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climate control
electromechanical
filtration
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hydraulics
pneumatics
process control
sealing & shielding





CAT 4900
Parflex Ultra High Pressure Thermoplastic Hose, Fittings and Accessories





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2

Hose & Fittings Part Numbers

Hose Part Number Build



2440N-16V30

2**4**40

2440

2440

1. Reinforcement I

- 0 = No spiralizing
- 1 = Two open spiralized layers
- 2 = Two closed spiralized lavers
- 3 = Two closed spiralized layers two open spiralized layers
- 4 = Four closed spiralized layers
- 5 = Four closed spiralized layers (increased pressure)
- 6 = Six closed spiralized layers
- 7 = Six closed spiralized layers (increased pressure)
- 8 = Eight closed spiralized layers
- 9 = Eight closed spiralized lavers (increased pressure)

2. Reinforcement II (If Reinforcement I ≠ 0)

- 1 = Synthetic fiber (not aramid)
- 2 = Aramid fiber
- 3 = Stainless steel wire
- 4 = Steel wire
- 5 = Iron wire
- 6 = Cord strand
- 7 = Steel wire and open spiralized synthetic yarn
- 8 = Steel wire and open spiralized cord strand
- 9 = Other construction

2. Reinforcement II (If Reinforcement I = 0)

- 0 = No braiding
- 1 = One braid of non-aramid fiber
- 2 = One braid of aramid fiber
- 3 = One braid of stainless steel
- 4 = One braid of steel wire
- 5 = One braid of iron wire
- 6 = one braidi of iron wire, zincplated

3. Reinforcement III

- 0 = No braiding
- 1 = One braid of non-aramid fiber
- 2 = One braid of aramid fiber
- 3 = One braid of stainless steel wire
- 4 = One braid of steel wire
- 5 = One braid of iron wire
- 6 = One braid of iron wire, zincplated
- 7 = (open)
- 8 = Different pressure reinforcement

N-16

V30

V30

4. Core Material

- D = POM (Delrin)
- E = Ethylene tetrafluoroethylene (ETFE) Ethylene chlorotrifluoroethylene (ECTFE)
- F = Fluorinated ethylene propylene (FEP)
- H = Thermoplastic Elastomer-Ether-Ester -Hvtrel®
- M = Mixture/co-extruded
- N = Polyamide (Nylon)
- P = Polyethylene (PE)
- S = Special material
- T = Polytetrafluoroethylene (PTFE)
- U = Thermoplastic polyurethanes (TPU)
- V = Polyvinylidene Fluoride (PVDF)

5. Hose Size (I.D.)

- 02 = 1/8" (3.2mm)
- 025 = 5/32" (4.0mm)
- 03 = 3/16" (4.8mm)
- 04 = 1/4" (6.4mm)
- 05 = 5/16" (7.9mm)
- 06 = 3/8" (6.4mm)
- 08 = 1/2" (12.7mm)
- 12 = 3/4" (19.0mm)
- 16 = 1" (25.4mm)
- 20 = 1-1/4" (31.8mm)
- 24 = 1-1/2" (38.1mm) 32 = 2" (50.8mm)
- 48 = 3" (76.0mm)

6. Cover Material

- 0 = Polyurethane (PUR)
- 1 = Polyurethane (PUR) seawater-resistant
- 3 = Polyamide (PA) Nylon (6, 11,
- or 12)
- 4 = Polyethylene (PE)
- 8 = Extra thick

7. Cover Color

- 0 = Black
- 1 = Black (methanol-washed
- hose types)
- 2 = Blue
- 3 = Green4 = Red
- 5 = Orange
- 6 = Yellow
- 7 = Grav 8 = Gold

Registered trademark of DuPont™



For detailed ordering information, please consult price list or contact Parflex Division

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Fitting Part Number Build



6Y4LX-9-3C

1. Design Type

- 1 = German-designed end fitting
- 6 = US-designed end fitting
- 2 = Reusable style end fittings

2. Connection Type

- 01 = NPT Male
- 02 = NPT Female
- 06 = JIC 37° Flare Female
- 5Y = Medium Pressure Swivel Female
- Y2 = Medium Pressure Male
- 6Y = High Pressure Swivel Female
- Y4 = High Pressure Male
- RX = Reusable
- AY = Type "M" Swivel Female
- YA = Type "M" Swivel Male
- MB = STECKO
- C3 / C9 = METRIC Swivel Female

- D9 = BSP Rigid Male
- G2 = BSP Swivel 90° Elbow Female
- 92 / BC = BSP Swivel Female
- 07 = NPS Swivel Female
- EZ = Waterblast Nozzle Female
- ZE = Waterblast Nozzle Male
- HY = Waterblast Nozzle Female
- YH = Waterblast Nozzle Male
- 3Z = Waterblast Nozzle Male
- HE = 2" Hammer Union, Cone w/ Wing Nut Male
- HN = 2" Hammer Union, Cone Threaded End w/
- Seal-Female
- TU = Tube Stub Fitting

3. Hose Series Designation

- 2X = 2840D, 2740D and 2640D Series Hoses
- 3X = 2022N Series Hoses
- 5X = All 2640 Series Hoses
- 8X = All 2244 and 2380 Series Hoses
- 9X = All 2300 Series Hoses
- AX = 2240D-025V34, 2245D-03V32 and 2243D-03V70
- BL = 2580N Series Hoses
- BS = 2388N Series Hoses
- CR = 57CR Series Hoses
- E2 = 2390N Series Hoses
- E3 = 2390N Series Hoses
- EX = 2020N Series Hoses
- HP = HP/HP8 Series Hoses
- HX = All 2740 Series Hoses
- KY = 2380N Series Hoses
- LX = All 2440 Series Hoses
- NX = 2240D-04 and 2300 Series Hoses
- PL = 2240D Series Hoses
- RX = 2020N-02V30 (Reusable Fittings)
- TX = 2240D and 2248D Series Hoses
- UX = 2448M Series Hoses
- WX = All 2840 Series Hoses

4. Connection Size

- JIC / Type M
- 2 = 5/16" 24 UNF
- 3 = 3/8" 24 UNF
- 4 = 7/16" 20 UNF
- 5 = 1/2" 20 UNF
- = 9/16" 18 UNF
- 7 = 5/8" 18 UNF
- 8 = 3/4" 16 UNF
- 10 = 7/8" 14 UNF
- 11 = 1" 12 UNF
- 12 = 1-1/16" 12 UNF
- 13 = 1-1/8" 12 UNF
- 15 = 1-1/4" 12 UNF
- 16 = 1-5/16" 12 UNF
- 17 = 1-3/8" 12 UNF
- 19 = 1-1/2" 12 UNF
- 20 = 1-5/8" 12 UNF

BSP

- 2 = G 1/8"
- 4 = G 1/4" 6 = G 3/8"
- 8 = G 1/2"

NPT

- 1 = 1/4" 28 UNF 1 = 1/16 - 27
 - 2 = 1/8 27
 - 4 = 1/4 18
 - 6 = 3/8 18
 - 8 = 1/2 14
 - 12 = 3/4 14
 - $16 = 1 11 \frac{1}{2}$
 - $20 = 1 \frac{1}{4} 11 \frac{1}{2}$
 - 24 = 1 1/-11 1/2
 - $32 = 2-11 \frac{1}{2}$
 - MP & HP Tube

Sized by nominal tube

- O.D.
- 4 = 1/4" 28 LH 6 = 3/8" - 24 LH
- 9 = 9/16" 18 LH
- 12 = 3/4" 16 LH
- 16 = 1" 14 LH

5. Hose Size

- 2 = 1/8" hose
- 2A = 5/32" hose
- = 3/16" hose
- 4 = 1/4" hose
- 5 = 5/16" hose
- 6 = 3/8" hose
- 8 = 1/2" hose
- 10 = 5/8" hose
- 12 = 3/4" hose
- 16 = 1" hose
- 24 = 1-1/2" hose
- 32 = 2" hose



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6. Fitting Material

C = Stainless steel

Blank = Carbon steel

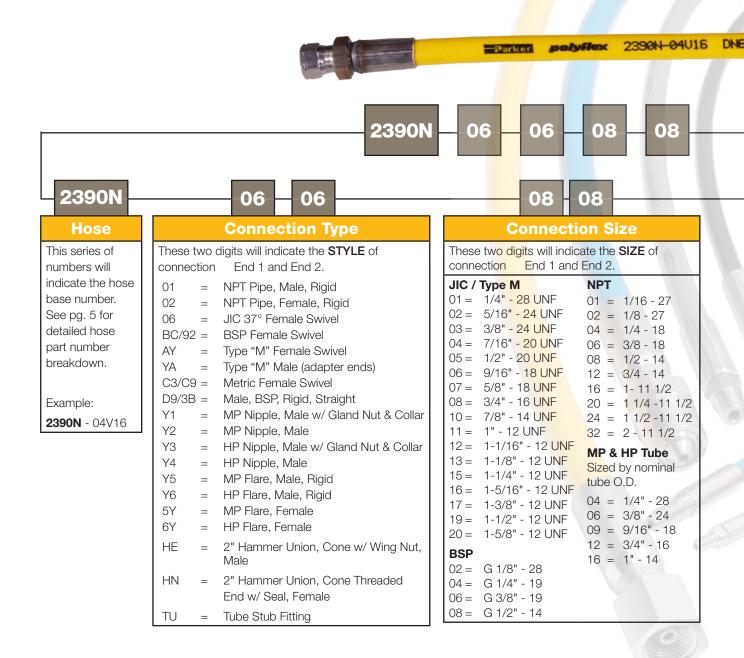
Any other materials will

be noted in the Fitting

section

Hose Assembly Part Numbers

polyflex Hose Assembly Nomenclature





(1/4") PN 49,0 MPa (7105 PSI) 4010 16 600 04 600 16 04 **Hose Size Fitting Material Hose Variation** Length Number This letter indicates the When specifying hose Indicate the This series of numbers size, indicate the twomaterial of the fittings used. assembly length will indicate the hose digit code. in imperial units. Carbon Steel variation number. This example is С Stainless Steel Hose Hose See pg. 5 for detailed 600 inches. Dash Code I.D. hose part number Size breakdown. 2/25" 012 1A 1/8" 02 02 Example: 5/32" 025 2B 2390N-04 V**16** 3/16" 03 03 1/4" 04 04 05 5/16" 05 3/8" 06 06 1/2" 08 08

3/4"

1"

1-1/4"

1-1/2"

2"

3"

12

16

20

24

32

48

12

16

20

24

32

48

Waterblast / Water Jetting



Visual Index of Watberblast / Water Jetting Hoses

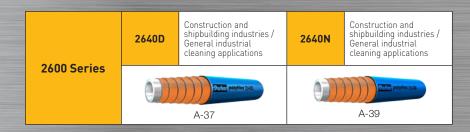


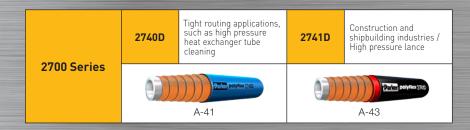


	2440D	High pressure heat exchanger tube cleaning	2440N	Construction and shipbuilding industries / General industrial cleaning applications	2448D High pressure heat exchanger tube cleaning		
2400 Series		A-31	9))	A-33		A-31	









	2840D	Water jet cutting equipment with water only or with abrasive additives / Hydroforming	2841D	Very high pressure lances up to 40,610 psi	2849D	Water jet cutting equipment with water only or with abrasive additives / Hydroforming
2800 Series		A-45		A-47		A-49

Oil & Gas 🤼

Visual Index of Oil & Gas Hoses





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A-63

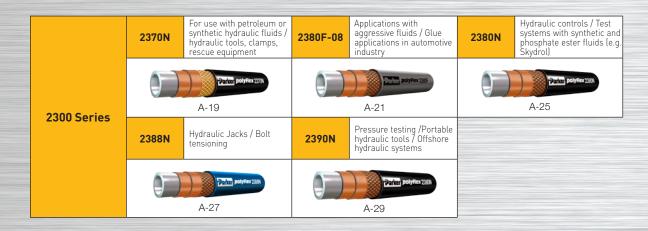
A-63

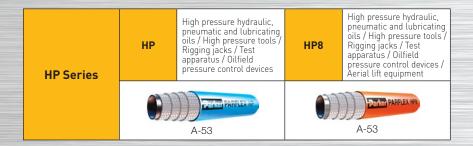
Hydraulic 🚫

Visual Index of Hydraulic Hoses









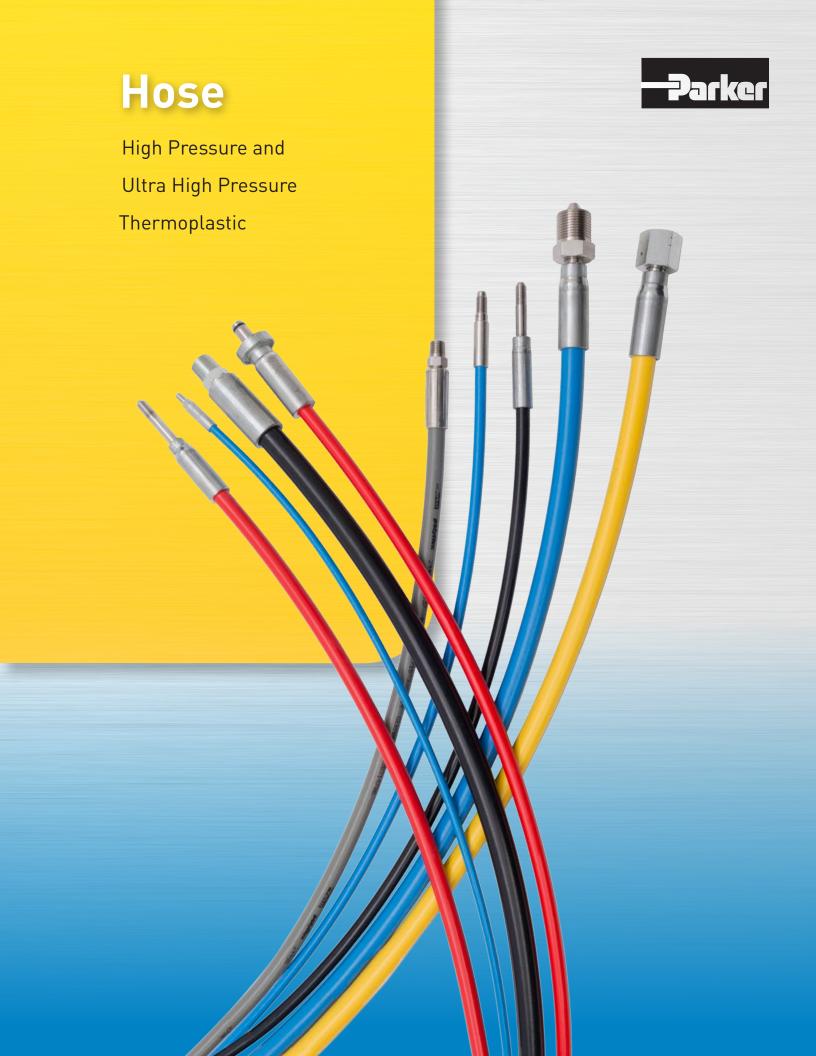


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2020N	
2022N	
2200 Series	
2240D/2248D	
2244N	
2300 Series	
2370N	
2380NW	
2380N	
2388N	
2390N	
2400 Series	
2440D/2448D	
2440D/2446D 2440N - Waterblast Hose	
2440N/2448N	
2500 Series	
2580N	
2600 Series	
2640D	
2640N	
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2740D	
2741D	
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2840D	
2841D	
2849D	
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Black Eagle	A-57
1-1/2" Black Eagle	
2" Black Eagle	
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ChemJec	
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polyflex Hose Safety

For Your Safety

The hose assemblies listed in this catalog are all special constructions with the hose having up to eight spiral layers of steel wire. Due to this construction, pressures are achieved which far exceed international standards. These hose types are manufactured and tested according to the **polyflex** standards which have proved to be effective over many years.

polyflex hose assemblies are used at considerable working pressures. The critical area of a hose assembly is the connection between flexible hose and rigid fitting (crimping area). Only the use of original **polyflex** components (hose, fittings and tooling) and full compliance with the **polyflex** assembly instructions can guarantee safety and conformity with standards. It is essential that training be given to customers in the hose assembly process in order to make high quality **polyflex** maximum pressure hose assemblies.

For the production and testing of the hose assemblies relevant to the applications, the guidelines and technical regulations, as well as, the protection and hazard prevention rulings must be adhered to.

You, as the manufacturer of **polyflex** hose assemblies, are obliged to mark these hose assemblies according to the regulations and to verify their safety by a final pressure test.

Non-compliance with these rules can lead to the premature failure of the hose assembly and the loss of warranty.



- Treat high pressure hose with extreme caution. **polyflex** hoses are ultra high pressure hoses, not garden hoses, and should be treated like high pressure vessels.
- Always inspect for frayed, damaged or worn spots before using.
- Check the end connections for wear, rust, cracks or other deterioration which could produce a dangerous projectile.
- Know the working pressures and burst pressures of all hoses before using them.
- Always use clean, filtered medium to prolong hose life.
- Always clean, drain and coil hoses after use.
- Use only hoses assembled by an authorized Parker distributor.



- Never fix a hose at the sleeves.
- Never use a hose with cuts or wire showing through the outer cover.
- Never use a hose with bubbles, listers or kinks.
- Don't exceed the bend radius and pressure rating for each hose.
- Don't run over the or crush the hose with vehicles.
- Hoses with corroded or leaking end connections should be avoided.
- Avoid using dirty medium or medium with sulfur compound in it.
- Dont bend the hose over scaffolding or pull heavy equipment with the hose.
- Don't let hose support its own weight off towers or buildings.
- Never use hose without hose arrestors (containment grips).
- Don't expect water jetting or hydraulic hose to last forever.
- Don't change or repair a hose without instructions from the manufacturer.
- Never disconnect a hose under pressure.



How to Read the Hose Section

1	2		3		4	Ę	5		6	7		8
Part Number	Jacket Color	_	ninal D.		Maximum 0.D.		Maximum Working Pressure		Minimum Bend Radius		ght	Fitting Series
#		()	(\bigcirc	(7	9	lbs lbs		
		inch	mm	inch	mm	psi	MPa	inch	mm	lbs/ft	kg/m	
2440N-16V37	Gray	1	25.0	1.47	37.4	8,160	56.2	11.8	300	1.34	2.00	LX

NOTE: The imperial measurements are in black. The metric equivalents appear in blue.

1 Part Number

Hose Series Part Number - gives the construction and core tube matierial of the hose

2 Jacket Color

Color of the hose jacket

3 Inside Diameter

Distance between inner walls of the core tube.

4 Outside Diameter

Nominal diameter of the hose

5 Working Pressure

Working pressure rating must meet or exceed the maximum operating pressure of the system including pressure spikes.

Working pressure listed is dependent on application. Water blast applications will typically have a 2.5:1 design factor. Hydraulic and Oil & Gas applications will typically have a 4:1 design factor. Contact Parflex division for detailed hose performance criteria.

6 Minimum Bend Radius

Minimum radius that the hose can be bent. Exceeding the bend radius can cause kinking, inner tube washout, or excessive stress on reinforcement resulting in shortened service life.

7 Weight

Provided in lbs/ft and kg/m

8 Approved Fitting

Approved fitting series for selected hose. Technical information for fittings is provided in Section B.



Hose Selection Chart

						Working	Pressure p	si [MPa]			
Nomin	al Size			2020N	2240D	2248D	2244N	2380NW	2388NW	2440D	
DN	size	inch	mm					23	23		
2	-012	2/25	2.0	11,020 (76.0)							
3	-02	1/8	3.2		15,950 (110.0)					30,000 (207.0)	
4	-025	5/32	4.0		17,400 (120.0)	21,750 (150.0)				31,900 (220.0)	
5	-03	3/16	4.8		14,500 (100.0)	20,300 (140.0)				26,100 (180.0)	
6	-04	1/4	6.4		15,950 (110.0)			15,950 (110.0)	18,560 (128.0)	23,780 (164.0)	
8	-05	5/16	7.9		13,050 (90.0)			14,500 (100.0)		21,750 (150.0)	
10	-06	3/8	9.5								
12	-08	1/2	12.7				31,900 (220.0)	12,760 (88.0)	15,950 (110.0)		
20	-12	3/4	19.0								
25	-16	1	25.4								
					•	•				•	
Fitting	Series			EX	PL AX NX	ТХ	LX	KY LX	KY BS	LX	
Page #				A-11	A-15	A-15	A-17	A-23	A-27	A-31	



В

Working Pressure - Waterblast Applications

	Working Pressure psi [MPa]											
2448D	7440N	2580N	2640D	2640N	2740D	2741D	2840D	2841D	2849D			
43,645 (301.0)			40,600 (280.0)		43,500 (300.0)							
			36,230 (250.0)		40,600 (280.0)		58,000 (400.0)					
					36,230 (250.0)	36,230 (250.0)	43,500 (300.0)	43,500 (300.0)	55,000 (380.0)			
		23,200 (160.0)										
	20,300 (140.0)	20,300 (140.0)		26,100 (180.0)			36,250 (250.0)					
	14,500 (100.0)	17,400 (120.0)		20,300 (140.0)								
	13,050 (90.0)											
LX	LX	BL	2X	5X	2X HX	2X	2X WX	2X	2X			
A-31	A-33	A-37	A-39	A-41	A-43	A-45	A-47	A-49	A-51			

Hose Selection Chart

		DN	2	3	4	5	6	8	
	Dimensions →	size	-012	-02	-025	-03	-04	-05	
	Hose Type	inch	2/25	1/8	5/32	3/16	1/4	5/16	
	<u> </u>	mm	2	3.2	4	4.8	6.4	7.9	
	2020N		6,890 (47.5)	5,800 (40.0)					
	2022N5	к					5,000 (34.5)		
	2022N10K						10,000 (69.0)		
IPa]	2244N				10,875 (75.0)				
Working Pressure psi [MPa]	2370N								
ressur	2380F								
rking P	2380N						10,150 (70.0)		
Mo	2388N						11,600 (80.0)		
	2390N						7,107 (49.0)		
	2580NMS	НА						10,150 (70.0)	
	HP/HP8					10,000 (69.0)	10,000 (69.0)		



Working Pressure - Hydraulic Applications

10	12	20	25	32		
-06	-08	-12	-16	-20	Fittings	Page
3/8	1/2	3/4	1	1 1/4	Fittings	raye
9.5	12.7	19	25.4	31.8		
					EX / RX	A-11
5,000 (34.5)	5,000 (34.5)				55	A-13
10,000 (69.0)	10,000 (69.0)				8X / 3X / LX	A-13
					8X	A-17
	5,075 (35.0)	4,350 (30.0)	3,985 (27.5)		9X / NX	A-19
	4,712 (32.5)				NX	A-21
	7,975 (55.0)		5,510 (38.0)	3,985 (27.5)	8X / NX	A-25
					8X	A-27
	6,017 (41.5)	5,075 (35.0)	4,060 (28.0)		8X / 9X / E2 / E3	A-29
						A-37
8,000 (55.2)					НР	A-55
(55.2)						A 00

Hose Selection Chart

	·	DN	6	8	10	12	20
	Dimensions ->	size	-04	-05	-06	-08	-12
	Hose Type	inch	1/4	5/16	3/8	1/2	3/4
	<u> </u>	mm	6.4	7.9	9.5	12.7	19
	Umbilical and Ju			einforced			
	2022N5K		5,000 (34.5)		5,000 (34.5)	5,000 (34.5)	
	2022N10I	K	10,000 (69.0)		10,000 (69.0)	10,000 (69.0)	
	57CR					5,000 (34.5)	
	Umbilical and Ju	mper l	loses - Wire Reir	nforced			
	2244N					7,975 (55.0)	
	2380N		10,150 (70.0)			7,975 (55.0)	
	2390N		7,107 (49.0)		6,450 (44.5)	6,017 (41.5)	5,075 (35.0)
	2440N		12,500 (87.5)		12,688 (87.5)	11,745 (81.0)	10,000 (69.0)
	2440N10I	K					
	2448N		15,000 (103.5)			12,688 (87.5)	
	2640N						12,500 (87.5)
5	Umbilical and Ju	mper l	loses - ChemJec				
מסו עוווא ו רכסתו כי אסו דווו מז	2440M		12,500 (87.5)	10,000 (69.0)	10,000 (69.0)	10,000 (69.0)	
)	2448M		15,000 (103.5)	15,000 (103.5)	15,000 (103.5)		
	2640M					15,000 (103.5)	
	BOP and Hotline	Hoses					
	2380N						
	2390N		7,107 (49.0)			6,017 (41.5)	5,075 (35.0)
	57CR					5,000 (34.5)	
	Large Bore for W	ell Ser	vicing (Black Ea	gle and Golden E	agle)		
	2240N						
	2248N						
	2440N						
	2448N						
	2580N						
	2640N						
	2640N15I	K					
	2648N						
	2448M						
	2580M						
	2640M						



Working Pressure - Oil & Gas Applications

25	32	40	50	78		
-16	-20	-24	-32	-48	Eittings	Page
1	1 1/4	1 1/2	2	3	Fittings	Page
25.4	31.8	38.1	50.8	76		
Y					T	
					55	A-13
					8X/3X/LX	A-13
5,000 (34.5)					CR	A-53
•					•	
					LX	A-17
5,510 (38.0)	3,985 (27.5)				8X	A-25
4,060 (28.0)					8X/9X/LX/SS	A-29
8,120 (56.0)					5X/LS/LX	A-35
10,000 (69.0)					LX	A-35
					8X/LX	A-35
					5X	A-41
					8X/LX	A-67
					UX/LX	A-67
					5X	A-67
5,510 (38.0)					8X/LX/NX	A-25
4,060 (28.0)					8X/9X/E2/E3	A-29
5,000 (34.5)					CR	A-53
			3,000 (20.7)	5,000 (34.5)	TX/S6	A-61/A-63
			5,000 (34.5)		S6	A-63
				10,000 (69.0)	LX	A-61
			5,000 (34.5)		5X	A-59
			10,000 (69.0)		5X	A-59
		10,000 (69.0)		15,000 (103.5)	5X	A-57/A-61
		15,000 (103.5)			5X	A-57
			15,000 (103.5)		СХ	A-59
			5,000 (34.5)		5X	A-65
			10,000 (69.0)		5X	A-65
		10,000 (69.0)			5X	A-65

2020N - High Pressure Hose



Features & Applications

- Very small hose I.D.
- Very flexible hose
- High pressure services where very small hose O.D. is required
- Versatile usage in mini-hydraulic and gas applications
- Measuring and diagnostic systems



Markets

■ Waterblast

Part Number	Jacket Color	Nominal I.D.			Maximum O.D.		Maximum Working Pressure		Minimum Bend Radius		Weight		Fitting Series
#			0		0	9	7		<i>\$</i>		lbs	5 c kg	
		DN	inch	mm	inch	mm	psi	MPa	inch	mm	lbs/ft	kg/m	
2020N-012R30	Black	2	2/25	2.0	0.20	4.9	11,020	76.0	0.79	20	0.01	0.02	EX



Markets

Hydraulic

Part Number	Jacket Color		Nominal I.D.		Maximum O.D.		Maximum Working Pressure		Minimum Bend Radius		Weight		Fitting Series
#			0		0	\bigcirc			\sim		lbs	5 C	
		DN	inch	mm	inch	mm	psi	MPa	inch	mm	lbs/ft	kg/m	
2020N-012R30	Black	2	2/25	2.0	0.20	4.9	6,890	47.5	0.79	20	0.01	0.02	EX
2020N-02V30	Black	3	1/8	3.2	0.24	6.0	5,800	40.0	1.20	30	0.02	0.02	EX/RX*

Construction

Core Tube: Polyamide

Reinforcement: One braided layer of high tensile strength

synthetic fiber

Cover: Polyamide, -012 pin-pricked on request

Options

Colors:

Black

Temperature Range

-012 sizes: -40°F to +180°F (-40°C to +82.2°C)

-02 sizes: -40°F to +212°F (-40°C to +100°C) with petroleum or synthetic hydraulic fluids and gases

Notes

Assembly working pressure is dependent on the lowest rated component. Therefore, if fittings have a lower pressure rating than the hose, the working pressure of the fittings is the working pressure of the assembly.

Not for use in airless paint spray or solvent spraying applications. Not a static dissipative hose.

Hose must be pin-pricked for gas service.

*RX Series fittings are field assembled. Contact the division for more information.



В

2020N - Fittings and Accessories

Fittings

Technical details available in Section B.

Hose Part Number	2020N-012R30	2020N-02V30
Fitting Part Numbers	101EX-2-012 101EX-4-012 106EX-4-012 1C9EX-6-012 1C9EX-8-012	201RX-2-2C 206RX-4-2C 2TURX-4-2C

Accessories

Hose Part Number	Accessory Part Numbers
#	Bend Restrictor
2020N-02V30	MBR003 (w/ reusable fittings) MBR004 (w/ crimp fittings)

2022N - High Pressure Hose **Electrically Non-Conductive**



Features and Applications

- Flexible and lightweight with excellent pressure capabilities
- Smooth bore for improved flow rate and low pressure drop
- ISO 13628-5 "Specification for Subsea Production Control Umbilicals", Section 7.9 Hose construction
- Long-length hose and hose umbilicals requiring lightweight construction
- Oilfield pressure control devices
- Offshore oil applications (control fluids, acidizing, methanol injection, well stimulation)
- High pressure hydraulics, pneumatics and lubricating oils
- High pressure tools
- Jacks
- Test apparatus



Markets

- Oil & Gas
- Hydraulic

Part Number	Jacket Color		Nominal I.D.		Maximum 0.D.		Maximum Working Pressure		Minimum Bend Radius		Weight		Fitting Series
#			0		0	\bigcirc			5	9	lbs	5 c kg	
		DN	inch	mm	inch	mm	psi	MPa	inch	mm	lbs/ft	kg/m	
2022N-04V91-5K	Black	6	1/4	6.4	0.50	12.7	5,000	34.5	2.01	51	0.08	0.12	55*
2022N-04V91-10K	Black	6	1/4	6.4	0.54	13.8	10,000	69.0	3.94	100	0.09	0.14	8X
2022N-06V91-5K	Black	10	3/8	9.5	0.63	16.1	5,000	34.5	2.99	76	0.10	0.15	55*
2022N-06V91-10K	Black	10	3/8	9.5	0.75	19.0	10,000	69.0	3.94	100	0.16	0.24	3X
2022N-08V91-5K	Black	12	1/2	12.7	0.82	20.8	5,000	34.5	4.00	102	0.11	0.17	55*
2022N-08V91-10K	Black	12	1/2	12.7	0.97	23.2	10,000	69.0	3.94	100	0.23	0.34	LX

Construction

Core Tube: Polyamide 11, methanol washed Reinforcement: High tensile aramid fiber

Cover: Sea water resistant Polyurethane, pin-pricked on request to allow adequate venting of permeable fluids

Options

Colors:

Black

Temperature Range

-40°F to +131°F (-40°C to +55°C)

Notes

Assembly working pressure is dependent on the lowest rated component. Therefore, if fittings have a lower pressure rating than the hose, the working pressure of the fittings is the working pressure of the assembly.

*For Parkrimp crimpers, refer to the crimp instructions in CAT 4460.



2022N - Fittings and Accessories

Fittings

Technical details available in Section B.

Hose Part Number	2022N-04V91-5K	2022N-04V91-10K	2022N-06V91-5K	2022N-06V91-10K	2022N-08V91-5K	2022N-08V91-10K
Fitting Part Numbers	19255-4-4C 1C955-8-4C 1C955-10-4C 1C955-12-4C 10655-12-4C	1068X-6-04C 1C98X-8-04C 1C98X-10-04C 1AY8X-6-04C 1068X-4-04C	10655-6-6C 1C955-12-6C 19255-6-6C	1063X-6-06C 1C93X-14-06C 1C93X-16-06C 1923X-8-06C 1063X-8-06C	10655-8-8C 19255-8-8C 1C955-16-8C 10655-6-8C	106LX-8-08C 192LX-8-08C 1C9LX-16-08C 106LX-12-08C

Accessories



2240D/2248D - High Pressure Tube **Cleaning Hose**



Features and Accessories

- DIN EN1829-2 compliant
- 20% smaller O.D. than existing competitor products
- High pressure service for tube cleaning applications, such as, heat exchanger tube cleaning in the chemical and refining industries
- Flexible lance at working pressures of 13,000 psi and above



Markets

Waterblast

Part Number	Jacket Color		Nominal I.D.			mum D.	Maxi Wor Pres	king	Be	mum nd lius	We	ight	Fitting Series
#			0		(\odot			\$	9	lbs	5 c kg	
		DN	inch	mm	inch	mm	psi	MPa	inch	mm	lbs/ft	kg/m	
2240D-02V32	Blue	3	1/8	3.2	0.28	7.1	15,950	110.0	2.36	60	0.05	0.07	PL
2240D-02V33-TC	Green	3	1/8	3.2	0.28	7.1	15,950	110.0	2.36	60	0.05	0.07	PL
2240D-025V34	Red	4	5/32	4.0	0.30	7.7	17,400	120.0	2.95	75	0.07	0.10	AX
2240D-025V33-TC	Red	4	5/32	4.0	0.30	7.7	17,400	120.0	2.95	75	0.07	0.10	AX
2240D-03V32	Blue	5	3/16	4.8	0.37	9.5	14,500	100.0	3.74	95	0.09	0.13	AX
2240D-03V34	Red	5	3/16	4.8	0.37	9.5	14,500	100.0	3.74	95	0.09	0.13	AX
2240D-03V36-TC	Yellow	5	3/16	4.8	0.37	9.5	14,500	100.0	3.74	95	0.09	0.13	TX/AX
2240D-04V32	Blue	6	3/8	9.5	0.46	11.6	15,950	110.0	4.33	110	0.13	0.20	NX
2240D-04V33	Blue	6	3/8	9.5	0.46	11.6	15,950	110.0	4.33	110	0.13	0.20	NX
2240D-05V32	Blue	8	5/16	7.9	0.53	13.4	13,050	90.0	4.72	120	0.17	0.25	AX
2240D-05V36-TC	Blue	8	5/16	7.9	0.53	13.4	13,050	90.0	4.72	120	0.17	0.25	TX/AX
2248D-025V32-TC	Blue	4	5/32	4.0	0.31	7.9	21,750	150.0	2.95	75	0.07	0.11	TX
2248D-03V32-TC	Blue	5	3/16	4.8	0.37	9.5	20,300	140.0	3.74	95	0.09	0.14	TX

Construction

Core Tube: Polyoxymethylene

Reinforcement: Two spiral layers of high tensile steel wire

Cover: Polyamide

Options

Red

Colors:

Blue

Green

Yellow

Temperature Range

+14°F to +158°F (-10°C to +70°C)

Notes

Assembly working pressure is dependent on the lowest rated component. Therefore, if fittings have a lower pressure rating than the hose, the working pressure of the fittings is the working pressure of the assembly.



2240D/2248D - Fittings and Accessories

Fittings

Technical details available in Section B.

Hose Part Number	2240D-02V32	2240D-02V33-TC	2240D-025V34	2240D-025V33-TC	2240D-03V3x	2240D-03V36-TC
Fitting Part Numbers	601PL-1-2 6HYPL-1-2	601PL-1-2 106TX-4-02W 1AYTX-6-02W 101TX-2-02W	601AX-1-2A 601AX-2-2A 602AX-1-2A 606AX-4-2A 6AYAX-6-2A 6EZAX-5-2A 6ZEAX-5-2A	601AX-1-2A 601AX-2-2A 606AX-4-2A 106TX-4-025W 1AYTX-6-025W 101TX-4-025W	601AX-2-3 602AX-2-3 606AX-4-3C 6AYAX-6-3	1YHTX-6-03W 1YHTX-6-03W-LH 106TX-6-03W 1AYTX-6-03W 101TX-4-03W 601AX-2-3
	2240D-04V3x	2240D-05V32	2240D-05V36-TC	2248D-025V32-TC	2248D-03V32-TC	
	601NX-2-4 601NX-4-4 601NX-4-4C 602NX-4-4 606NX-4-4C 606NX-6-4C	601AX-4-5 601AX-6-5	101TX-4-05W 1YHTX-6-05W 1YHTX-6-05W-LH 601AX-4-5	101TX-1-025 101TX-2-025 102TX-1-025 1YHTX-4-025	101TX-1-03 101TX-2-03 101TX-4-03 102TX-2-03 1YHTX-6-03	

Accessories

Hose Part Number		
#	Containment Grip	Bend Restrictor
2240D-03V32 2240D-03V34	MCG001SS MCGHS10-15	N/A
2240D-04V32	MCG001SS MCGHS10-15	MBR008
2240D-05V32	MCG001SS MCGHS10-15	MBR009

2244N - High Pressure Hose



Features and Applications

- High pressure waterblast service for the construction and shipbuilding industries
- General industrial cleaning applications mainly used to remove different kinds of dirt accumulation, or materials from various surfaces, such as those in tanks, from concrete, asphalt, etc.



Markets

■ Waterblast

Part Number	Jacket Color		Nominal I.D.		Maximum O.D.		Maximum Working Pressure		Mini Be Rac	nd	Wei	ight	Fitting Series
#			0		0	0				$\mathcal{A}_{\mathbf{x}}$		5 c [kg]	
		DN	inch	mm	inch	mm	psi	MPa	inch	mm	lbs/ft	kg/m	
2244N-08V16W	Yellow	12	1/2	12.7	0.90	22.9	12,760	88.0	5.91	150	0.54	0.80	LX



Markets

Hydraulic

Part Number	Jacket Color		Nominal I.D.		Maximum 0.D.		Maximum Working Pressure		Minimum Bend Radius		Wei	ight	Fitting Series
#			0		\odot	\bigcirc			\$	9	lbs	5 c [kg]	
		DN	inch	mm	inch	mm	psi	MPa	inch	mm	lbs/ft	kg/m	
2244N-025V00	Black	4	5/32	4.0	0.38	9.6	10,875	75.0	2.17	55	0.13	0.19	8X
2244N-08V71	Black	12	1/2	12.7	0.89	22.7	7,975	55.0	5.91	150	0.54	0.80	LX

Construction

Core Tube: Polyamide (V00)

Polyamide 11, methanol washed (V71)

Reinforcement: Two spiral layers, and one braided layer of

high tensile steel wire Cover: Polyurethane

Options

Colors:

Black

Temperature Range

-08 hoses: +14°F to +158°F (-10°C to +70°C)

-025 hose: -40°F to +212°F (-40°C to +100°C)

Notes

Assembly working pressure is dependent on the lowest rated component. Therefore, if fittings have a lower pressure rating than the hose, the working pressure of the fittings is the working pressure of the assembly.



2244N - Fittings and Accessories

Fittings

Technical details available in Section B.

Hose Part Number	2244N-08V16W	2244N-025V00	2244N-08V71
Fitting Part Numbers	1AYLX-11-08 1C9LX-16-08	6018X-2-2A 6018X-2-2AC 6018X-4-2AC 6068X-4-2AC 6AY8X-6-2AC	6AYLX-11-8C-SD 601LX-8-8C 606LX-8-8C 6AYLX-11-8C 6C9LX-16-8C

Accessories

Hose Part Number		Accessory Part Numbers									
#	Heavy Duty Abrasion Cover	Cover Sleeves	Spring Guard	Containment Grip	Bend Restrictor						
2244N-025V00	N/A	N/A	N/A	N/A	MBR008						
2244N-08V71	MHDC018	216-200-18	MSG4113	MCG005SS	N/A						

2370N - High Pressure Hose



Features and Applications

- High pressure service for use with petroleum or sythetic hydraulic fluids in hydraulic systems
- Especially suitable for hydraulic tools, clamps, rescue
- Suitable for use with phosphate ester fluid



Markets

Hydraulic

Part Number	Jacket Color	Nominal I.D.				Maximum Maximum Working Pressure		Minimum Bend Radius		Weight		Fitting Series	
#			0		(\bigcirc			5	9	lbs	5 c [kg]	
		DN	inch	mm	inch	mm	psi	MPa	inch	mm	lbs/ft	kg/m	
2370N-08V30	Black	12	1/2	12.7	0.79	20.0	5,075	35.0	5.90	150	0.28	0.42	9X / NX
2370N-12V30	Black	20	3/4	19.0	1.13	28.7	4,350	30.0	9.45	240	0.55	0.64	NX
2370N-16V30	Black	25	1	25.4	1.34	34.0	3,985	27.5	11.02	280	0.72	1.07	NX

Construction

Core Tube: Polyamide

Reinforcement: Two spiral layers of high tensile steel wire and

one braided layer of iron wire

Cover: Polyamide

Options

Colors:

Black

Temperature Range

 -40° F to $+140^{\circ}$ F (-40° C to $+60^{\circ}$ C)

Notes

Assembly working pressure is dependent on the lowest rated component. Therefore, if fittings have a lower pressure rating than the hose, the working pressure of the fittings is the working pressure of the assembly.



2370N - Fittings and Accessories

Fittings

Technical details available in Section B.

Hose Part Number	2370N-08V30	2370N-12V30	2370N-16V30
Fitting Part Numbers	1019X-8-08 1069X-10-08 106NX-8-08	101NX-12-12 106NX-12-12 106NX-16-12	101NX-16-16 106NX-16-16 106NX-20-16

Accessories



2380F - High Pressure Hose



Features and Applications

- FEP inner core offers exceptional chemical resistance
- Inert to virtually all hydraulic and chemical fluids
- Suitable for applications with aggressive fluids
- Glue applications in the automotive industry
- Material lines for temperatures below +80°C



Markets

Hydraulic

ı	Part Number	Jacket Color	Nominal I.D.			Maximum Maximum Working Pressure		Minimum Bend Radius		Weight		Fitting Series		
	#		0		\odot				\$	9	lbs	5 c kg		
			DN	inch	mm	inch	mm	psi	MPa	inch	mm	lbs/ft	kg/m	
238	80F-08V07	Gray	12	1/2	12.7	0.81	20.5	4,712	32.5	5.51	140	0.34	0.58	NX

Construction

Core Tube: Fluorinated ethylene propylene (FEP)

Reinforcement: Two closed spiral layers and two open spiral

layers of high tensile steel wire

Cover: Polyurethane

Options

Colors: Gray

Temperature Range

 -40° F to $+176^{\circ}$ F (-40° C to $+80^{\circ}$ C)

Notes

Assembly working pressure is dependent on the lowest rated component. Therefore, if fittings have a lower pressure rating than the hose, the working pressure of the fittings is the working pressure of the assembly.



2380F - Fittings and Accessories

Fittings

Technical details available in Section B.

Hose Part Number	2380F-08V07
Fitting Part	106NX-8-08
Numbers	101NX-8-08

Accessories

2380N....W- High Pressure Waterblast Hose



Features and Applications

- Low volumetric expansion
- Available in long lengths
- Replaces high pressure, rigid tubing where vibration and routing constraints are issues
- High pressure service in construction and shipbuilding industries
- General industrial cleaning applications



Markets

Waterblast

Part Number	Jacket Color	Nominal I.D.		Maximum O.D.		Maximum Working Pressure		Minimum Bend Radius		Weight		Fitting Series	
#			0		0	\bigcirc			\$	9	lbs	5 c [kg]	
		DN	inch	mm	inch	mm	psi	MPa	inch	mm	lbs/ft	kg/m	
2380N-04V03W	Green	6	1/4	6.4	0.52	13.3	15,950	110.0	2.80	70	0.18	0.27	KY
2380N-04V06W	Yellow	6	1/4	6.4	0.52	13.3	15,950	110.0	2.80	70	0.18	0.27	KY
2380N-05V00W	Black	8	5/16	7.9	0.62	15.8	14,500	100.0	3.54	90	0.24	0.35	KY
2380N-05V06W	Yellow	8	5/16	7.9	0.62	15.8	14,500	100.0	3.54	90	0.24	0.35	KY
2380N-08V10W	Black	12	1/2	12.7	0.90	22.9	12,760	88.0	5.91	150	0.46	0.68	LX
2380N-08V16W	Yellow	12	1/2	12.7	0.90	22.9	12,760	88.0	5.91	150	0.46	0.68	LX

Construction

Core Tube: Polyamide

Reinforcement: Two closed spiral layers and two open spiral

layers of high tensile steel wire

Cover: Polyurethane

Options

Colors: • Green



Black

Temperature Range

+14°F to +158°F (-10°C to +70°C)

Notes

Assembly working pressure is dependent on the lowest rated component. Therefore, if fittings have a lower pressure rating than the hose, the working pressure of the fittings is the working pressure of the assembly.



2380N...W - Fittings and Accessories

Fittings

Technical details available in Section B.

Hose Part Number	2380N-04V0xW	2380N-05V0xW	2380N-08V1xW
Fitting Part Numbers	101KY-2-04 101KY-4-04 1AYKY-6-04	101KY-4-05 101KY-6-05 1AYKY-8-05 1Y4KY-9-05	101LX-8-08 106LX-8-08 1AYLX-11-08

Accessories

Hose Part Number	Accessory Part Numbers									
Heavy Duty Abrasion Cover		Cover Sleeves	Spring Guard	Containment Grip	Bend Restrictor					
2380N-05V0xW	MHDC012	510-A-500-12	N/A	MCG001SS MCGHS10-15	MBR012					

2380N - High Pressure Hose



Features and Applications

- Small diameters available
- Low volumetric expansion
- Available in long lengths and twinline construction
- Replaces high pressure, rigid tubing where vibration and routing constraints are issues
- Used for hydraulic controls and test systems with synthetic fluids
- Portable hydraulic tools
- V91 hoses are for offshore oil applications (control fluids, acidizing, methanol injection and well stimulation)
- V33 hose can be used with posphate ester fluids



Markets

- Oil & Gas
- Hydraulic

Part Number	Jacket Color	Nominal I.D.		Maximum O.D.		Maximum Working Pressure		Minimum Bend Radius		Weight		Fitting Series	
#		0		\odot				\sim		lbs	5 c [kg]		
		DN	inch	mm	inch	mm	psi	MPa	inch	mm	lbs/ft	kg/m	
2380N-04V00	Black	6	1/4	6.4	0.52	13.3	10,150	70.0	2.80	70	0.27	0.18	8X
2380N-04V02	Blue	6	1/4	6.4	0.52	13.3	10,150	70.0	2.80	70	0.27	0.18	8X
2380N-04V04	Red	6	1/4	6.4	0.52	13.3	10,150	70.0	2.80	70	0.27	0.18	8X
2380N-04V06	Yellow	6	1/4	6.4	0.53	13.4	10,000	69.0	2.80	70	0.18	0.27	8X
2380N-04V33	Green	6	1/4	6.4	0.53	13.4	10,000	69.0	2.80	70	0.18	0.27	8X/NX
2380N-04V91	Black	6	1/4	6.4	0.53	13.4	10,000	69.0	2.80	70	0.18	0.27	8X
2380N-08V00	Black	12	1/2	12.7	0.90	22.9	7,975	55.0	5.91	150	0.46	0.68	LX
2380N-16V12	Blue	25	1	25.4	1.45	36.8	5,510	38.0	11.42	290	1.00	1.49	8X
2380N-16V16	Yellow	25	1	25.4	1.45	36.8	5,510	38.0	11.42	290	1.00	1.49	8X
2380N-20V30	Black	32	1 1/4	31.8	1.73	44.0	3,985	27.5	15.75	400	1.23	1.83	NX

Construction

Core Tube: Polyamide

V91 - Polyamide, Methanol washed

Reinforcement: Two closed spiral layers and two open spiral layers of high tensile steel wire

Cover: V0x — Polyurethane

V1x — Polyurethane V33 — Polyamide V91 — Polyurethane

Options

Colors:

Black

Blue

• Diu

Red

Yellow

Green

Temperature Range

-40°F to +212°F (-40°C to +100°C)

Notes



2380N - Fittings and Accessories

Fittings

Technical details available in Section B.

Hose Part Number	2380N-04V0x	2380N-04V33	2380N-04V91	2380N-08V00	2380N-16V1x	2380N-20V30
Fitting Part Numbers	1018X-6-4 1018X-4-04 1C38X-4-4 1D98X-4-4 1MB8X-6-4 1AY8X-6-04 1928X-4-04 1068X-4-04	1068X-4-04 1068X-6-04 601NX-4-4 601NX-4-4C 606NX-6-4C 6578X-6-4 6AY8X-6-4 6018X-6-4 6AYNX-6-4C	1068X-4-04C 1068X-6-04C 1018X-6-04C 1AY8X-6-04C	101LX-8-08 106LX-8-08 1AYLX-11-08	1068X-16-16C-SUBSEA	101NX-20-20 106NX-20-20

Accessories

Hose Part Number		Accessory Part Numbers										
#	Heavy Duty Abrasion Cover	Cover Sleeves	Spring Guard	Containment Grip	Bend Restrictor							
2380N-04V0x	MHDC012	510-A-500-12	MSG2106	MCG001SS MCGHS10-15	MBR010							
2380N-04V33	MHDC010 MHDC011	508-J-500-10	N/A	MCG001SS MCGHS10-15	MBR009							
2380N-04V91	MHDC012	510-A-500-12	MSG2106	MCG001SS MCGHS10-15	MBR010							

2388N - High Pressure Hose



Features and Applications

- Up to 35% lighter weight for a 20 meter hose assembly when compared to rubber hose
- High kink resistance
- Waterblast hoses are compliant with DIN EN 1829-2
- Hoses indicated for waterblast applications intended for construction, ship building and general industrial cleaning
- Particularly well-suited for the removal of dirt, rust and paint from the surface of ship decks, tanks, concrete and asphalt
- Grease injection hose
- High flexibility for hydraulic tools, rescue equipment, straightening benches and clamps



Markets

Waterblast

Part Number	Jacket Color	Nominal I.D.			Maximum O.D.		Maximum Working Pressure		Minimum Bend Radius		Weight		Fitting Series
#			0		\bigcirc				\$		lbs	5 c [kg]	
		DN	inch	mm	inch	mm	psi	MPa	inch	mm	lbs/ft	kg/m	
2388N-04V12W	Blue	6	1/4	6.4	0.53	13.4	18,560	128.0	3.15	80	0.20	0.30	KY
2388N-04V13W	Green	6	1/4	6.4	0.53	13.4	18,560	128.0	3.15	80	0.20	0.30	KY
2388N-08V12W	Blue	12	1/2	12.7	0.91	23.1	15,950	110.0	4.72	120	0.54	0.80	BS
2388N-08V13W	Green	12	1/2	12.7	0.91	23.1	15,950	110.0	4.72	120	0.54	0.80	BS
2388N-08V14W	Red	12	1/2	12.7	0.91	23.1	15,950	110.0	4.72	120	0.54	0.80	BS





Markets

- Oil & Gas
- Hydraulic

Part Number	Jacket Color	Nominal I.D.		Maximum 0.D.		Maximum Working Pressure		Minimum Bend Radius		Weight		Fitting Series	
#		0		0	\bigcirc				$\mathcal{A}_{\mathbf{k}}$		5 c [kg]		
		DN	inch	mm	inch	mm	psi	MPa	inch	mm	lbs/ft	kg/m	
2388N-04V04	Red	6	1/4	6.4	0.52	13.3	11,600	80.0	3.15	80	0.20	0.30	8X

Construction

Core Tube: Polyamide

Reinforcement: Two spiral layers and two open spiral layers of

high tensile steel wire Cover: Polyurethane

Options



Green

Red

Temperature Range

Waterblast hoses: 14°F to +158°F (-10°C to +70°C) Hydraulic hose: -40°F to +212°F (-40°C to +100°C)

Notes



2388N - Fittings and Accessories

Fittings

Technical details available in Section B.

Hose Part Number	2388N-04V1xW	2388N-08V1xW	2388N-04V04
Fitting Part Numbers	101KY-2-04 101KY-4-04 106KY-6-04 1AYKY-6-04	1AYBS-11-08 1AYBS-11-08C 101BS-8-08 101BS-8-08C 1C9BS-16-08	1018X-4-04 1068X-4-04 1068X-6-04 1AY8X-6-04

Accessories

Hose Part Number	Accessory Part Numbers					
#	Heavy Duty Abrasion Cover	Cover Sleeves				
2388N-04V1xW	MHDC012	510-A-500-12				
2388N-08V1xW	MHDC018	216-200-18				
2388N-04V04	MHDC012	510-A-500-12				

2390N - High Pressure Hose



Features and Applications

- Low dimensional change under pressure resulting in excellent response times
- Smooth bore for low pressure drop
- Meets or exceeds the performance requirements of ISO 13628-5
- Low volumetric expansion hose
- Used for subsea hydraulic controls long-length hot line hoses and stack control lines for BOP systems
- Portable hydraulic tools



Markets

- Oil & Gas
- Hydraulic

Part Number	Jacket Color		Nominal I.D.			Maximum 0.D.		Maximum Working Pressure		mum nd lius	Weight		Fitting Series
#		0		\bigcirc					\mathcal{A}		5 C kg		
		DN	inch	mm	inch	mm	psi	MPa	inch	mm	lbs/ft	kg/m	
2390N-04V00	Black	6	1/4	6.4	0.52	13.3	7,107	49.0	6.30	160	0.17	0.25	8X/9X/E2/E3
2390N-04V12	Blue	6	1/4	6.4	0.52	13.3	7,107	49.0	6.30	160	0.17	0.25	8X/9X/E2/E3
2390N-04V16	Yellow	6	1/4	6.4	0.52	13.3	7,107	49.0	6.30	160	0.17	0.25	8X/9X/E2/E3
2390N-06V91	Black	10	3/8	9.5	0.71	18.1	6,450	44.5	4.72	120	0.28	0.41	9X
2390N-08V12	Blue	12	1/2	12.7	0.83	21.2	6,017	41.5	5.91	150	0.36	0.54	9X/E2/E3
2390N-08V13	Green	12	1/2	12.7	0.83	21.2	6,017	41.5	5.91	150	0.36	0.54	9X/E2/E3
2390N-08V16	Yellow	12	1/2	12.7	0.83	21.2	6,017	41.5	5.91	150	0.36	0.54	9X/E2/E3
2390N-12V03	Green	20	3/4	19.0	1.14	29.0	5,075	35.0	11.81	300	0.61	0.90	LX/E2
2390N-16V12	Blue	25	1	25.4	1.38	35.0	4,060	28.0	11.02	280	0.79	1.17	9X/E2/E3
2390N-16V13	Green	25	1	25.4	1.38	35.0	4,060	28.0	11.02	280	0.79	1.17	9X/E2/E3
2390N-16V16	Yellow	25	1	25.4	1.38	35.0	4,060	28.0	11.02	280	0.79	1.17	9X/E2/E3

Construction

Core Tube: Polyamide

Reinforcement: Two closed spiral layers and two open spiral

layers of high tensile steel wire

Cover: V1x - Seawater-resistant Polyurethane

V00 - Polyurethane

V91 - PA 12

Options

Colors:

Black

Blue

Yellow

Green

Temperature Range

-40°F to +212°F (-40°C to +100°C)

V91 hose: max. of +158°F (+70°C) when used with water/glycol and methanol-based fluids

Notes



2390N - Fittings and Accessories

Fittings

Technical details available in Section B.

Hose Part Number	2390N-04Vxx	2390N-06V91	2390N-08V1x	2390N-12V03	2390N-16V1x
Fitting Part Numbers	1018X-6-4 1D98X-4-4 E206JCC3 E206JEC3 6019X-4-4C 6069X-6-4C 6AY9X-6-4C 139E3-4-4C 137E3-4-4C 137E3-4-4C 137E3-4-4C 106E3-4-4C	6019X-6-6 6019X-6-6C 6019X-8-6 6019X-8-6C 6069X-6-6C-SUBSEA 6069X-8-6C 6AY9X-8-6C	6019X-8-8 6019X-8-8C 6069X-8-8C 6AY9X-11-8C E213JFC4 19WE3-8-8C 19WE3-16-8C 19ME3-8-8C 19GE3-16-8C 19GE3-16-8C 106E3-8-8C 139E3-8-8C-411 137E3-8-8C-411	601LX-12-12C 601LX-16-12C 606LX-16-12C 6AYLX-16-12C 6C9LX-25-12C E220JHC1	6019X-16-16C 6069X-16-16C 6AY9X-16-16C E225JIC3 19WE3-16-16C 19WE3-24-16C 19ME3-24-16C 19GE3-16-16C 19GE3-24-16C 139E3-16-16C 139E3-16-16C-411 137E3-16-16C-411

Accessories

Hose Part Number	Ac	cessory Part Numbe	ers
#	Heavy Duty Abrasion Cover	Cover Sleeves	Containment Grip
2390N-04Vxx	MHDC010 MHDC011	508-J-500-10	MCG001SS
2390N-08V1x	MHDC016	216-200-18	MCG005SS MCGHS20-30
2390N-12V03	MHDC022	220-200-22	MCG002SS MCG005SS MCGHS20-30
2390N-16V1x	MHDC024	220-200-22	MCG003SS MCGHS30-40

2440D/2448D - Ultra High Pressure Water **Jetting Hose**



Features and Applications

- Fully compliant with DIN EN 1829-2
- Tough Cover (-TC) is extremely abrasion-resistant and prolongs the service life of the hose
- High pressure service for tube cleaning applications such as heat exchangers in the chemical and oil refining industries
- Application as flexible lance
- Ultra-high pressure service for the construction and shipbuilding industries and for general purpose industrial cleaning applications
- Hydrodemolition and removal of accumulated dirt and material from surfaces such as concrete, asphalt and tanks



Markets

Waterblast

Part Number	Jacket Color		Nominal I.D.			Maximum O.D.		Maximum Working Pressure		mum nd lius	Weight		Fitting Series
#			0		\odot				5		lbs	5 c kg	
		DN	inch	mm	inch	mm	psi	MPa	inch	mm	lbs/ft	kg/m	
2440D-02V32-TC	Blue	3	1/8	3.2	0.31	7.9	30,000	207.0	3.94	100	0.08	0.12	LX
2440D-02V37-TC	Gray	3	1/8	3.2	0.31	7.9	30,000	207.0	3.94	100	0.08	0.12	LX
2440D-025V37	Gray	4	5/32	4.0	0.41	10.5	31,900	220.0	3.94	100	0.14	0.21	LX
2440D-03V32-TC	Blue	5	3/16	4.8	0.45	11.5	26,100	180.0	5.12	130	0.19	0.28	LX
2440D-04V32-TC	Blue	6	1/4	6.4	0.49	12.5	23,780	164.0	6.10	155	0.22	0.33	LX
2440D-05V32-TC	Blue	8	5/16	7.9	0.59	15.1	21,750	150.0	6.89	175	0.30	0.44	LX
2448D-025V32-TC	Blue	4	5/32	4.0	0.39	9.9	43,645	301.0	4.72	120	0.15	0.22	LX
2448D-025V35-TC	Orange	4	5/32	4.0	0.39	9.9	43,645	301.0	4.72	120	0.15	0.22	LX

Construction

Core Tube: Polyoxymethylene

Reinforcement: Four spiral layers of maximum

tensile steel wire Cover: Polyamide

Options

Colors:
Blue

Gray

Orange

Temperature Range

+14°F to +158°F (-10°C to +70°C)

Notes



2440D/2448D - Fittings and Accessories

Fittings

Technical details available in Section B.

Hose Part Number	2440D-02V3x-TC	2440D-025V37	2440D-03V32-TC	2440D-04V32-TC	2440D-05V32-TC	2448D-025V3x-TC
Fitting Part Numbers	1AYLX-6-02 1HYLX-4-02 1HYLX-4-02-LH 1Y4LX-4-02 1YHLX-4-02 1YHLX-4-02-LH	601LX-2-2AC 6AYLX-6-2AC 6AYLX-4-2AC-PL 6HYLX-4-2AC-PL-LH 6Y4LX-4-2AC 6Y4LX-6-2AC 6YHLX-4-2AC-PL 6YHLX-4-2AC-PL-LH	601LX-4-3 65YLX-6-3 65YLX-6-3C 66YLX-4-3 66YLX-4-3C 692LX-4-3C 6AYLX-6-3 6AYLX-6-3C 6HYLX-4-3C-PL 6HYLX-4-3C-PL-LH 6HYLX-6-3C-PL-LH 6Y4LX-6-3C 6Y4LX-9-3C 6Y4LX-9-3C 6YHLX-4-3C-PL-LH 6YHLX-6-3C-PL-LH 6YHLX-6-3C-PL-LH	101LX-4-04 101LX-6-04 1AYLX-6-04 1Y2LX-6-04	601LX-4-5 601LX-4-5C 601LX-6-5C 601LX-6-5C 692LX-6-5C 6AYLX-8-5C 6HYLX-9-5C-PL-LH 6Y2LX-12-5C 6Y2LX-9-5C 6YHLX-9-5C-PL 6YHLX-9-5C-PL	6HYLX-4-2AC-PL 6HYLX-4-2AC-PL-LH 6YHLX-4-2AC-PL 6YHLX-4-2AC-PL-LH

Accessories

2440N - Ultra High Pressure Waterblast Hose



Features and Applications

- Compliant with DIN EN 1829-2
- High pressure, low volumetric expansion hose
- Flexible, chemical-resistant, lightweight alterative to steel pipe and rubber hose
- Ultra high pressure service for the construction and shipbuilding industries and general industrial cleaning applications
- Mainly used in hydrodemolition and to remove different kinds of dirt accumulation, or materials from various surfaces
- Waterjet technology, delivery hose



Part Number	Jacket Color	Nominal I.D.		Maximum O.D.		Maximum Working Pressure		Minimum Bend Radius		Weight		Fitting Series	
#			0		0	\bigcirc			\$	9	lbs	5 c [kg]	
		DN	inch	mm	inch	mm	psi	MPa	inch	mm	lbs/ft	kg/m	
2440N-08V30	Black	12	1/2	12.7	0.89	22.7	20,300	140.0	7.87	200	0.63	0.94	LX
2440N-08V32	Blue	12	1/2	12.7	0.89	22.7	20,300	140.0	7.87	200	0.63	0.94	LX
2440N-12V36	Yellow	20	3/4	19.0	1.19	30.2	14,500	100.0	9.84	250	0.98	1.46	LX
2440N-12V37	Gray	20	3/4	19.0	1.19	30.2	14,500	100.0	9.84	250	0.98	1.46	LX
2440N-16V30	Black	25	1	25.4	1.46	37.2	13,050	90.0	11.81	300	1.34	2.00	LX
2440N-16V36	Yellow	25	1	25.4	1.46	37.2	13,050	90.0	11.81	300	1.34	2.00	LX

Construction

Core Tube: Polyamide

Reinforcement: Four spiral layers of maximum

tensile steel wire Cover: Polyamide

Options

Colors: Black

Blue Yellow

Gray

Temperature Range

+14°F to +158°F (-10°C to +70°C)

Notes



2440N - Fittings and Accessories

Fittings

Technical details available in Section B.

Hose Part Number	2440N-08V3x	2440N-12V3x	2440N-16V3x
Fitting Part Numbers	601LX-8-8 601LX-8-8C 6AYLX-11-8C 6C9LX-16-8C 6Y2LX-12-8C 6Y2LX-9-8C	601LX-12-12C 601LX-16-12C 606LX-16-12C 6AYLX-16-12C 6C9LX-25-12C 6Y2LX-16-12C	601LX-16-16C 606LX-16-16C 6AYLX-16-16C 6C9LX-30-16C

Accessories

Hose Part Number		Accessory P	art Numbers	
#	Heavy Duty Abrasion Cover	Cover Sleeves	Spring Guard	Containment Grip
2440N-08V3x	MHDC018	216-200-18	MSG4113	MCGHS20-30
2440N-12V3x	MHDC022	220-200-22	MSG4120	MCG002SS MCGHS30-40
2440N-16V3x	MHDC026	520-A-500-26	MSG4125	MCG003SS MCGHS30-40

2440N/2448N - Ultra High Pressure Hose



Features and Applications

- Compliant with ISO 13628-5
- High pressure, low volumetric expansion hose
- Flexible, chemical-resistant, lightweight alterative to steel pipe and rubber hose
- V91 hoses are used in offshore applications such as, control fluids, acidizing, methanol injection and well stimulation



Markets

- Oil & Gas
- Hydraulic

Part Number	Jacket Color		Nominal I.D.			Maximum O.D.		Maximum Working Pressure		mum nd lius	Weight		Fitting Series
#			0		0	\bigcirc	(\$	9	lbs	kg	
		DN	inch	mm	inch	mm	psi	MPa	inch	mm	lbs/ft	kg/m	
2440N-04V91	Black	6	1/4	6.4	0.52	13.1	12,500	87.5	5.90	150	0.21	0.31	LS
2440N-06V91	Black	10	3/8	9.5	0.77	19.5	12,688	87.5	7.48	190	0.49	0.73	LS
2440N-08V91	Black	12	1/2	12.7	0.89	22.7	11,745	81.0	7.87	200	0.63	0.94	LX / 5X
2440N-12V91	Black	20	3/4	19.0	1.19	30.2	10,000	69.0	9.84	250	0.98	1.46	LX
2440N-16V91	Black	25	1	25.4	1.46	37.2	8,120	56.0	11.81	300	1.34	2.00	LX
2440N-16V91-10K	Black	25	1	25.4	1.47	37.2	10,000	69.0	11.81	300	1.34	2.00	LX
2448N-04V91	Black	6	1/4	6.4	0.54	13.7	15,000	103.5	5.90	150	0.26	0.38	8X
2448N-08V91	Black	12	1/2	12.7	0.89	22.7	12,688	87.5	7.87	200	0.63	0.94	LX

Construction

Core Tube: Methanol-washed PA11

Reinforcement: Four spiral layers of maximum

tensile steel wire Cover: Nylon 12

Options

Colors:

Black

Temperature Range

-40°F to +212°F (-40°C to +100°C)

Notes



■ Accessories

2440N/2448N - Fittings and Accessories

Fittings

Technical details available in Section B.

Hose Part Number	2440N-04V91	2440N-06V91	2440N-08V91	2440N-12V91
Fitting Part Numbers	6AYLX-6-4C 65YLX-6-4C 601LX-4-4C 6AYLX-6-4C-SD	6AYLX-8-6C 6Y2LX-9-6C	601LX-8-8C 6AYLX-11-8C 6C9LX-16-8C 6Y2LX-12-8C 6Y2LX-9-8C 6AYLX-11-8C-SD 6AY5X-11-8C-SUBSEA	601LX-12-12C 601LX-16-12C 606LX-16-12C 6AYLX-16-12C 6C9LX-25-12C 6Y2LX-16-12C 6AYLX-16-12C-SD
	2440N-16V91	2440N-1610K	2448N-04V91	2448N-08V91
	601LX-16-16C 606LX-16-16C 6AYLX-16-16C 6AYLX-16-16C-SD 6AYLX-16-16-HCL 6C9LX-30-16C 6HELX-16-16-HCL 6HNLX-16-16-HCL	16ALX-16-16C4462 1HNLX-32-16C4462 1Y2LX-16-16C4462	1018X-4-04C 1018X-6-04C 1068X-4-04C 1068X-6-04C 1AY8X-6-04C 1Y28X-6-04C 1Y28X-9-04C	101LX-8-08C 106LX-12-08C 106LX-8-08C 1AYLX-11-08C 1C9LX-16-08C 1Y2LX-12-08C 1Y2LX-9-08C 1Y4LX-9-08C

Accessories

Hose Part Number		Accessory P	art Numbers	
#	Heavy Duty Abrasion Cover	Cover Sleeves	Spring Guard	Containment Grip
2440N-04V91	MHDC010 MHDC011	508-J-500-10	N/A	MCG001SS MCGHS10-15
2440N-06V91	MHDC014	412-400	N/A	MCGHS15-20
2440N-08V91	MHDC018	216-200-18	N/A	MCGHS20-30
2440N-12V91	MHDC022	220-200-22	MSG4120	MCG002SS MCGHS30-40
2440N-16V91	MHDC026	520-A-500-26	MSG4125	MCG003SS MCGHS30-40

2580N - Ultra High Pressure Waterblast Hose



Features and Applications

- Compliant with DIN EN 1829-2
- MSHA hose meets requirements of MDG 41
- Ultra high pressure service for the construction and shipbuilding industries
- General industrial cleaning applications
- Mainly used in hydrodemolition and to remove different kinds of dirt accumulation, or materials from various surfaces, such as those in tanks, from concrete, asphalt, etc.
- MSHA Maximum pressure service for use with petroleum or synthetic hydraulic fluids



Part Number	Jacket Color		Nominal I.D.		Maximum O.D.		Maximum Working Pressure		Minimum Bend Radius		Weight		Fitting Series
#			0		0	\bigcirc			5	9	lbs	5 c kg	
		DN	inch	mm	inch	mm	psi	MPa	inch	mm	lbs/ft	kg/m	
2580N-06V12	Blue	10	3/8	9.5	0.85	21.6	23,200	160.0	3.74	95	0.63	0.94	BL
2580N-08V12	Blue	12	1/2	12.7	0.99	25.2	20,300	140.0	5.91	150	1.19	0.80	BL
2580N-12V12	Blue	20	3/4	19.0	1.29	32.8	17,400	120.0	6.69	170	1.18	1.76	BL
2580N-12V13	Green	20	3/4	19.0	1.29	32.8	17,400	120.0	6.69	170	1.18	1.76	BL
2580N-12V14	Red	20	3/4	19.0	1.29	32.8	17,400	120.0	6.69	170	1.18	1.76	BL



Part Number	Jacket Color		Nominal I.D.			mum D.	Maxi Worl Pres	king	Mini Be Rac	nd	Wei	ight	Fitting Series
#			0		(\bigcirc	(\$	9	lbs	5 c kg	
		DN	inch	mm	inch	mm	psi	MPa	inch	mm	lbs/ft	kg/m	
2580N-08V10-MSHA	Black	12	1/2	12.7	0.99	25.2	10,150	70.0	4.33	110	0.80	1.19	BL

Construction

Core Tube: Polyamide

Reinforcement: Four spiral layers and two open spiral layers of

high tensile steel wire Cover: Polyurethane

Options

Colors:

Blue

Red

Green

Black

Temperature Range

Waterblast hoses: +14°F to +158°F (-10°C to +70°C) MSHA hose: -40°F to +212°F (-40°C to +100°C)

Notes



2580N - Fittings and Accessories

Fittings

Technical details available in Section B.

Hose Part Number	2580N-06V12	2580N-08V12	2580N-12V1x	2580N-08V10-MSHA
Fitting Part Numbers	101BL-6-06 1AYBL-11-06 1AYBL-8-06 1C9BL-14-06 1C9BL-16-06	1AYBL-11-08 1C9BL-14-08 1C9BL-16-08 1C9BL-25-08 101BL-8-08 101BL-8-08C	101BL-12-12 1C9BL-25-12	101BL-8-08 101BL-8-08C 1AYBL-11-08 1AYBL-11-08C

Accessories



2640D - Ultra High Pressure Waterblast Hose



Features and Applications

- Compliant with DIN EN 1829-2
- Ultra high pressure service for the construction and shipbuilding industries
- General industrial cleaning applications
- Hydrodemolition



Markets

Waterblast

Part Number	Jacket Color		Nominal I.D.		Maximum O.D.		Maximum Working Pressure		Minimum Bend Radius		Weight		Fitting Series
#			0		(\bigcirc			\$	9	lbs	5 c [kg]	
		DN	inch	mm	inch	mm	psi	MPa	inch	mm	lbs/ft	kg/m	
2640D-025V32	Blue	4	5/32	4.0	0.47	12.0	40,600	280.0	5.51	140	0.20	0.29	2X
2640D-025V35	Orange	4	5/32	4.0	0.47	12.0	40,600	280.0	5.51	140	0.20	0.29	2X
2640D-03V32	Blue	5	3/16	4.8	0.51	12.9	36,230	250.0	6.89	175	0.28	0.41	2X
2640D-03V37	Gray	5	3/16	4.8	0.51	12.9	36,230	250.0	6.89	175	0.28	0.41	2X
2640D-05V37-TC	Gray	8	5/16	7.9	0.67	17.0	30,450	210.0	8.86	225	0.46	0.68	2X

Construction

Core Tube: Polyoxymethylene

Reinforcement: Six spiral layers of maximum tensile steel wire

Cover: Polyamide

Options



Orange Grav

Assembly working pressure is dependent on the lowest rated component. Therefore, if fittings have a lower pressure rating than the hose, the working pressure of the fittings is the working pressure of the assembly.

Notes

Temperature Range +14°F to +158°F (-10°C to +70°C)



2640D - Fittings and Accessories

Fittings

Technical details available in Section B.

Hose Part Number	2640D-025V3x	2640D-03V3x	2640D-05V37-TC
Fitting Part Numbers	16Y2X-4-025 1AY2X-6-025 1Y42X-4-025 1Y42X-6-025	16Y2X-4-03 1922X-4-03 1AY2X-6-03 1Y42X-6-03 1Y42X-9-03	1AY2X-13-05 1AY2X-10-05-SA 1AY2X-8-05-SA 1Y42X-6-05 1Y42X-9-05

Accessories

Hose Part Number	A	Accessory Part Number	s
#	Heavy Duty Abrasion Cover	Cover Sleeves	Containment Grip
2640D-025V3x	MHDC010 MHDC011	508-J-500-10	MCGHS10-15
2640D-03V3x	MHDC012	510-A-500-12	MCG001SS MCGHS10-15

2640N - Ultra High Pressure Hose



Features and Applications

- Ultra high pressure service for the construction and shipbuilding industries
- General industrial cleaning applications
- V91 hoses are used in offshore applications such as, control fluids, acidizing, methanol injection and well stimulation
- V91 hose tested according to ISO 13628-5



Markets

Waterblast

Part Number	Jacket Color		Nominal I.D.			Maximum 0.D.		Maximum Working Pressure		mum nd lius	Weight		Fitting Series
#			0		(\bigcirc					lbs	5 c [kg]	
		DN	inch	mm	inch	mm	psi	MPa	inch	mm	lbs/ft	kg/m	
2640N-08V32	Blue	12	1/2	12.7	0.96	24.5	26,100	180.0	11.42	290	0.92	1.37	5X
2640N-12V32	Blue	20	3/4	19.0	1.30	33.0	20,300	140.0	13.78	350	1.45	2.16	5X



Markets

Oil & Gas

Part Number	Jacket Color		Nominal I.D.		Maximum O.D.		Maximum Working Pressure		Minimum Bend Radius		Weight		Fitting Series
#			0		\bigcirc				\$	9	lbs	5 c [kg]	
		DN	inch	mm	inch	mm	psi	MPa	inch	mm	lbs/ft	kg/m	
2640N-12V91	Black	20	3/4	19.0	1.31	33.2	12,500	87.5	13.78	350	1.45	2.16	5X

Construction

Core Tube: Polyamide

V91 - Methanol-washed PA11

Reinforcement: Six spiral layers of maximum tensile steel wire

Cover: V32 - Polyamide

V91 - Plasticized Nylon 12

Options

Colors:

Blue

Black

Temperature Ranage

Waterblast hoses: -40° F to $+212^{\circ}$ F (-40° C to $+100^{\circ}$ C), $+14^{\circ}$ F to

+158°F (-10°C to +70°C) for water

O&G hose: -40°F to +212°F (-40°C to +100°C)

Notes



2640N - Fittings and Accessories

Fittings

Technical details available in Section B.

Hose Part Number	2640N-08V32	2640N-12V32	2640N-12V91
Fitting Part Numbers	6AY5X-11-8C 6C95X-16-8C 6Y25X-12-8C 6Y25X-9-8C	6015X-12-12C 6AY5X-16-12C 6AY5X-16-12C-SD 6C95X-25-12C 6Y25X-16-12C	6015X-12-12C 6AY5X-16-12C 6AY5X-16-12C-SD 6C95X-25-12C 6Y25X-16-12C

Accessories

Hose Part Number	Α	ccessory Part Number	s
#	Heavy Duty Abrasion Cover	Cover Sleeves	Containment Grip
2640N-08V32	MHDC018	416-400-16	MCGHS20-30
2640N-12V32	MHDC024	220-200-22	MCGHS30-40
2640N-12V71	MHDC024	220-200-22	MCGHS30-40

2740D - Ultra High Pressure Waterblast Hose



Features and Applications

- Tested to DIN EN 1829-2
- Small diameter, flexible hoses
- Ideal for tight routing applications
- Replaces high pressure steel tubing where flexibility and long lengths are important to minimize leak points
- Ultra high pressure waterblast lances for the construction and shipbuilding industries, common industrial cleaning applications, and high pressure tube cleaning in petrochemical and power plants
- Hydrodemolition
- Compression forming process (hydroforming) as a manufacturing procedure for truck and automotive industries
- Water Jet Cutting



Markets Waterblast

Part Number	Jacket Color	Nominal I.D.			Maximum O.D.		Maximum Working Pressure		Minimum Bend Radius		Weight		Fitting Series
#			0					\sim		lbs	5 c kg		
		DN	inch	mm	inch	mm	psi	MPa	inch	mm	lbs/ft	kg/m	
2740D-025V30	Black	4	5/32	4.0	0.47	12.0	43,500	300.0	4.72	120	0.27	0.41	2X
2740D-025V35	Orange	4	5/32	4.0	0.47	12.0	43,500	300.0	4.72	120	0.27	0.41	2X
2740D-03V30	Black	5	3/16	4.8	0.52	13.3	40,600	280.0	7.87	200	0.32	0.47	2X
2740D-03V35	Orange	5	3/16	4.8	0.52	13.3	40,600	280.0	7.87	200	0.32	0.47	2X
2740D-05V32	Blue	8	5/16	7.9	0.68	17.3	36,230	250.0	7.87	200	0.54	0.80	2X / HX
2740D-05V37	Gray	8	5/16	7.9	0.68	17.3	36,230	250.0	7.87	200	0.54	0.80	2X / HX

Construction

Core Tube: Polyoxymethylene

Reinforcement: Six spiral layers of maximum tensile steel wire

Cover: Polyamide

Options

Colors:

Black

Orange

Blue

Grav

Temperature Range

+14°F to +158°F (-10°C to +70°C)

Notes



2740D - Fittings and Accessories

Fittings

Technical details available in Section B.

Hose Part Number	2740D-025V3x	2740D-03V3x	2740D-05V3x
Fitting Part Numbers	1AY2X-6-025 1Y42X-4-025 1Y42X-6-025 16Y2X-4-025	16Y2X-4-03 1922X-4-03 1AY2X-6-03 1Y42X-6-03 1Y42X-9-03	1AY2X-10-05-SA 1AY2X-8-05-SA 1Y42X-6-05 1Y42X-9-05 6Y4HX-9-5C-XLT

Accessories

Hose Part Number			Accessory Pa	rt Numbers			
#	Heavy Duty Abrasion Cover	Cover Sleeves	Containment Grip	Bend Stiffener	Pressure Containment Shield and Sleeves		
2740D-025V3x	MHDC010 MHDC011	508-J-500-10	MCGHS10-15	N/A	N/A	N/A	
2740D-03V3x	MHDC012	510-A-500-12	MCG001SS MCGHS10-15	M55STIF4 M55STIF6	MHBS012	412-400	
2740D-05V3x	MHDC014	412-400	MCG001SS MCGHS15-20	N/A	MHBS016	416-400-16	

2741D - Ultra High Pressure Waterblast Hose



Features and Applications

- For very high pressure applications with working pressures up to 36,230 psi for the construction and shipbuilding industries.
- Dual outer cover for increased hose protection and easy identification of cover damage



Markets

Waterblast

Part Number	Jacket Color	Nominal I.D.		Maximum O.D.		Maximum Working Pressure		Minimum Bend Radius		Wei	Fitting Series		
#			0		0		($\mathcal{A}_{\mathbf{k}}$		5 c kg	
		DN	inch	mm	inch	mm	psi	MPa	inch	mm	lbs/ft	kg/m	
2741D-05V34/10	Black	8	5/16	7.9	0.84	21.2	36,230	250.0	7.87	200	0.64	0.95	2X

Construction

Core Tube: Polyoxymethylene

Reinforcement: Six spiral layers of maximum tensile steel wire Cover: Polyamide inner cover / Polyurethane outer cover

Options

Colors:

Black

Temperature Range

+14°F to +158°F (-10°C to +70°C)

Notes



В

2741D - Fittings and Accessories

Fittings

Technical details available in Section B.

Hose Part Number	2741D-05V34/10
Fitting Part Numbers	1AY2X-10-05-SA 1AY2X-8-05-SA 1Y42X-6-05 1Y42X-9-05

Accessories

2840D - Ultra High Pressure Waterblast Hose



Features and Applications

- Ultra high pressure waterblast hose
- Compression forming process (hydroforming)
- Water Jet Cutting



Markets

Waterblast

Part Number	Jacket Color		Nominal I.D.			Maximum O.D.		Maximum Working Pressure		mum nd lius	Weight		Fitting Series
#			0		\bigcirc				<i>₹</i>		lbs	5 C kg	
		DN	inch	mm	inch	mm	psi	MPa	inch	mm	lbs/ft	kg/m	
2840D-03V34	Red	5	3/16	4.8	0.59	15.0	58,000	400.0	7.87	200	0.43	0.63	2X
2840D-05V32	Blue	8	5/16	7.9	0.77	19.6	43,500	300.0	9.84	250	0.72	1.07	2X
2840D-05V35	Orange	8	5/16	7.9	0.77	19.6	43,500	300.0	9.84	250	0.72	1.07	2X
2840D-08V30	Black	12	1/2	12.7	1.77	29.9	36,250	250.0	13.78	350	1.68	2.50	WX
2840D-08V37	Gray	12	1/2	12.7	1.77	29.9	36,250	250.0	13.78	350	1.68	2.50	WX

Construction

Core Tube: Polyoxymethylene

Reinforcement: Eight spiral layers of maximum tensile steel

Cover: Polyamide

Options

Colors: Red

Blue

Orange

Black Gray

Temperature Range

Temperature Range: +14°F to +158°F (-10°C to +70°C)

Notes



^{*}Assemblies made with this hose require a burst shield.

2840D - Fittings and Accessories

Fittings

Technical details available in Section B.

Hose Part Number	2840D-03V34	2840D-05V3x	2840D-08V3x
Fitting Part Numbers	1AY2X-6-03-SA 1Y42X-6-03 1Y42X-9-03	1AY2X-10-05-SA 1AY2X-8-05-SA 1Y42X-6-05 1Y42X-9-05	6Y4WX-16-8C

Accessories

Hose Part Number		Accessory Part Numbers										
#	Heavy Duty Abrasion Cover Sleeves Containment Grip Bend Restrictor Stiffener Pressure Containment Shield and Sleeves											
2840D-03V34	MHDC014	412-400	MCGHS10-15 MBR014-B		M55STIF4 M55STIF6	MHBS012	412-400					
2840D-05V3x	MHDC016	216-200-18	MCGHS15-20	N/A	N/A	MHBS016	416-400-16					

2841D - Ultra High Pressure Waterblast Hose

Features and Applications

■ Ultra high pressure hose with working pressures up to 43,500 psi for the construction and shipbuilding industries





Markets

Waterblast

Part Number	Jacket Color	Nominal I.D.		Maximum Wo		Maxi Wor Pres	king	ig Bend		nd Weight		Fitting Series	
#			0		0	\bigcirc	(\$	9	lbs	5 c [kg]	
		DN	inch	mm	inch	mm	psi	MPa	inch	mm	lbs/ft	kg/m	
2841D-05V34/15	Orange	8	5/16	7.9	0.93	23.5	43,500	300.0	9.84	250	0.83	1.23	2X

Construction

Core Tube: Polyoxymethylene

Reinforcement: Eight spiral layers of maximum tensile steel

Cover: Polyamide inner cover / Polyurethane outer cover

Options

Colors: Orange

Temperature Range

Temperature Range: +14°F to +158°F (-10°C to +70°C)

Notes



В

2841D - Fittings and Accessories

Fittings

Technical details available in Section B.

Hose Part Number	2841D-05V34/15
Fitting Part Numbers	1AY2X-10-05-SA 1AY2X-8-05-SA 1Y42X-6-05 1Y42X-9-05

Accessories

2849D - Ultra High Pressure Waterblast Hose



Features and Applications

- Ultra-high pressure service for water jet cutting equipment with water only or with abrasive additives
- Replaces steel pipe where flexibility is important
- Compression forming (hydroforming)



Markets

Waterblast

Part Number	Jacket Color	Nominal I.D.		Maximum O.D.		Maximum Working Pressure		Minimum Bend Radius		Weight		Fitting Series	
#			0		0	\bigcirc			\$	9	lbs	5 c kg	
		DN	inch	mm	inch	mm	psi	MPa	inch	mm	lbs/ft	kg/m	
2849D-05V34	Red	8	5/16	7.9	0.77	19.6	55,000	380.0	11.02	280	0.79	1.17	2X

Construction

Core Tube: Polyoxymethylene

Reinforcement: Eight spiral layers of maximum tensile steel

wire

Cover: Polyamide

Options

Colors: Red

Temperature Range

Temperature Range: +14°F to +158°F (-10°C to +70°C)

Notes



В

2849D - Fittings and Accessories

Fittings

Technical details available in Section B.

Hose Part Number	2849D-05V34
Fitting Part Numbers	1AY2X-10-05-SA 1AY2X-8-05-SA 1Y42X-6-05 1Y42X-9-05

Accessories

57CR "Sea Wolf" - High Collapse Resistant Hose



Features and Applications

- Ulta-high abrasion resistant
- Suitable for marine (salt water) environment
- ISO 13628-5 "Specification for Subsea Production Control Umbilicals", Section 7.9 Hose construction
- Smooth bore for improved flow rate and low pressure drop
- Ideal solution for subsea hydraulic lines that are not under constant system pressure.
- Hose is not recommended for high pressure pneumatic service applications



Markets

Oil & Gas

Part Number	Jacket Color	Nominal I.D.			Waximum Wor		mum king sure	ting Bend		Weight		Fitting Series	
#			0		(\bigcirc			\$	9	lbs	5 c kg	
		DN	inch	mm	inch	mm	psi	MPa	inch	mm	lbs/ft	kg/m	
57CR-8-BLU	Blue	12	1/2	12.7	1.18	30.0	5,000	34.5	6.25	159	0.63	0.94	CR
57CR-8-YEL	Yellow	12	1/2	12.7	1.18	30.0	5,000	34.5	6.25	159	0.63	0.94	CR
57CR-16-BLU	Blue	25	1	25.4	2.00	50.8	5,000	34.5	10.75	273	1.46	2.17	CR
57CR-16-YEL	Yellow	25	1	25.4	2.00	50.8	5,000	34.5	10.75	273	1.46	2.17	CR

Construction

Core Tube: Polyamide with stainless steel helix support Reinforcement: High tensile strength aramid fiber Cover: Polyurethane

Options



Yellow

Temperature Range

-40°F to +140°F (-40°C to +60°C) for petroleum, synthetic hydraulic oils, waer and water-based hydraulic fluid

Notes



В

57CR "Sea Wolf" - Fittings and Accessories

Fittings

Technical details available in Section B.

Hose Part Number	57CR-8-BLU	57CR-16-BLU	57CR-8-YEL	57CR-16-YEL
Fitting Part Numbers	606CR-8-8C	606CR-8-8C	606CR-16-16C	606CR-16-16C

Accessories



HP - High Pressure Hose HP8 - High Pressure Non-Conductive Hose



Features and Applications

- Meets or exceeds SAE J517 for less than 50 microamps leakage under 75000 volts per foot
- Specially formulated thermoplastic elastomer core tube
- For use in high pressure hydraulic and pneumatic applications and can be used with lubricating oils
- Not recommended for water blast applications or for use in static discharge applications (i.e., airless paint spray)
- Non-conductive version (HP8) used in aerial lift equipment.
- High pressure tools
- Rigging jacks
- Test apparatus
- Oilfield pressure control devices
- Offshore oil applications



\ Markets

- Oil & Gas
- Hydraulic

Part Number	Jacket Color		Nominal I.D.		Maximum 0.D.		Maximum Working Pressure		Minimum Bend Radius		Weight		Fitting Series
#			0		(\odot			7	9	lbs	5 c [kg]	
		DN	inch	mm	inch	mm	psi	MPa	inch	mm	lbs/ft	kg/m	
HP-3	Blue	5	3/16	4.8	0.51	13.0	10,000	69.0	1.50	38	0.09	0.13	HP*
HP-4	Blue	6	1/4	6.4	0.58	14.7	10,000	69.0	2.50	64	0.11	0.16	HP*
HP-6	Blue	10	3/8	9.5	0.73	18.5	8,000	55.2	3.00	76	0.16	0.23	HP*
HP8-3	Orange	5	3/16	4.8	0.51	13.0	10,000	69.0	1.50	38	0.09	0.13	HP*
HP8-4	Orange	6	1/4	6.4	0.58	14.7	10,000	69.0	2.50	64	0.11	0.16	HP*
HP8-6	Orange	10	3/8	9.5	0.73	18.5	8,000	55.2	3.00	76	0.16	0.23	HP*

Construction

Core Tube: Specially formulated thermoplastic elastomer Reinforcement: High tensile strength aramid fiber

Cover: HP- perforated elastomeric cover HP8- non-perforated elastomeric cover

Options

Colors:

Blue



Temperature Range

-40°F to +150°F (-40°C to +66°C) for petroleum, synthetic or water-based hydraulic fluids, pneumatic and gas service, and with some solvents and chemicals

Notes

Assembly working pressure is dependent on the lowest rated component. Therefore, if fittings have a lower pressure rating than the hose, the working pressure of the fittings is the working pressure of the assembly.

The above hoses are not intended for use in static discharge applications (i.e., airless paint spray).

*For Parkrimp crimpers, refer to the crimp instructions in CAT 4460.



HP / HP8 - Fittings and Accessories

Fittings

Technical details available in Section B.

Hose Part Number	HP-3	HP-4	HP-6	HP8-3	HP8-4	HP8-6
Fitting Part Numbers	101HP-2-3 101HP-4-3 101HP-6-3 106HP-4-3	101HP-2-4 101HP-4-4 101HP-6-4 106HP-4-4 106HP-4-4C 106HP-6-4	101HP-4-6 101HP-6-6 101HP-8-6 106HP-8-6C 106HP-6-6 106HP-6-6C	101HP-2-3 101HP-4-3 101HP-6-3 106HP-4-3	101HP-2-4 101HP-4-3 101HP-4-4 101HP-6-4 101HP-6-4C 106HP-4-4 106HP-6-4	101HP-4-6 101HP-6-6 101HP-8-6 106HP-6-6

Accessories

Hose Part Number	Accessory Part Numbers
#	High Pressure Guard Kit
HP-3	HPG3-12K HPG3-23K
HP-4	HPG4-12K HPG4-23K
HP-6	HPG6-12K HPG6-23K
HP8-3	HPG3-12K-ORG HPG3-23K-ORG
HP8-4	HPG4-12K-ORG HPG4-23K-ORG
HP8-6	HPG6-12K-ORG HPG6-23K-ORG

Black Eagle- 1-1/2" Oilfield Service Hose



Features and Applications

- Up to 30% weight reduction in comparison to R13 rubber hoses - more than 70% in comparison to flexible pipe
- Lower bend radius when compared to composite hose
- Compact design smaller O.D. than flexible pipe
- ColorGard[™], an extra thick dual color Polyurethane sheath
- Long continuous lengths up to 1,000m without splicing (depending on hose type)
- Inner core has superior chemical resistance
- DNV Type Approval P 14038 acc. to API 7K and API 17J
- For oilfield services such as: cementing, water and gas injection hose, acidizing, mud circulation



Markets

Oil & Gas

Part Number	Jacket Color	Nominal I.D.		Maximum 0.D.		Maximum Working Pressure		Minimum Bend Radius		Weight		Fitting Series	
#			0		\odot				\$	9	lbs	5 C [kg]	
		DN	inch	mm	inch	mm	psi	MPa	inch	mm	lbs/ft	kg/m	
2640N-24V80	Black	40	1-1/2	38.1	2.78	70.5	10,000	69.0	19.69	500	4.84	7.20	5X
2640N-24V80-15K	Black	40	1-1/2	38.1	2.60	66.0	15,000	103.5	19.69	500	4.37	6.50	5X

Construction

Core Tube: Polyamide 11, methanol washed Reinforcement: 6 layers of high tensile steel wire Cover: Extra thick dual layer polyurethane

Options

Colors: ■ Black w/ ColorGardTM red inner sheath

Temperature Range

 -40° F to $+158^{\circ}$ F (-40° C to $+70^{\circ}$ C), 15K hose can be used intermittently at +212°F (+100°C)

Notes



В

Black Eagle - Fittings and Accessories

Fittings

Technical details available in Section B.

Hose Part Number	2640N-24V80	2640N-24V80-15K
Fitting Part Numbers	6015X-32-24-TC 6HE5X-32-24-FLATTC 6HE5X-32-24-SEGTC 6HN5X-32-24-TC	1HN5X-32-24C0SK 1HE5X-32-24C0SK 1HE5X-32-24C0SK-FLAT 1HE5X-32-24C0SK-SEG

Accessories

Hose Part Number	Accessory Part Numbers						
#	Containment Grip	Heat Shrink					
2640N-24V80	MCGHS3295-SS	HDT4500-48A					
2640N-24V80-15K	N/A	N/A					

Black Eagle- 2" Oilfield Service Hose



Features

- Up to 30% weight reduction in comparison to R13 rubber hoses - more than 70% in comparison to flexible pipe
- Lower bend radius when compared to composite hose
- Compact design smaller O.D. than flexible pipe
- ColorGardTM, an extra thick dual color Polyurethane sheath
- Long continuous lengths up to 1,000m without splicing (depending on hose type)
- Inner core has superior chemical resistance
- DNV Type Approval P 14038 acc. to API 7K and API 17J
- For oilfield services such as: cementing, water and gas injection hose, acidizing, mud circulation



Markets

Oil & Gas

Part Number	Jacket Color	Nominal I.D.		Maximum 0.D.		Maximum Working Pressure		Minimum Bend Radius		Weight		Fitting Series	
#		0		\bigcirc				\sim		lbs	5 c [kg]		
		DN	inch	mm	inch	mm	psi	MPa	inch	mm	lbs/ft	kg/m	
2448N-32V80	Black	50	2	50.8	3.17	80.5	5,000	34.5	500.00	20	8.50	5.71	5X
2580N-32V80	Black	50	2	50.8	3.33	84.5	10,000	69.0	800.00	32	9.40	6.32	5X
2648N-32V80	Black	50	2	50.8	3.39	86.0	15,000	103.5	800.00	31	12.10	8.13	CX

Construction

Core Tube: Polyamide 11, methanol washed

Reinforcement:

2448N - 4 spiral layers of high tensile steel wire

2580N - 4 spiral layers and 2 open spiral layers high tensile

steel wire

2648N - 6 spiral layers of high tensile steel wire Cover: Extra thick dual layer polyurethane

Options

Colors: ■ Black w/ ColorGardTM red inner sheath

Temperature Range

-40°F to +158°F (-40°C to +70°C)

Notes



В

Black Eagle - Fittings and Accessories

Fittings

Technical details available in Section B.

Hose Part Number	2448N-32V80	2580N-32V80	2648N-32V80
Fitting Part Numbers	6015X-32-32-TC 6HE5X-32-32-FLATTC 6HN5X-32-32-TC 6HE5X-32-32-SEGTC 6HB5X-32-32-TC-FLG 6HB5X-32-32-TC 6HB5X-32-32-TC 6HB5X-32-32C-TC-FLG-10K 6HB5X-32-32C-TC-10K 6HB5X-41-32-TC 6HB5X-41-32-TC	6015X-32-32-TC 6HE5X-32-32-FLATTC 6HN5X-32-32-TC 6HE5X-32-32-SEGTC 6HB5X-32-32-TC-FLG 6HB5X-32-32-TC 6HB5X-32-32C-TC-FLG-10K 6HB5X-32-32C-TC-10K 6HB5X-41-32-TC 6HB5X-41-32-TC	1HECX-32-32-FLAT

Accessories

Hose Part Number	Accessory Part Numbers					
#	Containment Grip	Heat Shrink				
2448N-32V80	MCGHS3295-SS	HDT4500-48A				
2580N-32V80	MCGHS3295-SS	HDT4500-48A				
2648N-32V80	N/A	N/A				

Black Eagle- 3" Oilfield Service Hose



Features

- Up to 30% weight reduction in comparison to R13 rubber hoses more than 70% in comparison to flexible pipe
- Lower bend radius when compared to composite hose
- Compact design smaller O.D. than flexible pipe
- ColorGard[™], an extra thick dual color Polyurethane sheath
- Long continuous lengths up to 1,000m without splicing (depending on hose type)
- Inner core has superior chemical resistance
- DNV Type Approval P 14038 acc. to API 7K and API 17J
- For oilfield services such as: cementing, water and gas injection hose, acidizing, mud circulation



Markets

Oil & Gas

Part Number	Jacket Color	Nominal I.D.		Maximum W		Wor	mum king sure	Minimum Bend Radius		Weight		Fitting Series	
#			0		(\bigcirc			5	9	lbs	5 c	
		DN	inch	mm	inch	mm	psi	MPa	inch	mm	lbs/ft	kg/m	
2240N-48V80	Black	78	3	76.0	4.49	114.0	5,000	34.5	39.93	1000	7.73	11.50	TX
2440N-48V80	Black	78	3	76.0	4.80	122.0	10,000	69.0	43.31	1100	12.57	18.70	LX
2640N-48V80	Black	78	3	76.0	4.49	130.5	15,000	103.5	47.30	1200	18.48	27.50	5X

Construction

Core Tube: Polyamide 11, methanol washed

Reinforcement:

2240N - 2 spiral layers of high tensile steel wire 2440N - 4 spiral layers high tensile steel wire 2640N - 6 spiral layers of high tensile steel wire Cover: Extra thick dual layer polyurethane

Options

Colors: ■ Black w/ ColorGardTM red inner sheath

Temperature Range

-40°F to +158°F (-40°C to +70°C), 2240N and 2440N can be used intermittently at +212°F (+100°C)

Notes

Assembly working pressure is dependent on the lowest rated component. Therefore, if fittings have a lower pressure rating than the hose, the working pressure of the fittings is the working pressure of the assembly.



В

Black Eagle - Fittings and Accessories

Fittings

Technical details available in Section B.

Hose Part Number	2240N-48V80	2440N-48V80	2640N-48V80
Fitting Part Numbers	1HETX-48-48 1HETX-48-48-FLAT 1HNTX-48-48	1HELX-48-48 1HELX-48-48-FLAT 1HNLX-48-48	1HE5X-48-48 1HE5X-48-48-FLAT 1HN5X-48-48

Accessories

Technical details available in Section E.



Black Eagle Light - Cementing Hose



Features

- Abrasive applications, such as cementing
- Signifantly higher abrasion resistance than common elastomer materials — longer service life and less contamination in cement slurry
- Easy visualization of core tube erosion— more efficient product inspection and reduced unscheduled downtime
- Lighter weight and smaller O.D. than common 4-layer constructions — faster and easier deployment



Markets

Oil & Gas

Part Number	Jacket Color	Nominal I.D.			Maxi 0.	mum D.	Maximum Working Pressure		Minimum Bend Radius		Weight		Fitting Series
#			0		(\bigcirc			<i>₹</i>		lbs	5 c [kg]	
		DN	inch	mm	inch	mm	psi	MPa	inch	mm	lbs/ft	kg/m	
2240N-32V10	Black	50	2	50.8	2.70	68.5	3,000	20.7	19.69	500	2.96	4.40	S6*
2248N-32V10	Black	50	2	50.8	2.70	68.5	5,000	34.5	19.69	500	2.96	4.40	S6*

Construction

Core Tube: Polyamide 11, two-layer core tube

Reinforcement: Two closed spiral layers of high tensile

steel wire

Cover: Polyurethane

Options

Colors:

Black

Temperature Range

-40°F to +212°F (-40°C to +100°C)

Notes

Assembly working pressure is dependent on the lowest rated component. Therefore, if fittings have a lower pressure rating than the hose, the working pressure of the fittings is the working pressure of the assembly.

*Fittings are not for use subsea. For subsea applications, see traditional Black Eagle product series.



Black Eagle Light - Fittings and Accessories

Fittings

Technical details available in Section B.

Hose Part Number	2240N-32V10	2448N-32V10					
Fitting Part Numbers	Offshore*: 1HES6-32-32-FLAT-SC 1HNS6-32-32-SC	Offshore*: 1HES6-32-32-FLAT-SC 1HNS6-32-32-SC					
	Onshore: 1HES6-32-32-FLAT 1HNS6-32-32	Onshore: 1HES6-32-32-FLAT 1HNS6-32-32					

^{*}Fittings are not for use subsea. For subsea applications, see traditional Black Eagle product series.

Accessories

Technical details available in Section E.

Golden Eagle- Chemical Injection and Acidizing Hose



Features and Applications

- ColorGardTM, an extra thick dual color Polyurethane sheath
- Long continuous lengths up to 1,000m without splicing (depending on hose type)
- Inner core has superior chemical resistance
- Compact design smaller OD than flexible pipe
- Up to 30% weight reduction in comparison to R13 rubber hoses more than 70% in comparison to flexible pipe
- Lower bend radius when compared to composite hose
- DNV Type Approval P 14038 acc. to API 7K and API 17J
- Water and chemical injection hose
- Acidizing
- Not recommended for gas applications



Markets

Oil & Gas

Part Number	Jacket Color	Nominal I.D.		Maximum O.D.		Maximum Working Pressure		Minimum Bend Radius		Weight		Fitting Series	
#		0		0					\mathcal{A}		5 c		
		DN	inch	mm	inch	mm	psi	MPa	inch	mm	lbs/ft	kg/m	
2640M-24V88	Gold	40	1-1/2	38.1	2.78	70.5	10,000	69.0	19.69	500	4.84	7.20	5X
2448M-32V88	Gold	50	2	50.8	3.17	80.5	5,000	34.5	19.69	500	5.71	8.50	5X
2580M-32V88	Gold	50	2	50.8	3.33	84.5	10,000	69.0	31.50	800	6.32	9.40	5X

Construction

Core Tube: Polyamide 11, methanol washed

Reinforcement:

2640M - 6 spiral layers of high tensile steel wire

2448M- 4 spiral layers high tensile steel wire

2580M - 4 spiral layers and two open spiral layers of high ten-

sile steel wire

Cover: Extra thick dual layer polyurethane

Options

Colors: ■ Gold w/ ColorGardTM red inner sheath

Temperature Range

-40°F to +158°F (-40°C to +70°C); 2640M short term up to +212°F (+100°C)

Notes

Assembly working pressure is dependent on the lowest rated component. Therefore, if fittings have a lower pressure rating than the hose, the working pressure of the fittings is the working pressure of the assembly.



В

Golden Eagle - Fittings and Accessories

Fittings

Technical details available in Section B.

Hose Part Number	2640M-24V88	2448M-32V88	2580M-32V88
Fitting Part Numbers	1HE5X-32-24C0SK 1HN5X-32-24C0SK	6015X-32-32-TC 6HE5X-32-32-FLATTC 6HN5X-32-32-TC 6HE5X-32-32-SEGTC 6HB5X-32-32-TC-FLG 6HB5X-32-32-TC 6HB5X-32-32C-TC-FLG-10K 6HB5X-32-32C-TC-10K 6HB5X-41-32-TC 6HB5X-41-32-TC	6015X-32-32-TC 6HE5X-32-32-FLATTC 6HN5X-32-32-TC 6HE5X-32-32-TC-FLG 6HB5X-32-32-TC-FLG 6HB5X-32-32-TC 6HB5X-32-32C-TC-FLG-10K 6HB5X-32-32C-TC-10K 6HB5X-41-32-TC-6HB5X-41-32-TC

Accessories

Technical details available in Section E.

Hose Part Number	Accessory Part Numbers					
#	Containment Grip	Heat Shrink				
2448M-32V88	MCGHS3295-SS	HDT4500-48A				

ChemJec- Long-length Umbilical Hose



Features

- Excellent chemical resistance
- Medium pressure, high temperature, low volumetric expansion hose
- Withstands high pressure cycles with no signs of stress cracking
- Meets or exceeds the performance requirements of ISO
- Long-length subsea umbilical hose



Markets

Oil & Gas

Part Number	Jacket Color	Nominal I.D.		Maximum Maxii O.D. Maxii Press		king Bend		Weight		Fitting Series			
		DN	inch	mm	inch	mm	psi	MPa	inch	mm	lbs/ft	kg/m	
2440M-04V38	Gold	6	1/4	6.4	0.52	13.1	12,500	87.5	5.90	150	0.21	0.31	8X
2440M-05V38	Gold	8	5/16	7.9	0.64	16.2	10,000	69.0	6.88	175	0.33	0.49	LX
2440M-06V38	Gold	10	3/8	9.5	0.77	19.5	10,000	69.0	7.48	190	0.49	0.73	LX
2440M-08V38	Gold	12	1/2	12.7	0.89	22.7	10,000	69.0	7.87	200	0.63	0.94	LX
2448M-04V38	Gold	6	1/4	6.4	0.54	13.7	15,000	103.4	9.06	230	0.26	0.38	UX
2448M-05V38	Gold	8	5/16	7.9	0.64	16.3	15,000	103.4	9.06	230	0.35	0.52	LX
2448M-06V38	Gold	10	3/8	9.5	0.79	20.1	15,000	103.4	7.87	200	0.56	0.83	UX
2640M-08V38	Gold	12	1/2	12.7	0.97	24.7	15,000	103.4	11.42	290	0.90	1.34	5X

Construction

Core Tube: Proprietary Specification, based on fluoropolymer technology

Reinforcement:

2440M / 2448M - 4 closed spiral layers of high tensile steel wire 2640M - 6 closed spiral layers of high tensile steel wire

Cover: Polyamide 12

Options

Colors: Oold

Temperature Range

-40°F to +212°F (-40°C to +100°C)

Notes

Assembly working pressure is dependent on the lowest rated component. Therefore, if fittings have a lower pressure rating than the hose, the working pressure of the fittings is the working pressure of the assembly.



В

ChemJec - Fittings and Accessories

Fittings

Technical details available in Section B.

Hose Part Number	2440M-04V38	2440M-05V38	2440M-06V38	2440M-08V38
Fitting Part Numbers	1018X-4-04C 1018X-6-04C 1028X-4-04C 1068X-4-04C 1068X-6-04C 1AY8X-6-04C	6AYLX-8-5C-M-SUBSEA 106LX-6-05C 1AYLX-8-05C	6AYLX-8-6C-SUBSEA 106LX-6-06C-M-SUBSEA 106LX-8-06C-M-SUBSEA	106LX-8-08C-M-SUBSEA 1Y2LX-12-08C-M-SUBSEA
	2448M-04V38	2448M-05V38	2448M-06V38	2640M-08V38
	101UX-6-04C 1AYUX-6-04C 1Y2UX-6-04C	6AYLX-8-5C-M-SUBSEA	1AYUX-8-06C 106UX-6-06C 1Y2UX-9-06C	1AY5X-11-08C-M-SUBSEA 1Y25X-12-08C-M-SUBSEA 1Y25X-9-08C-M-SUBSEA

Accessories

Technical details available in Section E.



Fittings

-Parker

Permanent / Crimp Fittings Field Attachable / Reusable Polyflex-Lok



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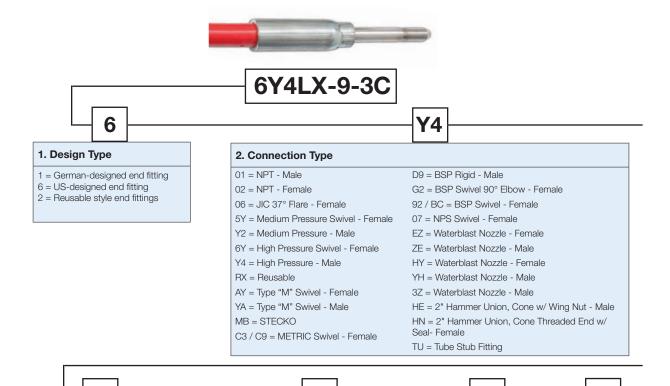
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Fitting Part Number Nomenclature



3. Hose Series Designation

- 2X = 2840D, 2740D and 2640D Series
- 3X = 2022N Series Hoses
- 5X = All 2640 Series Hoses
- 8X = All 2244 and 2380 Series Hoses
- 9X = All 2300 Series Hoses
- AX = 2240D-025V34
- BL = 2580N Series Hoses
- BS = 2388N Series Hoses
- CR = 57CR Series Hoses
- E2 = 2390N Series Hoses
- E3 = 2390N Series Hoses
- FX = 2020N Series Hoses
- HP = HP/HP8 Series Hoses
- HX = All 2740 Series Hoses
- KY = 2380N Series Hoses
- LX = All 2440 Series Hoses
- NX = 2240D-04, 2300 Series Hoses
- PL = 2240D Series Hoses
- RX = 2020N-02V30 (Reusable Fittings)
- TX = 2240D/2248D Series Hoses
- UX = 2448M Series Hoses
- WX = All 2840 Series Hoses

4. Connection Size

JIC / Type M 1 = 1/4" - 28 UNF

- = 5/16" 24 UNF
- 3 = 3/8" 24 UNF
- 4 = 7/16" 20 UNF
- = 1/2" 20 UNF
- 6 = 9/16" 18 UNF
- 7 = 5/8" 18 UNF
- = 3/4" 16 UNF
- 10 = 7/8" 14 UNF
- 11 = 1" 12 UNF
- 12 = 1-1/16" 12 UNF
- 13 = 1-1/8" 12 UNF
- 15 = 1-1/4" 12 UNF
- 16 = 1-5/16" 12 UNF
- 17 = 1-3/8" 12 UNF
- 19 = 1-1/2" 12 UNF
- 20 = 1-5/8" 12 UNF
- **BSP**
- 2 = G 1/8"
- 4 = G 1/4"
- 6 = G 3/8"8 = G 1/2"

NPT

- 1 = 1/16 27
- = 1/8 27
- 4 = 1/4 18
- 6 = 3/8 18
- 8 = 1/2 14
- 12 = 3/4 14
- $16 = 1-11 \frac{1}{2}$
- 20 = 1.1/4 11.1/2
- 24 = 1 1/-11 1/2
- $32 = 2-11 \frac{1}{2}$

MP & HP Tube

- Sized by nominal tube
- O.D.
- 4 = 1/4" 28 LH
- 6 = 3/8" 24 LH
- 9 = 9/16" 18 LH
- 12 = 3/4" 16 LH
- 16 = 1" 14 LH

6. Hose Size

- -2 = 1/8" hose
- -2A = 5/32" hose
- -3 = 3/16" hose
- -4 = 1/4" hose
- -5 = 5/16" hose
- -6 = 3/8" hose
- -8 = 1/2" hose
- -10 = 5/8" hose
- -12 = 3/4" hose
- -16 = 1" hose
- -24 = 1-1/2" hose
- -32 = 2" hose

1. Fitting Material

C = Stainless steel Blank = Carbon steel

Any other materials will be noted in the Fitting section

Parker Hannifin Corporation | Parflex Division | Stafford, TX | parker.com/pfd

Fitting Designation Descriptions

Fitting	Fitting Description	Fitting Designation
	National Pipe Tapered (NPT) - Male	01
	National Pipe Tapered (NPT) - Female	02
	JIC 37° Flare - Female	06
	Type "M" Swivel - Female	AY
	BSP Swivel - Female	92
	Metric Swivel - Female	C3 or C9
	BSP Rigid - Male	D9
	Stecko - Male	МВ



Fitting Designation Descriptions

Fitting	Fitting Description	Fitting Designation
	Tube Stub Fitting	TU
	Medium Pressure Swivel - Female	5Y
	High Pressure Female Swivel	6Y
	Hammer Union (Male) Cone with Wing Nut	HE
	Hammer Union (Female) Cone Threaded End with Seal	HN
	Medium Pressure Tube Nipple	Y2
	High Pressure Tube Nipple	Y4
	Waterblast Nozzle - Female	EZ

Fitting Designation Descriptions

Fitting	Fitting Description	Fitting Designation
	Waterblast Nozzle - Male	ZE
	Waterblast Nozzle - Female	НҮ
	Waterblast Nozzle - Male	YH



Ε

How to Read the Fittings Section

1	2		3		4	5		6		
Part Number	Thread Size				3 toff vance	He H and		Max. Working Pressure		
#							\geq			
		inch	mm	inch	mm	inch	mm	psi	MPa	
6AYHX-6-3C	9/16" - 18	3.20	81	1.40	36	0.68	17	40,600	280.0	

1 Part Number

The fitting part number gives the connection type and size of the fitting, as well as, the hose series and hose size the fitting is intended for (see part number breakdown on pg. B-2).

2 Thread Size

UNF threads will contain a number indicating the nominal diameter of the thread, followed by the pitch measured in threads per inch. Any other thread form will be identified in the thread size measurement (i.e. NPT, BSP, Metric, etc.).

3 Overall Fitting Length

This measurement indicates the total length of fitting from end to end.

4 Cutoff Allowance

End fitting dimension from the seating surface to the fitting hose stop. This dimension added to the length of the cut hose will yield the over-all length(OAL) of the hose assembly.

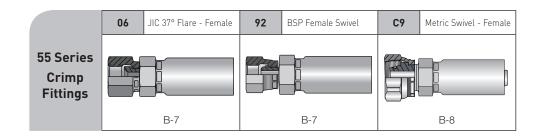
5 Hex Size

This is the dimension of the hex across opposing flats.

6 Maximum Working Pressure

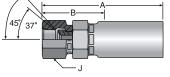
Maximum pressure at which the fitting should be operated. Most fittings are rated for the full working pressure of the hose. Fittings with maximum pressures that differ from the hose working pressure will be called out.

Note: The working pressure of a hose assembly is dependent upon the lowest rated component of that assembly. For example, if a hose is rated to 40K psi, but the fittings are rated to 15K psi, the working pressure of that assembly is 15K psi.



10655- JIC 37° Female Flare

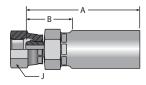
Material: Nipple - Stainless steel Shell - Stainless steel Nut - Stainless steel



Part Number	Nominal I.D.				Thread Size	Ove	A erall egth	E Cut Allow	off	He	J ex	Maximum Working Pressure	
#	0		<u> </u>					\supset	(
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
10655-4-04C	6	-04	1/4	6.4	7/16" - 20	2.56	65	1.30	33	0.670	17	10,000	69
10655-6-04C	6	-04	1/4	6.4	9/16" - 18	2.64	67	1.38	35	0.670	17	10,000	69
10655-6-06C	10	-06	3/8	9.5	9/16" - 18	2.72	69	1.30	33	0.750	19	10,000	69
10655-6-08C	12	-08	1/2	12.7	9/16" - 18	2.99	76	1.38	35	0.870	22	10,000	69
10655-8-08C	12	-08	1/2	12.7	3/4" - 16	3.11	79	1.54	38	0.870	22	10,000	69

19255- BSP Swivel - Female

Material: Nipple - Stainless steel Shell - Stainless steel Nut - Stainless steel



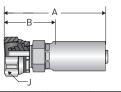
Part Number	Nominal I.D.		Thread Size	Ove Len		Cut Allow	off	He	-	Maxi Wor Press			
#	0								\supset				
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
19255-4-4C	6	-04	1/4	6.4	G 1/4" - 19	2.28	58	1.02	26	0.670	17		
19255-6-6C	10	-06	3/8	9.5	G 3/8" - 19	2.52	64	1.06	27	0.750	19		
19255-8-8C	12	-08	1/2	12.7	G 1/2" - 14	2.87	73	1.26	32	0.940	24		

^{*}Fitting is rated to the full working pressure of the hose



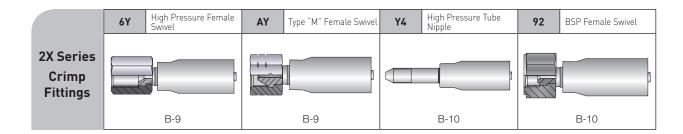
1C955- Metric Swivel - Female

Material: Nipple - Stainless steel Shell - Stainless steel Nut - Stainless steel



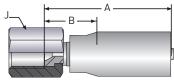
Part Number	Nominal I.D.		Thread Size	A Overall Length		B Cutoff Allowance		J Hex		Maximum Working Pressure*			
#	0								\supset				
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
1C955-8-4C	6	-04	1/4	6.4	M 16 x 1.5	2.76	70	1.50	38	0.670	17		
1C955-10-4C	6	-04	1/4	6.4	M 18 x 1.5	2.64	67	1.42	36	0.750	19		
1C955-12-4C	6	-04	1/4	6.4	M 20 x 1.5	2.52	64	1.26	32	0.750	19		
1C955-12-6C	10	-06	3/8	9.5	M 20 x 1.5	2.68	68	1.26	32	0.750	19		
1C955-16-8C	12	-08	1/2	12.7	M 24 x 1.5	3.03	77	1.42	36	0.940	24		

^{*}Fitting is rated to the full working pressure of the hose



16Y2X- High Pressure Female Swivel

Material: Nipple - Very high strength stainless steel
Shell - Zinc-plated high strength carbon steel

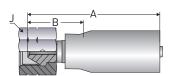


Part Number	Nominal I.D.		Thread Size	d A Overall Length			3 toff vance	J Hex		Maximum Working Pressure*			
#		(\supset		9
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
16Y2X-4-025	4	-025	5/32	4.0	9/16" - 18	2.99	76	0.90	23	0.875	22		
16Y2X-4-03	5	-03	3/16	4.8	9/16" - 18	2.99	76	0.90	23	0.875	22		

^{*}Fitting is rated to the full working pressure of the hose

1AY2X- Type "M" Female Swivel

Material: Nipple - Very high strength stainless steel
Shell - Zinc-plated high strength carbon steel



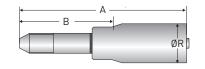
Part Number	Nominal I.D.		Thread Size	A Overall Length		B Cutoff Allowance		J Hex					
#	0								\supset				
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
1AY2X-6-025-SA	4	-025	5/32	4.0	9/16" - 18	2.40	61	0.94	24	0.875	22		
1AY2X-6-03-SA	5	-03	3/16	4.8	9/16"-18	3.58	91	1.50	38	0.875	22		
1AY2X-6-03	5	-03	3/16	4.8	9/16" - 18	3.58	91	1.50	38	0.875	22		
1AY2X-8-05-SA	8	-05	5/16	7.9	3/4"-16	3.58	91	1.50	38	1.000	25		
1AY2X-10-05-SA	8	-05	5/16	7.9	7/8"-14	3.58	91	1.50	38	1.250	32		

^{*}Fitting is rated to the full working pressure of the hose



1Y42X- High Pressure Tube Nipple

Material: Nipple - Very high strength stainless steel
Shell - Zinc-plated high strength carbon steel

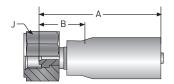


Part Number	Nominal I.D.										Thread Size	Ove	A erall igth	Cut Allow	off	Diam	-	Maxi Wor Press	king
#	0		0		0							Q	Z						
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa						
1Y42X-4-025	4	-025	5/32	4.0	1/4" - 28	3.50	88	1.97	50	0.615	16								
1Y42X-6-025	4	-025	5/32	4.0	3/8" - 24	3.90	98	2.17	55	0.615	16								
1Y42X-6-03	5	-03	3/16	4.8	3/8" - 24	4.60	116	2.28	58	0.750	19								
1Y42X-9-03	5	-03	3/16	4.8	9/16" - 18	4.60	116	2.48	63	0.750	19								
1Y42X-6-05	8	-05	5/16	7.9	3/8" - 24	4.60	116	2.48	63	0.905	23								
1Y42X-9-05	8	-05	5/16	7.9	9/16" - 18	4.90	125	2.48	63	0.905	23								

^{*}Fitting is rated to the full working pressure of the hose

1922X- BSP Female Swivel

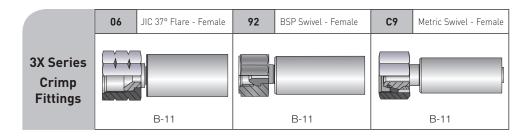
Material: Nipple - Very high strength stainless steel
Shell - Zinc-plated high strength carbon steel



Part Number	Nominal I.D.				Thread Size		A erall igth	Cut Allow	toff	He		Maximum Working Pressure*	
#	0										\supset	(7
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
1922X-4-03-SA	5 -03 3/16 4.8		G 1/4" - 19	3.11	79	1.02 26		0.875 22					

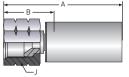
^{*}Fitting is rated to the full working pressure of the hose





1063X- JIC 37° Female Flare

Material: Nipple - Stainless steel Shell - Stainless steel Nut -Stainless steel

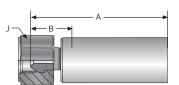


Part Number	Nominal I.D.				Thread Size	Ove	A Overall Length Al			He		Maximum Working Pressure		
#		(9								\supset			
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa	
1063X-6-06C	10	-06	3/8	9.5	9/16" - 18	2.72	69	1.30	33	0.870	22	10,000	69	
1063X-8-06C	10	-06	3/8	9.5	3/4" - 16	2.85	73	1.28	33	1.000	24	10,000	69	

1923X- BSP Female Swivel

Material: Nipple - Stainless steel Shell - Stainless steel

Stainless steel



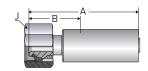
Part Number			ninal .D.		Thread Size	Ove	A erall egth	Cut Allow	toff	He	-	Maxi Wor Press	king
#		(9								\supset		2
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
1923X-8-06C	10	-06	3/8	9.5	G 1/2" - 14	2.60	66	0.87	22	1.180	30		

^{*}Fitting is rated to the full working pressure of the hose

1C93X- Metric Swivel - Female

Material: Nipple - Stainless steel Shell - Stainless steel

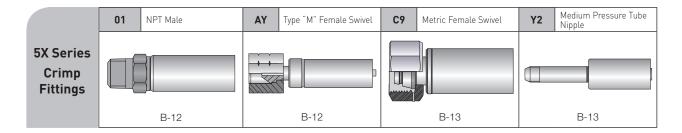
Nut -Stainless steel



Part Number			ninal D.		Thread Size		A erall gth	Cut Allow	off	He		Maxi Wor Press	
#		(9								\supset		
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
1C93X-14-06C	10	-06	3/8	9.5	M 22 x 1.5	2.95	75	1.20	30	1.180	30		
1C93X-16-06C	10	-06	3/8	9.5	M 24 x 1.5	3.50	88	1.35	34	1.180	30		

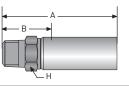
^{*}Fitting is rated to the full working pressure of the hose





6015X-NPT Male

Material: Nipple - Very high strength stainless steel Shell - Stainless steel



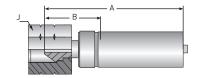
Part Number		Non I.	inal D.		Thread Size		rall gth		3 toff vance	He	ł ex	Maxi Wor Pres	
#		(9								\supset		
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
6015X-12-12C	20	-12	3/4	19.0	3/4" - 14	4.98	126	2.23	57	1.375	35	10,000	69

6AY5X- Type "M" Female Swivel

Material: Nipple - Very high strength stainless steel

SD / SUBSEA - High strength corrosion-resistant stainless steel

Shell and Nut - Stainless steel



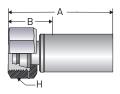
Part Number		Non I.	ninal D.		Thread Size	Ove	A erall igth	Cu	B toff vance	H	d and a second	Maxi Wor Press	king
#		(9								\supset	(
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
6AY5X-11-8C	12	-08	1/2	12.7	1" - 12	4.25	108	1.72	44	1.250	32		
6AY5X-16-12C	20	-12	3/4	19	1-5/16" - 12	4.26	108	1.52	39	1.500	38		
6AY5X-16-12C-SD	20	-12	3/4	19	1-5/16" - 12	4.26	108	1.52	39	1.500	38		
6AY5X-11-8C-SUBSEA	12	-08	1/2	12.7	1" - 12	4.22	107	1.98	50	1.250	32		
1AY5X-11-08C-M-SUBSEA	12	-08	1/2	12.7	1"-12	4.42	112	1.87	47	1.250	32		

^{*}Fitting is rated to the full working pressure of the hose

6C95X- Metric Female Swivel

Material: Nipple - Very high strength stainless steel

Shell - Stainless steel Nut - Carbon steel, zinc-plated



Part Number			ninal .D.		Thread Size	Ove	A erall igth		3 toff vance	He		Maxi Wor Pres:	king
#		(\bigcirc								\supset		
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
6C95X-16-8C	12	-08	1/2	12.7	M 24 x 1.5	3.58	91	1.45	37	1.260	32		
6C95X-25-12C	12	-08	1/2	12.7	M 36 x 2	4.37	111	1.60	41	1.810	46		

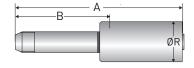
^{*}Fitting is rated to the full working pressure of the hose

6Y25X- Medium Pressure Tube Nipple

Material: Nipple - Very high strength stainless steel

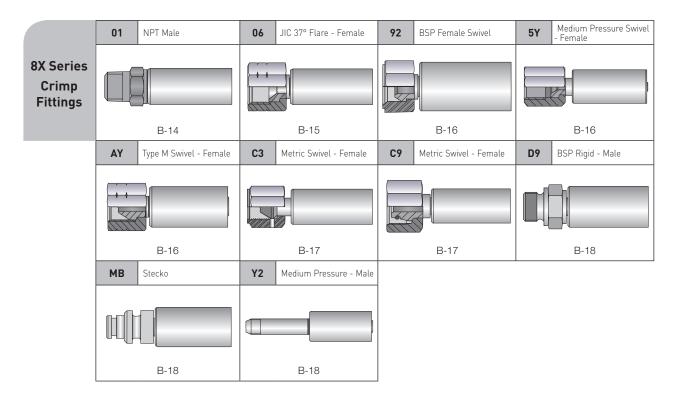
SUBSEA - High strength corrosion resistant stainless steel

Shell - Stainless steel



Part Number			ninal D.		Thread Size	-	A erall egth	Cu	B toff vance	Diam	-	Maxi Worl Pres	king
#		(9							Q	Z		7
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
6Y25X-9-8C	12	-08	1/2	12.7	9/16" - 18 LH	4.30	109	2.19	56	1.250	32	20,000	138
6Y25X-12-8C	12	-08	1/2	12.7	3/4" - 16 LH	4.20	107	2.10	53	1.250	32	20,000	138
6Y25X-16-12C	20	-12	3/4	19.0	1" - 14 LH	5.48	139	2.75	70	1.690	43	20,000	138
1Y25X-9-08C-M-SUBSEA	12	-08	1/2	12.7	9/16" - 18 LH	6.69	174	4.31	109	1.339	34	20,000	138
1Y25X-12-08C-M-SUBSEA	12	-08	1/2	12.7	3/4" - 16 LH	7.25	184	4.70	119	1.339	34	20,000	138



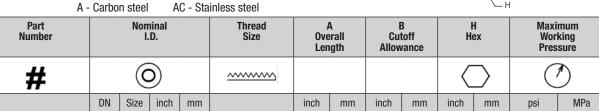


6018X-NPT Male

Material: Nipple - Very high strength stainless steel

A - Carbon steel AC - Stainless steel

Shell -Very high strength stainless steel



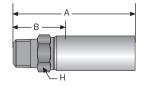
						Len	igth	Allow	ance			Pres	sure
#		(9								\supset		
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
6018X-2-2A	3	-02	1/8	3.2	1/8" - 27	1.86	47	0.76	19	0.630	16	15,000	103
6018X-2-2AC	3	-02	1/8	3.2	1/8" - 27	2.18	55	1.80	46	0.500	13	15,000	103
6018X-4-2AC	3	-02	1/8	3.2	1/4" - 18	2.44	62	1.35	34	0.620	16	15,000	103
6018X-6-4	6	-04	1/4	6.4	3/8" - 18	2.80	71	1.50	38	0.750	19	15,000	103

1018X-NPT Male

Material: Nipple - Carbon steel, zinc-plated

C - Stainless steel

Shell - Carbon steel, zinc-plated C - Stainless steel

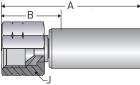


Part Number			ninal .D.		Thread Size	Ove Len	-		3 toff vance	He	-	Maxi Wor Pres	
#		(9								\supset		
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
1018X-4-04	6	-04	1/4	6.4	1/8" - 27	1.86	47	0.76	19	0.630	16	15,000	103
1018X-4-04C	6	-04	1/4	6.4	1/4" - 18	2.54	65	1.30	33	0.560	14	15,000	103
1018X-6-04	6	-04	1/4	6.4	1/8" - 27	2.18	55	1.80	46	0.500	13	15,000	103
1018X-6-04C	6	-04	1/4	6.4	1/4" - 18	2.44	62	1.35	34	0.620	16	15,000	103

6068X- JIC 37° Female Flare

Material: Nipple - Stainless steel

Shell - Stainless steel Nut - Stainless steel



Part Number			ninal D.		Thread Size		A erall egth	Cut Allow	toff	He	d and a second	Maxi Worl Pres	king
#		(9								\supset	(
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
6068X-4-2AC	3	-02	1/8	3.2	7/16" - 20	2.17	55	1.05	27	0.560	14	10,000	69

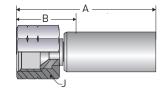
1068X- JIC 37° Female Flare

Material: Nipple - Carbon steel, zinc-plated

C - Stainless steel

SUBSEA - High strength stainless steel

Shell/Nut - Carbon steel, zinc-plated C / SUBSEA- Stainless steel



Part Number			ninal D.		Thread Size		A erall igth	Cut Allow	off	H		Maxi Worl Pres	king
#		(9								\supset		
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
1068X-4-04	6	-04	1/4	6.4	7/16" - 20	2.24	57	1.02	26	0.750	19	10,000	69
1068X-4-04C	6	-04	1/4	6.4	7/16" - 20	2.24	57	1.02	26	0.750	19	10,000	69
1068X-6-04	6	-04	1/4	6.4	9/16" - 18	2.17	55	0.94	24	0.750	19	10,000	69
1068X-6-04C	6	-04	1/4	6.4	9/16" - 18	2.17	55	0.94	24	0.750	19	10,000	69
1068X-16-16C-SUBSEA	25	-16	1	25.4	1 5/16"-12	3.80	97	1.70	44	1.610	41	10,000	69



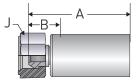
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8X Series Fittings

1928X-BSP Swivel - Female

Material: Nipple - Carbon steel, zinc-plated

Shell - Carbon steel, zinc-plated Nut - Carbon steel, zinc-plated



Part Number			ninal .D.		Thread Size	Ove	rall gth	Cut Allow	toff	He	d and a second	Maxi Wor Pres	
#		(9								\supset		
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
1928X-4-04	6	-04	1/4	6.4	G 1/4" - 19	2.20	56	0.98	25	0.750	19		

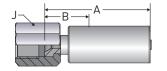
^{*}Fitting is rated to the full working pressure of the hose

65Y8X- Medium Pressure Swivel - Female

Material: Nipple - Carbon steel

Shell - Carbon steel, zinc-plated

Nut - Stainless steel



Part Number			ninal D.		Thread Size		A erall igth	Cur Allow	3 toff vance	Н	J ex	Maxi Wor Pres	king
#		(\bigcirc								\supset		9
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
65Y8X-6-4	6	-04	1/4	6.4	9/16" - 18	2.78	71	1.55	39	0.750	19	20,000	138

6AY8X- Type "M" Swivel - Female

Material: Nipple - High strength steel

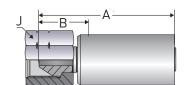
AC - Stainless steel C - High strength stainless steel

Shell - Carbon steel, zinc-plated

AC - Stainless steel C - Stainless steel

Nut - High strength steel

AC - Stainless steel C - Stainless steel



Part Number		Nominal I.D.			Thread Size	Ove	A erall egth	Cu	3 toff vance	H	J ex	Wor	mum king sure*
#	0										\supset	(7
	DN	DN Size inch mm			inch	mm	inch	mm	inch	mm	psi	MPa	
6AY8X-6-2AC	3	-02	1/8	3.2	9/16" - 18	2.32	59	1.24	31	0.680	17		
6AY8X-6-4	6 -04 1/4 6.4		9/16" - 18	2.54	65	1.30	33	0.750	19				
6AY8X-8-5C	8	-05	5/16	7.9	3/4" - 16	2.95	75	1.25	32	1.000	25		

^{*}Fitting is rated to the full working pressure of the hose



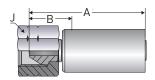
1AY8X- Type "M" Swivel - Female

Material: Nipple - Carbon steel, zinc-plated

Shell -

C - Stainless steel

Carbon steel, zinc-plate	е
C - Stainless steel	



Part Number			ninal D.		Thread Size	Ove	A erall egth	Cur Allow	-	H		Wor	mum king sure*
#	0										\supset		
	DN Size inch mm			inch	mm	inch	mm	inch	mm	psi	MPa		
1AY8X-6-04	6 -04 1/4 6.4		9/16" - 18	2.68	68	1.38	35	0.670	17				
1AY8X-6-04C	6 -04 1/4 6.4		9/16" - 18	2.68	68	1.38	35	0.670	17				

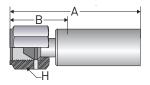
^{*}Fitting is rated to the full working pressure of the hose

1C38X- Metric Swivel - Female

Material: Nipple - High strength steel

Shell - Carbon steel, zinc-plated

Nut -Carbon steel



Part Number			ninal .D.		Thread Size	Ove	A erall egth	Cu	3 toff vance	H		Maxi Wor Press	king
#	0										\supset		
	DN Size inch mm			inch	mm	inch	mm	inch	mm	psi	MPa		
1C38X-4-4	6			M 14 x 1.5	2.45	62	1.20	30	0.750	19			

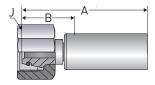
^{*}Fitting is rated to the full working pressure of the hose

1C98X- Metric Swivel - Female

Material: Nipple - High strength steel

Shell - Carbon steel, zinc-plated

Nut -Carbon steel



Part Number		Nominal I.D.			Thread Size		A erall egth		3 toff vance	He	J ex	Wor	mum king sure*
#	0										\supset		7)
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
1C98X-8-04C	6	-04	1/4	6.4	M 16 x 1.5	2.32	59	1.06	27	0.750	19		
1C98X-10-04C	6				M 18 x 1.5	2.20	56	1.30	33	0.866	22		

^{*}Fitting is rated to the full working pressure of the hose

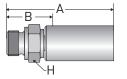


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8X Series Fittings

1D98X-BSP Rigid - Male

Material: Nipple - High strength steel
Shell - Carbon steel, zinc-plated



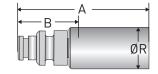
Part Number			ninal D.		Thread Size	Ove	A erall igth	Cut Allow	toff	He		Maxi Wor Press	
#	0										\supset		
	DN Size inch mm			mm		inch	mm	inch	mm	inch	mm	psi	MPa
1D98X-4-4	6	0 04 4/4 04		1/4" BSPP	2.65	67	1.39	35	0.750	19			

^{*}Fitting is rated to the full working pressure of the hose

1MB8X-Stecko - Male

Material: Nipple - High strength steel

Shell - Carbon steel, zinc-plated

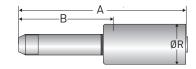


Part Number			ninal D.		Thread Size	Ove	A erall igth	Cut Allow	toff	Dian	R neter	Maxi Wor Press	king
#		0								Q	Ž		
	DN	DN Size inch mm			inch	mm	inch	mm	inch	mm	psi	MPa	
1MB8X-6-4	6 -04 1/4 6.4			2.85	72	1.58	40	0.860	22				

^{*}Fitting is rated to the full working pressure of the hose

1Y28X- Medium Pressure - Male

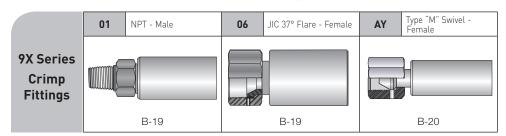
Material: Nipple - Stainless steel Shell - Stainless steel



Part Number		Nominal I.D.			Thread Size	Ove	A erall igth	Cut	3 toff vance	Dian	R neter	Maxii Worl Press	king
#	0									Q	Z		
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
1Y28X-6-04C	6			3/8"-24 LH	4.29	109	2.20	56	0.860	22	20,000	138	
1Y28X-9-04C	6			9/16"-18 LH	4.21	107	2.09	53	0.860	22	20,000	138	

^{*}Fitting is rated to the full working pressure of the hose

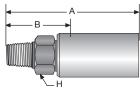




6019X-NPT Male

Material: Nipple - High strength steel

C - Stainless steel
Shell - Carbon steel
C - Stainless steel

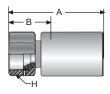


	Stallill	000 010	01								н		
Part Number			ninal .D.		Thread Size	Ove	A erall igth	Cut Allow	off	He		Wor	mum king sure
#		DN Circ isoh res									\supset		
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
6019X-4-4C	6	-04	1/4	6.4	1/4" - 18	2.38	60	1.12	28	0.630	16	15,000	103
6019X-6-6	10	-06	3/8	9.5	3/8" - 18	2.95	75	1.35	34	0.750	19	15,000	103
6019X-6-6C	10	-06	3/8	9.5	3/8" - 18	2.95	75	1.35	34	0.750	19	15,000	103
6019X-8-6	10	-06	3/8	9.5	1/2" - 14	3.16	80	1.56	40	0.870	22	15,000	103
6019X-8-6C	10	-06	3/8	9.5	1/2" - 14	3.16	80	1.56	40	0.870	22	15,000	103
6019X-8-8	12	-08	1/2	12.7	1/2" - 14	3.35	85	1.43	36	0.870	22	15,000	103
6019X-8-8C	12	-08	1/2	12.7	1/2" - 14	3.37	86	1.68	43	1.000	25	15,000	103
6019X-16-16C	25	-16	1	25.4	1" - 11 1/2	4.38	111	2.25	57	1.380	35	10,000	69

6069X- JIC 37° Female Flare

Material: Nipple - High strength stainless steel

Shell - Stainless steel Nut - Stainless steel



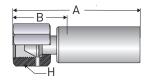
Part Number		Nominal I.D.		Thread Size	Ove Len	-	Cut Allow	off	H		Maxi Worl Pres	king	
#		0								\supset	(
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
6069X-4-4C	6	-04	1/4	6.4	9/16" - 18	2.36	60	1.10	28	0.680	17	10,000	69
6069X-6-4C	6	-04	1/4	6.4	7/16" - 20	2.24	57	0.98	25	0.630	16	10,000	69
6069X-8-6C	10	-06	3/8	9.5	3/4" - 16	2.79	71	1.19	30	1.000	25	10,000	69
6069X-8-8C	12	-08	1/2	12.7	3/4" - 16	3.00	76	1.30	33	0.870	22	10,000	69
6069X-16-16C	25	-16	1	25.4	1-5/16" - 12	3.79	96	1.65	42	1.500	38	10,000	69
6069X-6-6C-SUBSEA	10	-06	3/8	9.5	7/16" - 20	3.64	92	1.74	44	1.000	25	10,000	69



6AY9X- Type "M" Swivel - Female

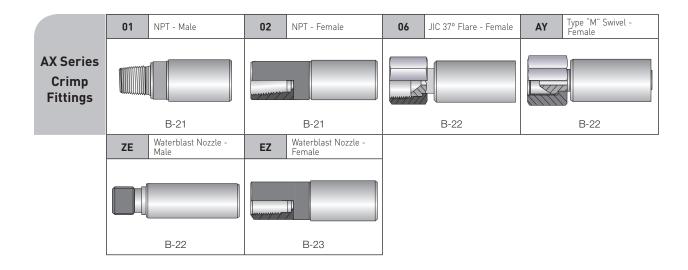
Material: Nipple - High strength stainless steel

Shell - Stainless steel Nut - Stainless steel



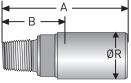
Part Number			ninal D.		Thread Size		A erall igth	Cut	3 toff vance	H		Wor	mum king sure*
#		(9								\supset		
	DN	DN Size inch mm			inch	mm	inch	mm	inch	mm	psi	MPa	
6AY9X-6-4C	6	-04	1/4	6.4	9/16" - 18	2.36	60	1.10	28	0.680	17		
6AY9X-8-6C	10	-06	3/8	9.5	3/4" - 16	2.79	71	1.19	30	1.000	25		
6AY9X-11-8C	12	-08	1/2	12.7	1" - 12	3.20	81	1.50	38	1.250	32		
6AY9X-16-16C	25	-16	1	25.4	1-5/16" - 12	3.79	96	1.65	42	1.500	38		

^{*}Fitting is rated to the full working pressure of the hose



601AX-NPT Male

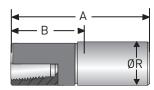
Material: Nipple - Carbon steel Shell - Carbon steel



Part Number		Nominal I.D.			Thread Size	-	A erall egth	Cut Allow	toff	F Dian		Maxi Worl Pres	king
#		0								Q	 Э	(7
	DN	DN Size inch mm			inch	mm	inch	mm	inch	mm	psi	MPa	
601AX-1-2A	3	-02	1/8	3.2	1/16" - 27	1.20	30	0.57	14	0.440	11	15,000	103
601AX-2-2A	3	-02	1/8	3.2	1/8" - 27	1.10	28	0.47	12	0.440	11	15,000	103
601AX-2-3	5	-03	3/16	4.8	1/8" - 27	1.28	33	0.50	13	0.460	12	15,000	103
601AX-4-5	8	-05	5/16	7.9	1/4" - 18	1.70	43	0.70	18	0.625	16	15,000	103
601AX-6-5	8	-05	5/16	7.9	3/8" - 18	1.70	43	1.02	26	0.625	16	15,000	103

602AX-NPT Female

Material: Nipple - Carbon steel Shell - Carbon steel



Part Number			ninal D.		Thread Size		\ erall gth		3 toff vance	Dian	R neter	Maxi Worl Pres	king
#		(9							Q	Z		
	DN Size inch mm			inch	mm	inch	mm	inch	mm	psi	MPa		
602AX-1-2A	3	-02	1/8	3.2	1/16" - 27	1.50	38	0.86	22	0.440	11	15,000	103
602AX-2-3	5	-03	3/16	4.8	1/8" - 27	1.64	42	0.84	21	0.520	13	15,000	103



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AX Series Fittings

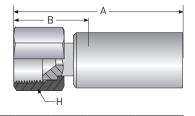
606AX- JIC 37° Female Flare

Material: Nipple - Carbon steel

Shell -

C - Stainless steel Carbon steel

C - Stainless steel
Nut - Carbon steel
C - Stainless steel

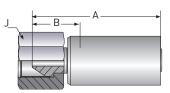


Part Number	Nominal I.D.				Thread Size		A erall igth		3 toff vance		H ex	Maxi Wor Pres	
#	0										\supset		
	DN Size inch mm			mm		inch	mm	inch	mm	inch	mm	psi	MPa
606AX-4-2A	3 -02 1/8 3.2		7/16" - 20	1.53	39	0.88	22	0.630	16	10,000	69		
606AX-4-3C	5 -03 3/16 4.8			7/16" - 20	1.84	47	0.86	22	0.560	14	10,000	69	

6AYAX- Type "M" Swivel - Female

Material: Nipple - Carbon steel

Shell - Carbon steel Nut - Carbon steel

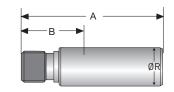


Part Number			ninal D.		Thread Size		A erall igth	Cut Allow	toff	Hè	J ex	Maxi Wor Press	king
#		(\supset	(2
	DN Size inch mm			inch	mm	inch	mm	inch	mm	psi	MPa		
6AYAX-6-2A	3	-02	1/8	3.2	9/16" - 18	1.52	39	0.86	22	0.750	19		
6AYAX-6-3	3 -02 1/8 3.2 5 -03 3/16 4.8			9/16" - 18	1.77	45	0.94	24	0.750	19			

^{*}Fitting is rated to the full working pressure of the hose

6ZEAX- Waterblast Nozzle - Male

Material: Nipple - Carbon steel Shell - Carbon steel



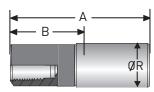
Part Number			ninal .D.		Thread Size	Ove Len	-	Cut Allow	toff	Dian	R neter	Maxi Wor Press	king
#		(9							Q	Z		
	DN Size inch mm			inch	mm	inch	mm	inch	mm	psi	MPa		
6ZEAX-5-2A	3	-02	1/8	3.2	5/16" - 24	1.31	33	0.69	18	0.440	11		

^{*}Fitting is rated to the full working pressure of the hose



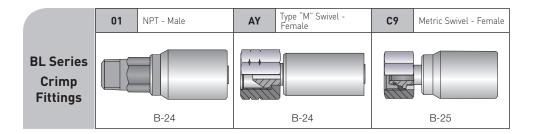
6EZAX- Waterblast Nozzle - Female

Material: Nipple - Carbon steel Shell - Carbon steel



Part Number			ninal .D.		Thread Size	Ove Len	\ erall gth	Cut Allow		Dian	R neter	Maxi Wor Press	king
#		(9							Q	Z		
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
6EZAX-5-2A	3	-02	1/8	3.2	5/16" - 24	1.50	38	0.90	23	0.440	11		

^{*}Fitting is rated to the full working pressure of the hose



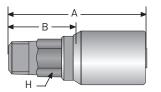
101BL- NPT Male

Material: Nipple - Carbon steel, zinc-plated

C - Stainless steel

Shell - Carbon steel, zinc-plated

C - Stainless steel



Part Number	Nominal I.D.				Thread Size	Ove	A erall igth		3 toff vance	H			mum king sure
#		(9								\supset		
	DN Size inch mm			inch	mm	inch	mm	inch	mm	psi	MPa		
101BL-6-06	10	-06	3/8	9.5	3/8" - 18	3.15	80	1.38	35	0.870	22	15,000	103
101BL-8-08	12	-08	1/2	12.7	1/2" - 14	3.54	90	1.77	45	0.870	22	15,000	103
101BL-8-08C	12	-08	1/2	12.7	1/2" - 14	3.54	90	1.77	45	0.870	22	15,000	103
101BL-12-12	20	-12	3/4	19.0	3/4" - 14	3.86	98	1.77	45	1.180	30	10,000	69

1AYBL- Type "M" Swivel - Female

Material: Nipple - Carbon steel, zinc-plated

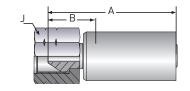
C - Stainless steel

Shell - Carbon steel, zinc-plated

C - Stainless steel

Nut - Carbon steel, zinc-plated

C - Stainless steel

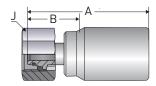


Part Number			ninal .D.		Thread Size	Ove	\ erall gth	E Cut Allow		He	J ex	Maxi Wor Press	king
#		(9								\supset		
	DN Size inch mm			inch	mm	inch	mm	inch	mm	psi	MPa		
1AYBL-11-06	10	-06	3/8	9.5	1" - 12	3.03	77	1.24	31	1.250	32		
1AYBL-11-08	12	-08	1/2	12.7	1" - 12	3.03	77	1.24	31	1.250	32		
1AYBL-11-08C	12	-08	1/2	12.7	1" - 12	3.03	77	1.24	31	1.250	32		

^{*}Fitting is rated to the full working pressure of the hose

1C9BL- Metric Swivel - Female

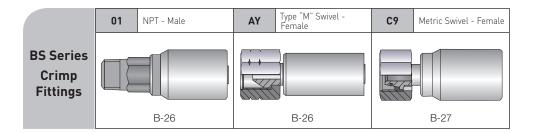
Material: Nipple - Carbon steel, zinc-plated Shell - Carbon steel, zinc-plated



Part Number			ninal D.		Thread Size		A erall igth	Cut Allow	toff	Hè		Maxi Wor Press	king
#		(9								\supset		
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
1C9BL-14-06	10	-06	3/8	9.5	M 22 x 1.5	3.15	80	1.43	36	1.180	30		
1C9BL-16-06	10	-06	3/8	9.5	M 24 x 1.5	3.31	84	1.43	36	1.180	30		
1C9BL-14-08	12	-08	1/2	12.7	M 22 x 1.5	3.15	80	1.43	36	1.060	27		
1C9BL-16-08	12	-08	1/2	12.7	M 24 x 1.5	3.15	80	1.43	36	1.180	30		
1C9BL-25-12	20	-12	3/4	19.0	M 36 x 2.0	3.82	97	1.75	44	1.810	46		

^{*}Fitting is rated to the full working pressure of the hose





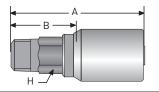
101BS-NPT Male

Material: Nipple - Carbon steel, zinc-plated

C - Stainless steel

Shell - Carbon steel, zinc-plated

C - Stainless steel



Part Number			ninal D.		Thread Size	Ove	A erall igth	Cur Allow	-	H		Maxi Wor Pres	
#		(9								\supset		
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
101BS-8-08	12	-08	1/2	12.7	1/2" - 14	3.66	93	1.56	40	0.870	22	15,000	103
101BS-8-08C	12	-08	1/2	12.7	1/2" - 14	3.66	93	1.56	40	0.870	22	15,000	103

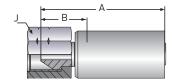
1AYBS- Type "M" Swivel - Female

Material: Nipple - Carbon steel, zinc-plated

C - Stainless steel

Shell - Carbon steel, zinc-plated

C - Stainless steel



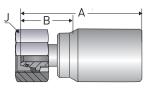
Part Number			ninal D.		Thread Size	Ove	A erall egth		3 toff vance	He	J ex	Maxi Wor Press	
#		(9								\supset		7)
	DN Size inch mm			inch	mm	inch	mm	inch	mm	psi	MPa		
1AYBS-11-08	12	-08	1/2	12.7	1" - 12	3.03	77	1.24	31	1.250	32		
1AYBS-11-08C	12	-08	1/2	12.7	1" - 12	3.03	77	1.24	31	1.250	32		

^{*}Fitting is rated to the full working pressure of the hose

1C9BS- Metric Swivel - Female

Material: Nipple - Carbon steel, zinc-plated

Shell - Carbon steel, zinc-plated Nut - Carbon steel, zinc-plated

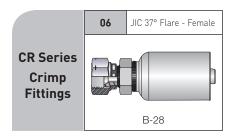


Part Number		Non I.	ninal D.		Thread Size		l erall egth	E Cut Allow	-	He	J ex	Maxi Wor Press	
#		(\supset		
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
1C9BS-16-08	12	-08	1/2	12.7	M 24 x 1.5	3.50	89	1.43	36	1.180	30		

^{*}Fitting is rated to the full working pressure of the hose



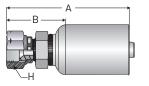
CR Series Fittings



606CR- JIC 37° Female Flare

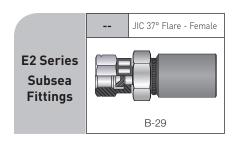
Material: Nipple - Stainless steel

Shell - Stainless steel Nut - Stainless steel



Part Number			ninal D.		Thread Size		A erall egth	E Cut Allow	off		H ex	Maxi Worl Pres	king
#	0										\supset		
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
606CR-8-8C	12	-08	1/2	12.7	3/4" - 16	3.88	98	2.13	54	1.000	25	10,000	69
606CR-16-16C	25	-16	1	25.4	1 5/16" - 12	5.00	127	2.75	70	1.625	41	10,000	69

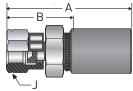
E2 Series Subsea Fittings



E2- JIC 37° Female Flare

Material: Nipple - Stainless steel

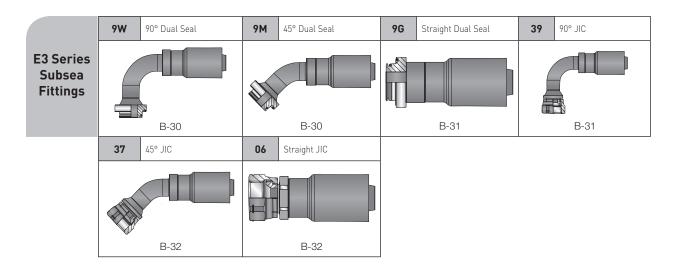
Shell - Stainless steel Nut - Stainless steel



Part Number			ninal .D.		Thread Size	Ove	A erall egth	Cur Allow	toff	H		Maxi Worl Pres	king
#		(9								\supset		7
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
E206JCC3	4	-04	1/4	6.4	7/16" - 20	2.12	54	1.20	30	0.63	16	10,000	69
E206JEC3	4	-04	1/4	6.4	9/16" - 18	2.20	56	1.12	28	0.75	19	10,000	69
E213JFC4	8	-08	1/2	12.7	3/4" - 16	3.35	85	1.61	41	0.94	24	10,000	69
E220JHC1	12	-12	3/4	19.0	1 1/16" - 12	4.00	102	2.16	54.7	1.42	36	10,000	69
E225JIC3	16	-16	1	25.4	1 5/16" - 12	4.30	109	2.10	53	1.63	41	10,000	69

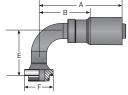


E3 Series Subsea Fittings



19WE3 - 90° Dual Seal

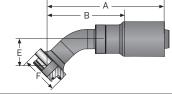
Material: Nipple - Stainless steel Shell - Stainless steel



Part Number			ninal D.		Flange Size	Ove	A erall egth	Cu	B toff vance	I	F	I		Maxir Work Press	king
#		(9											7	
	DN	Size	inch	mm	inch	inch	mm	inch	mm	inch	mm	inch	mm	psi	MPa
19WE3-8-8C	12	-08	1/2	12.7	1/2	4.11	104	2.44	62	1.25	32	2.11	54	5,000	34
19WE3-16-8C	12	-08	1/2	12.7	1	4.11	104	2.44	62	1.88	48	2.17	55	5,000	34
19WE3-16-16C	25	-16	1	25.4	1	5.45	138	3.13	80	1.88	48	3.27	83	5,000	34
19WE3-24-16C	25	-16	1	25.4	1-1/2	5.88	149	3.38	86	2.50	64	3.52	89	5,000	34

19ME3 - 45° Dual Seal

Material: Nipple - Stainless steel Shell - Stainless steel

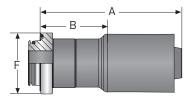


Part Number			ninal D.		Flange Size	0v	A erall ngth	Cu	3 toff vance	ı	-	ı		Maxin Work Press	ing
#		(0	
	DN	Size	inch	mm	inch	inch	mm	inch	mm	inch	mm	inch	mm	psi	MPa
19ME3-8-8C	12	-08	1/2	12.7	1/2	4.49	114	2.68	68	1.25	32	0.87	22	5,000	34
19ME3-16-8C	12	-08	1/2	12.7	1	4.53	115	2.68	68	1.88	48	0.92	23	5,000	34
19ME3-16-16C	25	-16	1	25.4	1	6.24	158	3.88	99	1.88	48	1.42	36	5,000	34
19ME3-24-16C	25	-16	1	25.4	1-1/2	6.32	161	3.93	100	2.50	64	1.86	47	5,000	34

E3 Series Subsea Fittings

19GE3 - Straight Dual Seal

Material: Nipple - Stainless steel Shell - Stainless steel

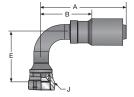


Part Number			ninal .D.		Flange Size	Ove	A erall igth	_	3 llowance	ı	F	Maxi Worl Pres	king
#		DN Size inch mm											
	DN	Size	inch	mm	inch	inch	mm	inch	mm	inch	mm	psi	MPa
19GE3-8-8C	12	-08	1/2	12.7	1/2	3.26	83	1.56	40	1.25	32	5,000	34
19GE3-16-8C	12	-08	1/2	12.7	1	3.26	83	1.56	40	1.25	32	5,000	34
19GE3-16-16C	25	-16	1	25.4	1	4.35	110	2.00	51	1.88	48	5,000	34
19GE3-24-16C	25	-16	1	25.4	1-1/2	4.48	114	2.13	54	2.50	64	5,000	34

139E3 - 90° JIC

Material: Nipple - Stainless steel Shell - Stainless steel

Nut - Stainless steel



Part Number			ninal D.		Thread Size	Ove	A erall egth	B Cut Allow	off	J He	x	E		Maxim Worki Press	ing
#		(9		<u>~~~~~</u>						\rightarrow			7	
	DN	Size	inch	mm	inch	inch	mm	inch	mm	inch	mm	inch	mm	psi	MPa
139E3-4-4C	6	-04	1/4	6.4	7/16" x 20	2.41	61	1.38	35	5/8	16	0.83	21	10,000	69
139E3-6-4C	6	-04	1/4	6.4	9/16" x 18	2.41	61	1.38	35	3/4	19	0.91	23	10,000	69
139E3-8-8C-411	12	-08	1/2	12.7	3/4" x 16	4.11	104	2.44	62	15/16	24	2.11	54	10,000	69
139E3-16-16C-411	25	-16	1	25.4	1-5/16" x 12	5.69	145	3.32	84	1-5/8	41	3.27	83	10,000	69

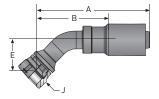


E3 Series Subsea Fittings

137E3 - 45° JIC

Material: Nipple - Stainless steel

Shell - Stainless steel Nut - Stainless steel

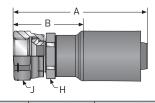


Part Number			ninal D.		Thread Size	Ove	A erall egth	B Cut Allow	off	J He	x	E		Maxim Worki Press	ing
#		(9		<u>~~~~~</u>						\rightarrow				
	DN	Size	inch	mm	inch	inch	mm	inch	mm	inch	mm	inch	mm	psi	MPa
137E3-4-4C	6	-04	1/4	6.4	7/16" x 20	2.51	64	1.50	38	5/8	16	0.39	10	10,000	69
137E3-6-4C	6	-04	1/4	6.4	9/16" x 18	2.70	69	1.68	43	3/4	19	0.43	11	10,000	69
137E3-8-8C-411	12	-08	1/2	12.7	3/4" x 16	4.75	121	3.06	78	15/16	24	1.14	29	10,000	69
137E3-16-16C-411	25	-16	1	25.4	1-5/16" x 12	6.50	165	4.13	105	1-5/8	41	1.69	43	10,000	69

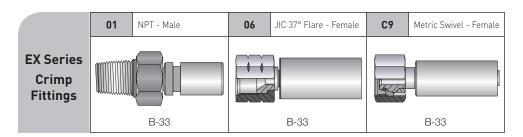
106E3 - Straight JIC

Material: Nipple - Stainless steel

Shell - Stainless steel Nut - Stainless steel

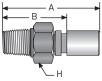


Part Number			ninal .D.		Thread Size	Ove	A erall igth	Cut Allow	off	J He	x	H He		Maxim Worki Press	ing
#		DN Size inch mm 6 -04 1/4 6.4									\rightarrow		\supset		
	DN	Size	inch	mm	inch	inch	mm	inch	mm	inch	mm	inch	mm	psi	MPa
106E3-4-4C	6	-04	1/4	6.4	7/16" x 20	2.46	62	1.44	37	5/8	16	5/8	16	10,000	69
106E3-6-4C	6	-04	1/4	6.4	9/16" x 18	2.55	65	1.50	38	3/4	19	5/8	16	10,000	69
106E3-8-8C	12	-08	1/2	12.7	3/4" x 16	3.55	90	1.88	48	1	25	15/16	24	10,000	69
106E3-16-16C	25	-16	1	25.4	1-5/16" x 12	4.76	121	2.38	60	1-5/8	41	1-1/2	41	10,000	69



101EX- NPT Male

Material: Nipple - Carbon steel, zinc-plated Shell - Carbon steel, zinc-plated

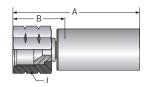


Part Number			ninal .D.		Thread Size	Ove	A erall igth	Cut Allow		H		Maxii Worl Pres	king
#	0										\supset		
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
101EX-4-012	20	-12	3/4	19.0	1/4" - 18	1.54	39	1.10	28	0.560	14	15,000	103
101EX-2-012	20	-12	3/4	19.0	1/8"-27	1.37	35	0.93	24	0.44	11	15,000	103

106EX- JIC 37° Female Flare

Material: Nipple - Carbon steel, zinc-plated Shell - Carbon steel, zinc-plated

Nut - Carbon steel, zinc-plated

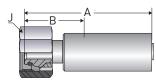


Part Number			ninal .D.		Thread Size		A erall egth	Cut Allow	toff	H		Maxi Wor Pres	king
#		(9								\supset		
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
106EX-4-012	20	-12	3/4	19.0	7/16" - 20	1.00	25	0.55	14	0.670	17	10,000	69

1C9EX- Metric Swivel - Female

 $\textbf{Material:} \ \ \text{Nipple - Carbon steel, zinc-plated}$

Shell - Carbon steel, zinc-plated Nut - Carbon steel, zinc-plated

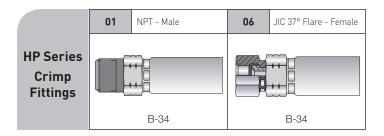


Part Number			ninal D.		Thread Size		\ erall gth	Cut Allow	off	Hè	J ex	Maxi Worl Press	king
#		(9								\supset		
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
1C9EX-8-012	20	-12	3/4	19.0	M 16 x 1.5	1.50	37	1.14	29	0.750	19		
1C9EX-6-012	20	-12	3/4	19.0	M 14 x 1.5	1.30	32	0.83	21	0.670	17		

^{*}Fitting is rated to the full working pressure of the hose



HP Series Fittings



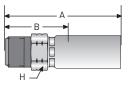
101HP- NPT Male

Material: Nipple - Carbon steel, zinc-plated

C - Stainless steel

Shell - Carbon steel, zinc-plated

C - Stainless steel



Part Number			ninal .D.		Thread Size	Ove	A erall egth	Cut Allow	toff		ł ex	Maxi Wor Pres	king
#		(9								\supset	(7
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
101HP-2-3	5	-03	3/16	4.8	1/8" - 27	1.94	49	1.19	30	0.560	14	15,000	103
101HP-4-3	5	-03	3/16	4.8	1/4" - 18	2.12	54	1.38	35	0.690	17	15,000	103
101HP-6-3	5	-03	3/16	4.8	3/8" - 18	2.22	56	1.50	38	0.750	19	15,000	103
101HP-2-4	6	-04	1/4	6.4	1/8" - 27	2.10	53	1.19	30	0.630	16	15,000	103
101HP-4-4	6	-04	1/4	6.4	1/4" - 18	2.28	58	1.38	35	0.690	17	15,000	103
101HP-6-4	6	-04	1/4	6.4	3/8" - 18	2.38	60	1.38	35	0.750	19	15,000	103
101HP-6-4C	6	-04	1/4	6.4	3/8" - 18	2.38	60	1.38	35	0.750	19	15,000	103
101HP-4-6	10	-06	3/8	9.5	1/4" - 18	2.70	69	1.50	38	0.750	19	15,000	103
101HP-6-6	10	-06	3/8	9.5	3/8" - 18	2.70	69	1.50	38	0.750	19	15,000	103
101HP-8-6	10	-06	3/8	9.5	1/2" - 14	2.96	75	1.75	44	0.940	24	15,000	103

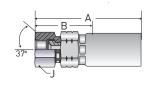
106HP- JIC 37° Female Flare

Material: Nipple - Carbon steel, zinc-plated

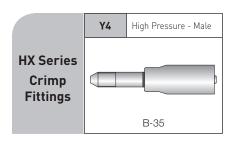
C - Stainless steel

Shell - Carbon steel, zinc-plated

C - Stainless steel

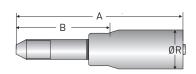


Part Number			ninal D.		Thread Size		l erall gth	Cut Allow	off	He		Maxi Worl Pres	king
#	DN Size inch mm								\supset				
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
106HP-4-3	5	-03	3/16	4.8	7/16" - 20	2.20	56	1.44	37	0.630	16	10,000	69
106HP-4-4	6	-04	1/4	6.4	7/16" - 20	2.49	63	1.56	40	0.630	16	10,000	69
106HP-4-4C	6	-04	1/4	6.4	7/16" - 20	2.49	63	1.56	40	0.630	16	10,000	69
106HP-6-4	6	-04	1/4	6.4	9/16" - 18	2.59	66	1.69	43	0.750	19	10,000	69
106HP-6-6	10	-06	3/8	9.5	9/16" - 18	2.91	74	1.63	41	0.750	19	10,000	69
106HP-6-6C	10	-06	3/8	9.5	9/16" - 18	2.91	74	1.63	41	0.750	19	10,000	69
106HP-8-6C	10	-06	3/8	9.5	3/4" - 16	3.10	79	1.80	46	0.938	24	10,000	69



6Y4HX- High Pressure Male

Material: Nipple - Carbon steel, zinc-plated Shell - Carbon steel, zinc-plated

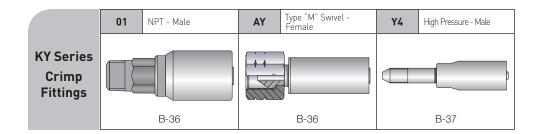


Part Number			ninal .D.		Thread Size	Ove Len	rall	Cut Allow	3 toff vance	Dian	? neter	Maxi Wor Press	king
#		(9							Q	Z		7)
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
6Y4HX-9-5C-XLT	8	-05	5/16	7.9	9/16" - 18	5.00	127	3.38	86	1.000	25		

^{*}Fitting is rated to the full working pressure of the hose

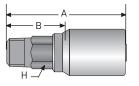


KY Series Fittings



101KY- NPT Male

Material: Nipple - Carbon steel, zinc-plated Shell - Carbon steel, zinc-plated

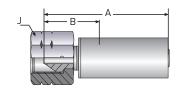


Part Number			ninal D.		Thread Size	Ove	A erall igth	Cut Allow		H		Maxi Worl Pres	king
#	O DN Gran last last										\supset		
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
101KY-4-04	6	-04	1/4	6.4	1/4" - 18	2.22	56	1.14	29	0.390	10	15,000	103
101KY-4-05	8	-05	5/16	7.9	1/4" - 18	2.70	69	1.42	36	0.511	13	15,000	103

1AYKY- Type "M" Swivel - Female

Material: Nipple - Carbon steel, zinc-plated Shell - Carbon steel, zinc-plated

Nut -Carbon steel, zinc-plated

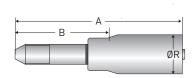


Part Number			ninal D.		Thread Size	Ove	A erall igth	E Cut Allow		Hè		Maxi Wor Pres	
#		(9								\supset		7
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
1AYKY-6-04	6	-04	1/4	6.4	3/8" - 18	2.28	58	0.98	25	0.748	19	15,000	103
1AYKY-8-05	8	-05	5/16	7.9	3/4" - 16	2.64	67	1.22	31	1.063	27	15,000	103

KY Series Fittings

1Y4KY- High Pressure - Male

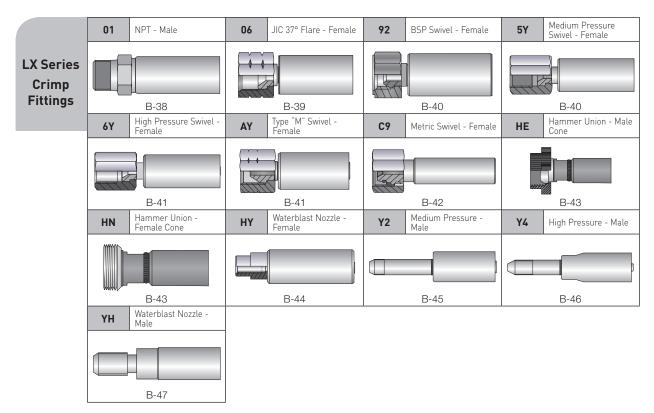
Material: Nipple - Carbon steel, zinc-plated Shell - Carbon steel, zinc-plated



Part Number			ninal .D.		Thread Size	Ove Len	-	Cut Allow	off	Dian	R neter	Maxi Wor Pres	king
#		(9							Q	Z		
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
1Y4KY-9-05	8	-05	5/16	7.9	9/16" - 18	3.90	99	2.60	66	0.787	20		

^{*}Fitting is rated to the full working pressure of the hose





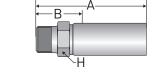
601LX- NPT Male

Material: Nipple - High strength steel

C - Stainless steel

Shell - Carbon steel, zinc-plated

C - Stainless steel

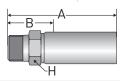


Part Number			ninal .D.		Thread Size	Ove	A erall igth	Cur Allow	toff	H	ł ex	Wor	mum king sure
#		(\bigcirc								\supset		
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
601LX-2-2AC	3	-02	1/8	3.2	1/8" - 27	1.90	48	0.76	19	0.500	13	15,000	103
601LX-4-3	5	-03	3/16	4.8	1/4" - 18	2.86	73	1.30	33	0.560	14	15,000	103
601LX-4-4C	6	-04	1/4	6.4	1/4" - 18	2.62	67	1.34	34	0.630	16	15,000	103
601LX-4-5	8	-05	5/16	7.9	1/4" - 18	2.78	71	1.18	30	0.630	16	15,000	103
601LX-4-5C	8	-05	5/16	7.9	1/4" - 18	2.78	71	1.18	30	0.630	16	15,000	103
601LX-6-5	8	-05	5/16	7.9	3/8" - 18	3.96	75	1.37	35	0.750	19	15,000	103
601LX-6-5C	8	-05	5/16	7.9	3/8" - 18	3.96	75	1.37	35	0.750	19	15,000	103
601LX-8-8	12	-08	1/2	12.7	1/2" - 14	3.75	95	1.70	43	1.130	29	15,000	103
601LX-8-8C	12	-08	1/2	12.7	1/2" - 14	3.75	95	1.70	43	1.130	29	15,000	103
601LX-12-12C	20	-12	3/4	19.0	3/4" - 14	4.75	121	2.10	53	1.380	35	10,000	69
601LX-16-12C	20	-12	3/4	19.0	1" - 11 1/2	4.90	124	2.25	57	1.380	35	10,000	69
601LX-16-16C	25	-16	1	25.4	1" - 11 1/2	5.00	125	2.50	64	1.380	35	10,000	69

101LX- NPT Male

Material: Nipple - High strength stainless steel

Shell - Stainless steel

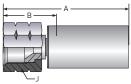


Part Number			ninal D.		Thread Size	Ove	A erall igth	Cut Allow	off	He	-	Maxii Worl Pres	king
#	DN Size inch mm								\supset				
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
101LX-4-04	6	-04	1/4	6.4	1/4"-18	3.15	80	1.42	36	0.560	14	15,000	103
101LX-4-04C	6	-04	1/4	6.4	1/4"-18	3.15	80	1.42	36	0.560	14	15,000	103
101LX-6-04	6	-04	1/4	6.4	3/8"-18	3.15	80	1.42	36	0.750	19	15,000	103
101LX-8-08	12	-08	1/2	12.7	1/2"-14	3.58	91	1.46	37	0.87	22	15,000	103
101LX-8-08C	12	-08	1/2	12.7	1/2"-14	3.58	91	1.46	37	0.87	22	15,000	103

606LX- JIC 37° Female Flare

Material: Nipple - High strength stainless steel

Shell - Stainless steel Nut - Stainless steel



Part Number			ninal D.		Thread Size	Ove	A erall igth	Cut Allow		Hè	J ex	Maxi Worl Pres	king
#	DN Size inch mm										\supset	(7
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
606LX-6-5C	8	-05	5/16	7.9	9/16" - 18	2.70	69	1.10	28	0.75	19	10,000	69
606LX-8-5C	8	-05	5/16	7.9	3/4" - 16	2.82	72	1.22	31	1.00	25	10,000	69
606LX-8-8C	12	-08	1/2	12.7	3/4" - 16	3.80	96	1.75	44	1.063	27	10,000	69
606LX-16-12C	20	-12	3/4	19.0	1-5/16" - 12	4.29	109	1.68	43	1.50	38	10,000	69
606LX-16-16C	25	-16	1	25.4	1-5/16" - 12	3.79	96	1.65	42	1.50	38	10,000	69

106LX- JIC 37° Female Flare

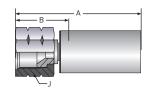
Material: Nipple - Carbon steel, zinc-plated

C - Stainless steel

Shell - Carbon steel, zinc-plated

C - Stainless steel

Nut - Carbon steel, zinc-plated C / SUBSEA - Stainless steel



Part Number		Nom I.	ninal D.		Thread Size	Ove	A erall igth	Cur Allow		Ho	J ex	Maxir Work Press	king
#		(\bigcirc								\supset		
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
106LX-8-08	12	-08	1/2	12.7	3/4" - 16	2.52	64	0.83	21	1.06	27	10,000	69
106LX-8-08C	12	-08	1/2	12.7	3/4" - 16	2.52	64	0.83	21	1.06	27	10,000	69
106LX-6-06C-M-SUBSEA	10	-06	3/8	9.5	9/16"-18	2.32	59	0.71	18	0.87	22	10,000	69
106LX-8-06C-M-SUBSEA	10	-06	3/8	9.5	3/4"-16	2.32	59	0.75	19	0.94	24	10,000	69
106LX-8-08C-M-SUBSEA	12	-08	1/2	12.7	3/4"-16	2.52	64	0.83	21	1.06	27	10,000	69

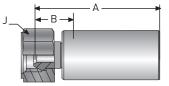


692LX-BSP Swivel - Female

Material: Nipple - High strength stainless steel

Shell - Stainless steel Nut - -3 size: Stainless steel

-5 size: Carbon steel, zinc-plated



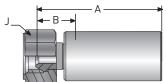
Part Number			ninal .D.		Thread Size	Ove	A erall igth	Cut Allow		He	J ex	Maxi Wor Press	king
#		(9								\supset		
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
692LX-4-3C	5	-03	3/16	4.8	G 1/4" - 19 BSPP	2.83	72	1.30	33	0.88	22		
692LX-6-5C	8	-05	5/16	7.9	G 3/8" - 19 BSPP	2.90	74	1.20	30	1.06	27		

^{*}Fitting is rated to the full working pressure of the hose

192LX-BSP Swivel - Female

Material: Nipple - Stainless steel

Shell - Stainless steel Nut - Stainless steel



Part Number			ninal .D.		Thread Size		A erall igth	Cut Allow	3 toff vance	Н		Maxi Wor Press	king
#		(9								\supset	(
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
192LX-8-08C	12	-08	1/2	12.7	G 1/2" - 14 BSPP	2.95	75	0.82	21	1.18	30		

^{*}Fitting is rated to the full working pressure of the hose

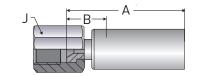
65YLX- Medium Pressure Female Swivel

Material: Nipple - High strength steel

C - High strength stainless steel

Shell - Carbon steel, zinc-plated

Nut - Stainless steel



Part Number			ninal D.		Thread Size		A erall egth		3 toff vance	H	J ex		mum king sure
#	DN Size inch mm								\supset				
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
65YLX-6-3	5	-03	3/16	4.8	9/16" - 18	3.08	78	1.53	39	0.75	19	20,000	138
65YLX-6-3C	5	-03	3/16	4.8	9/16" - 18	3.20	81	1.67	42	0.75	19	20,000	138
65YLX-6-4C	6	-04	1/4	6.4	9/16" - 18	2.84	72	1.54	39	0.75	19	20,000	138

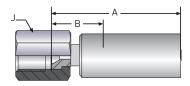
66YLX- High Pressure Female Swivel

Material: Nipple - High strength steel

C - High strength stainless steel

Shell - Carbon steel, zinc-plated

Nut - Stainless steel



Part Number			ninal .D.		Thread Size	Ove	A erall igth	Cut Allow		He	J ex	Maxi Wor Press	king
#		(9								\supset		
	DN	DN Size inch mm				inch	mm	inch	mm	inch	mm	psi	MPa
66YLX-4-3	5				9/16" - 18	2.80	71	1.28	33	0.75	19		
66YLX-4-3C	5	-03	3/16	4.8	9/16" - 18	2.93	74	1.42	36	0.68	17		

^{*}Fitting is rated to the full working pressure of the hose

1AYLX- Type "M" Swivel - Female

Material: Nipple - Carbon steel, zinc-plated

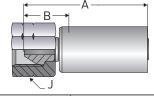
C - Stainless steel

Shell - Carbon steel, zinc-plated

C - Stainless steel

Nut - Carbon steel, zinc-plated

C - Stainless steel



Part Number			ninal .D.		Thread Size	Ove Len		Cut	3 toff vance	He	J ex	Maxi Wor Press	king
#											\supset		
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
1AYLX-6-02	3	-02	1/8	3.2	9/16" - 18	1.89	48	1.02	26	0.87	22		
1AYLX-6-04	6	-04	1/4	6.4	9/16" - 18	2.40	61	1.13	29	0.87	22		
1AYLX-6-04C	6	-04	1/4	6.4	9/16" - 18	2.95	75	1.26	32	0.87	22		
1AYLX-8-05C	8	-05	5/16	7.9	3/4" - 16	2.76	70	1.22	31	1.06	27		
1AYLX-11-08	12	-08	1/2	12.7	1" - 12	3.19	81	1.06	27	1.26	32		
1AYLX-11-08C	12	-08	1/2	12.7	1" - 12	3.19	81	1.06	27	1.26	32		

^{*}Fitting is rated to the full working pressure of the hose



6AYLX- Type "M" Swivel - Female

Material: Nipple - High strength steel

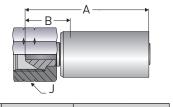
C - High strength stainless steel

SD / HCL / SUBSEA - High strength, corrosion-resistant stainless steel

Shell - Carbon steel, zinc-plated

C / SD / HCL / SUBSEA - Stainless steel

Nut - Stainless steel



Part Number			ninal D.		Thread Size	Ove	A erall igth	E Cut Allow	toff		J ex	Wor	mum king sure*
#		(\bigcirc								\supset		
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
6AYLX-6-2AC	3	-02	1/8	3.2	9/16" - 18	2.51	64	1.28	33	0.68	17		
6AYLX-6-3	5	-03	3/16	4.8	9/16" - 18	2.80	71	1.28	33	0.75	19		
6AYLX-6-3C	5	-03	3/16	4.8	9/16" - 18	2.93	74	1.42	36	0.68	17		
6AYLX-6-4C	6	-04	1/4	6.4	9/16" - 18	2.69	68	1.39	35	0.68	17		
6AYLX-6-4C-SD	6	-04	1/4	6.4	9/16" - 18	2.54	65	1.30	33	0.75	19		
6AYLX-8-5C	8	-05	5/16	7.9	3/4" - 16	2.82	72	1.22	31	1.00	25		
6AYLX-8-6C	10	-06	3/8	9.5	3/4" - 16	2.95	75	1.25	32	1.00	25		
6AYLX-11-8C	12	-08	1/2	12.7	1" - 12	3.53	90	1.50	38	1.25	32		
6AYLX-11-8C-SD	12	-08	1/2	12.7	1" - 12	3.53	90	1.50	38	1.25	32		
6AYLX-16-12C	20	-12	3/4	19.0	1-5/16" - 12	4.15	105	1.52	39	1.50	38		
6AYLX-16-12C-SD	20	-12	3/4	19.0	1-5/16" - 12	4.29	109	1.64	42	1.50	38		
6AYLX-16-16C	25	-16	1	25.4	1-5/16" - 12	5.45	139	2.04	52	1.50	38		
6AYLX-16-16C-SD	25	-16	1	25.4	1-5/16" - 12	5.45	139	2.04	52	1.50	38		
6AYLX-16-16-HCL	25	-16	1	25.4	1-5/16" - 12	5.45	139	2.04	52	1.50	38		
6AYLX-8-5C-M-SUBSEA	8	-05	5/16	7.9	3/4"-16	3.65	93	1.76	45	0.88	22		
6AYLX-8-6C-M-SUBSEA	10	-06	3/8	9.5	3/4"-16	3.23	82	1.45	37	1.00	25		

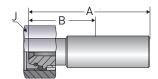
^{*}Fitting is rated to the full working pressure of the hose

6C9LX- Metric Swivel - Female

Material: Nipple - High strength stainless steel

Shell - Stainless steel

Nut - Carbon steel, zinc-plated



Part Number			ninal D.		Thread Size		A erall egth		3 toff vance	H	J ex	Maxi Wor Press	
#		DN Size inch mm									\supset		7
	DN	DN Size inch mm			inch	mm	inch	mm	inch	mm	psi	MPa	
6C9LX-16-8C	12	-08	1/2	12.7	M 24 x 1.5	3.48	88	1.44	37	1.26	32		
6C9LX-25-12C	20	-12	3/4	19.0	M 36 x 2	4.26	108	1.58	40	1.81	46		
6C9LX-30-16C	25	-16	1	25.4	M 42 x 2	4.65	118	2.05	52	1.97	50		

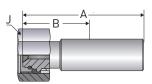
 $[\]ensuremath{^{*}\text{Fitting}}$ is rated to the full working pressure of the hose



1C9LX- Metric Swivel - Female

Material: Nipple - Stainless steel

Shell - Stainless steel Nut -Stainless steel



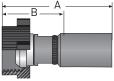
Part Number			ninal .D.		Thread Size	Ove Len	l erall gth	Cut Allow		He	J ex	Maxi Wor Press	king
#		0									\supset		
	DN Size inch mm		mm		inch	mm	inch	mm	inch	mm	psi	MPa	
1C9LX-16-08C	12	-08	1/2	12.7	M 24 x 1.5	3.46	88	1.34	34	1.26	32		

^{*}Fitting is rated to the full working pressure of the hose

6HELX- Hammer Union (Male) Cone w/ Wing Nut

Material: Nipple - High strength steel

Shell - Stainless steel Nut -Carbon steel

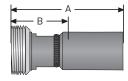


Part Number			ninal .D.		Thread Size	0ve	A erall igth		B toff vance	Maxi Wor Press	king
#	0										
	DN	Size	inch	mm		inch	mm	inch	mm	psi	MPa
6HELX-16-16-HCL	25	-16	1	25.4	2-5/16" - 2.5 ACME	6.00	153	3.63	92		

^{*}Fitting is rated to the full working pressure of the hose

6HNLX- Hammer Union (Female) Cone Threaded End w/ Seal

Material: Nipple - High strength steel Shell - Stainless steel



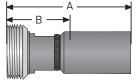
Part Number			ninal D.		Thread Size		A erall egth	E Cut Allow	toff	Maxi Wor Press	king
#	0									(
	DN Size inch mm		mm		inch	mm	inch	mm	psi	MPa	
6HNLX-16-16-HCL	25	-16	1	25.4	2-5/16" - 2.5 ACME	6.00	153	3.63	92		

^{*}Fitting is rated to the full working pressure of the hose



1HNLX- Hammer Union (Female) Cone Threaded End w/ Seal

Material: Nipple - High strength stainless steel Shell - High strength stainless steel

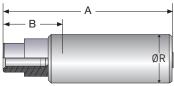


Part Number			ninal D.		Thread Size		A erall igth	E Cut Allow	toff	Maxi Wor Press	
#	0										
	DN Size inch mm		mm		inch	mm	inch	mm	psi	MPa	
1HNLX-32-16C4462	25	-16	1	25.4	4 1/8"-3 ACME	5.59	142	3.43	87		

^{*}Fitting is rated to the full working pressure of the hose

6HYLX- Waterblast Nozzle - Female

Material: Nipple - High strength stainless steel
Shell - Stainless steel

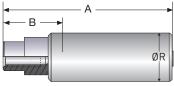


Part Number			ninal .D.		Thread Size	-	A erall egth	Cut Allow	toff	F Dian		Wor	mum king sure*
#		(9							Q	Z		
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
6HYLX-4-2AC-PL	3	-02	1/8	3.2	1/4" - 28	1.94	49	0.83	21	0.46	12		
6HYLX-4-2AC-PL-LH	3	-02	1/8	3.2	1/4" - 28 LH	1.94	49	0.83	21	0.46	12		
6HYLX-4-3C-PL	5	-03	3/16	4.8	1/4" - 28	1.94	49	0.72	18	0.49	13		
6HYLX-4-3C-PL-LH	5	-03	3/16	4.8	1/4" - 28 LH	1.94	49	0.72	18	0.49	13		
6HYLX-6-3C-PL	5	-03	3/16	4.8	3/8" - 24	2.09	53	0.87	22	0.49	13		
6HYLX-6-3C-PL-LH	5	-03	3/16	4.8	3/8" - 24 LH	2.09	53	0.87	22	0.49	13		
6HYLX-9-5C-PL	8	-05	5/16	7.9	9/16" - 18	2.64	67	1.04	26	0.82	21		
6HYLX-9-5C-PL-LH	8	-05	5/16	7.9	9/16" - 18 LH	2.64	67	1.04	26	0.82	21		

^{*}Fitting is rated to the full working pressure of the hose

1HYLX- Waterblast Nozzle - Female

Material: Nipple - High strength stainless steel
Shell - Stainless steel

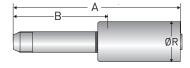


Part Number			ninal .D.		Thread Size	Ove	A erall egth	Cut Allow	-	Dian	R neter	Wor	mum king sure*
#		0								Q	ð		
	DN Size inch mm			mm		inch	mm	inch	mm	inch	mm	psi	MPa
1HYLX-4-02	3 -02 1/8 3.2		1/4"-28	1.77	45	0.87	22	0.34	9				
1HYLX-4-02-LH	3	-02	1/8	3.2	1/4"-28 LH	1.77	45	0.87	22	0.34	9		

^{*}Fitting is rated to the full working pressure of the hose

6Y2LX- Medium Pressure - Male

Material: Nipple - High strength stainless steel Shell - Stainless steel



Part Number			ninal D.		Thread Size	Ove Len		Cut Allow	toff	Dian	R neter	Maxii Worl Press	king
#		DN Size inch mm								Q	Z	(
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
6Y2LX-9-5C	8	-05	5/16	7.9	9/16" - 18 LH	2.60	66	0.88	22	0.82	21	20,000	138
6Y2LX-12-5C	8	-05	5/16	7.9	3/4" - 16 LH	3.74	95	2.05	52	0.95	24	20,000	138
6Y2LX-9-6C	10	-06	3/8	9.5	9/16" - 18 LH	3.80	97	2.04	52	1.22	31	20,000	138
6Y2LX-9-8C	12	-08	1/2	12.7	9/16" - 18 LH	4.20	107	2.20	56	1.13	29	20,000	138
6Y2LX-12-8C	12	-08	1/2	12.7	3/4" - 16 LH	4.13	105	2.08	53	1.13	29	20,000	138
6Y2LX-16-12C	20	-12	3/4	19.0	1" - 14 UNF LH	5.39	137	2.75	70	1.56	40	20,000	138



1Y2LX- Medium Pressure - Male

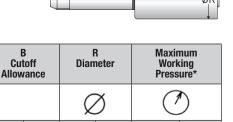
Material: Nipple - Carbon steel, zinc-plated

C - Stainless steel

SUBSEA - High strength stainless steel

Shell -Carbon steel, zinc-plated

C - Stainless steel

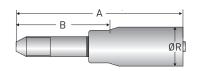


Part Number			ninal .D.		Thread Size	Ove	A erall ngth	Cu	B toff vance		R neter	Maxir Work Press	ing
#		ON Size inch mm								Q	7	7	\mathcal{C}
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
1Y2LX-6-04	6	-04	1/4	6.4	3/8" - 24 LH	4.72	120	2.56	65	0.67	17	20,000	138
1Y2LX-9-08C	12	-08	1/2	12.7	9/16"-18 LH	4.33	110	2.36	60	1.22	31	20,000	138
1Y2LX-12-08C	12	-08	1/2	12.7	3/4 - 16 UNF	6.22	158	4.09	104	1.22	31	20,000	138
1Y2LX-12-08C-M-SUBSEA	12	-08	1/2	12.7	3/4 - 16 UNF	7.25	184	4.70	119	1.30	33	20,000	138
1Y2LX-16-16C4462	25	-16	1	25.4	1" - 14 LH	7.13	181	5.00	127	1.06	27	20,000	138

6Y4LX- High Pressure - Male

Material: Nipple - High strength stainless steel

Shell - Stainless steel



Part Number			ninal .D.		Thread Size	Ove	A erall egth	Cu	3 toff vance	Dian	R neter	Wor	mum king sure*
#	DN Circ inch rom								Q	Z			
	DN Size inch mm		mm		inch	mm	inch	mm	inch	mm	psi	MPa	
6Y4LX-4-2AC	3	-02	1/8	3.2	1/4" - 28 LH	2.96	75	1.71	43	0.63	16		
6Y4LX-6-2AC	3	-02	1/8	3.2	3/8" - 24 LH	3.40	86	2.16	55	0.63	16		
6Y4LX-6-3C	5	-03	3/16	4.8	3/8" - 24 LH	3.86	98	2.35	60	0.67	17		
6Y4LX-9-3C	5	-03	3/16	4.8	9/16" - 18 LH	4.20	107	2.70	69	0.67	17		

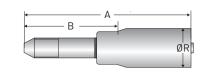
1Y4LX- High Pressure - Male

Material: Nipple - Carbon steel, zinc-plated

C - Stainless steel

Shell - Carbon steel, zinc-plated

C - Stainless steel



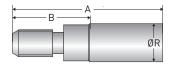
Part Number			ninal D.		Thread Size		A erall igth		3 toff vance	Dian	R neter	Wor	mum king sure*
#		(9							Q	Z		7)
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
1Y4LX-4-02	3	-02	1/8	3.2	1/4" - 28 LH	2.47	63	1.57	40	0.43	11		
1Y4LX-9-08C	12	-08	1/2	12.7	9/16" - 18 LH	4.88	124	2.75	70	1.38	35		



6YHLX- Waterblast Nozzle - Male

Material: Nipple - High strength stainless steel

Shell - Stainless steel

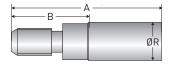


Part Number			ninal .D.		Thread Size	_	A erall igth		3 toff vance	Dian	-	Maxi Wor Press	king
#		(9							Q	Ž		7
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
6YHLX-4-2AC-PL	3	-02	1/8	3.2	1/4" - 28	2.10	53	0.87	22	0.50	13		
6YHLX-4-2AC-PL-LH	3	-02	1/8	3.2	1/4" - 28 LH	2.10	53	0.87	22	0.50	13		
6YHLX-4-3C-PL	5	-03	3/16	4.8	1/4" - 28	2.33	59	1.13	29	0.49	12		
6YHLX-4-3C-PL-LH	5	-03	3/16	4.8	1/4" - 28 LH	2.33	59	1.10	28	0.49	12		
6YHLX-6-3C-PL	5	-03	3/16	4.8	3/8" - 24	2.47	63	1.25	32	0.49	12		
6YHLX-6-3C-PL-LH	5	-03	3/16	4.8	3/8" - 24 LH	2.47	63	1.25	32	0.49	12		
6YHLX-9-5C-PL	8	-05	5/16	7.9	9/16" - 18	3.11	79	1.50	38	0.69	18		
6YHLX-9-5C-PL-LH	8	-05	5/16	7.9	9/16" - 18 LH	3.11	79	1.50	38	0.69	18		

^{*}Fitting is rated to the full working pressure of the hose

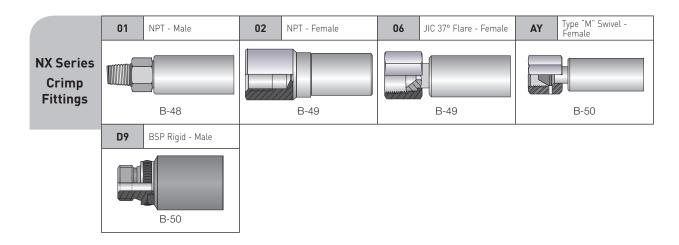
1YHLX- Waterblast Nozzle - Male

Material: Nipple - High strength stainless steel Shell - Carbon steel, zinc-plated



Part Number			ninal .D.		Thread Size	Ove Len	-	Cut Allow	off	F Dian	R neter	Maxi Wor Press	king
#		(9							Q	Z		
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
1YHLX-4-02	3	-02	1/8	3.2	1/4" - 28	1.772	45	0.87	22	0.34	9		
1YHLX-4-02-LH	3	-02	1/8	3.2	1/4" - 28 LH	1.772	45	0.87	22	0.34	9		

^{*}Fitting is rated to the full working pressure of the hose



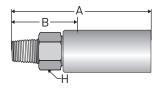
601NX- NPT Male

Material: Nipple - Carbon steel

C - Stainless steel

Shell - Carbon steel

C - Stainless steel

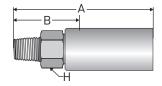


Part Number			ninal D.		Thread Size	Ove	A erall igth	Cut Allow	off	_	H ex	Maxi Worl Pres	king
#	0								\supset				
	DN Size inch mm			inch	mm	inch	mm	inch	mm	psi	MPa		
601NX-2-4	6	-04	1/4	6.4	1/8" - 27	1.44	37	0.50	13	0.62	16	15,000	103
601NX-4-4	6	-04	1/4	6.4	1/4" - 18	2.57	65	1.35	34	0.63	16	15,000	103
601NX-4-4C	6	-04	1/4	6.4	1/4" - 18	2.38	60	1.12	28	0.63	16	15,000	103

101NX- NPT Male

Material: Nipple - Carbon steel, zinc-plated

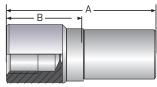
Shell - Carbon steel, zinc-plated



Part Number			ninal D.		Thread Size		A erall igth		3 toff vance	H		Maxi Wor Pres	
#		(\supset		
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
101NX-4-04	6	-04	1/4	6.4	1/4" - 18	2.57	65	1.35	34	0.63	16	15,000	103
101NX-6-06	10	-06	3/8	9.5	3/8" - 18	2.79	71	1.20	30	0.87	22	15,000	103
101NX-8-08	12	-08	1/2	12.7	1/2" - 14	3.11	79	1.46	37	0.87	22	15,000	103
101NX-12-12	20	-12	3/4	19.0	3/4" - 14	3.66	93	1.57	40	1.06	27	10,000	69

602NX-NPT Female

Material: Nipple - Carbon steel Shell - Carbon steel

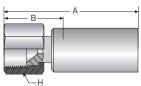


Part Number			ninal .D.		Thread Size		\ erall gth	Cut Allow	toff	He		Maxi Wor Pres	king
#		(9								\supset		
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
602NX-4-4	6	-04	1/4	6.4	1/4" - 18	2.38	60	1.12	28	0.63	16	15,000	103

606NX- JIC 37° Female Flare

Material: Nipple - Stainless steel Shell - Stainless steel

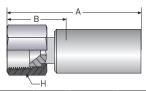
Nut - Stainless steel



Part Number			ninal D.		Thread Size	Ove	A erall igth	Cut Allow	off	H		Maxi Wor Pres	
#		(9								\supset		
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
606NX-4-4C	6	-04	1/4	6.4	7/16" - 20	2.23	57	0.99	25	0.63	16	10,000	69
606NX-6-4C	6	-04	1/4	6.4	9/16" - 18	2.36	60	1.11	28	0.68	17	10,000	69

106NX- JIC 37° Female Flare

Material: Nipple - Carbon steel, zinc-plated
Shell - Carbon steel, zinc-plated
Nut - Carbon steel, zinc-plated



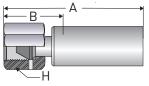
Part Number			ninal .D.		Thread Size	Ove	A erall igth	Cut	3 toff vance	H		Maxin Work Press	ing
#		(9								\supset	7	
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
106NX-4-04	6	-04	1/4	6.4	7/16" - 20	2.56	65	1.37	35	0.75	19	10,000	69
106NX-6-04	6	-04	1/4	6.4	9/16" - 18	2.56	65	1.32	34	0.75	19	10,000	69
106NX-6-06	10	-06	3/8	9.5	9/16" - 18	2.56	65	1.32	34	0.75	19	10,000	69
106NX-8-06	10	-06	3/8	9.5	3/4" - 16	2.82	72	1.23	31	0.95	24	10,000	69
106NX-8-08	12	-08	1/2	12.7	3/4" - 16	2.52	64	0.83	21	1.06	27	10,000	69
106NX-12-12	20	-12	3/4	19.0	1-1/16" - 12	3.78	96	1.69	43	1.42	36	10,000	69
106NX-16-12	20	-12	3/4	19.0	1-5/16" - 12	3.66	93	1.57	40	1.61	41	10,000	69
106NX-16-16	25	-16	1	25.4	1-5/16" - 12	3.84	98	1.67	43	1.61	41	10,000	69
106NX-20-20	32	-20	1-1/4	31.8	1 5/8" - 12	4.09	104	1.73	44	1.97	50	6,380	44



6AYNX- Type "M" Swivel - Female

Material: Nipple - Stainless steel

Shell - Stainless steel Nut - Stainless steel

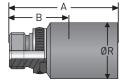


Part Number			ninal .D.		Thread Size		l erall gth	E Cut Allow	off	He		Maxi Wor Press	king
#		(9								\supset		
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
6AYNX-6-4C	6	-04	1/4	6.4	9/16" - 18	2.36	60	1.11	28	0.68	17		

^{*}Fitting is rated to the full working pressure of the hose

6D9NX-BSP Rigid - Male

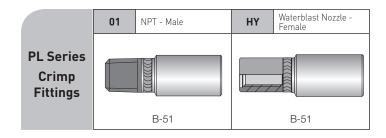
Material: Nipple - High strength steel Shell - Carbon steel



Part Number			ninal .D.		Thread Size		A erall igth	Cut Allow		F Dian	R neter	Maxi Wor Press	king
#		(9							Q	Z		
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
6D9NX-8-8-PL	12	-08	1/2	12.7	G 1/2" - 14	2.50	64	1.00	25	1.26	32		

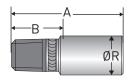
^{*}Fitting is rated to the full working pressure of the hose





601PL- NPT Male

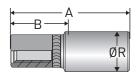
Material: Nipple - Carbon steel Shell - Carbon steel



Part Number			ninal D.		Thread Size		A erall igth	Cut Allow		Dian	R neter	Maxii Worl Pres	king
#		(9							Q	Z		
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
601PL-1-2	3	-02	1/8	3.2	1/16" - 27	1.06	27	0.47	12	0.38	10	15,000	103

6HYPL- Waterblast Nozzle - Female

Material: Nipple - Carbon steel Shell - Carbon steel

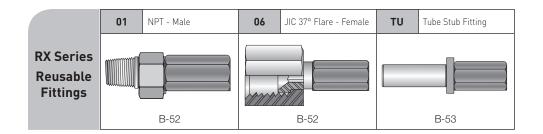


Part Number			ninal D.		Thread Size		A erall igth	Cut Allow	off	F Dian	? neter	Maxi Wor Press	king
#	0							Q	Z				
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
6HYPL-1-2	3	-02	1/8	3.2	#12 - 28	1.13	29	0.53	13	0.38	10		

^{*}Fitting is rated to the full working pressure of the hose

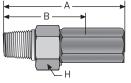


RX Series Reusable Fittings



201RX- NPT Male

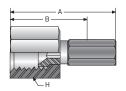
Material: Nipple - Stainless steel Shell - Stainless steel



Part Number		Non I.	ninal D.		Thread Size	Ove Len	l erall gth	E Cut Allow	4	H	ł ex	Maxi Wor Pres	king
#		(\supset	(
	DN Size inch mm			inch	mm	inch	mm	inch	mm	psi	MPa		
201RX-2-2C	3	-02	1/8	3.2	1/8" - 27	1.54	39	1.10	28	0.44	11	15,000	103

206RX- JIC 37° Female Flare

Material: Nipple - Stainless steel Shell - Stainless steel

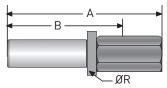


Part Number			ninal D.		Thread Size		A erall igth		3 toff vance	H		Maxi Wor Pres	king
#		(\supset	(
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
206RX-4-2C	3	-02	1/8	3.2	7/16" - 20	1.56	40	1.10	28	0.56	14	10,000	69

RX Series Reusable Fittings

2TURX- Tube Stub

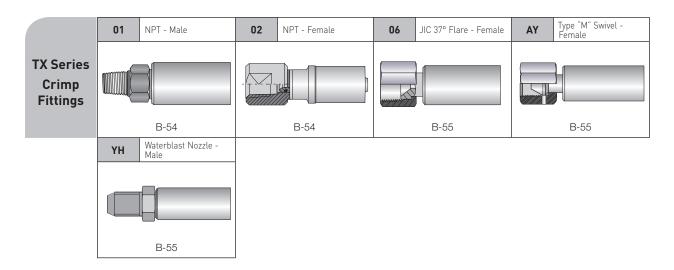
Material: Nipple - Stainless steel Shell - Stainless steel



Part Number			ninal D.		Thread Size	Ove Len	\ erall gth	Cut	3 toff vance	Dian	R neter		mum king sure*
#		(9							Q	Z		
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
2TURX-4-2C	3	-02	1/8	3.2	1/4" TUBE	1.65	42	1.20	30	0.38	10		

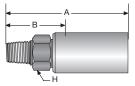
^{*}Fitting is rated to the full working pressure of the hose





101TX- NPT Male

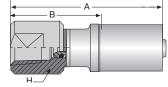
Material: Nipple - Carbon steel, zinc-plated Shell - Carbon steel, zinc-plated



Part Number			ninal D.		Thread Size	Ove	A erall egth		3 toff vance	Wre	H ench ats	Wor	mum king sure
#		(9								\supset	(
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
101TX-2-02W	3	-02	1/8	3.2	1/8"-27	1.73	44	0.87	22	0.38	10	15,000	103
101TX-1-025W	4	-025	5/32	4.0	1/16"-27	1.85	47	0.99	25	0.38	10	15,000	103
101TX-2-025	4	-025	5/32	4.0	1/8" - 27	1.93	49	1.06	27	0.38	10	15,000	103
101TX-4-025W	4	-025	5/32	4.0	1/4"-18	2.20	56	1.34	34	0.50	13	15,000	103
101TX-1-03	5	-03	3/16	4.8	1/16" - 27	2.13	54	1.06	27	0.38	10	15,000	103
101TX-2-03	5	-03	3/16	4.8	1/8" - 27	2.13	54	1.06	27	0.38	10	15,000	103
101TX-4-03	5	-03	3/16	4.8	1/4" - 18	2.40	61	1.35	34	0.53	13	15,000	103

102TX- NPT Female

Material: Nipple - Carbon steel, zinc-plated Shell - Carbon steel, zinc-plated

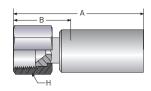


Part Number			ninal D.		Thread Size	Ove	A erall igth	Cut Allow	toff	Wre Fla	nch	Wor	mum king sure
#		(\bigcirc								\supset		
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
102TX-1-025	4	-025	5/32	4.0	1/16" - 27	1.77	45	0.95	24	0.47	12	15,000	103
102TX-2-03	5	-03	3/16	4.8	1/8" - 27	2.13	54	1.06	27	0.56	14	15,000	103

106TX- JIC 37° Female Flare

Material: Nipple - Carbon steel, zinc-plated

Shell - Carbon steel, zinc-plated Nut - Carbon steel, zinc-plated

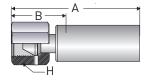


Part Number			ninal D.		Thread Size	Ove	A erall igth	Cur Allow		He		Maxi Wor Pres	king
#	DN Size inch mm										\supset		
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
106TX-4-02W	3	-02	1/8	3.2	9/16" - 18	1.57	40	0.83	21	0.68	17	10,000	69
106TX-4-025W	4	-025	5/32	4.0	9/16" - 18	1.73	44	0.83	21	0.68	17	10,000	69
106TX-6-03W	5	-03	3/16	4.8	9/16" - 18	1.89	48	0.99	25	0.75	19	10,000	69

1AYTX- Type "M" Swivel - Female

Material: Nipple - Carbon steel, zinc-plated

Shell - Carbon steel, zinc-plated Nut - Carbon steel, zinc-plated

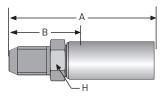


Part Number			ninal D.		Thread Size	Ove Len	-	Cut Allow		H		Wor	mum king sure*
#	0								\supset				
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
1AYTX-6-02W	3	-02	1/8	3.2	9/16"-18	1.85	47	1.10	28	0.75	19		
1AYTX-6-025W	4	-025	5/32	4.0	9/16"-18	1.77	45	0.91	23	0.75	19		
1AYTX-6-03W	5	-03	3/16	4.8	9/16"-18	1.97	50	0.91	23	0.75	19		

^{*}Fitting is rated to the full working pressure of the hose

1YHTX- Waterblast Nozzle - Male

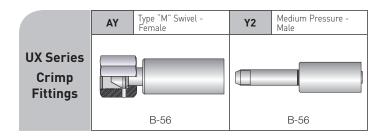
Material: Nipple - Carbon steel, zinc-plated Shell - Carbon steel, zinc-plated



Part Number			ninal D.		Thread Size	Ove	\ erall gth	Cut Allow		Wre Fla	nch	Maxi Wor Press	king
#		(\bigcirc								\supset		
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
1YHTX-4-025	4	-025	5/32	4.0	1/4" - 28	1.85	47	0.99	25	0.31	8		
1YHTX-6-03	5	-03	3/16	4.8	3/8" - 24	2.13	54	1.06	27	0.44	11		

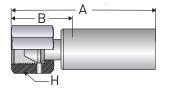
^{*}Fitting is rated to the full working pressure of the hose





1AYUX- Type "M" Swivel - Female

Material: Nipple - Stainless steel Shell - Stainless steel

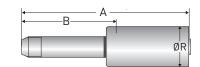


Part Number			ninal D.		Thread Size		A erall egth	E Cut Allow		He		Maxi Wor Press	
#		(9								\supset		7
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
1AYUX-6-04C	6	-04	1/4	6.4	9/16"-18	3.66	93	1.38	35	0.75	19		
1AYUX-8-06C	10	-06	3/8	9.5	3/4"-16	3.94	100	1.39	35	1.06	27		

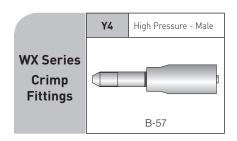
^{*}Fitting is rated to the full working pressure of the hose

1Y2UX- Medium Pressure - Male

Material: Nipple - Stainless steel Shell - Stainless steel

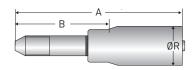


Part Number			ninal D.		Thread Size	Ove	A erall igth	E Cut Allow		Dian	R neter	Maxi Wor Pres	king
#		(9							Q	J		
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
1Y2UX-6-04C	6	-04	1/4	6.4	3/8" - 24 LH	4.29	109	2.20	56	0.71	18	20,000	138
1Y2UX-9-06C	10	-06	3/8	9.5	9/16" - 18 LH	4.84	123	2.24	57	1.10	28	20,000	138



6Y4WX- High Pressure - Male

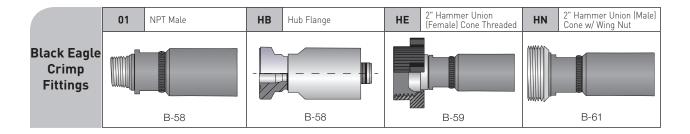
Material: Nipple - Stainless steel Shell - Stainless steel



Part Number			ninal D.		Thread Size		A erall igth		3 toff vance	F Dian	R neter	Wor	mum king sure*
#	0									Q	Z		
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
6Y4WX-16-8C	25	-16	1	25.4	1" - 14 LH	5.4	138	3.2	80	1.34	34		

^{*}Fitting is rated to the full working pressure of the hose

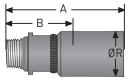




6015X- NPT Male

 $\textbf{Material:} \ \ \text{Nipple - Carbon steel, zinc-plated}$

Shell - Stainless steel

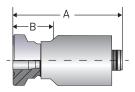


Part Number		Nominal I.D.			Thread Size	Ove	A erall igth	Cut Allow	-	Dian	R neter	Wor	mum king sure
#	0									Q	Z		
	DN	DN Size inch mm			inch	mm	inch	mm	inch	mm	psi	MPa	
6015X-32-24-TC	40	-24	1-1/2	38.1	2" - 11 1/2 NPT	9.09	231	4.21	107	3.35	85	5,000	34
6015X-32-32-TC	50	-32	2	50.8	2" - 11 1/2 NPT	9.61	244	4.22	107	3.25	83	5,000	34

6HB5X- Hub Flange

Material: Nipple - High strength stainless steel

Shell - Stainless steel



Part Number		Nominal I.D.			API Size	Ove	A erall igth	Cu	3 toff vance	Se	eal	Maxi Worl Press	king
#		(\bigcirc										
	DN	Size	inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
6HB5X-32-32-TC	50	-32	2	50.8	2-1/16" 5,000 PSI	10.18	259	4.68	119		BX152		
6HB5X-32-32C-TC-10K	50	-32	2	50.8	2-1/16" 10,000 PSI	10.70	272	5.30	135		BX152		
6HB5X-32-32-TC-FLG	50	-32	2	50.8	2-1/16" 5,000 PSI	10.18	259	4.68	119	8.50	BX152		
6HB5X-32-32C-TC-FLG-10K	50	-32	2	50.8	2-1/16" 10,000 PSI	10.70	272	5.30	135	7.88	BX152		
6HB5X-41-32-TC	50	-32	2	50.8	2-9/16" 5,000 PSI	10.18	259	4.68	119		BX153		
6HB5X-41-32-TC-FLG	50	-32	2	50.8	2-9/16" 5,000 PSI	10.18	259	4.68	119	9.62	BX153		

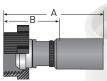
^{*}Fitting is rated to the full working pressure of the hose

Parker Hannifin Corporation | Parflex Division | Stafford, TX | parker.com/pfd

6HE5X- Hammer Union (Male) Cone w/ Wing Nut

Material: Nipple - Carbon steel, zinc-plated

Shell - Stainless steel Nut - Carbon steel



Part Number	Nominal I.D.				Thread Size	Ove Len			3 toff vance	Maxin Work Pressi	ing
#	0										
	DN Size inch mm			inch	mm	inch	mm	psi	MPa		
6HE5X-32-24-FLATTC	40	-24	1-1/2	38.1	4-1/8" - 3 ACME	9.13	232	4.25	108		
6HE5X-32-32-FLATTC	50	-32	2	50.8	4-1/8" - 3 ACME	11.50	292	6.10	155		
6HE5X-32-32-SEGTC	50	-32	2	50.8	4-1/8" - 3 ACME	11.73	298	6.34	161		

^{*}Fitting is rated to the full working pressure of the hose

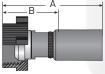
1HE5X- Hammer Union (Male) Cone w/ Wing Nut

Material: Nipple - High strength steel

COSK - High strength stainless steel

Shell - High strength stainless steel

Nut - Carbon steel



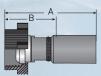
Part Number	Nominal I.D.				Thread Size	Ove	A erall igth	E Cut Allow	toff	Maxim Work Pressu	ing
#	0									7	
	DN	DN Size inch mm			inch	mm	inch	mm	psi	MPa	
1HE5X-32-24COSK-FLAT	50	-32	2	50.8	4-1/8" - 3 ACME	8.37	213	4.64	118		
1HE5X-48-48	78	-48	3	76.0	5-3/8" - 3 1/2 ACME	15.55	395	7.24	184		
1HE5X-48-48-FLAT	78	-48	3	76.0	5-3/8" - 3 1/2 ACME	15.55	395	7.22	183		

^{*}Fitting is rated to the full working pressure of the hose

1HECX- Hammer Union (Male) Cone w/ Wing Nut

Material: Nipple - High strength steel

Shell - High strength stainless steel



Part Number	Nominal I.D.				Thread Size		A erall igth		3 toff vance	Maxim Worki Pressi	ing
#	0										
	DN	DN Size inch mm				inch	mm	inch	mm	psi	MPa
1HECX-32-32-FLAT	50	-32	2	50.8	4-1/8" - 3 ACME	11.74	298	5.21	132		

^{*}Fitting is rated to the full working pressure of the hose

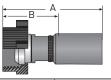


1HELX- Hammer Union (Male) Cone w/ Wing Nut

Material: Nipple - High strength steel

Shell - High strength stainless steel

Nut - Carbon steel



Part Number			ninal .D.		Thread Size		A erall egth		3 toff vance	Maxi Wor Press	king
#	0									(
	DN Size inch mm			mm		inch	mm	inch	mm	psi	MPa
1HELX-48-48	78	-48	3	76.0	5-3/8" - 3 1/2 ACME	15.55	395	7.52	191		
1HELX-48-48-FLAT	78	-48	3	76.0	5-3/8" - 3 1/2 ACME	15.55	395	7.24	184		

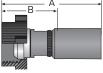
^{*}Fitting is rated to the full working pressure of the hose

1HES6- Hammer Union (Male) Cone w/ Wing Nut

Material: Nipple - High strength steel

Shell - High strength stainless steel

Nut - Carbon steel



Part Number	Nominal I.D.				Thread Size		A erall igth	Cur Allow	3 toff vance	Maxim Work Pressu	ing
#	0									(
	DN Size inch mm			mm		inch	mm	inch	mm	psi	MPa
1HES6-32-32-FLAT	50	-32	2	50.8	4-1/8" - 3 ACME	6.69	170	2.99	76		
1HES6-32-32-FLAT-SC	50	-32	2	50.8	4-1/8" - 3 ACME	6.69	170	2.99	76		

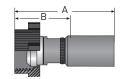
^{*}Fitting is rated to the full working pressure of the hose

1HETX- Hammer Union (Male) Cone w/ Wing Nut

Material: Nipple - High strength steel

Shell - High strength stainless steel

Nut - Carbon steel



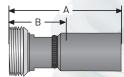
Part Number	Nominal I.D.				Thread Size	Ove	A erall egth	E Cut Allow	toff	Maxim Work Pressu	ing
#	0										
	DN Size inch mm			mm		inch	mm	inch	mm	psi	MPa
1HETX-48-48	78	-48	3	76.0	5-3/8"- 3 1/2 ACME	13.39	340	6.85	174		
1HETX-48-48-FLAT	78	-48	3	76.0	5-3/8"- 3 1/2 ACME	13.39	340	6.85	174		

^{*}Fitting is rated to the full working pressure of the hose



6HN5X- Hammer Union (Female) Cone Threaded End w/ Seal

Material: Nipple - High strength steel Shell - Stainless steel



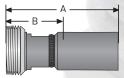
Part Number	Nominal I.D.				Thread Size	Ove Len			3 toff vance	Maxin Work Pressi	ing
#	0										
	DN Size inch mm			mm		inch	mm	inch	mm	psi	MPa
6HN5X-32-24-TC	40	-24	1-1/2	38.1	4 1/8"- 3 ACME	10.71	272	5.79	147		
6HN5X-32-32-TC	40 -24 1-1/2 38.1		4 1/8"- 3 ACME	9.56	243	4.18	106				

^{*}Fitting is rated to the full working pressure of the hose

1HN5X- Hammer Union (Female) Cone Threaded End w/ Seal

Material: Nipple - High strength steel

Shell - High strength stainless steel



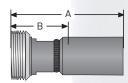
Part Number	Nominal I.D.				Thread Size	A Over Leng		B Cuto Allow		Maxim Worki Pressu	ing
#	0									7)
	DN	Size	inch	mm		inch	mm	inch	mm	psi	MPa
1HN5X-48-48	78	78 -48 3 76.0			5 3/8"-3 1/2 ACME	15.95	405	7.64	194		

^{*}Fitting is rated to the full working pressure of the hose

1HNLX- Hammer Union (Female) Cone Threaded End w/ Seal

Material: Nipple - High strength steel

Shell - High strength stainless steel



Part Number		Nom I.	inal D.		Thread Size	A Over Leng		B Cuto Allow		Maxi Wor Press	king
#	0									(2
	DN	Size	inch	mm		inch	mm	inch	mm	psi	MPa
1HNLX-48-48	78	-48	3	76.0	5 3/8"-3 1/2 ACME	15.95	405	7.64	194		

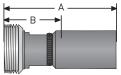
^{*}Fitting is rated to the full working pressure of the hose



1HNS6- Hammer Union (Female) Cone Threaded End w/ Seal

Material: Nipple - High strength steel

Shell - High strength stainless steel



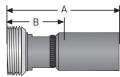
Part Number	Nominal I.D.				Thread Size		A erall igth		3 toff vance	Maxi Wor Press	king
#	0									(
	DN	DN Size inch mm				inch	mm	inch	mm	psi	MPa
1HNS6-32-32	50	-32	2	50.8	4 1/8"- 3 ACME	6.69	170	2.99	76		
1HNS6-32-32-SC	50	-32	2	50.8	4 1/8"- 3 ACME	6.69	170	2.99	76		

^{*}Fitting is rated to the full working pressure of the hose

1HNTX- Hammer Union (Female) Cone Threaded End w/ Seal

Material: Nipple - High strength steel

Shell - High strength stainless steel

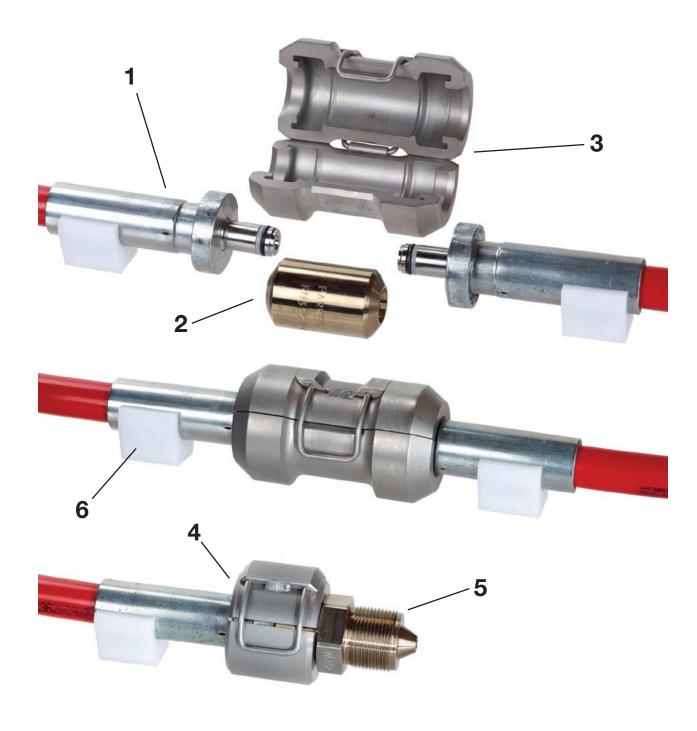


Part Number	Nominal I.D.				Thread Size	A Overall Length		B Cutoff Allowance		Maximum Working Pressure*	
#	0										
	DN	Size	inch	mm		inch	mm	inch	mm	psi	MPa
1HNTX-48-48	78	-48	3	76.0	5-3/8" - 3 1/2 ACME	13.78	350	7.24	184		

^{*}Fitting is rated to the full working pressure of the hose



Polyflex-Lok





Polyflex-Lok

Ref	Part Number	Description
	1TM2X-8-03-HPK	Fitting for DN 5 hoses including caps
	1TM2X-8-05-HPK	Fitting for DN 8 hoses including caps
1	1TMKY-8-05-HPK	Fitting for DN 8 hoses including caps
	1TMBL-9-08-HPK	Fitting for DN 12 hoses including caps
	1TMBS-9-08-HPK	Fitting for DN 12 hoses including caps
	TFTF-8-8	Hose connector bushing for DN 5 and DN 8
2	TFTF-8-9	Hose connector bushing - connection DN 5 or DN 8 to DN 12
	TFTF-9-9	Hose connector bushing for DN 12
3	HPK-HS-8	Hose connector
4	HPK-HSP-8	Pump/gun connector
	YTTF-6-8	Adapter M20 x 1.5 to DN 5 or DN 8
	YTTF-9-8	Adapter M26 x 1.5 to DN 5 or DN 8
	YTTF-9-9	Adapter M26 x 1.5 to DN 12
	YTTF-10-8	Adapter M30 x 2 to DN 5 or DN 8
5	YTTF-10-9	Adapter M30 x 2 to DN 12
	YTTF-12-8	Adapter M42 x 2 to DN 5 or DN 8
	YTTF-12-9	Adapter M42 x 2 to DN 12
	Y6TF-6-8	Adapter 3/4 - 16UNF to DN 5 or DN 8
	Y6TF-9-8	Adapter 1 1/8 - 12UNF to DN 5 or DN 8
6	TMCAP-8	Cap DN 5 or DN 8
O	TMCAP-9	Cap DN 12



Type M Adapters

Medium Pressure Adapters

High Pressure Adapters

NPT Adapters

JIC Adapters

Medium Pressure Valves

High Pressure Valves





Quick Couplings

Rogan Series Couplings

C-Series Hydraulic Couplings





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auton coupuiigo	
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Quick Coupling Nomenclature

Quick Coupling Part Numbers

The part number description given to the Rogan Series (Walther Quick Couplings) is as follows:

Example: HP006-0-NMC

HP006-0-NMC – Thru Hole Size (HP006 = .24", or 6mm, nominal thru hole diameter)

HP006-0-NMC – Component Type (0 = Female coupler with check valve)

HP006-0-NMC – Connection Type (N = NPT)

HP006-0-NMC – Connection Gender (M = Male)

HP006-0-NMC – Connection Size (C = 3/8" NPT)

Thru Hole Size					
HP006	P006 .24", or 6mm, nominal thru hole diameter				
HP010	.40", or 10mm , nominal thru hole diameter				

Comp	Component Type				
0	Female coupler with check valve				
1	Male nipple w/o check valve (straight through)				
2	Male nipple with check valve				

Thread Form Connection Type		Connection		Connection Size	
Commodation Type		Gender			
Н	High Pressure	M	Male	4	1/4"
L	Medium Pressure	F	Female	6	3/8"
Α	Type "M"			9	9/16"
N	NPT]			3/4"
X	X Low Angle Face Seal			16	1"
		•		В	1/4" NPT
				С	3/8" NPT
				D	1/2" NPT

Quick Coupling Nomenclature

Quick Coupling Part Numbers

The part number description given to the C Series couplings* is as follows:

Example: C10-116-1202

 C10-116-1202 - Part Type
 (C10 = Coupling Component)

 C10-116-1202 - Series
 (116 = Max. Working Pressure of 21,760 psi)

 C10-116-1202 - Component Type
 (1 = Coupler)

 C10-116-1202 - Connection
 (2 = BSP)

 C10-116-1202 - Gender
 (0 = Female)

 C10-116-1202 - Size
 (2 = 1/4")

Part Type			
C10 Coupling component			
C19	Adapter		

Series					
115	Working pressure of 14,500 psi (100 MPa)				
116	Working pressure of 21,760 psi (150 MPa)				
125	Working pressure of 29,000 psi (200 MPa)				
950	Adapters only - Working pressures up to 43,500 psi (300 MPa)				

Par	Part Type - Couplings only, not applicable to adapters		
1	Coupler		
6	Nipple		
5	Nipple w/o Check Valve		

Thr	Thread Form - Couplings only, not applicable to adapters						
Co	Connection Type Connection Gender Connection Size						
2	BSP	5	Male	1	1/8"		
4	NPT	0	0 Female		1/4"		
		2	Female w/ built-in locking device	4	3/8"		



^{*}This description is for couplings only. The part numbers for quick coupling adapters will deviate from this structure.

Rogan Series



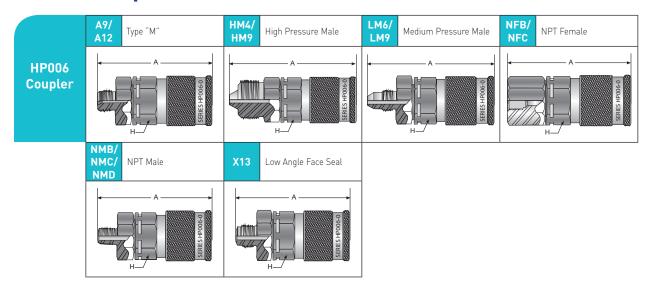
Rogan series quick couplings are versatile connecting devices that permit easy and rapid joining of hose assemblies to your system. Each coupling is assembled and pressure tested to at least 5,000 psi above its maximum rated working pressure. Couplings with check-valves can withstand the full working pressure in the disconnected condition. The standard seal material is Nitrile, however, Viton, EPDM and FFKM are also available.

Type Max. Working Pressure (psi)		Test Pressure (psi)	Nominal Thru Hold Diameter (in)			
HP006	30,000	35,000	0.24			
HP010	20,000	25,000	0.40			

Note: The choice of the threaded end form may limit the working pressure and the size of the thru hole in the coupling. Call **polyflex** for additional information.



HP006 Couplers — Visual Index



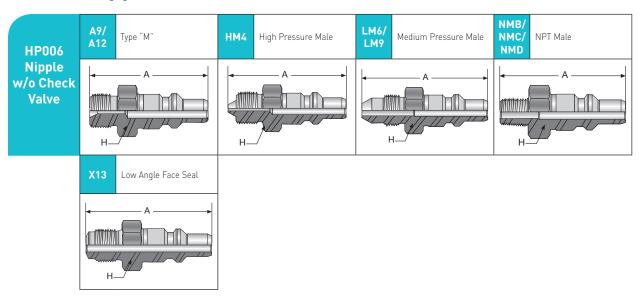
HP006 Coupler

Part Number			A Overall Length		H Hex		Max. Working Pressure	
#				\bigcirc				
		inch mm		inch	mm	psi	MPa	
HP006-0-A9	Type "M" (9/16" - 18)	3.30	83.82	1.19	30.23	30,000	207	
HP006-0-A12	Type "M" (3/4" - 16)	3.34	84.84	1.19	30.23	30,000	207	
HP006-0-HM4	1/4" High Pressure Male	3.46	87.88	1.19	30.23	30,000	207	
HP006-0-HM9	9/16" High Pressure Male	3.70	93.98	1.19	30.23	30,000	207	
HP006-0-LM6	3/8" Medium Pressure Male	3.54	89.92	1.19	30.23	20,000	138	
HP006-0-NFB	1/4" NPT Female	3.30	83.82	1.19	30.23	15,000	103	
HP006-0-NFC	3/8" NPT Female	3.30	83.82	1.19	30.23	15,000	103	
HP006-0-NMB	1/4" NPT Male	3.40	86.36	1.19	30.23	15,000	103	
HP006-0-NMC	3/8" NPT Male	3.30	83.82	1.19	30.23	15,000	103	
HP006-0-NMD	1/2" NPT Male	3.45	87.63	1.19	30.23	15,000	103	
HP006-0-X13 Low Angle Face Seal (9/16" - 18)		3.37	85.60	1.19	30.23	30,000	207	
Construction: Alloy steel								



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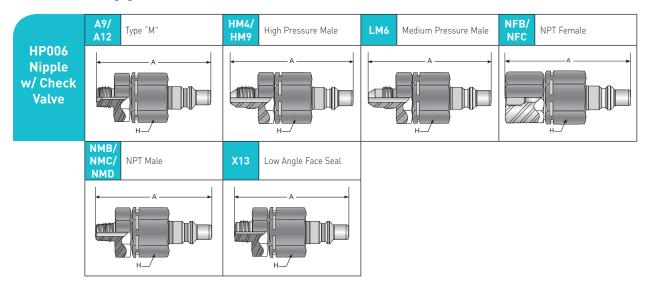
HP006 Nipple w/o Check Valve — Visual Index



HP006 Nipple w/o Check Valve

Part Number	Thread Type	A Overall Length		H Hex		Max. Working Pressure				
#	~~~~~			\bigcirc				(7)	
		inch mm		inch	mm	psi	MPa			
HP006-1-A9	Type "M" (9/16" - 18)	1.98	50.29	0.75	19.05	30,000	207			
HP006-1-A12	Type "M" (3/4" - 16)	2.16	54.86	0.87	22.10	30,000	207			
HP006-1-HM4	1/4" High Pressure Male	2.25	57.15	0.75	19.05	30,000	207			
HP006-1-LM6	3/8" Medium Pressure Male	2.33	59.18	0.75	19.05	20,000	138			
HP006-1-LM9	9/16" Medium Pressure Male	2.57	65.28	1.00	25.40	20,000	138			
HP006-1-NMB	1/4" NPT Male	2.09	53.09	0.75	19.05	15,000	103			
HP006-1-NMC	3/8" NPT Male	2.13	54.10	0.75	19.05	15,000	103			
HP006-1-NMD	1/2" NPT Male	2.31	58.67	1.00	25.40	15,000	103			
HP006-1-X13	Low Angle Face Seal (9/16" - 18)	2.17 55.12		0.75	19.05	30,000	207			
Construction: Alloy s	Construction: Alloy steel									

HP006 Nipple w/ Check Valve — Visual Index



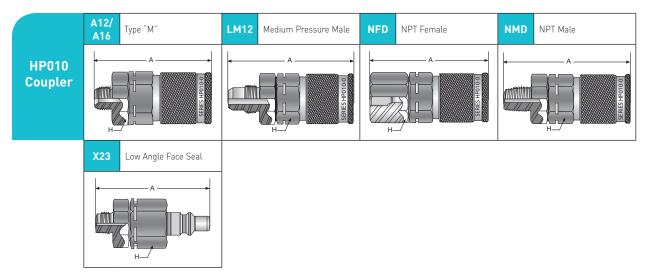
HP006 Nipple w/ Check Valve

Part Number	Thread Type	A Overall Length			H Hex		ax. Pressure			
#				\bigcirc		7				
		inch	mm	inch	mm	psi	MPa			
HP006-2-A9	Type "M" (9/16" - 18)	3.28	83.31	1.19	30.23	30,000	207			
HP006-2-A12	Type "M" (3/4" - 16)	3.30	83.82	1.19	30.23	30,000	207			
HP006-2-HM4	1/4" High Pressure Male	3.45	87.63	1.19	30.23	30,000	207			
HP006-2-LM6	3/8" Medium Pressure Male	3.52	89.41	1.19	30.23	20,000	138			
HP006-2-NFB	1/4" NPT Female	3.26	82.80	1.19	30.23	15,000	103			
HP006-2-NFC	3/8" NPT Female	3.25	82.55	1.19	30.23	15,000	103			
HP006-2-NMB	1/4" NPT Male	3.34	84.84	1.19	30.23	15,000	103			
HP006-2-NMC	3/8" NPT Male	3.34	84.84	1.19	30.23	15,000	103			
HP006-2-NMD	1/2" NPT Male	3.43	87.12	1.19	30.23	15,000	103			
HP006-2-X13	Low Angle Face Seal (9/16" - 18)	3.35	85.09	1.19	30.23	30,000	207			
Construction: Alloy s	Construction: Alloy steel									



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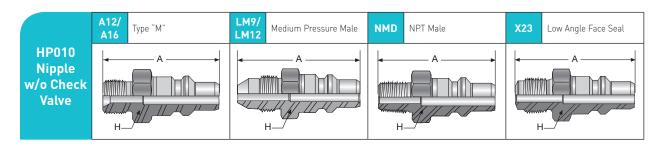
HP010 Coupler — Visual Index



HP010 Coupler

Part Number	Thread Type	A Overall Length		H Hex		Max. Working Pressure			
#	<u>~~~~~</u>							(7
		inch	mm	inch	mm	psi	MPa		
HP010-0-A12	Type "M" (3/4" - 16)	4.00	101.60	1.62	41.15	20,000	138		
HP010-0-A16	Type "M" (1" - 12)	4.10	104.14	1.62	41.15	20,000	138		
HP010-0-LM12	3/4" Medium Pressure Male	4.64	117.86	1.62	41.15	20,000	138		
HP010-0-NFD	1/2" NPT Female	4.27	108.46	1.62	41.15	15,000	103		
HP010-0-NMD	1/2" NPT Male	4.13	104.90	1.62	41.15	15,000	103		
HP010-0-X23	Low Angle Face Seal (3/4" - 16)	4.19 106.43		1.62	41.15	20,000	138		
Construction: Alloy s	Construction: Alloy steel								

HP010 Nipple w/o Check Valve — Visual Index



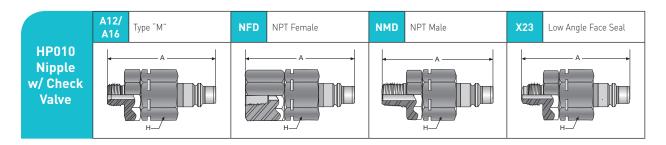
HP010 Nipple w/o Check Valve

Part Number	Connection Type	A Overall Length		H Hex		Max. Working Pressure	
#				\bigcirc			
		inch	mm	inch	mm	psi	MPa
HP010-1-A12	Type "M" (3/4" - 16)	2.40	60.96	1.06	26.92	20,000	138
HP010-1-A16	Type "M" (1" - 12)	2.53	64.26	1.18	29.97	20,000	138
HP010-1-LM9	9/16" Medium Pressure Male	3.12	79.25	1.18	29.97	20,000	138
HP010-1-LM12	3/4" Medium Pressure Male	2.84	72.14	1.06	26.92	20,000	138
HP010-1-NMD	1/2" NPT Male	2.52	64.01	1.06	26.92	15,000	103
HP010-1-X23	Low Angle Face Seal (3/4" - 16)	2.58	65.53	1.06	26.92	20,000	138
Construction: Alloy s	teel						



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HP010 Nipple w/ Check Valve — Visual Index



HP010 Nipple w/ Check Valve

Part Number	Connection Type	A Overall Length		H Hex		Max. Working Pressure				
#				\bigcirc		\bigcirc				
		inch	mm	inch	mm	psi	MPa			
HP010-2-A12	Type "M" (3/4" - 16)	4.00	101.60	1.62	41.15	20,000	138			
HP010-2-A16	Type "M" (1" - 12)	4.08	103.63	1.62	41.15	20,000	138			
HP010-2-NFD	1/2" NPT Female	4.14	105.16	1.62	41.15	15,000	103			
HP010-2-NMD	1/2" NPT Male	4.13	104.90	1.62	41.15	15,000	103			
HP010-2-X23	Low Angle Face Seal (3/4" - 16)	4.18 106.17		1.62	41.15	20,000	138			
Construction: Alloy s	Construction: Alloy steel									

C Series



Features:

- Working pressures up to 29,000 psi
- Non-drip valving for clean, safe, trouble-free performance and minimal air inclusion
- Built-in safety locking device to prevent accidental disconnect
- Wide range of threaded styles: NPT, BSP and "High Pressure"
- Adapters for ease of connection to high pressure hoses and fixed ports
- Thread sizes from 1/8" to 3/8"
- Protective dust caps are included to prevent damage and fluid contamination in disconnected position
- Rugged design and construction for long life in demanding applications

Applications:

- Torque Tensioning
- Stud Tensioning
- Rescue
- Bearing Pullers
- Intensifiers
- Hydrostatic Testing
- Pumps
- Jacks
- Spreaders

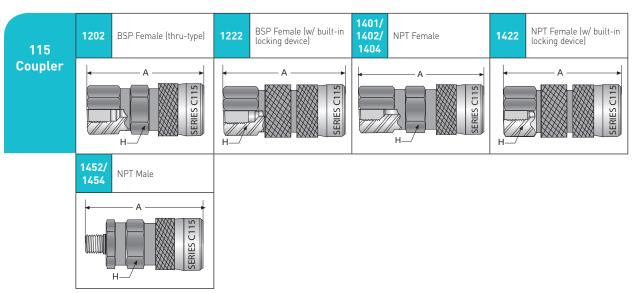
- Cable Cutters
- Nut Splitters
- Pipe Coupling Swagers
- Presses
- Clamping Fictures
- Crimpers
- Blow-out Preventors

Туре	Max. Working Pressure (psi)	Test Pressure (psi)	Nominal Thru Hold Diameter (in)		
C Series 115	14,500	21,800	0.11		
C Series 116	21,800	29,200	0.11		
C Series 125	29,800	36,300	0.11		

Note: The choice of the threaded end form may limit the working pressure and the size of the thru hole in the coupling. Call **polyflex** for additional information.



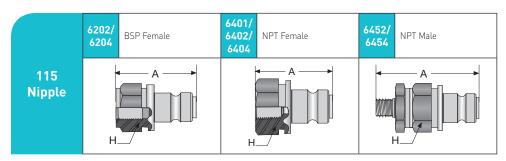
115 Coupler — Visual Index



115 Coupler

Connection Type	A Overall Length		H Hex		Max. Working Pressure			
					\bigcirc			7
	inch	mm	inch	mm	psi	MPa		
1/4" BSP Female (thru type)	2.30	58.42	0.94	23.88	14,500	100		
1/4" BSP Female (with built-in locking device)	2.30	58.42	0.94	23.88	14,500	100		
1/8" NPT Female	2.30	58.42	0.94	23.88	14,500	100		
1/4" NPT Female	2.30	58.42	0.94	23.88	14,500	100		
3/8" NPT Female	2.38	60.45	0.94	23.88	14,500	100		
1/4" NPT Female (with built-in locking device)	2.30	58.42	0.94	23.88	14,500	100		
1/4" NPT Male	2.45	62.23	0.94	23.88	14,500	100		
3/8" NPT Male	2.45	62.23	0.94	23.88	14,500	100		
	1/4" BSP Female (thru type) 1/4" BSP Female (with built-in locking device) 1/8" NPT Female 1/4" NPT Female 3/8" NPT Female 1/4" NPT Female (with built-in locking device) 1/4" NPT Male	Overall	Overall Length	Overall Length	Overall Length	Overall Length		

115 Nipple — Visual Index

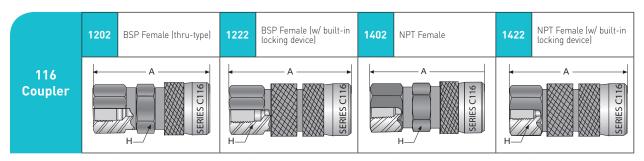


115 Nipple

Part Number	Connection Type	A Overall Length		H Hex		Max. Working Pressure	
#	<u>~~~~</u>					·	
		inch	mm	inch	mm	psi	MPa
C10-115-6202	1/4" BSP Female	1.47	37.34	0.87	22.10	14,500	100
C10-115-6204	3/8" BSP Female	1.56	39.62	0.94	23.88	14,500	100
C10-115-6401	1/8" NPT Female	1.42	36.07	0.87	22.10	14,500	100
C10-115-6402	1/4" NPT Female	1.42	36.07	0.87	22.10	14,500	100
C10-115-6404	3/8" NPT Female	1.46	37.08	0.94	23.88	14,500	100
C10-115-6452	1/4" NPT Male	2.40	60.96	0.87	22.10	14,500	100
C10-115-6454	3/8" NPT Male	2.55 64.77		0.94	23.88	14,500	100
Construction: All exp	osed components are made of z	inc-plated	steel.		*		



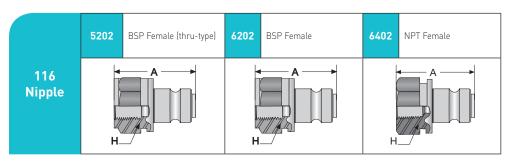
116 Coupler — Visual Index



116 Coupler

Part Number	Connection Type	A Overall Length		H Hex		Max. Working Pressure				
#				\bigcirc						
		inch	mm	inch	mm	psi	MPa			
C10-116-1202	1/4" BSP Female	2.30	58.42	0.94	23.88	21,750	150			
C10-116-1222	1/4" BSP Female (with built-in locking device)	2.30	58.42	0.94	23.88	21,750	150			
C10-116-1402	1/4" NPT Female	2.30	58.42	0.94	23.88	21,750	150			
C10-116-1422	1/4" NPT Female (with built-in locking device)	2.30	58.42	0.94	23.88	21,750	150			
Construction: All exp	Construction: All exposed components are made of zinc-plated steel.									

116 Nipple — Visual Index

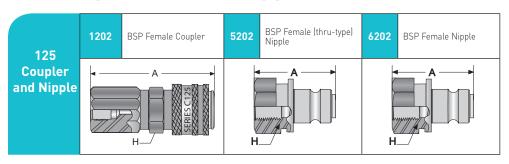


116 Nipple

Part Number	Connection Type	A Overall Length		H Hex		Max. Working Pressure	
#				\bigcirc			
		inch	mm	inch	mm	psi	MPa
C10-116-5202	1/4" BSP Female (thru type)	1.47	37.34	0.87	22.10	21,750	150
C10-116-6202	1/4" BSP Female	1.47	37.34	0.87	22.10	21,750	150
C10-116-6402	1/4" NPT Female	1.41 35.81		0.87	22.10	21,750	150
Construction: All exp	oosed components are made of z	inc-plated	steel.				



125 Coupler and 125 Nipple — Visual Index



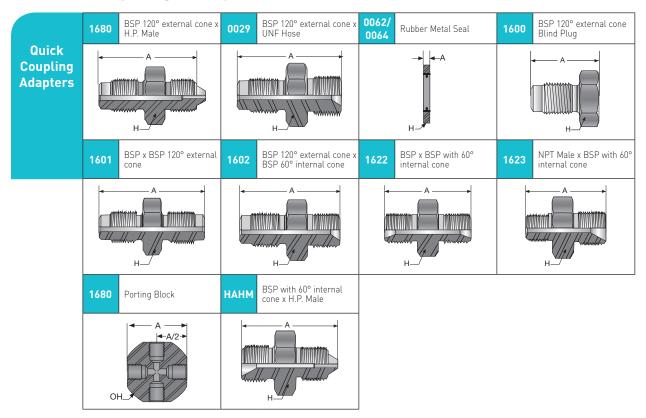
125 Coupler

Part Number	Connection Type	A Overall Length		A Overall Length		A Overall Length		H Hex		H Hex		A H Overall Length Hex			ax. Pressure
#	<u>~~~~~</u>			\bigcirc											
		inch	mm	inch	mm	psi	MPa								
C10-125-1202	1/4" BSP Female	2.65	67.31	0.94	23.88	29,000	200								
Construction: All exp	Construction: All exposed components are made of zinc-plated steel.														

125 Nipple

Part Number	Connection Type	A H Overall Length He		H Hex		A H Ma Overall Length Hex Working		
#	<u>~~~~~</u>				\bigcirc		7)	
		inch	mm	inch mm		psi	MPa	
C10-125-5202	1/4" BSP Female (thru type)	1.50	38.10	0.87	22.10	29,000	200	
C10-125-6202	1/4" BSP Female	1.50	38.10	0.87 22.10		29,000	200	
Construction: All exp	osed components are made o	f zinc-plate	ed steel.				•	

Quick Coupling Adapters — Visual Index



Quick Coupling Adapters

Part Number	Connection Type	<i>)</i> Overall	A Length		ł ex	Max. Working Pressure	
#				\bigcirc			
		inch	mm	inch	mm	psi	MPa
C09-125-1680	1/4" BSP 120° external cone x 1/4" HP Male	1.72	43.69	0.67	17.02	29,000	200
C19-950-0029	1/4" BSP 120° external cone x 9/16" UNF	1.48	37.59	0.67	17.02	29,000	200
C19-950-0062	1/4" Rubber Metal Seal	0.08	2.03	0.81	20.57	14,500	100
C19-950-0064	3/8" Rubber Metal Seal	0.08	2.03	0.94	23.88	14,500	100
C19-950-1600	1/4" BSP 120° external cone Blind Plug	1.07	27.18	0.67	17.02	29,000	200
C19-950-1601	1/4" BSP x 1/4" BSP 120° external cones	1.76	44.70	0.08	2.03	29,000	200
C19-950-1602	1/4" BSP 120° external cone x 1/4" BSP 60° internal cone	1.54	39.12	0.83	21.08	29,000	200
C19-950-1622	1/4" BSP x 1/4" BSP with 60° internal cone	1.25	31.75	0.83	21.08	29,000	200
C19-950-1623	1/4" NPT Male x 1/4" BSP with 60° internal cone	1.27	32.26	0.83	21.08	14,500	100
C19-950-1680	Porting Block	1.8	45.72	N/A	N/A	29,000	200
HAHM4BM4	1/4" BSP with 60° internal cone x 1/4" HP Male	1.47	37.34	0.83	21.08	30,000	207
Construction: A	ll C19 part numbers are manufactured with black zinc-p	olated ste	el.				





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Accessories

Heavy Duty Abrasion Cover and Cover Sleeves





Part Number	Size I.D. (inch)	Size 0.D. (inch)	Material	Reinforcement	Bend Radius (inch)	Weight (lbs/ft)	Cover Sleeves	Cover Sleeve Material
MHDC010	5/8	0.820	Clear Vinyl	White PVC Helix	3.0	0.15	508-J-500-10	Carbon Steel
MHDC011	5/8	0.820	Clear Vinyl	White PVC Helix	3.0	0.15	508-J-500-10	Carbon Steel
MHDC012	3/4	0.938	Clear Vinyl	White PVC Helix	3.0	0.20	510-A-500-12	Aluminum
MHDC014	7/8	1.120	Clear Vinyl	White PVC Helix	3.0	0.25	512-400-14	Carbon Steel
MHDC016	1	1.250	Clear Vinyl	White PVC Helix	3.0	0.27	216-200-18	Carbon Steel
							216-200-18	Carbon Steel
MHDC018	1-1/8	1.350	Clear Vinyl	White PVC Helix	3.5	0.29	620-100-18 (w/ 2640N-08)	Aluminum
MHDC022	1-3/8	1.625	Clear Vinyl	White PVC Helix	4.0	0.35	220-200-22	Carbon Steel
MHDC024	1-1/2	1.825	Clear Vinyl	White PVC Helix	4.0	0.40	220-200-22	Carbon Steel
MHDC026	1-5/8	1.905	Clear Vinyl	White PVC Helix	4.0	0.52	520-A-500-26	Aluminum
PVC-BLUE-012	3/4	0.938	Clear Vinyl	Blue PVC Helix	3.0	0.20	510-A-500-12	Aluminum
PVC-BLUE-016	1	1.250	Clear Vinyl	Blue PVC Helix	3.0	0.27	216-200-18	Carbon Steel
PVC-BLUE-018	1-1/8	1.375	Clear Vinyl	Blue PVC Helix	3.0	0.29	216-200-18	Carbon Steel
PVC-BLUE-024	1-1/2	1.780	Clear Vinyl	Blue PVC Helix	5.0	0.40	220-200-22	Carbon Steel
PVC-ORANGE-012	3/4	0.938	Clear Vinyl	Orange PVC Helix	3.0	0.20	510-A-500-12	Aluminum
PVC-ORANGE-016	1	1.250	Clear Vinyl	Orange PVC Helix	3.0	0.27	216-200-18	Carbon Steel

Spring Guards



Part Number	Size (I.D.)	Size (0.D.)	Length (in)	Material	Designated Hose Series
MSG060	0.61	0.77	300.00	Stainless Steel	2440N-04
MSG2006	0.61	0.77	6.30	Carbon Steel	2245N-04
MSG2106	0.63	0.89	7.87	Carbon Steel	2380N-04
MSG4113	0.90	1.27	18.00	Carbon Steel	-08 Hose Sizes
MSG4120	1.45	1.89	20.00	Stainless Steel	2440N-12
MSG4125	1.21	1.65	18.00	Stainless Steel	2440N-16

Bend Restrictors



Part Number	I.D. (inch)	O.D. (inch)	Length (inch)	Material
MBR003	0.250"	0.515"	2.33	Molded Vinyl
MBR004	0.250"	0.490"	2.16	Molded Vinyl
MBR008	0.500"	0.800"	6.00	Molded Vinyl
MBR010	0.625"	0.925"	6.00	Molded Vinyl
MBR012	0.770"	1.070"	6.00	Molded Vinyl

Accessories

Containment Grips



Part Number	Loop Size (inch)	Overall Length (inch)	Material	Breaking Strength (lbs)	Hose Size (0.D.)	Weight (lbs)
MCG001SS	1	25.5	Stainless Steel	2,900	0.38" - 0.69"	0.55
MCG002SS	2	37.5	Stainless Steel	9,400	1.00" - 1.56"	2.20
MCG003SS	1.26	65	Stainless Steel	14,400	1.25" - 1.94"	6.50
MCGHS10-15	0.71	26.18	Galvanized Steel	2,293	0.40" - 0.59"	0.15
MCGHS15-20	0.71	27.17	Galvanized Steel	2,900	0.59" - 0.79"	0.33
MCGHS20-30	0.71	26.97	Galvanized Steel	5,463	0.79" - 1.18"	0.40
MCGHS30-40	0.71	27.56	Galvanized Steel	7,891	1.18" - 1.57"	0.68
MCGHS40-50	0.71	28.54	Galvanized Steel	10,791	1.57" - 1.96"	1.04
MCGHS50-60	0.71	33.46	Galvanized Steel	10,791	1.96" - 2.36"	1.81
MCGHS3295-SS	4.50	81.50	Stainless Steel	49,000	1-1/2" and 2" (Black Eagle)	9.5

Dies



Part Number	Description	Fitting Series
#		
80C-HP3	Dies for HP3 Fittings	HP
80C-HP4	Dies for HP4 Fittings	HP
80C-HP6	Dies for HP6 Fittings	HP
80C-G03	Dies for HP3 Guards	N/A
80C-G04	Dies for HP4 Guards	N/A
80C-G06	Dies for HP6 Guards	N/A
83C-9X04	2390N-04	9X
83C-9X08	2390N-08	9X
83C-9X16	2390N-16	9X
80C-F08W	57CR-08	CR
83C-F16W	57CR-16	CR

Support Grips



Part Number	Loop Size (inch)	Overall Length (inch)	Material	Breaking Strength (lbs)	Hose Size (0.D.)	Weight (lbs)
MK022-03-038	4	9	Tin - Coated Bronze	750	0.63" - 0.74"	0.50
MK022-03-039	4	10	Tin - Coated Bronze	950	0.75" - 0.99"	0.25
MK022-03-041	5	12	Tin - Coated Bronze	1,500	1.00" - 1.24"	0.35
MK022-03-042	5	14	Tin - Coated Bronze	1,500	1.25" - 1.49"	0.40
MK022-03-043	5	15	Tin - Coated Bronze	1,500	1.50" - 1.74"	0.45
MK022-03-045	9	19	Tin - Coated Bronze	3,100	2.25" - 2.49"	1.25

Warning Tags





Part Number	Description
G214-250	White - General warning tag should be applied to all hoses
G214-245	Yellow - Warning tag for flex lances



Accessories

Pressure Containment Shield



Part Number	I.D. (inch)	O.D. (inch)	Retaining Sleeve	Stiffener	Material	Bend Radius (in)	Weight (lbs/ft)	Designated Hose Series
MHBS012	0.75	1.07	412-400	M55STIF-4 M55STIF-5 M55STIF-6	Rubber	9.5	0.42	2740D-03 and 2840D-03
MHBS016	1.00	1.28	416-400-16	N/A	Rubber	12.0	0.63	2740D-05 and 2840D-05

NOTE: Any assembly sold at a design factor lower than 2.5:1 requires the addition of a pressure containment shield, excluding 2849D.

ThreadMate® Anti-Gall Lubricant



Part Number	Description
#	
MTM04T	4 oz Tube

ThreadMate® is an extreme duty lubricant developed to reduce galling during the assembly of threaded parts.:

ThreadMate® promotes reliable sealing of pipe threads, even at high pressure, by reducing friction and galling during tightening, resulting in higher contact pressures of the sealing surfaces and better metal-to-metal contact.

ThreadMate® reduces the torque needed to make pressure-tight connections and tighten fasteners

General Technical

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Dash Size Systems for Hose and Tubing

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C

Selection, Installation & Maintenance of **polyflex** Hose and Hose Assemblies

Hoses and hose assemblies have a finite life span which can be affected by many factors. This recommended practice should be read by designers and users of hose to assist them in the proper selection of hose. These guidelines, while not exhaustive, will assist the user in maintaining hydraulic and pneumatic systems.

READ THE PARKER SAFETY GUIDE CONTAINED IN THIS CATALOG IN ITS ENTIRETY.

PART 1 - How to select hose

• Pressure - Maximum operating pressure of the hose must be greater than or equal to the system pressure. Pressure surges or system "spikes" in excess of the maximum operating pressure will shorten hose life and must be avoided.

- **Temperature** Ambient and fluid temperatures must not exceed the hose/fittings rated design temperature. Attempt to route hose away from or shield hose from high temperature sources.
- Size Adequately size hose and fittings to avoid damaging hose with excessive turbulence, or heat build-up, while maintaining proper flow and pressure. (Refer to fluid velocity nomogram on page F-5.)
- Fluid Compatibility Refer to Chemical Compatibility Guide on page F-20 for use of fluids with various materials. If unsure of an application, contact the factory. Additional care must be taken with gaseous applications. (See Safety Guide on page F-47.)
- Environment Conditions such as ozone, UV light, harsh chemicals, salt water, and other airborne contaminants can degrade hose and shorten its life.
- Length Hose length changes with pressure. This, along with equipment movement, must be considered in the system design.
- Proper couplings Always follow manufacturers' specifications and do not mix components of different manufacturers.
- Mechanical loads Conditions such as tensile and side loads, vibration, excessive flexing, and twist will reduce hose life. Use swivel fittings and adaptors to avoid hose twisting. Test the hose if the application is potentially problematic or unusual.
- Electrical conductivity Determine if the hose must be non-conductive to prevent electrical current flow or conductive to dissipate static electricity. Choose hose and fittings accordingly. (See Safety Guide for Electrical Conductivity issues.)

PART 2 - Installation & Maintenance

- Inspect components Check hose for cover cracks, blisters, cleanliness, kinks, cracks or core tube obstructions or other defects. Examine fittings for poor threads, obstructions, cracks, rust. Do not use hose or fittings if these problems exist.
- Assemble per instructions Instructions are available for companies, trained and authorized by Polyflex.
- Do not exceed specified minimum bend radius
 Use stress relievers to prevent sharp bends at the hose and fitting juncture. These can be spring guards or other stress relieving members.
- Ensure that hose bends rather than twists with equipment motion.
- Use a torque wrench or the flats from finger tight method to properly install port connections.
- After installation, eliminate air entrapped in system, pressurize to maximum operating pressure, and check for leaks and proper system function.
- After installation, periodically (frequency depends on severity of application and potential risk) inspect the system for the following:
 - 1. Blistered, degraded, or loose hose covers
 - 2. Stiff, cracked, or charred hose
 - 3. Cuts or abrasion of hose look for exposed reinforcement
 - 4. Leaks in hose or fittings
 - 5. Damaged or corroded fittings
 - 6. Excessive build up of dirt, grease, oils, etc.
 - 7. Defective or broken accessories (clamping devices, kink guards)
 - 8. Kinks in hoses
 - Upon discovery of any of these items, replace it, repair it, but DO NOT IGNORE IT!
- Retest the system after all maintenance procedures.
- Establish replacement schedules based on previous service life, or when failures could result in damage, personal injury, or excessive/ unacceptable downtime.



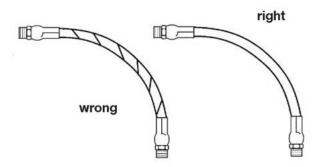
Dash Sizes

Dash sizes are commonly used to designate hose I.D., plastic tubing and metal tubing O.D. and coupling size. Dash size systems in common use:

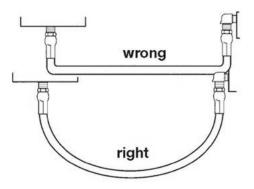
Nominal Hose I.D. or Tubing O.D.		Dash number for all polyflex	Nominal
Inch	Millimeter	hose	DN Size
3/32	2.0	-012	2
1/8	3.2	-2	3
5/32	4.0	-025 or 2A	4
3/16	4.8	-3	5
1/4	6.3	-4	6
5/16	7.9	-5	8
3/8	9.5	-6	10
13/32	10.3	-6.5	_
1/2	12.7	-8	12
5/8	15.9	-10	16
3/4	19.1	-12	20
7/8	22.2	-14	_
1	25.4	-16	25
1-1/8	28.6	_	_
1-1/4	31.8	-20	32
1-3/8	34.9	_	_
1-1/2	38.1	-24	40
1-13/16	46.0	_	_
2	50.8	-32	50



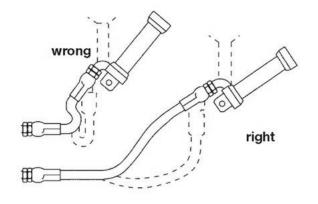
Installation Tips



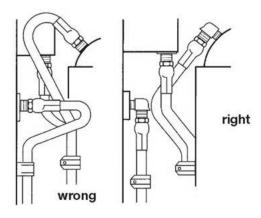
Hose is weakened when installed in twisted position. Also, pressure pulses in twisted hose tend to fatigue wire and loosen fitting connections. Design so that the machine motion produces bending rather than torsion.



Hose should exit coupling in a straight position rather than side loaded. The minimum bend radius must not be exceeded to avoid kinking of hose and flow restriction.

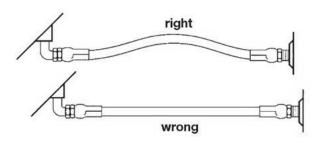


When hose assembly is installed in a flexing applications, remember that metal hose fittings are not part of the flexible portion.

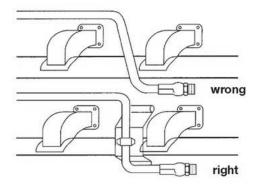


Use elbow or adapters as necessary to eliminate excess hose length and to ensure neater installation and easier maintenance.

Free hose length allowance:



Pressure can change hose in length by as much as $\pm 2\%$. This must be considered when cutting hose to appropriate length.



Avoid installing hose assemblies close to heat sources. However, if this should be required, insulate hose.



Volumetric flow Q

Gal/min*

(I/min)

Selection of Hose Diameter from Flow Rate and Velocity

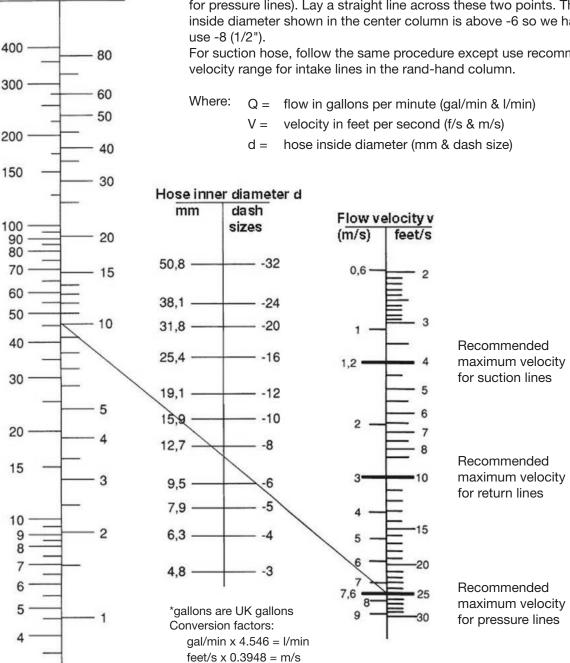
Flow capacities of Parker hose at recommended flow velocities

The chart below is provided as an aid in the determination of the correct hose size.

Example:

At 10 gallons per minute in th left-hand column and 25 feet per second in the right-hand column (the maximum recommended velocity range for pressure lines). Lay a straight line across these two points. The inside diameter shown in the center column is above -6 so we have to use -8 (1/2").

For suction hose, follow the same procedure except use recommended



^{*}Recommended velocities are according to hydraulic fluids of maximum viscosity 315 S.S.U. at 38°C working at room temperature within 18°C and 68°C



Determination of Pressure Drop in the Line

Velocity:
$$v = .409 \frac{Q}{d^2} = .509 \frac{W}{pd^2} = \frac{q}{.785d^2}$$

Reynold's Number: Re = 124
$$\frac{dvp}{\mu}$$
 = 6.31 $\frac{W}{d\mu}$ = 378 $\frac{dp}{d\mu}$

Pressure Drop, Isothermal, Incompressible Flow (Liquids):

$$\Delta P = .001 \ 294 \ \frac{fL \ p \ v^2}{d} = .000 \ 00336 \ \frac{fLW^2}{pd^5} = .0121 \ \frac{fL \ q^2}{d^5}$$

Pressure Drop, Isothermal, Compressible, long Lines (Gases and Vapors):

$$\frac{\Delta P}{P1} = 1 - \sqrt{1 - \frac{f L p \, 1^{v} 1^{2}}{12 \, g \, d \, P_{1}}}$$

Symbols and Units for Listed Formulas

d = Inside diameter of hose, inches

f = Friction coefficient, dimensionless

g = Gravitational constant, 32.2 ft/sec²

P1 = Input pressure, psi

 ΔP = Pressure difference, psi

q = Rate of flow at flowing condition, cu. ft/min

Q = Rate of flow, gals/min

Re = Reynolds number, dimensionless

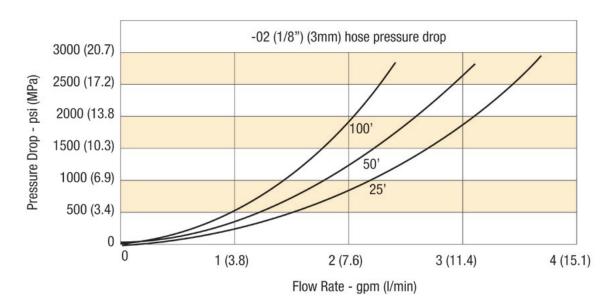
v = Flow velocity, ft/sec

W = Rate of flow, lbs/hr

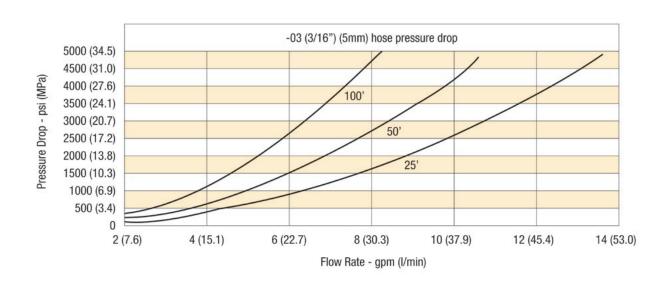
p = Weight density of fluid, lbs/cu. ft

 μ = Absolute (dynamic) viscosity, centipoises

For Size -02 (1/8") (3mm) Hoses

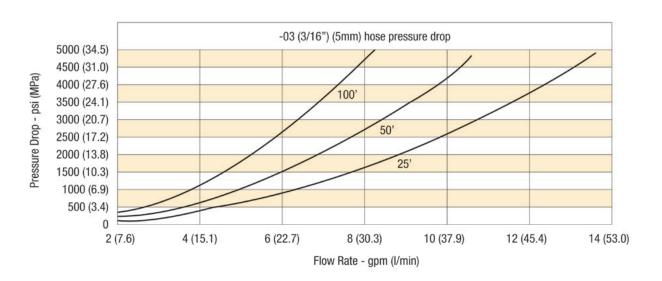


For Size -025 (5/32") (4mm) Hoses

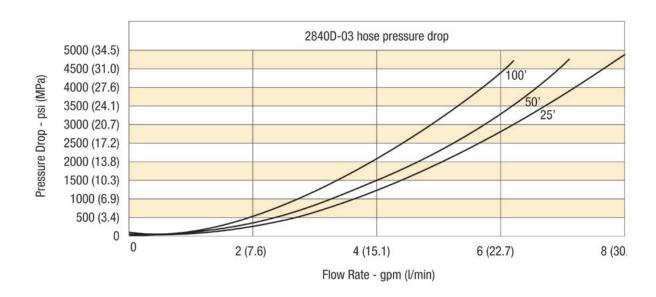




For Size -03 (3/16") (5mm) Hoses

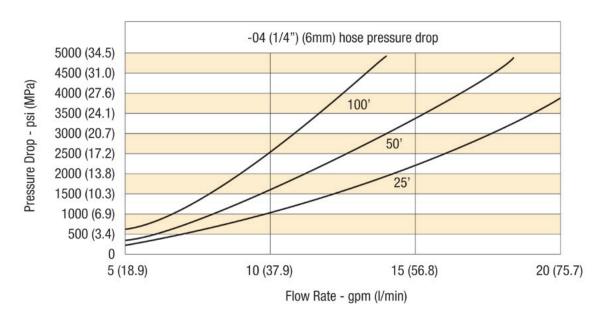


For Hose 2840D-03

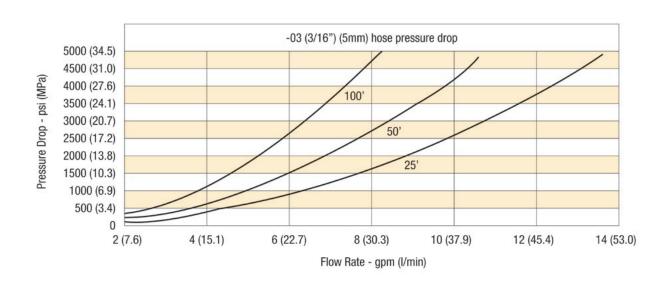




For Size -04 (1/4") (6mm) Hoses

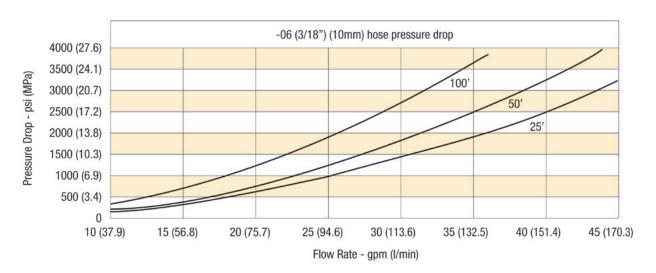


For Size -05 (5/16") (8mm) Hoses

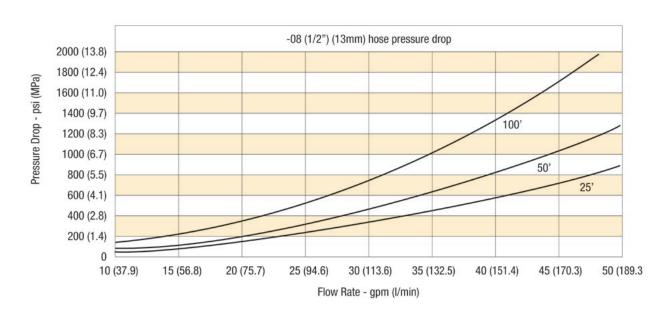




For Size -06 (3/8") (10mm) Hoses



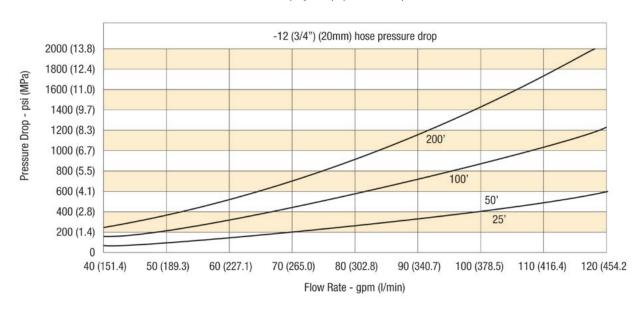
For Size -08 (1/2") (13mm) Hoses



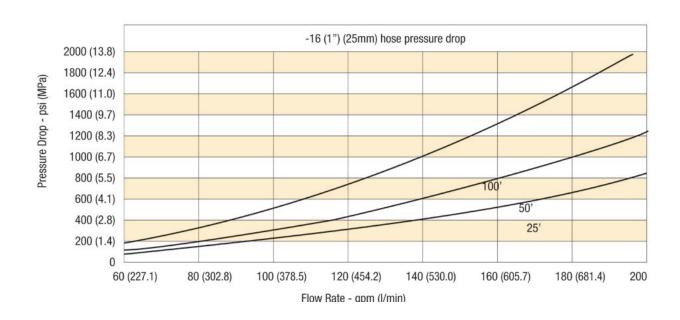


Pressure Drop vs. Flow

For Size -12 (3/4") (20mm) Hoses



For Size -16 (1") (25mm) Hoses



Results obtained from actual pressure drop test, pumping water through hose assembles with normal end fittings.



Remarks

- Figures shown in the table are for 1 meter of hose without fittings.
- Figures derived from calculation, not from testing.
- The recommended max fluid velocity is 7.6 m/s. Hoses have been used at higher fluid velocities. However this may result in cavitation. These flow figures are marked with a grey background.

Fluid: water

Dyn. viscosity: 1002 mPa s Kin. viscosity: 1002 cSt Temperature: 20°C

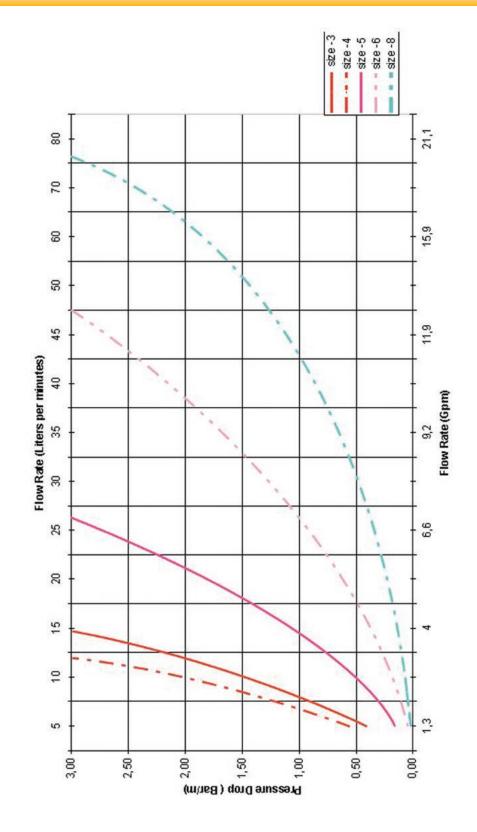
Flowrates: 5 up to 80 l/min. Sizes: 5 mm (-03) up to 13 mm (-08)

Flow	/rate		Pres	sure Drop in b	ar/m				
(l/min)	Gal (US)/		Nominal I.D.						
(1/111111)	min	5 mm (-03)	6 mm (-04)	8 mm (-05)	10 mm (-06)	13 mm (-08)			
5	1.3	0.40	0.54	0.13	0.05	0.02			
10	2.6	1.44	1.96	0.48	0.16	0.07			
15	4.0		4.35	1.07	0.36	0.15			
20	5.3			1.80	0.61	0.25			
25	6.6			2.70	0.91	0.38			
30	7.9				1.27	0.52			
35	9.2				1.69	0.69			
40	10.6					0.90			
45	11.9					1.12			
50	13.2					1.35			
60	15.9					1.91			
70	18.5								
80	21.1								

Maximum flowrates for sizes 5 mm (-03) up to 13 mm (-08)

Maximum fluid horizontal	Maximum Volumetric Flowrate								
velocity is 7.6 m/s		Nominal I.D.							
(laminar flow)	5 mm (-03)	6 mm (-04)	8 mm (-05)	10 mm (-06)	13 mm (-08)				
Radius r in mm	2.50	3.00	4.00	5.00	6.50				
Area in mm²	19.63	28.27	50.27	78.54	132.73				
Max. flowrate m³/min	0.01	0.01	0.02	0.04	0.06				
Max. flowrate Gallons/min	2.36	3.40	6.05	9.46	15.98				
Max. flowrate Liter/min	8.95	12.89	22.91	35.80	60.50				
Max. flowrate bbl/min	0.06	0.08	0.14	0.23	0.38				

Hydraulic Chart, Sizes 5 mm (-03) to 13 mm (-08)





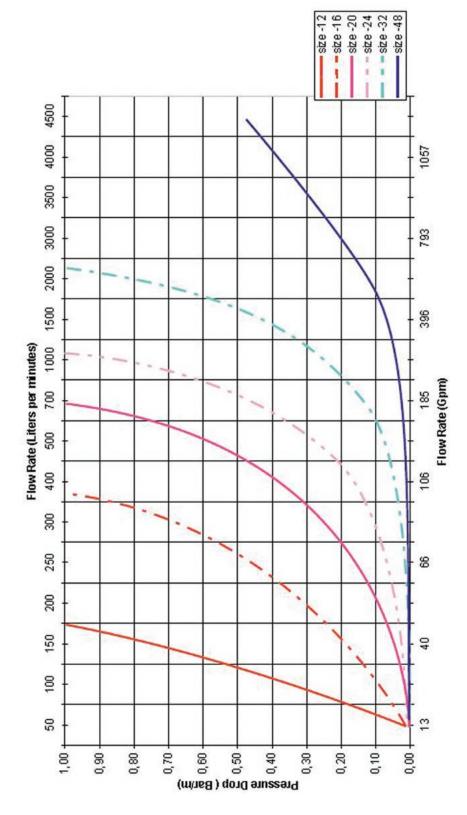
Flowrates: 5 up to 80 l/min. Sizes: 5 mm (-03) up to 13 mm (-08)

	Flowrate			Р	ressure Di	op in bar/ı	n	
	Cal (UC)/	Oilfield			Nomir	nal I.D.		
(l/min)	Gal (US)/ min	Oilfield BBL/min	20 mm (-12)	25 mm (-16)	32 mm (-20)	38 mm (-24)	50 mm (-32)	76 mm (-48)
50	13	0.31	0.01	0.01	0.00	0.00	0.00	0.00
100	226	0.62	0.16	0.04	0.01	0.01	0.00	0.00
150	40	0.95	0.36	0.09	0.03	0.01	0.00	0.00
200	53	1.26	0.61	0.15	0.05	0.02	0.01	0.00
250	66	1.57	0.91	0.22	0.07	0.03	0.01	0.00
300	79	1.88	1.27	0.31	0.10	0.04	0.01	0.00
400	106	2.52		0.54	0.17	0.07	0.02	0.00
500	132	3.14		0.81	0.26	0.11	0.03	0.00
700	185	4.41			0.49	0.21	0.05	0.01
1000	264	6.29			0.94	0.40	0.10	0.01
1500	396	9.43				0.86	0.21	0.03
2000	528	12.57					0.36	0.05
3000	793	18.88						0.11
3500	925	22.02						0.14
4000	1057	25.17						0.18
4500	1189	28.30						0.22

Maximum flowrates for sizes 5 mm (-03) up to 13 mm (-08)

Maximum fluid horizontal	Maximum Volumetric Flowrate								
velocity is 7.6 m/s	Nominal I.D.								
(laminar flow)	20 mm (-12)	25 mm (-16)	32 mm (-20)	38 mm (-24)	50 mm (-32)	76 mm (-48)			
Radius r in mm	10.0	12.5	16.0	19.0	25.0	38.0			
Area in mm ²	314.2	490.9	804.2	1134.1	1963.5	4536.5			
Max. flowrate m³/min	0.3	0.4	0.7	1.0	1.8	4.1			
Max. flowrate Gallons/min	74.7	116.6	191.1	269.5	466.6	1078.0			
Max. flowrate Liter/min	282.6	441.6	723.5	1020.2	1766.3	4080.7			
Max. flowrate bbl/min	1.8	2.8	4.6	6.4	11.1	25.7			

Hydraulic Chart, Sizes 20 mm (-12) to 76 mm (-48)





Gas Permeability of Plastics

Permeability coefficiant

Permeability Coefficient =
$$\frac{V}{A \times T \times p}$$

Where: V is the volume of gas, in cm³, which diffuses through a 1mm thickness

A is the area across which the gas diffuses, in m².

T is the diffusion time, in days.

p is the pressure difference across the plastic, in bar

Permeability Coefficients per DIN 53380

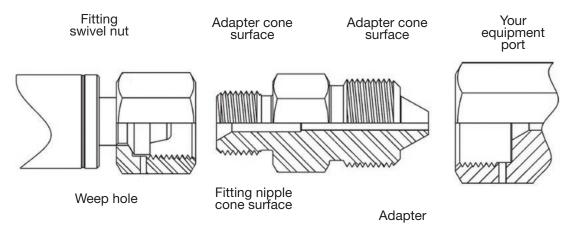
			Gas		
Material	N ₂	0,	CO ₂	H ₂	Не
PTFE	50	150	1500	_	3500
PVDF	3	2	10	_	60
PA-6 XE 3289	1	4	10	100*	60*
PA-6 A 28 NZ	0.5	2	5	50*	30*
PA-12 L 2124	_	30	180	210	160
PA-12 P40 TL	_	_	105	_	_
PA-12 L 25W40	8	35	150	1000*	500*
PA-12 L 2140	_	12	71	_	130
PA-11 P 40 TL	_	_	55	130	_
PA-11 POTL	2	20	65	65	_
POM H 2320	5	10	130	35	40
POM 150 SA	2	4	20	_	_
PEE 4055	150	_	3000	_	1400
PEE 5556	120	_	1600	_	900
PEE 7246	_	_	_	_	300



^{*} Calculated value. Diffusion constants based on normal room temperature. Actual behavior may vary considerably because of variations in processing the plastic.

Recommended Tightening Procedures

Connection	Thread Sizes	Tightenin	g Torque	
Connection	Thread Sizes	ft•lb	N∙m	
High Pressure				
1/4"	9/16" - 18	25	34	
3/8"	3/4" - 16	50	69	
9/16"	1-1/8" - 12	75	103	
Medium Pressure				
1/4"	7/16" - 20	20	28	
3/8"	9/16" - 18	30	41	
9/16"	13/16" - 16	85	117	
3/4"	3/4" NPSM	90	124	
1"	1-3/8" - 12	125	173	
Type "M" Swivel				
A9	9/16" - 18	25-30	34-41	
A12	3/4" - 16	40-50	55-69	
A14	7/8" - 14	50-60	69-83	
A16	1" - 12	75-85	103-117	
A21	1-5/16" - 12	100-120	138-166	



Leakage at swivel nut-to-adapter Joint (Seen by leak at weep hole in swivel nut)

- 1. Reduce system pressure to zero
- 2. Unscrew swivel nut and check cone surfaces of adapter and hose insert
- 3. If hose insert is is damaged, return hose to **polyflex** for repair and retest
- 4. If cone surfaces look good after cleaning, re-tighten swivel nut. Do not exceed 150% of recommended torque.

Leakage at type "M" adapter-to-port

(Seen by leak at weep hole in pressure port, or leak at threads for NPT adapters.)

- 1. Reduce system pressure to zero
- 2. Slacken hose swivel nut
- 3. Tighten adapter into port
- 4. Re-tighten swivel nut

Never use the swivel nut to tighten the adapter into the port.



Metric Conversion Chart

	Eng	lish to Metric		ı	Metric to English	
	Convert From	Convert To	Multiply By	Convert From	Convert To	Multiply By
	sq. in. (in²)	sq. mm (mm²)	645.16			
Area s S Density p Energy (((((((((((((((((((sq. in. (in²)	sq. cm (cm²)	6.4516	sq. mm (mm²)	sq. in. (in²)	0.00155
	sq. ft. (ft²)	sq. meters (m²)	0.0929			
Density	pounds/cubic foot (lb/ft³)	kg/cubic meter (kg/ m³)	16.02	kg/cubic meter (kg/ m³)	pounds/cubic foot (lb/ft³)	0.0624
Energy	British Thermal Units (Btu) (1J=Ws=0.2388 cal)	joules (J)	1055	joules (J)	British Thermal Units (Btu)	0.000947
Force	pounds - force (lbf) (1N = 0.102 kgf)	newtons (N)	4.448	newtons (N)	pounds - force (lbf)	0.2248
	inches (in)	millimeters (mm)	25.4	millimeters (mm)	inches (in)	0.03937
Length	feet (ft)	meters (m)	0.3048	meters (m)	feet (ft)	3.281
	miles (mi)	kilometers (km)	1.609	kilometers (km)	miles (mi)	0.621
	ounces (oz)	grams (g)	28.35	grams (g)	ounces (oz)	0.035
	pounds - mass (lb)	kilograms (kg)	0.4536	kilograms (kg)	pounds - mass (lb)	2.205
(woight)	short tons (2000lb) (tn)	metric tons (1000kg)	0.9072	metric tons (1000kg)	short tons (2000lb) (tn)	1.102
Power	horsepower (550 ft. lb/s) (hp)	kilowatts (kW)	0.7457	kilowatts (kW)	horsepower (550 ft. lb/s) (hp)	1.341
_	pounds/square inch (psi)	kilograms (f)/square cm (kg(f)/cm²)	0.0703	kilograms (f)/square cm (kg(f)/cm²)	pounds/square inch (psi)	14.22
Pressure	pounds/square inch (psi)	kilopascals (kPa)	6.8948	kilopascals (kPa)	pounds/square inch (psi)	0.145
	pounds/square inch (psi)	bars (100 kPa)	0.06895	bars (100 kPa)	pounds/square inch (psi)	14.503
Stress	pounds/square inch (psi) (1N/mm² = 1MPa)	megapascals (MPa)	0.006895	megapascals (MPa)	pounds/square inch (psi) (1N/mm² = 1MPa)	145.039
Temperature	degrees Fahrenheit (°F)	degrees Celsius (°C)	5/9 (after subtracting 32)	degrees Celsius (°C)	degrees Fahrenheit (°F)	9/5 (then add 32)
Torque or	pounds-force-foot (lb-ft)	Newtons-meter (Nm)	1.3567	Newtons-meter (Nm)	pounds-force-foot (lb-ft)	0.737
_	pounds-force-inch (lb-in)	Newtons-meter (Nm)	0.113	Newtons-meter (Nm)	pounds-force-inch (lb-in)	8.85
Velocity	feet/seconds (ft/s)	meters/second (m/s)	0.3048	meters/second (m/s)	feet/seconds (ft/s)	3.2808
	dynamic (centipoise)	Pascal-second (Pas)	0.001	Pascal-second (Pas)	dynamic (centipoise)	1000
Viscosity	kenematic-foot²/sec (ft²/s)	meter²/sec (m²/s)	0.0929	meter²/sec (m²/s)	kenematic-foot²/sec (ft²/s)	10.7643
Valore	cubic inch (in³)	cubic centimeter (cm³) (milliliter)	16.3871	cubic centimeter (cm³) (milliliter)	cubic inch (in³)	0.061
voiume	quarts (qt)	liters (1000 cm³)	0.9464	liters (1000 cm³)	quarts (qt)	1.057
	gallons (gal)	liters	3.7854	liters	gallons (gal)	0.2642

Glossary

Abrasion

Abrasion occurs in numerous forms; two of the more common are the typical rubbing or chafing, with the second being very high frequency, low amplitude friction. This type of abrasion results from pump pressure pulses otherwise known as pump ripple. It can also be caused by equipment vibration or resonance. Abrasion may occur when two hose lines cross or when a hose line rubs or bears against a fixed point. Abrasion resistance is also a function of temperature and attack of the cover material by aggressive chemicals. Spring guards or other protective sleeving can also ward off premature hose failure resulting from abrasion. Spring guards also distribute bending force often associated with excessive side loading or even kinking at the skirt of the coupling.

Ambient temperature

Exceedingly high or low ambient temperatures will affect the materials from which the hose is constructed and will negatively influence hose life. When at all possible, the hose should be routed in such a manner as to protect it from heat sources. In extreme cold applications, the equipment should be designed with remote relief valves to allow circulation and warming of the oil before hose articulation is attempted. The hose liner (core tube) of choice for extremely high or low temperature is Teflon®. Teflon® is serviceable at temperatures as low as -100°F and as high as +450°F. Consult the specific hose operating parameters for more information.

Bend Radius

The minimum bend radii listed in this catalog are valid at rated working pressures and indicated service temperatures. Service life of a hose may be shortened if the minimum radius is exceeded or if the hose is flexed continuously in use. Burst pressure and working pressure The specified burst pressure for each hose style and dash size are for unaged hoses tested at normal laboratory temperature in accordance with SAE J343 specification for normal service and technically ideal installations. The maximum recommended working pressure is 1/4 of the minimum rated burst pressure, except as otherwise specifically stated in those product specifications. For more severe service, a higher rated working pressure hose may have to be selected.

Hose installation tips

Establish hose size (I. D.) and style based upon flow rate (GPM), pressure drop, and chemical compatibility with fluid medium. Other significant factors to be considered in hose selection and installation are discussed briefly as follows:

Operating temperature

The temperature range for satisfactory service (maximum hose life) depends to a great extent upon the fluid being conveyed. Use of a hose above maximum specified temperature ratings will shorten hose life due, but not limited, to oxidation, chemical degradation and loss of compression within the coupling.

Pressure effects

Pressure surges and system shocks (spikes) are common in hydraulic systems. The normal 4:1 safety factor should reflect these transient pressures. Where these surges and shocks are considered severe or hazardous, the safety factor should be increased.

When hose is under pressure, it may change in length by as much as ±3%. Installation should compensate for shortening by providing an appropriate amount of slack and for lengthening by allowing space for this growth to be absorbed.

Routing and clamping

Whenever possible, and maximum efforts should be made to do so, hose should be routed to flex in a single plane. Routing hoses in flexure through compound bends results in torsions. When this is unavoidable, the torsion should be distributed over the maximum hose length possible. Wire reinforced hoses suffer the most rapid and severe loss of service life when applied in torsion. Extremely tight and improperly located clamps focus this torsion over short distances.

Analysis of the hose function is required before the proper clamping techniques can be selected. In some applications, hoses must be contained to stay out of harm's way and at the same time be free to come and go with equipment articulation. Other applications may require restrictive clamping, in which case a protective material should be used around the hose to provide the grasp without deformation of the hose by the clamp. These techniques also apply to the use of the popular method of clamping and clustering hoses with plastic tie straps.

Parker swivel adaptors feature 360° swiveling action that especially suits them for use in applications where hose moves, bends or twists. Swivel adapters connected to hose assemblies relieve twisting, prevent excessive flexing of hose, eliminate need for long radius bends, and cushion intraline shock caused by peak system pressure pulses.

High pressure adapters

It is critical that the adapter material be properly suited to the fluid media. Widely varying conditions frequently necessitate high pressure adapters constructed of materials other than conventional 316 stainless steel. Since many variables affect the corrosion resistance of metallic materials, it is Parker Hannifin's policy not to recommend materials based on corrosion resistance for specific fluid applications. The published recommended working pressure represent the capability of the subject fitting. Nevertheless, in some instances, the hose, hose fitting or other connector assembled to the adapter may dictate the maximum working pressure. The end-user should read and understand the Parker Safety Guide (Bulletin 4400-B.1) and follow its suggested practices and warnings.



D

General Chemical Resistance Table

Ratings Code

- G Good to excellent. Little or no swelling, tensile or surface changes. Preferred choice.
- Marginal or conditional. Noticeable effects but not necessarily indicating lack of serviceability.
 Further testing suggested for specific application. Very long-term effects such as stiffening or potential for crazing should be evaluated.
- P Poor or unsatisfactory. Not recommended without extensive and realistic testing.
- Indicates that this was not tested.

Materials Code for Hose Core Tubes

- N Polyamide
- M Coextruded tube with Fluoropolymer inner liner

Materials Code for Hose Cover

N Polyamide U/HF Polyurethane

Notes on the Chemical Resistance Table

- (1) The fluid resistance tables are simplified rating tabulations based on immersion tests at 24°C. Higher temperatures tend to reduce ratings. Since final selection depends on pressure, fluid and ambient temperature and other factors not known to Parker Hannifin, no performance guarantee is expressed or implied. The indications do not imply any compliance with standards and regulations and do not refer to possible changes of color, taste or smell. For food and drinking water specially approved materials have to be used. For fluids not listed or for advice on particular applications, please consult Parker Hannifin GmbH, **polyflex** Division in Hüttenfeld, Germany.
- (2) Hose applications for these fluids must take into account legal and insurance regulations. The chemical resistance indicated does not express or imply approval by certain institutions.
- (3) Satisfactory at some concentrations and temperatures, unsatisfactory at others.
- (4) For gas applications, the cover should be pin-pricked and the pressure must not be released quickly. Special safety guard accessories are to be used to prevent damage or personal injury in the event of failure.
- (5) Chemical resistance does not imply low permeation rates. Please consult Parker Hannifin for a recommendation for your specific requirements.
- (6) The indication of chemical resistance does not imply any special food compatibility; it refers only to the chemical resistance of the material.
- (7) Chemical resistance does not imply acceptability for use in airless paintspray applications. These applications require a special, electrically conductive hose. Reference the Safety Guide, 2.1.2

Not all remarks may apply to Oil & Gas products



General Chemical Resistance Table

Chemical	N	U/HF	М
Acetone	G	Р	L
Acetylene	_	_	_
Air (4)	G	G	G
Ammonium Chloride	Р	G	G
Ammonium Hydroxyde	G	Р	G
Anhydrous Ammonia	Р	Р	_
Aniline	Р	Р	G
Aromatic Hydrocarbons	G	L	_
Asphalt	G	G	L
Benzene	G	L	G
Butane (2) (4)	G	L	_
Calcium Chloride	_	G	G
Carbon Dioxide (4)	G	G	_
Carbon Monoxide (4)	_	G	_
Carbon Tetrachloride	G	Р	G
Chlorinated Hydrocarbon Base Fluids	G	L	_
Chlorinated Petroleum Oil	G	L	_
Chlorinated Solvents	_	Р	_
Chlorine, Gaseous, Dry	Р	Р	_
Chromic Acid	_	Р	L
Citric Acid Solutions	G	L	G
Crude Petroleum Oil	G	G	_
Cyclohexan (2)	G	G	G
Diesel Fuel (2)	G	G	_
Diester Oils	G	Р	_
Ethanol (6)	G	L	_
Ethers	G	Р	G
Ethylene Glycol	G	L	G
Ethylene Oxide	G	L	_
Fatty Acids	G	_	G
Formaldehyde	L	Р	G
Formic Acid J	Р	Р	G
Fuel Oil (2)	G	L	G
Gas (Oil) (2)	G	G	_
Gasoline	G	_	G
Glycerine	G	L	G
Glycols (to 135°F)	G	L	G
Grease (petroleum base)	G	G	_



General Chemical Resistance Table

Chemical	N	U/HF	М
Hexane (2)	G	G	G
Hydraulic Fluid (petroleum base)	G	G	L
Hydraulic Fluid (phosphate ester base)	G	L	_
Hydraulic Fluid (water base)	G	G	_
Hydraulic Oil (petroleum base)	G	G	L
Hydrochloric Acid	L	Р	G
Hydrofluoric Acid	Р	Р	G
Hydrolube (hydraulic fluid/water glycol base)	G	L	_
IRUS 902 (hydraulic fluid/water-oil emulsion)	G	G	_
Isooctane (2)	G	G	G
Kerosene (2)	G	L	G
Ketones	G	Р	G
Lime (calcium oxide)	G	G	G
Lindol (hydraulic fluid/phosphate esters)	G	Р	_
LP-Gas	_	_	_
Lubricating Oils (diester base)	G	Р	_
Lubricating Oils (petroleum base)	G	G	G
Methane	_	_	_
Methanol	G	Р	_
Methyl Alcohol (6)	G	Р	G
Methyl Ethyl Ketone (MEK)	G	Р	G
Methyl Ethyl Ketone Peroxide (MEKP)	L	Р	_
Methyl Isobutyl Ketone (MIBK)	G	Р	G
Methylen Chloride	L	Р	G
Mineral Oil	G	G	G
Mineral Spirits	_	L	_
Motor Oils	G	G	G
Naphta	G	Р	G
Natural Gas (4)	_	<u> </u>	_
Nitric Acid	Р	Р	L
Nitrobenzene	G	Р	G
Nitrogen, Gaseous (4) (5)	G	G	G
Nitrous Oxide	L	<u> </u>	_
Oil (SAE)	G	G	_
Oxygen, Gaseous (4) (5) (6)	G	G	G
Pentane (2)	G	L	G
Perchloric Acid	Р	Р	L
Petroleum Ether	_	_	_

General Chemical Resistance Table

Chemical	N	U/HF	M
Petroleum Oils	G	G	_
Phenols	Р	Р	_
Phosphate Esters (above 135°F)	G	Р	_
Phosphate Esters (to 135°F)	G	Р	_
Propane (4) (5)	_	_	_
Propylen Glycol	_	G	G
Salt Water	_	_	G
Silicone Greases	G	G	_
Silicone Oils	G	G	_
Sodium Borate	G	G	G
Sodium Carbonate	_	_	_
Sodium Chloride Solutions	G	G	G
Sodium Hydroxide, 50%	Р	Р	G
Sodium Hypochloride	Р	Р	G
Steam	Р	Р	G
Straight Synthetic Oils (phosphate esters)	G	Р	_
Sulphur Dioxide	L	L	G
Sulphur Hexafluoride Gas (4) (5)	G	G	_
Sulphuric Acid	Р	Р	_
Toluol, Toluene	G	L	G
Trichlorethylene	L	Р	G
Ucon (hydraulic fluid/water glycol base)	G	L	_
Water (above 60°C) (6)	G	Р	L
Water (to 60°C) (6)	G	G	G
Water Glycols (above 60°C)	L	Р	_
Water Glycols (to 60°C)	G	L	_
Water in oil Emulsions (above 60°C)	L	Р	_
Water in oil Emulsions (to 60°C)	G	L	_
Xylene	G	Р	G
Zinc Chloride	G	G	G



PARKER ENGINEERING MANUAL Technical Matrix for Parker **polyflex** Offshore Hoses

Parker Publication No. PFDE-ES29 Revised: March 2013

Scope

This engineering standard contains the main information which is important for the selection of hose for offshore applications.

Guidelines for handling and storage of hose, see PFDE-ES28 on pg F-29.

Notes

Detailed information is available in the appropriate hose datasheets. <u>They always</u> have precedence.

Most of the hoses have been fully qualified according to ISO 13628-5 for the working pressures stated, some at even higher pressures and temperatures. Contact Parker for detailed information.

Working pressures stated below are based on safety factor 4:1.

Maximum lengths values are approximate ones. Most of them have been proven during the manufacturing process.

Collapse pressures are typical values. Some of them have been measured on straight hoses, some at the hose minimum bend radius. The values measured at the minimum bend radius as per ISO 13628-5 are highlighted in all tables in italic underlined.

All values are only valid for hose assemblies, assembled with appropriate Parker fittings acc. to Parker assembly instructions assembled by Parker trained operators.



1 Hoses with methanol washed Nylon 11 core tube, multiple layers of steel wire and a Nylon outer jacket

Working temperature for these hoses is (-40°F to +212°F) (-40°C to +100°C). For chemical resistances of core tubes, see PFDE-ES28 on pg F-29.

Hose Part No.	Nominal I.D.	I D U.D.		Working Pressure		essure	Max. Manufact. Length	Weight in Air (kg/m)	Collapse Pressure
		(mm)	psi	bar	psi	bar	(m)		(bar)
2240N-04V91		11.6	6250	430	25000	1725	3500	0.17	<u>100</u>
2340N-04V91	6.4 mm	12.5	10000	690	40000	2760	3500	0.23	<u>150</u>
2380N-04V91	1/4"	13.4	10000	690	40000	2760	3200	0.27	<u>220</u>
2440N-04V91	Size -04	13.1	12500	875	50000	3500	3200	0.31	<u>260</u>
2448N-04V91		13.7	15000	1035	60000	4140	3000	0.38	<u>445</u>
2370N-06V91		16.5	6250	430	25000	1725	2500	0.33	<u>90</u>
2370N-06V91-10K*	9.5 mm	16.5	10000	690	25000	1725	2500	0.33	<u>90</u>
2390N-06V91	3/8"	18.1	6450	445	25800	1780	3200	0.41	150
2380N-06V91	Size -06	17.9	7500	517	30000	2070	2500	0.44	300
2440N-06V91		19.5	12500	875	50000	3500	3200	0.73	<u>320</u>
2390N-08V91	12.7 mm	21.2	6000	415	24000	1660	3500	0.57	<u>85</u>
2380N-08V91	1/2"	22.9	7500	517	30000	2070	3000	0.68	230
2440N-08V91	Size -08	22.7	11745	810	46980	3240	3000	0.94	<u>190</u>
2390N-12V91	19.1 mm	29	5000	345	20000	1380	3200	0.9	75
2440N-12V91*	3/4"	30.2	10000	690	36250	2500	2000	1.47	<u>80</u>
2640N-12V91	Size -12	33.2	12500	875	50000	3500	1800	2.16	<u>120</u>
2390N-16V91	25.4 mm	35	4060	280	16240	1120	3200	1.17	<u>39</u>
2440N-16V91	1"	37.2	8120	560	32625	2250	2000	1.9	<u>60</u>
2440N-16V91-10K*	Size -16	37.2	10000	690	32625	2250	2000	1.9	<u>60</u>
* Working pressures for	or these hoses	are based on s	afety facto	rs lower t	han 4:1.				



1.1 Large bore hoses with additional TPU outer jacket, "ColorGard™"

Hose Part No.	Nominal I.D.	Nominal O.D. (mm)	Work Press		Burst Pr	essure	Max. Manufact. Length	Weight in Air (kg/m)	Collapse Pressure (bar)
		(111111)	psi	bar	psi	bar	(m)		(bai)
2640N-24V80*	38.1 mm	70.5	10000	690	33350	2300	600	7.2	<u>65</u>
2640N-24V80-KOP*	1-1/2"	70.5	15000	1035	33750	2330	600	7.2	<u>65</u>
2640N-24V80-K0P2*	Size -24	66	15000	1035	33750	2330	600	6.5	<u>65</u>
2448N-32V80 PHalcon 2	50.8 mm	80	5000	345	20000	1380	1000	8.8	<u>49</u>
2580N-32V80* Black Eagle 2	2" Size -32	84	10000	690	25000	1725	1000	9.4	<u>57</u>
2240N-48V80* Black Eagle		114	5000	345	12500	862	350	11.5	20
2440N-48V80* Black Eagle	76.2 mm 3" Size -48	122	10000	690	25000	1725	300	18.7	<u>40</u>
2640N-48V80* Black Eagle		130	15000	1035	33750	2330	250	27.5	80
* Working pressures for	these hoses a	re based on sa	fety factors	lower tha	an 4:1.				



2 ChemJec hoses with fluoropolymer core tube, multiple layers of steel wire and a Nylon outer jacket

Working temperature for these hoses is (-40°F to +212°F) (-40°C to +100°C).

These hoses have an excellent chemical resistance against most of the aggressive chemicals.

Hose Part No.	Nominal I.D.	Nominal O.D.		Working Pressure Burst Pr		essure	Max. Manufact. Length	Weight in Air	Collapse Pressure (bar)
		(mm)	psi	bar	psi	bar	(m)	(kg/m)	(see Notes on pg F-24)
2240M-04V38	6.4 mmm	11.6	6250	430	25000	1725	3500	0,17	<u>105</u>
2340M-04V38		12.5	10000	690	40000	2760	3500	0,23	<u>205</u>
2380M-04V38	1/4"	13.4	10000	690	40000	2760	3200	0,27	<u>400</u>
2440M-04V38	Size -04	13.1	12500	875	50000	3500	3200	0,31	<u>295</u>
2448M-04V38		13.7	15000	1035	60000	4140	3000	0,38	<u>378</u>
2380M-05V38	7.9 mm	15.8	8700	600	34800	2400	2000	0,35	<u>167</u>
2440M-05V38	5/16"	16.15	10000	690	40000	2760	2500	0,49	<u>260</u>
2448M-05V38	Size -05	16.2	15000	1035	60000	4140	2500	0,52	385
2370M-06V38	9.5 mm	16.5	6250	430	25000	1725	2500	0,33	150
2440M-06V38	3/8"	19.5	10000	690	50000	3500	3200	0,73	<u>370</u>
2448M-06V38	Size -06	20.1	15000	1035	60000	4140	3000	0,83	<u>390</u>
2440M-08V38	12.7 mm	22.7	10000	690	40000	2760	3000	0,94	252
2640M-08V38	1/2" Size -08	24.7	15000	1035	60000	4140	2800	1,34	<u>300</u>
2390M-12V38	19.1 mm	29.0	5000	345	20000	1380	3200	0,9	75
2440M-12V38*	3/4" Size -12	30.2	10000	690	36250	2500	2000	1,47	<u>110</u>
2390M-16V38	25.4 mm	35	4000	280	16000	1120	3200	1,19	<u>35</u>
2440M-16V38-5K	1" Size -16	37.2	5000	345	32625	2250	2000	2,05	<u>65</u>
* Working pressures for	r these hose	s are based	on safety	factors	lower thai	1 4:1.			

2.1 Large bore hoses with additional TPU outer jacket, "ColorGard™"

Hose Part No.	Nominal I.D.	Nominal O.D.	Work Press		Bur Press		Max. Manufact. Length	Weight in Air	Collapse Pressure (bar)
		(mm)	psi	bar	psi	bar	(m)	(kg/m)	(see Notes on pg F-24)
2640M-24V88*	38.1 mm 1-1/2" Size -24	70.5	10000	690	33350	2300	600	7.2	65
2448M-32V88 Phalcon 5000 2	50.8 mm	80.5	5000	345	20000	1380	600	8.5	49
2580M-32V80* Golden Eagle 2	Size -32	84.5	10000	690	25000	1725	600	9.4	65
* Working pressures fo	r these hose	s are based	on safet	ty facto	rs lower tl	nan 4:1			



3 SeaWolf® high collapse resistance aramid reinforced hoses with nylon core tube and TPU outer jacket

Working temperature for these hoses is (-40°F to +140°F) (-40°C to +60°C). For chemical resistances of core tube, see PFDE-ES28 on pg F-29.

Hose Part No.	Nominal I.D.	Nominal O.D.	Work Press		Bur Press		Max. Manufact. Length	Weight in Air	Collapse Pressure (bar)
	1.5.	(mm)	psi	bar	psi	bar	(m)	(kg/m)	(see Notes on pg F-24)
57CR-8-BLU	12.7 mm 1/2" Size -08	30	5000	34.5	20000	1380	200	0.94	230
57CR-16-BLU	25.4 mm 1" Size -16	51	5000	34.5	20000	1380	200	2.17	210

4 Hoses with methanol washed Nylon 11 core tube, multiple aramid yarn braids and a TPU outer jacket

Working temperature for these hoses is $(-40^{\circ}\text{F to } +130^{\circ}\text{F})$ $(-40^{\circ}\text{C to } +55^{\circ}\text{C})$. For chemical resistances of core tubes, see PFDE-ES28.

Nominal I D	Nominal O.D.					Max. Manufact.	Weight in Air	Collapse Pressure (bar)
1.5.	(mm)	psi	bar	psi	bar	(m)	(kg/m)	(see Notes on pg F-24)
6.4 mm	12.7	5000	34.5	20000	1380	2000	0.12	<u>50</u>
1/4"	12.9	10000	69.0	40000	2760	3000	0.12	<u>75</u>
Size -04	13.8	10000	69.0	40000	2760	2500	0.14	<u>60</u>
9.5 mm	16.1	5000	34.5	20000	1380	2000	0.15	<u>14</u>
3/8" Size -06	19	10000	69.0	40000	2760	2000	0.19	<u>40</u>
12.7 mm	20.8	5000	34.5	20000	1380	2000	0.17	<u><10</u>
1/2" Size -08	23.2	10000	69.0	40000	2760	1500	0.34	<u>19</u>
	9.5 mm 3/8" Size -06 12.7 mm	Nominal I.D. (mm) 6.4 mm 12.7 1/4" 12.9 Size -04 13.8 9.5 mm 16.1 3/8" Size -06 19 12.7 mm 20.8 1/2" 23.3	Nominal Nominal O.D. (mm) Press psi	Nominal I.D.	Nominal I.D. Nominal O.D. (mm) Pressure Press	Nominal I.D. Nominal O.D. (mm) Pressure Pressure	Nominal I.D. Nominal O.D. (mm) Pressure Pressure Pressure Manufact. Length (m)	Nominal I.D. Nominal O.D. (mm) Pressure Pressure Manufact. Length (m) (kg/m)

PARKER ENGINEERING MANUAL

Instructions for Handling, Maintenance, Inspection and Repair of **polyflex** 1"-3" Large Bore Hoses and Assemblies Used in Oil & Gas Applications

Parker Publication No. PFDE-ES28 Revised: October 2014

1 Scope

This engineering standard is focused mainly on larger bore (1"-3"), long length Parker Polyflex multispiral wire-reinforced hoses used in well service operations. It is also relevant for shorter length hose assembly applications such as chemical injection, stimulation, cementing, flexible and testing lines. It provides information on recommended practices for handling, maintenance, inspection, and repair of hose assemblies.

Deployed as single line hoses or used in bundles, these hoses are available in sizes from 3/16" to 3" inside diameter with working pressures up to 1035 bar / 15,000 psi and continuous lengths greater than 3000 m, depending on size.

Hose can be self-supporting, clamped, supported by a guide wire or strengthened with an additional tensile reinforcement.

Parker Polyflex have certified several specialized testing facilities and their personnel to assemble, inspect, test and repair hose assemblies. Hose management is an essential part of the service they provide.

SAE J1273, ISO 17165-2, API RP 17B and ISO 13628 are excellent documents providing general guidelines for selection, routing, fabrication, installation, replacement, maintenance, and storage of hose and hose assemblies. Together with Parker Polyflex field experience, they provide the basis for the recommendations included in this engineering standard.

2 Hose Features

Parker Polyflex Oil & Gas multispiral wire-reinforced hoses have been used for over 30 years in both onshore and offshore applications. They are proven to be tough, easy to handle, lightweight (compared with alternatives), and offer excellent chemical resistance, integral external collapse, ozone and microbiological resistance.

In extreme, abrasive applications, Polyflex offers an additional extra thick ColorGard™ sheath incorporating a dual color "early warning" safety feature.

2.1 Design Life

Parker Polyflex large bore hoses are designed for prolonged service life. The prerequisite for this design life is that the hoses are used within the operating limits stated in the hose specification sheets. These limits include, but are not limited to, working pressure, number of pressure cycles, temperature range and bending radius.

In order to ensure a long service life, Parker Polyflex incorporates a combination of raw material suppliers testing and data, fatigue testing, and accelerated and specialized testing into the design of the hoses.

Obviously, due to many other factors affecting the service life, it is not possible to predict or guarantee service life of each individual hose assembly.

These factors may include, but are not limited to, mechanical loads (bending, torsion, tensile loads), frequent changes of temperature within the specified range, improper handling and storage, chemical attack, abrasive fluids, hose damage etc.



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3 Storage

Hoses and hose assemblies should be stored, wherever possible, empty and protected from the elements in a stress free condition either straight, in a coil, or on a drum. The inside diameter of the coil or drum should not be less than two times the minimum bend radius. If a hose assembly has been used with chemicals, it shall be flushed with water before putting it to storage (see also 5.4).

Example: hose with minimum bend radius 800 mm; minimum size of drum core/belly should be 2×800 mm = 1.6 m.

The fittings should be capped to prevent ingress of dirt or other contamination and any exposed threads protected from damage.

Storage of hoses and hose assemblies should take into account potential exposure to corrosive liquids, rodents, insects, UV light and high temperatures. Storage temperatures should be in the range of hose operating temperatures.

4 Handling

4.1 Personnel

Only trained personnel shall handle and connect hose assemblies.

Incorrect handling will seriously reduce the lifetime of the hose and could cause dramatic failure. The use of wire rope or chains directly against the outer cover should be avoided, and the routing of the assembly should ensure the hose is never bent below its minimum bend radius or twisted. Special attention should be paid to the area at the back of the fitting.

4.2 Spooling and Reeling

When reeling long length hose onto a drum it is essential to minimize the tension on the hose. Proof testing of a "stretched" hose while on the drum can cause premature failure of the hose or damage to the drum.

When operating from a vessel it is recommended that the hose is pressurized during the subsea deployment and retrieving operation. This

recommendation is based on the fact that during these operations the hose is always subjected to tensile force, at least due to its own weight. Tensile forces will result in hose elongation and possible deformation.

This is significantly reduced by pressurizing the hose, especially important if it is planned to proof test the hose assembly while coiled on a drum or winch. Deployment and retrieving pressures up to 200 bar had been found to be sufficient but this depends on the hose type and local safety regulations. For recommendations of pressure / load values see Appendix 2.

When re-spooling a long length assembly, the pay-off and take-up drums should be inline and a minimum of 10m apart. Depending on how the hose was delivered or re-spooled, the hose shall be spooled from either the top of the pay-off drum onto the top of the take-up drum or from bottom to bottom. (See Fig. 1 and Fig. 2 on next page.) These recommendations minimize the possibility of inducing twist into the hose.

When re-spooling a new hose that has a polyurethane cover, it is recommended to lubricate the hose cover with soapy water or other suitable lubricant so the hose will traverse more easily and position itself correctly onto the take-up drum/winch. See Fig. 1 (next page).

It is also recommended, when deploying the hose though a moon pool or over the side of a vessel, to align the hose routing in the same manner. See Fig. 2 (next page).

Note:

When first supplied, the layline printed on the hose is normally straight and visible. Twisting of the layline is an early indication of poor alignment or high tensile loading.



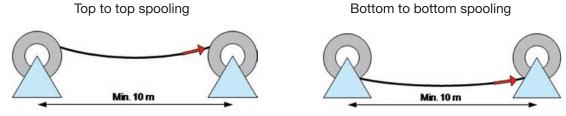


Fig. 1 Hose re-spooling

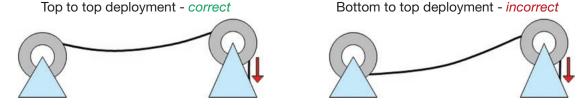


Fig. 2 Hose deployment

5 Possible causes of premature failure, and suggested preventative measures

5.1 Bending the hose below the minimum bend radius

This is most likely to occur if the end fitting is not supported during lifting, a support sling wrongly positioned, or the hose being pulled around a tight corner. It is important that hose should not be bent close to the end fittings. The straight section should be at least two times the outside diameter of the hose before it starts to bend.

Bend restrictors, lifting clamps and containment grips are useful accessories that help to reduce this type of handling problem.

5.2 Damage of the hose cover

Polyflex ColorGard™ extra thick, dual colour cover significantly reduces the risk of exposing the reinforcing wires. If the outer black cover has been abraded to the point that the "early warning" red inner cover can be seen, but the wire reinforcement has not been exposed, the assembly is still fit for use but shall be scheduled for inspection. Alternatively, a repair according to section 8.1.1 may be considered. If the hose cover is damaged to the extent that

the reinforcing wires are exposed, localized corrosion of the wires could occur causing a progressive reduction in burst pressure, and ultimately failure.

If used subsea, a damaged cover will allow water to ingress into the carcass of the hose and could cause the corrosion of the wire reinforcement and/or collapse of the core tube.

It is strongly recommended to immediately remove from service any hose assembly with exposed wires. See also section 8.1.2 for details. A Parker Polyflex specialized testing facility should be contacted and the procedure described in section 7.1.shall be followed.

5.3 Kinked, crushed or twisted hose

If a visible distortion of the hose occurred (kinked, crushed, twisted) it will have an impact on the function and lifetime of the hose. Reduction of burst pressure and external collapse pressure could result in a sudden failure of the hose assembly. This distortion can be caused by a high tensile load or other factors

Maintaining pressure in the hose will significantly reduce the risk of such distortion occurring.



5.4 Chemical attack or aging of the core tube

The use of chemicals at differing concentrations and/or temperatures can have a major effect on the life of a hose assembly and may cause dramatic hose failure. It is important to reference the chemical compatibility chart in the appendix of this document and keep the temperatures and concentrations within the specified limits.

Note:

It is critical that the hose is thoroughly flushed with water after each use.

If the hose is not flushed, the concentration of the fluid that is left in the assembly can increase and cause localised failure of the core tube.

5.5 Damage or corrosion of the end fitting

Incorrect handling or insufficient flushing after use could result in damage or corrosion of the end fitting. This will make connection difficult, probably cause leakage, and could result in sudden failure of the connection.

5.6 Flow rates

Depending on the abrasive properties of the fluid, high flow rates can result in erosion in the core tube or in the bore of the end fitting.

The maximum recommended flow rate is 15 m/sec, although much higher rates have been used short term with non abrasive fluids.

Note:

The condition of the core tube and end fittings are checked as part of the full inspection.

6 Routine in-field pre-job and postjob maintenance, inspection and testing

6.1 Routine in-field pre-job maintenance, inspection and testing

The operator shall visually inspect the hose assembly during every deployment. If any of the following conditions are found the hose shall be removed from service and scheduled for inspection.

- Damage to the outer cover which exposes the reinforcing wires.
- Kinked, crushed, or twisted hose.
- Reduction in the outside diameter of the hose.
- Blistered, soft, degraded, or loose outer cover.
- Cracked, damaged, or badly corroded fittings.

If in doubt, contact the original supplier or a Parker Polyflex specialized testing facility for advice.

Regular in-field pressure testing, (normally required after attaching connectors prior to hose deployment), should be restricted to a test pressure of 1,1× actual operating pressure, or the maximum stated working pressure of the hose assembly.

Prior to all pressure testing it must be ensured that all air is purged out of the hose. Failure to do so may result in core tube failure. To control that all air is removed it is sufficient to observe that the fluid flow leaving the hose is steady and constant for minimum of 5 minutes without any air bubbles or pulsations.



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6.2 Routine in-field post-job maintenance, inspection and testing

On completion of each operation both inside and outside hose surfaces should be flushed/ cleaned with sufficient clean water to ensure that all chemicals or residues are fully removed from the hose assembly.

The operator shall visually inspect the hose assembly during every recovery. If any of the following conditions are found the assembly shall be removed from service and scheduled for inspection.

- Damage to the outer cover which exposes the reinforcing wires.
- Kinked, crushed, or twisted hose.
- Reduction in the outside diameter of the hose.
- Blistered, soft, degraded, or loose outer cover.
- Cracked, damaged, or badly corroded fittings.

If in doubt, contact the original supplier or a Parker Polyflex specialized testing facility for advice.

6.3 Recertification of hose assemblies

Parker Polyflex recommend that all hose assemblies shall be returned to the original supplier or a Parker Polyflex specialized testing facility at least once a year for full inspection/recertification.

The supplier will issue a report detailing the condition of the assembly, and recommend recertification, repair, or replacement.

7 Procedure for full inspection

In addition to the standard marking (WP, month and year of production, hose assembly manufacturer and serial number) all hose assemblies will be marked with the recertification date (RECERT. MM/YYYY).

It is the responsibility of the purchaser to track the location of the hose assembly and the responsibility of the supplier to inform the purchaser a month before the hose assembly is due for full inspection/recertification.

Parker Polyflex have trained and certified specialized facilities and their personnel to assemble, inspect, test, repair and recertify hose assemblies.

Hose management is an essential part of the service they provide.

The history of each assembly must be logged showing the results of previous inspections and any repairs.

7.1 Customer pre-dispatch procedure before returning a hose assembly for inspection/repair

- The object is to make sure the hose assembly can be safely handled and the condition of the assembly will justify the transportation and inspection costs.
- The chosen inspection facility should be contacted if doubtful about any of the points below.
- Check and record assembly serial number (send information to test facility).
- Assembly must be free of chemical residues inside and outside (could result in refusal to handle returned assembly).
- Report on any findings out of section 6.1
- Method of transport, size and weight, (long length hose assemblies on drums or reels may require special handling equipment such as drums and re-spooling machinery).
- Customer will receive a budget price for inspection based on the information given by the end user.



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7.2 Full inspection of the returned hose assembly includes the following:

- Safety inspection, condition of assembly as received.
 - Check for chemical residue inside and outside (may require flushing or cleaning).
 - Assembly serial number (check assembly history including previous repairs).
- External inspection
- Internal inspection
- Inspection report

7.2.1 External inspection

- Damage to the outer cover (abrasion, incorrect routing)
- Exposed reinforcing wires. (damaged outer cover)
- Kinked, crushed, or twisted hose. (high tensile loading, incorrect routing)
- Reduction in the outside diameter of the hose (high tensile loading with no pressure)
- Blistered, soft, degraded, or loose outer cover. (chemical attack, leaking fitting, permeation or high temperature)
- Cracked, damaged, or badly corroded fittings (chemical attack, poor handling, old hose assembly)
- Damage or wear on fitting threads (poor handling, old hose assembly)
- Condition of containment grips / clamps. (abrasion, frayed wires, distortion)

7.2.2 Internal inspection

Internal inspection shall be done with an endoscope.

- Check for damage to bore of fittings, cracks, severe abrasion, corrosion.
- Check condition of core tube at the back of fittings (critical area).
- Scope maximum length of the core tube possible. Recommended minimum is 10 m both sides.

- Hose assemblies shorter than 20 m should be scoped on the complete length.
- Look for uneven surface (sign of wire fatigue, abrasion, chemical attack).

7.2.3 Inspection report

The testing facility will advise on the overall condition of the hose and end connections. Customer will receive detailed report of the

- findings, including recommended actions:
- recertification
- scrapping

repair

8 Procedure for repair and recertification

8.1 Repair

It is recommended, that all repairs are done by certified specialized testing facilities. Some repairs (see examples below) could be done in field. Be sure to maintain safety requirements.

8.1.1 Twisted hose, hose with reduced O.D., flattened hose

A hose with signs of twisting or deformation will need to be unreeled, as straight as possible, from the winch/drum in a safe environment and pressurized to working pressure for at least 1 hour and then pressure released. The hose shall be re-inspected to see if the hose has returned to its "untwisted, undistorted" original shape. If so, the hose should be again pressurized before rewinding back onto the winch/drum. Any sections of hose still misshapen should be cut out of the assembly.



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8.1.2 Hose with cover damage

No reinforcement wires exposed.

Temporary solution, the damaged area can be cleaned and protected by wrapping with a strong adhesive "duct / riggers" tape. If abraded to the point where the red ColorGard is visible, the damaged area should be thoroughly cleaned with mild solvent, a thin plastic sheet wrapped around the hose to form a mould. A two pack polyurethane mixture can then be poured into the mould and allowed to set. Remove mould after the polyurethane is set.

Reinforcement wires exposed.

It is strongly recommended to remove the hose assembly from service immediately. Any ingress of water into hose carcass will initiate corrosion of the reinforcement wire. It is difficult to estimate the rate of corrosion. At best, the hose could function for months, at worst, possibly less than one week. It is also possible that the core tube could have collapsed if the external pressure acting within the carcass is greater than internal pressure within the hose.

In any case, the lifetime of the hose assembly will be significantly reduced, and the hose assembly shall be immediately scheduled for inspection at certified specialized testing facility.

Decision to further use a hose assembly with exposed wire shall be based on a proof pressure test for 1,1× maxi-mum working pressure of the hose assembly. This test shall be conducted prior to every further job.

Repair of such a hose assembly is possible, but it will include cutting out the section of the hose, where the wires have been subjected to water. Obviously, this will require new fittings to be crimped and hose assembly to be proof pressure tested. Procedure for proof pressure testing in this case is specified in the assembly instructions for the appropriate hose type.

After successfully passing pressure test, hose assembly shall be permanently marked with the new recertification date (see section 7).

The testing facility will recommend if the condition of the hose warrants the cost of assembling new fittings, joining the lengths together and proof testing.

8.2 Recertification

Recertification shall include full inspection acc. to section 7.2 and a hydrostatic pressure test.

Unless otherwise agreed between customer and test facility, test conditions are:

Test pressure = 1.5× maximum working pressure of hose assembly. Allow for at least 30 minutes stabilization time before starting recording pressure decay.

Pressure hold time = 1 hour

Pressure decrease of maximum 5% is allowed.

After successfully passing pressure test, hose assembly shall be permanently marked with the new recertification date (see section 7).

The maximum number of pressurizations to 1.5× maximum working pressure is limited to 20.

Note:

The 20×1.5 WP pressurizations is likely to be a combination of annual inspections, re-ending damaged fittings, or cutting off damaged hose. Example 1 – undamaged hose and fittings tested once a year give an estimated lifetime of 20 years. Example 2 – after 5 years, – fitting re-ended 4 times, hose damaged 3 times, $5 \times 1.5 \times 1.5$



Appendix 1: Chemical Resistance Chart

The below chart contains chemical resistance information for Polyamide 11 (Nylon 11) and Fluoropolymer.

These are the most common core tube materials used for Parker Polyflex oil & gas hoses Please refer to the hose datasheets for more detailed information.

Rating Codes

E	Excellent	Good to excellent. Little or no swelling, tensile or surface change. Preferred choice.
Α	Good	Good to excellent. Little or no swelling, tensile or surface change. Limitations with temperature and type of fluid.
В	Limited	Marginal or conditional. Noticeable effects but not necessary indicating lack of serviceability. Further testing is suggested for specific application. Very long-term effects.
Х	Unsatisfactory	Poor or unsatisfactory. Not recommended without extensive and realistic testing.
-		Indicates that this was not tested.
*	Swelling	Increase of volume of material, due to absorption of a solvent.

Material Code for Hose Core Tube

N Polyamide

M Coextruded core tube with Fluoropolymer inner liner

Notes on Chemical Resistance Table

The chemical resistance table is a simplified rating tabulation based on immersion tests. Higher temperatures tend to reduce ratings. Since final selection depends on pressure, fluid, ambient temperature and many other factors not known to Parker Hannifin, no performance guarantee is expressed or implied.

The indications do not imply any compliance with standards and regulations and do not refer to possible changes of colour, taste or smell.

Some hose applications must take into account legal and insurance regulations. The chemical resistance indicated does not express or imply approval by certain institutions.

Chemical resistance does not imply low permeation rates.

For gas applications, the cover may be pin-pricked. Pin-pricking reduces the potential of cover blistering due to permeation. However, pin-pricked wire reinforced hoses are not suitable for subsea use. Parker Polyflex wire reinforced hoses may be used without pin-pricking. In this case, time of permanent use with gas should be limited to 30 days. Hoses with ColorGard will not be pin-pricked. No special precautions on decompression rate are required, however, explosive decompression rate (>200 bar/sec) is not recommended. Note that hoses with coextruded core tube with Fluorpolymer inner liner are not recommended for gas applications.

For fluids, not listed or for advice on particular applications, please contact Parker Hannifin, Polyflex Division in Lampertheim, Germany.



			1	V		М
Chemical	Concentration	20°C (68°F)	40°C (104°F)	60°C (140°F)	90°C (194°F)	100°C (212°F)
Acetaldehyde		А	В	Х	Х	А
Acetic Acid	5%	Α	А	А	В	Е
Acetic Acid	10%	Α	А	В	Х	Е
Acetic Acid	50%	В	Х	Х	Х	Е
Acetic Anhydride		В	Х	Х	Х	Е
Acetone	Pure	А	А	В	Х	А
Acetylene		Α	А	Α	-	Α
Air		А	А	А	А	А
Aluminium Sulfate	Saturated Solution	Α	А	Α	Α	Α
Ammonia	Liquid or Gas	А	А	А	Х	А
Ammonium Chloride		Α	А	Α	-	Α
Ammonium Hydroxide	Concentrated	А	А	А	А	А
Ammonium Nitrate		А	Α	Α	Α	Α
Ammonium Sulfate	Saturated Solution	А	А	В	-	Е
Amyl Acetate		Α	А	Α	В	Α
Aniline		B*	Х	Х	Х	Е
Asphalt		А	А	Α	Α	Α
Barium Chloride	Saturated Solution	А	А	А	А	А
Benzaldehyde		Α	В	Х	Х	Е
Benzene		А	A*	В	Х	Е
Butane		Α	Α	Α	Α	Α
Butyl Alcohol		A*	В	Х	Х	Е
Calcium Arsenate		Α	А	Α	-	Α
Calcium Chloride	Saturated Solution	А	А	А	А	А
Calcium Nitrate		А	Α	Α	-	Α
Camphor		А	-	-	-	А
Carbon Dioxide		Α	Α	Α	Α	Α
Carbon Monoxide		А	А	А	А	А
Carbon Disulfide		A*	B*	В	Х	Α
Carbon Tetrachloride		Х	Х	Х	Х	А
Cement Slurries		Α	Α	Α	-	Α
Chlorinated Solvents		В	Х	Х	Х	Е
Chloroform		В	Х	Х	Х	Е
Chromic Acid		Х	Х	Х	Х	Е
Citric Acid	Saturated Solution	Α	А	В	Х	Е
Copper Sulfate		А	А	А	А	А
Cyclohexane		А	А	А	В	А
Cyclohaxanol		А	В	Х	Х	Е



			1	N		М
Chemical	Concentration	20°C (68°F)	40°C (104°F)	60°C (140°F)	90°C (194°F)	100°C (212°F)
Cyclohexanone		А	В	Х	Х	Е
Diammonium Phosphate		А	А	В	-	Е
Dichloroethylene		В	Х	Х	Х	Е
Diesel		А	А	Α	А	А
Diester Oils		А	Α	Α	В	А
Diethanolamine	20%	А	A*	A*	В	А
Diethyl Ether		А	-	-	-	Е
Dioctylphthalate		А	А	А	В	А
Ethanol	Pure	A*	В	В	Х	E
Ethyl Acetate		А	А	А	-	А
Ethylene Glycol		A*	A*	В	Х	E
Ethylene Oxide		А	А	Х	Х	Е
Fatty Acid Esters		А	А	Α	А	Α
Formaldehyde	Technical	А	В	Х	Х	Е
Formic Acid	10%	Х	Х	Х	Х	E
Furfuryl Alcohol		А	A*	В	Х	Е
Gas (Coal)		Α	А	-	-	А
Gasoline (High Octane)		А	А	A*	-	А
Glucose		А	А	А	А	А
Glycerine	Pure	Α	А	В	Х	Е
Glycol		А	А	В	Х	А
Heptane		Α	А	A*	-	А
Hexane		Α	Α	Α	Α	Α
Hydrogen		Α	А	А	А	А
Hydraulik Fluid (petroleum base)		А	А	А	А	А
Hydraulik Fluid (phosphate ester base)		А	А	А	В	А
Hydraulik Fluid (water base)		Α	А	Α	А	Α
Hydrogen Peroxide	20%	Α	В	-	-	Е
Hydrochloric Acid	15%	А	В	Х	Х	E
Hydrochloric Acid	28%	Х	Х	Х	Х	Е
Hydrochloric Acid	37%	Х	Х	Х	Х	А
Hydrofloric Acid	3%	А	В	Х	Х	Е
Isocyanates		В	Х	Х	Х	E
Isooctane		А	А	А	А	А
Isopropyl Alcohol		А	В	Х	Х	E
Kerosene		А	А	A*	В	А

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			1	N .		М
Chemical	Concentration	20°C (68°F)	40°C (104°F)	60°C (140°F)	90°C (194°F)	100°C (212°F)
Lactic Acid		А	А	Α	В	Е
LP Gas		А	А	А	А	Е
Magnesium Chloride	50%	А	А	А	А	А
Mercury		А	А	А	А	Α
Methane		А	А	А	А	Е
Methanol	Pure	А	В	B*	Х	Е
Methyl-Cellosolve		А	А	А	Х	Α
Methyl Acetate		А	А	А	-	А
Methyl Bromide		А	Х	Х	Х	Е
Methyl Chloride		A	Х	Х	Х	Е
Methyl Sulfate		А	В	-	-	Е
Methyl Ethyl Ketone		А	А	В	Х	-
Methyl Isobutyl Ketone		А	Α	В	Х	Е
Methylene Chloride		X	Х	Х	Х	А
Monochlorobenzene		В	Х	Х	Х	Α
Naphta		А	А	А	-	А
Naphtalene		А	А	Α	В	Α
Natural Gas		A	А	А	А	Е
Nitric Acid		Х	Х	Х	Х	А
Nitrobenzene		В	Х	Х	Х	А
Nitrogen Gas		А	А	А	А	E
Oil Crude		А	А	А	В	А
Oils Refined		А	А	А	В	А
Oleic Acid		А	А	А	В	А
Oxalic Acid		А	А	В	Х	Е
Oxygen Gas		А	А	В	Х	А
Perchloric Acid		В	Х	Х	Х	В
Perchloroethylene		В	Х	Х	Х	Е
Petroleum Ether		А	А	А	В	E
Phosphoric Acid	50%	A	В	Х	Х	Е
Picric Acid		В	Х	Х	Х	Е
Potassium Carbonate		А	А	В	Х	Е
Potassium Chloride		А	А	В	Х	Е
Potassium Hydroxide	50%	А	В	Х	Х	Е
Potassium Nitrate		A*	B*	Х	Х	Е
Potassium Sulfate		А	А	А	А	А
Propane		А	А	А	А	А
Propylen Glycol		А	В	Х	Х	А



			1	V		М
Chemical	Concentration	20°C (68°F)	40°C (104°F)	60°C (140°F)	90°C (194°F)	100°C (212°F)
Pydraul F9		А	Α	А	-	Α
Pyridine	Pure	В	Х	Х	Х	Е
Sodium Borate		А	А	А	-	А
Sodium Carbonate	Saturated Solution	А	А	В	Х	Е
Sodium Chloride	Saturated Solution	Α	Α	А	Α	А
Sodium Hydroxide	50%	А	В	Х	Х	Е
Sodium Hypochlorite	Concentrated	В	Х	Х	Х	Е
Sodium Hypochlorite	Dilute Commercial	А	В	Х	Х	Е
Sodium Sulfide		А	Α	В	-	Е
Stearin		А	В	В	-	Е
Stearic Acid		А	А	А	В	Α
Styrene Monomer		А	A*	-	-	Е
Sulphur Dioxide		В	Х	Х	Х	А
Sulphur Hexafluoride Gas		А	А	А	А	А
Sulphuric Acid	10%	А	В	Х	Х	Α
Sulfic Anhydride		В	Х	Х	Х	Е
Tartaric Acid		А	Α	А	В	А
Tettraethyl Lead		А	-	-	-	Е
Tetrahydrofurane		А	А	В	Х	Е
Toluene		А	A*	В	В	Е
Trichloroethane		В	Х	Х	Х	E
Trichloroethylene		В	Х	Х	Х	Е
Tricresyl Phosphate		А	А	А	В	А
Tributyl Phosphate		А	А	А	В	А
Trisodium Phosphate		А	А	А	А	А
Triphenyl Phosphate		А	А	В	-	А
Turpentine		А	А	В	-	А
Urea		А	А	В	В	Е
Uric Acid		А	А	А	В	А
Vinegar		А	А	А	-	А
Water		А	А	А	А	А
Water Glycols		А	Α	А	В	А
Water, Sea		А	Α	Α	Α	Α
Water, Soda		А	Α	А	Α	А
Xylene		А	A*	В	В	E
Zinc Chloride		А	А	В	Х	Е

Appendix 2: Data for Tensile Loading and Weights of Polyflex Hoses

Note that all below values of tensile forces include the own weight of the hoses.

Pressurized hose can take higher tensile load, it will elongate less. All values below have been confirmed by testing. In all cases the hoses will not elongate more than 10%.

2448N-32V80	Pressure [bar]	0	100 and above		
2446IN-32V6U	Max. tensile force [kN]	15	20		
2580N-32V80	Pressure [bar]	0	100	200	300 and above
2360IN-32V60	Max. tensile force [kN]	25	30	35	40
2240N-48V80	Pressure [bar]	0	100 and above		
224014-46460	Max. tensile force [kN]	15	20		
0440N 40V00	Pressure [bar]	0	100	200 and above	
2440N-48V80	Max. tensile force [kN]	30	40	50	
2640N-48V80	Pressure [bar]	0	100	200	350 and above
2040IN-46V60	Max. tensile force [kN]	30	40	50	100

In the table below some figures are put together for information.

	Hose ID (mm)	Hose OD (mm)	Hose weight in air empty (kg/m)	Hose weight in air, full of water (kg/m)	Hose weight in water empty (kg/m)	Hose weight in water full of water (kg/m)
2448N-32V80	50.5	80.5	8.5	10.5	3.3	5.3
2580N-32V80	50.5	84.5	9.4	11.5	3.7	5.7
2240N-48V80	75.0	114.0	11.5	16.0	1.1	5.6
2440N-48V80	75.0	122.0	18.7	23.2	6.7	11.3
2640N-48V80	75.0	130,0	27.5	32.0	14.0	18.4

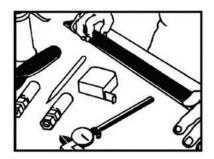
1st Example: No pressure. 300 m length of 2240N-48V80 shall be deployed. Hose weight in water, full of water, $5.6 \text{ kg/m} \times 300 \text{ m} = 1680 \text{ kg}$. Max tensile force is 15 kN, therefore a 300m length is too heavy to deploy in these conditions.

2nd Example: Pressure 100 bar. 300 m length of 2240N-48V80 shall be deployed. Hose weight in water, full of water, $5.6 \text{ kg/m} \times 300 \text{ m} = 1680 \text{ kg}$ max. tensile force is 20 kN, so a 300 m length of 2240N-48V80 is OK to deploy when pressurized at 100 bar, and an additional weight of 2000-1680=320 kg may be added.



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Twin Line and Multi-Line Separation Instructions



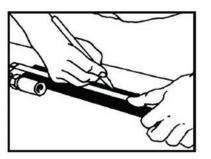
1. Position the twinned or multiline hose assembly so that it lies flat on work surface without tendancy to twist or turn.



4. Press the multi-line hose assembly firmly and flat against the work surface with your free hand so that it does not move. Using a Stanley trimming knife, model No. 10-515, or equivalent, draw the knife toward you with constant light to moderate pressure and a smooth stroke. Three or four strokes will be necesary to separate the hoses.

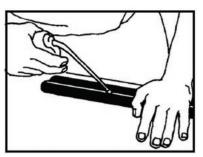
NOTE: It is important that the knife blade be perpendicular to the hose during this procedure so that the blade cuts only the center line of the web. EXTREME CARE MUST BE TAKEN TO AVOID CUTTING THROUGH THE COVER OF THE HOSES AND THEREBY EXPOSING THE REINFORCEMENT. If this occurs, the hose assembly must be discarded.

If the separation length is greater than that which can be accomplished with one continuous, smooth stroke, then the procedure should be repeated over shorter distances, always cutting toward the free end of the hoses.



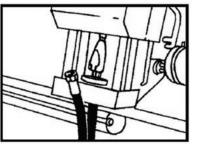
2. Measure and mark the length that the hoses are to be separated. Note: If length of separation is specified from the threaded or swivel nut end of coupling, deduct the cutoff allowance dimension for the specific style of coupling used. The cutoff allowance is obtainable from the hose fitting tables in Section B or can be calculated by subtracting the insertion depth of the shell from the overall coupling

length.

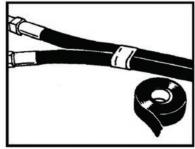


3. Lightly lubricate the web area between the hoses. Distribute the lubricant uniformly along the web of the assembly to be separated.

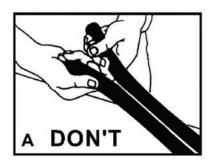
Parker Hoze-Oil or any lightweight oil will suffice. (SAE 10 or 20) The function of the oil is to reduce the friction of the knife lade so that it naturally seeks the center of the valley formed by the hoses. This eliminates the need for the operator to steer the knife.



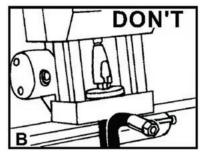
5. It is suggested that the separation length be sufficiently long so that the swaging or crimping operation can be accomplished without risk of kinking the hoses or tearing the web, which could result in exposure of the reinforcement. (See Photo B.)



6. At the option of the assembler as dictated by the installation, it is suggested that a nylon lashing strap or tape be applied at the termination of the separated length to provide protection against tearing of the web or hose covers.



Do not attempt to pull bonded hoses apart. Hoses must be separated with a blade using the process described above.



The separation length must allow for the swaging or crimping operation without damaging the hose.



Parker Safety Guide

Parker Safety Guide for Selecting and Using Hose, Tubing, Fittings, Connectors, Conductors, Valves and Related Accessories

Parker Safety Guide for Selecting and Using Hose, Tubing, Fittings, Connectors, Conductors, Valves and **Related Accessories** Publication No. 4400-B.1 Revised: September 2015

WARNING: Failure or improper selection or improper use of hose. tubing, fittings, assemblies, valves, connectors, conductors or related accessories ("Products") can cause death, personal injury and property damage. Possible consequences of failure or improper selection or improper use of these Products include but are

- · Fittings thrown off at high speed.
- · High velocity fluid discharge.
- Explosion or burning of the conveyed fluid.
- · Electrocution from high voltage electric powerlines.
- · Contact with suddenly moving or falling objects that are controlled by the conveyed fluid.
- · Injections by high-pressure fluid discharge.

· Dangerously whipping Hose.

- Tube or pipe burst.
- · Weld joint fracture.
- · Contact with conveyed fluids that may be hot, cold, toxic or otherwise injurious.
- · Sparking or explosion caused by static electricity buildup or other sources of electricity.
- · Sparking or explosion while spraying paint or flammable liquids.
- · Injuries resulting from inhalation, ingestion or exposure to fluids.

Before selecting or using any of these Products, it is important that you read and follow the instructions below. No product from any division in Fluid Connector Group is approved for in-flight aerospace applications. For hoses and fittings used in in-flight aerospace applications, please contact Parker Aerospace Group

GENERAL INSTRUCTIONS

- 1.0 Scope: This safety guide provides instructions for selecting and using (including assembling, installing, and maintaining) these Products. For convenience, all rubber and/or thermoplastic products commonly called "hose" or "tubing" are called "Hose" in this safety guide. Metallic tube or pipe are called "tube". All assemblies made with Hose are called "Hose Assemblies". All assemblies made with Tube are called "Tube Assemblies". All products commonly called "fittings", "couplings" or "adapters" are called "Fittings". Valves are fluid system components that control the passage of fluid. Related accessories are ancillary devices that enhance or monitor performance including crimping, flaring, flanging, presetting, bending, cutting, deburring, swaging machines, sensors, tags, lockout handles, spring guards and associated tooling. This safety guide is a supplement to and is to be used with the specific Parker publications for the specific Hose, Fittings and Related Accessories that are being considered for use. Parker publications are available at www.parker.com. SAE J1273 (www.sae.org) and ISO 17165-2 (www.ansi.org) also provide recommended practices for hydraulic Hose Assemblies, and should be followed.
- 1.1 Fail-Safe: Hose, Hose Assemblies, Tube, Tube Assemblies and Fittings can and do fail without warning for many reasons. Design all systems and equipment in a fail-safe mode, so that failure of the Hose, Hose Assembly, Tube, Tube Assembly or Fitting will not endanger persons or property.
- 1.2 Distribution: Provide a copy of this safety guide to each person responsible for selecting or using Hose, Tube and Fitting products. Do not select or use Parker Hose, Tube or Fittings without thoroughly reading and understanding this safety guide as well as the specific Parker publications
- 1.3 User Responsibility: Due to the wide variety of operating conditions and applications for Hose, Tube and Fittings. Parker does not represent or warrant that any particular Hose, Tube or Fitting is suitable for any specific end use system. This safety guide does not analyze all technical parameters that must be considered in selecting a product. The user, through its own analysis and testing, is solely responsible for:
- · Making the final selection of the Products.
- · Assuring that the user's requirements are met and that the application presents no health or safety hazards.
- Following the safety guide for Related Accessories and being trained to operate Related Accessories.
- Providing all appropriate health and safety warnings on the equipment on which the Products are used.
- · Assuring compliance with all applicable government and industry standards.
- 1.4 Additional Questions: Call the appropriate Parker technical service department if you have any questions or require any additional information. See the Parker publication for the Products being considered or used, or call 1-800-CPARKER, or go to www.parker.com, for telephone numbers of the appropriate technical service department.

2.0 HOSE, TUBE AND FITTINGS SELECTION INSTRUCTIONS

2.1 Electrical Conductivity: Certain applications require that the Hose be nonconductive to prevent electrical current flow. Other applications require the Hose and the Fittings and the Hose/Fitting interface to be sufficiently conductive to drain off static electricity. Extreme care must be exercised when selecting Hose, Tube and Fittings for these or any other applications in which electrical conductivity or nonconductivity is a factor.

The electrical conductivity or nonconductivity of Hose, Tube and Fittings is dependent upon many factors and may be susceptible to change. These factors include but are not limited to the various materials used to make the Hose and the Fittings, Fitting finish (some Fitting finishes are electrically conductive while others are nonconductive), manufacturing methods (including moisture control), how the Fittings contact the Hose, age and amount of deterioration or damage or other changes, moisture content of the Hose at any particular time, and other factors.

The following are considerations for electrically nonconductive and conductive Hose. For other applications consult the individual catalog pages and the appropriate industry or regulatory standards for proper selection.

- 2.1.1 Electrically Nonconductive Hose: Certain applications require that the Hose be nonconductive to prevent electrical current flow or to maintain electrical isolation. For applications that require Hose to be electrically nonconductive, including but not limited to applications near high voltage electric lines, only special nonconductive Hose can be used. The manufacturer of the equipment in which the nonconductive Hose is to be used must be consulted to be certain that the Hose, Tube and Fittings that are selected are proper for the application. Do not use any Parker Hose or Fittings for any such application requiring nonconductive Hose, including but not limited to applications near high voltage electric lines or dense magnetic fields, unless (i) the application is expressly approved in the Parker technical publication for the product, (ii) the Hose is marked "nonconductive", and (iii) the manufacturer of the equipment on which the Hose is to be used specifically approves the particular Parker Hose, Tube and Fittings for such
- Electrically Conductive Hose: Parker manufactures special Hose for certain applications that require electrically conductive Hose. Parker manufactures special Hose for conveying paint in airless paint spraying applications. This Hose is labeled "Electrically Conductive Airless Paint Spray Hose" on its layline and packaging. This Hose must be properly connected to the appropriate Parker Fittings and properly grounded in order to dissipate dangerous static charge buildup, which occurs in all airless paint spraying applications. Do not use any other Hose for airless paint spraying, even if electrically conductive. Use of any other Hose or failure to properly connect the Hose can cause a fire or an explosion resulting in death, personal injury, and property damage. All hoses that convey fuels must be grounded.

Parker manufactures a special Hose for certain compressed natural gas ("CNG") applications where static electricity buildup may occur. Parker CNG Hose assemblies comply with the requirements of ANSI/IAS NGV 4.2; CSA 12.52, "Hoses for Natural Gas Vehicles and Dispensing Systems" (www.ansi.org). This Hose is labeled "Electrically Conductive for CNG Use"



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on its layline and packaging. This Hose must be properly connected to the appropriate Parker Fittings and properly grounded in order to dissipate dangerous static charge buildup, which occurs in, for example, high velocity CNG dispensing or transfer. Do not use any other Hose for CNG applications where static charge buildup may occur, even if electrically conductive. Use of other Hoses in CNG applications or failure to properly connect or ground this Hose can cause a fire or an explosion resulting in death, personal injury, and property damage. Care must also be taken to protect against CNG permeation through the Hose wall. See section 2.6, Permeation, for more information. Parker CNG Hose is intended for dispenser and vehicle use within the specified temperature range. Parker CNG Hose should not be used in confined spaces or unventilated areas or areas exceeding the specified temperature range. Final assemblies must be tested for leaks. CNG Hose Assemblies should be tested on a monthly basis for conductivity per ANSI/ IAS NGV 4.2: CSA 12.52.

Parker manufactures special Hose for aerospace in-flight applications. Aerospace in-flight applications employing Hose to transmit fuel, lubricating fluids and hydraulic fluids require a special Hose with a conductive inner tube. This Hose for in-flight applications is available only from Parker's Stratoflex Products Division. Do not use any other Parker Hose for in-flight applications, even if electrically conductive. Use of other Hoses for in-flight applications or failure to properly connect or ground this Hose can cause a fire or an explosion resulting in death, personal injury and property damage. These Hose assemblies for inflight applications must meet all applicable aerospace industry, aircraft engine and aircraft requirements.

- 2.2 Pressure: Hose, Tube and Fitting selection must be made so that the published maximum working pressure of the Hose, Tube and Fittings are equal to or greater than the maximum system pressure. The maximum working pressure of a Hose, or Tube Assembly is the lower of the respective published maximum working pressures of the Hose, Tube and the Fittings used. Surge pressures or peak transient pressures in the system must be below the published maximum working pressure for the Hose, Tube and Fitting. Surge pressures and peak pressures can usually only be determined by sensitive electrical instrumentation that measures and indicates pressures at millisecond intervals. Mechanical pressure gauges indicate only average pressures and cannot be used to determine surge pressures or peak transient pressures. Published burst pressure ratings for Hose is for manufacturing test purposes only and is no indication that the Product can be used in applications at the burst pressure or otherwise above the published maximum recommended working pressure.
- 2.3 Suction: Hoses used for suction applications must be selected to insure that the Hose will withstand the vacuum and pressure of the system. Improperly selected Hose may collapse in suction application.
- 2.4 Temperature: Be certain that fluid and ambient temperatures, both steady and transient, do not exceed the limitations of the Hose, Tube, Fitting and Seals. Temperatures below and above the recommended limit can degrade Hose, Tube, Fittings and Seals to a point where a failure may occur and release fluid. Tube and Fittings performances are normally degraded at elevated temperature. Material compatibility can also change at temperatures outside of the rated range. Properly insulate and protect the Hose Assembly when routing near hot objects (e.g. manifolds). Do not use any Hose in any application where failure of the Hose could result in the conveyed fluids (or vapors or mist from the conveyed fluids) contacting any open flame, molten metal, or other potential fire ignition source that could cause burning or explosion of the conveyed fluids or vapors.
- 2.5 Fluid Compatibility: Hose, and Tube Assembly selection must assure compatibility of the Hose tube, cover, reinforcement, Tube, Plating and Seals with the fluid media used. See the fluid compatibility chart in the Parker publication for the product being considered or used. This information is offered only as a guide. Actual service life can only be determined by the end user by testing under all extreme conditions and other analysis.

Hose, and Tube that is chemically compatible with a particular fluid must be assembled using Fittings and adapters containing likewise compatible seals. Flange or flare processes can change Tube material properties that may not be compatible with certain requirements such as NACE

2.6 Permeation: Permeation (that is, seepage through the Hose or Seal) will occur from inside the Hose or Fitting to outside when Hose or Fitting is used with gases, liquid and gas fuels, and refrigerants (including but not limited to such materials as helium, diesel fuel, gasoline, natural gas, or LPG). This permeation may result in high concentrations of vapors which are potentially flammable, explosive, or toxic, and in loss of fluid. Dangerous explosions, fires, and other hazards can result when using the wrong Hose for such applications. The system designer must take into account the fact that this

permeation will take place and must not use Hose or Fitting if this permeation could be hazardous. The system designer must take into account all legal, government, insurance, or any other special regulations which govern the use of fuels and refrigerants. Never use a Hose or Fitting even though the fluid compatibility is acceptable without considering the potential hazardous effects that can result from permeation through the Hose or Tube Assembly. Permeation of moisture from outside the Hose or Fitting to inside the Hose or Fitting will also occur in Hose or Tube assemblies, regardless of internal pressure. If this moisture permeation would have detrimental effects (particularly, but not limited to refrigeration and air conditioning systems), incorporation of sufficient drying capacity in the system or other appropriate system safeguards should be selected and used. The sudden pressure release of highly pressurized gas could also result in Explosive Decompression failure of permeated Seals and Hoses.

- 2.7 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 due to heat generation or excessive fluid velocity.
- 2.8 Routing: Attention must be given to optimum routing to minimize inherent problems (kinking or flow restriction due to Hose collapse, twisting of the Hose, proximity to hot objects or heat sources). For additional routing recommendations see SAE J1273 and ISO 17165-2. Hose Assemblies have a finite life and should be installed in a manner that allows for ease of inspection and future replacement. Hose because of its relative short life, should not be used in residential and commercial buildings inside of inaccessible walls or floors, unless specifically allowed in the product literature. Always review all product literature for proper installation and routing instructions.
- 2.9 Environment: Care must be taken to insure that the Hose, Tube and Fittings are either compatible with or protected from the environment (that is, surrounding conditions) to which they are exposed. Environmental conditions including but not limited to ultraviolet radiation, sunlight, heat, ozone, moisture, water, salt water, chemicals and air pollutants can cause degradation and premature failure.
- 2.10 Mechanical Loads: External forces can significantly reduce Hose, Tube and Fitting life or cause failure. Mechanical loads which must be considered include excessive flexing, twist, kinking, tensile or side loads, bend radius, and vibration. Use of swivel type Fittings or adapters may be required to insure no twist is put into the Hose. Use of proper Hose or Tube clamps may also be required to reduce external mechanical loads. Unusual applications may require special testing prior to Hose selection.
- 2.11 Physical Damage: Care must be taken to protect Hose from wear, snagging, kinking, bending smaller that minimum bend radius and cutting, any of which can cause premature Hose failure. Any Hose that has been kinked or bent to a radius smaller than the minimum bend radius, and any Hose that has been cut or is cracked or is otherwise damaged should be removed and discarded. Fittings with damages such as scratches on sealing surfaces and deformation should be replaced.
- 2.12 Proper End Fitting: See instructions 3.2 through 3.5. These recommendations may be substantiated by testing to industry standards such as SAE J517 for hydraulic applications, or MIL-A-5070, AS1339, or AS3517 for Hoses from Parker's Stratoflex Products Division for aerospace applications.
- 2.13 Length: When determining the proper Hose or Tube length of an assembly take into consideration. The Hose length change due to pressure. The Tube length change due to thermal expansion or contraction, and the Hose or Tube machine tolerances and movements. When routing short hose assemblies, it is recommended that the minimum free hose length is always used. Consult the hose manufacturer for their minimum free hose length recommendations. Hose assemblies should be installed in such a way that any motion or flexing occurs within the same plane.
- 2.14 Specifications and Standards: When selecting Hose, Tube and Fittings, government, industry, and Parker specifications and recommendations must be reviewed and followed as applicable.
- 2.15 Hose Cleanliness: Hose and Tube components may vary in cleanliness levels. Care must be taken to ensure that the Hose and Tube Assembly selected has an adequate level of cleanliness for the application.
- 2.16 Fire Resistant Fluids: Some fire resistant fluids that are to be conveyed by Hose or Tube require use of the same type of Hose or Tube as used with petroleum base fluids. Some such fluids require a special Hose, Tube, Fitting and Seal, while a few fluids will not work with any Hose at all. See instructions 2.5 and 1.5. The wrong Hose, Tube, Fitting or Seal may fail after a very short service. In addition, all liquids but pure water may burn fiercely



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under certain conditions, and even pure water leakage may be hazardous. 2.17 Radiant Heat: Hose and Seals can be heated to destruction without contact by such nearby items as hot manifolds or molten metal. The same heat source may then initiate a fire. This can occur despite the presence of cool air around the Hose or Seal. Performance of Tube and Fitting subjected to the heat could be degraded.

- 2.18 Welding or Brazing: When using a torch or arc welder in close proximity to hydraulic lines, the hydraulic lines should be removed or shielded with appropriate fire resistant materials. Flame or weld spatter could burn through the Hose or Seal and possibly ignite escaping fluid resulting in a catastrophic failure. Heating of plated parts, including Hose Fittings and adapters, above 450°F (232°C) such as during welding, brazing or soldering may emit deadly gases. Any elastomer seal on fittings shall be removed prior to welding or brazing, any metallic surfaces shall be protected after brazing or welding when necessary. Welding and brazing filler material shall be compatible with the Tube and Fitting that are joined.
- 2.19 Atomic Radiation: Atomic radiation affects all materials used in Hose and Tube assemblies. Since the long-term effects may be unknown, do not expose Hose or Tube assemblies to atomic radiation. Nuclear applications may require special Tube and Fittings.
- 2.20 Aerospace Applications: The only Hose, Tube and Fittings that may be used for in-flight aerospace applications are those available from Parker's Stratoflex Products Division. Do not use any other Hose or Fittings for inflight applications. Do not use any Hose or Fittings from Parker's Stratoflex Products Division with any other Hose or Fittings, unless expressly approved in writing by the engineering manager or chief engineer of Stratoflex Products Division and verified by the user's own testing and inspection to aerospace industry standards.
- 2.21 Unlocking Couplings: Ball locking couplings or other Fittings with quick disconnect ability can unintentionally disconnect if they are dragged over obstructions, or if the sleeve or other disconnect member, is bumped or moved enough to cause disconnect. Threaded Fittings should be considered where there is a potential for accidental uncoupling.

3.0 HOSE AND FITTINGS ASSEMBLY AND INSTALLATION INSTRUCTIONS

- 3.1 Component Inspection: Prior to assembly, a careful examination of the Hose and Fittings must be performed. All components must be checked for correct style, size, catalog number, and length. The Hose must be examined for cleanliness, obstructions, blisters, cover looseness, kinks, cracks, cuts or any other visible defects. Inspect the Fitting and sealing surfaces for burrs, nicks, corrosion or other imperfections. Do NOT use any component that displays any signs of nonconformance.
- 3.2 Hose and Fitting Assembly: Do not assemble a Parker Fitting on a Parker Hose that is not specifically listed by Parker for that Fitting, unless authorized in writing by the engineering manager or chief engineer of the appropriate Parker division. Do not assemble a Parker Fitting on another manufacturer's Hose or a Parker Hose on another manufacturer's Fitting unless (i) the engineering manager or chief engineer of the appropriate Parker division approves the Assembly in writing or that combination is expressly approved in the appropriate Parker literature for the specific Parker product, and (ii) the user verifies the Assembly and the application through analysis and testing. For Parker Hose that does not specify a Parker Fitting, the user is solely responsible for the selection of the proper Fitting and Hose Assembly procedures. See instruction 1.4.

To prevent the possibility of problems such as leakage at the Fitting or system contamination, it is important to completely remove all debris from the cutting operation before installation of the Fittings. The Parker published instructions must be followed for assembling the Fittings on the Hose. These instructions are provided in the Parker Fitting catalog for the specific Parker Fitting being used, or by calling 1-800-CPARKER, or at www.parker.com.

- 3.3 Related Accessories: Do not crimp or swage any Parker Hose or Fitting with anything but the listed swage or crimp machine and dies in accordance with Parker published instructions. Do not crimp or swage another manufacturer's Fitting with a Parker crimp or swage die unless authorized in writing by the engineering manager or chief engineer of the appropriate Parker division.
- 3.4 Parts: Do not use any Parker Fitting part (including but not limited to socket, shell, nipple, or insert) except with the correct Parker mating parts, in accordance with Parker published instructions, unless authorized in writing by the engineering manager or chief engineer of the appropriate Parker division.

- 3.5 Field Attachable/Permanent: Do not reuse any field attachable Hose Fitting that has blown or pulled off a Hose. Do not reuse a Parker permanent Hose Fitting (crimped or swaged) or any part thereof. Complete Hose Assemblies may only be reused after proper inspection under section 4.0. Do not assemble Fittings to any previously used hydraulic Hose that was in service, for use in a fluid power application.
- 3.6 Pre-Installation Inspection: Prior to installation, a careful examination of the Hose Assembly must be performed. Inspect the Hose Assembly for any damage or defects. DO NOT use any Hose Assembly that displays any signs of nonconformance.
- 3.7 Minimum Bend Radius: Installation of a Hose at less than the minimum listed bend radius may significantly reduce the Hose life. Particular attention must be given to preclude sharp bending at the Hose to Fitting juncture. Any bending during installation at less than the minimum bend radius must be avoided. If any Hose is kinked during installation, the Hose must be discarded.
- 3.8 Twist Angle and Orientation: Hose Assembly installation must be such that relative motion of machine components does not produce twisting.
- 3.9 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 insure such restraints do not introduce additional stress or wear points.
- 3.10 Proper Connection of Ports: Proper physical installation of the Hose Assembly requires a correctly installed port connection insuring that no twist or torque is transferred to the Hose when the Fittings are being tightened or otherwise during use.
- 3.11 External Damage: Proper installation is not complete without insuring that tensile loads, side loads, kinking, flattening, potential abrasion, thread damage or damage to sealing surfaces are corrected or eliminated. See instruction 2.10.
- 3.12 System Checkout: All air entrapment must be eliminated and the system pressurized to the maximum system pressure (at or below the Hose maximum working pressure) and checked for proper function and freedom from leaks. Personnel must stay out of potential hazardous areas while testing and using.
- 3.13 Routing: The Hose Assembly should be routed in such a manner so if a failure does occur, the escaping media will not cause personal injury or property damage. In addition, if fluid media comes in contact with hot surfaces, open flame or sparks, a fire or explosion may occur. See section 2.4.
- 3.14 Ground Fault Equipment Protection Devices (GFEPDs): WARNING! Fire and Shock Hazard. To minimize the danger of fire if the heating cable of a Multitube bundle is damaged or improperly installed, use a Ground Fault Equipment Protection Device. Electrical fault currents may be insufficient to trip a conventional circuit breaker.

For ground fault protection, the IEEE 515: (www.ansi.org) standard for heating cables recommends the use of GFEPDs with a nominal 30 milliampere trip level for "piping systems in classified areas, those areas requiring a high degree of maintenance, or which may be exposed to physical abuse or corrosive atmospheres".

4.0 TUBE AND FITTINGS ASSEMBLY AND INSTALLATION INSTRUCTIONS

- 4.1 Component Inspection: Prior to assembly, a careful examination of the Tube and Fittings must be performed. All components must be checked for correct style, size, material, seal, and length. Inspect the Fitting and sealing surfaces for burrs, nicks, corrosion, missing seal or other imperfections. Do NOT use any component that displays any signs of nonconformance.
- 4.2 Tube and Fitting Assembly: Do not assemble a Parker Fitting with a Tube that is not specifically listed by Parker for that Fitting, unless authorized in writing by the engineering manager or chief engineer of the appropriate Parker division. The Tube must meet the requirements specified to the Fittings to a Tube. These instructions must be followed for assembling the Fittings to a Tube. These instructions are provided in the Parker Fitting catalog for the specific Parker Fitting being used, or by calling 1-800-CPARKER, or at www.parker.com.
- 4.3 Related Accessories: Do not preset or flange Parker Fitting components using another manufacturer's equipment or procedures unless authorized in writing by the engineering manager or chief engineer of the appropriate Parker division. Tube, Fitting component and tooling must be check for correct style, size and material. Operation and maintenance of Related Accessories must be in accordance with the operation manual for the designated Accessory.
- 4.4 Securement: In many applications, it may be necessary to restrain, protect, or guide the Tube to protect it from damage by unnecessary flexing,



Accessories

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pressure surges, vibration, and contact with other mechanical components. Care must be taken to insure such restraints do not introduce additional stress or wear points.

- 4.5 Proper Connection of Ports: Proper physical installation of the Tube Assembly requires a correctly installed port connection insuring that no torque is transferred to the Tube when the Fittings are being tightened or otherwise during use.
- 4.6 External Damage: Proper installation is not complete without insuring that tensile loads, side loads, flattening, potential abrasion, thread damage or damage to sealing surfaces are corrected or eliminated. See instruction 2.10.
- 4.7 System Checkout: All air entrapment must be eliminated and the system pressurized to the maximum system pressure (at or below the Tube Assembly maximum working pressure) and checked for proper function and freedom from leaks. Personnel must stay out of potential hazardous areas while testing and using.
- 4.8 Routing: The Tube Assembly should be routed in such a manner so if a failure does occur, the escaping media will not cause personal injury or property damage. In addition, if fluid media comes in contact with hot surfaces, open flame or sparks, a fire or explosion may occur. See section 2.4.

5.0 HOSE AND FITTING MAINTENANCE AND REPLACEMENT INSTRUCTIONS

- 5.1 Even with proper selection and installation, Hose life may be significantly reduced without a continuing maintenance program. The severity of the application, risk potential from a possible Hose failure, and experience with any Hose failures in the application or in similar applications should determine the frequency of the inspection and the replacement for the Products so that Products are replaced before any failure occurs. Certain products require maintenance and inspection per industry requirements. Failure to adhere to these requirements may lead to premature failure. A maintenance program must be established and followed by the user and, at minimum, must include instructions 5.2 through 5.7
- 5.2 Visual Inspection Hose/Fitting: Any of the following conditions require immediate shut down and replacement of the Hose Assembly:
- · Fitting slippage on Hose;
- Damaged, cracked, cut or abraded cover (any reinforcement exposed);
- Hard, stiff, heat cracked, or charred Hose;
- · Cracked, damaged, or badly corroded Fittings;
- · Leaks at Fitting or in Hose;
- Kinked, crushed, flattened or twisted Hose; and
- Blistered, soft, degraded, or loose cover.
- 5.3 Visual Inspection All Other: The following items must be tightened, repaired, corrected or replaced as required:
- · Leaking port conditions;
- Excess dirt buildup:
- · Worn clamps, guards or shields; and
- 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 leaks. Personnel must avoid potential hazardous areas while testing and using the system. See section 2.2.
- 5.5 Replacement Intervals: Hose assemblies and elastomeric seals used on Hose Fittings and adapters will eventually age, harden, wear and deteriorate under thermal cycling and compression set. Hose Assemblies and elastomeric seals should be inspected and replaced at specific replacement intervals, based on previous service life, government or industry recommendations, or when failures could result in unacceptable downtime, damage, or injury risk. See section 1.2. Hose and Fittings may be subjected to internal mechanical and/or chemical wear from the conveying fluid and may fail without warning. The user must determine the product life under such circumstances by testing. Also see section 2.5.
- 5.6 Hose Inspection and Failure: Hydraulic power is accomplished by utilizing high pressure fluids to transfer energy and do work. Hoses, Fittings and Hose Assemblies all contribute to this by transmitting fluids at high pressures. Fluids under pressure can be dangerous and potentially lethal and, therefore, extreme caution must be exercised when working with fluids under pressure and handling the Hoses transporting the fluids. From time to time, Hose Assemblies will fail if they are not replaced at proper time intervals.

Usually these failures are the result of some form of misapplication, abuse, wear or failure to perform proper maintenance. When Hoses fail, generally the high pressure fluids inside escape in a stream which may or may not be visible to the user. Under no circumstances should the user attempt to locate the leak by "feeling" with their hands or any other part of their body. High pressure fluids can and will penetrate the skin and cause severe tissue damage and possibly loss of limb. Even seemingly minor hydraulic fluid injection injuries must be treated immediately by a physician with knowledge of the tissue damaging properties of hydraulic fluid.

If a Hose failure occurs, immediately shut down the equipment and leave the area until pressure has been completely released from the Hose Assembly. Simply shutting down the hydraulic pump may or may not eliminate the pressure in the Hose Assembly. Many times check valves, etc., are employed in a system and can cause pressure to remain in a Hose Assembly even when pumps or equipment are not operating. Tiny holes in the Hose, commonly known as pinholes, can eject small, dangerously powerful but hard to see streams of hydraulic fluid. It may take several minutes or even hours for the pressure to be relieved so that the Hose Assembly may be examined safely.

Once the pressure has been reduced to zero, the Hose Assembly may be taken off the equipment and examined. It must always be replaced if a failure has occurred. Never attempt to patch or repair a Hose Assembly that has failed. Consult the nearest Parker distributor or the appropriate Parker division for Hose Assembly replacement information.

Never touch or examine a failed Hose Assembly unless it is obvious that the Hose no longer contains fluid under pressure. The high pressure fluid is extremely dangerous and can cause serious and potentially fatal injury.

- 5.7 Elastomeric seals: Elastomeric seals will eventually age, harden, wear and deteriorate under thermal cycling and compression set. Elastomeric seals should be inspected and replaced.
- 5.8 Refrigerant gases: Special care should be taken when working with refrigeration systems. Sudden escape of refrigerant gases can cause blindness if the escaping gases contact the eye and can cause freezing or other severe injuries if it contacts any other portion of the body.
- 5.9 Compressed natural gas (CNG): Parker CNG Hose Assemblies should be tested after installation and before use, and at least on a monthly basis per instructions provided on the Hose Assembly tag. The recommended procedure is to pressurize the Hose and check for leaks and to visually inspect the Hose for damage and to perform an electrical resistance test.

Caution: Matches, candles, open flame or other sources of ignition shall not be used for Hose inspection. Leak check solutions should be rinsed off after use.

6.0 HOSE STORAGE

- 6.1 Age Control: Hose and Hose Assemblies must be stored in a manner that facilitates age control and first-in and first-out usage based on manufacturing date of the Hose and Hose Assemblies. Unless otherwise specified by the manufacturer or defined by local laws and regulations:
- 6.1.1 The shelf life of rubber hose in bulk form or hose made from two or more materials is 28 quarters (7 years) from the date of manufacture, with an extension of 12 quarters (3 years), if stored in accordance with ISO 2230;
- 6.1.2 The shelf life of thermoplastic and polytetrafluoroethylene hose is considered to be unlimited;
- 6.1.3 Hose assemblies that pass visual inspection and proof test shall not be stored for longer than 2 years.
- 6.1.4 Storage: Stored Hose and Hose Assemblies must not be subjected to damage that could reduce their expected service life and must be placed in a cool, dark and dry area with the ends capped. Stored Hose and Hose Assemblies must not be exposed to temperature extremes, ozone, oils, corrosive liquids or fumes, solvents, high humidity, rodents, insects, ultraviolet light, electromagnetic fields or radioactive materials.



Offer of Sale

The goods, services or work (referred to as the "Products") offered by Parker-Hannifin Corporation, its subsidiaries, groups, divisions, and authorized distributors ("Seller") are offered for sale at prices indicated in the offer, or as may be established by Seller. The offer to sell the Products and acceptance of Seller's offer by any customer ("Buyer") is contingent upon, and will be governed by all of the terms and conditions contained in this Offer of Sale. Buyer's order for any Products specified in Buyer's purchase document or Seller's offer, proposal or quote ("Quote") attached to the purchase order, when communicated to Seller verbally, or in writing, shall constitute acceptance of this offer.

- 1. Terms and Conditions. Seller's willingness to offer Products for sale or accept an order for Products is subject to the terms and conditions contained in this Offer of Sale or any newer version of the same, published by Seller electronically at www.parker.com/saleterms/. Seller objects to any contrary or additional terms or conditions of Buyer's order or any other document or other communication issued by Buyer.
- 2. Price; Payment. Prices stated on Seller's Quote are valid for thirty (30) days, except as explicitly otherwise stated therein, and do not include any sales, use, or other taxes or duties unless specifically stated. Seller reserves the right to modify prices to adjust for any raw material price fluctuations. Unless otherwise specified by Seller, all prices are F.C.A. Seller's facility (INCOTERMS 2010). Payment is subject to credit approval and payment for all purchases is due thirty (30) days from the date of invoice (or such date as may be specified by Seller's Credit Department). Unpaid invoices beyond the specified payment date incur interest at the rate of 1.5% per month or the maximum allowable rate under applicable law.
- Shipment; Delivery; Title and Risk of Loss. All delivery dates are approximate. Seller is not responsible for damages resulting from any delay. Regardless of the manner of shipment, delivery occurs and title and risk of loss or damage pass to Buyer, upon placement of the Products with the shipment carrier at Seller's facility. Unless otherwise stated, Seller may exercise its judgment in choosing the carrier and means of delivery. No deferment of shipment at Buyers' request beyond the respective dates indicated will be made except on terms that will indemnify, defend and hold Seller harmless against all loss and additional expense. Buyer shall be responsible for any additional shipping charges incurred by Seller due to Buyer's acts or omissions.
- 4. Warranty. Seller warrants that the Products sold hereunder shall be free from defects in material or workmanship for a period of twelve (12) months from the date of delivery or 2.000 hours of normal use, whichever occurs first. All prices are based upon the exclusive limited warranty stated above, and upon the following disclaimer: DISCLAIMER OF WARRANTY: THIS WARRANTY IS THE SOLE AND ENTIRE WARRANTY PERTAINING TO PRODUCTS PROVIDED. SELLER DISCLAIMS ALL OTHER WARRANTIES, EXPRESS AND IMPLIED, INCLUDING DESIGN, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.
- Claims; Commencement of Actions. Buyer shall promptly inspect all Products upon receipt. No claims for shortages will be allowed unless reported to the Seller within ten (10) days of delivery. No other claims against Seller will be allowed unless asserted in writing within thirty (30) days after delivery. Buyer shall notify Seller of any alleged breach of warranty within thirty (30) days after the date the defect is or should have been discovered by Buyer. Any claim or action against Seller based upon breach of contract or any other theory, including tort, negligence, or otherwise must be commenced within twelve (12) months from the date of the alleged breach or other alleged event, without regard to the date of discovery
- LIMITATION OF LIABILITY. IN THE EVENT OF A BREACH OF WARRANTY, SELLER WILL, AT ITS OPTION, REPAIR OR REPLACE A DEFECTIVE PRODUCT, OR REFUND THE PURCHASE PRICE WITHIN A REASONABLE PERIOD OF TIME. IN NO EVENT IS SELLER LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF, OR AS THE RESULT OF, THE SALE, DELIVERY, NON-DELIVERY, SERVICING, USE OR LOSS OF USE OF THE PRODUCTS OR ANY PART THEREOF, OR FOR ANY CHARGES OR EXPENSES OF ANY NATURE INCURRED WITHOUT SELLER'S WRITTEN CONSENT. WHETHER BASED IN CONTRACT, TORT OR OTHER LEGAL THEORY. IN NO EVENT SHALL SELLER'S LIABILITY UNDER ANY CLAIM MADE BY BUYER EXCEED THE PURCHASE PRICE OF THE PRODUCTS
- 7. User Responsibility. The user, through its own analysis and testing, is solely responsible for making the final selection of the system and Product and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application and follow applicable industry standards and Product information. If Seller provides Product or system options based upon data or specifications provided by the user, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the Products or systems.
- 8. Loss to Buyer's Property. Any designs, tools, patterns, materials, drawings, confidential information or equipment furnished by Buyer or any other items

- which become Buyer's property, will be considered obsolete and may be destroyed by Seller after two (2) consecutive years have elapsed without Buyer ordering the items manufactured using such property. Seller shall not be responsible for any loss or damage to such property while it is in Seller's possession or control.
- 9. Special Tooling. A tooling charge may be imposed for any special tooling, including without limitation, dies, fixtures, molds and patterns, acquired to manufacture Products. Such special tooling shall be and remain Seller's property notwithstanding payment of any charges by Buyer. In no event will Buyer acquire any interest in apparatus belonging to Seller which is utilized in the manufacture of the Products, even if such apparatus has been specially converted or adapted for such manufacture and notwithstanding any charges paid by Buyer. Unless otherwise agreed, Seller has the right to alter, discard or otherwise dispose of any special tooling or other property in its sole discretion at any time.
- 10. Buyer's Obligation; Rights of Seller. To secure payment of all sums due or otherwise, Seller retains a security interest in all Products delivered to Buyer and this agreement is deemed to be a Security Agreement under the Uniform Commercial Code. Buyer authorizes Seller as its attorney to execute and file on Buyer's behalf all documents Seller deems necessary to perfect its security interest.
- 11. Improper Use and Indemnity. Buyer shall indemnify, defend, and hold Seller harmless from any losses, claims, liabilities, damages, lawsuits, judgments and costs (including attorney fees and defense costs), whether for personal injury, property damage, patent, trademark or copyright infringement or any other claim, brought by or incurred by Buyer, Buyer's employees, or any other person, arising out of: (a) improper selection, application, design, specification or other misuse of Products purchased by Buyer from Seller; (b) any act or omission, negligent or otherwise, of Buyer; (c) Seller's use of patterns, plans, drawings, or specifications furnished by Buyer to manufacture Products; or (d) Buyer's failure to comply with these terms and conditions. Seller shall not indemnify Buyer under any circumstance except as otherwise provided.
- 12. Cancellations and Changes. Buyer may not cancel or modify or cancel any order for any reason, except with Seller's written consent and upon terms that will indemnify, defend and hold Seller harmless against all direct, incidental and consequential loss or damage. Seller may change Product features, specifications, designs and availability.
- 13. Limitation on Assignment. Buyer may not assign its rights or obligations under this agreement without the prior written consent of Seller
- 14. Force Majeure. Seller does not assume the risk and is not liable for delay or failure to perform any of Seller's obligations by reason of events or circumstances beyond its reasonable control (hereinafter "Events of Force Majeure"). Events of Force Majeure shall include without limitation: accidents, strikes or labor disputes, acts of any government or government agency, acts of nature, delays or failures in delivery from carriers or suppliers, shortages of materials, or any other cause beyond Seller's reasonable control.
- 15. Waiver and Severability. Failure to enforce any provision of this agreement will not invalidate that provision; nor will any such failure prejudice Seller's right to enforce that provision in the future. Invalidation of any provision of this agreement by legislation or other rule of law shall not invalidate any other provision herein. The remaining provisions of this agreement will remain in full force and effect
- 16. Termination. Seller may terminate this agreement for any reason and at any time by giving Buyer thirty (30) days prior written notice. Seller may immediately terminate this agreement, in writing, if Buyer: (a) breaches any provision of this agreement (b) appoints a trustee, receiver or custodian for all or any part of Buyer's property (c) files a petition for relief in bankruptcy on its own behalf, or one if filed by a third party (d) makes an assignment for the benefit of creditors; or (e) dissolves its business or liquidates all or a majority of its assets
- 17. Governing Law. This agreement and the sale and delivery of all Products are deemed to have taken place in, and shall be governed and construed in accordance with, the laws of the State of Ohio, as applicable to contracts executed and wholly performed therein and without regard to conflicts of laws principles. Buyer irrevocably agrees and consents to the exclusive jurisdiction and venue of the courts of Cuyahoga County, Ohio with respect to any dispute, controversy or claim arising out of or relating to this agreement.
- 18. Indemnity for Infringement of Intellectual Property Rights. Seller is



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not liable for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights except as provided in this Section. Seller will defend and indemnify Buyer against allegations of infringement of U.S. patents, U.S. trademarks, copyrights, trade dress and trade secrets ("Intellectual Property Rights"). Seller will defend at its expense and will pay the cost of any settlement or damages awarded in an action brought against Buyer based on an allegation that a Product sold pursuant to this agreement infringes the Intellectual Property Rights of a third party. Seller's obligation to defend and indemnify Buyer is contingent on Buyer notifying Seller within ten (10) days after Buyer becomes aware of such allegations of infringement, and Seller having sole control over the defense of any allegations or actions including all negotiations for settlement or compromise. If a Product is subject to a claim that it infringes the Intellectual Property Rights of a third party, Seller may, at its sole expense and option, procure for Buyer the right to continue using the Product, replace or modify the Product so as to make it noninfringing, or offer to accept return of the Product and refund the purchase price less a reasonable allowance for depreciation. Notwithstanding the foregoing, Seller is not liable for claims of infringement based on information provided by Buyer, or directed to Products delivered hereunder for which the designs are specified in whole or part by Buyer, or infringements resulting from the modification, combination or use in a system of any Product sold hereunder. The foregoing provisions of this Section constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for infringement of Intellectual Property Rights.

- 19. Entire Agreement. This agreement contains the entire agreement between the Buyer and Seller and constitutes the final, complete and exclusive expression of the terms of sale. All prior or contemporaneous written or oral agreements or negotiations with respect to the subject matter are herein merged. The terms contained herein may not be modified unless in writing and signed by an authorized representative of Seller.
- 20. Compliance with Laws. Buyer agrees to comply with all applicable laws, regulations, and industry and professional standards of care, including those of the United Kingdom, the United States of America, and the country or countries in which Buyer may operate, including without limitation the U. K. Bribery Act, the U.S. Foreign Corrupt Practices Act ("FCPA"), the U.S. Anti-Kickback Act ("Anti-Kickback Act") and the U.S. Food Drug and Cosmetic Act ("FDCA"), each as currently amended, and the rules and regulations promulgated by the U.S. Food and Drug Administration ("FDA"), and agrees to indemnify and hold harmless Seller from the consequences of any violation of such provisions by Buyer, its employees or agents. Buyer acknowledges that it is familiar with the provisions of the U. K. Bribery Act, the FCPA, the FDA, and the Anti-Kickback Act, and certifies that Buyer will adhere to the requirements thereof. In particular, Buyer represents and agrees that Buyer will not make any payment or give anything of value, directly or indirectly to any governmental official, any foreign political party or official thereof, any candidate for foreign political office, or any commercial entity or person, for the purpose of influencing such person to purchase Products or otherwise benefit the business of Seller.

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