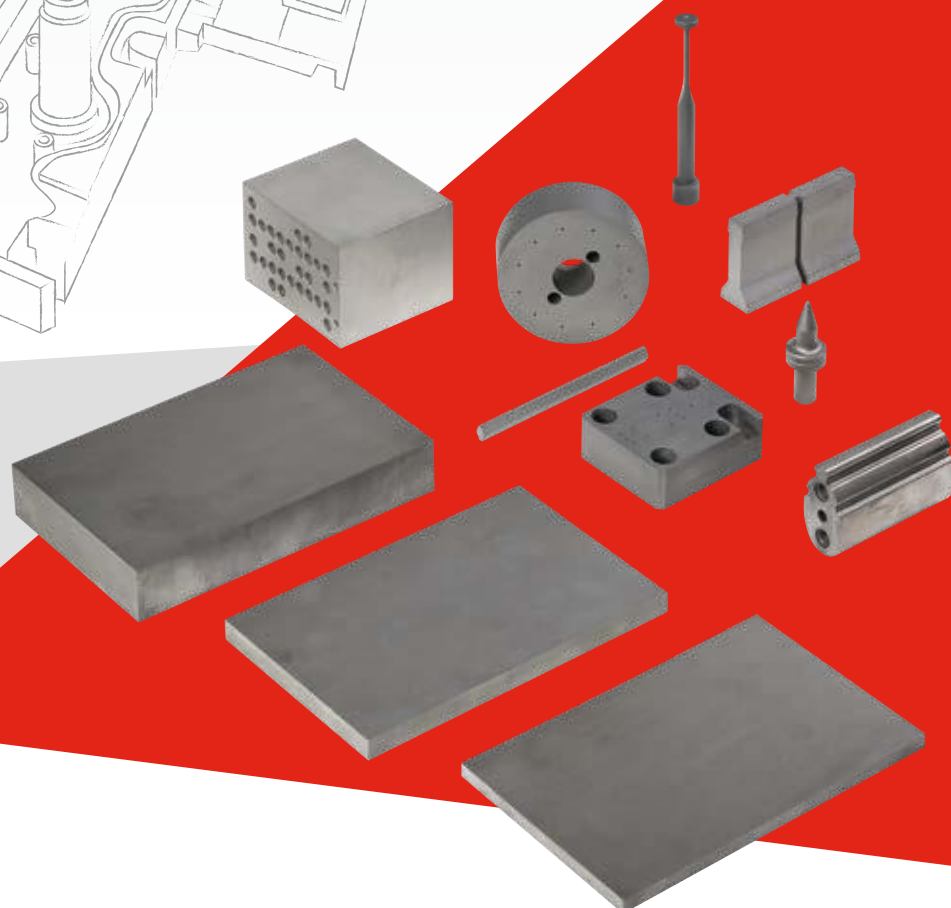
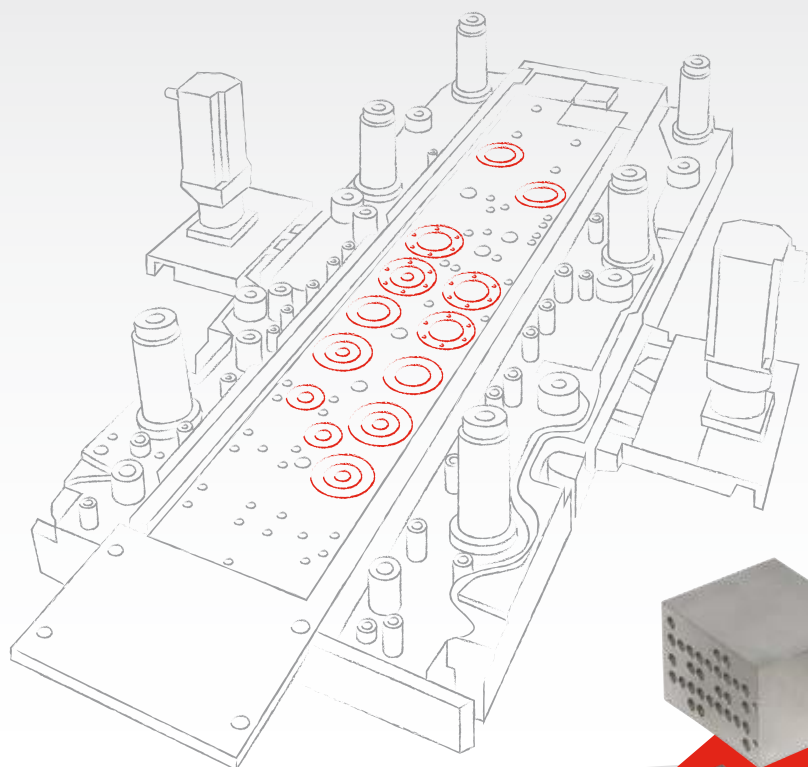


CERATIZIT E-Mobility

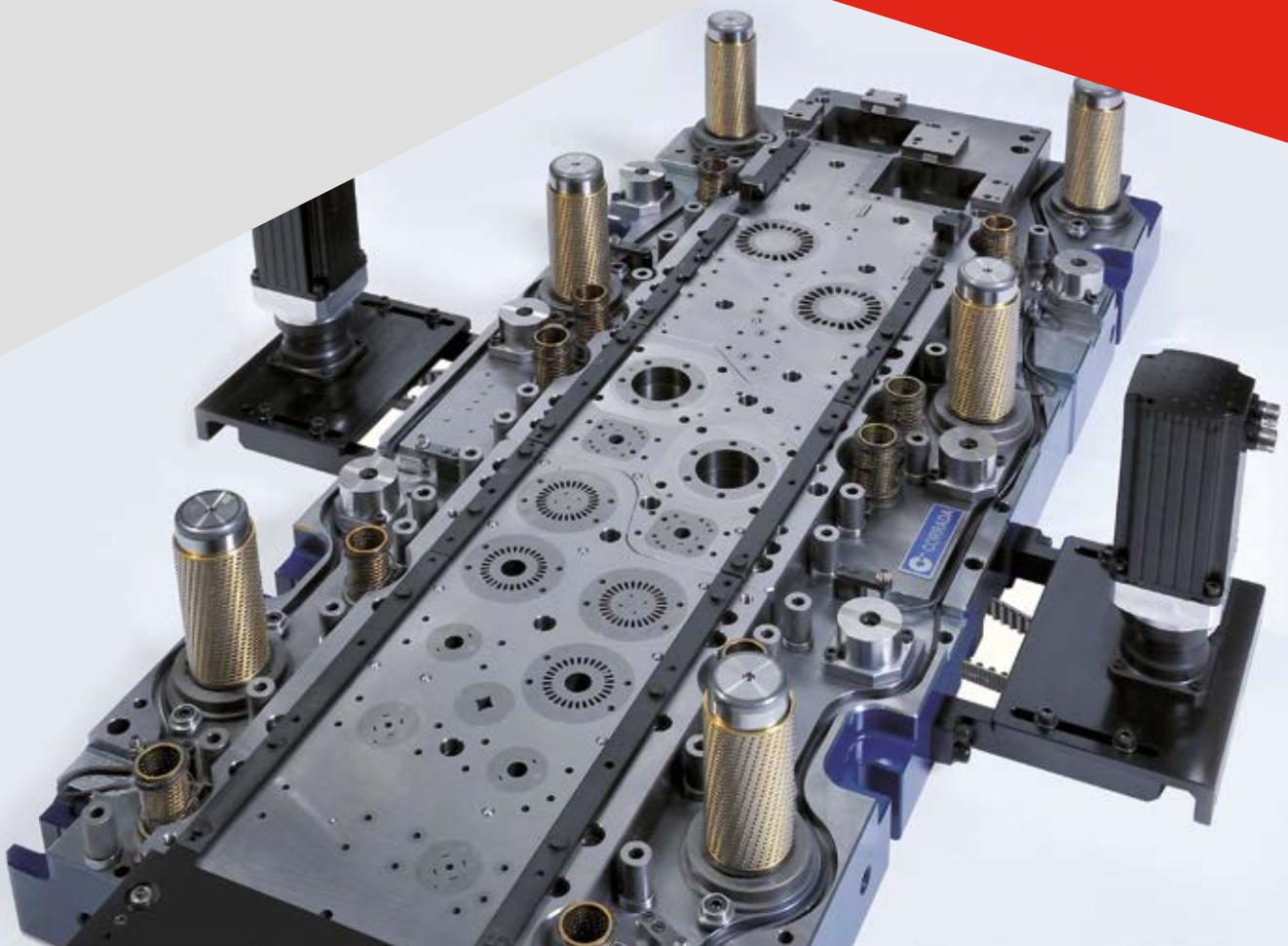


E-Mobility – introduction

Consistent growth in the number of electrically powered vehicles means the necessary motors must be produced with extreme efficiency. Cemented carbide is currently the best material suitable for the most economic production of rotor and stator sheets. Additionally, it has vibration-dynamic and wear-related advantages compared to steel.

We provide a wide range of tungsten carbide solutions for e-mobility, including carbide blanks for progressive die stamping tools for rotor and stator production, nickel-bound grades for magnet production as well as wear parts for the mass production of lithium-ion batteries. Furthermore, we offer ceramic solutions, such as balls and pins, including hybrid bearings for electric motors. If required, we are also able to supply carbide-steel composite solutions.

Optimal results are achieved combining the suitable carbide grade for your application with an outstanding service package: advice concerning grade characteristics and selection, optimisation of machining processes through our products and customer-specific seminars.



Product details

Carbide blanks for progressive die stamping tools, for rotor and stator production

Carbide meets the high requirements on the material for rotor and stator production – outstanding wear resistance through high hardness levels combined with high fracture toughness and transverse rupture strength create the perfect conditions for achieving maximum tool life.

The carbide used for the active parts must also have excellent corrosion protection to enable it to withstand long dwell times in the dielectric fluid during the eroding process without suffering corrosive damage.

Our corrosion-protected CF grades (in particular CF-H40S+) have proved their excellence for this purpose over many years, and they continue to be the material of choice for toolmaking.

Leading toolmakers and tool shops use CERATIZIT carbide blanks for punching tools for punching rotor and stator sheets for electric motors.

In order to be prepared for the products of the future, we have invested in our production department in Empfingen which allows us to produce parts with diameters up to 350 mm.



Tools for electric motor magnet production

When used for magnet powder compaction, our nickel-bound carbide grades (e.g. CTS17R NM) are guaranteed non-magnetic and boast increased wear resistance. For magnetic materials, our nickel grades offer excellent fracture toughness in addition to the necessary high hardness. You will benefit from the substantial increase in tool life and, compared to steel tools, machine downtimes are considerably reduced, making the entire system extremely efficient.



Wear parts for the mass production of lithium-ion batteries

Wear parts are another example of the mass production of lithium-ion batteries, as they withstand the abrasive

effect of the lithium salts that have to be mixed.

Components for fuel cell turbo compressors

We provide carbide components for fuel cell turbo compressors operating at a speed of up to 120,000 revolutions per minute.

When more revolutions per minute are required and the shafts must rotate at a speed exceeding 120,000 revolutions per minute, we provide the necessary ceramic products. Our ceramic products are so light that they still work reliably even at 150,000 revolutions per minute and more, rounding off the product portfolio for turbo compressors with solutions for extremely high speeds.



Hybrid bearings for electric motors

When using conventional steel bearings in electric motors, electrical erosion may occur. This is not a problem with hybrid bearings, as ceramic components are not electrically

conductive. We offer balls and rollers made of silicon nitride for hybrid bearings.

Customised solutions

We support our customers with unique know-how as an expert development partner to create the optimal product for their specific application.

Please contact us via wearparts@ceratizit.com for more details.

Applications

- ▲ Rotor and stator manufacturing
- ▲ Magnet production for electric motors
- ▲ Battery mass production of lithium-ion batteries
- ▲ Components for fuel cell turbo compressors
- ▲ Hybrid bearings for electric motors



CF grades

Our customers have been working for decades with our tried and tested fully-fledged corrosion-resistant CF (corrosion-free) carbide grades. They were developed specifically for the tool and die industry.

You can benefit right away from even better product characteristics:

- ▲ **High process reliability** with optimal cutting edge stability thanks to higher KIC values while maintaining the same hardness
- ▲ Excellent **corrosion protection** and reduced speed of corrosion
- ▲ **Stable processes** including delicate active parts thanks to enhanced transverse rupture strength and improved tensile strength

Composition and properties

Corrosion-resistant grades

CERATIZIT grade code	ISO code	U.S. code	Binder [%]	HV10	Hardness HV30	HRA	Transverse rupture strength		Fracture toughness
							[MPa]	[P.S.I.]	[MPa·m ^{1/2}]
Submicron grain									
CF-S12Z			6.0	1860	1830	93.2	3600	522.000	9.0
CF-S18Z			9.0	1630	1610	92.0	3500	508.000	11.0
Fine / medium grain									
CF-H25S+	K20-K30		8.5	1660	1640	92.2	3000	435.000	10.2
CF-H40S+	K40	C11/C12	12.0	1400	1380	90.3	3200	464.000	12.5
CF-F35Z			17.5	1200	1190	88.2	3300	479.000	15.6

Non magnetic grades

CERATIZIT grade code	ISO code	U.S. code	Binder [%]	HV10	Hardness HV30	HRA	Transverse rupture strength		Fracture toughness
							[MPa]	[P.S.I.]	[MPa·m ^{1/2}]
CTS17R NM		C18	8.5	1600	1580	91.6	2800	406.000	8.7

Advantages and benefits

Our service

Specific recommendation of the most suitable grade.

Widest range of corrosion-resistant grades available on the market.

Consistent quality.

Certified according to IATF 16949.

High rigidity, reduced abrasive wear.

Higher output quantity compared to active parts in steel.

Research in study groups with scientific institutes and partners from the e-mobility industry.

E-mobility R&D activities.

We offer tungsten carbide, ceramic or carbide-ceramic composite solutions.

Your benefits

Tool life optimisation, increased productivity, process optimisation.

Individual grade selection for the largest application range of stamping, bending, blanking and forming operations.

High productivity and repeatability.

Secure and reliable processes for customers.

Improved form accuracy of the active parts compared to steel and PM steel.

Cost-efficient and timesaving, particularly for large quantities.

Access to the latest developments and trends in e-mobility.

Innovative solutions.

High flexibility for every application.



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