



X-TREME[™]

SILICONE HOSE



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Cross-Reference Guide

SPECIFICATION	PARKER SERIES #	PUROSIL #	FLEXFAB BLUE #	FLEXFAB GREEN #	FEDERAL #	FLEXTECH #
SAE J20R1 Class A Std.	6750, 6620	7030	5515	5500	5515	
SAE J20R1 Class A Hvy.	6751	70	5581	5501	5581	C40
SAE J20R2 Class A	6623		5508			
SAE J20R3 Class A Std.	6722	80	5526		5526	
SAE J20R3 Class A Hvy.	6723			5521		
SAE J20R5 Class A (CAC) Hot	6823	367				
SAE J20R5 Class A (CAC) Cold	6824	784				
Vacuum Tubing	6789	50				

Warning! This guide is intended to help users determine which hoses, as described by their various manufacturers, have been designed to perform similar functions. Care must be taken by the user to compare any variances in materials and construction between manufacturers, and to ensure the selected hose does not constitute a safety risk or change in required performance.



SAFETY WARNING

Failure to consider how temperature and other conditions affect hose performance could result in death, personal injury or property damage.

As temperature increases or decreases, burst pressure, safe working pressure, coupling retention properties, and other safety characteristics of the hose can significantly decrease. Deterioration due to wear, impulse, and other environmental conditions should also be considered. The user, through its own analysis and testing, is solely responsible for making the final selection of the hose and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met.



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Industrial Hose Division
Stoughton, MA

www.safehose.com

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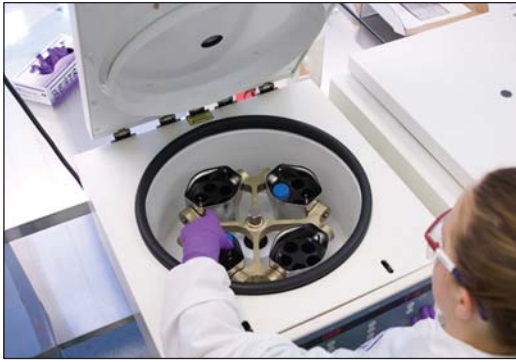
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What is Silicone Rubber?

Silicone rubber is a synthetic elastomer made from a cross-linked polymer that is reinforced with silica. As a result, silicone rubber has a number of chemical and mechanical properties that make it an extremely versatile material. Silicone rubber is:

- Odorless and tasteless
- Colorless (translucent)
- Water resistant
- Chemical and oxidation resistant
- Inert
- Ozone and UV resistant
- Non-conductive
- Extremely stable at elevated temperatures

Because silicone rubber is stable not only at elevated temperatures but at low temperatures as well, many designers specify silicone hose for use in extreme-temperature applications, ranging from -121°F to 600°F. In particular, silicone hose surpasses the temperature capabilities of rubber hose.

SILICONE HOSE BENEFITS

Beyond effectively handling temperature extremes, silicone hose offers a number of additional benefits for designers and users:

LONG SERVICE-LIFE—products last longer, have improved performance over the long haul, and have lower maintenance and warranty costs.

FLEXIBILITY—many silicone hoses are quite flexible, and some are the ultimate in flexibility while retaining their shape, for installation in tight envelopes or around obstructions.

SMOOTH FINISHES IN BRIGHT COLORS—easy installation and attractive looking. Color coding is possible as well.

CAN BE MADE INTO COMPLEX SHAPES—silicone materials can be shaped to fit specific requirements, eliminating costly assemblies and assembly labor. Also eliminates potential leak paths.

LOW PERMEATION—to reduce or eliminate emissions, odors.

THE ONLY HOSE TYPE THAT CAN BE TRULY STERILIZED—to ensure purity of products being manufactured or processed.



There is no better choice for today's trend in industry where there are applications surpassing the temperature capabilities of rubber hoses. **Silicone rubber hose is the ultimate choice** for those extreme-temperature applications.

Index by Series

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HEATER & COOLANT HOSES

6722 X-treme Standard-Wall Heater Hose

Extruded heater hose that meets or exceeds SAEJ20R3 Class A specifications. This product is utilized as standard equipment on trucks, cars and buses. Since this product is extruded it can be offered in long lengths, which saves money by reducing scrap. These hoses are resistant to coolant solutions, cracking, ozone, cold leaks, peeling and aging.

TUBE COLOR: Brick Red

REINFORCEMENT: High-temperature-resistant plies

COVER COLOR: Blue

BRANDING: PARKER SILICONE SERIES 6722 -65° to +350°F (DATE CODE) MADE IN MEXICO

TEMP. RANGE: -65° to +350°F

APPLICATIONS: Heater hose for cars, trucks and buses

SPECIFICATIONS: SAEJ20R3, SAEJ2387

MAX. WORKING PRESSURE: 1/3 of the Burst Pressure



PART NUMBER	SIZE INCH	INSIDE DIAMETER		OUTSIDE DIAMETER		LENGTH FT	BURST PRESSURE PSI	WEIGHT LBS/100FT	BEND RADIUS	
		INCH	MM	INCH	MM				INCH	MM
6722-0250500	1/4	0.250	6	0.526	13	500	250	10.11	0.5	13
6722-0375500	3/8	0.375	10	0.690	18	500	250	13.16	0.8	19
6722-0500025	1/2	0.500	13	0.815	21	25	250	16.90	1.5	38
6722-0500050	1/2	0.500	13	0.815	21	50	250	16.90	1.5	38
6722-0500100	1/2	0.500	13	0.815	21	100	250	16.90	1.5	38
6722-0500500	1/2	0.500	13	0.815	21	500	250	16.90	1.5	38
6722-0625025	5/8	0.625	16	0.940	24	25	250	24.00	1.8	44
6722-0625050	5/8	0.625	16	0.940	24	50	250	24.00	1.8	44
6722-0625100	5/8	0.625	16	0.940	24	100	250	24.00	1.8	44
6722-0625250	5/8	0.625	16	0.940	24	250	250	24.00	1.8	44
6722-0750025	3/4	0.750	19	1.065	27	25	200	25.88	2.8	70
6722-0750050	3/4	0.750	19	1.065	27	50	200	25.88	2.8	70
6722-0750100	3/4	0.750	19	1.065	27	100	200	25.88	2.8	70
6722-0750250	3/4	0.750	19	1.065	27	250	200	25.88	2.8	70
6722-0875100	7/8	0.875	22	1.213	31	100	175	27.80	4.3	108
6722-1000025	1	1.000	25	1.339	34	25	175	33.98	5.0	127
6722-1000050	1	1.000	25	1.339	34	50	175	33.98	5.0	127
6722-1000100	1	1.000	25	1.339	34	100	175	33.98	5.0	127

HEATER & COOLANT HOSES

6723 X-treme Heavy-Wall Heater Hose

Extruded heavy-duty heater hose that meets or exceeds SAEJ20R3 Class A specifications. This product is utilized as standard equipment on trucks, cars and buses. Since this silicone hose is extruded it can be offered in long lengths, which saves money by reducing scrap. These hoses are resistant to coolant solutions, cracking, ozone, cold leaks, peeling and aging.

TUBE COLOR: Brick Red

REINFORCEMENT: High-temperature-resistant plies

COVER: Blue

BRANDING: PARKER SILICONE SERIES 6723 -65° to +350°F (DATE CODE) MADE IN MEXICO

TEMP. RANGE: -65° to +350°F

APPLICATIONS: Heater hose for cars, trucks and buses

SPECIFICATIONS: SAEJ20R3, SAEJ2387

MAX. WORKING PRESSURE: 1/3 of the Burst Pressure



PART NUMBER	SIZE INCH	INSIDE DIAMETER INCH MM	OUTSIDE DIAMETER INCH MM	LENGTH FT	BURST PRESSURE PSI	WEIGHT LBS/100FT	BEND RADIUS INCH MM
6723-0250500	1/4	0.250 6	0.640 16	500	250	11.37	0.4 10
6723-0375500	3/8	0.375 10	0.765 19	500	250	15.09	0.6 16
6723-0500025	1/2	0.500 13	0.890 23	25	250	18.76	1.3 32
6723-0500050	1/2	0.500 13	0.890 23	50	250	18.76	1.3 32
6723-0500100	1/2	0.500 13	0.890 23	100	250	18.76	1.3 32
6723-0500500	1/2	0.500 13	0.890 23	500	250	18.76	1.3 32
6723-0625025	5/8	0.625 16	1.015 26	25	250	26.64	1.5 38
6723-0625050	5/8	0.625 16	1.015 26	50	250	26.64	1.5 38
6723-0625100	5/8	0.625 16	1.015 26	100	250	26.64	1.5 38
6723-0750025	3/4	0.750 19	1.140 29	25	200	28.73	2.4 60
6723-0750050	3/4	0.750 19	1.140 29	50	200	28.73	2.4 60
6723-0750100	3/4	0.750 19	1.140 29	100	200	28.73	2.4 60
6723-1000025	1	1.000 25	1.390 35	25	175	38.85	4.0 102
6723-1000050	1	1.000 25	1.390 35	50	175	38.85	4.0 102
6723-1000100	1	1.000 25	1.390 35	100	175	38.85	4.0 102

HEATER & COOLANT HOSES

6750 X-treme 3-Ply 20R1 Coolant Hose

Coolant hose that meets or exceeds SAEJ20R1 Class A specifications. This product is utilized for automotive, heavy-duty equipment and marine-coolant applications. Since this product is mandrel made, it is offered in 3-foot lengths. These hoses are extremely durable and resistant to coolant solutions.

TUBE COLOR: Brick Red

REINFORCEMENT: High-temperature-resistant plies

COVER COLOR: Blue

BRANDING: PARKER SILICONE SERIES 6750 -65° to +350°F (DATE CODE) MADE IN MEXICO

TEMP. RANGE: -65° to +350°F

APPLICATIONS: Coolant hose for cars, trucks, buses and heavy equipment

SPECIFICATIONS: SAEJ20R1 Class A

MAX. WORKING PRESSURE: 1/3 of the Burst Pressure



PART NUMBER	SIZE INCH	INSIDE DIAMETER		OUTSIDE DIAMETER		LENGTH FT	BURST PRESSURE PSI	WEIGHT LB/FT
		INCH	MM	INCH	MM			
6750-0250003	1/4	0.250	6	0.600	15	3	477	0.34
6750-0313003	5/16	0.313	8	0.660	17	3	477	0.45
6750-0375003	3/8	0.375	10	0.720	18	3	477	0.48
6750-0500003	1/2	0.500	13	0.850	22	3	425	0.52
6750-0625003	5/8	0.625	16	0.970	25	3	376	0.83
6750-0750003	3/4	0.750	19	1.100	28	3	325	0.91
6750-0875003	7/8	0.875	22	1.220	31	3	325	1.01
6750-1000003	1	1.000	25	1.350	34	3	299	1.08
6750-1125003	1-1/8	1.125	29	1.470	37	3	299	1.18
6750-1250003	1-1/4	1.250	32	1.600	41	3	276	1.28
6750-1313003	1-5/16	1.313	33	1.660	42	3	276	1.29
6750-1375003	1 3/8	1.375	35	1.720	44	3	276	1.39
6750-1500003	1 1/2	1.500	38	1.850	47	3	249	1.49
6750-1625003	1 5/8	1.625	41	1.970	50	3	249	1.59
6750-1750003	1-3/4	1.750	44	2.100	53	3	225	1.70
6750-1875003	1-7/8	1.875	48	2.220	56	3	200	1.80
6750-2000003	2	2.000	51	2.350	60	3	200	1.91
6750-2125003	2-1/8	2.125	54	2.470	63	3	175	2.02
6750-2250003	2-1/4	2.250	57	2.600	66	3	175	2.15
6750-2313003	2-5/16	2.313	59	2.660	68	3	175	2.25
6750-2375003	2-3/8	2.375	60	2.720	69	3	175	2.30
6750-2500003	2-1/2	2.500	64	2.850	72	3	149	2.40
6750-2625003	2-5/8	2.625	67	2.970	75	3	125	2.52
6750-2750003	2-3/4	2.750	70	3.100	79	3	125	2.64
6750-2875003	2-7/8	2.875	73	3.220	82	3	87	2.80
6750-3000003	3	3.000	76	3.350	85	3	87	3.00
6750-3125003	3-1/8	3.125	79	3.470	88	3	75	3.07
6750-3250003	3-1/4	3.250	83	3.600	91	3	75	3.16
6750-3313003	3-5/16	3.313	84	3.660	93	3	75	3.19
6750-3375003	3-3/8	3.375	86	3.720	94	3	75	3.23
6750-3500003	3-1/2	3.500	89	3.850	98	3	75	3.32
6750-3625003	3-5/8	3.625	92	3.970	101	3	49	3.38
6750-3750003	3-3/4	3.750	95	4.100	104	3	49	3.47
6750-3875003	3-7/8	3.875	98	4.220	107	3	49	3.58
6750-4000003	4	4.000	102	4.350	110	3	49	3.70
6750-4250003	4-1/4	4.250	108	4.600	117	3	49	4.05
6750-4500003	4-1/2	4.500	114	4.850	123	3	49	4.40
6750-4750003	4-3/4	4.750	121	5.100	130	3	49	4.59
6750-5000003	5	5.000	127	5.350	136	3	49	4.78

HEATER & COOLANT HOSES

6751 X-treme 4-Ply 20R1 Coolant Hose

Heavy-duty coolant hose that meets or exceeds SAEJ20R1 Class A specifications. This product is utilized for rugged automotive, heavy-duty equipment and marine-coolant applications. Since this product is mandrel made, it is offered in 3-foot lengths. These hoses are extremely durable and resistant to coolant solutions.

TUBE COLOR: Brick Red

REINFORCEMENT: High-temperature-resistant plies

COVER COLOR: Blue

BRANDING: PARKER SILICONE SERIES 6751 -65° to +350°F (DATE CODE) MADE IN MEXICO

TEMP. RANGE: -65° to +350°F

APPLICATIONS: Coolant hose for cars, trucks, buses and heavy equipment

SPECIFICATIONS: SAEJ20R1 Class A

MAX. WORKING PRESSURE: 1/3 of the Burst Pressure



PART NUMBER	SIZE INCH	INSIDE DIAMETER INCH MM	OUTSIDE DIAMETER INCH MM	LENGTH FT	BURST PRESSURE PSI	WEIGHT LB/FT
6751-0250003	1/4	0.250 6	0.630 16	3	477	0.50
6751-0313003	5/16	0.313 8	0.690 18	3	477	0.56
6751-0375003	3/8	0.375 10	0.760 19	3	477	0.69
6751-0500003	1/2	0.500 13	0.880 22	3	425	0.74
6751-0625003	5/8	0.625 16	1.010 26	3	376	0.86
6751-0750003	3/4	0.750 19	1.130 29	3	325	1.01
6751-0875003	7/8	0.875 22	1.260 32	3	325	1.11
6751-1000003	1	1.000 25	1.380 35	3	299	1.22
6751-1125003	1-1/8	1.125 29	1.510 38	3	299	1.38
6751-1250003	1-1/4	1.250 32	1.630 41	3	276	1.46
6751-1313003	1-5/16	1.313 33	1.690 43	3	276	1.55
6751-1375003	1-3/8	1.375 35	1.760 45	3	276	1.65
6751-1500003	1-1/2	1.500 38	1.880 48	3	249	1.83
6751-1625003	1-5/8	1.625 41	2.010 51	3	249	1.89
6751-1750003	1-3/4	1.750 44	2.130 54	3	225	1.95
6751-1875003	1-7/8	1.875 48	2.260 57	3	200	2.17
6751-2000003	2	2.000 51	2.380 60	3	200	2.28
6751-2125003	2-1/8	2.125 54	2.510 64	3	175	2.39
6751-2250003	2-1/4	2.250 57	2.630 67	3	175	2.46
6751-2313003	2-5/16	2.313 59	2.690 68	3	175	2.51
6751-2375003	2-3/8	2.375 60	2.760 70	3	175	2.58
6751-2500003	2-1/2	2.500 64	2.880 73	3	149	2.73
6751-2625003	2-5/8	2.625 67	3.010 76	3	125	2.88
6751-2750003	2-3/4	2.750 70	3.130 80	3	125	2.97
6751-2875003	2-7/8	2.875 73	3.260 83	3	87	3.11
6751-3000003	3	3.000 76	3.380 86	3	87	3.31
6751-3125003	3-1/8	3.125 79	3.510 89	3	75	3.38
6751-3250003	3-1/4	3.250 83	3.630 92	3	75	3.44
6751-3313003	3-5/16	3.313 84	3.690 94	3	75	3.47
6751-3375003	3-3/8	3.375 86	3.760 96	3	75	3.51
6751-3500003	3-1/2	3.500 89	3.880 99	3	75	3.60
6751-3625003	3-5/8	3.625 92	4.010 102	3	49	3.70
6751-3750003	3-3/4	3.750 95	4.130 105	3	49	3.81
6751-3875003	3-7/8	3.875 98	4.260 108	3	49	3.92
6751-4000003	4	4.000 102	4.380 111	3	49	4.04
6751-4250003	4-1/4	4.250 108	4.630 118	3	49	4.40
6751-4500003	4-1/2	4.500 114	4.880 124	3	49	4.70
6751-4750003	4-3/4	4.750 121	5.130 130	3	49	4.96
6751-5000003	5	5.000 127	5.380 137	3	49	5.20

HEATER & COOLANT HOSES

6789 X-treme Vacuum Hose

A durable extruded silicone vacuum tubing that is non-reinforced. This product is utilized in applications such as coolant overflows, emissions control, conduit and many others.

TUBE COLOR: Brick Red

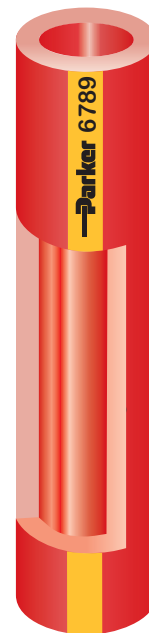
REINFORCEMENT: None

COVER COLOR: Brick Red

BRANDING: PARKER SILICONE SERIES 6789 -65° to +350°F (DATE CODE) MADE IN MEXICO

TEMP. RANGE: -65° to +350°F

APPLICATIONS: Vacuum tubing hose for cars, trucks, buses and heavy equipment



PART NUMBER	SIZE INCH	INSIDE DIAMETER INCH MM	OUTSIDE DIAMETER INCH MM	LENGTH FT	WEIGHT LB/100 FT	BEND RADIUS INCH MM
6789-0125050	1/8	0.125 3	0.225 6	50	3.88	0.1 3
6789-0125100	1/8	0.125 3	0.225 6	100	3.88	0.1 3
6789-0125500	1/8	0.125 3	0.225 6	500	3.88	0.1 3
6789-0156050	5/32	0.156 4	0.356 9	50	4.43	0.1 3
6789-0156100	5/32	0.156 4	0.356 9	100	4.43	0.1 3
6789-0156500	5/32	0.156 4	0.356 9	500	4.43	0.1 3
6789-0188050	3/16	0.188 5	0.388 10	50	4.54	0.1 3
6789-0188100	3/16	0.188 5	0.388 10	100	4.54	0.1 3
6789-0188500	3/16	0.188 5	0.388 10	500	4.54	0.1 3
6789-0250050	1/4	0.250 6	0.450 11	50	6.87	0.3 6
6789-0250100	1/4	0.250 6	0.450 11	100	6.87	0.3 6
6789-0250500	1/4	0.250 6	0.450 11	500	6.87	0.3 6
6789-0312500	5/16	0.312 8	0.533 14	50	6.74	0.8 19
6789-0312100	5/16	0.312 8	0.533 14	100	6.74	0.8 19
6789-0312500	5/16	0.312 8	0.533 14	500	6.74	0.8 19
6789-0375050	3/8	0.375 10	0.625 16	50	10.49	1.0 25
6789-0375100	3/8	0.375 10	0.625 16	100	10.49	1.0 25
6789-0375500	3/8	0.375 10	0.625 16	500	10.49	1.0 25
6789-0500050	1/2	0.500 13	0.750 19	50	13.58	1.8 44
6789-0500100	1/2	0.500 13	0.750 19	100	13.58	1.8 44
6789-0500500	1/2	0.500 13	0.750 19	500	13.58	1.8 44
6789-0625050	5/8	0.625 16	0.875 22	50	16.93	3.0 76
6789-0625100	5/8	0.625 16	0.875 22	100	16.93	3.0 76
6789-0625500	5/8	0.625 16	0.875 22	500	16.93	3.0 76
6789-0750050	3/4	0.750 19	1.000 25	50	18.90	3.5 89
6789-0750100	3/4	0.750 19	1.000 25	100	18.90	3.5 89
6789-0750500	3/4	0.750 19	1.000 25	500	18.90	3.5 89

HEATER & COOLANT HOSES

6823 X-treme CAC (Charge Air Cooler) Hose Hot Side 500°F



CAC hoses are used in all charge-cooler requirements since they are capable of handling an application that requires movement and misalignment. The hot side handles temperatures up to 500°F.

TUBE COLOR: Brick Red

REINFORCEMENT: None

COVER COLOR: Brick Red

BRANDING: PARKER SILICONE SERIES 6823 (DATE CODE) MADE IN MEXICO

TEMP. RANGE: -65° to +500°F

APPLICATIONS: Turbochargers on engines

SPECIFICATIONS: SAEJ20R5

MAX. WORKING PRESSURE: 1/3 of the Burst Pressure

PART NUMBER	SIZE INCH	INSIDE DIAMETER INCH MM	OUTSIDE DIAMETER INCH MM	LENGTH INCHES	BURST PRESSURE PSI	WEIGHT LB/EA
6823-30006000	3	3.00 76	3.24 82.3	6	80	0.37
6823-35006000	3-1/2	3.50 89	3.74 95.0	6	80	0.43
6823-40006000	4	4.00 102	4.24 107.7	6	80	0.55
6823-40008000	4	4.00 102	4.24 107.7	8	80	0.74

6824 X-treme CAC (Charge Air Cooler) Hose Cold Side 350°F



CAC hoses are used in all charge-cooler requirements since they are capable of handling an application that requires movement and misalignment. The cold side handles temperatures up to 350°F.

TUBE COLOR: Brick Red

REINFORCEMENT: None

COVER COLOR: Blue

BRANDING: PARKER SILICONE SERIES 6824 (DATE CODE) MADE IN MEXICO

TEMP. RANGE: -65° to +350°F

APPLICATIONS: Turbochargers on engines

SPECIFICATIONS: SAEJ20R5

MAX. WORKING PRESSURE: 1/3 of the Burst Pressure

PART NUMBER	SIZE INCH	INSIDE DIAMETER INCH MM	OUTSIDE DIAMETER INCH MM	LENGTH INCHES	BURST PRESSURE PSI	WEIGHT LB/EA
6824-30006000	3	3.00 76	3.32 84.4	6	80	0.52
6824-35006000	3-1/2	3.50 89	3.82 97.1	6	80	0.61
6824-40006000	4	4.00 102	4.32 109.8	6	80	0.70
6824-40008000	4	4.00 102	4.32 109.8	8	80	0.91

HEATER & COOLANT HOSES

Silicone Connectors

Parker offers a number of silicone hose connectors for use in automotive, heavy-duty trucking, marine and other high-performance, extreme-temperature applications. Custom constructions are also available for applications requiring unique configurations. Contact Parker Industrial Hose Division for specific information.



HUMP HOSE

- Utilized for movement and/or vibration in an application. The hump design allows the part to absorb the movement/vibration.
- Diameters and length of this hose can vary from 3" to 12".
- Temperature range: -65° to +350°F.

REDUCERS

- Also referred to as step hoses because of the dimensional change from one side to the other.
- Common length is 3".
- Offered up to 5" and 6".
- Temperature range: -65° to +350°F.

ELBOWS

- Most common: 45 and 90 degrees.
- Can be made as reducing elbows with one ID being larger than the other.
- Some elbows require one leg to be longer than the other.
- Caution should be used to ensure leg lengths are specified correctly.
- Temperature range: -65° to +350°F.

MARINE EXHAUST HOSE

- For wet exhaust systems.
- Made to SAE J2006 specifications.
- Designed to be the connection at the engine-exhaust manifold.

SPECIALTY PRODUCTS

- Custom formed hoses made for coolant applications.
- Unique angles and dimensions.
- Made on special mandrels.
- Made to customer's print and specification.

HEATER & COOLANT HOSES

6620 X-treme Plus SW Series

A softwall coolant/heater hose that is mandrel made in continuous lengths up to 130 feet, which is the longest length available in the industry. This hose is resistant to coolant solutions, cracking, ozone, cold leaks, peeling and aging. This X-treme Plus product is made for the connection between the radiator and any engine on heavy-duty equipment, buses, trucks, etc. Meets or exceeds SAEJ20R1 specifications.

TUBE COLOR: Black

REINFORCEMENT: High-temperature-resistant plies

COVER COLOR: Red

BRANDING: PARKER SILICONE SERIES 6620 -76° to +392°F (DATE CODE) MADE IN ITALY

TEMP. RANGE: -76° to +392°F

APPLICATIONS: Coolant and heater lines

SPECIFICATIONS: Meets or exceeds performance criteria of SAEJ20R1 Class A, ISO 1307-1997, TMC RP303B

MAX. WORKING PRESSURE: 1/3 of the Burst Pressure



PART NUMBER	SIZE INCH	INSIDE DIAMETER INCH MM	OUTSIDE DIAMETER INCH MM	LENGTH FT	BURST PRESSURE PSI	WEIGHT LBS/100FT
6620-0375130	3/8	0.394 10	0.709 18	130	900	12
6620-0500130	1/2	0.512 13	0.827 21	130	855	13
6620-0625130	5/8	0.630 16	0.945 24	130	750	15
6620-0688130	11/16	0.709 18	1.102 28	130	600	25
6620-0750130	3/4	0.748 19	1.142 29	130	600	26
6620-0813130	13/16	0.787 20	1.181 30	130	570	27
6620-0875130	7/8	0.866 22	1.260 32	130	525	29
6620-1000025	1	0.984 25	1.378 35	25	480	33
6620-1000130	1	0.984 25	1.378 35	130	480	33
6620-1188130	1-3/16	1.181 30	1.575 40	130	405	38
6620-1250130	1-1/4	1.260 32	1.654 42	130	390	40
6620-1375025	1-3/8	1.378 35	1.772 45	25	360	44
6620-1375130	1-3/8	1.378 35	1.772 45	130	360	44
6620-1500130	1-1/2	1.496 38	1.890 48	130	330	47
6620-1563130	1-9/16	1.575 40	1.969 50	130	315	49
6620-1625025	1-5/8	1.654 42	2.047 52	25	300	52
6620-1625130	1-5/8	1.654 42	2.047 52	130	300	52
6620-1750130	1-3/4	1.772 45	2.165 55	130	285	54
6620-1875130	1 7/8	1.890 48	2.283 58	130	270	58
6620-2000025	2	2.008 51	2.402 61	25	255	61
6620-2000130	2	2.008 51	2.402 61	130	255	61
6620-2188130	2-3/16	2.165 55	2.559 65	130	240	68
6620-2250130	2-1/4	2.283 58	2.677 68	130	225	70
6620-2370130	2-3/8	2.362 60	2.756 70	130	225	71
6620-2500130	2-1/2	2.500 64	2.894 73.5	130	210	77
6620-2563130	2-5/8	2.559 65	2.953 75	130	210	79
6620-2750130	2-3/4	2.756 70	3.150 80	130	195	84
6620-3000130	3	2.992 76	3.386 86	130	180	92
6620-3125130	3-1/8	3.150 80	3.543 90	130	165	93
6620-3375130	3-3/8	3.346 85	3.740 95	130	150	98
6620-3563130	3-9/16	3.543 90	3.937 100	130	150	104
6620-4000130	4	4.016 102	4.409 112	130	150	117

HEATER & COOLANT HOSES

6623 X-treme Plus HW Series

A hardwall coolant/heater hose that is made with helical wires for vacuum applications or to prevent collapse on long lengths, the X-treme Plus HW is offered in continuous lengths up to 130 feet, the longest length and most flexible silicone hose available in the industry. This hose is resistant to coolant solutions, cracking, ozone, cold leaks, peeling and aging. This product is made for the connection between the radiator and engine on heavy-duty equipment, buses, trucks, etc.

TUBE COLOR: Black

REINFORCEMENT: High-temperature-resistant plies with helical wires

COVER COLOR: Red

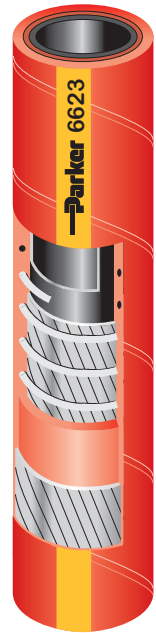
BRANDING: PARKER SILICONE SERIES 6623 -76° to +392°F (DATE CODE) MADE IN ITALY

TEMP. RANGE: -76° to +392°F

APPLICATIONS: Coolant and heater lines

SPECIFICATIONS: Meets or exceeds performance criteria of SAEJ20R2 Class A, ISO 1307-1997, TMC RP303B

MAX. WORKING PRESSURE: 1/3 of the Burst Pressure



PART NUMBER	SIZE INCH	INSIDE DIAMETER INCH MM	OUTSIDE DIAMETER INCH MM	LENGTH FT	BURST PRESSURE PSI	WEIGHT LBS/100FT	BEND RADIUS INCH MM
6623-0375130	3/8	0.394 10	0.728 18.5	130	900	19	2.6 65
6623-0500130	1/2	0.512 13	0.846 21.5	130	750	22	2.8 70
6623-0625130	5/8	0.630 16	0.965 24.5	130	600	26	3.0 75
6623-0750130	3/4	0.748 19	1.142 29	130	525	34	3.1 80
6623-0875130	7/8	0.866 22	1.260 32	130	480	38	3.5 90
6623-1000130	1	0.984 25	1.378 35	130	450	42	3.9 100
6623-1125130	1-1/8	1.102 28	1.496 38	130	390	46	4.1 105
6623-1188130	1-3/16	1.181 30	1.575 40	130	375	48	4.3 110
6623-1250130	1-1/4	1.260 32	1.654 42	130	375	51	4.7 120
6625-1375130	1-3/8	1.378 35	1.772 45	130	360	55	5.1 130
6623-1500130	1-1/2	1.496 38	1.890 48	130	330	65	5.9 150
6623-1563130	1-9/16	1.575 40	1.969 50	130	300	68	7.1 180
6623-1750130	1-3/4	1.772 45	2.165 55	130	270	75	8.3 210
6623-2000130	2	2.008 51	2.402 61	130	255	83	9.4 240
6623-2250130	2-1/4	2.283 58	2.677 68	130	225	103	9.8 250
6623-2375130	2-3/8	2.362 60	2.835 72	130	210	134	10.2 260
6623-2500130	2-1/2	2.500 63.5	2.972 75.5	130	210	141	10.6 270
6623-3000130	3	2.992 76	3.465 88	130	165	165	13.8 350
6623-4000130	4	4.016 102	4.567 116	130	150	252	15.7 400

HEATER & COOLANT HOSES

6621 X-treme Plus SF Series

The Super Flexible hose is a coolant/heater hose that is mandrel made in continuous lengths up to 130 feet, the longest length and most flexible silicone hose available in the industry. This hose is resistant to coolant solutions, cracking, ozone, cold leaks, peeling and aging. This product is made for extreme applications that require tight bends for connections between the radiator and the engine on heavy-duty equipment, buses, trucks, etc. The X-treme Plus SF has a Greek corrugated construction that allows this hose to be flexible enough to replace pre-formed elbows.

TUBE COLOR: Black

REINFORCEMENT: High-temperature-resistant plies with helical wire

COVER COLOR: Red Greek Corrugated

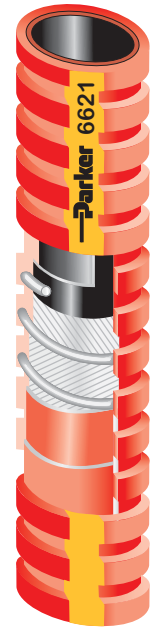
BRANDING: PARKER SILICONE SERIES 6621 -76° to +392°F (DATE CODE) MADE IN ITALY

TEMP. RANGE: -76° to +392°F

APPLICATIONS: Coolant and heater lines

SPECIFICATIONS: Meets or exceeds performance criteria of SAE J20R2, ISO 1307-1997

MAX. WORKING PRESSURE: 1/3 of the Burst Pressure



PART NUMBER	SIZE INCH	INSIDE DIAMETER INCH	INSIDE DIAMETER MM	OUTSIDE DIAMETER INCH	OUTSIDE DIAMETER MM	LENGTH FT	BURST PRESSURE PSI	WEIGHT LBS/100FT	BEND RADIUS INCH	BEND RADIUS MM
6621-0500025	1/2	0.512	13	0.906	23	25	225	20	1.4	35
6621-0500130	1/2	0.512	13	0.906	23	130	225	20	1.4	35
6621-0594130	19/32	0.591	15	0.984	25	130	225	21	1.8	45
6621-0625025	5/8	0.630	16	1.024	26	25	225	22	1.8	45
6621-0625130	5/8	0.630	16	1.024	26	130	225	22	1.8	45
6621-0688130	11/16	0.709	18	1.102	28	130	225	23	1.8	45
6621-0750025	3/4	0.748	19	1.142	29	25	225	24	2.0	50
6621-0750130	3/4	0.748	19	1.142	29	130	225	24	2.0	50
6621-0813130	13/16	0.787	20	1.181	30	130	225	25	2.0	50
6621-1000025	1	0.984	25	1.378	35	25	225	30	2.0	50
6621-1000130	1	0.984	25	1.378	35	130	225	30	2.0	50
6621-1125130	1-1/8	1.102	28	1.496	38	130	225	33	2.6	65
6621-1188130	1-3/16	1.181	30	1.575	40	130	225	35	3.0	75
6621-1250025	1-1/4	1.260	32	1.693	43	25	225	40	3.1	80
6621-1375025	1-3/8	1.378	35	1.811	46	25	225	43	3.7	95
6621-1500025	1-1/2	1.496	38	1.929	49	25	225	46	3.9	100
6621-1625130	1-5/8	1.654	42	2.087	53	130	225	49	4.7	120
6621-1750025	1-3/4	1.772	45	2.205	56	25	225	54	5.1	130
6621-2000025	2	2.008	51	2.480	63	25	225	88	5.9	150
6621-2188130	2-3/16	2.165	55	2.638	67	130	225	95	7.1	180
6621-2250130	2-1/4	2.283	58	2.756	70	130	225	99	7.9	200
6621-2375130	2-3/8	2.362	60	2.874	73	130	225	103	8.3	210
6621-2500130	2-1/2	2.500	64	3.012	76.5	130	225	108	8.7	220
6621-2563130	2-9/16	2.559	65	3.071	78	130	225	111	8.7	220
6621-2750130	2-3/4	2.756	70	3.307	84	130	225	133	9.8	250
6621-3000130	3	2.992	76	3.543	90	130	225	143	10.6	270
6621-3125130	3-1/8	3.150	80	3.701	94	130	225	150	11.8	300
6621-3563130	3-9/16	3.543	90	4.134	105	130	225	188	13.8	350
6621-4000130	4	4.016	102	4.567	116	130	225	210	15.7	400

HEATER & COOLANT HOSES

6622 X-treme Plus UF Series

The Ultra-Flexible corrugated coolant/heater hose is made in continuous lengths up to 130 feet, the longest length and most flexible silicone hose available in the industry. This hose is resistant to coolant solutions, cracking, ozone, cold leaks, peeling and aging. This product is made for extreme applications that require tighter bends than normal for connections between the radiator and any engine on heavy duty equipment, buses, trucks, etc.

TUBE COLOR: Black

REINFORCEMENT: High-temperature-resistant plies with helical wires

COVER COLOR: Red Corrugated

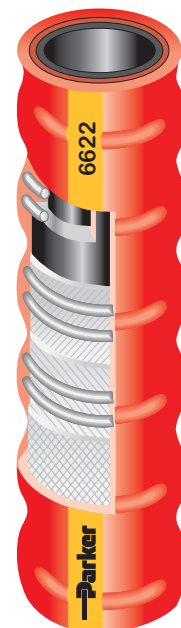
BRANDING: PARKER SILICONE SERIES 6622 -76° to +392°F (DATE CODE) MADE IN ITALY

TEMP. RANGE: -76° to +392°F

APPLICATIONS: Coolant and heater lines

SPECIFICATIONS: ISO 1307-1997

MAX. WORKING PRESSURE: 1/3 of the Burst Pressure



PART NUMBER	SIZE INCH	INSIDE DIAMETER		OUTSIDE DIAMETER		LENGTH FT	BURST PRESSURE PSI	WEIGHT LBS/100FT	BEND RADIUS	
		INCH	MM	INCH	MM				INCH	MM
6622-0750130	3/4	0.748	19	1.181	30	130	375	29	3.5	90
6622-1000130	1	0.984	25	1.417	36	130	300	36	3.9	100
6622-1188130	1-3/16	1.181	30	1.614	41	130	270	42	4.3	110
6622-1250130	1-1/4	1.260	32	1.693	43	130	270	44	4.5	115
6622-1375130	1-3/8	1.378	35	1.850	47	130	225	48	4.9	125
6622-1500130	1-1/2	1.496	38	2.008	51	130	225	59	5.1	130
6622-1563130	1-9/16	1.575	40	2.126	54	130	225	65	5.3	135
6622-1625130	1-5/8	1.654	42	2.165	55	130	225	68	5.3	135
6622-1750130	1-3/4	1.772	45	2.283	58	130	180	72	5.5	140
6622-1875130	1-7/8	1.890	48	2.402	61	130	180	76	5.9	150
6622-2000130	2	2.008	51	2.520	64	130	180	80	6.3	160
6622-2375025	2-3/8	2.362	60	2.874	73	25	120	93	6.5	165
6622-2500025	2-1/2	2.500	64	3.031	77	25	120	107	6.7	170
6622-2563130	2-9/16	2.559	65	3.150	80	25	120	109	6.7	170
6622-2750025	2-3/4	2.756	70	3.307	84	25	120	117	7.1	180
6622-3000025	3	2.992	76	3.543	90	25	120	130	8.7	220
6622-3125130	3-1/8	3.150	80	3.740	95	130	120	137	8.9	225
6622-3563130	3-9/16	3.543	90	4.409	112	130	105	215	9.8	250
6622-4000025	4	4.016	102	4.764	121	130	90	245	11.0	280

HOT AIR HOSES

6650 Inferno X-treme Plus SW Series

A softwall construction that is designed to handle extreme hot-air applications. The Inferno X-treme Plus is a high-performance hose that can be used for conveying air from compressors to storage tanks in the transfer of dry bulk commodities.

TUBE COLOR: Black

REINFORCEMENT: High-temperature-resistant plies

COVER COLOR: Black

BRANDING: PARKER SILICONE SERIES 6650 -76° to +392°F (DATE CODE) MADE IN ITALY

TEMP. RANGE: -76° to +392°F

APPLICATIONS: Hot-air transfer from compressors or plants

SPECIFICATIONS: ISO 1307-1997

MAX. WORKING PRESSURE: 1/3 of the Burst Pressure



PART NUMBER	SIZE INCH	INSIDE DIAMETER INCH MM	OUTSIDE DIAMETER INCH MM	LENGTH FT	BURST PRESSURE PSI	WEIGHT LBS/100FT
6650-2000130	2	2.008 51	2.559 65	130	450	82
6650-2000130H	2	2.008 51	2.717 69	130	450	119
6650-2750130	2-3/4	2.756 70	3.346 85	130	375	116
6650-3000130	3	2.992 76	3.661 93	130	330	159
6650-3000130H	3	2.992 76	3.780 96	130	300	187
6650-4000130	4	4.016 102	4.685 119	130	225	208

6651 Inferno X-treme Plus HW Series

The HW is designed similarly to the SW except this is a hardwall hose that has helical wires incorporated in the construction to handle rugged and extreme hot-air applications. The Inferno X-treme Plus is a high-performance hose that can be used for conveying air from compressors to storage tanks in the transfer of dry bulk commodities.

TUBE COLOR: Black

REINFORCEMENT: High-temperature-resistant plies with helical wires

COVER COLOR: Black

BRANDING: PARKER SILICONE SERIES 6651 -76° to +392°F (DATE CODE) MADE IN ITALY

TEMP. RANGE: -76° to +392°F

APPLICATIONS: Hot air transfer from compressors or plants

SPECIFICATIONS: ISO 1307-1997

MAX. WORKING PRESSURE: 1/3 of the Burst Pressure



PART NUMBER	SIZE INCH	INSIDE DIAMETER INCH MM	OUTSIDE DIAMETER INCH MM	LENGTH FT	BURST PRESSURE PSI	WEIGHT LBS/100FT	BEND RADIUS INCH MM
6651-1500130	1-1/2	1.496 38	2.126 54	130	600	97	6.3 160
6651-2000130	2	2.008 51	2.638 67	130	450	124	9.8 250
6651-2500130	2-1/2	2.500 63.5	3.228 82	130	390	192	11.0 280
6651-2750130	2-3/4	2.756 70	3.346 85	130	375	208	13.0 330
6651-3000130	3	2.992 76	3.720 94.5	130	330	224	14.2 360
6651-4000130	4	4.016 102	4.744 120.5	130	225	306	17.7 450

HOT AIR HOSES

6652 Inferno X-treme Plus FD SW Series

This FDA-approved softwall silicone hose is made for the delivery of hot air in high-performance, extreme-temperature applications that require food-grade, tasteless and odorless hose. The Inferno X-treme Plus FD is designed to convey hot air from the compressor to the storage tank in the transfer of dry bulk food commodities such as wheat, sugar or similar products.

TUBE COLOR: White

REINFORCEMENT: High-temperature-resistant plies

COVER COLOR: Blue

BRANDING: PARKER SILICONE SERIES 6652 -76° to +392°F (DATE CODE) MADE IN ITALY

TEMP. RANGE: -76° to +392°F

APPLICATIONS: Hot-air transfer in food industry

SPECIFICATIONS: USA FDA CFR 21 Part 177.2600, USA 3A Sanitary Standard Class II, ISO 1307-1997

MAX. WORKING PRESSURE: 1/3 of the Burst Pressure



PART NUMBER	SIZE INCH	INSIDE DIAMETER INCH MM	OUTSIDE DIAMETER INCH MM	LENGTH FT	BURST PRESSURE PSI	WEIGHT LBS/100FT	BEND RADIUS INCH MM
6652-2000130	2	2.008 51	2.559 65	130	450	82	6.3 160
6652-2000130H	2	2.008 51	2.717 69	130	450	119	9.8 250
6652-2750130	2-3/4	2.756 70	3.346 85	130	375	116	11.0 280
6652-3000130	3	2.992 76	3.661 93	130	330	159	13.0 330
6652-3000130H	3	2.992 76	3.780 96	130	330	187	14.2 360
6652-4000130	4	4.016 102	4.685 119	130	225	208	17.7 450

6653 Inferno X-treme Plus FD HW Series

This FDA-approved hardwall hose is made for the delivery of hot air in high-performance, extreme temperature applications that require food-grade, tasteless and odorless hose. The Inferno X-treme Plus FD is designed to convey hot air from the compressor to the storage tank in the transfer of dry bulk food commodities such as wheat, sugar or similar products.

TUBE COLOR: White

REINFORCEMENT: High-temperature-resistant plies with helical wires

COVER COLOR: Blue

BRANDING: PARKER SILICONE SERIES 6653 -76° to +392°F (DATE CODE) MADE IN ITALY

TEMP. RANGE: -76° to +392°F

APPLICATIONS: Hot-air transfer in food industry

SPECIFICATIONS: USA FDA CFR 21 Part 177.2600, USA 3A Sanitary Standard Class II, ISO 1307-1997

MAX. WORKING PRESSURE: 1/3 of the Burst Pressure



PART NUMBER	SIZE INCH	INSIDE DIAMETER INCH MM	OUTSIDE DIAMETER INCH MM	LENGTH FT	BURST PRESSURE PSI	WEIGHT LBS/100FT	BEND RADIUS INCH MM
6653-1500130	1-1/2	1.496 38	2.126 54	130	600	97	6.3 160
6653-2000130	2	2.008 51	2.638 67	130	450	124	9.8 250
6653-2500130	2-1/2	2.500 63.5	3.228 82	130	390	192	11.0 280
6653-2750130	2-3/4	2.756 70	3.346 85	130	375	208	13.0 330
6653-3000130	3	2.992 76	3.720 94.5	130	330	224	14.2 360
6653-4000130	4	4.016 102	4.744 120.5	130	225	306	17.7 450

FOOD TRANSFER HOSES

6660 X-treme Plus Food SW Series

The X-treme Food softwall hose is designed to handle the delivery of fatty and non fatty foods. This FDA-approved product is designed to be used as the flexible connection between pipes or fixed equipment. The X-treme Plus Food hose is specifically designed for food, wine, beer, beverages and pharmaceutical industries where it is necessary to have a high-performance, tasteless and odorless hose.

TUBE COLOR: White

REINFORCEMENT: High-temperature-resistant plies

COVER COLOR: White

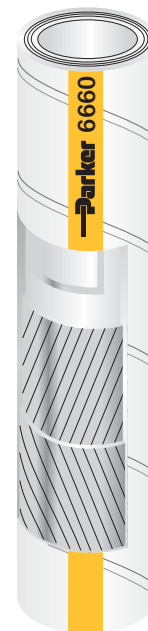
BRANDING: PARKER SILICONE SERIES 6660 -76° to +392°F (DATE CODE) MADE IN ITALY

TEMP. RANGE: -76° to +392°F

APPLICATIONS: Food, wine, beer and beverage transfer

SPECIFICATIONS: USA FDA CFR 21 Part 177.2600, USA 3A Sanitary Standard Class II, ISO 1307-1997

MAX. WORKING PRESSURE: 1/3 of the Burst Pressure



PART NUMBER	SIZE INCH	INSIDE DIAMETER INCH MM	OUTSIDE DIAMETER INCH MM	LENGTH FT	BURST PRESSURE PSI	WEIGHT LBS/100FT
6660-0625130	5/8	0.630 16	1.063 27	130	705	33
6660-0750130	3/4	0.748 19	1.181 30	130	615	37
6660-1000130	1	0.984 25	1.417 36	130	480	46
6660-1250130	1-1/4	1.260 32	1.693 43	130	375	56
6660-1500130	1-1/2	1.496 38	1.929 49	130	330	64
6660-1563130	1- 9/16	1.575 40	2.008 51	130	300	68
6660-2000130	2	2.008 51	2.441 62	130	255	84
6660-2500130	2-1/2	2.500 63.5	2.992 76	130	210	114
6660-2750130	2-3/4	2.756 70	3.228 82	130	195	125
6660-3000130	3	2.992 76	3.465 88	130	180	134
6660-3125130	3-1/8	3.150 80	3.622 92	130	165	141
6660-4000130	4	4.016 102	4.488 114	130	150	176

FOOD TRANSFER HOSES

6661 X-treme Plus Food HW Series

The X-treme Food hardwall hose is designed to handle the delivery of fatty and non fatty foods. This FDA-approved product is designed to be used as the flexible connection between pipes or fixed equipment. The X-treme Plus Food hose is specifically designed for food, wine, beer, beverages and pharmaceutical industries where it is necessary to have a high-performance, tasteless and odorless hose.

TUBE COLOR: White

REINFORCEMENT: High-temperature-resistant plies with helical wire

COVER COLOR: White

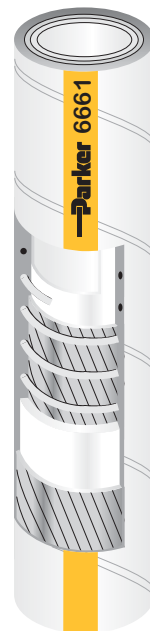
BRANDING: PARKER SILICONE SERIES 6661 -76° to +392°F (DATE CODE) MADE IN ITALY

TEMP. RANGE: -76° to +392°F

APPLICATIONS: Food, wine, beer and beverage transfer

SPECIFICATIONS: USA FDA CFR 21 Part 177.2600, USA 3A Sanitary Standard Class II, ISO 1307-1997

MAX. WORKING PRESSURE: 1/3 of the Burst Pressure



PART NUMBER	SIZE INCH	INSIDE DIAMETER		OUTSIDE DIAMETER		LENGTH FT	BURST PRESSURE PSI	WEIGHT LBS/100FT	BEND RADIUS	
		INCH	MM	INCH	MM				INCH	MM
6661-0625130	5/8	0.630	16	1.063	27	130	675	31	3.0	75
6661-0750130	3/4	0.748	19	1.181	30	130	600	36	3.1	80
6661-1000130	1	0.984	25	1.417	36	130	450	43	3.9	100
6661-1250130	1-1/4	1.260	32	1.693	43	130	375	53	4.7	120
6661-1500130	1-1/2	1.496	38	2.008	51	130	300	74	5.9	150
6621-1563130	1-9/16	1.575	40	2.087	53	130	300	78	7.1	180
6661-2000130	2	2.008	51	2.520	64	130	255	95	9.4	240
6661-2500130	2-1/2	2.500	63.5	3.031	77	130	225	156	10.6	270
6661-2750130	2-3/4	2.756	70	3.307	84	130	300	170	11.4	290
6661-3000130	3	2.992	76	3.543	90	130	270	182	14.2	360
6661-3125130	3-1/8	3.150	80	3.701	94	130	255	192	14.6	370
6661-4000130	4	4.016	102	4.567	116	130	225	257	15.7	400

FOOD TRANSFER HOSES

6662 X-treme Plus Food SF Series

The Super Flexible X-treme Food hose is designed to handle the delivery of fatty and non fatty foods. This FDA-approved product is designed to be used as the flexible connection between pipes or fixed equipment. The X-treme Plus Food is specifically for food, wine, beer, beverages and pharmaceutical industries where it is necessary to have a high-performance, tasteless and odorless hose.

TUBE COLOR: White

REINFORCEMENT: High-temperature-resistant plies with helical wires

COVER COLOR: Blue

BRANDING: PARKER SILICONE SERIES 6662 -76° to +392°F (DATE CODE) MADE IN ITALY

TEMP. RANGE: -76° to +392°F

APPLICATIONS: Food, wine, beer and beverage transfer

SPECIFICATIONS: USA FDA CFR 21 Part 177.2600, USA 3A Sanitary Standard Class II, ISO 1307-1997

MAX. WORKING PRESSURE: 1/3 of the Burst Pressure (75 psi; 5 Bar)



PART NUMBER	SIZE INCH	INSIDE DIAMETER INCH MM	OUTSIDE DIAMETER INCH MM	LENGTH FT	BURST PRESSURE PSI	WEIGHT LBS/100FT	BEND RADIUS INCH MM
6662-0625130	5/8	0.630 16	1.024 26	130	225	21	1.4 35
6662-0750130	3/4	0.748 19	1.142 29	130	225	24	1.8 45
6662-1000130	1	0.984 25	1.378 35	130	225	30	2.0 50
6662-1250130	1-1/4	1.260 32	1.693 43	130	225	40	3.1 80
6662-1500130	1-1/2	1.496 38	1.929 49	130	225	46	3.9 100
6662-1563130	1-9/16	1.575 40	2.008 51	130	225	48	4.3 110
6662-2000130	2	2.008 51	2.539 64.5	130	225	88	5.9 150
6662-2500130	2-1/2	2.500 63.5	3.051 77.5	130	225	108	8.5 215
6662-2750130	2-3/4	2.756 70	3.346 85	130	225	133	9.8 250
6662-3000130	3	2.992 76	3.583 91	130	225	143	10.6 270
6662-3125130	3-1/8	3.150 80	3.740 95	130	225	150	11.8 300
6662-4000130	4	4.016 102	4.646 118	130	225	210	15.7 400

FOOD TRANSFER HOSES

6663 X-treme Plus Food UF Series

The Ultra-Flexible X-treme Food hose is designed to handle the delivery of fatty and non-fatty foods. This FDA-approved product is designed to be used as the flexible connection between pipes or fixed equipment. The X-treme Plus Food hose is specifically for food, wine, beer, beverages and pharmaceutical industries where it is necessary to have a high-performance, tasteless and odorless hose.

TUBE COLOR: White

REINFORCEMENT: High-temperature-resistant plies with helical wires

COVER COLOR: Blue

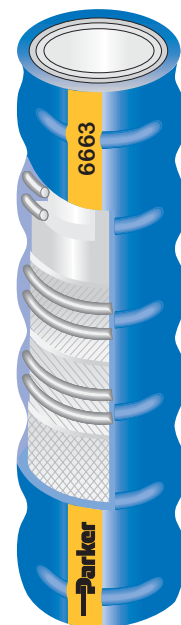
BRANDING: PARKER SILICONE SERIES 6663 -76° to +392°F (DATE CODE) MADE IN ITALY

TEMP. RANGE: -76° to +392°F

APPLICATIONS: Food, wine, beer and beverage transfer

SPECIFICATIONS: USA FDA CFR 21 Part 177.2600, USA 3A Sanitary Standard Class II, ISO 1307-1997

MAX. WORKING PRESSURE: 1/3 of the Burst Pressure



PART NUMBER	SIZE INCH	INSIDE DIAMETER		OUTSIDE DIAMETER		LENGTH FT	BURST PRESSURE PSI	WEIGHT LBS/100FT	BEND RADIUS	
		INCH	MM	INCH	MM				INCH	MM
6663-0750130	3/4	0.748	19	1.260	32	130	600	38	3.5	90
6663-1000130	1	0.984	25	1.496	38	130	480	48	4.0	100
6663-1250130	1-1/4	1.260	32	1.772	45	130	375	56	4.5	115
6663-1500130	1-1/2	1.496	38	2.087	53	130	330	64	5.1	130
6663-1563130	1-9/16	1.575	40	2.205	56	130	300	67	5.3	135
6663-2000130	2	2.008	51	2.598	66	130	240	83	6.3	160
6663-2500130	2-1/2	2.500	63.5	3.110	79	130	180	122	6.7	170
6663-2750130	2-3/4	2.756	70	3.386	86	130	150	133	7.9	200
6663-3000130	3	2.992	76	3.622	92	130	150	143	8.7	220
6663-3125130	3-1/8	3.150	80	3.819	97	130	150	150	9.8	250
6663-4000130	4	4.016	102	4.843	123	130	150	264	11.0	280

PHARMACEUTICAL & COSMETIC HOSES

6670 Pharm X-treme Plus SW Series

This X-treme softwall hose is designed for the delivery of pharmaceutical and cosmetic materials in high-temperature applications. This product is designed to be used as the flexible connection between pipes or fixed equipment. The Pharm X-treme Plus hose is specifically designed for the pharmaceutical industry where it is necessary to have a high-performance, tasteless and odorless hose that can be sterilized in an autoclave.

TUBE COLOR: White

REINFORCEMENT: High-temperature-resistant plies

COVER COLOR: Blue

BRANDING: PARKER SILICONE SERIES 6670 -76° to +392°F (DATE CODE) MADE IN ITALY

TEMP. RANGE: -76° to +392°F

APPLICATIONS: Pharmaceutical labs, manufacturing

SPECIFICATIONS: DIR.CEE 93/42, USP XXIII Class VI, ISO 1307-1997

MAX. WORKING PRESSURE: 1/3 of the Burst Pressure



PART NUMBER	SIZE INCH	INSIDE DIAMETER		OUTSIDE DIAMETER		LENGTH FT	BURST PRESSURE PSI	WEIGHT LBS/100FT
		INCH	MM	INCH	MM			
6670-0625130	5/8	0.630	16	1.063	27	130	705	33
6670-0750130	3/4	0.748	19	1.181	30	130	615	37
6670-1000130	1	0.984	25	1.417	36	130	480	46
6670-1250130	1 1/4	1.260	32	1.693	43	130	375	56
6670-1500130	1 1/2	1.496	38	1.929	49	130	330	64
6670-1563130	1 9/16	1.575	40	2.008	51	130	300	68
6670-2000130	2	2.008	51	2.441	62	130	255	84
6670-2500130	2 1/2	2.500	63.5	2.992	76	130	210	114
6670-2750130	2 3/4	2.756	70	3.228	82	130	195	125
6670-3000130	3	2.992	76	3.465	88	130	180	134
6670-3125130	3 1/8	3.150	80	3.622	92	130	165	141
6670-4000130	4	4.016	102	4.488	114	130	150	176

PHARMACEUTICAL & COSMETIC HOSES

6671 Pharm X-treme Plus HW Series

This X-treme hardwall hose is designed for the delivery of pharmaceutical and cosmetic materials in high-temperature applications. This product is designed to be used as the flexible connection between pipes or fixed equipment. The Pharm X-treme Plus hose is specifically designed for the pharmaceutical industry where it is necessary to have a high-performance, tasteless and odorless hose that can be sterilized in an autoclave.

TUBE COLOR: White

REINFORCEMENT: High-temperature-resistant plies with stainless helical wire

COVER COLOR: Blue

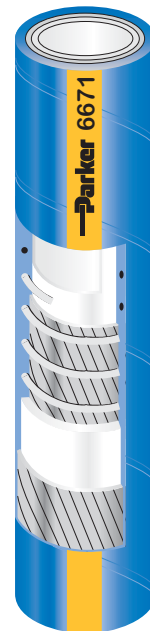
BRANDING: PARKER SILICONE SERIES 6671 -76° to +392°F (DATE CODE) MADE IN ITALY

TEMP. RANGE: -76° to +392°F

APPLICATIONS: Pharmaceutical labs, manufacturing

SPECIFICATIONS: DIR.CEE 93/42, USP XXIII Class VI, ISO 1307-1997

MAX. WORKING PRESSURE: 1/3 of the Burst Pressure



PART NUMBER	SIZE INCH	INSIDE DIAMETER		OUTSIDE DIAMETER		LENGTH FT	BURST PRESSURE PSI	WEIGHT LBS/100FT	BEND RADIUS	
		INCH	MM	INCH	MM				INCH	MM
6671-0625130	5/8	0.630	16	1.063	27	130	675	31	3.0	75
6671-0750130	3/4	0.748	19	1.181	30	130	600	36	3.1	80
6671-1000130	1	0.984	25	1.417	36	130	450	43	3.9	100
6671-1250130	1-1/4	1.260	32	1.693	43	130	375	53	4.7	120
6671-1500130	1-1/2	1.496	38	2.008	51	130	300	74	5.9	150
6671-1563130	1-9/16	1.575	40	2.087	53	130	300	78	7.1	180
6671-2000130	2	2.008	51	2.520	64	130	255	95	9.4	240
6671-2500130	2-1/2	2.500	63.5	3.031	77	130	225	156	10.6	270
6671-2750130	2-3/4	2.756	70	3.307	84	130	300	170	11.4	290
6671-3000130	3	2.992	76	3.543	90	130	270	182	14.2	360
6671-3125130	3-1/8	3.150	80	3.701	94	130	255	192	14.6	370
6671-4000130	4	4.016	102	4.567	116	130	225	257	15.7	400

PHARMACEUTICAL & COSMETIC HOSES

6672 Pharm X-treme Plus SF Series

The Super Flexible X-treme hose is designed for the delivery of pharmaceutical and cosmetic materials in high-temperature applications. This product is designed to be used as the flexible connection between pipes or fixed equipment. The Pharm X-treme Plus hose is specifically designed for the pharmaceutical industry where it is necessary to have a high-performance, tasteless and odorless hose that can be sterilized in an autoclave.

TUBE COLOR: White

REINFORCEMENT: High-temperature-resistant plies with stainless helical wire

COVER COLOR: Blue

BRANDING: PARKER SILICONE SERIES 6672 -76° to +392°F (DATE CODE) MADE IN ITALY

TEMP. RANGE: -76° to +392°F

APPLICATIONS: Pharmaceutical labs, manufacturing

SPECIFICATIONS: DIR.CEE 93/42, USP XXIII Class VI, ISO 1307-1997

MAX. WORKING PRESSURE: 1/3 of the Burst Pressure (75 psi; 5 Bar)



PART NUMBER	SIZE INCH	INSIDE DIAMETER INCH MM	OUTSIDE DIAMETER INCH MM	LENGTH FT	BURST PRESSURE PSI	WEIGHT LBS/100FT	BEND RADIUS INCH MM
6672-0625130	5/8	0.630 16	1.024 26	130	225	21	1.4 35
6672-0750130	3/4	0.748 19	1.142 29	130	225	24	1.8 45
6672-1000130	1	0.984 25	1.378 35	130	225	30	2.0 50
6672-1250130	1-1/4	1.260 32	1.693 43	130	225	40	3.1 80
6672-1500130	1-1/2	1.496 38	1.929 49	130	225	46	3.9 100
6672-1563130	1-9/16	1.575 40	2.008 51	130	225	48	4.3 110
6672-2000130	2	2.008 51	2.539 64.5	130	225	88	5.9 150
6672-2500130	2-1/2	2.500 63.5	3.051 77.5	130	225	108	8.5 215
6672-2750130	2-3/4	2.756 70	3.346 85	130	225	133	9.8 250
6672-3000130	3	2.992 76	3.583 91	130	225	143	10.6 270
6672-3125130	3-1/8	3.150 80	3.740 95	130	225	150	11.8 300
6672-4000130	4	4.016 102	4.646 118	130	225	210	15.7 400

PHARMACEUTICAL & COSMETIC HOSES

6673 Pharm X-treme Plus UF Series

The Ultra-Flexible X-treme Plus hose is designed for the delivery of pharmaceutical and cosmetic materials in high-temperature applications. This product is designed to be used as the flexible connection between pipes or fixed equipment. The Pharm X-treme Plus hose is specifically designed for the pharmaceutical industry where it is necessary to have a high-performance, tasteless and odorless hose that can be sterilized in an autoclave.

TUBE COLOR: White

REINFORCEMENT: High-temperature-resistant plies with stainless helical wires

COVER COLOR: Blue

BRANDING: PARKER SILICONE SERIES 6673 -76° to +392°F (DATE CODE) MADE IN ITALY

TEMP. RANGE: -76° to +392°F

APPLICATIONS: Pharmaceutical labs, manufacturing

SPECIFICATIONS: DIR.CEE 93/42, USP XXIII Class VI, ISO 1307-1997

MAX. WORKING PRESSURE: 1/3 of the Burst Pressure



PART NUMBER	SIZE INCH	INSIDE DIAMETER		OUTSIDE DIAMETER		LENGTH FT	BURST PRESSURE PSI	WEIGHT LBS/100FT	BEND RADIUS	
		INCH	MM	INCH	MM				INCH	MM
6673-0625130	5/8	0.630	16	1.142	29	130	700	29	2.5	80
6673-0750130	3/4	0.748	19	1.260	32	130	600	38	3.5	90
6673-1000130	1	0.984	25	1.496	38	130	480	48	3.9	100
6673-1250130	1-1/4	1.260	32	1.772	45	130	375	56	4.5	115
6673-1500130	1-1/2	1.496	38	2.087	53	130	330	64	5.1	130
6673-1563130	1-9/16	1.575	40	2.205	56	130	300	67	5.3	135
6673-2000130	2	2.008	51	2.598	66	130	240	83	6.3	160
6673-2500130	2-1/2	2.500	63.5	3.110	79	130	180	122	6.7	170
6673-2750130	2-3/4	2.756	70	3.386	86	130	150	133	7.9	200
6673-3000130	3	2.992	76	3.622	92	130	150	143	8.7	220
6673-3125130	3-1/8	3.150	80	3.819	97	130	150	150	9.8	250
6673-4000130	4	4.016	102	4.843	123	130	150	264	11.0	280

CRYOGENIC HOSE & TUBING

6635 Polar X-treme Plus SW Series

The name says it all, this silicone hose is made for the extreme cold-temperature applications, such as industrial refrigeration, inertisation in the chemical and pharmaceutical industry and the delivery of dry ice in the food industry. The softwall construction keeps this hose lightweight and flexible. The Polar X-treme Plus SW is offered in 130-foot continuous lengths.

TUBE COLOR: Brick Red

REINFORCEMENT: High-temperature-resistant plies

COVER COLOR: Brick Red

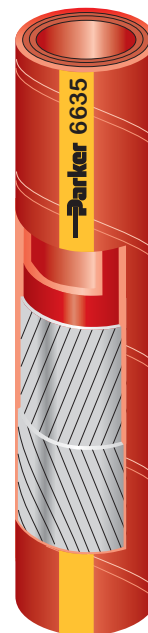
BRANDING: PARKER SILICONE SERIES 6635 -121° to +392°F (DATE CODE) MADE IN ITALY

TEMP. RANGE: -121° to +392°F

APPLICATIONS: Industrial refrigeration, dry ice transfer

SPECIFICATIONS: ISO 1307-1997

MAX. WORKING PRESSURE: 1/3 of the Burst Pressure



PART NUMBER	SIZE INCH	INSIDE DIAMETER INCH MM	OUTSIDE DIAMETER INCH MM	LENGTH FT	BURST PRESSURE PSI	WEIGHT LBS/100FT
6635-0625130	5/8	0.630 16	1.063 27	130	630	27
6635-0750130	3/4	0.748 19	1.181 30	130	570	30
6635-0875130	7/8	0.866 22	1.260 32	130	525	39
6635-1000130	1	0.984 25	1.457 37	130	430	44

FIRESLLEEVE

6639 Firesleeve 1022 Series

The Firesleeve 1022 is no ordinary fire sleeve. This highly flexible and elastic sleeve makes it a great cover for any product that needs protection. This sleeving is also impermeable as well as acid, chemical and oil resistant. The smooth cover prevents welding slag and other materials from depositing between the fiberglass fibers.

TUBE COLOR: Fiberglass

REINFORCEMENT: N/A

COVER COLOR: Brick Red

BRANDING: PARKER SILICONE SERIES 6639 -76° to +500°F (DATE CODE) MADE IN ITALY

INTERNAL TEMP. RANGE: -76° to +1022°F

EXTERNAL TEMP. RANGE: -76° to +500°F

APPLICATIONS: Hose and cable protective covers



PART NUMBER	SIZE INCH	INSIDE DIAMETER INCH MM	OUTSIDE DIAMETER INCH MM	LENGTH FT	WEIGHT LBS/100FT
6639-0750032	3/4	0.748 19	1.004 26	32	12
6639-1000032	1	0.984 25	1.240 31	32	15

Note: Firesleeve 1382°F and Firesleeve 1832°F available upon request

Chemical Resistance Guide for Silicone Hose

MATERIAL HANDLED	COMPATIBILITY	MATERIAL HANDLED	COMPATIBILITY	MATERIAL HANDLED	COMPATIBILITY	MATERIAL HANDLED	COMPATIBILITY
Acetic acid, dilute, 10%	B	Carbon tetrachloride	X	Hydraulic fluids: Water glycol	A	Potassium hydroxide	C
Acetic acid glacial	C	Castor oil	A	Hydrobromic acid	X	Potassium sulfate	A
Acetic acid anhydride	I	Cellosolve acetate	X	Hydrochloric acid	X	Propane	X
Acetone	X	CFC-12	I	Hydrocyanic acid	B	Sewage	B
Acetylene	C	China wood oil, tung oil	X	Hydrofluoric acid	X	Soap solution	A
Air 68°F (20°C)	A	Chlorine, dry/wet	X	Hydrofluosilicic acid	I	Soda ash, sodium carbonate	A
Air 150°F (65°C)	A	Chlorinated solvents	X	Hydrogen gas 140°F (60°C)	C	Sodium bicarbonate, baking soda	A
Aluminum chloride 150°F (65°C)	A	Chloroacetic acid	I	Hydrogen peroxide	A	Sodium bisulfate	A
Aluminum fluoride 150°F (65°C)	B	Chlorosulfonic acid	X	Hydrogen sulfide, dry	X	Sodium chloride	A
Aluminum sulfate 150°F (65°C)	A	Chromic acid	C	Hydrogen sulfide, wet	X	Sodium cyanide	A
Alums 150°F (65°C)	A	Citric acid	A	Isobutyl alcohol	A	Sodium hydroxide to 50% at 140°F	A
Ammonia gas, anhydrous	I	Coke oven gas	B	Isopropyl alcohol	A	Sodium hypochlorite	B
Ammonia 10% water solution	A	Copper chloride 150°F (65°C)	A	Isooctane	X	Sodium metaphosphate	A
Ammonia 30% water solution	C	Copper sulfate 150°F (65°C)	A	Kerosene	X	Sodium nitrate	X
Ammonium chloride	C	Corn oil	A	Lacquers	X	Sodium perborate	B
Ammonium hydroxide	C	Cottonseed oil	A	Lacquers solvents	X	Sodium peroxide	C
Ammonium nitrate	A	Creosote, coal tar	C	Lactic acid	A	Sodium phosphate, monobasic	X
Ammonium phosphate monobasic	A	Creosote, coal tar wood	X	Linseed oil	A	Sodium phosphate, dibasic	X
Ammonium phosphate dibasic	A	Creosols, cresylic acid	I	Lubricating oil, crude	C	Sodium phosphate, tribasic	X
Ammonium phosphate tribasic	A	Dichlorobenzene	X	Lubricating oil, refined	C	Sodium silicate	A
Ammonium sulfate	A	Dichloroethylene	X	Magnesium chloride 150°F (65°C)	A	Sodium sulfate	A
Amyl acetate	X	Diesel fuel	X	Magnesium hydroxide 150°F (65°C)	B	Sodium sulfide	A
Amyl alcohol	X	Diethanolamine 20%	X	Magnesium sulfate 150°F (65°C)	A	Sodium thiosulfate, hypo	I
Aniline, Aniline oil	X	Diethylamine	B	Mercuric chloride	A	Soybean oil	A
Aniline, dyes	X	Diisopropylamine	I	Mercury	A	Stannic chloride	B
Asphalt	I	Diethylphthalate	X	Methyl alcohol, methanol	A	Steam 450°F (230°C)	I
Barium chloride 150°F (65°C)	A	Ethers	X	Methyl chloride	X	Stearic acid	A
Barium hydroxide 150°F (65°C)	A	Ethyl acetate	B	Methyl ethyl ketone	X	Sulfur	B
Barium sulfide 150°F (65°C)	A	Ethyl alcohol	A	Methyl isopropyl ketone	C	Sulfur chloride	C
Beer	A	Ethyl cellulose	C	Milk	A	Sulfur dioxide, dry	B
Beet sugar liquors	A	Ethyl chloride	C	MTBE	I	Sulfur trioxide, dry	B
Benzene, Benzol	X	Ethyl glycol	A	Mineral oils	A	Sulfuric acid, 10%	X
Benzine, petroleum ether	X	Ferric chloride 150°F (65°C)	A	Natural gas	C	Sulfuric acid, 11% - 75%	X
Benzine, petroleum naphtha	X	Ferric sulfate 150°F (65°C)	B	Nickel chloride 150°F (65°C)	A	Sulfuric acid, 76% - 95%	X
Black sulfate liquor	A	Formaldehyde	B	Nickel sulfate 150°F (65°C)	A	Sulfuric acid, fuming	X
Blast furnace gas	A	Formic acid	C	Nitric acid, crude	X	Sulfurous acid	X
Borax	B	Fuel oil	X	Nitric acid, diluted 10%	C	Tannic acid	B
Boric acid	A	Furfural	X	Nitric acid, concentrated 70%	X	Tar	B
Bromine	X	Gasoline, unleaded	X	Nitrobenzene	C	Tartaric acid	A
Butane	X	Gasoline + MTBE	X	Oleic acid	X	Toluene, Toluol	X
Butyl acetate	X	Gasoline Hi Test + MTBE	X	Oleum	I	Trichloroethylene	X
Butyl alcohol, Butanol	C	Gelatin	A	Oxalic acid	B	Turpentine	X
Calcium bisulfate	C	Glucose	A	Oxygen	X	Urea, water solution	A
Calcium chloride	A	Glue	A	Palmitic acid	X	Vinegar	A
Calcium hydroxide	A	Glycerine, glycerol	A	Perchloroethylene	C	Vinyl acetate	X
Calcium hypochlorite	C	Green sulfate liquor	A	Petroleum oils and crude 200°F (95°C)	X	Water, acid mine	A
Caliche liquors	B	HFC-134	I	Phosphoric acid, crude	C	Water, fresh	A
Cane sugar liquors	A	Hydraulic fluids: Petroleum	C	Phosphoric acid, pure 45%	C	Water, distilled	A
Carbolic acid, phenol	X	Hydraulic fluids: Phosphate ester alkyl	X	Picric acid, molten	X	Whiskey and wines	A
Carbon dioxide, dry-wet	A	Hydraulic fluids: Phosphate ester aryl	X	Picric acid, water solution	I	Xylene, xylol	X
Carbon disulfide	X	Hydraulic fluids: Phosphate ester blends	X	Potassium chlorite	A	Zinc chloride	A
Carbon monoxide 140°F (60°C)	A	Hydraulic fluids: Silicate ester	X	Potassium cyanide	A	Zinc sulfate	A

KEY: A = Good Resistance B = Fair Resistance C = Poor Resistance X = Not Recommended I = Insufficient Information

This tabulation is based on tests and on generally available sources, and believed to be reliable. This must be used only as a guide since it does not take into consideration all variables that may be encountered in actual use, such as but not limited to temperature, concentration pressure, duration of exposure, stability of the fluid and possible contamination. In all cases, the compound should always be tested with the chemical it is going to handle. All data is based on usage at 70°F (21°C) unless noted.

www.safehose.com
IHP Customer Service: 440-268-2400
Toll Free: 866-816-1467 or 866-816-1670

Parker Hannifin Corporation
Industrial Hose Division
Canton, Ohio 44705



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GOODYEAR
RUBBER PRODUCTS INC.

Call Toll Free: 1-866-711-4673
WebSales@GoodyearRubberProducts.com

**We Ship
World Wide**

Visit **www.safehose.com**, Parker's one-stop website for complete information on Industrial Hose products, specifications, safe hose assembly practice, and to locate your nearest **Circle of Safety** distributor.

Product Search

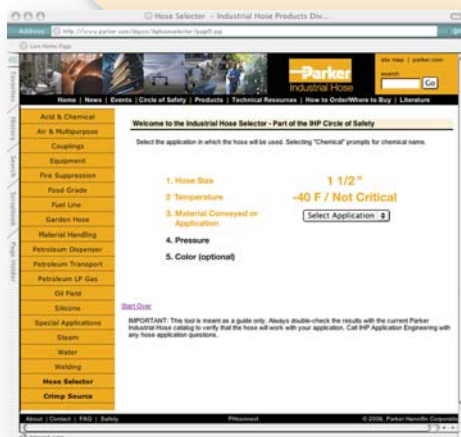
If you know the Parker part number, series or brand, try the Product Search. As an added convenience, we've tied this in with our competitive interchange to help you find the proper Parker hose by searching on a competitive part number, brand or series.

Select Products by Application

Click on an application to see all the Parker industrial hoses available to meet your application requirements. With the broadest line of industrial hoses available, Parker has products to meet almost any specification.

Interactive Hose Selector

Unsure which type of hose you need? Try our Hose Selector. Using the S.T.A.M.P.E.D. method of hose selection, this tool allows you to find the hose or hoses that will fit your application needs. With a direct tie into our CrimpSource program, it will even provide crimp specifications to allow you to assemble the safest hose assembly in the industry.



CrimpSource

Parker's exclusive on-line software application that supplies the necessary crimp specifications to match a hose with a coupling or fitting and ensure that the resulting hose assembly adheres to Parker's safety standards.

CrimpSource is the foundation on which the Circle of Safety program is built.

Distributor Locator

Just enter your zip code into our Distributor Locator. We'll list the Circle of Safety distributors in closest proximity to your zip code, let you know their phone number and address, and even direct you to their web page for more information.



Technical Resources

Helpful, up-to-date hose safety information, including standards, conversions, technical bulletins and specifications.

Literature

Download catalogs and bulletins or order printed items.

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Featured Product: X-treme Plus SF Silicone Series

This Super Flexible hose is a coolant / heater hose that is mandrel made in continuous lengths up to 130 feet, the longest length and most flexible silicone hose available in the industry. This hose is resistant to coolant solutions, cracking, ozone, cold leaks, peeling and aging. This product is made for extreme applications that require tight bends for connections between the radiator and the engine on heavy-duty equipment, buses, trucks, etc. The X-treme Plus SF has a Greek corrugated construction that allows this hose to be flexible enough to replace pre-formed elbows.

Circle of Safety

Many industrial hose manufacturers will suggest which coupling to use with which hose for a given application, but they won't guarantee that combination will perform to the rated burst pressure of the hose.

Parker will.

Our Circle of Safety program establishes Parker's Industrial Hose Division as a single, accountable source with a specific performance guarantee to protect distributors and end users from accidents, unplanned downtime and increased liability associated with ill-matched industrial hose assemblies.

Circle of Safety Program Details

Looking for more information on the Circle of Safety program? Clicking on the Circle of Safety logo in this overview will display the full details of the program, including its features, advantages and benefits to end-users and distributors.

Parker Safety Guide



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

Parker Publication No. 4400-B.1

Revised: May, 2002

WARNING: Failure or improper selection or improper use of hose, tubing, fittings, assemblies 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 not limited to:

- Fittings thrown off at high speed.
- High velocity fluid discharge.
- Explosion or burning of the conveyed fluid.
- Electrocutation 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.
- 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. Only Hose from Parker's Stratoflex Products Division is approved for in-flight aerospace applications, and no other Hose can be used for such in-flight applications.

1.0 GENERAL INSTRUCTIONS

- 1.1 **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. All assemblies made with Hose are called "Hose Assemblies". All products commonly called "fittings" or "couplings" are called "Fittings". All related accessories (including crimping and swaging machines and tooling) are called "Related Accessories". 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.
- 1.2 **Fail-Safe:** Hose, and Hose 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 or Hose Assembly or Fitting will not endanger persons or property.
- 1.3 **Distribution:** Provide a copy of this safety guide to each person that is responsible for selecting or using Hose and Fitting products. Do not select or use Parker Hose or Fittings without thoroughly reading and understanding this safety guide as well as the specific Parker publications for the products considered or selected.
- 1.4 **User Responsibility:** Due to the wide variety of operating conditions and applications for Hose and Fittings, Parker and its distributors do not represent or warrant that any particular Hose 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 Hose and Fitting.
 - Assuring that the user's requirements are met and that the application presents no health or safety hazards.
 - Providing all appropriate health and safety warnings on the equipment on which the Hose and Fittings are used.
 - Assuring compliance with all applicable government and industry standards.
- 1.5 **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 product 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 AND FITTING 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 Fitting and the Hose/Fitting interface to be sufficiently conductive to drain off static electricity. Extreme care must be exercised when selecting Hose and Fittings for these or any other applications in which electrical conductivity or nonconductivity is a factor. The electrical conductivity or nonconductivity of Hose 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 these 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 and Fittings that are selected are proper for the application. Do not use any Parker Hose or Fitting for any such application requiring nonconductive Hose, including but not limited to applications near high voltage electric lines, 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 and Fitting for such use.

- 2.1.2 **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. Parker manufactures a special Hose for certain compressed natural gas ("CNG") applications where static electricity buildup may occur. Parker CNG Hose assemblies comply with AGA Requirements 1-93, "Hoses for Natural Gas Vehicles and Fuel Dispensers". This Hose is labeled "Electrically Conductive for CNG Use" 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 at a maximum temperature of 180°F. Parker CNG Hose should not be used in confined spaces or unventilated areas or areas exceeding 180°F. Final assemblies must be tested for leaks. CNG Hose Assemblies should be tested on a monthly basis for conductivity per AGA 1-93. 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

Parker Safety Guide Continued

cause a fire or an explosion resulting in death, personal injury, and property damage. These Hose assemblies for in-flight applications must meet all applicable aerospace industry, aircraft engine, and aircraft requirements.

- 2.2 Pressure:** Hose selection must be made so that the published maximum recommended working pressure of the Hose is equal to or greater than the maximum system pressure. Surge pressures or peak transient pressures in the system must be below the published maximum working pressure for the Hose. 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. Temperatures below and above the recommended limit can degrade Hose to a point where a failure may occur and release fluid. 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 Assembly selection must assure compatibility of the Hose tube, cover, reinforcement, and Fittings 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 that is chemically compatible with a particular fluid must be assembled using Fittings and adapters containing likewise compatible seals.
- 2.6 Permeation:** Permeation (that is, seepage through the Hose) will occur from inside the Hose to outside when Hose 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 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 even though the fluid compatibility is acceptable without considering the potential hazardous effects that can result from permeation through the Hose Assembly. Permeation of moisture from outside the Hose to inside the Hose will also occur in Hose 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.
- 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).
- 2.9 Environment:** Care must be taken to insure that the Hose 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 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. 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 than 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.
- 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 establishing a proper Hose length, motion absorption, Hose length changes due to pressure, and Hose and machine tolerances and movement must be considered.
- 2.14 Specifications and Standards:** When selecting Hose and Fittings, government, industry, and Parker specifications and recommendations must be reviewed and followed as applicable.
- 2.15 Hose Cleanliness:** Hose components may vary in cleanliness levels. Care must be taken to insure that the Hose 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 require use of the same type of Hose as used with petroleum base fluids. Some such fluids require a special Hose, while a few fluids will not work with any Hose at all. See instructions 2.5 and 1.5. The wrong Hose may fail after a very short service. In addition, all liquids but pure water may burn fiercely under certain conditions, and even pure water leakage may be hazardous.
- 2.17 Radiant Heat:** Hose 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.
- 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 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.
- 2.19 Atomic Radiation:** Atomic radiation affects all materials used in Hose assemblies. Since the long-term effects may be unknown, do not expose Hose assemblies to atomic radiation.
- 2.20 Aerospace Applications:** The only Hose 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 in-flight 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 couplings with disconnect sleeves can unintentionally disconnect if they are dragged over obstructions or if the sleeve is bumped or moved enough to cause disconnect. Threaded couplings should be considered where there is a potential for accidental uncoupling.
- 3.0 HOSE AND FITTING 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. The Parker published instructions must be followed for assembling the

Parker Safety Guide Continued

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 Reusable/Permanent:** Do not reuse any field attachable (reusable) 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.

4.0 HOSE AND FITTING MAINTENANCE AND REPLACEMENT INSTRUCTIONS

- 4.1** 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. A maintenance program must be established and followed by the user and, at minimum, must include instructions 4.2 through 4.7.
- 4.2 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.

4.3 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.

4.4 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.

4.5 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.

4.6 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.

4.7 Elastomeric seals:

Elastomeric seals will eventually age, harden, wear and deteriorate under thermal cycling and compression set. Elastomeric seals should be inspected and replaced.

4.8 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.

4.9 Compressed natural gas (CNG):

Parker CNG Hose Assemblies should be tested after installation and before use, and at least on a monthly basis per AGA 1-93 Section 4.2 "Visual Inspection Hose/Fitting". The recommended procedure is to pressurize the Hose and check for leaks and to visually inspect the Hose for damage.

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.

Offer of Sale

- 1. Terms and Conditions of Sale:** All descriptions, quotations, proposals, offers, acknowledgments, acceptances and sales of Seller's products are subject to and shall be governed exclusively by the terms and conditions stated herein. Buyer's acceptance of any offer to sell is limited to these terms and conditions. Any terms or conditions in addition to, or inconsistent with those stated herein, proposed by Buyer in any acceptance of an offer by Seller, are hereby objected to. No such additional, different or inconsistent terms and conditions shall become part of the contract between Buyer and Seller unless expressly accepted in writing by Seller. Seller's acceptance of any offer to purchase by Buyer is expressly conditional upon Buyer's assent to all the terms and conditions stated herein, including any terms in addition to, or inconsistent with those contained in Buyer's offer. Acceptance of Seller's products shall in all events constitute such assent.
- 2. Payment:** Payment shall be made by Buyer net 30 days from the date of delivery of the items purchased hereunder. Parker reserves the right to charge interest on all past due amounts. Any claims by Buyer for omissions or shortages in a shipment shall be waived unless Seller receives notice thereof within 30 days after Buyer's receipt of the shipment.
- 3. Delivery:** Unless otherwise provided on the face hereof, delivery shall be made F.O.B. Seller's plant. Regardless of the method of delivery, however, risk of loss shall pass to Buyer upon Seller's delivery to a carrier. Any delivery dates shown are approximate only and Seller shall have no liability for any delays in delivery.
- 4. Warranty:** Seller warrants that the items sold hereunder shall be free from defects in material or workmanship for a period of 365 days from the date of shipment to Buyer, or 2,000 hours of use, whichever expires first. **THIS WARRANTY COMPRISES THE SOLE AND ENTIRE WARRANTY PERTAINING TO ITEMS PROVIDED HEREUNDER. SELLER MAKES NO OTHER WARRANTY, GUARANTEE, OR REPRESENTATIONS OF ANY KIND WHATSOEVER. ALL OTHER WARRANTIES, INCLUDING BUT NOT LIMITED TO, MERCHANTABILITY AND FITNESS FOR PURPOSE, WHETHER EXPRESS, IMPLIED, OR ARISING BY OPERATION OF LAW, TRADE USAGE, OR COURSE OF DEALING ARE HEREBY DISCLAIMED.**

NOTWITHSTANDING THE FOREGOING, THERE ARE NO WARRANTIES WHATSOEVER ON ITEMS BUILT OR ACQUIRED WHOLLY OR PARTIALLY, TO BUYER'S DESIGNS OR SPECIFICATIONS.
- 5. Limitation Of Remedy:** SELLER'S LIABILITY ARISING FROM OR IN ANY WAY CONNECTED WITH THE ITEMS SOLD OR THIS CONTRACT SHALL BE LIMITED EXCLUSIVELY TO REPAIR OR REPLACEMENT OF THE ITEMS SOLD, OR REFUND OF THE PURCHASE PRICE PAID BY BUYER, AT SELLER'S SOLE OPTION. IN NO EVENT SHALL SELLER BE LIABLE FOR ANY INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES OF ANY KIND OR NATURE WHATSOEVER, INCLUDING BUT NOT LIMITED TO LOST PROFITS ARISING FROM OR IN ANY WAY CONNECTED WITH THIS AGREEMENT OR ITEMS SOLD HEREUNDER, WHETHER ALLEGED TO ARISE FROM BREACH OF CONTRACT, EXPRESS OR IMPLIED WARRANTY, OR INTORT, INCLUDING WITHOUT LIMITATION, NEGLIGENCE, FAILURE TO WARN OR STRICT LIABILITY.
- 6. Changes, Reschedules and Cancellations:** Buyer may request to modify the designs or specifications for the item sold hereunder as well as the quantities and delivery dates thereof, or may request to cancel all or part of this order, however, no such requested modification or cancellation shall become part of the contract between Buyer and Seller unless accepted by Seller in a written amendment to this Agreement. Acceptance of any such requested modification of cancellation shall be at Seller's discretion, and shall be upon such terms and conditions as Seller may require.
- 7. Special Tooling:** A tooling charge may be imposed for any special tooling, including without limitation, dies, fixtures, molds and patterns, acquired to manufacture items sold pursuant to this contract. 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 items sold hereunder, even if such apparatus has been specially converted or adapted for such manufacture and notwithstanding any charges paid by

Buyer. Unless otherwise agreed, Seller shall have the right to alter, discard or otherwise dispose of any special tooling or other property in its sole discretion at any time.

- 8. 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, may be considered obsolete and may be destroyed by Seller after two (2) consecutive years have elapsed without Buyer placing an order for the items which are 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. Taxes:** Unless otherwise indicated on the face hereof, all prices and charges are exclusive of excise, sales, use, property, occupational or like taxes which may be imposed by any taxing authority upon the manufacture, sale or delivery of the items sold hereunder. If any such taxes must be paid by Seller, or if Seller is liable for the collection of such tax, the amount thereof shall be in addition to the amounts for the items sold. Buyer agrees to pay all such taxes or to reimburse Seller therefor upon receipt of its invoice. If Buyer claims exemption from any sales, use or other tax imposed by any taxing authority, Buyer shall save Seller harmless from and against any such tax, together with any interest or penalties thereon which may be assessed if the items are held to be taxable.
- 10. Indemnity For Infringement of Intellectual Property Rights:** Seller shall have no liability for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights except as provided in this Part 10. Seller will defend and indemnify Buyer against allegations of infringement of U.S. patents, U.S. trademarks, copyrights, trade dress and trade secrets (hereinafter '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 an item sold pursuant to this contract infringes in 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 an item sold hereunder 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 said item, replace or modify said item so as to make it noninfringing, or offer to accept return of said item and return the purchase price less a reasonable allowance for depreciation. Notwithstanding the foregoing, Seller shall have no liability for claims of infringement based on information provided by Buyer, or directed to items 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 item sold hereunder. The foregoing provisions of this Part 10 shall constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for infringement of Intellectual Property Rights.

If a claim is based on information provided by Buyer or if the design for an item delivered hereunder is specified in whole or in part by Buyer, Buyer shall defend and indemnify Seller for all costs, expenses or judgments resulting from any claim that such item infringes any patent, trademark, copyright, trade dress, trade secret or any similar right.

- 11. Force Majeure:** Seller does not assume the risk of and shall not be liable for delay or failure to perform any of Seller's obligations by reason of circumstances beyond the reasonable control of Seller (hereinafter 'Events of Force Majeure'). Events of Force Majeure shall include without limitation, accidents, acts of God, strikes or labor disputes, acts, laws, rules or regulations of any government or government agency, fires, floods, delays or failures in delivery of carriers or suppliers, shortages of materials and any other cause beyond Seller's control.
- 12. Entire Agreement/Governing Law:** The terms and conditions set forth herein, together with any amendments, modifications and any different terms or conditions expressly accepted by Seller in writing, shall constitute the entire Agreement concerning the items sold, and there are no oral or other representations or agreements which pertain thereto. This Agreement shall be governed in all respects by the law of the State of Ohio. No actions arising out of the sale of the items sold hereunder or this Agreement may be brought by either party more than two (2) years after the cause of action accrues.