

Tricones

Drilling Tools

Product Catalogue

DRILLCO® 

About Us

DRILLCO® is at the forefront of innovation in the drilling industry, developing cutting-edge products and services that boost productivity, reduce downtime, and lower environmental impact.

With significant investments in R&D and partnerships with top universities, DRILLCO® leverages advanced simulation software to create bespoke consumables, equipment, and drilling services designed for optimal performance.

As a Chilean multinational, DRILLCO® specializes in providing state-of-the-art technological solutions for soil drilling in various sectors, including mining, geothermal, quarrying, water wells, and civil engineering projects.

Our modern 5,000 m² production facility in Quilicura boasts an impressive annual output capacity of 24,000 products, ensuring we meet the growing demands of our global clientele.

Exporting 85% of our products to 35 countries across the Americas, Africa, Europe, and Oceania, Drillco has achieved an average annual growth rate of 20% over the past three years, underscoring our commitment to excellence and innovation.

¿Why DRILLCO®?

Today, with over 50 years of expertise in hard rock drilling, DRILLCO® stands as the leader in mining drilling, boasting a presence in more than 30 countries through its 10 international branches. The PUMA BY DRILLCO® brand is a hallmark of quality and innovation, with PUMA® products in use from the Arctic Circle to Patagonia and from Siberia to the Sahara Desert.

At DRILLCO®, our mission is to deliver the lowest cost per meter in the market by tailoring our products to meet the unique requirements of each client.

This commitment to customization enables us to provide products specifically designed for every rock condition, ensuring a seamless user experience and helping our clients achieve their operational and economic objectives with ease.



Information / Code Signature

Insert Types



Dome Shape Tungsten Insert

DRILLCO®'s dome-shaped insert is engineered to provide optimal resistance against wear and impact, making it ideal for drilling in hard and abrasive formations. Its rounded profile enhances the cutting action by distributing pressure evenly, which reduces the likelihood of fracturing the insert. This design also aids in minimizing damage to the surrounding rock, facilitating smoother drilling operations and extending the overall lifespan of the tricone bit.



Flat Shape Tungsten Insert

DRILLCO®'s flat shape insert has a cylindrical body with a flat, level top surface.

Unlike conical or ballistic inserts, the cutting face of a flat insert is not pointed or rounded but rather flat and broad.

This design increases the protection of the surface area of the die (steel) in contact with the material being drilled.



Conical Shape Tungsten Insert

DRILLCO®'s conical insert features a conical design that enhances its ability to penetrate hard and abrasive formations.

Its pointed tip facilitates effective rock breaking and reduces wear on the insert. The conical shape also improves the insert's stability during drilling, making it suitable for applications where directional control and efficient cutting are essential.



Ballistic Tungsten Insert

DRILLCO®'s ballistic shape is optimized for cutting through soft and medium hard formations, where a sharper, more focused point is required to efficiently break the rock.

The ballistic design allows for faster drilling speeds compared to other insert shapes, as it minimizes the surface area in contact with the rock, reducing drag.

IADC

IADC Classification

The IADC classification system for tricone bits consists of several key components that categorize tricone bits based on their design features and intended applications. Here are the main elements:

1. Tricone Bit Type: This indicates the general type of tricone bit, such as roller cone, fixed cutter, or diamond bits.

2. Insert configuration: This describes the shape and arrangement of the inserts on the tricone bit. Common configurations include:

- Steel Tooth
- Tungsten carbide inserts
- Composite inserts

3. Tricone Bit Size: This refers to the diameter of the tricone bit, which is critical for compatibility with the drilling equipment and the wellbore specifications.

4. Application code: This provides information about the intended use of the tricone bit, including suitability for various formations (soft, medium, hard, or abrasive formations).

5. Design Features: Additional design characteristics may include the number of rows, cutting structure, and other features that influence performance.

6. IADC code: The code itself is a combination of letters and numbers that encapsulates the above information, allowing for easy identification and classification of tricone bits.

This classification system helps operators select the appropriate tricone bit for specific drilling conditions and enhances communication within the industry.



IADC digits

The IADC classification system consists of three digits:

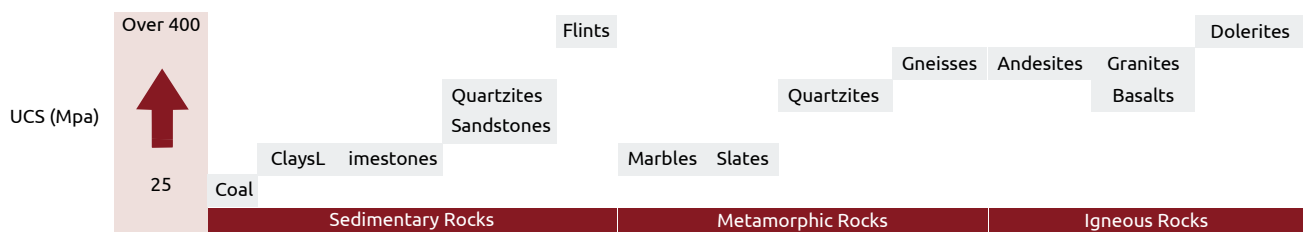
1. Geological Formation:

First digit

Digits 1, 2, 3: correspond to Milled Tooth (MT) tricone bits.

Digits 4, 5, 6, 7, 8: correspond to tungsten carbide insert (TCI) tricone bits.

The higher the number, the greater the hardness of the corresponding formation.



2. Hardness classification of the rock / Cutting Structure:

Second digit

Digits 1, 2, 3, 4 : Represent different categories of formation hardness.

Formation Strength	
1	Soft
2	Soft to Medium
3	Medium to Hard
4	Hard

3. Tricone Bit Profile:

Third digit: Code refers to special features and the bearing system.

Digits 1-7 Each number has a specific meaning, for example:

- Bearing type
- Unsealed or sealed
- External protection on the Leg or Shirttail
- Offset
- Insert Rows

Desing of cutting structure and tricone bit profile for PUMA

The cutting structure of Tricone bit is designed according to formation lithology and tricone bit type.



Milled Tools Tricone

DRILLCO®'s Milled Tools tricone bit is designed with hardened steel teeth that provide excellent penetration and durability in various geological formations.

This type of tricone bit is particularly effective in soft to medium rock and is characterized by its aggressive cutting action.

The Milled Tooth can be configured in various shapes and sizes to optimize performance based on the specific drilling conditions, these tricone bits are often used in applications where the formation is not excessively abrasive, allowing for efficient drilling and extended service life.

Tricone Carbyde Insert

This type of tricone bit is commonly used in the drilling of oil and gas wells, as well as in geothermal energy projects, mining, and other large-scale excavation activities.

They are suitable for use in a variety of rock formations, including soft shale, limestone, sandstone, and hard granite.



Borehole Bottom Cleaning and Debris Removal

For drilling to be effective, the bottom of the hole must be kept constantly clean, removing debris immediately after it is formed. If this is not done, a great deal of energy will be consumed in crushing these particles, resulting in wear and loss of performance, as well as the risk of entrapment.

Compressed air performs the following functions in this system:

- Cool and lubricate the tricone bit bearings
- Clean the bottom of the hole
- Raise the cuttings with an adequate ascending speed

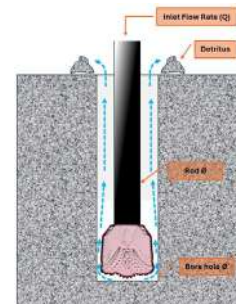
Borehole cleaning is achieved through the injection of a fluid—air, water, or foam—under pressure, delivered to the borehole bottom via a central passage in the drill rods and dispersed through designated openings in the tricone bit.

Debris is evacuated through the annular space between the drill rods and the borehole wall. Air flushing is commonly employed in open-pit operations, where dust can be effectively managed with collectors. Additionally, the introduction of water enhances borehole wall stability.

The recommended upward velocities for effective air cleaning range between 15 and 30 m/s, depending on the specific drilling model.

$$Q = V_R (\text{Air speed required}) \cdot (\text{ØBorehole}^2 - \text{ØRod}^2) \cdot 47 \left(\frac{m^3}{min} \right)$$

$$Q = \frac{V_R \cdot (\text{ØBorehole}^2 - \text{ØRod}^2)}{183.3} (cfm)$$



Utilizing the previously derived equations, the air flow rate can be calculated. Conversely, if the air flow rate is predetermined or set, the corresponding drilling speed can be determined.

Below are reference values for flushing speed; however, initial tests are recommended to calibrate these values according to specific operational conditions and the client's drilling environment.

- Fine Debris and Lightweight Minerals: 26 m/s | 5,000 ft/min
- Large Debris and Heavy Minerals: 36 m/s | 7,000 ft/min
- Large Debris with High Water Presence: 52 m/s | 10,000 ft/min

These values provide a baseline for flushing speeds, ensuring effective debris removal under varying conditions.



Tricones

Tricone bits are renowned for their versatility and efficiency in drilling applications. Featuring three rotating cones, these bits excel in various geological formations, including soft, medium, and hard rock. Each cone is equipped with hardened steel teeth or tungsten carbide inserts, providing durability and enhanced cutting performance. The design allows for optimal weight distribution and cooling, resulting in extended bit life and improved rate of penetration (ROP). Additionally, Tricone bits are available in various sizes and configurations, making them suitable for mining, oil and gas exploration, and water well drilling. Their adaptability to different drilling conditions and formations makes them a popular choice among industry professionals.

PR TRI Ø10 5/8 MSB615 API REG 6 5/8



*Referential Image

Code	3021006152001		
Description	Unit	Dimension	
Diameter	inch /mm	10 5/8" - 270 mm	
IADC		6-1-5	
Connection Thread	inch	6" 6 5/8"	Beco Regular
Nozzle	3 units	Steel	

Operating Parameters*		
Weight on Bit (WOB)	KN	140 to 280
Rotary Speed	RPM	60 to 100
Air Back Pressure	MPa	0,2 - 0,4

Features		
Bering	----	Standar Roller Semi-Close
Application	----	Mining Copper / Gold
Insert Shape	MPa	159 - 207
	----	Semi Ballistic
	----	5-4-4
Lug Protection	----	Welding + Inserts

PR TRI Ø7 7/8 MSB635 API REG 4 1/2



*Referential Image

Code 3020706352001

Description	Unit	Dimension
Diameter	inch /mm	7 7/8" - 200 mm
IADC		6-3-5
Connection Thread	inch	4 1/2" Regular
Nozzle	3 units	Steel

Operating Parameters*

Weight on Bit (WOB)	KN	120 to 240
Rotary Speed	RPM	80 to 100
Air Back Pressure	MPa	0,2 - 0,4

Features

Bering	----	Standar Roller Semi-Close
Application	----	Mining Copper / Gold
UCS	MPa	200 - 262
Insert Shape	----	Semi Ballistic
Rows	----	4-4-4
Lug Protection	----	Welding + Inserts

PR TRI Ø12 1/4 MSC625 BECO 6



*Referential Image

Code	3021206252002		
Description	Unit	Dimension	
Diameter	inch /mm	12 1/4" - 311 mm	
IADC		6-2-5	
Connection Thread	inch	6" 6 5/8"	Beco Regular
Nozzle	3 units	Steel	

Operating Parameters*		
Weight on Bit (WOB)	KN	200 to 370
Rotary Speed	RPM	60 to 110
Air Back Pressure	MPa	0,2 - 0,4

Features		
Bering	----	Standar Roller Semi-Close
Application	----	Mining Copper / Gold
UCS	MPa	200 - 262
Insert Shape	----	Ballistic
Rows	----	4-4-4
Lug Protection	----	Welding + Inserts

PR TRI Ø12 1/4 MSA635 API REG 6 5/8



*Referential Image

Code	3021206352002		
Description	Unit	Dimension	
Diameter	inch /mm	12 1/4" - 311 mm	
IADC		6-3-5	
Connection Thread	inch	6" 6 5/8"	Beco Regular
Nozzle	3 units	Steel	

Operating Parameters*		
Weight on Bit (WOB)	KN	215 to 380
Rotary Speed	RPM	60 to 90
Air Back Pressure	MPa	0,2 - 0,4

Features		
Bering	----	Standar Roller Semi-Close
Application	----	Mining Copper / Gold / Iron
UCS	MPa	276 - 331
Insert Shape	----	Semi Ballistic
Rows	----	5-5-4
Lug Protection	----	Welding + Inserts

PR TRI Ø12 1/4 MSC625 API REG 6 5/8



*Referential Image

Code	3021206251001	
Description	Unit	Dimension
Diameter	inch /mm	12 1/4" - 311 mm
IADC		6-2-5
Connection Thread	inch	6" Beco 6 5/8" Regular
Nozzle	3 units mm	Steel Ø22 / Ø25

Operating Parameters*

Weight on Bit (WOB)	KN	200 to 370
Rotary Speed	RPM	60 to 110
Air Back Pressure	MPa	0,2 - 0,4

Features

Bering	----	Journal & Roller Bearing Close
Application	----	Mining Copper
UCS	MPa	200 - 262
Insert Shape	----	Double spherical teeth
ROWS	----	5-4-4
Lug Protection	----	Welding + Inserts

PR TRI Ø12 1/4 MSA635 BECO 6



*Referential Image

Code	3021206351001	
Description	Unit	Dimension
Diameter	inch /mm	12 1/4" - 311 mm
IADC		6-3-5
Connection Thread	inch	6" Beco 6 5/8" Regular
Nozzle	3 units mm	Steel Ø22 / Ø25

Operating Parameters*		
Weight on Bit (WOB)	KN	215 to 380
Rotary Speed	RPM	60 to 90
Air Back Pressure	MPa	0,2 - 0,4

Features		
Bering	----	Journal & Roller Bearing Close
Application	----	Mining Copper
UCS	MPa	200 - 262
Insert Shape	----	Double spherical teeth
ROWS	----	5-4-4
Lug Protection	----	Welding + Inserts

PR TRI Ø7 7/8 MFE117 API REG 4 1/2

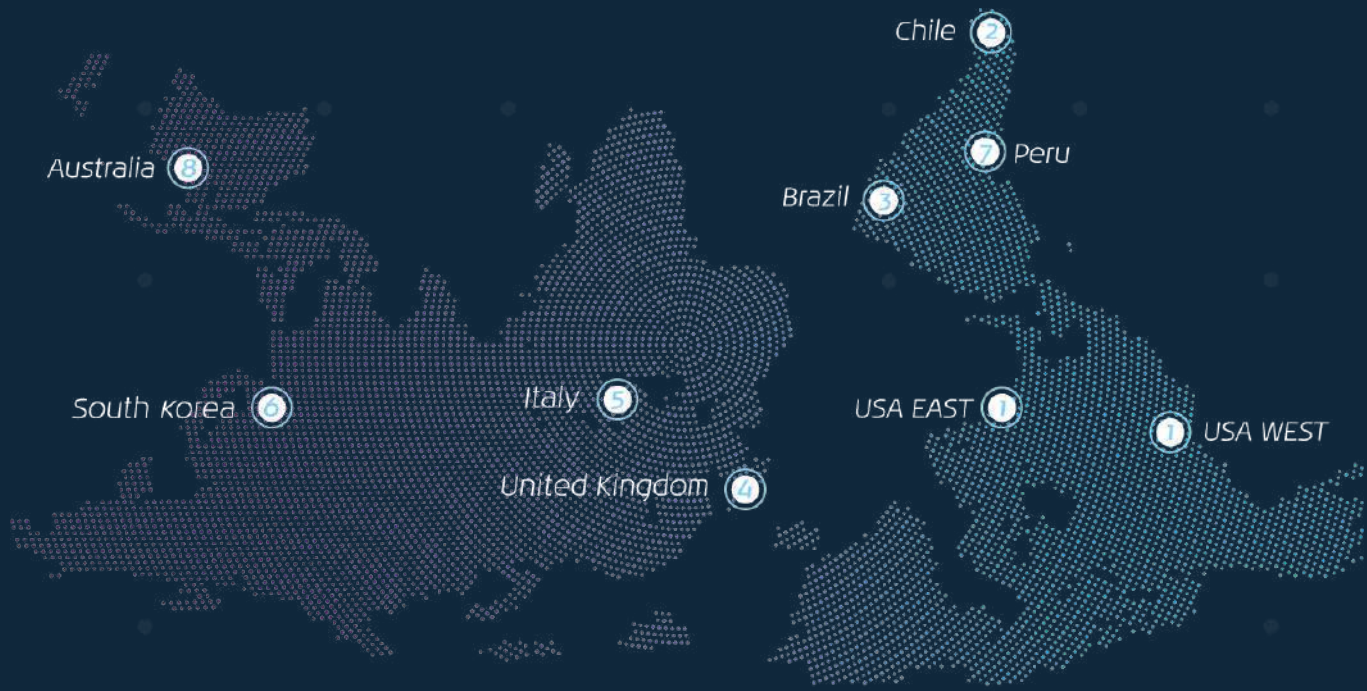


*Referential Image

Code	3020701171001		
Description	Unit	Dimension	
Diameter	inch /mm	7 7/8" - 200 mm	
IADC		1-1-7	
Connection Thread	inch	4 1/2"	Regular
Nozzle	3 units	Steel	

Operating Parameters*			
Weight on Bit (WOB)	KN	70 to 180	
Rotary Speed	RPM	60 to 300	

Features			
Bering	----	Journal & Roller Bearing Close	
Application	----	Mining Copper	
UCS	MPa	200 - 262	
Insert Shape	----	Double spherical teeth	
Rows	----	5-4-4	
Lug Protection	----	Welding + Inserts	



1 Drillco USA
Elko, NV
Atlanta, GA
Rockwood, PA
infousa@drillco.com

2 Drillco Chile
Santiago
infochile@drillco.com

3 Drillco Brazil
Santa Catarina
infobrazil@drillco.com

4 Drillco UK
Leeds
infoeuropa@drillco.com

5 Drillco Italy
Milan
info@drillco.it

6 Drillco Asia
Seoul, South Korea
infoasia@drillco.com

7 Drillco Peru
Lima
infoperu@drillco.com

8 Drillco Australia
Sydney
infoaustralia@drillco.com

Discover more at: www.drillco.com

CONTACT US



info@drillco.com

