GATES HYDRAULICS Hose, Couplings & Equipment











EQUIPMENT

HOSE/CPLG. Selection

GLOBALSPIRAL Couplings

PCM/PCS

FERRULES

MEGACRIMP COUPLINGS

POWER CRIMP

LOW PRESSURE

COUPLINGS

COUPLINGS

POLARSEAL

COUPLINGS

C14 Couplings

PCTS

Field Attachable

G1 & G2 COUPLINGS

FIELD

ATTACHABLE C5

COUPLINGS

SURELOK AIR BRAKE

COUPLINGS

QUICK DISCONNECT

COUPLERS

NEW BALL

ACCESSORIES

EQUIPMENT AND PARTS

VALVES

THERMO-PLASTIC

COUPLINGS

Seven Easy Steps for Selecting the Proper Hose

An effective way to remember hose selection criteria is to remember the word...

STAMPED

- S = Size
- T = Temperature
- A = Application
- M = Material to be conveyed
- **P** = Pressure
- **E** = Ends or couplings
- **D** = Delivery (volume and velocity)

1. Hose Size (Dash Numbers)

The inside diameter of the hose must be adequate to keep pressure loss to a minimum and avoid damage to the hose due to heat generation or excessive turbulence. See hose sizing Nomographic Chart.

To determine the replacement hose size, read the layline printed on the side of the original hose. If the original hose layline is painted over or worn off, the original hose must be cut and the inside diameter measured for size.

NOTE: Before cutting an original hose assembly, measure the overall assembly length and fitting orientation. These measurements will be required to build the replacement assembly.

The hydraulics industry has adopted a measuring system called Dash Numbers to indicate hose and coupling size. The number which precedes the hose or coupling description is the dash size (see table). This industry standard number denotes hose I.D. in sixteenths of an inch. (The exception to this is the SAE100R5 hoses C5C, C5D, C5E, C5M as well as, C14 and AC134a, where dash sizes denote hose I.D. equal to equivalent tube O.D.) See chart to the right.

		Hose I.D. (I	nches)					
	All Exce C14 ar	pt C5 Series, 1d AC134a	C5 Series, C14 and AC134a					
Dash No.	Inches	Millimeters	Inches	Millimeters				
-2	1/8	3.2						
-3	3/16	4.8						
-4	1/4	6.4	3/16	4.8				
-5	5/16	7.9	1/4	6.4				
-6	3/8	9.5	5/16	7.9				
-8	1/2	12.7	13/32	10.3				
-10	5/8	15.9	1/2	12.7				
-12	3/4	19.0	5/8	15.9				
-14	7/8	22.2						
-16	1	25.4	7/8	22.2				
-20	1-1/4	31.8	1-1/8	28.6				
-24	1-1/2	38.1	1-3/8	34.9				
-32	2	50.8	1-13/16	46.0				
-36	2-1/4	57.6						
-40	2-1/2	63.5	2-3/8	60.3				
-48	3	76.2						
-56	3-1/2	88.9						
-64	4	101.6						
-72	4-1/2	115.2						

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Hose O.D. can be a critical factor when hose routing clamps are used or hoses are routed through bulkheads. Check individual hose specification tables for O.D.'s.

2. Temperature

When selecting a replacement assembly, two areas of temperature must be considered. These are fluid temperature and ambient temperature. The hose selected must be capable of withstanding the minimum and maximum temperature seen by the system. Care must be taken when routing near hot manifolds and in extreme cases a heat shield may be advisable.

See the Gates Hydraulic Hose Selection Guide; Hose Specification Pages; and/or the Additional Temperature Limits for Gates Hydraulic Hoses Chart for temperature ranges and limits for water, water/oil emulsions and water/glycol solutions.

3. Application

Determine where or how the replacement hose or assembly is to be used. Most often only a duplicate of the original hose will have to be made. To fulfill the requirements of the application, additional questions may need to be answered, such as:

- Where Will Hose be Used?
- Fluid and/or Ambient Temperature?
- Hose Construction?
- Equipment Type?
- Fluid Compatibility?
- Thread End Connection Type?
- Working and Surge Pressures?
- Environmental Conditions?
- Permanent or Field Attachable Couplings?
- Suction Application?
- Routing Requirements?
- Thread Type?
- Government and Industry Standards Being Met?
- Unusual Mechanical Loads?
- Minimum Bend Radius?
- Non-Conductive Hose Required?
- Excessive Abrasion?

4. Material to be Conveyed

Some applications require specialized oils or chemicals to be conveyed through the system. Hose selection must ensure compatibility of the hose tube, cover,couplings and O-rings with the fluid used. Additional caution must be exercised in hose selection for gaseous applications such as refrigerants and LPG.

NOTE: All block type couplings contain nitrile O-rings which must be compatible with the fluids being used.

5. Pressure

Most important in the hose selection process is knowing system pressure, including pressure spikes. Published working pressures must be equal to or greater than the system pressure. Pressure spikes greater than the published working pressure will shorten hose life and must be taken into consideration. Gates DOES NOT recommend using hoses on applications having pressure spikes greater than published working pressures of the hose.

6. Ends of Couplings

Identify end connections using Gates coupling templates and measuring tools or Coupling Identification section. Once thread ends have been identified, consult the appropriate section of the catalog for specific part number selection.

7. Delivery (Volume and Velocity)

If the same I.D. of the original hose is used, assume the system is properly sized to efficiently transport fluid. If the system is new or altered, determine the hose I.D. needed to transport required fluid volume flow by using the Nomographic Chart.

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C14 Couplings
PCTS THERMO- PLASTIC COUPLINGS
FIELD ATTACHABLE G1 & G2 COUPLINGS
FIELD ATTACHABLE C5 COUPLINGS
SURELOK AIR Brake Couplings
QUICK Disconnect Couplers
NEW BALL VALVES
ACCESSORIES
EQUIPMENT AND PARTS





EQUIPMENT

HOSE/CPLG. SELECTION

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* Except 1/4" ** Except 3/8" & 1/2"

Agency Specifications and Hose Selection Guide

INDUSTRY AGENCIES

- ABS American Bureau of Shipping
- AS Australia Standard
- DIN Deutsch Industry Norm, German
- **DNV** Det Norske Veritas for North Sea Floating Vessels
- EN European Norm/Standard
- **GL** Germanischer Lloyds
- IJS Industrial Jack Specifications
- RCCC Regular Commom Carrier Conference for Fleet Truck and Bus
- SAE Society of Automotive Engineers

GOVERNMENT AGENCIES

DOT/FMVSS - U.S. Department of Transportation/ Federal Motor Vehicle Safety Standard MSHA - U.S. Mine Safety and Health Administration USCG - U.S. Coast Guard

Meets These Agency Specifications

Hose Type	ARC	10	DIN	עאס	EN	CI	110	RCCC	SVE	DOT/ FMVSS	МСНУ	USCG	J1942
nose type	ADO	AO	DIN	IN DNV 4SH/4SP X E 3 4SP 3 4SP 3 4SP 3 4SP 3 4SP 3 4SP X X 2 2SN X X X X X X X X X X X X X	LIN	UL	100	nuuu	JAL	DOT/ FIVINGS	INIONA	Fuel Oil	Power
EFG6K, G6K	Х	Х	20023 4SH/4SP	Х	EN 856 4SH/4SP				100R15		Х		Х
EFG5K, G5K	Х	Х	20023 4SH/4SP	Х	EN 856 4SH/4SP				100R13		Х		Х
EFG4K, G4K	Х	Х	20023 4SP		EN 856 4SP				100R12		Х		Х
EFG3K, G3K	Х		20023 4SP		EN 856 4SP				100R12		Х		Х
M5K		Х				Х							
M4K+	Х	Х				Х			100R19		Х		Х
M4KH	Х					Х			100R19		Х		Х
G2XH									100R2 Type AT		Х		Х
G2AT-HMP									100R2 Type AT		Х		Х*
M2T [®]	Х	Х		Х	EN 853 2SN				100R16		Х		Х
M2T [®] Plus					EN 853 2SN				100R16		Х		
CM2T					EN 857 2CS		1		100R16		Х		
G2		Х	20022 2SN	Х	EN 853 2SN	Х			100R2 Type AT		Х		Х
G2H		Х		Х	EN 853 2SN				100R2 Type AT		Х	Х	Х
J2AT							Х				Х		
МЗК	Х	Х		Х	EN 857	Х	1		100R17		Х		Х
M3K -12, -16	Х	Х		Х	EN 857	Х	1		100R17, 100R9		Х	Х	Х
G1		Х	20022 1SN	Х	EN 853 1SN	Х	1		100R1 Type AT		Х		Х
G1H				Х	EN 853 1SN		1		100R1 Type AT		Х	Х	
MegaTech™							1		J1402, J1405	106-74 (-4 to -10)			
TR500									J1402	106-74			
NABT							1		J844				
050							1		10005	106-74 Type All (-4 to			
696								RP305(B)	100K5	-10)			
C5E									J1405	106-74 Type Al			
C5D							1		J1405	106-74 Type All			
C5M	Х						1		J30R2, J1527		Х	Х	
G3H					EN 854 R3		1		100R3				
GTH, GTHX					EN 854 R6		1		100R6				
GMV	X@	Х					1		100R4		Х		Х
LOL							1				Х		
THERMOPLASTIC TH7, TH7NC*** TH8, TH8NC TH18, TH18NC									100R7 100R8 100R18				
C14									100R14				
REFRIGERANT							-		100111-				
PolarSeal® AC134a									J51 Type 2, J2064				
POWER STEERING PS188									2050				

*** TH7NC meets ANSI A92.2 for vehicle mounted aerial devices (-3 to -8)

@ to be used with a fire sleeve

Gates Corporation



HOSE/CPLG. SELECTION

GLOBALSPIRAL

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Characteristics of Hose Stock Types

The characteristics shown below are for the normal or usual range of these specific stocks. Stocks can be changed somewhat through different compounding to meet the requirements of specialized applications. Tube and cover stocks may occasionally be upgraded to take advantage of improved materials and technology.

For detailed information on a specific hose tube or cover stock, check the Chemical Resistance Table and also the specific hose page.

	Neoprene (Poly- Choroprene) Type A	Nitrile (Acrylonitrile and Butadiene) Type C	Nylon Type Z	Hypalon* (Chlorosulfonated Polyethylene) Type M	EPDM (Ethylene Propylene Diene) Type P	CPE (Chlorinated Polyethylene) Type J	PTFE (Poly- tetrafluoro- ethylene) Type T
Flame Resistance	Very Good	Poor	Good	Good	Poor	Good	Good
Petroleum Base Oils	Good	Excellent	Good to Excellent	Good	Poor	Very Good	Excellent
Diesel Fuel	Fair to Good	Good to Excellent	Good to Excellent	Good	Poor	Good	Excellent
Resistance to Gas Permeation	Good	Good	Good To Excellent	Good to Excellent	Fair to Good	Good	Good to Excellent
Weather	Good to Excellent	Poor	Excellent	Very Good	Excellent	Good	Excellent
Ozone	Good to Excellent	Poor for Tube; Good For Cover	Excellent	Very Good	Outstanding	Good	Excellent
Heat	Good	Good	Good	Very Good	Excellent	Excellent	Excellent
Low Temperature	Fair to Good	Poor to Fair	Excellent	Poor	Good to Excellent	Good	Excellent
Water-Oil Emulsions	Excellent	Excellent	Good to Excellent	Good	Poor	Excellent	Excellent
Water/Glycol Emulsions	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent
Diesters	Poor	Poor	Excellent	Fair	Excellent	Very Good	Excellent
Phosphate Esters	Fair (For Cover)	Poor	Excellent	Fair	Very Good	Very Good	Excellent
Phosphate Ester Base Emulsions	Fair (For Cover)	Poor	Excellent	Fair	Very Good	Very Good	Excellent

*Registered trademark of DuPont.

Cover Abrasion Resistance

These comparisons are based on test results per ISO 6945 abrasion testing. The table shows the expected number of times of extended cover service life as compared to a standard cover.

	Modified Nitrile (Standard cover)	Nylon Sleeve	XtraTuff™	MegaTuff [®]
Relative Abrasion Resistance	1	15 X Standard Cover	25 X Standard Cover	300 X Standard Cover





Hose & Coupling Section

Gates Hydraulic Hose Selection Guide

HOSE/CPI G.		Standard Industry Construction		Stock					
SELECTION		Standard Industry	Description	Construction	Use	Tub	е	Cover	
OLLEONON		Specification		(Reinforcement)		Name	Type	Name	Type
		SAE 100R15 EN 856 TYPE 4SP/4SH	EFG6K	4&6-spiral, wire	Extremely High Pressure, Petrol, Oils, Environmental Fluids	Nitrile	С	Neoprene	A
COUPLINGS		SAE 100R13 EN 856 TYPE 4SP/4SH	EFG5K	4&6-spiral, wire	Extremely High Pressure, Petrol, Oils, Environmental Fluids	Nitrile	С	Neoprene	A
		SAE 100R12 EN 856 TYPE 4SP	EFG4K	4&6-spiral, wire	Extremely High Pressure, Petrol, Oils, Environmental Fluids	Nitrile	С	Neoprene	A
PCM/PCS FERRULES		SAE 100R12 EN 856 TYPE 4SP	EFG3K	4-spiral, wire	Extremely High Pressure Petrol, Oils	Nitrile	С	Neoprene	A
		SAE 100R15 EN 856 TYPE 4SP/4SH	G6K	4&6-spiral, wire	Extremely High Pressure	Neoprene	А	Neoprene	А
MEGACRIMP COUPLINGS		SAE 100R13 EN 856 TYPE R13/4SP/4SH	G5K	4&6-spiral, wire	Extremely High Pressure Petrol, Oils	Neoprene	А	Neoprene	А
		SAE 100R12 EN 856 TYPE 4SP	GЗК	4-spiral, wire	Extremely High Pressure Petrol, Oils	Neoprene	Α	Neoprene	А
POWER		SAE 100R12 EN 856 TYPE R12	C12	4-spiral, wire	High Pressure, Petrol, Oils	Neoprene	Α	Neoprene	A
CRIMP COUPLINGS		SAE 100R2 Type AT EN 853 Type 2SN	G2	2-braid, wire	Petroleum Oils	Nitrile	С	NBR/PVC	C2
		SAE 100R2 Type AT	MegaTech™ II	2-braid, wire	Petroleum Oils	CPE	J	Blue Textile	
		SAE 100R2 Type AT	G2L	2-braid, wire	Petroleum Oils, Low Temperatures	Nitrile	С	Neoprene	Α
LOW		SAF 100B16	M2T®	2-braid, wire	Tight Bends, High Elexibility	Nitrile	С	NBB/PVC	C2
PRESSURE		Gates Proprietary	M6K	2-braid, wire	Tight Bends, High Flexibility	Nitrile	C	NBR/PVC	C2
COUPLINGS		Gates Proprietary	M5K	2-braid, wire	Tight Bends, High Flexibility	Nitrile	С	NBR/PVC	C2
		SAE 100R19	M4K+	2-braid, wire	Tight Bends, High Flexibility	Nitrile	С	NBR/PVC	C2
		SAE 100R17	МЗК	1 & 2-braid, wire	Tight Bends, High Flexibility	Nitrile	С	NBR/PVC	C ₂
COUPLINGS		SAE 100R17 EN 857 1SC	МЗКН	1-braid, wire	High Pressure Oil	Nitrile	С	NBR/PVC	C2
		SAE 100R2 Type AT EN 853 TYPE 2SN	G2H	2-braid, wire	High Temperature	Nitrile	С	Hypalon+	М
C14		SAE 100R2 Type AT	G2XH	2-braid, wire	Multi-Fluid, High Temperature	CPE	J	CPE	J
COUPLINGS		SAE 100R2 Type AT	G2AT-HMP	2-braid, wire	Multi-Fluid, High Temperature	CPE	J	Neoprene	A
			JZAI	2-braid, wire	Industrial Jack Hose	INITE	<u> </u>	NBR/PVC	62
PCTS		EN 853 Type 1SN	G1	1-braid, wire	Petroleum Oils	Nitrile	С	NBR/PVC	C2
THERMO- Plastic	,	EN 853 TYPE 1SN	G1H	1-braid, wire	High Temperature	Nitrile	С	Hypalon+	M
COUPLINGS		EN 854 TYPE R3	G3H	2-braid, textile	Petrol. Oils, Antifreeze, Water, High Temperature	Nitrile	C	Neoprene	A
		EN 854 TYPE R6	GTH	1-braid, textile	Petrol. Oils, Antifreeze, Water, High Temperature	Nitrile	С	Neoprene	A
FIELD		SAE 100R4	G4H	2-spiral, textile, helical wire	Return & Suction High Temperature	Nitrile	С	Neoprene	A
ATTACHABLE		SAE 100R4	GMV	2-spiral, textile, helical wire	Return & Suction High Temperature	Nitrile	С	Neoprene	A
G1 & G2		SAE 30R2 Type 1 & 2	RLA	1-braid, textile	Return & Low Pressure	Nitrile	C	NBR/PVC	C2
COUPLINGS	,		RLC	3-braid, textile	Return & Low Pressure	Nitrile		NBR/PVC	<u>C2</u>
			LOC	1-braid textile	Petrol Oils Antifreeze Water & Air	Nitrile	C	***	A/C2
		SAE J1402, J1019	MegaTech TM	2-braid, wire, textile	Hot Oil, Air Return Line	CPE	J	Textile	
FIELD		SAE J1019	MegaTech™ 250	2-braid, wire, textile	Transmission Oil Cooler, Hot Oil, Air Return Line	CPE	J	Textile	
ATTACHABLE		SAE J1402, DOT FMVSS106-74	TR500	2-braid, wire, textile	Petrol & Syn. Fluids, Air Brakes	Nitrile	С	Textile	
C5 COUPLINGS		SAE 100R5, DOT FMVSS106-74, Type All	*C5C	3-braid, T-W-T	Petr. Oil, Air Brake, Power Steering	*Nitrile	С	Textile	-
		SAE J1402, DOT FMVSS106-74, Type All	C5D	3-braid, T-W-T	Petrol & Syn. Fluids, Air Brakes	CPE	J	Textile	_
SURELOK AIR		SAE J1527, SAE J1942, ISO 7840	C5M	1-braid, wire	Marine Fuel & Oil	Nitrile	C	NBR/PVC	C2
BRAKE		DOTFMVSS106-74, Type Al	C5E	3-braid, I-W-I	Air Brake, Power Steering, Lube	Nitrile		l extile	
COUPLINGS		PTFE	014			DIFF			
		SAE 100R14	C14CT	1 - braid, stainless steel	High Temperature, Multi Fluid, Nonconductive	PIFE		Stainless Steel	
		Thermonicotic	01401	1-Dialu, stairliess steel	High Temperature, Multi Fluid, Conductive	FIFE		Stairliess Steel	
QUICK		SAE 100B7	TH7	1-braid polyester	Patrolaum & Synthatic Fluids	Nylon	7	Urethane	
DISCONNECT		SAE 10007	TH7NC/TH7NCDI	1-braid, polyester	Non-conductive	Nylon	7	Urethane	
COUPLERS		SAE 100R7	TH7DL	1-braid, polyester	Petroleum & Synthetic Fluids. Dual Line	Nylon	Z	Urethane	U
		SAE 100R7	TH7NCDL	1-braid, polyester	Non-conductive, Dual Line	Nylon	Z	Urethane	U
		SAE 100R8	TH8	2-braid, Polyester	Petroleum & Synthetic Fluids	Nylon	Z	Urethane	U
NEW BALL		SAE 100R8	TH8NC	2-braid, Polyester	Non-conductive	Nylon	Z	Urethane	U
VALVES		SAE 100R18	TH18	1-band, Synthetic Fiber	Petroleum & Synthetic Fluids	Nylon	Z	Urethane	U
		SAE 100R18	TH18NC	2-band, Synthetic Fiber	Non-conductive	Nylon	Z	Urethane	U
		Refrigerant							
ACCESSORIES		SAE J51 Type All Dimensions/ Type D PerformanceJ2064, Type C, Class II Performance	PolarSeal® AC134a	Nylon barrier, 2-spiral, Polyester	Air Conditioning (R12 and R134a)	Chloroprene	A	EPDM	Р
EQUIPMENT		Power Steering, SAE J2050	PS188	2-braid, Nylon	Power Steering Fluids, High Temperature	Hypalon+	М	Neoprene	A
AND PARTS		PowerClean™	PowerClean™	1 & 2-braid, wire,	Tight Bends, High Flexibility	Nitrile	С	NBR/PVC	C ₂

* -4 and -5 sizes have a Neoprene tube. ** Nitrile or Neoprene + Registered trademark of DuPont.





EQUIPMENT

Gates Hydraulic Hose Selection Guide

	Temp. Dash Size vs. Rated Working Pressure (psi)																
Description	Range (°F)	-2	-3	-4	-5	-6	-8	-10	-12	-16	-20	-24	-32	-40	-48	-56	-64
EFG6K	-40 +250					6,000	6,000	6,000	6,000	6,000	6,000						
EFG5K	-40 +250					5,000	5,000	5,000	5,000	5,000	5,000						
EFG4K	-40 +250					4,000	4,000	4,000	4,000	4,000	4,000						
EFG3K	-40 +250										3,000						
G6K	-40 +250					6,000	6,000	6,000	6,000	6,000	6,000	6,000					
G5K	-40 +250						5,000	5,000	5,000	5,000	5,000	5,000	5,000				
G3K	-40 +250								.,		3.000	3.000	3.000				
C12	-40 +250										.,	2,500	2,500				
62	-40 +212		6 000	5 800		4 800	4 000	3 625	3 100	2 400	1 825	1 300	1 175				
MegaTech™ II	10 1212		0,000	0,000		1,000	1,000	0,020	0,100	2,100	1,020	1,000	.,				
Col	70 . 212			5 900		1 900	4 000	2 625	2 100	2 400	1.925	1 200					
M2T®	10 +212			5,000		4,000	2,500	2,000	2 250	2,400	1,020	1,000					
IVIZ I	-40 +212			0,000		4,000	3,300	3,000	2,230	2,000							
IVIOK.	-40 +212			5,000		5 000	5 000										
ACIVI	-40 +212			5,000		5,000	5,000	4.000	4.000								
1014K+	-40 +212			4,000	0.000	4,000	4,000	4,000	4,000	0.000							
M3K	-40 +212			3,000	3,000	3,000	3,000	3,000	3,000	3,000							
M3KH	-40 +250			3,000		3,000											
G2H	-40 +275										1,650	1,300	1,175				
G2XH	-40 +300									2,500							
G2AT-HMP	-40 +300						4,250	3,500	3,000								
J2AT	-40 +120			10,000		10,000											
G1	-40 +212		3,625	3,275	3,125	2,600	2,325	1,900	1,525	1,275	925	725	600				
G1H	-40 +275			2,750		2,250	2,000	1,500	1,250	1,000	625	725	600				
G3H(C3H)	-40 +275			1,250		1,125	1,000		750	565	375						
GTH(C6H)	-40 +275		500	400	400	400	400	350	300								
G4H	-40 +275								300	212	200						
GMV	-40 +275								350	300	250	162	112	68	62	56	56
RLA	-40 +212		250	250	250	250	200	200	200	160							
RLC	-40 +275									200	200	200	200	150	150	150	
LOC	-40 +212			300		300	300	300	300					ĺ			
LOL	-40 +212		300	300	300	300	300	300	300								
TR500	-40 +250			500		500	500	500	500	500		1					
MegaTech™	-40 +300			1000		1000	1000	1000	1000	1000	1000	500	500	500	500		
MegaTech™ 250	-40 +212			250		250	250	250	250	250	250						
C5C	-40 +212			3,000	3,000	2,250	2,000	1,750	1,500	800	625	500	350	350			
C5D	-40 +300•			1.500	1.500	1.500	1.250	1.250	750	400							
C5M	-40 +212				500	500	500	500	500	500							
C5E	-40 +300•			1 500	1 500	1 500	1 250	1 250	750	400	300						
	10 1000			1,000	1,000	1,000	1,200	1,200	100	100	000						
C14	***			1 500	1 500	1 500	1 000	800	800	800							
C14 (Static)	-62 +72			3,000	3,000	2 500	2 000	1 500	1 200	1 000							
C14CT	***			3,000	3,000	1,500	1,000	1,000	1,200	1,000							
C14CT (Static)	170					2,500	2,000										
CT4CT (Static)	+12					2,300	2,000										
TU7	65 . 200	2 500	2 000	0.750	2 500	2.250	2 000		1.250	1 000							
	-03 +200	2,300	3,000	2,730	2,000	2,230	2,000		1,200	1,000							
TH7NC	-03 +200	2,500	3,000	2,750	2,500	2,250	2,000		1,200	1,000							
TH7DL	-65 +200			2,750	2,500	2,250	2,000										
TH/NCDL	-65 +200			2,750		2,250	2,000										
IH8	-65 +200		5,000	5,000		4,000	3,500		2,250	2,000							
TH8NC	-65 +200		<u> </u>	5,000		4,000	3,500			ļ		ļ					
TH18	-67 +212		<u> </u>	3,000	3,000	3,000	3,000	3,000		ļ		ļ				L	L
TH18NC	-67 +212			3,000	3,000	3,000	3,000	3,000									
PolarSeal® AC134a	-22 +257					500	500	500	500								
PS188	-40 +300					1,500											
PowerClean	-40 +212			3,500		3,000	2,500										
	10 1212			6,000		5,000	4,000										

HOSE/CPLG. Selection
GLOBALSPIRAL Couplings
PCM/PCS Ferrules
MEGACRIMP Couplings
POWER CRIMP COUPLINGS
LOW PRESSURE COUPLINGS
POLARSEAL Couplings
C14 Couplings
PCTS THERMO- PLASTIC COUPLINGS
FIELD ATTACHABLE G1 & G2 COUPLINGS
FIELD ATTACHABLE C5 COUPLINGS
SURELOK AIR BRAKE COUPLINGS
QUICK DISCONNECT COUPLERS
NEW BALL VALVES
ACCESSORIES
EQUIPMENT AND PARTS

*** Dynamic temperatures -65 +400; Static temperatures +73 +450 • All purpose fleet application service - 40°F to +300°F (-40°C to +149°C), air to +250°F



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EQUIPMENT AND PARTS

Additional Temperature Limits for Gates Hydraulic Hoses

Caution: Water, water/oil emulsions and water/glycol solutions must be kept below the temperatures listed in the table below, relative to line pressures.

Hose	Pressure Lines	Return Lines
EFG6K, EFG5K, EFG4K, EFG3K, G6K, G5K, G3K, C12, G2, G2L, MCPB+, M2T®, M6K, M5K, M4K+, M3K, RFS, RLA, C5C, C5E, CPS, LOC, LOL	+200°F (+93°C)	+180°F (+82°C)
G2H, G1H, MegaTech [™] Line, G2AT-HMP, G2XH, C5D, G3H, GTH, G4H, GMV, RLC, TR500, PowerClean [™] , M3KH, M4KH	+225°F (+107°C)	+180°F (+82°C)

Maximum Temperature Limits for Water, Water/Oil Emulsions and Water/Glycol Solutions

Caution: The fluid manufacturer's recommended maximum operating temperature for any given fluid must not be exceeded. If different than the above listed hose temperatures, the lower limit must take precedence. Actual service life at temperatures approaching the recommended limit will depend on the particular application and the fluid being used in the hose. Intermittent (up to 10 percent of operating time) refers to momentary temperature surges. Detrimental effects increase with increased exposure to elevated temperatures.

Do NOT expose hose to maximum temperature and maximum rated working pressure at the same time.



SELECTION, INSTALLATION AND MAINTENANCE OF HOSE AND HOSE ASSEMBLIES— SAE J1273 OCT96 SAE Recommended Practice

Report of the Fluid Conductors and Connectors Technical Committee, approved September 1979 and reaffirmed May 1986. Completely revised by the SAE Fluid Conductors and Connectors Technical Committee SC2— Hydraulic Hose and Hose Fittings October 1996. Rationale statement available.

1. Scope

Hose (also includes hose assemblies) has a finite life and there are a number of factors which will reduce its life. This SAE recommended practice is intended as a guide to assist system designers and/or users in the selection, installation, and maintenance of hose. The designers and users must make a systematic review of each application and then select, install, and maintain the hose to fulfill the requirements of the application. The following are general guidelines and are not necessarily a complete list.

WARNING—IMPROPER SELECTION, INSTALLATION, OR MAINTENANCE MAY RESULT IN PREMATURE FAILURES, BODILY INJURY, OR PROPERTY DAMAGE.

2. References

2.1 Applicable Documents

The following publications form a part of this specification to the extent specified herein. The latest issue of SAE publications shall apply.

2.1.1 SAE PUBLICATIONS — Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

> J516—Hydraulic Hose Fittings J517—Hydraulic Hose

3. Selection

The following is a list of factors which must be considered before final hose selection can be made:

3.1 Pressure

After determining the system pressure, hose selection must be made so that the recommended maximum operating pressure is equal to or greater than the system pressure. Surge pressures higher than the maximum operating pressure will shorten hose life and must be taken into account by the hydraulic designer.

3.2 Suction

Hoses used for suction applications must be selected to ensure the hose will withstand the negative pressure of the system.

3.3 Temperature

Care must be taken to ensure that fluid and ambient temperatures, both static and transient, do not exceed the limitations of the hose. Special care must be taken when routing near hot manifolds.

3.4 Fluid Compatibility

Hose selection must assure compatibility of the hose tube, cover, and fittings with the fluid used. Additional caution must be observed in hose selection for gaseous applications.

3.5 Size

Transmission of power by means of pressurized fluid varies with pressure and rate of flow. The size of the components must be adequate to keep pressure losses to a minimum and avoid damage to the hose due to heat generation or excessive turbulence.

3.6 Routing

Attention must be given to optimum routing to minimize inherent problems.

3.7 Environment

Care must be taken to ensure that the hose and fittings are either compatible with or protected from the environment to which they are exposed. Environmental conditions such as ultraviolet light, ozone, salt water, chemicals, and air pollutants can cause degradation and premature failure and, therefore, must be considered.



C8



HOSE/CPLG. Selection

EQUIPMENT

GLOBALSPIRAL Couplings

PCM/PCS Ferrules

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POWER CRIMP COUPLINGS

low Pressure Couplings

POLARSEAL Couplings

C14 Couplings

PCTS THERMO-PLASTIC

COUPLINGS

FIELD ATTACHABLE G1 & G2

COUPLINGS

ATTACHABLE C5 COUPLINGS

SURELOK AIR Brake Couplings

QUICK DISCONNECT

COUPLERS

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ACCESSORIES

EQUIPMENT

AND PARTS



HOSE/CPLG.

SELECTION

GLOBALSPIRAL

COUPLINGS

PCM/PCS

FERRULES

MEGACRIMP COUPLINGS

POWER

CRIMP

LOW

COUPLINGS

PRESSURE

COUPLINGS

POLARSEAL

COUPLINGS

COUPLINGS

C14

PCTS

THERMO-

COUPLINGS

PLASTIC

Field Attachable

G1 & G2

FIELD Attachable

C5

COUPLINGS

COUPLINGS

SURELOK AIR

COUPLINGS

BRAKE

QUICK DISCONNECT

COUPLERS

NEW BALL VALVES

ACCESSORIES

FOUIPMENT

AND PARTS

Hose & Coupling Section

3.8 Mechanical Loads

External forces can significantly reduce hose life. Mechanical loads which must be considered include excessive flexing, twisting, kinking, tensile or side loads, bend radius, and vibration. Use of swivel type fittings or adapters may be required to ensure no twist is put into the hose. Unusual applications may require special testing prior to hose selection.

3.9 Abrasion

While a hose is designed with a reasonable level of abrasion resistance, care must be taken to protect the hose from excessive abrasion which can result in erosion, snagging, and cutting of the hose cover. Exposure of the reinforcement will significantly accelerate hose failure.

3.10 Proper End Fitting

Care must be taken to ensure proper compatibility exists between the hose and coupling selected based on the manufacturer's recommendations substantiated by testing to industry standards such as SAE J517. End fitting components from one manufacturer are usually not compatible with end fitting components supplied by another manufacturer (i.e., using a hose fitting nipple from one manufacturer with a hose socket from another manufacturer). It is the responsibility of the fabricator to consult the manufacturer's written instruction or the manufacturer directly for proper end fitting componentry.

3.11 Length

When establishing proper hose length, motion absorption, hose length changes due to pressure, as well as hose and machine tolerances must be considered.

3.12 Specifications and Standards

When selecting hose, government, industry, and manufacturers' specifications and recommendations must be reviewed as applicable.

3.13 Hose Cleanliness

Hose components vary in cleanliness levels. Care must be taken to ensure that the assemblies selected have an adequate level of cleanliness for the application.

3.14 Electrical Conductivity

Certain applications require that hose be non-conductive to prevent electrical current flow. Other applications require the hose to be sufficiently conductive to drain off static electricity. Hose and fittings must be chosen with these needs in mind.

4. Installation

After selection of proper hose, the following factors must be considered by the installer.

4.1 Pre-Installation Inspection

Prior to installation, a careful examination of the hose must be performed. All components must be checked for correct style, size, and length. In addition, the hose must be examined for cleanliness, I.D. obstructions, blisters, loose cover, or any other visible defects.

4.2 Follow Manufacturers' Assembly Instructions

Hose assemblies may be fabricated by the manufacturer, an agent for or customer of the manufacturer, or by the user. Fabrication of permanently attached fittings to hydraulic hose requires specialized assembly equipment. Field-attachable fittings (screw style and segment clamp style) can usually be assembled without specialized equipment, although many manufacturers provide equipment to assist in this operation. SAE J517 hose from one manufacturer is usually not compatible with SAE J516 fittings supplied by another manufacturer. It is the responsibility of the fabricator to consult the manufacturer's written assembly instructions or the manufacturers directly before intermixing hose and fittings from two manufacturers. Similarly, assembly equipment from one manufacturer is usually not interchangeable with that of another manufacturer. It is the responsibility of the fabricator to consult the manufacturer's written instructions or the manufacturer directly for proper assembly equipment. Always follow the manufacturer's instructions for proper preparation and fabrication of hose assemblies.

4.3 Minimum Bend Radius

Installation at less than minimum bend radius may significantly reduce hose life. Particular attention must be given to preclude sharp bending at the hose/ fitting juncture.



4.4 Twist Angle and Orientation

Hose installations must be such that relative motion of machine components produces bending of the hose rather than twisting.

4.5 Securement

In many applications, it may be necessary to restrain, protect, or guide the hose to protect it from damage by unnecessary flexing, pressure surges, and contact with other mechanical components. Care must be taken to ensure such restraints do not introduce additional stress or wear points.

4.6 Proper Connection of Ports

Proper physical installation of the hose requires a correctly installed port connection while ensuring that no twist or torque is put into the hose.

4.7 Avoid External Damage

Proper installation is not complete without ensuring that tensile loads, side loads, kinking, flattening, potential abrasion, thread damage, or damage to sealing surfaces are corrected or eliminated.

4.8 System Check Out

After completing the installation, all air entrapment must be eliminated, and the system pressurized to the maximum system pressure and checked for proper function and freedom from leaks.

NOTE-Avoid potential hazardous areas while testing.

5. Maintenance

Even with proper selection and installation, hose life may be significantly reduced without a continuing maintenance program.

Frequency should be determined by the severity of the application and risk potential. A maintenance program should include the following as a minimum:

5.1 Hose Storage

Hose products in storage can be affected adversely by temperature, humidity, ozone, sunlight, oils, solvents, corrosive liquids and fumes, insects, rodents, and radioactive materials. Storage areas should be relatively cool and dark and free of dust, dirt, dampness, and mildew.

5.2 Visual Inspections

Any of the following conditions requires replacement of the hose:

- a. Leaks at fitting or in hose. (Leaking fluid is a fire hazard.)
- b. Damaged, cut, or abraded cover. (Any reinforcement exposed.)
- c. Kinked, crushed, flattened, or twisted hose.
- d. Hard, stiff, heat cracked, or charred hose.
- e. Blistered, soft, degraded, or loose cover.
- f. Cracked, damaged, or badly corroded fittings.
- g. Fitting slippage on hose.

5.3 Visual Inspections

The following items must be tightened, repaired, or replaced as required:

- a. Leaking port conditions.
- b. Clamps, guards, shields.
- c. System fluid level, fluid type, and any air entrapment.

5.4 Functional Test

Operate the system at maximum operating pressure and check for possible malfunctions and freedom from leaks.

NOTE-Avoid potential hazardous areas while testing.

5.5 Replacement Intervals

Specific replacement intervals must be considered based on previous service life, government or industry recommendations, or when failures could result in unacceptable down time, damage, or injury risk.

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FERRULES

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COUPLINGS

POWER

CRIMP

LOW

COUPLINGS

PRESSURE

COUPLINGS

POLARSEAL

COUPLINGS

COUPLINGS

C14

PCTS

THERMO-

COUPLINGS

ATTACHABLE

COUPLINGS

ATTACHABLE C5 COUPLINGS

SURELOK AIR

COUPLINGS

BRAKE

QUICK DISCONNECT

COUPLERS

NFW BALL

ACCESSORIES

FOUIPMENT

AND PARTS

VALVES

PLASTIC

FIELD

G1 & G2

FIELD

Hose & Coupling Section

DOT FMVSS 106-74

MOTOR VEHICLE SAFETY STANDARD FOR BRAKE HOSES

Gates has received an increasing number of inquiries about the Department of Transportation (DOT) regulation FMVSS-106 regarding air brake hose. The requirements of the standard were issued by the National Highway Traffic Safety Administration and are published in the Federal Register, 49 Code of Federal Regulations, Part 571. MVSS 106 Brake Hoses.

NOTE: Anyone making brake assemblies must be registered with the Department of Transportation.

What is FMVSS-106?

The standard is written with specifics on labeling, performance tests, tests procedures, and registration. It is not a standard for design specifications for motor vehicle brake hose, brake hose assemblies, or brake hose end fittings. The Standard No. 106 will ensure that each user of brake hose will be supplied only the highest quality of hose. DOT will conduct random performance testing in accordance with the test procedures to ensure that the hoses, couplings, and assemblies meet FMVSS 106.

"The purpose of the standard is to reduce deaths and injuries occurring as a result of brake system failure from pressure or vacuum loss due to hose or hose assembly rupture." The regulations will apply to all over-the-road vehicles including trailers and motorcycles. Off-the-road vehicles will not be regulated if they are designed to operate on those other than public roads.

Basic Provisions of FMVSS-106.

- 1. Three types of brake hose are covered (hydraulic, air, and vacuum brake) together with couplings and hose assemblies. At this point, we will only focus on air brake hose and assemblies.
- 2. Performance level for brake hose is established instead of design specifications.
- **3.** Permanent as well as reusable fittings are permissible with air brake hose. Inside and outside diameters standards for air brake hose intended for use with field attachable couplings have been established. These hoses are identified as Type I and Type II.

Gates Customer/Assembler with Regard to FMVSS-106.

1. Test (dimensional and pressure) each assembly or per customer's requirements before it is packaged and delivered to the customer.

2. Two of every 100 air brake hose assemblies produced or per customer's requirements are subjected to hydrostatic pressure testing and tensile strength (destructive) testing.

Labeling of Air Brake Hose.

Any customer crimping air brake assemblies must be registered with the National Traffic Safety Administration (NHTSA).

The National Highway Traffic Safety Administration (NHTSA) requires:

- 1. Product DOT CERTIFICATION. (Gates Corporation responsibility. The Gates logo is our DOT registration.)
- 2. Registration of the assembler. (Customer/Distributor responsibility.)*
- **3.** Permanent assembly identification. (Customer/ Distributor responsibility.) Refer to Gates frosted air brake hose labels below.

* To begin the registration process, please complete the BRAKE HOSE REGISTRATION application form on the following page. You can mail or fax the completed form to the address and number listed on the form.

Frosted Air Brake Hose Labels

Product Number: 7484-0023

To assist you in complying with the NHTSA requirement for identifying brake hose assemblies, Gates now offers mylar hose labels.

- Self-adhesive
- 1" wide by 3-3/4" long, with a 1-1/2" by 1" white area on one end for printed information
- Format suitable for typewriters, computer printers or hand writing
- Accepts 9-10 typed characters per row, 4 or 5 on a row
- Wrap-around label resists damage from elements

Label application procedure:

- **1.** Print appropriate information on label.
- **2.** Wrap tag around hose assembly, printed end first.
- **3.** Cover printed end with clear mylar tail of label.

Comes in 500 labels per pack.





Gates Corporation





	EQUIPMENT
Brake Hose Registration Application "PLEASE TYPE or PRINT CLEARLY" AND SUBMIT BRAKE HOSE APPLICATION TO: JEANETTE GREENFIELD AT THE FOLLOWING NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION (NHTSA) ADDRESS:	HOSE/CPLG. Selection
Jeanette Greenfield	GLOBALSPIRAL COUPLINGS
Office of Vehicle Safety Compliance 400 Seventh Street, S.W. NSA-32 Washington, DC 20590	PCM/PCS FERRULES
Phone (202) 366-5317 Fax (202) 366-1024 www.nhtsa.dot.gov	MEGACRIMP Couplings
DATE:	POWER CRIMP COURLINGS
BRAKE HOSE MANUFACTURER'S ADDRESS	
Plant Name:	
Post Office Box No.:	COUPLINGS
Street:	POLARSEAL
City:	COUPLINGS
* DESIGNATION SYMBOL(s):	C14
State (Province):	COUPLINGS
Country:	PCTS
Zip Code:	THERMO- PLASTIC
Plant Contact Person:	COUPLINGS
Phone Number:	FIELD
Fax Number:	G1 & G2 COUPLINGS
** (COMPLETE ONLY IF THIS IS A FOREIGN MANUFACTURER) BRAKE HOSE MANUFACTURER'S US AGENT	FIELD
Agent Name:	ATTACHABLE C5
Post Office Box No.:	COUPLINGS
Street:	SURELOK AIR
City:	BRAKE COUPLINGS
State:	
Country:	QUICK DISCONNECT
Zip Code:	COUPLERS
Agent Contact Person:	NEW BALL
Agent Fax Number:	VALVEO
Agent Phone Number:	ACCESSORIES
* DESIGNATION SYMBOL(s): May consist of block capital letters, numerals or a symbol.	EQUIPMENT AND PARTS





EQUIPMENT

HOSE/CPLG. SELECTION

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COUPLINGS

PCM/PCS Ferrules

MEGACRIMP COUPLINGS

Power Crimp Couplings

LOW Pressure Couplings

POLARSEAL COUPLINGS

C14 Couplings

PCTS THERMO-PLASTIC COUPLINGS

FIELD Attachable G1 & G2 Couplings

FIELD Attachable C5 Couplings

SURELOK AIR BRAKE COUPLINGS

QUICK DISCONNECT COUPLERS

NEW BALL VALVES

ACCESSORIES

EQUIPMENT AND PARTS

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How to Make Hose Assemblies of Specific Lengths

Select the hose and couplings required to make the desired hydraulic assembly. Measure the entire length of the assembly. Then use the formula below to calculate the required hose cut length for the assembly.

Hose Cut Length = Assembly Overall Length Minus C1 Minus C2

Cut-off value "C" is the length of that part of the coupling not directly in contact with or applied to the hose. Therefore, subtract the two "C" values from the total length of the assembly and you will have the approximate hose length to be replaced. Assembly Overall Length



Hose Length = Assembly Overall Length Minus (C1 + C2)

Example: Total assembly overall length = 12.5"

(Assembly consists of 3/8" G1 hose with 1/2" Male Pipe (6G-8MP) and 3/8" Female JIC (6G-6FJX) terminations)

Assembly Overall Length – C1 – C2 = Hose Cut Length 12.5" – 1.36 – 1.19 = 9.95" (+/- 3/16" tolerance)

Note the "cut-off" measurement "C" for each of the couplings as listed in the specifications tables.

Male Pipe (NPTF - 30° Cone Seat)

Desc	#		Θ	Ð	H1 (ln.)	L (In.)	C (In.)
4G-2MP	G25100-0402	7100-10025	1/4	1/8—27	1/2	1.97	0.94
4G-4MP	G25100-0404	7100-10032	1/4	1/4—18	9/16	207	1.04
4G-6MP	G25100-0406	7100-10045	1/4	3/8—18	11/16	2.13	1.10
4G-8MP	G25100-0408	7100-10055	1/4	1/2—14	7/8	2.40	1.38
5G-4MP	G25100-0504	7100-00065	5/16	1/4—18	5/8	2 28	1.18
6G-4MP	G25100-0604	7100-10075	3/8	1/4—18	5/8	2.28	1.19
6G-6MP	G25100-0606	7100-10085	3/8	3/8—18	11/16	2.19	1.09
6G-8MP	G25100-0608	7100-10095	3/8	1/2—14	7/8	2.46	1.36
8G-6MP	G25100-0806	7100-00105	1/2	3/8—18	13/16	2.60	.12



Female JIC 37° Flare Swivel

Desc	#		Θ	Ð	H1 (ln.)	H2 (In.)	L (In.)	C (In.)
4G-4FJX	G25170-0404	7100-10885	1/4	7/16—20	1/2	9/16	2.10	1.08
4G-5FJX	G25170-0405	7100-10895	1/4	1/2—20	1/2	11/16	2.21	1.19
4G-6FJX	G25170-0406	7100-10905	1/4	9/16—18	9/16	3/4	2.22	1.19
5G-5FJX	G25170-0505	7100-00915	5/16	1/2—20	5/8	11/16	2.23	1.13
5G-6FJX	G25170-0506	7100-00925	5/16	9/16—18	5/8	3/4	2.31	1 21
6G-4FJX	G25170-0604	7100-10925	3/8	7/16—20	5/8	9/16	2.30	1.20
6G-5FJX	G25170-0605	7100-10935	3/8	1/2—20	5/8	11/16	2.23	1.13
6G-6FJX	G25170-0606	7100-10945	3/8	9/16—18	5/8	3/4	2.31 🤇	1.19
6G-8FJX	G25170-0608	7100-10955	3/8	3/4—16	11/16	7/8	2.48	1.38



SAE Length Tolerances for Hydraulic Hose Assemblies and Specified Hose Lengths (Reprinted from National Hose Assemblies Manufacturers Association NHAM-STD-2)

Length

For cut lengths from 0 up to and including 12" For cut lengths above 12" up to and including 18" For cut lengths above 18" up to and including 36" For cut lengths above 36"

Tolerance

+ 1/8" + 3/16"

÷ 1/4"

+ 1% of length measured to the nearest 1/8"



Gates Corporation







EQUIPMENT

How to Describe Gates Hydraulic Hose Assemblies - con't. HOSE/CPLG. SELECTION -ſH GLOBALSPIRAL COUPLINGS **Coupling A Information Coupling B Information** Hose Type PCM/PCS FERRULES Male Female Gates ____ __ I.D. ___ Male Female or Angle _____° Drop: OS OM OL OXL Angle _____° Drop: OS OM OL OXL SAE 100R MEGACRIMP COUPLINGS or Drop Length____ (mm) or Drop Length____ (mm) **Dash Size:** Thread Thread $\square 2 \square 3$ 4 5 6 POWER 8 10 12 16 20 CRIMP JIC (37° Flare) JIC (37° Flare) COUPLINGS 40 48 24 32 56 NPTF □ NPTF 64 LOW O-Ring Boss O-Ring Boss Temperature _____ PRESSURE COUPLINGS Working Pressure (psi): Flat-Face O-Ring Flat-Face O-Ring (ORFS) 100 (ORFS) 101-250 POLARSEAL COUPLINGS 250-499 500-1000 Code 61 Code 61 1001-2999 3000-3999 4000-5999 6000 C14 Code 62 Code 62 COUPLINGS Application BSPP BSPP Return Line Pressure Line PCTS DIN (Light/Heavy) DIN (Light/Heavy) Intake Line High Pressure Line THERMO-PLASTIC Special Fluid _ Other Other COUPLINGS FIELD Overall **Hose Guards** ATTACHABLE In. Imm Length G1 & G2 COUPLINGS Full Partial From End Coupling Length Length of Coupling Orientation: Wire Spring FIELD ATTACHABLE C5 COUPLINGS 225 180 SURELOK AIR Flat Armor Spring BRAKE 270° COUPLINGS OLIICK DISCONNECT **Nylon Sleeve** COUPLERS Measure from centerline of flanged head to centerline of flanged head NEW BALL for length of assembly. VALVES **Plastic Coil Sleeve** Offset angle is measured with far coupling vertically downward. ACCESSORIES Orientation angle is measured clockwise. FOUIPMENT AND PARTS

C15

Gates Corporation



Hose Assembly Routing Tips

Proper hose installation is essential for satisfactory performance. If hose length is excessive, the appearance of the installation will be unsatisfactory and unnecessary cost of equipment will be involved. If hose assemblies are too short to permit adequate flexing and changes in length due to expansion or contraction, hose service life will be reduced.

The following diagrams show proper hose installations which provide maximum performance and cost savings. Consider these examples in determining length of a specific assembly.



When hose installation is straight, allow enough slack in hose line to provide for length changes which will occur when pressure is applied.



Adequate hose length is necessary to distribute movement on flexing applications and to avoid abrasion.



Avoid twisting of hose lines bent in two planes by clamping hose at change of plane.



Reduce number of pipe thread joints by using hydraulic adapters instead of pipe fittings.



When radius is below the required minimum, use an angle adapter to avoid sharp bends.





Use proper angle adapters to avoid tight bend in hose.





Prevent twisting and distortion by bending hose in same plane as the motion of the port to which hose is connected.





Route hose directly by using 45° and/or 90° adapter and fittings. Avoid excessive hose length to improve appearance.



Note: To allow for length changes when hose is pressurized, do not clamp at bends so that curves will absorb changes. Do not clamp high and low pressure lines together. SELECTION GLOBALSPIRAL COUPLINGS PCM/PCS FERRULES MEGACRIMP COUPLINGS

EQUIPMENT

HOSE/CPLG.

POWER CRIMP COUPLINGS

low Pressure Couplings

POLARSEAL Couplings
C14 Couplings
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FIELD ATTACHABLE G1 & G2 Couplings
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Hose Assembly Routing Tips - con't.

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POWER CRIMP COUPLINGS

LOW PRESSURE COUPLINGS

POLARSEAL COUPLINGS

C14 COUPLINGS

PCTS THERMO-PLASTIC COUPLINGS

FIELD ATTACHABLE G1 & G2 COUPLINGS

FIFI D ATTACHABLE C5 COUPLINGS

SURELOK AIR BRAKE COUPLINGS

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FOUIPMENT



High ambient temperatures shorten hose life, so make sure hose is kept away from hot parts. If this is not possible, insulate hose.



To avoid hose collapse and flow restriction, keep hose bend radius as large as possible. Refer to hose specification tables for minimum bend radius.



When installing hose, make sure it is not twisted. Pressure applied to a twisted hose can result in hose failure or loosening of connections.



Elbows and adapters should be used to relieve strain on the assembly, and to provide neater installations which will be more accessible for inspection and maintenance.



Run hose in the installation so that it avoids rubbing and abrasion. Often, clamps are required to support long hose runs or to keep hose away from moving parts. Use clamps of the correct size. A clamp too large allows hose to move inside the clamp and causes abrasion.

Hydraulic Flareless Assembly Procedure (per SAE J514 6.1.3 & 6.1.4)

- 1. Bottom the tube in the coupling, and tighten the nut until the ferrule just grips the tube. With a little experience, the technician can determine this point by feel. If the couplings are bench assembled, the gripping action can be determined by rotating the tube by hand as the nut is drawn down. When the tube can no longer be turned by hand, the ferrule has started to grip the tube.
- 2. After the ferrule grips the tube, tighten the nut one full turn. This may vary slightly with different tubing materials, but for general practice, it is a good rule for the technician to follow.

 λa

Put socket in vise as

Put socket in vise as shown. Turning counter-clockwise, thread hose into socket. Leave a gap of 1/32" to 1/16" betweer end of hose and inside shoulder of socket.

2.

Oil insert thread on з. nipple thoroughly

Assembly of Field Attachable Couplings — Five Easy Steps







5 Inspect assembly internally for cut or bulged tube obstructions and cleanliness.

AND PARTS

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Be sure to thoroughly oil hose.





Coupling Selection

End Configuration Selection

It is important to keep in mind that the hose assembly (coupling and hose) is only one component of the system. In choosing the correct end terminations for the couplings attached to the hose, formal design standards and sound engineering judgement should be used.

In the absence of formal design standards, consider the following factors in choosing the proper end termination:

- Pressure
- Impulse frequency, amplitude and wave form
- Vibration
- Corrosion
- Dissimilar metals (galvanic corrosion)
- Maintenance procedures and frequency
- Installation reliability
- Connection's risk in the system
- Exposure to the elements
- Operator's and/or bystander's exposure to the connection
- Installation, operation and service activities and practices that affect safety

If there are any questions as to what end fittings should be used, Gates recommends that you consult your field sales representative or the Gates Hose and Connector Product Application Group for assistance.

Stem and Ferrule Selection

Choosing the proper stem and ferrule depends on the specific hose and termination to be used in the assembly. Check the Gates Crimp Data manual to ensure proper hose assembly components and crimp specifications. Gates also offers eCrimp[™], an online crimp database that can be downloaded. The site is www.gates.com/ecrimp. The user must have Microsoft Access 2000.

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After determining the proper coupling components, refer to the Table of Contents in this catalog to find the proper coupling section. The ferrules are at the end of each coupling section.

Stem Selection

Different hoses may require different coupling styles. To make your selection, determine the correct stem to be used.

- There are two functional ends of the stem to consider:
- 1. the hose end for hose attachment;
- 2. the thread end for port attachment.



References to the coupling type(s) recommended for a specific hose are listed on the individual hose data pages; for example, G5K hose specifies GS and PCM couplings.

The thread end of a coupling (or adapter) can be identified by comparing the coupling being replaced or by measuring the port or thread end to which it is to be attached.

See thread end identification nomenclature.



EQUIPMENT

HOSE/CPLG. SELECTION

GLOBALSPIRAL COUPLINGS

PCM/PCS FERRULES

MEGACRIMP COUPLINGS

POWER CRIMP COUPLINGS

LOW PRESSURE COUPLINGS Code

А

AB

API

BBDS

BKHD

BSPP

BSPT

В

ΒJ

ΒL

BS

С

CC

DH

DL

FABX

FBO

FFGX

FFN

FOR

FFS

FG

FKX

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POLARSEAL COUPLINGS

C14 COUPLINGS

PCTS THERMO-PLASTIC COUPLINGS FIELD ATTACHABLE G1 & G2

COUPLINGS

FIELD ATTACHABLE C5 COUPLINGS SURELOK AIR BRAKE COUPLINGS

OLIICK DISCONNECT COUPLERS NEW BALL VALVES ACCESSORIES

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Coupling Selection - con't.

Coupling and Adapter End Style Nomenclature

Gates couplings feature a meaningful description by combining end-style codes shown below that make thread end identification fast and easy. Always refer to Gates Crimp Data Charts when selecting hose and coupling combinations.

In the following example, the Gates description 12GS-12FJX90L identifies a GlobalSpiral[™] Female JIC Swivel 90° Bend Long Drop coupling for -12 (3/4") hose size and -12 (3/4") stem size.



Description	Code	Description
Adapterless	LH	Long Hex
Air Brake	LN	Lock Nut
API Unions	Μ	Male
Brass	MB	Male Boss
British Bonded Seal	MBAX	Male Boss Adapterless Swivel
Banjo	MBDS	Metric Bonded Seal
Bulkhead	MFA	Male Flareless Assembly (Ermeto)
Block	MFG	Male French GAZ
Bite Sleeve	MKB	Metric Kobelco
British Standard Pipe Parallel	MM	Metric Male
British Standard Pipe Tapered	MN	Metric Nut
Caterpillar Flang	MPG	Male Special Grease Fitting
Clamping Collar	MPLN	Male Pipe Long Nose
DIN Heavy	MLSP	Metric Light Stand Pipe
DIN Light	MSP	Metric Stand Pipe
Female	NASP	North American Stand Pipe
Female Air Brake Swivel	OR	O-Ring
Female British Flat-Face O-Ring	Р	Pipe Thread (NPTF or NPSM)
Female Braze-on Stem	PL	Press Lok®
Flat-Face	PT	Port
Female French GAZ Swivel	PWX	Pressure Washer Swivel
(Female Kobelco)	QLD	Quick-Lok® Direct
Female Flareless Nut	QHD	Quick-Lok® High
Flat-Face O-Ring	R	Field Attachable
Female Flareless Sleeve	S	SAE (45° Flare)
Female Grease Thread	SP	Special
Female Komatsu Style Swivel	SS	Stainless Steel
Code 61 O-Ring Flange	TS	Tube Sleeve
Caterpillar Style O-Ring Flange	TSN	Tube Sleeve Nut
Code 62 O-Ring Flange Heavy	Х	Swivel
Flange O-Ring Special	Z	Parker Triple Thread
Female SAE Tube	22	22-1/2° Bent Tube Angle
Hose Length Extender	30	30° Bent Tube Angle
Hose Length Extender (Caterpillar)	45	45° Bent Tube Angle
Hose Mender	60	60° Popt Tubo Apolo
Hammer Union	67	67 1/08 Dept Tube Angle
Inverted Flare	ю/ 00	0/-1/2 Bent Tube Angle
JIC (37° Flare)	90	90 Dent Tube Angle
Japanese Industrial Standard	110	
Komatsu Style (Japanese 30° Seat)	135	135 Bent Tube Angle



Coupling Selection – continued

Thread End Dash Sizes, Descriptions and Dimensions

Coupling Dash Size and End Style

Coupling dash size is a shorthand method of denoting the size of a particular end fitting (see Thread Chart).

- EXAMPLE: 12MP denotes a 3/4" male pipe thread end fitting. The corresponding thread description for a 3/4" pipe thread is 3/4 -14 NPTF solid male.
- EXAMPLE: 12FJX denotes a 3/4" female JIC swivel (37° seat) end fitting. The corresponding thread description for a 3/4" JIC thread is 1-1/16 12 JIC 37° flare swivel female.
- EXAMPLE: 12FL denotes a 3/4" SAE standard pressure (Code 61) flange fitting. This is the standard fitting description for a 3/4" SAE standard pressure flange.

Termination Drop Lengths

Bent tube couplings carry a suffix designation that specifies the degree of bend and the length of the drop.

For example, a **12FJX90S** is a female JIC swivel with a 90 degree bend. The "S" designates an SAE J516 short drop length. The short and long drops are specified in SAE J516. Flat-face and metric couplings meet ISO-12151-1 drop length specifications. Medium drops are not specified and can vary from manufacturer to manufacturer.

- ${f S}$ Short Drop
- M Medium Drop
- L Long Drop
- XL Extra Long Drop

Special, non-industry standard drop lengths are designated with a numerical suffix instead of the S,M,L code. For example, a **12FJX90-075** designates a 75mm drop.

SAE J516 Drop Length Specifications

JIC 37°, Code 61, Code 62

Hose Size	Short Drop (mm)	Long Drop (mm)
-4	17.3	45.7
-6	21.6	55.4
-8	27.7	61.7
-10	31.2	65.3
-12	46.2	94.7
-16	54.4	110.0

ISO 12151-1 Drop Length Specifications Flat-Face O-Ring

Hose Size	Short Drop (mm)	Medium Drop (mm)	Long Drop (mm)
-4	20.8	32.0	45.7
-6	22.9	38.0	54.1
-8	29.2	41.0	63.8
-10	32.3	46.0	70.1
-12	47.8	58.0	96.0
-16	56.1	71.0	114.3
-20	63.8	78.0	129.3
-24	68.6	86.0	140.7
-32	88.0	140.0	222.0

Thread End Catalog Descriptions

Gates coupling ends shown on the following pages are accepted as industry standards. See detailed catalog listings for availability of specific hose/coupling combinations, detailed descriptions, thread end configurations such as swivels and bent tubes and special ends.

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GLOBALSPIRAL Couplings
PCM/PCS Ferrules
MEGACRIMP Couplings
POWER CRIMP COUPLINGS
LOW PRESSURE COUPLINGS
POLARSEAL Couplings
C14 Couplings
PCTS THERMO- PLASTIC COUPLINGS
FIELD ATTACHABLE G1 & G2 COUPLINGS
FIELD ATTACHABLE C5 COUPLINGS
SURELOK AIR Brake Couplings
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FIELD Attachable C5 Couplings

SURELOK AIR Brake Couplings

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Equipment And Parts **Sealing Types for Hydraulic Couplings**

When identifying hydraulic couplings, it is important to identify the type of seal made. There are three major types of coupling interfaces used in hydraulics today: Thread Interface, O-Rings and Mated Angle or Mechanical Joint. These three interfaces have developed differently in different parts of the world. In the following pages, country of origin and the coupling styles found in each country are identified. Brief descriptions and dimensional data help identify your particular coupling style.

Identifying couplings is as easy as 1-2-3!

1. Determine Seal Type.

- Thread Interference
 - O-Ring
 - Mated Angle or Mechanical Joint
 - Mated Angle with O-Ring

Thread Interference. A characteristic of this thread is that the male is thinner at the front than it is at the back. As the male is threaded into the female, the edges of the thread distort by flattening out. This distortion creates the seal.

O-Ring. The O-ring on the male being compressed against the corresponding female makes this seal. This type of seal is excellent for high-pressure applications. The threads pull the fitting against the port, trap the O-ring and flatten it to form a tight seal.

Mated Angle or Mechanical Joint. Different angles are used to create the seal. The seal takes place where the two angles meet and are wedged into one another. These can be cut with the angle either being inverted or standard. Standard seat couplings have the nose angle of the male on the outer surface of the coupling. Inverted seat couplings contain the nose angle of the male on the inside bore of the coupling.

Mated Angle with O-Ring. These couplings are a hybrid, which use both the mated angle and the O-ring to make the seal.

2. Visual Identification.

Thread Interference. These are the easiest because the only factor here is whether the termination is male or female. Couplings that use this seal are:



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Center Lines Are Parallel Center Lines At An Angle Using the seat gauge, determine the angle of the seat, as illustrated. When the centerlineof the seat gauge extends parallel with the projected longitudinal axis of the coupling, then the angles of Righ Wrong the gauge and seat match. NOTE: Thread binding will occur when DIN 24° JIC 37 different thread configurations are used.

3. Measure Threads.

DO NOT mix thread configurations.

Because some couplings have very similar characteristics, the only way to determine the correct identification is by measuring the thread. Follow the procedure below when measuring coupling threads:

Read "In"



With the caliper measure the thread diameter of the largest point. (Outside diameter (O.D.) of male threads-Inside Diameter (I.D.) of female threads.)



Using the thread gauge, determine the number of threads per inch. Comparison of gauge and coupling threads against a lighted background will ensure an accurate reading.

Match the measurements taken above against those in the following tables that appear to be similar to the coupling under consideration.

Gates provides many useful tools to assist you in identifying the right coupling!



Coupling/Thread Identification Tools

Hydraulic Coupling Templates

Industrial Advertising Number: 39549

These templates provide a fast and easy way to measure North American threads, International threads, flange ends, seat angles (37° and 45°) and hose I.D.

Stainless Steel Digital Caliper

Product Number: 7369-0322

Caliper features an easy-to-read LCD screen clearly displaying the crimp diameter digitally. Capable of four-way measurement: inside, outside, depth and step. Constructed of hardened stainless steel and comes in a handy, protective carrying case.

International Thread Identification Kit

Product Number: 7369-0319

A sturdy, attractive carrying case suitable for counter display and field sales calls. Contains male metric and BSP plugs for identifying thread size, pocket thread I.D. kit, and flow chart with step-by-step instructions. For female thread identification, simply couple with the mating male.

Pocket Thread Identification Kit

Product Number: 7369-4318

To properly identify the correct replacement couplings, the measuring tools shown here should be used.

Contents:

Calipers Seat Gauges (English) Seat Gauges (Metric) Thread Gauges Thread I.D. Guide.



EQUIPN	IENT	
HOSE/C Select	PLG. Ton	
GLOBALS COUPLIN	spiral Igs	
PCM/P(Ferrul	CS LES	
Megac Coupli	RIMP NGS	
POWER CRIMP COUPLI	NGS	
LOW		



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FIELD Attachable G1 & G2 Couplings

FIELD Attachable C5 Couplings

SURELOK AIR Brake Couplings

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Thread Chart

For All Hose I.D.'s Except C5 Series, C14 and AC134a.

Komatsu		MDH M16	MDL M10X1.0 M12X1.5 M14X1.5 M16	METRIC (mm) 8 10 12 14 1	Copper/Nylon Air Brake Thread 7/10-24 17/20	Japanese Flare Thread 1/8-28 1/4-19 3/8-	Japanese Pipe Tapered Thread 1/6-28 1/6-19 3/6-	BSPT Thread 1/8-28 1/4-19 3/8-	BSPP Thread 1/8-28 1/4-19 3/8-	Code 62 Flange Head O.D.	Code 61 Flange Head O.D.	$\begin{array}{c} \text{Compression} \\ \text{Thread} & \$_{to-24} & \$_{to-24} & \imath_{to-24} & \imath_{z-24} & \$_{to-24} \\ \end{array}$	Inverted Flare Thread ¾-28 ¾-24 ¼-20 ‰	Flat-Face Thread 9/16-18 11/16	$\begin{array}{llllllllllllllllllllllllllllllllllll$	SAE 45° Flare Thread ¾re-24 ¾re-24 ¾re-20 ¾re-20 ⅔re-	JIC 37° Flare Thread ⁵ / ₁₆ -24 ³ / ₈ -24 ⁷ / ₁₆ -20 ⁹ / ₁₆ -	NPSM Swivel Thread 1/s-27 1/s-18 3/s-	NPTF Pipe Thread 1/6-27 1/4-18 3/6-	DASH SIZE 2 3 4 5 6
	M18X1.5	5 M18X1.5	5 M18X1.5	18								⁵ /8-24	11/16-18			¹¹ / ₁₆ —16				7
M20X1.5		M20X1.5		20	11/16-20	¹ / ₂ -14	1/2-14	1/2-14	1/2-14	1.25	1.19	11/16-20	^{3/4-18}	13/16-16	3/4-16	3/4-16	3/4-16	1/2-14	1/2-14	œ
	M22X1.5		M22X1.5	22	13/16-18	⁵ /8-14	⁵ /8-14	5/8-14	5/8-14		1.335	13/16-18	⁷ /8-18	1-14	⁷ /8-14	⁷ /8-14	⁷ /8-14			10
M24X1.5	M24X1.5	M24X1.5		24	1-18	3/4-14	3/4-14	3/4-14	3/4-14	1.62	1.50	1-18	11/16-16	13/16-12	11/16-12	11/16-14	11/16-12	3/4-14	3/4-14	12
			M26X1.5	26											13/16-12		13/16-12			14
M30X1.5	M30X1.5	M30X2.0	M30X2.0	30		1-11	1-11	1-11	1-11	1.88	1.75			17/16-12	15/16-12		15/16-12	1-111/2	1-111/2	16
	M33X1.5			ය		11/4-11	11/4-11	11/4-11	11/4-11	2.12	2.00			111/16-12	15/8-12		15/8-12	11/4-111/2	11/4-111/2	20
M36X1.5	M36X1.5	M36X2.0	M36X2.0	36		11/2-11	11/2-11	11/2-11	11/2-11	2.50	2.38			2-12	17/8-12		17/8-12	11/2-111/2	11/2-111/2	24
	M42X1.5	M42X2.0		42		2-11	2-11	2-11	2-11	3.12	2.81				21/2-12		21/2-12	2-111/2	2-111/2	32
M45X1.5		M45X2.0	M45X2.0	45							3.31						3-12		21/2-8	40
M52X1.5		M52X2.0	M52X2.0	52							4.00						31/2-12		3-8	48

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Coupling Identification

There are five coupling systems generally used for hydraulic connections today. They are identified geographically or by country as: This section lists the origin and coupling style found in each country. Brief descriptions and dimensional data follows each coupling style.

North American British French German Japanese

North American Thread Types

Iron Pipe Thread Abbreviations

N National

National Pipe Tapered thread for Fuel is a dryseal

thread. It is used for both male and female ends.

The NPTF male will mate with the NPTF, NPSF,

The NPTF male has tapered threads and a 30° inverted

seat. The NPTF female has tapered threads and no seat.

The seal takes place by deformation of the threads. The

NPSM female has straight threads and a 30° inverted

The NPTF connector is similar to, but not interchange-

able with, the BSPT connector. The thread pitch is

different in most sizes. Also, the thread angle is 60° instead of the 55° angle found on BSPT threads.

NPT Pipe Thread

Thread OD

NPTF or

NPSF

Solid Female

(FP)

30

I

Thread 0D

NPTF

Solid Male

(MP, MPLN)

seat. The seal takes place on the 30° seat.

- S Straight ThreadT Tapered Thread
- **F** Fuels **M** Mechanical Joint

P Pipe

or NPSM female.

NPTF

NPSF

National Pipe Straight thread for Fuels is sometimes used for female ends and properly mates with the NPTF male end. However, SAE recommends the NPTF thread in preference to the NPSF for female ends.

NPSM

National Pipe Straight thread for Mechanical Joint is used on the female swivel nut of iron pipe swivel adapters. The leak-resistant joint is not made by the sealing fit of threads, but by a tapered seat in the coupling end.

Dash	Nominal	No. Threads	Female Thread	Male Thread	Max. Torque Recommendation for
3120	SIZE (III.)	hei men	I.D. (In.)	0.D. (In.)	Dry NPTF* (Ft. Lbs.)
-2	1/8	27	23/64	13/32	20
-4	1/4	18	15/32	35/64	25
-6	3/8	18	19/32	43/64	35
-8	1/2	14	3/4	27/32	45
-12	3/4	14	61/64	1-1/16	55
-16	1	11-1/2	1-13/64	1-5/16	65
-20	1-1/4	11-1/2	1-17/32	1-43/64	80
-24	1-1/2	11-1/2	1-25/32	1-29/32	95
-32	2	11-1/2	2-1/4	2-3/8	120

*NOTES:

- Torque values can vary considerably depending on thread condition. Use only enough torque to achieve adequate sealing.
- With female straight or parallel pipe threads (NPSM), maximum values are 50 percent of those listed in the table.
- 3. If thread sealant is used, maximum values shown should be decreased by 25 percent.

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Thread ID

NPSM

Swivel Female

(FPX)

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GLOBALSPIRAL COUPLINGS PCM/PCS FERRULES MEGACRIMP COUPLINGS POWER CRIMP COUPLINGS

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POLARSEAL Couplings

C14 Couplings

PCTS THERMO-PLASTIC

COUPLINGS

FIELD Attachable

COUPLINGS

G1 & G2

FIELD Attachable C5 Couplings

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COUPLINGS

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Hose & Coupling Section

Coupling Identification

North American Thread Types (con't.)

*JIC (37° Flare)

The Society of Automotive Engineers (SAE) specifies a 37° angle flare or seat be used with high pressure hydraulic tubing. These are commonly called JIC couplings.

The JIC 37° flare male will mate with a JIC female only.* The JIC male has straight threads and a 37° flare seat. The JIC female has straight threads and a 37° flare seat. The seal is made on the 37° flare seat.

Some sizes have the same threads as the SAE 45° flare. Carefully measure the seat angle to differentiate.

*Note: Some C5, C5E and Lock-On couplings may have dual machined seats (both 37° and 45° seats).

JIC 37° Flare



Dash Size		Throad	Female	Male	Steel Torque			
		Cino	Thread	Thread	Recommenda	tion (Ft. Lbs.)		
Size	(In.)	5120	I.D. (In.)	0.D. (In.)	Min.	Max.		
-2	1/8	5/16 – 24	17/64	5/16	-	-		
-3	3/16	3/8 – 24	21/64	3/8	-	-		
-4	1/4	7/16 – 20	25/64	7/16	10	11		
-5	5/16	1/2 – 20	29/64	1/2	13	15		
-6	3/8	9/16 – 18	1/2	9/16	17	19		
-8	1/2	3/4 – 16	11/16	3/4	34	38		
-10	5/8	7/8 – 14	13/16	7/8	50	56		
-12	3/4	1-1/16 – 12	31/32	1-1/16	70	78		
-14	7/8	1-3/16 – 12	1-7/64	1-3/16	-	-		
-16	1	1-5/16 – 12	1-15/64	1-5/16	94	104		
-20	1-1/4	1-5/8 – 12	1-35/64	1-5/8	124	138		
-24	1-1/2	1-7/8 – 12	1-51/64	1-7/8	156	173		
-32	2	2-1/2 - 12	2-27/64	2-1/2	219	243		

*SAE (45° Flare)

A term usually applied to fittings having a 45° angle flare or seat. Soft copper tubing is generally used in such applications as it is easily flared to the 45° angle. These are for low-pressure applications—such as for fuel lines and refrigerant lines.

The SAE 45° flare male will mate with an SAE 45° flare female only or a dual seat JIC/SAE 45°.*

The SAE male has straight threads and a 45° flare seat. The SAE female has straight threads and a 45° flare seat. The seal is made on the 45° flare seat.

Some sizes have the same threads as the SAE 37° flare.

Carefully measure the seat angle to differentiate.

***Note:** Some C5, C5E and Lock-On couplings may have dual machined seats (both 37° and 45° seats).

SAE 45° Flare



SAE 45° Flare Male (MS)

www.gates.com/hydraulics

SAE 45° Flare Swivel Female (FSX)

Thread ID

Dash Size	Nominal Size (In.)	Thread Size	Female Thread	Male Thread	Steel Recomn (Ft.	Torque nendation Lbs.)
			I.D. (In.)	0.D. (In.)	Min.	Max.
-2	1/8	5/16 - 24	17/64	5/16	-	-
-3	3/16	3/8 – 24	21/64	3/8	-	-
-4	1/4	7/16 – 20	25/64	7/16	10	11
-5	5/16	1/2 - 20	29/64	1/2	13	15
-6	3/8	5/8 – 18	9/16	5/8	17	19
-7	7/16	11/16 – 16	5/8	11/16	-	-
-8	1/2	3/4 – 16	11/16	3/4	34	38
-10	5/8	7/8 – 14	13/16	7/8	50	56
-12	3/4	1-1/16 – 14	63/64	1-1/16	70	78

Special Power Steering Thread End

Dash Size	Nominal Size	Thread Size	Female Thread	Male Thread	
	(In.)		I.D. (In.)	0.D. (In.)	
-6	3/8	11/16 – 18	5/8	11/16	

I

PCTS THERMO-PLASTIC COUPLINGS

FIELD Attachable G1 & G2 Couplings

FIELD ATTACHABLE C5 COUPLINGS

SURELOK AIR Brake Couplings

QUICK DISCONNECT COUPLERS

NEW BALL VALVES

ACCESSORIES

Equipment And Parts





Coupling Identification

North American Thread Types (con't.)

O-Ring Boss

The O-ring boss male will mate with an O-ring boss female only. The female is generally found on ports.

The male has straight threads, a sealing face and an O-ring. The female has straight threads and a sealing face. The seal is made at the O-ring on the male and the sealing face on the female.

			Female	Mala			Steel Torque Recommendations (F		ions (Ft. Lbs)	
Dash Size	Nominal Size (In.)	Thread Size	Thread	Thread	0-R	ling	Below Working	elow 4,000 psi Above 4,000 psi orking Pressure Working Pressure		e 4,000 psi ng Pressure
			I.D. (In.)	0.D. (In.)	I.D. (In.)	DESCR	Min.	Max.	Min.	Max.
-2	1/8	5/16 – 24	17/64	5/16	0.239	-	-	-	-	-
-3	3/16	3/8 – 24	21/64	3/8	0.301	30R	-	-	8	10
-4	1/4	7/16 – 20	25/64	7/16	0.351	40R	14	16	14	16
-5	5/16	1/2 – 20	29/64	1/2	0.414	50R	-	-	18	20
-6	3/8	9/16 – 18	1/2	9/16	0.468	60R	24	26	24	26
-8	1/2	3/4 – 16	11/16	3/4	0.644	80R	37	44	50	60
-10	5/8	7/8 – 14	13/16	7/8	0.755	100R	50	60	72	80
-12	3/4	1-1/16 – 12	31/32	1-1/16	0.924	120R	75	83	125	135
-14	7/8	1-3/16 – 12	1-7/64	1-3/16	1.048	140R	-	-	160	180
-16	1	1-5/16 – 12	1-15/64	1-5/16	1.171	160R	111	125	200	220
-20	1-1/4	1-5/8 – 12	1-35/64	1-5/8	1.475	200R	133	152	210	280
-24	1-1/2	1-7/8 – 12	1-51/64	1-7/8	1.720	-	156	184	270	360
-32	2	2-1/2 – 12	2-27/64	2-1/2	2.337	-	-	-	-	-

SAE Straight Thread O-Ring Boss



Gates Adapterless – MBAX

The Gates Adapterless coupling is designed for use in OEM assembly line applications. It eliminates the need for an adapter by directly connecting into the port, which reduces the number of possible leak points and reduces installation labor. It allows easy installation and eliminates the troubles of alignment on bent tube assemblies. It eliminates the performance limitations of the traditional male swivel. A jam nut locks the coupling into place.

Assemblies using the Gates Adapterless coupling can be serviced by replacing the assembly with an MB adapter in the port and a standard end termination (for example, an MB-MJ adapter and FJX couplings).

WARNING: The tightening of the jam nut is absolutely critical to performance so that the Adapterless coupling does not become a "live swivel". A live swiveling condition can cause wearing of the internal seals and result in leaks.

The Gates Adapterless coupling uses SAE O-Ring Boss threads. See the table above. The installation torque values are the same as SAE O-Ring Boss.



Swivel Nut

HOSE/CPLG. Selection
GLOBALSPIRAL Couplings
PCM/PCS FERRULES
MEGACRIMP Couplings
Power Crimp Couplings
LOW PRESSURE COUPLINGS
POLARSEAL Couplings
C14 Couplings
PCTS THERMO- PLASTIC COUPLINGS
FIELD ATTACHABLE G1 & G2 COUPLINGS
FIELD ATTACHABLE C5 COUPLINGS
SURELOK AIR BRAKE COUPLINGS
QUICK Disconnect Couplers
NEW BALL VALVES
ACCESSORIES
EQUIPMENT AND PARTS





EQUIPMENT

HOSE/CPLG. Selection

GLOBALSPIRAL Couplings

PCM/PCS Ferrules

MEGACRIMP Couplings

POWER CRIMP COUPLINGS

LOW PRESSURE COUPLINGS

POLARSEAL COUPLINGS

C14 COUPLINGS

PCTS THERMO-PLASTIC COUPLINGS

FIELD Attachable G1 & G2 Couplings

FIELD ATTACHABLE C5 COUPLINGS

SURELOK AIR Brake Couplings

QUICK Disconnect Couplers

NEW BALL Valves

ACCESSORIES

EQUIPMENT AND PARTS



North American Thread Types (con't.)

O-Ring Flange—SAE J518

The SAE Code 61 and Code 62 4-bolt split flange is used worldwide, usually as a connection on pumps and motors. There are three exceptions.

- 1. The -10 size, which is common outside of North America, is not an SAE standard size (generally found on Komatsu equipment).
- 2. Caterpillar flanges, which are the same flange O.D. as SAE Code 62, have a thicker flange head ("C" dimension in Table).

3. Poclain flanges, which are completely different from

SAE flanges.

SAE Code 61 and Code 62



Flange Head (FL/ FLH, FLC)

4-Bolt Split Flange Bolt Hose Dimensions

В

Dach	Nominal	Code 61 (FL)			Code 62 (FLH)			Caterpillar Code 62 (FLC)					
Size	Flange Size (In.)	Flange O.D. (In.)	A (In.)	B (In.)	C (In.)	Flange O.D. (In.)	A (In.)	B (In.)	C (In.)	Flange O.D. (In.)	A (In.)	B (In.)	C (In.)
-8	1/2	1.188	.688	1.500	.265	1.250	.718	1.594	.305	-	-	-	-
-10	5/8	1.345	-	_	.265	-	-	-	-	-	-	-	_
-12	3/4	1.500	.875	1.875	.265	1.625	.937	2.000	.345	1.625	.938	2.000	.560
-16	1	1.750	1.031	2.062	.315	1.875	1.093	2.250	.375	1.875	1.094	2.250	.560
-20	1-1/4	2.000	1.188	2.312	.315	2.125	1.250	2.625	.405	2.125	1.250	2.625	.560
-24	1-1/2	2.375	1.406	2.750	.315	2.500	1.437	3.125	.495	2.500	1.438	3.125	.560
-32	2	2.812	1.688	3.062	.375	3.125	1.750	3.812	.495	3.125	1.750	3.812	.560
-40	2-1/2	3.312	2.000	3.500	.375	-	-	_	-	-	-	_	-
-48	3	4.000	2.438	4.188	.375	-	_	-	_	-	-	-	_
-56	3-1/2	4.500	2.750	4.750	.422	-	-	-	-	-	-	-	-
-64	4	5.000	3.062	5.125	.442	-	-	-	-	-	-	-	-
-80	5	6.000	3.625	6.000	.442	_	_	_	-	-	-	_	_

O-Ring Face Seal (ORFS)—SAE J1453

A seal is made when the O-ring in the male contacts the flat face on the female. Couplings are intended for hydraulic systems where elastomeric seals are acceptable to overcome leakage and leak resistance is crucial.

The solid male O-ring face seal fitting will mate with a swivel female O-ring face seal SAE J1453 fitting only.

An O-ring rests in the O-ring groove in the male.





Male Flat-Face O-Ring (MFFOR)



Female Flat-Face O-Ring Swivel (FFORX)

	Nominal		Female Thread	Male Thread	0-Ring
Dash Size	Size (In.)	Thread Size	I.D. (In.)	0.D. (In.)	Size
-4	1/4	9/16 – 18	1/2	9/16	-011
-6	3/8	11/16 – 16	5/8	11/16	-012
-8	1/2	13/16 – 16	3/4	13/16	-014
-10	5/8	1 – 14	15/16	1	-016
-12	3/4	1-3/16 – 12	1-1/8	1-3/16	-018
-16	1	1-7/16 – 12	1-11/32	1-7/16	-021
-20	1-1/4	1-11/16 – 12	1-19/32	1-11/16	-025
-24	1-1/2	2 – 12	1-29/32	2	-029







EQUIPMENT

HOSE/CPLG. SELECTION

GLOBALSPIRAL

COUPLINGS

PCM/PCS FERRULES

Coupling Identification

North American Thread Types (con't.) **Flareless Tube**

The flareless solid male will mate with a female flareless nut and compression sleeve only.

The male has straight threads and a 24° seat. The female has straight threads and has a compression sleeve for a sealing surface. The seal is made between the compression sleeve and the 24° seat on the male, and between the compression sleeve and the tubing on the female.



	Tube	Nominal		Female Thread	Male Thread
Dash Size	Size (In.)	Size (In.)	Thead Size	I.D. (In.)	0.D. (In.)
-2	1/8	5/16	5/16 – 24	17/64	5/16
-3	3/16	3/8	3/8 – 24	21/64	3/8
-4	1/4	7/16	7/16 – 20	25/64	7/16
-5	5/16	1/2	1/2 – 20	29/64	1/2
-6	3/8	9/16	9/16 – 18	1/2	9/16
-8	1/2	3/4	3/4 – 16	11/16	3/4
-10	5/8	7/8	7/8 – 14	13/16	7/8
-12	3/4	1-1/16	1-1/16 – 12	31/32	1-1/16
-14	7/8	1-3/16	1-3/16 – 12	1-7/64	1-3/16
-16	1	1-5/16	1-5/16 – 12	1-15/64	1-5/16
-20	1-1/4	1-5/8	1-5/8 – 12	1-35/64	1-5/8
-24	1-1/2	1-7/8	1-7/8 – 12	1-51/64	1-7/8
-32	2	2-1/2	2-1/2 – 12	2-27/64	2-1/2

Dash Size

-4

-6

-8

-12

-16

North American Stand Pipe (NASP)

A stand pipe assembly is comprised of three components attached to a male fitting. The components are a Stand Pipe Tube, Bite Sleeve and Nut. The Nut is placed over the Stand Pipe, followed by the Bite Sleeve (see illustration below). The Bite Sleeve and Stand Pipe are selected on the basis of tube O.D. required.





SAE Inverted Flare

The SAE 45° inverted flare male will mate with an SAE 42° inverted flare female only.

The male has straight threads and a 45° inverted flare. The female has straight threads and a 42° inverted flare. The seal is made on the 45° flare seat on the male and the 42° flare seat on the female.







SAE Inverted Flare	
Swivel Male (MIX)	
2	

SAE Inverted Flare Solid Female

Dash	Nominal	Thread	Female Thread	Male Thread
Size	Size (In.)	Size	I.D. (In.)	0.D. (In.)
-2	1/8	5/16 – 28	9/32	5/16
-3	3/16	3/8 – 24	21/64	3/8
-4	1/4	7/16 – 24	25/64	7/16
-5	5/16	1/2 – 20	29/64	1/2
-6	3/8	5/8 – 18	37/64	5/8
-7	7/16	11/16 – 18	5/8	11/16
-8	1/2	3/4 – 18	45/64	3/4
-10	5/8	7/8 – 18	13/16	7/8
-12	3/4	1-1/16 – 16	1	1-1/16

				1	
- 18	1/2	2	9/16]	MEGACKIMP COUPLINGS
16	11/16		3/4		
14	13/16		7/8		
- 12	31/3	32	1-1/16]	POWER
- 12	1-7/	64	1-3/16		
- 12	1-15/	64	1-5/16		COUPLINGS
- 12	1-35/	′64	1-5/8]	
- 12	1-51/	64	1-7/8		LOW
- 12	2-27/	′64	2-1/2		PRESSURE
·				-	COUPLINGS
					POLARSEAL Couplings
					C14 Couplings
Tube 0.D). (In.)	Tube L	ength (In.)		PCTS Thermo- Plastic
0.20	9 8		1.88		COUPLINGS
0.50	<u> </u>	-	1.00		
0.00	5	-	1.16		FIELD
1.00	0	-	1 12		ATTACHABLE
	0	1			G1 & G2 COUPLINGS
					FIELD ATTACHABLE C5 COUPLINGS
					SURELOK AIR Brake Couplings
le Thre	ad	Male '	Thread	1	QUICK
D. (In.)		0.D.	(In.)	•	
9/32		5/	16	1	GOUFLENS
21/64		ر ر	/8	1	
		. 1			

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COUPLINGS

POWER

CRIMP COUPLINGS

LOW PRESSURE COUPLINGS

C14 COUPLINGS

PCTS THERMO-PLASTIC

FIELD ATTACHABLE G1 & G2

FIELD ATTACHABLE C5

COUPLINGS

COUPLINGS

COUPLINGS

BRAKE

OLIICK DISCONNECT

COUPLERS

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AND PARTS

VALVES

POLARSEAL COUPLINGS

Hose & Coupling Section

Coupling Identification

Air Brake Fittings

Female air brake swivels are designed to work exclusively with a male air brake adapter. Federal law requires only this combination to be used on air brake lines from the valve to the air brake

diaphram chamber. PCM/PCS

FERRULES The male has straight threads and an inverted seat. The female has straight threads and a corresponding inverted flare. The seal is made on the flare seats of both the male and female. MEGACRIMP





Dash Size	Thread Size	Female Thread I.D. (In.)	Male Thread O.D. (In.)
-6	3/4 – 20	23/32	3/4
-8	7/8 – 20	27/32	7/8

Male Air Brake

Female Air Brake Swivel

Grease Fittings

Special Male Grease Fitting





Special Female Grease Fitting



1/2-27 Tapered Thread

1/8-27 Pipe Thread

Parker Triple Thread Flare Fittings

Parker Triple Thread Flare Fittings





	Nominal		Female Thread	Male Thread
Dash Size	Size (In.)	Thread Size	I.D. (ln.)	O.D. (ln.)
-16	1-5/16	1-5/16 – 14	1-1/4	1-5/16

Swivel Female (FZX)

Solid Male (MZ)

SURELOK AIR **Press-Lok® Connectors** COUPLINGS

Press-Lok style connectors are found on mining equipment worldwide.

The seal is made when the O-ring on the male contacts the inside surface of the female. The two connectors are held together with a staple.

Press-Lok Connectors



Male Press-Lok Connectors

Dash Size	Nominal Size (In.)	Female I.D. (In.)	Male O.D. (In.)
-4	1/4	.39	.40
-6	3/8	.55	.56
-8	1/2	.70	.71
-12	3/4	.94	.95
-16	1	1.22	1.23
-20	1-1/4	1.49	1.50

For more information and specifications on these couplings, please see the Gates Mining Products Catalog #99993 or visit www.gates.com/mining.

www.gates.com/hydraulics

Female Press-Lok Connectors

⊕

I.D.

Staple Holes





HOSE/CPLG. SELECTION

GLOBALSPIRAL

COUPLINGS

PCM/PCS FERRULES

MEGACRIMP COUPLINGS

POWER CRIMP

LOW

COUPLINGS

PRESSURE

COUPLINGS

POLARSEAL

COUPLINGS

C14 COUPLINGS

PCTS

FIELD

G1 & G2

COUPLINGS

THERMO-PLASTIC

COUPLINGS

ATTACHABLE

Coupling Identification

Foreign Thread Types

Identifying Foreign Couplings

If you can identify the country of origin of the equipment you are working with, it is easy to identify the coupling style. Simply find the appropriate country in the following pages and locate the particular coupling in the table that follows.

British

It is a common misconception that all foreign threads are metric. This is not always the case. There are two common thread forms: Metric and Whitworth (BSP). The country of origin and the proper nomenclature for each is listed below.

British Standard Pipe Parallel

Popular couplings have British Standard Pipe (BSP) threads, also known as Whitworth threads. These can be parallel threads (BSPP) with a 30° inverted flare or tapered threads (BSPT), with a 30° inverted flare. Port connections are usually made with BSPP threads and a soft metal cutting ring for sealing.

The BSPP (parallel) male will mate with a BSPOR (parallel) female or a female port.

The BSPP male has straight threads and a 30° seat. The BSPOR female has straight threads, a 30° seat, and O-ring. The female port has straight threads and a spotface. The seal on the port is made with an O-ring or soft metal washer on the male.

The BSPP (parallel) connector is similar to, but not interchangeable with, the NPSM connector. The thread pitch is different in most sizes, and the thread angle is 55° instead of the 60° angle found on NPSM threads.

British Standard Pipe

The BSPT (tapered) male will mate with a BSPT

The BSPT male has tapered threads. When mat-

BSPOR (parallel) female port, the seal is made on

ing with either the BSPT (tapered) female or the

The BSPT connector is similar to, but not inter-

pitch is different in most cases, and the thread

angle is 55° instead of the 60° angle found on

changeable with, the NPTF connector. The thread

(tapered) female, or a BSPOR (parallel) female.

Dash Size	Nominal Size (In.)	Thread Size	Female Parallel Thread	Male Parallel Thread	To Recomr (Ft.	rque nendation Lbs.)
			I.D. (In.)	0.D. (In.)	Min.	Max.
-2	1/8	1/8 – 28	11/32	3/8	7	9
-4	1/4	1/4 – 19	15/32	17/32	11	18
-6	3/8	3/8 – 19	19/32	21/32	19	28
-8	1/2	1/2 – 14	3/4	13/16	30	36
-10	5/8	5/8 – 14	13/16	29/32	37	44
-12	3/4	3/4 – 14	31/32	1-1/32	50	60
-16	1	1 – 11	1-7/32	1-11/32	79	95
-20	1-1/4	1-1/4 - 11	1-17/32	1-21/32	127	152
-24	1-1/2	1-1/2 - 11	1-25/32	1-7/8	167	190
-32	2	2 – 11	2-7/32	2-11/32	262	314

British Standard Pipe Parallel (BSPOR)

(FBSPORX)

Female

Parallel

Thread

I.D. (In.)

11/32

15/32

19/32

3/4

13/16

31/32

1 - 7/32

1-17/32

1-25/32

2-7/32 2-11/32

Male

Parallel

Thread

0.D. (In.)

3/8

17/32

21/32

13/16

29/32

1-1/32

1-11/32

1-21/32

1-7/8

British Standard Pipe Tapered (BSPT)

Thread I.D.



Thread

Size

1/8 - 28

1/4 – 19

3/8 - 19

1/2 - 14

5/8 – 14

3/4 - 14

1 – 11

1-1/4 - 11

1-1/2 - 11

2 – 11

Thread

ΟD



Torque Recommendation

(Ft. Lbs.)

Port

Max.

9

18

28

36

44

60

95

152

190

314

BSPT

Female

(FBSPT)

BSPP Male (MBSPP)

Nominal

Size

(In.)

1/8

1/4

3/8

1/2

5/8

3/4

1

1-1/4

1-1/2

2

Dash

Size

-2

-4

-6

-8

-10

-12

-16

-20

-24

-32

BSPOR Female BSPOR Female

Min.

7

11

19

30

37

50

79

127

167

262

FIELD ATTACHABLE C5 COUPLINGS
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NPTF threads.

Tapered

the threads.

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BSPT

Male

(MBSPT)

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PCM/PCS Ferrules

MEGACRIMP Couplings

Power Crimp Couplings

LOW PRESSURE COUPLINGS

POLARSEAL Couplings

C14 Couplings

PCTS THERMO-PLASTIC COUPLINGS

FIELD ATTACHABLE G1 & G2 COUPLINGS

FIELD ATTACHABLE C5 COUPLINGS

SURELOK AIR Brake Couplings

QUICK DISCONNECT COUPLERS

NEW BALL VALVES

ACCESSORIES

EQUIPMENT AND PARTS

Coupling Identification

Foreign Thread Types – British (con't.)

British Flat-Face Seal

A seal is made when the O-ring in the male contacts the flat face on the female. These couplings are intended for hydraulic systems where elastomeric seals are acceptable to overcome leakage and leak resistance is crucial.

The solid male British O-ring face seal fitting will mate with a swivel female British O-ring face seal fitting only. An O-ring rests in the O-ring groove in the male.

Dash Size	Nominal Size (In.)	Thread Size	Female Parallel Thread	Male Parallel Thread	Torque Recommendatio (Ft. Lbs.)	
			I.D. (In.)	0.D. (ln.)	Min.	Max.
-6	3/8	3/8-19	19/32	21/32	18	20
-8	1/2	1/2-14	3/4	13/16	32	40
-12	3/4	3/4-14	31/32	1 1/32	65	80





-Thread ID

Male British Flat-Face (MBFF)



French

Popular couplings are French GAZ. These have a 24° seat and metric threads. These are similar to German DIN couplings, but the threads are different in some sizes. Although both are metric threads, the French use fine threads in all sizes and German DIN couplings use coarse threads in larger sizes. Most port connections are flange connections. French flanges are different than SAE—they have a lip that protrudes from the flange face. These are called Poclain-style flanges.

GAZ 24°

The French Metric (GAZ) male will mate with the female 24° cone or the female tube fitting.

The male has a 24° seat and straight metric threads. The female has a 24° seat or a tubing sleeve and straight metric threads and is interchangeable with female Kobelco.

When measuring the flare angle with the seat angle gauge, use the 12° gauge. The seat angle gauge measures the angle from the connector centerline.

French Metric (GAZ)



Male 24° Cone

Female 24° Cone





Female Tube Fitting

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Coupling Identification

Foreign Thread Types – French (con't.)

GAZ Poclain 24° Flange

The Poclain (French GAZ) 24° high pressure flange is usually found on Poclain equipment.

The male flange will mate with a female flange or port. The seal is made on the 24° seat.



Poclain (French GAZ)





German DIN (Deutsche Industrial Norme)

Popular couplings are German DIN (Deutsche Industrial Norme). A coupling referred to as "metric" usually means a DIN coupling.

DIN 24° Cone

The DIN 24° cone male will mate with any of the females shown.

The male has a 24° seat, straight metric threads, and a recessed counterbore which matches the tube O.D. of the coupling used with it. The mating female is a 24° cone with O-ring, a metric tube fitting or a universal 24° and 60° cone.

There is a light and heavy series DIN coupling. Proper identification is made by measuring both the thread size and the tube O.D. (The heavy series has a smaller tube O.D. but a thicker wall section than the light.)

When measuring the flare angle with the seat angle gauge, use the 12° gauge. The seat angle gauge measures the angle from the connector centerline.

Metric	Female Thread	Male Thread	Tube O.D.		Torque Recommendation (Ft. Lbs.)	
Size	I.D. (mm)	0.D. (mm)	Light Series (mm)	Heavy Series (mm)	Min.	Max.
M12x1.5	10.5	12.0	6	—	7	15
M14x1.5	12.5	14.0	8	—	15	26
M16x1.5	14.5	16.0	10	8	18	30
M18x1.5	16.5	18.0	12	10	22	33
M20x1.5	18.5	20.0	14	12	26	37
M22x1.5	20.5	22.0	15	14	30	52
M24x1.5	22.5	24.0	—	16	30	52
M26x1.5	24.5	26.0	18	—	44	74
M30x2.0	28.0	30.0	22	20	59	89
M36x2.0	34.0	36.0	28	25	74	111
M42x2.0	40.0	42.0	_	30	74	162
M45x2.0	43.0	45.0	35	_	133	184
M52x2.0	50.0	52.0	42	38	148	221

DIN 24° Male and Mating Females



Male 24° Cone, DIN 2353 (MDL/MDH)

Female 24° Cone with O-Ring (FDLORX/FDHORX)

O-Ring

Thread		///
I.D. ↓	$ \qquad \qquad$	

Female Universal 24° and 60° Cone (FDLX/FDHX)

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Power Crimp Coupling	ŝS	
low Pressur Coupling	E SS	
POLARSE Coupling	AL SS	
C14 Coupling	S	
PCTS Thermo- Plastic Coupling	ŝS	
Field Attachai G1 & G2 Coupling	BLE	
Field Attachai C5 Coupling	BLE	
Surelok Brake Coupling	AIR SS	
QUICK Disconni Coupler:	ECT S	
NEW BALI Valves	L	
ACCESSO	RIES	
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C34		

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C35

Coupling Identification

Foreign Thread Types – German DIN (con't.)

DIN 60° Cone

The DIN 60° cone male will mate with the female universal 24° or 60° cone connector only.

The male has a 60° seat and straight metric threads. The female has a 24° and 60° universal seat and straight metric threads.

When measuring the flare angle with the seat angle gauge, use the 30° gauge. The seat angle gauge measures the angle from the connector centerline.

Metric Thread	Female Thread	Male Thread	Tube O.D.	Torque Recommendation (Ft. Lbs.)		
Size	I.D. (mm)	0.D. (mm)	(mm)	Min.	Max.	
M14x1.5	12.5	14.0	8	15	26	
M16x1.5	14.5	16.0	10	18	30	
M18x1.5	16.5	18.0	12	22	33	
M22x1.5	20.5	22.0	15	30	52	
M26x1.5	24.5	26.0	18	44	74	
M30x1.5	28.5	30.0	22	59	59	
M38x1.5	36.5	38.0	28	74	111	
M45x1.5	43.5	45.0	35	133	184	
M52x2.0	50.5	52.0	42	148	221	

DIN 60° Male and Mating Female



Male 60° Cone, DIN 6711

Female Universal 24° and 60° Cone

W


Coupling Identification

Foreign Thread Types – German DIN (con't.)

DIN 3852 Couplings Type A & B (Parallel Threads)

The male DIN 3852 Type A & B couplings will mate with the female DIN coupling shown below. Gates offers this thread as an adapter.

The male and female type A & B couplings have straight threads. The seal occurs when the ring seal (Type A) or the face seal (Type B) mates with the face of the female port.

There are two series of DIN 3852 Type A & B couplings, the light (L) and the heavy (S) series.

Note: Commonly used threads on male metric adapters.

DIN 3852 Couplings Type A & B (Parallel Threads)



Male Type A Male Type B



Female Types A & B

	Tube	Metric Three				ead Parallel			Whitworth Thread Parallel								
Corioo	0.0	Thread	Fei	male			Male)		Thread	Femal	e (BSPO	R)		Male (BS	SPP)	
361162	0.0.	a	Thread I.D.	Α	В	Thread O.D.	Α	В	C		Thread I.D.	Α	В	Thread O.D.	Α	В	C
	(mm)	Size	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	Size	(ln.)	(mm)	(mm)	(In.)	(mm)	(mm)	(mm)
	6	10x1.0	8.5	15	1.0	10	14	1.5	8	1/8-28	11/32	15	1.0	3/8	14	1.5	8
	8	12x1.5	10.5	18	1.5	12	17	2.0	12	1/4-19	15/32	19	1.5	1/2	17	2.0	12
	10	14x1.5	12.5	20	1.5	14	19	2.0	12	1/4-19	15/32	19	1.5	1/2	19	2.0	12
	12	16x1.5	14.5	22	1.5	16	21	2.5	12	3/8-19	19/32	23	2.0	21/32	21	2.5	12
Light	15	18x1.5	16.5	24	2.0	18	23	2.5	12	1/2-14	3/4	27	2.5	13/16	23	2.5	12
L LIGHT	18	22x1.5	20.5	28	2.5	22	27	3.0	14	1/2-14	3/4	27	2.5	13/16	27	3.0	14
	22	26x1.5	24.5	32	2.5	26	31	3.0	16	3/4-14	31/32	33	2.5	1-1/32	31	3.0	16
	28	33x2.0	31.5	40	2.5	33	39	3.0	18	1-11	1-7/32	40	2.5	1-5/16	39	3.0	18
	35	42x2.0	40.5	50	2.5	42	49	3.0	20	1-1/4-11	1-17/32	50	2.5	1-21/32	49	3.0	20
	42	48x2.0	46.5	56	2.5	48	55	3.0	22	1-1/2-11	1-25/32	56	2.5	1-7/8	55	3.0	22
	6	12x1.5	10.5	18	1.5	12	17	2.0	12	1/4-19	15/32	19	1.5	1/2	17	2.0	12
	8	14x1.5	12.5	20	1.5	14	19	2.0	12	1/4-19	15/32	19	1.5	1/2	19	2.0	12
	10	16x1.5	14.5	22	1.5	16	21	2.5	12	3/8-19	19/32	23	2.0	21/32	21	2.5	12
	12	18x1.5	16.5	24	2.0	18	23	2.5	12	3/8-19	19/32	23	2.0	21/32	23	2.5	12
Cilloon	14	20x1.5	18.5	26	2.0	20	25	3.0	14	1/2-14	3/4	27	2.5	13/16	25	3.0	14
5 neavy	16	22x1.5	20.5	28	2.5	22	27	3.0	14	1/2-14	3/4	27	2.5	13/16	27	3.0	14
	20	27x2.0	25.5	33	2.5	27	32	3.0	16	3/4-14	31/32	33	2.5	1-1/32	32	3.0	16
	25	33x2.0	31.5	40	2.5	33	39	3.0	18	1-11	1-7/32	40	2.5	1-5/16	39	3.0	18
	30	42x2.0	40.5	50	2.5	42	49	3.0	20	1-1/4-11	1-17/32	50	2.5	1-21/32	49	3.0	20
	38	48x2.0	46.5	56	2.5	48	55	3.0	22	1-1/2-11	1-25/32	56	2.5	1-7/8	55	3.0	22

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Coupling Identification

Foreign Thread Types – German DIN (con't.)

DIN 3852 Type C Metric and Whitworth Tapered (BSPT) Thread Connectors

The DIN 3852 Type C couplings are available with either

The male and female couplings have tapered threads.

of DIN 3852 Type C Couplings: extra light (LL),

with the female as shown.

light (L) and heavy (S).

metric or Whitworth British thread. The male will mate only

The seal takes place on the threads. There are three series

DIN 3852 Type C Metric and Whitworth Tapered Thread Connectors



Metric Tapered Threads Whitworth Tapered Threads Tube Female Male Female Male Thread Thread Series 0.D. Thread I.D. Thread O.D Thread I.D. Thread O.D A (mm) A (mm) B (mm) A (mm) A (mm) B (mm) Size Size (mm) (mm)(mm) (In.) (In.) 8x1.0 8.40 1/8-28 .392 8 6.5 5.5 8 8 11/32 5.5 1/8 LL Extra 65 8 8.40 5 8x1.0 55 8 1/8-28 11/32 5.5 1/8392 8 10.40 6 10x1.0 85 5.5 10 8 1/8-28 11/32 5.5 1/8392 8 Light 10x1.0 85 5.5 10 10.40 8 1/8-28 11/32 55 1/8 .392 8 8 6 10x1.0 8.5 5.5 10 10.40 8 1/8-28 11/32 5.5 1/8 .392 8 8 12x1.5 10.5 8.5 12 12.53 12 1/4-19 15/32 8.5 1/4 .532 12 L 10 14x1.5 12.5 8.5 14 14.53 12 1/4 - 1915/328.5 1/4.532 12 12 16x1.5 14.5 8.5 16 16.53 12 3/8-19 19/32 8.5 3/8 .670 12 Light 18x1.5 16.5 18 18.53 12 1/2-14 3/4 8.5 1/2 .839 14 15 8.5 10.5 18 22x1.5 20.5 10.5 22 22.65 14 1/2-14 3/4 1/2 839 14 6 12x1.5 10.5 8.5 12 12.53 12 1/4-19 15/32 8.5 1/4 .532 12 8 14x1.5 12.5 8.5 14 14.53 12 1/4-19 15/32 8.5 1/4 .532 12 16.53 12 3/8-19 8.5 10 16x1.5 14.5 8.5 16 19/32 3/8 .670 12 S Heavy 12 18x1.5 16.5 8.5 18 18.53 12 3/8-19 19/32 85 3/8 .670 12 14 20x1.5 18.5 10.5 20 20.65 14 1/2-14 3/4 10.5 1/2 .839 14 16 22x1.5 20.5 10.5 22 22.65 14 1/2-14 3/4 10.5 1/2 .839 14

Metric Stand Pipe Assembly

A metric stand pipe assembly is comprised of three components attached to a male fitting. The components are: a Stand Pipe Tube, Bite Sleeve and Metric Nut. The nut is placed over the Stand Pipe, followed by the Bite Sleeve (see illustration below). For DIN light assemblies, a DIN light metric nut is used. For DIN heavy assemblies, a DIN heavy metric nut is used. The Bite Sleeve and Stand Pipe are selected on the basis of tube O.D.



Metric Stand Pipe	Bite Sleeve	Metric Nut	Thread
(mm)	(mm)	Light	Heavy
6	6	M12x1.5	—
8	8	M14x1.5	M16x1.5
10	10	M16x1.5	M18x1.5
12	12	M18x1.5	M20x1.5
15	15	M22x1.5	_
16	16	—	M24x1.5
18	18	M26x1.5	_
20	20	—	M30x2.0
22	22	M30x2.0	_
25	25	—	M36x2.0
28	28	M36x2.0	_
30	30	—	M42x2.0
35	35	M45x2.0	_
38	38		M52x2.0
42	42	M52x2.0	_

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Coupling Identification

Foreign Thread Types (con't.)

Japanese

There are two popular types of coupling styles in Japan, Japanese Industrial Standard and Komatsu. These couplings look similar to Male JIC and Female JIC Swivel couplings. However there are two major differences: The threads are BSP and the seat angle is only 30° instead of 37° for JIC.

- 1. Japanese Industrial Standard. Most Japanese equipment uses this type of coupling with a 30° seat and British Standard Pipe Parallel threads. They are not interchangeable with British couplings, since the flare is not inverted.
- 2. Komatsu. All Komatsu equipment uses couplings with a 30° seat and metric fine threads. All flanges are Code 61 or Code 62, except -10 which utilizes a special Komatsu-style flange that does not conform to SAE standard sizing.

Japanese 30° Flare **Parallel Threads**

The Japanese 30° flare male connector will mate with a Japanese 30° flare female only.

The male and female have straight threads and a 30° seat. The seal is made on the 30° seat.

The threads on the Japanese 30° flare connector conform to JIS B 0202, which are the same as the BSPOR threads. Both the British and Japanese connectors have a 30° seat, but they are not interchangeable because the British seat is inverted.

Dash Size	Nominal Size (In.)	Thread Size	Female Thread I.D. (In.)	Male Thread 0.D. (In.)
-2	1/8	1/8 – 28	11/32	3/8
-4	1/4	1/4 – 19	7/16	17/32
-6	3/8	3/8 – 19	19/32	21/32
-8	1/2	1/2 – 14	3/4	13/16
-10	5/8	5/8 – 14	13/16	29/32
-12	3/4	3/4 – 14	15/16	1-1/32
-16	1	1 – 11	1-13/16	1-15/16
-20	1-1/4	1-1/4 — 11	1-17/32	1-21/32
-24	1-1/2	1-1/2 - 11	1-25/32	1-7/8
-32	2	2 – 11	2-7/32	2-11/32



(MJIS)

(FJISX)

Japanese Tapered Pipe Thread

The Japanese tapered pipe thread connector is identical to and fully interchangeable with the BSPT (tapered) connector. The Japanese connector does not have a 30° flare and will not mate with the BSPOR female.

The threads conform to JIS B 0203, which are the same as BSPT threads.

The seal on the Japanese tapered pipe thread connector is made on the threads.

Dash Size	Nominal Size	Thread Size	Female Parallel	Male Parallel
-2	1/8	1/8 – 28	11/32	3/8
-4	1/4	1/4 – 19	7/16	17/32
-6	3/8	3/8 – 19	19/32	21/32
-8	1/2	1/2 – 14	3/4	13/16
-12	3/4	3/4 – 14	15/16	1-1/32
-16	1	1 – 11	1-13/16	1-15/16
-20	1-1/4	1-1/4 – 11	1-17/32	1-21/32
-24	1-1/2	1-1/2 – 11	1-25/32	1-7/8
-32	2	2 – 11	2-7/32	1-11/32
-32	2	2 - 11	2-7/32	2-11/32



Male (MBSPT)

Thread I.D. Female (FBSPT)

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Coupling Identification

Foreign Thread Types – Japanese (con't.)

Komatsu Style 30° Flare Parallel Threads

The Komatsu style 30° flare parallel thread connector is identical to the Japanese 30° flare parallel thread connector except for the threads. The Komatsu style connector uses metric fine threads which conform to JIS B 0207. Gates identifies these as Komatsu-style by marking the hex nuts with two small notches.

Dash	Nominal Size			Female	Male Thread	
Size	(In.)	(mm)	Thread Size	Thread I.D. (mm)	(0.D.) (mm)	
-6	3/8	9.5	M18x1.5	16.5	18	
-8	1/2	13	M22x1.5	20.5	22	
-10	5/8	16	M24x1.5	22.5	24	
-12	3/4	19	M30x1.5	28.5	30	
-16	1	25	M33x1.5	31.5	33	
-20	1-1/4	32	M36x1.5	34.5	36	
-24	1-1/2	1-1/2 38		40.5	42	

The Komatsu style connector seals on the 30° flare.





Female (FKX)

Male (MK)

Komatsu Style Flange Fitting

The Komatsu style flange fitting is nearly identical to and fully interchangeable with the SAE Code 61 flange fitting. In all sizes the O-ring dimensions are different. When replacing a Komatsu style flange with an SAE style flange, an SAE style O-ring must always be used.



*(-10 is a non-SAE size flange)





Flange (FL)

Metric Kobelco Metric Bite Sleeve

Flange Head

These are similar to the German DIN 24° cone, but the DIN style uses courser threads. Therefore, the Kobelco and German DIN are not interchangeable for female Kobelco (see French GAZ 24° swivel).



Male	24 °	Cone	(MKB)
			(

Dash Size	Metric Thread Size	Female Thread I.D. (mm)	Male Thread O.D. (mm)
-22	M30X1.5	28	30
-28	M36X1.5	34	36
-35	M45X1.5	43	45

_____Male 24°

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Thr	ead	Config	gura	ation	s for	Stem	Style	es			
				1 .10					<i>c</i> ¹		

These three-digit numbers identify the various coupling thread configurations

100 -	– MP	Male Pipe (NPTF - 30° Cone Seat)	177	-FJX60	Female JIC 37° Flare Swivel - 60° Bent Tube
101 -	– MPLN	Male Pipe Long Nose	178	-FJX60L	Female JIC 37° Flare Swivel - 60° Bent Tube Long
102	-MPAPI	Male Pipe for API Unions			Drop
103	-MPLH	Male Pipe Long Hex	179	-FJX90S	Female JIC 37° Flare Swivel - 90° Bent Tube
105	-MPX	Male Pipe Swivel (NPTF - Without 30° Cone			Short Drop
		Seat)	180	-FJX90M	Female JIC 37° Flare Swivel - 90° Bent Tube
106	-MPX90	Male Pipe Swivel - 90° Block (NPTF - Without 30° Cone Seat)	181	-FJX90L	Female JIC 37° Hare Swivel - 90° Bent Tube Long Drop
107	-MPX90L	Male Pipe Swivel - 90° Block Long (NPTF – Without 30° Cone Seat)	182	-FJX90XL	Female JIC 37° Flare Swivel - 90° Bent Tube Extra Long Drop
110	- FP - FPX	Female Pipe (NPTF - Without 30° Cone Seat)	183	-FJX90-000	Female JIC 37° Flare Swivel - 90° Bent Tube Non-ISO Drop (mm)
112	FPXT	Female Pine Swivel Tanered Threads (NPTE)	185	-FJXP	Female JIC 37° Flare Swivel Under Pressure
120	-MB	Male O-Bing Boss	187	-FJX90BLK	Female JIC 37° Flare Swivel - 90° Block
121	-MBX	Male O-Ring Boss Swivel	195	-MS	Male SAE 45° Flare
122	-MBX45	Male O-Bing Boss Swivel - 45° Block	196	-MS45	Male SAE 45° Flare - 45° Bent Tube
123	-MBX90	Male O-Ring Boss Swivel - 90° Block	197	-MS90	Male SAE 45° Flare - 90° Bent Tube
124	-MBX90L	Male O-Ring Boss Swivel - 90° Block Long	199	-MS90BLK	Male SAE 45° Flare - 90° Block
130	-MBAX	Male O-Ring Boss Adapterless Swivel	200	-FSX	Female SAE 45° Flare Swivel
133	-MBAX45	Male O-Ring Boss Adapterless Swivel - 45° Bent	201	-FSXLT	Female SAE 45° Flare Swivel Long Tube
		Tube	202	-FSX45	Female SAE 45° Flare Swivel - 45° Bent Tube
134	-MBAX90M	Male O-Ring Boss Adapterless Swivel - 90° Bent Tube Medium Drop	203	-FSX45L	Female SAE 45° Flare Swivel - 45° Bent Tube Long Drop
135	-MBAX90S	Male O-Ring Boss Adapterless Swivel - 90° Bent Tube Short Drop	204	-FSX90S	Female SAE 45° Flare Swivel - 90° Bent Tube Short Drop
136	-MBAX90L	Male O-Ring Boss Adapterless Swivel - 90°	205	-FSX90	Female SAE 45° Flare Swivel - 90° Bent Tube
140	-FMX	Bent Tube Long Drop Female MegaSeal® Swivel	206	-FSX90L	Female SAE 45° Flare Swivel - 90° Bent Tube Long Drop
141	-FMXL	Female MegaSeal Swivel Long	207	-FSX90XL	Female SAE 45° Flare Swivel - 90° Bent Tube
142	-FMX30	Female MegaSeal Swivel - 30° Bent Tube			Extra Long Drop
143	-FMX30L	Female MegaSeal Swivel - 30° Bent Tube Long Drop	210 211	—FJSX —FJSX45	Dual Seat Female JIC 37°/SAE 45° Flare Swivel Dual Seat Female JIC 37°/SAE 45° Flare Swivel
144	-FMX45S	Female MegaSeal Swivel - 45° Bent Tube Short Drop	212	-FJSX90	- 45° Bent Tube Dual Seat Female JIC 37°/SAE 45° Flare Swivel
145	-FMX45	Female MegaSeal Swivel - 45° Bent Tube	010		- 90 Dent Tube
146	-FMX45L	Female MegaSeal Swivel - 45° Bent Tube Long Drop	213	-FJSA90L	- 90° Bent Tube Long Drop
147	-FMX60	Female MegaSeal Swivel - 60° Bent Tube	225		Male Flat-Face O-Ring
148	-FMX60L	Female MegaSeal Swivel - 60° Bent Tube Long	220		Formale Flat Face O-Ring Buiki lead Long Nose
		Drop	229		Female Flat-Face O-Fling Swivel Short
149	-FMX90S	Female MegaSeal Swivel - 90° Bent Tube Short	230		Female Flat-Face O-Ring Swivel Long
150		Female MegaSeal Swivel - 90° Bent Tube	234	-FFORX45S	Female Flat-Face Swivel - 45° Bent Tube Short
151	-FMX90L	Female MegaSeal Swivel - 90° Bent Tube Long	201		Drop Econolo Flat Face Switch 45° Bont Tube
152	-FMX90XL	Female MegaSeal Swivel - 90° Bent Tube Extra	239	-FFORX90S	Female Flat-Face Swivel - 90° Bent Tube Short
165	— M. I	Male JIC 37° Flare	240	-FEORX90M	Female Flat-Face Swivel - 90° Bent Tube
166	-MJI	Male JIC 37° Flare Long	241	-FFORX90	Female Flat-Face Swivel - 90° Bent Tube Long
167	-M.190BL K	Male JIC 37° Flare - 90° Block			Drop
170	—FJX	Female JIC 37° Flare Swivel	242	-FFORX90XL	Female Flat-Face Swivel - 90° Bent Tube Extra
171	-FJXL	Female JIC 37° Flare Swivel Long			Long Drop
172	-FJX30	Female JIC 37° Flare Swivel - 30° Bent Tube	248	-FFORX135	Female Flat-Face Swivel - 135° Bent Tube
173	-FJX30L	Female JIC 37° Flare Swivel - 30° Bent Tube	300	-FL	Code 61 O-Ring Flange
		Long Drop	301	-FLL	Code 61 O-Ring Flange Long
174	-FJX45S	Female JIC 37° Flare Swivel - 45° Bent Tube	302	-+L22	Code 61 O-Ring Hange – 22-1/2° Bent Tube
		Short Drop	304	-FL30	Code 61 O-Ring Hange - 30° Bent Tube
175	-FJX45	Female JIC 37° Flare Swivel - 45° Bent Tube	305	—FL30L	Code 61 O-Ring Flange - 30° Bent Tube Long Drop
1/6	—FJX45L	Female JIC 37° Flare Swivel - 45° Bent Tube Long Drop			





HOSE/CPLG. Selection

Gates Global Part Numbering System

Thread Configurations – continued

306 Drop	-FL45S	Code 61 O-Ring Flange - 45° Bent Tube Short	416 - FLC90L	Caterpillar Style O-Ring Flange (Code 62) - 90° Bent Tube Long Drop	GLOBALSPIRAL
307	—FL45	Code 61 O-Ring Flange - 45° Bent Tube	450 — TBFL	Two Bolt Flange (Code 61)	GOOPLINGS
309	—FL60	Code 61 O-Ring Flange - 60° Bent Tube	452 – TBFL45	Two Bolt Flange (Code 61) - 45° Bent Tube	
310	-FL60L	Code 61 O-Ring Flange - 60° Bent Tube Long	454 – TBFL90	Two Bolt Flange (Code 61) - 90° Bent Tube	PCM/PCS
		Drop	460 – ABC	Air Brake Compression	FERRULES
311	—FL67	Code 61 O-Ring Flange – 67-1/2° Bent Tube	461 -STA	Straight Tube Assembly	
312	-FL67L	Code 61 O-Ring Flange – 67-1/2° Bent Tube Long	470 — FPFL	French Poclain Flange	MECACDIMD
		Drop	500 -MIX	SAF Male Inverted Swivel	
313	-FL90XS	Code 61 O-Ring Flange - 90° Bent Tube Extra	501 - MIX	SAE Male Inverted Swivel Long	OUDI LINUS
		Short Drop	502 - MIX45	SAE Male Inverted Swivel - 45° Bent Tube	
314	-FL90S	Code 61 O-Ring Flange - 90° Bent Tube Short	504 — MIX90	SAE Male Inverted Swivel - 90° Bent Tube	POWER
045	FL 00	Drop	506 - MIX120	SAE Male Inverted Swivel - 120° Bent Tube	CRIMP
315	-FL90	Code 61 O-Ring Flange - 90° Bent Tube	508 —FI	Female Inverted	COUPLINGS
316	-FL90L	Code 61 O-Ring Flange - 90° Bent Tube Long	510 -MEA	SAE Malo Elaraloss Assombly	
217		Code 61 O Ping Flange 00° Pont Tube Extra	511 MEAOO	SAE Male Flareless Assertibly	LOW
317	-FL90AL	Long Drop	511 - MIFA90	Stand Dine	PRESSURE
318	- FL 90XXI	Code 61 O-Bing Flange - 90° Bent Tube Extra	520 - 3P	Stand Pipe Long	COUPLINGS
•.•	. 2007012	Extra Long Drop	521 - 3PL	Stand Pipe Long	
323	-FL100	Code 61 O-Ring Flange - 100° Bent Tube	522 - 3P43	Stand Pipe - 43 Dent Tube	
325	—FL110	Code 61 O-Ring Flange - 110° Bent Tube	524 — SP90	Stand Pipe - 90° Bent Tube	POLARSEAL
327	—FL120	Code 61 O-Ring Flange - 120° Bent Tube	527 — FBO	Female Braze-On Stems	GOUPLINGS
329	—FL125	Code 61 O-Ring Flange - 125° Bent Tube	530 -PL	Male Press-Loc Stems	
331	—FL135	Code 61 O-Ring Flange - 135° Bent Tube	531 —PL45	Male Press-Loc Stems - 45° Bent Tube	C14
342	-RFL905	Reuseable Flange - 90° Special	532 - PL90	Male Press-Loc Stems - 90° Bent Tube	COUPLINGS
350	—FLH	Code 62 O-Ring Flange Heavy	535 -HLE	Hose Length Extender	
351	— FLHL	Code 62 O-Ring Flange Heavy Long	536 — HLE45	Hose Length Extender - 45° Bent Tube	DOTO
352	-FLH22	Code 62 O-Bing Flange Heavy – 22-1/2° Bent	537 -HLE 90	Hose Length Extender - 90° Bent Tube	THEBMO-
		Tube	538 — HLESG	Hose Length Extender - Sight Glass	PLASTIC
354	-FLH30	Code 62 O-Ring Flange Heavy - 30° Bent	539 — HLET	Hose Length Extender - Tee	COUPLINGS
Tube	•		540 — FABX	Female Air Brake Swivel	
357	-FLH45	Code 62 O-Ring Flange Heavy - 45° Bent	541 – HLE180	Hose Length Extender - 180° Bent Tube	
Tube			543 — TBFLX	Two Bolt Flange Swivel	
358	—FLH45L	Code 62 O-Ring Flange Heavy - 45° Bent	560 - MPG	Male Special Grease Fitting	G1 & G2
250		Code 62 O Ding Elange Heavy 60° Pant	561 —FG	Female Special Grease Fitting	COUPLINGS
JUDE		Code 62 O-Ring Flange Heavy - 60 Benn	562 — FZX	Parker Triple Thread Female Swivel	
361	, —FLH67	Code 62 O-Bing Flange Heavy – 67-1/2° Bent	563 - PWX	Pressure Washer Swivel (Karcher)	
001	T EI IOT	Tube	564 — BJF	Banjo (Ford Tractor)	FIELD
364	-FLH90S	Code 62 O-Ring Flange Heavy - 90° Bent	570 - MST	Male SAE 45° Flare - Straight Tube	ATTACHABLE
		Tube Short Drop	571 - MST45	Male SAE 45° Flare - 45° Bent Tube	
365	-FLH90	Code 62 O-Ring Flange Heavy - 90° Bent	572 - MST90	Male SAE 45° Flare - 90° Bent Tube	
Tube	<u>}</u>		579 - FTON134SP45	Female SAE Tube O-Ring Nut Swivel w/R134A	
366	-FLH90L	Code 62 O-Ring Flange Heavy - 90° Bent		Service Port - 45° Bent Tube	SURELOK AIR
		Tube Long Drop	580 - MTON134SP	Male SAE Tube O-Ring Nut w/R134a Service	BRAKE
367	-FLH90XL	Code 62 O-Ring Flange Heavy - 90° Bent		Port	COUPLINGS
270		Flange Without O Bing Croove (Code 62)	381 - MITUN 1345P45	Nale SAE Tube O-Ring Nul W/R1348 Service	
310		Catarpillar Style O Ding Elange (Code 62)	582 - MTON134SP90	Male SAF Tube O-Bing Nut w/B134a Service	QUICK
400	-FLC	Caterpillar Style O-Ring Flange (Code 62)		Port - 90° Bent Tube	DISCONNECT
401	-FLOL	Caterpillar Style O-Ring Flange (Code 62) Long	583 - MTON	Male SAE Tube O-Ring Nut	COUPLERS
402	-FLG22	Caterpiliar Style O-Ring Flange (Code 62) -	584 - MTON45	Male SAE Tube O-Ring Nut - 45° Bent Tube	
404	- EL C30	Caternillar Style O-Ring Flange (Code 62) - 30°	585 - MTON90	Male SAE Tube O-Ring Nut - 90° Bent Tube	
	. 2000	Bent Tube	586 - FTONR12SP	Female SAE Tube O-Ring Nut Swivel w/R12	
407	-FLC45	Caterpillar Style O-Ring Flange (Code 62) - 45°		Service Port	VALVEO
		Bent Tube	587 - FTONR12SP90	Female SAE Tube O-Ring Nut Swivel w/R12	
409	-FLC60	Caterpillar Style O-Ring Flange (Code 62) - 60°		Service Port- 90° Bent Tube	ACCESSORIES
		Bent Tube	588 - FTON134SP	Female SAE Tube O-Ring Nut Swivel w/R134a	
411	-FLC67	Caterpillar Style O-Ring Flange (Code 62) -		Service Port	FOLIIDMENT
		67-1/2° Bent Lube	589 - FTON134SP90	Female SAE Tube O-Ring Nut Swivel - 90°	
415	-FLC90	Caterpillar Style U-Ring Flange (Code 62) - 90° Bent Tube		Deni Tude W/D134d SEIVICE FUIL	



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EQUIPMENT

HOSE/CPLG. SELECTION

Gates Global Part Numbering System Thread Configurations – continued

GLOBALSPIRAL Couplings	590 — FTON 591 — FTON45	Female SAE Tube O-Ring Nut Swivel Female SAE Tube O-Ring Nut Swivel - 45° Bent Tube	751 — MSP45 752 — MSP90 705 — MPSPT	Metric Stand Pipe - 45° Bent Tube Metric Stand Pipe - 90° Bent Tube
PCM/PCS	592 - FTON90	Female SAE Tube O-Ring Nut Swivel - 90° Bent Tube	800 - FRSPT	Japanese Tapered Thread
FERRULES	593 - FTOMN	Female SAE Tube O-Ring Metric Nut Swivel		Japanese Tapered Thread
	594 - FTOMN45	Female SAE Tube O-Ring Metric Nut Swivel -	810 - MBSPP	Male British Standard Pipe Parallel
MEGACRIMP COUPLINGS	595 - FTOMN90	45° Bent Tube Female SAE Tube O-Ring Metric Nut Swivel - 90° Bent Tube	811 — MBSPPLN 830 — FBSPORX	Male British Standard Pipe Parallel Long Nose Female British Standard Parallel Pipe O-Ring Swivel
POWER	596 — FTON90BL Block	Female SAE Tube O-Ring Nut Swivel - 90°	831 - FBSPORX45	Female British Standard Parallel Pipe O-Ring Swivel - 45° Bent Tube
CRIMP	597 - MIO	Male Inverted O-Ring	832 - FBSPORX90	Female British Standard Parallel Pipe O-Ring
COUPLINGS	598 - MIO45	Male Inverted O-Ring - 45° Bent Tube		Swivel - 90° Bent Tube
	599 - MIO90	Male Inverted O-Ring - 90° Bent Tube	845 - FBSPORX90BL	Female British Standard Parallel Pipe O-Ring
LOW	600 - MIOBKHD	Male Inverted O-Ring Bulkhead		Swivel - 90° Block
PRESSURE	601 - MIOBKHD45	Male Inverted O-Ring Bulkhead - 45° Bent Tube	847 - FBX90BLK	Female British Standard Pipe Parallel - 90° Block
COUPLINGS	602 - MIOBKHD90	Male Inverted O-Ring Bulkhead - 90° Bent Tube	850 — BSPBJ	BSPP Banjo
	604 - FTDON	Female Tube Dual O-Ring Nut Swivel	855 — FBFFX	Female British Flat-Face Swivel
POLARSEAL	605 - FTDON45	Female Tube Dual O-Ring Nut Swivel – 45°	904 — MK	Male Komatsu
COUPLINGS		Bent lube	910 — FKX	Female Komatsu Style Japanese Metric Swivel
	606 — FIDON90	Female Tube Dual O-Ring Nut Swivel – 90° Bent Tube	911 —FKX45	- 45° Bent Tube
C14	607 — FTDOMN	Female Tube Dual O-Ring Metric Nut Swivel	913 — FKX90	Female Komatsu Style Japanese Metric Swivel
COUPLINGS	608 — FIDOMN45	Female Tube Dual O-Ring Metric Nut Swivel –		- 90 Deni Tube
		Eemale Tube Dual O-Ring Metric Nut Swivel -	930 — FJISA 935 — MMEA	Male Metric Flareless Assembly
PCTS		90° Bent Tube	947 — ESLTOBSP	Female (Ford) Spring Lock "T" O-Bing Splicer
THERMO-	610 - FTON180	Female Tube O-Ring Nut Swivel 180°	948 —ESLSP	Female (Ford) Spring Lock Liquid Line Splicer
	611 - MIO134SP	Male Inverted O-Ring w/R134a Service Port	949 -MSL45	Male (Ford) Spring Lock - 45° Bent Tube
GOOPLINGS	612 - MIO134SP45	Male Inverted O-Ring Bulkhead w/R134a	950 -MSL	Male (Ford) Spring Lock
		Service Port – 45° Bent Tube	951 -MSL90	Male (Ford) Spring Lock - 90° Bent Tube
FIELD Attachari f	613 — MIO134SP90	Male Inverted O-Ring w/R134a Service Port – 90° Bent Tube	952 -FSL	Female (Ford) Spring Lock
G1 & G2	614 - TORSP	Universal T-Splicers English Threads	953 - FSL90	Female (Ford) Spring Lock - 90° Bent Tube
COUPLINGS	615 - MDL	Male DIN Light Series 24° Inverted Cone	954 -R12SP	Hose Splicer w/R12 7/16-20 Thread Service
	645 - FDLORX	Female DIN Light Series O-Ring Swivel 24° Cone	Port	Formale (Four) Contract and 458 Dept Tube
FIELD	650 - FDLORX45	Female DIN Light Series O-Ring Swivel 24° Cone - 45° Bent Tube	955 — F3L43 956 — R134SP	Hose Splicer w/R134AService Port
C5	655 - FDLORX90	Female DIN Light Series O-Ring Swivel 24° Cone - 90° Bent Tube	957 — R134SPRL 958 — CFTON90	Female Rotalok w/R134a Service Port – 90° Block Compressor Female Tube O-Ring Nut - 90°
COUPLINGS	670 - FDFFX	Female DIN Flat-Face Swivel		Bent Tube
	675 — MFG	Male French GAZ	959 - CHION90BL	Compressor Female Tube O-Ring Nut - 90° Block
SURELOK AIR	680 — FFGX	Female French GAZ Swivel	960 — CFTON134SP90BL	Compressor Female Tube O-Ring Nut w/
BRAKE	685 — FFGX45	Female French GAZ Swivel - 45° Bent Tube	961 _CBSB12SP90	Compressor Pad Block – Single
COUPLINGS	690 - FFGX90	Female French GAZ Swivel - 90° Bent Tube	ODI ODOITIZOI 00	With Switch or Service Port
	715 - MDH	Male DIN Heavy Series 24° Inverted Cone	962 - CBSRR12SP90	Compressor Pad Block – Single Reversed
QUICK	720 - FDHORX	Female DIN Heavy Series O-Ring Swivel 24° Cone		With Switch or Service Port
DISCONNECT COUPLERS	725 - FDHORX45	Female DIN Heavy Series O-Ring Swivel 24° Cone - 45° Bent Tube		
	730 - FDHORX90	Female DIN Heavy Series O-Ring Swivel 24° Cone - 90° Bent Tube		
NEW BALL	735 – MKB	Metric Kobelco		
VALVES	750 - MSP	Metric Stand Pipe		

ACCESSORIES

EQUIPMENT AND PARTS





				EQUIPMENT
Gates G Air Brak	lobal Part Numbe	ering Syste	m	HOSE/CPLG. Selection
In the following coupling with -8	example, the Global Part Number ((1/2") tube size and -8 (1/2") thread	G31100-0808 identifie size.	es a SureLok™ Male Pipe (MP)	GLOBALSPIRAL Couplings
G 31	100-08	08		PCM/PCS FERRULES
		Thread Size	(1/2")	MEGACRIMP COUPLINGS
	Stem Si	ze (1/2")		DOWED
	Thread Configuration (se	e below)		CRIMP COUPLINGS
Series Stem	1 Style (see below)			
Series Stem G31−SureLok™	Styles: Fittings (Description = AB)			LOW PRESSURE COUPLINGS
G32—Compressi G33—Air Brake F	on Fittings (Description = ABC) 	= ABR)		POLARSEAL COUPLINGS
Thread Con These three-digit nu	figurations Imbers identify the various coupling thread	configurations		C14 COUPLINGS
021 — MP-ATDV 027 — MP-CV	Air Tank Drain Valve	302 — AB-AB-BKHDL 350 — AB-MEA-BKHD	Air Brake Bulkhead – Long Air Brake to Male Flareless Assembly Bulkhead	
030 — MAB-MP	Air Brake Adapter	360 — AB-FP-BKHD	Air Brake to Female Pipe Bulkhead	PCTS
031 — GH	Glad Hand	377 — AB-GH-BKHD	Air Brake to Glad Hand Bulkhead	PLASTIC
032 — GHS	Gladhand Seal	400 — AB-AB	Air Brake Union	COUPLINGS
040 — ISI-AB	Tube Sleeve Insert	404 — AB-AB90	Air Brake Union - 90° Air Brake Union - Tao	
050 — TS-AB 060 — TSN-ΔB	Tube Sleeve Tube Sleeve Nut	430 — ΑΒ-ΑΒ-ΑΒ 451 — ΔΒ-ΔΒ-ΔΒ	All Diake Union - Tee Jump UP	FIELD
061 — SGN-ABR	Spring Guard Nut	452 — AB-AB-AB	Air Brake Union - Tee Jump DOWN	ATTACHABLE
100 — AB-MP	Air Brake to Male Pipe (NPTF - 30° Cone Seat)	453 — AB-AB-AB	Air Brake Union - Tee with Bracket	COUPLINGS
102 — AB-MP45	Air Brake to Male Pipe - 45°	601 — AB-MP-TV	Air Brake to Male Pipe Truck Valve - 90°	
104 — AB-MP90	Air Brake to Male Pipe - 90°	602 — MP-ABC-TV	Male Pipe to Air Brake Truck Valve - 90°	
105 — AB-MP-Port90	Air Brake to Male Pipe - 90° with Port	610 — MP-MS90-TV	Male Pipe to Male SAE 45° Flare Truck Valve - 90°	ATTACHABLE
110 — ABR3G-IVIP 111 — ABRI-MP	All blake to Male Pipe with Spring Guard	612 — MS-MP90-TV 620 — SB-MP90-TV	Nale SAE 43 Flate to Male Pipe Truck Valve - 90 Single Read Male Pipe Truck Valve - 90°	C5
112 — SGABR	Air Brake Spring Guard	622 — SB-MP90-TVP	Single Bead Male Pipe Truck Valve with Pin Handle -	COUPLINGS
122 — AB-MPX45	Air Brake to Male Pipe Swivel - 45°	90°		
124 — AB-MPX90	Air Brake to Male Pipe Swivel - 90°	630 — FP-MP90-TV	Female Pipe to Male Pipe Truck Valve - 90°	SURELOK AIR
130 — MP-AB-AB	Male Pipe to Air Brake - Tee	650 — MP-FP-FP3WTV	3-Way Truck Valve	BRAKE
131 — MP-AB-AB	Male Pipe to Air Brake - Tee Jump UP	655 — FP-FP-FP4WTV	4-Way Truck Valve – Short Handle	COOPLINGS
132 — IVIP-AB-AB 132 — ΔR-ΔR-MP	iviale Mipe to All BTAKE - LEE JUMP DOWN Δir Brake to Male Pipe - Τορ	000 FP-FP-FP4WTV-L 701 ΜΕΔ-ΜΕΛΩΩ	4-vvdy TTUCK Valve – LONY Handle Male Flareless Assembly to Male Flareless Assembly	.
135 — AB-AB-MP	Air Brake to Male Pipe - Tee Jump UP		Shut-Off Cock	
136 — AB-AB-MP	Air Brake to Male Pipe - Tee Jump DOWN	705 — MFA-MPSC	Male Flareless Assembly to Male Pipe Shut-Off Cock	COUPLERS
138 — AB-AB-MP45	Air Brake to Male Pipe - Tee - 45°	710 — MP-FPSC	Male Pipe to Female Pipe Shut-Off Cock	
140 — MPX-AB-AB	Male Pipe Swivel to Air Brake - Tee	715 — FP-FPSC	Female Pipe to Female Pipe Shut-Off Cock	NEW BALL
142 — AB-AB-MPX	Air Brake to Male Pipe Swivel - Tee	720 — MS-MPSC	Male SAE 45° Flare to Male Pipe Shut-Off Cock	VALVES
150 — AB-FP 151 — ABB, EP	AIF Brake to Female Pipe	730 — MS-MSSC	Male SAE 45° Flare to Male SAE 45° Flare Shut-Off	
154 — AB-FP90	Air Brake to Female Pine - 90°	801 — MP-ADC	Male Pipe Air Drain Cock	ACCESSORIES
160 — AB-AB-FP	Air Brake to Female Pipe - Tee	805 — FP-MPADC	Female Pipe to Male Pipe Air Drain Cock	
167 — MP-AB-FP	Male Pipe to Air Brake to Female Pipe - Tee	832 — MP-ADCBN	Male Pipe Air Drain Cock – Bibb Nose	FOUNDATION
300 — AB-AB-BKHD	Air Brake Bulkhead	850 — ATNKV	Air Tank Valve	AND PARTS
301 — AB-AB-BKHDS	Air Brake Bulkhead – Short	970 — AB-MAN	6-Port Manifold	ANDTAILD





EQUIPMENT

HOSE/CPLG. Selection

GLOBALSPIRAL

COUPLINGS

PCM/PCS

FERRULES

MEGACRIMP

COUPLINGS

POWER

CRIMP COUPLINGS

LOW

C14

PCTS THERMO-PLASTIC COUPLINGS

FIELD ATTACHABLE G1 & G2 COUPLINGS

FIELD ATTACHABLE C5 COUPLINGS

SURELOK AIR BRAKE COUPLINGS

QUICK DISCONNECT COUPLERS

NEW BALL VALVES

ACCESSORIES

EQUIPMENT AND PARTS

PRESSURE COUPLINGS

POLARSEAL COUPLINGS

COUPLINGS

Gates Global Part Numbering System Adapters

In the following example, the Global Part Number G60110-0808 identifies a Male Pipe NPTF (MP) to Male Pipe NPTF (MP) adapter with -8 (1/2") pipe thread and -8 (1/2") pipe thread size. **Meets SAE100R2 working pressures except where noted.**

Series Stem Styles:



These three-digit numbers identify the various coupling thread configurations

These three-digit hum	ibers identify the valious coupling thread contin	guialloris	
SAE to SAE		60410— MJ-MJ	Male JIC 37° Flare to Male JIC 37° Flare
60050— FFN	Female Flareless Nut	60420- M.J-F.J	Male JIC 37° Flare to Female JIC 37° Flare
60051—FFS	Female Flareless Sleeve	60422— M.J-F.JX	Male JIC 37° Flare to Female JIC 37° Flare Swivel
60102— MP-PLUG	Male Pipe NPTF Plug	60424 MJ-EJX45	Male JIC 37° Flare to Female JIC 37° Flare – 45°
60110— MP-MP	Male Pipe NPTF to Male Pipe NPTF	60445 M.I-BKHD	Male JIC 37° Flare to Male JIC 37° Flare Bulkhead
60115— MP-MP90	Male Pipe NPTF to Male Pipe NPTF - 90°	60446 MJ-BKHD45	Male JIC 37° Flare to Male JIC 37° Flare Bulkhead –
60130— MP-FPS	Male Pipe NPTF to Female Pipe NPTF Reducer Bushing		45°
	- Short	60447 M.I-BKHD90	Male JIC 37° Flare to Male JIC 37° Flare Bulkhead –
60132— MP-FPL	Male Pipe NPTF to Female Pipe NPTF Increasing		90°
	Bushing – Long	60469MI_MI_MI	Male IIC 37° Flare – Tee
60136— MP-FP90	Male Pipe NPTF to Female Pipe NPTF - 90°	60470 MI-MI-FIX	Male IIC 37° Flare on Run to Female IIC 37° Flare
60140- MP-FPX	Male Pipe NPTF to Female Pipe Swivel NPSM		
60142— MP-FPX45	Male Pipe NPTF to Female Pipe Swivel NPSM – 45°	60471M IM IM IBKHD	Male IIC 37° Flare on Run to Male IIC 37° Flare
60144 — MP-FPX90	Male Pipe NPTF to Female Pipe Swivel NPSM – 90°		Rulkhead – Tee
60152— FP-FP	Female Pipe NPTF to Female Pipe NPTF	60472 MI-MIRKHD-MI	Male IIC 37° Elare to Male IIC 37° Elare Bulkhead to
60156— FP-FP90	Female Pipe NPTF to Female Pipe NPTF – 90°		Male JIC 37° Flare – Tee
60160— FP-FPX	Female Pipe NPTF to Female Pipe Swivel NPSM	60473 MI-F.IX-MI	Male JIC 37° Flare to Female JIC 37° Flare Swivel to
60162— FP-FPX45	Female Pipe NPTF to Female Pipe Swivel NPSM – 45°		Male JIC 37° Flare – Tee
60164— FP-FPX90	Female Pipe NPTF to Female Pipe Swivel NPSM – 90°	60490- MJ-MP	Male JIC 37° Flare to Male Pipe NPTF
60181— FP-FP-FP	Female Pipe NPTF – Tee	60497— M.I-MP45	Male JIC 37° Flare to Male Pipe NPTE – 45°
60183— FP-FP-MP	Female Pipe NPTF on Run to Male Pipe NPTF – Tee	60499— MJ-MP90	Male JIC 37° Flare to Male Pipe NPTE -90°
60184 — FPX-FPX-FPX	Female Pipe Swivel NPSM – Tee	60510- MJ-FP	Male JIC 37° Flare to Female Pipe NPTF
60186— FPX-FPX-MP	Female Pipe Swivel NPSM on Run to Male Pipe NPTF –	60514 MJ-FP90	Male JIC 37° Flare to Female Pipe NPTF -90°
	Tee	60520— FJX-MP	Female JIC 37° Flare Swivel to Male Pipe NPTF
60248 — OR	O-Rings for Straight Thread Boss Fittings	60524— FJX-MP90	Female JIC 37° Flare Swivel to Male Pipe NPTF - 90°
60250— MB-PLUG	Male O-Ring Boss Plug	60530— FJX-FP	Female JIC 37° Flare Swivel to Female Pipe NPTF
60275— MB-FP	Male O-Ring Boss to Female Pipe NPTF	60541 — MJBKHD-MP	Male JIC 37° Flare Bulkhead to Male Pipe NPTF
60285— MB-FPX	Male O-Ring Boss to Female Pipe Swivel NPTF	60551 — MJ-MJ-MP	Male JIC 37° Flare on Run to Male Pipe NPTF - Tee
60287— MB-FPX45	Male O-Ring Boss to Female Pipe Swivel NPTF – 45°	60650- MS-MP	Male SAE 45° Flare to Male Pipe NPTF – Brass
60289— MB-FPX90	Male O-Ring Boss to Female Pipe Swivel NPTF – 90°	60654 MS-MP90	Male SAE 45° Flare to Male Pipe NPTF – Brass – 90°
60291— FB-MP	Female O-Ring Boss to Male Pipe NPTF	60660	Male SAE 45° Flare to Female Pipe NPTF – Brass
60301— MB-MJ	Male O-Ring Boss to Male JIC 37° Flare	60664- MS-FP90	Male SAE 45° Flare to Female Pipe NPTF - Brass -90°
60308— MB-MJ45	Male O-Ring Boss to Male JIC 37° Flare – 45°	60698- ORFF	O-Rings for Flat Face Fittings
60312— MB-MJ90	Male O-Ring Boss to Male JIC 37° Flare – 90°	60701— FF-CAP	Female Flat-Face O-Ring Cap
60350— MJ-MJ-MB	Male JIC 37° Flare on Run to Male O-Ring Boss – Tee	60702 — MFFOR-PLUG	Male Flat-Face O-Ring Plug
60352— MB-MJ-MJ	Male O-Ring Boss to Male JIC 37° Flare to Male JIC	60724 — MFFOR-FFORX90	Male Flat-Face O-Ring to Female Flat-Face Swivel-90°
	37° Flare – Tee	60742 — MFFOR-MFFOR-	^o
60394 — TS	Tube Sleeve	FFORX	Male Flat-Face O-Ring on Run to Female Flat-Face
60395— TSN	Tube Sleeve Nut		Swivel – Tee
60399— LN	Locknuts for Bulkhead Fittings	60770 — MFFOR-MP	Male Flat-Face O-Ring to Male Pipe NPTF
60401— FJ-CAP	Female JIC 37° Flare Cap	60800- MFFOR-MB	Male Flat-Face O-Ring to Male O-Ring Boss
60402— MJ-PLUG	Male JIC 37° Flare Plug	60801 — MFFOR-MBL	Male Flat-Face O-Ring to Male O-Ring Boss - Long
60405 — MJ-FB0	Male JIC 37° Flare to Female Braze-On	60805- MFFOR-MB45	Male Flat-Face O-Ring to Male O-Ring Boss - 45°

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Gates Corporation





HOSE/CPLG.

Gates Global Part Numbering System — Adapters (Continued)

Thread Configurations (Continued)

mcau	oomigurau	ons (continueu)			SELECTION
60810— 60820 —	MFFOR-MB90 - MFFOR-	Male Flat-Face O-Ring to Male O-Ring Boss – 90°	62473 — MBSPPOR- MFFOR45	Male British Standard Pipe Parallel with O-Ring to Male	
	MFFOR-MB	Male Flat-Face O-Ring on Run to Male O-Ring Boss –		Flat-Face O-Ring – 45°	GLOBALSPIRAL
60821 -	- MFFOR-MB-		62475 — MBSPPOR- MFFOR90	Male British Standard Pipe Parallel with O-Ring to Male	COUPLINGS
	MFFOR	Male Hat-Face O-Ring to Male O-Ring Boss to Male Flat-Face O-Ring – Tee	62500 — FBSPP-MP	Hat-Face 0-Ring – 90° Female British Standard Pipe Parallel to Male Pipe	PCM/PCS
60880 - 60897 -	- FFURX-INJ - FL-CAP	Code 61 O-Ring Flange Cap	62520 — FBSPP-FP	Female British Standard Pipe Parallel to Female Pipe	FERRULES
60898 -	- FLUK	Flange Fittings	62550 — FBSPP-MJ	Ferale British Standard Pipe Parallel to Male JIC 37°	MEGACRIMP
60900 - 60901	- GENS - FL-MJ ELAK MI /	Code 61 O-Ring Flange to Male JIC 37° Flare	62605 — FBSPPX-MP90	Finale British Standard Pipe Parallel Swivel to Male	COUPLINGS
00501	FL5K-MJ	Code 61 O-Ring Flange to Male JIC 37° Flare High	62650 — FBSPPX-MJ	Female British Standard Pipe Parallel Swivel to Make	DOWED
60905 — 60906—	- FL-MJ45 FL 4K-MJ45/	Code 61 O-Ring Flange to Male JIC 37° Flare-45°	62660 — FBSPPX-FJX	Female British Standard Pipe Parallel Swivel to Female	CRIMP
	FL5K-MJ45	Code 61 O-Ring Flange to Male JIC 37° Flare High	62750 — FBSPPX-MJ	Female British Standard Pipe Parallel Swivel to Male	COUPLINGS
60910 — 60911 —	- FL-MJ90 - FL 4K-MJ90 /	Code 61 O-Ring Flange to Male JIC 37° Flare–90°	62801 — FBFFOR-MJ Metric Conversion	Female British Flat-Face O-Ring to Male JIC 37° Flare	LOW
	FL5K-MJ90	Code 61 O-Ring Flange to Male JIC 37° Flare High	63099 — MM-PLUG	Male Metric O-Ring Plug	PRESSURE
60015		Pressure – 90°	63120 — MM-FP	Male Metric with O-Ring to Female Pipe NPTF	COUPLINGS
00313-	FL5K-MFFOR	Code 61 O-Ring Flange to Male Flat-Face O-Ring High	63150 — MM-MJ 63160 — MM-M 190	Male Metric with O-Ring to Male JIC 37° Flare	
60920-	EL/K-MEEOR/5/	Pressure	63350 — MDL-MJ	Male DIN 24° Cone – Light Series to	POLARSEAL
00020	FL5K-MFF0R45	Code 61 O-Ring Flange to Male Flat-Face O-Ring High	63450 — FDLX-MJ	Male JIC 37° Flare Female DIN 24° Cone Swivel – Light Series to Male JIC	COUPLINGS
60925 —	- FL4K-MFF0R90/ FL5K-MFF0R90	Code 61 O-Ring Flange to Male Flat-Face O-Ring High	63650 — MDH-MJ	3/° Flare Male DIN 24° Cone – Heavy Series to Male JIC 37°	C14
60927 —	- FLH-CAP	Pressure– 90° Code 62 O-Ring Flange Cap	63750 — FDHX-MJ	Find Female DIN 24° Cone Swivel – Heavy Series to Male	COUPLINGS
60929 -	- FHHS	Flange Half Set (Code 62 - SAE J518)	63980 — MKB-PLUG	Male Kobelco Plug	DOTO
60930 -	- FLH6K-INJ	(6,000 PSI)	63990 — MKB-MJ	Male Kobelco to Male JIC 37° Flare	THERMO-
60935 —	- FLH6K-MJ45	Code 62 O-Ring Flange Heavy to Male JIC 37° Flare –	International to Interna	tional	PLASTIC
60940	- FLH6K-MJ90	Code 62 O-Ring Flange Heavy to Male JIC 37° Flare -	64075 — BBDS 64094 — MBSPOR-PLUG	British Bonded Seal Male British Standard Pine Parallel with O-Bing Plug	COOPLINGS
60945 —	- FLH6K-MFF0R/	Code 62 Q-Bing Flange Heavy to Male Flat-Face	64095 — ORFBSPP	O-Rings for British Standard Parallel Pipe (BSPP Couplings)	FIELD
		0-Ring (6,000 PSI)	64097 — FBSPP-CAP	Female British Standard Pipe Parallel Cap	ATTACHABLE
60950 —	- FLH4K-MFFOR45/	Code 62 O-Bing Flange Heavy to Male Flat-Face	64098 — MBSPT-PLUG 64099 — MBSPP-PLUG	Male British Standard Pipe Tapered Plug Male British Standard Pipe Parallel Plug	COUPLINGS
C0055		0-Ring - 45° (6,000 PSI)	64350 — MBSPP-FBSPPX	Male British Standard Pipe Parallel to Female British	
60955 -	FLH4K-IVIFFUR90/ FLH6K-MFF0R90	Code 62 O-Ring Flange Heavy to Male Flat-Face	64775 — MBDS	Metric Bonded Seal	FIELD
60959—	CATEHS	0-Ring - 90° (6,000 PSI) Caternillar-Style Flance Halve Sets	64780 — ORDINL	O-Rings for DIN Light Series (MegaCrimp® and GlobalSpiral™ Couplings)	ATTACHABLE
Dritich C	onversion to C		64781 — ORDINH	O-Rings for DIN Heavy Series (MegaCrimp® and Global SpiralTM Countings)	COUPLINGS
62150 -	- MRSPT-M.I	AC Male British Standard Pine Tanered Thread to Male JIC	64782 — ORDIN	O-Rings for DIN Heavy Series (PC, PCM & PCS	
02100		37° Flare	64787 — BS	Couplings) Metric Bite Sleeve	SURELOK AIR
62153 —	- MBSPT-MJ45	Male British Standard Pipe Tapered Thread to Male JIC	64788 — MNL	Metric Bite Nut – Light	BRAKE
621 55 –	- MBSPT-MJ90	Male British Standard Pipe Tapered Thread to Male JIC	64789 — MNH 64790 — MM-PLUG	Metric Bite Nut – Heavy Male Metric Plug	COUPLINGS
62200	- MBSPP-MP	Male British Standard Pipe Parallel to Male Pipe NPTF	64792 — MDL-PLUG 64793 — FDI -CAP	Male DIN 24° Cone – Light Series Plug Female DIN 24° Cone – Light Series Cap	OUTOK
62220 -	- MBSPP-FP	Male British Standard Pipe Parallel to Female Pipe	64794 — MDH-PLUG	Male DIN 24° Cone – Heavy Series Plug	DISCONNECT
62300 -	-MBSPP-MJ	Male British Standard Pipe Parallel to Male JIC 37°	64795 — FDH-CAP	Female DIN 24° Cone – Heavy Series Cap	COUPLERS
62305 —	-MBSPP-MJ45	Male British Standard Pipe Parallel to Male JIC 37°	65097 — FJIS-CAP	Female Japanese Industrial Standard Cap	NEW BALL
62310 -	-MBSPP-MJ90	Male British Standard Pipe Parallel to Male JIC 37°	65100 — FJIS-PLUG	viale Japanese Industrial Standard Plug Female Japanese Industrial Standard to Male 37° Flare	VALVES
62320 -	-MBSPP-FJX	Male British Standard Pipe Parallel to Female JIC 37°	65599 — FK-CAP 65599 — MK-PLUG	remaie komatsu Cap Male Komatsu Plug	4005000000
62450 –	-MBSPPOR-MJ	Male British Standard Pipe Parallel with O-Ring to Male	65700 — FK-MJ 65700 — MK-MK	Male Komatsu to Male Komatsu	ACCESSORIES
62460 –	-MBSPPOR-MJ90	Male British Standard Pipe Parallel with O-Ring to Male	65800 — MK-MJ 65800 — MK-FK90	Male Komatsu to Female Komatsu – 90° Male Komatsu to Female Komatsu – 90°	EQUIPMENT
62470—	MBSPPOR-MFFOR	Male British Standard Pipe Parallel with O-Ring to Male Flat-Face O-Ring		Tee	AND PARTS



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EQUIPMENT

HOSE/CPLG. SELECTION

GLOBALSPIRAL COUPLINGS

PCM/PCS FERRULES

MEGACRIMP COUPLINGS

POWER CRIMP COUPLINGS

LOW PRESSURE COUPLINGS

POLARSEAL COUPLINGS

C14 COUPLINGS

PCTS THERMO-PLASTIC COUPLINGS

FIELD ATTACHABLE G1 & G2 COUPLINGS

FIELD ATTACHABLE C5 COUPLINGS

SURELOK AIR BRAKE COUPLINGS

OLIICK DISCONNECT COUPLERS

NEW BALL VALVES ACCESSORIES

> EQUIPMENT AND PARTS

> > C47

Gates Global Part Numbering System Quick Disconnect Couplers

Gates Quick Disconnect couplers feature a meaningful part number that makes coupling identification fast and easy. Always refer to Gates Cross Reference Charts when selecting a quick disconnect coupler for a competitive interchange. G940 Series - Agricultural Standard - Ball Valve

G94021-0808 **Body Style** Identification Assembly 0 Male Tip (Nipple) 1 Female Coupler 2 3 Repair Kit Coupling Body Letter Thread Thread Nominal 5 O-Ring Style Series Style Coupling Size Optional-Backup Ring 6 (see below) (see right) Size (Double Acting 8 Dust Plug (see right) Dust Cap 9 Sleeve)

Thread Style

- 0 Not Applicable
- Female Pipe 1
- 2 Female O-Ring Boss
- **Bulkhead Mounts** 3 Female British
- 4 Parallel Pipe

Miscellaneous

- D Double-Acting Sleeve
- Ρ Connect-Under-Pressure Option

Coupling	Series	Indentification
oouping	001100	maomanoution

MQBA	Male Quick Disconnect Ball Agricultural
FQBA(DA)	Female Quick Disconnect Ball Agricultural (Double Acting Sleeve)
G941 Series - Ag	ricultural Standard—Poppet Valve
MQPA	Male Quick Poppet Agricultural
FQPA	Female Quick Poppet Agricultural
G942 Series - Jo	ohn Deere Old Style
MQBAJD	Male Quick Ball Agricultural John Deere
FQBAJD	Female Quick Ball Agricultural John Deere
G943 Series - In	ternational Harvester Old Style
MQBAIHC	Male Quick Ball Agricultural International Harvester
G944 Series - J.	I. Case Old Style
MQBAJIC	Male Quick Ball Agricultural J.I. Case
G945 Series - In	dustrial ISO 7241-1—Series B
MQPI	Male Quick Poppet Industrial
FQPI	Female Quick Poppet Industrial
G949 Series - Fl	ush Face, HTMA
MQFF	Male Quick Flush Face
CPMQFF	Male Quick Disconnect Flush Face (Connect-Under-Pressure)
FQFF	Female Quick Flush Face
CPFQFF	Female Quick Disconnect Flush Face (Connect-Under-Pressure)
G950 Series - Hi	gh Pressure Flush Face
MQFFH	Male Quick Flush Face (High Pressure)
FQFFH	Female Quick Flush Face (High Pressure)

G951 Series - W	ing Nut
MQW	Male Quick Wing
FQW	Female Quick Wing
G952 Series - Hi	gh Pressure Wing Nut
MQWH	Male Quick Wing (High Pressure)
FQWH	Female Quick Wing (High Pressure)
G953 Series - Ve	ery High Pressure Flush Face
MQFFVH	Male Quick Flush Face (Very High Pressure)
FQFFVH	Female Quick Flush Face (Very High Pressure)
G956 Series - Inc	dustrial ISO 7241-1—Series A
MQP	Male Quick Poppet
FQP	Female Quick Poppet
G959 Series - Ag	pricultural Adapters
MJD	John Deere Old Style
MISO	ISO Style
MIHC	International Harvester Style
Miscellaneous	
DA	Double Acting Sleeve
ISO	Industrial Standards Organization
DP	Dust Plug
DC	Dust Cap
DSO	Double Shut Off
FP	Female Pipe
FB	Female O-Ring Boss
QDAOR	G940 Series O-Ring for Female Coupler
QDIBR	G945 Series Backup Ring for Female Coupler
QDIOR	G945 Series O-Ring for Female Coupler
QDOR	G956 Series O-Ring for Female Coupler
QDBR	G956 Series Backup Ring for Female Coupler





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Coupling/Thread Configurations

GlobalSpiral[™] (GS) Couplings

GLOBALSPIRAL COUPLINGS

EQUIPMENT

HOSE/CPLG. SELECTION

for EFG6K, G6K, EFG5K, G5K, EFG4K, G4K, EFG3K and G3K Hose (Continued)



EQUIPMENT AND PARTS

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MGS-FDHORX

MGS-FBSPORX





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for High and Medium Pressure Hoses (Continued)

Coupling/Thread Configurations

MegaCrimp[®] Couplings

globalspiral Couplings

HOSE/CPLG. Selection

PCM/PCS FERRULES Ð MEGACRIMP COUPLINGS G-MIX90 G-MFA G-NASP G-FABX G-MIX45 POWER CRIMP COUPLINGS LOW PRESSURE COUPLINGS G-MDL G-BJ G-FG G-FZX G-PWX POLARSEAL COUPLINGS C14 COUPLINGS G-FDLORX G-FDLORX45 G-FDLORX90 G-FFGX G-MDH PCTS THERMO-PLASTIC COUPLINGS FIELD ATTACHABLE G1 & G2 COUPLINGS G-FDHORX90 G-MBSPT G-FDHORX45 **G-FDHORX** G-MLSP FIELD ATTACHABLE C5 COUPLINGS SURELOK AIR BRAKE COUPLINGS G-FBSPORX90BL G-MBSPP **G-FBSPORX** G-FBSPORX45 G-FBSPORX90 Æ QUICK DISCONNECT COUPLERS NEW BALL VALVES G-FKX45 G-FKX90 G-FBFFX G-FKX G-FKX45M **G-FJISX** G-FKX90M ACCESSORIES EQUIPMENT AND PARTS

Gates Corporation

Chemical Resistance Ratings for Gates Hose Polymers, Couplings and Adapter Materials

The Chemical Resistance Table lists the relative resistance of hose and coupling materials to more common chemicals. These ratings do not cover all possible variations of all factors, such as temperature, concentration, degradation or fluid contamination, etc. Testing under actual conditions is the best way to ensure chemical compatibility for critical applications.

For specific information, contact Gates Hose/ Connector Product Application, Denver, Colorado.

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Rating Scale

"1"	Excellent resistance
"2"	Good resistance
"X"	Not recommended
"_"	Testing recommende

How to Use the Chemical Resistance Table

- 1. Chemicals are listed alphabetically.
- 2. Find the hose, coupling and adapter material type that has a resistance rating of "1" or "2" (See Rating Scale).
- 3. Find hose(s) with compatible polymer(s) in the Gates Hydraulic Hose Selection Guide.
- 4. Look for compatible couplings for the selected hose(s) by following the hose page references in the Selection Guide.

NOTE: O-Rings used with couplings also must be considered for chemical compatibility with the fluid to be conveyed. This includes couplings containing internal O-rings; for example, MPX (Male Pipe Swivel). Gates standard O-ring is made of Nitrile. If O-rings other than Nitrile are required, contact Gates Denver.









HOSE/CPLG. SELECTION

EQUIPMENT

AND PARTS

Hose & Coupling Section

Chemical Resistance Table

SELECTION	Rating Scale: 1 Excellent	Gates Hose Polymers							(&	Cou Ac	ıplir dapt	ngs ters	;	Rating Scale: 1 Excellent	G	ate	es H	ose	C &	oup Ada	oling apte	gs ers						
GI OBAI SPIRAI	2 Good resistance			Tra	de l	Vam	ies				20	316			2 Good resistance			Trac	de N	am	les				202	0		
COUPLINGS	X Not recommended	А	С	C₂	J			Z		-	<u>e</u> 3	<u>el</u> 3			X Not recommended	Α	С	C_2	J			Z		-	19	n R		
	 Testing recommended 	e		Š			only)			Ste	Ste	Ste	ε		 Testing recommended 	e		Š			only)			Ste	t St		Ε	
DOM/DOC		Drer	е	e/P		alon	ating		ا ء	ő	less	lesa	inu	s		Drer	e	e/P		lon	ating		_	u Q	less	Ω.	nui	s
FERRIILES		leol	litril	litril	Ř	N D	over	Ë	읽	arb	tain	tain	Jun	sras	o	leo	litril	litril	Ц	ž		Ë	읫	arb	tain		un .	sras
I LIIIIOLLO	Chemical Name	2	2	2	0	<u> </u>	<u>)</u> ©	<u>a</u>	2	0	S	S	۹	ш	Chemical Name	2	2	2	0	<u> </u>	್ರಿ	<u>n</u>	2	0	ŝ	<u> </u>		<u>ш</u>
	Α														Ammonium Chloride, 10% Boiling Ammonium Chloride, 28% Boiling	X	X X	-	-	2	-	1	X	X X	2	2 2	X X	X X
MEGACRIMP	Absorption Oil	2	1	2	1	2	-	1	1	_	-	-		1	Ammonium Chloride, 50% Boiling	X	Х	-	-	-	-	1	X	Х	2	2	Х	Х
COUPLINGS	Acetaldehyde	X	X	Х	-	X	1	1	2	1	1	1	1	1	Ammonium Hydroxide	2	2	2	1	1	Х	1	1	2	1	1	-	Х
	Acetamide	1	2	-	-	-	Х	1	-	-	-	-	-	-	Ammonium Hydroxide, 3 Molar	1	Х	-	-	-	2	1	-	Х	2	2	Х	Х
POWER	Acetic Acid, 5-20%	2	X	2	1	2	Х	1	1	X	2	2	2	X	Ammonium Hydroxide, Concentrated	$\begin{vmatrix} 1 \\ 2 \end{vmatrix}$	2	2	-	2	-	1	-	1	2	2 1	X	-
CRIMP	Acetic Acid. 30%	2	X	-	1	-	2	1	$\hat{2}$	X	2	2	2	x	Ammonium Nitrate, Fertilizer	1	2	1	1	1	1	1	Х	1	1	1	2	Х
COUPLINGS	Acetic Acid, 50%	2	Х	2	1	-	-	1	2	Х	2	2	2	Х	Ammonium Nitrite	1	1	-	-	-	-	-	1	2	1	1	Х	-
	Acetic Acid, 50% Boiling	X	Х	-	-	-	-	1	Х	Х	Х	2	-	-	Ammonium Persulfate	X	Х	Х	1	-	Х	-	X	Х	2	2	Х	Х
IOW	Acetic Acid, 80%	X	Х	-	-	-	-	1	X	Х	2	2	2	X	Ammonium Persulfate, 5%		X X	-	-	2	×	2	X	X X	2	2	X X	X X
PRESSURE	Acetic Acid, 80% Bolling Acetic Acid, 100%	X	X	-	-	-	2	1	X	X	X	2	× 2	X	Ammonium Phosphate	'	~				~			~	2	-	~	~
COUPLINGS	Acetic Acid, 100% Boiling	X	X	-	-	-	Х	1	X	X	X	2	-	X	(Mono, Di, Tri, Basic)	1	1	1	1	1	1	1	2	Х	2	2	Х	-
	Acetic Acid, 100% (Hot) Vapors	2	2	-	-	-	-	-	Х	Х	Х	2	2	Х	Ammonium Sulfate	1	2	1	1	1	1	1	Х	Х	Х	2	Х	Х
	Acetic Acid, Air Free	-	-	-	-	-	-	1	-	Х	Х	Х	-	Х	Ammonium Thiocyanate		1	-	1	1 v	-	1	-	1	1	1	- V	- 2
POLARSEAL	Acetic Acid, Annydride	X	X	X	1	2	1	1	X	X Y	2	2	2	X Y	Amyl Alcohol	2	2	2	1	-	-	1	1	1	1	1	1	1
COUPLINGS	Acetic Acid, Arealed	X	Х	-	_	_	-	1	1	X	2	1	2	X	Amyl Borate	2	2	2	-	-	-	-	-	-	-	-	-	-
	Acetic Acid, Glacial	X	Х	Х	1	Х	Х	1	Х	Х	2	2	2	-	Amyl Chloride	X	-	Х	2	Х	-	1	2	-	1	1	-	-
C14	Acetone (Dimethylketone)	Х	Х	Х	1	Х	Х	1	1	1	1	1	1	1	Amyl Chloronaphthalene	X	X	X	-	X	-	1	-	-	1	1	-	-
COUPLINGS	Acetonitrile (Methyl Cyanide)	2	X	2	1	2	-	-	-	- 1	- 1	-	- 1	-	Amyl Phenol	^	-	-	-	-	-	1		-	1	1 1	-	-
	Acrylonitrile (Vinyl Cvanide)	X	X	X	1	x	-	-	-	1	1	1	2	1	AN-0-3 Grade M	1	1	-	-	-	-	-	-	-	-	-	-	-
PCTS	Aero Lubriplate	1	1	-	-	-	-	-	-	1	1	1	1	-	AN-0-6	1	1	-	-	-	-	-	-	-	-	-	-	-
THERMO-	Aero-Safe 2300	X	Х	-	-	-	Х	-	-	1	1	1	1	1	AN-0-366	1	1	-	-	-	-	-	- V	-	-	-	-	-
PLASTIC	Aeroshell Type 1A, 1AC, 4	2	1	-	-	-	1	-	-	-	-	-	-	-	Anderol, L-774 (Diester) Anderol, L-826 (Diester)	X	2	-	-	2	-	1	X	-	2	-	2	2
COUPLINGS	Aeroshell 17 Grease	2	1	2	-	-	X	-	-	1	1	1	1	2	Anderol, L-829 (Diester)	X	2	-	-	-	-	1	X	-	-	-	-	-
	Aeroshell 750	X	2	-	-	-	Х	-	-	1	1	1	1	-	ANG-25 (Glyceral Ester)	2	2	-	-	-	-	1	2	-	-	-	-	-
	Air, Ambient	1	1	1	1	1	1	1	1	1	1	1	1	1	ANG-25 (Diester Base, TG749)	X	2	-	-	-	-	1	X	1	1	1	1	-
ATTACHABLE	Air, 150°F	1	1	1	1	1	1	1	1	1	1	1	1	1	Aniline Aniline Dves		X	X	2	×	X -	1	2	2	1	1 1	Х 2	X X
G1 & G2	AIF, 180°F Air 200°F		2	2	1	2	2	1	2	1	1	1	1	1	Aniline Hydrochloride	X	Х	-	2	-	-	1	-	X	1	1	-	-
COUPLINGS	Aircraft Hyd. Oil AA	-	1	-	-	-	-	-	-	1	1	1	1	1	Animal Gelatin	1	1	-	1	-	-	1	-	-	1	1	-	-
	Alcohol	1	1	-	-	-	-	1	-	1	1	1	1	1	Animal Fats	2	1	-	1	-	-	1	1	1	1	1	1	Х
	Alcohol, Amyl	2	2	-	-	-	-	1	1	-	2	1	2	-	Animal UII (Lard UII)	2	1	- 2	1	-	-	1	-	1	1	1	1	-
FIELD	Alcohol, Benzyl Alcohol, Butyl		X X	- 2	1	2	2	1	-	1	1	1	- 1	- 1	Antifreeze, Glycol Base	2	1	1	1	1	_	1	1	1	1	1	1	1
C5	Alcohol, Denatured	1	1	-	-	1	-	1	1	1	1	1	1	1	Antimony Chloride, 50%	-	1	-	-	-	-	1	Х	Х	Х	Χ	-	-
COUPLINGS	Alcohol, Diacetone	·	Х	-	-	2	-	1	-	1	1	1	1	1	AN-VV-0-366B Hydraulic Fluid	1	-	-	-	-	-	-	2	-	-	-	-	-
	Alcohol, Ethyl (Ethanol)	1	1	1	1	1	2	1	1	1	1	1	1	2	Aqua Regia (Concentrated)	X	X 1	X	2	X	X	1	X	X	Χ.	X -	X	-
	Alcohol, Furfural Alcohol, Heyyl (Heyanol)	2	X 1	X	1	2	2	1	-	2	1	1	1	1	Arco C2, 100		1	_	_	-	_	_	_	_	_	-	-	-
SURELOK AIR	Alcohol, Isobutyl	2	2	-	-	1	-	1	1	1	1	1	1	2	Aromatic Fuel 30%, Mil.	-	-	-	-	-	-	1	-	-	-	-	-	-
	Alcohol, Isopropyl (Isopropanol)	2	2	2	-	2	2	1	1	1	1	1	1	2	Aromatic Fuel 50%	X	2	-	-	-	-	1	-	-	-	-	-	-
GOOFLINGS	Alcohol, Methyl (100%) (Methanol)	1	1	1	1	1	-	1	1	1	1	1	1	2	Aromatic Hydrocarbons	X	Х	-	- 1	Х	2	1	-	2	1	2	2	2
	Alcohol, Methyl (6%)	1	1	1	-	1	-	1	1	1	1	1	1	2	Askarel, Transformer Oil	X	x	x	-	x	-	1		1	1	1	-	1
QUICK	Alcohol, Propyl		1	-	_	_	_	1	x	2	1	1	1	1	Asphalt, Under 180°F	2	2	2	Х	Х	1	1	-	1	1	1	-	2
DISCONNECT	Alkazene	X	Х	Х	-	Х	Х	-	-	1	1	-	-	-	Asphalt, Cut Back	X	2	2	-	Х	1	1	1	1	1	1	2	2
COUPLERS	Aluminum Chloride	1	1	1	1	1	2	1	Х	Х	2	2	Х	Х	Asphalt, Topping		X	-	-	-	-	1	-	1	1	1	- 1	- 1
	Aluminum Fluoride		1	1	1	1	2	1	X	Х	2	2	2	X 1	ASTM OILNO.	$\begin{vmatrix} 1\\ 2 \end{vmatrix}$	2	1	-	2	2	1	1	1	1	י 1	י 1	1 1
NEW BALL	Aluminum Hydroxide Saturated		1	-	-	-	2	1	1	-	1	1	-	-	ASTM Oil No. 3	X	1	X	Х	X	-	1	1	1	1	1	1	1
VALVES	Aluminum Nitrate	1	1	1	1	1	2	1	-	Х	1	1	2	-	ASTM Oil No. 4	X	2	-	-	-	-	1	-	1	1	1	1	-
	Aluminum Sulfate	1	1	1	1	1	Х	1	1	Х	Х	2	Х	Х	ASTM Reference Fuel A	2	1	1	1	1	-	1	1	1	1	1	1	1
100500000	Alums (Ammonium or Potassium)	1	1	1	1	1	-	1	-	Х	2	2	Х	Х	ASTM Reference Fuel C	(2) v	1	(2) V	2	X Y	-	1		1	1	1 1	1	1
ACCESSORIES	Ammonium Carbonate	¹	2	-	-	-	2	-	1	- 1	1	1	2	X -	ATL-857	Â	2	-	-	-	-	-	_	-	-	-	-	-
	Ammonium Chloride, 1%	X	2	1	1	1	1	1	1	X	2	2	Х	Х	Atlantic Dominion F	2	1	-	-	-	-	-	-	-	-	-	-	-
FOUNDATION									_								_											

Ocover stock rating only; Rating for tube stock "X" *Use Gates fuel hose or contact Denver Product Applications Department.





Chemical Resistance Table

Rating Scale:	-	Gat	tes	Ho	se F	Poly	me	'S		Coi & A	upli dap	ngs oters	-		Rating Scale:	(Gat	tes	Но	se	Pol	yme	ers	8	Coi & Ac	uplir dapt	ngs ters	;	-	SELECTION
2 Cood registered			Tra	ade	Na	me	s			4	9			-	Cood registance			Т	rade	e Na	ame	s		\square	4	9			-	
X Not recommended	A	С	C.	1				7	1	30	31				X Not recommended	Α	С	C	2]				7	1	30	31				GLOBALSPIRAL
 Testing recommended 		-	0			14	-	_	teel	Stee	Stee	_			 Testing recommended 	-	-	<u> </u>)			ş	-	teel	Stee	Stee	_			GOUPLINGS
 resulting recommended 	prene	e	le/PV(alon	hane		Ę	on St	less (less (minum	ŝ		- resung recommended	prene	e		. 16/1		hane	rating or	u 5	on St	less (less (ninum	ş		PCM/PCS
Chemical Name	Neo	Nitri	Nitri	ä	Hyp Hyp	Uret	PTF	N	Cart	Staii	Staiı	Alur	Bras		Chemical Name	Neo	Nitri	Nite		בי בי	Uret U			Cart	Staiı	Staiı	Alur	Bras		FERRULES
Aurex 903R (Mobil)	2	1	-	-	-	-	-	-	-	-	-	-	-	-	C					-		-			-	-			-	
Automatic Brake Fluid	2	Х	-	-	-	-	1	-	1	1	1	1	-		Calcium Acetate	X	X)		1	X		1 -	2	2	2	X	1		MECACDIMD
Automatic Transmission Fluid - ATF	2	1	-	1	-	-	1	-	1	1	1	1	-		Calcium Arsenate	-	-						1 1	-	-	-	-	-		
Aviation Gasoline, Mil.	-	2	-	-	-	-	-	-	1	1	1	1	-		Calcium Bisulfate	1	1	2	2 -	1	1		1 -	-	2	1	-	Х		
Baltic Types 100, 150, 200, 300, 500		1	-	-	-	-	1	-	-	-	-	-	_		Calcium Bisulfide	1	1	2	2 1		1 '	1	1 -	-	2	2	Х	Х		
Banvel, Concentrated (Ag Spray)		-	-	-	-	-	1	1	-	-	1	-	-		Calcium Carbonate	1	1	1	1 -	1	1 ·		11		1	1	1 Y	X 1		POWER
Bardol B	X	Х	Х	-	Х	-	1	-	1	1	1	-	-		Calcium Chlorate		1	1	1.		1.		1 -	2	2	1	1	-		CRIMP
Barium Carbonate	1	1	1	1	1	-	1	1	2	1	1	Х	1		Calcium Chloride	1	1	1	1 1	1	1 .		1 1	X	2	1	X	-		COUPLINGS
Barium Chloride	X	1	1	1	1	1	1	1	X	2	2	Х	2		Calcium Hydroxide	1	2	2	2 -		1)	< ·	1 -	X	Х	1	-	2		
Barium Chloride, 5%	ľ	1	-	-	-	-	1	X	2	I	1	X	-		Calcium Hydroxide, 10% Boiling	-	2				-		1 X	2	1	1	Х	Х		LOW
Solution (Hot)	X	1	-	-	-	-	1	Х	2	2	2	Х	-		Calcium Hydroxide, 20% Boiling	1.1	-				-	•	1 X	-	1	1	Х	Х		PRESSURE
Barium Hydroxide	1	1	1	1	1	Х	1	1	X	1	1	Х	Х		Calcium Hypochlorite 5%	1.1	-			-	-	-		-	Χ	2	X	Χ		COUPLINGS
Barium Sulfate	1	1	-	1	2	-	1	1	2	1	1	2	2		(Under 100°F)	X	2)	< -		2		1 X	X	Х	2	х	Х		
Barium Sulfate, Aqueous															Calcium Hypochlorite, 15%		-		-		-					-				
Solution (Hot)	X	-	-	-	-	-	1	X	2	1	1	2	-		(Under 100°F)	X	-)	< 1		2		1 X	-	Х	2	Х	Х		POLARSEAL
Banum Sumue Bavol D		1	-	-	-	-	-	2		-	-	~	~		Calcium Nitrate	1	1	1	1 1	1	1		1 1	X	2	2	Х	1		COUPLINGS
Bayol 35		1	-	-	-	-	-	-	-	-	-	-	-		Calcium Silicate	-	2		- 1		2	-	1 -	1	1	1	1	1		
Beet Sugar Liquors	X	1	1	1	1	Х	1	-	2	2	2	2	Х		Calcium Sulfide		2			1			1 - 1 2	2	1	1	2	-		C14
Bellows 80-20 Hydraulic Oil	-	1	-	-	-	2	1	-	-	-	-	-	-		Caliche Liquors		2				1 .		1 -	1	1	1	-	-		
Benzaldehyde	X	Х	Х	2	X	1	1	1	1	1	1	1	1		Cane Sugar Liquors	1	1	2	2 -	1	-		1 -	1	1	1	1	2		COOL FILLING
Benzene, Benzol Benzene Sulfenie Acid		Х	Х	Х	X	2	1	1		1	1	1	1		Carbolic Acid, Phenol	Х	Х)	< -	1	X	< .	1 X	X	1	1	2	Х		
Benzine Petroleum Ether	Î	2	×	1	-	2	1	-		- 1	2	1	1		Carbon Dioxide, Dry	2	1	1	1 1		1 '	1	1 -	1	1	1	1	1		PCTS
Benzoic Acid 21°C (70°F)	X	X	X	1	-	-	1	-	1	1	1	1	1		Carbon Dioxide, Wet	2	1	1	1	 > ·	1 · v ·		l - 1 1	1	1	1	1	1 V		THERMO-
Benzol	X	Х	Х	Х	-	-	1	1	1	1	1	1	1		Carbon Monoxide Under		^		- 4	<u> </u>	^ 4	-		2			2	^		PLASTIC
Benzyl Alcohol	X	Х	-	1	-	-	1	Х	1	1	1	1	-		150°F (Hot)	2	2	2	2 -	1	1		1 2	1	1	1	1	1		COUPLINGS
Benzyl Benzoate	-	-	-	-	-	-	1	-	1	1	1	-	-		Carbon Tetrachloride, 5%-10%	-	-				-		1 -	-	Х	-	-	-		
Benzyl Unioriae Biodiesel**	X	X	X	X	-	-	1	2		- 1	- 1	-	-		Carbon Tetrachloride, Pure	X	Х)	Κ 2	2	XX	< .	1 X	X	Х	2	2	2		FIFI D
Bismuth Carbonate	X	-	-	-	-	-	1	-	1	1	1	-	-		Carbonic Acid	1	1	1	1 1		1)	< ·	1 - 1 1		1	1	2	X		ATTACHABLE
Black Point 77	-	1	-	-	-	-	-	-	-	-	-	-	-		Caustic Soda 20%	2	X	2	< -	1	24	<u>~</u> ~ ·	1 1 1 2	2	1	1	X	X		G1 & G2
Black Sulfate Liquor	2	2	2	2	2	-	1	1	1	1	1	-	1		Caustic Soda, 50%	2	X	ý	κ ·		1)	<u>`</u>	1 2	2	1	1	X	Х		COUPLINGS
Blast Furnace Gas	X	Х	Х	-	Х	Х	1	-	1	1	1	2	1		Cellosolve Acetate, Under 100°F	X	Х)	< 2	2	Х		1 -	2	2	2	1	-		
Borax, Sodium Borate Bordeaux Mixture		2	2	1	1	1	1	X 1	2	1	1	X 1	2		Cellosolve, Butyl, Under 100°F	X	Х)	< .		Х		1 -	2	2	2	2	-		
Boric Acid		1	1	-	1	1	1	X	X	2	2	1	X		Cellosolve, Union Carbide,		v								~	0	0			FIELD
Boron Fuels, HEF	X	Х	-	-	-	-	-	-	-	-	-	-	-		Cellugard Cellugard 200		X 1				-		I - 1 -	2	2	2	2	1		C5
Brake Fluid, Petroleum Base	2	1	2	1	Х	-	1	-	1	1	1	-	1		Cellulube 90, 150, 220, 300, 550	X	X)	ζ.	-	Х		' 1 -	1	1	1	1	1		COUPLINGS
Brake Fluid, Synthetic Base	X	Х	Х	1	Х	-	1	1	1	1	1	1	1		Cellulube 1000, 220A, ST220, A60	X	Х)	< .	-	Х		1 -	1	1	1	1	1		COOL FILLING
Bray 66 - 130 Brayco 719-r (M/-H-010)		2	-	-	-	-	1	-	-	-	-	-	-		Cellutherm 2505A	Х	2			-	-			-	-	-	-	-		
Brayco 885 (MII -1 -6085A)	X	2	-				-	-			-	-	-		Chevron Fr-10,13,20.8	-	-		 ,	•	-	•	1 -	1	1	1	-	1		SURELOK AIR
Brayco 910	2	2	-	-	-	-	-	-	-	-	-	-	-		Chlordane Chlorinate Paraffin & Petroleum Oil	X	X)	< ·		X ·		11	1	- 1	- 1	- 1	- 1		BRAKE
Brine	1	1	1	1	-	-	1	1	2	1	1	-	2		Chlorine Gas. Drv	N/A	Х	N	/A N	/A			1 -	2	X	X	-	2		COUPLINGS
Brom-113	X	2	-	-	-	-	-	-	-	-	-	-	-		Chlorine Gas, Wet	N/A	x	N	AN/	/A	-		1 -	X	Х	Х	Х	Х		
Brom-114 Broming Dry		2	-	-	-	-	-	-	-	-	-	-	-		Chlorine Trifluoride	X	Х				-			1	1	1	1	-		ошск
Bromme, Dry Bunker Oil	Ŷ	2	2		×	2	1 1	- 1		1	1	- 1	1		Chlorine Water, 3% Chlorine	X	Х)	< ·	-	-		1 -	-	Х	Х	-	-		DISCONNECT
Butadiene	X	2	-	-	-	-	1	1	-	1	1	-	1		Chlorine Water, 25% Chlorine	X	X)	<. /		2 2	2 .	12 1V	-	X	X	-	-		COUPLERS
Butane	X	Х	Х	-	Х	Х	1	Х	1	1	1	-	1		Chlorobenzene	Â	X	Ś	$\langle \rangle$	· ·	χ.		1 X		2	2	x	1		
Butter Oil	2	-	-	-	-	-	1	-	1	1	1	1	1		Chlorobromo Methane	X	X	Ś	. , (.	-	Х		1 -	2	2	2	Х	1		
Butyric Acid	X	-	-	1	-	-	1	Х	X	1	1	-	2		Chloroform	Х	Х)	$\langle \rangle$	< 1	Х		1 X	2	1	1	Х	1		NEW BALL
Butyl Acetate		X 1	X 1	2	X	-	1	- 1	2	1	1	1	1		0-Chloronaphthalene	Х	Х)	< ·	-	-		12	1	1	1	-	1		VALVES
Butyl Amine		-	-	-	-	-	1	1		1	1	1	1		Chlorosulfonic Acid	2	Х)	()	< /			I X	1	-	-	-	-		
Butyl Carbitol	2	2	-	1	-	-	1	-	1	1	1	1	1		Chlorox Bleach	X 2	X 2)	<pre></pre>	۲. ۱	x) 2		1 - 1 1		1 V	1	X Y	I X		ACCESSORIES
Butyl Mercaptan	-	-	-	-	-	-	1	-	-	1	1	1	-		Chromic Acid. 5%	X	X						i I 1 X	Ŷ	X	2	X	X		AUCOUNICO
Butyl Stearate	X	2	2	2	-	-	1	-	1	1	1	1	1		Chromic Acid, 10%	X	_X)	(2	< .	1_X	X	X	2	X	Х	_	
Butyraldehyde	X	Х	-	2	-	-	1	-	-	-	-	-	1		*Use Gates fuel hose or contact	Den://	er F	Drov	duct	Anr	olicet	ione	Dens	rtme	ent				-	EQUIPMENT
	0	Cov	/er s	tock	k rati	ing c	only;	Ratir	ig fo	r tuk	oe st	tock '	"X"		**Nitrile 150°E or less, no consta	int cor	ntad	nt.		· •P•			- opc							AND PARTS

**Nitrile 150°F or less, no constant contact.



The World's Most Trusted Name in Belts, Hose and Hydraulics.



Hose & Coupling Section

EQUIPMENT

HOSE/CPLG. SELECTION

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PCM/PCS FERRULES

MEGACRIMP COUPLINGS

POWER CRIMP COUPLINGS LOW

PRESSURE COUPLINGS

POLARSEAL COUPLINGS

C14

COUPLINGS

PCTS THERMO-PLASTIC COUPLINGS

FIELD ATTACHABLE G1 & G2 COUPLINGS

FIELD ATTACHABLE C5 COUPLINGS

SURELOK AIR BRAKE COUPLINGS

QUICK DISCONNECT COUPLERS NEW BALL

VALVES ACCESSORIES

> EQUIPMENT AND PARTS

Rating Scale: 1 Excellent	G	ate	s H	ose	Pc	olym	ers		8	Cou L Ac	ıplir dap	ngs ters	
2 Good resistance	А	С	C_2	J			Z	2		04	16		
X Not recommended		7	rac	le N	lan	nes			-	el 3	el 3		
 Testing recommended 	oprene	ile	ile/PVC	ш	oalon	thane r rating only)	ĥ	on	bon Stee	inless Ste	inless Ste	minum	SS
Chemical Name	Ne	Nit	Nit	G	Ŧ	n ∎ §	Ηd	Ŋ	Cal	Sta	Sta	Alu	Bra
Chromic Acid, 25%	Х	Х	Х	1	2	Х	1	Х	Х	Х	2	Х	Х
Chromic Acid, 50%	Х	Х	Х	1	2	X	1	Х	X	X	2	1	X
Circo Light Process Oil	1	1	-	-	-	-	1	-	1	1	1	1	-
Citgo FR Fluids	-	Х	-	Х	-	2	1	-	1	1	1	-	1
Citgo Glycol FR-20XD Citgo Sentry (Under 100°E)	- 2	1	- 1	Ĵ	- X	2	1	Ĵ	1	1	1	Ĵ	1
Citgo Tractor Hydraulic Fluid	-	1	-	-	-	2	1	-	1	1	1	-	1
Citric Acid, 5%	-	2	-	-	-	-	1	1	Х	1	1	1	Х
Citric Acid, 5% @150°F	- 1	2	-	-	-	-	1	X 1	X	X	1	2	X 1
Citric Acid, 15% Boiling	1	2	-	-	-	-	1	Х	X	2	1	X	Х
Citric Acid, Concentrated Boiling	1	Х	1	-	1	2	1	Х	Х	Х	1	Х	Х
Coal Gas	1	Х	-	1	-	1	1	-	-	-	-	-	-
Coal Lars Cod Liver Oil	X 1	2	X 1	2	2	-	1	X -		1	1	1	1
Coke Oven Gas (Under 100°F)	X	2	Х	-	2	-	1	-	1	1	1	1	1
Condor 1000,1002,1004,													
1006,1008	-	2	-	-	-	-	-	-	-	-	-	-	-
1014.1016		2	-	-	-	-	-	-	-	-	-	-	-
Convelex 10	Х	Х	-	-	-	-	-	-	-	-	-	-	-
Copper Arsenate, Cupric Arsenate	-	-	-	-	2	-	1	-	1	1	1	-	-
Copper Chloride, 1%	1	1			-	-	1	X X	X	X X	1	-	X
Copper Chloride, Cupric Chloride	2	2	2	2	2	1	1	2	X	Х	1	-	Х
Copper Cyanide, Cupric Cyanide	2	2	2	-	2	-	1	Х	1	1	1	-	Х
Copper Nitrate, 1% & 5%	1	1	-	-	-	-	1	1	X	1	1	X	Х
Copper Sulfate, Cupric Sulfate	1	1	1	1	1	1	1	1	X	1	1	X	X
Copper Sulfate, 10%	1	1	-	-	-	-	1	-	X	2	2	Х	-
Copper Sulfate, 50%	1	1	-	-	-	-	1	-	-	2	2	-	-
Corn Oil	X 2	2	2	2	Х	Х	1	-	1	1	1	- 1	1
Cottonseed Oil	2	2	1	2	2	x	1	2	1	1	1	1	1
Creosote, Wood Or Coal Tar													
(Under 100°F)	Х	2	Х	-	Х	Х	1	Х	2	1	1	1	Х
Cresol, Cresylic Acid (Under 100°F)	X	X	-	-	-	-	1	X	2	1	1	2	-
Crude Petroleum Oil (Under 100°F)	Х	Х	2	2	2	2	1	-	X	X	2	1	-
Cutting Oil, Water Soluble	Х	1	-	-	-	-	1	-	1	1	1	-	1
Cutting Oil, Sulfur Base	X 2	1	-	- 1	- Y	-	1	-		1	1	1	1
Cyclohexane	X	2	-	1	Х	1	1	1	1	1	1	1	1
Cyclohexanone	Х	Х	Х	2	Х	1	1	1	-	1	1	2	-
Cymene	Х	Х	Х	Х	Х	-	1	-	1	1	1	1	1
D													
Dasco FR150, FR200,													
FR200B, FR310 Dasco JER	1	1	2	-	-	-	1 1	1	1	1	1	1	1
DC200, DC510, DC550, DC560	-	1	-	-	-	-	-	1	-	1	1	1	1
Decalin	Х	2	-	2	Х	-	1	1	-	-	-	-	1
Dectol R&O Oils	X	1	-	- -	-	2	-	-	-	-	-	-	-
Developing Fluids. Photo	1	1	-	1	-	-	-	1	$ _{X}^{1}$	1 X	2	-	-
Developing Solutions, Hypos	2	-	-	1	2	-	1	-	-	1	1	-	-
Diacetone	Х	Х	Х	1	Х	-	1	1	1	1	1	1	1
Diacetone Alcohol Dibenzel Ether	- X	X X	2	1	-	-	1	1	1	1	1	1	1
Dibutyl Ether	Х	X	-	1	-	-	1	-	1	1	1	1	1
													_

Rating Scale: 1 Excellent	G	ate	s H	ose	Po	olym	ers		8	Cou & Ao	uplii dap	ngs ters	;
2 Good resistance	A	С	C_2	J			Z	2		04	16		
X Not recommended		7	Trac	le l	lan	nes			_	el 3(<u>e</u>] 3:		
 Testing recommended 	e		Q			only)			Stee	Ste	Ste	۶	
-	ren	d)	P/		b	ating		_	5	less	ess	inur	(
	leo	litrij	litrij	Ë	lypa	over n	Ë	lyloi	arb	tain	tain	lum	ras
Chemical Name	Z	Z	Z	0	T	⊃ ⊙	1	z	1	0 1	ທ ₁	<	1
Dibutyl Prinalate (Under 120°F)	X	X	X	2	-	-	1	-	-	-	-	-	1
Dichlorobenzene	X	Х	Х	Х	Х	Х	1	1	-	1	1	-	1
Dichloroethane	X	Х	Х	Х	-	-	1	Х	-	Х	Х	Х	Х
Diesel, Biodiesel**	-	-	-	-	-	- 1	1	1	-	1	1	-	-
Diester Lubricant MII -I-7808		2	2	-	-	-	1	-		1	1	1	-
Diester Synthetic Lubricants	X	2	-	-	-	-	1	-	1	1	1	1	-
Diethylamine (Under 120°F)	2	2	-	2	Х	-	1	1	1	1	1	1	1
Diethylene Glycol	1	1	1	1	1	1	1	1	1	1	1	1	1
Diethyl Ether		X	-	2	-	-	1	-		1	1	-	1
Diethyl Sebacate	X	Х	Х	2	-	-	1	-	-	1	1	-	1
Diisobutylene	X	2	-	1	Х	-	1	-	2	1	1	2	1
Diisobutyl Ketone	X	Х	Х	2	Х	-	1	1	1	1	1	1	1
Disopropyl Ketone		X Y	X	2	X	-	1	1	-	1	1	-	1
Dimethyl Formamide (Under 120°F)	x	Х	X	-	-	-	1	-	1	1	1	1	-
Dimethyl Phthalate	X	Х	Х	1	Х	-	1	-	-	-	-	-	1
Dioctyl Phthalate	X	Х	Х	2	Х	-	1	-	1	1	1	1	1
Dioctyl Sebacate		X	X	X	Х	-	1	- 1		1	1	1	-
Dipentene	Â	X	-	2			1	-		1	1	1	1
Dirco Oils	-	1	-	-	-	-	1	1	1	1	1	1	1
Dispersing Oil #10	X	Х	-	-	-	-	1	-	1	1	1	1	-
Dowtherm A	X	X	Х	2	Х	Х	1	-	1	1	1	1	1
DOWINERINE DP47 200 Flow - DOW		1	-	2	-	-	1	1		1	1	1	1
Duro FR-HD	-	1	-	-	-	Х	1	1	1	1	1	1	1
Duro Oils	-	1	-	-	-	-	1	1	1	1	1	1	1
E													
Elco 28-EPLubricant	X	1	-	-	-	-	-	-	1	1	1	1	-
Enamels Energol HI 68	-	-	-	Ĵ	Ĵ	-	-	-	1	- 1	- 1	1	1
Energol HLPC 68	-	1	-	-	-	-	-	-	1	1	1	1	1
EPHydraulic Oils, Chevron	-	1	-	-	-	-	-	-	1	1	1	1	1
Epichlorohydrin (Under 120°F)	X	Х	-	-	-	-	1	-	1	2	1	1	-
ESam-6 FIUI0 Ethanol	2	-	-	- 1	Ĵ	- X	- 1	1	- X	- 1	- 1	-	1
Ethanolamine, Aminoethanol	2	2	-	1	Х	X	1	1	1	1	1	1	1
Ethers (Under 120°F)	X	2	Х	1	2	2	1	1	1	1	1	1	1
Ethyl Acetate	X	Х	Х	2	Х	2	1	1	1	1	1	2	2
Ethyl Acetoacetate	X	X X	X X	1	X X	X X	1	-		1	1	1	1
Ethyl Alcohol	1	1	1	1	-	-	1	1	1	1	1	1	2
Ethyl Amine, Monoethylamine	X	Х	Х	1	Х	Х	1	-	2	1	1	2	1
Ethyl Benzene	X	Х	Х	2	Х	1	1	-	1	1	1	1	1
Ethyl Bromide, Di Ethyl Butyrate	X	X X	X X	2	X	-	1	-		1	1	1	1
Ethyl Cellulose	-	-	-	1	-	-	1	-	1	1	1	-	1
Ethyl Chloride	X	Х	Х	-	-	Х	1	-	2	1	1	1	2
Ethyl Ether		Х	Х	Х	-	-	1	-	2	1	1	1	1
Ethyl Mercaptan Ethyl Oxalate	X	X X	× -	-	X Y	X X	1	-	2	-	-	-	-
Ethyl Pentachlorobenzene	-	Х	-	X	-	1	1	-	2	1	1	-	1
Ethyl Silicate	1	1	1	1	-	1	1	1	1	1	1	1	1
Ethylene Chloride	X	Х	Х	Х	-	1	1	Х	2	1	1	-	2
Ethylene Chlorohydrin,	_v	v	v			v	1	v	1	1	0	v	
Ethylene Diamine (Under 100°F)		2	2	1	X	x	1	-	-	-	-	^ -	1
Ethylene Dichloride	X	Х	-	2	-	1	1	1	-	1	1	Х	-
Ethylene Glycol	1 1	1	1	1	1	1	1	1	2	1	1	1	1

**Nitrile 150°F or less, no constant contact.

1 1 1

1 1 1 1 1

Ethylene Glycol



1 1

2

1 1

Brass



HOSE/CPLG. Selection

GLOBALSPIRAL COUPLINGS

PCM/PCS Ferrules

MEGACRIMP COUPLINGS

POWER CRIMP COUPLINGS

LOW PRESSURE COUPLINGS

C14 COUPLINGS

PCTS THERMO-PLASTIC

POLARSEAL COUPLINGS

Chemical Resistance Table

Rating Scale:	G	ate	s H	ose	Po	olym	iers		8		ıpliı dap	ngs ters	
2 Good resistance			Tra	de	Nai	mes				4	9		
X Not recommended	Δ	С	C.	J			7	,		30	31		
		-	0	-		ş			tee	Stee	Stee	_	
- resung recommended	ene		Ъ		Ľ	ng or			n Si	SS	SS	m	
	b	rile	rile/	ш	palc	er rati	Ш	b	ę	ainle	ainle	шi	ass
Chemical Name	Re	Ż	Ž	<u>с</u>	Ŧ	<u>گ</u>	РТ	ź	Sa	Sta	Sta	AIL	B
F													
Factovis 52	-	1	-	-	-	-	-	-	1	1	1	1	1
Fatty Acids	2	2	2	2	Х	1	1	1	2	1	1	1	2
Ferric Chloride	-	-	-	1	2	-	1	1	X	X	X	X	X
Ferric Chloride, 1% Boiling		2	-	-	-	-	1	1	Ŷ	Z V	Z Y	Ŷ	Ŷ
Ferric Chloride, 5% Still	2	1	_	_	-	-	1	1	Â	X	x	X	X
Ferric Chloride, 5% Agitated	-	·					·						~
or Aerated	2	2	-	-	-	-	1	1	X	Х	Х	Х	Х
Ferric Chloride, 10%	2	1	-	-	-	-	1	1	X	Х	Х	Х	Х
Ferric Sulfate	2	2	2	1	2	-	1	1	X	1	1	Х	Х
Ferrous Chloride	1	1	-	1	2	-	1	-	X	1	2	-	2
Ferrous Nitrate	2	2	2	-	2	-	1	-	-	1	1	-	-
Ferrous Sulfate, Copper Gas	2	2	2	I	2	-	1	- 1	× ×	1	2	V	2
Ferrous Sulfate, Saturated		-	-	-			1	1	<u></u>	2	2	x	2
Fire Resistant Hydraulic Fluid. Texaco	-	1	-	-	-	-	1	-	1	1	1	1	1
Firtec 290, MF	-	-	-	-	-	-	1	-	-	-	-	-	-
Fixing Solution, Photo	2	-	-	-	2	-	1	-	-	1	1	-	-
Fluoboric Acid	1	1	-	1	-	-	1	-	1	-	1	Х	-
Fluoboric Acid, 65%	2	-	-	1	2	Х	1	-	-	1	1	-	-
Fluosilicic Acid	2	1	-	-	-	-	1	-	X	Х	Х	X	1
Fluosilicic Acid, 50%	2	X	Х	1	2	Х	1	X	-	-	-	1	- V
Formaldehyde 37%		× 2	-	1	- 2	- 2	1	2		1	1	1	۸ 1
Formaldehyde, 57 %	-	-	_	-	-	-	1	1	x	2	1	2	1
Formic Acid (Under 120°F)	1	Х	1	1	2	Х	1	2	X	2	1	1	2
Formic Acid, Dilute Hot	1	Х	-	1	-	-	1	Х	X	2	1	2	Х
Freon 12 (Under 100°F)	U	lse	Fre	eon	Нo	se	0 n l	y	2	1	1	1	1
Freon 114	U	lse	Fre	eon	Нo	se	0 n l	y	1	1	1	1	-
Fruit Juices			~		-	-	1	1	X	1	1	-	-
Fuel UII	2	1	(1)	1	Х	2	1	1	2	2	2	1	2
Fumanic Aciu		Ŷ	Ŷ	1	-	^	1	-		1	1	1	1
Furan Resin	x	X	-	-	-	-	1	-	-	-	1	-	-
Furfural Alcohol, Ant Oil	2	Х	Х	1	2	-	1	1	2	1	1	1	1
Fusel Oil, Grain Oil	Х	Х	-	-	-	-	1	-	-	-	-	-	-
Fyrguard 150, 200	-	1	-	-	-	-	1	-	1	1	1	1	1
Fyrquel A60, 90, 100, 150,													
220, 300, 500	X	Х	-	-	-	-	1	-	1	-	-	1	-
Fyrquel 1000, 15R&0,		v					1		1			1	
220ha0, 330ha0	^	^	-	-	-	-		-		-	-	-	<u> </u>
Gallic Acid (Under 100°F)	Х	Х	Х	1	-	Х	1	2	Х	1	1	Х	-
Gas, Natural	-	-	-	Х	-	-	1	-	1	1	1	-	2
Gasohol	2	*	*	-	Х	-	1	-	2	1	1	1	1
Gasoline, Aviation	X	-	2	-	-	-	1	-	-	1	1	1	1
Gasoline, Meter	X	*	-	-	-	-	1	Х	1	1	1	1	Х
Gasoline, Premium		*	*	-	Х	Х	1	-	2	1	1	1	1
Gasoline, Sour	X A	× ×	*	-	- V	v	1	-	2	1	1	X 1	-
Gasoline, Unleaded Under				2	^	^	1	-	2	1	1		1
50% Aromatics	X	*	Х	-	Х	Х	1	-	2	1	1	1	1
Gelatin	1	1	-	-	-	-	1	1	X	1	1	1	-
Glauber's Salt	2	Х	-	-	-	-	1	-	1	1	1	-	-
Glucose	1	1	1	-	1	1	1	1	1	1	1	1	1
Glue (Under 120°F)	2	2	2	-	1	1	1	2	2	1	1	2	Х
Glycerine, Glycerol	1	1	1	1	1	1	1	1	2	1	1	1	2
Glycole // Index 12005	-	1	-	-	-	-	1	-	1	1	1	1	1
Grease, Ester Base	-	-	-	-	-	-	1	1		1	1	1	1

Rating Scale:	G	ate	s H	ose	Po	lym	ers		(Οοι	ıplir	ngs	
1 Excellent			_						8	ι Ac	lap	ters	
2 Good resistance	<u> </u>	_	Tra	de	Nar	nes				304	316		
X Not recommended	A	С		J		Þ	2		<u>e</u>	steel	steel		
- Testing recommended	eoprene	itrile	itrile/PV0	PE	ypalon	rethane	TFE	ylon	arbon St	tainless S	tainless S	luminum	rass
Chemical Name	ž	z	z	Ö	Í	<u>⊃</u> ĕ	Ŀ.	ź	Ű	ş	ş	₹	m
Grease, Petroleum Base	2	1	2	-	2	1	1	1	1	1	1	1	1
Grease, Silicone Base Green Sulfate Liquor. Under 100°F	2	2	1	2	1	-	1	-		1	1	-	-
Gulf FR Fluid G-200	-	1	-	-	-	Х	1	-	1	1	1	1	1
Gulf FR Fluid P37, P40, P43,		v				V							
P45, P47	-	X	-	-	-	X		-	-	-	-	-	-
Halowax Oil	Х	Х	Х	-	Х	-	1	-	-	-	-	-	-
Heptachlor, In Petroleum	-	2	Х	-	-	-	1	-	-	-	-	-	-
Heptane (Under 100°F)	2	1	2	1	Х	1	1	1	1	1	1	1	1
N-Hexaldenyde Hexane (Under 120°E)	6	1	ଁ	2	- 1	- 1	1	1		1	1	1	1
Hexene	2	2	-	1	-	-	1	-	1	1	1	-	1
Hexyl Alcohol	1	2	1	1	-	-	1	-	1	1	1	1	2
High Viscosity Lubricant, U4	2	1	-	-	-	-	1	-	-	-	-	-	-
High Viscosity Lubricant, H2 Hilo MS #1		X	-	-	-	-	-	-		-	-	-	-
Houghto-Safe 1010,1055		~											
(Phos. Ester)	Х	Х	Х	1	Х	-	1	-	1	1	1	1	1
Houghto-Safe 1115,1120,		v	V		V		-						
Houghto-Safe 271 416 520	X	X	X	I	X	-	I	-		I	I	I	1
616 (Water/Glycol)	2	1	1	-	-	2	1	-	1	1	1	1	1
Houghto-Safe 620, 625, 640,													
525 (Water/Glycol)	1	1	1	-	-	2	1	-	1	1	1	1	1
(Water/Oil Emulsion)	2	1	-	-	-	-	1	-	1	1	1	1	1
Hy-Chock Oil	-	1	-	-	-	-	1	1	1	1	1	-	-
Hydrafluid 760, Texaco and													
Houghton	-	1	-	-	-	-	1	1		1	1	-	1
Hydranulu Azrau, A, B, AA, C Hydrasol A		1	-	-	-	-	1	1		1	1	-	-
Hydraulic Fluid, Phosphate								·	·				
Ester Base	Х	Х	Х	1	-	Х	1	1	1	1	1	-	-
Hydraulic Fluid, Std. Petroleum Oils	2	1	2	1	2	2	1	1		1	1	1	1
Hydraulic Fluid HF - 18, HF - 20		1	-	-	-	2	1	1		1	1	1	1
Hydraulic Fluid HF - 31	-	-	-	-	-	-	1	1	1	1	1	1	1
Hydraulic Oils, Petroleum	2	1	-	-	-	-	1	1	1	1	1	1	1
Hydraulic Oils, Synthetic Hydraulic Safety Eluid 200	-	Х	-	-	-	-	1	-	1	1	1	1	1
& 300, Texaco	-	1	-	-	-	1	1	-	1	1	1	1	1
Hydrazine	X	Х	Х	-	-	2	1	-	-	-	-	-	-
Hydro-Drive Oil, Houghton	-	1	-	-	-	2	1	-	-	-	-	-	-
Hydrobromic Acid 37%		X	×	- 1	- 2	- X	1	X		1	1	X X	-
Hydrochloric Acid	2	Х	-	-	-	-	1	Х	X	X	X	Х	Х
Hydrochloric Acid, 3 Molar	2	Х	-	-	-	-	1	Х	X	Х	Х	Х	Х
Hydrochloric Acid, Concentrated	X	Х	-	-	-	- V	1	X	X	X	Х	Х	Х
Hydrochloric Acid, 15%		-	X	1	2	X	1	X	X	X	X	X	X
Hydrocyanic Acid, 20% Under 100°F	X	Х	Х	-	2	Х	1	1	X	1	1	1	Х
Hydrocyanic Acid, 98%	-	-	-	-	-	-	1	-	-	-	-	-	-
Hydrofluoric Acid, 10%	2	2	X	1	1	X	1	X	X	X	X	X	X
Hydrofluoric Acid. 48%	[∠]	X	X	1	2	X	I	٨	^	X	٨	X	٨
(Under 120°F)	2	Х	Х	1	2	Х	1	Х	X	Х	Х	Х	Х
Hydrofluoric Acid, 70%	-	Х	Х	-	2	Х	1	Х	X	Х	Х	Х	Х
Hydrofluoric Acid, Concentrated	X	X	Х	1	2	Х	1	Х	X	Х	Х	Х	Х
Hydrofluosilicic	x	X	X	X	-	-	1	X	X	X	Ā	X	-
Hydrogen	1	1	-	1	-	-	1	-	X	Х	Х	1	-

COUPLINGS FIELD ATTACHABLE G1 & G2 COUPLINGS FIELD ATTACHABLE C5 COUPLINGS SURELOK AIR BRAKE COUPLINGS QUICK DISCONNECT COUPLERS NEW BALL VALVES ACCESSORIES EQUIPMENT AND PARTS

OCover stock rating only; Rating for tube stock "X"

*Use Gates fuel hose or contact Denver Product Applications Department.

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HOSE/CPLG. SELECTION

GLOBALSPIRAL COUPLINGS

PCM/PCS FERRULES

MEGACRIMP COUPLINGS

POWER CRIMP COUPLINGS

LOW PRESSURE COUPLINGS

C14 COUPLINGS

PCTS THERMO-PLASTIC COUPLINGS

FIELD ATTACHABLE G1 & G2 COUPLINGS

FIELD ATTACHABLE C5 COUPLINGS

SURELOK AIR BRAKE COUPLINGS

QUICK DISCONNECT COUPLERS

NEW BALL VALVES

ACCESSORIES

EQUIPMENT AND PARTS

C57

POLARSEAL COUPLINGS

Hose & Coupling Section

Chemical Resistance Table

Rating Scale: 1 Excellent	G	ate	s H	ose	Po	olym	iers		8	Col k Ad	ıpliı dap	ngs ters	;
2 Good resistance	А	С	C_2	J			Z	2		4	9		
X Not recommended		7	Trac	le N	lan	nes				el 3(el 31		
 Testing recommended 	0		Q			Ś			tee	Ste	Ste	_	
rooting rootinnended	ene		٩		ы	ane			S S	ess	SSS	nun	
	Idoe	trile	trile	Щ	/pal	eth:	Ë	/lon	arbo	ainle	ainle	umi	ass
Chemical Name	ž	Ż	Ż	ΰ	Í	2 §	2	ź	ő	ş	ß	Ā	ģ
Hydrogen Chloride Gas	-	-	-	1	-	-	1	-	-	1	1	-	-
Hydrogen Cyanide Gas	-	- Y	-	-	-	-	-	-	2	- 2	- 1	1	-
Hydrogen Peroxide. Dilute	1	2	-	-	2	-	1	1	1	-	1	-	X
Hydrogen Peroxide, 10%	Х	1	Х	1	2	Х	1	Х	X	2	1	1	Х
Hydrogen Peroxide, 30%	Х	2	Х	1	2	Х	1	Х	X	2	1	1	Х
Hydrogen Peroxide, 70%	X	X	Х	1	-	Х	1	Х	X	2	1	1	X
Hydrogen Peroxide, 90% Hydrogen Sulfide	× 2	X X	-	-	-	-	1	- 1	2	2	1	-	X X
Hydrogen Sulfide Aqueous Solution	2	Х	-	-	-	-	1	-	X	-	-	Х	-
Hydrogen Sulfide, Gas	-	-	-	-	-	-	-	-	-	-	-	-	-
Hydrolube, Water Glycol	2	1	-	-	-	Х	1	-	1	1	1	-	1
Hydrolubric Oil, Houghton	-	2	-	-	- V	2	1	1	-	-	-	-	-
Hydroquinone Hykil No.6 (33%): Water (67%)	^	2	-	-	-	-	1	-	1	-	-	-	-
Hypochlorous Acid (Under 120°F)	Х	X	Х	-	2	-	1	1	2	2	2	Х	-
Hypoid Grease (Parapoid 10-C)	-	1	-	-	-	-	1	-	-	-	-	-	-
1													
Imol, Imol S150, S220, S300,													
S500	-	1	-	-	-	2	1	1	1	1	1	1	-
Industron 53 Ink (Printers)	- 1	1	-	-	-	-	1	- 1	2	2	- 1	-	2
Ink Oil	-	2	-	-	-	-	1	-	1	1	1	-	1
Insulating Oil (Transformer)	2	1	2	-	Х	-	1	-	1	1	1	-	1
Isobutyl Alcohol	2	2	2	1	-	-	1	1	1	1	1	1	2
lodine (Under 100°F)	X 2	X	-	1	2	X X	1	1	2	2	2	X	-
Iodine Pentafluoride	X	Х	_	_	_	-	1	_	x	2	2	X	_
Isooctane	1	1	2	2	1	2	1	1	1	1	1	2	1
Isooctyl Thioglucolate	-	-	-	-	-	-	1	1	-	-	-	-	-
Isobutane - WET	X	X	-	-	- V	X	1	X	X	1	1	2	1
Isopropyl Acetate	2	2	2	1	2	2	1	1		2	1	1	2
Isopropyl Ether	X	X	X	-	-	-	1	1	1	1	1	1	1
J													
Fuel JP-3 (Under 100°F)	2	1	2	-	Х	2	1	1	1	1	1	2	1
Jet Fuel JP-4 (Under 100°F)	ОХ	1	2	-	Х	-	1	1	1	1	1	2	1
Jet Fuel JP-5	Х	1	Х	-	Х	-	1	1	2	1	1	2	1
Jet Fuel JP-0 Jet Fuel JP-x	2	1	X	-	X	-	1	1	2	1	1	2	1
K	~	<u> </u>									<u> </u>	-	<u> </u>
Kerosene	Х	1	2	1	Х	-	1	1	1	1	1	1	1
Ketchup	1	1	-	-	-	-	1	1	-	1	1	-	-
Ketones	Х	Х	Х	-	Х	Х	1	1	1	1	1	2	1
L													
Lacquer Solvents	X	X	X	-	X	2	1	1		2	1	1	1
Lactic Acid	1	X	x		1	x	1	-	x	2	1	X	2
Lactic Acid (5%)	2	1	-	-	-	-	1	1	X	2	1	1	Х
Lactic Acid (5% Boiling)	Х	Х	-	-	-	-	1	-	X	2	1	2	Х
Lactic Acid (10% Boiling)	Х	Х	-	-	-	-	1	-	X	2	1	Х	Х
Lactol	2	2	2	- 1	-	-	1	- 1		1	1	1	1
Lasso (Ag Spray)	-	-	-	-	-	-	1	1	-	1	1	-	^
Latex	1	1	-	-	Х	-	1	1	1	1	1	1	1
Lead Acetate	Х	Х	-	1	2	1	1	-	2	2	2	Х	1
Lead Arsenate	2	2	-	-	-	-	1	-	1	1	1	-	-
Lead Nitrate	2	2	1	- 1	1 2	1	1	Ĵ		2	2	1	-
	1			1	2				<u>'</u>				

											Iviesityi Uxide
)	-	Х	2	1	1	1	1	1	2	1	Methane
2	-	Х	-	1	1	1	1	1	2	1	Methoxychlor (Insecticide)
<	-	Х	-	1	1	2	1	1	2	1	Methyl Acetate
(-	Х	-	1	1	2	1	1	2	1	Methyl Acrylate
(-	Х	-	1	1	2	1	1	2	1	Methyl Alcohol
											Methyl Amine (25%
2)	1	Y		1	1	1	1	1	1	1	Aqueous Solution)
9		Λ	-	1	1		1	1			Methyl Amine (60%)
/	_	Y	Y	1	1	1	1	1	2	1	Methyl Amine (99%)
\	-	^	^	1	1	1	1	1	2	-	Methyl Bromide
											Methyl Butyl Ketone (MBK)
<	-	Х	2	1	1	X	2	1	1	1	Methyl Cellosolve (Under 100°F)
(-	Х	-	1	1	X	Х	1	1	1	Methyl Chloride
(-	1	Х	1	-	X	2	1	Х	2	Methyl Ethyl Ketone (MEK)
-	-	-	-	1	1	X	2	1	1	Х	Methyl Formate
-	-	-	-	1	-	X	2	1	2	Х	Methyl Isobutyl Ketone
	-	-	-	1	-	Х	2	1	Х	Х	(MIBK, 100°F)
2	-	-	-	1	-	1	1	1	1	1	Methyl Isopropyl Ketone
	1	-	-	1	1	1	1	1	1	Х	Methyl Methacrylate
-	-	-	-	1	1	-	1	1	-	-	Methyl Salicylate
	-	Х	-	1	1	1	1	1	1	1	Methyl Sulfate (Dimethyl,
-	1	2	1	1	-	2	2	2	Х	1	Under 100°F)
-	-	-	-	1	-	1	1	1	-	-	Methylene Chloride
-	-	1	1	1	-	1	2	2	-	-	Methylene Dichloride
	1	2	-	1	-	1	1	1	-	-	Mineral Oil (Under 120°F)
atir	na fa	or tu	be s	tock	"Х"						Mineral Spirits
ac	t De	nver	Pro	duct	App	licat	ions	s De	partr	men	

Rating Scale:	G	ate	s H	ose	Po	lym	ers				iplir tan	igs ters	
1 Excellent	Δ	C	C	.1			7	,			(O		
2 Good resistance	<u> </u>	-	U ₂	0 10 N	lam	00		•		130	1316		
Tracting recommended			()		am	2			eel	stee	stee		
 resting recommended 	ene		λ		Ë	ng of the second			St	ss	ss	m	
	brdo	rile	rile/	ш	palo	er rati	Ш	ы	5 0	ainle	ainle	mi	3SS
Chemical Name	Ne	Ż	Ż	G	Ŧ:	5 <u>8</u>	РТ	ź	Sa	Sta	Sta	Alu	ä
Lead, Tetraethyl (Under 100°F)	Х	2	Х	-	Х	-	1	2	-	-	-	-	-
Lead, Tetramethyl	X	2	Х	-	Х	1	1	-	-	-	-	-	-
Lecitnin Liaroin (Petroleum Ether.	2	X	-	-	-	-	I	-	-	I	I	-	-
Under 120°F)	Х	1	-	-	Х	-	1	-	2	1	1	Х	-
Lime (Chlorinated, Free						_					0		
Lime Bleach (Under 100°E)	- X	1	- X	1	- X	1	-	-	- X	- 2	2	-	-
Lime Sulphur	1	X	-	-	-	-	2	1	2	1	1	Х	Х
Lime Sulfur (Under 135°F)	1	Х	Х	-	2	-	2	1	2	1	1	Х	Х
Lindane (Ag Spray)	- V	- 2	- Y	-	-	-	1	1	- V	1	1	- 1	-
Linseed Oil	x	1	-	-	-	-	1	1	1	1	1	2	2
Linseed Oil (Boiled)	2	2	1	1	1	1	1	-	2	1	1	1	2
Lubricating Oil (SAE 10, 20,	2	0					1	1	4	1	1	1	4
Lubricating Oils (Diester.	2	2	-	-	-	-	1	1		I	I	I	I
Under 135°F)	Х	2	Х	-	-	Х	1	1	1	1	1	1	1
M													
Machine Oil (Under 135°F)	1	1	2	-	2	-	1	1	1	1	1	1	1
Magnesium Carbonate	1	1	1	-	1	1	1	- 1	2	2	2	1	-
Magnesium Hydroxide	2	2	2	1	1	Х	1	-		1	1	x	X
Magnesium Nitrate	2	2	2	-	1	-	1	-	2	2	2	Х	1
Magnesium Sulfate	2	2	2	1	1	1	1	1	2	2	2	2	2
Malathion (Ag Spray Dilute) Maleic Acid	2	2 X	-	1	1	-	1	-	2	2	1	-	-
Malic Acid	-	-	-	-	-	-	1	-	2	2	1	-	-
Manganese Salts	-	1	1	-	1	-	1	-	-	-	-	-	-
Maxmul (Penzoil Hydraulic Huid) Mercuric Chloride	2	1	2	- 1	- 1	-2	1	- X		- 1	1	- X	- X
Mercuric Cyanide	1	2	2	-	1	-	-	-	2	2	2	X	-
Mercurous Nitrate (Under 120°F)	1	2	2	-	1	-	1	-	1	1	1	Х	-
Mercury Mercityl Ovide	1	2	2	1	1 v	2	1	1	1	1	1	X	X
Methane	2	1	-	-	-	-	1	-	-	1	1	-	-
Methoxychlor (Insecticide)	-	-	-	-	-	-	1	Х	1	1	1	-	-
Methyl Acetate	X	Х	Х	1	Х	-	1	-	1	1	1	1	1
Methyl Acrylate		X 1	X 1	- 1	× -	-	1	1		1	1	1	2
Methyl Amine (25%												-	_
Aqueous Solution)	2	Х	-	-	-	-	1	-	1	1	1	1	-
Methyl Amine (60%) Methyl Amine (99%)	2	2 X	-	-	-	-	1	2		1	1	1	2
Methyl Bromide	x	Х	Х	-	Х	Х	1	1	1	1	1	X	1
Methyl Butyl Ketone (MBK)	Х	Х	Х	2	Х	-	1	-	1	1	1	1	1
Methyl Cellosolve (Under 100°F) Methyl Chloride	2	X	- Y	1 Y	X	-	1	-	2	2	2	2	1
Methyl Ethyl Ketone (MEK)	x	Х	Х	2	X	Х	1	1	1	1	1	2	1
Methyl Formate	2	Х	Х	-	Х	-	1	-	2	1	1	1	1
Methyl Isobutyl Ketone		v	v	0	v	v	1	1	4	1	1	1	4
Methyl Isopropyl Ketone	Â	X	X	2	X	X	1	1		1	1	1	1
Methyl Methacrylate	Х	Х	Х	2	2	-	1	-	2	2	2	-	-
Methyl Salicylate	2	2	2	-	-	-	1	-	1	1	1	1	1
Under 100°F)	x	Х	Х	-	Х	1	1	1	1	1	1	-	
Methylene Chloride	X	Х	Х	Х	X	-	1	X	1	1	1	Х	1
Methylene Dichloride	X	Х	Х	-	-	-	1	1	1	1	1	X	1
Mineral Oli (Under 120°F)	1	1	1	-	X	-	1	-		1	1	2	1

Ocover stock rating only; Ra *Use Gates fuel hose or conta





Chemical Resistance Table

Rating Scale:	G	ate	es H	ose	e Po	olym	ers		8	Coi & Ao	upliu dap	ngs ters	;	Rating Scale:
2 Good resistance			Tra	de	Nar	nes				4	9			2 Good resistance
Not recommended	Δ	С	C.	J			7	,		1 30	31			X Not recommended
Testing recommended	<u> </u>	-	0	-		ŝ	_		ee	stee	stee			Testing recommended
 resung recommended 	ene		M		E	ng of			St	ss	ss	m		 resung recommended
	dc	rile	rile/	ш	oalo	er rati	Ш	Ы	ą	inle	inle	mir	ISS	
Chemical Name	Ne l	Niti	Niti	G	Ŧ	P S	Ы	ź	Ga	Sta	Sta	Alu	Bra	Chemical Name
Mobile Therm 603	-	1	-	-	-	-	1	-	1	1	1	1	1	D
Molasses (Under 120°F)	2	2	2	-	1	1	1	-	2	1	1	2	Х	Pa lat
Monochlorobenzene	X	Х	Х	Х	Х	Х	1	-	1	1	1	Х	1	Paint Solvents (Oil Base)
Monoethanolamine	X	2	-	1	Х	-	1	-	1	1	1	2	1	Paints (Oil Base)
Motor Oile (Linder 125°E)	-	- 1	-	- 1	-	-	1	- 1	-	1	1	- 1	-	Paint Thinner, Duco
Mould Oil	-	-	-	-	-	-	1	-		1	1	-	-	Palmetic Acid
Muriatic Acid (Hydrochloric)	X	Х	Х	1	2	Х	1	Х	X	X	X	Х	Х	Palm Oil
Mustard	1	2	1	-	1	-	1	-	Х	1	1	2	-	Paraffin (Petroleum)
N														Paratormaldenyde Peanut Oil (Less Than 100°F)
Nanhtha (Low Aromatic Content)	X	2	X	1	X	-	1	1	2	1	1	1	1	Pentasol
Naphthalene (Tar Camphor)	X	X	X	1	X	-	1	1	1	1	1	1	1	Perchloric Acid
Naphthalene	X	Х	Х	-	Х	-	1	-	1	1	1	-	1	Perchloroethylene
Naphthenic Acid	-	2	-	-	-	-	1	-	-	2	1	-	-	(Tetrachloroethylene)
Natural Gas	-	-	-	-	-	-	1	-	1	1	1	-	2	Petroleum Ether
Nickel Acetate	-	-	-	-	-	-	1	-	1	1	1	1	1	Petroleum Oil (Grude)
Nickel Chloride	2	2	2	1	2	-	1	1		1	1	1	1	Petroleum Oil (Above 250°F)
Nickel Plating Solution	2	2	-	-	2	×	1	-	2	2	2	_	-	Petroleum Oils (Under 100°F)
Nickel Salts	2	-	1	-	-	-	1	-	-		-	-	-	Petroleum Oils (Refined)
Nicotine Salts	-	-	-	-	-	1	1	-	1	Х	2	-	-	Petroleum Oils (Sour)
Nitric Acid	X	Х	-	-	-	-	1	-	X	1	1	-	Х	Phenol (Carbolic Acid)
Nitric Acid, 3 Molar	X	Х	-	-	-	-	1	-	X	1	1	-	Х	Phenol (70/30 Water)
Nitric Acid, Concentrated (Boiling)	X	Х	-	-	-	-	1	Х	X	2	2	Х	Х	Phenol (85/15 Water)
Nitric Acid, Inhibited		v					1			1	1	1	v	Phorone (Disopropylidene Acelone) Phosphate Esters (Concentrated)
Nitric Acid, Red Fuming (RNFA)	ÎŶ	X	x	-	x	x	1	×	Ŷ	2	2	2	X	Phosphate Esters (3 Molar)
Nitric Acid, 5% To 10%	X	X	X	1	2	Х	1	X	x	2	2	1	X	Phosphate Esters (Dilute)
Nitric Acid, 20%	X	Х	Х	1	2	Х	1	Х	X	2	2	Х	Х	Phosphoric Acid
Nitric Acid, 50% (Boiling)	X	Х	Х	Х	Х	Х	1	Х	Х	2	2	Х	Х	Phosphoric Acid (3 Molar)
Nitric Acid, 65% (Boiling)	X	Х	Х	Х	Х	Х	1	Х	X	2	2	Х	Х	Phosphoric Acid (Concentrated)
Nitric Acid & Hydrochloric Acid	-	Х	-	-	-	-	1	-	X	X	X	X	-	Phosphoric Acid (1%)
Nitrophapa		×	×	2	X	X	1	2		1	1	1	1	Phosphoric Acid (10%)
Nitrogen	$\begin{vmatrix} \hat{1} \\ 1 \end{vmatrix}$	1	2	1	1	1	1	1		1	1	1	1	Phosphoric Acid (10% Hot)
Nitrogen Oxide Up To 50%	`		2						[•]					Phosphoric Acid (50%)
(Under 100°F)	1	1	2	1	1	-	1	1	1	1	1	-	Х	Phosphoric Acid (50% Hot)
Nitromethane	X	Х	Х	-	-	-	1	1	1	1	1	1	1	Phosphoric Acid (85%)
Nitropropane	X	Х	Х	-	-	-	1	1	1	1	1	1	1	Phosphoric Acid (85% Hot)
Nyvac 20 (WG), 30 (WG)	-	1	-	-	-	-	1	-		1	1	1	1	Phosphoric Acid (Aerated)
Nyvac FR Fluid		1	-	-	-	-	1	-		1	1	1	1	Photographic Developers
N-Octane	x	2	_	1	X	_	-	_		1	1	-	1	Photographic, Emulsions
										·	· ·		·	Photographic, Fixing Solutions
	2	2	2	1			1	1	1	1	1		2	Phthalic Acid
Oils Crude	X	2	-	-	-		1	-					-	Picric Acid (Water Solution 100°
Oil (SAE, Under 100°F)	1	1	1	1	2	1	1	1	1	1	1	1	1	Pinene Pine Oil
Oleic Acid (Under 120°F)	2	2	2	1	2	1	1	-	2	2	1	1	2	Piperazine Hydrochloride
Oleum	X	Х	Х	Х	Х	-	1	Х	-	-	1	-	-	Solution (34%)
Olive Oil	X	2	2	2	Х	-	1	-	2	1	1	1	2	Pitch
OS 45 Type III (OS45)	1	2	-	-	-	-	1	-	-	-	-	-	-	Plating Solutions (Chrome)
US 45 Type IV (US45-1)		2	-	-	-	-	1	-	-	-	-	-	-	Plating Solutions (Other)
US / U Ovalic Acid (5% Hot And Cold)		2	-	-	-	-	1	- 2	- V	- 2	1	- 1	- Y	Polyester Resin
Oxalic Acid (10%)	2	2	-	-	-	_	1	2	x	2	1	1	X	Polyurethane Foam (Under 125°F)
Oxalic Acid (10% Boiling)	X	X	-	-	-	-	1	-	X	X	X	X	Х	Potassium Acetate
Oxalic Acid	X	Х	Х	1	2	Х	1	Х	Х	2	1	2	Х	Potassium Bisulfite
Oxygen, Gaseous	-	-	-	-	-	-	1	-	1	1	1	1	1	Potassium Bromate
Ozone (Dry)	2	Х	2	1	2	1	1	2	1	1	1	1	1	Potassium Bromide
Uzone (Wet)	-	Х	-	-	-	-	1	-	X	2	1	2	-	Potassium Carbonate (Potash)

stance rabi	e												
Rating Scale: 1 Excellent	G	iate	s H	ose	e Po	olym	iers		8	Cou & Ao	uplii dap	ngs ters	5
2 Good resistance			Tra	de	Na	mes				04	16		
X Not recommended	А	С	C_2	J			Z	2	_	el 3	el 3		
 Testing recommended 	oprene	ile	rile/PVC	ш	oalon	ethane er rating only)	щ	on	bon Stee	inless Ste	inless Ste	minum	SS
Chemical Name	Neo	Niti	ΖİŢ	G	Ŧ	P	Б	ź	Ga	Sta	Sta	Alu	Bra
Р													
•	X	-	-	-	X	X	1	2	-	1	1	1	1
int Solvents (Oil Base)	X	Х	-	-	Х	Х	1	2	-	1	1	1	1
ints (Oil Base)	-	1	-	-	1	-	1	1	-	-	-	-	-
int Thinner, Duco	2	1	-	-	-	-	1	1	2	2	1	2	Х
Imetic Acid	2	2	2	1	X	1	1	1	2	2	1	1	X
IM UII raffin (Petroleum)	2	1	2	- 1	2	-	1	- 1		1	1	1	1
raformaldehvde	2	2	2	-	2	2	1	-	1	1	1	1	-
anut Oil (Less Than 100°F)	2	1	2	-	-	-	1	-		1	1	1	1
ntasol	2	2	2	-	2	-	1	1	1	1	1	1	1
rchloric Acid	Х	Х	-	-	2	Х	1	Х	X	2	1	Х	-
rchloroethylene													
Tetrachloroethylene)	X	X	Х	2	Х	-	1	2	1	1	1	Х	X
troleum Ether troleum Oil (Crude)	×	2	-	1	-	-	1	-	2	1	-	-	1
troleum Oil (Below 250°F)	2	1	_	_	_	-	1	_		_	_	_	_
troleum Oil (Above 250°F)	X	X	-	-	-	-	1	-	-	-	-	-	-
troleum Oils (Under 100°F)	2	1	2	-	2	2	1	-	1	1	1	1	1
troleum Oils (Refined)	2	1	2	-	2	2	1	1	1	1	1	1	1
troleum Oils (Sour)	2	2	-	-	Х	2	1	-	2	1	1	1	Х
enol (Carbolic Acid)	X	Х	Х	1	Х	Х	1	Х	2	1	1	1	Х
enol (70/30 Water)	X	X	-	-	-	-	1	-	-	1	1	1	-
vrone (Diisonronvlidene Acetone)	Ŷ	x	-	-	×	Ŷ	1	-		1	1		1
osphate Esters (Concentrated)	x	x	-	Х	X	X	1	2	-	-	-	-	-
osphate Esters (3 Molar)	Х	Х	-	2	2	Х	1	2	-	-	-	-	-
osphate Esters (Dilute)	Х	Х	-	1	1	Х	1	2	-	-	-	-	-
osphoric Acid	2	2	-	-	-	-	1	-	-	-	2	-	-
osphoric Acid (3 Molar)	X	Х	-	-	-	-	1	-	-	-	-	-	-
osphoric Acid (Concentrated)		X	-	-	-	-	1	-	-	-	- 1	-	-
osphoric Acid (1%)	2	×	-	-	-	-	1	-		1	1	-	X
osphoric Acid (10%)	2	X	-	-	-	-	1	-	x	-	1	Х	X
osphoric Acid (10% Hot)	2	Х	-	-	-	-	1	-	X	-	1	Х	Х
osphoric Acid (50%)	2	2	2	1	1	Х	1	Х	X	2	1	Х	2
osphoric Acid (50% Hot)	2	Х	-	-	-	-	1	-	X	Х	2	Х	Х
osphoric Acid (85%)	2	Х	-	1	1	Х	1	Х	X	2	2	Х	Х
osphoric Acid (85% Hot)	2	Х	-	-	-	-	1	-		Х	X	Х	Х
osphoric Acid Air Free	-	-	-	-	-		1	-	Îx	-	-	x	-
otographic Developers	1	1	-	-	-	-	1	-	X	1	1	-	-
otographic, Emulsions	-	-	-	-	-	-	1	-	-	-	-	-	-
otographic, Fixing Solutions	2	-	-	-	2	-	1	-	-	1	1	-	-
thalic Acid	-	-	-	-	-	-	-	-	2	2	1	2	-
ric Acid (Water Solution 100°F)	2	2	2	-	2	-	1	Х		1	1	X	X
iene Io Oil	×	2	-	2	-	-	1	- 1		1	1	1	I
erazine Hydrochloride		2	-	2	~	-	1	'	'				-
Solution (34%)	-	2	-	-	-	-	1	-	-	-	-	-	-
ch	2	1	-	-	2	2	1	1	-	-	-	-	-
ting Solutions (Chrome)	Х	Х	-	-	-	Х	1	Х	-	Х	Х	-	-
ting Solutions (Other)	-	1	-	-	-	-	1	-	-	-	-	-	-
lyester Resin	-	-	-	-	-	-	-	2	-	-	-	-	-
yureuriarie Foam (Under 125°F) tassium Acetate	2	- 2	-	- 1	- 2	- Y	1	-	- 2	- 1	- 1	- V	-
tassium Bicarbonate	1	1	-	-	1	-	1	1		2	2	1	-
tassium Bisulfite	-	1	-	-	-	-	1	1	<u>-</u>	-	-	-	-
tassium Bromate	-	-	-	-	-	-	1	-	-	-	-	-	-
tassium Bromide	1	1	-	-	1	2	1	1	Х	Х	2	Х	-
tassium Carbonate (Potash)	1	1	1	1	1	2	1	1	2	1	1	Х	Х

HOSE/CPLG. Selection
GLOBALSPIRAL Couplings
PCM/PCS Ferrules
MEGACRIMP Couplings
Power Crimp Couplings
LOW PRESSURE COUPLINGS
POLARSEAL Couplings
C14 Couplings
PCTS Thermo- Plastic Couplings
FIELD ATTACHABLE G1 & G2 Couplings
FIELD ATTACHABLE C5 COUPLINGS
SURELOK AIR Brake Couplings
QUICK DISCONNECT COUPLERS
NEW BALL VALVES
ACCESSORIES

Equipment And Parts

O Cover stock rating only; Rating for tube stock "X" *Use Gates fuel hose or contact Denver Product Applications Department.



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Hose & Coupling Section

EQUIPMENT

HOSE/CPLG. SELECTION

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> POLARSEAL COUPLINGS

C14 COUPLINGS

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FIELD ATTACHABLE G1 & G2 COUPLINGS

FIELD ATTACHABLE C5 COUPLINGS

SURELOK AIR BRAKE COUPLINGS

QUICK DISCONNECT COUPLERS

NEW BALL VALVES

ACCESSORIES

EQUIPMENT AND PARTS

C59

Chemical R	esistance Table
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Rating Scale:	G	iate	s H	lose	e Pc	olym	ers		8	Coi k Ad	ıplir dap	ngs ters	5	Rating Scale:	G	iate	es H	lose	e Po	olym	ers		(&	Cou Ad	plin lapt	ngs ters	
2 Good resistance			Tra	ide	Nar	nes				4	9			Cood resistance			Trac	de l	Nan	nes				4	9		
Ket recommended	Δ	C	C				7	,		8	9			Z Good resistance	Δ	C	C	.1			7	,		8	3		
	<u> </u>	-	02	-		2		-	ee	stee	stee				~	-	02			S		-	ee	stee	stee		
 resting recommended 	ene		PXC		Ľ	ne			St	ss	SS	ш		 Testing recommended 	ene		M		Ę	ng on			St	s	ss	m	
	br	rile	rile/	ш	oalc	er rati	Ш	Ы	1 Q	inle	inle	min	ISS	2	opre	rile	rile/	ш	oalc	er rati	벁	5	ōđ	inle	inle	min	ISS
Chemical Name	Ne	Nit	Nit	СР	H	2 00	ΡT	N	Ca	Sta	Sta	Alu	Bro	Chemical Name	Ň	Nit	Nit	СР	HyI	D S	ΡT	ž	Cal	Sta	Sta	Alu	Bra
Potassium Chlorate	1	1	-	-	-	2	1	1	2	2	2	2	-	D													_
Potassium Chloride (1% To 5%)	1	1	-	1	-	2	1	1	1	2	2	Х	Х	Bamrod (Ag Spray)	_	_	-	-	_		1	1	1	1	1	1	1
Potassium Chloride (Boiling)	-	-	-	-	-	-	1	-	-	2	2	-	X	Rando Oils	-	1	-	-	-	2	1	i	1	1	1	1	1
Potassium Cyanide Potassium Dichromate		1	Ĵ	1	-	-	1	2	2	2	2	× 2	×	Rape Seed Oil	2	Х	-	-	Х	-	1	2	1	1	1	1	1
Potassium Ferrocvanide	-	-	_	-	_	_	1	-	2	1	1	2	_	Red Oil (Comm. Oleic Acid,													
Potassium Fluoride	-	-	-	-	-	-	1	-	-	-	-	-	-	MIL-H-5606)	2	2	2	1	2	-	1	1	2	2	1	1	2
Potassium Hydroxide	2	2	-	-	-	-	1	-	1	1	1	-	-	Refined Wax (Petroleum)	2	1	2	-	-	2	1	1	1	1	1	-	1
Potassium Hydroxide (5%)	1	1	-	-	-	-	1	1	2	2	2	Х	Х	Richfield Weed Killer	×	2	-	-	×	-	1	_	-	-	-	-	-
Potassium Hydroxide							-			0		v	v	Round Up	2	2	-	-	-	-	1	1	2	1	1	1	1
(27% BOIIING) Potassium Hydroxide	-	-	-	-	-	-	I	-	2	2	I	X	X	Rubilene Oils	-	1	-	-	-	2	1	1	-	-	-	-	-
(30%, Caustic Potash)	-	-	-	1	-	-	1	-	-	-	-	-	-	9													
Potassium Hydroxide														Salicylic Acid	1	Х	-	-	-	-	1	1	1	1	1	2	-
(50% Boiling)	-	-	-	-	-	-	1	-	2	2	2	Х	Х	Salt Water (Sea Water)	2	2	2	-	2	1	1	1	2	1	1	Х	2
Potassium Hydroxide (70%)	-	Х	-	-	-	-	1	-	-	-	-	Х	Х	Santosafe W-G15, W-G20,													
Potassium Hydroxide (70% Hot)	-	-	-	-	-	-	1	-	X	-	-	Х	Х	W-G30	-	1	-	-	-	2	1	1	1	1	1	1	1
Potassium liotide		1	-	- 1	-	- 1	1	1	1	2	2	- 2	- 2	Santo Sate 300	Х	Х	-	-	-	-	1	-	1	1	1	1	-
Potassium Nitrate (1% To 5%)		1	_	-	_	-	1	-	1	1	1	1	2	Sewage	2	2	2	1	2	-	1	1	x	1	1	2	1
Potassium Permanganate	1	2	-	-	-	-	1	2	1	2	2	2	-	SFR Fluid B (Shell)	-	X	-	-	-	-	1	-	-	-	-	-	-
Potassium Permanganate (5%)	1	1	-	-	-	-	1	1	1	1	1	1	-	SFR Fluid C (Shell)	-	Х	-	-	-	-	1	-	-	-	-	-	-
Potassium Persulfate	-	-	-	-	-	-	1	-	-	-	-	-	-	Shellac	2	1	-	-	-	-	1	1	1	1	1	1	-
Potassium Phosphate		-	-	-	1	-	1	-	X	2	2	X	-	Shellac (Bleached)	2	1	-	-	-	-	1	1	1	1	1	1	2
Potassium Sulfate - 1% & 5%		1	-	1	-	-	1	1	1	2	2	1	- Y	Shellac (Urange)	2	1	-	-	-	-	1	1	1	1	1	1	2
Potassium Sulfide		1	-	_	_	_	1	-	2	2	2	-	-	Silicone Oils	2	2	2	-	2		1	1	1	1	1	1	1
Potassium Sulfite	1	1	-	1	-	-	1	-	1	1	1	1	-	Silver Cyanide	1	-	-	-	-	-	1	-	1	1	1	X	-
Potassium Thiosulfate	1	-	-	-	1	-	1	-	-	-	-	-	-	Silver Nitrate	1	1	1	1	1	-	1	1	2	1	1	1	2
Primatol A, S, P (Ag Spray)	-	-	-	-	-	-	1	-	-	-	-	-	-	Skydrol 500A& 7000	Х	Х	Х	2	Х	-	1	1	1	1	1	1	-
Propane Gas		X	-	-	-	Х	1	-	1	1	1	-	1	Soap Oil	Х	X	-	-	X	-	1	-	1	1	1	÷	÷
Propionic Acia Propyl Acetate		X	-	2	-	-	1	-	1		2	2	-	Soap Solutions	2	1	2	1	1	1	1	1	1	1	1	1 V	1
Propyl Alcohol		1	2	1	-	Х	1	1	1	1	1	-	2	Soda Water	-	-	-	-	-	1	1	1	-	-	-	-	-
Propylene (Liquid Or Gas, Ambient)	X	Х	-	1	-	-	1	2	1	1	1	1	-	Sodium Acetate	Х	Х	Х	1	Х	2	1	1	1	1	1	1	1
Propylene Dichloride	-	-	-	-	-	-	1	-	1	2	1	Х	-	Sodium Benzoate	-	-	-	-	-	1	1	-	-	-	-	-	-
Propylene Glycol	1	1	-	1	1	1	1	2	1	1	1	-	-	Sodium Bicarbonate	1	1	1	1	1	1	1	1	2	1	1	2	2
Propylene Oxide	X	X	-	-	-	-	-	-	2	1	1	2	-	Sodium Bisulfate (Niter Cake)	1	1	1	1	1	1	1	1	Х	2	1	Х	Х
Punna Insecucide Puronale RX Oils		1	-	-	-	- 2	1	2	1	1	1	1	2	Sodium Bisulfite	1	1	1	1	1	1	1	1	2	1	1	2	-
Pyranol. Transformer Oil	2	1	-	-	-	-	1	-	1	1	1	1	-	Sodium Carbonate	1	1	1	1	1	1	1	1	2	2	2	x	2
Pydraul	Х	Х	-	-	-	-	1	-	-	-	-	-	-	Sodium Chlorate	2	1	-	-	1	1	1	1	2	2	2	Х	-
Pydraul 10E, 29E-LT, 30E, 60,														Sodium Chloride	1	1	1	1	1	1	1	1	2	2	1	Х	Х
65E, 115E	X	Х	-	2	-	-	1	-	1	1	1	1	1	Sodium Chloride - 2%	1	1	-	-	-	-	1	1	2	2	1	Х	Х
Pydraul 135 Pydraul 150	-	X	-	2	-	-	1	2	1	1	1	- 1	- 1	Sodium Chloride - 5%	1	1	-	-	-	-	1	1	-	2	1	Х	X
Pydraul 280	Â	x	x	2	Ŷ	2	1	2	1	1	1	-	-	Sodium Chloride Saturated	1	1	-	-	-	-	1	-	-	2	1	Y	~
Pydraul 312	X	Х	Х	2	-	2	1	1	1	1	1	-	-	Sodium Chloride Saturated	'							·				Λ	
Pydraul 50E	-	-	-	2	-	2	1	1	1	1	1	-	-	(Boiling)	-	-	-	-	-	-	1	-	-	2	1	Х	-
Pydraul 540	Х	Х	Х	2	Х	Х	1	Х	1	1	1	-	-	Sodium Chloride Slurry	-	-	-	-	-	-	1	-	-	-	-	-	-
Pydraul 625	X	Х	Х	2	Х	2	1	2	1	1	1	-	-	Sodium Cyanide	1	1	1	1	1	1	1	1	2	1	1	Х	Х
Pyuraul A-200 Pydraul F-9	X	X X	X Y	2	X Y	X 2	1	2 1	1	1	1	-	-	Sodium Dichromate	2	1	-	1	2	1	1	1	-	-	-	-	-
Pyridine (50%)	x	Х	-	-	X	1	1	-	1	1	1	1	1	Sodium Ferrocyanide	-	-	-	-	-	-	1		2	-	-	2	-
Pyrogard 160, 230, 630	-	-	-	-	-	-	1	-	1	1	1	-	-	Sodium Fluoride	-	1	-	-	-	_	1	_	2	2	2	_	-
Pyrogard 51, 53, 55	-	Х	-	-	-	-	1	-	1	1	1	-	-	Sodium Fluoride (5%)	-	1	-	-	-	-	1	1	2	2	2	-	-
Pyrogard C, D	-	1	-	-	-	2	1	1	1	1	1	1	1	Sodium Fluoride (70%)	-	-	-	-	-	-	1	-	-	-	2	-	-
Q														Sodium Hydrosulfide	1	Х	-	-	-	-	1	-	-	-	-	-	-
Quench Oil	2	2	-	-	-	-	1	-	-	1	1	1	-	Soaium Hyarosultite Sodium Hydroxido	- 0	- 0	-	-	-	-	1	-	- 2	-	-	-	-
Quintolubric 822	2	1	-	-	-	-	1	-	1	1	1	1	1	Sodium Hydroxide (3 Molar)	2	2	-	-	-	-	1	-	-	_	-	-	X
OCover stock rati	ng o	nly;	Rati	ng fo	or tu	be s	tock	"X"						Sodium Hydroxide (10%)	-	-	-	1	-	-	1	_	-	-	-	-	-

*Use Gates fuel hose or contact Denver Product Applications Department.





2 Constructor X Intercommended Torde Alones X Intercommended Torde Alones X Intercommended Z Constructor X Intercommended Torde Alones X Intercommended Discretion X I	Rating Scale: 1 Excellent	0	Gat	es	Но	se	Po	lym	ers		ξ	Co & A	upli dap	ngs ter	5	_	Rating Scale: 1 Excellent	(Gat	es	Но	se	Pol	ym	ers		(8	Cou	ıplir dap	ngs ters	5	_	SELECTION
A. U. C. J. X. M. Horsmannelski A. O. C. J. X. M. Horsmannelski A. O. C. J. Difference Difference <thdifference< th=""> Difference</thdifference<>	2 Good resistance			Т	rad	le N	lan	nes				4	9			-	2 Good resistance			Т	rac	le l	Van	nes				4	9			_	GLOBAL SPIRAL
	X Not recommended	A	С	; c	2	J			Z	2	_	el 30	el 31				X Not recommended	A	(2 (C ₂	J			Z		_	el 30	el 31				COUPLINGS
Chemical Name Soluti Module (20) Soluti Modue	 Testing recommended 	e		ç	2			(juc			Stee	Ste	Ste	۶			 Testing recommended 	e		ç	ų			(juc			Stee	Ste	Ste	۶			
Chematical Nume B		oren	đ		Ĺ D		alon	nane rating		c	uo Uo	less	less	inur	ŝ			oren	d	į	e/P/		alon	rating .		۲	uo Si uo	less	less	inur	ŝ		PCM/PCS
Soluti Mysche (DS Cul) 1 <th1< th=""> 1 <th1< th=""> <th1< th=""></th1<></th1<></th1<>	Chemical Name	Neo	Nitri	Nitri		GPE:	Å H		PTFE	Nylo	Carb	Stain	Stain	Alum	Bras		Chemical Name	Neor	Ni+ri		Nitri	CPE S	HVP H		PTF	Nylo	Carb	Stain	Stain	Alum	Bras	_	FERRULES
Solution	Sodium Hydroxide (20% Cold)		2	-	-	-	-	-	1	1	1	1	1	X	X		Sulfuric Acid, Aerated, No Velocity		-		-	-	-	-	1	-	2	2	2	X	-		
Side Produce Drive Constant Produce Drive Dr	Sodium Hydroxide (20% Hot)		2	2	-	1	1	-	1	2	2	1	1	X	X		Sulfuric Acid, All Free No Velocity Sulfuric Acid, Concentrated	X	>			-	2	-	1	-	-	1	2	-	-		MEGACRIMP
Soluti Microbis (5%) 1 2 1 X X Z Z X Siluti Acid (7%) 1 X X X X X Z X N Powers Soluti Microbis (7%) Z X	Sodium Hydroxide (50% Cold)	2	Х	>	K	1	1	-	1	2	2	2	2	Х	Х		Sulfuric Acid, Fuming, Oleum	X			-	-	-	-	1	-	2	1	1	2	-		COUPLINGS
Soluri Mytoch (PN) 2 X V V X X V V X V POWER Soluri Mytoch (PN) V X V V X X V X </td <td>Sodium Hydroxide (50% Hot)</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>1</td> <td>2</td> <td>-</td> <td>1</td> <td>Х</td> <td>Х</td> <td>2</td> <td>2</td> <td>Х</td> <td>Х</td> <td></td> <td>Sulfuric Acid (10%)</td> <td>1</td> <td>2</td> <td>2</td> <td>2</td> <td>1</td> <td>1</td> <td>-</td> <td>1</td> <td>Х</td> <td>-</td> <td>Х</td> <td>Х</td> <td>2</td> <td>Х</td> <td></td> <td></td>	Sodium Hydroxide (50% Hot)	-	-	-	-	1	2	-	1	Х	Х	2	2	Х	Х		Sulfuric Acid (10%)	1	2	2	2	1	1	-	1	Х	-	Х	Х	2	Х		
Solute From Lay I	Sodium Hydroxide (60%)	2	Х 2		X	1	2	-	1	Х	X	2	2	X	X		Sulfuric Acid (30%)				- V	1	1	-	1	X	X	X	2	X	X		POWER
Schur Hyspanis Y X Y X	Sodium Hydroxide (70% Gold)	_	-		_	-	2		1		-	_	-	-	-		Sulfuric Acid (75%)		Ś	(X	-	2	2	1	Ŷ	X	X	2	X	X		CRIMP
Soluti Hypercharle 1 X <thx< th=""> Z <thz< th=""></thz<></thx<>	Sodium Hydroxide (80% Hot)	1	Х	-	-	-	-	-	1	-	Х	Х	Х	Х	Х		Sulfuric Acid (93%)	X)	(Х	-	X	-	1	Х	2	Х	2	Х	Х		COUPLINGS
Solut Hypocherine, G:S	Sodium Hypochlorite	1	Х	-	-	-	-	-	1	-	Х	Х	Х	Х	-		Sulfuric Acid (98%)	X		(Х	Х	Х	-	1	Х	2	Х	2	Х	Х		
Soluti Pignation X X X I I X X I I X X I	Sodium Hypochlorite, 5%	-	X		X	1	1	Х	1	1	X	X	2	X	X		Sulfurous Acid	2	2	2	-	-	-	-	1	X	Х	X	2	2	-		LOW
Solutine Margin programa 2 2 2 1 <th1< th=""> 1 1 1</th1<>	Sodium Hypochionie, 20%		-	. /	-	-		~	1	2	X	1	2	X	~		Sulfurous Acid (10%) Sulfurous Acid (75%)	X		(×	1	1	2	1	×	x	X	2	X	X		PRESSURE
Sodum Netroine X X v v X v V X V	Sodium Metaphosphate	2	2	2	2	1	2	-	1	1	x	1	1	1	X		Sun R&O Oils		1		-	-	-	2	1	1	1	1	1	1	1		COUPLINGS
Solum Protocie X X V I I X X I I X I	Sodium Nitrate	X	Х	-	-	1	2	1	1	1	1	2	2	2	2		Sunsafe (Fire Resist. Hydr. Fluid)	2	1		-	-	-	2	1	1	1	1	1	1	-		
Sodum Prexode Sodum Dixedu 1 2 1 </td <td>Sodium Perborate</td> <td> X</td> <td>Х</td> <td>-</td> <td>-</td> <td>-</td> <td>Х</td> <td>-</td> <td>1</td> <td>2</td> <td>Х</td> <td>1</td> <td>1</td> <td>1</td> <td>Х</td> <td></td> <td>Suntac HPOils</td> <td>-</td> <td>1</td> <td></td> <td>-</td> <td>-</td> <td>-</td> <td>2</td> <td>1</td> <td>1</td> <td>1</td> <td>-</td> <td>1</td> <td>1</td> <td>-</td> <td></td> <td></td>	Sodium Perborate	X	Х	-	-	-	Х	-	1	2	Х	1	1	1	Х		Suntac HPOils	-	1		-	-	-	2	1	1	1	-	1	1	-		
Soluti Procential Region 1 </td <td>Sodium Peroxide (Sodium Dioxide)</td> <td></td> <td>2</td> <td>1</td> <td>1</td> <td>2</td> <td>1</td> <td>-</td> <td>1</td> <td>X</td> <td>X</td> <td>1</td> <td>1</td> <td>1</td> <td>X</td> <td></td> <td>Suntac WR Oils</td> <td>1.1</td> <td>1</td> <td></td> <td>-</td> <td>-</td> <td>-</td> <td>2</td> <td>1</td> <td>1</td> <td>1</td> <td>-</td> <td>1</td> <td>1</td> <td>-</td> <td></td> <td>POLARSEAL</td>	Sodium Peroxide (Sodium Dioxide)		2	1	1	2	1	-	1	X	X	1	1	1	X		Suntac WR Oils	1.1	1		-	-	-	2	1	1	1	-	1	1	-		POLARSEAL
Schum Programe (Diasci) 2 1 - 1 <th1< th=""> 1 1 1</th1<>	Sodium Phosphate (Mono)		1		-	-	2	-	1	-	2	-	-		~		Super Hydraulic Oils (Conoco)		1		2	2	-	2	1	1	1	1	1	- 1	-		COUPLINGS
Solum Displaye (Thiase) 2 1 - 1 <td>Sodium Phosphate (Dibasic)</td> <td>2</td> <td>1</td> <td></td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>1</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td></td> <td>Sutan Plus, Herbicide</td> <td>X</td> <td>)</td> <td>(</td> <td>Х</td> <td>1</td> <td>-</td> <td>-</td> <td>-</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>-</td> <td></td> <td></td>	Sodium Phosphate (Dibasic)	2	1		-	-	-	-	1	-	-	-	-	-	-		Sutan Plus, Herbicide	X)	(Х	1	-	-	-	1	1	1	1	1	-		
Sodum Sodum <th< td=""><td>Sodium Phosphate (Tribasic)</td><td>2</td><td>1</td><td></td><td>-</td><td>-</td><td>-</td><td>-</td><td>1</td><td>-</td><td>2</td><td>2</td><td>2</td><td>-</td><td>-</td><td></td><td>Sutazine Plus, Herbicide</td><td>X</td><td></td><td>(</td><td>-</td><td>1</td><td>-</td><td>-</td><td>-</td><td>1</td><td>Х</td><td>1</td><td>1</td><td>1</td><td>-</td><td></td><td>C14</td></th<>	Sodium Phosphate (Tribasic)	2	1		-	-	-	-	1	-	2	2	2	-	-		Sutazine Plus, Herbicide	X		(-	1	-	-	-	1	Х	1	1	1	-		C14
Sodium Saidale (rol) 1 <th1< th=""> 1 <th1< th=""></th1<></th1<>	Sodium Silicate	1	1		-	1	1	2	1	1	1	1	1	-	1		Synthetic Oil (Citgo)		-		-	-	-	2	-	1	1	1	1	-	-		COUPLINGS
Solum Surial Image: Strate in the strate	Sodium Silicate (Hot) Sodium Sulfate		1		-	- 1	-	-	1	- 1	2	2	2	X	X 2		Syrup	2	1		2	-	-	-	1	1	-	1	1	1	-		
Solum Sulfie, Sturied 1 1 - - - 1 2 2 1 N 1 1 2 1 <th1< th=""> 1 1 <th1< th=""></th1<></th1<>	Sodium Sulfide		1		-	1	1	1	1	1	X	X	2	Х	X		T				~		V				~	v	~				DOTO
Sodium Suffie 2 2 1 <	Soium Sulfide, Saturated	1	1		-	-	-	-	1	1	2	2	1	Х	Х		Tall Oil (Under 150°F)	2	2	<u>,</u>	2	-	X	-	1	-	2	X 2	2	X 1	- 2		THERMO-
Sodium Suffit, 19% (b) 10° 1 <th1< th=""> 1 1 <th1< <="" td=""><td>Sodium Sulfite</td><td>2</td><td>2</td><td>2</td><td>2</td><td>1</td><td>2</td><td>1</td><td>1</td><td>2</td><td>1</td><td>1</td><td>1</td><td>-</td><td>Х</td><td></td><td>Tannic Acid (10%)</td><td>2</td><td>></td><td>(</td><td>-</td><td>1</td><td>2</td><td>-</td><td>1</td><td>x</td><td>2</td><td>1</td><td>1</td><td>2</td><td>X</td><td></td><td>PLASTIC</td></th1<></th1<>	Sodium Sulfite	2	2	2	2	1	2	1	1	2	1	1	1	-	Х		Tannic Acid (10%)	2	>	(-	1	2	-	1	x	2	1	1	2	X		PLASTIC
Solution Construction	Sodium Sulfite, 5%		1		-	-	-	-	1	-	1	1	1	1	-		Tar And Tar Oil	2	-		-	-	-	2	1	1	1	1	1	1	2		COUPLINGS
(p+P) 1 <td>Sodium Thiosulfate</td> <td> '</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td></td> <td></td> <td>Tar (Bituminous, Under 100°F)</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>Х</td> <td>-</td> <td>-</td> <td>1</td> <td>-</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>2</td> <td></td> <td></td>	Sodium Thiosulfate	'									2	2	2	2			Tar (Bituminous, Under 100°F)	2	2	2	2	Х	-	-	1	-	1	1	1	1	2		
Sodum Tipolybiosphate (STPP) · <th< td=""><td>(HPO, Antichior)</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>Х</td><td>1</td><td>1</td><td>2</td><td>Х</td><td></td><td>Tartaric Acid</td><td> 2</td><td>2</td><td>-</td><td>2</td><td>1</td><td>1</td><td>-</td><td>1</td><td>1</td><td>X 1</td><td>2</td><td>2</td><td>2</td><td>X 1</td><td></td><td></td></th<>	(HPO, Antichior)	1	1	1	1	1	1	1	1	1	Х	1	1	2	Х		Tartaric Acid	2	2	-	2	1	1	-	1	1	X 1	2	2	2	X 1		
Solus Olis - 1 -	Sodium Tripolyphosphate (STPP)	-	-		-	-	-	-	1	-	-	1	1	Х	Х		Tenol Oils		1		-	-	-	2	1	1	1	1	1	-	-		
Double Conduction Particle	Solnus Oils Sour Crude Oil	-	1		-	-	-	2	1	1	1	1	1	1	1		Tergitol	-	-		-	-	-	-	1	-	2	1	1	-	2		G1 & G2
Spent Acid - - - 2 - 1 1 - Teressite - 1	Sovbean Oil	2	2	2	2	-	2		1	1	1	1	1	1	-		Terpineol	X	2	2	-	1	2	-	1	2	-	-	-	-	-		COUPLINGS
Stanic Chloride X 2 2 1 X Z <thz< th=""> <thz< th=""> Z <thz< th=""> <t< td=""><td>Spent Acid</td><td>- </td><td>-</td><td></td><td>-</td><td>-</td><td>2</td><td>-</td><td>1</td><td>-</td><td>-</td><td>1</td><td>1</td><td>-</td><td>-</td><td></td><td>Terresstic</td><td>-</td><td>1</td><td>))</td><td>-</td><td>-</td><td>-</td><td>-</td><td>- 1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>-</td><td>-</td><td></td><td></td></t<></thz<></thz<></thz<>	Spent Acid	-	-		-	-	2	-	1	-	-	1	1	-	-		Terresstic	-	1))	-	-	-	-	- 1	1	1	1	1	-	-		
Stannic Chloride, 50% X	Stannic Chloride	X	2	2	2	1	Х	-	1	Х	Х	Х	Х	Х	Х		Tetraethyl Lead Blend	X	2	2	2	2		2	1	-	2	2	-	-	-		
Stannus Cirilide (Junde 1001) 1 <t< td=""><td>Stannic Chloride, 50%</td><td></td><td>1</td><td></td><td>-</td><td>- 1</td><td>- 1</td><td>-</td><td>1</td><td>- V</td><td>X</td><td>X</td><td>X</td><td>X</td><td>-</td><td></td><td>Tetrahydrofuran (THF)</td><td>X</td><td></td><td>(</td><td>-</td><td>-</td><td>Х</td><td>2</td><td>1</td><td>1</td><td>2</td><td>-</td><td>-</td><td>-</td><td>-</td><td></td><td>FIELD</td></t<>	Stannic Chloride, 50%		1		-	- 1	- 1	-	1	- V	X	X	X	X	-		Tetrahydrofuran (THF)	X		(-	-	Х	2	1	1	2	-	-	-	-		FIELD
Starch 2 2 - 1 <td>Stannous Chloride, 15%</td> <td></td> <td>1</td> <td></td> <td>_</td> <td>-</td> <td>-</td> <td></td> <td>1</td> <td>-</td> <td>x</td> <td>x</td> <td>-</td> <td>X</td> <td></td> <td></td> <td>Tetralin</td> <td>X</td> <td></td> <td>(</td> <td>-</td> <td>-</td> <td>Х</td> <td>-</td> <td>1</td> <td>2</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>-</td> <td></td> <td>ATTACHABLE</td>	Stannous Chloride, 15%		1		_	-	-		1	-	x	x	-	X			Tetralin	X		(-	-	Х	-	1	2	1	1	1	1	-		ATTACHABLE
Steam USE STEAM HOSE - 2 1 1 1 - 2 1 1 1 - 2 1 1 1 - 2 1 1 1 - 2 1 1 1 - 2 1 1 1 1 - 2 1 <th1< th=""> 1 1</th1<>	Starch	2	2	-	-	-	1	1	1	1	Х	1	1	1	-		Thiopen			(-	-	-	-	1	-	÷	-	-	-	-		COUPLINGS
Stearin 2 2 2 1 1 1 X </td <td>Steam</td> <td>ψse</td> <td>STE</td> <td>AM</td> <td>HO</td> <td>SE</td> <td>-</td> <td>2</td> <td>1</td> <td>-</td> <td>1</td> <td>1</td> <td>1</td> <td>-</td> <td>2</td> <td></td> <td>Toluene (Toluol)</td> <td></td> <td>) }</td> <td>(</td> <td>л Х</td> <td>- X</td> <td>- X</td> <td>-</td> <td>1</td> <td>-</td> <td>1</td> <td>2</td> <td>2</td> <td>X 1</td> <td>X 1</td> <td></td> <td></td>	Steam	ψse	STE	AM	HO	SE	-	2	1	-	1	1	1	-	2		Toluene (Toluol)) }	(л Х	- X	- X	-	1	-	1	2	2	X 1	X 1		
Jordani 2 2 7 </td <td>Stearic Acid</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>1</td> <td>2</td> <td>1</td> <td>1</td> <td>1</td> <td>X</td> <td>2</td> <td>1</td> <td>Х</td> <td>Х</td> <td></td> <td>Toluene Diisocyanate (Under 150°</td> <td>Ϋ́Ρ, Χ</td> <td>-</td> <td></td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>1</td> <td>-</td> <td>1</td> <td>1</td> <td>1</td> <td>-</td> <td>-</td> <td></td> <td></td>	Stearic Acid	2	2	2	2	1	2	1	1	1	X	2	1	Х	Х		Toluene Diisocyanate (Under 150°	Ϋ́Ρ, Χ	-		-	-	-	-	1	-	1	1	1	-	-		
Styrene (Monomer) X X - - - 1	Stoddard Solvent	2	2	· `	-	- 1	-	í X	1	2 1	2	- 1	- 1	- 1	- 1		Transformer Oil (Askarel Types)	X	\rightarrow	(Х	1	Х	-	1	-	1	1	1	1	-		SURELOK AIR
Styrene (Monomer) - X - 2 2 X 2 X 2 X 2 X 2 X 2 X 2 X 2 X 2 X 2 X 2 X 2 X 2 X 2 X 2 X 2 X 2 X 2 1 <th1< th=""> 1 <th1< th=""></th1<></th1<>	Styrene (Vinyl Benzene)	X	X		-	-	-	-	1	1	1	1	1	1	1		Transformer Oil (Petroleum Type)	2	1		2	1	Х	2	1	1	1	1	1	1	1		BRAKE
Sucrose Solutions 1	Styrene (Monomer)	-	Х	-	-	2	-	-	1	2	2	Х	2	Х	2		Transmission Fluid, Type A Tributoxyethyl Phosphate	2 v	1	(Z X	т Х	2 X	2	1	2	1	1	1	1 ¥	1		COUPLINGS
Summin Cade (10%, Under 1/0+7) - 1 1 1 1 1 1 <	Sucrose Solutions	1	1	1	1	-	1	-	1	-	1	1	1	-	-		Tributyl Phosphate	Î	Ś	(X	2	X	-	1	-	1	-	-	X	-		
Sulfare Green Liquor 1 1 - - - 1 1 2 2 2 X - Trichloromonofluoroethane (Feon 17) Use Freen Hose 1 1 1 X - DISCONNECT COUPLERS Sulfur - 1 1 1 1 1 1 1 1 1 1 1 1 1 </td <td>Sulfamic Acid (10%, Under 170°F) Sulfate Black Liquor</td> <td> - 1</td> <td>- 1</td> <td></td> <td>-</td> <td>1</td> <td>2</td> <td>-</td> <td>1</td> <td>-</td> <td>2</td> <td>- 2</td> <td>- 2</td> <td>- Y</td> <td>-</td> <td></td> <td>Trichloroethylene</td> <td>X</td> <td>\rightarrow</td> <td>(</td> <td>Х</td> <td>2</td> <td>Х</td> <td>-</td> <td>1</td> <td>2</td> <td>Х</td> <td>2</td> <td>1</td> <td>Х</td> <td>1</td> <td></td> <td>QUICK</td>	Sulfamic Acid (10%, Under 170°F) Sulfate Black Liquor	- 1	- 1		-	1	2	-	1	-	2	- 2	- 2	- Y	-		Trichloroethylene	X	\rightarrow	(Х	2	Х	-	1	2	Х	2	1	Х	1		QUICK
Sulfur - <td>Sulfate Green Liquor</td> <td></td> <td>1</td> <td></td> <td>_</td> <td>-</td> <td>_</td> <td>-</td> <td>1</td> <td>1</td> <td>2</td> <td>2</td> <td>2</td> <td>X</td> <td>-</td> <td></td> <td>Trichloromonofluoroethane</td> <td></td> <td></td> <td></td> <td></td> <td>_</td> <td></td> <td>DISCONNECT</td>	Sulfate Green Liquor		1		_	-	_	-	1	1	2	2	2	X	-		Trichloromonofluoroethane					_											DISCONNECT
Sulfur (Molten) X	Sulfur	-	-		-	-	-	-	-	-	-	-	-	-	-		(Freon 17)			U	Jse F	reo	n Ho	se		1	1	1	Х	-			COUPLERS
Sulture Chlonde X Z Z <thz< th=""></thz<>	Sulfur (Molten)	X	Х	-	-	-	-	-	-	-	-	-	-	-	-		(Freon 113)			ļ	se Fi	reon	i Hos	e	1	1	1	Х	-				
Law bindle blocked (hold) Law bindle (Liquid) Law bindle (Li	Sulfur Chloride		X		K -	2	2	-	1	2	X	X 2	2	X 1	X		Tricresyl Phosphate	X		(Х	1	Х	-	1	1	1	2	2	Х	-		NEW BALL
Sulfur Dioxide (Liquid) 2 X - 2 - 1 <td>Sulfur Dioxide (Drv)</td> <td></td> <td>X</td> <td>)</td> <td>K</td> <td>-</td> <td>2</td> <td>-</td> <td>1</td> <td>X</td> <td>2</td> <td>2</td> <td>1</td> <td>1</td> <td>1</td> <td></td> <td>Triethanolamine (TEA)</td> <td>2</td> <td>2</td> <td>2</td> <td>-</td> <td>1</td> <td>2</td> <td>-</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td></td> <td>VALVES</td>	Sulfur Dioxide (Drv)		X)	K	-	2	-	1	X	2	2	1	1	1		Triethanolamine (TEA)	2	2	2	-	1	2	-	1	1	1	1	1	1	1		VALVES
Sulfur Hexaflouride (Gas) 1 2 - 2 -<	Sulfur Dioxide (Liquid)	2	X		-	-	2	-	1	-	-	-	-	-	-		Tripolyphosphate (STPP)	X	. 1	 >	-	-	-	-	1	-	-	2	1	X	-		
Sulfur Trioxide (Dry) X You is a straight of the interval o	Sulfur Hexaflouride (Gas)	1	2	-	-	-	2	-	1	Х	-	-	-	-	-		Turpentine		2	-)	2	- 2	Z X	-	1	1	X	1	1	1	2		
Sulfuric Acid, 3 Molar X X - - 1 <td>Sulfur Trioxide (Dry)</td> <td>X</td> <td>X</td> <td></td> <td>K</td> <td>Х</td> <td>Х</td> <td>-</td> <td>1</td> <td>1</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>Х</td> <td></td> <td>Type I Fuel (MIL-S-3136)</td> <td></td> <td>2</td> <td></td> <td></td> <td>-</td> <td></td> <td>·</td> <td></td> <td>•</td> <td></td> <td>•</td> <td>•</td> <td>'</td> <td>-</td> <td></td> <td>ACCESSORIES</td>	Sulfur Trioxide (Dry)	X	X		K	Х	Х	-	1	1	2	2	2	2	Х		Type I Fuel (MIL-S-3136)		2			-		·		•		•	•	'	-		ACCESSORIES
Type II Fuel (MIL-S-3136) X 2 1 - 1 1 1 1 1 - EQUIPMENT	Sulfuric Acid, 85%		X		_	_	_	-	1	-	^	-	-	-	-		ASTM Fuel A	2	1		-	-	-	-	1	-	1	1	1	1	-		
		1							-		<u> </u>					•	Type II Fuel (MIL-S-3136)	X	2	2	-	-	-	-	1	-	1	1	1	1	-	_	EQUIPMENT

O Cover stock rating only; Rating for tube stock "X" *Use Gates fuel hose or contact Denver Product Applications Department.



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C60

EQUIPMENT



Hose & Coupling Section

Chemical Resistance Table

HOSE/CPLG. SELECTION

GLOBALSPIRAL COUPLINGS

PCM/PCS FERRULES

MEGACRIMP COUPLINGS

POWER CRIMP COUPLINGS

LOW PRESSURE

COUPLINGS

POLARSEAL COUPLINGS

C14 COUPLINGS

PCTS THERMO-PLASTIC COUPLINGS

FIELD ATTACHABLE G1 & G2 COUPLINGS

FIELD ATTACHABLE C5 COUPLINGS

SURELOK AIR BRAKE COUPLINGS

QUICK DISCONNECT

COUPLERS

NEW BALL VALVES

ACCESSORIES

EQUIPMENT AND PARTS

Rating Scale: 1 Excellent	Gates Hose Polymers							Couplings & Adapters					
2 Good resistance			Tra	de	Naı	nes				8	16		
X Not recommended	Α	С	C_2	J			Z	2	_	el 3	el 3		
- Testing recommended	Veoprene	Vitrile	Vitrile/PVC	CPE	Hypalon	Jrethane	TFE	lylon	Carbon Stee	stainless Ste	stainless Ste	Aluminum	Brass
	~	~	2	<u> </u>	-	20	-	~	<u> </u>	0)	0)	~	<u> </u>
ASTM Fuel B	х	1	-	-	-	-	1	-	1	1	1	1	-
U													
Ucon Hydrolube Types 150CP,													
200CP	-	1	-	-	-	2	1	1	1	1	1	1	1
Ucon Hydrolube Types													
275CP, 300CP, 550CP	-	-	-	-	-	-	1	-	-	-	-	-	-
	-	1	-	-	-	2	1	1		1	1	I	I
Union ATE Turne E	-	1	-	-	-	2	1	1		1	1	-	-
Union ATF Type F	-	1	-	-	-	2	1	1		1	1	I	I
Union G-2 Fluid	-	1	-	-	-	2	1	1		1	1	-	-
Union G-POII	-	1	-	-	-	2	1	1		1	1	1	1
Union Hydraulic Oli Aw	-	1	-	-	-	2	1	1		1	1	1	1
Union Hydraulic Tractor Fluid	-	1	-	-	-	2	-	1		1	1	1	I
Urea Solution		2	-	1	1	2	1	1		1	1	2	-
V													
Varnish	Х	Х	Х	-	Х	-	1	1	2	1	1	1	2
Vegetable Oils	2	1	2	1	-	2	1	1	1	1	1	1	2
Vegetable Oil (Hot)	-	-	-	-	-	-	1	1	2	2	2	1	2
Versilube	1	1	-	-	-	-	1	-	1	1	1	1	-
Versilube F-50, F-44	2	2	2	-	2	2	1	1	1	1	1	1	1
Vinegar	2	Х	Х	2	Х	-	1	1	X	2	1	Х	Х
Vinyl Acetate	Х	Х	Х	1	Х	-	1	-	2	1	2	1	2
Vinyl Chloride (Chloroethylene,													
Monomer)	Х	Х	Х	Х	Х	-	1	-	2	1	1	2	Х
Vitrea Oils	Х	Х	Х	-	-	2	1	1	1	1	1	-	-

Rating Scale: 1 Excellent	G	Gates Hose Polymers						8	Couplings & Adapters				
2 Good resistance			Tra	de	Naı	nes				64	16		
X Not recommended	Α	С	C_2	J			Z	Z	_	el 3	el 3		
 Testing recommended Chemical Name 	Neoprene	Nitrile	Nitrile/PVC	CPE	Hypalon	Urethane (cover rating only)	PTFE	Nylon	Carbon Stee	Stainless Ste	Stainless Ste	Aluminum	Brass
W													
Water	1	1	1	1	1	1	1	1	2	1	1	1	1
Water, Acid Mine	2	X	-	-	-	-	1	1	X	2	2	X	X
Water Deiopized (Deminoralized)	2	2	-	-	I	1	1	I	^	2	2	-	-
Water Distilled	2	1			1	1	1	1	v	1	1	1	1
Water Fresh		1					1	1	Ŷ	1	1	1	X
Water In Oil Emulsions			_	_	_	2	1	1				-	-
Water Potable (EDA Tube Only)				Use	FDA	Hose	, On	lv -	-	-	-	-	
Water, Salt	2	1	-	-	-	-	1	1	Х	2	2	Х	Х
White & Bagley No. 2190	<u> </u>	-								-	-		
Cutting Oil	2	1	-	-	-	-	1	-	-	-	-		-
Wines	2	1	1	1	1	-	1	1	2	2	2	1	-
Wood Oil	2	1	-	1	2	1	1	1	1	1	1	1	-
X													
Xylene	X	Х	-	Х	-	2	1	Х	2	2	2	-	-
Z													
Zeric	-	1	-	-	-	2	1	2	-	-	-	-	-
Zinc Acetate	2	Х	-	-	Х	-	1	2	1	1	1	1	1
Zinc Chloride Solutions	1	1	1	1	1	-	1	1	X	2	1	Х	Х
Zinc Chromate	-	-	-	1	1	-	1	-	-	1	1	-	-
Zinc Hydrate	-	-	-	-	-	2	1	-	-	-	-	-	-
Zinc Sulfate Solutions	2	2	2	1	2	-	1	2	X	2	1	Х	Х

OCover stock rating only; Rating for tube stock "X" *Use Gates fuel hose or contact Denver Product Applications Department.

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EQUIPMENT

HOSE/CPLG. Selection

GLOBALSPIRAL Couplings

PCM/PCS FERRULES

MEGACRIMP COUPLINGS

POWER CRIMP COUPLINGS

LOW PRESSURE COUPLINGS

C14 Couplings

PCTS THERMO-PLASTIC COUPLINGS

POLARSEAL COUPLINGS

Properties of C14 PTFE Tube

Tensile Strength, 73°	1500-3000 Lb./Sq. In.		
Elongation, 73°F (23°	C)	100-200%	
Stiffness, 73°F (23°C)		60,000 Lb/Sq. In.	
Impact Strength	@70°F (21°C)	2.0 FtLb./In.	
	@73°F (23°C)	3.5 FtLb./In.	
	@170°F (77°C)	6.0 FtLb./In.	
Hardness, Durometer		D55-D70 Shore D	
Compressive Stress a	at		
1% Deformation	@73°F (23°C)	600 Lb./Sq.In.	
1% Offset	@73°F (23°C)	1000 Lb./Sq.In.	
Deformation Under Lo	oad, 24 Hrs. @ 122°F (50°C)		
1200 Lb./Sq.In.		4-8%	
2000 Lb./Sq.In.		25%	
Heat-Distortion Temp	erature @66 Lb./Sq. In.	250°F (121°C)	
Coefficient of Linear 7	hermal Expansion per °F; 77-140°F (25-60°C)	5.5 x 10⁻⁵	
Thermal Conductivity	0.18 ln.	1.7 B.T.U./Hr./Sq.Ft./°F/In.	
Specific Heat		0.25 B.T.U./Lb./°F	
Water Absorption		0.0%	
Flammability		Nonflammable	
Specific Gravity		2.1-2.3	

FIELD Attachable G1 & G2 Couplings

FIELD ATTACHABLE C5 COUPLINGS

SURELOK AIR Brake Couplings

QUICK DISCONNECT COUPLERS

NEW BALL Valves

ACCESSORIES

EQUIPMENT AND PARTS

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Electrostatic Discharge

Most applications of PTFE hose do not require the use of a conductive inner tube. Under certain applications, the potential for Static Discharge must be considered. Be aware that static electricity can be a hazard. Under those conditions where static discharge can occur, the use of conductive Gates C14CT hose is recommended. The following should serve to increase your knowledge and understanding of this phenomenon and how to avoid its occurrence:

When two different materials contact each other, electrons from one material can move across its boundary and associate with the other. These electrons align themselves with the material contacted. If the two materials are good conductors of electricity, the positive and negative electrons flow back and forth between them, keeping them in balance. If one or both are insulators, the flow will not occur. A charge will then build up on the surface of one of the materials. When the charge exceeds the electric strength of the material, electric breakdown results.

In applying this to PTFE hose, we have to consider fluids and gases that are poor conductors of electricity and the flow rates of those fluids and gases. In order for a liquid or gas to be a poor electrical conductor, it will generally satisfy one or both of the following conditions:

- 1. Be nonpolar; that is, an imbalance between protons and electrons, and/or
- 2. Contain a nonmixable component or a suspended solid; such as water in kerosene.

So when a liquid contacts a PTFE tube that isn't a good conductor (white PTFE innercore), the result is phase separation and the electric charge starts to build. The rate at which static electricity builds up now becomes a function of the fluid flow rate. When the electric strength of the PTFE tube is exceeded, the electric charge will **puncture the tube wall and ground itself on the stainless steel braid of the hose.**

In hydraulics, high pressures generally mean high velocities. Historically, fluids were filtered upstream of the hoses using metallic filter elements. The metallic element helped to ground the charge. But, today, most filtration is done with paper-type and glass-fiber filter elements that have a tendency to inject an electrostatic charge into the fluid they are filtering.

Steam and fuels are two specific areas of concern. No hoses in this catalog can or should be used in steam applications. Contact Gates Product Application for proper hose recommendation. Fuels (i.e., gasoline and white spirits, hydrazine, benzene, diesel oils, etc.) are, for the most part, "nonconductive" liquids and have a resistance greater than 108 ohm. These fluids usually are transferred at fairly low velocities, but there still is a potential for an electrostatic discharge due to external factors, such as humidity and, to some extent, temperature. You should take all of these factors into account even at fluid velocities at or below 1 meter per second.

When using PTFE hose, you can offset the potential hazard of electrostatic discharge by using a conductive Gates C14CT hose. Carbon is added to the PTFE inner tube wall during manufacture. The carbon layer directs the electrostatic charge down the inner diameter of the hose to the metal end fittings. This prevents the charge from building up on the inner tube wall.

So, it's important to examine any application where nonconductive fluids are used and any of the above conditions exist. This section is not meant to cover all conditions or situations when they involve fuels, steam or other media which may cause electrostatic buildup or potential discharge. If you need help on any individual application, contact Hose/Connector Product Application, Denver.

Following is a list of some of the chemicals that meet at least one of the criteria necessary to create electrostatic discharge:

Lacquer Solvents

Naphtha

• Octane

• Pinene

• Steam

• Toluene

• Varnish

• Versilube

• Turpentine

• Petroleum

Silicone Oils

• Skydrol 500 & 700

Transformer Oil

Paint

Naphthalene

- Cyclohexane
- Decalin
- Diacetone
- Dibutyl Ether
- Dibutyl Phthalate
- Dibutyl Sebacate
- Dimethyl Phthalate
- Dioctyl Phthalate
- Dipentene
- Fuel Oil
- Gasoline
- Hexane
- Hexene
- Hydrazine
- Kerosene
- Lacquers

General Industry Practice has identified the above fluids as requiring a conductive hose—Gates C14CT.

HOSE/CPLG. Selection
GLOBALSPIRAL Couplings
PCM/PCS Ferrules
MEGACRIMP Couplings
POWER CRIMP COUPLINGS
LOW PRESSURE COUPLINGS
POLARSEAL Couplings
C14 Couplings
PCTS THERMO- PLASTIC COUPLINGS
FIELD ATTACHABLE G1 & G2 COUPLINGS
FIELD ATTACHABLE C5 COUPLINGS
SURELOK AIR Brake Couplings
QUICK Disconnect Couplers
NEW BALL VALVES
ACCESSORIES
FOLIIPMENT

EQUIPMENT

Fates

C64

AND PARTS



EQUIPMENT

HOSE/CPLG. Selection

GLOBALSPIRAL Couplings

PCM/PCS FERRULES

MEGACRIMP Couplings

POWER CRIMP COUPLINGS

low Pressure Couplings

POLARSEAL Couplings

C14 Couplings

PCTS THERMO-PLASTIC COUPLINGS

FIELD ATTACHABLE G1 & G2 COUPLINGS

FIELD Attachable C5 Couplings

SURELOK AIR Brake Couplings

QUICK Disconnect Couplers

NEW BALL VALVES

ACCESSORIES

EQUIPMENT AND PARTS

C65

Effusion/Corrosion for PTFE Hose and Hose Assemblies

What is Effusion?

It is the process where chemical molecules move through the PTFE wall and escape from a hose or hose assembly. It is sometimes called permeation. The rate at which effusion occurs depends upon temperature, pressure, wall thickness and the hose material.

The fact that effusion occurs isn't the problem. This process will happen with most all media in most hose material.

The basic issues are:

- 1. At what rate will effusion occur?
- 2. How hazardous are the media?
- 3. In what kind of environment does effusion take place; closed room, outside, etc.?

General media concerns regarding the potential effects of effusion:

Media where corrosion is not of concern, but effusion may displace the air we breathe, thus becoming a hazard to personnel.

Some of the chemicals in this category are:

- Carbon Dioxide
- Nitrogen
- Steam

Neon

Argon

Xenon

Krypton

- OxygenHelium
- Media that can effuse in their "vapor phase"; i.e., their boiling point is below approximately +52°C (+125°F) at atmospheric pressure. These media can form chemicals that can corrode the braid and/or cause injury to personnel.

Some of these include:

- Acetaldehyde (Flammable, toxic)
- Benzene (Flammable, toxic)
- Liquid Butane (Flammable)
- Carbon Disulfide (Flammable, toxic)
- Diethyl Ether (Flammable, narcotic)
- Ethyl Mercaptan (Flammable, toxic)
- Hydrochloric Acid (Corrosive, toxic)

- Lacquer Solvents (Flammable)
- Methyl Bromide (Flammable, toxic, corrosive)
- Methylene Chloride (Toxic)
- Methyl Formate (Flammable, toxic)
- Liquid Propane (Flammable)
- Sulphur Trioxide (Corrosive, toxic)
- Liquid Chlorine (Corrosive, toxic)
- Media with the potential to effuse and cause corrosion of the braid reinforcement and fitting materials. These chemicals are all gases while at atmospheric pressure and a temperature of +13°C (+56°F) or lower.

Some of these chemicals are:

- Acetylene (Flammable)
- Butadiene (Flammable)
- Butane Gas (Flammable)
- Carbon Monoxide (Toxic, flammable)
- Chlorine (Toxic, corrosive)
- Chlorine Trifluoride (Toxic, corrosive)
- Ethyl Chloride (Toxic, corrosive)
- Hydrogen (Flammable)
- Hydrogen Chloride (Corrosive, toxic)
- Hydrogen Sulfide (Flammable, toxic)
- Hydrocyanic Acid (Flammable, toxic)
- Hydrogen Cyanide (Flammable, toxic)
- Coke Oven Gas (Flammable, toxic)
- Natural Gas (Flammable, toxic)
- Propane Gas (Flammable)
- Sulfur Dioxide (Corrosive)
- Vinyl Chloride Monomer (Toxic, corrosive)

It is important that hose assemblies used in these applications are installed in well-vented areas to avoid potential problems for personnel and/or equipment.







Hydraulic System Pressure Drop

What is Pressure Drop?

As related to our business, pressure drop is the difference between the pressure of a fluid as it enters one end of a hydraulic hose assembly and the pressure of that fluid as it leaves the other end. There will be a difference in pressure, and it will be less. How much less depends on what is between the beginning and end of the hose assembly. Here are some examples of things that can influence the amount of pressure drop.

- 1. FRICTION This is the rubbing of fluid against the inside walls of the hose assembly.
- 2. TYPE OF FLUID Different fluids behave differently under pressure. Thicker fluids are moved with greater difficulty and will exhibit greater pressure drop.
- 3. TEMPERATURE OF THE FLUID Warming fluid thins it so it flows more easily, as with automotive oil.
- LENGTH OF HOSE ASSEMBLY The longer it is, the more surface there is for friction to decrease pressure.
- SIZE (I.D.) OF HOSE Affects the fluid velocity for a given flow rate. Higher velocities result in greater pressure drop. Therefore, a larger I.D. hose will produce less pressure drop.
- TYPE OF COUPLINGS & ADAPTERS Any change in bore or change in direction (such as with 45° or 90° elbows) can increase the amount of pressure drop.
- 7. FLOW RATE Pressure drop increases with flow rate for same size hose.

Who Cares About Pressure Drop?

Suppose you need 4,000 psi of output from a hose assembly for hydraulic equipment to run efficiently. There will be some pressure drop and you must allow for it in helping to plumb the system with Gates hose, couplings and adapters. This means that the input pressure to the hose assembly must be equal to the output plus the amount of pressure drop. If the pressure drop in this example is 150 psi, then you will need 4,150 psi of input.

How Can You Determine the Amount of Pressure Drop?

That's the easy part of it. Contact your local Gates representative who is trained and equipped to quickly solve such problems for you. He will need input variables and fittings used from you as shown (see below). A Gates Pressure Drop analysis printed below will then be provided for your application.

Sample	Pressure	Drop	Analysis
--------	----------	------	----------

Input Variables:

Fittings Used:

Flow Rate: 15 (GPM)

- 1. Standard Straight Fitting
- 2. 90-Degree Angle Coupling

Specific Gravity: 0.85 Free Hose Length: 20.0 (ft)

Viscosity: 20.0 (Centistokes)

Dash Size (1/16")	Velocity (Ft/Sec)	Hose Pressure Drop (psi/Ft)	Total Pressure Drop-Hose & Fittings (psi)	(1) Reynolds Number	(2) Heat Gain (BTUH)	(3) Horse- power Loss
5	62.8	28.8	789.6	7584	17483	6.87
6	43.6	12.2	399.1	6320	8838	3.47
8	24.5	3.2	81.3	4740	1801	0.71
*10	15.7	1.1	31.2	3792	691	0.27
12	10.9	0.5	12.7	3160	280	0.11
16	6.1	0.1	2.6	2730	58	0.02
20	3.9	0.0	0.8	1896	18	0.01

*Recommended hose size, based on velocity, pressure drop, heat gain and hp loss.

(1) **Reynolds Number** = $\frac{\text{inertia flow forces}}{\text{friction forces (or viscosity)}}$ indicates the type of flow.

Reynolds No. Range	Type of Flow
0–2000	Laminar
2000-3000	Transient
3000 +	Turbulent

- (2) Heat Gain is the total amount of energy converted to heat energy that will raise the fluid temperature if it is not dissipated.
- (3) Horsepower Loss is a measure of the conversion of mechanical energy to heat energy and is related to system heat gain.







EQUIPMENT

HOSE/CPLG. SELECTION

GLOBALSPIRAL

COUPLINGS

PCM/PCS

C67

Pressure Drop Data Form

Fill in all the following BEFORE contacting your local Gates representative for assistance in solving pressure drop problems or contacting Gates Product Application. You can now conveniently calculate your ownpressure drops by visiting www.gates.com/pressuredrop.

FERRULES	Your Name:							
MEGACRIMP Couplings	Date://							
POWER	Customer'sName:	Location:						
CRIMP Couplings	Type of Application:							
LOW	I. FLUID DATA NEEDED:							
PRESSURE Couplings	A. Viscosity (thickness) in:							
POLARSEAL	1. Centistokes (mm ² /sec.)							
COUPLINGS	or	or						
C14 Couplings	2. Saybolt Seconds Universal (SSU)							
	or	or						
PCTS THERMO- PLASTIC	3. Ft. ² /sec.							
COUPLINGS	B. Specific Gravity							
Field Attachable	C. Or, if you cannot determine A & B above, then give:							
G1 & G2 Couplings	1. Fluid brand name and type							
FIELD	2. Fluid temperature							
ATTACHABLE C5	D. Flow rate (GPM)							
COUPLINGS	II. HOSE DATA NEEDED:							
SURELOK AIR BRAKE	A. Size (I.D.) in inches or dash size							
COUPLINGS	B. Length of assembly in feet							
QUICK DISCONNECT	III. COUPLING and ADAPTER DATA NEEDED:							
COUPLERS	List quantity and catalog description of each coupling an	d adapter used in the hose assembly.						
NEW BALL Valves								
ACCESSORIES								
FOILIDMENT								
AND PARTS								



PSI to Metric

(1 psi = 6.89 kPa)

EQUIPMENT

HOSE/CPLG. Selection

GLOBALSPIRAL

COUPLINGS

Pressure Conversions

Metric to PSI

(1 KPa = .145 ps)

Kilo Pascals (kPa)	Mega Pascals (MPa)	Bar (Bar)	Pounds per Square Inch (psi)	Pounds per Square Inch (psi)	Kilo Pascals (kPa)	Mega Pascals (MPa)	Bar (Bar)
100	0.1	1	14.5	10	68.9	0.07	0.7
200	0.2	2	29.0	20	137.9	0.14	1.4
300	0.3	3	43.5	30	206.8	0.21	2.1
400	0.4	4	58.0	40	275.8	0.28	2.8
500	0.5	5	72.5	50	344.7	0.34	3.4
600	0.6	6	87.0	60	413.7	0.41	4.1
700	0.7	7	101.5	70	482.6	0.48	4.8
800	0.8	8	116.0	80	551.6	0.55	5.5
900	0.9	9	130.5	90	620.5	0.62	6.2
1,000	1.0	10	145.0	100	689	0.7	6.9
2,000	2.0	20	290.1	200	1,379	1.4	13.8
3,000	3.0	30	435.1	300	2,068	2.1	20.7
4,000	4.0	40	580.2	400	2,758	2.8	27.6
5,000	5.0	50	725.2	500	3,447	3.4	34.5
6,000	6.0	60	870.2	600	4,137	4.1	41.4
7,000	7.0	70	1,015.3	700	4,826	4.8	48.3
8,000	8.0	80	1,160.3	800	5,516	5.5	55.2
9,000	9.0	90	1,305.3	900	6,205	6.2	62.1
10,000	10	100	1,450	1,000	6,895	6.9	68.9
20,000	20	200	2,901	2,000	13,790	13.8	137.9
30,000	30	300	4,351	3,000	20,684	20.7	206.8
40,000	40	400	5,802	4,000	27,579	27.6	275.8
50,000	50	500	7,252	5,000	34,474	34.5	344.7
60,000	60	600	8,702	6,000	41,369	41.4	413.7
70,000	70	700	10,153	7,000	48,263	48.3	482.6
80,000	80	800	11,603	8,000	55,158	55.2	551.6
90,000	90	900	13,053	9,000	62,053	62.1	620.5
100,000	100	1000	14,504	10,000	68,948	68.9	689
200,000	200	2000	29,008	20,000	137,895	137.9	1,379
300,000	300	3000	43,511	30,000	206,843	206.8	2,068
				40.000	275 790	275.8	2 758

Examples

(A)	Conve	ert 3,429 psi	to the	e equivale	ent pressure in Bar.
		3,000 psi	=	206.8	Bar
	+	400 psi	=	27.6	Bar
	+	20 psi	=	1.4	Bar
	+	9 psi	=	.62	Bar
		3429 psi	=	236.42	Bar

(B) Convert 3,429 psi to the equivalent pressure in MPa.									
	3,000 psi	=	20.680	MPa					
+	400 psi	=	2.760	MPa					
+	20 psi	=	.140	MPa					
+	9 psi	=	.062	MPa					
	3,429 psi	=	23.642	MPa					

PCM/PCS Ferrules
MEGACRIMP Couplings
Power Crimp Couplings
LOW PRESSURE COUPLINGS
POLARSEAL Couplings
C14 Couplings
PCTS THERMO- PLASTIC COUPLINGS
FIELD ATTACHABLE G1 & G2 Couplings
FIELD ATTACHABLE C5 COUPLINGS
SURELOK AIR Brake Couplings
QUICK DISCONNECT COUPLERS
NEW BALL VALVES
ACCESSORIES
EQUIPMENT

AND PARTS



EQUIPMENT

HOSE/CPLG. SELECTION

Steam Conditions

The chart below shows steam conditions. The heavy black line is the boiling point of water at various gauge pressures. Any point on the line represents saturated steam. Any point below the line represents Hot Water and any point above the line represents Superheated Steam.

Caution: 198°C (388°F) at 200 psi is the maximum recommended steam condition for Gates C14 hose.

Caution: Considering the potential for electrostatic discharge, Gates C14CT "conductive" hose is recommended.

196 (388)177 (350)Superheated Steam femperature, °C (°F) 149 (300)Hot Water 121 (250)98 (200) 0 50 100 150 200 Gauge Pressure, psi

Fahrenheit-Celsius Conversion





PCM/PCS FERRULES

COUPLINGS

MEGACRIMP COUPLINGS

POWER CRIMP COUPLINGS

LOW PRESSURE COUPLINGS

POLARSEAL COUPLINGS

C14 COUPLINGS

PCTS THERMO-PLASTIC COUPLINGS

FIELD ATTACHABLE G1 & G2 COUPLINGS

FIELD ATTACHABLE C5 COUPLINGS

SURELOK AIR BRAKE COUPLINGS

QUICK DISCONNECT COUPLERS

NEW BALL VALVES

ACCESSORIES

EQUIPMENT AND PARTS

www.gates.com/hydraulics





Fahrenheit-Celsius Conversion

Look up a temperature reading in the middle column (shaded). If it's in degrees Centigrade, read the Fahrenheit equivalent in the right-hand column. If it's in degrees Fahrenheit, read the Centigrade equivalent In the left-hand column.

C	F\C	F
-68	-90	-130
-62	-80	-112
-57	-70	-94
-51	-60	-76
-46	-50	-58
-40	-40	-40
-34	-30	-22
-29	-20	-4
-23	-10	14
-17.8	0	32
-17.2	1	33.8
-16.7	2	35.6
-16.1	3	37.4
-15.6	4	39.2
-15.0	5	41.0
-14.4	6	42.8
-13.9	7	44.6
-13.3	8	46.4
-12.8	9	48.2
-12.2	10	50.0
-11 7	11	51.8
-11.1	12	53.6
-10.6	13	55.4
-10.0	14	57.2
-9.4	15	59.0
-8.9	16	60.8
-8.3	17	62.6
-7.8	18	64.4
-7.2	19	66.2
-6.7	20	68.0
-6.1	21	69.8
-5.6	22	71.6
-5.0	23	73.4
-4.4	24	75.2
-3.9	25	77.0
-3.3	26	78.8
-2.8	27	80.6
-2.2	28	82.4
-1.7	29	84.2
-1.1	30	86.0
6	31	87.8
0	32	89.6
.6	33	91.4
1.1	34	93.2
1.7	35	95.0
2.2	36	96.8
2.8	37	98.6
3.3	38	100.4
3.9	39	102.2
4.4	40	104.0

C	E/C	E
5.0	/1	105.8
5.6	41	107.6
6.1	42	107.0
0.1	43	109.4
0./	44	112.0
7.2	45	113.0
7.8	40	114.8
8.3	47	116.6
8.9	48	118.4
9.4	49	120.2
10.0	50	122.0
10.6	51	123.8
11.1	52	125.6
11.7	53	127.4
12.2	54	129.2
12.8	55	131.0
13.3	56	132.8
13.9	57	134.6
14.4	58	136.4
15.0	59	138.2
15.6	60	140.0
16.1	61	141.8
16.7	62	143.6
17.2	63	145.4
17.8	64	147.2
18.3	65	149.0
18.9	66	150.8
19.4	67	152.6
20.0	68	154.4
20.6	69	156.2
21.1	70	158.0
21.7	71	159.8
22.2	72	161.6
22.8	73	163.4
23.3	74	165.2
23.9	75	167.0
24.4	76	168.8
25.0	77	170.6
25.6	78	172.4
26.1	79	174.2
26.7	80	176.0
27.2	81	177.8
27.8	82	179.6
28.3	83	181.6
28.9	84	183.2
29.4	85	185.0
30.0	86	186.8
30.6	87	188.6
31.1	88	190.0
31.7	80	102.4
31.1	09	10/ 0
32.2	01	105.0
JZ.0	31	190.0

C	F\C	F
33.3	92	197.6
33.0	93	107.0
34.4	94	201.2
25.0	05	201.2
25.6	95	203.0
26.1	90	204.0
26.7	97	200.0
30.7	98	206.4
37.2	99	210.2
37.8	100	212.0
43	110	230
49	120	248
54	130	266
60	140	284
66	150	302
71	160	320
77	170	338
82	180	356
88	190	374
93	200	392
99	210	410
100	212	413.6
104	220	428
110	230	446
116	240	464
121	250	482
127	260	500
132	270	518
138	280	536
143	290	554
149	300	572
154	310	590
160	320	608
166	330	626
170	338	640
171	340	644
177	350	662
182	360	680
186	366	691
188	370	698
193	380	716
198	388	730
199	390	734
204	400	752
208	406	763
210	410	770
216	420	788
210	420	808
221	430	824
221	440	024
232	400	042

SEL	ECTION		
GLO COU	Balspiral Iplings	-	
PCN FER	M/PCS RULES		
ME COL	gacrimp Jplings		
POV CRI COL	ver Mp Jplings		
LOV PRE COL	V Essure Jplings		
POL COL	.arseal Jplings		
C14 COL	i Jplings		
PCT The Pla Col	TS ERMO- Astic Jplings		
FIEI Att G1 COL	ld Tachable & G2 Jplings	Ē	
FIEI ATT C5 C0L	ld 'Achable Jplings	1	
SUF BR/ COL	RELOK AIF Ake Jplings	1	
QUI DIS COL	ck Connect Jplers	ſ	
NEV VAL	N BALL .Ves		
٨٢٢	ressorie	ic.	



C70

EQUIPMENT AND PARTS

EQUIPMENT

HOSE/CPLG. Selection

GLOBALSPIRAL Couplings

PCM/PCS Ferrules

MEGACRIMP COUPLINGS

> Power Crimp Couplings

LOW PRESSURE COUPLINGS

POLARSEAL

COUPLINGS

C14 COUPLINGS

PCTS THERMO-PLASTIC COUPLINGS

FIELD Attachable G1 & G2 Couplings

FIELD ATTACHABLE C5

COUPLINGS SURELOK AIR

Brake Couplings

QUICK Disconnect

COUPLERS

NEW BALL VALVES

ACCESSORIES

EQUIPMENT AND PARTS



Inches			Inches			Inches		
Fractions	Decimals	Millimeters	Fractions	Decimals	Millimeters	Fractions	Decimals	Millimeters
1/64	.015625	.397	23/64	.359375	9.128	11/16	.6875	17.463
1/32	.03125	.794	3/8	.375	9.525	45/64	.703125	17.859
3/64	.046875	1.191	25/64	.390625	9.922	23/32	.71875	18.256
1/16	.0625	1.588	13/32	.40625	10.319	47/64	.734375	18.653
5/64	.078125	1.984	27/64	.421875	10.716	3/4	.750	19.050
3/32	.09375	2.381	7/16	.4375	11.113	49/64	.765625	19.447
7/64	.109375	2.778	29/64	.453125	11.509	25/32	.78125	19.844
1/8	.125	3.175	15/32	.46875	11.906	51/64	.796875	20.241
9/64	.140625	3.572	31/64	.484375	12.303	13/16	.8125	20.638
5/32	.15625	3.969	1/2	.500	12.700	53/64	.828125	21.034
11/64	.171875	4.366	33/64	.515625	13.097	27/32	.84375	21.431
3/16	.1875	4.763	17/32	.53125	13.494	55/64	.859375	21.828
13/64	.203125	5.159	35/64	.546875	13.891	7/8	.875	22.225
7/32	.21875	5.556	9/16	.5625	14.288	57/64	.890625	22.622
15/64	.234375	5.953	37/64	.578125	14.684	29/32	.90625	23.019
1/4	.250	6.350	19/32	.59375	15.081	59/64	.921875	23.416
17/64	.265625	6.747	39/64	.609375	15.478	15/16	.9375	23.813
9/32	.28125	7.144	5/8	.625	15.875	61/64	.953125	24.209
19/64	.296875	7.541	41/64	.640625	16.272	31/32	.96875	24.606
5/16	.3125	7.938	21/32	.65625	16.669	63/64	.984375	25.003
L		1				' 1	1.000	25.400

Metric (SI) – U.S. Units for Fluid Power Use

(The following conversions are based on information taken from ASTM, American Society for Testing and Materials, Handbook E380-72.)

Quantity	Customary U.S. Unit	SI Unit	Conversion from U.S. to SI Units	Conversion from SI to U.S. Units
Area	Square Inch (in ²)	Square Metre (m ²)	(in²) x (6.4516 x 10 -4) = (m²)	(m²) x 1550.003 = (in²)
Force	Pound (lb,)	Newton (N)	(lbf) x 4.4482 = (N)	(N) x (2.2481 x10 ⁻¹) = (lb,)
Frequency	Cycles/Second (cps)	Hertz (H ₂)	$1 (cps) = 1(H_z)$	1(Hz) = 1(cps)
Length	Inch (in)	Metre (m)	(in) x (2.540 x 10 ⁻²) = (m)	(m) x 39.370 = (in)
Mass	Pound (lb,,)	Kilogram (kg)	(lbm) x .4536 = (kg)	$(kg) \times 2.2046 = (lb_m)$
Power	Electric Horsepower (HP)	Watt (W)	(HP) x (7.460 x 10 ²) = (W)	(W) x (1.3405 x 10 ⁻³) = (HP)
	Pounds/Sq In (psi)	Newtons/Sq Metre (N/m²)	(psi) x (6.8948 x 10³) = (N/m²)	(N/m²) x (1.4504 x 10 ⁻⁴) = (psi)
Pressure	(psi) (psi) (Bar)	Mega Pascal (MPa) Bar (Bar) (N/m²)	(Non-Preferred Conversions) (psi)/145 = MPa psi/14.5 = Bar (Bar) x 100,000 = (N/m²)	(MPa) x 145 = (psi) (Bar) x (1.4504 x 10') = (psi) (N/m²) x (1.00 x 10°) = (Bar)
Temperature	Degrees Fahrenheit (°F)	Degrees Celsius (°C)	(°Celsius) = 0.556(°F-32)	(1.8°C) + 32 = °F
Torque	Pound-Inch (lb _r -in)	Newton-Metres (N-m)	(lb,-in) x (1.1298 x 10 ⁻¹) = (N-m)	(N-m) x 8.8507 = (lb _t -in)
	US Gallon (Gal)	Cubic Metre (m³)	(Gal) x (3.7854 x 10 ^{.3}) = (m ³)	(m³) x (2.6417 x 10²) = (Gal)
Volume		Litre (I)	(Non-Preferred Conversions) (Gal) x 3.7854 = (I)	(l) x (2.6417 x 10 ⁻¹) = (Gal)
Work	Foot-Pound (ft-lb,)	Joule (J)	(ft-lb _i) x 1.3558 = (J)	$(J) \times (7.3756 \times 10^{-1}) = (ft-lb_{,})$


Hose & Coupling Section



Tightening and Torque Recommendations for Hydraulic Couplings

The art of making a leak-proof connection with hydraulic couplings is to tighten the couplings properly at the time of installation. An over-tightened coupling may be just as apt to leak as an under-tightened coupling. This is because over-tightening a coupling may result in overstressing and/or cracking.

The torque values in the following tables give the minimum and maximum torque recommendations. The minimum value will create a leak-proof seal under most conditions. Applying torque values greater than the maximum recommendation will distort and/or crack the fitting. Values listed in SAE J514 are for qualification testing only and should not be used as the basis for setting up torque values for a production environment. These need to be established based on the coupling manufacturer's recommendations.

When tightening couplings, make sure that the hose does not twist on the adapter. Twisting will shorten hose life and scar the sealing surfaces of swivel type couplings (JIC, 45°, etc.), which can create leaks. For straight couplings, use a torque wrench on the hex swivel nut and a standard box wrench on the stem hex. Bent tube couplings can be restrained by holding onto the ferrule. When a crowsfoot wrench is used with a torque wrench, adjustments to the torque readings must be made otherwise over-tightening will occur. The distance E, as shown below, from the center of the drive socket to the center of the crowsfoot must be added to the torque value reading.

The following equation can be used to make these adjustments:



Actual Torque = $(\underline{E+L}) \times (\text{Torque Wrench Reading})$, where L

- L is in inches
- E is in inches
- Torque is in Ib.-in., Ib.-ft, or Newton-Meters

An example of using this equation is shown below:

Torque wrench reading = 45 lb.-ft. E = 1.5 inches L = 12 inches

Actual Torque = $(1.5+12) \times (45) = 50.6$ lb.-ft 12

This example shows that the actual torque is approximately 10 percent higher than the reading indicates. All torque recommendations are based on dry threads. If oil or thread sealant is used, the maximum recommended torque values could be decreased by as much as 25 percent.

We do recommend lubricating all O-rings prior to insertion into flange head and ORS grooves. This will minimize the possibility of nicking the O-ring when it is installed. The torque values obtained from tightening pipe threads can vary considerably, depending on the conditions of the threads. Adequate sealing can occur at values much lower than the maximum values listed in the chart. However, the minimum torque values must be used to obtain adequate sealing.

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