

INNOVATION

Net prices, valid until 31.07.2016

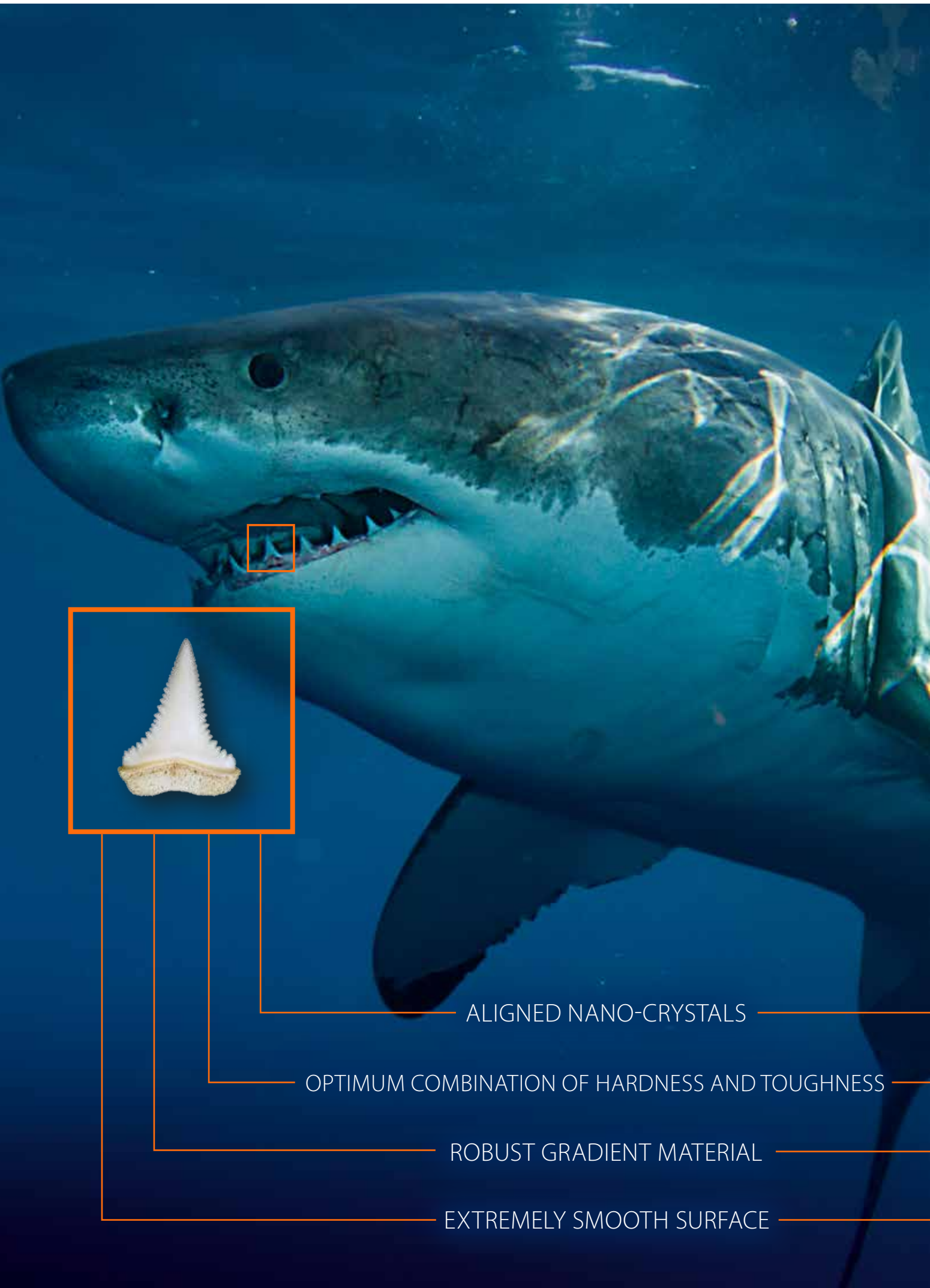


Premium Quality by Hoffmann Group

ENDURING POWER INSPIRED BY NATURE.

The new GARANT high performance cutting tool material HB 7020 for maximum wear resistance – inspired by nature.

 **Hoffmann Group**[®]
Tools to make you better



ALIGNED NANO-CRYSTALS

OPTIMUM COMBINATION OF HARDNESS AND TOUGHNESS

ROBUST GRADIENT MATERIAL

EXTREMELY SMOOTH SURFACE

Mother Nature's perfect example: Wear resistance

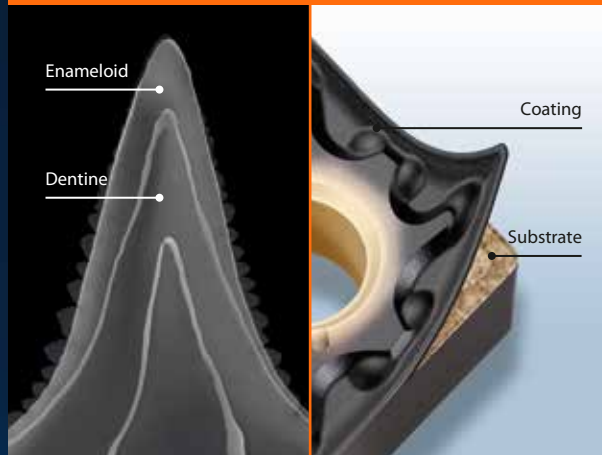
THE SHARK TOOTH STRUCTURE, PERFECTED BY EVOLUTION, PROVIDES THE INSPIRATION FOR GARANT TURNING GRADE HB 7020'S CUTTING TOOL MATERIAL

Shark tooth:

The combination of two components turns the shark tooth into a deadly weapon:

- Extremely tough outer layer of enameloid with Fluorapatite $\text{Ca}_5(\text{PO}_4)_3\text{F}$ protects against wear and tear.
- Soft dentine with high toughness on the inside of the tooth prevents chipping due to brittle fracture.

OPTIMUM COMBINATION OF HARDNESS AND TOUGHNESS



HB 7020:

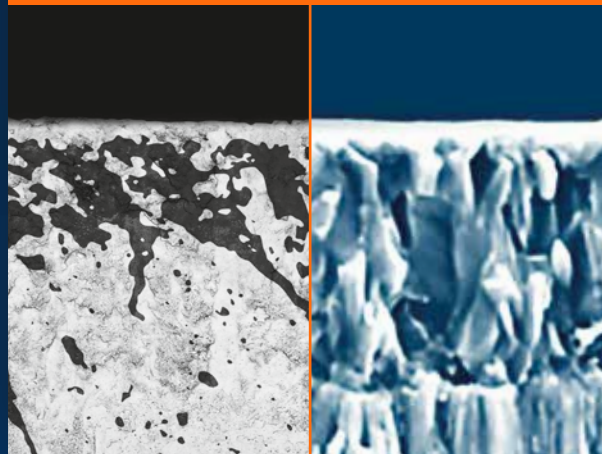
Two components turn our HB 7020 into the superlative in machining steel:

- Wear resistant, thermo resistant outer CVD coating system consisting of Al_2O_3 and $\text{Ti}(\text{C},\text{N})$ with maximum hardness values.
- Highest toughness values of the inner carbide substrate prevent chipping and brittle fracture.

Shark tooth:

- Specially structured enameloid, deviating from the perpendicular, provides a smooth tooth surface.
- Minimum degree of friction between prey and shark tooth.
- Minimum loss of dental enamel through abrasion.

EXTREMELY SMOOTH SURFACE



HB 7020:

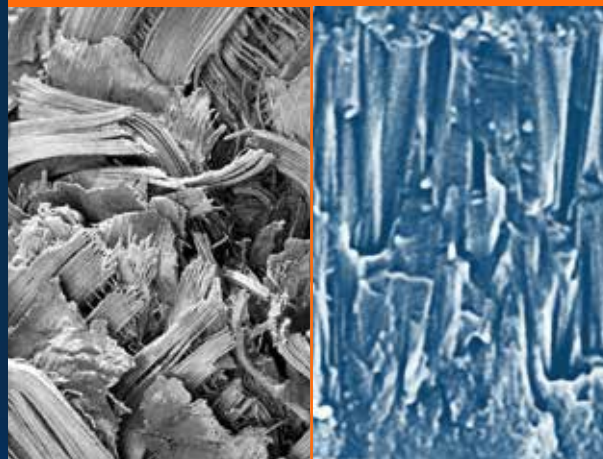
- Optimised surface finish of the Al_2O_3 coating layer.
- Minimum degree of friction between workpiece and cutting material.
- Minimum abrasion and development of heat due to the chip sliding off the cutting insert surface.

e to the power of 4



Shark tooth:

- The extreme hardness of the shark tooth is due to grain sizes of only a few μm .
- Wear resistance due to evenly aligned crystals of the enameloid.



ALIGNED NANO-CRYSTALS



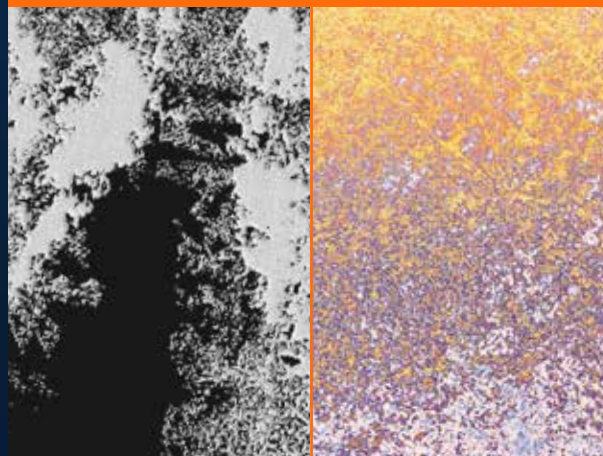
HB 7020:

- Maximum hardness of the Ti(C,N) coating due to grain sizes in the nano-range.
- Higher toughness due to aligned crystal structure.



Shark tooth:

- Smooth transition between enameloid and dentine with the best possible adhesion properties due to (smooth) gradients.
- Organic proportion increases towards dentine-enameloid interface.
- Both components are solidly interlinked.



ROBUST GRADIENT MATERIAL



HB 7020:

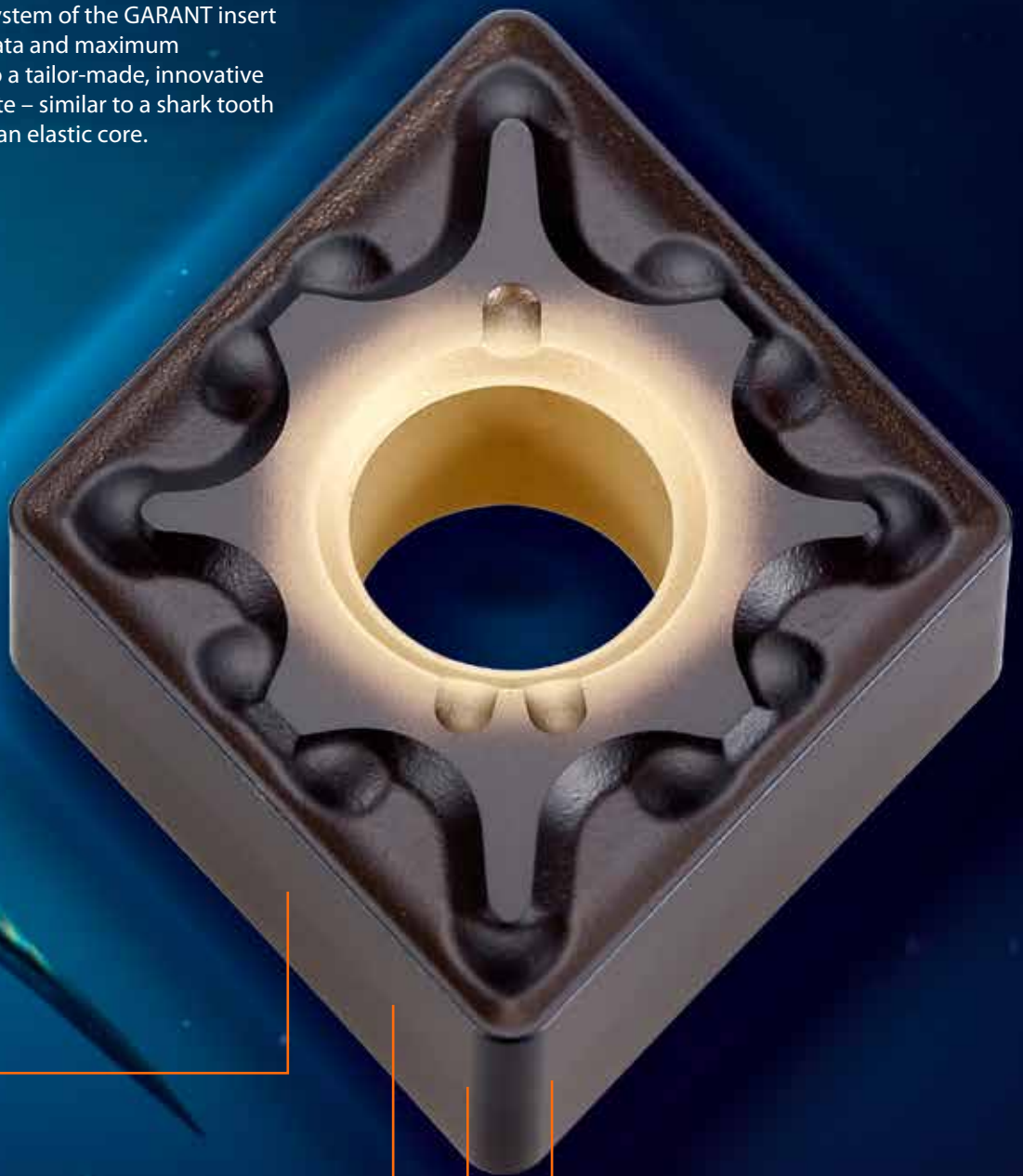
- TiN proportion in the substrate is not, as previously, evenly distributed but tapers off.
- Increased TiN proportion at the edges of the carbide substrate for optimum adhesion between substrate and coating.
- No shearing of the coating due to adapted thermal expansion coefficient of the substrate.

Robust, sharp-edged and uniquely good!

THE NEW GARANT TURNING GRADE HB 7020 WAS INSPIRED BY NATURE'S PERFECT EXAMPLE – A SHARK TOOTH

With properties like a shark tooth perfected by evolution, the new GARANT turning grade HB 7020 convinces during comparative tests for machining steel.

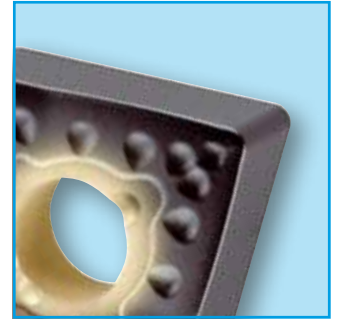
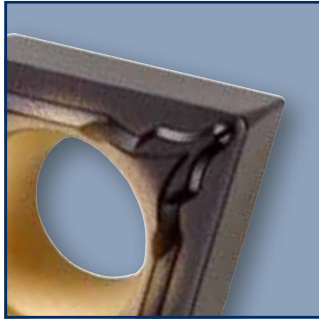
The multilayer coating system of the GARANT insert makes highest cutting data and maximum reliability possible due to a tailor-made, innovative gradient carbide substrate – similar to a shark tooth with a hard exterior and an elastic core.



Premium Quality by Hoffmann Group

The geometries

FOR OPTIMUM CHIP BREAKING IN MACHINING STEEL



SS – The finishing one

- Very good chip control for low cutting depths.
- Smooth chip evacuation due to dynamically shaped cutting edge.

SM – The general purpose one

- The SM geometry achieves the perfect balance between breaking strength and sharpness.

SG – The robust one

- First choice for interrupted cutting and work-pieces with hardened surfaces.

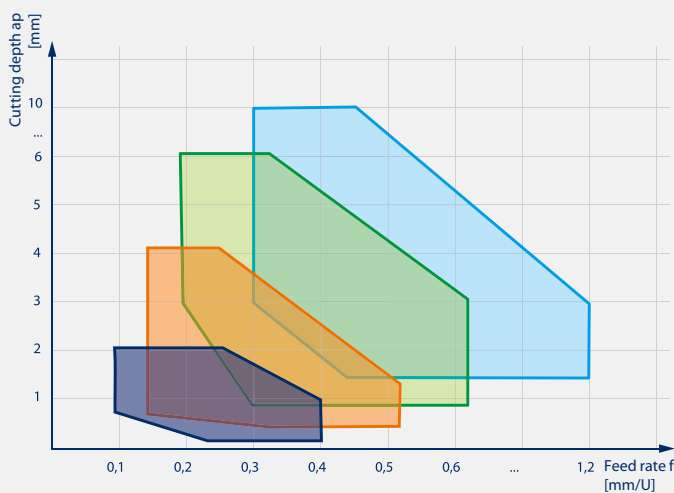
SR – The roughing one

- For extreme interrupted cutting and great cutting depths.
- Chip breaker for one-sided inserts.

Application areas of the HB 7020 geometries

Optimum chip breaking in the whole ISO P range: HB 7020 is available in 4 different geometries, specially adapted to grade HB 7020. Every steel turning application is covered!

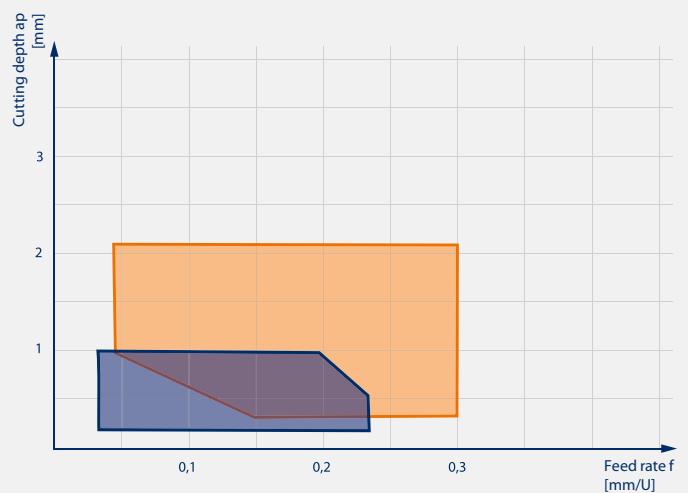
Chip breaker chart for inserts with negative basic shape



■ SS – Fine

■ SM – Universal

Chip breaker chart for inserts with positive basic shape



■ SG – Robust

■ SR – Rough

Test winner GARANT HB 7020

THE IDEAL CUTTING MATERIAL FOR SLIGHTLY INTERRUPTED CUT

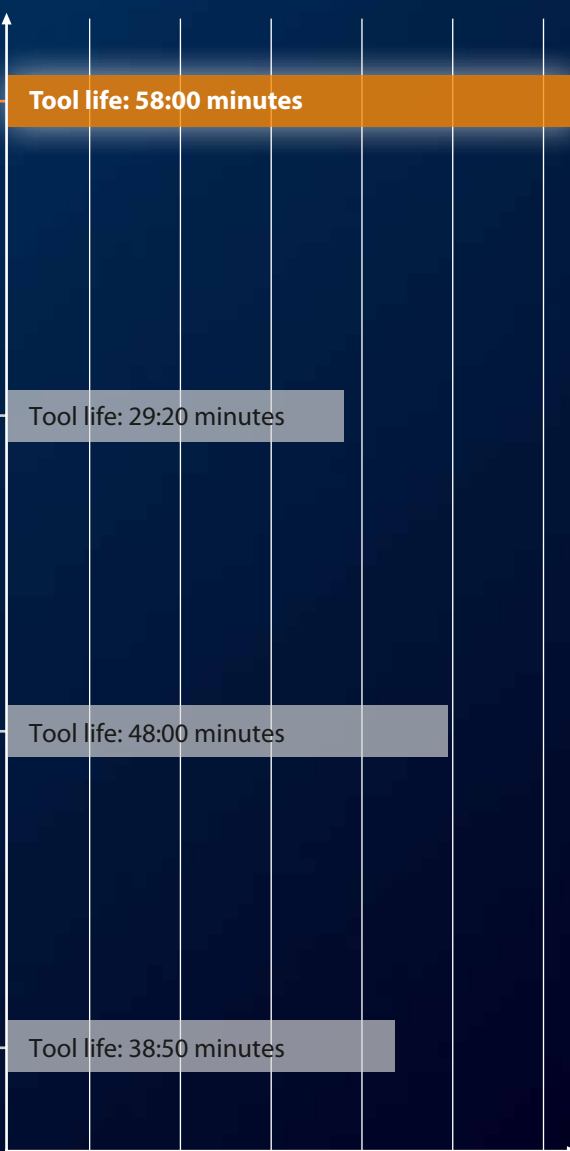
Cutting speed VC									
ISO code:	P	P	P	P	P				
Starting values	380	325	270	225	180	●	●	○	○

Best results regarding tool life when machining steel

Material	16MnCr5 (1.7131)
Cutting speed v_c	325 m/min
Feed rate f	0.35 mm/U
Cutting depth a_p	2.1 mm
Wet	



CNMG120408-SM HB 7020



Comparable competitor's product



Comparable competitor's product



Comparable competitor's product



Tool life [min]

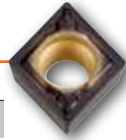
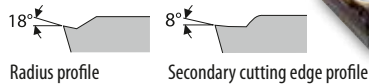
Discover our range



Indexable inserts with **positive** basic shape

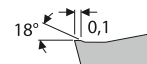
SS chip breaker

Finishing



SM chip breaker

Medium machining



Type	HB7020	Availability	
21G 26 0050 CCMT060202-SS	XXX	✓	10
21G 26 0052 CCMT060204-SS	XXX	✓	10
21G 26 0056 CCMT09T302-SS	XXX	✓	10
21G 26 0058 CCMT09T304-SS	XXX	✓	10
21G 26 0064 CCMT120404-SS	XXX	from 01.08.2015	10
21G 26 0066 CCMT120408-SS	XXX	from 01.08.2015	10
21G 26 0351 DCMT070202-SS	XXX	✓	10
21G 26 0353 DCMT070204-SS	XXX	✓	10
21G 26 0356 DCMT11T302-SS	XXX	✓	10
21G 26 0359 DCMT11T304-SS	XXX	✓	10
21G 26 0361 DCMT11T308-SS	XXX	✓	10
21G 26 0742 SCMT09T304-SS	XXX	from 01.08.2015	10
21G 26 0744 SCMT09T308-SS	XXX	from 01.08.2015	10
21G 26 0950 TCMT110202-SS	XXX	from 01.08.2015	10
21G 26 0952 TCMT110204-SS	XXX	from 01.08.2015	10
21G 26 0956 TCMT16T304-SS	XXX	✓	10
21G 26 1142 VBMT110302-SS	XXX	from 01.08.2015	10
21G 26 1144 VBMT110304-SS	XXX	from 01.08.2015	10
21G 26 1150 VBMT160402-SS	XXX	from 01.08.2015	10
21G 26 1152 VBMT160404-SS	XXX	from 01.08.2015	10
21G 26 1154 VBMT160408-SS	XXX	from 01.08.2015	10
21G 26 1364 VCMT110302-SS	XXX	from 01.08.2015	10
21G 26 1366 VCMT110304-SS	XXX	✓	10
21G 26 1372 VCMT160404-SS	XXX	✓	10
21G 26 1374 VCMT160408-SS	XXX	✓	10

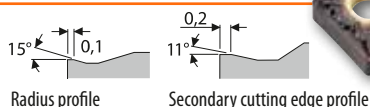
Type	HB7020	Availability	
21G 26 0140 CCMT060202-SM	XXX	✓	10
21G 26 0142 CCMT060204-SM	XXX	✓	10
21G 26 0148 CCMT09T302-SM	XXX	✓	10
21G 26 0150 CCMT09T304-SM	XXX	✓	10
21G 26 0152 CCMT09T308-SM	XXX	✓	10
21G 26 0158 CCMT120404-SM	XXX	✓	10
21G 26 0160 CCMT120408-SM	XXX	✓	10
21G 26 0449 DCMT070202-SM	XXX	✓	10
21G 26 0452 DCMT070204-SM	XXX	✓	10
21G 26 0458 DCMT11T302-SM	XXX	✓	10
21G 26 0462 DCMT11T304-SM	XXX	✓	10
21G 26 0464 DCMT11T308-SM	XXX	✓	10
21G 26 0762 SCMT09T304-SM	XXX	✓	10
21G 26 0763 SCMT09T308-SM	XXX	✓	10
21G 26 0765 SCMT120404-SM	XXX	✓	10
21G 26 0766 SCMT120408-SM	XXX	✓	10
21G 26 0980 TCMT110202-SM	XXX	from 01.08.2015	10
21G 26 0982 TCMT110204-SM	XXX	✓	10
21G 26 0986 TCMT16T304-SM	XXX	✓	10
21G 26 0988 TCMT16T308-SM	XXX	✓	10
21G 26 1224 VBMT110304-SM	XXX	from 01.08.2015	10
21G 26 1232 VBMT160404-SM	XXX	✓	10
21G 26 1234 VBMT160408-SM	XXX	✓	10
21G 26 1454 VCMT110304-SM	XXX	✓	10
21G 26 1458 VCMT160404-SM	XXX	✓	10
21G 26 1459 VCMT160408-SM	XXX	✓	10



Indexable insert with **negative** basic shape

SS chip breaker

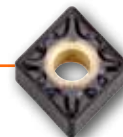
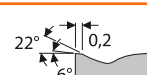
Finishing



Type	HB7020	Availability	
25 0050	XXX	✓	10
25 0052	XXX	from 01.08.2015	10
25 0058	XXX	✓	10
25 0060	XXX	✓	10
25 0652	XXX	✓	10
25 0654	XXX	✓	10
25 0658	XXX	✓	10
25 0660	XXX	✓	10
25 1142	XXX	from 01.08.2015	10
25 1144	XXX	✓	10
25 1432	XXX	from 01.08.2015	10
25 1434	XXX	from 01.08.2015	10
25 1732	XXX	from 01.08.2015	10
25 1734	XXX	from 01.08.2015	10
25 1952	XXX	✓	10
25 1954	XXX	✓	10
25 1962	XXX	from 01.08.2015	10
25 1964	XXX	from 01.08.2015	10

SM chip breaker

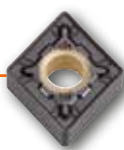
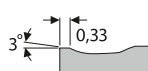
Medium machining



Type	HB7020	Availability	
25 0150	XXX	✓	10
25 0152	XXX	✓	10
25 0156	XXX	✓	10
25 0158	XXX	✓	10
25 0160	XXX	✓	10
25 0168	XXX	from 01.08.2015	10
25 0752	XXX	✓	10
25 0754	XXX	✓	10
25 0760	XXX	✓	10
25 0762	XXX	✓	10
25 0764	XXX	from 01.08.2015	10
25 1030	XXX	from 01.08.2015	10
25 1032	XXX	from 01.08.2015	10
25 1036	XXX	from 01.08.2015	10
25 1038	XXX	from 01.08.2015	10
25 1222	XXX	✓	10
25 1224	XXX	✓	10
25 1226	XXX	✓	10
25 1542	XXX	✓	10
25 1544	XXX	✓	10
25 1802	XXX	from 01.08.2015	10
25 1804	XXX	from 01.08.2015	10
25 2062	XXX	✓	10
25 2064	XXX	✓	10
25 2068	XXX	✓	10
25 2070	XXX	✓	10

SG chip breaker

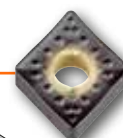
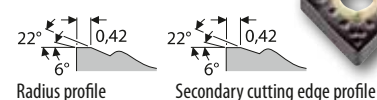
Roughing



Type	HB7020	Availability	
25 0322	XXX	✓	10
25 0324	XXX	from 01.08.2015	10
25 0328	XXX	from 01.08.2015	10
25 0334	XXX	from 01.08.2015	10
25 0336	XXX	✓	10
25 0862	XXX	from 01.08.2015	10
25 0864	XXX	from 01.08.2015	10
25 1070	XXX	from 01.08.2015	10
25 1072	XXX	from 01.08.2015	10
25 1076	XXX	from 01.08.2015	10
25 1078	XXX	from 01.08.2015	10
25 1324	XXX	from 01.08.2015	10
25 1326	XXX	from 01.08.2015	10
25 2208	XXX	from 01.08.2015	10
25 2210	XXX	from 01.08.2015	10

SR chip breaker

One-sided insert
Rough machining



Type	HB7020	Availability	
25 0452	XXX	from 01.08.2015	10
25 0453	XXX	from 01.08.2015	10
25 0458	XXX	from 01.08.2015	10

GARANT Tool24

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