SUPERIOR PERFORMANCE DRIVES PRODUCTIVITY

Element Six works in partnership with customers to deliver state-of-the-art cutting and drilling products that increase productivity in the mining industries.

elementsix™

a De Beers Group Company

INNOVATOR IN MANY INDUSTRIES

Developing cutting-edge products and materials to give customers competitive advantage.

From our global network and unique state-of-the-art Global Innovation Centre (GIC), near Oxford, UK, Element Six works in partnership with customers to develop cutting-edge products and materials that give them a competitive advantage.

In the Mining industry, Element Six has developed Percussive Diamond Inserts (PDIs). Thanks to our specially engineered 3D PCD (Polycrystalline diamond) technology, PDIs drill 10 times the depth achieved with conventional tungsten carbide inserts.

Our innovative product portfolio ranges from ready-to-press powders for localised product fabrication to a variety of wear parts in the form of fabricated products for the oil and gas, chemical and pharmaceutical, agriculture, recycling, industrial machining, extraction, steel and manufacturing industries.

By working closely with road contractors, Element Six has developed the most advanced type of road picks currently available. D Power™ Road Cutters, tipped with polycrystalline diamond (PCD), one of the hardest materials on the planet, deliver over 40 times the life of a standard carbide cutters.

CONTENTS

SINCE LAUNCHING IN 2012, D POWER™ HAS MILLED MORE THAN 100 MILLION SQUARE METRES AROUND THE WORLD.

WORLD CLASS COMPETENCE IN MINING

WORLD LEADERS IN SYNTHETIC DIAMOND AND CARBIDE INNOVATION

Element Six, the market leader in synthetic diamond has been pioneering the manufacture of synthetic diamond for industrial purposes for over 50 years. Today Element Six offers customers an unequalled portfolio of synthetic diamond and tungsten carbide products. All Element Six solutions are designed to extend tool and component life and to dramatically improve industry productivity. Our global representation network enables Element Six to offer world-class customer service and supply chain support to partners in a variety of industries:

- Mining and tunnelling
- Construction
- Oil & Gas
- Automotive and transportation
- Textiles
- Chemicals
- Recycling
- Agriculture and forestry

Element Six has been producing high-performance cutting tools and drill bits for the mining and tunnelling industries for more than 50 years. Our products are used globally whenever mining operators look for solutions when "the going gets tough".

Element Six has the application engineering competence to deliver the most productive and cost efficient tools for any given mining challenge thanks to our ability to combine:

- Unrivalled material know-how
- Innovative tungsten carbide compositions
- High tech, diamond-based supermaterials
- A sound understanding of modern mining methods

Our product solution offering covers the entire range of mining tools including:

- Flat and round-shank picks with optimised insert geometries for all types of holder systems on mining machinery
- Rotary drill bits for roof-bolting applications, for both wet and vacuum drilling systems
- Accessories such as tool holders, drill string components and change-out tools

Our extensive R&D activities enable us to provide innovative leadership for real-world solutions. These solutions allow us to tackle the challenges our mining customers are constantly faced with:

- Productivity optimisation for entire production systems
- Delivering significant and measurable cost benefits
- Improving the health and safety of operating personnel

Supermaterials developed by Element Six show the way in which materials technology can challenge the accepted boundaries of performance and deliver unprecedented levels of efficiency in many different industries.

Element Six tools for drilling applications dramatically increase the productivity per meter drilled.

Element Six provides step-change mining picks that deliver superior performance in underground mining applications.

UNEQUALLED MATERIALS EXPERTISE IN MINING APPLICATIONS

Element Six can offer customers unequalled materials expertise for mining tools and accessories. With the broadest materials portfolio in the industry we deliver optimal tool performance at minimise total cost.

UNIQUE COBALT BINDER TECHNOLOGY FOR HIGH WEAR RESISTANCE

Our mining grades of tungsten carbide are based on innovative carbides for maximum wear resistance with cobalt binder content to optimise fracture toughness for any given application. The patented MasterGrade® carbide takes this concept to the next level of performance.

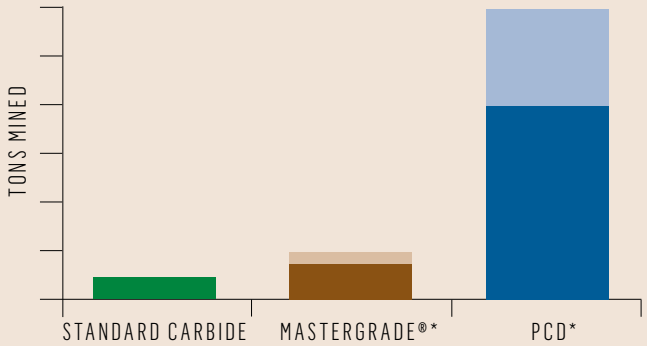
INCREASING WEAR RESISTANCE WITHOUT REDUCING FRACTURE TOUGHNESS

By infusing nano-carbides into the cobalt binder Element Six reduces binder wear resulting in an even higher level of wear resistance without sacrificing fracture toughness. With more than 50 years of diamond synthesis experience and a wide range of diamond supermaterials in our portfolio, we manufacture tools with unprecedented performance for use in the most severe conditions.

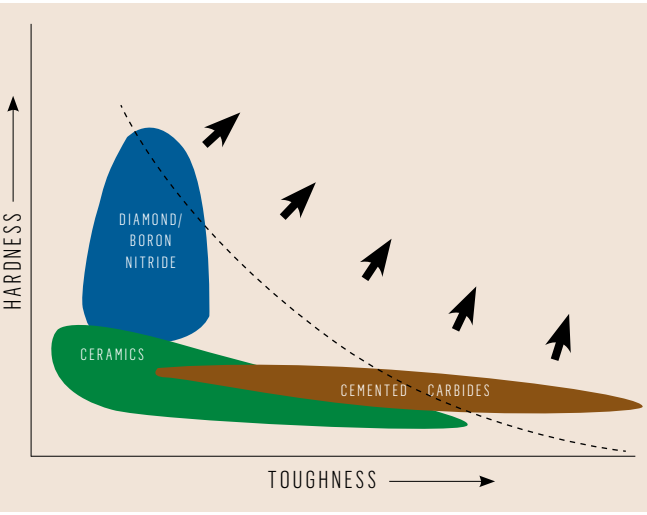
SYNTHETIC DIAMOND-BASED SUPERMATERIALS FOR EXTREME PERFORMANCE

Synthetic diamond, the hardest material known to man, is ideally suited for drilling and mining in highly abrasive and very hard conditions. If extreme performance is required, such as in remote mining situations, our technical team can configure customised tools with PCD (polycrystalline diamond) tips. These extend tool life dramatically and can also be combined with our patented hard-facing technology for further system performance gains.

PICK DISCARD LIFE COMPARISON



** Performance can vary from one application to another.*



RANGE OF CARBIDE GRADES FOR MINING AND CONSTRUCTION TOOLS

GRADE	SINTERED WC GRAIN SIZE	Co CONTENT % ± 0.2	DENSITY g/cm³ ±0.1	COERCIVITY Oe	HARDNESS HV20 ±50	HARDNESS HRA ± 0.3	TRS MPa
B20	coarse	8.0	14.70	90-120	1250	88.7	2800
B25	coarse	10.0	14.50	75-110	1200	88.2	3150
B30	coarse	11.0	14.40	75-105	1150	87.7	3000
B20N	extra coarse	8.6	14.65	45-60	1050	86.5	2300
B25SN	extra coarse	9.5	14.55	50-68	1050	86.5	2100
B30SN	extra coarse	11.0	14.40	50-70	1000	85.8	2100
MASTERGRADE®							
B15MN	extra coarse	6.5	14.95				
B25MN	extra coarse	9.5	14.60				

The innovative MasterGrade® technology is an enhancement of the hardmetal binder with infused nano carbides

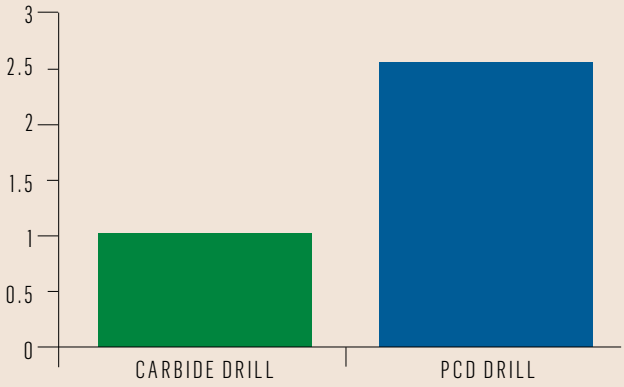
Further grades available upon request.

HOW QUALITY TOOLS IMPROVE PRODUCTIVITY

Tools that stay sharper longer have a direct effect on productivity. This reduces downtime for tool changes, increases sump and shear rates resulting in increased tonnages and profit.

HOLES DRILLED PER SHIFT

(ROOF BOLTING IN HARD SANDSTONE)

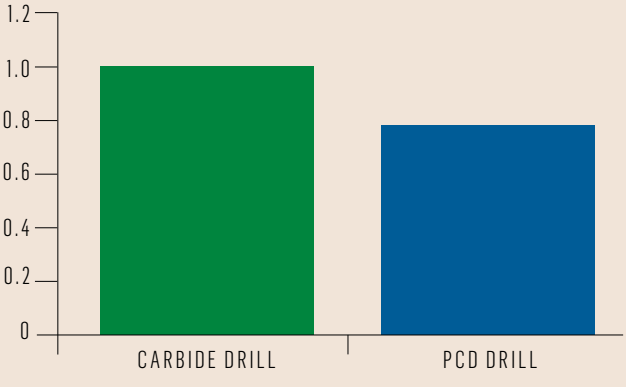


MINIMISE RELATIVE TOOL COSTS

With the combination of Element Six's tool design expertise and materials know-how, we develop the right tool to get the job done - at the lowest relative cost. Element Six understands customers' applications and can draw on an extensive expertise to develop the right solutions for new applications.

RELATIVE TOOL COST PER METER DRILLED

(ROOF BOLTING IN HARD SANDSTONE)



IMPROVE HEALTH & SAFETY

Having the best and sharpest tools – even after long engagement times – also has a direct effect on health and safety. Sharp tools produce:

– Less fines, reducing explosion risk and dust

– Lower machine stress

– Less vibration, reducing operator fatigue and improving machine lifetime

Fewer tool changes also translate in less human exposure to dangerous conditions.

HOW CUSTOMERS BENEFIT FROM PARTNERING WITH ELEMENT SIX

Element Six possesses a broad material portfolio:

– High-quality tungsten carbide suitable for the majority of operating conditions

– Speciality and premium-performance tungsten carbide materials for difficult and challenging situations

– A variety of diamond-based supermaterials when nothing else gets the job done

The extensive practical experience in mining of our industry expert and engineer teams, gives Element Six the competitive advantage where it comes to delivering unmatched performance at the lowest possible cost.

Element Six sharpest mining tools can improve health and safety in a mining environment.

A WIDE RANGE OF MINING PICKS

Both the economic and technical efficiency of a mining project is affected by where the tip of the pick hits unbroken rock. That is why using mining picks that maximise the efficiency of the machinery and deliver the optimum balance between toughness, impact and wear resistance for the rock formations encountered make a vital difference.

ELEMENT SIX OFFERS MINING PICKS SUITABLE FOR:

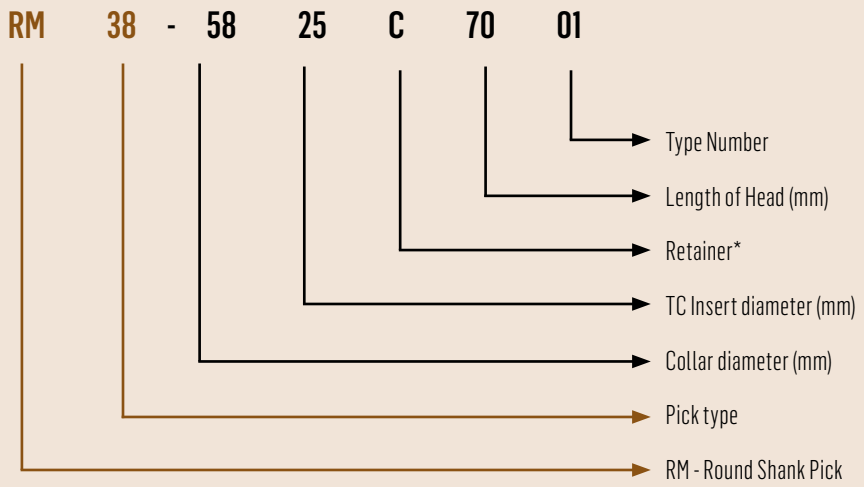
– Longwall Shearer Drums
– Continuous Miners
– Surface Miners
– Mining Road Headers
– Tunnelling Road Headers

THE RIGHT TOOL FOR THE RIGHT CUTTING APPLICATIONS

Drawing from more than 50 years of expertise in synthetic diamond and tungsten carbide materials and tool manufacturing know-how, Element Six can develop for a given application or set of conditions the right tool:

– Mining picks, available in standard and customised sizes
– Cutting inserts, from robust tungsten carbide grades to PCD especially developed for mining applications
– MasterGrade® picks, utilising the innovative MasterGrade® technology for optimal performance in highly abrasive conditions
– Pick tips in shapes and dimensions that are optimised and adapted to the material to be cut
– Retainers and securing elements, available in different types
– Pick bodies, made from hardened steel to provide long tool life
– Pick holder series for acceptance of all types of picks
– Heavy duty holders, also available with wear-resistant bushing

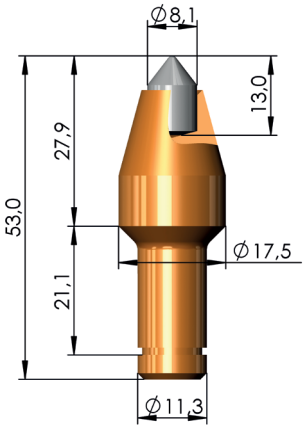
TYPE DESCRIPTION FOR ELEMENT SIX ROUND SHANK PICKS



RETAINER*

H	sleeve
S	snap ring
C	clip ring
HS	sleeve + snap ring
T	trenching ring
CH	fricition sleeve

CONSTRUCTION / PILING / TRENCHING / ROUND SHANK PICKS



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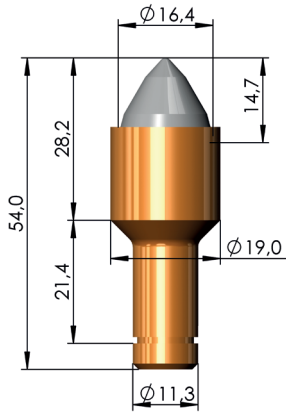

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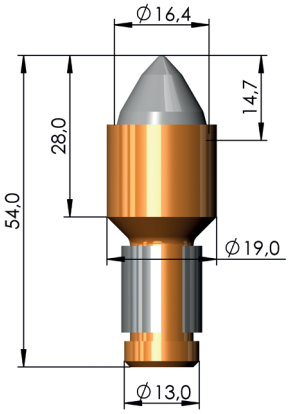

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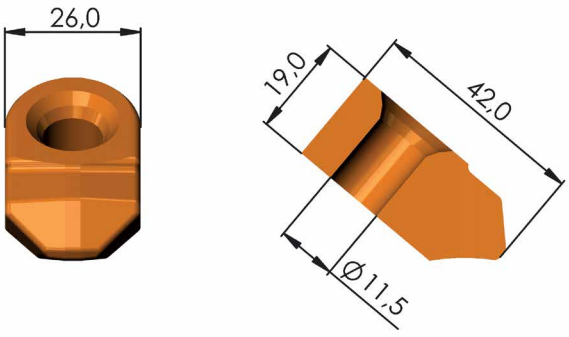

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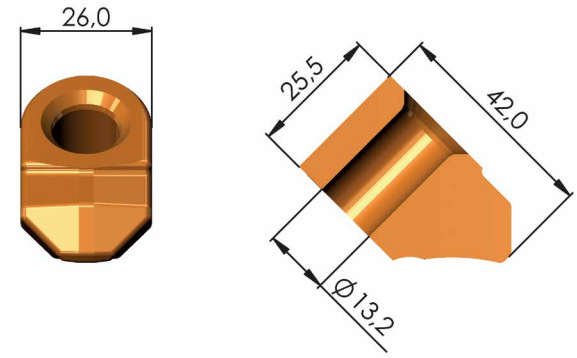

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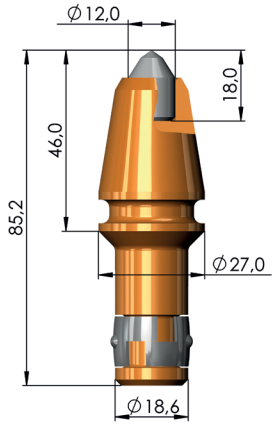
All dimensions in mm.

CONSTRUCTION / PILING / TRENCHING / ROUND SHANK PICKS



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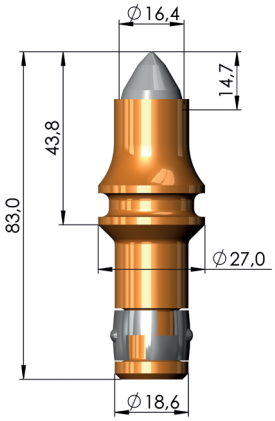

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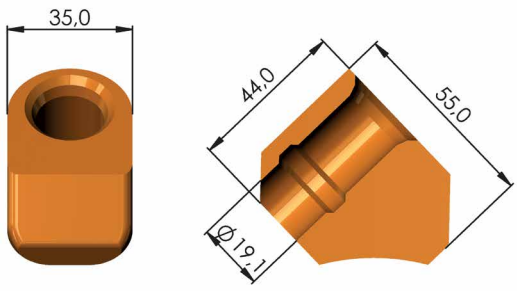

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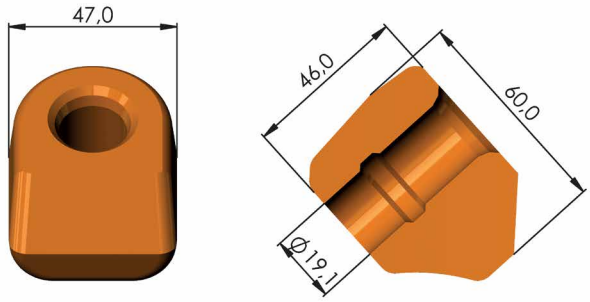

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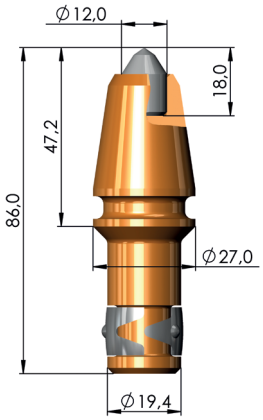
All dimensions in mm.

CONSTRUCTION / PILING / TRENCHING / ROUND SHANK PICKS



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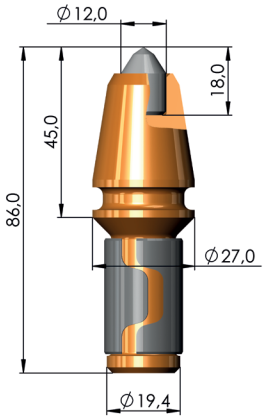

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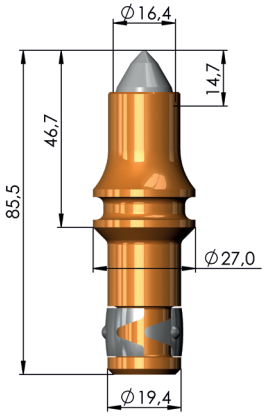

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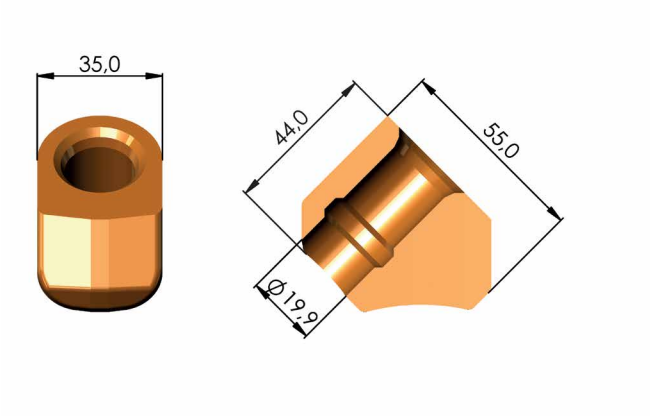

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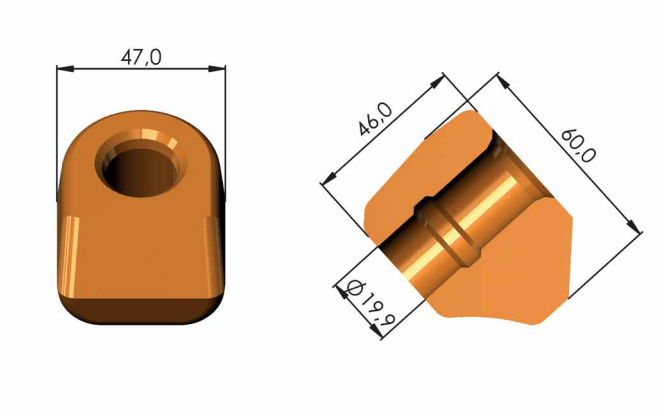

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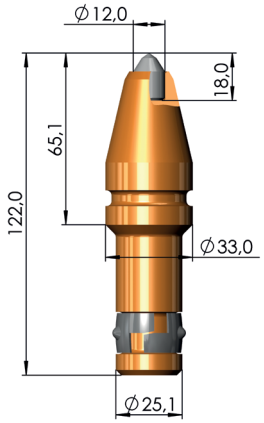
All dimensions in mm.

CONSTRUCTION / PILING / TRENCHING / ROUND SHANK PICKS



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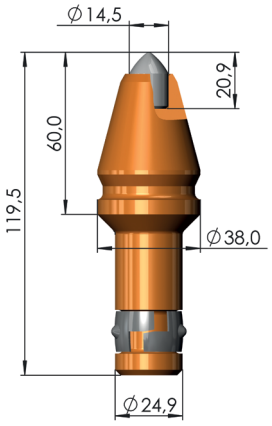

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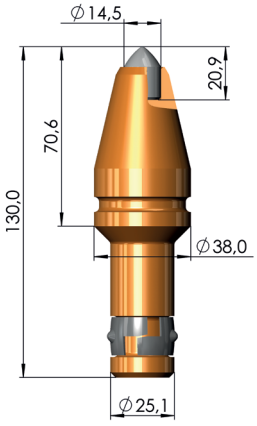

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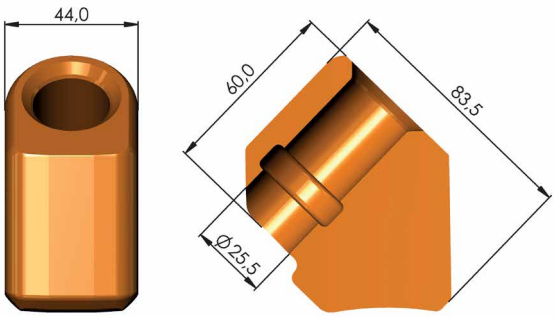

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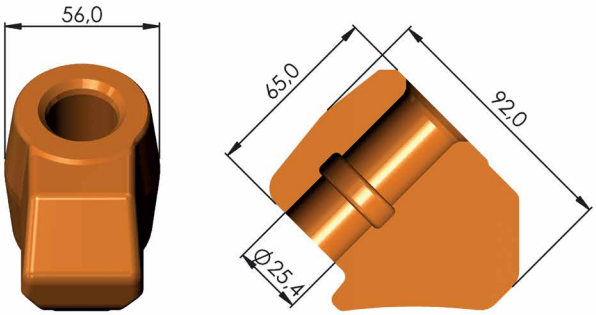

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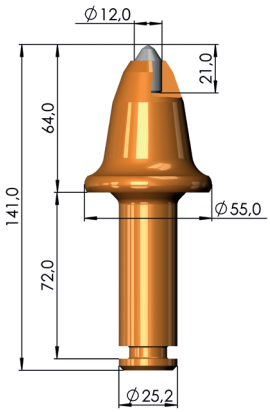
CONSTRUCTION / PILING / TRENCHING / ROUND SHANK PICKS



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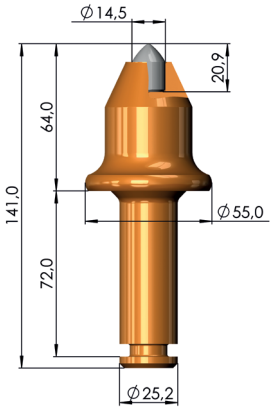

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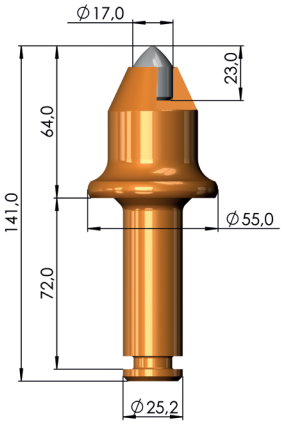

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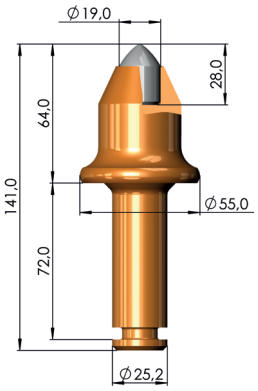

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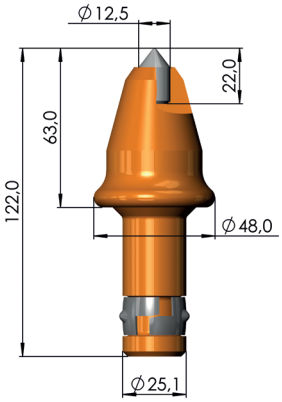

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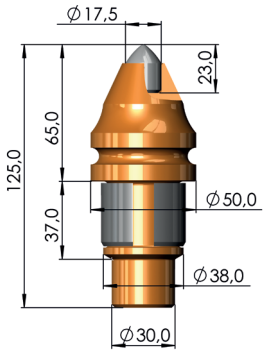
CONSTRUCTION / PILING / TRENCHING / ROUND SHANK PICKS



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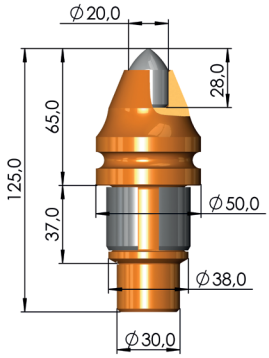

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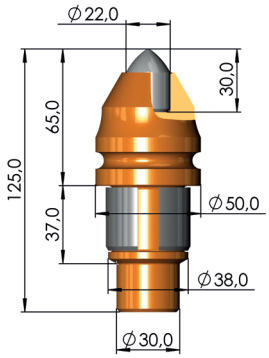

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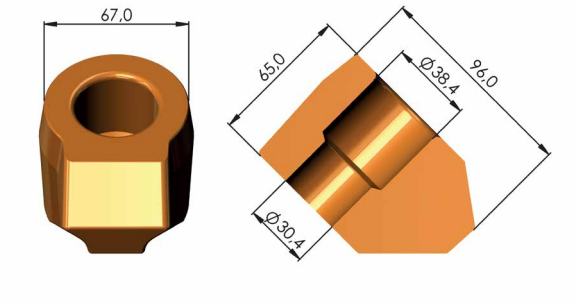

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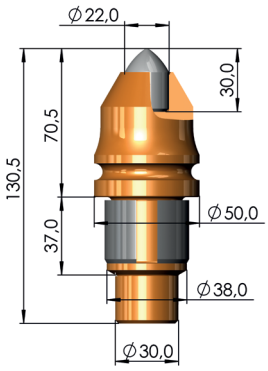

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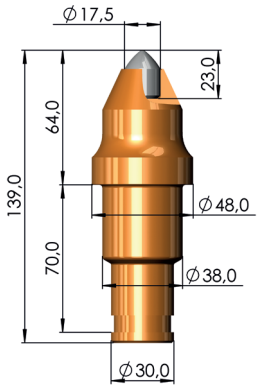
All dimensions in mm.

CONSTRUCTION / PILING / TRENCHING / ROUND SHANK PICKS



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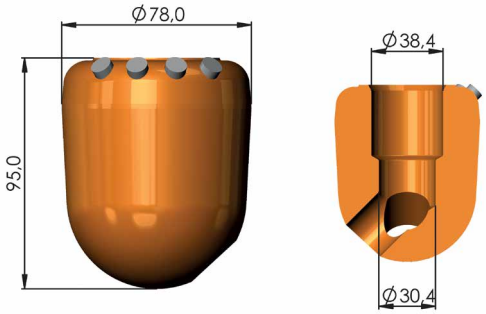

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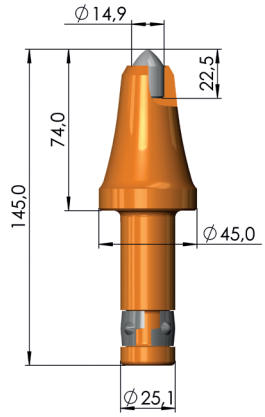
TUNNELING / MINING / ROUND SHANK PICKS



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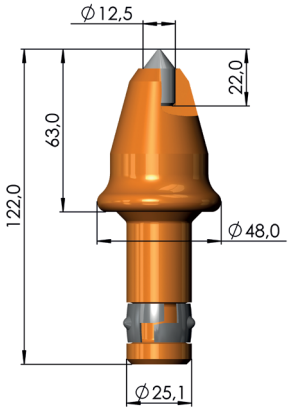

RM5 - 4813 C63 01
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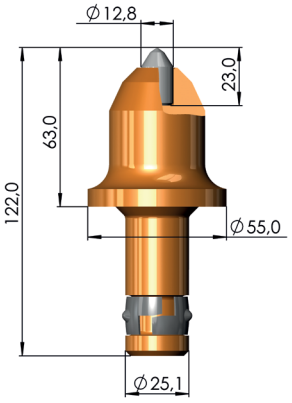
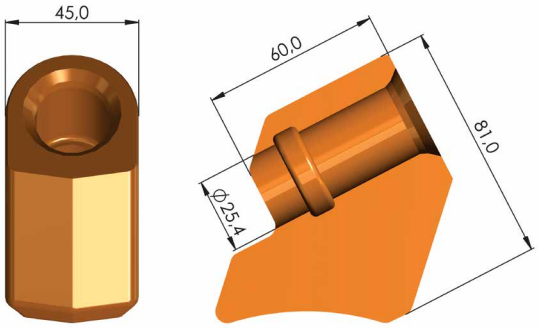
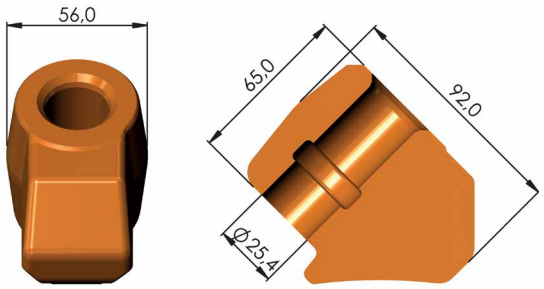


RM5 - 5513 C63 01
part-no.11050037

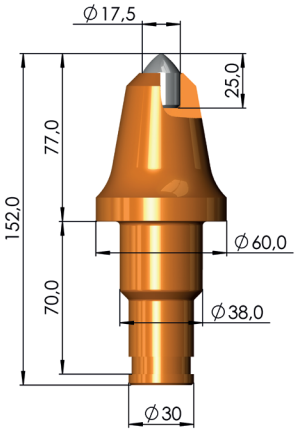


RH5 - M
part-no.13010030

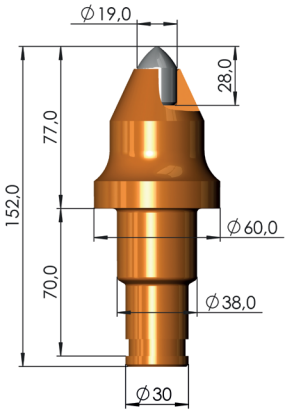


RH5 - 25-T
part-no.13010125

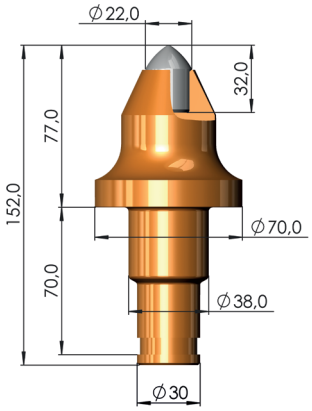
TUNNELING / MINING / ROUND SHANK PICKS



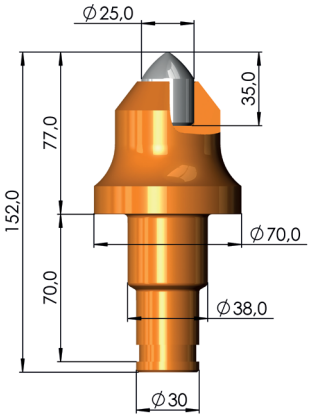
RM7 - 6018 S77 01
part-no.11070137



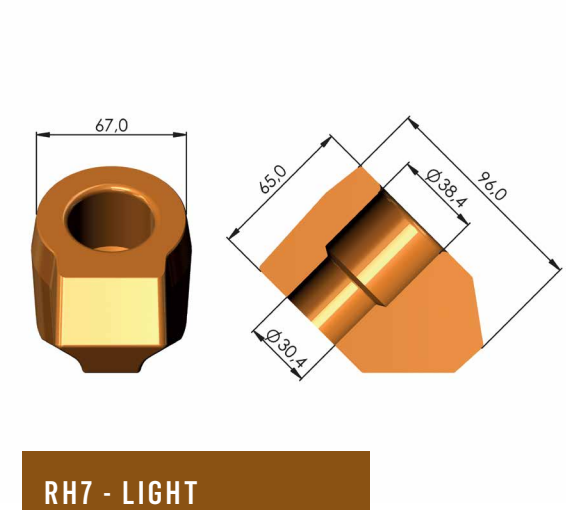
RM7 - 6019 S77 01
part-no.11070125



RM7 - 7022 S77 01
part-no.11070120



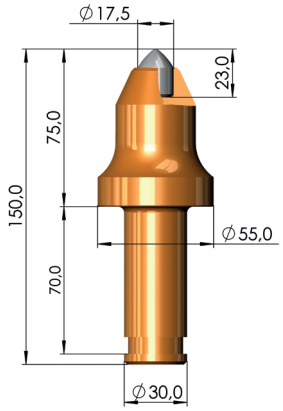
RM7 - 7025 S77 05
part-no.11070088



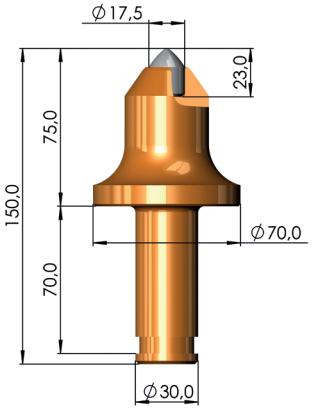
RH7 - LIGHT
part-no.13010036

All dimensions in mm.

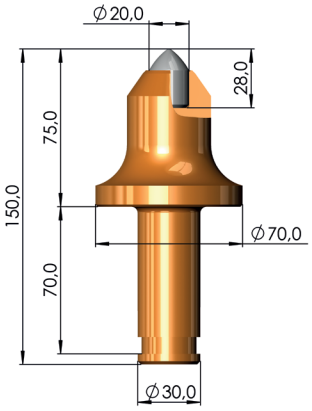
TUNNELING / MINING / ROUND SHANK PICKS



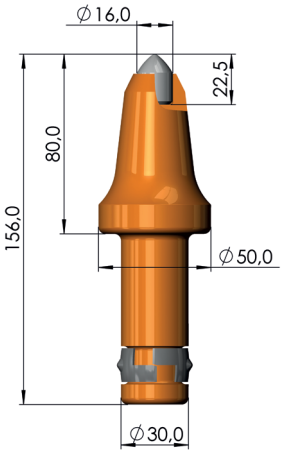
RM8 - 5517 S75 01
part-no.11080035



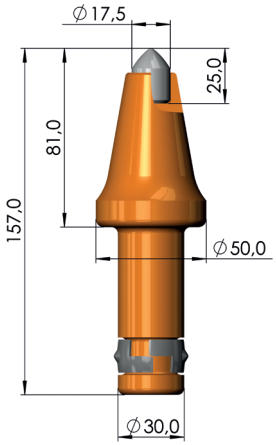
RM8 - 7017 S75 01
part-no.11080108



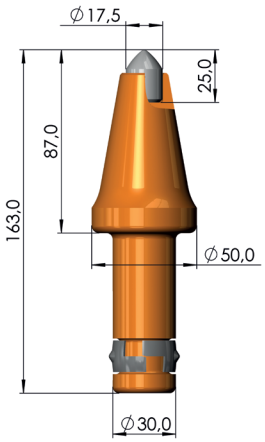
RM8 - 7020 S75 01
part-no.11080109



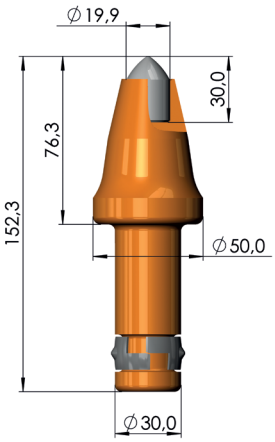
RM8 - 5016 C80 01
part-no.61150005



RM8 - 5018 C81 01
part-no.61150003



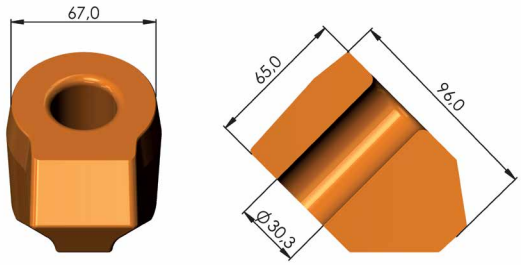
RM8 - 5018 C87 01
part-no.61150002



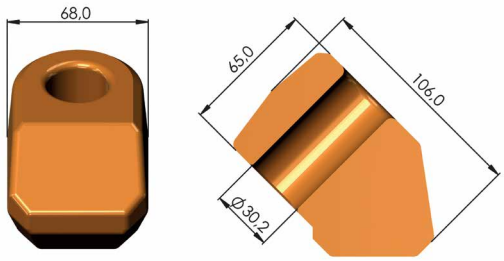
RM8 - 5020 C76 01
part-no.61150004

All dimensions in mm.

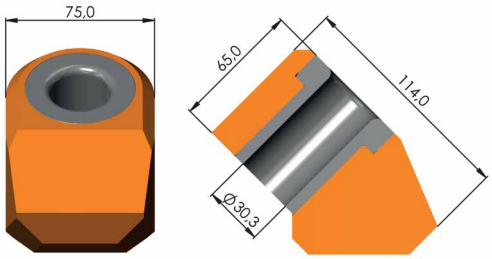
TUNNELING / MINING / ROUND SHANK PICKS



RH8 - 30 LIGHT
part-no.13010115



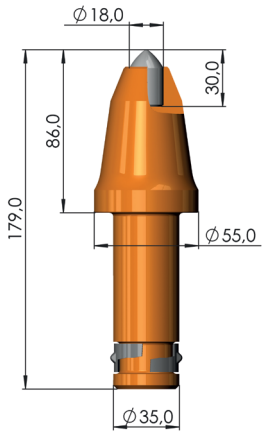
RH8 - 30 M-L
part-no.13010089



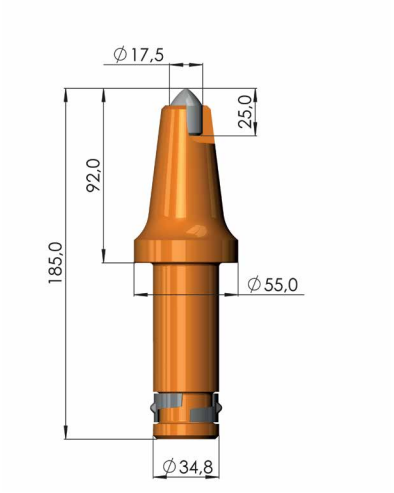
RH8 - 30 WITH SLEEVE
part-no.13010038

RM8 - SAFETY RING
part-no.61990147

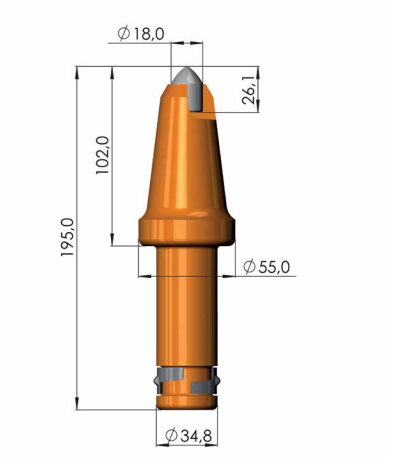
TUNNELING / MINING / ROUND SHANK PICKS



RM35 - 5518 C86 01
part-no.61150006

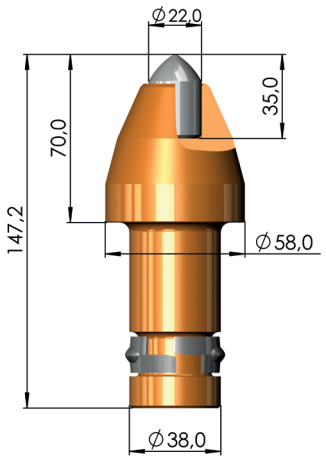


RM35 - 5518 C92 01
part-no.61150007

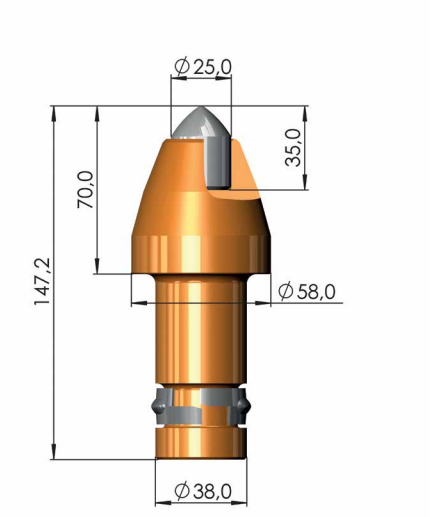


RM35 - 5518 C102 01
part-no.61150008

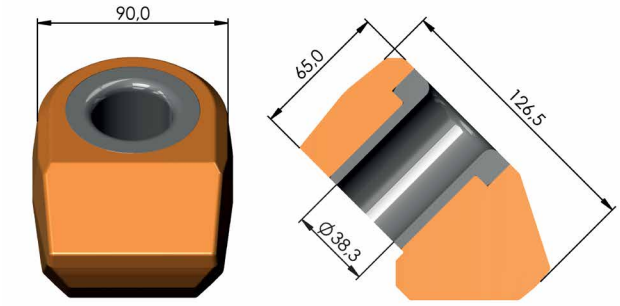
TUNNELING / MINING / ROUND SHANK PICKS



RM38 - 5822 C70 01
part-no.11090041

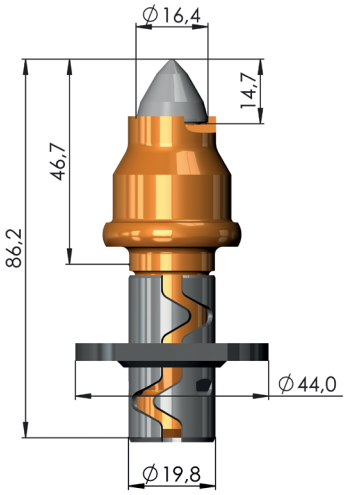


RM38 - 5825 C70 01
part-no.11090050

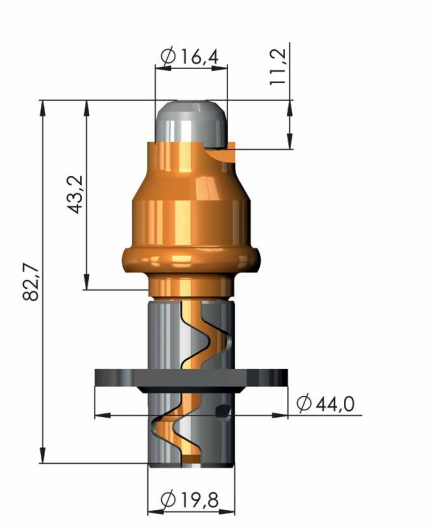


RH38 - WITH SLEEVE
part-no.13010043

SNOW PLOUGHS AND GRADERS / ROUND SHANK PICKS



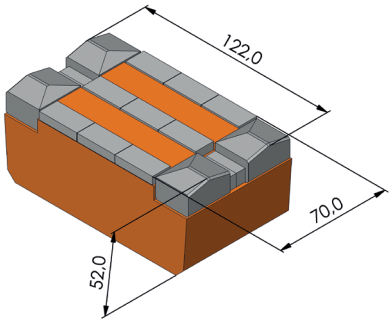
RM3 - 3016 H47 01
part-no.11031324



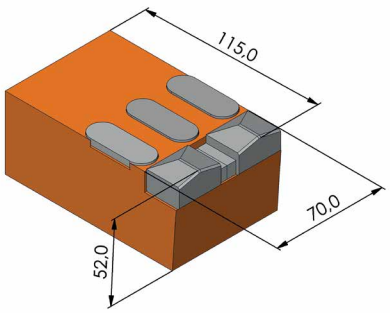
RM3 - 3016 H43 01
part-no.11031416

All dimensions in mm.

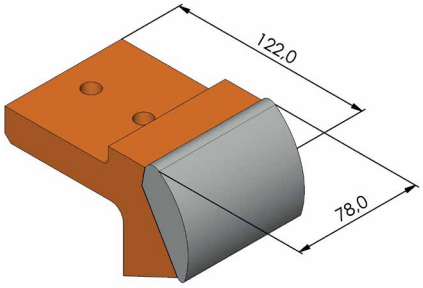
SNOW PLOUGHS AND GRADERS / ROUND SHANK PICKS



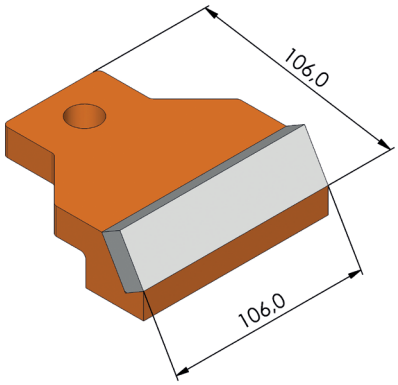
MORBARK 122 x 70 x 52
part-no.14410067



MORBARK 115 x 70 x 52
part-no.14410058



STONE CRUSHER 122 x 78 x 73
part-no.14020020



STONE CRUSHER 106 x 106 x 3
part-no.14020011

MINING / ROTARY DRILL BITS

MINING / ROTARY DRILL BITS

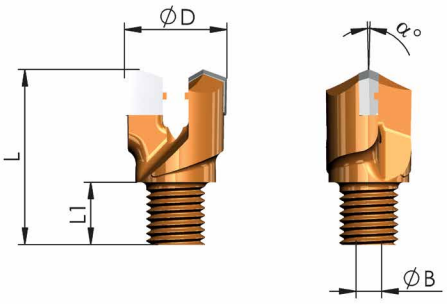
TYPE DESCRIPTION FOR ELEMENT SIX DRILL BITS AND PCD-DRILL BITS

DB 2 / 32 M16 m N 01

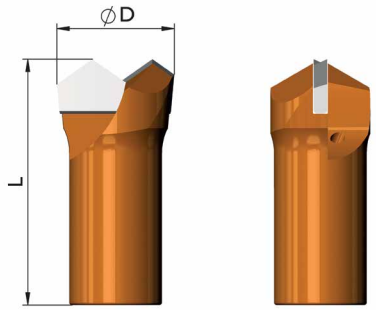
- 01 → Type Number
- N → Cutting angle (P = positive; O = neutral; N = negative)
- m → f = female thread; m = male thread
- M16 → Coupling type (thread; VK = square; R = Round Shank; A = Wedge Shank; K = conus)
- 32 → Cutting diameter (mm)
- 2 → Number of cutting wings
- DB → DB = Drill Bit; PCD = Polycrystalline Diamonds

K+S Aktiengesellschaft.

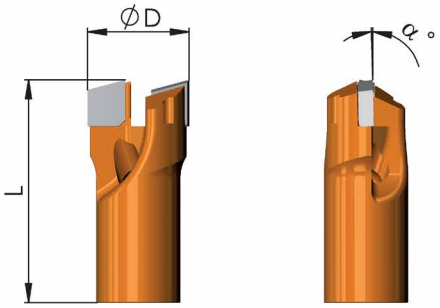
MINING / ROTARY DRILL BITS



PART-NO.	DESCRIPTION	Ø D (mm)	L (mm)	L1 (mm)	THREAD	Ø B (mm)	α°
22310190	DB 2/27 M 16 m N 01	27,0	47,5	17,0	M16	7,0	neg.
22310100	DB 2/28 M 16 m N 01	28,0	47,5	17,0	M16	7,0	neg.

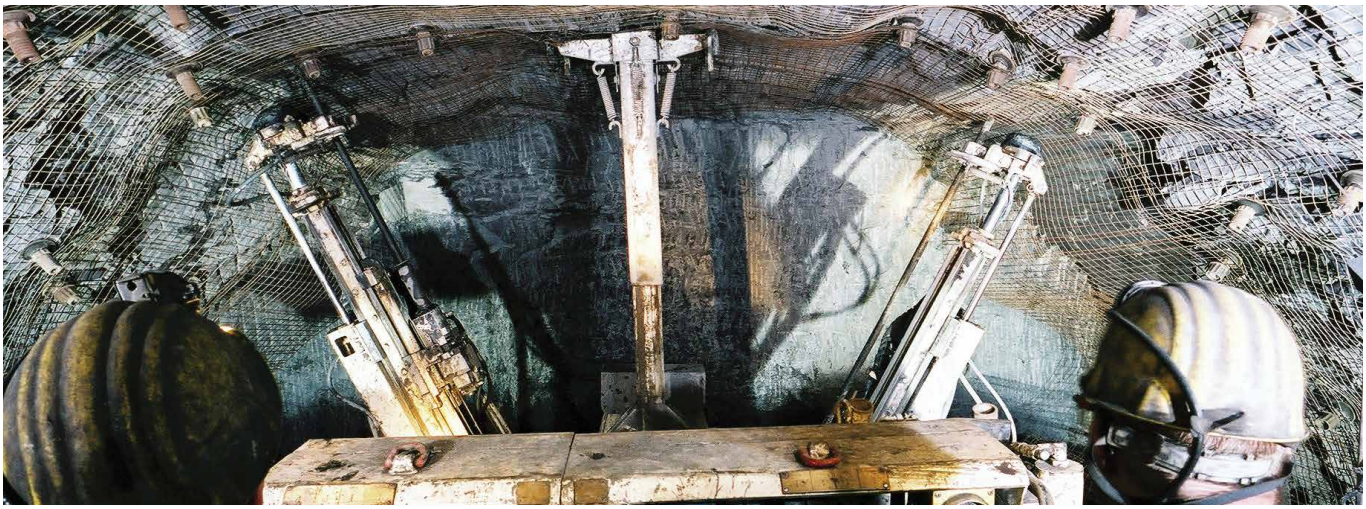


PART-NO.	DESCRIPTION	Ø D (mm)	L (mm)	THREAD
22310228	DB 2/32 B17 f O 05	32,5	72,0	B17
22310002	DB 2/43 A25 f O 01	43,0	90,0	R1 " right

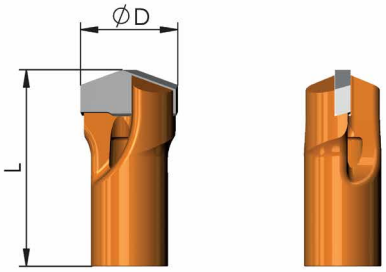


PART-NO.	DESCRIPTION	Ø D (mm)	L (mm)	THREAD	α°
61020311	DB 2/25 Rd16 f N 01	24,6	53,0	Rd 16	neg.
61020312	DB 2/26 Rd16 f N 01	25,8	53,3	Rd 16	neg.
61020313	DB 2/37 Rd20 f O 01	36,5	71,0	Rd 20	0

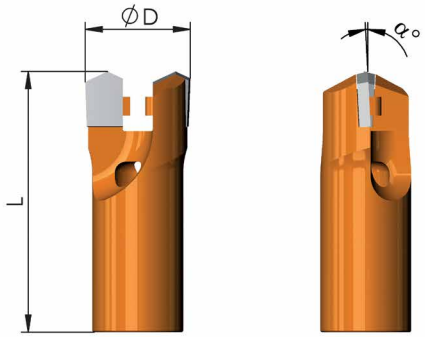
MINING / ROTARY DRILL BITS



RAG Deutsche Steinkohle.

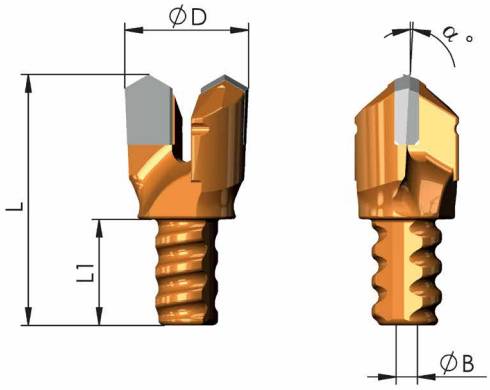


PART-NO.	DESCRIPTION	Ø D (mm)	L (mm)	THREAD
61020314	DB 2/26 Rd16 f O 01	25,6	50,9	Rd 16

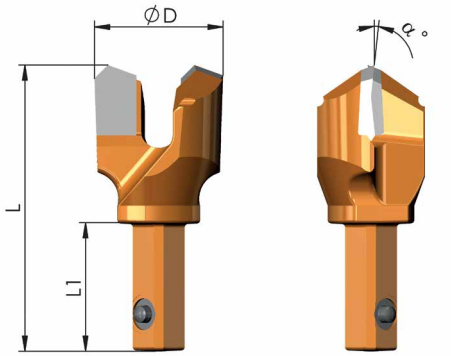


PART-NO.	DESCRIPTION	Ø D (mm)	L (mm)	THREAD	α°
61020310	DB 2/28 Rd20 f N 01	28,0	69,0	Rd 20	neg

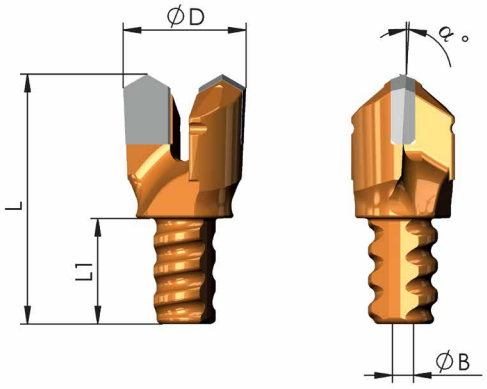
MINING / ROTARY DRILL BITS



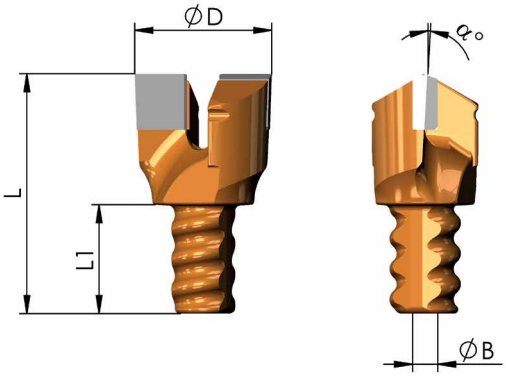
PART-NO.	DESCRIPTION	Ø D (mm)	L (mm)	L1 (mm)	THREAD	Ø B (mm)	α°
22350049	DB 2/35 KW20 m P 04	35,0	71,0	30,0	Rd 20 x 3 Gg./1"	6,0	pos.
22350082	DB 2/40 KW20 m P 03	40,0	70,5	30,0		6,0	pos.
22350070	DB 2/42 KW20 m P 02	42,0	71,0	30,0		6,0	pos.
22350078	DB 2/46 KW20 m O 04	46,0	75,0	30,0		6,5	O



PART-NO.	DESCRIPTION	Ø D (mm)	L (mm)	L1 (mm)	THREAD	α°
22350026	DB 2/38 VK m P 01	38,2	85,0	38,0	VK13	pos.
22350028	DB 2/40 VK m P 01	40,6	85,0	38,0	VK13	pos.
22350046	DB 2/60 VK m P 01	60,0	98,0	45,0	VK24	pos.

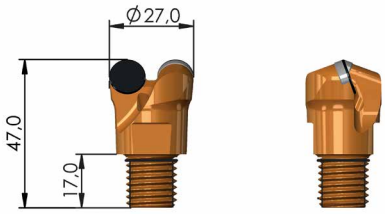


PART-NO.	DESCRIPTION	Ø D (mm)	L (mm)	L1 (mm)	Ø B (mm)	α°
22350091	DB 2/38 KW20 m P 04	38,0	71,0	30,0	7,0	pos.

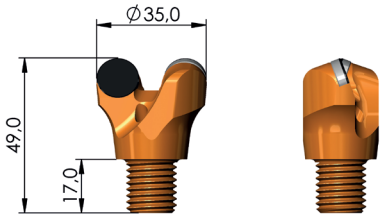


PART-NO.	DESCRIPTION	Ø D (mm)	L (mm)	L1 (mm)	Ø B (mm)	α°
22350092	DB 2/38 KW20 m P 05	38,0	66,5	30,0	7,0	pos.

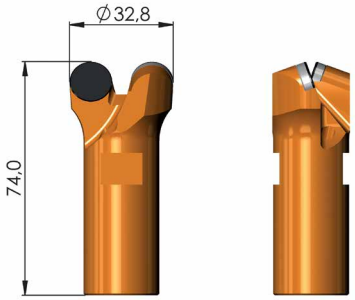
MINING / PCD DRILL BITS



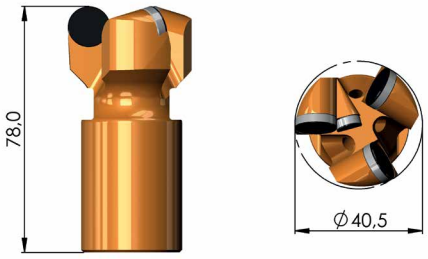
PCD 2/27 M16 m N 02
part-no.22340186



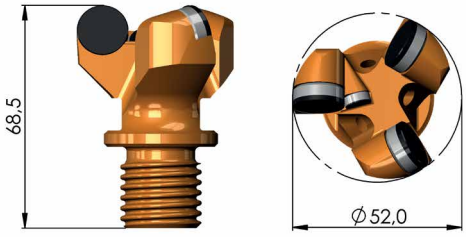
PCD 2/35 M16 m N 02
part-no.22340108



PCD 2/32 B17 f N 01
part-no.22340012

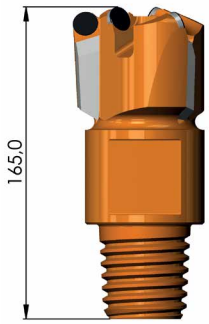


PCD 3/40 A25 f N 01
part-no.22340088

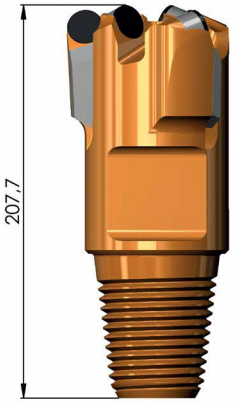


PCD 3/52 RD25 m N 01
part-no.22340081

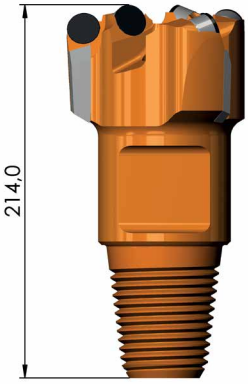
MINING / PCD DRILL BITS



PCD 3/76 Gg46 m N 02
part-no.22340107



PCD 3/95 API m N 02
part-no.22340102



PCD 3/112 API m N 01
part-no.22340105

All dimensions in mm.

ELEMENT SIX

Element Six, part of the De Beers Group of Companies, designs, develops and produces synthetic diamond and other supermaterials, and operates worldwide with primary manufacturing facilities in China, Germany, Ireland, South Africa, the UK and US.

Element Six supermaterial solutions are used in applications such as cutting, grinding, drilling, shearing and polishing, while the extreme properties of synthetic diamond beyond hardness are opening up new applications in a wide array of industries such as optics, power transmission, water treatment, semiconductors and sensors.

If you would like to know more about Element Six please visit our website www.e6.com or contact us at any of the addresses below.

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