

BD DRILL

DIAMOND BITS

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Black Diamond Drilling Services Australia Pty Ltd



Diamond Drill Bits

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Bits Classification

Bits can be divided into impregnated diamond bits, surface-set diamond bits, CL diamond bits, PDC bits and TC bits.

Impregnated Diamond Bits

Black Diamond's impregnated diamond drill bits are divided into K series, R series and S series according to the manufacturing process. And the matrix heights have C6, C9, C12, C15 and C25.

K series bits are widely used, divided into 6 types of matrix K1, K3, K5, K7, K9 and K11.

R series bits have ultra-wide spectrum, divided into 3 types of matrix R3, R7 and R9.

S series bits can achieve ultra-high matrix, divided into 5 types of matrix S1, S3, S5, S7, S9.



Surface-Set Diamond Bits

Surface-set diamond drill bits are brazed with large grain diamonds, which have excellent penetration efficiency.

Standard	Waterway Numbers	SPC
NC, HC	6	25/40
NC3, HC3	6	25/40



CL Diamond Bits

CL type diamond bits is designed in the structure of gear profile, which are used for drilling in soft formation. It has the characteristics of high efficiency and productivity, superb cooling and powder discharging effect, which have been utilized worldwide and achieved good results.



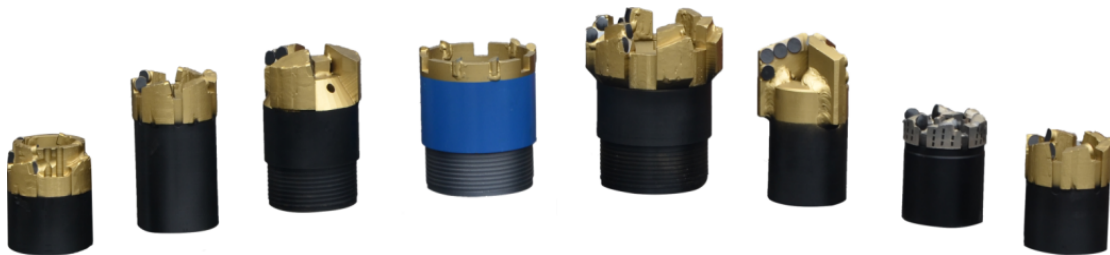
PDC Bits & TC Bits

PDC bits are the abbreviation of polycrystalline diamond compact bits, which have two kinds of manufacturing process, matrix type and steel type. They are divided into coring type and non-coring type, suitable for soft to medium hard formation. Black Diamond' PDC drill bits have various types and are made of high-quality anti-impact oil PDC cutters.

TC drill bits are made of tungsten carbide which welded on the drill steel body which is generally used for drilling soft rock formation namely 1-4 grade sedimentary rocks, quaternary and other strata. Crushed TC drill bits improve drilling efficiency and coring rates in specific environments.

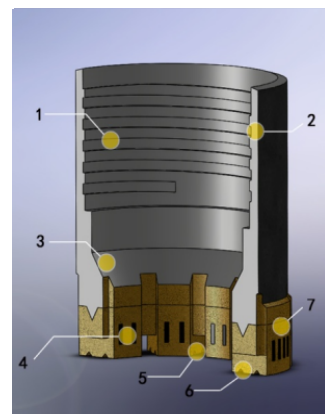


Item	Type		
PDC Bit	PDC Coring Bit	PDC Non-Coring Bit	Matrix PDC Bit
TC Bit	TC Coring Bit	Non-Coring TC Bit	Crushed TC Bit



Impregnated Diamond Bits Structure

Seq.	Item	Function
1	Thread	High precision CNC lathe processing, special thread gauge inspection
2	Bit Shank	Made of high quality alloy steel material
3	Core Lifter Case Seat	Supports core lifter case when breaking core
4	Tungsten Carbide	High wear ratio polycrystalline diameter, increase bit stability
5	Waterway	Control water flow to cool and remove rock dust
6	Profile	Ensure the new bit starts working quickly
7	Crown	Using Prealloyed powder, superb impregnate & control diamond, cut rock



Impregnated Diamond Bits Matrix

K Series Standard Matrix

Classification	Standard Matrix Number			
A, B Size Core Bit			C9-K7	C9-K9
B Size Core Bit			C12-K7	C12-K9
N, H, P Size Core Bit	C9-K3	C9-K5	C9-K7	C9-K9
N, H, P size Core Bit	C12-K3	C12-K5	C12-K7	C12-K9
S, U size Core bit	K7			
Single & Double Tube Core Bit	C6-K3	C6-K5	C6-K7	C6-K9
Single & Double Tube Bit	C9-K3	C9-K5	C9-K7	C9-K9
Casing Bit, Rod & Casing Shoe	K5			
Standard Profile	Point profile			
Standard Waterway Numbers	A size 4, B size 6, N size 8, H size 10, P size 12			
Standard Waterway Width	4.5, 5.5, 7			

Note: K1 and K11 are selected when drilling environment is known

R Series Standard Matrix

Standard	Standard Matrix Number		
BC, NC, HC	C12-R3	C12-R7	C12-R9
Standard Profile	Point profile		
Standard Waterway Numbers	BC size 6, NC size 8, HC size 10		
Standard Waterway Width	5.5		

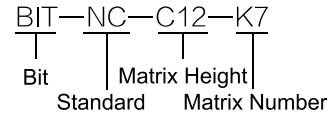
S Series Standard Matrix

Standard	Standard Matrix Number		
BC	C15-S9		
NC, HC	C15-S3	C15-S7	C15-S9
NC, HC	C25-S3	C25-S7	C25-S9
Standard Profile	Point profile + Turbo waterway		
Standard Waterway Numbers	BC size 6, NC size 8, HC size 10, Fan shaped waterway		

Note: S1 and S5 are selected when drilling environment is known

Selection Guideline of Impregnated Diamond Bits Matrix

Impregnated Diamond Bit Coding



Selection Guideline of Impregnated Diamond Bits Matrix (I)

Bit Matrix	K1/S1	K3/S3	K5/S5	K7/S7	K9/S9	K11
	R3		R7		R9	
Matrix Hardness	HRC54	HRC42	HRC30	HRC18	HRC06	HRC00
Rock Hardness	Select K1 or S1 in case of low working life of K3 or S3	Soft rock → Medium hard rock → Hard rock →			Select K11 without footage of K9 or S9	
Grain Size of the Rock		← Large grain ← Medium grain ← Fine grain ←				
Breakage of the Rock		← Serious Breakage ← Normal Breakage ← Complete ←				
Drilling Rig Power		← High power ← Medium Power ← Low power ←				

Selection Guideline of Impregnated Diamond Bits Matrix (II)

Hardness	Soft Rock	Soft Rock	Soft Rock	Medium Hard Rock	Medium Hard Rock	Medium Hard Rock	Hard Rock	Hard Rock	Extra Hard Rock
Mohs Hardness	1-2.5	3-3.5	4	4.5	5-5.5	6-6.5	7-7.5	8	8.5
Boart Longyear ALPHA series		02	02 06ABR 07ABR	02 06ABR 07ABR	06ABR 07ABR	06ABR 07ABR 08ABR 08COM	08ABR 08COM 09 09COM	09 09COM 10COM	09 09COM 10COM
Boart Longyear UMX series	SSUMX	SSUMX 07UMX	SSUMX 07UMX 09UMX	SSUMX 07UMX 09UMX	SSUMX 07UMX 09UMX	SSUMX 07UMX 09UMX	07UMX 09UMX 10UMX	09UMX 10UMX	09UMX 10UMX
ATLAS		3AC	7AC	7AC	7AC 11AC	11AC	11AC 13AC	13AC	15AC
FORDIA		HERO3	HERO7	HERO7	9-11 HERO7	9-11 HERO9	9-11 HERO11	11-14	11-14
BLACK DIAMOND	K1	K3	K3/K5	K3/K5	K5/K7	K5/K7/K9	K7/K9	K9/K11	K11
	R3			R7			R9		
	S1	S3	S3/S5	S3/S5	S5/S7	S5/S7/S9	S7/S9	S9	K11
	CL Type Bit								

Guideline for Impregnated Diamond Bits Operating Parameters

Standard	Water Flow L/min	RPM	Penetration Rate				Weight on Bit	
			in/min		cm/min		lb	kN
			200rpi	250rpi	80r/cm	100r/cm		
T2-46	20-35	2300	11.5	9.2	29	23	1,200-2,800	9-20
		1400	7	5.5	18	14		
		1000	5	4	13	10		
T2-76	30-55	1350	6.5	5.2	15	13	2,800-5,800	14-25
		900	4.5	3.6	11	9		
T2-101	50-70	1000	5	4	13	10	3,800-7,800	18-36
		800	3.5	2.8	9	7		
AC	20-40	2000	10	8	25	20	2,000-5,000	9-23
		1200	6	4.8	15	12		
		850	4.25	3.4	11	9		
BC BC2	30-45	1700	8.5	6.8	22	17	2,000-5,000	9-23
		1000	5	4	13	10		
		700	3.5	2.8	9	7		
NC NC3	45-85	1350	6.75	5.4	17	14	3,000-6,000	14-27
		800	4	3.2	10	8		
HC HC3	50-100	1000	5	4	13	10	4,000-8,000	18-36
		600	3	2.4	8	6		
PC PC3	60-120	800	4	3.2	10	8	5,000-10,000	23-45
		500	2.5	2	6	5		

Standard & Technical Parameters of Diamond Bits

C, C2 Series Bit

Seq.	Standard	Item	OD*ID(mm)	Matrix Height	Matrix Available
1	AC	Drill Bit	47.6*27.0	C9	K9
2	BC	Drill Bit	59.5*36.3	C9, C12	K7, K9
3	BC2	Drill Bit	59.5*40.7	C9, C12	K7, K9
4	NC	Drill Bit	75.3*47.6	C9, C12	K3, K5, K7, K9
5	NC2	Drill Bit	75.3*50.8	C9, C12	K7, K9
6	HC	Drill Bit	95.6*63.5	C9, C12	K3, K5, K7, K9
7	PC	Drill Bit	122.0*85.0	C9, C12	K3, K5, K7, K9
8	SC	Drill Bit	147.6*102.0	C12	K7

C3 Series Bit

Seq.	Standard	Item	OD*ID(mm)	Matrix Height	Matrix Available
1	BC3	Drill Bit	59.5*33.5	C12	K7, K9
2	NC3, NCTT	Drill Bit	75.3*45.0	C12	K5, K7, K9
3	HC3, HCTT	Drill Bit	95.6*61.1	C12	K5, K7, K9
4	PC3, PCTT	Drill Bit	122.0*83.0	C12	K5, K7

W Series Casing Shoe

Seq.	Standard	Item	OD*ID(mm)	Matrix Height	Matrix Available
1	AW	Casing Shoe	59.5*48.2	C6	K5
2	BW	Casing Shoe	75.3*60.2	C6	K5
3	NW	Casing Shoe	92.0*76.2	C6	K5
4	HW	Casing Shoe	117.6*99.7	C6	K5
5	HWT	Casing Shoe	117.6*99.7	C6	K5
6	PW	Casing Shoe	143.5*124.5	C6	K5
7	PWT	Casing Shoe	143.5*124.5	C6	K5
8	SW	Casing Shoe	172.5*146.7	C6	K5