Gates

A Tomkins Company

33498
May 2007

OIL FIELD PRODUCTS CATALOG

Your local distributor:

33498
May 2007

Gates Corporation
1551 Wewatta Street / P.O. Box 5887 / Denver, CO 80217-5887
Telephone: 303-744-5070 / Fax: 303-744-4410
www.gates.com

OFFSHORE LAND RIG

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For Oilfield Hose and Industrial Service Hose specifications, refer to the Gates Industrial Hose Products/List Prices catalog (# 39496-000). Phone No. 303-744-4286

For Hydraulic Hose and Hydraulic Equipment (Crimper) specifications, refer to the Gates Hydraulic Hose, Fittings & Equipment catalog (# 35093). Phone No. 303-744-4286

For Industrial Belt specifications, refer to Gates Industrial Power Transmission Products catalog (#19993). Phone No. 303-744-4800.


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LAND RIG

Gates Worldwide Locations

Gates Corporation
1551 Wewatta Street, P.O. Box 5887
Denver, Colorado 80217-5887
Tel: (303) 744-5070
Fax: (303) 744-4540

Gates Canada, Inc.
300 Henry Street
Brantford, Ontario
N3S 7R5, Canada
Tel: (519) 759-4141
Fax: (519) 759-0944

Gates Rubber de Mexico
Cerrada de Galeana No. 5
Fracc. Industrial La Loma
54060 Tlalnepantla
Edo de Mexico, Mexico
Tel: 52-555-333-2700
Fax: 52-555-333-2701

Gates Europe N.V.
Dr, Carlierlaan 30
B-9320 Erembodegem, Aalst
Belgium
Tel: 32-53-762-711
Fax: 32-53-762-713

Gates Corporation
Latin America Operations
Gates InterAmerica
3609 North 29th Avenue
Hollywood, Florida 33020 USA
Tel: (954) 926-4568
Fax: (954) 926-8024

Gates Argentina
Irala 345
(1163) Buenos Aires
Argentina
Tel: 54-11-4307-5050
Fax: 54-11-4307-3907

Gates do Brasil Ind. & Com. Ltda.
Rua Cesario Alvim, 624
Caixa Postal, 1521
03054-900 Sao Paulo
Brasil
Tel: 55-11-609-98822
Fax: 55-11-291-0647

Gates Rubber Co. (S) Pte. Ltd.
No. 1 Changi South Street 3
Singapore 486477
Tel: 65-545-3800
Fax: 65-545-5322

The Gates Group (Shanghai) Co., Ltd.
No. 15 Hai Tang Street
China-Singapore Suzhou Industrial Park
Suzhou 215021
PR China
Tel: 86-521-6761-9633
Fax: 86-512-6761-7184

Gates Indonesia (Representative Office)
Ariobimo Sentral 4th Floor
Jl. H.R. Rasuna Said Kav.X-2
No. 5, Jakarta 12950, Indonesia
Tel: 62-21-5270-721
Fax: 62-21-2525-760

Gates Rubber Company
Mastura Building 5/F
1-9-6 Shiba, Minato-ku
Tokyo, 105-0014, Japan
Tel: 81-3-5439-5188
Fax: 81-3-5439-5189

Gates Thailand (Representative Office)
Eastern Seaboard Industrial Estate
64/86 Moo4 T. Pluakdang A. Pluakdang
Rayang 21140, Thailand
Tel: 66-38-954-361
Fax: 66-38-954-362

Gates India
Ambala Chandigarh Highway
P.O: Lairu, 140501
Punjab, India
Tel: 91-1762-27050-53
Fax: 91-1762-274151

Gates Australia Pty. Ltd.
1-15 Hydrive Close
Dandenong South, Victoria 3175
Australia
Tel: 61-3-9797-9666
Fax: 61-3-9797-9600

Section 1
Oil Field Quote/Order Request Form

OFFSHORE LAND RIG

Completing the Choke & Kill or Cementing Hose Request for Quote/Order Form

1. You must fill in **all** the information on the form in order to have your quote request/order processed. Any missing information can lead to costly delays in processing your request. If there are any questions about any part of the form or the application, check details with your oil field customer, or call Ron Trujillo at (303) 744-4735.

2. The Date, Customer Name, P.O.# (if actual order) must be completed. Hose Type is Choke & Kill or Cementing. Hose Size is the hose I.D. Fill in Overall Length of the assembly, Quantity and Working Pressure. If customer requests safety clamp & chain, lift eye clamp or stainless steel armor, be sure to check the appropriate boxes.

3. There **must** be a fitting identified on the form for each end of the hose. Give **all** the requested information for each fitting (hub, flange, hammer union, etc.).

    * Type:
    * Nominal Size:
    * Working Pressure:
    * Ring No.:
    * Groove: STD or Stainless Steel

4. For examples of how to complete the fitting section see “Most Commonly Used Weld-On Fittings” section. On each drawing there is an example of how to fill in the quote form.

5. For any special fitting not pictured on the form use the “Other” category at the bottom of the form.

6. Check the appropriate box for any certifications or standards (i.e., DNV, ABS, Lloyd’s of London, etc) that are requested by the customer.

7. Fax the quote request to the appropriate marketing representative to quote.

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C&K or S C&K HOSE REQUEST FOR QUOTE \ ORDER

Date _____ Customer _____ P.O.#_____ RB# _____

Hose Type _____ Hose Size _____ Overall Length _____

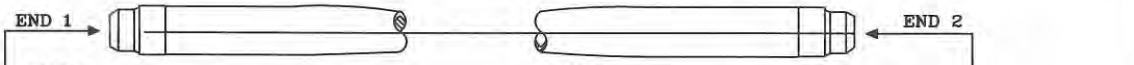
Order Qty. _____ Working Pressure _____ psi H2S Service 20% Max

Safety Clamp & Chain ☐ YES Lift Eye Clamp ☐ YES S.S. Armor ☐ YES

☐ C&K or Cementing Hose 10,000 psi W.P. - 15,000 psi test - Spec 4758F

☐ S C&K or Cementing Hose 15,000 psi W.P. - 22,500 psi test - Spec 4758L

Add-On Fittings (will be furnished welded) TPC: _____



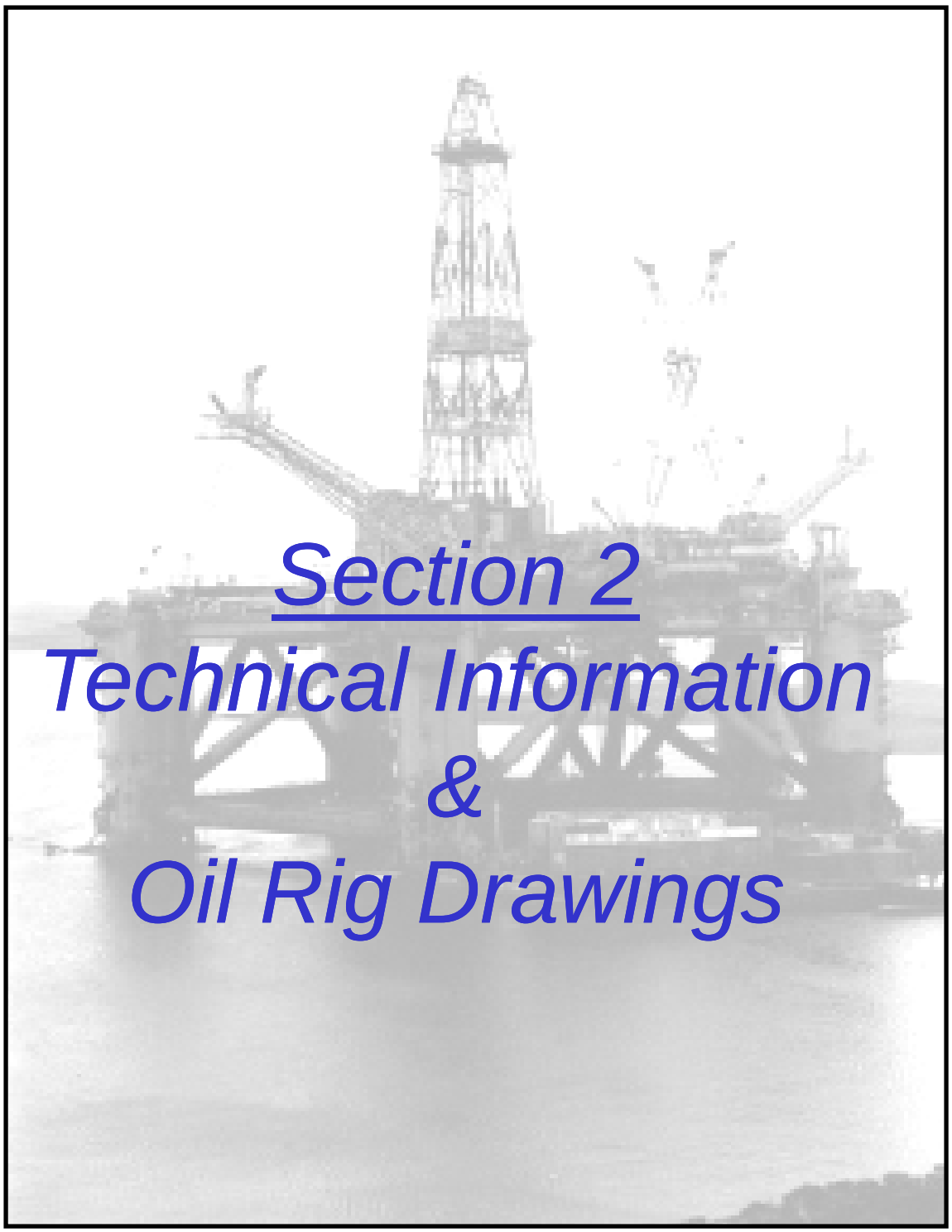
END 1	END 2
HUB	**HUB**
Type _____ Nominal Size _____	Type _____ Nominal Size _____
Working Pressure _____	Working Pressure _____
Ring No. BX _____	Ring No. BX _____
Groove: STD _____ or SS. _____	Groove: STD _____ or SS. _____
FLANGE	**FLANGE**
Type _____ Nominal Size _____	Type _____ Nominal Size _____
Working Pressure _____	Working Pressure _____
Ring No. R, RX, BX _____	Ring No. R, RX, BX _____
Groove: STD _____ or SS. _____	Groove: STD _____ or SS. _____
HAMMER UNION–FEMALE SUB.	**HAMMER UNION–FEMALE SUB.**
Type _____	Type _____
Pipe Size _____ Fig.No. _____	Pipe Size _____ Fig.No. _____
HAMMER UNION–MALE SUB/NUT	**HAMMER UNION–MALE SUB/NUT**
Type _____	Type _____
Pipe Size _____ Fig.No. _____	Pipe Size _____ Fig.No. _____
OTHER	**OTHER**
Type _____	Type _____
Nominal Size _____ Working psi _____	Nominal Size _____ Working psi _____
Male _____ Female _____	Male _____ Female _____

CERTIFICATIONS/STANDARDS * =Request Compliance/Additional Cost

Third Party Certify/Inspection

* DNV	☐ YES	* Letter of Conformance	☐ YES
* Databook	☐ YES _____ # of Books	Cplg./Nipple Mat'l. Traceability NACE (Incl.)	☐ YES
* ABS	☐ YES		
* OTHER	☐ YES _____		
* DIN German	☐ YES 3.1.C		
DIN German	☐ YES 3.1.B	Hydrostatic Test Cert. (Incl.)	

Form #39547
DATE: 5-01-07
REVISION: 7



Section 2
Technical Information
&
Oil Rig Drawings

OFFSHORE

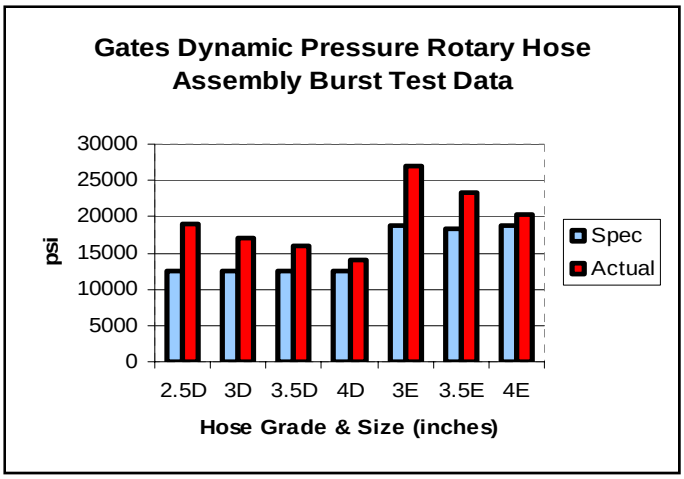
LAND RIG

Progressive Products for your Rapidly Advancing Technology

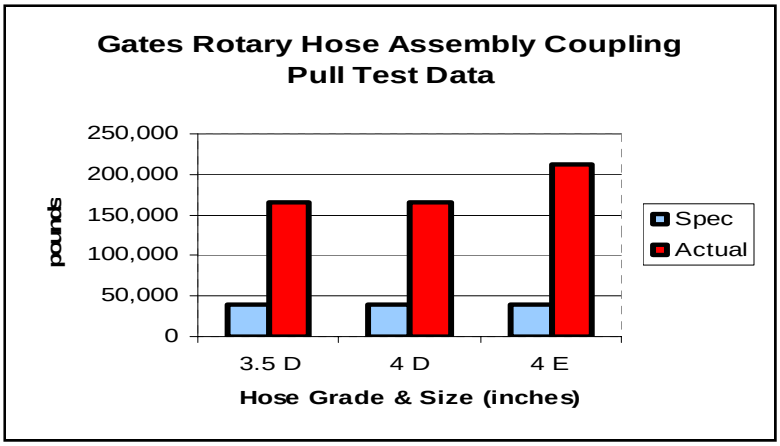
OFFSHORE LAND RIG

Gates High Performance Dynamic Pressure Rated Rotary Hose Assemblies

To keep pace with rapidly advancing drilling technology involving directional drilling and down-linking with negative pressure pulses, Gates offers a high performance API 7K rated rotary hose assembly that far exceeds minimum standards. In addition to a high quality hose construction, the Gates system has a swage attached coupling with no seals to leak and no set screws to loosen with operation vibrations or epoxy to weaken with working temperatures above 180 degrees F. Burst test results significantly exceed the API 7K minimum standards as shown in the chart below.



Coupling pull tests on hose assemblies show outstanding coupling retention capabilities as shown in the chart below. The Grade D hose assemblies were pressurized to 5,000 psi and then pulled. The hose stretched 15" and 12 5/8" before pressure loss. The Grade E test assembly pressurized to 7500 psi stretched 16" before pressure loss. None of the test assemblies exhibited coupling separation. This is important for the safety of operators in the vicinity of such heavy, high pressure hose assemblies that could come crashing down if coupling separation were to occur.



Important: The statements and data on this page are *not* intended as an implied warranty. The test data is obtained with new, unused hose assemblies under controlled conditions. Results in actual use of products may be different from the test data due to many factors including, but not limited to: conditions of use, care given the assembly, temperature and pressure, material passing through the assembly, frequency of use, and wear and tear of the assembly.

OFFSHORE LAND RIG

Gates Oilfield Hose Flow Rate Limits

On some oil rigs, the flow rate of mud to the drill pipe has been increased significantly. Flow rates as high as 3100 GPM have been reported. Three pumps aligned to work together can be set up to produce the higher flow rate.

There are factors that need to be considered to safely and cost effectively provide such a high flow rate. As flow rate (GPM) increases, velocity of that fluid through a conduit such as a hose or a pipe will also increase. As velocity increases, the turbulence of the moving fluid increases. Excessive turbulence produces erosive friction, heat, and vibration. This can have a damaging effect on hose, pipe, pumps, and other components in the system, significantly reducing their length of service life. Things will not last nearly as long under increasingly severe conditions. Replacing these expensive components more frequently is compounded with the additional service downtime.

To maximize the length of service time from hoses, etc., and reduce damaging effects of excessive velocity, Gates recommends limiting the fluid velocity to a maximum of 30 fps (feet per second). Higher flow rates will require larger bore hoses and in some cases multiple hose lines. The table below summarizes the relationship of hose size, flow rates and velocity. To avoid costly, frequent replacements and downtime, stay out of the high velocity shaded area in this table.

Flow Rates

(*Velocity for various pumping rates)

Hose I.D. (In.)	*Velocity, ft/sec (fluids) gpm																			
	100	150	200	250	300	350	400	450	500	550	600	650	700	750	1000	1500	2000	2500	3000	3500
2 1/2	6.5	9.8	13.1	16.3	19.6	22.8	26.1	29.4	32.6	35.9	39.2	42.4	45.7	49	65.3	97.9	130.6	163.2	195.8	228.5
3	—	6.8	9.1	11.3	13.6	15.9	18.1	20.4	22.7	24.9	27.2	29.5	31.7	34	45.3	68	90.7	113.3	136	158.7
3 1/2	—	5	6.7	8.3	10	11.7	13.3	15	16.6	18.3	20	21.6	23.3	25	33.3	50	66.6	83.3	99.9	116.6
4	—	3.8	5.1	6.4	7.7	8.9	10.2	11.5	12.8	14	15.3	16.6	17.9	19.1	25.5	38.3	51	63.8	76.5	89.3
4+4 (Two hoses; velocities shown per hose)															12.8	19.1	25.5	31.9	38.3	44.6
4+4+4 (Three hoses; velocities shown per hose)															8.5	12.8	17	21.2	25.5	29.7

Calculations based on the equation below:

$$*V = \frac{0.408 \times gpm}{d^2}$$

*V= Velocity, ft./sec.

Gpm = gallons per minute

d = hose I.D., inches

Note: For Optimum performance, maximum velocity should not exceed 30 feet per second.

OFFSHORE LAND RIG

Safety & Maintenance of Gates Rotary & Vibrator Hoses

Forward

The objective of this manual is to emphasize SAFETY by providing recommended procedures for proper handling, storage, use and maintenance of rotary drilling and vibrator hose assemblies. External inspection and field pressure testing prior to any continued service of a hose assembly is critical to ensure safe operation. These are MANDATORY PROCEDURES for applications where an assembly failure could result in serious bodily injury or severe property damage.

Scope

This procedure is a recommended practice for the storage, handling, operations, testing and inspection of flexible connectors.

This includes connectors between the standpipe and swivel (A: Rotary Drilling Hose) as well as connectors between the pump and standpipe (B: Vibrator Hose) for pumping mud at high pressures during oil drilling and exploration work (see Figure 1).

This applies to hoses having inside diameters of up to 4” with API grade classifications D and E.

Warning

A failure of a rotary drilling or vibrator hose in service may result in serious bodily injury or severe property damage.

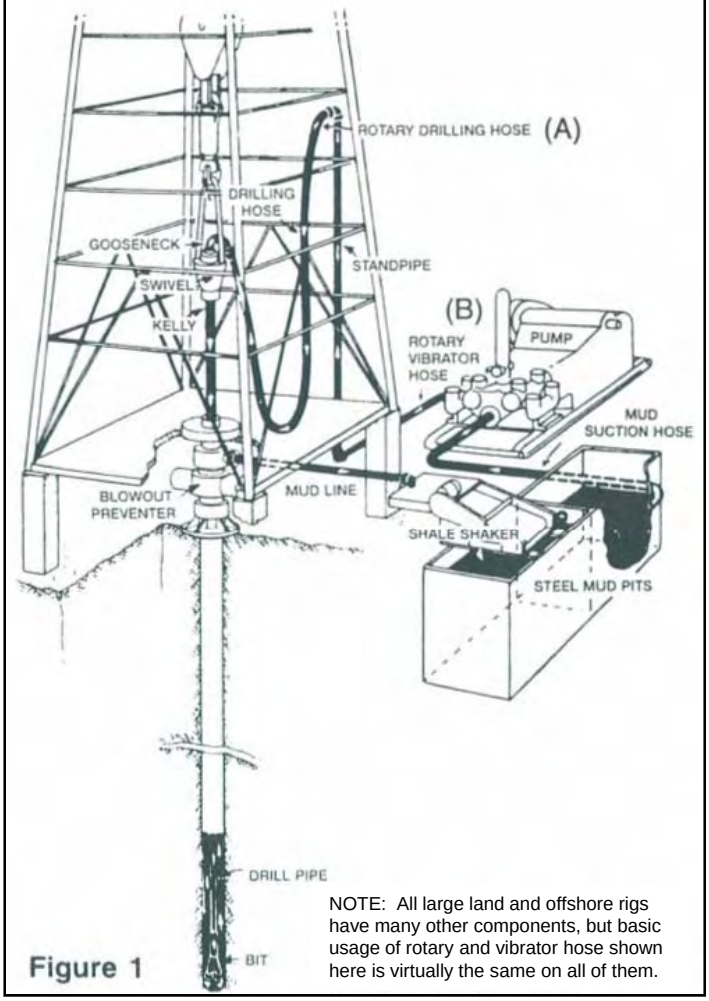


Figure 1

NOTE: All large land and offshore rigs have many other components, but basic usage of rotary and vibrator hose shown here is virtually the same on all of them.

OFFSHORE LAND RIG

Safety & Maintenance of Gates Rotary & Vibrator Hoses

Storage

1. Completely drain hose assembly before placing in storage.

2. Whenever feasible, store hose in original shipping crate. This will provide extra protection against the deteriorating effects of solvents, corrosive liquids, ozone and sunlight. Hose should be stored so coils are in a horizontal plane.

3. Certain rodents and insects can damage hose. Adequate protection from them should be provided too.

4. The ideal temperature for storing hose ranges from 50° F (10° C) to 70° F (21° C) with a maximum limit of 100° F (38° C). If stored below 32° F (0° C), hose will become stiff and will require warming before being placed in service. Hose should not be stored near sources of heat, such as radiators or base heaters.

5. To avoid adverse affects of high ozone concentrations, hose should not be stored near electrical equipment that may generate ozone or be stored for any lengthy period in geographical areas with high concentrations of ozone. Exposure to sunlight, direct, reflected or even through windows should be avoided.

6. Do not stack hose or place anything heavy on top of it to prevent damage.

Handling

Caution: Care should be exercised to prevent mishandling. Crushing or kinking of hose can cause severe damage to reinforcement. If this occurs, remove hose from service.

1. In order to minimize the chance of kinking, hose should preferably be removed from its crate by hand, laid out in a straight line, then lifted by means of a catline attached near one end of hose.

2. Hose assemblies should never be lifted by the safety clamp and chain. The assembly should always be lifted by the lift eye clamps (see figures 2 and 5).

3. Attachment of a set of lift eye clamps to the hose end coupling to safely lift and move a heavy rotary hose assembly is a **necessity** to avoid hose kink damage. A set of lift eye clamps can be obtained on special order (see Figure 2).

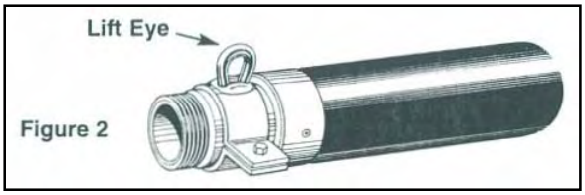


Figure 2

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Safety & Maintenance of Gates Rotary & Vibrator Hoses

Recommended Practices

Where applicable, the following recommended practices should be used on rotary drilling and vibrator hose.

A. Overall Hose Length

1. Includes standard connector and/or special adapters (see Figure 3).

B. Rotary Hose Length

1. In order to avoid kinking hose, the hose length and standpipe height should be such that when raising or lowering, as in making mousehole connections, the hose will have a normal bend radius at the swivel when it is at its lowest drilling position and at the standpipe when it is at its highest drilling position. Use the following equation to determine the recommended hose length.

$L_H = L_T/2 + \pi R + S$

Where:

L_H = Length of hose in ft.
L_T = Length of hose travel in ft.
R = Minimum bend radius in ft.
= 4' for 2 1/2" and 3" hose
= 4.5' for 3 1/2" and 4" hose
S = Allowance for contraction in L_H due to maximum recommended working pressure in ft., which is 1 ft. for all sizes.

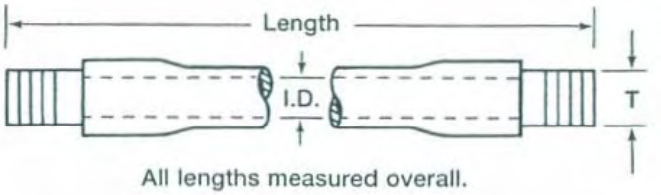


Figure 3

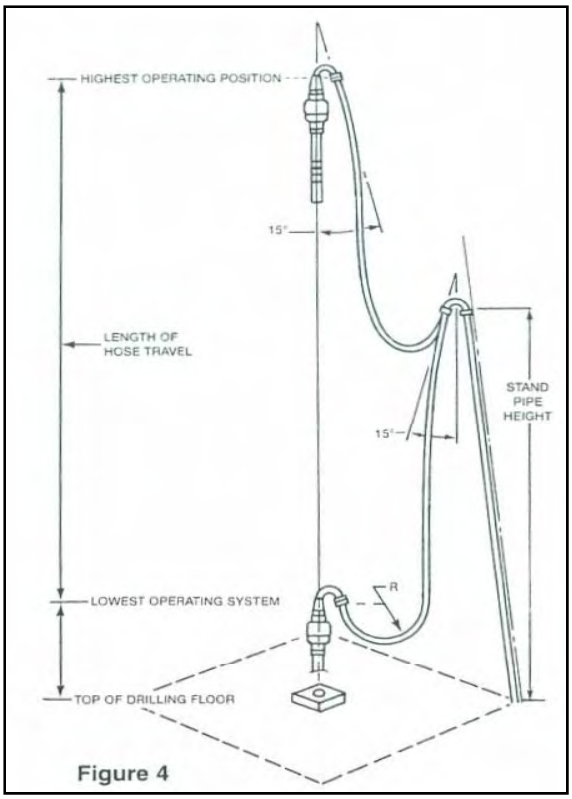


Figure 4

C. Standpipe Height

1. Use the following equation to determine the recommended standpipe height (see Figure 4).

H_S LT/2 + Z

Where:

H_S = Vertical height of standpipe in ft.
L_T = Length of hose travel in ft.
Z = Height in ft. from top of derrick floor to end of hose at swivel when swivel is at its lowest drilling position.

NOTE: When the actual hose length is greater than the calculated length, the standpipe height should be increased by half the difference between the actual length and calculated height.

Safety & Maintenance of Gates Rotary & Vibrator Hoses

D. Vibrator Hose Length

1. It's important to choose a vibrator hose having an inside diameter equal to that of the pump discharge fitting and the fluid supply line inside diameters. This is necessary to allow free flow of fluid and to avoid turbulence or unnecessary abrasion of the hose tube. The length of vibrator hose should be given careful consideration. It should be long enough to prevent kinks near the couplings, yet short enough to prevent kinks in the radius near the middle of the hose.

E. Hose Connections

1. Line pipe threads should only be used on working pressure of 5,000 psi or less. Threaded end connections should not be welded to the coupling as this will damage hose. Working pressure of 5,000 psi and above should have end connections butt welded to the coupling. The connections attaching the hose to the swivel and standpipe should be as tangential as possible. The use of a standard connection on the swivel gooseneck will ensure this relationship at top of hose. It's recommended that a 180 degree gooseneck be used on the standpipe connection if the standpipe is vertical. A 160 degree gooseneck should be used if the standpipe has the same slope as the derrick leg.

F. Vibration and Pulsation

1. Continuous pressure pulsations and vibrations may shorten the useful life of rotary and vibrator hoses used in high pressure mud piping systems. Surge chambers or pulsation dampeners of the proper size should be installed in each mud pump discharge line to minimize pulsations and vibrations in the mud lines and hoses. The precharge pressure for pulsation dampeners should be set at 10 percent of the maximum pump pressure. The lines on the suction side of the pump should be pressure charged or operated with a flooded suction to minimize cavitation that can cause pulsations. Pulsation dampeners designed for the pump suction lines should also be installed to minimize pulsation if cavitation occurs.

G. Operating Limits.

1. Operating personnel should be advised as to the highest and lowest drilling positions, length of standpipe, etc., for which the hose was selected. Drilling operations should be carried out within such limits.

H. Clearance

1. Hose installation should allow adequate clearance between hose and derrick or mast.

I. Barge Attended Off-Shore Rigs

1. When rotary hose is used as a flexible line between barges or off-shore drilling rigs, care must be used so hose is in alignment between both end connections. It's recommended that swivel joints be used at both ends. Drilling in rough water and high seas, resulting in excessive flexing and jerking of hose, will cause premature failure.

OFFSHORE LAND RIG

Safety & Maintenance of Gates Rotary & Vibrator Hoses

Operations

Caution: Care should be exercised during operation to prevent crushing or kinking of hose. Crushing or kinking can cause severe damage to cable reinforcement. If this occurs, remove hose from service and test as outlined in the "Field Test Pressure" section.

A. Working Temperature

1. Working temperature should not exceed 180°F (82°C). Temperatures encountered higher than 180°F (82°C) will shorten the useful life of the hose.

B. After Coolers

1. Compressors should always be equipped with after coolers to lower the air or gas temperatures within tolerable limits. If after coolers are not used, air or gas entering hose at excessively high temperatures can accelerate the hose aging rate, thus reducing the expected service life.

C. Working Pressure

1. The recommended maximum working pressure for rotary hose is shown in Table 1. Working pressure includes the pressure surges that occur in the system.

Table 1
Maximum Working Pressures

HOSE I.D. (In.)	Available Grades	Working Pressures (psi)	
		Grade D	Grade E
2 1/2	D, E	5,000	7,500
3	D, E	5,000	7,500
3 1/2	D, E	5,000	7,500
4	D, E	5,000	7,500

D. Oil Base Muds

1. The use of oil base muds having an excessively high aromatic content will cause hose inner liner to swell, resulting in less abrasion resistance which can shorten service life. It's recommended that oil base muds be held to a minimum aniline point of 150°F (66°C).

E. Twisting

1. Hose should not be intentionally back twisted. In order to prevent twisting, it's suggested that a swivel be installed on the gooseneck end of hose. Each length of hose has a yellow longitudinal stripe. Use this as a guide to ensure hose is installed without any twist.

F. Safety Clamps (see Figure 5)

1. All rotary hoses and vibrator hoses 8' or longer are marked with the notation "Attach Safety Clamp Here". Safety clamps must be installed prior to placing hose into service.

   a. For rotary hose — This dimension shall be 6" to 18" from the inboard end of the coupling.

   b. For vibrator hose — This dimension shall be 6" to 10" from the inboard end of the coupling.

2. A set of safety clamps can be obtained on special order. The location for attaching these safety clamps is shown by marks at each end of the assembly. Lift eye/clamps are also available. Do not use the safety clamp or chain for lifting (see Figure 5).

Safety & Maintenance of Gates Rotary & Vibrator Hoses

Operations Cont.

3. The safety clamp should be tightened securely, but not to such an extent as to damage hose or reduce the inside bore diameter. In the case of rotary hose, the safety chain should be attached to a derrick upright at the standpipe end, rather than a transverse support, so the chain will be free to move upward without restricting movement of the hose, should the traveling block be raised too high.

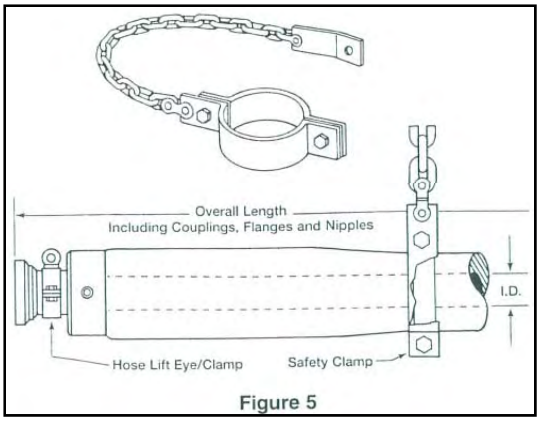


Figure 5

Field Test Pressure

Hose assemblies subjected to abnormal abuse such as severe end pull, flattening, crushing, sharp kinking or excessive pressurization must be immediately inspected and hydro-statically tested at 1.25 times the rated working pressure. Follow steps 4 through 9 below.

Field testing of rotary hose, when required for establishing periodic safety levels of continued operation, should be conducted with these factors as a guide:

1. Check and properly attach safety clamp and chain for complete safety compliance.
2. Avoid all back twist.
3. Suspend hose in normal unstressed position from standpipe to swivel.
4. Visually inspect hose for any external damage to hose body, end structure or couplings.
5. Raise pressure between 1,000 and 10,000 psi per minute.
6. Bleed air when using mud, oil or water as permissible test media.
7. Restrict duration of test pressure to a maximum of 10 minutes.
8. Do not exceed 1.25 times the maximum rated working pressure when testing.
9. Conduct field testing under full responsibility of end user with SAFETY in mind.

External Inspection

1. Carefully examine hose cover prior to each rig-up or every 30 days, whichever comes first.
2. Hose cover serves the primary function of protecting cable reinforcement from physical or environmental damage. Cover should be carefully examined to detect areas where cable reinforcement may have been damaged. Inspect hose cover for cuts, gouges, tears and abrasion.
3. Any cuts, gouges or tears in the cover down to, but not into cable reinforcement should be regularly

Safety & Maintenance of Gates Rotary & Vibrator Hoses

External Inspection Cont.

inspected to ensure further deterioration does not occur. If cable reinforcement is exposed and rust or corrosion is evident, remove hose from service.

4. Cover may show surface cracking due to prolonged exposure to sunlight or ozone. Such deterioration, as long as it does not expose the cable reinforcement, is not usually cause for removal from service.

On-The-Job Welding

CAUTION: On-the-job welding of hose assemblies is not recommended. Excessive heating from welding can cause hose damage.

Warranty

Black Gold® oil field hoses are warranted by Gates Corporation to be free from defects in material and workmanship for the life of the product. Should a defect be proven in the product's material or workmanship, Gates will, at its option, replace or repair any rotary drilling or vibrator hose of our manufacture.


OFFSHORE


LAND RIG

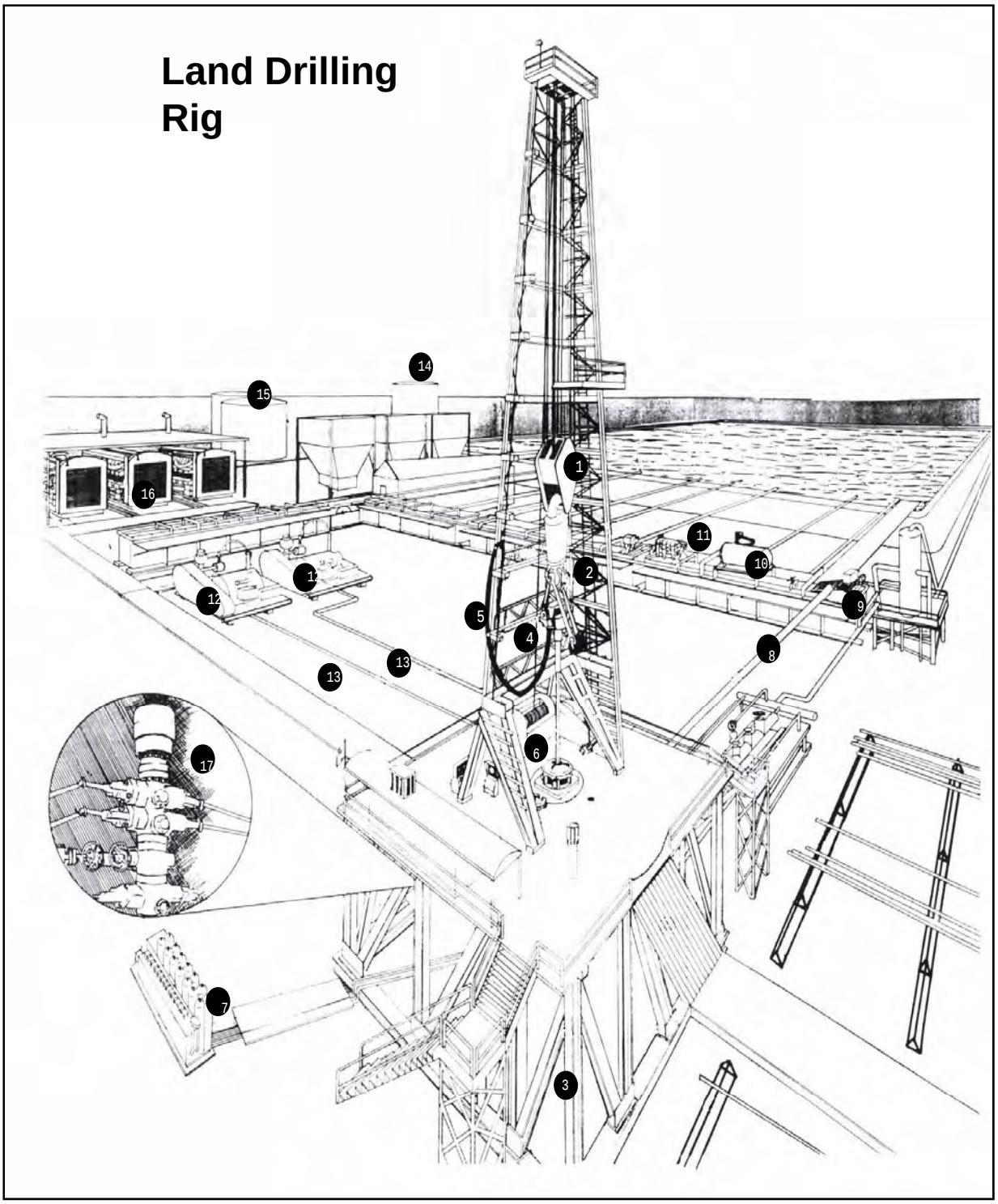
The Gates commitment to the oil field industry is reflected in our complete product line. We make technically superior products to serve the industry.

- Full line of specialty oil field hoses manufactured to the API 7K specifications
- Full line of hydraulic hose and connectors
- Hydraulic crimpers and equipment
- Industrial hoses
- Industrial Belt Drive Systems

The pages in this section show an overview of both a land base rig and a semi-submersible rig and the recommended Gates products for specific applications.

OFFSHORE LAND RIG

Land Drilling Rig




OFFSHORE

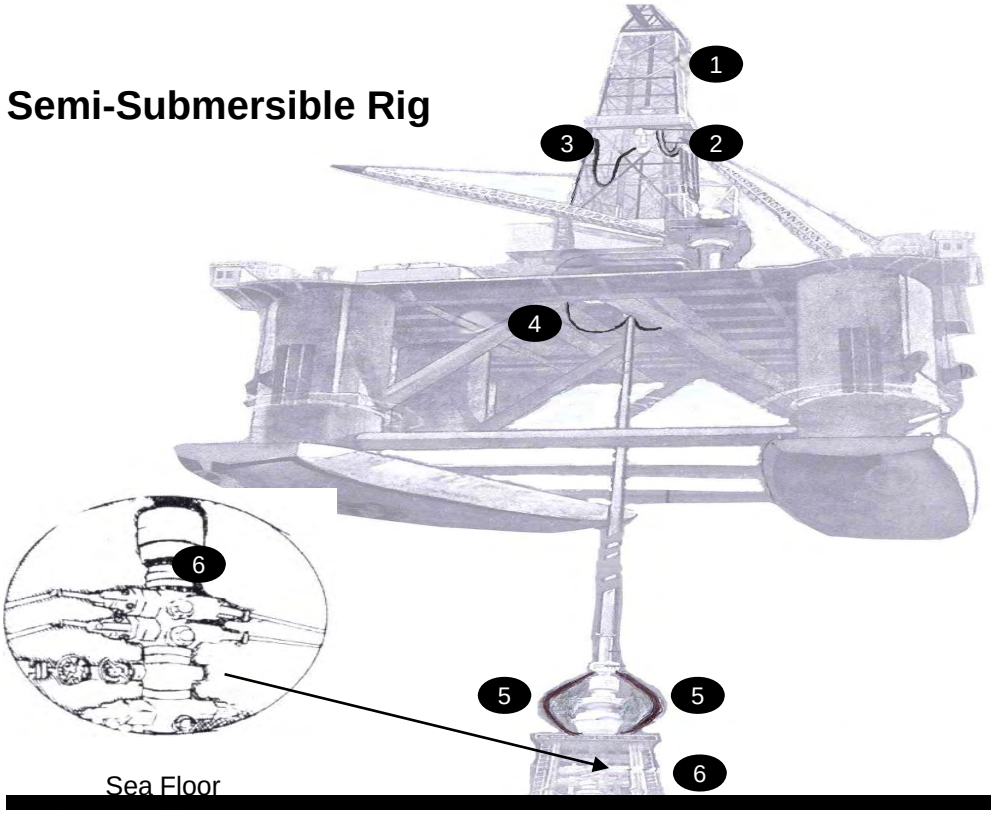

LAND RIG

Land Drilling Rig Components and Gates Recommended Products

No.	Rig Component	Gates Recommended Hose	Gates Recommended Belts
1	Traveling Block		
2	Hook		
3	Substructure		
4	Swivel / Top Drive	Black Gold® Rotary Drilling Hose	
5	Stand Pipe	Black Gold® Rotary Drilling Hose	
6	Drawworks		
7	Accumulator Unit (Koomey)	16 B.O.P. Hose Insert	• Super HC V-Belts and Powerband
8	Mud-Return Line	• 6" Super-Vac® Hose • Longhorn®	
9	Shale Shaker		• Predator • Super HC V-Belt and Powerband • Hi-Power II V-Belt and Powerband
10	Degasser		• Predator • Super HC V-Belt and Powerband • Hi-Power II V-Belt and Powreband
11	Desilter		• Predator • Super HC V-Belt and Powerband • Hi-Power II V-Belt and Powerband
12	Mud Pumps		• Predator • Super HC V-Belt and Powerband • Hi-Power II V-Belt and Powerband
13	Mud-Discharge Lines	Black Gold® Vibrator Hose	
14	Water Tank	• Super-Vac® • Trident® 400 • Premo Flex®	
15	Fuel Storage	• Longhorn® • Sea Horse® • Sea Horse® HW	
16	Engines and Generators	Radiator Hoses	• Predator • Super HC V-Belt and Powerband • Hi-Power II V-Belt and Powerband
17	Blowout Preventer Stack	• 16 B.O.P. Insert Hose • Black Gold® Choke & Kill Hose • G5K, G6K, C12M	

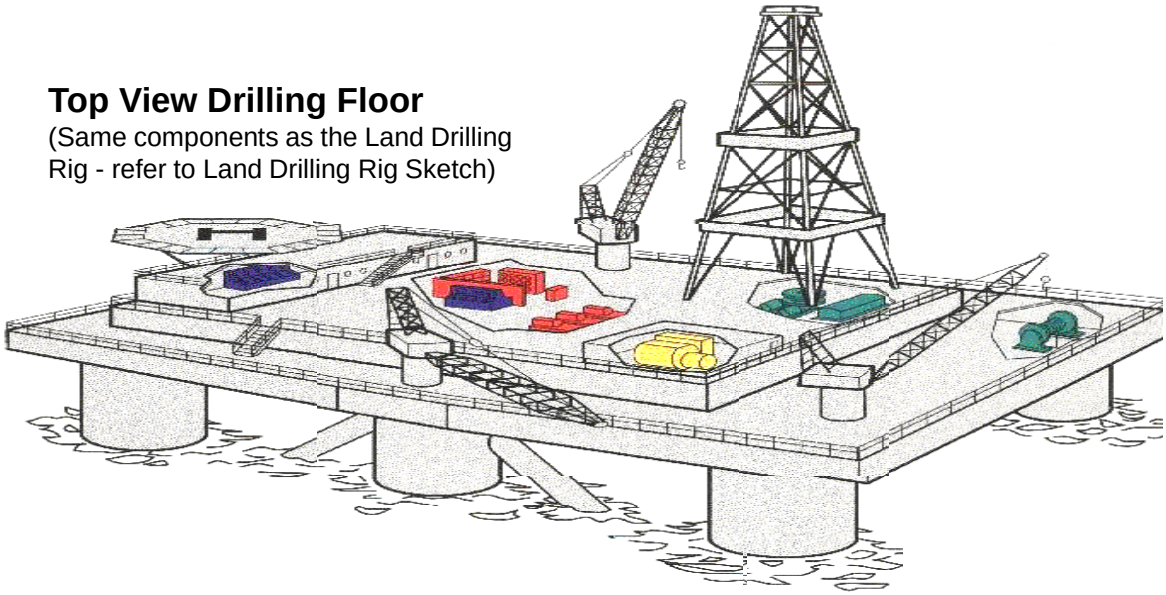
OFFSHORE LAND RIG

Semi-Submersible Rig



Top View Drilling Floor

(Same components as the Land Drilling Rig - refer to Land Drilling Rig Sketch)



OFFSHORE LAND RIG

Semi-Submersible Drilling Rig Components and Gates Recommended Products

No.	Rig Component	Gates Recommended Hose
1	Derrick	
2	Motion Compensator	Black Gold® Motion Compensator hoses
3	Rotary (Kelly) Hose	Black Gold® Rotary Drilling Hose
4	Droop Hoses	Black Gold® Choke & Kill Hoses
5	Flexible Joint & Annular Preventer	Black Gold® Choke & Kill Hoses
6	Blowout Preventer Stack	• 16 B.O.P. • Black Gold® Choke & Kill Hose • G5K, G6K, C12M

The semi-submersible drilling floor components are the same as the Land Drilling Rig components - refer to the Land Drilling Rig sketch and components to determine Gates recommended products.

OFFSHORE LAND RIG

Gates Hose Applications in the Oilfield

For ordering information, please see the **Oilfield Hose** section of your Gates Guide.

Choke and Kill Hoses

Black Gold® Choke and Kill and Super Choke and Kill Hose

A choke-and-kill system is used in offshore drilling to control well kicks – pockets of high pressure gas that get into the drill string during drilling.

As the gas moves upward, it expands, making the drilling mud too lightweight to control pressures in the hole. If the kick is too strong, it can blow out the well.

To prevent this, the crew closes rams on the blowout preventer stack. This seals off the annulus – the pipeway through which mud returns from the wellhead on the seafloor to the drilling rig on the ocean surface.

Next, high pressure mud, up to 15,000 psi, is pumped down the *choke line* to force the gas back into the formation.

If this is not successful, high pressure cement, up to 15,000 psi, is pumped down the well through the *kill line*. The well is sealed off, the drilling unit is separated, and the well and all equipment in the hole are lost.

When the blowout preventer system is on the seafloor, Gates Black Gold® Choke and Kill (or Super Choke and Kill) hoses are used around the flexible joint (above the blowout preventer on the seafloor). This joint allows for rig movement with the waves and current.

Choke and Kill hoses run from the preventer stack to the choke and kill pipelines attached to the marine riser.

At the top of the marine riser, Black Gold® Choke and Kill (or Super Choke and Kill) hoses are used around the drill string's telescoping joint. They run from the choke and kill pipelines at the top of the riser to the choke and kill manifolds on the drill rig. These hoses often are called droop hoses.

Choke hoses are interchangeable with kill hoses.

Gates Black Gold® Choke and Kill and Super Choke and Kill hoses are manufactured to handle up to 20% hydrogen sulfide gas for one hour at 200°F (93°C) at working pressure.

Hydrogen sulfide (H2S) is a lethal gas encountered in rock formations in many drilling areas.

Gates Hose Applications in the Oilfield

These Gates hoses also pass Lloyd's of London Flexible Hose Fire Test OSG/1000/499 at 1,300°F (700°C) for 30 minutes at rated working pressure.

Choke and Kill Hoses must:

Be pressure rated for the same pressures as the blowout preventer stack.

Meet all minimum blowout preventer testing requirements.

Have consistent interior diameters to minimize wear at the point of diameter change.

The number of angular deflections within these hoses should be kept to a minimum. If hoses must make several angular changes between the stack and the choke manifold, it may be advisable to use tees and crosses to absorb the turbulent erosion effects at these points.

Available in lengths up to 90 feet (27.5 meters), inside diameters 2 ½ and 3 inches (63.5 and 76.2 mm).

Special stainless steel armoring is available for all Gates choke and kill hoses on request. Lifting collars and safety chains are also available.

Motion Compensator Hose

Black Gold® Motion Compensator Hose

Motion Compensators are used on an offshore rig's hoisting system. They compensate for the up and down movement of the rig, so that even pressure is kept on the drill string.

Motion compensators are either integral parts of the traveling block or are installed just below it. They are hydraulically actuated units, pressurized by an air-oil accumulator.

Gates Black Gold Motion Compensator hose supplies fluid to the accumulator from a cylinder mounted on the derrick.

Supplied in lengths up to 90 feet (27.5 meter), inside diameters: 2 ½ , 3, 3 ½ and 4 inches (63.5, 76.2, 88.9 and 101.6 mm).

Important: Systems use various types of fluids. Hose must be used that is compatible with the particular fluid being used. Be certain to state the type of fluid when ordering Gates Motion Compensator Hose.


OFFSHORE


LAND RIG

Gates Hose Applications in the Oilfield

Drilling Hoses

Black Gold® Rotary Hose

Rotary drilling hose runs from the top of the standpipe to the swivel to provide flexibility between the standpipe and the swivel movement. This hose carries drilling fluid from the mud pumps to the shallow drill string.

Gates Black Gold® Rotary Drilling hose handles working pressures as high as 7,500 psi while remaining flexible enough to travel up and down with the traveling block.

The hose is supplied in lengths of up to 90 feet (27.5 meters). Inside diameters range from 2 ½ to 4 inches (63.5 to 101.6 mm).

Since drilling fluids are usually dense and abrasive, the hose tube must have adequate oil, chemical and abrasion resistance.

The hose cover must withstand gouging, harsh weather, oil and other corrosive fluids common at drilling sites. Stainless steel armoring is available upon request.

Safety clamps and chains are available. The correct location for mounting is designated on the hose.

Black Gold® Rotary Vibrator Hose

This hose, the same as the Black Gold® Rotary hose, connects the vibrating mud pump manifold to the standpipe manifold. Its main function is accommodating alignment and dampening vibration as it transports the mud to the standpipe.

Hose lengths range from 6 to 30 feet (1.8 to 9.1 meters), with inside diameters of 2 ½ to 4 inches (63.5 to 101.6 mm).

Low Working Pressure, Lightweight Hose

Powerbraid® Plus Rotary Hose

This Gates hose is used for air drilling and/or mud drilling of small diameters and relative shallow holes. It is also used on workover rigs.

Supplied in 50-foot (15.2 meters) lengths with inside diameters of 2”, 2 ½” and 3” (50.8 mm, 63.5 mm, and 76.2 mm).


OFFSHORE


LAND RIG

Gates Hose Applications in the Oilfield

Also available for this application are hydraulic hoses C12 (through 2 inch [50.8 mm] diameters at 2,500 psi wp) and C13 (through 2 inch [50.8 mm] diameters at 5,000 psi wp).

Service Hoses

Sea Horse® Fuel Suction or Transfer Hose

Use Sea Horse® Transfer hose for offshore and onshore petroleum suction/ discharge service. Sea Horse has a high working pressure and small minimum bend radius. It is particularly suited to applications involving diesel fuels and other petroleum products where a long, extremely lightweight and flexible hose is required.

Available in lengths up to 200 feet (61 meters) with inside diameters ranging from 2 to 6 inches (50.8 to 152.4 mm).

Note: United States Coast Guard approval for use on offshore drilling Rigs and platforms is pending.

Trident® 400 Multi-Service Hose

Trident is recommended for fuel, water and air transfer where a long, lightweight flexible hose is needed.
Note: United States Coast Guard approval for use on offshore drilling rigs and platforms is pending.

Supplied in 200 foot (61 meters) lengths.

OFFSHORE LAND RIG

Rig Technology

By far the most common method of drilling is *rotary drilling,* in which a rotating bit connected to a rotating pipe grinds a hole in the earth.

The pipe is hollow so it can carry specially mixed *drilling mud* to the bottom of the hole. The mud floats the cuttings back to the surface.

Rotary drilling is used throughout the world on seafloors as well as mountainsides. Its basic principles may seem elementary, but today's rig technology is sophisticated and complex. From the *toolpusher* on a North Sea drilling platform to a *roughneck* on a small land rig, the personnel who work the oil patch must have both skill and talent.

This section provides a basic idea of how modern rotary drilling works, both on shore and off.

Components of a Land Rig Hoisting System

The most obvious part of an oil rig is its derrick. This supports the block-and-tackle hoist system that lifts and lowers the drill pipe and other equipment into and out of the hole.

Derricks, by strict definition, are hauled to the drill site in pieces and then assembled. Today, however, many land rigs have truck-mounted *masts.* In common usage, "derrick" applies to both.

Derricks must carry great amounts of weight (for a deep hole, the drill string may weigh 250 tons). They are rated for both the load they can handle and the wind they can withstand.

At the top of the derrick is the *crown block,* a large set of pulleys through which a wire rope (*the drilling line)* is threaded.

The wire rope also is threaded through the *traveling block,* an arrangement of pulleys that has a large hook attached. The traveling block moves up and down the derrick to raise and lower drilling equipment.

The wire rope is let out or taken up by the *drawworks,* which operates like a huge winch. The drawworks has clutches and chain-and-gear drives for speed and direction changes. The drawworks' *catheads* are used to hoist equipment around the rig floor or to *make up* (put together) or *break out (take apart)* the drill string.

Rig Technology

Rotating System

Attached to the traveling block's huge hook is the *swivel* (Figure 1). It carries all the weight of the drill pipe, drill collars and bit. It also acts as a kind of funnel for drilling mud going into the *kelly* and down the drill string.

The kelly is a hollow, flat-sided pipe about 40 feet long that rotates inside the swivel. It fits into the *rotary table.* The rotary table, on the floor of a rig, is the component that provides the rotation for rotary drilling.

With its master bushing and kelly bushing, the rotary table acts like a giant wrench that grasps the kelly and rotates it. The kelly moves up and down in the rotary table.

The kelly turns the rest of *drill string – the* pipe, heavy collars and bit.

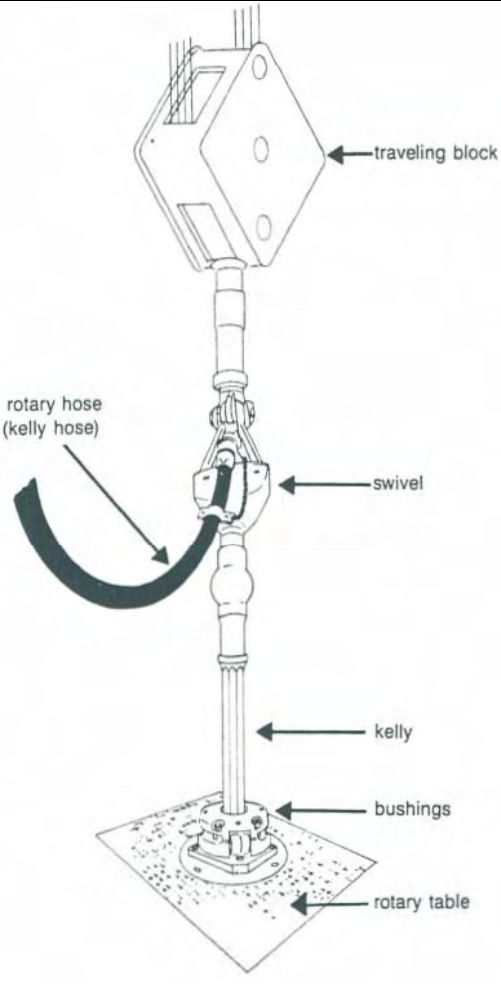


Figure 1
The traveling block and rotating system

Rig Technology

Attached to the bottom of the kelly is drill pipe – steel pipe usually in 30-foot *joints* (lengths) threaded at each end (Figure 2).

Drill pipe is added a joint at a time as the hole gets deeper. To do this, a joint of pipe is hoisted from the pipe rack and is temporarily stored in the *mousehole.* The kelly and swivel are swung over and the new joint is *made up* on the kelly. Then the joint is raised and connected to the rest of the drill string.

Huge tongs are used to loosen and tighten the connection between the pipe and kelly. It takes careful coordination among expert crew members to handle this procedure quickly and efficiently.

Attached to the bottom of the drill pipe are drill collars – thick-walled pipes, 30 feet long, used to weight the bit as it drills. The number and size of the drill collars depend upon the formation being drilled.

It is the bit, of course, that actually drills the hole. The bit is attached below the drill collars. The type of bit used depends on the type of rock being drilled.

All bits have holes to allow drilling fluid to exit.

Bit technology itself is highly advanced. It is possible for an expert to tell much about the downhole situation from carefully observing how the bit is wearing.

Together, the swivel, kelly, drill pipe, drill collars and bit are called the *drill stem.* Commonly, “drill string” refers to the column – the drill pipe and collars.

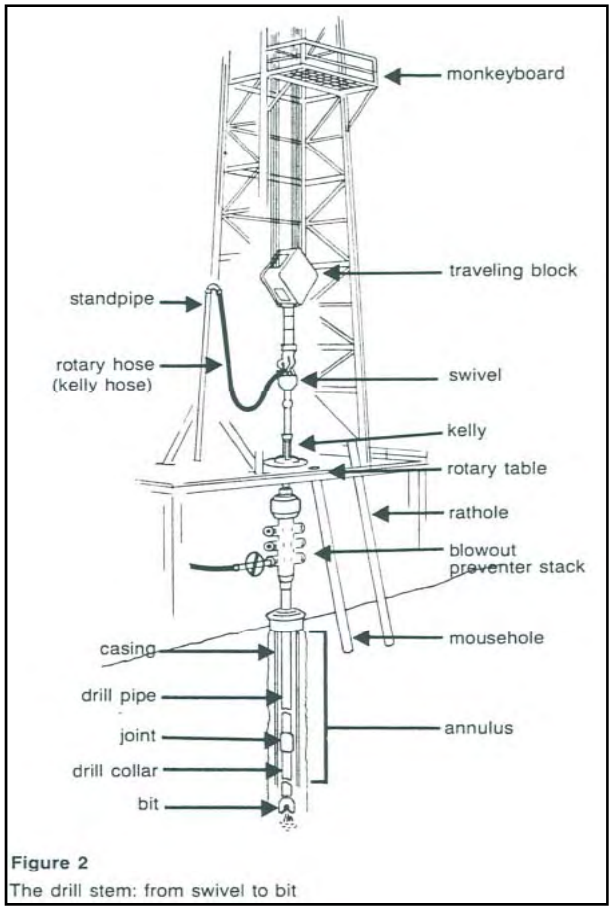


Figure 2
The drill stem: from swivel to bit

Eventually, the bit must be changed for different rock formations or it must be replaced because of wear. Or other operations must be done downhole (such as testing the rock for oil). Then the drill pipe, collars and bit are tripped out of the hole.

The kelly and swivel are temporarily placed in the *rathole* out of the way. The drill pipe is raised and broken out (taken apart) in stands or sections of three lengths of pipe each called a thribble. A stand can include four lengths (a fourble) or two lengths (a double).

Tripping out requires a great deal of coordination by the crew. As the floormen break out the tool joints, a derrickman leans the stands in the *finger- board* high on the derrick. The derrickman handles this operation from the *monkeyboard,* as much as 90 feet above the rig floor.

Mud Circulating System

Drilling fluid pumped through the drill string has a number of purposes. It cools and lubricates the spinning drill bit. When it leaves the bit at the bottom of the hole, it flows back toward the surface in the *annulus,* the space between the drill pipe and the earth (Figure 3). Cuttings float to the surface in the drilling mud. The mud also cakes the hole to give it stability.

Drilling mud has another very important function. Rock formations may contain pockets of oil, gas or water under extremely high pressures. A drilled hole may intersect any of these. When any of these high-pressure fluids enter the hole, that is called a *kick.*

In its pressurized escape to the surface, the fluid or gas may blow the entire drill string and drilling mud out of the ground or even out of the derrick. Oil well gushers are examples of such blowouts.

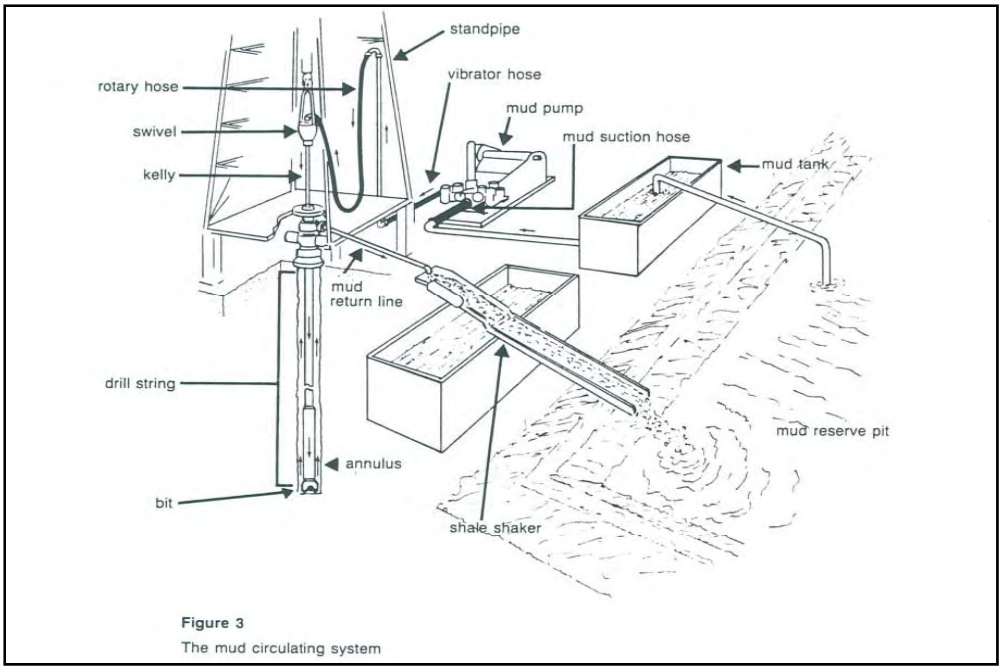


Figure 3
The mud circulating system

Rig Technology

Blowouts can destroy millions of dollars of equipment, waste valuable oil, damage the environment – and take lives.

Drilling mud is the first line of defense against blowouts. Its weight and density put pressure inside the hole, keeping formation pressures in check.

Actually, the *mud* is a very carefully measured mix of water, clay, weighting material (often the mineral barite) and other chemicals. This mixture may be changed by the *mud engineer* as pressures change downhole.

Mud technology is highly complex and mud service companies have a mud engineer on the rig during the drilling. Also, the crew is trained to recognize downhole problems by observing changes in the mud.

Mud components are stored on the rig in the *mudhouse.* The mixed mud travels from the mud storage pits via *mud suction lines* to the mud pumps.

The mud is discharged at pressures from 1,000 to 5,000 psi. The mud is pumped (through *rotary vibrator hose)* into the standpipe mounted on the derrick.

Gates **Black Gold® Rotary Vibrator Hose** is used for this application.

At the upper end of the standpipe, the mud goes into the *rotary* or *kelly* hose, and then into the swivel. Flexible hose is used to accommodate the vertical movement of the swivel and kelly. Gates Black Gold® Rotary hose is used for this Application.

From the swivel, the mud goes down the kelly, drill string and bit at the bottom of the hole, then returns to the surface.

At the surface, the mud exits through a *mud return line* (a metal pipe) and falls into the *shale shaker,* which sifts out cuttings.

These days, the mud circulation system is essentially closed, so mud is constantly being “cleaned” by degassers, desilters and desander’s to be re-circulated.

On a land rig, the cuttings are dumped into a pit. Offshore, the cuttings are carried by barge to a land disposal site.

Note: In some rock formations, air can be used to drill. It is considerably faster. The air is circulated by large compressors with the cuttings blasted out of the hole through a blooey line. When a formation that needs to be drilled with mud is reached, the crew muds up.

Rig Technology

Blowout Prevention System

No well is drilled without *blowout preventers,* known as BOPs in the oil patch. Blowout preventers are hydraulically controlled valves used to control well kicks and prevent blowouts. Gates Hydraulic and Choke and Kill hoses are used in BOP systems.

A single well may have three or more preventers, stacked one on top of the other. On a land rig, the stack is located beneath the rig floor at ground level.

The top preventer on a stack is usually the *annular preventer* (Figure 4). It can completely seal off the annulus (the space between the drill pipe and borehole). It also can seal off a hole that has no pipe.

Below the annular preventer are additional controls called *ram preventers.* They are designed to fit around the various sizes of drill pipe to hold, close or seal the mud return annulus.

Blind rams seal off the open hole. *Pipe rams* can seal off the drill pipe and the hole.

When a well kicks, there are several options. The downhole pressure can be cycled out through the BOP system's manifolds at the surface.

Or an attempt can be made to force the downhole fluid back into the formation. This is done by pumping drilling fluid under high pressure into the hole through a *choke and kill line.* Gates Black Gold® Choke and Kill hose is used for this purpose.

A final option is to pump in cement, seal off the hole and abandon the drilling operation.

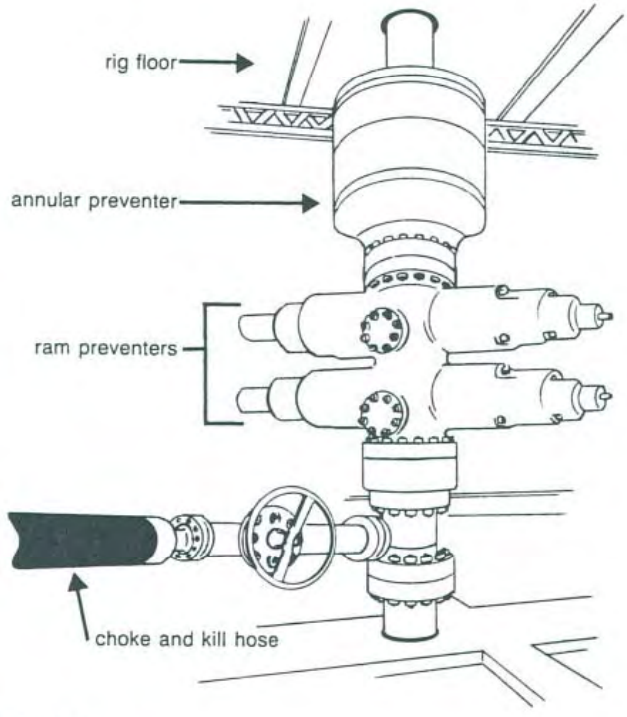


Figure 4
Blowout preventer stack

Rig Technology

Power System

Today most rigs are diesel powered. The diesel engines drive electric generators for the electric motors that run the drawworks, mud pumps and the rotary table.

Sometimes engines are *compounded* with clutches, chains and sprockets, belts and pulleys, and shafts in order to distribute power from prime movers to pumps, drawworks and other machinery.

Casing and Cementing

To prevent cave-ins as the well is drilled, at times drilling is stopped and special *casing* pipe is brought in to line the hole. Generally, the casing is cemented into place (set) by a subcontractor – a well cementing service company. After the casing is set, drilling continues to a specified depth, then the drill string is brought up and more casing is set.

When the formation that may contain oil is reached, tests are made. The *mud logger* inspects cuttings from the shaker to see if oil is present. If it is, the question is whether the well contains enough oil to make setting production casing worthwhile since it is costly.

Coring, well logging and drill stem testing are the most common downhole tests for reservoir characteristics. All are performed by service companies.

If the operating company decides to produce oil from the well, production casing is set. Then the well is perforated by small explosive charges – another specialized procedure handled by a service company. After perforation, tubing is placed in the well as a conduit for the oil. On the surface, a stack of valves called a *Christmas tree* is installed to control the flow.

Offshore Drilling

A drill string turns, a bit makes a hole in the earth and drilling fluid brings cuttings to the surface. These basics are the same whether the hole is on the earth's surface or in a seabed.

But just about everything else about offshore drilling is different. The differences begin with the fact that the drilling rig itself has to be supported over – or in – the water. And the drill string has to extend through the water from the rig to the borehole.

Water moves.

A rig may be supported either by something that floats in the water, or by something that sits (or stands) on the seafloor.

The choice of a floating or a bottom-supported rig depends greatly upon where it will drill: the depth of the water, weather and wave action, and the distance from land.

Rig Technology

Choices range from ships to artificial islands used in the Arctic where ice would crush other structures.

Another consideration is how long it will be on location. A tremendously costly permanent platform would not be chosen for a wildcat well that may or may not find oil. But it may be the choice in a proven field where reserves are expected to last *25* years.

It is important to distinguish offshore drilling rigs from offshore platforms. Platforms are immobile units used in known oil fields from which several *development wells* can be drilled to tap a proven reservoir. Platforms are large enough to contain both production as well as drilling facilities.

Rig Types

Jackup

Today, most of the world's offshore drilling is in continental shelf waters, which vary to a maximum of about 600 feet (183 meters).

This has made the *jack up* rig one of the most common in the world. Jackups work in up to *450* feet (137 meters) of water (Figure 5).

A jackup can be floated to its site since its legs (which pass through its hull) can be jacked up out of the water. On site, the legs are jacked down until they sit firmly on the seafloor. Then the hull is jacked up out of the way of waves.

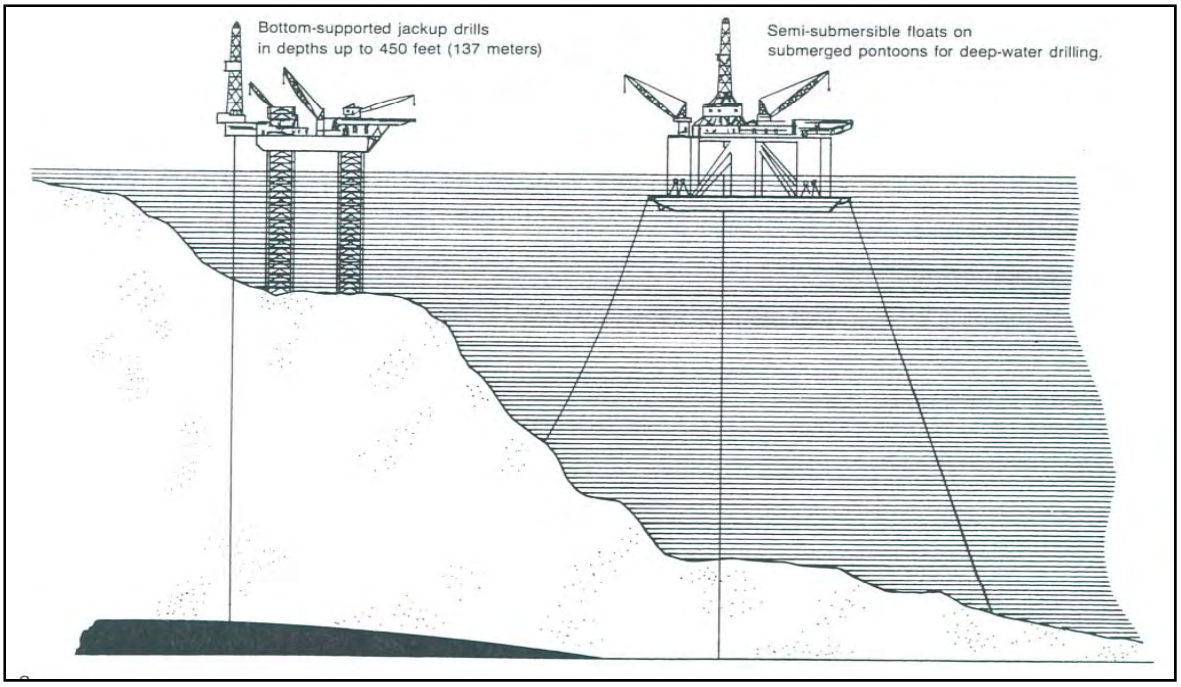


Fig. 5 Offshore drilling rigs

Rig Technology

Semi-Submersible

Popular because of its stability, the floating *semi-submersible* is a common sight in the North Sea.

In contrast to a submersible, which can be completely flooded to sit on the seafloor, a semi-submersible floats just beneath the surface on submerged pontoons that use water for ballast.

Anchors and computer-controlled propellers keep the vessel on the well site.

Semis are one of the two most frequently used floating rigs. The other is the drill ship.

Drill Ship

Drill ships are useful in deep and remote waters, because they can generally handle more weight than other types of offshore rigs. Drill ships can better handle the weight of a long drill string, and they can carry larger amounts of supplies, so resupplying is less frequent.

On drill ships, the rig itself is usually located amidship. A sealed hole called the moon pool allows the drill string to pass through the hull.

As with semi-submersibles, the drill ship is kept in position with computer controlled thrusters, an anchor system, or both.

Components of an Offshore Rig

In many ways, a rotary drilling rig uses the same basic principles, whether it is on land or on a unit above water. That is, the bit turns on the bottom weighted by drill collars and rotated by pipe, which is turned by a rotary table and suspended in the hole by a block-and-tackle system.

But the fact that the drill string must be in water has led to some highly specialized offshore technology. This technology is different for bottom-supported rigs and for rigs that float.

Casing

On a bottom-supported offshore rig, casing isn't just a pipe liner inside the borehole. It also extends from the borehole on the seafloor to a point above the water surface, just below the rig floor. This casing is called *conductor casing.* The casing is necessary to guide the drill string and also to return the drilling fluid and cuttings to the surface.

Marine Riser System

On floating rigs, a *marine riser system* is used instead of conductor casing. This is because floating rigs must adjust to the relative movement between ocean surface and the fixed wellhead on the ocean floor.

The marine riser isn't the only system that differs on a floating rig. Blowout prevention is another.

Rig Technology

Blowout Preventers

On bottom-supported units, the blowout preventers can be located above the water's surface on top of the conductor casing, below the rig deck.

On floating rigs, however, BOPs are located on the seafloor, and are called *sub sea blowout preventers* (Figure 6). If bad weather forces a floating rig off site, the well can be safely closed off at the ocean floor and the vessel can move away.

The sub sea BOP and the marine riser system have to be specially connected to each other and to the rig, again because of water action.

Beginning at the seafloor, the system is installed this way:

First, a temporary guide base with a hole in the center and four cables on its outside corners is lowered to the seafloor. These cables help guide the drill string through the guide base center so it can make a hole.

After the first part of the hole is drilled, *foundation pile* (the first string of casing) is set in the seabed wellbore.

Next, a structure is lowered onto the base to support the foundation pile and a permanent guide structure is lowered. This is the base for the blowout preventer stack.

To connect the BOP to its marine riser, a special *flexible joint* is used. This accommodates the movement of the riser in the water.

At the surface end of the marine riser, another special joint called a *telescoping joint* is used to connect the riser to the floating rig.

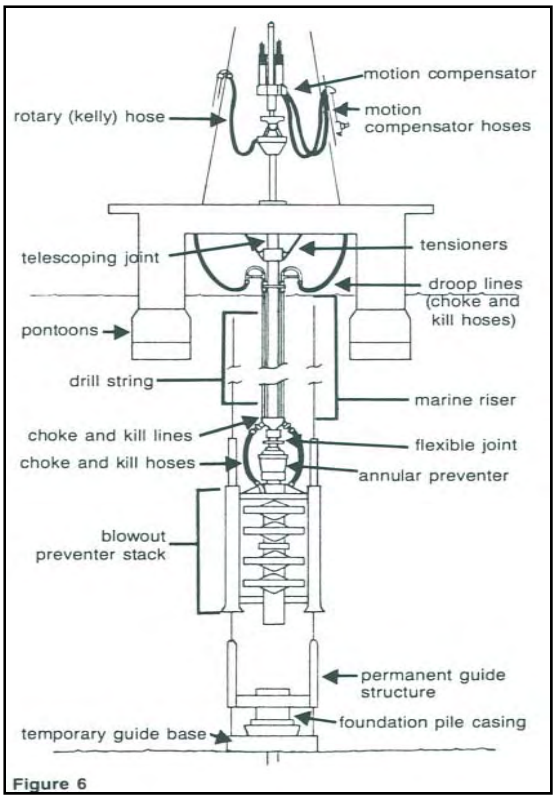


Figure 6

Rig Technology

Choke and Kill System

For bottom-supported rigs, the choke and kill system is similar to that used on land rigs, since the BOP is located above the water surface, near the system's manifolds and pumps.

On floating rigs, however, a unique choke and kill system has been developed to connect the BOP on the seafloor and the pumps and manifolds on the rig.

This system includes pipelines that run alongside the marine riser and flexible hose around the two movable joints (Figure 6). Gates **Black Gold® Choke and Kill (or Super Choke and Kill) hoses** connect the sub sea BOP to the marine riser around the flexible joint.

At the upper end of the marine riser, choke and kill hoses are also used around the telescoping joint. These often are called *droop lines.*

When a well being drilled by a floating rig kicks, the sub sea blowout preventer seals off the upper drill string. Then an attempt is made to release the kick through manifolds on the rig. To do this, the choke line is opened and the kick is allowed to rise out of the well.

If this is not successful, an attempt is made to force the downhole fluid back into the formation. Drilling fluid at up to 15,000 psi pressure is pumped down the choke line.

If this is not successful, the kill ram is opened and high pressure cement is pumped through the kill line.

Two other systems have been developed to accommodate the movement of floating rigs. One is a system of tensioners between the riser system and the rig. The other is a motion compensator.

Motion Compensator

A motion compensator is a hydraulic system that compensates for the up and down motion of the rig vessel to keep constant pressure on the drill string. The system is either an integral part of the traveling block or is mounted to it. When the vessel heaves, the traveling block moves up and down in relation to the drill string. A motion compensator evens this out.

The compensator is pressurized by an air-oil accumulator (Figure 7). Gates **Black Gold® Motion Compensator Hose** supplies either air or hydraulic fluid to the accumulator from a cylinder mounted on the derrick.

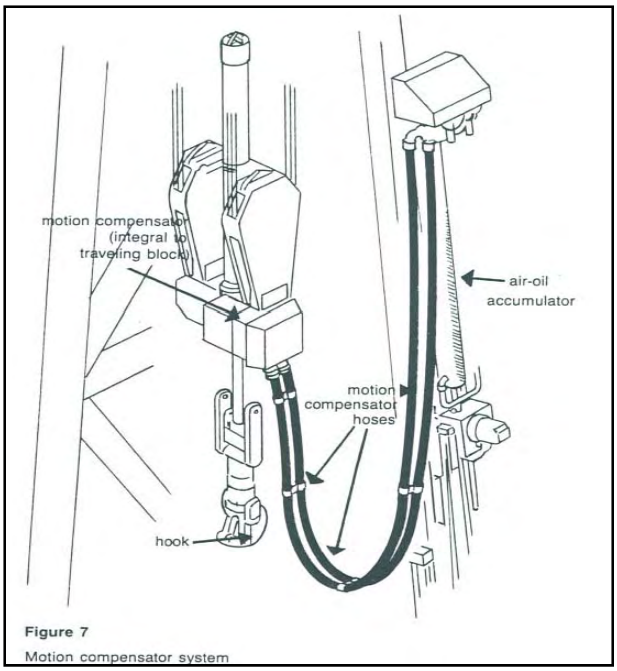


Figure 7
Motion compensator system

Rig Technology

Offshore Supply Equipment

Two of the most obvious characteristics of an offshore drill rig are its helicopter pad and its cranes. These are integral to supplying every offshore rig.

Manpower is often transported by helicopter. But drill pipe, collars and other equipment arrives by ship or barge.

The pedestal crane, with its ability to rotate in full circle, is used almost exclusively on offshore rigs. Sea conditions can make crane operations extremely hazardous, compared to operations on land. Because of this, offshore crane operation has become yet another specialty in the oil patch.

Hydrogen Sulfide

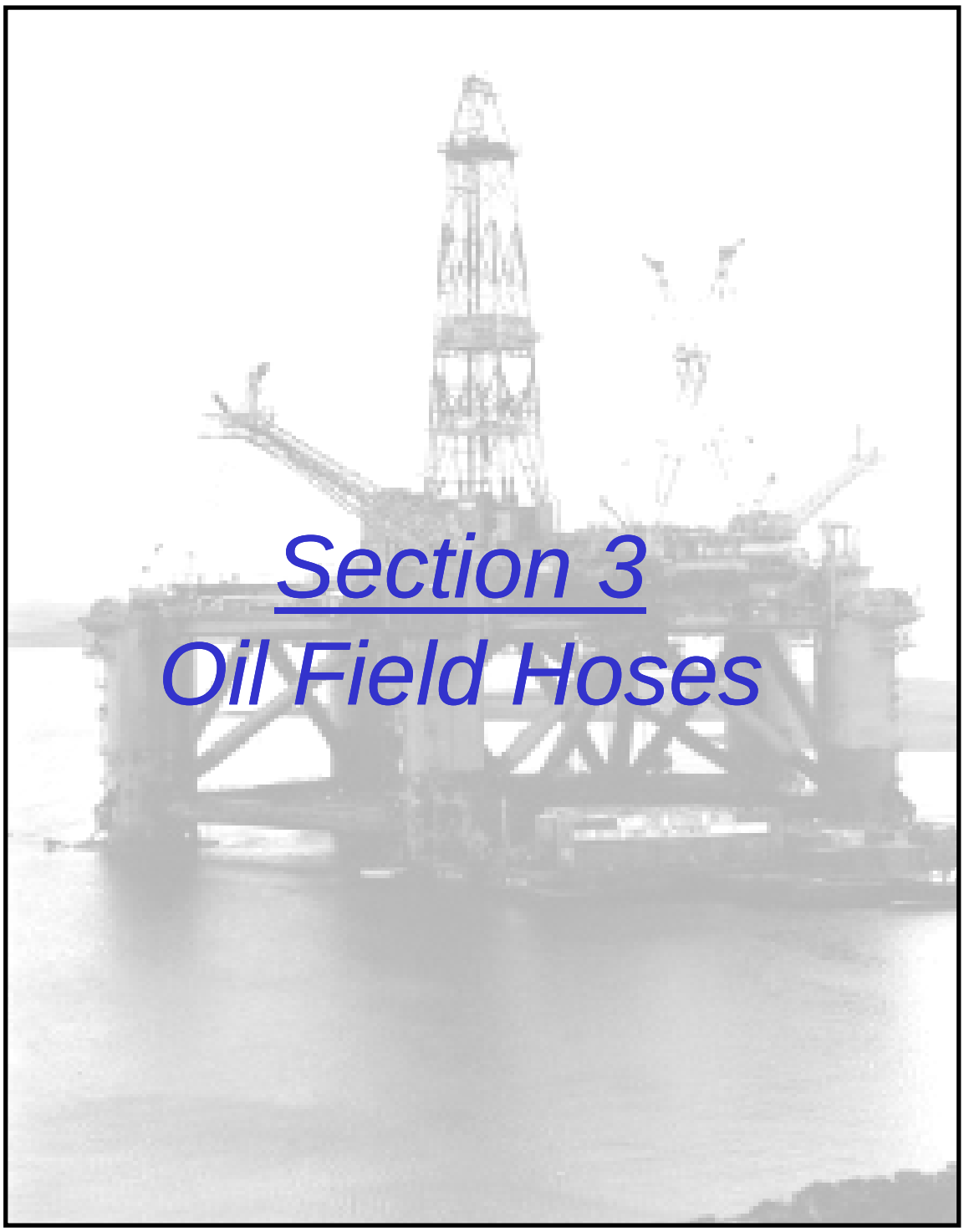
One of the most dangerous factors encountered in drilling, particularly offshore, is the lethal gas *hydrogen sulfide,* often called H2S

It deserves special mention. Hydrogen sulfide is nearly as lethal as cyanide, one of the most caustic substances on earth. It occurs in relatively young rocks, by geologic measure, and is encountered in many drilling theatres, onshore as well as off, including the Gulf of Mexico and the North Sea.

Rigs are equipped with special warning lights and sirens to indicate when H2S is encountered during drilling. Crew members are also issued gas masks and are trained in escape procedures should hydrogen sulfide be released at a rig site.

Blowout prevention systems must be able to withstand H2S gas long enough to allow for escape. For this reason, Gates Choke and Kill Hose and Super Choke and Kill Hose is manufactured to withstand 20 percent H2S for a period of one hour at 200°F (93°C) at working pressure.

These hoses also pass Lloyd’s of London Flexible Hose Fire test OSG/l000/499 at 1,300°F (700°C) for 30 minutes at rated working pressure.



Section 3
Oil Field Hoses

OFFSHORE

LAND RIG

Gates Addresses the Needs of Modern Drilling Technology

Increased production and efficiency requires better methods and equipment. In the past, traditional vertical down hole drilling involved only static pressures. The popular rotary hose coupling design for the steady high pressures at that time was the built-in epoxy coupling. Production competition led to the development of directional drilling and down linking with negative pressure pulses and elevated temperatures. Built-in epoxy couplings do not hold up as well to the hammering effect of dynamic pressures and higher temperatures.

Since 1998, Gates has offered a high performance dynamic pressure rated assembly with swage-on couplings that meet the demands of today's higher performance drilling methods. This advanced coupling has no set screws to loosen with the pounding vibrations of directional drilling and down-linking. There are no nipple seals to leak. And there is no Epoxy to break down at the elevated temperatures that are experienced in these dynamic drilling procedures. These new dynamic couplings are performance proven (see data in Section 2). They can be swaged to rotary hose by certified assemblers at various locations around the world making special orders quickly available to drillers.

As a result of the success of the new dynamic pressure rated swage-on couplings, Gates is making this their standard rotary hose coupling and discontinuing the former built-in epoxy coupling. Existing rotary hose assemblies with epoxy couplings fully meet the static pressure conditions of standard vertical drilling and are acceptable for those applications until they are no longer available.


OFFSHORE


LAND RIG

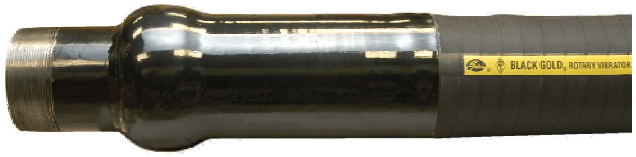
GATES CERTIFIED ROUGHNECK DISTRIBUTOR

Gates Rotary Drilling, Vibrator, Cementing, Sour Service, Choke and Kill, Motion Compensator and De-coker oilfield hoses shown in this section have couplings attached by a Gates certified assembler from hose already in their stock. The advantage is that hose from the assembler's stock can be cut to the customer's specified length. Couplings are then swaged-on, tested to API 7K standards and then shipped all in a matter of just hours! This greatly reduces the lead time required to supply product meeting customer specific needs. The resulting hose assembly far exceeds Gates standard for coupling pull and burst pressure tests assuring Gates high quality for added safety.

Robsco, Inc.
4749 Eastpark Drive
Houston, Texas 77028
www. robsco.com
Ph. 713-672-1777
FAX: 713-672-1956
Kenneth Jones
ken@robsco.com
Customer Service
sales@robsco.com

Gates Black Gold®
Rotary Drilling/Vibrator Hose or Motion Compensator Hose

5,000 psi W.P. - 10,000 psi Test Grade D



OFFSHORE LAND RIG

Certification/Standards
API 7K
Coupling/Mat'l Traceability (Additional Cost)
ISO 6807
Letter of Conformance (Additional Cost)
Test Certificates
3rd Party Witness Test (Additional Cost)

Specification 4774 PE

RECOMMENDED FOR: Flexible connection between standpipe and swivel (Rotary Drilling) or between pump and standpipe (Rotary Vibrator) for pumping mud at extra high pressure in oil drilling and exploration work. Meets the high demands of directional drilling and down linking with negative pressure pulses and elevated temperatures. Motion Compensator hose is used for stabilization of rotary drilling and pumping equipment against vertical wave action on offshore drill platforms. **The Motion Compensator hose is not recommended for phosphate ester fluids.**

TEMPERATURE: -4ºF to +180ºF (-20ºC to +82ºC).

TUBE: Type C_3 (Modified Nitrile). 3/16" thick. Black. Specially compounded for handling abrasive, corrosive and oily drilling mud.

REINFORCEMENT: Multiple layers of polyester cord over tube. Multiple layers of "close wound", high tensile steel cables, with one layer of adhesion fabric placed between cable layers. Multiple layers of reinforcement under cover.

COVER: Type C_4 (Modified Nitrile). Black. Specially compounded UltraBrasion cover is resistant to abrasion, corrosion, cutting, gouging, oil and weather. One continuous longitudinal yellow transfer label. Serial number and manufacture date embossed.

COUPLINGS: Swaged – API male line pipe threads standard. Gates recommends butt-welded couplings. Couplings can be supplied with your choice of end fitting (see "Most Commonly used Welded-On Fittings" section for more detailed information).

NOTE: FIELD WELDING OF FITTINGS TO COUPLING IS **NOT** RECOMMENDED.

FITTINGS:

AVAILABLE SIZES:

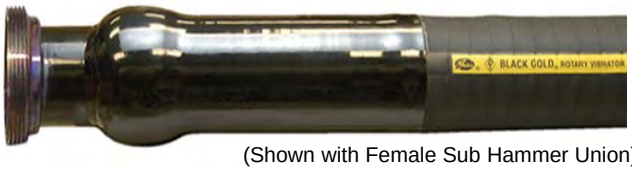
Available Sizes (Inches)	2-1/2	3	3-1/2	4	Spec.
Nom. O.D.	4.14	4.61	5.25	5.61	4774PE
Min. Bend Radius (Inches)	36	48	54	54	
Wt. per Ft. of hose (Lbs)	9.8	10.8	12.8	13.4	
Coupling Threads API (T) (In.)	3"	4"	4"	5"	
Swage Cplg. Wts. Each (Lbs)	33	44.5	47	55	
Maximum length of hose (Feet)	90	90	90	90	
Safety Clamp & Chain Part No.	7361-0825	7361-0830	7361-0835	7361-0840	

OPTIONAL: Accessories such as SAFETY CLAMPS, HOSE LIFT EYE & COLLAR CLAMP and STAINLESS STEEL ARMOR are found on page 53.

OFFSHORE LAND RIG

Gates Black Gold®
Rotary/Vibrator Drilling Hose

7,500 psi W.P. - 15,000 psi Test API Grade E



(Shown with Female Sub Hammer Union)

Specification 4773 PE

Certification/Standards
API 7K
Coupling/Mat'l Traceability (Additional Cost)
ISO 6807
Letter of Conformance (Additional Cost)
Test Certificates
3rd Party Witness Test (Additional Cost)

RECOMMENDED FOR: Flexible connection between standpipe and swivel (Rotary Drilling) or between pump and standpipe (Rotary Vibrator) for pumping mud at extra high pressure in oil drilling and exploration work. Meets the high demands of directional drilling and down linking with negative pressure pulses and elevated temperatures.

TEMPERATURE: -4ºF to +180ºF (-20ºC to +82ºC).

TUBE: Type C_3 (Modified Nitrile). 3/16" thick. Black. Specially compounded for handling abrasive, corrosive and oily drilling mud.

REINFORCEMENT: Multiple layers of polyester cord over tube. Multiple layers of "close wound", high tensile plated steel cables with one layer of adhesion fabric placed between cable layers. Multiple layers of reinforcement under cover.

COVER: Type C_4 (Modified Nitrile). Black. Specially compounded UltraBrasion cover is resistant to abrasion, corrosion, cutting, gouging, oil and weather. One continuous longitudinal yellow transfer label. Serial number and manufacture date embossed.

COUPLINGS: Swaged – API 7K hose assemblies with working pressures exceeding 5,000 psi, the end fitting willl be butt-welded onto the hose coupling. Couplings can be supplied with your choice of end fitting (see "Most Commonly used Welded-On Fittings" section for more detailed information). **NOTE:** FIELD WELDING OF FITTINGS TO COUPLING IS **NOT** RECOMMENDED.

FITTINGS:

Hammer Unions

Female Sub Male Sub./Nut

Hubs

Flanges

AVAILABLE SIZES:

Available Sizes (Inches)	2-1/2	3	3-1/2	4	Spec.
Nom. O.D.	5.16	5.66	6.04	6.40	4773PE
Min. Bend Radius (Inches)	48	48	54	60	
Wt. per Ft. of hose (Lbs)	20.2	22.6	24.1	25.8	
Swage Cplg. Wts. Each (Lbs)	62	70	75	90	
Maximum length of hose (Feet)	90	90	90	90	
Safety Clamp & Chain Part No.	7361-0835	7361-0840	7361-0845	7361-0850	

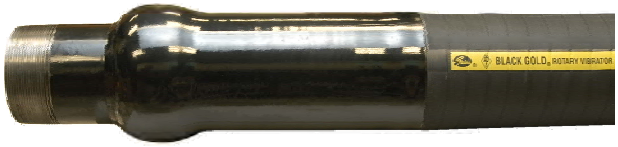
OPTIONAL: Accessories such as SAFETY CLAMPS, HOSE LIFT EYE & COLLAR CLAMP and STAINLESS STEEL ARMOR are found on page 53.

OFFSHORE LAND RIG

Gates Black Gold® Cementing Hose

5,000 psi W.P. - 10,000 psi Test

Certification/Standards
Coupling/Mat'l Traceability (Additional Cost)
Letter of Conformance (Additional Cost)
Test Certificates
3rd Party Witness Test (Additional Cost)



Specification 4774F

RECOMMENDED FOR: Used as a flexible connection between the cementing pump manifold and cementing head for conveyance of cement slurries at high pressure.

TEMPERATURE: -4ºF to +200ºF (-20ºC to +93ºC).

TUBE: Type V (Fluoroelastomer). Black. Excellent resistance to abrasion, corrosion, oil and weather.

REINFORCEMENT: Multiple layers of "close wound", high tensile plated steel cables with one layer of adhesion fabric placed between cable layers. Multiple layers of reinforcement under cover.

COVER: Type C_4 (Modified Nitrile). Black. Specially compounded UltraBrasion cover is resistant to abrasion, corrosion, cutting, gouging, oil and weather. One continuous longitudinal yellow transfer label. Serial number and manufacture date embossed.

COUPLINGS: Swaged – API male line pipe threads standard. Gates recommends butt-welded couplings. Couplings can be supplied with your choice of end fitting (see "Most Commonly used Welded-On Fittings" section for more detailed information).

NOTE: FIELD WELDING OF FITTINGS TO COUPLING IS **NOT** RECOMMENDED.

FITTINGS: Hammer Unions Hubs Flanges

Female Sub Male Sub./Nut

AVAILABLE SIZES:

Available Sizes (Inches)	2-1/2	3	3-1/2	4	Spec.
Nom. O.D.	4.15	4.61	5.25	5.58	4774F
Min. Bend Radius (Inches)	36	48	54	54	
Wt. per Ft. of hose (Lbs)	10.1	11.1	13.2	13.9	
Coupling Threads API (T) (In.)	3"	4"	4"	5"	
Swage Cplg. Wts. Each (Lbs)	33	44.5	47	55	
Maximum length of hose (Feet)	90	90	90	90	
Safety Clamp & Chain Part No.	7361-0825	7361-0830	7361-0835	7361-0840	

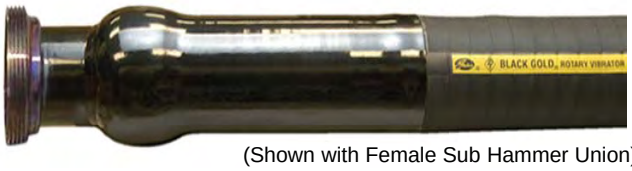
OPTIONAL: Accessories such as SAFETY CLAMPS, HOSE LIFT EYE & COLLAR CLAMP and STAINLESS STEEL ARMOR are found on page 53.

OFFSHORE LAND RIG

Gates Black Gold® Cementing Hose

10,000 psi W.P. - 15,000 psi Test

Certification/Standards
Coupling/Mat'l Traceability (Additional Cost)
Letter of Conformance (Additional Cost)
Test Certificates
3rd Party Witness Test (Additional Cost)



(Shown with Female Sub Hammer Union)

Specification 4773LE

RECOMMENDED FOR: Used as a flexible connection between the cementing pump manifold and cementing head for conveyance of cement slurries at high pressure.

TEMPERATURE: -4ºF to +200ºF (-20ºC to +93ºC).

TUBE: Type V (Fluoroelastomer). Black. Excellent resistance to abrasion, corrosion, oil, weather.

REINFORCEMENT: Multiple layers of "close wound", high tensile plated steel cables with one layer of adhesion fabric placed between cable layers. Multiple layers of reinforcement under cover.

COVER: Type C_4 (Modified Nitrile). Black. Specially compounded UltraBrasion cover is resistant to abrasion, corrosion, cutting, gouging, oil and weather. One continuous longitudinal yellow transfer label. Serial number and manufacture date embossed.

COUPLINGS: Swaged – API 7K hose assemblies with working pressures exceeding 5,000 psi, the end fitting willl be butt-welded onto the hose coupling. Couplings can be supplied with your choice of end fittings, (see "Most Commonly used Welded-On Fittings" section for more detailed information). **NOTE:** FIELD WELDING OF FITTINGS TO COUPLING IS **NOT** RECOMMENDED.

FITTINGS: Hammer Unions

Female Sub Male Sub./Nut

Hubs

Flanges

AVAILABLE SIZES:

Available Sizes (Inches)	2-1/2	3	3-1/2	Spec.
Nom. O.D.	5.14	5.64	6.05	4773LE
Min. Bend Radius (Inches)	48	48	54	
Wt. per Ft. of hose (Lbs)	20.6	23.0	24.6	
Coupling Wts. Each (Lbs)	62	70	75	
Maximum length of hose (Feet)	90	90	90	
Safety Clamp & Chain Part No.	7361-0835	7361-0840	7361-0845	

OPTIONAL: Accessories such as SAFETY CLAMPS, HOSE LIFT EYE & COLLAR CLAMP and STAINLESS STEEL ARMOR are found on page 53.

OFFSHORE LAND RIG

Gates Black Gold® Cementing Hose

15,000 psi W.P. - 22,500 psi Test

Certification/Standards
Coupling/Mat'l Traceability (Additional Cost)
Letter of Conformance (Additional Cost)
Test Certificates
3rd Party Witness Test (Additional Cost)

(Shown with hub fitting)

Specification 4758L

RECOMMENDED FOR: Used as a flexible connection between the cementing pump manifold and cementing head for conveyance of cement slurries at high pressure.

TEMPERATURE: -4ºF to +200ºF (-20ºC to +93ºC).

TUBE: Type V (Fluoroelastomer). Black. Excellent resistance to abrasion, corrosion, oil, weather.

REINFORCEMENT: Multiple layers of "close wound", high tensile plated steel cables to withstand flexing and high pressures encountered in offshore operations. Multiple layers of fabric reinforcement under cover.

COVER: Type C_4 (Modified Nitrile). Black. Specially compounded UltraBrasion cover is resistant to abrasion, corrosion, cutting, gouging, oil and weather. One continuous longitudinal yellow transfer label. Serial number and manufacture date embossed.

COUPLINGS: Special Built-In supplied with your choice of end fittings, (see "Most Commonly used Welded-On Fittings" section for more detailed information).
NOTE: FIELD WELDING OF FITTINGS TO COUPLING IS **NOT** RECOMMENDED.

FITTINGS: Hammer Unions Hubs Flanges

Female Sub Male Sub./Nut

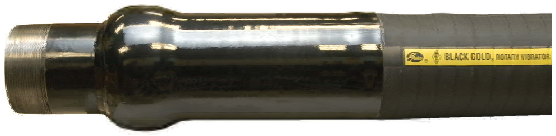
AVAILABLE SIZES:

Available Sizes (Inches)	2-1/2	3	Spec.
Nom. O.D.	5.66	6.16	4758L
Min. Bend Radius (Inches)	60	60	
Wt. per Ft. of hose (Lbs)	29.4	33.2	
Coupling. Wts. Each (Lbs)	130	172	
Maximum length of hose (Feet)	90	90	
Safety Clamp & Chain Part No.	7361-0840	7361-0845	

OPTIONAL: Accessories such as SAFETY CLAMPS, HOSE LIFT EYE & COLLAR CLAMP and STAINLESS STEEL ARMOR are found on page 53.

Gates Black Gold®
Sour Service

5,000 psi W.P. - 10,000 psi Test



Specification 4774F

OFFSHORE LAND RIG

Certification/Standards

Coupling/Mat'l Traceability (Additional Cost)
Letter of Conformance (Additional Cost)
NACE
Test Certificates
3rd Party Witness Test (Additional Cost)

RECOMMENDED FOR: Flexible connection between the standpipe and swivel (rotary drilling) or between pump and standpipe (rotary vibrator).

TEMPERATURE: -4ºF to +200ºF (-20ºC to +93ºC).

TUBE: Type V (Fluoroelastomer). Black. Resists abrasion, corrosion, oil, weather and up to 20% H_2S. **NOTE:** Hose is manufactured to handle up to 20% Hydrogen Sulfide (H_2S) for 1 hour at 93ºC (200ºF) at rated working pressure.

REINFORCEMENT: Multiple layers of "close wound", high tensile steel cables with one layer of adhesion fabric placed between cable layers. Multiple layers of reinforcement under cover.

COVER: Type C_4 (Modified Nitrile). Black. Specially compounded UltraBrasion cover is resistant to abrasion, corrosion, cutting, gouging, oil and weather. One continuous longitudinal yellow transfer label. Serial number and manufacture date embossed.

COUPLINGS: Swaged – meets NACE MR0175. API male line pipe threads standard. Gates recommends butt-welded couplings. Couplings can be supplied with your choice of end fitting (see "Most Commonly used Welded-On Fittings" section for more detailed information). **NOTE:** FIELD WELDING OF FITTINGS TO COUPLING IS **NOT** RECOMMENDED.

FITTINGS: Hammer Unions

Female Sub Male Sub./Nut

Hubs

Flanges

AVAILABLE SIZES:

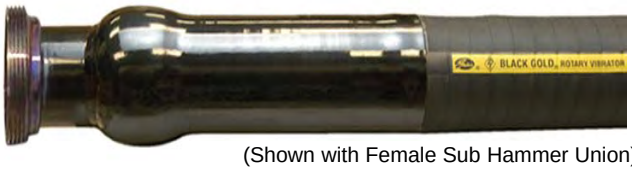
Available Sizes (Inches)	2-1/2	3	3-1/2	4	Spec.
Nom. O.D.	4.15	4.61	5.25	5.58	4774F
Min. Bend Radius (Inches)	36	48	54	54	
Wt. per Ft. of hose (Lbs	10.1	11.1	13.2	13.9	
Coupling Threads API (T) (In.)	3"	4"	4"	5"	
Swage Cplg. Wts. Each (Lbs)	33	44.5	47	55	
Maximum length of hose (Feet)	90	90	90	90	
Safety Clamp & Chain Part No.	7361-0825	7361-0830	7361-0835	7361-0840	

OPTIONAL: Accessories such as SAFETY CLAMPS, HOSE LIFT EYE & COLLAR CLAMP and STAINLESS STEEL ARMOR are found on page 53.

OFFSHORE LAND RIG

Gates Black Gold® Sour Service

10,000 psi W.P. - 15,000 psi Test



(Shown with Female Sub Hammer Union)

Specification 4773LE

Certification/Standards

Coupling/Mat'l Traceability (Additional Cost)
ISO 6807
Letter of Conformance (Additional Cost)
NACE
Test Certificates
3rd Party Witness Test (Additional Cost)

RECOMMENDED FOR: Flexible connection between standpipe and swivel (rotary drilling) or between pump and standpipe (rotary vibrator).

TEMPERATURE: -4ºF to +200ºF (-20ºC to +93ºC).

TUBE: Type V (Fluoroelastomer). Black. Resists abrasion, corrosion, oil, weather and up to 20% H_2S. **NOTE:** Hose is manufactured to handle up to 20% Hydrogen Sulfide (H_2S) for 1 hour at 93ºC (200ºF) at rated working pressure.

REINFORCEMENT: Multiple layers of "close wound", high tensile steel cables with one layer of adhesion fabric placed between cable layers. Multiple layers of reinforcement under cover.

COVER: Type C_4 (Modified Nitrile). Black. Specially compounded UltraBrasion cover is resistant to abrasion, corrosion, cutting, gouging, oil and weather. One continuous longitudinal yellow transfer label. Serial number and manufacture date embossed.

COUPLINGS: Swaged – meets NACE MR0175. API 7K hose assemblies with working pressures exceeding 5,000 psi, the end fitting will be butt-welded onto the hose coupling. Couplings can be supplied with your choice of end fitting (see "Most Commonly used Welded-On Fittings" section for more detailed information). **NOTE:** FIELD WELDING OF FITTINGS TO COUPLING IS **NOT** RECOMMENDED.

FITTINGS: Hammer Unions Hubs Flanges

Female Sub Male Sub./Nut

AVAILABLE SIZES:

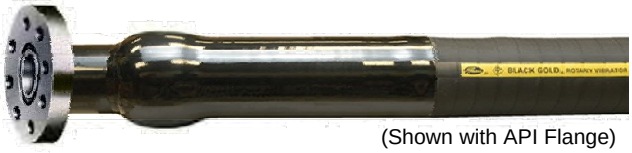
Available Sizes (Inches)	2-1/2	3	3-1/2	4	Spec.
Nom. O.D.	5.14	5.64	6.05	6.40	4773LE
Min. Bend Radius (Inches)	48	48	54	60	
Wt. per Ft. of hose (Lbs)	20.6	23.0	24.6	26.4	
Swage Cplg. Wts. Each (Lbs)	62	70	75	90	
Maximum length of hose (Feet)	90	90	90	90	
Safety Clamp & Chain Part No.	7361-0835	7361-0840	7361-0845	7361-0850	

OPTIONAL: Accessories such as SAFETY CLAMPS, HOSE LIFT EYE & COLLAR CLAMP and STAINLESS STEEL ARMOR are found on page 53.

OFFSHORE LAND RIG

Gates Black Gold® Choke and Kill

5,000 psi W.P. - 10,000 psi Test



(Shown with API Flange)

Specification 4774F and 4773LE

Certification/Standards

Coupling/Mat'l Traceability (Additional Cost)
Letter of Conformance (Additional Cost)
NACE
Test Certificates
3rd Party Witness Test (Additional Cost)

RECOMMENDED FOR: Flexible hose between the riser and manifold or around the ball joint of offshore drilling rigs.

TEMPERATURE: -4ºF to +200ºF (-20ºC to +93ºC).

TUBE: Type V (Fluoroelastomer). Black. Resists abrasion, corrosion, oil, weather and up to 20% H_2S. **NOTE:** Hose is manufactured to handle up to 20% Hydrogen Sulfide (H_2S) for 1 hour at 93ºC (200ºF) at rated working pressure.

REINFORCEMENT: Multiple layers of "close wound", high tensile steel cables with one layer of adhesion fabric placed between cable layers. Multiple layers of reinforcement under cover.

COVER: Type C_4 (Modified Nitrile). Black. Specially compounded UltraBrasion cover is resistant to abrasion, corrosion, cutting, gouging, oil and weather. One continuous longitudinal yellow transfer label. Serial number and manufacture date embossed.

COUPLINGS: Swaged – meets NACE MR0175. Per API – flexible Choke and Kill hose end fittings will be butt-welded and the pressure rating shall be equivalent to the pressure rating of the flexible hose. Couplings can be supplied with your choice of end fitting (see "Most Commonly used Welded-On Fittings" section for more detailed information). **NOTE:** FIELD WELDING OF FITTINGS TO COUPLING IS **NOT** RECOMMENDED.

FITTINGS: Hammer Unions Hubs Flanges

Female Sub Male Sub./Nut

AVAILABLE SIZES:

Available Sizes (Inches)	2-1/2	3	3-1/2	4	Spec.
Nom. O.D. Nom. O.D.	4.15 –	4.61 –	5.25 –	– 6.40	4774F 4773LE
Min. Bend Radius (Inches)	36	48	54	60	
Wt. per Ft. of hose (Lbs) Wt. per Ft. of hose (Lbs)	10.1 –	11.1 –	13.2 –	– 26.4	4774F 4773LE
Swage Cplg. Wts. Each (Lbs)	33	44.5	47	90	
Maximum length of hose (Feet)	90	90	90	90	
Safety Clamp & Chain Part No.	7361-0825	7361-0830	7361-0835	–	4774F
Safety Clamp & Chain Part No.				7361-0850	4773LE

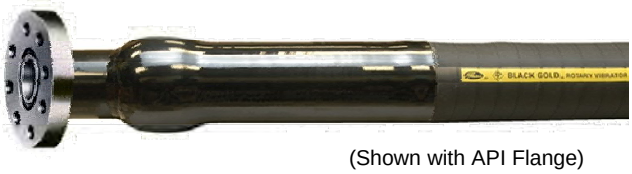
OPTIONAL: Accessories such as SAFETY CLAMPS, HOSE LIFT EYE & COLLAR CLAMP and STAINLESS STEEL ARMOR are found on page 53.

OFFSHORE LAND RIG

Gates Black Gold® Choke and Kill Hose

10,000 psi W.P. - 15,000 psi Test

Certification/Standards
Coupling/Mat'l Traceability (Additional Cost)
Letter of Conformance (Additional Cost)
NACE
Test Certificates
3rd Party Witness Test (Additional Cost)



(Shown with API Flange)

Specification 4773LE

RECOMMENDED FOR: Flexible hose between the riser and manifold or around the ball joint of offshore drilling rigs.

TEMPERATURE: -4ºF to +200ºF (-20ºC to +93ºC).

TUBE: Type V (Fluoroelastomer). Black. Resists abrasion, corrosion, oil, weather and up to 20% H_2S. **NOTE:** Hose is manufactured to handle up to 20% Hydrogen Sulfide (H_2S) for 1 hour at 93ºC (200ºF) at rated working pressure.

REINFORCEMENT: Multiple layers of "close wound", high tensile plated steel cables with one layer of adhesion fabric placed between cable layers. Multiple layers of reinforcement under cover.

COVER: Type C_4 (Modified Nitrile). Black. Specially compounded UltraBrasion cover is resistant to abrasion, corrosion, cutting, gouging, oil and weather. One continuous longitudinal yellow transfer label. Serial number and manufacture date embossed.

COUPLINGS: Swaged – meets NACE MR0175. Per API – flexible Choke and Kill hose end fittings will be butt-welded and the pressure rating shall be equivalent to the pressure of the flexible hose. Couplings can be supplied with your choice of end fittings, (see "Most Commonly used Welded-On Fittings" section for more detailed information). **NOTE:** FIELD WELDING OF FITTINGS TO COUPLING IS **NOT** RECOMMENDED.

FITTINGS:

Hammer Unions

Female Sub

Male Sub./Nut

Hubs

Flanges

AVAILABLE SIZES:

Available Sizes (Inches)	2-1/2	3	3-1/2	Spec.
Nom. O.D.	5.14	5.64	6.05	4773LE
Min. Bend Radius (Inches)	48	48	54	
Wt. per Ft. of hose (Lbs)	20.6	23.0	24.6	
Coupling Wts. Each (Lbs)	60	70	75	
Maximum length of hose (Feet)	90	90	90	
Safety Clamp & Chain Part No.	7361-0835	7361-0840	7361-0845	

OPTIONAL: Accessories such as SAFETY CLAMPS, HOSE LIFT EYE & COLLAR CLAMP and STAINLESS STEEL ARMOR are found on page 53.

OFFSHORE LAND RIG

Gates Black Gold® Super Choke and Kill Hose

15,000 psi W.P. - 22,500 psi Test

(Shown with hub fitting)

Specification 4758L

Certification/Standards

Coupling/Mat'l Traceability (Additional Cost)
Letter of Conformance (Additional Cost)
NACE
Test Certificates
3rd Party Witness Test (Additional Cost)

RECOMMENDED FOR: Flexible hose between the riser and manifold or around the ball joint of offshore drilling rigs.

TEMPERATURE: -4ºF to +200ºF (-20ºC to +93ºC).

TUBE: Type V (Fluoroelastomer). Black. Resists abrasion, corrosion, oil, weather and up to 20% H_2S. **NOTE:** Hose is manufactured to handle up to 20% Hydrogen Sulfide (H_2S) for 1 hour at 93ºC (200ºF) at rated working pressure.

REINFORCEMENT: Multiple layers of "close wound", high tensile plated steel cables to withstand flexing and high pressures encountered in offshore operations. Multiple layers of fabric reinforcement under cover.

COVER: Type C_4 (Modified Nitrile). Black. Specially compounded UltraBrasion cover is resistant to abrasion, corrosion, cutting, gouging, oil and weather. One continuous longitudinal yellow transfer label. Serial number and manufacture date embossed.

COUPLINGS: Special Built-In – meets NACE MR0175. Per API – flexible Choke and Kill hose end fittings will be butt-welded and the pressure rating shall be equivalent to the pressure rating of the flexible hose. Couplings can be supplied with your choice of end fittings, (see "Most Commonly used Welded-On Fittings" section for more detailed information).

NOTE: FIELD WELDING OF FITTINGS TO COUPLING IS **NOT** RECOMMENDED.

FITTINGS:

Hammer Unions

Female Sub Male Sub./Nut

Hubs

Flanges

AVAILABLE SIZES:

Available Sizes (Inches)	2-1/2	3	Spec.
Nom. O.D.	5.66	6.16	4758L
Min. Bend Radius (Inches)	60	60	
Wt. per Ft. of hose (Lbs)	29.4	33.2	
Coupling. Wts. Each (Lbs)	130	172	
Maximum length of hose (Feet)	90	90	
Safety Clamp & Chain Part No.	7361-0840	7361-0845	

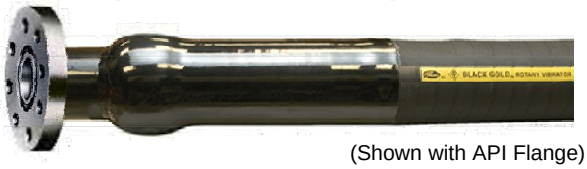
OPTIONAL: Accessories such as SAFETY CLAMPS, HOSE LIFT EYE & COLLAR CLAMP and STAINLESS STEEL ARMOR are found on page 53.

Gates Black Gold®
Rotary Decoking Hose

5,000 psi W.P. - 10,000 psi Test API Grade D
7,500 psi W.P. - 15,000 psi Test API Grade E

OFFSHORE LAND RIG

Certification/Standards
Coupling/Mat'l Traceability (Additional Cost)
Letter of Conformance (Additional Cost)
Test Certificates
3rd Party Witness Test (Additional Cost)



(Shown with API Flange)

Specification 4774PE (Grade D) or 4773PE (Grade E)

RECOMMENDED FOR: Coke is one of the by-products used in oil refining. It is stored in silos until it can be loaded into railroad cars for shipment. The coke hardens after being placed in the silos. To unload the coke from the silos, a decoking hose is attached to a drill stem which travels down the silo. Using warm water and high pressure to wash the loosened coke from the silo.

TEMPERATURE: -4ºF to +180ºF (-20ºC to +82ºC).

TUBE: Type C_3 (Modified Nitrile). 3/16" thick. Black. Specially compounded for handling abrasive, corrosive and oily drilling mud.

REINFORCEMENT: Multiple layers of polyester cord over tube. Multiple layers of "close wound", high tensile steel cables with one layer of adhesion fabric placed between cable layers. Multiple layers of reinforcement under cover.

COVER: Type C_4 (Modified Nitrile). Black. Specially compounded UltraBrasion cover is resistant to abrasion, corrosion, cutting, gouging, oil and weather. One continuous longitudinal yellow transfer label. Serial number and manufacture date embossed.

COUPLINGS: Swaged – supplied with API standard flanges or equivalent of your choice.
NOTE: FIELD WELDING OF FITTINGS TO COUPLING IS **NOT** RECOMMENDED.

FITTINGS: Flanges

AVAILABLE SIZES:

Available Sizes (Inches)	3	3-1/2	4	Spec.
Nom. O.D.	4.61	5.25	5.61	4774PE
Nom. O.D.	5.66	6.04	6.40	4773PE
Min. Bend Radius (Inches)	48	54	54	4774PE
Min. Bend Radius (Inches)	48	54	60	4773PE
Wt. per Ft. of hose (Lbs)	10.8	12.8	13.4	4774PE
Wt. per Ft. of hose (Lbs)	22.6	24.1	25.8	4773PE
Coupling. Wts. Each (Lbs)	44.5	47	55	4774PE
Coupling. Wts. Each (Lbs)	70	75	90	4773PE
Maximum length of hose (Feet)	90	90	90	4774PE
Maximum length of hose (Feet)	90	90	90	4773PE
Safety Clamp & Chain Part No.	7361-0830	7361-0835	7361-0840	4774PE
Safety Clamp & Chain Part No.	7361-0840	7361-0845	7361-0850	4773PE

OPTIONAL: Accessories such as SAFETY CLAMPS, HOSE LIFT EYE & COLLAR CLAMP and STAINLESS STEEL ARMOR are found on page 53.

Optional: 1. Safety clamps can be obtained on special order. Location attaching these safety clamps is shown by notations marked at each end of the assembly. (Additional Cost).

2. Hose lift eye and collar clamp also available. Do not use safety clamp and chain for lifting. (Additional Cost).

3. An external stainless steel armor shield can be supplied. Applied over the hose cover. The armor provides extra abrasion and mechanical protection for the hose, where external abuse is severe. (Additional Cost).

OFFSHORE LAND RIG

Motion Compensator Hose (Plain End)

Specification 4651RL

RECOMMENDED FOR: Stabilization of rotary drilling and pumping equipment against vertical wave action on offshore drill platforms.

TEMPERATURE: -40ºF to +250ºF (-40ºC to +121ºC).

TUBE: Type A (Neoprene). Black. Oil resistant synthetic rubber.

REINFORCEMENT: Four alternating layers of spiraled, high tensile steel wire over a layer of fabric.

COVER: Type A (Neoprene). Black. Oil resistant synthetic rubber. Special longitudinal red stripe for easy identification.

MAXIMUM WORKING PRESSURE: 2,500 psi

AVAILABLE SIZES: 2" I.D. only.

LENGTHS: 200 ft. maximum.

COUPLINGS: Gates PCS Coupling

32PCS-32MPAPI

PCS Ferrule

OFFSHORE LAND RIG

16 B.O.P.
Blow-Out Preventer

Specification 4651RL

Certification/Standards
DNV
MSHA
SAE
USCG
This product can be tested to meet other oil field related certificates/standards.

RECOMMENDED FOR: Insert hose in all oilfield blow-out systems. This rugged hose has been tested for 5,000 psi static pressure requirements. **NOTE:** Insert must be sleeved and shielded for B.O.P. applications in accordance with applicable specifications.

TEMPERATURE: -40ºF to +250ºF (-40ºC to +121ºC).

TUBE: Type A (Neoprene). Black. Oil resistant synthetic rubber.

REINFORCEMENT: Four alternating layers of spiraled, high tensile steel wire over a layer of fabric.

COVER: Type A (Neoprene). Black. Oil resistant synthetic rubber. Special longitudinal red stripe for easy identification.

MAXIMUM WORKING PRESSURE: 5,000 psi static

AVAILABLE SIZES: 1" I.D. only.

LENGTHS: Standard Pack - 200 ft. Coiled and tied.

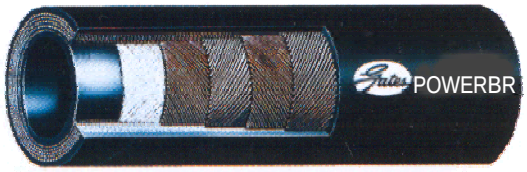
COUPLINGS: Gates Global Spiral Coupling

16GS-16MPAPI

GS Ferrule

OFFSHORE LAND RIG

Powerbraid® Plus



Certification/Standards
DNV
MSHA
SAE
USCG
This product can be tested to meet other oil field related certificates/standards.

Specification 4651RL, 4651PL, 4651ZL – For 3,000 and 5,000 psi

RECOMMENDED FOR: Rotary hose applications on work over rigs and slim hole or seismograph rigs designed to operate at a maximum of 3,000 to 5,000 psi rated working pressure depending on size. Applications on small or medium-size drilling rigs used for water well operations, water well core drill, blast or shot hole operations. Hoses are flexible connectors in pressure lines used in conveying mud or air. For normal air or mud applications and where increased resistance to external abuse or pump pulsations is required.

TEMPERATURE: -40ºF to +180ºF (-40ºC to +82ºC) continuous service.

TUBE: Type A (Neoprene). Black. For 1-1/2" and 2" I.D. 5,000 psi and 2" I.D. 3,000 psi.
Type C (Nitrile). Black. For 1" and 1-1/4" I.D. 5,000 psi.
RMA (Class B) Medium oil resistance.

REINFORCEMENT: High tensile steel wire.

COVER: Type A (Neoprene). Black with blue longitudinal stripe.

MAXIMUM WORKING PRESSURE: 5,000 psi 1", 1-1/4", 1-1/2" and 2"
3,000 psi 2" static

AVAILABLE SIZES: 1" through 2" I.D.

LENGTHS: 50 ft. and 200 ft. lengths.

COUPLINGS: Gates PCS –PCM –GS – Coupling


32PCS-32MPAPI (3000 psi)


PCS Ferrule


20GS-20MPAPI (5000 psi)


32PCM-32MPAPI (5000 psi)

16GS-16MPLN (5000 psi) (not shown)

Swaged-On Permanent Couplings – API threads on connecting end of stem for easy flange attachment. Strong collar to anchor ferrule to stem. Electroplated steel. Also available in stainless steel, and other special metals.


Permanent Swaged

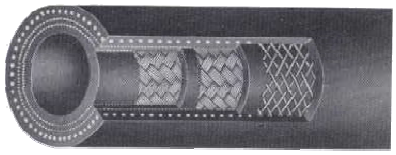

Ferrule

Wildman Type A reusable couplings (not shown).
(API threads only)

SOURCES: Dixon Valve & Coupling Co.
George Myer Company, Inc.

OFFSHORE LAND RIG

Powerbraid® Plus



Certification/Standard
MSHA
RMA (Class A)

Specification 3670H – For 2,000 and 2,500 psi

RECOMMENDED FOR: Rotary hose applications on work over rigs and slim hole or seismograph rigs designed to operate at a maximum of 2,000 or 2,500 psi rated working pressure depending on size. Applications on small or medium-size drilling rigs used for water well operations, water well core drill, blast or shot hole operations. Hoses are flexible connectors in pressure lines used in conveying mud or air. For normal air or mud applications and where increased resistance to external abuse or pump pulsations is required.

TEMPERATURE: -40ºF to +180ºF (-40ºC to +82ºC) continuous service.

TUBE: Type C (Nitrile). Black. Specially compounded to provide high resistance to oil, abrasion and heat.

REINFORCEMENT: High tensile steel wire.

COVER: Type A (Neoprene). Black with blue longitudinal stripe.

MAXIMUM WORKING PRESSURE:
2,500 psi 2 1/2”
2,000 psi 3”

AVAILABLE SIZES: 2 1/2” and 3” I.D.

LENGTHS: 50 ft. maximum.

COUPLINGS: Swaged-On Permanent Couplings – API threads on connecting end of stem for easy flange attachment. Strong collar to anchor ferrule to stem. Electroplated steel. Also available in stainless steel, and other special metals.

Wildman Type A reusable couplings (not shown).
(API threads only)


Permanent Swaged


Ferrule

SOURCES: Dixon Valve & Coupling Co.
George Myer Company, Inc.

OFFSHORE LAND RIG

Hot Oiler Hose

Certification/Standards
MSHA

Specification 4657F

RECOMMENDED FOR: Static pressure, hot oiler applications. Designed specifically to handle the transfer of hot oil at 270ºF continuous, 300ºF intermittent to clear the paraffin around the casing to help start the flow of oil to the surface. Meets Flame Resistance Acceptance Designation “MSHA 2G-11C”.

TEMPERATURE: -40ºF to +300ºF (-40ºC to +149ºC).

TUBE: Type C (Nitrile). Black. Oil resistant synthetic rubber.

REINFORCEMENT: Two braids of high tensile steel wire.

COVER: Type M (Hypalon). Black. Oil and abrasion resistant thin synthetic rubber.

MAXIMUM WORKING PRESSURE: 2,300 psi static

AVAILABLE SIZES: 1 1/2” I.D.

LENGTHS: Standard Pack - 120 ft. carton.

COUPLINGS: Permanent PC Stems and Ferrules available only in sizes -24 (1-1/2”) and -32 (2”).
No skiving required for PC couplings.

Field Attachable “Type T” Couplings.
No Skiving required for Field Attachable “Type T” Couplings.

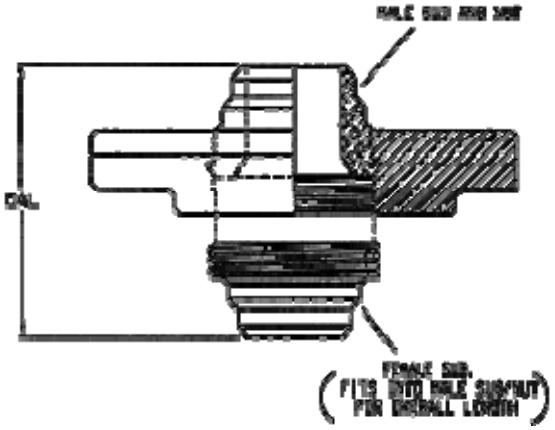
Section 4
Most Commonly Used Add on Fittings (Rotary/Choke & Kill Hose)

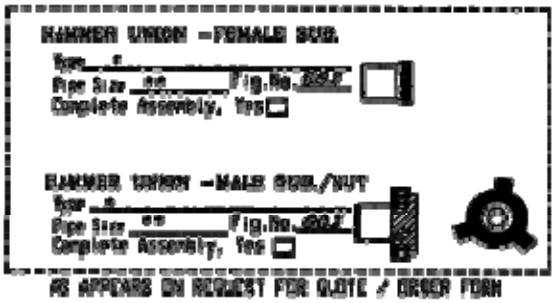
OFFSHORE LAND RIG

Most Commonly Used Add-On Fittings (Rotary/Choke & Kill Hose)

HAMMER UNION — FIG. 602

***TYPE: WECO, BEST, KEMPER, ANSON, CATAWISSA, ABCO**





AS APPEARS ON REQUEST FOR QUOTE / ORDER FORM

DIMENSIONS

Pipe Size	Overall Assembled Length	Standard Service Working P.S.I.	Standard Service Test P.S.I.	Sour Gas Service Working P.S.I.	Sour Gas Service Test P.S.I.
2	3 31/32	4,000	9,000	4,000	9,000
3	3 11/16	4,000	9,000	4,000	9,000
4	3 11/16	4,000	9,000	4,000	9,000

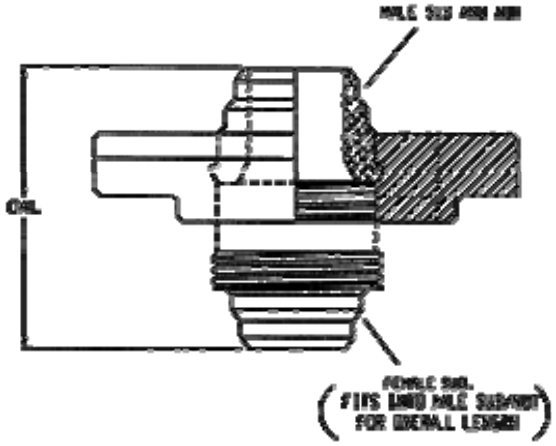
GATES CORPORATION
DENVER, COLORADO, USA

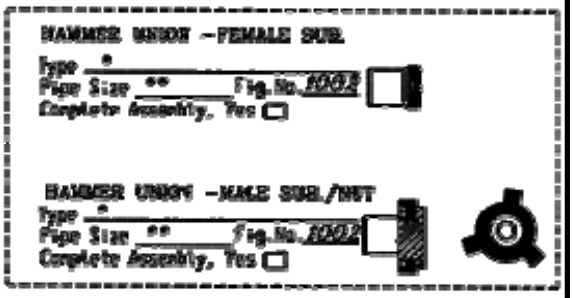
OFFSHORE LAND RIG

Most Commonly Used Add-On Fittings
(Rotary/Choke & Kill Hose)

HAMMER UNION — FIG. 1002

***TYPE: WECO, BEST, KEMPER, ANSON, CATAWISSA, ABCO**





AS APPEARS ON REQUEST FOR QUOTE / ORDER FORM

DIMENSIONS

** Pipe Size	Overall Assembled Length	Standard Service Working P.S.I.	Standard Service Test P.S.I.	Sour Gas Service Working P.S.I.	Sour Gas Service Test P.S.I.
2	5 1/32	10,000	15,000	7,500	12,000
3	5 7/16	10,000	15,000	7,500	12,000
4	5 11/16	10,000	15,000	7,500	12,000
5	6 1/8	7,500	11,250	5,000	7,500
6	6 1/2	7,500	11,250	5,000	7,500

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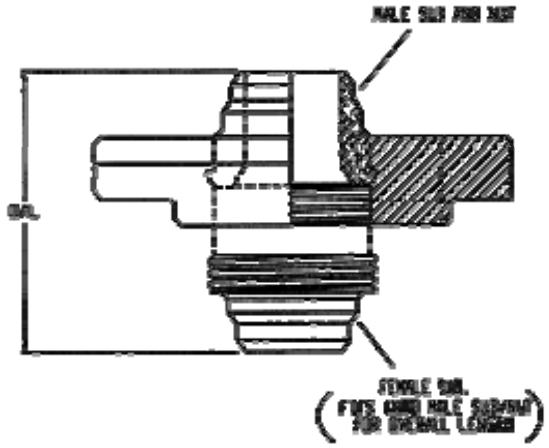
DENVER, COLORADO, USA

OFFSHORE LAND RIG

Most Commonly Used Add-On Fittings
(Rotary/Choke & Kill Hose)

HAMMER UNION — FIG. 1003

***TYPE: WECO, BEST, KEMPER, ANSON, CATAWISSA, ABCO**



HAMMER UNION –FEMALE SUB.
Type *
Pipe Size ** Fig. No. 1003
Complete Assembly, Yes ☐

HAMMER UNION –MALE SUB./NUT
Type *
Pipe Size ** Fig. No. 1003
Complete Assembly, Yes ☐

AS APPEARS ON REQUEST FOR QUOTE / ORDER FORM

DIMENSIONS

** Pipe Size	Overall Assembled Length	Standard Service Working P.S.I.	Standard Service Test P.S.I.	Sour Gas Service Working P.S.I.	Sour Gas Service Test P.S.I.
2	9 7/8	10,000	15,000	7,500	12,500
3	9 1/8	10,000	15,000	7,500	12,500
4	10 15/16	7,500	12,000	5,000	7,500
5	10 15/16	7,500	12,000	5,000	7,500

GATES CORPORATION
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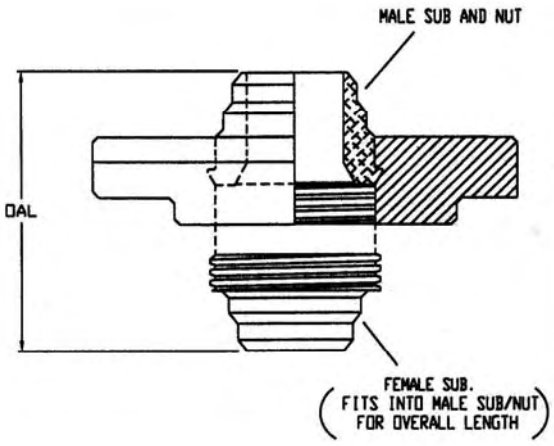
OFFSHORE LAND RIG

Most Commonly Used Add-On Fittings (Rotary/Choke & Kill Hose)

HAMMER UNION — FIG. 1502

*TYPE: WECO, BEST, KEMPER, ANSON, CATAWISSA, ABCO



HAMMER UNION – FEMALE SUB.
Type *
Pipe Size ** Fig.No. 1502
Complete Assembly, Yes ☐

HAMMER UNION – MALE SUB./NUT
Type *
Pipe Size ** Fig.No. 1502
Complete Assembly, Yes ☐

AS APPEARS ON REQUEST FOR QUOTE / ORDER FORM

DIMENSIONS

** Pipe Size	Overall Assembled Length	Standard Service Working P.S.I.	Standard Service Test P.S.I.	Sour Gas Service Working P.S.I.	Sour Gas Service Test P.S.I.
2	6 1/4	15,000	22,500	10,000	15,000
3	5 1/4	15,000	22,500	10,000	15,000
4	10 1/2	15,000	22,500	10,000	15,000

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DENVER, COLORADO, USA

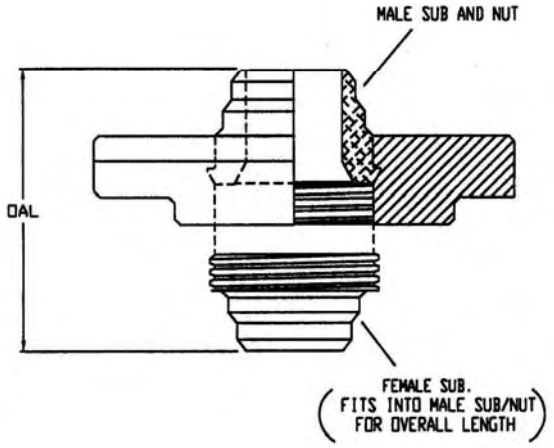
DATE: 6-6-01
REVISION: 1

OFFSHORE LAND RIG

Most Commonly Used Add-On Fittings (Rotary/Choke & Kill Hose)

HAMMER UNION — FIG. 2002

*TYPE: WECO, BEST, KEMPER, ANSON, CATAWISSA, ABCO



HAMMER UNION – FEMALE SUB.
Type *
Pipe Size ** Fig.No. 2002
Complete Assembly, Yes ☐

HAMMER UNION – MALE SUB./NUT
Type *
Pipe Size ** Fig.No. 2202
Complete Assembly, Yes ☐

AS APPEARS ON REQUEST FOR QUOTE / ORDER FORM

DIMENSIONS

** Pipe Size	Overall Assembled Length	Standard Service Working P.S.I.	Standard Service Test P.S.I.	Sour Gas Service Working P.S.I.	Sour Gas Service Test P.S.I.
2	7 3/32	20,000	30,000	N/A	N/A
3	10 1/2	20,000	30,000	N/A	N/A

DATE: 6-6-01
REVISION: 1

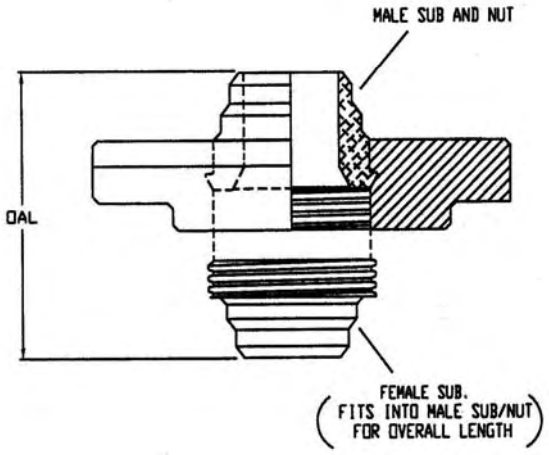
GATES CORPORATION
DENVER, COLORADO, USA

OFFSHORE LAND RIG

Most Commonly Used Add-On Fittings (Rotary/Choke & Kill Hose)

HAMMER UNION — FIG. 2202

*TYPE: WECO, BEST, KEMPER, ANSON, CATAWISSA, ABCO



HAMMER UNION – FEMALE SUB.
Type *
Pipe Size ** Fig.No. 2202
Complete Assembly, Yes ☐

HAMMER UNION – MALE SUB./NUT
Type *
Pipe Size ** Fig.No. 2202
Complete Assembly, Yes ☐

AS APPEARS ON REQUEST FOR QUOTE / ORDER FORM

DIMENSIONS

** Pipe Size	Overall Assembled Length	Standard Service Working P.S.I.	Standard Service Test P.S.I.	Sour Gas Service Working P.S.I.	Sour Gas Service Test P.S.I.
2	7 3/8	N/A	N/A	15,000	22,500
3	9 9/16	N/A	N/A	15,000	22,500

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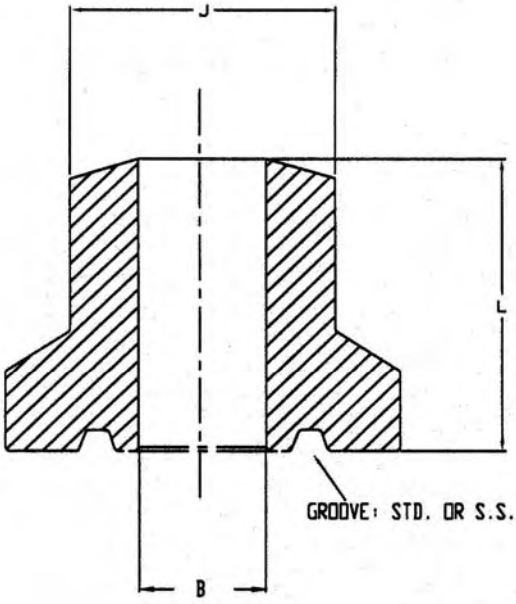
DATE: 6-6-01
REVISION: 1

OFFSHORE LAND RIG

Most Commonly Used Add-On Fittings (Rotary/Choke & Kill Hose)

CAMERON HUB CONNECTIONS FOR 5,000 psi RATED WORKING PREISSURE



HUB
Type *Cameron* Nominal Size ✱
Working Pressure *5,000 P.S.I.*
Ring No. ✱✱
Groove: STD _____ or SS. _____

As Appears on Request For Quote / Order Form

DIMENSIONS

✱ NOMINAL SIZE AND BORE 'B'	MINIMUM LENGTH 'L'	LARGE DIAMETER OF NECK 'J'	✱✱ RING NUMBER BX
2 1/16	2.625	3.656	152
2 9/16	2.75	4.406	153
3 1/8	2.875	4.938	154
4 1/16	3.00	6.250	155

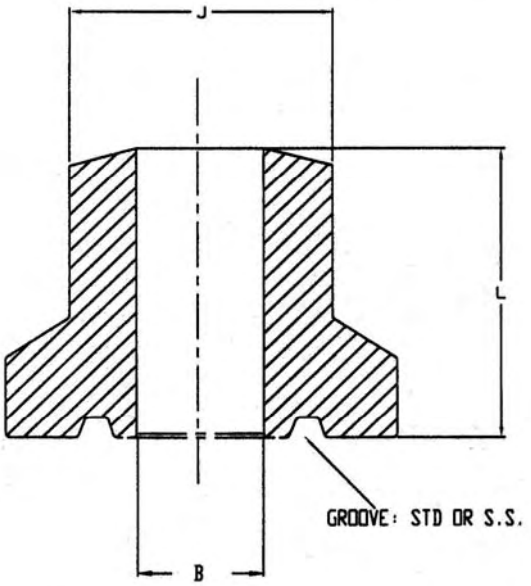
DATE: 6-6-01
REVISION: 4

GATES CORPORATION
DENVER, COLORADO, USA

OFFSHORE LAND RIG

Most Commonly Used Add-On Fittings
(Rotary/Choke & Kill Hose)

CAMERON HUB CONNECTIONS FOR
10,000 psi RATED WORKING PRESSURE



HUB
Type *Cameron* Nominal Size *
Working Pressure *10,000 P.S.I.*
Ring No. **
Groove: STD _____ or SS. _____

AS APPEARS ON REQUEST FOR QUOTE / ORDER FORM

DIMENSIONS

* NOMINAL SIZE AND BORE "B"	MINIMUM LENGTH "L"	LARGE DIAMETER OF NECK "J"	** RING NUMBER BX
2 1/16	2.750	4.406	152
2 9/16	2.875	4.938	153
3 1/8	3.000	6.250	154
4 1/16	3.250	6.812	155

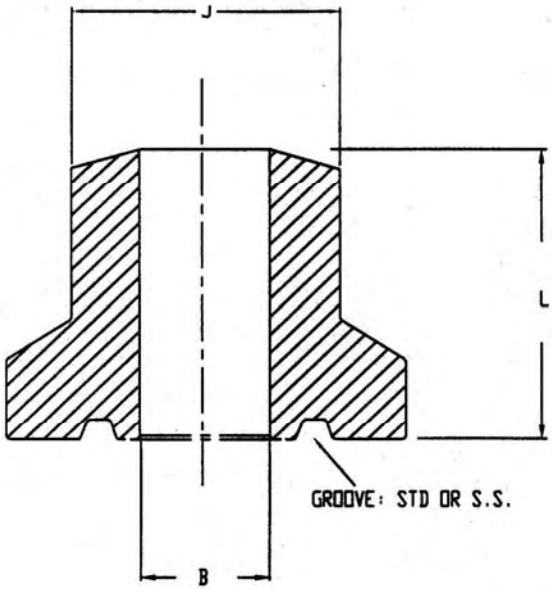
GATES CORPORATION
DENVER, COLORADO, USA

DATE: 6-6-01
REVISION 4

OFFSHORE LAND RIG

Most Commonly Used Add-On Fittings (Rotary/Choke & Kill Hose)

CAMERON HUB CONNECTIONS FOR 15,000 psi RATED WORKING PRESSURE



HUB
Type *Cameron* Nominal Size *
Working Pressure *15,000 P.S.I.*
Ring No.**
Groove: STD _____ or SS. ____

AS APPEARS ON REQUEST FOR QUOTE / ORDER FORM

DIMENSIONS

* NOMINAL SIZE AND BORE "B"	MINIMUM LENGTH "L"	LARGE DIAMETER OF NECK "J"	** RING NUMBER BX
2 1/16	3.625	4.500	152
2 9/16	3.625	4.500	153
3 1/8	3.750	6.812	154
4 1/16	3.875	11.625	155

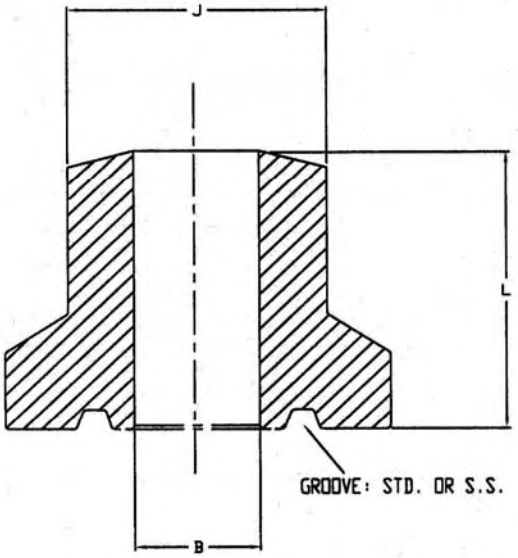
DATE: 6-6-01
Revision 3

GATES CORPORATION
DENVER, COLORADO, USA

OFFSHORE LAND RIG

Most Commonly Used Add-On Fittings (Rotary/Choke & Kill Hose)

API TYPE 16BX INTEGRAL HUB CONNECTIONS FOR 5,000 psi RATED WORKING PRESSURE



HUB
Type *API 16BX* Nominal Size *
Working Pressure *5,000 P.S.I.*
Ring No. **
Groove: STD _____ or SS. _____

As Appears on Request For Quote / Order Form

DIMENSIONS

* NOMINAL SIZE AND BORE B	MINIMUM LENGTH L	LARGE DIAMETER OF NECK "J"	** RING NO. BX
2 1/16	2.625	3.656	152
2 9/16	2.750	4.406	153
3 1/8	2.875	4.938	154
4 1/16	3.000	6.25	155

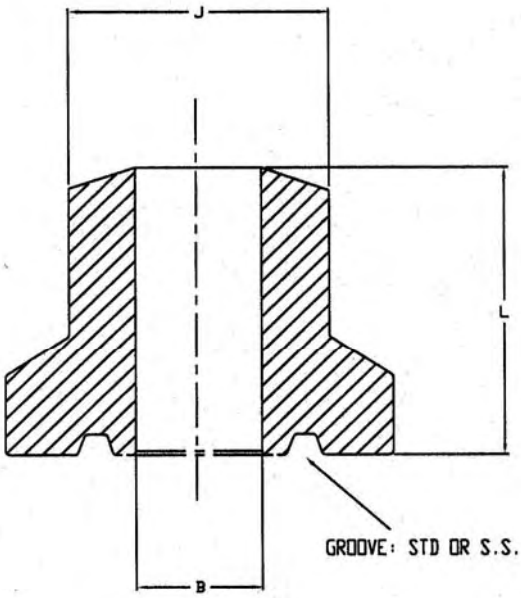
DATE: 6-6-01
REVISION: 3

GATES CORPORATION
DENVER, COLORADO, USA

OFFSHORE LAND RIG

Most Commonly Used Add-On Fittings (Rotary/Choke & Kill Hose)

API TYPE 16BX INTEGRAL HUB CONNECTIONS FOR 10,000 psi RATED WORKING PRESSURE



HUB
Type *API 16BX* Nominal Size *
Working Pressure *10,000 P.S.I.*
Ring No. **
Groove: STD _____ or SS. _____

As Appears on Request For Quote / Order Form

DIMENSIONS

* NOMINAL SIZE AND BORE "B"	MINIMUM LENGTH "L"	LARGE DIAMETER OF NECK "J"	** RING # BX
2 1/16	2.750	4.406	152
2 9/16	2.875	4.938	153
3 1/16	3.000	6.250	154
4 1/16	3.250	6.812	155

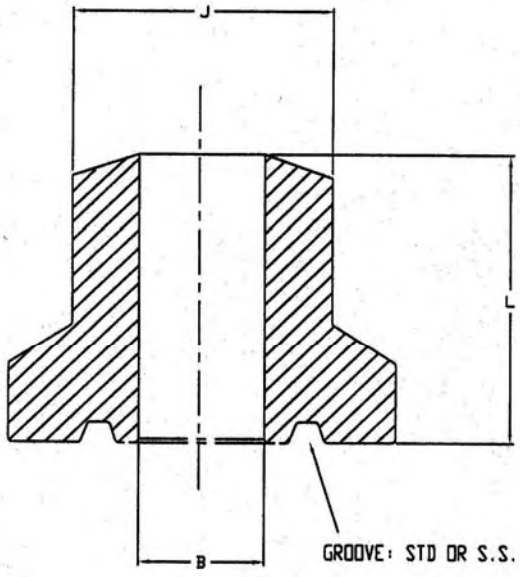
DATE: 06-06-01
REVISION 4

GATES CORPORATION
DENVER, COLORADO, USA

OFFSHORE LAND RIG

Most Commonly Used Add-On Fittings (Rotary/Choke & Kill Hose)

API TYPE 16BX INTEGRAL HUB CONNECTIONS FOR 15,000 psi RATED WORKING PRESSURE



HUB
Type *API 16BX* Nominal Size *
Working Pressure *15,000 P.S.I.*
Ring No. **
Groove: STD _____ or SS. _____

As Appears on Request For Quote / Order Form

DIMENSIONS

* NOMINAL SIZE AND BORE "B"	MINIMUM LENGTH "L"	LARGE DIAMETER OF NECK "J"	** RING NUMBER BX
2 1/16	3.625	4.500	152
2 9/16	3.625	4.500	153
3 1/16	3.750	6.812	154
4 1/16	3.875	11.625	155

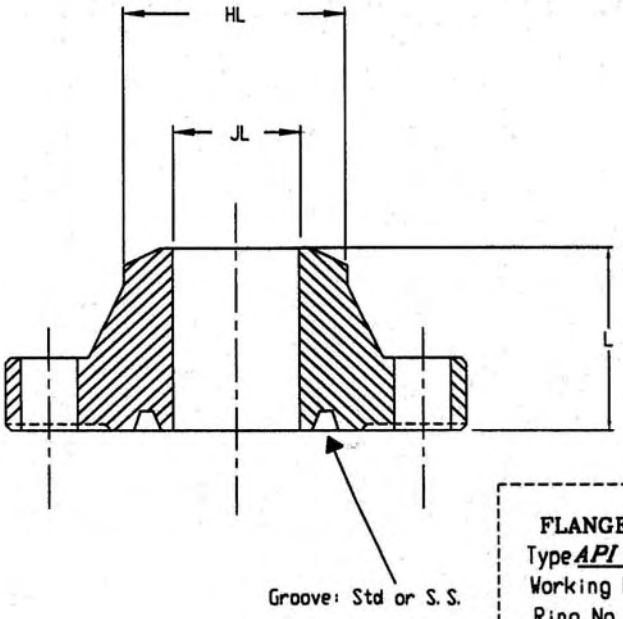
GATES CORPORATION
DENVER, COLORADO, USA

DATE: 6-6-01
REVISION: 2

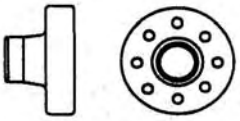
OFFSHORE LAND RIG

Most Commonly Used Add-On Fittings (Rotary/Choke & Kill Hose)

API TYPE 6B FLANGE FOR 3,000 psi RATED WORKING PRESSURE



FLANGE
Type *API 6B* Nominal Size *
Working Pressure *3000 P.S.I.*
Ring No. **
Groove: STD _____ or SS. _____



As Appears on Request For Quote / Order Form

DIMENSIONS

* Nominal Size and Bore	Max. Bore J L	Min. Length L	Neck Dia. H L	** Ring No. R OR RX
2 1/16	1.97	4.31	2.38	24
2 9/16	2.35	4.44	2.88	27
3 1/8	2.93	4.31	3.50	31
4 1/16	3.86	4.81	4.50	37
5 1/8	4.84	5.31	5.56	41

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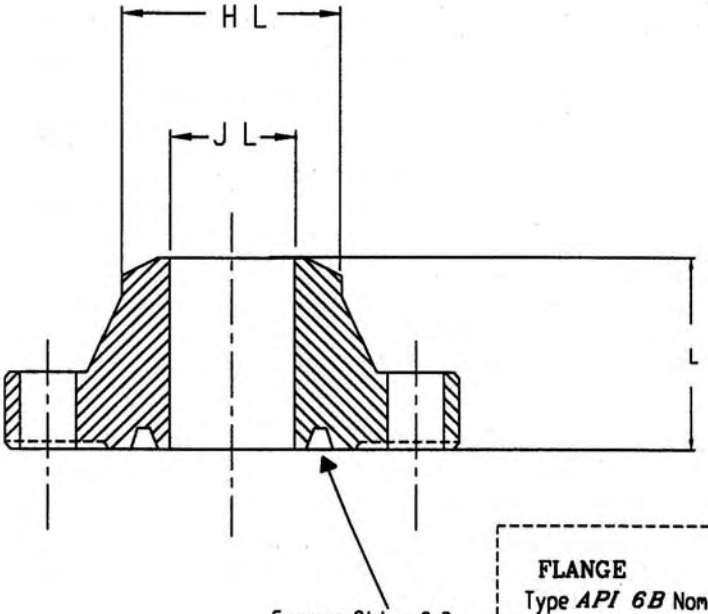
GATES CORPORATION
DENVER, COLORADO, USA

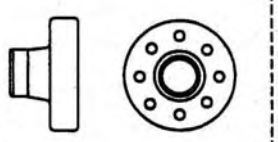
OFFSHORE LAND RIG

Most Commonly Used Add-On Fittings (Rotary/Choke & Kill Hose)

API TYPE 6B FLANGE FOR 5,000 psi RATED WORKING PRESSURE



FLANGE
Type *API 6B* Nominal Size *
Working Pressure *5000 P.S.I.*
Ring No. **
Groove: STD _____ or SS. _____



As Appears on Request For Quote / Order Form

DIMENSIONS

* Nominal Size and Bore	Max. Bore J L	Min. Length L	Neck Dia. H L	** Ring No. R OR RX
2 1/16	1.72	4.31	2.38	24
2 9/16	2.16	4.44	2.88	27
3 1/8	2.65	4.94	3.50	35
4 1/16	3.47	5.19	4.50	39
5 1/8	4.34	6.44	5.56	44

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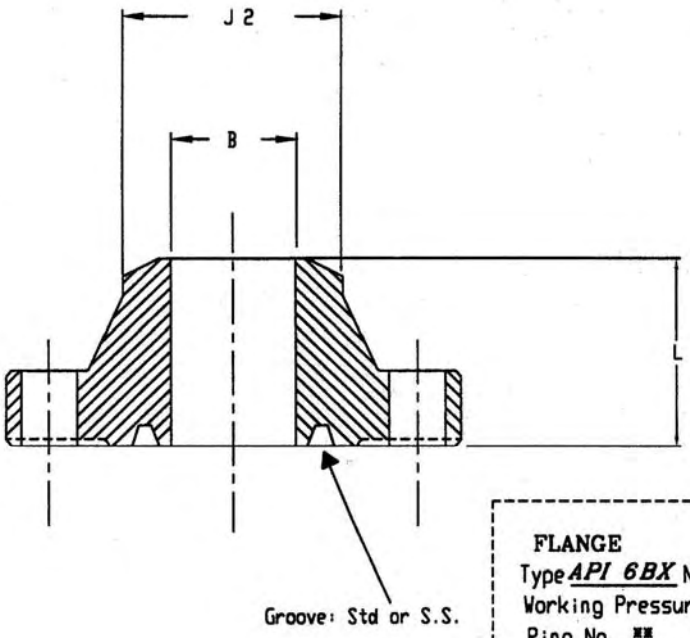
GATES CORPORATION
DENVER, COLORADO, USA

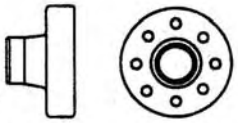
OFFSHORE LAND RIG

Most Commonly Used Add-On Fittings (Rotary/Choke & Kill Hose)

API TYPE 6BX FLANGE FOR 10,000 psi RATED WORKING PRESSURE



FLANGE
Type *API 6BX* Nominal Size *
Working Pressure *10,000 P.S.I.*
Ring No. **
Groove: STD _____ or SS. _____



As Appears on Request For Quote / Order Form

* Nominal Size and Bore	DIMENSIONS Max. Bore B	Min. Length L	Neck Dia. J 2	** Ring No. BX
2 1/16	2.09	4.01	2.94	152
2 9/16	2.59	4.52	3.62	153
3 1/16	3.09	5.05	4.34	154
4 1/16	4.09	5.90	5.75	155
5 1/8	5.16	6.57	7.19	169

GATES CORPORATION
DENVER, COLORADO, USA

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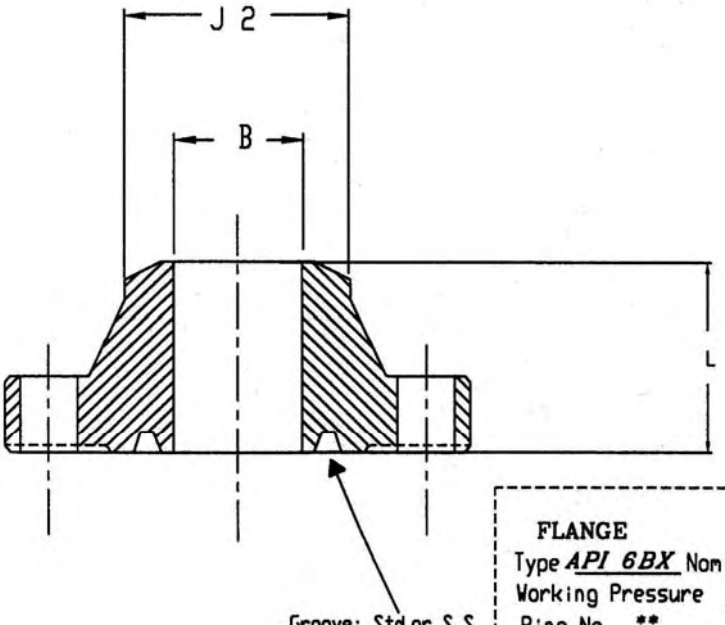
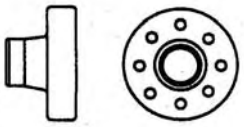
OFFSHORE LAND RIG

Most Commonly Used Add-On Fittings
(Rotary/Choke & Kill Hose)

API TYPE 6BX FLANGE FOR 15,000 psi RATED WORKING PRESSURE



FLANGE
Type *API 6BX* Nominal Size *
Working Pressure *15,000 P.S.I.*
Ring No. **
Groove: STD _____ or SS. _____



As Appears on Request For Quote / Order Form

DIMENSIONS

* Nominal Size and Bore	Max. Bore B	Min. Length L	Neck Dia. J 2	** Ring No. BX
2 1/16	2.09	4.37	3.25	152
2 9/16	2.59	4.75	3.94	153
3 1/16	3.09	5.28	4.81	154
4 1/16	4.09	6.22	6.25	155

GATES CORPORATION
DENVER, COLORADO, USA

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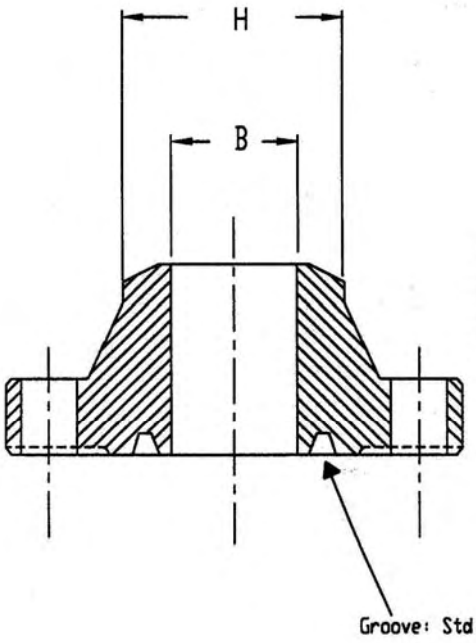
REVISION 3

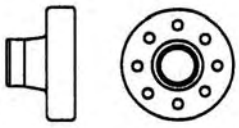
OFFSHORE LAND RIG

Most Commonly Used Add-On Fittings
(Rotary/Choke & Kill Hose)

RING JOINT FLANGE FOR
1500 LB. PRESSURE RATING



FLANGE
Type *Ring Joint* Pipe Size *
Working Pressure *1500 LB.*
Ring No. **
Groove: STD X or SS. ____



AS APPEARS ON REQUEST FOR QUOTE / ORDER FORM

DIMENSIONS

* PIPE SIZE	Specified by Customer Max. Bore B	Neck Dia. H	** Ring No. R	Working psi	Test psi
4		4.50	39	3,375	5,400
5		5.56	44	3,375	5,400
6		6.63	46	3,375	5,400

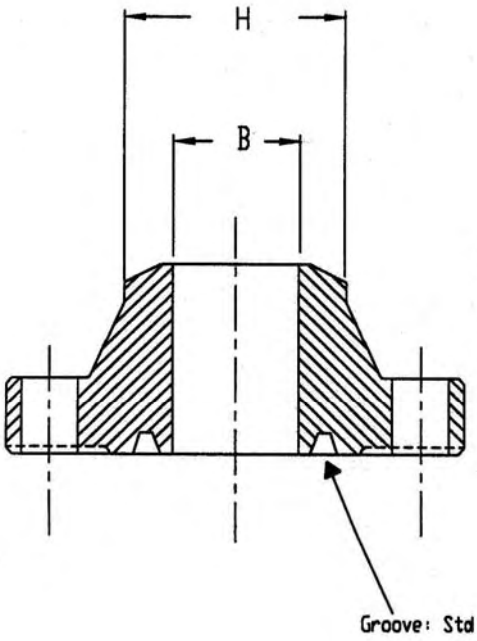
GATES CORPORATION
DENVER, COLORADO, USA

DATE: 6-6-01
REVISION: 2

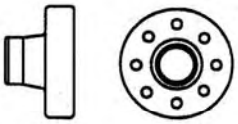
OFFSHORE LAND RIG

Most Commonly Used Add-On Fittings (Rotary/Choke & Kill Hose)

RING JOINT FLANGE FOR 2500 LB. PRESSURE RATING



FLANGE
Type *Ring Joint* Pipe Size *
Working Pressure *2500 LB.*
Ring No. **
Groove: STD X or SS. ____



As Appears on Request For Quote / Order Form

DIMENSIONS

* Pipe Size	Specified by Customer Max. Bore B	Neck Dia. H	** Ring No. R	Working psi	Test psi
4		4.50	39	5,625	9,000
5		5.56	42	5,625	9,000
6		6.63	47	5,625	9,000

GATES CORPORATION
DENVER, COLORADO, USA

DATE: 6-6-01
REVISION: 2

OFFSHORE LAND RIG

Most Commonly Used Add-On Fittings (Rotary/Choke & Kill Hose)

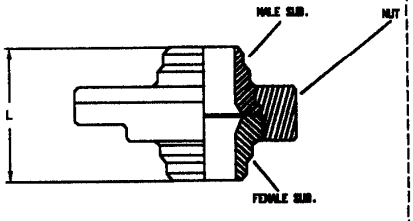
OTHER

OTHER
Type * _____
Bore Size ____ Working(psi)_____
Male _____ Female_____
Complete assembly_____

AS APPEARS ON REQUEST FOR QUOTE / ORDER FORM

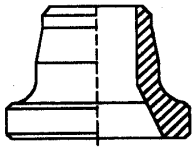
* TYPES:

- HUBER - YALE HAMMER UNION



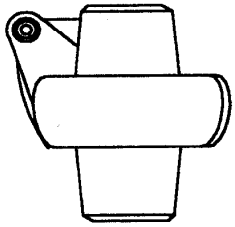
Note: Does not mate with ~~other Hammer Unions~~

- GRAYLOC CONNECTOR

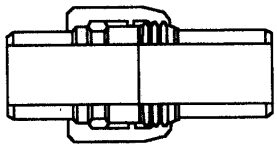


-Galperti UR
-Techlok Connector
~~(Does not mate with Graylock or Galperti)~~

- UNIBOLT STEEL COUPLING

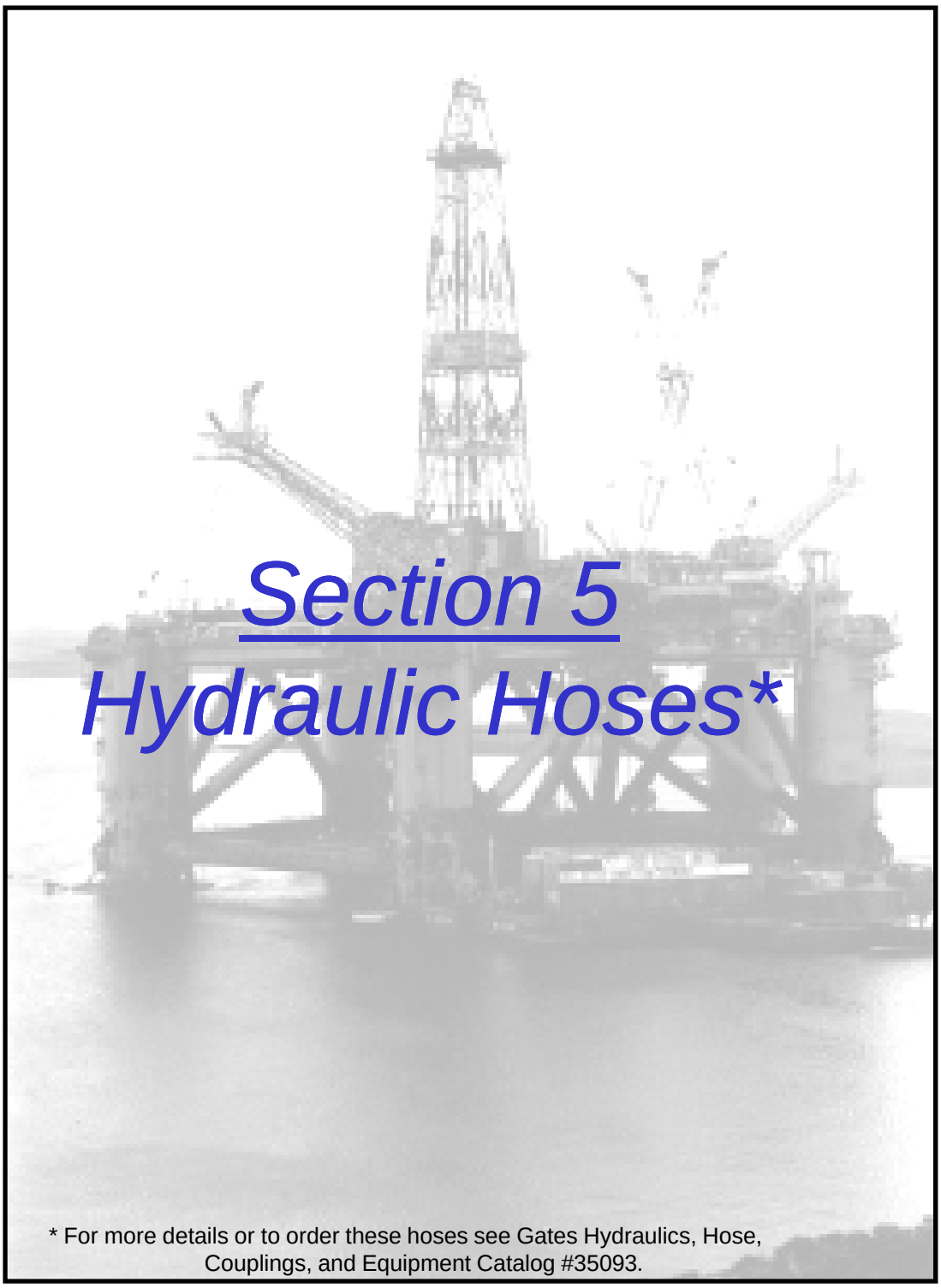


- DYNETOR CONNECTOR
Single Nut or Double Nut



GATES CORPORATION
DENVER, COLORADO, USA

DATE: 9-29-97
REVISION: 0

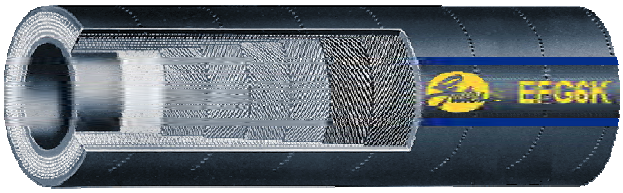


Section 5
Hydraulic Hoses*

* For more details or to order these hoses see Gates Hydraulics, Hose, Couplings, and Equipment Catalog #35093.

OFFSHORE LAND RIG

EFG6K Spiral Wire Hose



Specification 4651Z, ZF, ZL, ZS, ZT

Certification/Standards

ABS
DIN – 20023 4SH/4SP
DNV
EN – 856 4SH/4SP
MSHA
SAE – 100R15
USCG
This product can be tested to meet other oil field related certificates/standards.

RECOMMENDED FOR: Extremely high pressure, high impulse applications such as hydrostatic transmissions. EFG6K is designed to meet all requirements of SAE 100R15 specifications. Meets Flame Resistance Acceptance Designation of "MSHA 2G". Makes designing and plumbing of extremely high pressure hydraulic systems easy and efficient. Compatible with biodegradable hydraulic fluids like polyol ester, polyglycol and vegetable oil as well as standard petroleum based fluids.
Applications – B.O.P., Heavy Equipment

TEMPERATURE: -40ºF to +250ºF (-40ºC to +121ºC).

TUBE: Type C (Nitrile). Black. Oil resistant synthetic rubber.

REINFORCEMENT: Four alternating layers of spiraled, high tensile steel wire.
Six alternating layers of spiraled, high tensile steel wire on -20 and -24 sizes.

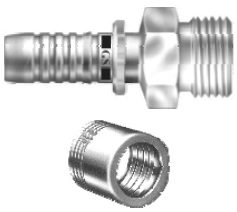
COVER: Two cover types available:
(1) Standard cover – Type A (Neoprene). Black. Oil resistant synthetic rubber. Dual gold stripe layline.
(2) MegaTuff® - a special cover designed to withstand the toughest, most abrasive environments. MegaTuff lasts up to 300 times longer than standard hose during hose-to-hose and hose-to-metal abrasion tests.

MAXIMUM WORKING PRESSURE: 6,000 psi

AVAILABLE SIZES: 3/8" through 1 1/4" I.D.
MegaTuff available 1/2" through 1 1/4"

LENGTHS: Standard Pack - 100 ft. carton in sizes -6 through -16.
Standard Pack - 50 ft. carton in sizes -20 through -24.
Also available in extra-long 200 ft. lengths.

COUPLINGS: GS Stems and Ferrules available in sizes -6 (3/8") through -20 (1 1/4").
No skiving required for GS couplings.



OFFSHORE LAND RIG

EFG5K Spiral Wire Hose

Specification 4651Z, ZL, ZS

Certification/Standards

ABS
DIN – 20023 4SH/4SP
DNV
EN – 856 4SH/4SP
MSHA
SAE – 100R13
USCG
This product can be tested to meet other oil field related certificates/standards.

RECOMMENDED FOR: Extremely high pressure hydraulic applications. EFG5K is designed to meet all requirements of the proposed SAE 100R13 specifications. Meets Flame Resistance Acceptance Designation of "MSHA 2G". Compatible with biodegradable hydraulic fluids such as polyol ester, polyglycol and vegetable oil as well as standard petroleum based fluids.
Applications – B.O.P., Production Equipment

TEMPERATURE: -40ºF to +250ºF (-40ºC to +121ºC).

TUBE: Type C (Nitrile). Black. Oil resistant synthetic rubber.

REINFORCEMENT: Four alternating layers of spiraled, high tensile steel wire on -10, -12 and -16 sizes.
Six alternating layers of spiraled, high tensile steel wire on -20, -24 and -32 sizes.

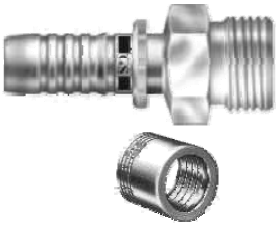
COVER: Two cover types available:
(1) Standard cover – Type A (Neoprene). Black. Oil resistant synthetic rubber. Dual red stripe layline.
(2) MegaTuff® - a special cover designed to withstand the toughest, most abrasive environments. MegaTuff lasts up to 300 times longer than standard hose during hose-to-hose and hose-to-metal abrasion tests.

MAXIMUM WORKING PRESSURE: 5,000 psi

AVAILABLE SIZES: 3/8" through 1 1/4" I.D.
MegaTuff available 3/8" through 1 1/4"

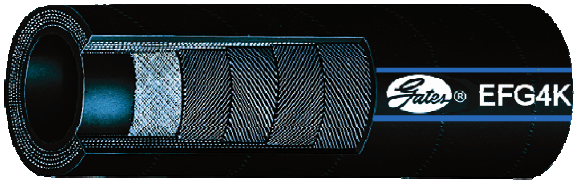
LENGTHS: Standard Pack - 100 ft. carton in sizes -10 through -16.
Standard Pack - 50 ft. carton in sizes -20.
Also available in extra-long 200 ft. lengths.

COUPLINGS: GS Stems and Ferrules available in sizes -6 (3/8") through -20 (1 1/4").
No skiving required for GS couplings.



OFFSHORE LAND RIG

EFG4K Spiral Wire Hose



Specification 4651XF, XT, XL

Certification/Standards

DIN – 20023 4SP
EN – 856 4SP
MSHA
SAE – 100R12
This product can be tested to meet other oil field related certificates/standards.

RECOMMENDED FOR: Very high pressure hydraulic applications. Exceeds all performance requirements for SAE 100R12, EN 856 R12, and EN 856 SP (-16). Compatible with biodegradable hydraulic fluids such as polyol ester, polyglycol and vegetable oil as well as standard petroleum based fluids. Meets Flame Resistance Acceptance Designation "MSHA 2G".

TEMPERATURE: -40ºF to +250ºF (-40ºC to +121ºC).

TUBE: Type C (Nitrile). Black. Oil resistant synthetic rubber.

REINFORCEMENT: Four alternating layers of spiraled, high tensile steel wire.

COVER: Two cover types available:
(1) Standard cover – Type A (Neoprene). Black. Oil resistant synthetic rubber.
(2) MegaTuff® - a special cover designed to withstand the toughest, most abrasive environments. MegaTuff lasts up to 300 times longer than standard hose during hose-to-hose and hose-to-metal abrasion tests.

MAXIMUM WORKING PRESSURE: 4,000 psi

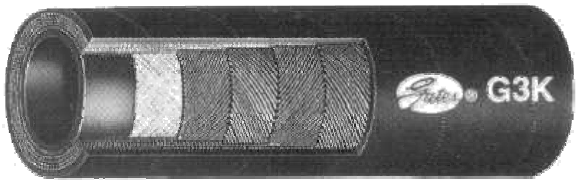
AVAILABLE SIZES: 3/8" through 1 1/4" I.D.
MegaTuff available 3/8" through 1 1/4"

LENGTHS: Standard Pack - 100 ft. carton in sizes -6 through -20.
Also available in extra-long 200 ft. lengths.

COUPLINGS: GS Stems and Ferrules available in sizes -6 (3/8") through -20 (1 1/4").
No skiving required for GS couplings.

OFFSHORE LAND RIG

G3K Spiral Wire Hose



Certification/Standards

ABS
DIN – 20023 4SP
EN 856 4SP
MSHA
SAE – 100R1
This product can be tested to meet other oil field related certificates/standards.

Specification 4651R, RF, RL, RT

RECOMMENDED FOR: Extremely high pressure, high impulse applications. G3K is designed to exceed all performance requirements of SAE 100R11 and SAE 100R12 specifications. Meets Flame Resistance Acceptance Designation "MSHA 2G".
Applications – B.O.P., Heavy Equipment

TEMPERATURE: -40ºF to +250ºF (-40ºC to +121ºC).

TUBE: Type A (Neoprene). Black. Oil resistant synthetic rubber.

REINFORCEMENT: Four alternating layers of spiraled, high tensile steel wire.

COVER: Two cover types available:
(1) Standard cover – Type A (Neoprene). Black. Oil resistant synthetic rubber. Dual white stripe layline.
(2) MegaTuff® - a special cover designed to withstand the toughest, most abrasive environments. MegaTuff lasts up to 300 times longer than standard hose during hose-to-hose and hose-to-metal abrasion tests.

MAXIMUM WORKING PRESSURE: 3,000 psi

AVAILABLE SIZES: 1 1/4" through 2" I.D.
MegaTuff available 1 1/4" through 2" I.D.

LENGTHS: Standard Pack - 50 ft. carton in sizes -20 through -32.
Also available in long 121 ft. to 200 ft. lengths.

COUPLINGS: GS Stems and Ferrules (except -24 (1 1/2") and -32 (2") sizes.
No skiving required for GS couplings.

Permanent PCS Stems and Ferrules available only in sizes -24 (1-1/2") and -32 (2").
No skiving required for PCS couplings.

OFFSHORE LAND RIG

G2 Wire Braid Hose

Specification 4657F

Certification/Standards

DIN – 20022 2SN
DNV
EN – 853 2SN
MSHA
SAE – 100R2 Type AT
USCG
This product can be tested to meet other oil field related certificates/standards.

RECOMMENDED FOR: High pressure hydraulic oil lines. Meets or exceeds the requirements of SAE 100R2AT and performance requirements of DIN20022 2SN. Meets Flame Resistance Acceptance Designation "MSHA 2G".
Applications – Well Servicing Unit, Power Tongs, Reverse Drilling Units, Fishing Tools, Casing Handling Equipment.

TEMPERATURE: -40ºF to +212ºF (-40ºC to +100ºC).

TUBE: Type C (Nitrile). Black. Oil resistant synthetic rubber.

REINFORCEMENT: Two braids of high tensile steel wire.

COVER: Type C_2 (Modified Nitrile). Black. Oil and abrasion resistant thin synthetic rubber.

MAXIMUM WORKING PRESSURE: Varies by size (Reference Gates Hydraulic Hose Catalog #35093).

AVAILABLE SIZES: 3/16" through 2" I.D.

LENGTHS: Available in 50 ft. length or bulk cartons.

COUPLINGS: MegaCrimp® Couplings available for sizes through -20 (1 1/4").
No skiving required for MegaCrimp couplings.

Permanent PC Stems and Ferrules available only in sizes -24 (1-1/2") and -32 (2").
No skiving required for PC couplings.

Field Attachable "Type T" Couplings.
No Skiving required for Field Attachable "Type T" Couplings.

OFFSHORE LAND RIG

M3K Mega3000® Hose

Specification 4657GC, SF

Certification/Standards

ABS
DNV
EN – 856 4SH/4SP
GL
MSHA
SAE – 100R17
USCG
This product can be tested to meet other oil field related certificates/standards.

RECOMMENDED FOR: High pressure hydraulic oil lines. Meets SAE 100R17 requirements. M3K hose has smaller exterior dimensions and significantly tighter bend radius than other SAE 100R1 and 100R2 hose.
Applications – Hydraulic systems requiring tight bending.

TEMPERATURE: -40ºF to +212ºF (-40ºC to +100ºC).

TUBE: Type C (Nitrile). Black. Oil resistant synthetic rubber.

REINFORCEMENT: Braided, high tensile steel wire. Sizes -4, -6 and -8 are one braid; sizes -10, -12 and -16 are two braid.

COVER: Two cover types available:
(1) Standard cover – C_2 (Modified Nitrile). Black. Oil , abrasion and weather resistant synthetic rubber.
(2) MegaTuff® - a special cover designed to withstand the toughest, most abrasive environments. MegaTuff lasts up to 300 times longer than standard hose during hose-to-hose and hose-to-metal abrasion tests.

MAXIMUM WORKING PRESSURE: 3,000 psi

AVAILABLE SIZES: 1/4” through 1” I.D.

LENGTHS: Available in 50 ft. bulk reels.

COUPLINGS: MegaCrimp® Couplings available for all sizes.
No skiving required for MegaCrimp couplings.

OFFSHORE LAND RIG

G1 1-Wire Braid Hose

Specification 4657

Certification/Standards

DIN – 20022 1SN
DNV
EN – 853 1SN
GL
MSHA
SAE – 100R1 Type AT
USCG
This product can be tested to meet other oil field related certificates/standards.

RECOMMENDED FOR: Medium pressure hydraulic lines. Meets or exceeds the requirements of SAE 100R1 Type AT and SAE 100R1 Type S and performance requirements of EN 853 1SN. Meets Flame Resistance Acceptance Designation "MSHA 2G".
Applications – Hydraulic systems requiring tight bending.

TEMPERATURE: -40ºF to +212ºF (-40ºC to +100ºC).

TUBE: Type C (Nitrile). Black. Oil resistant synthetic rubber.

REINFORCEMENT: One braid high tensile steel wire.

COVER: Type C_2 (Modified Nitrile). Black. Oil and abrasion resistant synthetic rubber.

MAXIMUM WORKING PRESSURE: 600 psi (-40) through 3,625 psi (-3).

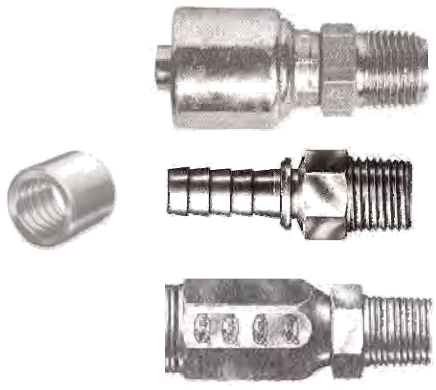
AVAILABLE SIZES: 3/16" through 2" I.D.

LENGTHS: 50 ft. and 100 ft. in a carton or on a reel.

COUPLINGS: MegaCrimp® Couplings available for sizes -4 (1/4") through -20 (1 1/4").
No skiving required for MegaCrimp couplings.

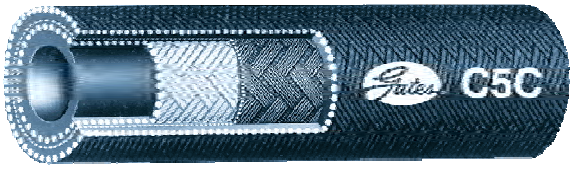
Permanent PC Stems and Ferrules available for sizes -3 (3/16"), -24 (1 1/2") and -32 (2").
No skiving required for PC couplings.

Field Attachable "Type T" Couplings.
No Skiving required for Field Attachable "Type T" Couplings.



OFFSHORE LAND RIG

C5C Textile-Wire-Textile Hose



Specification 3658C

Certification/Standards

DOT – FMVSS 106-74 Type AII
RCCC – RP305(B)
SAE – 100R5
SAE – J1402 Type AII
This product can be tested to meet other oil field related certificates/standards.

RECOMMENDED FOR: Medium pressure hydraulic petroleum based oil lines in impulse applications, lube oil, air and water in applications such as air brakes, power steering (**CAUTION:** Intended for heavy-duty commercial vehicle use only), turbocharger oil supplies, tilt cab cylinders, transmission coolant and filtration lines. Meets or exceeds the requirements of SAE 100R5 for traditional hydraulic applications, DOT FMVSS 106-74 Type AII and SAE J1402 Type AII for air brake applications (-4 to -12). Not recommended for gasoline or diesel fuel.

TEMPERATURE: Under SAE 100R5 (hydraulic) conditions -40ºF to +212ºF (-40ºC to +100ºC).
All-purpose fleet applications (hot lube oil lines) -40ºF to +300ºF (-40ºC to +149ºC).
Air to +160ºF (+71ºC). Avoid continuous use at maximum temperature concurrent with maximum working pressures.

TUBE: Type A (Neoprene). Black. Oil resistant synthetic rubber. For -4 and -5 sizes.
Type C (Nitrile). Black. Oil resistant synthetic rubber. For -6 through -40 sizes.

REINFORCEMENT: One braid of high tensile carbon steel wire over one braid of polyester.

COVER: Black. Oil and mildew resistant polyester braid.

MAXIMUM WORKING PRESSURE: 350 psi (-40) to 3,000 psi (-4).

AVAILABLE SIZES: 3/16” through 2 3/8” I.D.

LENGTHS: 50 ft. and 100 ft. or reel up to 440 ft. (depends on size).

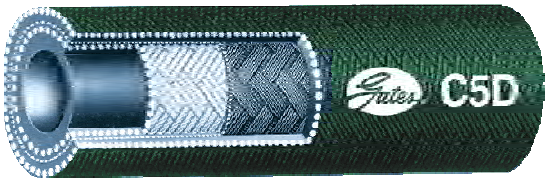
COUPLINGS: C5 Field Attachable Couplings.
No Skiving required for C5 Field Attachable Couplings.

Permanent PC Crimp Couplings.
for sizes through -12 (5/8”).
No skiving required for PC couplings.

NOTE: *Federal law requires registration with the Department of Transportation for anyone producing air brake hose assemblies with swaged or crimped fittings.*

OFFSHORE LAND RIG

C5D High Temp. Multi-Fluid



Specification 3658D

Certification/Standards

DOT – FMVSS 106-74 Type AII
SAE – J1019
SAE – J1402 Type AII
SAE – J30R2
This product can be tested to meet other oil field related certificates/standards.

RECOMMENDED FOR: Petroleum base or phosphate ester fluids; diesel fuels and filtration lines, transmission coolant lines, hot lube oil lines, power steering (**CAUTION:** Intended for heavy-duty commercial vehicle use only), gasoline and turbocharger oil supplies. Tilt cab cylinder and air brakes. C5D (-4 to -12) meets or exceeds DOT FMVSS 106-74 Type AII, SAE J1402 Type AII and SAE J1019 and fuel resistance of SAE J30R2

TEMPERATURE: -40ºF to +300ºF (-40ºC to +149ºC).
Air to +250ºF (+121ºC) only, maximum phosphate esters to +212ºF (+100ºC).

TUBE: Type J (CPE). Black. Oil resistant synthetic rubber.

REINFORCEMENT: One braid of high tensile steel wire over one braid of polyester..

COVER: Green. Oil and mildew resistant, polyester braid impregnated with synthetic rubber.

MAXIMUM WORKING PRESSURE: 400 psi (-16) through 1,500 psi (-4).

AVAILABLE SIZES: 3/16” through 7/8” I.D.

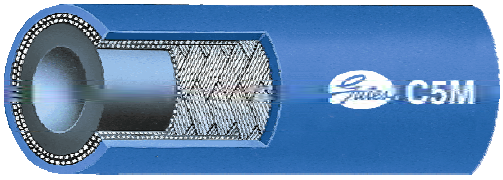
LENGTHS: 50 ft. and bulk reels up to 440 ft.

COUPLINGS: C5 Field Attachable Couplings.
No Skiving required for C5 Field Attachable Couplings.

NOTE: *Federal law requires registration with the Department of Transportation for anyone producing air brake hose assemblies with swaged or crimped fittings.*

OFFSHORE LAND RIG

C5M Marine Fuel Line Hose



Specification 3658F

Certification/Standards

ABS
SAE – J1019
SAE – J1402 Type AII
SAE – J1527 Type A Class I
SAE – J1942
SAE – J30R2
This product can be tested to meet other oil field related certificates/standards.

RECOMMENDED FOR: On-shore/off-shore and marine diesel fuel and gasoline applications, and hot oil lines up to 212ºF. Meets marine fuel line specifications SAE J1527 Type A Class 1 and SAE J1942 requirements. Exceeds performance requirements of SAE J30R2 for non-marine applications.

TEMPERATURE: -4ºF to +212ºF (-20ºC to +100ºC).

TUBE: Type C (Nitrile). Black. Oil and heat resistant synthetic rubber.

REINFORCEMENT: One wire braid.

COVER: Type C_2 (Modified Nitrile). Blue.

MAXIMUM WORKING PRESSURE: 500 psi

AVAILABLE SIZES: 1/4” through 7/8” I.D.

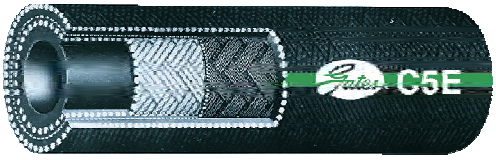
LENGTHS: 50 ft. and reels up to 385 ft.

COUPLINGS: Brass or carbon steel C5 Field Attachable Couplings. No Skiving required for C5 Field Attachable Couplings.

Permanent Power Crimp® PC (Stainless Steel for Marine Applications). No skiving required for PC couplings.

OFFSHORE LAND RIG

C5E High-Temp Flexline Hose



Certification/Standards

DOT – FMVSS 106-74 Type AI
SAE – J1019
SAE – J1402 Type AI (-4 through -12)
This product can be tested to meet other oil field related certificates/standards.

Specification 3658E

RECOMMENDED FOR: Air brake hose, power steering (**CAUTION:** Intended for heavy-duty commercial vehicle use only), fuel filter, engine and transmission coolant lines and hot (+300ºF) lube oil lines.

TEMPERATURE: -40ºF to +300ºF (-40ºC to +149ºC).
Air to +250ºF (+121ºC) maximum only.

TUBE: Type C (Nitrile). Black. Oil resistant synthetic rubber.

REINFORCEMENT: One braid of high tensile steel wire over one braid of polyester.

COVER: Black. Oil and heat resistant, textile braid impregnated with synthetic rubber. Green stripe.

MAXIMUM WORKING PRESSURE: 300 psi through 1,500 psi

AVAILABLE SIZES: 3/16” through 1 1/8” I.D.

LENGTHS: 50 ft. and reels to 440 ft.

COUPLINGS: C5E Field Attachable Couplings. No Skiving required for C5E Field Attachable Couplings.

Permanent Power Crimp® PC Couplings. No skiving required for Permanent PC couplings.

Section 6
Hydraulic Crimpers and Equipment*

* For more details or to order these hoses see Gates Hydraulics, Hose, Couplings, and Equipment Catalog #35093.

OFFSHORE LAND RIG

GC32-XD™ Crimper
Global Crimper

GATES NEW 2” “Xtra Duty” HOSE CRIMPER

The 32 indicates that it crimps through 2” I.D. hoses for the entire Gates Hydraulic product line and the XD stands for Xtra Duty that points out that this can handle every day crimping volume even in a large hose assembly shop. This crimper is equipped with A 5HP 2-stage pump that delivers twice the number of crimps per minute as the OmniCrimp® 21 machine it replaces. This pump, along with the patented CLOVER LEAF crimp design, delivers over 470 tons of crimp force to efficiently handle up to 2” six wire hose and couplings. This design also eliminates any and all finished coupling crimp O.D. taper that is a problem for ordinary crimpers in the market place. The open throat allows for crimping from the front or back of the machine although it is recommended that bent tube couplings are crimped by inserting from the back.

Capability:
Crimps every hose and coupling in the Gates catalog up to 2 1/2” ID

Model Number:
GC32-XD

Product Number:
7480-7001

Part Number:
78828

Motor:
5 HP

Power Source:
208-264 Volts, 45-65 HZ, 1 or 3 Phase and 20 Amps electrical inverter for world-wide use.

Crimper Dimensions:
37” H x 23” W x 19 1/2” D

Stand Dimensions (Adjustable Height):
25 1/2” H x 31 3/4” W x 16 1/2” D

Weight:
660 lbs.

Crimping Force:
470 Tons

OFFSHORE LAND RIG

MobileCrimp® 4-20 Crimper and Pumps

The latest in high tech crimping. Portable (mobile) crimper is light and powerful enough to crimp up to 1-1/4" four spiral hose. Great for jobs in the field (only weighs 57 pounds). Digital accuracy for precise, consistent crimping.

Digital Dial Control - Simple and economical. Just dial in appropriate crimp setting and hold the pump start button until light comes on and buzzer sounds, then release. Ability to lock in setting for multiple assemblies. Light and buzzer operate on two "AAA" batteries. Die sets sold separately.

Positive Stop Control - No settings necessary, color-coded spacer rings control the crimp. Just hold the pump start button until the ram extends to a fixed "stop" for each crimp, then release. Controlled crimp stroke for ease of repeatability. Die sets and spacer rings sold separately.

Hand Pump - No power source needed. Economical, convenient and portable for use anywhere. Make factory-quality assemblies in the field to minimize downtime.
Pressure Rating: 10,000 psi (Weight 25.6 lbs.)

Shop Air Pump - Works off standard shop air (90 psi). Economical, convenient and versatile for use wherever 90 psi compressed air is available.
Pressure Rating: 10,000 psi (Weight 12 lbs.)

1/4 HP 12 Volt DC Pump - Mobile operation, runs on standard 12 volt car/truck battery or a 12 volt portable battery pack. Ideal for tough jobs in the field.
Pressure Rating: 10,000 psi (Weight 20.5 lbs.)

1/4 HP 115 Volt AC Pump - Economical and light weight for portability.
Pressure Rating: 10,000 psi (Weight 20 lbs.)

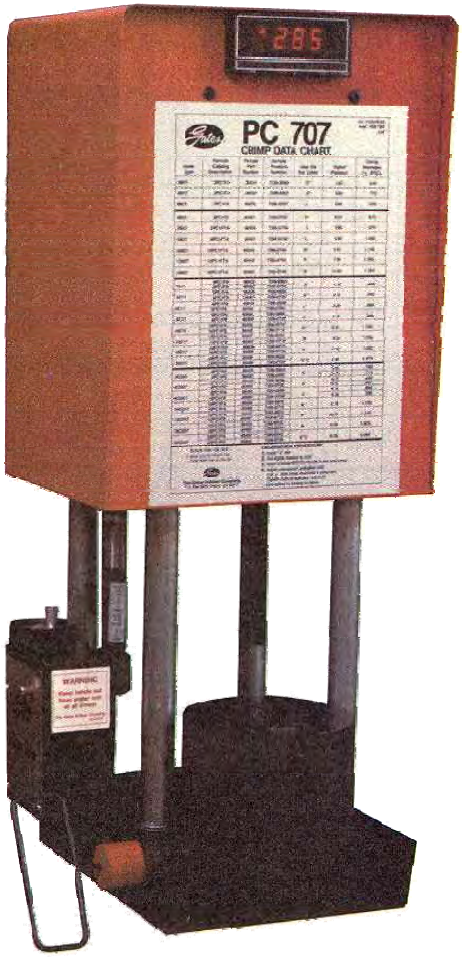
1/2 HP 115 Volt AC Pump - Medium speed. Economical. Recommended for a stationary or mobile application.
Pressure Rating: 10,000 psi (Weight 32 lbs.)

1-1/2 HP 115 Volt AC Pump - High speed. Recommended for stationary applications.
Pressure Rating: 10,000 psi (Weight 108 lbs.)

1/2 HP 230 Volt AC Pump - Medium speed. Economical. Recommended for a stationary or mobile application.
Pressure Rating: 10,000 psi (Weight 32 lbs.)

OFFSHORE LAND RIG

PC707
Crimper and Power Source



The Gates Power Crimp 707 is the most precise, yet simplest crimper made. It was the first crimper with electronic digital readout to indicate gauge setting. The toughest part about using the 707 is pushing a button. It takes just a few seconds to make factory-quality hose assemblies.

Crimps hydraulic hoses from low pressure return lines to extremely high pressure spirals, from 3/16" to 11/4" I.D. Crimps straight and bent tube stems, plus 45º and 90º block types (with notched die cone).

Production Rate: 100 assemblies per hour (using 1/2" I.D. 2-wire straight thread assemblies).

Dimensions: 13" wide by 12" deep by 26 1/2" high.

Weight 188 lbs.

Pump and dies sold separately.

Power Source: The flows of two fixed displacement pumps are combined to delivery a high volume of oil at low pressure for fast transversion.

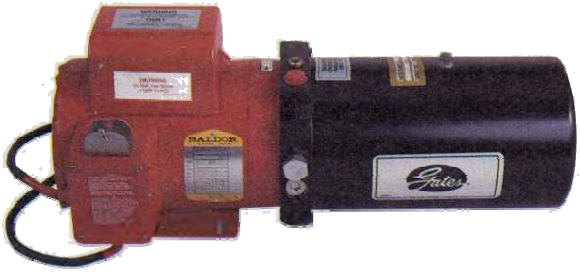
- 115 Volt, 30 Amp, Circuit, 1 HP, 60 Cycles
- 230 Volt, 15 Amp, 1 HP, 60 Cycles

Dimensions: 12" wide by 25" deep by 18" high

Weight: 65 lbs.

Maximum Working Pressure: 4,900 psi

Oil Capacity: 6-Quart (20W), (10W in cold below 40ºF).



OFFSHORE LAND RIG

OmniCrimp® 21

- Horizontal Front-End Feed makes crimping easier and convenient. Large hoses with 90º bent tubes and flanges load without removing the dies.
- Crimping sizes from 3/16" to 2" 6-spiral wire hose with all coupling configurations.
- Unique Speed-Loading Die System is fast and clean. Each die has its own storage cylinder. To load machine, simply slide dies into place.
- Compact and comes with detachable lifting hooks.
- Self-contained … there's no need for plumbing hydraulic lines, air bleeding or special hook-ups. Everything is included within the shroud … even the pump. A vinyl cover is included to protect the machine when not in use. The machine is ready to use… just plug it it.
- Built-in light illuminates crimping cylinder interior…makes setting depth stop simple.
- Over 20 different die sets (purchased separately) are available in their own storage cylinders…9 of which can be stored on the front of the crimper.

Dimensions: 26" wide by 26" deep by 20" high.

Weight: 500 lbs.

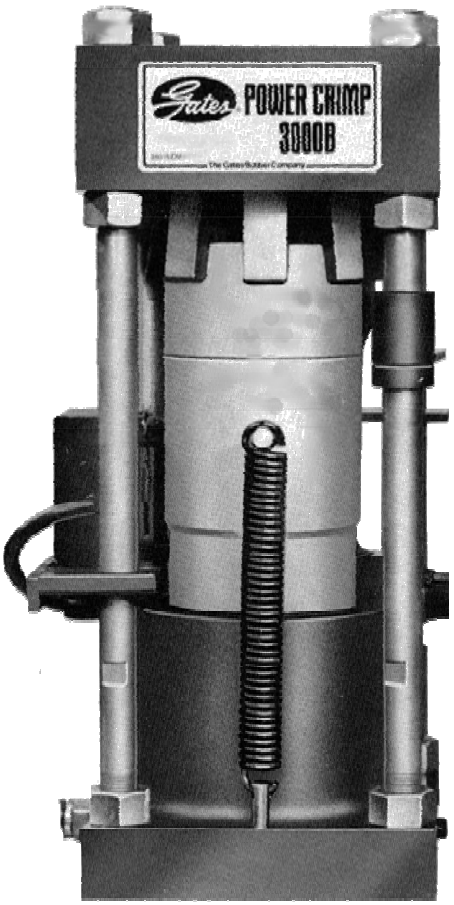
Power Source: 220 Volt, Single Phase, 3 HP, 20 Amp.

Maximum Operating Pressure: 10,000 psi

Stand and foot switch also available.

OFFSHORE LAND RIG

Power Crimp® 3000B
Crimper and Power Source



You can use Power Crimp 3000B to couple permanent hose assemblies in hose sizes from 3/16” through 2” (Including 6 spiral). Power Crimp 3000B is rugged enough to absorb the punishment of continued use. The ram can exert a hydraulic force in excess of 125 tons and can crimp all Gates hydraulic hose types, 3/16” through 2”.

This Gates crimper uses an automatic limit switch to give push-button convenience during the crimping operation - accurately and dependably.

Dimensions: 10” x 10” x 25”

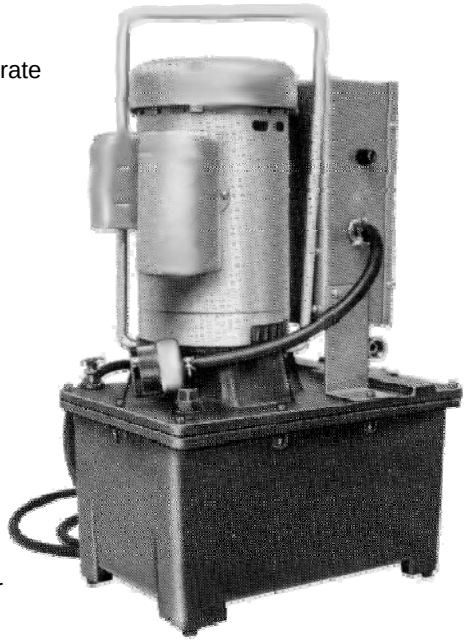
Production Rate: 209 assemblies per hour (using 1/2” ID one wire braid hose and straight stems with return stroke limiting arm). Weight 375 lbs.

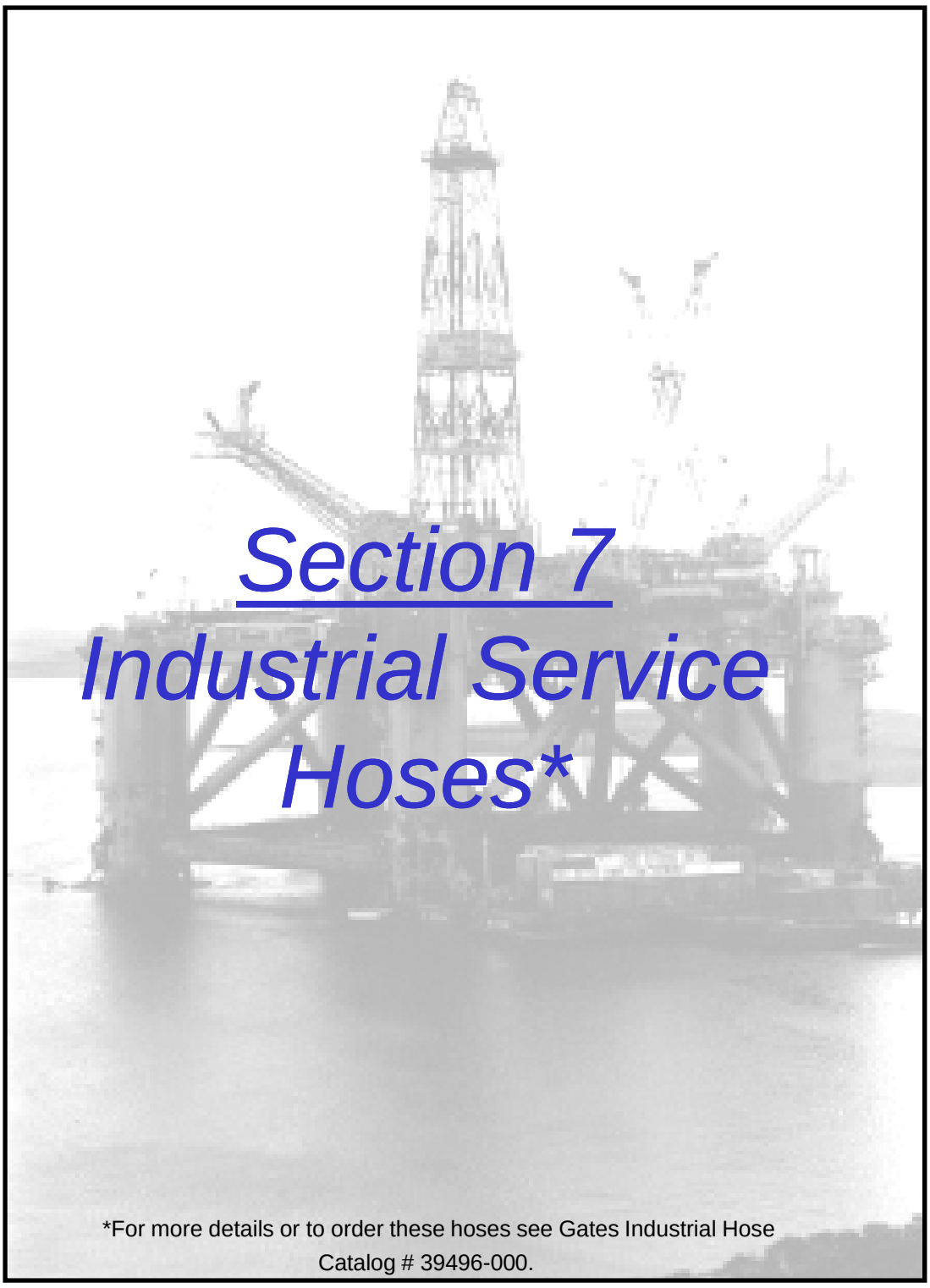
Pump and dies sold separately.

Power Source: An electrical power unit is used to operate this machine.

We offer several different Electro-Hydraulic pumps.

- 440 Volt, 3 HP, 3-Phase, 60 Cycles
  Hydraulic Pressure Rating: 11,000 psi
  12-Quart Oil Capacity (20W)
- 230 Volt, 3 HP, Single Phase, 60 Cycles
  Hydraulic Pressure Rating: 11,000 psi
  12-Quart Oil Capacity (20W)
- 230 Volt, 3 HP, 3-Phase, 60 Cycles
  Hydraulic Pressure Rating: 11,000 psi
  12-Quart Oil Capacity (20W)
- 115 Volt, 2 HP, Single Phase, 60 Cycles
  Hydraulic Pressure Rating: 11,000 psi
  8-Quart Oil Capacity (20W)
- Different voltage pumps are available on special order





Section 7
Industrial Service Hoses*

*For more details or to order these hoses see Gates Industrial Hose Catalog # 39496-000.

OFFSHORE LAND RIG

Premo Flex®
Air & Multi-Purpose Hose

Specification 3205R

Certification/Standards

RMA (Class A) – Tube
RMA (Class B) – Cover

RECOMMENDED FOR: Applications requiring a premium grade spiral hose with excellent flexibility and maximum resistance to air, water, petroleum oils and lubricating oils (to 212°F). Recommended for gasoline, kerosene and fuel oil transfer only (to 120°F). Excellent weather and ozone resistance.

TEMPERATURE: -40ºF to +212ºF (-40ºC to +100ºC).

TUBE: Type C (Nitrile). Black.
Meets RMA (Class A) High oil resistance.

REINFORCEMENT: Synthetic, high tensile textile cord.

COVER: Type C_2 (Modified Nitrile). Red.
Meets RMA (Class B) Medium oil resistance.

MAXIMUM W.P. 250 and 315 psi depending on size. Reference Gates Industrial Hose Catalog #39496-000.

AVAILABLE SIZES: 3/16" through 1 1/2" I.D.

LENGTHS: Standard Pack is reels.

COUPLINGS:

Up through 1/2" only - Standard Air Hose - Machined brass with serrated shank, NPTF threads on hex solid male and on hex solid female and NPSM threads on hex swivel female.

Sources: American Coupling Co. APG Lenz, Inc. National Coupling Co. Anderson Fittings Dixon Valve & Coupling Co. Plews-Schrader

Up through 1" with bands, up through 1/2" with ferrules

Cast Brass Short Shank – Cast brass, serrated shank, hex swivel female with washer, solid male, GHT threads, 3/4 – 11 1/2.

Sources: APG J.C. Gadd Co. Seal-Fast, Inc

Machined Brass Short Shank - Machined brass, serrated shank. Each set has round swivel female and solid male, GHT, washer seal. Octagon nut male and female.

Sources: American Coupling Co. Anderson Fittings APG Campbell Fittings, Inc. Lenz, Inc.

Long Shank - Case brass, serrated shank, set has hex male and hex swivel female coupling with a washer seal. Threads are GHT or NPSM.

Sources: APG Dixon Valve & Coupling Co. Seal-Fast, Inc.

Tri-Lokt - Machined steel insert, male NPT threads only. Held in place with steel yoke and Band-It Jr. clamps. Insert is reusable - can be reinstalled with new yoke and clamps.

Source: Band-It-IDEX, Inc.

Interlocking, Ground Joint - Malleable iron swivel. Inserts and spud may be either steel or malleable iron. All parts are cadmium plated. Male and female threads both NPT with same nominal size as hose ID. Ground joint between spud and female insert. Available with 2 and 4-bolt clamps.

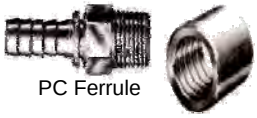
Source: APG Dixon Valve & Coupling Co. P-T Coupling Co. Seal-Fast, Inc.

Interlocking, Washer Joint - Malleable iron swivel. Insert and spud may be either malleable iron or steel. All pats are cadmium plated. Female thread in spud is NPT with same nominal size as hose ID. Washer joint between insert and spud. Available with 2 and 4-bolt clamps.

Source: Campbell Fittings, Inc. Dixon Valve & Coupling Co. P-T Coupling Co.

Gates PowerCrimp® couplings available only in 1 1/2" ID – API or NPT threads on connecting end stem for easy flange attachment. Strong collar to anchor ferrule to stem. Electroplated steel. For hose ID's smaller than 1 1/2" contact Gates Product Application for recommended couplings.

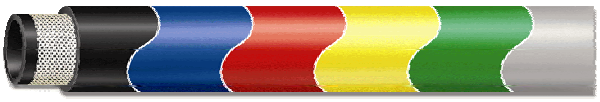
Source: Gates Corporation



PC Ferrule

OFFSHORE LAND RIG

LOL Plus – Lock-On Hose
Air & Multi-Purpose Hose



Specification 3284D, E, G, H, R, Y

Certification/Standards

RMA (Class A) – Tube
RMA (Class B) – Cover

RECOMMENDED FOR:	Petroleum-base hydraulic oils, water, glycol antifreeze solutions, hot lubricating oils, and air. **NOTE: Lock-On hose and couplings are not recommended for pressure surge applications or critical applications, such as permanent piping in residential or commercial buildings. Not recommended for gasoline or diesel fuels.**
TEMPERATURE:	-40ºF to +212ºF (-40ºC to +100ºC) normal service. For air: 160ºF (+ 71ºC) only. For water emulsion, see Gates Hydraulic Hose Catalog #35093.
TUBE:	Type C (Nitrile). Black. Meets RMA (Class A) High oil resistance.
REINFORCEMENT:	Braided, high tensile synthetic textile cord.
COVER:	Type A (Neoprene). Black. Type C_2 (Modified Nitrile). Blue, Red, Yellow, Green or Gray. Meets RMA (Class A) High oil resistance. Flame-resistant.
MAXIMUM WORKING PRESSURE:	300 psi
AVAILABLE SIZES:	1/4” through 3/4” I.D.
LENGTHS:	Standard Pack is reels.
COUPLINGS:	Gates Hydraulic Lock-On Couplings (Reference Gates Hydraulic Hose Catalog #35093) or clamp over beaded nipple.

OFFSHORE LAND RIG

Duro Flex®
Air & Multi-Purpose Hose

Specification 3200R, B

Certification/Standards

RMA (Class B) – Tube

RECOMMENDED FOR: Applications requiring maximum flexibility and good resistance to air, water and heat. For SAE oils intermittent contact only.

TEMPERATURE: -40ºF to +200ºF (-40ºC to +93ºC) continuous service.

TUBE: Type B_1 (Specially compounded elastomer). Black.
Meets RMA (Class B) Medium oil resistance.

REINFORCEMENT: Synthetic, high tensile textile cord.

COVER: Type P (EPDM). Red. All sizes through 1/2“ have perforated cover. (Black cover available on special order).

MAXIMUM WORKING PRESSURE: 250 and 300 psi depending on size. Reference Gates Industrial Hose Catalog #39496-000.

AVAILABLE SIZES: 1/4” through 1 1/2” I.D.

LENGTHS: Standard Pack is reels.

COUPLINGS:

Up through 1/2” only - Standard Air Hose - Machined brass with serrated shank, NPTF threads on hex solid male and on hex solid female and NPSM threads on hex swivel female.

Sources: American Coupling Co. APG Lenz, Inc. National Coupling Co.
Anderson Fittings Dixon Valve & Coupling Co. Plews-Schrader

Up through 1” with bands, up through 1/2” with ferrules

Cast Brass Short Shank – Cast brass, serrated shank, hex swivel female with washer, solid male, GHT threads, 3/4 – 11 1/2.

Sources: APG J.C. Gadd Co. Seal-Fast, Inc

Machined Brass Short Shank - Machined brass, serrated shank. Each set has round swivel female and solid male, GHT, washer seal. Octagon nut male and female.

Sources: American Coupling Co. Anderson Fittings APG Campbell Fittings, Inc. Lenz, Inc.

Long Shank - Case brass, serrated shank, set has hex male and hex swivel female coupling with a washer seal. Threads are GHT or NPSM.

Sources: APG Dixon Valve & Coupling Co. Seal-Fast, Inc.

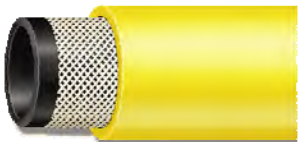
Gates PowerCrimp® couplings available only in 1 1/2” ID – API or NPT threads on connecting end stem for easy flange attachment. Strong collar to anchor ferrule to stem. Electroplated steel. For hose ID’s smaller than 1 1/2” contact Gates Product Application for recommended couplings.

Source: Gates Corporation

PC Ferrule

OFFSHORE LAND RIG

Terminator®
Air & Multi-Purpose Hose



Specification 3202T, TW

Certification/Standards

RMA (Class A) – Tube
RMA (Class A) – Cover
MSHA

RECOMMENDED FOR: Applications requiring a premium-quality, multi-purpose hose with superior abrasion resistance for air, oil and some chemical applications. Excellent durability for extra long life in these applications: mining, air drill, construction, poultry plants and other severe service. Excellent weather and ozone resistance.

TEMPERATURE: -40ºF to +212ºF (-40ºC to +100ºC) continuous service.

TUBE: Type C (Nitrile). Black.
Meets RMA (Class A) High oil resistance.

REINFORCEMENT: Synthetic, high tensile textile cord.

COVER: Type C4 (Carboxylated Nitrile). Yellow.

MAXIMUM WORKING PRESSURE: 501 psi

AVAILABLE SIZES: 1/4" through 2" I.D.

LENGTHS: 1/4" through 1 1/4" I.D. Standard Pack is reels.
1 1/2" and 2" I.D. 100 ft. lengths.

COUPLINGS:

Up through 1/2" only - Standard Air Hose - Machined brass with serrated shank, NPTF threads on hex solid male and on hex solid female and NPSM threads on hex swivel female.

Sources: American Coupling Co. APG Lenz, Inc. National Coupling Co. Anderson Fittings Dixon Valve & Coupling Co. Plews-Schrader

Up through 1" with bands, up through 1/2" with ferrules

Cast Brass Short Shank – Cast brass, serrated shank, hex swivel female with washer, solid male, GHT threads, 3/4 – 11 1/2.

Sources: APG J.C. Gadd Co. Seal-Fast, Inc

Machined Brass Short Shank - Machined brass, serrated shank. Each set has round swivel female and solid male, GHT, washer seal. Octagon nut male and female.

Sources: American Coupling Co. Anderson Fittings APG Campbell Fittings, Inc. Lenz, Inc.

Long Shank - Case brass, serrated shank, set has hex male and hex swivel female coupling with a washer seal. Threads are GHT or NPSM.

Sources: APG Dixon Valve & Coupling Co. Seal-Fast, Inc.

Gates PowerCrimp® couplings available only in 1 1/2" ID – API or NPT threads on connecting end stem for easy flange attachment. Strong collar to anchor ferrule to stem. Electroplated steel. For hose ID's smaller than 1 1/2" contact Gates Product Application for recommended couplings.

Source: Gates Corporation

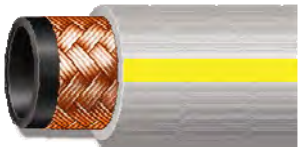
PC Ferrule

Gates MegaCrimp® - NPT threads on connecting end of stem for easy flange attachment. Electroplated steel. The "C" insert assures an even distribution of crimping forces to form a concentric seal.

Source: Gates Corporation

OFFSHORE LAND RIG

18MB – Air Drill (Wire Braid)
Air & Multi-Purpose Hose



Specification 3618, GL

RECOMMENDED FOR: Extra heavy duty, high pressure use on industrial, construction and pneumatic mining applications requiring wire braided hose with an oil resistant tube and abrasion resistant cover.

TEMPERATURE: -30ºF to +212ºF (-34ºC to +100ºC).

TUBE: Type A (Neoprene). Black.

REINFORCEMENT: Braided, high tensile steel wire.

COVER: Type C_2 (Modified Nitrile). Gray with yellow stripe. All sizes are perforated. For 3/4" through 1 1/4" sizes only.
Type D_3 (Natural Rubber). Gray with yellow stripe. All sizes are perforated. For 1 1/2" through 4" sizes only.

MAXIMUM WORKING PRESSURE: 500 psi, 600 psi for 2" only.

AVAILABLE SIZES: 3/4" through 4" I.D.

LENGTHS: 3/4" through 4" I.D. 50 ft. lengths.
1 1/2" I.D. 50 ft. and 60 ft. lengths.

COUPLINGS:

Interlocking, Ground Joint - Malleable iron swivel. Inserts and spud may be either steel or malleable iron. All parts are cadmium plated. Male and female threads both NPT with same nominal size as hose ID. Ground joint between spud and female insert. Available with 2 and 4-bolt clamps.

Source: APG Dixon Valve & Coupling Co. P-T Coupling Co. Seal-Fast, Inc.

Interlocking, Washer Joint - Malleable iron swivel. Insert and spud may be either malleable iron or steel. All parts are cadmium plated. Female thread in spud is NPT with same nominal size as hose ID. Washer joint between insert and spud. Available with 2 and 4-bolt clamps.

Source: Campbell Fittings, Inc. Dixon Valve & Coupling Co. P-T Coupling Co.

Universal Quick Acting – Cast malleable iron with cadmium plate, cast bronze. Washer seal between two quick-acting heads. Several types of heads are available, but all have same-size attaching heads regardless of hose size. Fingers lock together with quarter-turn rotation.

Source: A P G Campbell Fittings, Inc. Dixon Valve & Coupling Co. P-T Coupling Co. Seal-Fast, Inc.

OFFSHORE LAND RIG

609W Dry Cement Delivery Material Handling

Specification 3129F, H, L

RECOMMENDED FOR: Pneumatic transfer of bulk cement and other dry bulk materials.

TEMPERATURE: -40ºF to +150ºF (-40ºC to +66ºC).

TUBE: Type D_3 (Natural Rubber). Black. Static conductive.

REINFORCEMENT: Synthetic, high tensile textile.

COVER: Type D (SBR). Black with gray spiral stripe.

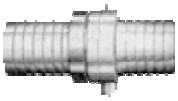
MAXIMUM WORKING PRESSURE: 20 to 60 psi depending on size. Reference Industrial Hose Catalog #39496-000

AVAILABLE SIZES: 3" through 6 5/8" I.D. with 1/8" tube.
4" I.D. with 3/16" or 1/4" tube.

LENGTHS: 100 ft. lengths.

COUPLINGS:

Brass Pin Lug – Cast brass shank and swivel, shank is serrated. NPSM threads in female and male, with washer seal. Sizes under 3" have lugs on female only.



Source: APG Dixon Valve & Coupling Co. P-T Coupling Co.

Combination Nipple – Swaged steel with scored or serrated shank, NPT threads same nominal size as I.D. of hose. Special plastic materials available.

Victaulic Nipple

Source: A P G Band-It-IDEX, Inc. Campbell Fittings, Inc. Dixon Valve & Cplg. Co. Martin Brass Works, Inc. P-T Coupling Co. Seal-Fast, Inc.

Quick-Connecting - The basic parts of this coupling are a bronze female shank coupler and a male adapter, which have a washer seal but no threads. These two parts fit snugly together and are held in place by two dams on the female shank coupler, which rotate against a groove in the male adapter. This allows the coupling to be connected or disconnected very quickly. Adapters and dust caps are available as shown below. Standard materials are bronze or aluminum.

Sources: A P G Dixon Valve Coupling Co. OPW Engineered Systems P-T Coupling Co. Scully Signal Co. Seal-Fast, Inc.

*Part A Adapter | *Part B Coupler | *Part C Shank Coupler | *Part D Coupler | Part E Shank Adapter | Part F Adapter | Dust Cap | Dust Plug | 90º Elbow Coupler with or without Valve

*Part A and part D have female NPT threads. Part B and Part F have male NPT threads. Above threads have same nominal size as hose ID. The above couplers and adapters are used to convert threaded-end couplings to quick connect.

OFFSHORE LAND RIG

Longhorn®
Petroleum Transfer

Specification 4688CC, DC

RECOMMENDED FOR: Transfer of commercial gasolines, diesel oils, fuel oils and other petroleum products. Ideal for oil field service truck use. Compatible with commercially available Bio-Diesel fuels up to B-100 for intermittent use only. Hoses must be drained after use.

TEMPERATURE: -40ºF to + 180ºF (-40ºC to +82ºC). **Warning: Do not convey fuels over 120ºF (+49ºC).**

TUBE: Type C (Nitrile). Black.

REINFORCEMENT: Synthetic, high tensile textile with steel wire helix.

COVER: Type A (Neoprene). Black with red spiral stripe.

MAXIMUM WORKING PRESSURE: 150 psi

AVAILABLE SIZES: 1" through 4" I.D. Smooth Cover.
2" through 6" I.D. Corrugated Cover.

LENGTHS: 1" through 4" I.D. 100 ft. lengths.
6" I.D. 50 ft. lengths.

COUPLINGS:

Combination Nipple - Swaged steel with scored or serrated shank, NPT threads same nominal size as I.D. of hose. Special plastic materials available.

Sources: A P G Band-It-IDEX, Inc. Campbell Fittings, Inc. Dixon Valve & Coupling Co. Martin Brass Works, Inc. P-T Coupling Co. Seal-Fast, Inc.

Victaulic Nipple

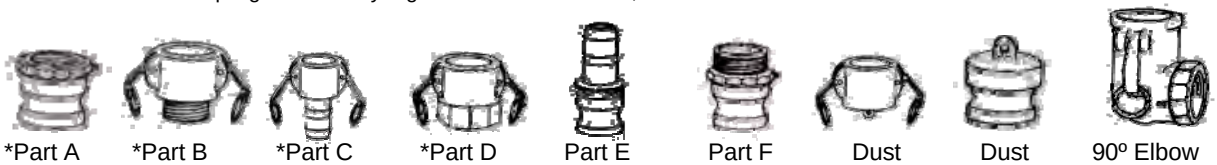
Internal Expansion-Brass - Body is forged brass. Ferrule is cold-drawn copper alloy. Male coupling has NPT threads, female swivel coupling has NPSH threads. All threads same nominal size as hose I.D. except 1 3/8" ID size, which has 1 1/2 – 11 1/2 threads. On 1 1/2" and larger sizes, female has special tightening lugs.

Sources: Dixon Valve & Coupling Co. ProGrip Co. United Metal Industries, Inc.

Ferrule

Quick-Connecting - The basic parts of this coupling are a bronze female shank coupler and a male adapter, which have a washer seal, but no threads. These two parts fit snugly together and are held in place by two dams on the female shank coupler, which rotate against a groove in the male adapter. This allows the coupling to be connected or disconnected very quickly. Adapters and dust caps are available as shown below. Standard materials are bronze or aluminum.

Sources: A P G Dixon Valve Coupling Co. OPW Engineered Systems P-T Coupling Co. Scully Signal Co. Seal-Fast, Inc.



*Part A Adapter | *Part B Coupler | *Part C Shank Coupler | *Part D Coupler | Part E Shank Adapter | Part F Adapter | Dust Cap | Dust Plug | 90º Elbow Coupler with or without Valve

*Part A and part D have female NPT threads. Part B and Part F have male NPT threads. Above threads have same nominal size as hose ID. The above couplers and adapters are used to convert threaded-end couplings to quick connect.

OFFSHORE LAND RIG

Brahma®
Petroleum Transfer

Specification 4688RB

RECOMMENDED FOR: Transfer of commercial gasoline, diesel oils, fuel oils and other petroleum products where external abrasion resistance is critical. Ideal for oil field service truck use. Compatible with commercially available Bio-Diesel fuels up to B-100 for intermittent use only. Hoses must be drained after use.

TEMPERATURE: -40º F to +180ºF (-40ºC to + 82ºC). **Warning: Do not convey fuels over 120ºF (+49ºC).**

TUBE: Type C (Nitrile). Black.

REINFORCEMENT: Synthetic, high tensile textile with steel wire helix.

COVER: Type L (UHMWPE) over a base of Type A (Neoprene). Black corrugated cover with black dots and red spiral stripe.

MAXIMUM WORKING PRESSURE: 150 psi

AVAILABLE SIZES: 2” through 4” I.D.

LENGTHS: 100 ft. lengths.

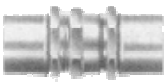
COUPLINGS:

Combination Nipple – Swaged steel with scored or serrated shank, NPT threads same nominal size as I.D. of hose. Special plastic materials available.

Source: A P G Band-It-IDEX, Inc. Campbell Fittings, Inc. Dixon Valve & Cplg. Co. Martin Brass Works, Inc. P-T Coupling Co. Seal-Fast, Inc.

Victaulic Nipple

Internal Expansion-Brass - Body is forged brass. Ferrule is cold-drawn copper alloy. Male coupling has NPT threads, female swivel coupling has NPSH threads. All threads same nominal size as hose I.D. except 1 3/8" I.D. size, which has 1 1/2 - 11 1/2 threads. On 1 1/2" and larger sizes, female has special tightening lugs.



Source: Dixon Valve & Coupling Co. ProGrip Co. United Metal Industries, Inc.

Quick-Connecting - The basic parts of this coupling are a bronze female shank coupler and a male adapter, which have a washer seal but no threads. These two parts fit snugly together and are held in place by two dams on the female shank coupler which rotate against a groove in the male adapter. This allows the coupling to be connected or disconnected very quickly. Adapters and dust caps are available as shown below. Standard materials are bronze or aluminum.

Sources: A P G Dixon Valve Coupling Co. OPW Engineered Systems P-T Coupling Co. Scully Signal Co. Seal-Fast, Inc.

*Part A Adapter

*Part B Coupler

*Part C Shank Coupler

*Part D Coupler

Part E Shank Adapter

Part F Adapter

Dust Cap

Dust Plug

90º Elbow Coupler with or without Valve

*Part A and part D have female NPT threads. Part B and Part F have male NPT threads. Above threads have same nominal size as hose ID. The above couplers and adapters are used to convert threaded-end couplings to quick connect.

OFFSHORE LAND RIG

Steer®
Petroleum Transfer

Specification 4688CN

RECOMMENDED FOR: Transfer of commercial gasolines, diesel oils, fuel oils and other petroleum products for discharge service. Compatible with commercially available Bio-Diesel fuels up to B-100 for intermittent use only. Hoses must be drained after use.

TEMPERATURE: -40º F to +180ºF (-40ºC to + 82ºC). **Warning: Do not convey fuels over 120ºF (+49ºC).**

TUBE: Type C (Nitrile). Black.

REINFORCEMENT: Synthetic, high tensile textile with static conductor.

COVER: Type A (Neoprene). Black with red spiral stripe.

MAXIMUM WORKING PRESSURE: 150 psi

AVAILABLE SIZES: 2" through 4" I.D.

LENGTHS: 100 ft. lengths.

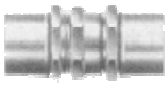
COUPLINGS:

Combination Nipple – Swaged steel with scored or serrated shank, NPT threads same nominal size as I.D. of hose. Special plastic materials available.

Victaulic Nipple

Source: A P G Band-It-IDEX, Inc. Campbell Fittings, Inc. Dixon Valve & Cplg. Co. Martin Brass Works, Inc. P-T Coupling Co. Seal-Fast, Inc.

Internal Expansion-Brass - Body is forged brass. Ferrule is cold-drawn copper alloy. Male coupling has NPT threads, female swivel coupling has NPSH threads. All threads same nominal size as hose I.D. except 1 3/8" I.D. size which has 1 1/2 - 11 1/2 threads. On 1 1/2" and larger sizes, female has special tightening lugs.



Source: Dixon Valve & Coupling Co. ProGrip Co. United Metal Industries, Inc.

Quick-Connecting - The basic parts of this coupling are a bronze female shank coupler and a male adapter, which have a washer seal but no threads. These two parts fit snugly together and are held in place by two dams on the female shank coupler which rotate against a groove in the male adapter. This allows the coupling to be connected or disconnected very quickly. Adapters and dust caps are available as shown below. Standard materials are bronze or aluminum.

Sources: A P G Dixon Valve Coupling Co. OPW Engineered Systems P-T Coupling Co. Scully Signal Co. Seal-Fast, Inc.

*Part A Adapter | *Part B Coupler | *Part C Shank Coupler | *Part D Coupler | Part E Shank Adapter | Part F Adapter | Dust Cap | Dust Plug | 90º Elbow Coupler with or without Valve

*Part A and part D have female NPT threads. Part B and Part F have male NPT threads. Above threads have same nominal size as hose ID. The above couplers and adapters are used to convert threaded-end couplings to quick connect.

OFFSHORE LAND RIG

Super-Vac®
Petroleum Transfer

Specification 4688V

RECOMMENDED FOR: Tank truck service, including oil field vacuum truck, where full suction or rated working pressures are required. Ideal for applications handling crude oil, salt and fresh water, tank bottoms, drilling mud, dilute solutions of hydrochloric acids, diesel fuels and sewage transfer. **NOTE: NOT RECOMMENDED FOR REFINED PETROLEUM PRODUCTS SUCH AS GASOLINE.**

TEMPERATURE: -40º F to +150ºF (-40ºC to + 66ºC). **Warning: Diesel fuel normally conveyed below 120ºF (+49ºC).**

TUBE: Type C (Nitrile). Black.

REINFORCEMENT: Synthetic, high tensile textile with steel wire helix.

COVER: Type D (SBR). Black corrugated with blue spiral stripe.

MAXIMUM WORKING PRESSURE: 60 to 150 psi depending on size. Reference Industrial Hose Catalog #39496-000

AVAILABLE SIZES: 1" through 6" I.D.

LENGTHS: 1" through 4" I.D. 100 ft. lengths.
6" I.D. 20 ft. and 50 ft. lengths.

COUPLINGS:

Combination Nipple – Swaged steel with scored or serrated shank, NPT threads same nominal size as I.D. of hose. Special plastic materials available.

Source: A P G Band-It-IDEX, Inc. Campbell Fittings, Inc. Dixon Valve & Cplg. Co. Martin Brass Works, Inc. P-T Coupling Co. Seal-Fast, Inc.

Victaulic Nipple

Malleable Iron Pin Lug – Malleable iron shank and swivel with serrated shank, cadmium plated. NPSM threads in male and female, washer seal. Pin lugs on female only.

Source: A P G Dixon Valve & Coupling Co. P-T Coupling Co. Seal-Fast, Inc.

OFFSHORE LAND RIG

Sea Horse® Fuel Transfer
Petroleum Transfer

Specification 4110SS

RECOMMENDED FOR: Offshore/onshore transfer applications involving discharge service for diesel oils and other similar petroleum products where an extremely lightweight, flexible hose with a high rated working pressure and a small minimum bend radius is required. Compatible with commercially available Bio-Diesel fuels up to B-100 for intermittent use only. Hoses must be drained after use.

TEMPERATURE: -40º F to +180ºF (-40ºC to + 82ºC) continuous service.

TUBE: Type C (Nitrile). Black.

REINFORCEMENT: Synthetic, high tensile textile with static wire.

COVER: Type A (Neoprene). Black with red spiral stripe.

MAXIMUM WORKING PRESSURE: 300 psi

AVAILABLE SIZES: 2" through 5" I.D.

LENGTHS: 200 ft. lengths.

COUPLINGS:

Interlocking, Ground Joint - Malleable iron swivel. Inserts and spud may be either steel or malleable iron. All parts are cadmium plated. Male and female threads both NPT with same nominal size as hose ID. Ground joint between spud and female insert. Available with 2 and 4-bolt clamps.

Source: A P G Dixon Valve & Coupling Co. Seal-Fast, Inc. P-T Coupling Co.

Interlocking, Washer Joint - Malleable iron swivel. Insert and spud may be either malleable iron or steel. All parts are cadmium plated. Female thread in spud is NPT with same nominal size as hose ID. Washer joint between insert and spud. Available with 2 and 4-bolt clamps.

Source: Dixon Valve & Coupling Co. Campbell Fittings, Inc. P-T Coupling Co.

Permanent Swaged or Crimped - NPT threads on connecting end of stem for easy flange attachment. Strong collar to anchor ferrule to stem. Electroplated steel. Also available in stainless steel, brass and other special metals.

Sources: Campbell Fittings, Inc. Dixon Valve & Coupling Co. Gates Corporation George Myer Co., Inc.

Solid Male

Ferrule

Internal Expansion-Brass - **For 2" & 2 1/2" ID Only** - Body is forged brass. Ferrule is cold alloy. Male coupling has NPT threads, female swivel coupling has NPSH threads. All threads same nominal size as hose I.D. On 1 1/2" and larger sizes, female has special tightening lugs.

Sources: Dixon Valve & Coupling Co. ProGrip Co. United Metal Industries, Inc.

Ferrule

OFFSHORE LAND RIG

Sea Horse® Hard Wall Fuel Suction/Discharge Petroleum Transfer

Specification 4688SS

RECOMMENDED FOR: Offshore/onshore or dockside applications handling gasoline, oils and other petroleum products in loading and unloading tankers and barges where a lightweight, hardwall, flexible hose in long continuous lengths is desired. Compatible with commercially available Bio-Diesel fuels up to B-100 for intermittent use only. Hoses must be drained after use.

TEMPERATURE: -40º F to +180ºF (-40ºC to + 82ºC) continuous service.

TUBE: Type C (Nitrile). Black.

REINFORCEMENT: Synthetic, high tensile textile with steel wire helix.

COVER: Type A (Neoprene). Black with red spiral stripe.

MAXIMUM WORKING PRESSURE: 200 to 300 psi depending on size. Reference Industrial Hose Catalog #39496-000

AVAILABLE SIZES: 2” through 6” I.D.

LENGTHS: 2” through 4” I.D. 200 ft. lengths.
6” I.D. 100 ft. lengths.

COUPLINGS:

Interlocking, Ground Joint - Malleable iron swivel. Inserts and spud may be either steel or malleable iron. All parts are cadmium plated. Male and female threads both NPT with same nominal size as hose ID. Ground joint between spud and female insert. Available with 2 and 4-bolt clamps.

Source: A P G Dixon Valve & Coupling Co. Seal-Fast, Inc. P-T Coupling Co.

Interlocking, Washer Joint - Malleable iron swivel. Insert and spud may be either malleable iron or steel. All parts are cadmium plated. Female thread in spud is NPT with same nominal size as hose ID. Washer joint between insert and spud. Available with 2 and 4-bolt clamps.

Source: Dixon Valve & Coupling Co. Campbell Fittings, Inc. P-T Coupling Co.

Solid Male

Ferrule

Permanent Swaged or Crimped - NPT threads on connecting end of stem for easy flange attachment. Strong collar to anchor ferrule to stem. Electroplated steel. Also available in stainless steel, brass and other special metals.

Sources: Campbell Fittings, Inc. Dixon Valve & Coupling Co. Gates Corporation
George Myer Co., Inc.

OFFSHORE LAND RIG

Trident® 400 Petroleum Transfer

Specification 3150B

RECOMMENDED FOR: Water, air and petroleum product transfer applications where a lightweight, flexible hose in long lengths is required. **Note: For fuels, use a petroleum transfer hose with a Type C (Nitrile) tube.**

TEMPERATURE: -30º F to +158ºF (-34ºC to + 70ºC) continuous service.

TUBE: Type A (Neoprene). Black.

REINFORCEMENT: Synthetic, high tensile textile.

COVER: Type A (Neoprene). Black with blue spiral stripe for high visibility.

MAXIMUM WORKING PRESSURE: 400 psi

AVAILABLE SIZES: 2" through 4" I.D.

LENGTHS: 200 ft. lengths.

COUPLINGS:

Interlocking, Ground Joint - Malleable iron swivel. Inserts and spud may be either steel or malleable iron. All parts are cadmium plated. Male and female threads both NPT with same nominal size as hose ID. Ground joint between spud and female insert. Available with 2 and 4-bolt clamps.

Source: A P G Dixon Valve & Coupling Co. Seal-Fast, Inc. P-T Coupling Co.

Interlocking, Washer Joint - Malleable iron swivel. Insert and spud may be either malleable iron or steel. All parts are cadmium plated. Female thread in spud is NPT with same nominal size as hose ID. Washer joint between insert and spud. Available with 2 and 4-bolt clamps.

Source: Dixon Valve & Coupling Co. Campbell Fittings, Inc. P-T Coupling Co.

Permanent Swaged or Crimped - NPT threads on connecting end of stem for easy flange attachment. Strong collar to anchor ferrule to stem. Electroplated steel. Also available in stainless steel, brass and other special metals. All sizes.

Sources: Campbell Fittings, Inc. Dixon Valve & Coupling Co. Gates Corporation George Myer Co., Inc.

Solid Male

Ferrule

Tri-Lokt - Machined steel insert, male NPT threads only. Held in place with steel yoke and Band-It Jr. clamps. Insert is reusable - can be reinstalled with new yoke and clamps.

Source: Band-It-IDEX, Inc.

OFFSHORE LAND RIG

LP350 Butane-Propane Petroleum Transfer

Specification 3220LP, 3320

Certification/Standards

UL Standard No. 21, Type 1
(Applies to all sizes)
CAN/CGA-8.1-M86
(Applies to 1/4" through 1")
NFPA 58, Section 2-4.6

RECOMMENDED FOR: Liquid or gaseous propane, butane or any combination of these two mixtures. Can be used for natural gas (not to exceed 50 psi) under certain conditions such as: open/outside areas and well ventilated factory buildings (if local building codes permit). **Not recommended for residential, office buildings or as fuel line hose on compressed natural gas vehicles**. Contact Denver Product Application (303) 744-5070 for inspection and assembly testing information.

TEMPERATURE: -40º F to +180ºF (-40ºC to + 82ºC) continuous service.
Warning: Do not convey LP Gas over 140ºF (60ºC).

TUBE: Type C (Nitrile) up to 1 1/4". Black.
Type A (Neoprene) 1 1/2", 2" and 3". Black.

REINFORCEMENT: Braided, high tensile synthetic textile cord.

COVER: Type A (Neoprene). Black. All sizes are perforated.

MAXIMUM WORKING PRESSURE: 350 psi

AVAILABLE SIZES: 1/4" through 3" I.D.

LENGTHS: 1/4" through 1 1/4" I.D reels.
3/4" I.D. through 1" I.D. 100 ft., 125 ft., 150 ft. lengths.
1 1/2" I.D. through 3" I.D. 60 ft. lengths.

COUPLINGS:

Gates Power Crimp® couplings only for 1-1/2 and 2" I.D. Do not use male swivel, reusable or o-ring type couplings.
API or NPT threads on connecting end of stem for easy flange attachment. Strong collar to anchor ferrule to stem. Electroplated steel.
Source: Gates Corporation

For 3" ID - Dixon LP Boss only.

OFFSHORE LAND RIG

205MB Steam King®
Steam Hose

Specification 3605

RECOMMENDED FOR: All types of steam — saturated and superheated — up to 250 PSI and +450ºF (+232ºC).
NOTE: DO NOT ALTERNATE USE BETWEEN STEAM AND WATER.

TEMPERATURE: -40º F to +450ºF (-40ºC to + 232ºC) continuous service.

TUBE: Type P_2 (EPDM). Black.

REINFORCEMENT: Braided, high tensile steel wire.

COVER: Type P_2 (EPDM). Black. All sizes are perforated.

MAXIMUM WORKING PRESSURE: 250 psi

AVAILABLE SIZES: 3/8" through 2" I.D.

LENGTHS: 3/8" I.D. through 1" I.D. reels.
3/8" I.D. through 2" I.D. 50 ft. lengths.

COUPLINGS:

Interlocking, Ground Joint - Malleable iron swivel. Inserts and spud may be either steel or malleable iron. All parts are cadmium plated. Male and female threads both NPT with same nominal size as hose ID. Ground joint between spud and female insert. Available with 2 and 4-bolt clamps.

Source: A P G Dixon Valve & Coupling Co. Seal-Fast, Inc. P-T Coupling Co.

Interlocking, Washer Joint - Malleable iron swivel. Insert and spud may be either malleable iron or steel. All parts are cadmium plated. Female thread in spud is NPT with same nominal size as hose ID. Washer joint between insert and spud. Available with 2 and 4-bolt clamps.

Source: Dixon Valve & Coupling Co. Campbell Fittings, Inc. P-T Coupling Co.


OFFSHORE


LAND RIG

Coupling Sources

American Couplings Company
A Dixon Company
Westmont, IL 60559
(800) 323-4440

Anderson Fittings
Oak Forrest, IL 60452
(800) 323-5284

A P G
Houston, TX 77020
(800) 888-5223

Band-IT-IDEX, Inc.
Denver, CO 80216
(303) 320-4555

Campbell Fittings, Inc.
Boyertown, PA 19512
(800) 367-3678

Dixon Valve & CouplIng Co.
Chestertown, MD 21620
(800) 355-1991

Gadd, J.C., Company
Denver, CO 80227
(720) 849-4392

George Myer Company, Inc.
Houston, TX 77023
(800) 600-3074

Lenz, Inc.
Dayton, OH 45401
(937) 277-9364

Martin Brass Works, Inc.
Jamaica, NY 11433
(718) 523-3146

National Coupling Co.
Stafford, TX 77477
(281)499-2583

OPW Engineered Systems
Lebanon, OH 45036
(800) 547-9393

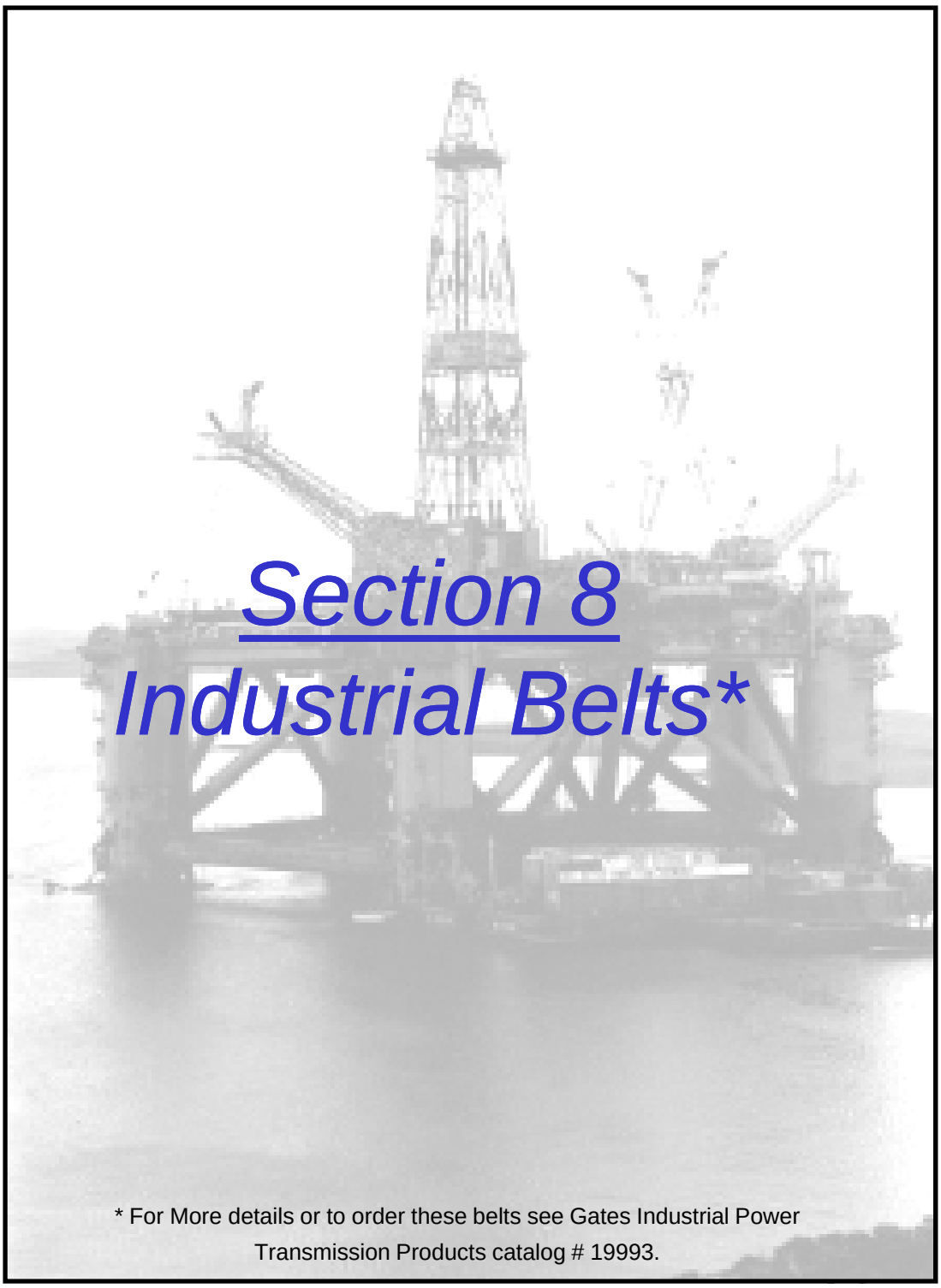
P-T Coupling Co.
ProGrip Co.
Enid, OK 73701
(800) 654-0320

Plews-Schrader
Division of Tomkins Ind. & Auto
Dixon, IL 61021
(800) 545-1689

Scully Signal Co.
Wilmington, MA 01887
(617) 692-8600

Seal-Fast, Inc.
Houston, TX 77220
(800) 681-1515

United Metal Industries, Inc.
New Hyde Park, NY 11040
(800) 359-6801



Section 8
Industrial Belts*

* For More details or to order these belts see Gates Industrial Power Transmission Products catalog # 19993.

OFFSHORE LAND RIG

Short Cut Ways to Figure Pump Drives

* **D**	=	Diameter of Pump Sheave
*** d**	=	Diameter of Engine Sheave
SPM	=	Strokes per Minute
RPM	=	Engine speed in Revolutions Per Minute
R	=	Gear Box Ratio
*** C**	=	Shaft Center Distance

$$\mathbf{D} = \frac{\text{RPM x d}}{\text{SPM x R}}$$

$$\mathbf{d} = \frac{\text{SPM x R x D}}{\text{RPM}}$$

$$\mathbf{SPM} = \frac{\text{RPM x d}}{\text{R x D}}$$

$$\mathbf{RPM} = \frac{\text{SPM x R x D}}{\text{d}}$$

$$\mathbf{R} = \frac{\text{RPM x d}}{\text{SPM x D}}$$

$$\textbf{Belt Length} = 2C + 1.57\,(D + d) + \frac{(D - d)^2}{4C}$$

* Required values to determine belt length.

NOTE: When the end user provides the SPM and gear box ratio data use the following formula:

DN RPM = SPM x R

OFFSHORE LAND RIG

Predator® V-Belt

PREDATOR

Recommended For: Gates Predator® belts outperform the competition on heavily shock loaded drives. Predator belts are used on oilfield drives where belt whip and turnover are problems and machinery with pulsating, shock or stalling loads, such as piston pumps, gas compressors and pumping units driven by internal combustion engines. This belt is so durable, its only limitation is the equipment it's used on. Other applications include mud pump drives, generators, heavy duty compressors, shale shaker screens and injection pumps.

Reinforcement: Aramid tensile cords combine virtually zero stretch with extraordinary strength and durability that is pound-for-pound stronger than steel.

Cover: Bareback cover resists debris and allows the belt to slip under extreme shock load conditions, reducing heat build-up and prolonging belt life.

Additional Exclusive Construction Features:

- **Concave Sidewalls** provide a better fit in the sheave for uniform loading and maximum life.
- **Multiple Layer Tie-Band** provides lateral rigidity so that the individual strands perform as one.
- **Strands are Precision Matched** to maximize power absorption and belt life, especially on longer belts.
- **Oil and Heat Resistance** is provided by high quality chloroprene rubber compounds.
- **Resistant** to the effects of harsh environments.

Available Cross Sections: CP, 8VP (available up to 12 strands)
3VP (available up to 10 strands)
5VP (available up to 16 strands)

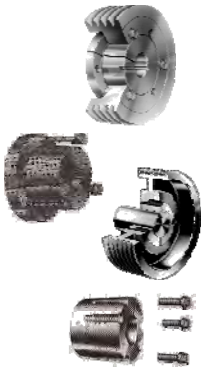
Recommended Metal:

QD® Sheaves - Full split bushing allows easy installation and removal. Precise sheave design produces positive, press fit to shaft and no sheave wobble. Narrower sheave design is precision manufactured, static balanced and transmits higher horsepower.

QD Bushings - Made to precise tolerances. Popular bore sizes available in both English and metric sizes.

Taper-Lock® Sheaves - Split tapered bushings that allow quick, easy installation and removal. Sheave hub is flush with the bushing. Narrower sheave design is precision manufactured, static balanced and transmits higher horsepower.

Taper-Lock Bushings - Made to precise tolerances. Popular bore sizes are available in both English and Metric sizes.



Predator® belts do not meet RMA requirements for belt static conductivity

Taper-Lock® is a registered trademark of Reliance Electric.
QD® is a registered trademark of Emerson Electric.

OFFSHORE LAND RIG

Gates Super HC® V-Belts

Super HC V-Belt

Super HC Molded Notch V-Belt

Gates Super HC® and Super HC® Molded Notch PowerBand® Belt

Recommended For: Gates Super HC® and Super HC Molded Notch belts can transmit up to 3 times the horsepower of a conventional V-Belt in the same amount of space – or the same horsepower in 1/2 to 2/3 the space. The molded notched belt is designated by an "x" in the specification charts. Super HC belts can be used for pumping units, injection pumps, compressors and other oilfield equipment. Applications: Shaker screens, generator drives, air compressors, general purpose pumps (air, water, gas), machine shop equipment (saws, drills, sanders), accumulator units, degasser, desilter and compressors.

Reinforcement: Flex-Bonded Tensile Member protects the Super HC V-belt from failure due to cord separation.

Cover: Flex-Weave® Cover provides protection for the core of the belt . Excellent flexibility permits the belt to bend more easily over even the smallest sheaves with far less strain on the fabric. This results in extra long wear ability and extends the belt's life.

Additional Exclusive Construction Features:

- **Precisely Engineered Arched Top** prevents distortion of tensile section. Proper alignment of section means uniform load distribution on cords.
- **Concave Sidewalls** fill out and become straight when belt is bent around a sheave. This assures full contact with the sides of the sheave, distributing the wear evenly and resulting in extra belt life.
- **Radius Relief** on bottom corners combines with the Concave Sides to assure even distribution of wear and proper support in the sheave groove. The radius prevents the belt from "bottoming" at the lower corners, thus minimizing corner wear.
- **Oil and Heat Resistance**
- **Static Conductive**
- **Vextra™ Construction** provides 33% longer life construction (available on 3VX and 5VX cross sections).

Any V-80 belt will match and perform with any other V-80 belt of the same size and type.

Available Cross Sections: 3V, 5V, 8V; 3VX, 5VX (molded notch; Vextra®)

Available Number of Strands on Powerband Belts: 3V300 thru 3V750 – up to 22 strands and 3V800 thru 3V1400 – up to 30 strands
5V - up to 18 strands and 5VX up to 13 strands
8V1000 thru 8V1400 - up to 11 strands and 8V1500 thru 8V6000 up to 12 strands

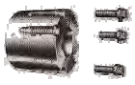
Recommended Metal:

QD® Sheaves - Full split bushing allows easy installation and removal. Precise sheave design produces positive, press fit to shaft and no sheave wobble. Narrower sheave design is precision manufactured, static balanced ant transmits higher horsepower.

QD Bushing - Made to precise tolerances. Popular bore sizes are available in both English and metric sizes.

Taper-Lock® Sheaves - Split tapered bushings that allow quick, easy installation and removal. Sheave hub is flush with the bushing. Narrower sheave design is precision manufactured, static balanced and transmits higher horsepower.

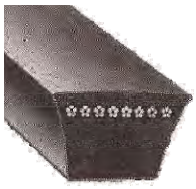
Taper-Lock Bushing- Made to precise tolerances. Popular bore sizes are available in both English and Metric sizes.



Taper-Lock® is a registered trademark of Reliance Electric.
QD® is a registered trademark of Emerson Electric.

OFFSHORE LAND RIG

Gates Hi-Power® II V-Belt



Gates Hi-Power® II PowerBand® Belt

Recommended For: Conventional HI-Power® II V-Belts are designed to replace worn belts on all kinds of oilfield drives and are the industry's No. 1 choice for replacement purposes. Applications: Shale shaker screens, generator drives, air compressors, general purpose pumps (air, water, gas), accumulator unit, degasser, machine shop equipment (sanders, drills and saws), desilter and compressors.

Reinforcement: Flex-Bonded Tensile Member protects this V-belt from failure due to cord separation. The tensile member is saturated with a material that bonds equally well with both the cords and rubber. When vulcanized, both are joined in a solid chemical bond.

Cover: Flex-Weave® Cover protects the core of the belt from oil, grease, etc. The unique construction helps give the belt added flexibility and contributes to extra belt life.

Additional Exclusive Construction Features:

- **Balanced Construction** gives improved service on conventional cross-section drives.
- **Oil and Heat Resistance**
- **Static Conductive**
- **Radius Relief** on bottom corners combines with the concave sides to assure even distribution of wear and proper support in the sheave groove. The radius prevents the belt from "bottoming" at the lower corners, thus minimizing corner wear.
- **Arched Top** provides superior strength to prevent distortion of the tensile cord section. Thus, the load is evenly distributed with each cord carrying its proper share.
- V80 Any V-80 belt will match and perform with any other V-80 belt of the same size and type.

Available Cross Sections: A, B, C, D and E

Available Number of Strands

on Powerband Belts: A Section Powerbands - up to 20 strands

B Section Powerbands - up to 16 strands

C Section Powerbands - up to 12 strands

D Section Powerbands - up to 7 strands in sizes up to 180"

- up to 8 strands on longer lengths

Recommended Metal:

QD® Sheaves - Full split in bushing allows easy installation and removal. Precise sheave design produces positive, press fit to shaft and no sheave wobble. Sheave design is precision manufactured and static balanced.

QD Bushing - Made to precise tolerances. Popular bore sizes available in both English and metric sizes.

Taper-Lock® Sheaves - Split tapered bushings allow quick, easy installation and removal. Sheave hub is flush with the bushing. Sheave design is precision manufactured and static balanced.

Taper-Lock Bushing- Made to precise tolerances. Popular bore sizes are available in both English and Metric sizes.

Taper-Lock® is a registered trademark of Reliance Electric.
QD® is a registered trademark of Emerson Electric.

Section 9
Certifications and Standards

OFFSHORE LAND RIG

Certifications/Standards Available on Gates Products

DNV - Det Norske Veritas (Norway)

DNV works as a certifying authority, inspection authority, quality assurance contractor to licensees, etc. The basis for certification is national regulations, recognized and accepted codes and standards, technical notes, etc. as applicable to offshore installations. DNV does not have a type approval program for high pressure Rotary/ Vibrator or Choke and Kill hoses. Such hoses may be certified on a case-by-case basis if customer and/or rig destination warrants. Gates complies and will meet DNV standards if required (additional cost).

Veritasveien 1,
1322 Hovik, Norway
Phone: (47) 67 57 99 00

or

DNV - North America
16340 Park Ten Place, Suite 100
Houston, TX 77084
Phone: (281) 721-6600

ISO - International Organization for Standardization (International)

ISO specifies requirements for textile and steel-reinforced rubber hoses and hose assemblies for use with water and/or oil based muds at high pressure in rotary drilling service. Gates hoses are manufactured in accordance with ISO-6807-1984 (E) specification - rubber hoses and hose assemblies for rotary drilling and vibration applications.

1, rue de Varembé
Case postale 56
Ch-1211 Geneva 20, Switzerland
Phone: 4122 749 01 11

or

American Nat'l Standards Institute
1819 L Street NW Suite 600
Washington, D.C. 20036
Phone: (202) 293-8020

NACE - National Association of Corrosion Engineers (United States)

NACE establishes and maintains standards for material requirements relating to the prevention of sulfide stress cracking (SSC) of metals in the oil and gas production industry. Depending on customer and/or rig destination, Gates high pressure coupling and nipple assemblies are prepared in accordance with NACE Std. MR-01-75 (Current Rev) material requirements -- sulfide stress cracking resistant metallic material for oil field equipment (additional cost).

1440 S Creek Drive
Houston, TX 77084-4906
Phone: (281) 228-6280

OFFSHORE LAND RIG

Certifications/Standards Available on Gates Products

HSE - Health & Safety Executive

HSE requires a review and acceptance of equipment for the purpose of issuing or maintaining a certificate of fitness by working with a certifying authority. The basis for certification will be accepted codes, standards, and specifications frequently specified for drilling and well completion equipment for offshore installations (additional cost).

Offshore Safety Division
Lord Cullen House
Fraser Place
Aberdeen AB25 3UB Scotland
Phone: 01224 25 2500

U.S. Coast Guard (United States)

U.S. Coast Guard regulates the inspection and certification, design and equipment, and operation of mobile offshore drilling units. Gates Industrial service hoses have passed and are certified by U.S. Coast Guard per CFR 46, 56.60-25© . Gates service hoses are manufactured in accordance with these regulations.

Department of Transportation
United States Coast Guard
2100 2nd St. SW
Washington, D.C. 20593
Phone: (202) 267-2397

SAE - Society of Automotive Engineers (United States)

Representatives of various manufacturers establish minimum industry standards. Though automotive oriented, many products are used in other industries. SAE merely recommends and has no “policy powers”. Gates manufactures hydraulic hoses and fittings that meet SAE standards.

400 Commonwealth Drive
Warrendale, PA 15096
Phone: (724) 772-8510

API - American Petroleum Institute

Gates manufacturers rotary drilling hose to API Spec. 7K standards. Gates is licensed to use the API monogram.

1220 L Street NW 9th Floor
Washington, D.C. 20005
Phone: (202) 682-8000 or (202) 962-4791

OFFSHORE LAND RIG

Certifications/Standards Available on Gates Products

MSHA - Mine Safety Health Administration (United States)

This governing body works primarily with mining in the United States, producing specifications and approvals for various products used in mines. Gates hydraulic hoses meet these MSHA guidelines in many applications. It has been found that numerous oil rigs have been specifying MSHA products due to their stringent standards.

Approval & Certification Center
RR1, Box 251
Industrial Park Road
Triadelphia, WV 26059
Phone: (304) 547-0400

The following are some major third party authorities set up to witness testing of hoses and to certify acceptance.

ABS - American Bureau of Shipping (United States)

ABS sends surveyors to manufacturing facilities and associated quality procedures to certify that the facility and procedures are acceptable and the facility is capable of producing a uniform, quality product. Gates hose manufacturing facility has been surveyed by ABS and certified (additional cost).

ABS Americas
ABS Plaza, 16855 Northchase Drive
Houston, TX 77060
Phone: (713) 873-0700

Lloyd's Register of Shipping (England)

Lloyd's Register of Shipping is a certifying authority set up to witness and certify fire test OSG/1000/499 on high pressure flexible hoses. Such hoses are required to pass the fire test for offshore installations for operation within the sectors of the North Sea, I.e., Gates Black Gold Choke and Kill hoses have passed this requirement (additional cost).

Lloyd's Register of Quality Assurance, Inc.
1401 Enclave Pkwy Suite 200
Houston, TX 77077
Phone: (281) 398-7370

OFFSHORE LAND RIG

Certifications/Standards Available on Gates Products

The following are Test Agencies

SwRI - Southwest Research Institute

SwRI is an independent testing and engineering facility. The Gates Corporation requested that SwRI conduct fire test OSG/1000/499 on high pressure flexible hoses. Such hoses are required to pass the fire test for offshore installations for operations within the sector of the North Sea. Gates Choke and Kill hoses, for example, are certified by Lloyd's Register of Shipping (SAS/F010022 or current certificate). Gates high pressure oilfield hoses are manufactured to company with this agreement.

6220 Culebra Road
San Antonio, TX 78284
Phone: (210) 684-5111

Otis - Otis Engineering Corporation

Otis Engineering, a Halliburton Company, is an independent testing and engineering facility. The Gates Corporation requested that Otis Engineering conduct the 20% H2S test requirement per API standard for "Flexible Choke and Kill Hose Lines". Gates Black Gold Choke and Kill and Super Choke and Kill hoses have passed and are manufactured to comply with this test.

2601 E Belt Line Road
Carrollton, TX 75006
Phone: (972) 418-3000

or

P.O. Box 819052
Dallas, TX 74381-9052

OFFSHORE LAND RIG

Certification for a Trusted Provider

PETROLEOS MEXICANOS

GRUPO TECNICO DE EVALUACION DE PROVEEDORES E INSPECCION DE BIENES

N° REPORTE: GTE-SC-003/2005
NORMAS NMX-CC-9001: 2000
ISO – 9001: 2000

CERTIFICADO DE PROVEEDOR CONFIABLE

N° 0462/2005

GATES DE MEXICO, S.A. DE C.V. (0002262) PTA. ATLACOMULCO
CALLE 6 S/N
PARQUE INDUSTRIAL ATLACOMULCO
ATLACOMULCO, EDO. DE MEX.

DE ACUERDO CON LA AUDITORIA A SU SISTEMA DE GESTION DE LA CALIDAD EFECTUADA POR PETROLEOS MEXICANOS Y ORGANISMOS SUBSIDIARIOS, CONFORME AL PROCEDIMIENTO **GTEPIB-007/99**, SE OTORGA EL PRESENTE CERTIFICADO PARA EL SUMINISTRO DE LOS SIGUIENTES PRODUCTOS:

FABRICACION DE MANGUERAS: HIDRAULICAS, INDUSTRIAL, TERMOPLASTICA, CONEXIONES, ENSAMBLES. PARA APLICACION EN BAJA, MEDIANA Y ALTA PRESION.

ESTE CERTIFICADO SE EXTIENDE, EN EL ENTENDIDO DE QUE PETROLEOS MEXICANOS EFECTUARA AUDITORIAS DE SEGUIMIENTO A SU SISTEMA DE GESTION DE LA CALIDAD, RESERVANDOSE EL DERECHO DE REVOCAR SU VALIDEZ, DE ACUERDO CON LOS RESULTADOS QUE SE OBTENGAN Y NO EXIME AL PROVEEDOR DE PRESENTAR SUS PRODUCTOS PARA VERIFICACION DE LA CALIDAD, CUANDO ASI SE LE REQUIERA.

FECHA DE EMISION: MARZO / 2005
FECHA DE EXPIRACION: MARZO / 2007

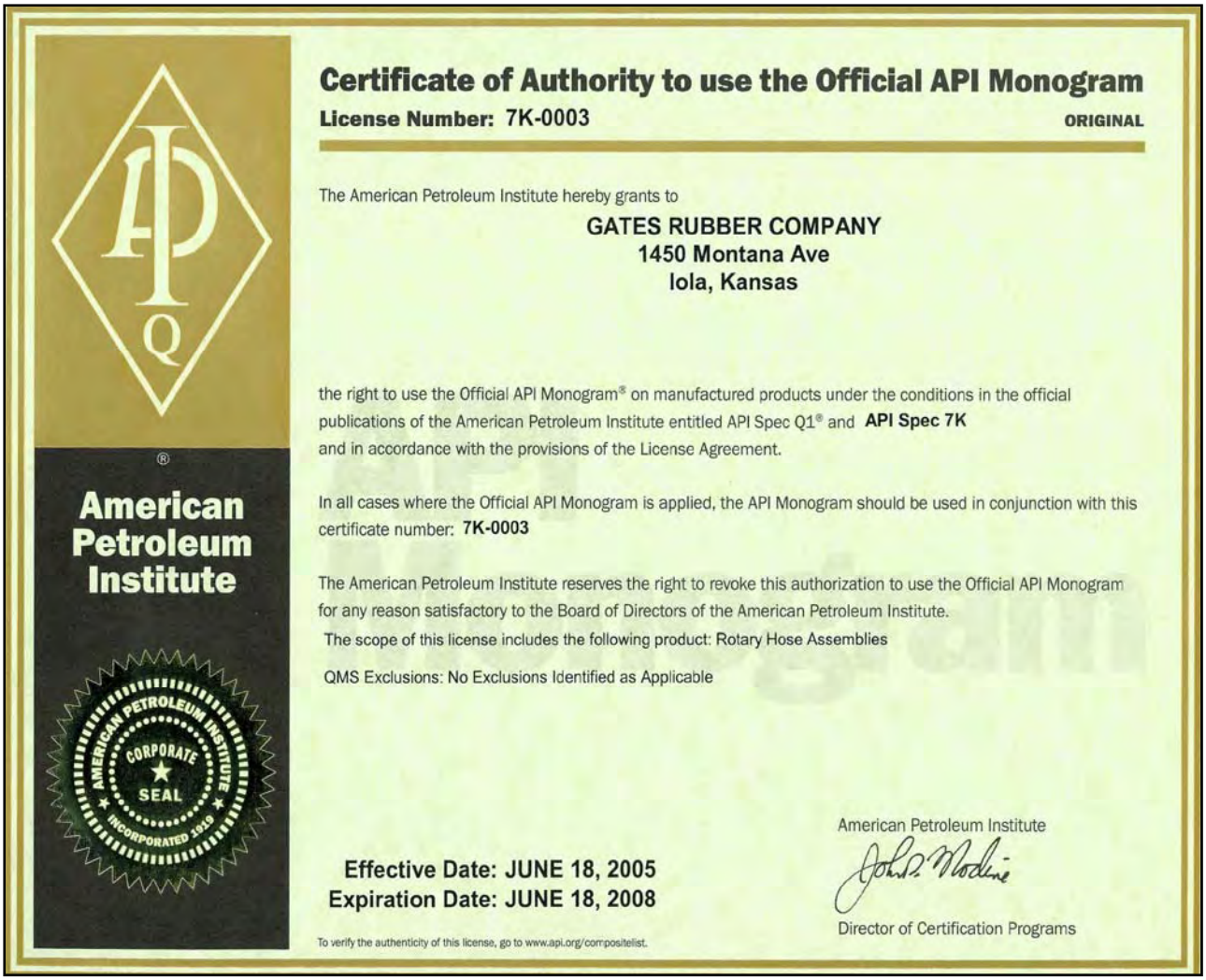
LIC. GERARDO LOZANO MONTEMAYOR
PRESIDENTE

LUISA MAGDALENA FLORES DELGADO
SECRETARIO EJECUTIVO

JORGE ESPINOSA DE LOS MONTEROS Z.
SECRETARIO TECNICO

OFFSHORE LAND RIG

API 7K Approval



Certificate of Authority to use the Official API Monogram

License Number: 7K-0003 **ORIGINAL**

The American Petroleum Institute hereby grants to

GATES RUBBER COMPANY
1450 Montana Ave
Iola, Kansas

the right to use the Official API Monogram® on manufactured products under the conditions in the official publications of the American Petroleum Institute entitled API Spec Q1® and **API Spec 7K** and in accordance with the provisions of the License Agreement.

In all cases where the Official API Monogram is applied, the API Monogram should be used in conjunction with this certificate number: **7K-0003**

The American Petroleum Institute reserves the right to revoke this authorization to use the Official API Monogram for any reason satisfactory to the Board of Directors of the American Petroleum Institute.

The scope of this license includes the following product: Rotary Hose Assemblies

QMS Exclusions: No Exclusions Identified as Applicable

American Petroleum Institute

Director of Certification Programs

Effective Date: JUNE 18, 2005
Expiration Date: JUNE 18, 2008

To verify the authenticity of this license, go to www.api.org/compositelist.

CERTIFICATE OF APPROVAL

This is to certify that the Quality Management System of:

The Gates Corporation
999 Michigan Avenue
Iola, Kansas 66749, USA

having been audited in accordance with the "Rules for the Registration Scheme for ISO/TS 16949:2002 First Edition", has been approved by Lloyd's Register Quality Assurance, Coventry, West Midlands, UK, to the following Quality Management System Standard:

ISO/TS 16949:2002

The Quality Management System is applicable to:

Design and Manufacture of Hose Products, Coupled Assemblies and Warehousing and Distribution of Gates Rubber Products.

Approval
Certificate No: 112745

Original ISO/TS 16949 Approval: *April 21, 2004*
Current Certificate: *April 21, 2004*
Certificate Expiry: *April 20, 2007*

Issued by LRQA

IATF Certificate No: 0015418

This document is subject to the provision on the reverse
This approval is carried out in accordance with the LRQA assessment and certification procedures and monitored by LRQA.

CERTIFICATE SCHEDULE

The Gates Corporation

Locations	*Activities*
999 Michigan Avenue *Iola, Kansas 66749, USA*	*Manufacture of Hose Products, Coupled Assemblies and Warehousing and Distribution Of Gates Rubber Products.*
1551 Wewatta Street *Denver, Colorado 80217, USA*	*Strategic Planning, Industrial Hose Business Unit, Hydraulic Hose Business Unit, Industrial Sales, OEM Sales, Product Control, Process Engineering, Product Applications, Manufacturing Systems, Customer Service, Design and Development of Hydraulic Hose and Related Products. Design and Development of Hose Couplings and Fittings. Design and Development of Hose Assemblies. Product Commercialization.*

Approval
Certificate No: 112745

Original ISO/TS 16949 Approval: *April 21, 2004*

Current Certificate: *April 21, 2004*

Certificate Expiry: *April 20, 2007*

Page 1 of 1

IATF Certificate No: 0015418

This document is subject to the provision on the reverse.
This approval is carried out in accordance with the LRQA assessment and certification procedures and monitored by LRQA.

OFFSHORE LAND RIG

Example of Rotary Hose Test Certification

Gates Corporation
Hydraulic Products Division
1450 Montana Road
P.O. Box 606
Iola, Kansas 66749
Telephone (620) 365-4100
Fax (620) 365-4110

CERTIFICATION

The Gates Corporation hereby certifies that the following hose was tested per spec.requirements and passed hydrostatic test per API Spec. 7K, 3rd Edition, April 1, 2002, Table 8 to _____PSI in accordance with this product number. Hose/Burst exceeds design per 9.10.3 (2 1/2 times W.P.)

Gates P/N Size Serial Number

The Gates Corporation

Date & Initial

Carol J. Porter,
Quality Assurance Manager

OFFSHORE LAND RIG

Example of Coupling Material Traceability

Quality VALVE & MACHINE WORKS, INC.

P.O. BOX 24727
°827 CLINTON DR.

HOUSTON, TX 77229-4727
HOUSTON, TX 77029

(713) 675-7444
FAX: (713) 675-2518

CERTIFICATE OF CONFORMANCE

Quality Valve & Machine Works, Inc. is engaged in the manufacture of API Gate Valves and Chokes, API Fittings, Manifold Assemblies, and Rotary Drilling Equipment for Service Pressures from 3,000 PSI MSP to 20,000 PSI MSP. Equipment manufactured in these facilities meets or exceeds the applicable sections of API Specification 6A, API Specification 7, ANSI Standard B31.3, ANSI Standard B16.5, and Nace Standard MR-01-75 for (W.O.G.) and Sour Service. Quality Valve and Machine Works, Inc. is authorized to apply the API Monogram to Equipment manufactured in accordance with API Specification 6A and API Specification 7.

The following equipment as manufactured on QVM Sales Order No. **28355** for **GATES RUBBER COMPANY** Customer's Purchase Order No. **IOP 010607** is hereby Certified to have been manufactured, tested and inspected in accordance with applicable specifications as listed above.

Reference No. **R5004 & R5005**

Description: **5" FIG 1002 BW FEMALE SUBS WELDED TO 4" ROTARY HOSE BW END NIPPLES**

Signed: _____ 01-4-00

OFFSHORE LAND RIG

Example of Coupling Material Traceability

FMC Corporation
Fluid Control Division
2825 West Washington Box 1377
Stephenville, Texas 76401

PRODUCT CERTIFICATE

CUSTOMER: GATES RUBBER COMPANY
C.O. #: IOP008742
F.C.O. #: 122584
LINE #: 1
QUANTITY: 2

This is to certify that the material sold and listed below was manufactured in accordance with FMC Standards and Procedures and meet/or exceed the requirements of the applicable FMC specifications, procedures, and purchase order requirements. FMC is an approved manufacturer under the requirements set forth in ISO 9001 Quality systems-Model for quality assurance in design/development, production, installation, and servicing.

COMPONENT #	REF. #	COMPONENT NAME
3257395	E776	FEMALE SUB: UNION, 5 FIG 1002, XXHVY BW, 7500 CWP, CHARPY

QA REPRESENTATIVE: Kelly Pahmer DATE: 11/10/99

"We will be our customers' most valued supplier by providing products and services that meet our customers' expectations."

OFFSHORE LAND RIG

Example of Coupling Material Traceability

FMC Corporation
Fluid Control Division
2825 West Washington Box 1377
Stephenville, Texas 76401

Ref. # : E776
Customer: GATES RUBBER COMPANY
C.O. # : IOP008742
F.C.O.# : 122584

MATERIAL CERTIFICATION

Part No.: 3257395
Raw P/N : P501825
Mat'l Spec.: MS-382;HT-27
Rev.#: AD

Part Name: FEM SUB-5" 1002 XXHVY BW
Heat # : 10216
Condition: SS
Material: 4130 LOW ALY STEEL

	Specification	Actual
Carbon (C)	.280- .330	.310
Manganese (Mn)	.400- .600	.470
Phosphorous (P)	.025 max.	.014
Sulphur (S)	.025 max.	.015
Silicon (Si)	.150- .350	.210
Chromium (Cr)	.800- 1.100	.960
Molybdenum (Mo)	.150- .250	.190
Tensile (psi.)	120,000 min.	122,200
Yield (psi.)	100,000 min.	101,800
Elongt'n. (%)	15.0 min.	19.7
Hardness	235- 286 BHN	277 BHN
Charpy (ft.lbs) Long. (@ - 20DEG. F)	31 avg/23.6 min	38avg/34min

SUPPLEMENTAL DATA: (Boxes marked 'X' are applicable.)

☐ Components have been manufactured in accordance with the requirements of NACE MR-01-75.

☐ Components have been subjected to magnetic particle testing per ASTM E709 using ASNT Level II certified personnel and met the acceptance criteria of API 14D and MSS SP-53 (FMC Spec NE-01)

I herby certify that the above information is correct as contained in the records of FMC Corporation.

QA REPRESENTATIVE: _____ DATE: 11/10/99

"We will be our customers' most valued supplier by providing products and services that meet our customers' expectations."

OFFSHORE LAND RIG

Example of ABS Certification Rotary Hoses

ABS Group Inc.

Report No. 2001-5542-H-1 Project No. S66751A2 Date: March 1, 2001 Office: Indiana

Certificate/Report on: Two (2) Rotary Hoses: 3 /12"D X 25' with Safety Clamps, 5000PSI WP, 5 ¼" – 8UN-2A and 2B Straight Threads and 4" – 8API Line Pipe Threads	Accepted Date: March 1, 2001
Purchaser and Address: **Petrobras**	Order No.: PO# AFM:110-660-694/00//PCM:630.190.011/01
Manufacturer and Address: Gates Rubber Company, Inc. Iola, Kansas	Order No. March 0101
Shipped to: GATES BRAZIL	Weight: 1,919 POUNDS APPROXIMATELY (TOTAL) 2 CRATES

THIS IS TO CERTIFY THAT THE UNDERSIGNED DID, AT THE REQUEST OF, GATES RUBBER COMPANY, INC. FOR PETROBRAS **ON MARCH 1, 2001**, TO WITNESS PROOF TEST AT GATES RUBBER COMPANY, INC. LOCATED IN IOLA, KANSAS, USA.

1.0 SUMMARY:

SEE BELOW

2.0 CONTACTS:

Mrs. Judy Johnson – Quality Assurance Tech
Mr. Ed Murpey – Rotary Drill Lead Person
Mr. Dave Gillispie – Rotary Drill Production Operator

3.0 DOCUMENTS REVIEWED:

See Documents Attached:

OFFSHORE LAND RIG

Example of ABS Certification Rotary Hoses

ABS Group Inc.

4.0 INSPECTION ACTIVITIES:

On March 1, 2001 ABS Group Inc. was present at Gates Rubber Company, Inc. at their Iola, Kansas manufacturing facility. Gates Rubber Company is an ISO/9001 and QS-9000 certificate holder, and was approved by ABS-QE effective August 18, 1999, (certificate Number 32485) and was also approved to manufacture products to API - 7K specification (certificate Number 7K-0003). This visit was to Witness Proof Test of **Two (2) Rotary Hose: 3 ½" D X 25' with safety Clamps, and with a 5000 PSI working pressure and tested to Gates Quality Procedure # L3199-73 which conforms to API Spec. 7K Grade "D" dated 11/7/00 of 10,000 PSI.**
Hydrostatic Testing of this Rotary Hose was witnessed by the undersigned, and was found to be acceptable to the API Specs and Gates Rubber Quality procedures.

Chart Recorder # MPG-0316 was recalibrated on February 14, 2001 and so was the Pressure Gauge # MPG-0317. These recording devises comply with the Gates Quality System regarding Calibration. The pressure Gauge was tested using a Dead Weight Tester which was tested itself by an outside contractor on October 24, 2000 and conforms to the NIST Specifications. The Pressure gauge was within +/- 1%, and so was the Dead weight Tester.

2 Crates will contain the hoses, which were not inspected at this visit.

DOCUMENTS ATTACHED

1 Page – Gates Rubber Certification as per API Spec. 7K, 2nd Edition, April 1, 1996 Table 8 to 10,000 PSI

5.0 The report was written without prejudice to all parties concerned.

Conrad M. Serwatka

Senior Authorized Inspector Supervisor
ABS Group Inc. - Midwest

OFFSHORE LAND RIG

Example of ABS Certification Rotary Hoses

ABS Group Inc.

Report No. 2001-5542-H-1 Project No. S66751A2 Date: March 1, 2001 Office: Indiana

INSPECTION RELEASE NOTE

Client/Purchaser: **P**			
Client/Purchase Order (or Sub-order) No: **PO# AFM:110.660.694/00//PCM:630.190.011/01**			
Supplier/Vendor (or Sub-Vendor): **GATES RUBBER COMPANY, INC. 1450 MONTANA ROAD, IOLA, KANSAS 66749 U.S.A.**			
Supplier/Vendor Reference No.: MARCH0101			
The following material/equipment was subject to final inspection on: **WITNESSED PROOF TESTED AND INSPECTED ON** MARCH 1, 2001 **AT GATES RUBBER COMPANY, INC.**			
And found satisfactory in accordance with: **API SPECIFICATION 7K GRADE D AND GATES RUBBER QUALITY PROCEDURE L3199-73 DATED 11-7-00**			
ITEM NUMBER 1 2	DESCRIPTION 2-ROTARY HOSES 3 ½"D x 25' WITH SAFETY CLAMPS@ 5000PSI WORKING PRESSURE, TESTED TO 10,000 PSI S/N L20227 & S/N L20228	QUANTITY ACCEPTED 2	ITEM (Complete/Part Complete) COMPLETE
Packing Checked Yes X No		Markings Checked Yes **X** No	
Documentation attached Yes **x** No		If Yes, Specify: SEE DOCUMENTS ATTACHED IN REPORT	
Inspected items die-stamped or marked for identification YES NO X			
Remarks:			

Conrad M. Serwatka
REVIEWED /
REPRESENTATIVE-ABS GROUP INC.

OFFSHORE LAND RIG

Example of ABS Certification Rotary Hoses (Grade E)

AMERICAN BUREAU OF SHIPPING
EQUIPMENT TYPE APPROVAL PROGRAM

Attachment To
Certificate No.
98-CH16054-X

Port of
Chicago, Illinois

Date: 25 February 1998

Manufacturer:	**The Gates Rubber Company - Iola Division** 999 Michigan Avenue P. O. Box 606 Iola, Kansas 66749
Equipment:	Rotary Hose
Gates Rubber Company Model:	Grade E
Description:	4" ID Black Gold Rotary Drilling Hose
Intended Service:	To be used as High Pressure Mud Rotary Hose to connect the mud standpipe gooseneck to the top drive.
Operating Envelope:	***Maximum Allowable Working Pressure:*** 7,500 psi ***Maximum Test Pressure:*** 15,000 psi ***Minimum Burst Pressure:*** 18,750 psi ***Maximum Design Temperature:*** 82° C (180°F) ***Minimum Design Temperature:*** -20° C (-4°F)
Specification & Standards:	API Specification 7K 1990 ABS Guide for Certification of Drilling Systems (CDS Guide).
Comments:	1.) Hydrostatic testing to 1.5 times the design pressure is to be Performed for the hose assembly in accordance with Section 5.11.3.2 of ABS Guide for the Certification of Drilling System. 2.) Copies of the certified material test reports are to be made Available to the attending Surveyor and are to be traceable to the material used in accordance with Section 7.13 of the 1990 CDS Guide.

Glen E. Magrane — Surveyor

This Certificate evidences compliance with one or more of the Rules, guides, standards or other criteria of American Bureau of Shipping or a statutory, industrial or manufacturer's standard and is issued solely for the use of the Bureau, its committees, its clients, or other authorized entities. This certificate is governed by the terms and conditions on the reverse side hereof.

Form ABS 257 (7/90)-2

OFFSHORE LAND RIG

Example of ABS Certification Rotary Hoses (Grade E)

AMERICAN BUREAU OF SHIPPING

DATE: 25 February 1992

PORT OF ISSUE: Chicago, Illinois

REPORT ON: Initial Type Approval Plant Survey

REPORT NO.: 98-[illegible]-302

CERTIFICATE NO.: 98-[illegible]-X

NAME OF COMPANY: The Gates Rubber Company - [illegible] Division

LOCATION: 999 Michigan Ave. P.O. Box [illegible]/Iola, [illegible]

PRODUCT/SERVICE: Rotary Drilling Hose

APPLICABLE STANDARD(S)/ SPECIFICATION(S): 1990 ABS [illegible] Guide, API Specification 7K

AUDIT/SURVEY CONDUCTED BY: Glen E. [illegible]/ABS Americas, Chicago

AUDIT FREQUENCY: (FOR PERIODIC AUDITS ONLY) Initial Audit, Subsequent Periodic Audits Annually

AREAS COVERED: Management, Receiving Inspection, Manufacturing Inspection, Assembly Inspection, Final Inspection, Testing, Documentation Control, Record Keeping

RESULTS: The results of the audit were generally satisfactory.

Page 1 of

Billed To:

Invoice No. and Date

Fees

Expenses

Total

Distribution:

Glen E. [illegible]

NOTE: [illegible]

FORM [illegible]

OFFSHORE LAND RIG

Example of ABS Certification Rotary Hoses (Grade E)

Certificate No.
98-CH16054-X

AMERICAN BUREAU OF SHIPPING ★ EQUIPMENT TYPE APPROVAL PROGRAM ★

Port of
CHICAGO, ILLINOIS

Date: 25 FEBRUARY 1998

This is to Certify THAT THE UNDERSIGNED SURVEYOR TO THIS BUREAU DID, AT THE REQUEST OF THE GATES RUBBER COMPANY, ATTEND THEIR FACILITY AT IOLA, KANSAS ON THE 25th DAY OF FEBRUARY 1998, IN ORDER TO CARRY OUT AN INITIAL SURVEY OF THE FACILITIES AND ASSOCIATED QUALITY PROCEDURES, AND THAT THE FACILITY IS CONSIDERED CAPABLE OF PRODUCING AN ACCEPTABLE UNIFORM PRODUCT, AND THAT THE EQUIPMENT LISTED IN THE ENCLOSED ATTACHMENT IS ELIGIBLE TO BECOME PART OF A CLASSED VESSEL AND TO BE PLACED ON THIS BUREAU'S LIST OF TYPE APPROVED EQUIPMENT, SUBJECT TO ANNUAL PLANT SURVEYS BY A SURVEYOR TO THIS BUREAU AND RENEWAL OF THE CERTIFICATE AFTER 5 YEARS.

SURVEY	DATE	SURVEYOR'S SIGNATURE
Initial	25 FEB1998	
First		
Second		
Third		
Fourth		

This Certificate evidences compliance with one or more of the Rules, guides, standards or other criteria of American Bureau of Shipping or a statutory, industrial or manufacturer's standard and is issued solely for the use of the Bureau, its committees, its clients, or other authorized entities. This certificate is governed by the terms and conditions on the reverse side hereof.

Form AB 257 (7/90)-1

OFFSHORE LAND RIG

ABS Type Approval for Hydraulic Hoses

ABS

00-HS156975-PDA
CERTIFICATE NUMBER

07 July 2000
DATE

Houston, Texas
ABS TECHNICAL OFFICE

CERTIFICATE OF
Product Design Assessment

This is to Certify **The Gates Rubber Company**
(COMPANY)

that a representative of this Bureau did, at the request of the above noted Company, assess design plans and data for the below listed product. This assessment is a representation by the Bureau as to the degree of compliance the design exhibits with applicable sections of the Rules. This assessment do not waive certification or classification procedures required by ABS Rules for products to be installed in ABS classed vessels or facilities. This certificate, by itself, does not reflect that the product is Type Approved. The scope and limitations of this assessment are detailed on the pages attached to this certificate; and it will remain valid for five years from the date of issue or until the Rules or specifications used in the assessment are revised (whichever occurs first)

PRODUCT: Non-Metallic Flexible Hoses and End Fittings

MODEL: As per attached listings

ABS RULE: Section 4-6-2/5.7 of the 2000 Steel Vessel Rules

OTHER STANDARD: Not Applicable

AMERICAN BUREAU OF SHIPPING

(ENGINEER)
Henry Robles, Principal Engineer

A8258(3/00)

NOTE: This certificate evidences compliance with one or more of the Rules, Guides, standards or other criteria of American Bureau of Shipping or a statutory, industrial or manufacturer's standard and is issued solely for the use of the Bureau, its committees, its clients or other authorized entities. Any significant changes to the aforementioned product without ABS approval will result in this certificate becoming null and void. This certificate is governed by the terms and conditions on the reverse side hereof.

TX02/00_02D-PDA(0300)
US 1000

OFFSHORE LAND RIG

ABS Type Approval for Hydraulic Hoses

Gates Rubber Company, The (PDA)
990 S. Broadway
P.O. Box 5887
Denver
Colorado
80217-5887
United States of America
Telephone: 303-744-5329
Fax: 303-744-4410

Certificate No: 00-HS156975-PDA

Product : **Non-Metallic Flexible Hoses with End Fittings**

Model Name: **G3K, G5K, G6K (PDA)**

Intended Service:
Hydraulic Fluids

Description:
Model G3K - size 20, 24, 32 with end fitting series GS, PCS; Model G5K - size 10 through 32 with end fitting series GS, PCM; Model G6K - size 6 through 24 with end fitting series GS, PCM

Ratings:
Model G3K - MAWP 3000 psi; Model G5K - MAWP 5000 psi; Model G6K - MAWP 6000 psi; Each hose model may only utilize end fittings corresponding with the end fitting series number listed above. Temperature range is to be in accordance with manufacturer' specifications.

Service Restrictions:
1.) The hoses are to be complete with factory assembled end fittings or factory supplied ends installed in accordance with manufacturer's procedure in accordance with 4-6-2/5.7.1(b). 2.) The types of end connections utilized (e.g. threaded, flanged, etc.) are to comply with the applicable requirements and limitations of the Rules - See 4-6-2/5.5, 4-6-7/3.5.1. 3.) Hose assemblies are to be installed only where flexibility is required and are not to be subject to torsional deflection under normal conditions. In addition, the length of the hose is to be limited to the required for flexibility only as per 4-6-2/5.7.1(a) of the Rules. 4.) Fittings made of aluminum are not to be used on the hose assembly.

Comments:
Not Applicable

STANDARDS

ABS Rules:
Section 4-6-2/5.7 of the 2000 Steel Vessel Rules

Government Authority:
International:
National:
Others:

OFFSHORE LAND RIG

ABS Type Approval for Hydraulic Hoses

Gates Rubber Company, The (PDA)
990 S. Broadway
P.O. Box 5887
Denver
Colorado
80217-5887
United States of America
Telephone: 303-744-5329
Fax: 303-744-4410

Certificate No: 00-HS156975-PDA

Product : **Non-Metallic Flexible Hoses with End Fittings**

Model Name: **C12M, C12, C13, C5M (PDA)**

Intended Service:
Hydraulic Fluids, except C5M for Fuel Oil

Description:
Model C12M - size 6, 8, 12, 16, 20 with end fitting series GS, PCS; Model C12 - size 24, 32 with end fitting series GS, PCS; Model C13 - size 10 through 32 with end fitting series GS, PCM; Model C5M - size 5 through 16 with end fitting series Reusable, PCSS

Ratings:
Model C12M - size 6, 8, 12, 16 - MAWP 4000 psi; Model C12M - size 20 - MAWP 3000 psi; Model C12 - size 24, 32 - MAWP 2500 psi; Model C13 - size 10 through 32 - MAWP 5000 psi; Model C5M - size 5 through 16 - MAWP 500 psi; Each hose model may only utilize end fittings corresponding with the end fitting series number listed above. Temperature range is to be in accordance with manufacturer' specifications.

Service Restrictions:
1.) The hoses are to be complete with factory assembled end fittings or factory supplied ends installed in accordance with manufacturer's procedure in accordance with 4-6-2/5.7.1(b). 2.) The types of end connections utilized (e.g. threaded, flanged, etc.) are to comply with the applicable requirements and limitations of the Rules - See 4-6-2/5.5, 4-6-7/3.5.1. 3.) Hose assemblies are to be installed only where flexibility is required and are not to be subject to torsional deflection under normal conditions. In addition, the length of the hose is to be limited to the required for flexibility only as per 4-6-2/5.7.1(a) of the Rules. 4.) Fittings made of aluminum are not to be used on the hose assembly.

Comments:
Not Applicable

STANDARDS

ABS Rules:
Section 4-6-2/5.7 of the 2000 Steel Vessel Rules

Government Authority:
International:
National:
Others:

OFFSHORE LAND RIG

ABS Type Approval for Hydraulic Hoses

Gates Rubber Company, The (PDA)
990 S. Broadway
P.O. Box 5887
Denver
Colorado
80217-5887
United States of America
Telephone: 303-744-5329
Fax: 303-744-4410

Certificate No: 00-HS156975-PDA

Product : **Non-Metallic Flexible Hoses with End Fittings**

Model Name: **M3K, M4K (PDA)**

Intended Service:
Hydraulic Fluids

Description:
Model M3K - size 4 through 16 with end fitting series MegaCrimp; Model M4K - size 4 through 12 with end fitting series MegaCrimp, GS

Ratings:
Model M3K - MAWP 3000 psi; Model M4K - MAWP 4000 psi; Each hose model may only utilize end fittings corresponding with the end fitting series number listed above. Temperature range is to be in accordance with manufacturer' specifications.

Service Restrictions:
1.) The hoses are to be complete with factory assembled end fittings or factory supplied ends installed in accordance with manufacturer's procedure in accordance with 4-6-2/5.7.1(b). 2.) The types of end connections utilized (e.g. threaded, flanged, etc.) are to comply with the applicable requirements and limitations of the Rules - See 4-6-2/5.5, 4-6-7/3.5.1. 3.) Hose assemblies are to be installed only where flexibility is required and are not to be subject to torsional deflection under normal conditions. In addition, the length of the hose is to be limited to the required for flexibility only as per 4-6-2/5.7.1(a) of the Rules. 4.) Fittings made of aluminum are not to be used on the hose assembly.

Comments:
Not Applicable

STANDARDS

ABS Rules:
Section 4-6-2/5.7 of the 2000 Steel Vessel Rules

Government Authority:
International:
National:
Others: