



G-ROC TRICONE BITS

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In the whole drilling package of Drill rig and the drill string, it is the bit that actually gets in contact with the rock. The bit has to go through all the variable ground conditions to successfully complete the desired service life with appreciated penetration rates. This role of bit makes it an important component in the whole drill package. The big task given to the bit is to drill fast and live long.

A lot of external and internal factors will decide the performance of the bit. External factors like the compressive strength, abrasiveness, selection of drill string, drill rig and the air package etc and internal factors like cutting structure, design, metallurgy, carbide and process will influence the performance of the bit

We G-ROC has considered both the factors and developed products that will accomplish the given task. An ISO certified company with years of experience on field and in manufacturing ensures that the product leaves our premises with the best of the quality.



Bit Selection

G-ROC follows the standard coding system of IADC (International Association of Drilling Contractors)

First Digit of IADC Code – Bit Type and Hardness Class

1 to 3 – Steel Tooth

3 to 8 – Tungsten Carbide

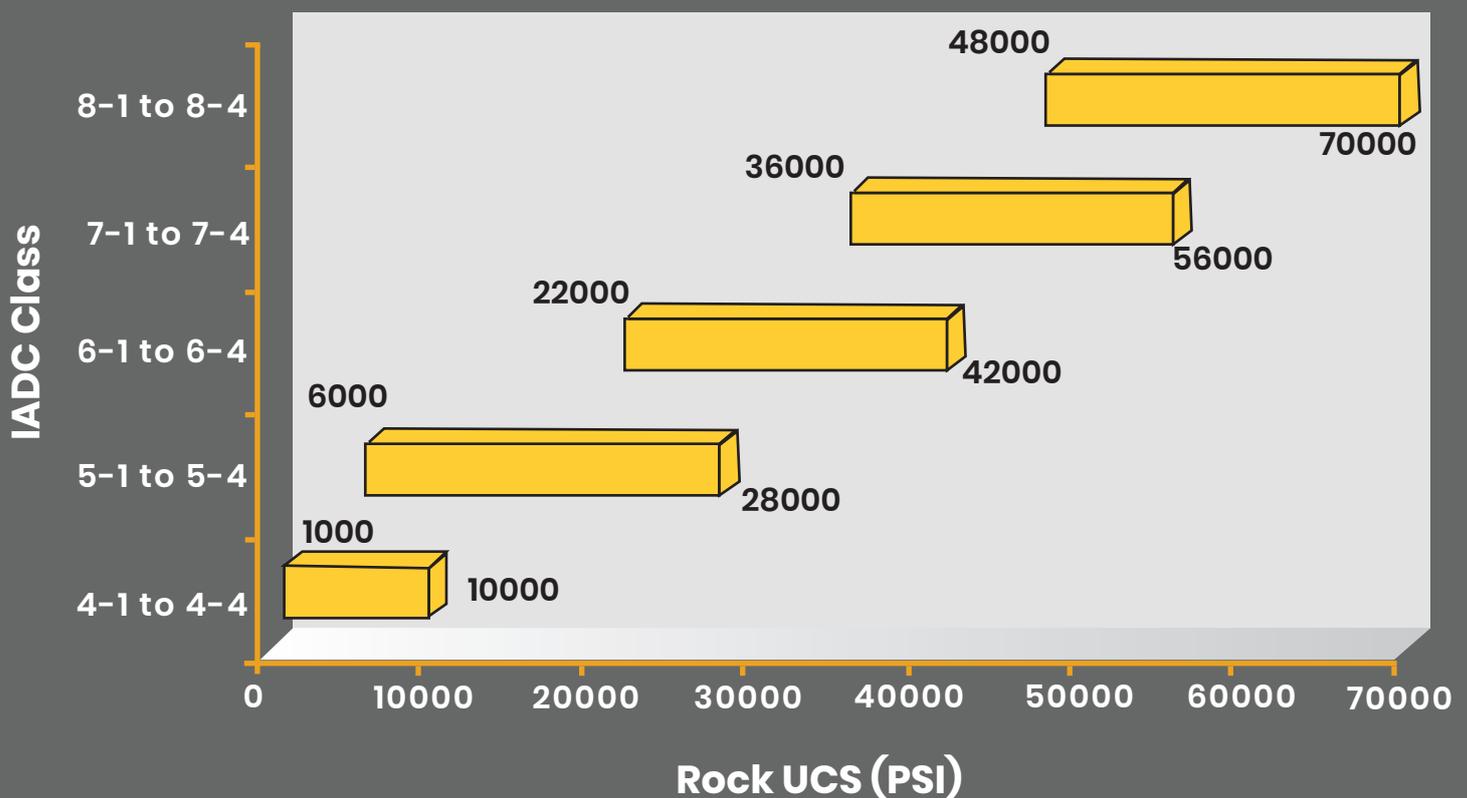


Higher the digit, Higher is the hardness of the rock it is used in

Second Digit of IADC Code – Indicates the hardness sub class

1 – 4, 1 indicates the softest subclass of first digit of IADC and 4 the hardest

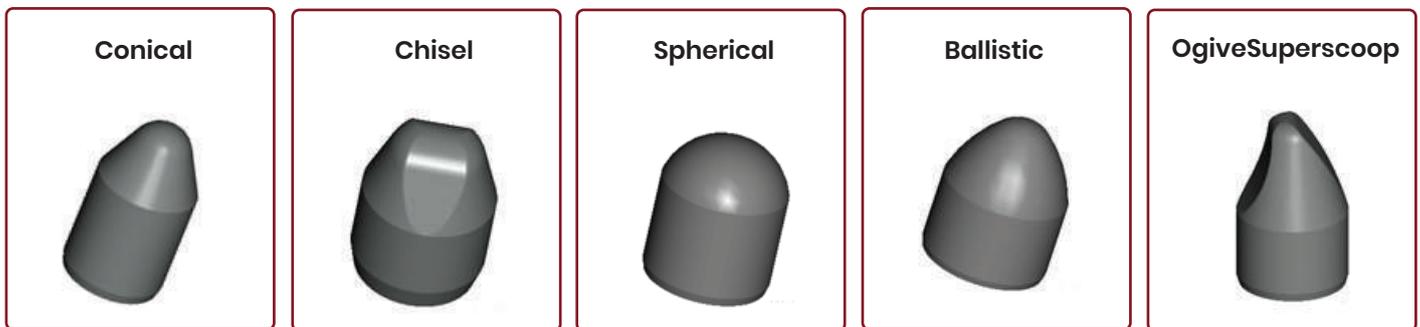
IADC vs. Rock UCS



Third digit of IADC – Indicates the Bit Features

1. **Roller Bearing – “Open Bearing” Fluid Circulation**
2. **Roller Bearing – “Open Bearing” air circulaion**
3. **Roller Bearing with Gage Protection – Any non sealed, open air or fluid bearing with gage protection.**
4. **Sealed Roller Bearing – Tooth or TCI**
5. **Sealed Roller Bearing with Gage Protection – Tooth or TCI, 311 mm and larger.**
6. **Sealed Friction Bearing – Tooth or TCI**
7. **Sealed Friction Bearing with Gage Protection – Tooth or TCI, 311 mm and smaller**
8. **Directional Drilling Features**
9. **Other Features**

Carbide Inserts

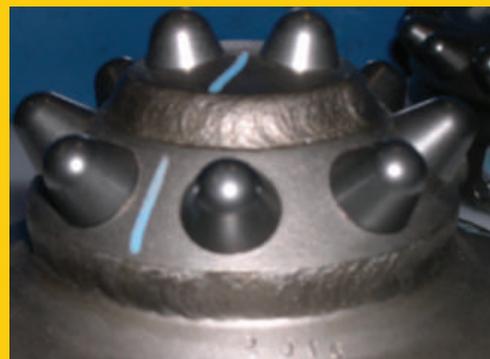


Other Features

Armor



Hard Nose



Cutting Structure

Cutting Structure on G-ROC bits are engineered for better penetration rates and increased bit life. The classification of G-ROC TCI bits depends on the Carbide shape, size and the count. It is clear that the height of the carbide lowers as we move higher on the IADC scale. The count of the carbide increases with the increase in IADC. In short the inserts of bits used to drill soft formation have high protrusions, diameter and less count. The inserts in bits used to drill the hardest formation will have the shortest protrusions and more count. The skill is to modify the cutting structure in each type to the drilling conditions for the utmost results

G4



G7



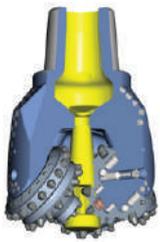
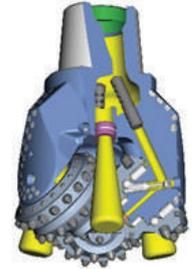
Bearing design

With varying loads applied on bit in different applications, all our bearings are designed to hold these conditions and achieve the best possible life. A fail proof concept supported by the precision machining and assembly guarantees the longevity of the bearing

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Open Bearing – Air Circulation – Non obstructive passages to ensures a smooth and un restricted airflow from the rig to the bearing area. This air cools, lubricates and cleans the bearing thereby increasing the longevity of the bearing. This bearing structure is more popular in mining applications



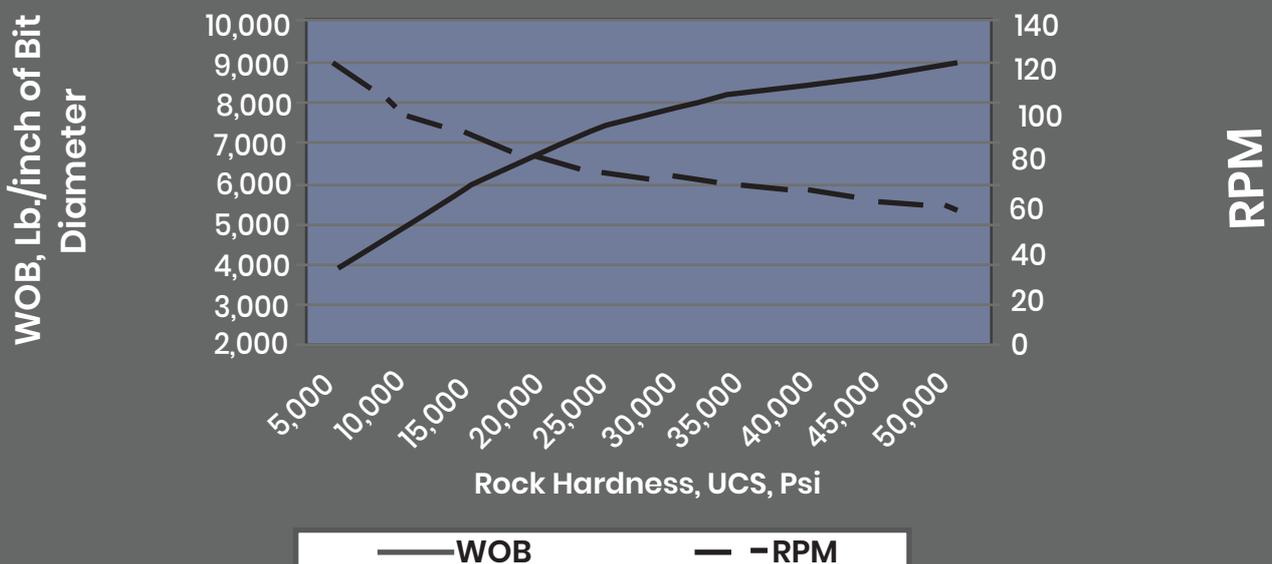
Open Bearing – Air, Mud Circulation – This bearing structure is more popular in Water Well application. This type of open bearing is without air passage and is used to drill with Mud or other drilling additives.

Pull Down and Rotation requirements

As known rotary drilling is called a non-percussive drilling. Right Weight on Bit and rotation speed helps to break the rock and progress further during drilling. Required Pull down is given to sufficiently shove the teeth of the bit into the rock to break it efficiently. On the other hand the rpm on the bit ensures the indexing of the teeth on the bit.

In soft rock drilling, not much weight on bit is required, rpm is the prime driver for better ROP. In the case of hard rock, it is vice versa.

Operating Parameters vs. Rock Hardness

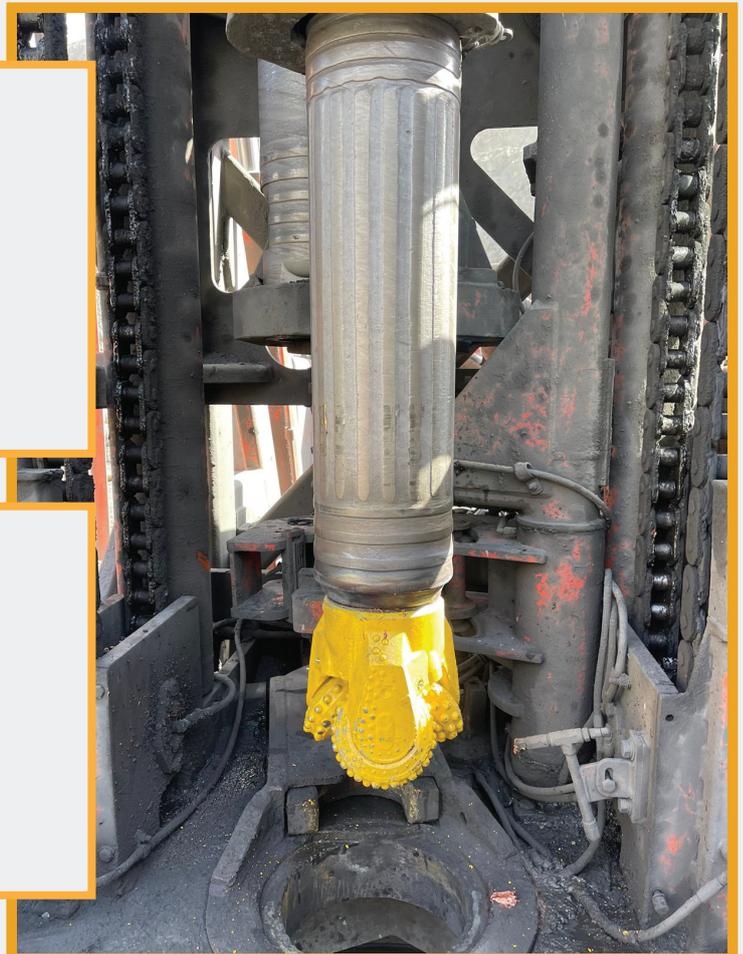


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Open bearing – Air Circulation

Bit Diameter		IADC Classification																
Inch	mm	3-3	4-1	4-2	4-3	4-4	5-1	5-2	5-3	5-4	6-1	6-2	6-3	6-4	7-1	7-2	7-3	7-4
5 7/8"	150												•					
6 1/4"	159	•							•				•					
6 1/2"	165																	
6 3/4"	171			•					•				•	•			•	
7"	178																	
7 7/8"	200			•					•				•	•			•	
8 1/2"	216								•				•				•	
8 5/8"	219																	
9"	229			•					•				•				•	
9 1/2"	241																	
9 7/8"	251	•		•					•				•	•		•	•	
10 5/8"	270	•		•					•				•				•	
11"	284								•				•				•	
12 1/4"	311								•				•			•		



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Open bearing - Air, Mud or Foam Circulation

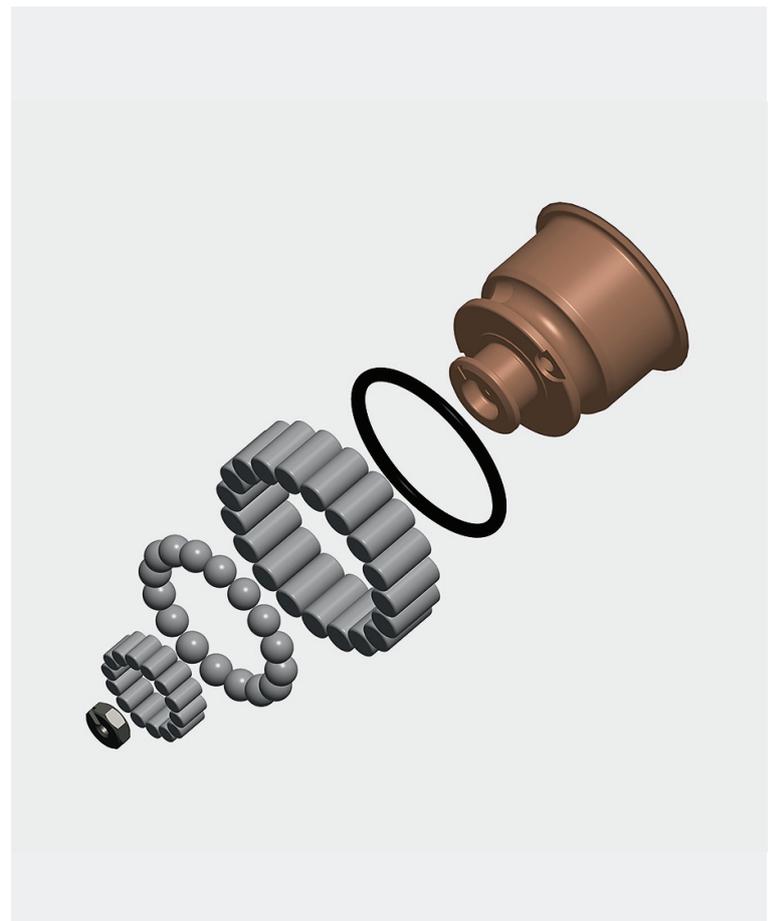
Bit Diameter		IADC Classification							
Inch	mm	11	23	32	33	40	50	60	70
2 1/2"	63.50	•	•	•	•		•		•
2 5/8"	66.67	•	•	•	•		•		•
2 7/8"	73.02	•	•	•	•		•		•
2 15/16"	74.61	•	•	•	•		•		•
3"	76.20	•	•	•	•		•		•
3 1/8"	79.37	•	•	•	•		•		•
3 1/4"	82.55	•	•	•	•		•		•
3 3/8"	85.72	•	•	•	•		•		•
3 1/2"	88.90	•	•	•	•		•		•
3 5/8"	92.07	•	•	•	•		•		•
3 3/4"	95.25	•	•	•	•		•		•
3 7/8"	98.42	•	•	•	•		•		•
4"	101.60	•	•	•	•		•		•
4 1/8"	104.80	•	•	•	•		•		•
4 1/4"	107.60	•	•	•	•		•		•
4 3/8"	111.10	•	•	•	•		•		•
4 1/2"	114.30	•	•	•	•		•		•
4 5/8"	117.50	•	•	•	•		•		•
4 3/4"	120.70	•	•	•	•		•		•
4 7/8"	123.80	•	•	•	•		•		•
5"	127.00	•	•	•	•		•		•
5 1/8"	130.20	•	•	•	•		•		•
5 1/4"	133.40	•	•	•	•		•		•
5 3/8"	136.50	•	•	•	•		•		•
5 1/2"	139.70	•	•	•	•		•		•
5 5/8"	142.8	•	•	•	•		•		•
5 3/4"	146	•	•	•	•		•		•
5 7/8"	149.2	•	•	•	•	•	•		•
6"	152.4	•	•	•	•	•	•		•
6 1/8"	155.6	•	•	•	•		•		•
6 1/4"	158.8	•	•	•	•		•		•
6 3/8"	161.9	•	•	•	•		•		•
6 1/2"	165.1	•	•	•	•		•		•
6 5/8"	168	•	•	•	•		•		•
6 3/4"	171.5	•	•	•	•	•	•		•
7"	177.8	•	•	•	•		•		•
7 1/4"	184								•
7 3/8"	187								•
7 1/2"	191				•				•
7 5/8"	193.6								•
7 7/8"	200	•		•			•	•	
8"	203							•	
8 1/2"	216								
8 5/8"	219								
9 1/2"	241								
9 5/8"	244								
9 7/8"	251				•			•	
10"	254				•				
10 5/8"	270								
12 1/4"	311								

Sealed bearing - Mud Circulation

Bit Diameter		IADC Classification							
Inch	mm	117	216	527	647				
4 3/4"	120.70	•	•	•					
5 1/8"	130.20			•					
5 1/2"	139.70	•		•					
6"	152.4	•		•					
6 1/4"	158.8	•		•					
6 1/2"	165.1	•		•					
6 3/4"	171.5	•		•					
7 7/8"	200	•		•					
8 1/2"	216	•		•					
9 7/8"	251	•		•					
10 5/8"	270				•				
12 1/4"	311	•		•					

Semi-Sealed bearing - Air Circulation

Bit Diameter		IADC Classification							
Inch	mm	43	52	63	74				
9 7/8"	251	•			•				
10 5/8"	270			•	•				
11"	284			•	•				
12 1/4"	311								



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Care and Maintenance

Avoid dropping of the bits which can damage the teeth on the bit. At most care to be taken to protect the threads by handling the bits rightly and applying slight anti galling grease on it.

Avoid exposing the new bits to dust and junk. Don't leave the new bits in open. Ensure to pack the new bits in covered boxes

New Bit Start Up

Follow the 1/3rd rule for the first hole. Apply 1/3rd of the recommended WOB and RPM for the 1/3rd depth of the hole. Apply 2/3rd of the recommended WOB and RPM for the 2/3rd of the hole depth. Apply the recommend WOB and RPM on bit for the last 1/3rd depth of the hole.



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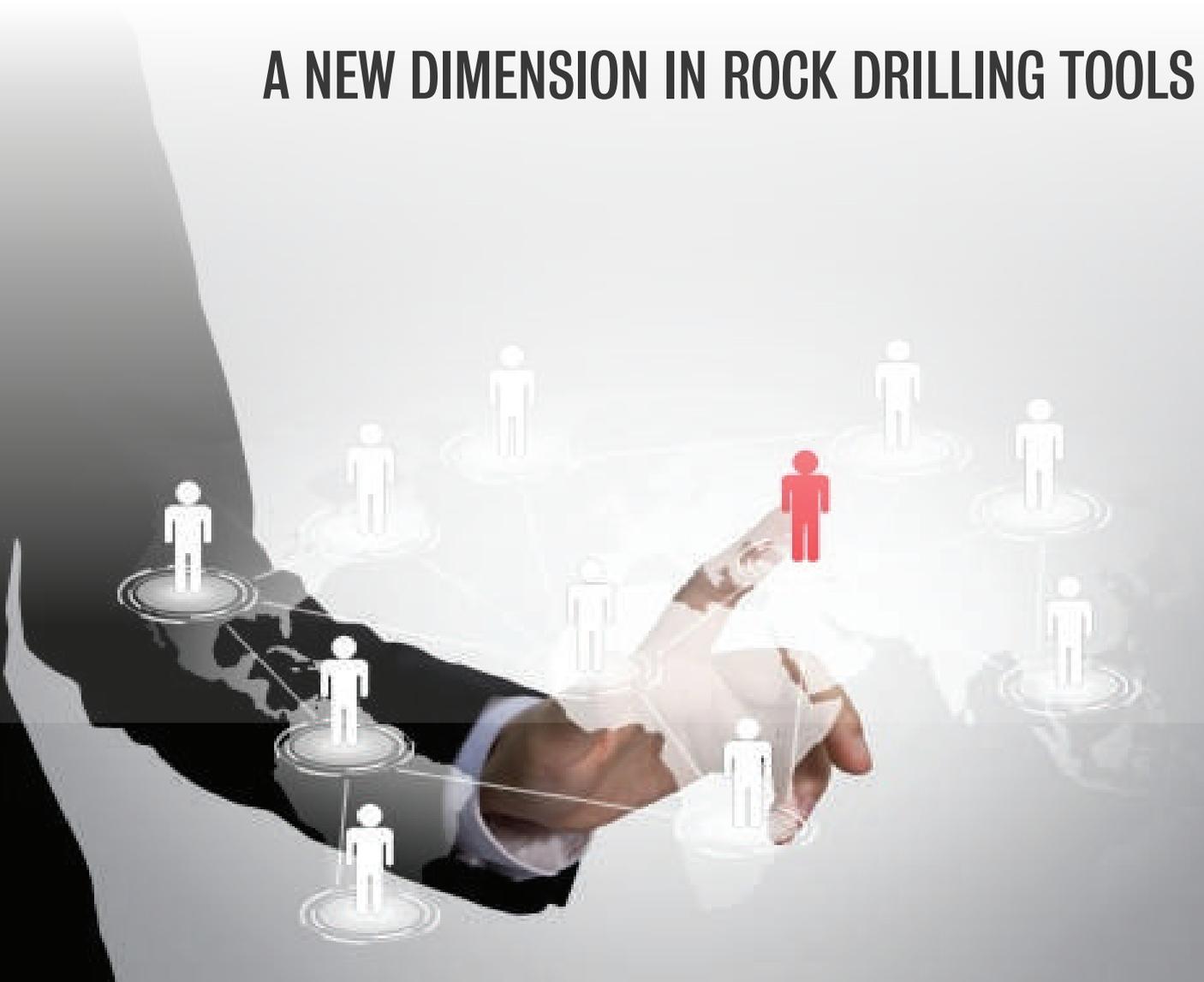


While Drilling

- ✔ Never leave the bit inside a wet hole
- ✔ Keep the bit in rotation while it is in hole
- ✔ Ensure Continuous supply of Air when the bit is inside the hole
- ✔ Never use new bit to re drill holes.



A NEW DIMENSION IN ROCK DRILLING TOOLS



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