Micropile Drilling System

6

Drilling Programme Setup

API Drill Rod Friction Welded

API Saver & Crossover Subs

Tubing & Casing Physical Properties

Continuous Flight Auger, Hex Coupling & Auger Bit

Casing Socket/Collars – Threaded Ends

Down-The-Hole (DTH) Hammer

Duplex Drilling System

Plastic Centralizer

优钻地质材料供应有限公司
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API DRILLING PROGRAMME

API Crossover Sub (Saver Sub)

API Drill

Stabilizer / Hole opener (Recommended to use for Tricone Bit drilling to provide bit load)

Hole Opener

Bit Sub

Drilling Bits

API DRILL ROD

(WITH FRICTION WELDED TOOL JOINT)

Product Origin: Korea

Drill Rod Body		Tool Joint	Wall Thickness	Available Length	Weight
OD	ID		mm	m	kg
3 ½″ (88.9 mm)	76.1 mm	2 3/8″ API Reg Pin x Box	6.4	3.0	45.0
		2 3/8″ API Reg Pin x Box	6.4	1.5	25.5
		2 3/8″ API Reg Pin x Box	6.4	1.0	19.0
4 ½″ (114.3 mm)	100.1 mm	3 ½″ API Reg Pin x Box	7.1	3.0	65.0
		3 ½″ API Reg Pin x Box	7.1	1.5	39.0
		3 ½″ API Reg Pin x Box	7.1	1.0	32.0
5 ½″ (139.7 mm)	123.5 mm	4 ½″ API Reg Pin x Box	8.1	3.0	99.7
		4 ½″ API Reg Pin x Box	8.1	1.5	60.7
		4 ½″ API Reg Pin x Box	8.1	1.0	47.7
5 ½″ (139.7 mm)	120.7 mm	4 ½″ API Reg Pin x Box	9.5	3.0	111.6
		4 ½″ API Reg Pin x Box	9.5	1.5	65.7
		4 ½″ API Reg Pin x Box	9.5	1.0	-

Raw Material Specifications

Drill Rod	:	API 5CT N-80 or API 5CT P-110
Yield Strength	:	80,000-110,000 psi
Tensile Strength	:	Minimum 100,000 psi
Tool Joint	:	JIS SCM415 with heat treatment c/w protection cap both ends

After friction welding process, heat affected zone to be normalized.

Friction Welding Process

SAVER/CROSSOVER SUBS

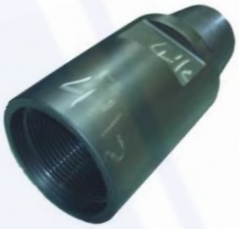
API Reg Pin x API Reg Box

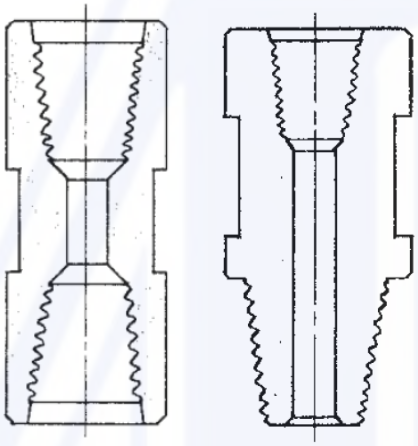
3½"Pin x 2⅜" Box (260 mm Overall Length)
3½"Pin x 2⅞"Box (305mm Overall Length)
3½"Pin x 3½"Box (280mm Overall Length)
3½"Pin x 3½"Box (450mm Overall Length)
3½"Pin x 3½"Box (190mm Overall Length)
3½"Pin x 4½"Box (300mm Overall Length)
4½"Pin x 3½"Box (300mm Overall Length)
4½"Pin x 4½"Box (300mm Overall Length)
6⅝"Pin x 4½"Box (300mm Overall Length)
2⅞"Pin x 2⅜"Box (230mm Overall Length)
2⅞"Pin x Short Thread 2⅜"Box (230mm Overall Length)

Imported API Crossover/Subs
Origin: KOREA
JSI SCM415 Carburised and Hardened to HRc 46~50

API Reg Pin x API Reg Pin

3½"Pin x 3½"Pin (280mm Overall Length)
3½"Pin x 3½"Pin (430mm Overall Length)
3½"Pin x 4½"Pin (300mm Overall Length)
2⅜"Pin x 2⅜"Pin (280mm Overall Length)
2⅜"Pin x 2⅜"Pin (430mm Overall Length)
2⅜"Pin x 3½"Pin (280mm Overall Length)
2⅜"Pin x 3½"Pin (430mm Overall Length)
4½"Pin x 4½"Pin (280mm Overall Length)





API Reg Box x API Reg Box

2⅜"Box x 2⅞" Box (240mmOverall Length)
2⅞"Box x 3½" Box (240mmOverall Length)
3½"Box x 2⅜"Box (260mmOverall Length)
3½"Box x 3½"Box (280mmOverall Length)
3½"Box x 4½"Box (300mmOverall Length)
4½"Box x 4½"Box (300mmOverall Length)
6⅝"Box x 3½"Box (300mmOverall Length)
6⅝"Box x 4½"Box (300mmOverall Length)
2⅜"Box x 2⅜"Box (230mmOverall Length)
6⅝"Box x 6⅝"Box (300mmOverall Length)

API Tool Female Joint

3½" Box x 4Flat Wrench Slot (218 mm Overall Length)
4½" Box x 4Flat Wrench Slot (238 mm Overall Length)
6⅝" Box x 4 Flat Wrench Slot

API Tool Male Joint

3½"JointPin x 5½″ODBody x (70mmOverall Length)
4½"JointPin x 5½″ODBody x (230mmOverall Length)
6⅝"JointPin x One end with NO flat Wrench Slot

PHYSICAL PROPERTIES

(CASING & TUBING)

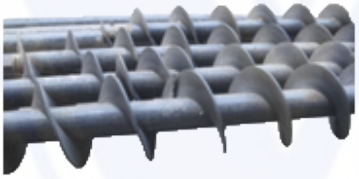
SPECIFICATION	APPLICATION	GRADE	MECHANICAL	
			YIELD STRENGTH (psi)	TENSILE STRENGTH (psi)
API 5CT	GROUP 1	H-40	40,000 ~ 80,000	≧ 60,000
		J-55	55,000 ~ 80,000	≧ 75,000
		K-55	55,000 ~ 80,000	≧ 95,000
		N-80	80,000 ~ 110,000	≧ 100,000
	GROUP 2	L-80	80,000 ~ 95,000	≧ 95,000
		L-80 9CR	80,000 ~ 95,000	≧ 95,000
		L-80 13CR	80,000 ~ 95,000	≧ 95,000
		C-90	90,000 ~ 105,000	≧ 100,000
		C-95	95,000 ~ 110,000	≧ 105,000
		T-95	95,000 ~ 110,000	≧ 105,000
	GROUP 3	P-110	110,000 ~ 140,000	≧ 125,000
	GROUP 4	Q-125	125,000 ~ 150,000	≧ 135,000
SM SERIES	G GENERAL & DEEP WELL SERVICE	SM-95G	95,000 ~ 125,000	≧ 110,000
		SM-125G	125,000 ~ 155,000	≧ 140,000
		SM-140G	140,000 ~ 170,000	≧ 150,000
		SM-150G	150,000 ~ 180,000	≧ 160,000
		SM-155G	155,000 ~ 185,000	≧ 163,000
	T,TT HIGH COLLAPSE STRENGTH	SM-80T	80,000 ~ 110,000	≧ 100,000
		SM-95T	95,000 ~ 125,000	≧ 110,000
		SM-95TT	95,000 ~ 125,000	≧ 110,000
		SM-110T	110,000 ~ 140,000	≧ 125,000
		SM-110TT	110,000 ~ 140,000	≧ 125,000
		SM-95TS	95,000 ~ 110,000	≧ 105,000
		SM-125TT	125,000 ~ 150,000	≧ 135,000
	TS HIGH COLLAPSE & SOUR WELL SERVICE	SM-80TS	80,000 ~ 95,000	≧ 100,000
		SM-90TS	90,000 ~ 105,000	≧ 103,000
		SM-95TS	95,000 ~ 110,000	≧ 105,000
		SM-C100T	100,000 ~ 115,000	≧ 105,000
		SM-C110T	110,000 ~ 125,000	≧ 115,000
	S SOUR WELL SERVICE	SM-80S	80,000 ~ 95,000	≧ 100,000
		SM-90S	90,000 ~ 105,000	≧ 103,000
		SM-95S	95,000 ~ 110,000	≧ 105,000
		SM-C100	100,000 ~ 115,000	≧ 105,000
		SM-C110	110,000 ~ 125,000	≧ 115,000
	SS SEVERE SOUR WELL SERVICE	SM-85SS	85,000 ~ 100,000	≧ 100,000
		SM-90SS	90,000 ~ 105,000	≧ 100,000
		SM-100SS	100,000 ~ 115,000	≧ 105,000
	L LOW TEMPERATURE SERVICE	SM-80L	80,000 ~ 110,000	≧ 100,000
		SM-80LL	80,000 ~ 110,000	≧ 100,000
		SM-95L	95,000 ~ 125,000	≧ 105,000
		SM-95LL	95,000 ~ 125,000	≧ 105,000
		SM-110L	110,000 ~ 140,000	≧ 125,000
		SM-110LL	110,000 ~ 140,000	≧ 125,000
NEW SM SERIES	CO2 CORROSIVE WELL SERVICE	SM9CR-75	75,000 ~ 90,000	≧ 95,000
		SM9CR-80	80,000 ~ 95,000	≧ 95,000
		SM9CR-95	95,000 ~ 110,000	≧ 105,000
		SM13CR-75	75,000 ~ 90,000	≧ 95,000
		SM13CR-80	80,000 ~ 95,000	≧ 95,000
		SM13CR-85	95,000 ~ 100,000	≧ 100,000
		SM13CR-95	95,000 ~ 110,000	≧ 105,000
		SM13CR-80	80,000 ~ 95,000	≧ 90,000
		SM13CR-95	95,000 ~ 110,000	≧ 105,000
		SM13CR-110	110,000 ~ 125,000	≧ 115,000
	CO_2-LOW H_2S CORROSIVE WELL SERVICE	SM22CR-65	65,000 ~ 100,000	≧ 93,000
		SM22CR-110	110,000 ~ 140,000	≧ 125,000
		SM22CR-125	125,000 ~ 145,000	≧ 130,000
		SM22CR-140	140,000 ~ 160,000	≧ 145,000
		SM25CR-75	75,000 ~ 100,000	≧ 95,000
		SM25CR-110	110,000 ~ 140,000	≧ 125,000
		SM25CR-125	125,000 ~ 145,000	≧ 130,000
		SM25CR-140	140,000 ~ 160,000	≧ 145,000
		SM25CRW-80	≧ 80,000	≧ 116,000
		SM25CRW-110	110,000 ~ 140,000	≧ 125,000
		SM25CRW-125	125,000 ~ 145,000	≧ 130,000
		SM25CRW-140	140,000 ~ 160,000	≧ 145,000

CONTINUOUS FLIGHT AUGER
(HELICOID)
AND AUGER BIT

Available Flight Material
Mild Carbon Steel
A-36
8620
304 Stainless
304L
316L
Aluminum
A514-Gr.B

Available Flight Thickness	
inch	mm
/	4.7625
/4	6.3500
/	7.9375
/	9.5250
7/	11.1125
1/	12.7000
/	14.2875
/	15.8750
/	15.8750

Helicoids



Helicoids & Stem

Hex Coupling Pin x Box

Auger Bit
(No Waterholes)

Fish Tail Auger Bit

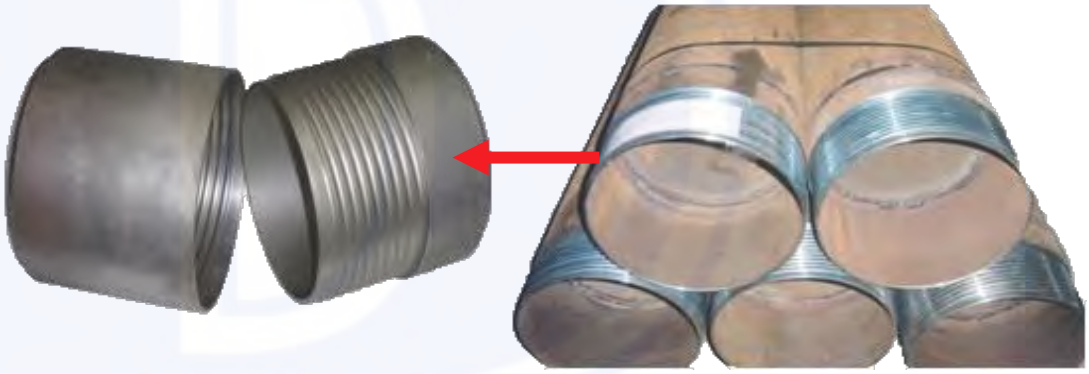
Kenclaw Bit

7½″ & 9½″ Kenclaw (Auger) Bit with 3-Waterholes

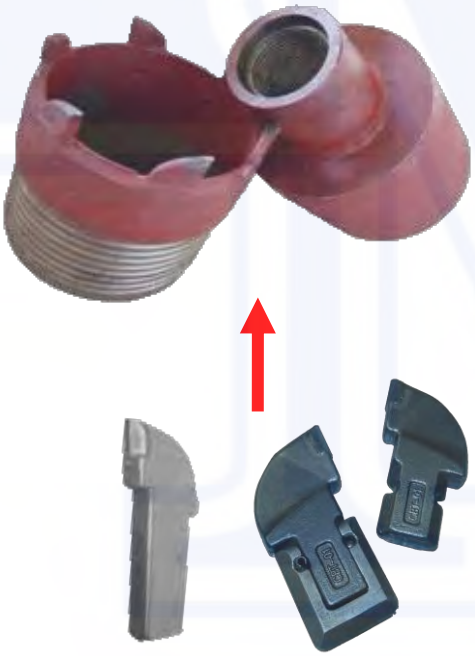
CASING SOCKET/CASING COLLARS

Origin: KOREA

Material: Seamless Tube ASTM A53 Gr. B Material with Carburised and Hardened to HRc 36~40



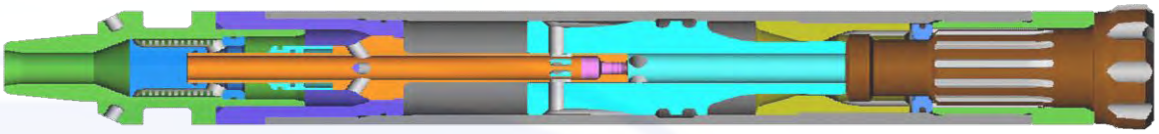
	3½"	5"	6"	7"	8"	10"	12"	14"	16"
Outside Diameter OD (mm)	88.9	141.3	168.3	178.0	219.3	273.0	323.9	355.6	406.4
Inner Diameter ID (mm)	66.9	119.3	146.3	155.0	196.3	249.0	295.3	323.6	376.2
Thickness (mm)	11.0	11.0	11.0	11.5	11.5	12.0	14.3	16.0	15.31
Thread Length (mm)	113.0	113.0	113.0	113.0	113.0	113.0	150.0	150.0	150.0
Overall Length (mm)	190.0	190.0	190.0	190.0	190.0	300.0	300.0	300.0	300.0



Misc Flat Cutter Short with Holder

500mm diameter with 20 pcs welding bar, 10mm apart

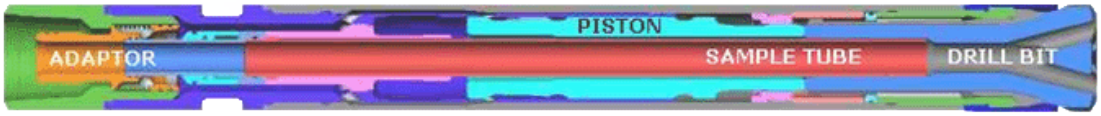
DOWN-THE-HOLE (DTH) HAMMER



SPECIFICATION:

HAMMER SIZE		4"				5"		6"		
HAMMER MODEL		K090E	K090D	K090S	K090M	K120D	K120S	K140D	K140S	K140X
BIT SHANK						K110D	K110S			
	Ingersoll	DHD340A	DHD340A			DHD350R		DHD360		
	Sandvik			SD4			SD5		SD6	XL6
	Numa									
	Halco				MACH44					
Recommend Hole DIA	mm / inch	4-1/8" ~ 5" (105 - 127)				5-1/8" ~ 5-3/4" (130 - 146)		6-1/2" ~7-1/2" (152 - 190)		
Hammer DIA	mm	94	94	94	94	120	120	138	138	138
Cylinder Bore	mm	75	75	75	75	95	95	115	115	115
Piston Stroke	mm	100	100	100	100	100	100	100	100	100
Piston Weight	kg	6.0	6.5	6.0	6.0	11.0	11.0	23.0	23.0	23.0
Length (w/o Bit)	mm	875	925	926	910	1017	1017	1264	1280	1290
Weight (w/o Bit)	kg	34	33	35	33.5	62	63	104	104	105
Correction Type		API $2^3/_8$ Reg. Pin				API $3^1/_2$ Reg. Pin		API 31/2 Reg. Pin		
Air Flow Needed	150 PSI (10.5kg/cm^2)	230 (6.5)	240 (6.8)	240 (6.8)	230 (6.5)	290 (8.2)		400 (11.3)	420 (11.9)	420 (11.9)
	200 PSI (14.0kg/cm^2)	300 (8.5)	315 (8.9)	315 (8.9)	300 (8.5)	410 (11.6)		545 (15.4)	580 (16.4)	580 (16.4)
	250 PSI (17.6kg/cm^2)	380 (10.8)	400 (11.3)	400 (11.3)	380 (10.8)	510 (14.4)		700 (19.8)	740 (20.9)	740 (20.9)
	300 PSI (21.0kg/cm^2)	470 (13.3)	495 (14.0)	495 (14.0)	470 (13.3)	620 (17.6)		860 (24.4)	910 (25.8)	910 (25.8)
	350 PSI (24.1kg/cm^2)	530 (15.0)	550(15.5)	550(15.5)	530 (15.0)	750 (21.2)		1025 (29)	1060 (30)	1060 (30)

HAMMER SIZE		8"		10"			12"					
HAMMER MODEL		K170S	K180D	K220	K220S	KA12	K270	K270R	K270D	K270S	K270S-D	K270N
BIT SHANK				K220		KA12	K270	K270R				
	Ingersoll-Rand		DHD380						DHD112			
	Sandvik	SD8			SD10					SD12	SD-12D	
	Numa											N120
	Halco											
Recommend Hole DIA	inch	7-1/2"~10"	7-3/4"~10-5/8"	9-7/8"~11-7/8"	9-7/8"~12"	11-7/8"~15	11-7/8"~17-1/2" (300~445)					
	mm	(190~253)	(195~270)	(250~300)	(250~305)	(300~380)						
Hammer DIA	mm	168	182	220	226	245	275	285	275			
Cylinder Bore	mm	132	148	165			216					
Piston Stroke	mm	100	100	105			105					
Piston Weight	kg	31	38	46			125					
Length (w/o Bit)	mm	1309	1345	1525	1480	1430	1818	1662	1750	1729	1729	1750
Weight (w/o Bit)	kg	170	200	350	360	325	645	715	620	618	618	618
Correction Type		API 4-1/2 Reg. Pin		API 5-1/2 Reg. Pin	API 6-5/8 Reg. Pin	HEX' JOINT	API 6-5/8 Reg. Pin	HEX' JOINT	API 6-5/8 Reg. Pin			
Air Flow Needed	100 PSI (7.0kg/cm^2)	-	-	-			-	-	-	-	-	-
	150 PSI (10.5kg/cm^2)	510(14.4)	610(17.3)	690(19.5)			880(24.9)	880(24.9)	880(24.9)	880(24.9)	880(24.9)	880(24.9)
	200 PSI (14.0kg/cm^2)	690(19.5)	830(23.5)	980(27.8)			1250(35.4)	1250(35.4)	1250(35.4)	1250(35.4)	1250(35.4)	1250(35.4)
	250 PSI (17.6kg/cm^2)	890(25.2)	1070(30.3)	1290(36.5)			1700(48.1)	1700(48.1)	1700(48.1)	1700(48.1)	1700(48.1)	1700(48.1)
	300 PSI (21.0kg/cm^2)	1090(30.9)	1315(37.2)	1610(45.6)			-	-	-	-	-	-
	350 PSI (24.1kg/cm^2)	-	-	-			-	-	-	-	-	-



RC Hammer is available

DUPLEX DRILLING SYSTEM

APPLICATION

Duplex drilling utilizes either a single drifter (top hammer) or a single rotary head to drive a drill string consisting of both an outer casing and an inner drill string simultaneously.

Duplex drilling is a potential solution for drilling in harder ground conditions which cannot easily be displaced and require containment of the flushing media within the drill string. Common conditions where Duplex drilling is used are gravels and hard rock formations as well as situations where the ground conditions are unknown or conditions where there is a risk of creating cavities in the ground due to uncontrolled flushing.

A Duplex drill system can be driven by a single hydraulic drifter and utilizes rotary percussive casing as well as rotary percussive inner rods. These systems are run with carbide casing crowns and percussive drill bits for overburden drilling.

A Duplex system can also be driven by a single rotary head in combination with a down the hole hammer (DTH), Tri-cone bit or drag bit on the inner drill string. In this arrangement the internal drill string is typically made up of API drill rods.

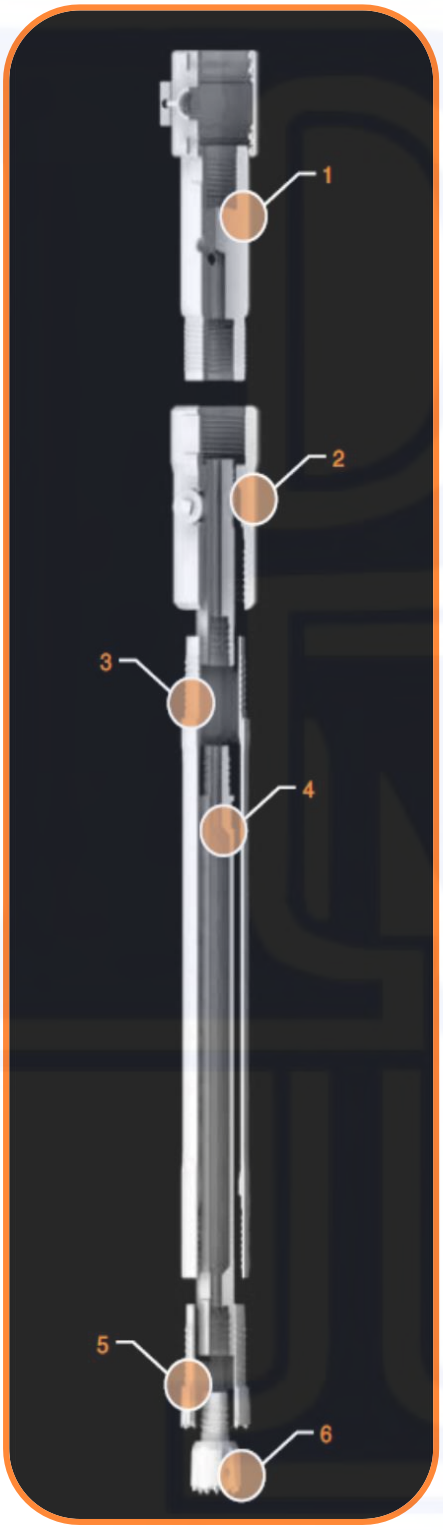
Duplex drilling is a controlled flushing method to prevent contact of the flushing medium with the bore hole wall. The flushing media enters the drill string through a flushing head and travels down the drill string within the inner drill rod. The flushing media exits the drill bit on the inner drill string and carries the cuttings up the drill string in the annular area between the outside of the inner rod and the inside of the casing. The cuttings and flushing media exit the drill string through the ejection bell attached to the casing.

Duplex systems offer the driller the flexibility to deal with many different drilling conditions. This includes the ability to stop driving the casing and continue on drilling to depth with only the inner string.

DIAMETER OFFERING

CASINGØ	INTERNAL RODØ	
88.9mm	51mm	1 1/2" T38
101.6mm	63.5mm	1 1/2" T38
114.3mm	76.1mm	1 3/4" T45
133mm	88.9mm	1 3/4" T45
152.4mm	101.6mm	1 3/4" T45

Courtesy of BOART LONGYEAR



FLUSHING HEAD (1)

Duplex drilling flushing heads allow for the introduction of flushing media into the duplex drilling string as well as an exit point through the ejection bell. Flushing heads are selected to match the shank on the hydraulic drifter, the casing diameter and thread, and the type of inner drill rod being utilized.

EJECTION BELL (2)

The ejection bell is part of the flushing head assembly. Casing is threaded into the bottom of the ejection bell. The ejection bell is threaded onto the flushing body. The ejection ports on the ejection bell are threaded so they can be plugged if required to direct flushing fluids to the outside of the casing.

CASING (3)

Duplex drilling systems utilize rotary percussive casing. Casing is either friction welded male/female construction or female/female with nipple connections.

INNER DRILL ROD (4)

The inner drill string of duplex drill systems are either friction welded rotary percussive rods or percussive T38 or T45 drill steel. These systems also can utilize TDN inner drill rods.

CASING BIT (5)

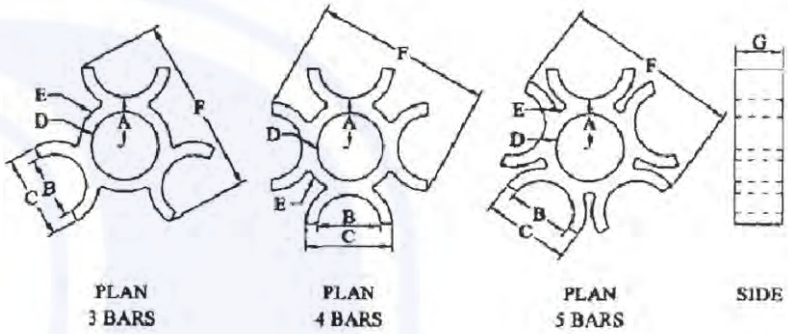
Casing bits for duplex systems are ring bits with tungsten carbide inserts. The type of carbide insert is dependent on the ground conditions being drilled.

INNER STRING BIT (5)

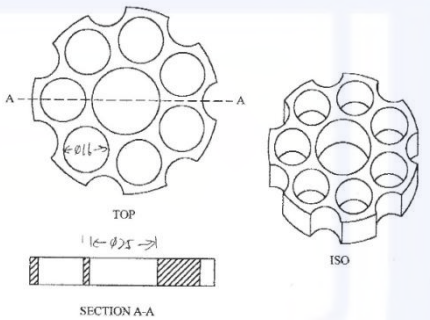
The inner drill string bit of duplex drilling systems typically utilizes a full face percussive bit with tungsten carbide inserts. Duplex drilling systems can also use rotary bits or down the hole hammers (DTH).

Courtesy of BOART LONGYEAR

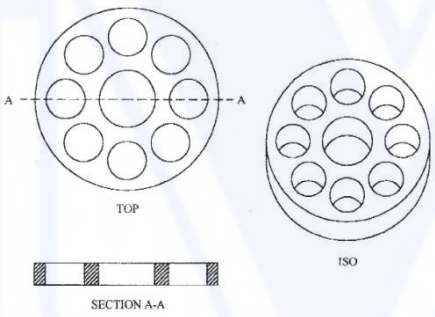
PLASTIC FLOWER CENTRALIZER



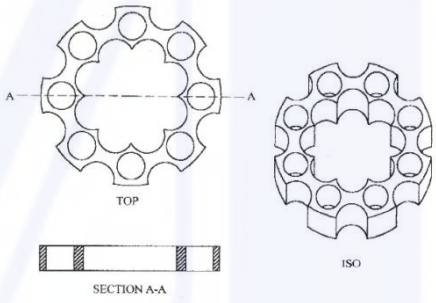
S/N	PART NO.	DIMENSION	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)
1.	PP0099	25T x 3 Bars x 150mm Pole	R21	28	38	Ø29	Ø40	77	38
2.	PP0101	25T x 4 Bars x 150mm Pole	R21	28	38	Ø29	Ø40	77	38
3.	PP0076	32T x 3 Bars x 200mm Pole	R29	41	51	Ø36	Ø56	109	38
4.	PP0078	32T x 4 Bars x 200mm Pole	R29	41	51	Ø36	Ø56	109	38
5.	PP0103	32T x 5 Bars x 200mm Pole	R29	41	51	Ø36	Ø56	109	38
6.	PP0125	40T x 3 Bars x 200m Pole	R29	50	63	Ø36	Ø56	117	45
7.	PP0136	40T x 4 Bars x 200m Pole	R29	50	63	Ø36	Ø56	117	45
8.	PP0083	40T x 3 Bars x 250m Pole	R35	50	63	Ø45	Ø68	130	38
9.	PP0080	40T x 4 Bars x 250m Pole	R35	50	63	Ø45	Ø68	130	38
10.	PP0105	40T x 5 Bars x 250m Pole	R35	50	63	Ø45	Ø68	130	38
11.	PP0107	40T x 4 Bars x 300m Pole	R42	50	63	Ø55	Ø80	139	38
12.	PP0109	40T x 5 Bars x 300m Pole	R42	50	63	Ø55	Ø80	139	38
13.	PP0112	40T x 6 Bars x 300m Pole	R42	50	63	Ø55	Ø80	139	38



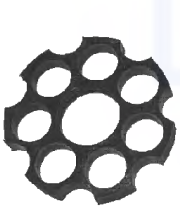
PLASTIC STRAND SPACER (PP0104)



PLASTIC STRAND SPACER (PP0108)



PLASTIC STRAND SPACER (PP0106)



PP0104

PP0106

PP0108

PP0122

PP0118