BETEK

MADE IN GERMANY

INDUSTRIAL TECHNOLOGIES

TUNGSTEN CARBIDE

SIMONGROUP

BETEK TUNGSTEN CARBIDE TOOLS

INDUSTRIAL TECHNOLOGIES

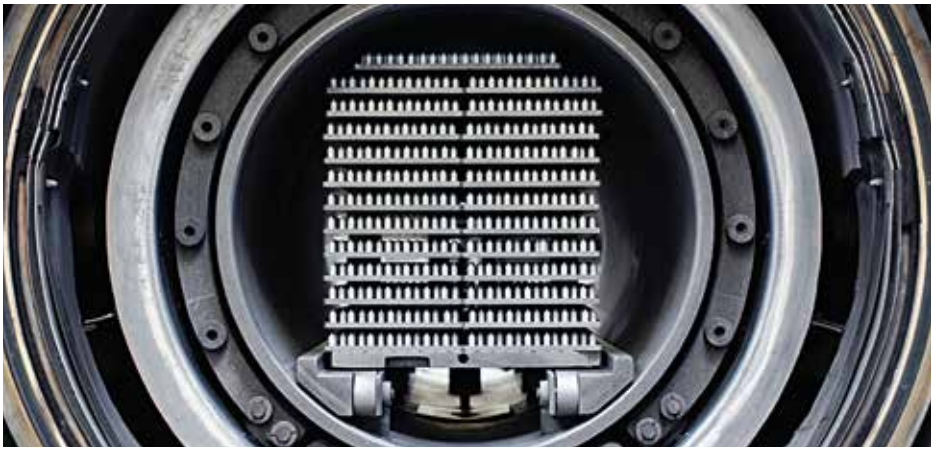
- CRUSHING & MIXING
- TUNGSTEN CARBIDE
- RAIL TRACK CONSTRUCTION
- INDUSTRIAL SOLUTIONS

IN USE WORLDWIDE

TUNGSTEN CARBIDE AND STEEL

Steel and carbide are two materials with totally different expansion coefficients when subjected to heat. Nevertheless, it is of steel and tungsten carbide that our tools are made, with tungsten carbide for the wear-resistant tip, and steel for the tool shank. Since tools reach high temperatures during use, extreme tensile stresses are generated. These stresses are absorbed by a special brazing material that joins the tungsten carbide tip to the steel section.

We have developed our own methods and systems for this brazing process, which is carried out on fully automated machines with the process covered in an inert protective gas. Manufacturing parameters are fully monitored and documented to ensure consistent quality. Afterwards, brazing shear strengths are checked to ensure that our "Masters of the construction site" lose no time due to broken tools!



BETEK HIGH-TECH TOOLS

1

CUSTOMER SERVICE

- Efficient, customised solutions based on flexible structures
- Personalised, quick response to customer requirements

2

DEVELOPMENT & CONSTRUCTION

- Quick creation of samples and prototypes
- Competitive pricing thanks to close cooperation with all production units

3

TUNGSTEN CARBIDE MANUFACTURING

- High-purity raw materials are used for high strength
- Consistently high, pore-free tungsten carbide quality through precise process control thanks to years of experience and know-how

4

SOLDERING PRODUCTION UNIT

Production facilities and processes specially developed to perfection by experts in the combination of tungsten carbide and steel

5

AUTOMATION

Maintaining a competitive edge on the global market thanks to a high degree of automation and flexible manufacturing facilities

6

QUALITY ASSURANCE

Continuous quality testing of the entire manufacturing chain all the way up to the installation site, in conformity with DIN ISO 9001:2000 and DIN EN ISO 14001

7

TRAINING

User training courses at BETEK or on-site for sustainable, long-term commercial success and customer satisfaction

8

LOGISTICS

Quick responses thanks to:

- the use of the very latest IT and enhanced logistics networking
- Standard products kept in stock

OUR KNOW-HOW COMBINED WITH STATE-OF-THE-ART PRODUCTION TECHNOLOGIES GUARANTEES THE FINEST QUALITY, MADE IN GERMANY

TUNGSTEN CARBIDE

THE RAW MATERIALS

The situation on the raw materials market is characterized by risk factors. Extreme price developments, challenging availability of raw materials due to export restrictions for political reasons and price increases are only a few of the factors that influence the market.

Numerous studies in recent years have addressed the question of how the supply of critical basic materials can be ensured. These basic materials, which are difficult to procure, are important for next generation technologies such as electromobility, information technology and renewable energies.
Raw materials are designated as critical if the high supply risk primarily results from the global raw material production being concentrated in a few countries. In many cases, the raw material is also difficult to replace and its recycling rate is low. The economic harm when supply is disrupted is also taken into consideration. According to the results of these studies, tungsten is a high-grade critical material.

TUNGSTEN:
The greatest amount of tungsten, which BETEK requires for carbide production, is found in the People's Republic of China, which simultaneously has the world's highest demand. China's government has severely restricted the export rate and subsequently reduced intended export volumes; the risk of bottlenecks is high. Outside of China, tungsten deposits are found in the USA, Australia, Peru, Bolivia, Russia, Korea and Canada. In Europe and neighboring areas, there are a few extraction areas in Portugal, Spain, the UK and Austria. There have been efforts for several years to start new mines or reopen decommissioned mines outside of China. However, this is associated with high investment costs.

COBALT:
Even if cobalt is not one of the rarest raw materials, it is also only extracted in a few countries. Critical areas such as the Republic of Congo, which covers nearly 50% of the world's demand, are among the suppliers here. Cobalt is required for high-tech developments such as super-alloys for aviation, catalytic converters, lithium-ion based batteries or medical technology applications. These developments force companies like BETEK to source alternatives early which can be used over the long term as substitutes for tungsten or cobalt. In order to be able to produce independently of market risks and dictated prices, BETEK is already accessing a large amount of raw materials from the European and Middle Eastern regions now.

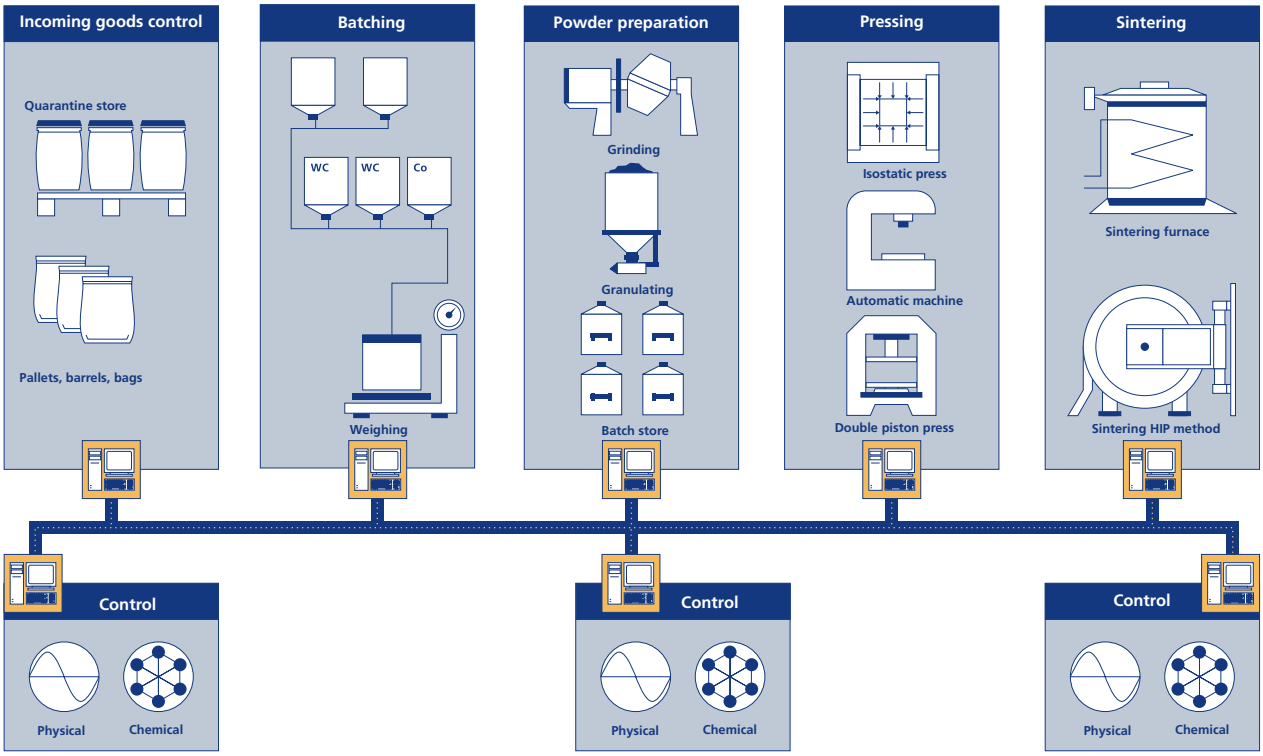
The suppliers are simultaneously development partners of BETEK who have their own mines and recycling operations.

TUNGSTEN CARBIDE

MATERIAL DEVELOPMENT

The SIMON company group has its own materials laboratory. When it comes to the analysis and development of carbide materials, examination of proprietary powder mixtures and granulates as well as the analysis of semi-finished and finished parts and sintered parts are essential for quality assurance, in addition to a careful analysis of delivered raw materials. The company group's laboratory performs a substantial part of the carbide analyses itself, such as hardness measurements, determination of magnetic properties and carbon content. Analyses of density, flexural strength and wear, particularly in the case of carbide qualities, are likewise part of the extensive analysis program. The laboratory has a great deal of experience and many years of established know-how in the field of carbide.

The laboratory is furnished with state-of-the-art equipment, e.g.: ICP spectrometer for element analysis, various light microscopes for assessment of micro-structures, scanning electron microscope with up to 10,000x magnification, a laboratory attritor for process and product development, a grinding block and a rotation evaporator as well as two lab furnaces for production-oriented sintering.



QUALITY ASSURANCE

ANALYSIS METHODS

MICROSCOPY: SEM, LIGHT MICROSCOPE

DIGITAL PICTURE ARCHIVING

LABORATORY ATTRITOR

ROTARY EVAPORATOR

QUALITY MEASUREMENTS

- Hardness testing
- Magnetic measurement carbide phase
- Magnetic measurement binder phase
- Bending fracture testing
- Tensile / pressure tests
- Wear simulation
- Mikroskopy
- SEM-Mikroskopy
- Material development in laboratory scale:
  - Powder mixture
  - Granulating
  - Drying
  - Pressing
  - Sintering
- Density measurement
- Carbon analytics
- Polished specimens of TC
- Spektral analysis for incoming goods control
- Measuring sintered part contours

TC – FINISHING PROCESSES

READY FOR YOUR PRODUCT

After sintering, we can process your carbides by various methods or combinations of methods upon request, if the application requires special form and surface qualities, special dimensional accuracy or increased surface protection of the carbides, for example. We offer the grinding processes of centerless cylindrical grinding, slide grinding and a process for surface compaction.
Application areas for ground carbide pins:

- Tricone bits (press-fit)
- DTH- and TH bits (shrunk-in)
- High pressure grinding rolls (bonded)

BETEK has automatic centerless cylindrical grinding machines with high throughput and automatic feeding and monitoring elements, as well as smaller systems for mechanized processing of small-scale productions for testing purposes. Centrifugal force vibratory finishing systems which deburr carbides, round off edges and clean, mat and polish the carbide pins serve for vibratory finishing of carbides.

After grinding of the carbides, the carbides can be surface compacted upon request. The rotation in the grinding container produces a hardening effect in the carbides to be processed and the surface compacts during the rotation process to the desired maximum hardness value. At the same time, however, the exceptional properties in the interior of the carbides, toughness and high flexural strength are uniformly retained.

SYSTEM FOR CENTERLESS CYLINDRICAL GRINDING.

DIAMETER INSPECTIONS ACCOMPANYING PRODUCTION ARE ALSO PERFORMED AT BETEK FOR QUALITY ASSURANCE.

TC – FINISHING, QUALITY MANAGEMENT

TO ENSURE BEST QUALITY

All production steps during manufacturing as well as during finishing are optimized down to the last detail and monitored, controlled and improved as required.

PRODUCTION:

From receipt of raw materials to spray drying and pressing to sintering, constant quality controls accompany the entire production process of the carbide. Exacting process control is decisive for quality in carbide production. This starts with the composition of the carbide powder, which varies according to the properties of the final products. The powders are compressed into form under electronic monitoring of the pressing parameters.

Consistency in the process control also applies during sintering, during which the pressed forms receive their exceptional carbide properties. Quality inspections permanently accompany all processes. This is also based on high values, so that the tools are free of cavities, have the optimal carbon content and exhibit the right flexural strength. Carbide must have high wear resistance but also have sufficient toughness. Every application requires a different ratio of hardness and toughness. As a leading specialist in this field, BETEK has specialized knowledge and experience here.

FINISHING:

Our finishing processes are also consistently monitored in order to ensure the uniform quality of the final products: our products are also subjected to various controls during the different finishing stages, process-accompanying monitoring steps and subsequent final inspection. For example, diameter monitoring and geometric control of the carbides are performed during the grinding processes. The cylinder shape of our carbide pins are inspected on three planes — this allows for deviations on the tiniest scale to be ascertained and corrected.

The surface roughness of the carbides is measured so that the carbide inserts can later be optimally connected with the various steel tool bodies. The result are reliable and durable carbide inserts which prove themselves even under the most severe application conditions.

THE MOST STATE-OF-THE-ART EQUIPMENT FOR DIMENSIONAL CONTROL OF THE GROUND INSERTS.

TUNGSTEN CARBIDE GRADES

GRADE RECOMMENDATION

Just give us a call or send us an e-mail, and we'll give you advice on all issues related to our TC. This includes advice on the choice of grades and shapes, which have to be matched to the intended job and the ground conditions.

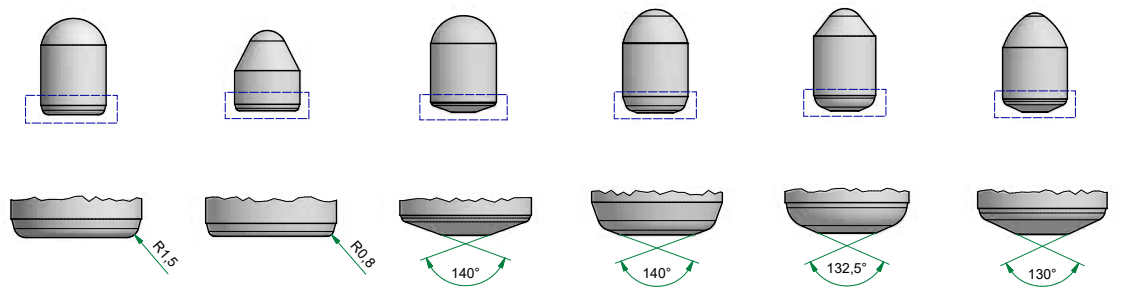
Our support includes solving even the trickiest of problems and can extend all the way to developing new TCs or tools systems. We'll assist you in selecting from the different possibilities, and we can also manufacture individual solutions, on request. Just discuss your wear problem or application with us, and we'll find the most economical solution, even for applications in which steel is used for wear protection.

TC SPECIFICATIONS WITH APPLICATION RECOMMENDATION:

TC grade	WC Balance %	Co Balance. % ±0,2	Average grain size * (µm)	Density (g/cm³) ± 0,20	Hardness HV 10 ± 50	Application recommendation
FINE GRAIN SIZES						
B-10-F/1	94,0	6,0	4 - 5	14,90	1400 ± 40	Down-the-hole (DTH) and TH (Top Hammers) for mining, water well, construction and oild drilling rotor tips for VSI crusher
B-10-F/1M	94,0	6,0	4 - 5	14,90	1430 ± 30	
B-10-F	94,0	6,0	4	14,90	1475	
B-10-F/2	94,0	6,0	3	14,95	1535	
MIDDLE GRAIN SIZES						
B-15	92,5	7,5	4 - 6	14,75	1350	Drill bits for overburden drilling
B-20	90,5	9,5	4 - 6	14,55	1300	Drill bits for overburden drilling and drill rods
B-25	90,0	10,0	4 - 6	14,50	1200	Tricone / Rotary Bits for mining, oil drilling, Mineral processing
B-30	89,0	11,0	5 - 7	14,40	1150	
BO-30	89,0	11,0	5 - 7	14,40	1200 ±100	Foundation drilling, carbide plates for surface protection, snow plough tools
B-35	87,0	13,0	5	14,20	1110	Mineral processing
B-40	85,0	15,0	4 - 6	14,00	1030	Shredder tools, HDD, Tunneling and Agriculture, Mineral processing
BO-40	85,0	15,0	4 - 6	14,00	1100	
B-45	82,0	18,0	6	14,00	960	Mineral processing
B-50	80,0	20,0	6	14,00	900	Mineral processing
COARSE GRAIN SIZES						
B-10-G	94,0	6,0	20 - 25	14,90	1180	Road milling for Asphalt and Concrete
B-20-G	91,5	8,5	20 - 25	14,65	1050	Round shank cutter bits for Tunneling, Mining and Vertical Drilling, Trenching, Agricultulre
B-25-G	90,5	9,5	20 - 25	14,55	1020	Shredder and Chipper Tools, Forestry Mulcher
B-40-G	85,0	15,0	20 - 25	14,00	900	Stone Splitting Tools, Teeth for Sizer and Double-Roll-Crusher

APPLICATIONS

TUNGSTEN CARBIDE BOTTOM SHAPES



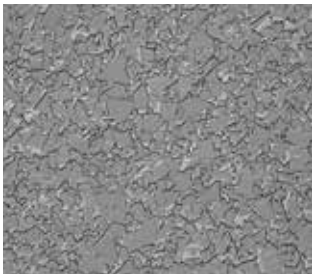
- Bottom Shape A
- Bottom Shape B
- Bottom Shape C
- Bottom Shape D
- Bottom Shape E
- Bottom Shape F

TC FOR TRICONE-BITS

Grade recommendations:

B25:

BETEK recommends medium grain carbide grades for use in three-winged core drill bits / tricone bits / rotary bits, such as carbide B25 (fig.: structure image.) This grade consists of 90% WC and 10% CO. It is suitable for soft, medium and hard rock in mining construction, oil drilling, HDD and water well drilling technology applications.

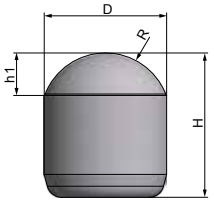


B30:

This grade consists of 89% WC and 11% CO and is suitable for very hard rock, especially for use in iron ore extraction.

HEMISPHERICAL SHAPE

Ø D mm	H mm	h1 mm	Bottom shape	Radius mm	TC grade	Drawing no.
10,3	10,0	1,6	B	9	B25	4393
14,3	22,0	5,1	D	7,5	B25	4774

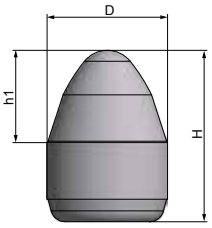


APPLICATIONS

TC FOR TRICONE-BITS

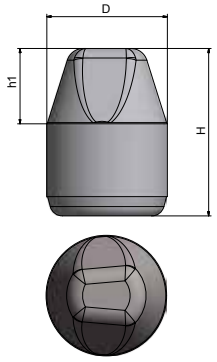
PARABOLIC / SEMI-BALLISTIC SHAPE

Ø D mm	H mm	h1 mm	Bottom shape	TC grade	Drawing no.
10,3	16,0	5,4	D	B20	4650
12,3	17,5	9,4	A	B25	4425
12,3	17,5	9,1	B	B25	91376
12,4	21,7	8,3	C	B20	4524



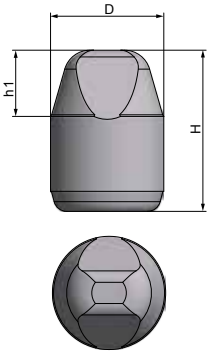
TRICONE SHAPE

Ø D mm	H mm	h1 mm	Bottom shape	TC grade	Drawing no.
13,0	18,5	7,6	A	B25	4478
14,3	20,0	9,1	A	B25	4468
14,4	20,0	9	A	B25	91056
16,3	23,0	10	A	B25	4410
16,4	22,0	10,5	A	B25	91033
17,9	24,5	11,7	A	B25	91011



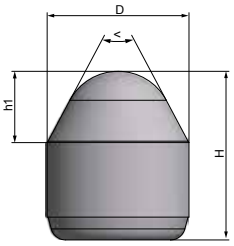
ROOFTOP SHAPE

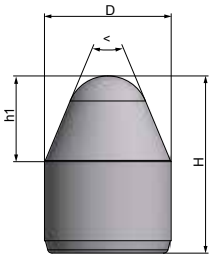
Ø D mm	H mm	h1 mm	Angle	Bottom shape	TC grade	Drawing no.
8,3	10,8	4,7	62	B	B25	4366
11,3	12,5	6,7	65	B	B25	91369
11,3	14,5	6,7	65	A	B25	4626
11,3	14,5	6,7	65	B	B25	91371
13,0	18,5	7,6	58	A	B25	4614
13,0	18,5	7,5	58	B	B25	91381
16,4	22,0	10,5	52	A	B25	91048
17,9	27,0	14	48	B	B25	91273



CONICAL SHAPE

Ø D mm	H mm	h1 mm	Angle	Radius mm	Bottom shape	TC grade	Drawing no.
8,3	9,8	4,6	53,7	2,8	B	B25	4395
10,3	12,5	5,1	52	4,1	B	B25	4428
11,3	14,0	5,6	52,2	4,5	A	B25	4427
11,3	14,0	5,6	52,2	4,5	B	B25	91372
11,3	14,5	6,7	49	4	A	B25	4324
11,3	14,5	6,5	49	4	B	B25	91374
11,3	16,5	8,7	45	3	A	B25	4392
11,3	16,5	8,5	45	3	B	B25	91375
12,3	15,7	7,2	50	4,2	B	B25	91384
12,3	15,7	6,5	48	5	A	B25	4374
12,3	15,7	6,3	48	5	B	B25	91340
12,3	16,7	7,55	46	4,2	B	B25	91383
12,3	16,7	6,5	47,8	5	A	B25	4375
12,3	16,7	6,3	47,8	5	B	B25	91370
12,3	17,5	9,6	50	2,5	B	B25	91377
13,0	16,5	5,7	60	5,5	A	B25	4556
13,0	16,5	5,6	60	5,5	B	B25	91380
13,0	18,0	7,3	31	5,8	A	B25	4424
13,0	18,0	7,1	31	5,8	B	B25	91379
13,0	18,0	7,5	46,5	4,8	B	B25	91444
13,0	18,0	8,2	43,4	4,6	B	B25	91385
13,0	19,0	10,2	50	2,6	A	B25	4307
13,0	19,0	10,1	50	2,6	B	B25	91382
13,0	19,5	10,2	41,2	3,8	A	B25	4470
13,0	19,5	10	41,2	3,8	B	B25	91378
14,3	16,5	8,2	46	5,5	A	B25	4484
14,3	17,0	7,2	56	5,5	A	B25	4605
14,3	18,0	8,2	46	5,5	A	B25	4627
14,3	19,0	7,2	44,8	6,2	B	B25	91248
14,3	19,0	7,2	56	5,5	A	B25	4628
14,3	19,0	8,2	54,3	4,8	B	B25	91249
14,3	20,0	9,2	38	5,5	A	B25	4629
14,3	20,0	8,2	38	6	B	B25	91247
14,3	20,0	9,7	45,4	4,6	B	B25	91246
14,3	20,0	10,1	38	5	A	B25	4616
14,3	21,0	11,3	42,4	4	A	B25	4391



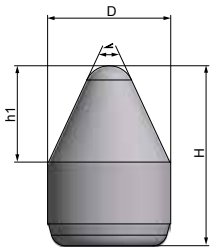


APPLICATIONS

TC FOR TRICONE-BITS

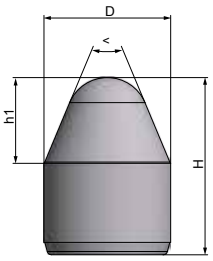
CONICAL SHAPE

Ø D mm	H mm	h1 mm	Angle	Radius mm	Bottom shape	TC grade	Drawing no.
16,3	18,0	9,2	50	6	A	B25	4483
16,3	20,0	9,2	50	6	A	B25	4658
16,3	20,0	10	54,2	4,8	B	B25	91252
16,3	21,0	8,2	48,6	6,8	A	B25	4409
16,3	21,0	8,2	48,6	6,8	B	B25	91250
16,3	21,0	10	54,2	4,8	B	B25	91251
16,3	22,0	11,3	42	5,5	A	B25	4615
16,3	23,0	12,2	54,4	3	A	B25	4317
16,3	23,5	12,6	40	5	A	B25	4467
16,3	24,0	11,1	42	5,5	B	B25	91262
16,3	24,0	11,3	42	5,5	A	B25	4597
16,3	24,5	13,8	41,4	4,2	A	B25	4316
16,3	25,5	12,6	40	5	A	B25	4053
16,4	19,5	10	52,6	5	A	B25	91016
16,4	21,0	10	43,4	6	A	B25	91017
16,4	22,0	11	46,8	5	A	B25	91018
16,4	25,5	14,3	30,8	5,5	B	B25	91034



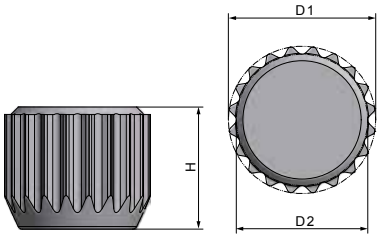
CONICAL SHAPE

Ø D mm	H mm	h1 mm	Angle	Radius mm	Bottom shape	TC grade	Drawing no.
17,9	22,5	8,6	51	7,5	A	B25	4611
17,9	28,0	15,3	46	3,5	B	B25	4378
17,9	20,5	8,5	51,2	7,5	A	B25	91010
17,9	22,0	11	48	6	A	B25	91006
17,9	24,0	11	38,2	7	A	B25	91007
17,9	28,0	15	38,6	5	A	B25	91012
17,9	29,0	16	38,6	4,5	A	B25	91062
17,9	30,0	16	38,6	4,5	A	B25	91013
17,9	30,0	15	29,5	6,35	B	B25	91390
19,3	23,5	11,2	47	7,2	A	B25	4417
19,3	25,5	10,8	45	7,7	A	B25	4415
19,3	25,0	11,2	47	7,2	A	B25	4416
19,3	30,5	16,8	45,8	3,8	A	B25	4373
19,3	32,0	17,7	35	5,5	B	B25	91391



SERRATED SHAPE

Ø D1 mm	Ø D2 mm	H mm	TC grade	Drawing no.
6,5	5,7	4,7	B25	4613
8,3	7,1	6,5	B20	4612
9,8	8,8	8,2	B20	4663

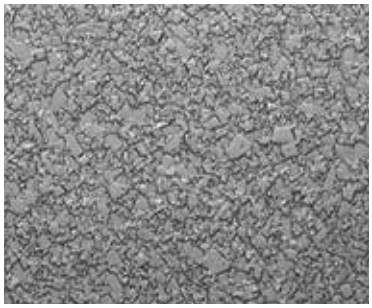


APPLICATIONS

TH- & DTH-BITS

GRADE RECOMMENDATION:

In addition to the tried and tested grades, BETEK has also developed additional carbide qualities for use on in-hole hammer drils (DTH and TH bits) and covers the entire range of requirements for the use of tools in the fields of mining, tunneling, construction and water wells. The carbide grades used here are fine grain qualities with low binder ratio of 6% cobalt. Fig.: structure image of grade B10F with the finest grain structure.

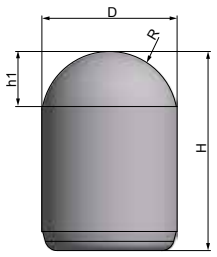


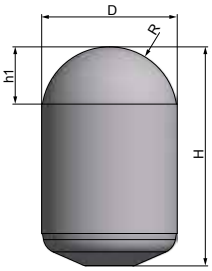
TC GRADE OVERVIEW FOR TH- & DTH-BITS

TC grade	WC weight %	Co weight %	Hardness HV 10 ± 50
B-10-F/1	94,0	6,0	1400 ± 40
B-10-F/1M	94,0	6,0	1430 ± 30
B-10-F	94,0	6,0	1475
B-10-F/2	94,0	6,0	1535

HEMISPHERICAL SHAPE

Ø D mm	H mm	h1 mm	Radius mm	Bottom shape	Drawing no.
7,4	10,5	2,6	3,8	C	91555
7,4	9,8	2,6	3,8	F	91767
8,2	11,4	2,7	4,3	C	91554
9,0	12,5	3,2	4,7	C	91449
9,0	14,2	3,2	4,7	C	91546
10,3	13,5	4,4	5,1	C	91520
10,3	15,1	4,4	5,1	C	91333
10,3	16,0	4,4	5,1	C	91521
10,3	13,5	4,4	5,1	F	91785
10,3	15,2	4,4	5,1	F	91781
10,6	14,2	3,5	5,6	C	91285
11,4	16,5	4	6	C	91188
11,4	17,8	4	5,9	E	4504
11,3	12,8	4,9	5,6	F	91768
11,3	16,0	4,9	5,6	F	91632
12,3	18,0	4,1	6,5	D	4736
12,4	18,0	4,7	6,3	E	4510
12,4	17,0	4,7	6,3	E	91526
12,4	20,0	4,7	6,3	E	91527
12,4	18,3	4,7	6,3	F	91799
13,0	19,0	4,5	6,8	C	91189
13,3	18,3	5,5	6,7	F	91784
14,3	22,0	4,9	7,5	D	4774
14,3	20,0	4,9	7,5	E	91529
14,3	24,0	4,9	7,5	E	91530
14,4	22,0	5,8	7,25	E	4509
14,3	15,3	5,7	7,2	F	91786
14,3	18,3	5,7	7,2	F	91769
14,6	22,7	5,4	7,5	C	91217
16,3	19,0	6,6	8,2	A	91436
16,3	24,0	6,6	8,2	A	91439
16,3	21,0	6,6	8,2	C	91532
16,3	26,5	6,6	8,2	C	91533
16,3	24,8	5,7	8,6	D	4701
16,4	26,5	6,9	8,2	E	4060
17,0	26,0	6,4	8,7	C	91220
18,4	30,0	7,9	9,2	C	91538
19,4	23,1	7,2	10	A	91441
19,4	25,4	7,2	10	A	91446
19,4	28,6	7,2	10	A	91440
20,4	30,2	8,8	10,2	C	91543



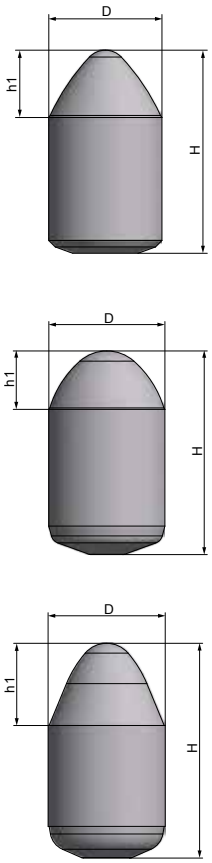


APPLICATIONS

TC FOR TH- & DTH-BITS

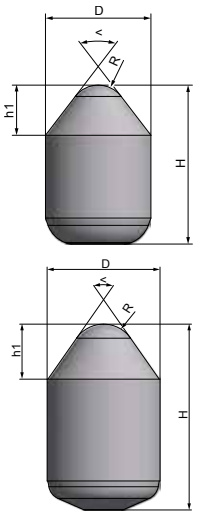
PARABOLIC / SEMI-BALLISTIC SHAPE

Ø D mm	H mm	h1 mm	Bottom shape	Bottom shape	Drawing no.
7,4	11,5	3,4	B10F1	C	4088
7,4	10,5	3,4	B10F1M	F	91777
8,3	12,0	4,4	B10F1M	F	91778
9,4	12,5	4,7	B10F1M	F	91776
10,3	14,5	5,4	B10F1M	C	91522
10,3	16,0	5,5	B10F1M	C	91205
10,3	17,0	5,4	B10F1M	C	91523
10,3	16,0	5,4	B10F	D	4650
10,3	13,5	5,4	B10F1M	F	91797
10,3	16,0	5,4	B10F1M	F	91794
10,6	15,5	5,1	B10F1	C	91187
11,4	14,9	5,7	B10F1	C	91215
11,4	20,0	5,7	B10F1	C	91214
11,4	20,9	8	B10F	E	4505
11,3	16,0	5,7	B10F1M	F	91779
12,3	19,0	6,5	B10F	D	4651
12,4	21,7	8,3	B10F	E	4524
12,4	18,0	6,6	B10F	E	91528
12,4	21,0	6,6	B10F	E	91531
12,4	19,0	6,6	B10F1	F	4494
13,0	20,6	6,3	B10F1	C	91216
13,3	21,0	6,7	B10F	D	4388
13,4	23,5	8,9	B10F	E	4499
14,3	23,0	7,5	B10F	D	4634
14,3	21,0	6,5	B10F	E	91534
14,3	25,0	6,5	B10F	E	91535
14,4	26,0	9,6	B10F	E	4443
16,3	19,8	8,1	B10F1	A	91437
16,3	24,9	8,1	B10F1	A	91438
16,3	23,0	8,1	B10F	C	91536
16,3	28,0	8,1	B10F	C	91537



CONICAL SHAPE

Ø D mm	H mm	h1 mm	Radius mm	Angle	Bottom shape	Bottom shape	Drawing no.
7,4	10,5	3,7	2,5	60	C	B10F1M	91260
8,2	11,4	4,2	3	57	C	B10F1	91185
9,0	13	4,7	3	60,8	C	B10F1	91186
9,0	14,2	4,7	3	60,8	C	B10F1	91448
9,3	14	4,3	2,8	75	D	B10F	4933
10,3	16,5	4,6	3,15	75	D	B10F	4935
10,3	17	4,7	3,15	75	D	B10F	4466
11,3	18,4	6,4	1,5	75	D	B10F	4956
11,4	19,3	5,4	3	75	C	B10F	4492
12,3	19,5	5,8	3,5	75	D	B10F	4728
12,4	19,5	6,8	3	67	E	B10F	4465
14,3	23,7	6,6	4,2	75	D	B10F	4729

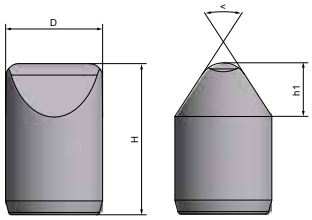


APPLICATIONS

TC FOR TUNNELLING

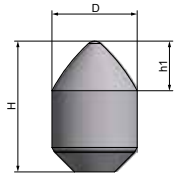
ROOFTOP SHAPE

Ø D mm	H mm	h1 mm	Angle	TC grade	Drawing no.
7,0	12,0	3,3	90	BO-30	4672
9,1	17,0	5,3	75	BO-30	4885
15,4	24,0	8,5	66	B40	4471
20,4	30,0	12,5	65	BO-40	4464



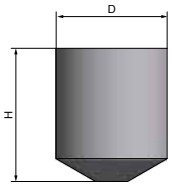
PARABOLIC SHAPE

Ø D mm	H mm	h1 mm	TC grade	Drawing no.
14,8	24,0	8,3	B20G	4888
17,4	28,5	10,5	B20G	4418
18,9	29,0	11,0	B20G	4305
24,8	35,0	13,4	B20G	4445



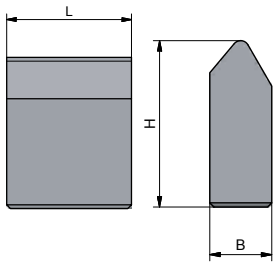
FLAT TOP SHAPE

Ø D mm	H mm	TC grade	Drawing no.
7,0	8,4	B40	4889
9,1	12,0	BO-30, BO-40	4886
10,8	12,0	BO-30	4742
12,3	14,0	BO-30	4575
14,8	8,0	BO-30	4310
14,8	15,0	BO-30	4890
17,8	17,0	BO-30	4293



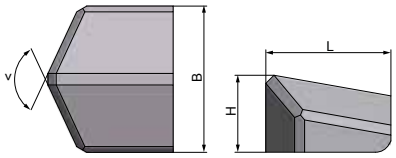
BLOCK FOR SCRAPER BLADES I

B mm	L mm	H mm	TC grade	Drawing no.
33,0	14,9	40,0	B40	4515



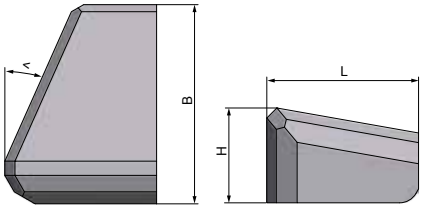
BLOCK CENTER

B mm	L mm	H mm	Angle	TC grade	Drawing no.
33,0	30,0	20,0	130	B25G, B40	4299
38,0	25,0	15,0	130	B40	4718
38,0	32,5	20,0	130	B25G, B40	4877
50,0	32,7	19,3	130	B25G	4660
50,0	45,0	29,8	130	B25G, B40	4682



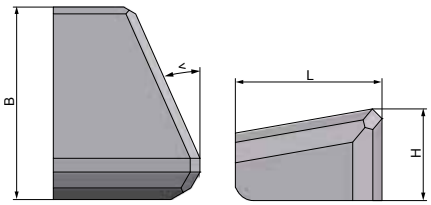
BLOCK LEFT

B mm	H mm	L mm	Angle	TC grade	Drawing no.
42,0	24,5	16,0	24,0	BO-40	4012
42,0	32,0	20,0	24,0	B40	4791
50,0	34,8	24,0	24,4	BO-30	4662



BLOCK RIGHT

B mm	H mm	L mm	Angle	TC grade	Drawing no.
42,0	24,5	16,0	24,0	BO-40	4010
42,0	32,0	20,0	24,0	B40	4792
50,0	34,8	24,0	24,4	BO-30	4661

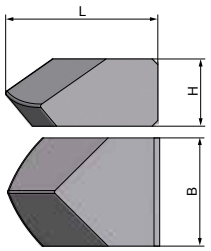


APPLICATIONS

TC FOR TUNNELLING

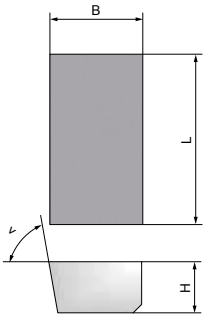
BLOCK, FOR SCRAPER BLADES II

B mm	H mm	L mm	TC grade	Drawing no.
19,0	10,0	25,0	B25G	4343
19,0	11,8	26,7	B20G	4794
23,0	11,8	26,7	B25G	4858

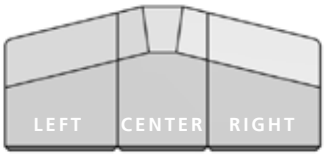


PLATES FOR SCRAPER BLADES

L mm	B mm	H mm	Angle	TC grade	Drawing no.
20,0	11,0	6,0	80	BO-30	4793
25,0	10,9	6,0	80	BO-30	4866



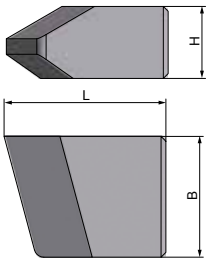
TC SYSTEMS FOR SCRAPER BLADES



LEFT: 4902
CENTER: 4900
RIGHT: 4901

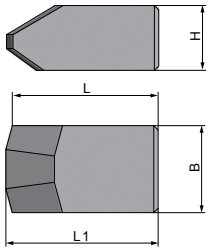
SCRAPER BLADES LEFT

System-Nr.	L mm	B mm	H mm	TC grade	Drawing no.
A	33,5	25,0	14,9	B40	4902
B	43,7	25,0	14,9	B40G	4969
C	43,6	33,0	15,0	B40	4412



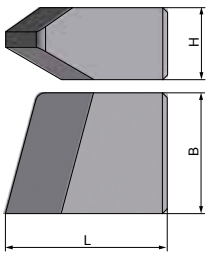
SCRAPER BLADES CENTER

System-Nr.	L1 mm	L mm	B mm	H	TC grade	Drawing no.
A	35,0	33,5	20,0	14,9	B40	4900
B	49,6	43,7	20,0	14,9	B40G	4970
C	43,0	43,6	33,0	15,0	B40	4413



SCRAPER BLADES RIGHT

System-Nr.	L mm	B mm	H mm	TC grade	Drawing no.
A	33,5	25,0	14,9	B40	4901
B	43,7	25,0	14,9	B40G	4969
C	43,6	33,0	15,0	B40	4412

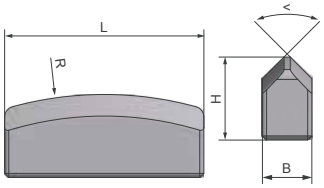


APPLICATIONS

TC FOR STONE SPLITTING TOOLS

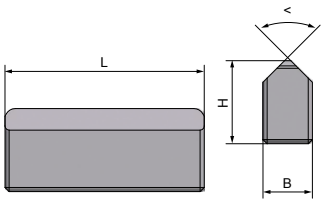
PLATES WITH RADIUS

L mm	B mm	H mm	Angle	Radius mm	TC grade	Drawing no.
39,0	11,9	20,0	90	74	B40G	4905
48,0	11,9	20,0	90	84	B40G	4892
58,0	13,9	25,0	90	120	B40G	4298



PLATES WITHOUT RADIUS

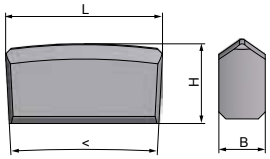
L mm	B mm	H mm	Angle	TC grade	Drawing no.
25,0	7,9	16,0	80	BO-30	4788
39,0	11,9	20,0	90	B40G	4911
48,0	11,9	20,0	90	B40G	4700



TC FOR INTEGRAL DRILL STEEL AND ANCHOR DRILLING

PLATES

L mm	B mm	H mm	Angle	TC grade	Drawing no.
34,5	9,9	17,9	6	B20	4513
36,5	9,9	17,0	6	B20	4976
38,5	9,9	17,9	6	B20	4360
39,5	9,9	17,9	6	B20	4514
40,5	9,9	17,9	6	B20	4512

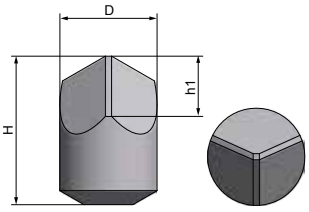


APPLICATIONS

TC FOR DIFFERENT WEAR SOLUTIONS

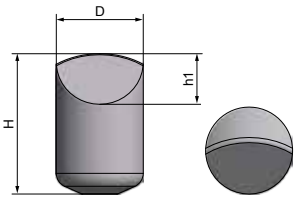
ANCHOR-DRILLING SHAPE I

Ø D mm	H mm	h1 mm	TC grade	Drawing no.
12,3	20	7,5	B25	91114
15,7	24	9,7	BO-30	4422



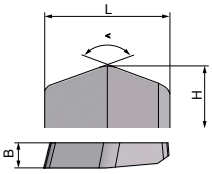
ANCHOR-DRILLING SHAPE II

Ø D mm	H mm	h1 mm	TC grade	Drawing no.
12,3	19,85	7,15	B25	4421
15,45	25	8,7	B25	91075



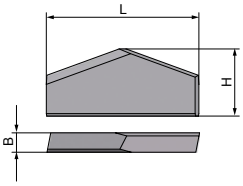
PLATES SHAPE I

L mm	B mm	H mm	Angle	TC grade	Drawing no.
32,6	9,0	22,6	140	BO-30	4444
50,0	10,0	25,0	143	BO-30	4533



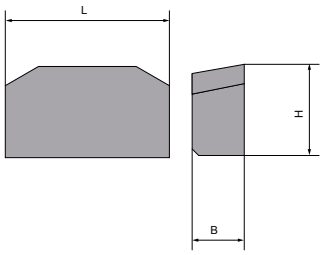
PLATES SHAPE II

L mm	B mm	H mm	Variant	TC grade	Drawing no.
26,2	4,9	13,5	Uni	B20	4469
50,0	6,4	22,0	right	BO-30	4871
50,0	6,4	22,0	left	BO-30	4502



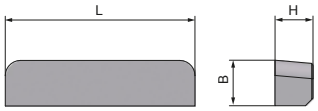
PLATES SHAPE III

L mm	B mm	H mm	TC grade	Drawing no.
25,2	8,0	14,0	B40	4853



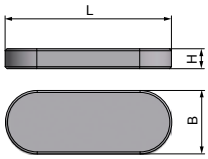
PLATES SHAPE IV

L mm	B mm	H mm	TC grade	Drawing no.
25,0	5,0	6,0	B15	4876



PLATES SHAPE V

L mm	B mm	H mm	TC grade	Drawing no.
41,7	15,9	5,0	BO-30	4851

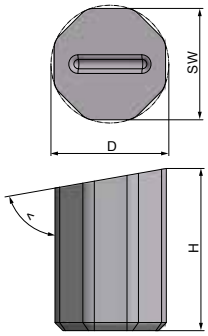


APPLICATIONS

TC FOR DIFFERENT WEAR SOLUTIONS

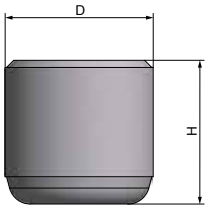
OCTAGONAL SHAPE

Wrench size	Ø D mm	H mm	Angle	TC grade	Drawing no.
7,5	7,95	10,0	80	BO-30	4815
7,5	7,95	15,5	80	B20, BO-30	4852
10,0	10,6	15,0	80	B10F, B15, B20, BO-30	4863
14,5	15,5	20,0	80	B20	91051
15,0	15,9	20,0	80	BO-30	4870



FLAT TOP INSERTS

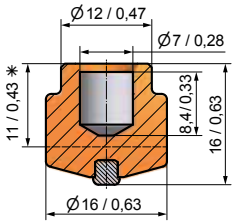
Ø D mm	H mm	TC grade	Drawing no.
8,4	6,0	B25	4488
8,4	7,5	B25	4489
10,3	7,6	B25	4490
10,3	10,0	B25	4429



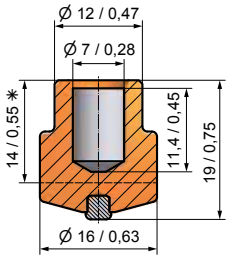
EXTENSIVE WEAR PROTECTION

OVERVIEW

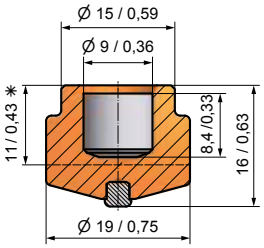
Betek can provide the appropriate stud welding machine for the TungStuds wear protection system.



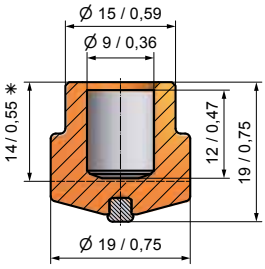
▪ **BTS01** BTSD16/16 | 150



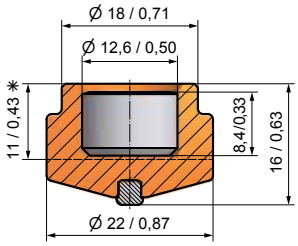
▪ **BTS02** BTSD16/19 | 150



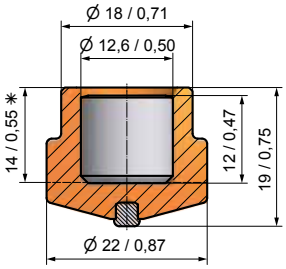
▪ **BTS03** BTSD19/16 | 150



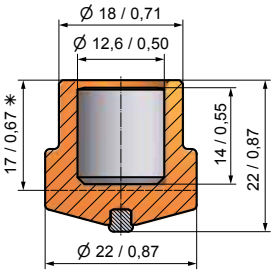
▪ **BTS04** BTSD19/19 | 150



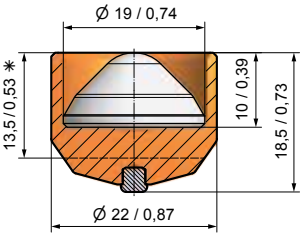
▪ **BTS05** BTSD22/16 | 100



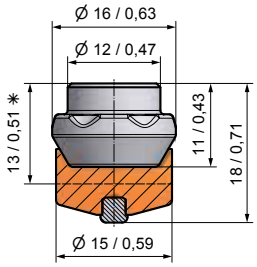
▪ **BTS06** BTSD22/19 | 100



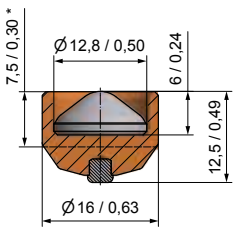
▪ **BTS07** BTSD22/22 | 100



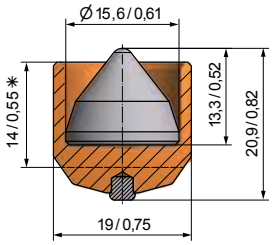
▪ **BTS08** BTSD22/18,5SG | 100



▪ **BTS10B** BTSD16/18B | 150



▪ **BTS20** BTSD16/12,5SG | 150



▪ **BTS100** BTSD19/15,6SG | 150

*Height after welding

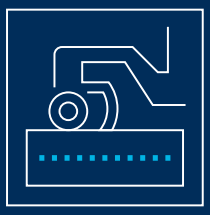
BETEK

SURFACE TECHNOLOGIES

- ROAD MILLING
- SURFACE MINING
- STABILISING

UNDERGROUND TECHNOLOGIES

- FOUNDATION DRILLING
- MINING
- TRENCHLESS
- TRENCHING
- TUNGSTUDS
- DRUM CUTTERS



ENVIRONMENTAL TECHNOLOGIES

- AGRICULTURE
- GRADER TOOLS
- FORESTRY & RECYCLING

INDUSTRIAL TECHNOLOGIES

- CRUSHING & MIXING
- TUNGSTEN CARBIDE
- RAIL TRACK CONSTRUCTION
- INDUSTRIAL SOLUTIONS

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