



# Road Milling

Ceratops Road Milling Bits  
Pavement Maintaining Work  
(Milling, Planning, Regenerating, Road Mixing)

## ZIGONG INTERNATIONAL MARKETING, LLC

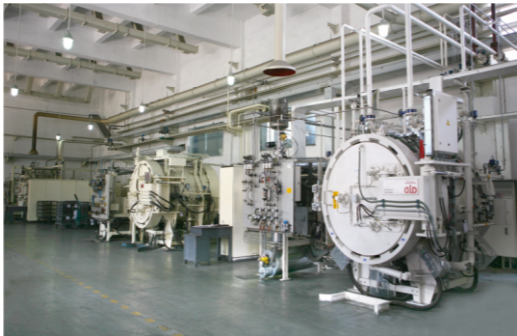
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ZIGONG INTERNATIONAL MARKETING, LLC



# Ceratops Branding The ROADWAYS



Performance that Delivers  
65 Years of Making Successful Products



Allow your company to take complete command of all your road construction work. The Ceratops tools provide durability, creating longevity of milling time and allows maximum machine performance.

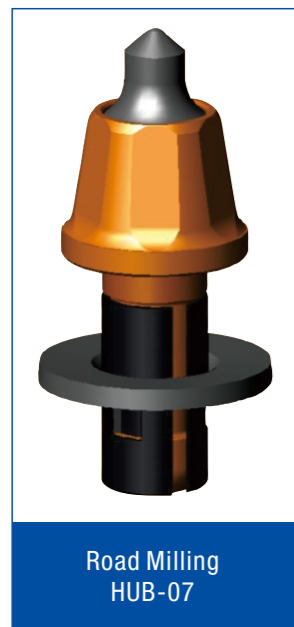
Most of the tools used in milling machines, regenerators, and soil stabilizers are made up of five separate components:

1. Carbide tip①
2. Special copper-based flux②
3. Cold forging steel body③
4. Stamping washer④
5. Clamping sleeve⑤



HUZ-05A decompositions

Milling tools are widely used in different applications in different designs. However, the components of a tool and its basic function are the same.



Road Milling  
HUB-07



Road milling  
HUS-13



Regeneration  
and soil stabilizing  
HUB-09/22

## QUALITY ACCOMPLISHES THE FUTURE

The industrial advantage for the milling tool  
The “CERATOPS” brand virgin carbide tips  
The “CERATOPS” superior carbide tools

The components of a milling tool  
Carbide tip  
Special copper-based flux  
Cold forging steel body  
Stamping washer  
Clamping sleeve

The application of the road milling tools  
Tool shape and code  
Wear of a milling tool  
Case study  
Road milling tool selection  
Recommendation



Company introduction

Founded in 1965, ZGCC is China's first domestic-designed large-scale cemented carbide manufacturer independently designed and constructed in China. It is one of the core members of China Minmetals with three production bases of cemented carbide, hardfacing materials, and tungsten & molybdenum products.

ZGCC's products are widely used in machinery, metallurgy, petroleum, mining, construction, electronics and aerospace, the comprehensive strength is at the forefront of cemented carbide manufacturers. ZGCC has an advanced and multifunctional post-doctoral research & development workstation and a provincial technology R&D center with over 300 patents.

ZIM was built in 2003 in the US for the purpose of distributing tungsten carbide powder and parts in the North American and South American market. The company's office is located in Houston, Texas, which enables ZIM to provide faster delivery, rapid response to better serve customers.



The cemented carbide industrial base



The Hardfacing materials and Coating service industrial base



The tungsten & molybdenum industrial base

Advanced Technology & Equipment



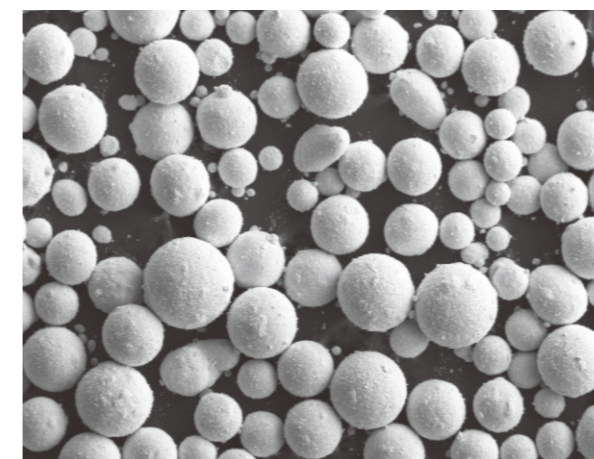
RTP Powder Production Line



Pressing



Sintering Process



RTP Powder Morphology



Carbide Tips

ZGCC Milling Tools

Cemented Carbide Tips

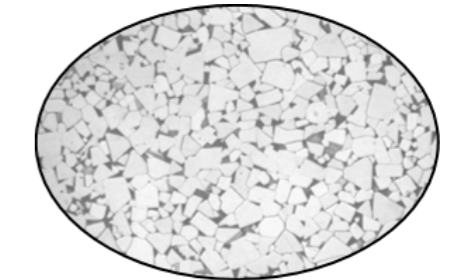
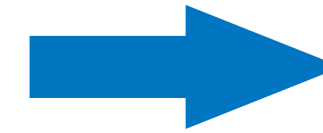


HUZ-05

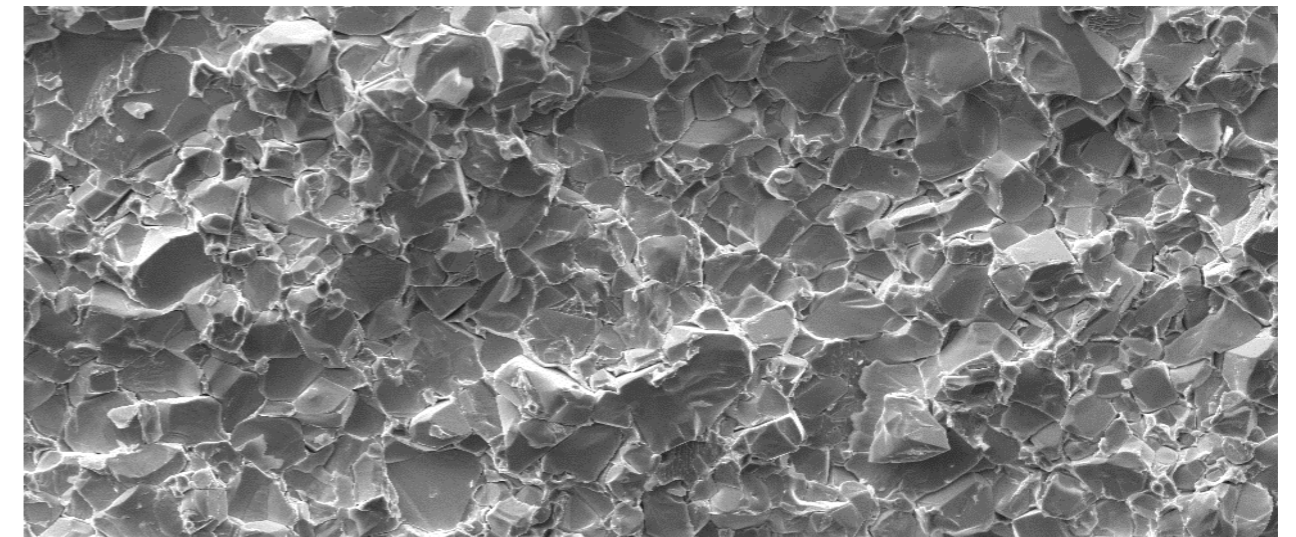


The tools play an essential role in all kinds of surface milling. During the milling process, the cutter loosens the aggregate of the construction pavement and turns it into small pieces that can be recycled again.

The complete production flow of "Ceratos" milling tools



WC Metallograph image



SEM image of a carbide tip fracture morphology

A carbide tip is made of tungsten carbide and cobalt. Tungsten carbide is the hard phase, and the cobalt is the binder that binds different micro tungsten carbide particles to ensure the tip has excellent wear and anti-rupture resistance under the large impact load.

Different micro sizes of tungsten carbide particles are available to choose during the RTP powder preparation process to ensure the wear resistance of the carbide tips. Fine tungsten carbide powder can provide better wear resistance; medium and coarse tungsten carbide powder has better performance in elevated temperature and prohibit cracks.

The improper ratio of ingredients, incorrect preparation of RTP powder, and improper sintering process will lead to increased wear in the high-temperature milling process, leading to premature damage.

Zigong has specialized in producing various kinds of cemented carbide for over 50 years. Strict quality control, professional production equipment, and leading production technology can ensure the consistency and accuracy of the preparation of RTP powder, blank pressing, and sintering.

**Cemented Carbide Tips**

**Flat-bottom tips**

Flat-bottom carbide tips can be used to mill different complex asphalt layers. The optimized tip shape can effectively guide the aggregate flow direction and protect the steel body. The different top angle design ensures that the carbide tip has long-lasting penetration performance, ensuring a smooth, stable, and efficient milling process.



**Cap-shaped tips**

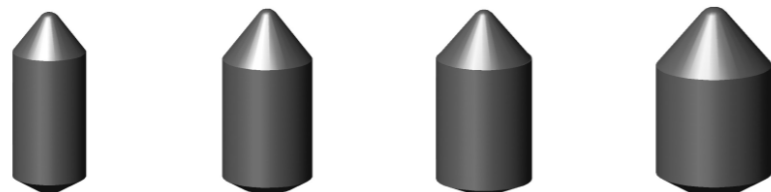
Cap-shaped carbide tips can be used to mill different hardness asphalt, concrete, and stabilizing layers and can also be used for regeneration and soil stabilization. The Cap-shaped tips have the same diameter as the flat-bottom tips. The shapes are also similar. The main differences are the bottom shape and waist design. The more robust waist design ensures the cap-shaped tips can withstand more substantial milling impact load and provide more effective wear protection for the steel body, extending the tool service time.



Cap-shaped carbide tips

**Plug tips**

Plug tips can be used for milling cement concrete pavement with a cobblestone base. Linear tip design ensures consistent tip strength; The optimized tooth angle ensures long-lasting penetration and a smooth, stable, and efficient milling process.



Plug carbide tips

**Special Copper-based Flux**

**Carbide tips brazed with the steel body**

The carbide tips are solidly welded to the correct position of the cutter body by the brazing process. The high temperature and vibration during milling will cause the thermal expansion of carbide teeth and steel body to some extent. A copper-based flux layer between the carbide tip and the cutter body mitigates high-temperature vibration and maintains incredibly high strength, ensuring the carbide tip and steel body do not fall off.



Copper-based flux



High-temperature brazing

Many laboratory pressure tests of data prove that the brazing strength is sufficient and reliable even under immense pressure. The Carbide tip will not fall off from the steel body after brazing.



Random sampling inspection  
Professional testing equipment to test weld strength



Destructive test result  
The weld joint is firm and not falling off

**Cold forging steel body**

**High-quality alloy cold-forging steel body**  
 The tool body is made of high-quality alloy structural steel by cold forging. Special heat treatment is used to make the tool body present a step distribution of high hardness at the head and low hardness at the shank. The multi-hardness distribution mode enables the cutter body to withstand high shear stress and impact load in the milling process, and the cutter body shows the ideal quality characteristics that the head has excellent wear resistance and the shank has excellent bending resistance.  
 The hardness and bending strength of the tool head and shank determine the serviceability and working life of the tool head.

	HUB Body	Regular
	HUB Body	Reinforced
	HUB Body	with puller groove

	HUZ Body	Regular
	HUS Body	Regular
	HUS Body	Reinforced

**Stamping Washer**

**The purpose is to protect the shank:**

The washer is made of superior high manganese alloy steel and formed by precision stamping. After strict heat treatment, it has high wear resistance and continuous protection of the milling tool shank. The tool head is fitted with a Ø44mm or Ø45mm OD washer that completely covers the end face of the tool holder to withstand compressive stress and most wear.



Regular 4mm thick washer

Reinforced 7mm thick washer

Note: The washer pre-tightens the sleeve when the tool leaves the factory. Please note that the washer must be removed from the sleeve when installing.

**Precision Clamping Sleeve**

**The purpose is to secure the shank:**

Selected superior high manganese alloy plate, precision mold stamping, forming, controlled atmosphere heat treatment, and surface corrosion prevention treatment. The sleeve has high precision roundness and appropriate tightening force, which can ensure a reliable connection between the shank and the tool holder and has excellent rotation.



Excellent rotation feature

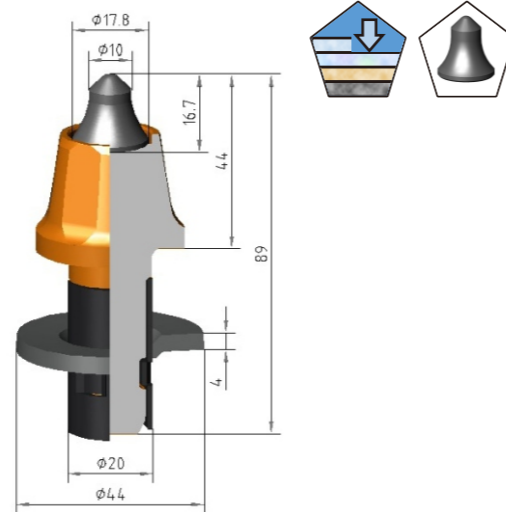
**Tool Shape and Code**

Code	Meaning			
HUB	Asphalt tool (Suitable for all kinds of hardness pavement asphalt and stabilizing layers milling)			
HUS	Concrete tool (Suitable for C30 grade or below concrete hacking pavement, shallow milling, cement hacking construction)			
HUZ	Comprehensive tool (Suitable for asphalt, stabilizing layer deep or super deep milling, general concrete pavement hacking construction)			
Plug carbide tips code				
08-18	Diameter of the carbide tips (mm)			
Flat-bottom carbide tips code				
01-22	Two digits represent different holder diameters and heights			
Cap-shaped carbide tips code				
02-09	Two digits represent different shank diameters and heights			
Steel-body feature				
C	C represents puller groove			
Shank diameter				
No suffix	The shank diameter is 20mm			
/22	Held in the toolholder bore with a shank diameter of 22mm			
/25	Held in the toolholder bore with a shank diameter of 25mm			
Series	Steel body Head		Carbide Tips	
	Height (mm)	Shank Diameter (mm)	Holder Diameter (mm)	Height (mm)
HUB	80~95	20~25	16~22	16~22
HUS	88~95	20~25	08~18	10~30
HUZ	88~95	20~25	16~22	16~22
Road Reclamation Non-standard series	Custom-made	14~38	Custom-made	Custom-made

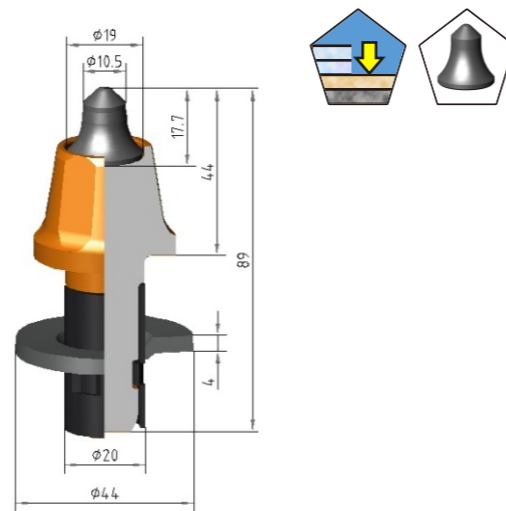


20mm Shank

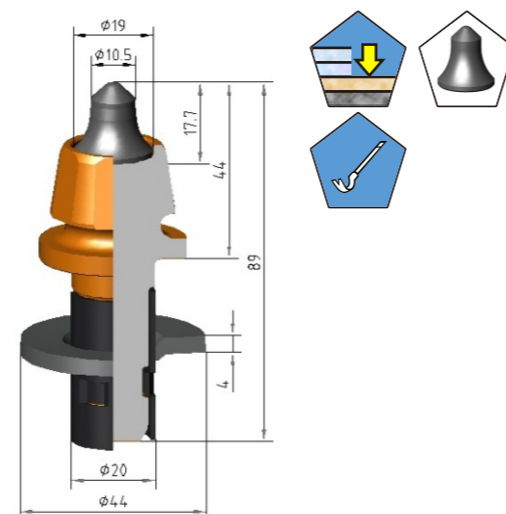
HUB-02	
Code	Meaning
HUB	Classic steel body for asphalt milling
-02	18mm flat-bottom tip
	20mm shank
Bit weight, g/Ea.	304
Pieces per box	50
Recommended Application	Asphalt



HUB-03	
Code	Meaning
HUB	Classic steel body for asphalt milling
-03	19mm flat-bottom tip
	20mm shank
Bit weight, g/Ea.	307
Pieces per box	50
Recommended Application	Asphalt and stabilizing

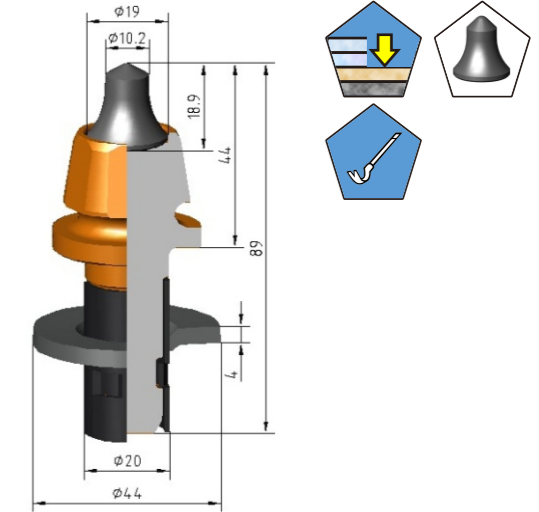


HUB-03C	
Code	Meaning
HUB	Classic steel body for asphalt milling
-03C	19mm flat-bottom tip
	20mm shank
Bit weight, g/Ea.	295
Pieces per box	50
Recommended Application	Asphalt and stabilizing

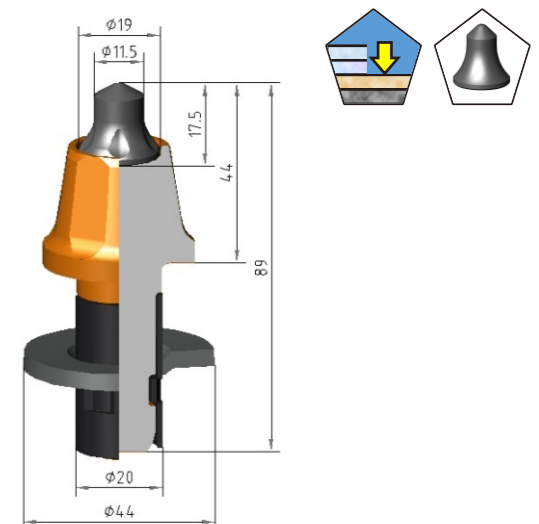


20mm Shank

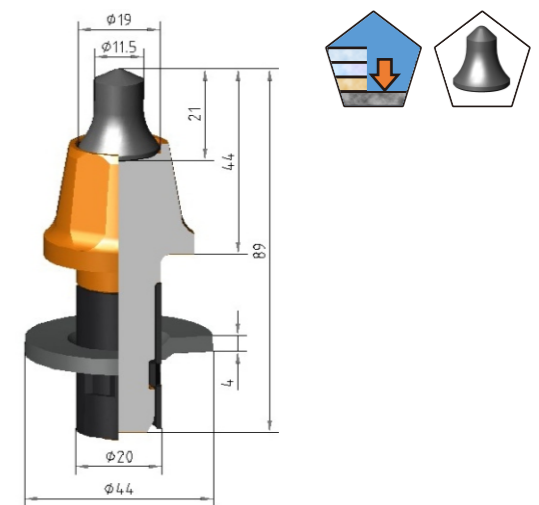
HUB-03LC	
Code	Meaning
HUB	Classic steel body for asphalt milling
-03LC	19mm flat-bottom carbide tip
	20mm shank
Bit weight, g/Ea.	293
Pieces per box	50
Recommended Application	Asphalt



HUB-05A	
Code	Meaning
HUB	Classic steel body for asphalt milling
-05A	19mm flat-bottom reinforced tip
	20mm shank
Bit weight, g/Ea.	308
Pieces per box	50
Recommended Application	Asphalt and stabilizing

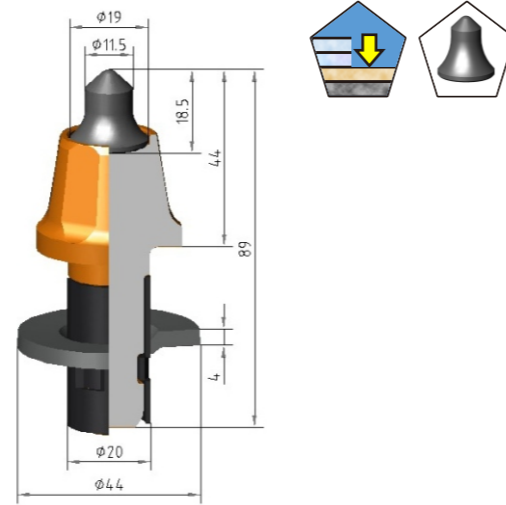


HUB-05L	
Code	Meaning
HUB	Proprietary steel body for asphalt milling
-05L	19mm flat-bottom reinforced tip
	20mm shank
Bit weight, g/Ea.	316
Pieces per box	50
Recommended Application	Asphalt and stabilizing

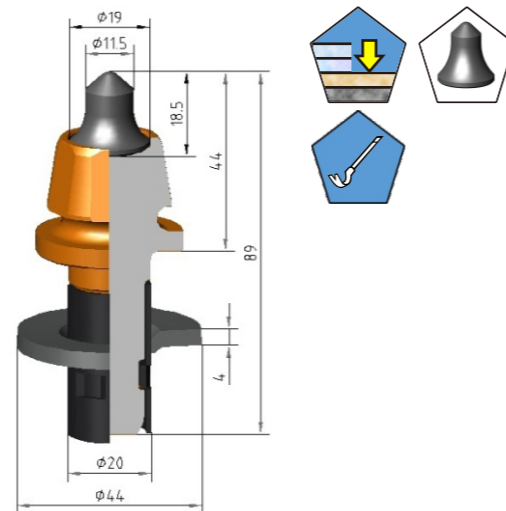


20mm Shank

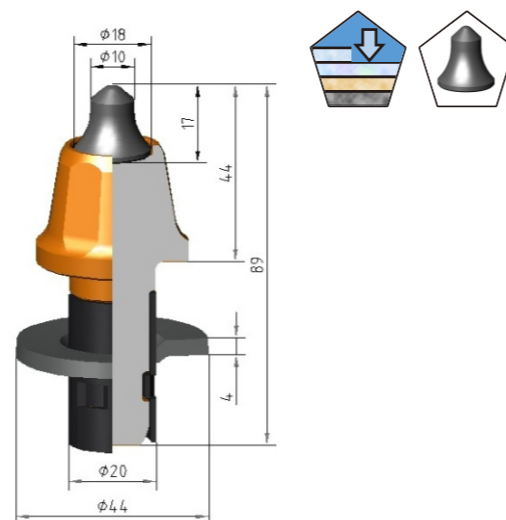
HUB-07	
Code	Meaning
HUB	Classic steel body for asphalt milling
-07	19mm flat-bottom tip
	20mm shank
Bit weight, g/Ea.	308
Pieces per box	50
Recommended Application	Asphalt and stabilizing



HUB-07C	
Code	Meaning
HUB	Classic steel body for asphalt milling
-07C	19mm flat-bottom tip with puller groove
	20mm shank
Bit weight, g/Ea.	297
Pieces per box	50
Recommended Application	Asphalt and stabilizing

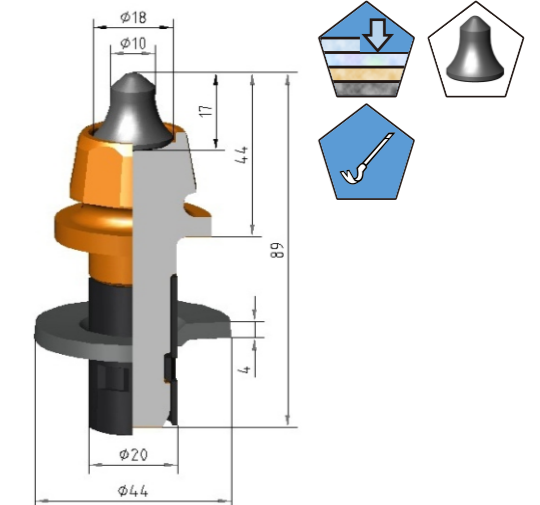


HUB-08	
Code	Meaning
HUB	Classic steel body for asphalt milling
-08	18mm flat-bottom tip
	20mm shank
Bit weight, g/Ea.	306
Pieces per box	50
Recommended Application	Asphalt and stabilizing

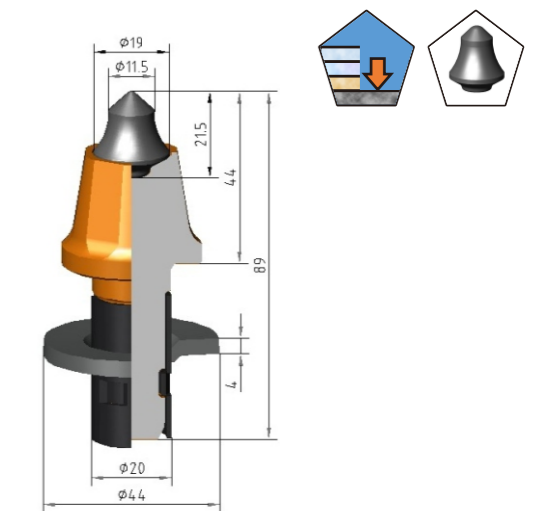


20mm Shank

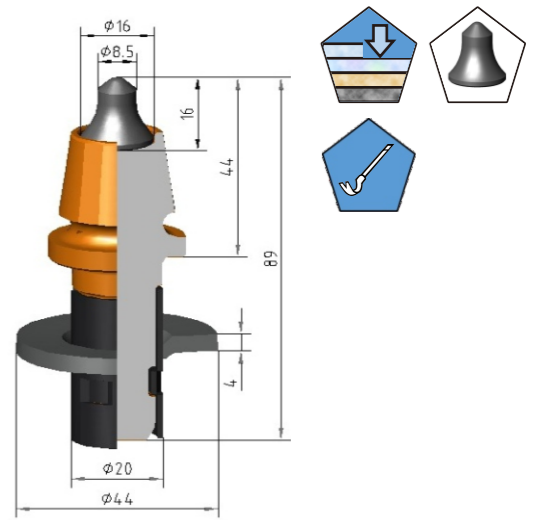
HUB-08C	
Code	Meaning
HUB	Classic steel body for asphalt milling
-08C	18mm Cap-shaped tip with puller groove
	20mm shank
Bit weight, g/Ea.	293
Pieces per box	50
Recommended Application	Asphalt and stabilizing



HUB-09	
Code	Meaning
HUB	Classic steel body for asphalt milling
-09	19mm Cap-shaped tip
	20mm shank
Bit weight, g/Ea.	313
Pieces per box	50
Recommended Application	Asphalt and stabilizing

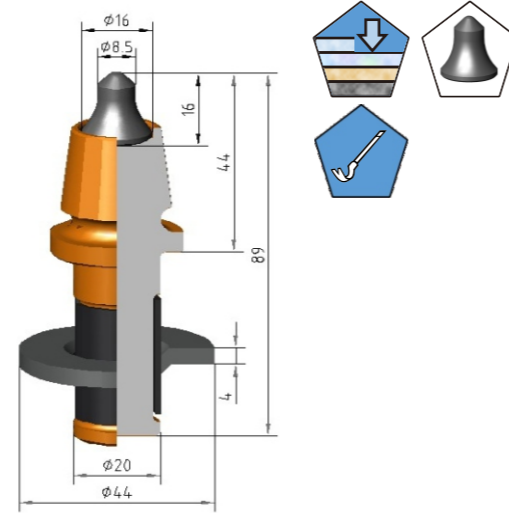


HUB-10C	
Code	Meaning
HUB	Classic steel body for asphalt milling
-10C	16mm flat-bottom tip with puller groove
	20mm shank
Bit weight, g/Ea.	293
Pieces per box	50
Recommended Application	Asphalt

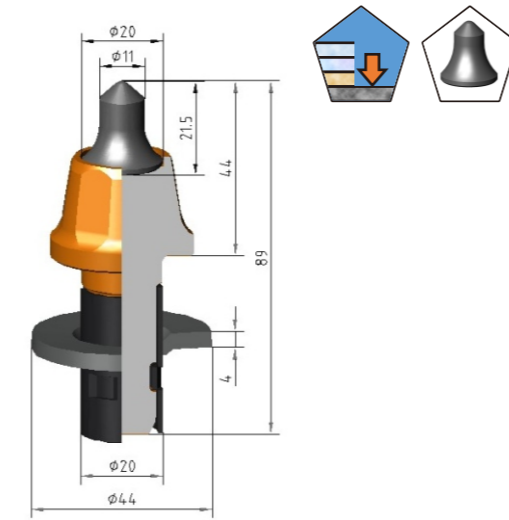


20mm Shank

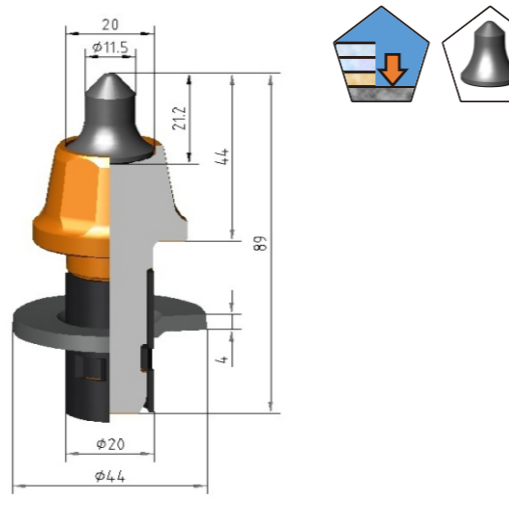
HUB-10CA	
Code	Meaning
HUB	Classic steel body for asphalt milling
-10CA	16mm flat-bottom tip with puller groove
	20mm shank
Bit weight, g/Ea.	293
Pieces per box	50
Recommended Application	Asphalt



HUB-12	
Code	Meaning
HUB	Classic steel body for asphalt milling
-12	20mm flat-bottom tip
	20mm shank
Bit weight, g/Ea.	303
Pieces per box	50
Recommended Application	Asphalt and stabilizing

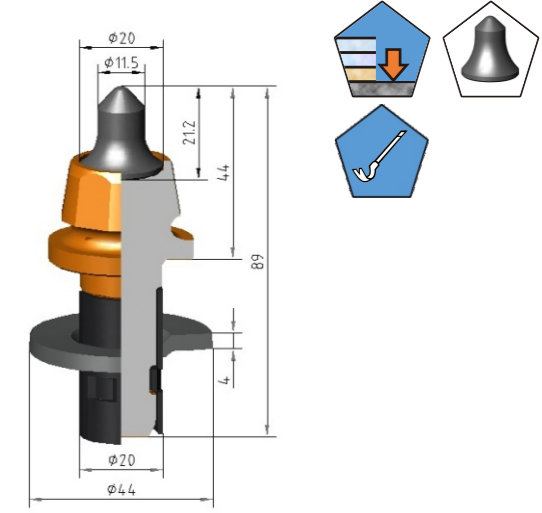


HUB-14	
Code	Meaning
HUB	Classic steel body for asphalt milling
-14	20mm reinforced flat-bottom tip
	20mm shank
Bit weight, g/Ea.	304
Pieces per box	50
Recommended Application	Asphalt and stabilizing

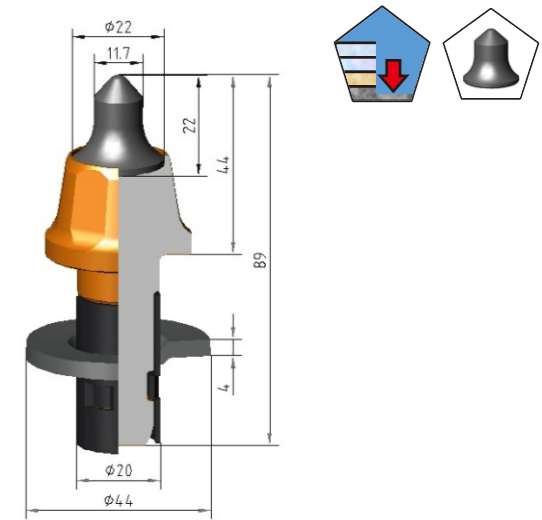


20mm Shank

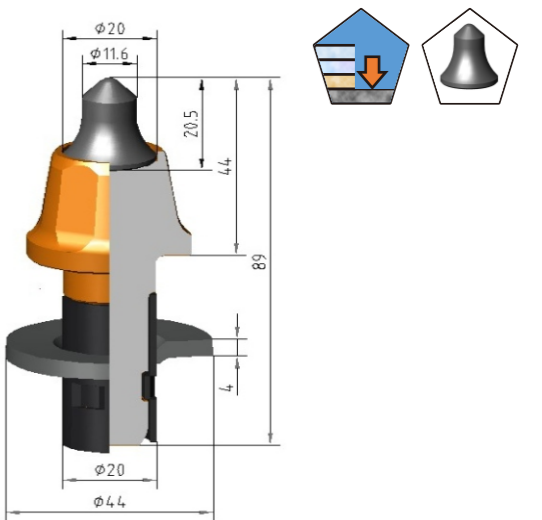
HUB-14C	
Code	Meaning
HUB	Classic steel body for asphalt milling
-14C	20mm reinforced flat-bottom tip with puller groove
	20mm shank
Bit weight, g/Ea.	291
Pieces per box	50
Recommended Application	Asphalt and stabilizing



HUB-15	
Code	Meaning
HUB	Classic steel body for asphalt milling
-15	22mm flat-bottom
	20mm shank
Bit weight, g/Ea.	305
Pieces per box	50
Recommended Application	Asphalt and stabilizing

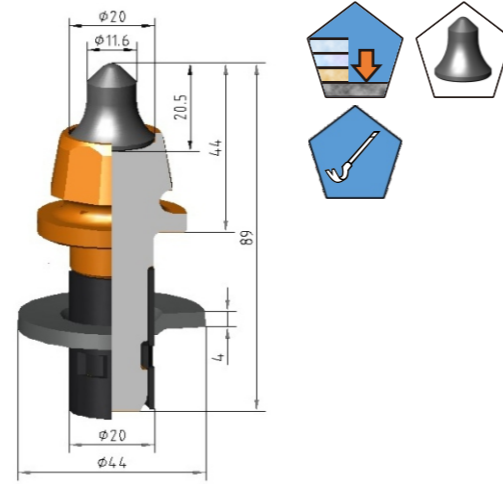


HUB-20A	
Code	Meaning
HUB	Classic steel body for asphalt milling
-20A	20mm reinforced flat-bottom tip
	20mm shank
Bit weight, g/Ea.	306
Pieces per box	50
Recommended Application	Asphalt and stabilizing

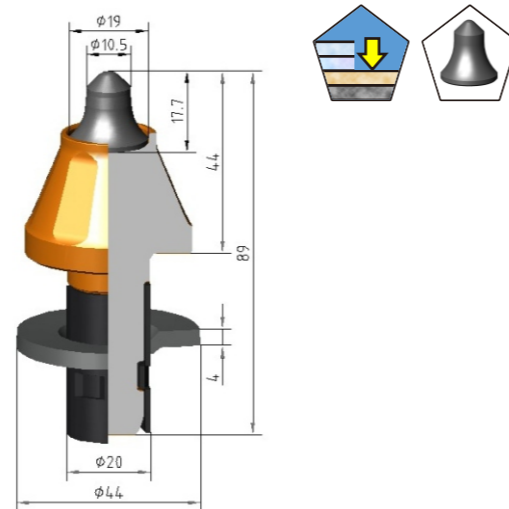


20mm Shank

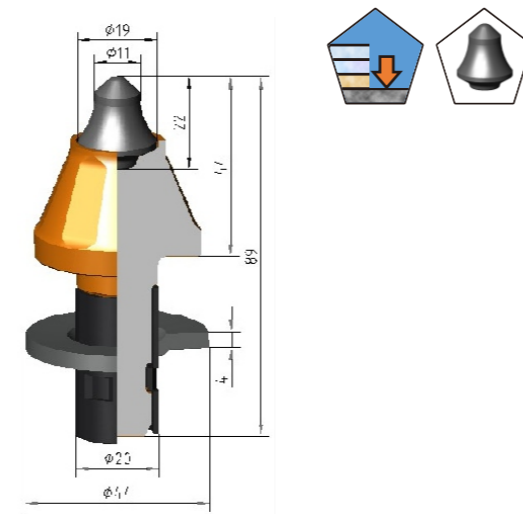
HUB-20C	
Code	Meaning
HUB	Classic steel body for asphalt milling
-20C	20mm flat-bottom tip with puller groove
	20mm shank
Bit weight, g/Ea.	291
Pieces per box	50
Recommended Application	Asphalt and stabilizing



HUZ-03	
Code	Meaning
HUZ	Comprehensive steel body
-03	19mm flat-bottom tip
	20mm shanke
Bit weight, g/Ea.	344
Pieces per box	50
Recommended Application	Asphalt and stabilizing

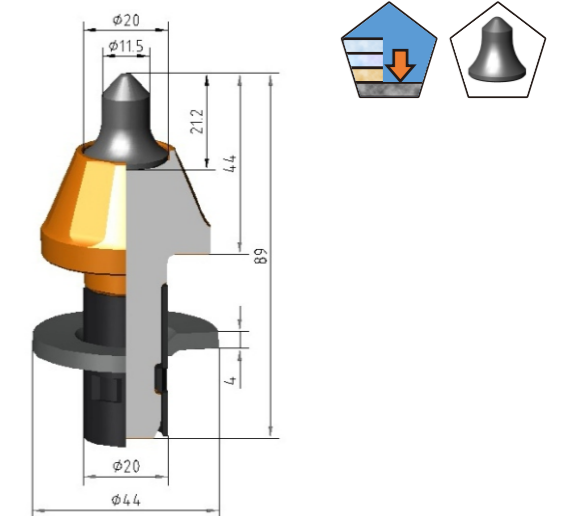


HUZ-05	
Code	Meaning
HUZ	Comprehensive steel body
-05	19mm Cap-shaped tip
	20mm shank
Bit weight, g/Ea.	350
Pieces per box	50
Recommended Application	Asphalt and stabilizing

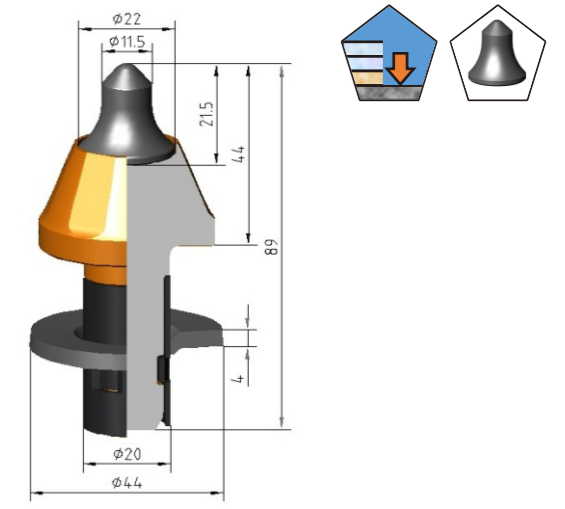


20mm Shank

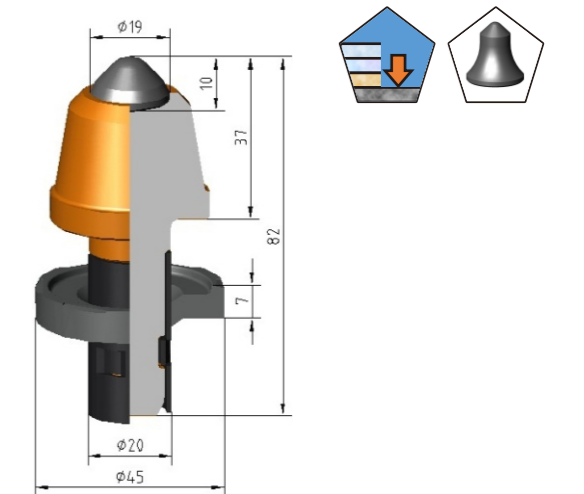
HUZ-14	
Code	Meaning
HUZ	Comprehensive steel body
-05A	20mm flat-bottom tip
	20mm shank
Bit weight, g/Ea.	338
Pieces per box	50
Recommended Application	Asphalt and stabilizing



HUZ-15	
Code	Meaning
HUZ	Comprehensive steel body
-15	22mm flat-bottom tip
	20mm shank
Bit weight, g/Ea.	352
Pieces per box	50
Recommended Application	Asphalt and stabilizing

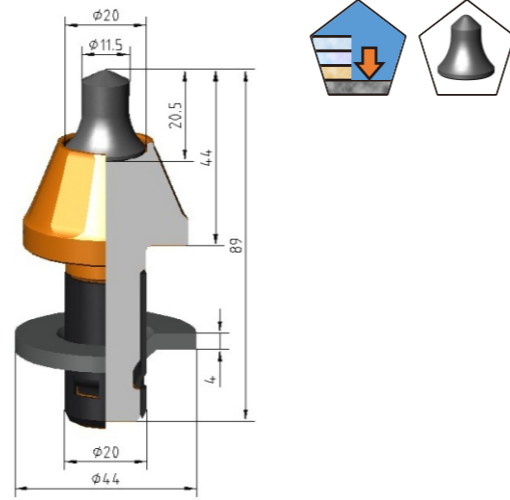


HUZ-19	
Code	Meaning
HUZ	Comprehensive steel body
-19	19mm flat-bottom tip
	20mm shank e
Bit weight, g/Ea.	375
Pieces per box	40
Recommended Application	Stabilization with rocks

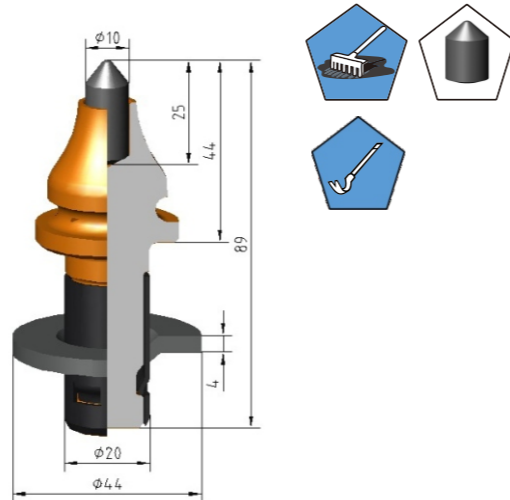


20mm Shank

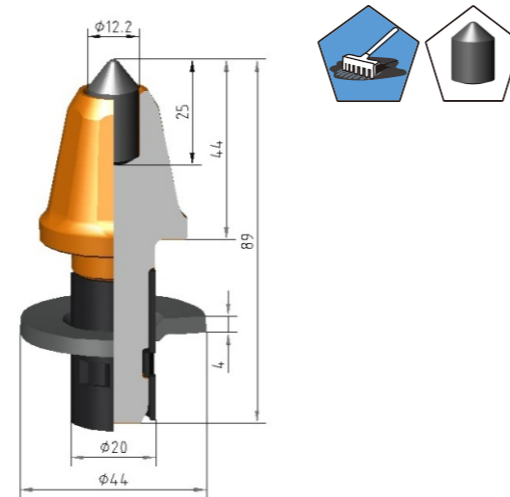
HUZ-20	
Code	Meaning
HUZ	Proprietary comprehensive steel body
-20	20mm flat-bottom tip
	20mm shank
Bit weight, g/Ea.	347
Pieces per box	50
Recommended Application	Asphalt and stabilizing



HUS-10NC	
Code	Meaning
HUS	Classic steel body for asphalt milling
-10NC	10mm plug tip with puller groove
	20mm shank
Bit weight, g/Ea.	263
Pieces per box	50
Recommended Application	Concrete

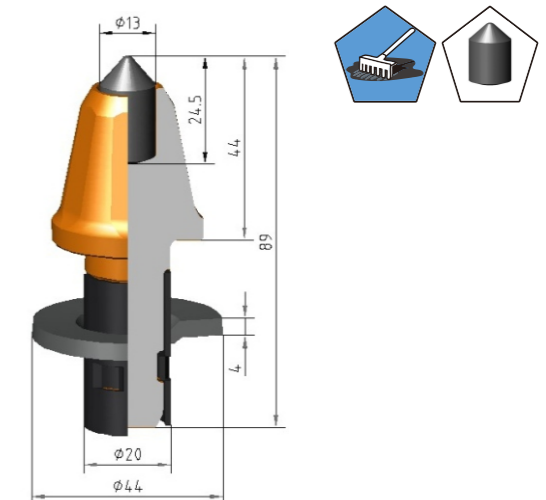


HUS-12	
Code	Meaning
HUS	Asphalt milling
-12	12mm plug tip
	20mm shank
Bit weight, g/Ea.	312
Pieces per box	50
Recommended Application	Concrete and shallow milling

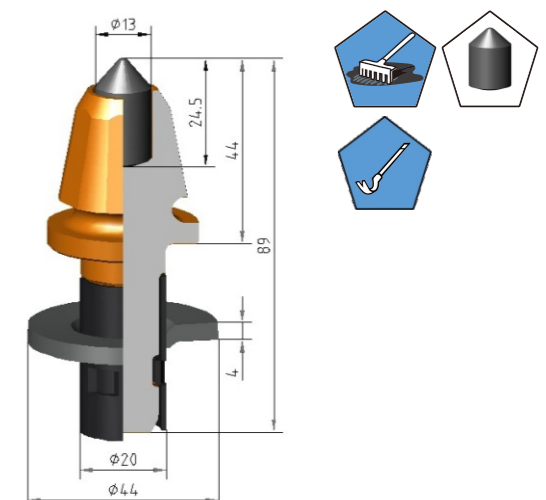


20mm Shank

HUS-13	
Code	Meaning
HUS	Classic steel body for asphalt milling
-13	13mm plug tip
	20mm shank
Bit weight, g/Ea.	316
Pieces per box	50
Recommended Application	Concrete and shallow milling

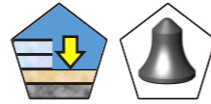
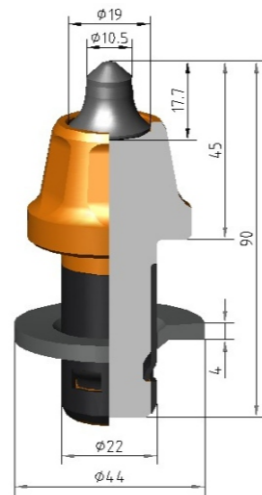


HUS-13C	
Code	Meaning
HUS	Classic steel body for asphalt milling
-13C	13mm plug tip with puller groove
	20mm shank
Bit weight, g/Ea.	305
Pieces per box	50
Recommended Application	Concrete and shallow milling

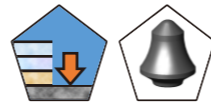
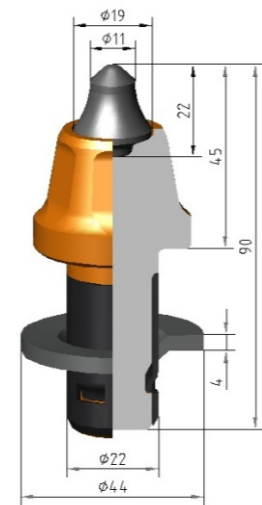


22mm Shank

HUB-03/22	
Code	Meaning
HUB	Supreme steel body
-03	19mm flat-bottom tip
/22	22mm shank with 4mm thick washer
Bit weight, g/Ea.	387
Pieces per box	40
Recommended Application	Asphalt, stabilizing, regenerating

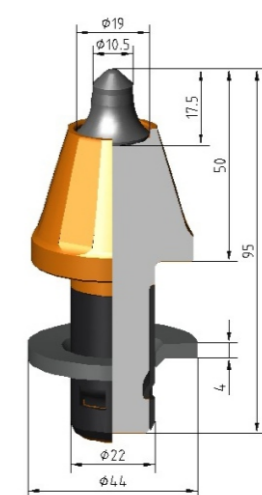


HUB-09/22	
Code	Meaning
HUB	Supreme steel body
-09	19mm Cap-shaped tip
/22	22mm shank with 7mm thick washer
Bit weight, g/Ea.	395
Pieces per box	40
Recommended Application	Asphalt, stabilizing, regenerating

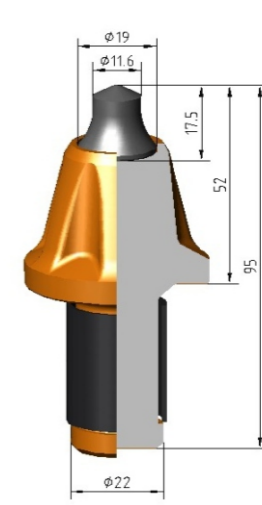


22mm Shank

HUZ-03/22	
Code	Meaning
HUZ	Proprietary steel body
-03	19mm flat-bottom tip
/22	22mm shank with 4mm thick washer
Bit weight, g/Ea.	382
Pieces per box	40
Recommended Application	Asphalt, stabilizing, regenerating

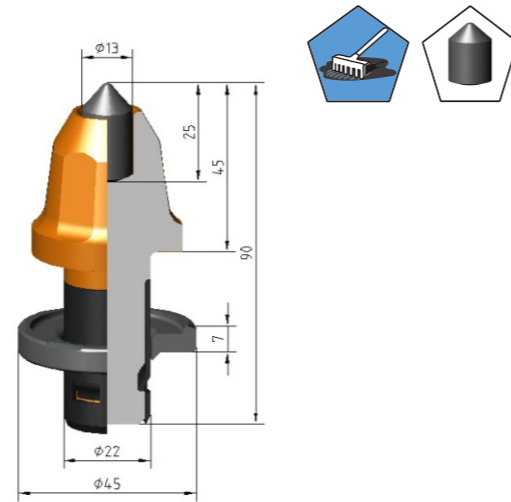


HUZ-04/22	
Code	Meaning
HUZ	Grooved steel body
04	19mm flat-bottom reinforced tip
/22	20mm shank
Bit weight, g/Ea.	410
Pieces per box	40
Recommended Application	Asphalt, stabilizing, regenerating

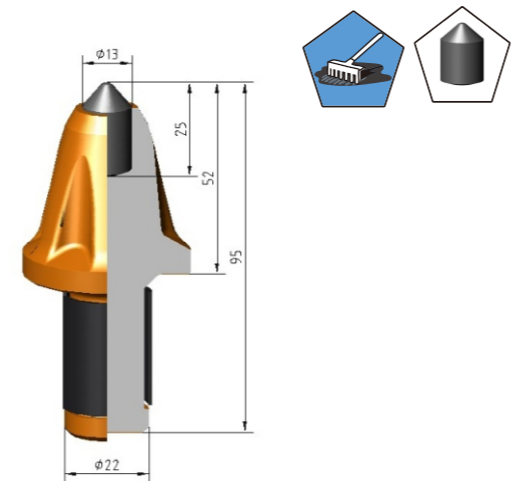


22mm Shank

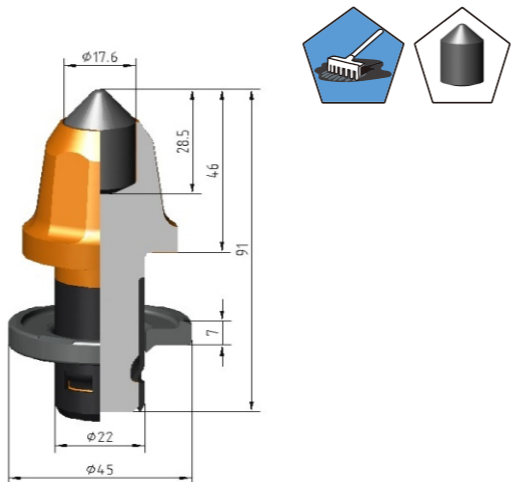
HUS-13/22	
Code	Meaning
HUS	Reinforced steel body for asphalt milling
-13	13mm plug tip
/22	22mm shank with 7mm thick washer
Bit weight, g/Ea.	418
Pieces per box	40
Recommended Application	Concrete, regenerating



HUS-13A/22	
Code	Meaning
HUS	Grooved and reinforced steel body
-13A	13mm plug tip
/22	22mm shank
Bit weight, g/Ea.	439
Pieces per box	40
Recommended Application	Concrete, regenerating

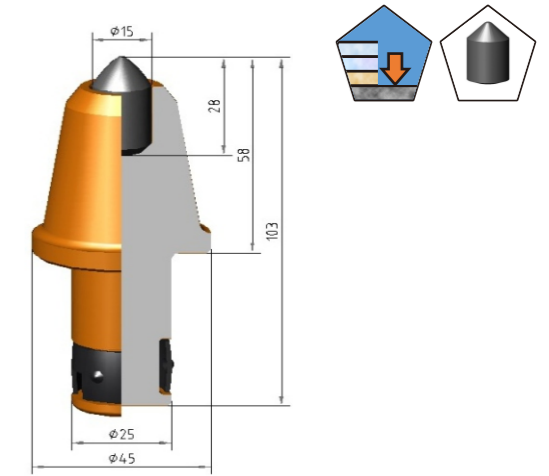


HUS-18/22	
Code	Meaning
HUS	Reinforced steel body for asphalt milling
-18	17.6mm plug tip
/22	22mm shank with 7mm thick washer
Bit weight, g/Ea.	440
Pieces per box	40
Recommended Application	Concrete, gravel, regenerating

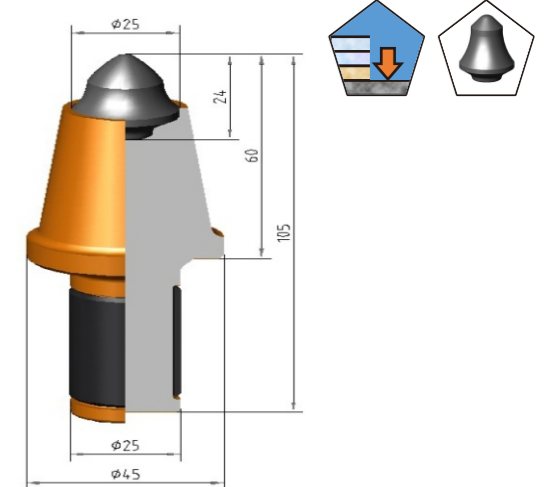


25mm Shank

HUS-15L/25	
Code	Meaning
HUS	Reinforced steel body for asphalt milling
-15L	15mm plug tip
/25	25mm shank
Bit weight, g/Ea.	563
Pieces per box	30
Recommended Application	Concrete, gravel pavement regenerating

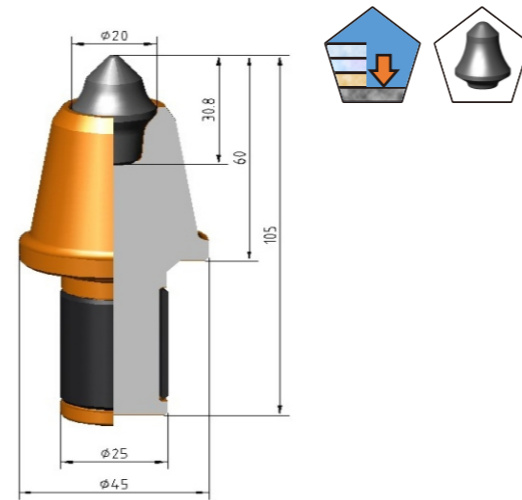


HUS-25M/25	
Code	Meaning
HUS	Reinforced steel body for asphalt milling
-25M	25mm Cap-shaped tip
/25	25mm shank
Bit weight, g/Ea.	585
Pieces per box	30
Recommended Application	Concrete, gravel pavement regenerating



25mm Shank

HUS-20X/25	
Code	Meaning
HUS	Reinforced steel body for asphalt milling
-20X	20mm Cap-shaped tip
/25	25mm shank
Bit weight, g/Ea.	567
Pieces per box	30
Recommended Application	Concrete, gravel pavement regenerating



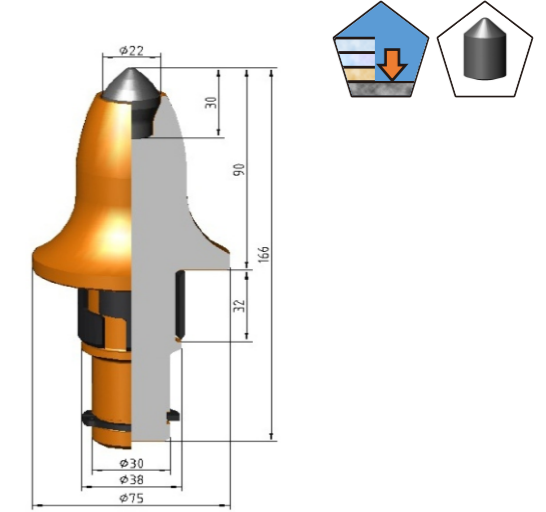
Convex clamping sleeve



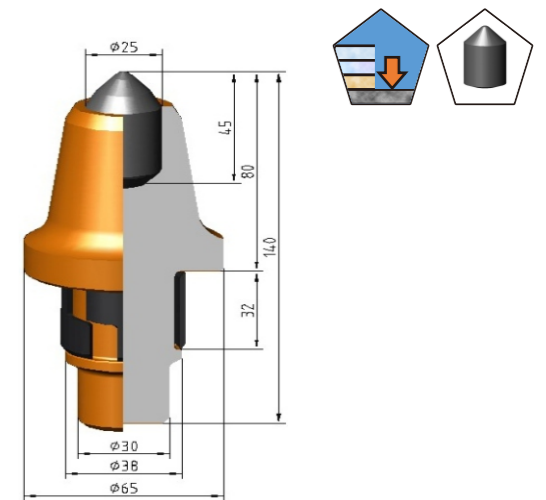
25mm straight opening clamping sleeve

38/30mm Shank

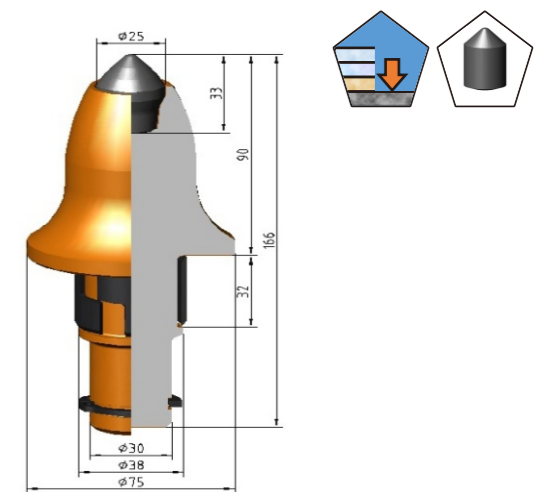
HUS-22G/3830	
Code	Meaning
HUS	Reinforced steel body for asphalt milling
-22G	22mm flat-bottom tip
/3830	38mm step shank
Bit weight, g/Ea	1690
Pieces per box	10
Recommended Application	Grave stabilizing, concrete generating



HUS-25/3830	
Code	Meaning
HUS	Reinforced steel body for asphalt milling
-25	25mm plug tip
/3830	38mm step shank
Bit weight, g/Ea	1601
Pieces per box	10
Recommended Application	Concrete regenerating



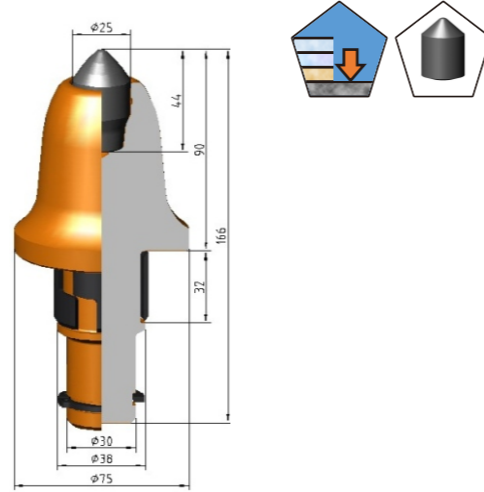
HUS-25G/3830	
Code	Meaning
HUS	Reinforced steel body for asphalt milling
-25G	25mm Cap-shaped tip
/3830	38mm step shank with wedding band clamping sleeve
Bit weight, g/Ea	1728
Pieces per box	10
Recommended Application	Grave stabilizing, concrete generating



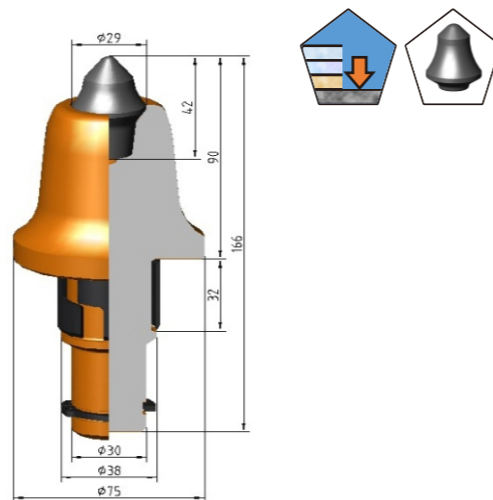


38/30mm Shank

HUS-25GL/3830	
Code	Meaning
HUS	Reinforced steel body for asphalt milling
-25GL	25mm plug tip
/3830	38mm step shank
Bit weight, g/Ea	2116
Pieces per box	10
Recommended Application	Concrete, cement generating



HUS-29XL/3830	
Code	Meaning
HUS	Reinforced steel body for asphalt milling
-29XL	25mm Cap-shaped tip
/3830	38mm step shank
Bit weight, g/Ea	2062
Pieces per box	10
Recommended Application	Grave stabilizing, concrete generating



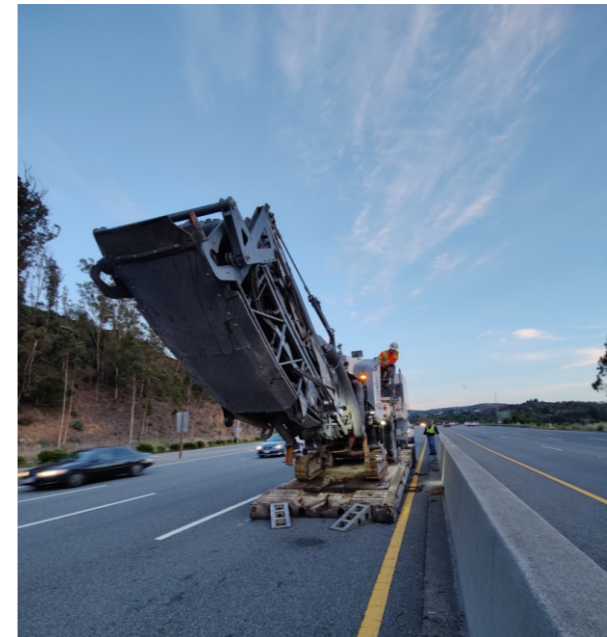
φ38mm wedding clamping sleeve



φ38×3 snap ring

## Creating your Own Success Story!

You must build a foundation to ensure a successful road construction program. This success is built on experience, knowhow, and with the most solid engineering possible. If you want reliability and progress, the Ceratops is the brand you are looking for!



**You want a Job Done Right!  
Ceratops Road Milling Bits...**



Performance that Delivers



Zigong International Marketing, LLC (ZIM) is a US based subsidiary of Zigong Cemented Carbide Co., Ltd (ZGCC).

ZGCC is a leading manufacturer of cemented carbide parts, mining bits, road milling bits, and trenching bits manufacturer since 1965.

ZIM is located in the oil & gas hub, Houston, Texas.

Our professional sales and technical teams work closely with our customer in the North America and South America to meet wear, abrasion, and corrosion requirements.

We help our customers by stocking sufficient inventory to ensure quick deliveries.

Our “CERATOPS” brand Mining bits, Road Milling bits and Trenching bits is quite popular in the market.

Road Bit Icons

<p>Cutting conditions: <b>Light</b></p>	<p>Cutting conditions: <b>Medium</b></p>	<p>Cutting conditions: <b>Heavy</b></p>
<p>Cutting conditions: <b>Severe</b></p>	<p><b>Roughening</b></p>	<p>Insert Type: <b>Flat-bottom</b></p>
<p>Insert Type: <b>Cap-shaped</b></p>	<p>Insert Type: <b>plug</b></p>	<p><b>With puller groove</b></p>