

Cat[®] Tricone Drill Bits



Product Support & Logistics Division



Cat[®] Tricone Drill Bits

Cat tricone drill bits are designed for the toughest and most severe rotary blasthole applications, yet suitable for all your drilling needs. Cat's comprehensive tricone bit offering includes a wide range of bit diameters with various carbide shapes/cutting face arrangements to maximize rate of penetration. Caterpillar's extensive experience with heat treatment technology and advanced air-cooled bearing design yields longer life, resulting in lower overall drilling costs. Please contact your Cat dealer to discuss the details of your unique application and how Caterpillar can partner with you to achieve the lowest possible drilling cost.



Rock Formation to Tricone Bit Conversions									
		Rock Formation							
		Limestone (soft) Sandstone	Limestone (hard)	Quartzite (soft) Ironstone	Granite	Dolorite	Basalt Quartzite (hard)		
		Rock Strength (MPa)							
Inch	mm	10	125	185	200	250	345	435	480
6 3/4	171	S-2	M-1		M-3				
7 7/8	200	S-2	M-1		M-3				
9	229	S-3		M-2		H-1			
9 7/8	251	M-1		M-3			H-1		
10 5/8	271	S-3		M-3			H-1		
12 1/4	311	M-1		M-3			H-1		

Cat [®] Tricone Drill Bits												
Bit Diameter		Soft			Medium			Hard			Weight	
in	mm	1	2	3	1	2	3	1	2	3	kg	lbs
6 3/4	171		546-3432		550-1610		550-1612				21	46
7 7/8	200		546-3434		547-1830		548-7876				37	81
9	229			550-1614		550-1616		550-1618			43	96
9 7/8	251				533-7827		543-1428	543-1430			66	145
10 5/8	271			550-1172			545-3906	545-5279			72	160
12 1/4	311				550-1620		533-7830	550-2360			99	220

Note: Caterpillar continues to develop drill bit models for availability off-the-shelf. If your application does not have a Cat Part Number, it can be developed upon request. Please contact your local Cat dealer.

6-3/4" (171 mm) Cat[®] Tricone Drill Bits



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Features / Benefits

- **Air Cooled Bearings** - Cat's anti-friction design provides for long life in tough applications by reducing the heat generation of tricone drill bits.
- **Cone Protection** - Utilize special technology to prevent severe wear on the cone by drilling cuttings and unbroken rock ridges; therefore, greatly improving the working life of the bit. The gage row design has been proven to improve resistance to diameter shrinkage.
- **Cutting Structure** – Optimized for high wear resistance and toughness of the inserts, enable aggressive cutting to increase rate of penetration.
- **Cone Carbide Layout** - Designed to create an optimal rock fragmentation to provide the highest rate of penetration for your particular application.
- **Shirrtail Protection** - Several advanced techniques and materials are considered, the best combination is selected by our engineers to provide excellent protection in this region to further extend the bit's service life.
- **Cuttings Removal** - Special design increases space for cutting removal with enlarged "junk slot", which facilitates removal of drilling cuttings.



Specifications	
IADC	4-3-2
Bearing and seal	Ball Locked and Roller Bearing, Air-cooled
Number of rows	4-4-3
Number of cutters	93
Cutter shapes	Conical, Chisel and Round
Circulation	3 Air jet nozzles
Pin connection thread size	3 1/2 API REG* with back flow valve
Standard nozzle installed	14 mm
Approximate Weight	46 lbs (21kg)

Operating Parameters	
Weight on bit (WOB)	6,000 to 27,000 lbs (30-120 kn)
Rotary speed	90 to 120 RPM
Air back pressure on bit	29-58 PSI (0.2 - 0.4 MPa)

Nozzle Inside Diameters		
in.	mm.	Part Number
1/2	12	545-7155
9/16	14	553-5029
5/8	16	553-5030
Pin		553-5026

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Specifications	
IADC	5-4-2
Bearing and seal	Ball Locked and Roller Bearing, Air-cooled
Number of rows	4-4-3
Number of cutters	93
Cutter shapes	Conical and Round
Circulation	3 Air jet nozzles
Pin connection thread size	3 1/2 API* REG with back flow valve
Standard nozzle installed	14 mm
Approximate weight	46 lbs (21kg)

Operating Parameters	
Weight on bit (WOB)	13,000 to 37,500 lbs (60-166 kn)
Rotary speed	80 to 110 RPM
Air back pressure on bit	29-58 PSI (0.2-0.4 MPa)

Nozzle Inside Diameters		
in.	mm.	Part Number
1/2	12	545-7155
9/16	14	553-5029
5/8	16	553-5030
Pin		553-5026

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Specifications	
IADC	6-4-2
Bearing and seal	Ball Locked and Roller Bearing, Air-cooled
Number of rows	4-4-4
Number of cutters	105
Cutter shapes	Conical, Ovoid and Round
Circulation	3 Air jet nozzles
Pin connection thread size	3 1/2 API* REG with back flow valve
Standard nozzle installed	14 mm
Approximate weight	46 lbs (21kg)

Operating Parameters	
Weight on bit (WOB)	20,000 to 40,500 lbs (90-180 kn)
Rotary speed	60 to 100 RPM
Air back pressure on bit	29-58 PSI (0.2-0.4 MPa)

Nozzle Inside Diameters		
in.	mm.	Part Number
1/2	12	545-7155
9/16	14	553-5029
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7-7/8" (200 mm) Cat[®] Tricone Drill Bits



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Specifications	
IADC	4-3-2
Bearing and seal	Ball Locked and Roller Bearing, Air-cooled
Number of rows	4-4-4
Number of cutters	116
Cutter shapes	Conical Compacts, Chisel, Round
Circulation	3 Air jet nozzles
Pin connection thread size	4 1/2 API* REG with back flow valve
Standard nozzle installed	14 mm
Approximate weight	75 lbs (34 kg)

*Also available in BECO pin thread

Operating Parameters	
Weight on bit (WOB)	7,875 to 31,500 lbs (35-140 kN)
Rotary speed	90 to 120 RPM
Air back pressure on bit	29-58 PSI (0.2-0.4 MPa)

Nozzle Inside Diameters		
in.	mm.	Part Number
1/2	12	558-9407
33/64	13	558-9408
9/16	14	548-9538
5/8	16	553-5027
11/16	18	553-5028
Pin		549-0519

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Specifications	
IADC	5-4-2
Bearing and seal	Ball Locked and Roller Bearing, Air-cooled
Number of rows	4-4-4
Number of cutters	122
Cutter shapes	Conical and Round
Circulation	3 Air jet nozzles
Pin connection thread size	4 1/2 API* REG with back flow valve
Standard nozzle installed	14 mm
Approximate weight	75 lbs (34kg)

*Also available in BECO pin thread

Operating Parameters	
Weight on bit (WOB)	15,750 to 39,380 lbs (70-175 kN)
Rotary speed	80 to 110 RPM
Air back pressure on bit	29-58 PSI (0.2-0.4 MPa)

Nozzle Inside Diameters		
in.	mm.	Part Number
1/2	12	558-9407
33/64	13	558-9408
9/16	14	548-9538
5/8	16	553-5027
11/16	18	553-5028
Pin		549-0519

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Specifications	
IADC	6-4-2
Bearing and seal	Ball Locked and Roller Bearing, Air-cooled
Number of rows	4-4-4
Number of cutters	135
Cutter shapes	Conical Ovoid, and Round
Circulation	3 Air jet nozzles
Pin connection thread size	4 1/2 API* REG with back flow valve
Standard nozzle installed	14 mm
Approximate weight	75 lbs (34 kg)

*Also available in BECO pin thread

Operating Parameters	
Weight on bit (WOB)	23,630 to 47,250 lbs (105-210 kN)
Rotary speed	60 to 100 RPM
Air back pressure on bit	29-58 PSI (0.2-0.4 MPa)

Nozzle Inside Diameters		
in.	mm.	Part Number
1/2	12	558-9407
33/64	13	558-9408
9/16	14	548-9538
5/8	16	553-5027
11/16	18	553-5028
Pin		549-0519

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9" (229 mm) Cat[®] Tricone Drill Bits



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Specifications	
IADC	5-1-2
Bearing and seal	Ball Locked and Roller Bearing, Air-cooled
Number of rows	3-3-4
Number of cutters	89
Cutter shapes	Conical Chisel, and Round
Circulation	3 Air jet nozzles
Pin connection thread size	4 1/2 API* REG with back flow valve
Standard nozzle installed	16 mm
Approximate weight	110 lbs (50 kg)

*Also available in BECO pin thread

Operating Parameters	
Weight on bit (WOB)	9,000 to 36,000 lbs (40-160 kN)
Rotary speed	90 to 120 RPM
Air back pressure on bit	29-58 PSI (0.2-0.4 MPa)

Nozzle Inside Diameters		
in.	mm.	Part Number
1/2	12	558-9407
33/64	13	558-9408
9/16	14	548-9538
5/8	16	553-5027
11/16	18	553-5028
Pin		549-0519

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Specifications	
IADC	6-3-2
Bearing and seal	Ball Locked and Roller Bearing, Air-cooled
Number of rows	4-4-4
Number of cutters	146
Cutter shapes	Conical, Ovoid, and Round
Circulation	3 Air jet nozzles
Pin connection thread size	4 1/2 API* REG with back flow valve
Standard nozzle installed	16 mm
Approximate weight	110 lbs (50 kg)

*Also available in BECO pin thread

Operating Parameters	
Weight on bit (WOB)	27,000 to 54,000 lbs (120-240 kN)
Rotary speed	60 to 100 RPM
Air back pressure on bit	29-58 PSI (0.2-0.4 MPa)

Nozzle Inside Diameters		
in.	mm.	Part Number
1/2	12	558-9407
33/64	13	558-9408
9/16	14	548-9538
5/8	16	553-5027
11/16	18	553-5028
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Specifications	
IADC	7-2-2
Bearing and seal	Ball Locked and Roller Bearing, Air-cooled
Number of rows	5-5-4
Number of cutters	166
Cutter shapes	Conical, Ovoid, and Round
Circulation	3 Air jet nozzles
Pin connection thread size	4 1/2 API* REG with back flow valve
Standard nozzle installed	16 mm
Approximate weight	110 lbs (50 kg)

*Also available in BECO pin thread

Operating Parameters	
Weight on bit (WOB)	36,000 to 63,000 lbs (160-280 kN)
Rotary speed	60 to 90 RPM
Air back pressure on bit	29-58 PSI (0.2-0.4 MPa)

Nozzle Inside Diameters		
in.	mm.	Part Number
1/2	12	558-9407
33/64	13	558-9408
9/16	14	548-9538
5/8	16	553-5027
11/16	18	553-5028
Pin		549-0519

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9-7/8" (251 mm) Cat[®] Tricone Drill Bits



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- **Cuttings Removal** - Special design increases space for cutting removal with enlarged "junk slot", which facilitates removal of drilling cuttings.



Specifications	
IADC	5-4-2
Bearing and seal	Ball Locked and Roller Bearing, Air-cooled
Number of rows	4-4-4
Number of cutters	121
Cutter shapes	Conical Compacts
Circulation	3 Air jet nozzles
Pin connection thread size	6 5/8 API* REG with Back Flow Valve
Standard nozzle installed	5/8 in (16 mm)
Approximate weight	145 lbs (66 kg)

Nozzle Inside Diameters		
in.	mm.	Part Number
9/16	14	540-9154
5/8	16	541-4661
11/16	18	541-4662
7/8	22	541-6668
15/16	24	547-8707
1	25	541-4671

*Also available in BECO pin thread

Operating Parameters	
Weight on bit (WOB)	20,000 to 50,000 lbs (88.9-222.4 kN)
Rotary speed	60 to 120 RPM
Air back pressure on bit	29-58 PSI (0.2-0.4 MPa)

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Specifications	
IADC	6-4-2
Bearing and seal	Ball Locked and Roller Bearing, Air-cooled
Number of rows	5-4-4
Number of cutters	154
Cutter shapes	Conical Compacts
Circulation	3 Air jet nozzles
Pin connection thread size	6 5/8 API* REGwith Back Flow Valve
Standard nozzle installed	5/8 in (16 mm)
Approximate weight	145 lbs (66 kg)

*Also available in BECO pin thread

Operating Parameters	
Weight on bit (WOB)	30,000 to 60,000 lbs (133.4-266.8 kN)
Rotary speed	60 to 100 RPM
Air back pressure on bit	29-58 PSI (0.2-0.4 MPa)

Nozzle Inside Diameters		
in.	mm.	Part Number
9/16	14	540-9154
5/8	16	541-4661
11/16	18	541-4662
7/8	22	541-6668
15/16	24	547-8707
1	26	563-1052

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Specifications	
IADC	7-2-2
Bearing and seal	Ball Locked and Roller Bearing, Air-cooled
Number of rows	5-5-4
Number of cutters	176
Cutter shapes	Conical Compacts
Circulation	3 Air jet nozzles
Pin connection thread size	6 5/8 API* REG with Back Flow Valve
Standard nozzle installed	5/8 in (16 mm)
Approximate weight	143 lbs (65 kg)

*Also available in BECO pin thread

Operating Parameters	
Weight on bit (WOB)	40,000 to 90,000 lbs (177.0-400.3 kN)
Rotary speed	60 to 100 RPM
Air back pressure on bit	29-58 PSI (0.2-0.4 MPa)

Nozzle Inside Diameters		
in.	mm.	Part Number
9/16	14	540-9154
5/8	16	541-4661
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1	25	541-4671

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10-5/8" (271 mm) Cat[®] Tricone Drill Bits



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Specifications	
IADC	6-4-2
Bearing and seal	Ball Locked and Roller Bearing, Air-cooled
Number of rows	5-5-4
Number of cutters	157
Cutter shapes	Conical Compacts
Circulation	3 Air jet nozzles
Pin connection thread size	6 5/8 API* REG with Back Flow Valve
Standard nozzle installed	18 mm
Approximate weight	158 lbs (72 kg)

*Also available in BECO pin thread

Operating Parameters	
Weight on bit (WOB)	30,000 to 65,000 lbs (133-289 kN)
Rotary speed	60 to 100 RPM
Air back pressure on bit	29-58 PSI (0.2-0.4 MPa)

Nozzle Inside Diameters		
in.	mm.	Part Number
9/16	14	540-9154
5/8	16	541-4661
11/16	18	541-4662
7/8	22	541-6668
15/16	24	547-8707
1	25	541-4671

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Features / Benefits

- **Air Cooled Bearings** - Cat's anti-friction design provides for long life in tough applications by reducing the heat generation of tricone drill bits.
- **Cone Protection** - Utilize special technology to prevent severe wear on the cone by drilling cuttings and unbroken rock ridges; therefore, greatly improving the working life of the bit. The gage row design has been proven to improve resistance to diameter shrinkage.
- **Cutting Structure** – Optimized for high wear resistance and toughness of the inserts, enable aggressive cutting to increase rate of penetration.
- **Cone Carbide Layout** - Designed to create an optimal rock fragmentation to provide the highest rate of penetration for your particular application.
- **Shirrtail Protection** - Several advanced techniques and materials are considered, the best combination is selected by our engineers to provide excellent protection in this region to further extend the bit's service life.
- **Cuttings Removal** - Special design increases space for cutting removal with enlarged "junk slot", which facilitates removal of drilling cuttings.



Specifications	
IADC	5-3-2
Bearing and seal	Ball Locked and Roller Bearing, Air-cooled
Number of rows	4-4-4
Number of cutters	119
Cutter shapes	Conical Compacts
Circulation	3 Air jet nozzles
Pin connection thread size	6 5/8 API* REG with Back Flow Valve
Standard nozzle installed	18 mm
Approximate weight	158 lbs (72 kg)

*Also available in BECO pin thread

Operating Parameters	
Weight on bit (WOB)	21,000 to 53,000 lbs (93-235 kN)
Rotary speed	80 to 120 RPM
Air back pressure on bit	29-58 PSI (0.2-0.4 MPa)

Nozzle Inside Diameters		
in.	mm.	Part Number
9/16	14	540-9154
5/8	16	541-4661
11/16	18	541-4662
7/8	22	541-6668
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Specifications	
IADC	7-2-2
Bearing and seal	Ball Locked and Roller Bearing, Air-cooled
Number of rows	5-5-4
Number of cutters	182
Cutter shapes	Conical Compacts
Circulation	3 Air jet nozzles
Pin connection thread size	6 5/8 API* REG with Back Flow Valve
Standard nozzle installed	18 mm
Approximate weight	158 lbs (72 kg)

*Also available in BECO pin thread

Operating Parameters	
Weight on bit (WOB)	45,000 to 100,000 lbs (200-444 kN)
Rotary speed	60 to 100 RPM
Air back pressure on bit	29-58 PSI (0.2-0.4 MPa)

Nozzle Inside Diameters		
in.	mm.	Part Number
9/16	14	540-9154
5/8	16	541-4661
11/16	18	541-4662
7/8	22	541-6668
15/16	24	547-8707
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12-1/4" (311 mm) Cat[®] Tricone Drill Bits



Cat tricone drill bits are designed for the toughest and most severe rotary blasthole applications, yet suitable for all your drilling needs. Cat's comprehensive tricone bit offering includes a wide range of bit diameters with various carbide shapes/cutting face arrangements to maximize rate of penetration. Caterpillar's extensive experience with heat treatment technology and advanced air-cooled bearing design yields longer life, resulting in lower overall drilling costs.



Features / Benefits

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- **Cuttings Removal** - Special design increases space for cutting removal with enlarged "junk slot", which facilitates removal of drilling cuttings.



Specifications	
IADC	6-4-2
Bearing and seal	Ball Locked and Roller Bearing, Air-cooled
Number of rows	5-4-4
Number of cutters	182
Cutter shapes	Conical Compacts
Circulation	3 Air jet nozzles
Pin connection thread size	6 5/8 API* REG with back flow valve
Standard nozzle installed	11/16 in (25 mm)
Approximate weight	225 lbs (102 kg)

*Also available in BECO pin thread

Operating Parameters	
Weight on bit (WOB)	37,000 to 90,000 lbs (164.5-400.3 kN)
Rotary speed	60 to 100 RPM
Air back pressure on bit	29-58 PSI (0.2-0.4 MPa)

Nozzle Inside Diameters		
in.	mm.	Part Number
9/16	14	540-9154
5/8	16	541-4661
11/16	18	541-4662
7/8	22	541-6668
15/16	24	547-8707
1	25	541-4671

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Specifications	
IADC	7-2-2
Bearing and Seal	Ball Locked and Roller Bearing, Air-cooled
Number of rows	5-5-4
Number of cutters	186
Cutter shapes	Conical Compacts
Circulation	3 Air jet nozzles
Pin Connection thread size	6 5/8 API* REG with back flow valve
Standard nozzle installed	25 mm
Approximate Weight	225 lbs (102 kg)

*Also available in BECO pin thread

Operating Parameters	
Weight on bit (WOB)	50,000 to 100,000 lbs (222-444 kN)
Rotary speed	60 to 100 RPM
Air back pressure on bit	29-58 PSI (0.2-0.4 MPa)

Nozzle Inside Diameters		
in.	mm.	Part Number
9/16	14	540-9154
5/8	16	541-4661
11/16	18	541-4662
7/8	22	541-6668
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Specifications	
IADC	5-4-2
Bearing and seal	Ball Locked and Roller Bearing, Air-cooled
Number of rows	4-4-4
Number of cutters	143
Cutter shapes	Conical Compacts
Circulation	3 Air jet nozzles
Pin connection thread size	6 5/8 API* REG with back flow valve
Standard nozzle installed	25 mm
Approximate weight	225 lbs (102 kg)

*Also available in BECO pin thread

Operating Parameters	
Weight on bit (WOB)	30,000 to 70,000 lbs (200-444 kN)
Rotary speed	60 to 120 RPM
Air back pressure on bit	29-58 PSI (0.2-0.4 MPa)

Nozzle Inside Diameters		
in.	mm.	Part Number
9/16	14	540-9154
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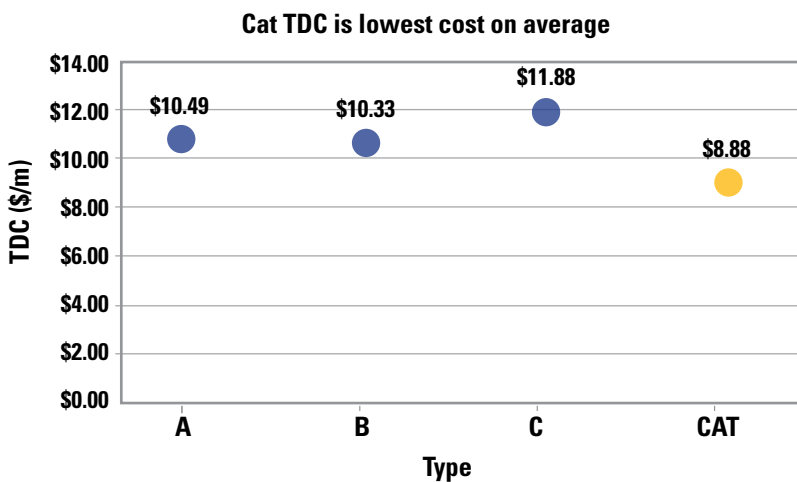
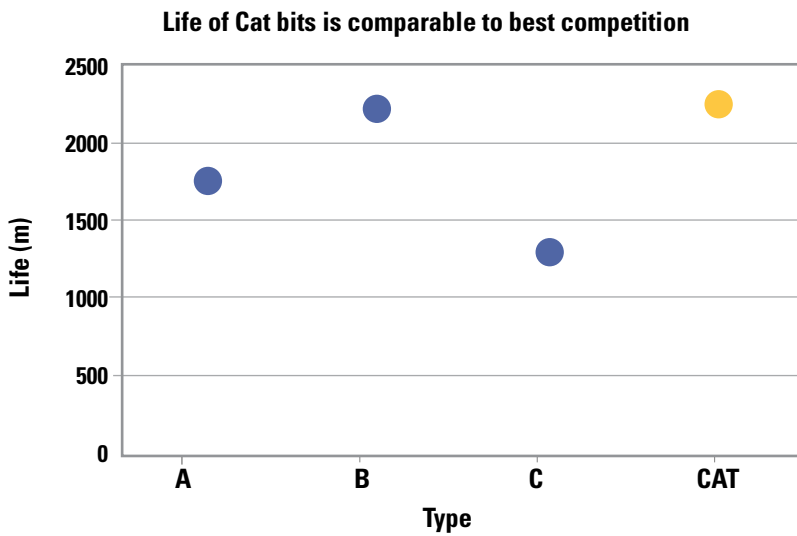
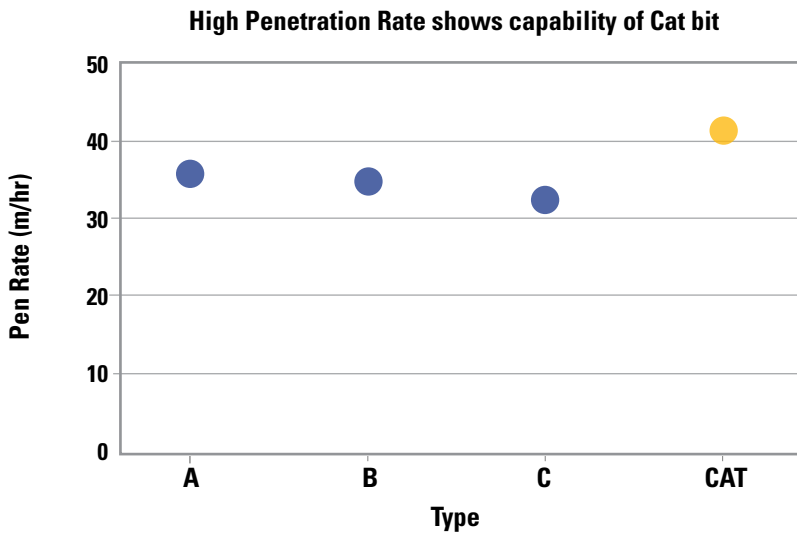
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Cat Tricone Bits are built to provide what our customers expect:

- Cat Performance
- Cat Product Support
- Cat Parts Distribution
- Reduced Total Drilling Cost (TDC)*

* Customer testing performed on Cat part number 533-7827. Bit types A, B, and C are competitive makes at the same mine site. Results may vary at other mine sites.

Cat design demonstrated lowest TDC = **Best Value**

$$\text{Total Drilling Cost (TDC)} = \frac{\text{Bit Cost (\$)}}{\text{Bit Life (m)}} + \frac{\text{Machine Cost (\$/h)}}{\text{Rate of Penetration (m/h)}}$$



For more information, please contact your local Cat dealer.

PEXQ1027-01
www.cat.com

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