



INNOVATION

THE NEW CF GRADE FAMILY

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THE NEW CF GRADE FAMILY

CORROSION-RESISTANT GRADES

Corrosion-resistant grades

CF-S12Z – Submicron grade with very high hardness for applications with highly abrasive materials.

CF-S18Z – Increased fracture toughness allows the usage of a submicron grade for applications where high bending forces occur.

CF-H25S – Fine-medium grade with high hardness and fracture toughness for high requirements regarding abrasive wear.

CF-H40S – The grade for universal application, ideal compromise between hardness and fracture toughness.

CF-F35Z – Fine-medium grade especially designed for stamping, bending, blanking and forming applications.

CF-20HP – Medium-coarse grade combining the hardness of a fine grade with the fracture toughness of a coarse grade.

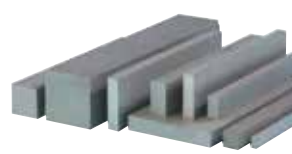
CTEB00



CTEB20



CTSS



CTPP



CTSB



CTRR



CTRG



The CERATIZIT online shop



Grades available in stock and via E-Techstore within 24 hours:

Product code	CF-S12Z	CF-S18Z	CF-H25S+	CF-H40S+	CF-F35Z	CF-20HP
CTEB00	▲	▲	▲	▲	▲	▲
CTEB20	●	●	●	●	●	●
CTSS	▲	●	▲	●	▲	▲
CTSB	▲	●	▲	●	▲	▲
CTPP	▲	▲	▲	●	▲	▲
CTRR	▲	●	▲	●	▲	▲
CTRG	▲	●	▲	●	▲	▲

● = stock item

▲ = upon request

The following grades are available as special versions:

Type	CF-S12Z	CF-S18Z	CF-H25S+	CF-H40S+	CF-F35Z	CF-20HP
Special blocks	●	●	●	●	●	●
Special blocks with start bore / steel plug / threaded hole	●	●	●	●	●	●
Preforms according to customer drawing	●	●	●	●	●	●
Preforms to customer drawing with steel plug/thread	●	●	●	●	●	●

● = standard production



Evolution for higher performance

CF grade

	CF-S12Z
Binder content	6.0 %
Grain size	submicron
Corrosion resistance	YES
Hardness [HV10]	1860
Transverse rupture strength [MPa]	3600
Fracture toughness [MPa*m ^{1/2}]	9.0

	CF-S18Z
Binder content	9.0 %
Grain size	submicron
Corrosion resistance	YES
Hardness [HV10]	1630
Transverse rupture strength [MPa]	3500
Fracture toughness [MPa*m ^{1/2}]	11.0

	CF-H25S+
Binder content	8.5 %
Grain size	fine-medium
Corrosion resistance	YES
Hardness [HV10]	1660
Transverse rupture strength [MPa]	3000
Fracture toughness [MPa*m ^{1/2}]	10.2

	CF-H40S+
Binder content	12.0 %
Grain size	fine-medium
Corrosion resistance	YES
Hardness [HV10]	1400
Transverse rupture strength [MPa]	3200
Fracture toughness [MPa*m ^{1/2}]	12.5

	CF-F35Z
Binder content	17.5 %
Grain size	fine-medium
Corrosion resistance	YES
Hardness [HV10]	1200
Transverse rupture strength [MPa]	3300
Fracture toughness [MPa*m ^{1/2}]	15.6

	CF-20HP
Binder content	10.0 %
Grain size	medium-coarse
Corrosion resistance	YES
Hardness [HV10]	1300
Transverse rupture strength [MPa]	2800
Fracture toughness [MPa*m ^{1/2}]	15.1

replaces old grades

TSM10 / CTS12L	TSM20 / CTS15L
6.0 %	7.5 %
submicron	submicron
NO	NO
1870	1790
3500	3600
8.2	8.6

MG18 / CTS20L	TSM33
10.0 %	10.0 %
submicron	submicron
NO	NO
1680	1610
3700	3700
9.4	9.4

H20S / CTF12	H30S / CTF18
6.0 %	9.0 %
fine	fine
NO	NO
1640	1400
2200	2800
9.9	10.9

H30S / CTF18	H40S / CTF24
9.0 %	12.0 %
fine	fine
NO	NO
1400	1330
2800	3000
10.9	12.0

H50S / CTF30	H60S / CTF40
15.0 %	20.0 %
fine	fine
NO	NO
1240	1070
3100	3400
13.1	14.2

B30S / CTC20	B40S / CTC25
10.0 %	12.5 %
coarse	coarse
NO	NO
1170	1080
3000	3050
13.1	16.3



CF-F35Z

Corrosion-resistant fine-medium grade with high fracture toughness

Application

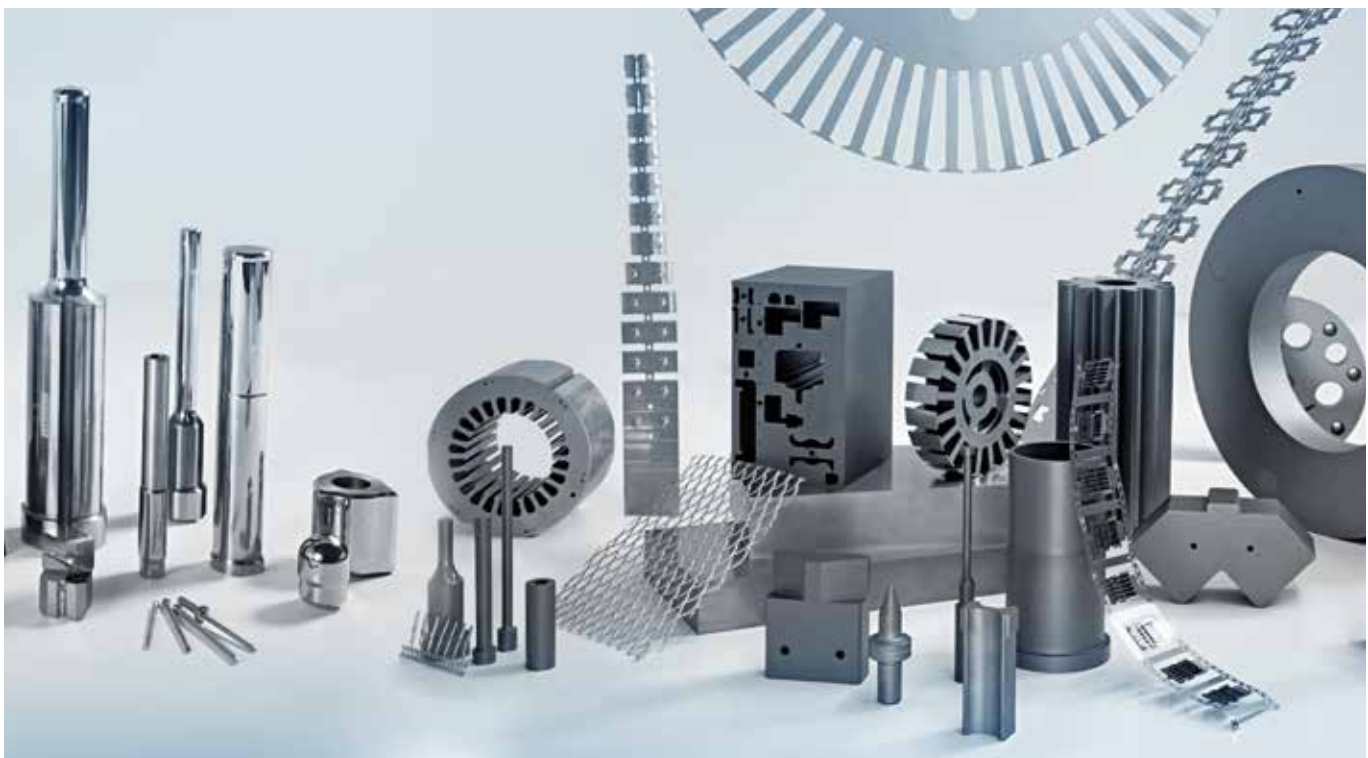
- ▲ Stamping of thick sheet metal
- ▲ Stamping of high-tensile strip material
- ▲ Bending & forming applications
- Replaces HSS/PM steels in wear or corrosion situations
- Replaces fine-medium grades such as H40S/H50S/H60S with low K_{IC} values (fracture toughness, edge stability) when there are problems with edge chipping
- Replaces H50S & H60S as a variant with protection against corrosion
- Alternative to CF-20HP in case of breakage issues or edge chipping
- Shows very good results in the milling process regarding surface and economy

CF-20HP

Corrosion-resistant medium-coarse grade with high hardness

Application

- ▲ Characterised by high hardness and a maximum K_{IC} value (fracture toughness, edge stability)
- ▲ Hardness of a fine grain grade and K_{IC} value of a coarse grain grade
- ▲ Stamping of thick sheet metal
- ▲ Bending and forming applications
- Replaces HSS/PM steels and carbide coarse grains in case of wear or corrosion issues
- Replaces fine-medium grain grades such as H40S/H50S when there are problems with edge chipping
- Alternative to CF-F35Z when the binder content is too high for the application (e.g. adhesion)





Application matrix for the tool and die industry

The following table offers a good basis for choosing the right grade.
Further influencing factors such as the composition of the strip material, cutting gap, lubrication, geometry of the active parts

and the structure of the tools should be taken into account in order to select the optimal grade.

		Requirements regarding the surface quality*				
		min. max.				
		Tensile strength (N/mm ²)				
Strip thickness (mm)	min.	< 500	500 – 900	900 – 1400	1400 – 2000	> 2000
	max.	Requirements regarding the surface quality*	CF-S12Z CF-S18Z CF-H25S+	CF-S12Z CF-S18Z CF-H25S+	CF-S18Z CF-H25S+	CF-S18Z CF-H40S+
< 0.2		CF-S12Z CF-S18Z CF-H25S+	CF-S12Z CF-S18Z CF-H25S+	CF-S18Z CF-H25S+	CF-H40S+ CF-F35Z	CF-F35Z CF-20HP
0.2 – 0.5		CF-S18Z CF-H25S+	CF-S18Z CF-H40S+	CF-S18Z CF-H40S+	CF-F35Z CF-20HP	○
0.5 – 0.8		CF-S18Z CF-H40S+	CF-H40S+	CF-H40S+	CF-F35Z CF-20HP	○
0.8 – 1.2		CF-H40S+	CF-H40S+	CF-H40S+ CF-F35Z	CF-F35Z CF-20HP	○
1.2 – 1.5		CF-H40S+	CF-H40S+ CF-F35Z CF-20HP	CF-F35Z CF-20HP	○	○
1.5 – 2		CF-H40S+	CF-H40S+ CF-F35Z CF-20HP	CF-F35Z CF-20HP	○	○
2 – 3		CF-H40S+ CF-F35Z CF-20HP	CF-F35Z CF-20HP	○	○	○
3 – 6		CF-F35Z CF-20HP	○	○	○	○
6 – 10		○	○	○	○	-
> 10		○	○	○	-	-

○ Insufficient data. Test can be carried out upon request.

* Minimal damage due to machining operation (formation of thermal cracks, white zone, ...) and low roughness values. Adhesion due to strip material requires the best possible surface quality.