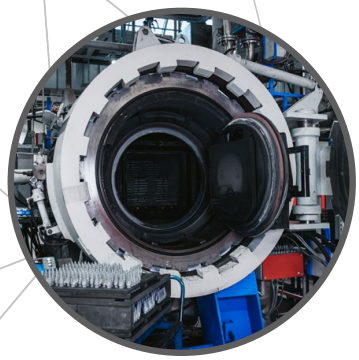
CERATIZIT GROUP

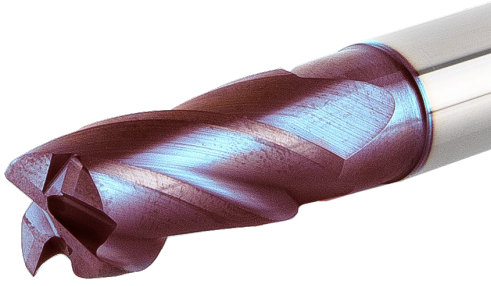
For experts by experts

The CERATIZIT centre of excellence for cutting tool products, rods and preforms is located at the Breitenwang/Reutte site in Austria, where all production processes are carried out--from powder treatment and manufacturing of bars and rods to the recycling of carbides. CERATIZIT Austria GmbH is certified in accordance with ISO 9001 and currently employs a staff of approximately 850.



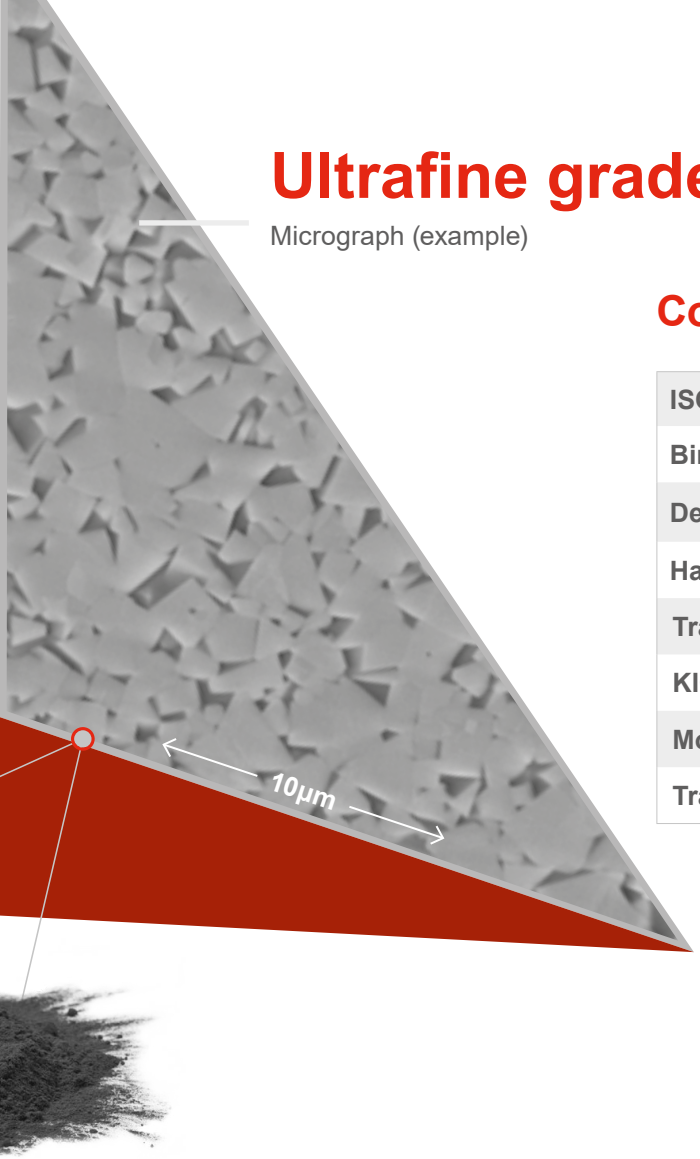
Only the best will do

- As the innovative market leader for carbide bars and rods we aim to
- Provide competent technical and sales support
- Ensure maximum availability with the largest standard product range on the market.
- Deliver premium quality precision tools--always



Ultrafine grades

Micrograph (example)



Composition and properties

ISO CODE*	K10 - K20
Binder [m %]	6.5
Density [g/cm³]	14.72
Hardness [HV30]	2080
Transverse rupture strength [MPa]	3800
KIC (Shetty) [MPa*m$^{1/2}$]**	8.7
Modulus of elasticity [GPa]	618
Transverse contraction [-]	0.206

*The standard ISO codes for carbides which were developed for fine to medium grain sizes no longer correspond current standards. Only the application data are relevant for the correct grade selection.

Application group / DIN ISO 513

The presentation of carbide grades serves as a recommendation based on the material in question. In addition to the material in question, there are a number of factors to take into consideration, including the machining process, machining parameters and coating, as well as macro and micro geometry. As these factors influence each other, we are unable to provide a definitive performance prognosis of a given machining process. Diagram colours indicate the respective application groups in accordance with ISO 513, while the colour level indicates how suitable it is for the respective material. Due to their importance, aluminium and titanium alloys are depicted separately. Lastly, the purple diagrams point out special properties to take into consideration for a given carbide grade.

Application areas:

Hardened steels

These materials have a hardness range of 50 to 72 HRC and have a high wear and abrasion resistance. However, they are very difficult to machine, as the material's high abrasive properties lead to high temperatures on the cutting edge. HSC-machining plays a crucial role here as the goal is meshing maximum machining performance with optimum surface quality.

Key industries: Automotive, machine construction, tool and die production

Composite and sandwich materials

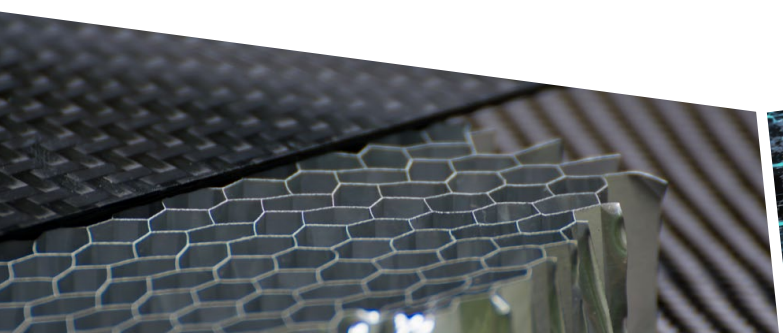
CFRP (carbon-fiber reinforced polymers), GFRP (glass-fiber reinforced polymers), AFK (aramid-fiber reinforced materials) and various sandwich materials (e.g. CFRP-aluminum composite) boast extraordinary strength and low weight, making them ideal for use in lightweight construction. Although they are very abrasive, their thermal load is quite low. When machining these materials, it is crucial to avoid the detachment of composite material layers (delamination) and to reduce fiber protrusions.

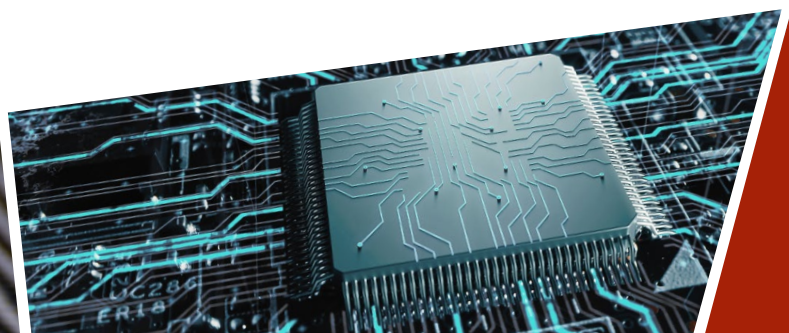
Key industries: Automotive, aerospace, shipbuilding

Printed circuit boards

Printed circuit boards are mediums for electronic components and are available as single-sided or multilayer printed circuit boards (e.g. computers, cell phones). The base plate is usually made of fiber-reinforced plastic and is therefore very brittle and abrasive. The primary machining processes used here are milling and drilling.

Key industries: Electronics





Aluminium alloys

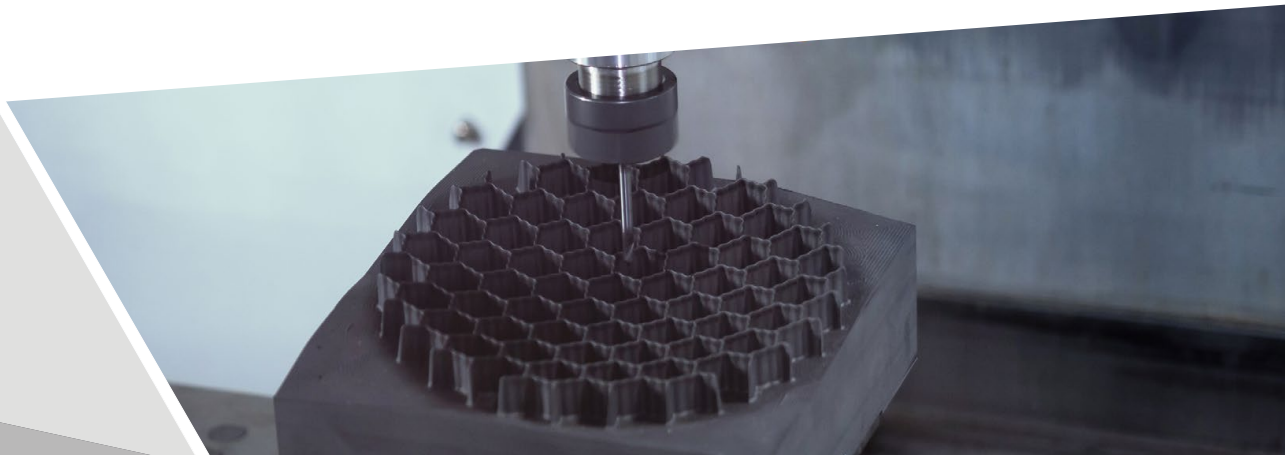
Aluminium is characterized by excellent corrosion resistance properties and a high degree of strength in relation to its density. To further boost its strength and hardness, aluminum alloys are common, e.g. with silicon. The material conserves resources and is also easy to recycle. However, its abrasiveness presents a challenge when machining.

Key industries: Automotive (eMobility), engine and gear manufacturing, tool and machine construction, aerospace

Graphite

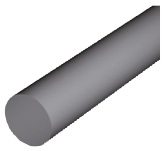
Graphite is a heat-resistant and dimensionally stable material. Furthermore, it has excellent electrical and thermal conductivity. On the down side, the material is very brittle and abrasive, which leads to the production of graphite dust during machining. Graphite is a key component for the manufacture of electrodes, where high demands are placed on shape and position tolerances. As there are no preformed components, graphite components are always manufactured from blocks and sheets. The spectrum ranges from large components, such as crucibles, to electrodes and small screws.

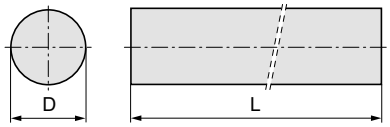
Key industries: Tool and die production, machine and plant construction, medical technology, semiconductors



Rods, raw

Ultrafine grades

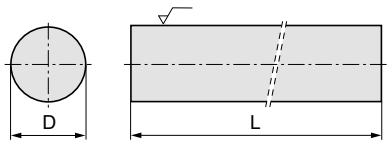




D [mm]	L [mm]	Type, designation	D-Tol. [mm]	CTU13L
3.25	330	RR 0325-330	-0/+0.20	▲
4.20	330	RR 0420-330	-0/+0.20	▲
5.20	330	RR 0520-330	-0/+0.25	▲
6.20	330	RR 0620-330	-0/+0.25	▲
8.20	330	RR 0820-330	-0/+0.30	▲
10.50	330	RR 1020-330	-0/+0.30	▲
12.20	330	RR 1220-330	-0/+0.30	▲
14.20	330	RR 1420-330	-0/+0.30	▲
16.20	330	RR 1620-330	-0/+0.45	▲
18.20	330	RR 1820-330	-0/+0.45	▲
20.20	330	RR 2020-330	-0/+0.45	▲

Rods, ground, metric

Ultrafine grades

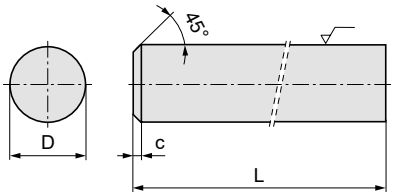


D [mm]	L [mm]	Type, designation	D-Tol. [mm]	ISO 286	CTU13L
3.00	330	RGM 0300-330	+0/-0004	h5	▲
4.00	330	RGM 0400-330	+0/-0005	h5	▲
6.00	330	RGM 0600-330	+0/-0005	h5	▲
8.00	330	RGM 0800-330	+0/-0006	h5	▲
10.00	330	RGM 1000-330	+0/-0006	h5	▲
12.00	330	RGM 1200-330	+0/-0008	h5	▲
16.00	330	RGM 1600-330	+0/-0008	h5	▲
20.00	330	RGM 2000-330	+0/-0009	h5	▲

○ limited storage ● standard on stock ▲ new products from stock Other grades and measurements on request

Milling cutter blanks, metric

Ultrafine grades



D [mm]	L [mm]	Type, designation	D-Tol. [mm]	ISO 286	c [mm]	DIN 6527	CTU13L
3.00	39	RGMC 0300-039	+0/-0004	h5	0.30	x	▲
3.00	50	RGMC 0300-050	+0/-0004	h5	0.30		▲
4.00	51	RGMC 0400-051	+0/-0005	h5	0.40	x	▲
6.00	51	RGMC 0600-051	+0/-0008	h5	0.40	x	▲
6.00	58	RGMC 0600-058	+0/-0005	h5	0.40	x	▲
6.00	75	RGMC 0600-075	+0/-0005	h5	0.40		▲
6.00	100	RGMC 0600-100	+0/-0005	h5	0.40		▲
8.00	64	RGMC 0800-064	+0/-0006	h5	0.60	x	▲
8.00	75	RGMC 0800-075	+0/-0006	h5	0.60		▲
8.00	100	RGMC 0800-100	+0/-0006	h5	0.60		▲
10.00	73	RGMC 1000-073	+0/-0006	h5	0.80	x	▲
10.00	100	RGMC 1000-100	+0/-0006	h5	0.80		▲
12.00	84	RGMC 1200-084	+0/-0008	h5	0.80	x	▲
12.00	100	RGMC 1200-100	+0/-0008	h5	0.80		▲
16.00	93	RGMC 1600-093	+0/-0008	h5	0.80	x	▲
20.00	105	RGMC 2000-105	+0/-0009	h5	1.00	x	▲

○ limited storage ● standard on stock ▲ new products from stock Other grades and measurements on request

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