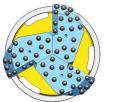
## **Rock Tools**

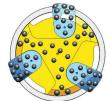
# **CASING PRODUCTS** *WATER WELL & CONSTRUCTION* SMB & SMB-G | UMB | DTH HAMMER & BITS

AITSUBISHI MATERIALS U.S.A.

# SMB SMB-G CASING Advance system

#### **Hole Straightness**





## High speed and straight drilling in a wide range of ground conditions.

The SMB and SMB-G model devices have a smoother operation than eccentric devices.

#### **Our devices have:**

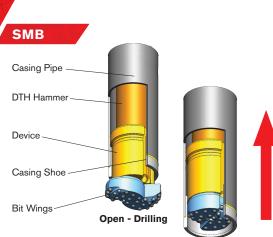
- 2 to 3 cutting edges (guides)
- Drills on all sides at all times
- Smoother and faster penetration rate

#### **Eccentric devices have:**

- One cutting reamer
- Cuts one side only
- Rougher drilling
- Slower penetration rate

SMB – Super Max Bit

SMB-G – Super Max Bit G-Model



SMB-G

Casing Pipe

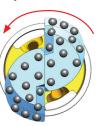
DTH Hammer

Casing Shoe

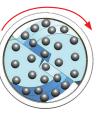
Bit Wings

Device -

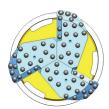
Close - Retraction



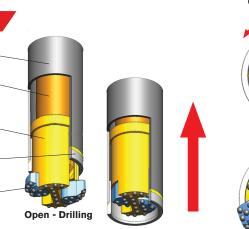
**Open - Forward** 



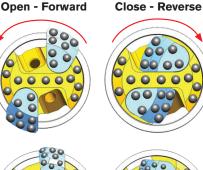
**Close - Reverse** 

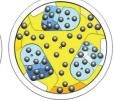




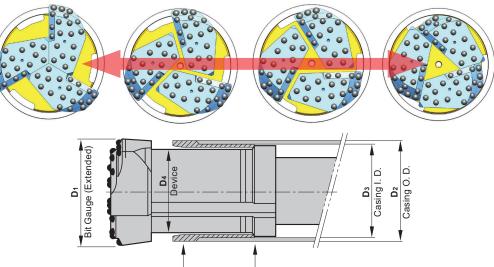


**Close - Retraction** 





**Smoother extending and retracting** SMB has better extending and retracting reliability with fewer performance troubles do to simultaneous wing bits support.



Casing Shoe Casing Pipe

				Bit G	auge		Applic	able Casir	ıg Pipe	Device O. D.	Hammer					
Туре	Two Wing	Three Wing	Exter D	nded	Retra	acted	Max. O.D. D2	Min. I.D. D3	Nominal Size	0. D. D₄	Size	*	2	*	* 4	* 5
			mm	in.	mm	in.	mm	mm	in.	mm	in.					
90	•		125	4.92	91	3.58	114.3	102.3	4"	92	3"					
115	•		152	5.98	114	4.49	141.3	126.6	5"	115	4"					V
140	•		185	7.28	140	5.51	165.2	153.2	6"	141	5"					
165	•		215	8.46	166	6.54	190.7	178.7	7"	167	6"					
187	•		237	9.33	186	7.32	216.3	202.3	8"	187	6"					
215	•	•	272	10.71	217	8.54	254.0	241.0	9"	218	8"					
240		•	290	11.42	232	9.13	273.1	254.5	10"	240	8"		ł			
280		•	340	13.39	281	11.06	318.5	301.7	12"	283	10"				Î	
315		•	373	14.69	314	12.36	355.6	336.6	14"	316	12"					
365		•	425	16.73	363	14.29	406.4	387.4	16"	365	12"					
410		•	478	18.82	412	16.22	457.2	435.0	18"	414	15"					
460		•	530	20.87	461	18.15	508.0	482.6	20"	463	15" 18"	ł		ļ		
510		•	580	22.83	509	20.04	558.8	533.4	22"	511	15" 18"					
560		•	630	24.80	559	22.01	609.6	584.2	24"	561	18"					
600		•	685	26.97	600	23.62	660.4	631.8	26"	603	20"		ļ		ļ	

 $\boldsymbol{\star}$  When ordering, information about casing diameters

(O.D. and I.D.) is necessary.

\* Order made bits can be manufactured upon request.

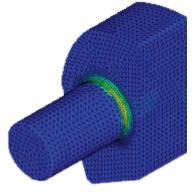
\*1 : Water Well
\*2 : Piling, Foundation
\*3 : Pipe Roof, Water Service, Water Remove, Anchoring

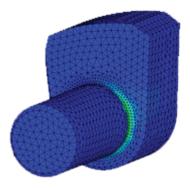
\*4 : Geothermal, Oil Well

\*5 : Fore Piling

#### Stronger wing bits shaft

The SMB-G wing bits have a larger contact area with the device, compared with SMB, which allows for the wing bits shaft to be stronger for more durability.



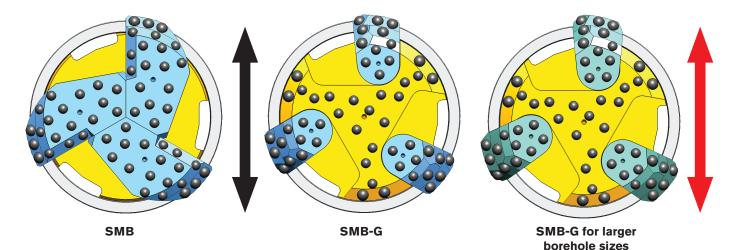


SMB Wing bits shaft

SMB-G Wing bits shaft

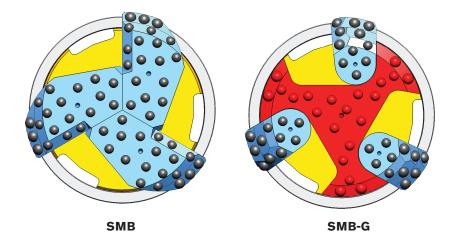
#### For larger cutting diameter and thicker casing

SMB-G model allows for multiple borehole size cuts to accept larger casing, ring shoes (for Dual Rotary) and drive shoes, at a lower cost for a better ROI.



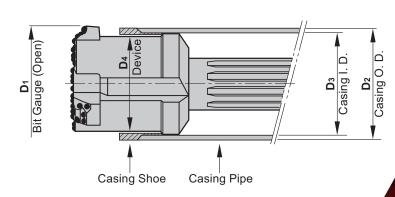
#### Faster penetration for hard rock conditions

SMB-G was designed to drill in hard and harsh rock conditions to improve striking impact and transmit force directly into the rocks.



Impact area ratio

	SMB	SMB-G
Directly	0%	<b>53</b> %
Indirectly	100%	47%



				Bit G	auge		Applic	cable Casi	ng Pipe	Device	Hammer					
Туре	Two Wings	Three Wings	Ор	en 1	Clo	ose	Max. O.D. <b>D</b> 2	Min. I.D. <b>D</b> 3	Normal Size	O. D. <b>D</b> 4	Size	*	2	* 3	* 4	* 5
			mm	in.	mm	in.	mm	mm	in.	mm	in.					
115	•		152	5.98	114	4.49	141.3	126.6	5"	115	4"					
140	•		185	7.28	140	5.51	165.2	153.2	6"	141	5"					
187		•	237	9.33	186	7.32	216.3	202.3	8"	187	6"					
215		•	272	10.71	217	8.54	254.0	241.0	9"	218	8"			l		
240		•	290	11.42	232	9.13	273.1	254.5	10"	240	8"			I		
280		•	340	13.39	281	11.06	318.5	301.7	12"	283	10"			l		
315		•	373	14.69	314	12.36	355.6	336.6	14"	316	12"		I	I		
365		•	425	16.73	363	14.29	406.4	387.4	16"	365	12"			1		
460		•	530	20.87	461	18.15	508.0	482.6	20"	463	15" 18"	ł		ł	Ţ	
560		•	630	24.80	559	22.01	609.6	584.2	24"	561	18"			4		

\* When ordering, information about casing diameters (O.D. and I.D.) is necessary.

\* Order made bits can be manufactured upon request.

\*1 : Water Well

\*2 : Piling, Foundation

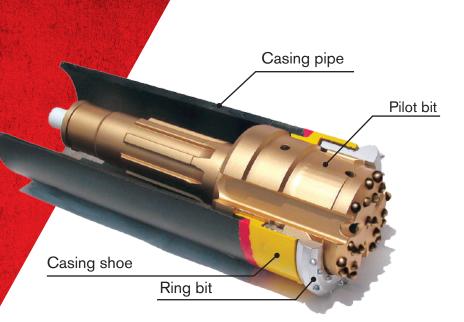
\*3 : Pipe Roof, Water Service, Water Remove, Anchoring

\*4 : Geothermal, Oil Well

\*5 : Fore Piling

# UMB CASING Advance System

*"High speed straight drilling in a wide range of ground conditions"* 



## Easy and Speedy Lock System





6

UMB EASY LOCK SYSTEM is designed with a male key on the pilot bit and a female key on the ring bit for a more consistent fit.

- Easy locking system to unlock and re-lock for flushing out cuttings.
- Cuttings will not stay in female key.



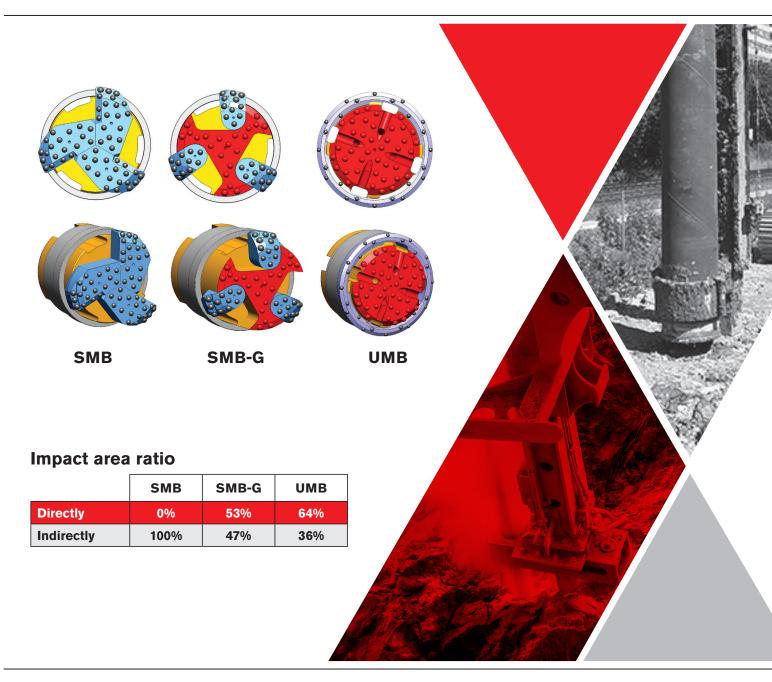




- 1) Drive the pilot bit through the casing pipe
- 2) Connect to ring bit by rotating to the locked position
- 3) READY TO DRILL
- Finish drilling by rotating the pilot bit in opposite direction and pulling it out

# Faster penetration for tough rock conditions for straighter borehole drilling

UMB is designed for drilling in harsh rock conditions by providing a larger pilot bit surface to improve striking impact to transmit energy into rock directly.



## For various applications and a wide range of ground conditions

The dual bit system provides vertical, horizontal, and even inclined drilling for a broader range of ground conditions such as sand, gravel, boulders, and rock.

The ULTRA MAXBIT casing systems/models are available for a variety of applications. Check out the table below for the range of casing sizes and use for each casing system/model.

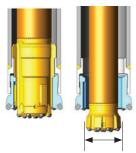
Standard DTH System Model	Connection	Suitable for	Casing Type	Application
Single Pass Model	Thread	Soft ground Shallow hole	Permanent	Piling Construction
Normal Model	Thread	Heavy duty Deep Hole	Permanent	Piling Construction Water Well / Geothermal
Multi Use Model	Inter Linked	Re-Using	Retrievable / Temporary	Anchoring, Foundation

Big Bore DTH System Model	Connection	Suitable for	Casing Type	Application
Big Bore Model				
	Inter Linked	Larger Bore Drilling	Permanent	Water Well / Geothermal

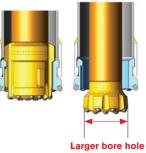
#### **Larger Bore Hole**

The Big-Bore DTH system provides larger borehole drilling compared with the standard system.





**Big-Bore System** 



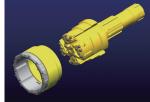
Top Hammer System Model	Connection	Suitable for	Casing Type	Application
Top Hammer Model				
	Thread	Small Hole Funneling	Permanent	Piling Construction

#### **VENTURI MODEL**

The VENTURI MODEL provides a variety of advantages and solution for sensitive ground drilling:

- The flushing air does not hit directly to the bottom of the borehole.
- Minimal air leakage into the formation to eliminate enlarging borehole.
- The reverse flushing causes a vacuum effect to remove the cuttings.
- Face groove designed by CAE simulation and analysis for more efficient flushing.
- Standard and Big Bore systems are available.

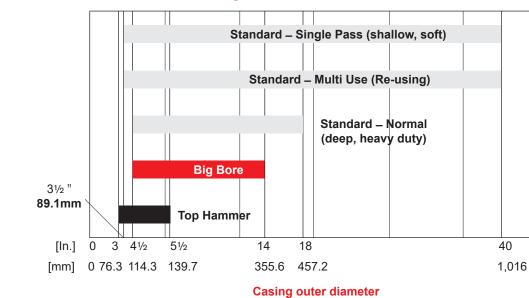






Standard System

Big Bore System



#### Casing sizes available for each systems and models

Air Flushing Simulation

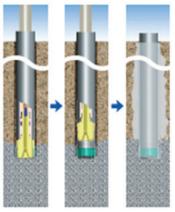
#### **Various Applications**

#### Permanent casing - Piling and Underpinning/ Foundation/Horizontal drilling

Soft ground conditions require a stable foundation during construction. DIAEDGE drilling system is ideal to drill through the overburden to the solid bedrock to fill with concrete.

STEP 1: Drilling to bedrock STEP 2: Pulling out pilot bit STEP 3: Cementing

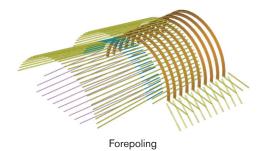
Recommendation Soft ground / Shallow hole → Single pass Heavy Duty / Deep hole → Normal



Permanent casing

#### Permanent casing - Tunneling / Forepoling

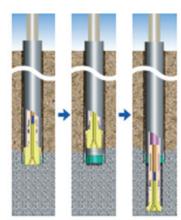
DIAEDGE Top Hammer products are ideal for forepoling or tube umbrella applications where relatively short holes are required, and casings are left in the ground.



Permanent casing drill through - Water well / Geothermal

DIAEDGE casing advancement systems help in water and thermal well applications when casing is required for drilling in broken overburden and the casing pipe is left in the hole for stabilization. DIAEDGE Down-the-Hole bits are designed to drill through the bedrock to complete the well.

STEP 1: Drilling to bedrock STEP 2: Pulling out pilot bit STEP 3: Re-drilling bedrock by single DTH bit



Permanent casing drill through

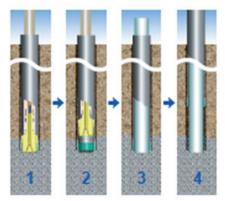
Recommendation

Soft ground / Shallow hole → Single pass Heavy Duty / Deep hole → Normal For large bore drilling bedrock → Big Bore

#### Retrievable/Temporary casing- Anchoring, Foundation

DIAEDGE Multi-Use Models are ideal when Retrievable / Temporary casings are needed. The groove and repeat use functionality of DIAEDGE's Multi-Use casing system makes pulling the casing pipe easy for overburden drilling applications when casing needs removing from the ground.

STEP 1: Drilling to bedrock STEP 2: Pulling out pilot bit STEP 3: Set up structural object STEP 4: Pulling out casing



Retrievable casing

#### **Standard DTH System**

Normal

Multi Use

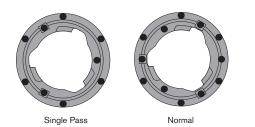
Single Pass

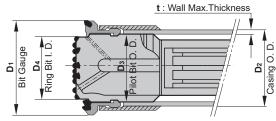
# Casing o. D. Casing Bit - D. Casing Bit - D. Casing Bit - D. Casing Bit - D. Casing O. Casing O. D. Casing O. Casing O

Ring Set (Ring Bit & Casing Shoe) Casing Pipe **Ring Bit** Pilot Bit Compatible System Part Type Part Number Outer Wall Max Outer Outer Inner Weight Weight Dia. Thickness Dia. Dia. Dia. Hammer Model (kg) (kg) D2 D4 **D**1 **D**3 t CASING PIPE ø89.1mm (3 1/2") 56 74 100 6.3 DHD065 056D Single pass 5.0 27 US056D-02-R-266 (0.25") 2.20" 3.94" 2.91" 89.1 (3 1/2") 59 99 73 7.0 DHD065 UM059W-02-R-240 059W Multi use 5.0 2.4 (0.28") 2 32" 3.90" 2.87" CASING PIPE ø114.3mm (4 1/2") DHD3.5 8.5 72 126 92 US072A-03-BB-004 072A Single pass COP34 9.1 4.7 US072A-03-R-035 2.83" 4.96" 3.62" COP32 8.5 DHD3.5 8.5 72 126 92 10.0 UN072A-03-BB-005 072A 4.7 Normal COP34 9.1 (0.39") UN072A-03-R-077 2.83" 4.96" 3.62" COP32 8.5 DHD3.5 8.5 72 122 92 072W Multi use COP34 9.1 4.4 072A Pilot bit UM072W-03-R-285 2.83' 4.80" 3 62" COP32 8.5 DHD3 5 8.7 72 126 95.5 072B Single pass COP34 9.3 4.8 US072B-03-R-090 2.83" 4.96" 3.76" COP32 8.7 DHD3.5 8.7 72 126 95.5 8.0 072A Ring bit 072B COP34 9.3 4.8 UN072B-03-R-368 Normal (0.31") 2.83' 4.96" 3.76" COP32 8.7 DHD3.5 8.7 72 122 95.5 072X Multi use COP34 9.3 4.6 072B Pilot bit UM072X-03-R-369 2.83' 4.80" 3 76' COP32 8.7 DHD3.5 95 78 124 98 114.3 6.5 078W Multi use 39 UM078W-03-R-239 COP34 10.1 (4 1/2") (0.26") 3.07' 4.88" 3.86" COP32 9.5 DHD3.5 9.7 80 124 99.5 080A Single pass COP34 3.9 US080A-03-R-341 10.3 3.15" 4.88" 3.92" COP32 9.7 DHD3.5 9.7 80 124 99.5 6.35 COP34 080A Normal 4.0 UN080A-03-R-249 10.3 (0.25") 3.15' 4.88" 3.92" COP32 9.7 80 **DHD3.5** 9.7 128 99.5 080W Multi use 4.5 080A Pilot bit UM080W-03-R-371 COP34 10.3 3.15' 5.04" 3.92" COP32 9.7 DHD3.5 10.1 82 126 100 10.7 US082A-03-R-372 082A Single pass COP34 3.8 3.23' 4.96' 3 94' COP32 10.1 DHD3.5 10.1 82 100 126 6.0 082A Normal COP34 10.7 3.9 UN082A-03-R-373 (0.24") 3.23' 4.96" 3.94" COP32 10.1 DHD3.5 10.1 82 128 100 082A Pilot bit UM082W-03-R-342 082W Multi use 4.5 COP34 10.7 3.23" 5.04" 3.94" COP32 10.1

Unit: mm (Upper) inch (Bottom)

## **Big Bore System**

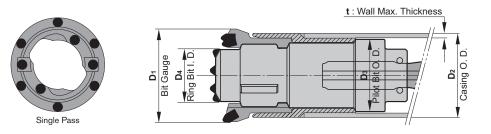




Unit: mm (Upper) inch (Bottom)

Casi	ng Pipe	Туре	Ri	ng Bit			Pilot Bit		Ring Set (Ring Bit & Casing Shoe)	Compatible Part	System Part Number
Outer Dia.	Wall Max. Thickness		Model	Inner Dia.	Outer Dia.	Outer Dia.	Hammer	Weight (kg)	Weight (kg)	Fait	Number
<b>D</b> 2	t			D4	<b>D</b> 1	<b>D</b> 3		(Kg)	(Kg)		
CASI	NG PIPE	ø114	.3mm (4 1/	2")							
				86	137	96	DHD3.5 COP34	6.9	4.8		
	8.0	086L	Single pass	3.39"	5.39"	3.78"	COP34 COP32	7.5 6.9	4.8		UB086L-03-R-222
114.3	(0.31")	080L	for RD-pile	86	137	96	14/00	7.0			
(4 1/2")				3.39"	5.39"	3.78"	W80	7.8	4.8		UB086L <u>W80</u> R280 *1
	5.6		Large bore hole	92	137	101.5	DHD3.5	8.6			
	(0.22")	092L	(Single pass)	3.62"	5.39"	4.00"	COP34 COP32	9.2 8.6	4.4		UB092L-03-R-229
CASI		ø139	.7mm (5 1/	2")			001 32	0.0			
- United				106	166	118	DHD340	10.7			
	40.0		0	4.17"	6.54"	4.65"	QL40	12.0	7.7		UB106L-04-R-223
	10.0 (0.39")	106L	Single pass for RD-pile	106	166	118	SD4	11.8			
			·				W100	10.7	7.7		UB106LW1034R226
139.7 (5 1/2")				4.17"	6.54"	4.65"	DHD340	13.7			*1
(• )		116L	Large bore hole (Single pass)	116	161	127	QL40	15.0	5.4		UB116L-04-R-230
	5.6 (0.22'')		(ongie pass)	4.57"	6.34"	5.00"	SD4	14.8			
	(0.22)	118L	Large bore hole	118	161	127	DHD340 QL40	14.0 15.3	5.3		UB118L-04-R-335
			(Single pass)	4.65"	6.34"	5.00"	SD4	15.1			
CASI	NG PIPE	ø168	.3mm (6 5/	/8")							
				127	195	141	DHD350 QL50	20.0 19.5	9.7		UB127L-05-R-224
	12.5	127L	Single pass	5.00"	7.68"	5.55"	SD5	19.3	5.7		001272-00-11-224
	(0.49")	1216	for RD-pile	127	195	141	W120	19.8	0.7		
				5.00"	7.68"	5.55"	VV120	19.0	9.7		UB127L <u>W1235</u> R227 *1
			Large bore hole	141	189	154	DHD350	24.5			
	6.3	141M	(Single pass)	5.55"	7.44"	6.06"	QL50 SD5	24.0 23.9	6.7	141L Ring set	UB141M-05-R-247
168.3	(0.25")		Large bore hole	141	189	154	DHD350	24.5			
(6 5/8")		141M	(Single pass)	5.55"	7.44"	6.06"	QL50 SD5	24.0 23.9	7.0		UB141M-05-R-246
			Large bore hole	141	189	155	DHD350	23.9			
		141L	(Single pass)	5.55"	7.44"	6.10"	QL50	24.0	6.7		UB141L-05-R-231
							SD5 DHD350	23.9 24.5			
	5.6 (0.22'')	141L	Large bore hole (Single pass)	141	189	155	QL50	24.0	6.7		UB141L-05-R-276
			(emgie pase)	5.55"	7.44"	6.10"	SD5	23.9			
	(0.22)				100			260			
	(0.22)	143L	Large bore hole	143	189	155	DHD350 QL50	25.0 24.5	6.6		UB143L-05-R-336
			(Single pass)	143 5.63"	189 7.44"	155 6.10"			6.6		UB143L-05-R-336
CASI			U U	5.63"	7.44"	6.10"	QL50 SD5	24.5 24.4	6.6		UB143L-05-R-336
CASI			(Single pass) .8mm (7'') Large bore hole	5.63" 153			QL50 SD5 DHD360	24.5 24.4 31.2			
177.8	NG PIPE	ø177	(Single pass) .8mm (7")	5.63"	7.44"	6.10"	QL50 SD5 DHD360 QL60 SD6	24.5 24.4 31.2 30.7 33.7	6.6 7.2		UB143L-05-R-336 UB153L-06-R-244
	NG PIPE	ø177	(Single pass) .8mm (7'') Large bore hole	5.63" 153	7.44" 200	6.10" 162	QL50 SD5 DHD360 QL60	24.5 24.4 31.2 30.7			

\*1 Actual hammer model.



Unit: mm (Upper) inch (Bottom)

Casi	ing Pipe	Туре	Ri	ng Bit			Pilot Bit		Ring Set (Ring Bit & Casing Shoe)	Compatible Part	System Part Number
Outer Dia.	Wall Max. Thickness		Model	Inner Dia.	Outer Dia.	Outer Dia.	Thread	Weight (kg)	Weight (kg)		
D2	t			<b>D</b> 4	<b>D</b> 1	D3		(9)	(9)		
CASI	NG PIPE	ø76.3	8mm (3'')								
76.3 (3")	8.0 (0.31")	042A	Single pass	42	86	58.5	R32	1.8	2.3		UT042AR32BBL370
. ,	· · · ·			1.65"	3.39"	2.30"					
CASI	NG PIPE	Ø88.	9mm (3 1/2	· ·	0.5						
		050B	Single pass	50	95	67.5	T38	3.3	2.9	050A Ring bit	UT050BM38BBL304
	9.5 (0.37")			1.97"	3.74"	2.66"					
	(0.57)	050B	Single pass	50	100	67.5	T38	3.3	3.1		UT050BM38BBL168
				1.97"	3.94"	2.66"					
		050A	Single pass	50 1.97"	95 3.74"	67.5	T38	3.3	2.9	050B Pilot bit	UT050AM38BBL323
	8.0 (0.31")			50	3.74 100	2.66" 67.5					
	(0.000)	050A	Single pass	1.97"	3.94"		T38	3.3	3.1	050B Pilot bit 050B Ring bit	UT050AM38BBL324
						2.66"					
88.9 (3 1/2")		050C	Single pass	50 1.97"	95	67.5	T38	3.3	3.0	050B Pilot bit 050A Ring bit	UT050CM38BBL305
(*					3.74"	2.66"					
	7.0 (0.28'')	050C	Single pass	50 1.97"	100 3.94"	67.5 2.66"	T38	3.3	3.2	050B Pilot bit 050B Ring bit	UT050CM38BBL303
				56	100	73.5				·	
		056E	Single pass	2.20"	3.94"	2.89"	T38	3.5	2.4		UT056EM38BBL268
				56	100	2.09 74					
	6.35 (0.25")	056B	Single pass	2.20"	3.94"	2.91"	T38	3.6	2.6	056A Ring bit	UT056BM38BBL140
				56	100	78					
	4.0 (0.16")	056A	Single pass	2.20"	3.94"	3.07"	T38	3.5	2.6		UT056AM38BBL133
CASI		a101	.6mm (4")	2.20	3.94	3.07					
CASI		וווש	.011111 (4 )	60	114	79					
	10.0 (0.39")	060D	Single pass	2.36"	4.49"	3.11"	T38	4.5	4.0	060A Pilot bit	UT060DM38BBL359
				60	114	81					
	9.5 (0.37")	060A	Single pass	2.36"	4.49"	3.19"	T38	4.6	4.0		UT060AM38BBL306
101.6				60	114	81					
(4")	8.0 (0.31")	060B	Single pass	2.36"	4.49"	3.19"	T38 4.6	4.6	4.1	060A Pilot bit 060A Ring bit	UT060BM38BBL307
				60	114	81				060A Pilot bit	
	7.0	060C	Single pass	2.36"	4.49"	3.19"	T38 4.6		4.2	060A Ring bit	UT060CM38BBL325
	(0.28")			65	114	85					
		065A	Single pass	2.56"	4.49"	3.35"	T38	5.3	3.6		UT065AM38BBL269

# MD HAMMER DTH HAMMER & BITS

MD HAMMER

## **DTH Hammer**

- Offers a valveless pneumatic percussion hammer for drilling in all rock formations
- Designed for water well, blast hole, and construction
- Simple design for easy maintenance
- Fast Penetration Rates for straighter holes in deeper depth
- Increased air cycle efficiency for improved performance
- Hardened internal parts to maximum service life and longevity
- Larger diameter holes
- Reversible sleeve

	San Carace	RE AND ALL AND ALL AND	and the second	10 4 4 4 4 4	State of State	and the second se	and the second							
<table-container>          Process of the state in the state</table-container>	Size	Hammer	Bit Shank										Air Volume	Operating
HMDH03.5         305/MDD3         312 to 414         3.1         2.5         4.0         400         12         58         2.5         2.3° APP Pn UP         150         500           HMDH03.81         305/MDD384         4 to 412         3.35         2.5         4.0         1016         5.31         2.5.4         6.3.5         Pn UP         4.5         3.4           4         HMDH03.84         305/MDD384         4 to 412         3.35         2.5         4.0         1016         5.31         2.5.4         6.3.5         Pn UP         4.5         3.4           4         HMDH03.40         30/MDD344         4 to 5         3.63         2.5         4.3.6         4.3.7         2.0         8.3         3.7         2.38°API Pn UP         150         500           4         12.0 518         4.1         3.3         40.54         40.05         2.2         112         3.7         2.38°API Pn UP         4.5         3.40           4         12.0 518         4.1         3.3         40.54         40.5         2.2         112         3.7         2.38°API Pn UP         150         500           4         4.01         3.3         40.54         40.5         4.0				inch	inch	inch	inch	inch	lbs	lbs	inch	Connection	cfm	psi
HUDH03.5         365 / MODA         88 ho 108         78.7         63.5         1016         1016         5.31         25.4         63.5         Pm (p)         4.5         3.4           HMDH03.8H         367 / MODA5         44 ho 412         3.35         2.5         40         40         12         74         2.5         2.38 / API         150         500           4         HMDH03.8         307 / MODA5         41.6         3.63         2.55         4.36         4.37         20         33         3.6         63.3         2.2 gar API         150         500         500         500         500         700         4.5         3.4         3.5 <td< td=""><td></td><td></td><td></td><td>mm</td><td>mm</td><td>mm</td><td>mm</td><td>mm</td><td>kg</td><td>kg</td><td>mm</td><td></td><td>cmm</td><td>bar</td></td<>				mm	mm	mm	mm	mm	kg	kg	mm		cmm	bar
3.5         Important         6.6         8.9         0.00         7.8         6.5         10.16         5.31         2.5.4         6.35         Phu ()         4.5         3.4           HMDH03.41         3.05/M003.41         3.35         2.5         4.0         0.40         12         7.4         2.5         2.38" APP         2.08" APP         4.50         3.60           A         HMDH03.40         3.01/102 http         5.51         6.41         1016         1016         5.3         6.8         7.00         4.5         3.40           A         HMDH03.40         3.01/102 http         9.22         7.5         1107         1110         8.5         3.8         7.6         Phu ()         4.5         3.40           A         412.0 5.18         4.1         3.3         40.54         4.00         2.2         112         3.         2.38" APP         1.500         5.5         4.00         7.6         Phu ()         4.5         3.4           A         401/M0045         411         8.33         1035         10025         10         5.0         7.6         7.00         7.5         7.00         7.5         7.00         7.5         7.00         7.5         7.00<			305 / MDD3 5	3 1/2 to 4 1/4	3.1	2.5	40	40	12	56	2.5		150	500
HMDH03.H         305 / MDD2, H         40 + 1/2         3.5         2.5         40         40         12         74         2.5         2.387 API PM b         150         500           4         HMDH03.H         301 / MDD3.H         40.1 / MDD3.H         85.1         64         1016         0.10         5.3         33.6         63.5         PM b         4.5         34           4         HMDH03.H         40.1 / MDD3.H         410.5         5.35         4.07         10.10         8.5         3.8         7.6         PM b         4.5         34.0           4.5         340 / MDD3.H         412.10 5.18         4.11         3.3         40.7         40.9         2.2         112         3         2.387 API PM b         1500         500           4.5         41.21 0.5 18         4.11         3.3         40.54         40.95         2.2         112         3         2.387 API PM b         1500         500           4.5         41.10 13.0         104.14         8.33         1026         1029         10         50         7.6         2.387 API PM b         150         50         4.0         3.07         PM b         4.5         3.127 API PM b         14.5         3.4         4	3.5	TIMDTID0.0	0007 WIDD0.0	89 to 108	78.7	63.5	1016	1016	5.31	25.4	63.5	Pin Up	4.5	34
Image: biol:	0.0			4 to 4 1/2	3.35	2.5	40	40	12	74	2.5	2 3/8" API	150	500
4         HMDH034         340 / MD0340         102 to 127         92.2         75         1107         1110         8.5         38         76         Mage of the temp of te		HIMDHD3.5H	3037 WDD3.5H	102 to 115	85.1	64	1016	1016	5.3	33.6	63.5	Pin Up	4.5	34
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	4		340 / MDD340	4 to 5	3.63	2.95	43.6	43.7	20	83	3	2 3/8" API	150	500
4.5         HMDH0345         340 / MD0345         114 to 130         104.14         83.3         1034         1039         10         50         76         Pm lp         4.5         3.4           HMDH035         Q40 / MDQ45         41.12 to 5118         4.1         3.3         40.54         40.5         2.2         112         3         2.38"API         Fin Up         4.5         500           Fin UP         41.10         104.14         83.3         1026         1029         10         50         76         Pm UP         4.5         3.4           Fin UP         4.12 to 518         4.13         3.1         1026         1029         10         50         76         Pm UP         4.5         3.4           Fin UP         4.15         3.12" API         1150         500         100         100         103         143         3.5         3.12" API         1150         500         100         14.5         3.12" API         Pm UP         4.5         3.4           Fin UP         112         115         94.2         1222         1222         1222         14         64.8         88.9         312" API         450         500         500         13         3.4	4	TIMDTID340	340 / WIDD340	102 to 127	92.2	75	1107	1110	8.5	38	76	Pin Up	4.5	34
A-5         Index         I			240 / MDD245	4 1/2 to 5 1/8	4.1	3.3	40.7	40.9	22	112	3	2 3/8" API	150	500
HMDHQ46         Q40 / MDQ54         4 12 10 5 1/8         4.1         3.3         40.54         40.0         22         112         3         2 38" APP Pn UP         150         500           A         MMDHQ46         Q40 / MDQ54         114 to 130         104.14         83.3         1026         1029         10         50         76         Pn UP         4.5         34           A         MMDHQ50         QL5 / MDQ50         5 to 6         4.53         3.71         47.2         47.1         30         143         3.5         3.12" APP         15.0         50.0           HMDH030         350 / MDD350         5 to 6         4.53         3.71         48.2         48.1         30         143         3.5         3.12" APP         150         500           5.5         HMDHQ55         QL5 / MDQ55         512" to 52         115         94.2         1222         1122         14         64.8         88.9         Pin UP         4.5         34           5.5         HMDHQ56         QL5 / MDQ55         512" to 5         114         14.7         44.6         30         148         3.5         3.12" APP         150         50.5           6.14         512" to 78         129	4.5	HMDHD345	340 / MDD345	114 to 130	104.14	83.3	1034	1039	10	50	76	Pin Up	4.5	34
Image: biole intermediate intermed	4.5		040 / MD045	4 1/2 to 5 1/8	4.1	3.3	40.54	40.5	22	112	3	2 3/8" API	150	500
HMDHQ60         OL5 / MDQ50         127 to 152         115         94.2         1199         1196         14         64.8         88.9         Ph (h)         4.5         34           HMDHQ50         350 / MDQ30         5 to 6         4.53         3.71         48.2         48.1         30         143         3.5         3.12" API         150         500         500         4.5         34           5.5         HMDHQ50         QL5 / MDQ55         5 to 6         5.1         4.1         44.7         44.6         300         148         3.5         3.12" API         45.0         500           5.5         HMDHQ50         QL5 / MDQ55         512 to 6         5.1         4.1         44.7         44.6         300         148         3.5         3.12" API         7.0         34           6.5         HMDHQ50         QL6 / MDQ60         6 to 7         5.46         4.5         48.1         48.5         43         215         4         3.12" API         450         500           9.0         QL6 / MDQ60         GL6 / MDQ60         6 to 7         5.46         4.5         52.2         52.6         43         215         4         3.12" API         450         500		HMDHQ45	Q40 / MDQ45	114 to 130	104.14	83.3	1026	1029	10	50	76	Pin Up	4.5	34
1         1         1         1         1         64.8         88.9         Pin up         4.5         34           1         1         1         64.8         88.9         1         1         64.8         88.9         1         1         1         64.8         88.9         1         1         50         50         50         1         1         4         4         1         0         1         3         5         1         1         94.2         1         1         64.8         88.9         1         1         3         3         1         4.5         3         3         1         3         3         1         4.5         3         3         1         3         3         1         3         3         3         1         4.5         3         3         1         3         <				5 to 6	4.53	3.71	47.2	47.1	30	143	3.5	3 1/2" API	150	500
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	_	HMDHQ50	QL5 / MDQ50	127 to 152	115	94.2	1199	1196	14	64.8	88.9	Pin Up	4.5	34
Image: border	5		050 / MDD050	5 to 6	4.53	3.71	48.2	48.1	30	143	3.5	3 1/2" API	150	500
5.5         HMDHQ55         QL5 / MDQ65         139.7 to 152         101         1135         1143         14         67.1         88.9         Pin Up         7         34            HMDHQ65         QL6 / MDQ60         139.7 to 152         129.5         104         1135         1143         14         67.1         88.9         Pin Up         7         34            HMDHQ60         QL6 / MDQ60H         152 to 178         139         102         1222         1232         19.5         97.5         102         Pin Up         13         34            HMDHQ60H         QL6 / MDQ60H         61/4 to 7         5.75         4.5         48.1         48.5         43         215         4         312" API         450         500         500            HMDHQ60H         QL6 / MDQ60H         61/4 to 7         5.75         4.5         52.2         52.6         43         215         4         312" API         450         500            HMDHD360         360 / MD_D360         6 to 7         5.46         4.5         52.2         52.6         43         250         4         312" API         450         500		HMDHD350	350 / MDD350	127 to 152	115	94.2	1222	1222	14	64.8	88.9	Pin Up	4.5	34
HMDHQ60         QL6 / MDQ60         G to 7         5.46         4.5         48.1         144         67.1         88.9         Pin Up         7         34           HMDHQ60         QL6 / MDQ60         G to 7         5.46         4.5         48.1         48.5         43         215         4         31/2" API Pin Up         450         500           HMDHQ60H         QL6 / MDQ60H         G to 7         5.75         4.5         48.1         48.5         43         215         4         31/2" API Pin Up         450         500           HMDHQ60H         QL6 / MDQ60H         G to 7         5.75         4.5         48.1         48.5         43         215         4         31/2" API Pin Up         450         500           HMDHQ60H         QL6 / MDQ60H         G to 7         5.46         4.5         52.2         52.6         43         215         4         31/2" API Pin Up         450         500           HMDHD360H         360 / MDD- D360H         6 1/4 to 7         5.75         4.5         52.2         52.6         43         250         4         31/2" API Pin Up         450         500           158.75 to 178         146         102         1325         1336 <td< td=""><td></td><td></td><td></td><td>5 1/2 to 6</td><td>5.1</td><td>4.1</td><td>44.7</td><td>44.6</td><td>30</td><td>148</td><td>3.5</td><td>3 1/2" API</td><td>250</td><td>500</td></td<>				5 1/2 to 6	5.1	4.1	44.7	44.6	30	148	3.5	3 1/2" API	250	500
HMDHQ60         QL6 / MDQ60         Total Stress	0.0	HMDHQoo	QL5 / MDQ55	139.7 to 152	129.5	104	1135	1143	14	67.1	88.9	Pin Up	7	34
Image: Figure 1         Instant				6 to 7	5.46	4.5	48.1	48.5	43	215	4	3 1/2" API	450	500
HMDHQ60H         QL6 / MDQ60H         QL6 / MDQ60H         152 to 178         146         102         1222         1232         20         97.5         102         Pin Up         13         34           HMDHQ60H         360 / MDD360         6 to 7         5.46         4.5         52.2         52.6         43         215         4         3 1/2" API Pin Up         450         500           HMDHD360         360 / MDD         152 to 178         139         102         1325         1336         20         97.5         102         Pin Up         13         34           HMDHD360H         360 / MD- D360H         6 1/4 to 7         5.75         4.5         52.2         52.6         43         250         4         3 1/2" API Pin Up         450         500           HMDHQ66H         360 / MD- D360H         6 1/4 to 7         5.75         4.5         52.2         52.6         43         250         4         3 1/2" API Pin Up         450         500           158.75 to 178         146         102         1325         1336         20         97.5         102         Pin Up         13         34           6.14         5.75         4.75         46.8         47.2         45		HMDHQ60	QL6 / MDQ60	152 to 178	139	102	1222	1232	19.5	97.5	102	Pin Up	13	34
6         152 to 178         146         102         1222         1232         20         97.5         102         Pin Up         13         34           4         MDD1360         360 / MDD360         6 to 7         5.46         4.5         52.2         52.6         43         215         4         3 1/2" API Pin Up         450         500           4         MDD1360         360 / MDD D360H         6 to 7         5.75         4.5         52.2         52.6         43         250         4         3 1/2" API Pin Up         450         500           4         MDHD360H         360 / MDD D360H         6 1/4 to 7         5.75         4.5         52.2         52.6         43         250         4         3 1/2" API Pin Up         450         500           6.5         MDHQ65         360 / MDC65         6 1/4 to 7         5.75         4.75         46.8         47.2         45         251         4         3 1/2" API Pin Up         450         500           6.5         MDHQ65         QL6 / MDQ656         6 1/4 to 7         5.75         4.75         46.8         47.2         45         261         4         3 1/2" API Pin Up         450         500           1MDHQ65H				6 1/4 to 7	5.75	4.5	48.1	48.5	43	215	4	3 1/2" API	450	500
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$		HMDHQ60H	QL6 / MDQ60H	152 to 178	146	102	1222	1232	20	97.5	102	Pin Up	13	34
HMDHD360H         ABC         152 to 178         139         102         1325         1336         20         97.5         102         Pin Up         13         34           HMDH360H         360 / MD- D360H         6 1/4 to 7         5.75         4.5         52.2         52.6         43         250         4         3 1/2" API Pin Up         450         500           6.5         HMDHQ65         QL6 / MDQ65H         6 1/4 to 7         5.75         4.75         46.8         47.2         45         251         4         3 1/2" API Pin Up         450         500           6.5         HMDHQ65         QL6 / MDQ65H         6 1/4 to 7         5.75         4.75         46.8         47.2         45         251         4         3 1/2" API Pin Up         450         500           6.6         HMDHQ65         QL6 / MDQ65H         6 1/2 to 7         5.9         4.75         46.8         47.2         455         268         4         3 1/2" API Pin Up         450         500           HMDHQ85H         QL6 / MDQ65H         6 1/2 to 7         5.9         4.75         46.8         47.2         455         268         4         3 1/2" API Pin Up         450         500           8	6			6 to 7	5.46	4.5	52.2	52.6	43	215	4	3 1/2" API	450	500
HMDHD360H         MOV/MD- D360H         158.75 to 178         146         102         1325         1336         20         97.5         102         Pin Up         13         34           6.5         HMDHQ65         QL6 / MDQ65         6 1/4 to 7         5.75         4.75         46.8         47.2         45         251         4         3 1/2* API Pin Up         450         500           6.6         HMDHQ65         QL6 / MDQ65         6 1/4 to 7         5.75         4.75         46.8         47.2         45         251         4         3 1/2* API Pin Up         450         500           HMDHQ65H         QL6 / MDQ65H         6 1/2 to 7         5.9         4.75         46.8         47.2         45         268         4         3 1/2* API Pin Up         450         500           HMDHQ65H         QL6 / MDQ65H         165 to 178         150         121         1189         1198         20.4         121.5         102         Pin Up         13         34           8         HMDHQ80         QL8 / MDQ80H         77/8 to 10         7.1         5.87         56.2         57         78         414         5.9         4 1/2* API Pin Up         900         500           200 to 254	1	HMDHD360	360 / MDD360	152 to 178	139	102	1325	1336	20	97.5	102	Pin Up	13	34
HMDHU360H         D360H         158.75 to 178         146         102         1325         1336         20         97.5         102         Pin Up         13         34           6.5         HMDHQ65         QL6 / MDQ65H         6 1/4 to 7         5.75         4.75         46.8         47.2         45         251         4         31/2* API Pin Up         450         500           6.5         HMDHQ65         QL6 / MDQ65H         6 1/2 to 7         5.9         4.75         46.8         47.2         45         251         4         31/2* API Pin Up         450         500           HMDHQ65H         QL6 / MDQ65H         6 1/2 to 7         5.9         4.75         46.8         47.2         45         268         4         31/2* API Pin Up         450         500           HMDHQ65H         QL6 / MDQ65H         6 1/2 to 7         5.9         4.75         46.8         47.2         45         268         4         31/2* API Pin Up         450         500           165 to 178         150         121         1189         1198         20.4         121.5         102         Pin Up         133         34           8         HMDHQ80         QL8 / MDQ80         77.8 to 10			360 / MD-	6 1/4 to 7	5.75	4.5	52.2	52.6	43	250	4	3 1/2" API	450	500
HMDHQ65         QL6 / MDQ65         158.75 to 178         146         121         1189         1198         20.4         113.8         102         Pin Up         13         34           HMDHQ65H         QL6 / MDQ65H         6 1/2 to 7         5.9         4.75         46.8         47.2         45         268         4         3 1/2" API Pin Up         450         500           HMDHQ65H         QL6 / MDQ65H         6 1/2 to 7         5.9         4.75         46.8         47.2         45         268         4         3 1/2" API Pin Up         450         500           165 to 178         150         121         1189         1198         20.4         121.5         102         Pin Up         13         34           8         HMDHQ80         QL8 / MDQ80         7.1         5.87         56.2         577         78         414         5.9         4 1/2" API Pin Up         900         500           200 to 254         180         149         1427         1524         35         188         150         Pin Up         26         34           HMDHD380         380 / MDD380         77/8 to 10         7.1         5.87         56.9         57.7         78         414 <t< td=""><td></td><td>HMDHD360H</td><td>D360H</td><td>158.75 to 178</td><td>146</td><td>102</td><td>1325</td><td>1336</td><td>20</td><td>97.5</td><td>102</td><td>Pin Up</td><td>13</td><td>34</td></t<>		HMDHD360H	D360H	158.75 to 178	146	102	1325	1336	20	97.5	102	Pin Up	13	34
6.5         HMDHQ65H         QL6 / MDQ65H         158.75 to 178         146         121         1189         1198         20.4         113.8         102         Pin up         133         34           4.00         HMDHQ65H         QL6 / MDQ65H         6 1/2 to 7         5.9         4.75         46.8         47.2         45         268         4         31/2" API Pin up         450         500           165 to 178         150         121         1189         1198         20.4         121.5         102         Pin up         133         34           8         HMDHQ80         QL8 / MDQ80H         77/8 to 10         7.1         5.87         56.2         57         78         414         5.9         41/2" API Pin up         900         500           204         HMDHQ80         380 / MDD380         77/8 to 10         7.1         5.87         56.9         57.7         78         414         5.9         41/2" API Pin up         900         500           4MDHD380         380 / MDD380         77/8 to 10         7.1         5.87         56.9         57.7         78         414         5.9         41/2" API Pin up         900         500 <td></td> <td>1000</td> <td></td> <td>6 1/4 to 7</td> <td>5.75</td> <td>4.75</td> <td>46.8</td> <td>47.2</td> <td>45</td> <td>251</td> <td>4</td> <td>3 1/2" API</td> <td>450</td> <td>500</td>		1000		6 1/4 to 7	5.75	4.75	46.8	47.2	45	251	4	3 1/2" API	450	500
HMDHQ65H         QL6 / MDQ65H         6 1/2 to 7         5.9         4.75         46.8         47.2         45         268         4         3 1/2" API Pin Up         450         500           8         HMDHQ65H         QL6 / MDQ65H         165 to 178         150         121         1189         1198         20.4         121.5         102         Pin Up         13         34           8         HMDHQ80         QL8 / MDQ801         77/8 to 10         7.1         5.87         56.2         577         78         414         5.9         41/2" API Pin Up         900         500           8         HMDHQ80         QL8 / MDQ800         77/8 to 10         7.1         5.87         56.9         57.7         78         414         5.9         41/2" API Pin Up         900         500           9         400 to 254         180         149         1427         1524         35         188         150         Pin Up         26         34           9         41/2" API Pin Up         77/8 to 10         7.1         5.87         56.9         57.7         78         414         5.9         41/2" API Pin Up         900         500		HMDHQ65	QL6 / MDQ65	158.75 to 178	146	121	1189	1198	20.4	113.8	102	Pin Up	13	34
HMDHQ65H         QL6 / MDQ65H         165 to 178         150         121         1189         1198         20.4         121.5         102         Pin Up         13         34           8         HMDHQ80         QL8 / MDQ80H         7/8 to 10         7.1         5.87         56.2         57         78         414         5.9         41/2" API Pin Up         900         500           8         HMDHQ80         380 / MDD380         77/8 to 10         7.1         5.87         56.9         57.7         78         414         5.9         41/2" API Pin Up         900         500           HMDHD380         380 / MDD380         77/8 to 10         7.1         5.87         56.9         57.7         78         414         5.9         41/2" API Pin Up         900         500	6.5			6 1/2 to 7	5.9	4.75	46.8	47.2	45	268	4	3 1/2" API	450	500
HMDHQ80         QL8 / MDQ80         200 to 254         180         149         1427         1524         35         188         150         Pin Up         26         34           HMDHD380         380 / MDD380         77/8 to 10         7.1         5.87         56.9         57.7         78         414         5.9         4 1/2" API         900         500		HMDHQ65H	QL6 / MDQ65H	165 to 178	150	121	1189	1198	20.4	121.5	102		13	34
HMDHQ80         QL8 / MDQ80         200 to 254         180         149         1427         1524         35         188         150         Pin Up         26         34           8         HMDHD380         380 / MDD380         77/8 to 10         7.1         5.87         56.9         57.7         78         414         5.9         4 1/2" API         900         500				7 7/8 to 10	7.1	5.87	56.2	57	78	414	5.9	4 1/2" API	900	500
HMDHD380 380 / MDD380 77/8 to 10 7.1 5.87 56.9 57.7 78 414 5.9 41/2"API 900 500		HMDHQ80	QL8 / MDQ80	200 to 254	180	149	1427	1524	35	188	150	1	26	34
	8		000 ( 1000000	7 7/8 to 10	7.1	5.87	56.9	57.7	78	414	5.9	4 1/2" API	900	500
		HMDHD380	380 / MDD380	200 to 254	180	149	1445	1542	35	188	150		26	34



		Face Style
Shank	Head size range	C: Concave, F: Flat, V: Convex, K: Kavex
305/3.5	3 1/2"-4"	C.F.V
305/3.5	4" -4 1/4"	C.F.V
340	4" -4 7/8"	C.F.V
340	5" -5 1/8"	C.F.V
350	5" -5 7/8"	C.F.V
350	6"	C.F.V
350	5 3/4"-5 7/8"	К
350	6"	к
360	5 3/4"-6 3/8"	C.F.V
360	6 1/2"-7"	C.F.V
360	6" -7"	K(5/8" Gage)
360	6" -7"	K(3/4" Gage)
360	7 1/4"-7 3/4"	C.F.V
360	7 7/8"-8 7/8"	C.F.V
360	8 1/2"-8 7/8"	K(5/8" Gage)
380	7 5/8"-8 1/4"	C.F.V
380	8 1/2"-8 7/8"	C.F.V
380	9"	C.F.V
380	9 1/2"-10"	C.F.V
380	10 1/2"-11"	C.F.V
380	11 1/2"-12 1/4"	C.F.V
Q40	4 1/2"-4 7/8"	C.F.V
Q40	5" -5 1/8"	C.F.V.
QL5	5" -5 7/8"	C.F.V.
QL5	6"	C.F.V.
QL5	5 3/4"-5 7/8"	К
QL5	6"	К
QL6	5 3/4"-6 3/8"	C.F.V
QL6	6 1/2"-7"	C.F.V
QL6	6" -7"	K(5/8" Gage)
QL6	6 3/4"	K(5/8" Gage)
QL6	7"	K(5/8" Gage)
QL6	6" -7"	K(3/4" Gage)
QL6	7 1/4"-7 3/4"	C.F.V
QL6	7 7/8"-8 7/8"	C.F.V
QL8	7 5/8"-8 1/4"	C.F.V
QL8	8 1/2"-8 7/8"	C.F.V
QL8	9"	C.F.V
QL8	9 1/2"-10"	C.F.V
QL8	10 1/2"-11"	C.F.V
QL8	11 1/2"-12 1/4"	C.F.V
QL8	11 1/2"-12 1/4"	C.F.V

High quality steel bodies are expertly machined and heated treated to precision standards to eliminate any bit body failures.

Our top-quality carbide buttons are formulated and sintered in house.

#### CONCAVE

The concave bit is the most common face style used in the market today. The dish typeface gives excellent penetration in medium and hard rock formations while maintaining a straight hole. This face has unique air flushing characteristics.Concave is the predominate face style for the majority of drilling conditions.

#### FLAT

The flat face bit, as the name implies, is flat across the bit front. This bit is very aggressive in drilling applications and is best suited for tough rock and hard rock with broken formation. The flat bit is used primarily in blast hole work; the bit tends to lead off in deep holes. Rock Tools flat face bits come with standard face slots to aid in keeping the cutting face clean.

#### CONVEX

The convex face is used in tough drilling formations where the front of the bit tends to be prematurely worn away. The convex style tends to keep the drilling face intact longer by drilling with the two rows of buttons on the convex face. This face style gives good hole penetration.

#### KAVEX

This kavex face bit is a combination of convex/concave. This type of face is recommended for abrasive formations in the hard and tough range where other bit faces wear away quickly. The kavex is designed to improve the cleaning of cuttings, thus reducing body wear. The concave center helps drill a straight hole.

#### WIDE GAUGE

The wide-gauge face is a convex but in a heavy-duty design. The buttons are larger, and the gauge row is set on a different angel. It has used in tough, abrasive drilling formations where the face and buttons prematurely wear away. The wide-gauge style keeps the drilling face intact longer by drilling with the two rows of (3/4) buttons on the wide-gauge face, which gives good hole penetration.

If you have any request for face designs, shanks, carbide sizes and configuration, please feel free to contact us.











#### For Your Safety

#### • Don't handle inserts and chips without gloves.

- Please machine within the recommended application range and exchange expired tools with new ones in advance of breakage.
- Please use safety covers and wear safety glasses.
- When using compounded cutting oils, please take fire precautions.
- When attaching inserts or spare parts, please use only the correct wrench or driver.
- When using rotating tools, please make a trial run to check run-out, vibration and abnormal sounds etc.

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RT-2020-2