



Oilfield  
Solutions  
at Better  
Value

## Comprehensive Product Guide

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**MFF International Pte Ltd**  
*Oilfield Solutions at Better Value*

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## ABOUT MFF INTERNATIONAL



We are Singapore incorporated company into engineering products and solutions, catering to various key industries including Oil/Gas, Marine and Manufacturing.

Our aim for the Oil/gas industry is to provide Oilfield Solutions at Better Value, our products and services are widely focused for Drilling, Completion and Production requirements.

We focus to specific requirements of our clients based on their specific needs/requirements, either the requirements is for standard or non-standard products. We ensure we provide the best technical inputs in selecting the right product, based on the best past performance and at very optimum cost.

Customer excellence is our key driver for our business, we as a company aim to provide the best possible product, making sure the designing, compliance to International standards like API, ASTM, ASME and would have undergone the best manufacturing practices to achieve a product of highest quality and performance levels.

Oil/gas industry is a key for us; however we do focus equally on marine and manufacturing industries for providing our products and solutions. Marine we focus on steel and special materials offerings and for the manufacturing we focus on Fasteners, those fasteners of high strength, special design, standard, as well as non-standard and stainless including Duplex and super duplex, and we are also moving slowly into fitting products and solutions.

Our short-term goal is to be an Asia's renowned supplier for drilling, marine, offshore and fastening solutions by 2015.

▶ **PRODUCT PROFILE**

# DRILLING PRODUCTS/ SOLUTIONS



We focus on Drilling, Completion and Production areas of an Oil/gas industry. Drilling products like Drill Pipes, HWDPs and Drill collars, Bottom Hole tools (BHAs) are few of our key products. Packers and liners are very few completion solutions we provide. Production tools including Casing, Tubing, Macaroni Tubing, Pumping equipment, PCP and Electrical Submersible Pumps are few of our production products for oil/gas industry. However, we are also in the process of expanding our products and services to various other areas. Our other solutions include:-



- Marine and Offshore Supplies
- Manufacturing; Fastening and Fittings

If there are any requirements for those products or tools not mentioned here, feel free to contact us.



## DRILLING TOOLS



### Drill Pipe

- Drill pipes are manufactured as per API 5DP
- Size : 2 3/8" to 6 5/8", Grades : X, E, G & S

Drill Pipe Specification									
Size	Weight Designation	Calculated Plain-End Weight		Outside Diameter		Wall thickness		Grade	Upset Ends, for weld-on tool joints
		Wpe	Wpe	D	D	T	T		
In	lbs/ft	lb/ft	kg/m	in	mm	in	mm		
2 3/8	6.65	6.27	9.33	2.375	60.3	0.280	7.11	E, X, G, S	Ext.Upset
2 7/8	10.40	9.72	14.47	2.875	73.0	0.362	9.19	E, X, G, S	Int.Upset or Ext.Upset
3 1/2	9.50	8.81	13.12	3.500	88.9	0.254	6.45	E	Int.Upset or Ext.Upset
3 1/2	13.30	12.32	18.34	3.500	88.9	0.368	9.35	E, X, G, S	Int.Upset or Ext.Upset
3 1/2	15.50	14.64	21.79	3.500	88.9	0.449	11.40	E	Int.Upset or Ext.Upset
3 1/2	15.50	14.64	21.79	3.500	88.9	0.449	11.40	X, G, S	Ext.Upset or Int.-Ext.Upset
4	14.00	12.95	19.27	4.000	101.6	0.330	8.38	E, X, G, S	Int.Upset or Ext.Upset
4 1/2	13.75	12.25	18.23	4.500	114.3	0.271	6.88	E	Int.Upset or Ext.Upset
4 1/2	16.60	15.00	22.32	4.500	114.3	0.337	8.56	E, X, G, S	Ext.Upset or Int.-Ext.Upset
4 1/2	20.00	18.71	27.84	4.500	114.3	0.430	10.92	E, X, G, S	Ext.Upset or Int.-Ext.Upset
5	16.25	14.88	22.16	5.000	127.0	0.296	7.52	X, G, S	Int.Upset
5	19.50	17.95	26.70	5.000	127.0	0.362	9.19	E	Int.-Ext.Upset
5	19.50	17.95	26.70	5.000	127.0	0.362	9.19	X, G, S	Ext.Upset or Int.-Ext.Upset
5	25.60	24.05	35.80	5.000	127.0	0.500	12.70	E	Int.-Ext.Upset
5	25.60	24.05	35.80	5.000	127.0	0.500	12.70	X, G, S	Ext.Upset or Int.-Ext.Upset
5 1/2	21.90	19.83	29.52	5.500	139.7	0.361	9.17	E, X, G, S	Int.-Ext.Upset
5 1/2	24.70	22.56	33.57	5.500	139.7	0.415	10.54	E, X, G, S	Int.-Ext.Upset
6 5/8	25.20	22.21	33.04	6.625	168.3	0.330	8.38	E, X, G, S	Int.-Ext.Upset
6 5/8	27.72	24.24	36.06	6.625	168.3	0.362	9.19	E, X, G, S	Int.-Ext.Upset

### Heavy Weight Drill Pipes (HWDP)

Heavy Weight Drill Pipe (HWDP) is manufactured from AISI 4145H modified steel. HWDP is bored, drifted and fully heat treated to meet or exceed the mechanical property requirements of NS-1. A through-wall hardness range of 285-341 HB and a charpy "V" notch impact strength of 42 joules at 20°C are guaranteed one inch below the surface.

#### API Connection

All API connections comply with dimensional requirements specified in API spec 7 and API RP 7G. Common sizes and styles are summarized in Table 1 below. Premium connections are available on request.

#### Options Available

- Integral or friction welded
- Standard and spiral
- Hard-banding
- Full length internal plastic coating
- Alloy steel
- Non-magnetic steel
- Sale or rental



TABLE 1				
Nominal Size (in)	Tool Joint OD (in)	HWDP ID (in)	Wall Thickness (in)	Connection Type
3-1/2	4-3/4 or 4-7/8	2-1/16	0.718	NC38
3-1/2	4-3/4 or 4-7/8	2-1/4	0.625	NC38
4	5-1/4 or 5-3/8	2-9/16	0.719	NC40
4-1/2	6-1/4 or 6-3/8	2-3/4	0.875	NC46
5	6-1/2 or 6-5/8	3	1.000	NC50
5-1/2	7-1/4	3-1/4	1.094	5-1/2 FH
6-5/8	8 or 8-1/4	4-1/2	1.063	6-5/8 FH

#### Integral or Welded Heavy Weight Drill Pipe

- HWDP manufactured as per API 7-1
- Material: AISI 4145H Modified alloy steel
- Tool Joints used in manufacture of DP are as per API 7-1
- Size: 3 1/2", 4 1/2", 5" & 5 1/2"

HWDP MATERIAL MECHANICAL PROPERTIES			
Drill Collar Diameter (in)	Minimum Yield Strength (psi)	Minimum Tensile Strength (psi)	Minimum Hardness (BHN)
3-1/2 thru 6-5/8	110,000	140,000	285



Contact us for detailed specification for any of your requirements

## Drill Collar

Drill Collars are manufactured from 4145H modified steel. Drill Collars are bored and drifted to API spec 7-1 and fully heat treated to meet or exceed the mechanical property requirements of API spec 7-1 and NS-1. A through-wall hardness range of 285–341 HB and a charpy “V” notch impact strength of 42 joules at 20°C are guaranteed one inch below the surface.

### API Connection

All API connections comply with dimensional requirements specified in API spec 7 and API RP 7G. Common sizes and styles are summarised in Table 1. Premium connections are available on request.



### Options Available

- Spiral and slick
- Slip and elevator groove
- Hard-banding
- Alloy steel
- Non-magnetic steel
- Sale or rental

### Standard Steel Drill Collars

- Drill Collars manufactured as per API 7
- Material : AISI 4145H Mod alloy steel or Non-Magnetic material
- Spiral or Standard Drill Collars
- Size : 3 1/8” to 11”
- Grade : Heat-treated to 285 – 341 BHN
- Mechanical Properties and Dimensional Reports submitted.
- Third Inspection can be arranged and report will be sent direct to Customers
- The Drill Collar is used between the drill pipe and the bit in the drill stem. It is used to put weight on the bit.

TABLE 1

Drill Collar Number*	Drill Collar Diameter (in)	Bore (in) +1/16" -0"	Length (ft)
NC23-31	3-1/8	1-1/4	30
NC26-35	3-1/2	1-1/2	30
NC31-41	4-1/8	2	30 or 31
NC35-47	4-3/4	2	30 or 31
NC38-50	5	2-1/4	30 or 31
NC44-60	6	2-1/4 or 2-13/16	30 or 31
NC46-62	6-1/4	2-1/4 or 2-13/16	30 or 31
NC46-65	6-1/2	2-1/4 or 2-13/16	30 or 31
NC46-67	6-3/4	2-1/4	30 or 31
NC50-70	7	2-1/4 or 2-13/16	30 or 31
NC50-72	7-1/4	2-13/16	30 or 31
NC56-77	7-3/4	2-13/16	30 or 31
NC56-80	8	2-13/16	30 or 31
6-5/8 API Reg	8-1/4	2-13/16	30 or 31
NC61-90	9	2-13/16	30 or 31
7-5/8 API Reg	9-1/2	3	30 or 31
NC70-97	9-3/4	3	30 or 31
NC70-100	10	3	30 or 31
8-5/8 API Reg	11	3	30 or 31

\*The Number Connection (NC) is an API connection. The first two digits are the pitch diameter of the thread and the last two digits are the outside diameter of the drill collar.

### DRILL COLLAR MATERIAL MECHANICAL PROPERTIES

Drill Collar Diameter (in)	Minimum Yield Strength (psi)	Minimum Tensile Strength (psi)	Minimum Hardness (BHN)
3-1/8 thru 6-7/8	110,000	140,000	285
7 thru 11	100,000	135,000	285



## DOWNHOLE TOOLS

### Stabilizers

- Integral Blade Stabilizers
- Manufactured as per API 7
- Material : AISI 4145H, AISI 4145H MOD Alloy Steel, AISI 4140-4142, AISI 4340
- Hard-facing : HF1000, HF2000, HF3000, HF4000, HF5000
- Size : 6” to 26”
- Mechanical Properties and Dimensional Reports submitted.
- Third Inspection can be arranged and report will be sent direct to Customers
- Integral Blade Stabilizers are manufactured from 4145H alloy steel bar or forgings, quenched and tempered to 285-341 Brinell hardness

Stabilizers are fairly short subs which have blades attached to their external surface. By providing support for the BHA (Bottom Hole Assembly) at certain points they can be used to control the trajectory of the well. The blades can be either straight or spiral in shape. Spiral blades can give 360° contact with the borehole.

MFF supplies Integral Bladed Stabilizers manufactured from AISI 4145H modified steel. All Stabilizers are bored, drifted and fully heat treated to meet or exceed the mechanical properties requirements of API and NS-1. A through-wall hardness range of 285–341 HB and charpy “V” notch impact strength of 42 joules at 20°C are guaranteed one inch below the surface.

Stabilizers are available in both “open” design and “tight” design, near bit or string, and can be supplied in alloy or non-magnetic steel.

### API Connection

All API connections comply with dimensional requirements specified in API spec 7 and API RP 7G. Common sizes and styles are summarized in the table below. Premium connections are available on request.

### Hard-facing

The type of hard-facing to be applied on drilling equipment has to be carefully chosen taking into account drilling parameters and formation.

MFF offers a complete range to suit all drilling conditions.

### Hard-facing Types

- HF 1000 (crushed carbide)
- HF 2000 (crushed carbide and tungsten traps)
- HF 3000 (T.C.I. spray matrix spray powder and tungsten insert)
- HF 4000 (buttons)
- HF 5000 (technodur)

### Options Available

- Integral blade
- Welded blade
- Alloy steel
- Non-magnetic steel
- Sale or rental



### STANDARD IBS SPECIFICATION

Hole Size Range (in)	Drill Collar OD Range (in)	Bore (in)	Overall Length (in)	Blade Length (in)
4-3/4	3-3/4	1-1/2	62	10
5-7/8	4-3/4	1-3/4	62	10
6-3/4	5-1/2	2-1/3	64	12
7-7/8	6-1/2	2-13/16	64	12
8-1/2 to 8-3/4	6-3/4 to 7	2-13/16	65	13
9-1/4 to 9-7/8	7-1/4 to 8-1/4	2-13/16	66	13
10-5/8	8-1/4	2-13/16	66	13
12 to 12-1/4 8	8-1/4 to 9-1/2	3	72	15
17-1/2	10	3	76	15
24	10	3	91	20
28	10	3	95	20

Other sizes available on request.

### Hole Openers

- Heavy duty Three Stage Hole Opener designed and supplied by MFF International Pte Ltd.
- Particularly suitable for use in areas where boulders are likely and could lead to normal single stage tools 'walking' off target.
- The tool is normally used on a roller cone-type bit with a cutting structure matching the hole opener or run with a bullnose for cleanout operations.
- Key benefits and features:
  - Smooth running due to offset angle of cutters
  - Reduced vibration from asymmetric layout of cutting structure
  - Tool stability enhanced by reinforced pilot conditioning section
  - Improved cleaning from variable directional diffused nozzles
  - Easy to redress tool on rig

New diamond impregnated gauge protection helps prevent tools from going under gauge and possibly losing cones. This also contributes to reduced vibration, smoother running and ultimately delivers a truer hole shape, eliminating unwanted ledges and other defects in the hole. Tool sizes available from 26" to 42".

GRANT STYLE		SECURITY STYLE	
Size (in)	Body (in)	Size (in)	Body (in)
17-1/2	9-1/2	6	4-3/4
21	9-1/2	8-1/2	6-1/2
22	9-1/2	9-5/8	6-1/2
23	9-1/2	12-1/4	8
24	9-1/2	14-3/4	8
26	9-1/2	16	9-1/2
36	9-1/2	17-1/2	8 and 9-1/2
42	9-1/2	20	8
		22	9-1/2
		26	8 and 9-1/2
		28	9-1/2
		29	9-1/2
		30	9-1/2
		32	9-1/2
		36	9-1/2 and 11-1/4
		42	9-1/2

MFF International Pte Ltd. hole openers have a range of cutting structures and hydraulics to suit any application where hole enlargement is needed without drift diameter issues.

The body design permits use of substantially larger bearings on each of the individual cones for added durability while the body itself is manufactured from a solid billet of AISI 4145 heat treated steel, inspected to DS1/NS1 and NS2 for rental equipment.

The cutter ensures optimum penetration, long life and exceptionally smooth running as a result of our random cutter design and cone offset angle technology – developed over many years by the bits industry.

An optimised body to hole size allows high annual velocities to be achieved alongside the hole opener body, permitting much better hole cleaning than any existing designs. Cleaning is supported by three jets which remove cuttings and reduce the need for re-cutting.



### Rotary Drill Bits

- MFF offer Rotary Drill Bits in:
- Fixed Cone Type
  - Roller Cone Type

A Fixed Cone Bits is one where there are no moving parts, but drilling occurs due to percussion or rotation of the drill string. Fixed Cone Bits can be either polycrystalline diamond compact (PDC) or grit hot-pressed inserts (GHI).

Roller Cone Bits can be either tungsten carbide inserts (TCI) or milled tooth (MT). The manufacturing process and composites used in each type of drill bit make them ideal for specific drilling situations. Additional enhancements can be made to any bit to increase the effectiveness for almost any drilling situation.

A major factor in drill bit selection is the type of formation that needs to be drilled. The effectiveness of a drill bit varies by formation type. There are three types of formations: soft, medium and hard. A soft formation includes unconsolidated sands, clays, soft limestones, red beds and shale. Medium formations include calcites, dolomites, limestones, and hard shale. Hard formations include hard shale, calcites, mudstones, cherty lime stones and hard and abrasive formations.

MFF International could supply all sizes, types and brand of drill bits. Please feel free to contact us for detailed technical and commercial information.



Fixed Cone



Roller Cone

- Drill bits are manufactured as per API Specifications.
- Drill bits are categorized into two main categories:
  - Fixed Cone Bits
  - Roller Cone Bits
- Fixed Cone - Mainly PDC bits
- In Roller Cone - Insert Cone Bits (TCI) or Tooth Cone Bits (MT)

### Fishing Tools

A general term for special mechanical devices used to aid the recovery of equipment lost in downhole. These devices generally fall into four classes: diagnostic, inside grappling, outside grappling, and force intensifiers or jars.

Diagnostic devices may range from a simple impression block made in a soft metal, usually lead, that is dropped rapidly onto the top of the fish so that upon inspection at the surface, the fisherman may be able to custom design a tool to facilitate attachment to and removal of the fish. Other diagnostic tools may include electronic instruments and even downhole sonic or visual-bandwidth cameras.

Inside grappling devices, usually called spears, generally have a tapered and threaded profile, enabling the fisherman to first guide the tool into the top of the fish, and then thread the fishing tool into the top of the fish so that recovery may be attempted.

Outside grappling devices, usually called overshots, are fitted with threads or another shape that "swallows" the fish and

does not release it as it is pulled out of the hole. Overshots are also fitted with a crude drilling surface at the bottom, so that the overshoot may be lightly drilled over the fish, sometimes to remove rock or metallic junk that may be part of the sticking mechanism.

Jars are mechanical downhole hammers, which enable the fisherman to deliver high-impact loads to the fish, far in excess of what could be applied in a quasi-static pull from the surface.

MFF Supplies most of the fishing tools as per the API Standards. Few are listed as below:

- Fishing Jar
- Bumper sub
- Junk sub
- Taper sub
- Casing Scrapper
- Jar Intensifiers
- Fishing magnet
- Junk mills
- Grapple releasing spear

Fishing Jar							
O.D.(in)	4 1/2"	4 3/4"	6 1/4"	6 1/2"	6 3/4"	7"	8"
Pull-down length mm	3980	3980	4098	4177	4177	4250	4318
I.D. (mm)	1 1/2"	2"	2 1/4"	2 1/4"	2 1/4"	2 1/2"	2 3/4"
Stroke(mm)	305	305	320	320	320	320	330
Tensile load (KN)	780	980	1270	1370	1470	1570	1870
Max. tension in downhole (KN)	340	400	700	750	800	800	800
Sealing pressure Mpa	20	20	20	20	20	20	20

Highest working temperature	150	150	150	150	150	150	150
Threads API	NC31	NC38	NC50	NC50	NC50	NC50	6 5/8REG

Please contact us for detailed specifications/inquiry for any of the fishing tools, only few are listed above but we can supply all the other fishing tools as well.

### Grapple Releasing Spear (Casing Spear)

The Grapple Releasing Spear is an internal catch fishing tool designed to retrieve tubular members from the well bore. It is a rugged, dependable, and inexpensive device. The simple design assures positive engagement throughout the fishing operation is easy to release and re-engage if necessary and may be run in conjunction with other equipment such as pack-off attachments and internal cutting tools.



Grapple Releasing Spear											
Nominal Catch	2-3/8 Tub	2-7/8 Tub	3-1/2 Tub	4 Tub	4-1/2 Tub	5CSG	6 CSG	7 CSG	8-5/8 CSG	9-5/8 CSG	13-3/8 CSG
Spear OD(H)	1-7/8	2-5/16	2-13/16	3-1/4	3-5/8	4-1/2	5	5-3/4	7-1/4	8-1/4	11-3/4
Spear ID	3/8	3/8	1/2	3/4	3/4	7/8	1	2	2-3/4	2-3/4	3-1/2
Part No.	GRS-23	GRS-27	GRS-34	GRS-4	GRS-44	GRS-5	GRS-6	GRS-7	GRS-85	GRS-95	GRS-133



Casing Scrapper



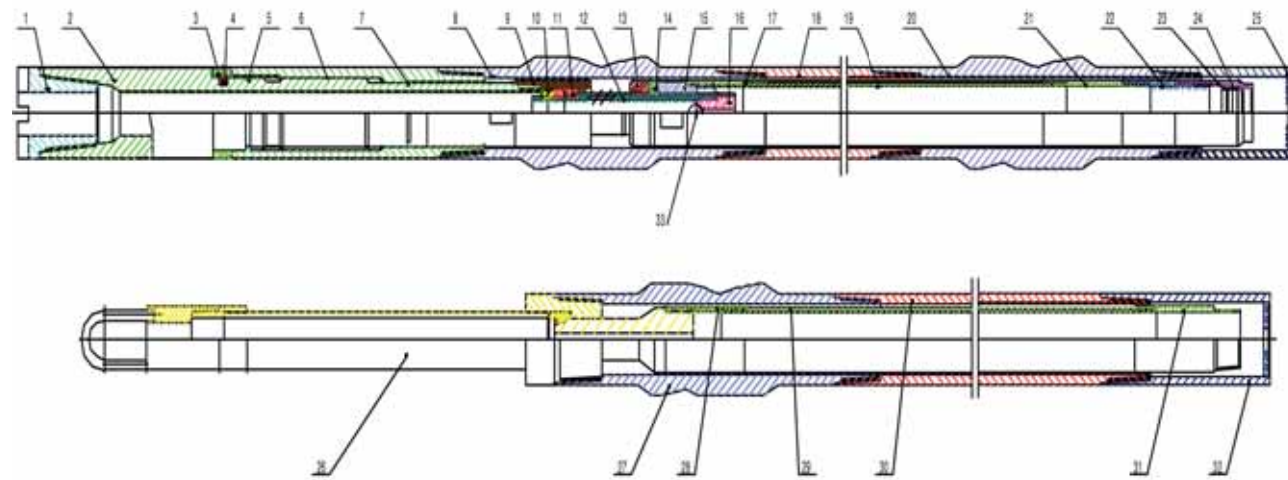
Casing Scrapper

### Coring Tools

Coring process is to deepen the wellbore by way of collecting a cylindrical sample of rock. A core bit is used to accomplish this, in conjunction with a core barrel and core catcher. The bit is usually a drag bit fitted with either PDC or natural diamond cutting structures, but the core bit is unusual in that it has a hole in its centre. This allows the bit to drill around a central cylinder of rock, which is taken in through the bit and into the core barrel. The core barrel itself may be thought of as a special storage chamber for holding the rock core. The core catcher serves to grip the bottom of the core and, as tension

is applied to the drill string, the rock under the core breaks away from the undrilled formation below it. The core catcher also retains the core so that it does not fall out the bottom of the drill string, which is open in the middle at that point. Coring unit assembly comprises of Core Bit, Core Barrel, Stabilizer and Accessories.

CORING UNIT ASSEMBLY (CORE BARREL ASSEMBLY) LAYOUT AS BELOW



Item No	Parts	Quantity (Nos)	Item No	Parts	Quantity (Nos)
1	Thread Protector	1	18	Outer Barrel	1
2	Safety Joint Sub	1	19	Inner Barrel	1
3	Friction Ring	1	20	Core Barrel Stabilizer	1
4	Spring	1	21	Lower Inner Tube Extension	1
5	Safety Joint Upper O-Ring	1	22	Inner tube Shoe (Top End)	1
6	Safety Joint Barrel	1	23	Inner Tube Shoe, Pilot Type	1
7	Safety Joint Lower O-Ring	1	24	Standard Spring Core Catcher	1
8	Core Barrel Stabilizer	1	25	Protector- 1	1
9	Cartridge Thrust Bearing	1	26	Elevator Sub	1
10	Bearing Retainer	1	27	Core Barrel Stabilizer	1
11	Thrust Bearing	1	28	Upper Inner Tube Extension	1
12	Inner Tube Plug	1	29	Inner Barrel	1
13	Thrust Collar	1	30	Outer Barrel	1
14	Thrust Ring	1	31	Lower Inner Tube Extension	1
15	Long Distance Adjuster	1	32	Protector-2	1
16	Pressure Relief Plug	1	33	Steel Ball	1
17	Upper Inner Tube Extension	1			

### Coring Barrel

The core barrels are fit-for-purpose for all standard coring operations, long core barrel runs, motor coring, and coring in highly-deviated wells. The barrels offer the optimal coring system for enhanced coring performance and quality core recovery. It consists of a safety joint, outer barrel, inner barrel, swivel assembly, stabilizers, and core catcher assembly. The safety joint and outer barrels are manufactured from specialty heat treated alloy to provide the ultimate in strength and durability. Standard spring core catcher with tungsten carbide grit I.D. grips and breaks the core at the bottom. Hard faced

integral blade stabilizers offer greatest strength and wear resistance of the core barrel.



Specifications								
Core Barrel	Barrel Size inches	Standard Length ft (m)	Make Up lb	Torque ft (Nm)	Fluid Capacity gpm(lpm)		Recommended Maximum Pull lbs (N)	
<b>Conventional Core Barrels</b>								
250 P	4 3/4 x 2-5/8	60(18.29)	4,700	(3,672)	164	(621)	232,000	(1,031,936)
250P	6 1/4 x 4	60(18.29)	9,400	(12,745)	275	(1,041)	365,000	(1,623,520)
250P	6 3/4 x 4	60(18.29)	11,100	(15,050)	387	(1,465)	407,000	(1,810,336)
250P	8 x 5 1/4	60(18.29)	21,900	(29,693)	295	(1,117)	602,000	(2,677,696)
<b>High Torque Core Barrels</b>								
HT10	4 3/4 x 2 5/8	60(18.29)	10,000	(13,558)	164	(621)	250,000	(1,112,000)
HT30	6 3/4 x 4	60(18.29)	30,000	(40,675)	387	(1,465)	530,000	(2,357,440)
HT40	8 x 5 1/4	60(18.29)	40,000	(54,233)	295	(1,117)	600,000	(2,668,800)
<b>Hydro-Lift Core Barrels</b>								
HLift	6 3/4 x 4	30 (9.14)	11,100	(15,050)	200	(757)	407,000	(1,810,336)
HLift	8 x 4 3/4	30 (19.14)	21,900	(29,693)	250	(946)	602,000	(2,677,696)



**Core Barrel Accessories:** 1. Swivel Assembly 2. Core Marker 3. Stabilizers 4. Ball Pick Up 5. Listing Sub  
6. Core Bit 7. Inner Shoe & Core Catcher 8. Handling Tools

### Coring Bit (PDC Bit)

A drilling tool that uses polycrystalline diamond compact (PDC) cutters to shear with a continuous scraping motion. These cutters are synthetic diamond disks about 1/8-in. thick and about 1/2 to 1

inch in diameter. PDC bits are effective at drilling formations, especially when used in combination with oil-base muds.

## Drilling Jars

### i. Hydraulic Drilling Jars

This integral hydraulic jar provide up jarring and down jarring. When downhole drilling tools are stuck, the jar can provide a huge impact to release the tools, thus the drilling operation can be continued quickly. The jar can be operated easily and conveniently

with high reliability and applied to many downhole activities of drilling, coring, fishing, work-over etc.

O.D. in	I.D. in	Connection API	Max. Working Load Lbf	Tensile Yield Strength Lbf	Torsion Yield Strength Lbf-ft	Up Stroke in	Down Stroke in	Overall Length (in locked position) ft-in
4 3/4	2 1/4	NC38	80,000	440,000	20,000	8	7	29'10"
6 1/4	2 3/4	NC50	150,000	650,000	50,000	8	7	31'2"
6 1/2	2 3/4	NC50	175,000	850,000	60,000	8	7	31'2"
7	2 3/4	NC50	200,000	1,050,000	65,000	8	7	31'6"
8	3	6-5/8REG	300,000	1,500,000	118,000	8	7	32'
9 1/2	3	7-5/8REG	500,000	1,900,000	180,000	8	8	32'6"

### ii. Mechanical Drilling Jar

This full mechanical drilling jar offers mechanical jarring in both directions. This load scope of the up jarring and the down jarring is wide, which can be adjusted in maintenance station or in site according to the requirement. The special flexible extended shaft can cut down the flexural stress of the jar body efficiently, so it is the most suitable drilling jar for vertical well, deep well, complicated well and directional well operations.



O.D. in	I.D. in	Connection API	Max. Working Load Lbf	Tensile Yield Strength Lbf	Torsion Yield Strength Lbf-ft	Up Stroke in(mm)	Down Stroke in	Overall Length ft-in
3 3/4	1	2-7/8REG	55100	230000	6000	8	8	19'
4 1/4	1 4/9	NC31	72000	310000	15000	8	8	21'
4 3/4	2	NC38	108000	440000	20000	7 3/4	8	20'10"
6 1/4	2 1/4	NC46	138000	610000	50000	5 7/8	6 17/32	21'5"
6 1/2	2 1/4	NC50	138000	850000	56000	5 7/8	6 17/32	21'5"
7	2 1/4	NC50	138000	1050000	60000	5 7/8	6 17/32	21'7"
8	2 13/16	6-5/8REG	180000	1500000	110000	5 11/16	7	23'9"
9	3	7-5/8REG	198000	1800000	150000	8	8	25'5"

Mechanical Drilling Jar Type JSZ integrates the up jarring with the down jarring. It can reduce the harmfulness of the flexural stress in downhole operation, so it is safer and reliable, superior in offshore drilling and directional drilling.

O.D. in	I.D. in	Connection API	Max. Working Load Lbf	Tensile Yield Strength Lbf	Torsion Yield Strength Lbf-ft	Up Stroke in	Down Stroke in	Overall Length (in locked position) ft-in
4 7/8	2 1/32	NC38	110,160	440,000	20,000	9	6	13'7"
6 3/8	2 1/4	NC46	139,380	610,000	50,000	9	6	13'7"
6 3/4	2 1/4	NC46	139,380	850,000	75,000	9	6	13'7"
7	2 1/4	NC50	139,380	1,050,000	100,000	9	6	13'7"
8	2-13/16	6-5/8REG	183,000	1,500,000	150,000	9	6	13'10"

### iii. Double Acting Hydraulic-Mechanical Drilling Jar (Hydro-Mechanical)

This is a jarring and stuck releasing tool. It integrates the up jar and down jar impact and can release the stuck occurred during drilling operation. According to the requirement, the

tool can automatically control the impact strength and times of jarring. It is an ideal tool for vertical drilling and deflecting drilling.

O.D. in	I.D. in	Connection API	Max. Working Load Lbf	Tensile Yield Strength Lbf	Torsion Yield Strength Lbf-ft	Up Stroke in	Down Stroke in	Overall Length (in locked position) ft-in
4 7/8	2 1/32	NC38	110,160	440,000	20,000	9	6	14'9"
6 3/8	2 1/4	NC46	139,380	610,000	50,000	9	6	16'5"
6 3/4	2 1/4	NC46	139,380	850,000	75,000	9	6	16'5"
7	2 1/4	NC50	139,380	1,050,000	100,000	9	6	16'5"
8	2 13/16	6-5/8REG	183,000	1,500,000	150,000	9	6	16'7"

## OCTG

### CASING -> API 5CT

- Manufactured as per API 5CT
- OD : 4 1/2" to 20"
- Wall Thickness : 6 to 40 mm
- Grade : J55,K55,N80,L80,P110
- Thread : LTC, STC or BTC
- Available : Seamless or Electric Resistance Welded (ERW)



API 5CT	API 5CT	CARBON	MANGANESE	MOLYBDENUM	CHROMIUM	NICKEL	COPPER	PHOSPHOROUS	SULFUR	SILICON	YIELD	TENSILE	HARD	HEAT TREATMENT					
GROUP	GRADE	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX						
1	H-40	-	-	-	-	-	-	0.03	0.03	-	40,000	80,000	60,000	NONE					
	J-55	-	-	-	-	-	-	0.03	0.03	-	55,000	80,000	75,000	N N&T Q&T					
	K-55	-	-	-	-	-	-	0.03	0.03	-	55,000	80,000	95,000	NONE					
	N-80	-	-	-	-	-	-	0.03	0.03	-	80,000	110,000	110,000	N N&T Q&T					
2	M-65	-	-	-	-	-	-	0.03	0.03	-	65,000	85,000	85,000	22	N N&T Q&T				
	C-75 1 <sup>f</sup>	-	0.50	-	1.90	0.15	0.40	-	-	-	0.04	0.06	0.45	75,000	90,000	95,000	N & T		
	C-75 2 <sup>g</sup>	-	0.43	-	1.50	-	-	-	-	-	0.04	0.06	0.45	75,000	90,000	95,000	Q & T		
	C-75 3 <sup>h</sup>	0.38	0.48	0.75	1.00	0.15	0.25	0.80	1.10	-	0.04	0.06	-	75,000	90,000	95,000	N & T		
	L-80 1	-	0.43 <sup>g</sup>	-	1.90	-	-	-	-	0.25	0.35	0.03	0.03	0.45	80,000	95,000	95,000	23	Q & T
	L-80 9CR	-	0.15	0.30	0.60	0.90	1.10	8.00	10.00	0.50	0.25	0.02	0.01	1.00	80,000	95,000	95,000	23	Q & T
	L-80 13CR	0.15	0.22	0.25	1.00	-	-	12.00	14.00	0.50	0.25	0.02	0.01	1.00	80,000	95,000	95,000	23	Q & T
	C-90 1	-	0.35	-	1.00	0.25 <sup>b</sup>	0.75	-	1.20	0.99	-	0.02	0.01	-	90,000	105,000	100,000	25.4	Q & T
	C-90 2	-	0.50	-	1.90	-	NL	-	NL	0.99	-	0.03	0.01	-	90,000	105,000	100,000	25.4	Q & T
	C-95	-	0.45 <sup>c</sup>	-	1.90	-	-	-	-	-	-	0.03	0.03	0.45	95,000	110,000	105,000	-	Q & T
3	T-95 1	-	0.35	-	1.20	0.25 <sup>d</sup>	1.50	0.40	1.50	0.99	-	0.02	0.01	-	95,000	110,000	105,000	25.4	Q & T
	T-95 2	-	0.50	-	1.90	-	-	-	-	0.99	-	0.03	0.01	-	95,000	110,000	105,000	25.4	Q & T
	P-105	-	-	-	-	-	-	-	-	-	0.04	0.06	-	105,000	135,000	120,000	-	N & T	
	P-110	-	-	-	-	-	-	-	-	-	0.03 <sup>e</sup>	0.03 <sup>e</sup>	-	110,000	140,000	125,000	-	Q & T	
	Q-125 1	-	0.35	-	1.00	-	0.75	-	1.20	0.99	-	0.02	0.01	-	125,000	150,000	135,000	-	Q & T
	Q-125 2	-	0.35	-	1.00	-	NL	-	NL	0.99	-	0.02	0.02	-	125,000	150,000	135,000	-	Q & T
4	Q-125 3	-	0.50	-	1.90	-	NL	-	NL	0.99	-	0.03	0.01	-	125,000	150,000	135,000	-	Q & T
	Q-125 4	-	0.50	-	1.90	-	NL	-	NL	0.99	-	0.03	0.02	-	125,000	150,000	135,000	-	Q & T

#### NOTES:

- N.L. = No limit. Elements shown must be reported in product analysis
- <sup>a</sup>The carbon content for L-80 may be increased to 0.50% maximum if the product is oil quenched.
- <sup>b</sup>The molybdenum content for Grade C-90, Type 1 has no minimum tolerance if the wall thickness is less than 0.700 inch.
- <sup>c</sup>The carbon content for C-95 may be increased to 0.55% maximum if the product is oil quenched.
- <sup>d</sup>The molybdenum content for Grade T-95, Type 1 may be decreased to 0.15% minimum if the wall thickness is less than 0.700 inch.
- <sup>e</sup>The phosphorous is 0.020% max. and the sulfur is 0.010 max. for EW Grade P-110.
- <sup>f</sup>These grades are no longer referenced in current revision.

#### CHARPY REQUIREMENTS

Transverse = S(0.152t + 0.064) or 15 ft-lbs, whichever is greater  
 Longitudinal = S(0.304t + 0.128) or 30ft-lbs, whichever is greater  
 S = Maximum specified yield strength in ksi  
 t = The critical thickness in inches based on specified dimensions for couplings, or wall thickness  
 \* Charpy's required on all products except for H-40



### TUBING -> API 5CT

OCTG tubing is manufactured as per API 5CT standard, every specification complies by this standard and due care is taken in the manufacturing and inspection process to meet and exceed customer requirements.

API 5CT requirements are listed as below, and in general these tubing are manufactured by seamless steel making process and into different grades of material properties as specified by API 5CT standards.

All grades are available and we also offer these tubing with premium connection over and above the

API connections. Please feel free to contact us if you have any requirements, we will be of pleased to answer and advise on the correct product/ specifications.

- Manufactured as per API 5CT
- OD : 2 3/8" to 4 1/2"
- Grade : H40, J55, K55, N80, M65, L80, C90, T95, P110
- End Finish : PS, PSB, PLB, PSLB
- Length : R1, R2, R3
- End : NUE, EUE



Diameter		Wall Thickness		Weight				Thread Form of Pipe End				
				Non-Upset		External Upset T&C						
mm	in	mm	in	kg/m	lbs/ft	kg/m	lbs/ft	J55	L80	N80	C90	P110
60.30	2.38	7.24	0.17	5.96	4.00	7.00	4.70	PN	PN	PN	PN	PN
		4.83	0.19	6.85	4.60	7.00	4.70	PNU	PNU	PNU	PNU	PNU
		6.45	0.25	8.64	5.80	8.09	5.95	PNU	PNU	PNU	PNU	PNU
73.03	2.88	5.51	0.22	9.53	6.40	9.69	6.50	PNU	PNU	PNU	PNU	PNU
		7.82	0.31	12.80	8.60	12.95	8.70	PNU	PNU	PNU	PNU	PNU
88.90	3.50	5.49	0.12	11.46	7.70	13.85	9.30	PN	PN	PN	PN	PN
		6.45	0.25	13.70	9.20	13.85	9.30	PNU	PNU	PNU	PNU	PNU
		7.34	0.29	15.19	10.20	13.85	9.30	PN	PN	PN	PN	PN
114.30	4.50	9.52	0.38	18.91	12.70	19.28	12.95	PNU	PNU	PNU	PNU	PNU
		6.88	0.27	18.96	12.60	18.98	12.75	PNU	PNU	PNU	PNU	PNU

### Macaroni Tubing -> API 5CT

Macaroni tubing is small diameter tubing manufactured as per API 5CT standard, this macaroni generally comes in the sizes of 1" (1.315" OD), 1 1/4" (1.66" OD), 1 1/2" (1.90"OD) and 2 1/16"OD. The last one that's 2 1/16" is used less often.

Macaroni Tubing which is part of a Macaroni string, this Macaroni string is run in the wells for the production by the method referred as artificial gas lift, this is conducted in those wells which have ceased to flow due to exhausted life of the well. And in the process of artificial gas lift, Macaroni string is run inside the production tubing string of 2 7/8" or 3 1/2", and high pressure gas is forced through the macaroni string, due to this increased pressure inside the well, the flow will commence again from the production tubing.



This macaroni tubing which is part of macaroni string is very key in this artificial lift process, as this tubing should withstand various extensive forces applied during this process.

Macaroni tubing are generally manufactured by seamless steel making process, and preference is given for the Integral Joint (IJ) tubing, and there are instances wherein External Upset End (EUE) tubing with coupling are also used and followed by least application of Non-Upset End Tubing with coupling (NUE)

- Manufactured as per API 5CT
- OD : 1.050", 1.315", 1.900", 2 1/16"
- Grade : H40, J55, L80, N80, C90, P110
- End Finish : NUE, EUE, IJ
- Length : R1, R2, R3
- Packing in bundles

SIZE (O.D.)	WT/FT (NOM)	WALL THK.	I.D. (NOM)	DRIFT (API)	PIN LENGTH	THDS / IN.	O.D. STD.	I.D. (NOM)	NOMINAL TORQUE VALUES FT. LBS	COLLAPSE PRESSURE			INTERNAL YIELD PRESSURE			JOINT YIELD STRENGTH					
										J-55	C-75	N&L-80	J-55	C-75	N&L-80	J-55	C-75	N&L-80			
Tubing Dimensions										API Integral Joint						Performance Properties - API Integral Joint					
IN.	LBS.	IN.	IN.	IN.	IN.	NO.	IN.	IN.	J-55	N&C-75	P-105	%	PSI	PSI	PSI	PSI	PSI	PSI	PSI	LBS.	LBS.
1-(1.315)	1.72	.133	1.049	0.955	1-1/8	10	1.550	0.970	400	520	550	80	10,000	13,640	14,550	9,730	13,270	14,160	21,960	29,940	31,940
1-1/4(1.660)	2.33	.140	1.380	1.286	1-1/4	10	1.880	1.301	500	650	690	82	8,490	11,580	12,360	8,120	11,070	11,810	30,500	41,600	44,370
1-1/2(1.900)	2.76	.145	1.610	1.516	1-3/8	10	2.110	1.531	580	760	810	84	7,750	10,570	11,280	7,350	10,020	10,680	36,970	50,420	53,780
2-1/16	3.25	.156	1.751	1.657	1-7/16	10	2.325	1.672	740	970	1030	95	7,690	10,480	11,180	7,280	9,920	10,590	49,070	66,910	71,370
Tubing Dimensions										API External Upset T & C						Performance Properties - API External Upset T & C					
1-(1.315)	1.8	.133	1.049	0.955	1-1/4	10	1.900	1.049	570	740	790	100	10,000	13,640	14,550	9,730	13,270	14,160	27,160	37,040	39,510
1-1/4(1.660)	2.4	.140	1.380	1.286	1-3/8	10	2.200	1.380	690	910	960	100	8,490	11,580	12,360	8,120	11,070	11,810	36,770	50,140	53,480
1-1/2(1.900)	2.9	.145	1.610	1.516	1-7/16	10	2.500	1.610	880	1150	1220	100	7,750	10,570	11,280	7,350	10,020	10,680	43,970	59,960	63,960
Tubing Dimensions										API Non-Upset T & C						Performance Properties - API Non-Upset T & C					
1-(1.315)	1.7	.133	1.049	0.955	1-1/8	10	1.660	1.049	270	360	380	56	10,000	13,640	14,550	9,730	13,270	14,160	15,060	20,540	21,910
1-1/4(1.660)	2.3	.140	1.380	1.286	1-1/4	10	2.054	1.380	350	460	490	58	8,490	11,580	12,360	8,120	11,070	11,810	21,360	29,120	31,060
1-1/2(1.900)	2.75	.145	1.610	1.516	1-3/8	10	2.200	1.610	410	540	570	59	7,750	10,570	11,280	7,350	10,020	10,680	26,250	35,800	38,180



## Line Pipe

We supply line pipes for different applications, whether for wells, pipelines, surface casing and structural applications, we offer a wide variety of steel pipe. We can supply new, used or limited service as per our customer's specifications. We can also arrange coating or machine slotting for you with delivery direct to your job site.



Selected Pipe Schedules  
Standard Steel Pipe Sizes

Nominal Size	O. D.	"Standard Weight"			"Extra Strong"			"Double Extra Strong"		
		I. D.	Wall Thickness	Wt. Per Ft. Plain Ends	I. D.	Wall Thickness	Wt. Per Ft. Plain Ends	I. D.	Wall Thickness	Wt. Per Ft. Plain Ends
1/8	0.405	0.269	0.068	0.24	0.215	0.095	0.31	-	-	-
1/4	0.540	0.364	0.088	0.42	0.302	0.119	0.54	-	-	-
3/8	0.675	0.493	0.091	0.57	0.423	0.126	0.74	-	-	-
1/2	0.840	0.622	0.109	0.85	0.546	0.147	1.09	0.294	0.294	1.71
3/4	1.050	0.824	0.113	1.13	0.742	0.154	1.47	0.434	0.308	2.44
1	1.315	1.049	0.133	1.68	0.957	0.179	2.17	0.599	0.358	3.66
1-1/4	1.660	1.380	0.140	2.27	1.278	0.191	3.00	0.896	0.382	5.21
1-1/2	1.900	1.610	0.145	2.72	1.500	0.200	3.63	1.100	0.400	6.41
2	2.375	2.067	0.154	3.65	1.939	0.218	5.02	1.503	0.436	9.03
2-1/2	2.875	2.469	0.203	5.79	2.323	0.276	7.66	1.771	0.552	13.70
3	3.500	3.068	0.216	7.58	2.900	0.300	10.25	2.300	0.600	18.58
3-1/2	4.000	3.548	0.226	9.11	3.364	0.318	12.51	2.728	0.636	22.85
4	4.500	4.026	0.237	10.79	3.826	0.337	14.98	3.152	0.674	27.54
5	5.563	5.047	0.258	14.62	4.813	0.375	20.78	4.063	0.750	38.55
6	6.625	6.065	0.280	18.97	5.761	0.432	28.57	4.897	0.864	53.16
8	8.625	8.071	0.277	24.70	7.625	0.500	43.39	6.875	0.875	72.42
8	8.625	7.981	0.322	28.5	-	-	-	-	-	-
10	10.750	10.192	0.279	31.20	9.750	0.500	54.74	-	-	-
10	10.750	10.136	0.307	34.24	-	-	-	-	-	-
10	10.750	10.020	0.365	40.48	-	-	-	-	-	-
12	12.750	12.090	0.330	43.77	11.750	0.500	65.42	-	-	-
12	12.750	12.000	0.375	49.56	-	-	-	-	-	-

Selected Pipe Specifications

Manufacture Specification	Process Type	Minimum Yield (Psi)	Minimum Tensile (Psi)
ASTM A53F	Continuous Weld	25,000	45,000
ASTM A53A	ERW or Seamless	30,000	48,000
ASTM A53B	ERW or Seamless	35,000	60,000
ASTM A106B	Seamless	35,000	60,000
ASTM A252-2	ERW, Smls or DSAW	35,000	60,000
API 5LA	CW, ERW, Smls or DSAW	30,000	48,000
API 5LB	CW, ERW, Smls or DSAW	35,000	60,000
API 5LX-42	ERW, Smls or DSAW	42,000	60,000
API 5LX-52	ERW, Smls or DSAW	52,000	66,000
API 5LX-60	ERW, Smls or DSAW	60,000	75,000



## WELLHEAD TOOLS

### Casing Head

Casing Heads have a straight bore bowl with 45° landing shoulder design which avoids damage to sealing areas by drilling tools and prevents test plug and bowl protector wedging problems when pressure is applied.

Few Casing Heads are based on the same reliable design with exception that the bowl is longer, which permits the acceptance of the hanger with larger load capacity for deeper drilling.

Casing Heads are normally furnished with threaded outlets and studded outlets are available upon request. Bottom connections can be furnished threaded or slip-on for welding.

Contact us for detailed product specification including the data sheets.

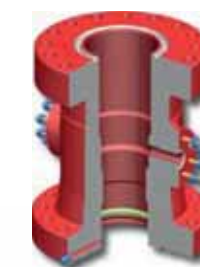


### Casing Spools

Casing spools are straight bore bowl with 45° landing shoulder design. Bottom preparation can be the PE/BG, "OO" bottom (for below 5000 psi application) or double "P" seal bottom. The BG preparation allows the use of reducer bushings "PE" (Pressure Energized). Outlets are normally threaded; optional studded / flanged outlets are available.

An additional function of the casing spool is to allow for testing BOPs while drilling, retaining the bowl protector, and pressure-testing casing seals through a test port.

Casing spools provide a controlled bore in the top bowl for the casing hanger seals, they also provide seals in the bottom bowl to pack off the previous casing string and isolate the ID seals from internal casing pressure.



#### Available

- Working Pressure: 2,000 psi ~ 15,000 psi
- Bore Size: 11" thru 13-5/8"
- Temperature: - 60°C to 121°C (K,U)
- Material Classes: AA ~ FF
- Product Specification Level: PSL1 ~ PSL4
- Performance Requirement: PR1, PR2
- End connectors: bolt- through flange or studded

### Tubing Head

TCM Tubing Heads are a straight bore bowl with 45° landing shoulder design which avoids damage to sealing areas by drilling tools, and prevents wedging of the tubing hangers, bowl protectors and test plugs. The secondary seal for the last casing pipe can be an integrated "OO" seal type or the plastic injection type, but also accepts reducer bushings "4-O" and "PE" (Pressure Energized).

The upper flange is supplied with lockdown screws for pack off re-energization and tubing hanger retention. The lower flange includes a grease fitting and orifice for testing of the secondary seal. Tubing Head can be used for single completions and or for dual completions based on the designs.

Please contact us to get the correct advise which type of tubing head is required based on various completion and other requirements. Please do write to us for further information.



## Casing Hanger

### MCG-01 Casing Hanger

Slips, slip bowl and a type H pack off seal ring are all combined in the MCG-01. The Type "H" pack off provides a positive annulus pack off after the casing has been suspended and cut off.

### MCG-02 Casing Hanger

Combined in a single unit, the MCG-02 wrap around Casing Hanger incorporates pack off, slip bowl and slips. When the casing load is suspended, the pack off automatically seals the casing annulus below the slips. The MCG-02 Hanger's controlled friction reduces casing deflection, can be easily installed and is economical

### Slip Style Casing Hangers - Wraparound

The Wraparound slip casing hanger is a step tapered design able to support extreme casing weights greater than rated joint strengths without the possibility that the casing will collapse from tensile loading.



#### Features:

- Wraparound, slip type, weight-set hanger
- May be installed through the BOP
- Suitable for heavy casing loads
- Support casing weight and seals annulus before the BOP is removed
- Weight supported on solid shoulder not on seal which will not over compress the seal
- Upper body diameter is larger to centralize and protect seals

#### Available:

Nominal Sizes: 9", 11", 13-3/8", 21-1/4"  
Casing Sizes: 5" thru 16-3/4"

## Tubing Hanger

The Wrap-Around Tubing Hanger is designed to maintain control of the tubing/casing annulus while allowing reciprocation of the tubing.

The tubing hanger is a high capacity, mandrel tubing Hanger pressure rated to 15,000 psi. The design of the Tubing hanger must be compatible with the bowl it lands in and the adapter to which it attaches.

The tubing hangers and the tubing head adapters have been linked by nomenclature to make pairing them together easier. For the TG-M model, the 'T' represents the tubing head bowl design and the 'M' represents the tubing hanger

### PE Secondary Seal

PE Secondary Seal is inserted in the bottom bowl of a casing spool or tubing spool and retained with a snap wire. The seal is energized when the spool is installed over the casing stub and the flange connection is made up. It is available in standard API casing sizes, as well as nonstandard casing sizes, and is built to provide safe, dependable service in pressure applications through 5000 psi.

### Rubber-Sealed Tubing Hangers



- MFF offers a wide range of rubber sealed tubing hangers for single completion
- All hangers are available with internal preparation for back pressure valve. DHCV (Down Hole Control Valve) and injection ports are optional.
- Available in extended seal neck or slick neck

### Slip Style Casing Hangers - Wraparound and Hinged

The 'WE' wraparound slip hinged casing hanger is used when casing weight is insufficient to energize the 'W' casing annulus seal. The sealing element is located above the slips and is mechanically activated by cap screws independent of the casing string load on the slips.



#### Features:

- Wraparound, slip hanger
- Used when annulus seal is required independent of casing load
- Usually installed at the casing head or spool
- Elastomer seal mechanically activated by cap screws

#### Available:

Nominal Sizes: 9", 11", 13-3/8", 21-1/4"  
Casing Sizes: 5" thru 16-3/4"

### Wrapped Casing Hangers



- Wraparound, slip type hanger
- For easy installation and reliable operation, is used for connecting casing head and surface casing
- For connection of 20", 13-3/8", 9-5/8" surface casing pipe

### Mandrel Style Casing Hangers



- Mandrel style hanger is fluted to allow cement returns
- Hanger is rated to or above the joint strength of the casing it is suspending
- Compression-type seal is energized by locking pins
- Extended Neck Interference seals, seal off in adapter, standard DWE casing spool or tubing head

### Metal-Sealed Tubing Hangers



- Metal-to-metal seals are standard for high pressure (15,000 psi and above) completions
- Hanger coupling with back pressure valve threads
- Provides complete pressure control while BOP's are removed and the tree is installed
- Back pressure valve can be removed through the tree with appropriate service equipment

### Wrapped Tubing Hangers



- Wraparound tubing hanger has a compression type seal
- Holds pressure from both sides

### Dual Tubing Hangers



- All kinds of cables can penetrate the tubing head with good insulation and seal.
- Working Pressure: 3,000 - 15,000 Psi

## Christmas Tree

Wellhead & X'mas tree assembly, the key equipment in oil/gas production, consists of casing head, tubing head and X'mas tree, which are applicable for connection of casing string and tubing string, sealing the annular space between casing and tubing and controlling the pressure of the production wellhead and adjusting the flow rate of oil/gas wellhead as well as some special operations such as acid fracture, injection and test etc.



#### Technical specification

- The design meets the requirement of API SPEC 6A.
- Rated working pressure 2000~20000PSI
- Rated working temp K L P R S T U V
- Material class AA, BB, CC, DD, EE FF
- Product specification level PSL1~PSL4
- Performance requirement level PR1-PR2
- Suitable medium Petroleum, natural gas, mud etc.



Spacer Spool



Spool

### Gate & Seat Design for Slab Gate

Gate Valve was developed to satisfy the need for a high quality reliable valve which is reasonably priced. All Gate valve makes full use of modern materials and manufacturing techniques. It is easy to maintain, conforms to international design requirements and Quality Assurance Programme. All Gate Valve are manufactured to API 6A Specification as a basic minimum, in a Plant that is API Q1 and ISO9001 approved and certified.

### Forged or Cast Body & Bonnet

All type gate valve bodies and bonnets are manufactured from forged or cast AISI 4130/ 4140 low alloy or AISI 410 SS steel. Other materials for extreme service, such as Inconel or Duplex stainless steel are available to order.

### Metal-to-Metal Seat to Body Interface

Precision lapped faces between the gate and seat ensure a metal-to-metal pressure tight seal is maintained. Seat is lapped on both surface to give a true metal to metal seal between the body and seat. This seal is further reinforced and protected by a Teflon or Viton lip seal, giving bubble tight sealing performance at pressure below 10 psi.



API 6A Gate Valve

Double Flanged Adaptor



Slab Gate Valve



Surface Safety Valve



Gate Valve



Choke Valve

Please contact us for many other wellhead products.

## DRILLING EQUIPMENTS & RIG ACCESSORIES

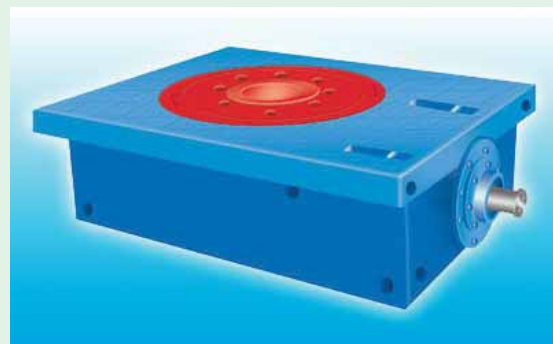
### Top Drive System



### Mud Pumps



### Rotary Table



### Crown Block



### Hook Blocks



### Draw Works



### Diesel Generator Sets

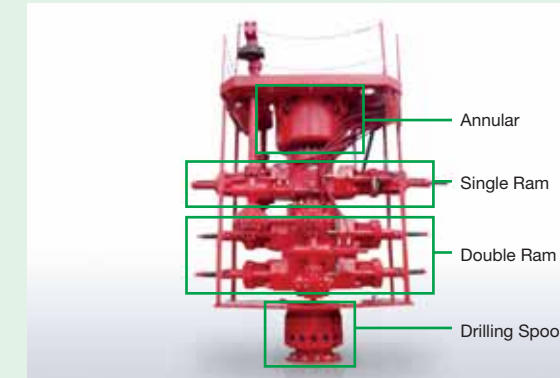


MFF can supply all types above equipment in all brands and model. Please contact us for detailed specifications.

## Blow Out Preventers (BOP)

- BOP stands for "BLOW OUT PREVENTER"
- Types : 1) Blowout Preventer Stack (Api 16a) 1.1) Annular BOP 1.2) RAM BOP

### BLOWOUT PREVENTER STACK (API 16A)



Blowout preventer stack is the main wellhead pressure control equipment for oil & gas drilling, no matter onshore or offshore drilling. BOP stack consists of annular blowout preventer, single ram blowout preventer, double ram blowout preventer and drilling spool. MFF supplies BOP stacks which are Shaffer or Cameron type. These are designed and manufactured as per API Spec 16A

### ANNULAR BOP



well blowout effectively and realize safe construction. Annular BOP shall be equipped with hydraulic control system. It is usually used with ram BOP and also independently.

#### Specification

- It can seal any size of annular space with a kind of rubber if there is a drilling tool, tubing or casing in hole.
- When there is no drilling tool in hole, it can seal the well head completely.
- When the well blowout and overflow happens during drilling, coring or well logging, it can seal the annular spaces between Kelly, coring tools, cable, wire line and well bore.
- Under the control of the hydraulic control system which is equipped with a depressurizing pressure regulating valve or a cushion accumulator, it can force stripping with 18° tool joint.

Annular BOP is an important part of wellcontrol equipment. It mainly applies to control wellhead pressure during drilling, work over operations and formation testing etc. to prevent

### RAM BOP



etc. to prevent well blowout effectively and realize safe construction.

#### Specification

- With proper pipe ram sealing the annular space between casing and tubular when there is tubular in the well bore
- With blind ram sealing the wellhead completely when there is no tubular in the well bore.
- When the well head is closed, using the kill manifold and choke manifold which are connected to the spool and the side-outlet of the shell to perform special operations such as mud circulating, choking and releasing, well killing etc.
- If necessary, drilling tools can be hung with pipe ram.
- With shear rams shearing the drilling tools to seal the well in some special circs.

Ram BOP with hydraulic control is a key part of well- control equipment. It's used for controlling wellhead pressure during drilling, work over operations and formation testing

MFF International, can supply all Branded NEW or USED BOP and its accessories. Please feel free to contact us to know more about our BOP solutions.

