Industrial Hoses

Technical Handbook

Parker

ENGINEERING YOUR SUCCESS.

Technical Handbook

	Hose	ID Range (mm)	Temp. Range (°C)	Application	Tube	Reinforcement	Cover	WP (bar)	De-sign factor	Suc-tion	Industry standard	Page
Oil & Fuel	CARBOPRESS N/L 10	5 - 25	-25 / +80	fuel, oil, petrol aromatic < 50 %	NBR	textile	NBR/EPDM	10	3			A4
	CARBOPRESS N/L 20	6 - 25	-25 / +80	fuel, oil, petrol aromatic < 50 %	NBR	textile	NBR/EPDM	20	3			A4
	CARBURITE 10	19 - 150	-30 / +80	fuel, oil, petrol aromatic < 50 %	NBR	textile	NBR/SBR	10	3	yes		A5
	CARBOCORD EN 12115	19 - 100	-25 / +80	fuel, oil, petrol aromatic < 50 %	NBR	textile + copper wires	NBR/SBR	16	4		EN 12115	A6
	CHEMIOEL EN 12115	19 - 100	-25 / +80	fuel, oil, petrol aromatic < 50 %	NBR	textile + copper wires	NBR/SBR	16	4	yes	EN 12115	A7
	CERVINO EN 12115	50 - 100	-40 / +80	fuel, oil, petrol aromatic < 50 %	NBR	textile + copper wires	NBR/SBR	16	4	yes	EN 12115	A8
	E-Z FORM™ HT	12.7 - 25.4	-40 / +150	petroleum-based oil	CPE	textile	NBR	10	4	yes		A9
Automotive & Boat	RADIOR 10	7 - 15	-30 / +100	cooling line system	EPDM	textile	EPDM	10	3			B4
	E-Z FORM™ GS	12.7 - 102	-45 / +125	high flexible hose for coolant line system	EPDM	textile	EPDM	5	4	yes	SAE J 20R2 - D1	B5
	RADIOR DIN 6	10 - 50	-40 / +125	cooling line system	EPDM	textile	EPDM	6	3			B6
	Series 6722	6 - 25	-54 / +177	Heater and cooling line system	SILICONE	textile	SILICONE	5.7	3		SAE J20R3 Class A	B7
	AIRBRAKE DIN 74310	9 - 13	-40 / +70	breaking system	EPDM	textile	EPDM	10	4		DIN 74310	B8
	Series 395 SAE J 30R7	4.8 - 12.7	-40 / +125	car & motorbike fuel system	NBR	textile	CR	2.4/5.2	5		SAE 30 R7	B9
	TBSE	4 - 10	-30 / +100	car & motorbike fuel system	NBR	textile	NBR/EPDM	10	3			B10
	TBE	3 - 7.5	-20 / +90	car & motorbike fuel system	NBR	textile		10	3			B11
	CARBOBLUE N/L 10	16 - 25	-40 / +100	nox reducing system	EPDM	textile	EPDM	10	3			B12
	CARBOBLUE N/L 20	6 - 25	-40 / +100	nox reducing system	EPDM	textile	EPDM	20	3			B12
	WAVEMASTER™	6.3 - 19	-29 / +100	marine barrier fuel hose	NYLON	textile	NBR/PVC	7	4	light	Refer to the page	B13
	SM/TR 311	19 - 50	-20 / +80	coolant line	NBR	textile	NBR/CR	3	> 3.5	yes	EN ISO 7840 A1	B14
	SUPER-FLEX® FL-7	4.7 - 19.1	-40 / +125	low permation fuel hose	NBR/THV	textile	CPE	6.9	5	light	SAEJ30R7/J30R14T2	B15
	SUPER-FLEX® FL	4.7 - 15.9	-30 / +125	low permation fuel hose	NBR/ barrier	textile	CPE	6.9	5	light	AEJ30R7/J30R14T2	B16
Gas	AUTOGENE EN ISO 3821 NR/L – NB/L 20	6.3 - 10	-25 / +80	welding process	EPDM/SBR	textile	EPDM	20	3		EN ISO 3821	C4
	PROPANPRESS EN ISO 3821 NA/L 20	6.3 - 10	-30 / +70	propan gas delivery	NBR/NR	textile	EPDM	20	3		EN ISO 3821	C5
	CARBO G NW/L 10 – NB/R 10	8 - 13	-20 / +90	household applicances	NBR	textile	EPDM	10	3		UNI CIG 7140	C6
Water	FUCINO 20	50 - 120	-30 / +80	water, non aggressive liquids	SBR	textile	SBR	20	3			D4
	PRESCORD N/R 10	8 - 25	-30 / +80	water, non aggressive liquids	SBR	textile	SBR/EPDM	10	3			D5
	IDRO 10	25 - 75	-30 / +80	water, non aggressive liquids	SBR	textile	SBR	10	3			D6
	BEVERA 10	19 - 203	-30 / +80	water, non aggressive liquids	SBR	textile	SBR	10	3	yes		D7
	MULTIREX	19 - 150	-10 / +60	water, non aggressive liquids	PVC	PVC wire	PVC	7	3	yes		D8
Hot Water & Steam	RADIOR 3	10 - 100	-40 / +100	cooling line system	EPDM	textile	EPDM	3	3			E4-E5
	RADIOR K 1003	12 - 65	-40 / +100	cooling line system	NBR	textile	CR	5	3			E6
	THERMOPRESS 10	12 - 60	-40 / +100	cooling line and hot water	EPDM	textile	EPDM	10	4			E7
	VIGOR 2 EN ISO 6134 Type 2/A	13 - 51	-40 / +210	steam industrial application	EPDM	textile	EPDM	18	10		EN ISO 6134 Type 2/A	E8
	VIGOR 2 NR EN ISO 6134 Type 2/A	13 - 51	-40 / +210	steam industrial application	EPDM	textile	EPDM	18	10		EN ISO 6134 Type 2/A	E8

• • ISO 7840, ABYC, CARB, CE, EPA, NMMA, SAE J1527 A1-15, USCG A1 • •

	Hose	ID Range (mm)	Temp. Range (°C)	Application	Tube	Reinforcement	Cover	WP (bar)	De-sign factor	Suc-tion	Industry standard	Page
Acid & Chemicals	POLIAX D EN 12115	19 - 100	-35 / +100	chemical resistance table	EPM	textile + copper wires	EPDM	16	4		EN 12115	F4
	POLIAX D SM EN 12115	19 - 100	-35 / +100	chemical resistance table	EPM	textile + copper wires	EPDM	16	4	yes	EN 12115	F5
	POLIAX UPE CON SM EN 12115	19 - 100	-20 / +100	chemical resistance table	UHMWPE	textile + copper wires	EPDM	16	4	yes	EN 12115	F6
	POLIAX UPE CON SM EN 12115 OND	19 - 100	-20 / +100	chemical resistance table	UHMWPE	textile + copper wires	EPDM	16	4	yes	EN 12115	F7
	POLIAX F EN 12115	13 - 75	-40 / +150	chemical resistance table	PTFE	textile + copper wires	EPDM	16	4	yes	EN 12115	F8
	POLIAX PHARMA	13 - 51	-60 / +200	chemical resistance table	SILICONE	textile + copper wires	SILICONE	6/15	3	yes		F9
Material Handling	LIBECCIO EN ISO 3861	19 - 100	-30 / +70	wet and dry sand and cement	BR/NR	textile	SBR/NBR	10	4		EN ISO 3861	G4
	INTONACATRICI 40	25 - 65	-30 / +70	wet and dry sand and cement	BR/NR	textile	SBR	40	3			G5
	BETON 80	51 - 125	-40 / +70	high pressure concrete pumping	NR/SBR	steel wire	NR/SBR	80	2.5			G6
	CERGOM	25 - 200	-30 / +70	high abrasive materials	CERAMIC	textile + copper wires	SBR/NBR	6	3	yes		G7
	ASPIREX	20 - 250	-15 / +60	suction equipment	PVC	PVC wire	PVC	-	-	yes		G8
Beverage & Food	DRINKPRESS WB/L 10	10 - 25	-20 / +100	food & beverage, wash-down	NBR	textile	NBR/PVC	10	4		FDA - EC	H4
	GAMBRINUS UPE SM EN12115	19 - 100	-20 / +100	food & beverage	UHMWPE	textile + copper wires	EPDM	16	4	yes	**EN 12115 - FDA - DM	H5
	GAMBRINUS BLUE 10	19 - 102	-30 / +80	fatty food & beverage	NBR	textile	NBR/PVC	10	3		* BfR - DM - FDA - EC	H6
	GAMBRINUS BLUE SM 10	19 - 102	-30 / +80	fatty food & beverage	NBR	textile	NBR/PVC	10	3	yes	* BfR - DM - FDA - EC	H7
	GAMBRINUS RED SM 10	19 - 102	-40 / +120	wine and soft drinks food & beverage	EPDM	textile	EPDM	10	3	yes	* BfR - DM - FDA - EC	H8
	VINITRESS	6 - 50	-20 / +60	food & beverage	PVC	textile	PVC	20	3		EC 90/128 CLASS A-B-C	H9
	APERSPIR	12 - 150	-10 / +60	food & beverage	PVC	steel wire	PVC	15	3	yes	EC 90/128 CLASS A-B-C	H10
	ENOREX	25 - 120	-25 / +60	wine and soft drinks food & beverage	PVC	PVC wire		10	3	yes	EC 1935:2004 CLASS A-B-C	H11
Multipurpose & Air	GST II Black 15	5 - 38	-40 / +100	compressed air, non aggressive liquids	EPDM	textile	EPDM	15	4			I4
	GST II Red 15	6.5 - 38	-40 / +100	compressed air, non aggressive liquids	EPDM	textile	EPDM	15	4			I5
	GST II Black 20	6.5 - 25	-40 / +100	compressed air, non aggressive liquids	EPDM	textile	EPDM	20	4			I6
	PYTHON N/L 20	10 - 50	-40 / +120	multipurpose	EPDM	textile	EPDM	20	3			I7
	PYTHON NV/L 20	10 - 50	-40 / +120	multipurpose	EPDM	textile	EPDM	20	3			I8
	PYTHON NY/L 30	6 - 100	-40 / +120	multipurpose	EPDM	textile	EPDM	30	3			I9
	JUMBO N/L	13 - 25	-40 / +120	multipurpose	EPDM	textile	EPDM	20	3			I10
	MINIERA 20 MSHA	19 - 100	-30 / +80	compressed air, non aggressive liquids	SBR/NBR	textile	CR	20	3		MSHA	I11
	E-Z FORM™ MP	12.7 - 75	-34 / +120	high flexible hose for multipurpose	CR	textile	CR	5	4	yes		I12
	OILPRESS N/L 20	6 - 25	-35 / +100	multipurpose	NBR	textile	NBR/PVC	20	3			I13
	OILPRESS N/L 30	6 - 25	-35 / +100	multipurpose	NBR	textile	NBR/PVC	30	3			I13
	APERFRUT 20	8 - 19	-15 / +60	agricultural spray	PVC	textile	PVC	20	4			I14
	APERFRUT 40	8 - 13	-15 / +60	agricultural spray	PVC	textile	PVC	40	3			I14
	APERFRUT 80	8 - 13	-15 / +60	agricultural spray	PVC	textile	PVC	80	2.5			I14

* BfR Class2 - DM 21/03/73 - FDA title21 - EC 1935/2004 **EN 12115 - FDA title 21 - DM 21/03/73 - DM 220 26/04/93

Rubber Hose Construction

Tube

It is the innermost rubber or plastic element of the hose. Must be resistant to the materials it is intended to convey. The characteristics of the rubber or plastic compound and the thickness of the tube depend on the service in which the hose will be used.

Reinforcement

Can be textile, plastic or metal, alone or in combination, built into the body of the hose to withstand internal pressures, external forces or combination

Cover

It is the outer element and can be made of rubber, plastic or textile materials. The function of the cover is to protect the hose from damage and environment.

Long Length (LL) Production method:

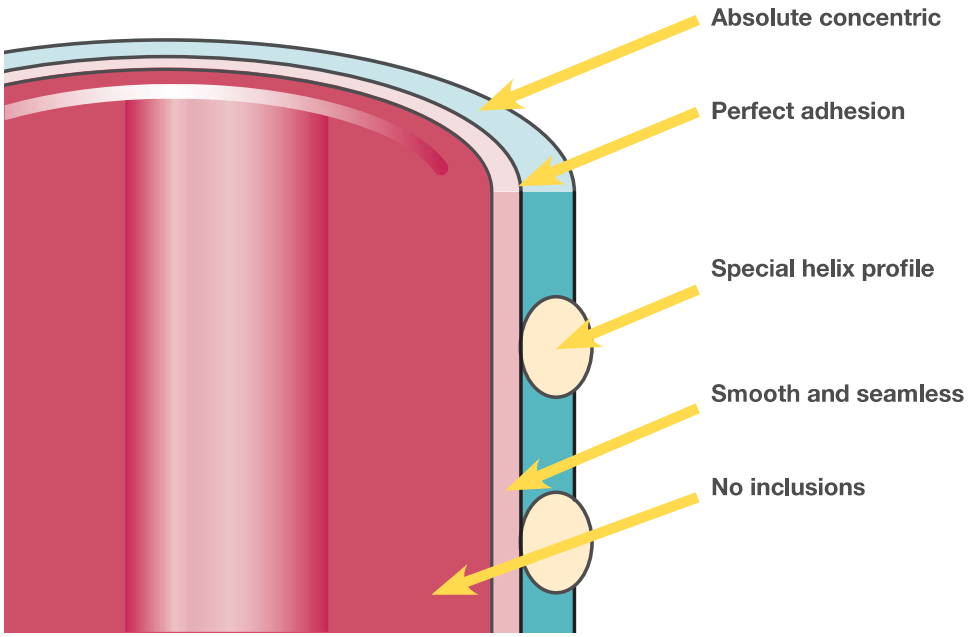
Seamless extruded hoses without or on flexible mandrel and eventually white lead vulcanization with synthetic textile yarn reinforcement for standard production up to 100 m and internal diameter up to I.D. 35 mm.

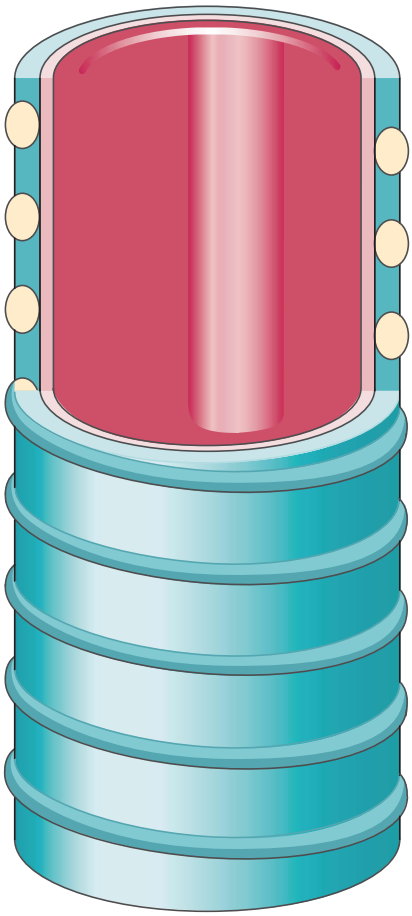
Mandrel Made (MM) Production method:

Hose produced on a rigid mandrel with a reinforcement of textile fabrics or steel braids, with or without steel wire helix, for standard production length up to 40 m and internal diameter range from I.D. 19 mm to I.D. 200 mm.

PVC Hose Construction

Flexible hose having a rigid PVC spiral or a steel wire reinforcement spiral embedded in a PVC wall.





Hose Part Number Description

IH35.... → PVC Hose

IH30.... → Long Length Rubber Hose

IH36.... → Mandrel made Rubber Hose

IH42.... → Mandrel made Rubber Hose

IH7.... → Global Hose Series

Example

IH35562019/50 → PVC Hose

IH35562019/50 → PVC Hose, length 50 m

IH35562019/0 → PVC Hose, length: variable

Hose to be ordered in coils.

Conversion Chart

	Unit	Base Unit	Conversion Unit	Factor
Length	1 inch	in	mm	25.4
	1 milllimetre	mm	in	0.03934
	1 foot	ft	m	0.3048
	1 metre	m	ft	3.28084
Area	1 square-inch	sq in	cm^2	6.4516
	1 square-centimetre	cm^2	sq in	0.1550
	1 gallon (UK)	gal	l	4.54596
Volume	1 litre	l	gal (UK)	0.219976
	1 gallon (US)	gal	l	3.78533
	1 litre	l	gal (US)	0.264177
Weight	1 pound	lb	kg	0.453592
	1 kilogramme	kg	lb	2.204622
Torque	1 pound foot	lb • ft	kg • m	1.488164
	1 newton metre	kg • m	lb • ft	0.671969
	1 pound per square inch	psi	bar	0.06895
	1 bar	bar	psi	14.5035
	1 pound per square inch	psi	MPa	0.006895
Pressure	1 mega pascal	MPa	psi	145.035
	1 kilo pascal	kPa	bar	0.01
	1 bar	bar	kPa	100
	1 mega pascal	MPa	bar	10
	1 bar	bar	MPa	0.1
Velocity	1 foot per second	ft / s	m / s	0.3048
	1 metre per second	m / s	ft / s	3.28084
	1 gallon per minute (UK)	gal / min.	l / min.	4.54596
Flow rate	1 litre per minute	l / min.	gal / min. (UK)	0.219976
	1 gallon per minute (US)	gal / min.	l / min.	3.78533
	1 litre per minute	l / min.	gal / min. (US)	0.264178
Temperature	Fahrenheit degree	°F	°C	5/9 • (°F-32)
	Celsius degree	°C	°F	°C • (9 /5) +32

(UK) Unit of United Kingdom
(US) Unit of USA

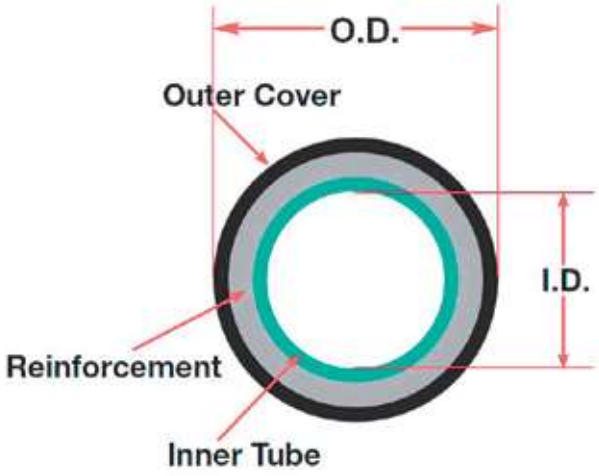
Before you spec it, STAMP it.

S T A M P

SIZE TEMPERATURE APPLICATION MEDIA PRESSURE

SIZE

The hose Internal and External Diameter must be sized accurately to obtain the proper values to couple the hose with reusable or permanent fittings. The measuring system of the inside and outside diameter of the hose is universally regulated by ISO 4671 while the hose tolerances are listed in the ISO 1307 if not superseded by particular and specific other norms (i.e. EN 12115).



TEMPERATURE

When specifying hose, there are two temperatures you need to identify. One is the **ambient temperature** which is the temperature that exists outside the hose in the application where it is being used; the other is the **media temperature** which is the temperature of the media conveyed through the hose. Very high or low ambient temperatures can have adverse affects on the hose cover and reinforcement materials, resulting in reduced service life. Media temperatures can have a much greater impact on hose life. For example, rubber loses flexibility if operated at high temperatures for extended periods.

S T A M P
SIZE TEMPERATURE APPLICATION MEDIA PRESSURE

APPLICATION

Before selecting a hose, it is important to consider how the hose will be used. Answering the following questions may help:

- **Which is the media conveyed?**
- **What type of equipments are involved?**
- **Is it a static or dynamic application?**
- **Are there any routing constrains?**
- **Do you need particular cover features?**
- **Should the hose comply with any industry or government standards?**
- **Which are the electrical hose conductivity/ resistance requirements?**

Sometimes specific applications require hoses specific dimensions, features or performance characteristics. For example, applications where hoses will encounter rubbing or abrasive surfaces, would be best handled by our family of abrasion resistant hose. When application space is tight, bend radius is another important consideration. We offer hoses with increased flexibility and smaller outer diameters enabling faster, easier routing in small spaces, reducing both hose length and inventory requirements. Industry standards set specific requirements concerning construction type, size, tolerances, burst pressure, and media compatibility. You must select a hose that meets the legal requirements as well as the functional requirements of the application.

MEDIA

What will the hose convey? Some applications require the use of specialized oils or chemicals. The hose you order must be compatible with the medium being conveyed. Compatibility must cover the inner tube, the cover, hose fittings, and o-rings as well. Use the Oil and Fuel and Chemical Resistance Chart you find in this section to select the correct components of the hose that will be compatible with your system's media.

PRESSURE

Hose selection must be made so that the published maximum 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.

Each Parker hose has a pressure rating which can be found on the HOSE SELECTION MATRIX. Burst pressure ratings are not an indication that the product can be used above the published maximum working pressure. It is for this reason that the burst pressure ratings have been removed from the hose charts within the catalog. However the burst pressure is indicated by the design factor of each hose type.

Standards

ABYC
- WAVEMASTER™

BfR XXI cat. 2
- GAMBRINUS BLUE 10
- GAMBRINUS BLUE 10 SM
- GAMBRINUS RED 10 SM
- POLIAX PHARMA

CARB
- WAVEMASTER™

CE
- WAVEMASTER™
- SM TR 311

DIN 73411
- RADIOR DIN 6

DIN 74310
- AIRBRAKE DIN 74310

DM 21/03/73
- ENOREX
- GAMBRINUS BLUE 10
- GAMBRINUS BLUE 10 SM
- GAMBRINUS RED 10 SM
- GAMBRINUS UPE SM EN 12115
- POLIAX PHARMA

DM 220 26/04/93
- GAMBRINUS UPE SM EN 12115

EC 1935:2004
- ENOREX
- GAMBRINUS BLUE 10
- GAMBRINUS BLUE 10 SM
- GAMBRINUS RED 10 SM

EU 10/2011
- VINITRESS
- ENOREX
- APERSPIR

EN 12115
- CARBOCORD EN 12115
- CERVINO EN 12115
- CHEMIOEL EN 12115
- GAMBRINUS UPE SM EN 12115
- POLIAX D EN 12115
- POLIAX D SM EN 12115
- POLIAX F EN 12115
- POLIAX UPE CON SM EN 12115
- POLIAX UPE CON SM OND EN 12115

EN ISO 3821
- AUTOGENE EN ISO 3821 NR/L - NB/L 20
- PROPANPRESS EN ISO 3821 NA/L 20

EN ISO 3861
- LIBECCIO EN ISO 3861

EN ISO 6134
- VIGOR 2 EN ISO 6134 Type 2/A

EN ISO 7840
- SM TR 311
- WAVEMASTER™

EPA
- WAVEMASTER™

European Pharmacopoeia
- POLIAX PHARMA

MSHA
- MINIERA 20 MSHA

FDA
- DRINKPRESS WB/L 10
- GAMBRINUS BLUE 10
- GAMBRINUS BLUE 10 SM
- GAMBRINUS RED 10 SM
- GAMBRINUS UPE SM EN 12115
- POLIAX F
- POLIAX PHARMA

NMMA
- WAVEMASTER™

SAE J 30 R7
- CARBOPRESS SAE J 30 R7
- SUPER-FLEX® FL
- SUPER-FLEX® FL-7

SAE J 20 R2 - D1
- E-Z FORM™ GS

SAE J 20 R3 Class A
- SERIES 6722

SAE J 30 R14T2
- SUPER-FLEX® FL
- SUPER-FLEX® FL-7

SAE J1527 A1-15
- WAVEMASTER™

UNI CIG 7140
- CARBO G NB/R 10
- CARBO G NW/L 10

USCG A1
- WAVEMASTER™

USP XXXII class - VI requirements
- POLIAX PHARMA
- POLIAX F

Guidelines to the Use and Cleaning of Food and Pharma Rubber Hose

The hoses offered in our catalogue are manufactured in accordance with the best production practices, observing the international norms and specifications regulating this sector to guarantee safety, performance, quality and hygiene.

Transport, storage, handling, usage and media may contaminate the hose and affect its performance.

Therefore Parker recommends cleaning and sanitizing the hose prior to and after each use to maintain hose efficiency and prevent harmful contamination.

However our suggestions are superseded by specific local government regulations and industry standards.

Cleaning and sanitizing steps:

- **flush with hot drinking water**
- **Cleaning process with detergents/chemicals**
- **Rinse with drinking water at 20 °C for max 10 min**
- **Sterilization process**
- **Rinse with drinking water at 20 °C for max 10 min**
- **Check to determine that all residuals have been eliminated**

The frequency depends on the type of food and liquid conveyed and environment condition.

The frequency and time of exposure to detergents/disinfectants may compromise the service life of the hose. Thus we recommend regular inspection of the hose to evaluate its physical conditions.

Media	Compound	Concentration	Temperature
Hot Water	NBR, UPE, EPDM, SILICONE	-	Up to 90 °C
Steam	NBR	-	Up to 110 °C – max 10 min
	EPDM, UPE, PTFE		Up to 130 °C – max 30 min
	SILICONE		Up to 135 °C – max 18 min
Caustic Soda	NBR, SILICONE	2%	Up to 65 °C
		4%	Up to 25 °C
	EPDM, UPE, PFTE	2%	Up to 85 °C
		5%	Up to 25 °C
Nitric Acid	NBR, SILICONE	0,1%	Up to 65 °C
		2%	Up to 25 °C
	EPDM, UPE, PFTE	0,1%	Up to 85 °C
		3%	Up to 25 °C
Peracetic Acid	NBR, SILICONE	1%	Up to 25 °C
	EPDM, UPE, PFTE		Up to 40 °C

For other cleaning media and support pls contact Parker

Oil and Fuel Compatibility

Hose series	Max Ambient temperature °C	Fuel types							
		Fuel	Diesel	LPG-CNG	B10	B20	B100	E10	E100
ARCTIC-EDGE	100	G up to 70°	G up to 100°	C	G up to 70°	G up to 70°	C	G up to 70°	G up to 70°
CARBOCORD EN 12115	100	G up to 70°	E up to 70°	C	G up to 70°	G up to 70°	C	G up to 70°	C
CARBOPRESS N/L	100	G up to 70°	E up to 70°	X	E up to 70°	E up to 70°	E up to 70°	G up to 70°	C
Series 395 SAE J 30 R7	125	E up to 70°	E up to 100°	G up to 70°	E up to 100°	E up to 70°	G up to 70°	E up to 70°	E up to 70°
CARBURITE 10	100	E up to 70°	E up to 70°	C	G up to 70°	G up to 70°	C	G up to 70°	C
CERVINO EN 12115	100	E up to 70°	E up to 70°	C	G up to 70°	G up to 70°	C	G up to 70°	G up to 70°
CHEMIOEL EN 12115	100	E up to 70°	E up to 70°	C	G up to 70°	G up to 70°	C	G up to 70°	G up to 70°
E-Z FORM™ HT	150	E up to 120°	E up to 120°	C	E up to 120°	E up to 120°	G up to 100°	G up to 70°	G up to 70°
E-Z FORM™ MP	121	E up to 100°	E up to 100°	C	E up to 100°	E up to 100°	C	G up to 70°	G up to 70°
OILPRESS N/L	120	G up to 70°	E up to 100°	G up to 70°	E up to 100°	E up to 70°	E up to 70°	G up to 70°	E up to 70°
SM TR 311	80	E up to 70°	E up to 70°	C	E up to 100°	G up to 100°	C	E up to 100°	C
SUPER-FLEX® FL	125	E up to 100°	E up to 100°	C	E up to 100°	E up to 100°	E up to 100°	E up to 100°	G up to 100°
SUPER-FLEX® FL-7	125	E up to 100°	E up to 100°	C	E up to 100°	E up to 100°	G up to 100°	E up to 100°	G up to 100°
TBE	90	E up to 70°	E up to 70°	C	G up to 70°	G up to 70°	X	E up to 70°	G up to 70°
TBSE	100	E up to 70°	E up to 70°	G up to 70°	G up to 70°	G up to 70°	X	E up to 70°	G up to 70°
WAVEMASTER™	100	E up to 70°	E up to 70°	C	E up to 70°	E up to 70°	E up to 70°	E up to 70°	G up to 70°

Fuel	max 50 % Aromatic (Aliphatic /Aromatic + MBTE)
Diesel	Std mineral Diesel
LPG-CNG	Liquefied petroleum gas or Compressed Natural gas
B10	Biodiesel 10 % in std diesel
B20	Biodiesel 20 % in std diesel
B100	Biodiesel 100 %
E10	Ethanol Alcohol 10 % in Fuel
E100	Ethanol Alcohol 100 %

The indicate temperature is related to the Media and not to the ambient

E = Excellent
G = Good
C = Conditional
X = Unsatisfactory

Conductive Value Table

As for ISO 8031

$R<10^3$	Conductive Compound
$10^3 < R < 10^8$	Antistatic Compound
$R > 10^8$	Insulating Compound

Electrical Properties of Rubber Hose

Electrical Conductivity

Industrial hoses generally fall into three categories:
conductive, nonconductive, or somewhere in-between. Because of its unique properties, it is possible for rubber to be nonconductive at low voltage and conductive at high voltage. When using a hose in an application that has electrical resistance requirements (low electrical resistance for conductive applications or high electrical resistance for nonconductive applications), always select a hose that is specifically designed to meet the specific need. Since conductivity or no conductivity is not a consideration for many applications, electrical resistance ratings do not exist for many hoses.

Conductive & Antistatic Hose

Static electricity is generated by the flow of material (even some liquids) through a hose. As the material flows, molecules collide and generate friction, which creates minute amounts of electrical charge (excess electrons). The charge accumulates potential energy at the delivery end the hose (coupling/nozzle). The amount of charge increases with material volume and linear velocity, coarseness of the material, and length of the hose. If not properly grounded, the acumulated charge (potential energy) will seek its own ground. The charge will be attracted to external materials in proximity (such as a steel storage container); if not properly grounded, the electrons may arc (jump) to the external material, igniting volatile materials in the hose, or in proximity to the hose. Electrically conductive wires and conductive rubber components are used in hose to prevent static electricity build-up and discharge as a spark. It is essential that the user determine the need for static bonded hose based on (a) the intended use of the hose, (b) instructions from the company's safety division, (c) the insurer, and (d) the laws of the localities and states in which the hose will be used. Some types of hose include a helical or static wire(s). This wire can be used for electrical continuity provided that proper contact is made and maintained between it and the hose couplings.

Nonconductive Hose

Nonconductive hose constructions are those that resist the flow of electrical current. In some specific applications, especially around high voltage electrical lines, it is imperative for safety that the hose be nonconductive. Unless the hose is designed particularly to be nonconductive and is so branded, do not conclude that it is nonconductive. Many black rubber compounds are inherently and inadvertently conductive. Nonconductive hose is usually made to a qualifying standard that requires it to be tested to verify the desired electrical properties. The hose is frequently (but not necessarily) non-black in colour and clearly branded to indicate it is designed for nonconductive applications.

WARNING!
Unless a hose is described as, or specifically and clearly branded to be conducting or nonconducting, assume that the electrical properties are uncontrolled.

Properties of Basic Rubber Compounds

This table provides some information on the general properties of the most common rubber compounds. Most compounds used in the manufacture of rubber hose are made of different basic rubbers,each contributing to the physical properties of the finished product.

ASTM D 1418	Chemical Name	Properties
CR	**Chloroprene**	Excellent weathering and ozone resistance, flame retarding, abrasion resistance. Good resistance to compressed air and to oil.
CSM	**Chloro-sulfonyl-polyethylene**	Excellent resistance to ozone, weathering and acid, particularly of the coloured compounds. Resistant to petroleum based fluids.
EPDM	**Terpolymer of ethylene-propylene-diene**	Good resistance to heat, ageing and abrasion. Poor resistance to petroleum based fluids.
EPM	**Copolymers of ethylene and propylene**	Excellent resistance to heat, ageing, abrasion and ozone. Good resistance to many chemicals. Poor resistance to aromatics.
FKM	**Fluorine rubber**	Excellent resistance to a wide range of chemicals and to heat. Poor physical properties.
IIR	**Isobutene-isoprene**	Good resistance to chemicals, such as alcohols, ketones and esters.
NBR	**Acrylonitrile-butadiene**	Excellent oil resistance good aromatics and solvents resistance.
NR	**Natural rubber**	Good physical properties including abrasion and low temperature resistance. Poor resistance to petroleum based fluids.
SBR	**Styrene-butadiene**	Good physical properties with resistance to heat and abrasion. Poor resistance to petroleum based fluids.
NBR/PVC	**Acrylonitrile-butadiene-vynil-chloride**	Good resistance to oil and aromatics. Recommended as hose cover, when a good weathering, ozone and abrasion resistance is required.
UHMWPE	**Ultra high molecular weight polyethylene**	Excellent abrasion resistance and very low coeffi-cient of friction. Excellent resistance to chemicals, oil and aromatic fuels. Biologically inert and suitable for foodstuffs delivery.
PTFE	**Polytetrafluoroethylene**	Excellent resistant against the majority of chemicals, also at high concentration. Superior resistance to heat. Very low friction. Great mechanical properties.
Silicone (VMQ)	**Polysiloxane**	Outstanding Heat and cold resistance. Resistance to oils, solvents and other chemicals. Electrical insulation.

Chemical Resistance Table

The following table is essentially based upon the most updated technical data available, on information from raw material suppliers, as well as some International Standards, e.g. ISO TR 7620, EN 12115, and other publications.
Due to the big variety and amount of different chemical products, the given ratings are only partly based on our own tests. Consequently, the chart is given as a guidance only, and it cannot be assumed as a guarantee, expressed or implied, for the suitability of a product for a specific application. This is due to the widespread range of parameters which are not under our direct control like temperature (internal and external) pressure (constant or peaks) frequency of service and working environment.
For the same reasons, it is impossible to give scientifically based indications concerning service life of hoses, and to determine a generally valid replacement date. This can be verified for instance with periodical hydrostatic tests and a visual check. When in doubt please contact our technical service.
Ratings are based on room temperature.
Parker will cooperate by supplying sampling for tests, and carrying out tests with special chemical products.

WARNING
The service life of rubber hoses is not endless. Consequently the user must periodically check the suitability of a rubber hose for the intended application, particularly in the presence of dangerous or polluting chemical products or when using the hose at elevated pressures and/or temperatures.
Continuous use at the highest allowed pressures and temperatures dramatically reduces the service life of a rubber hose.
After use hose must be emptied out and washed down.
Many chemical products can cause severe injuries to people or damage to property, or risks of environmental pollution if the hose leaks or bursts.

Trade Name	Description	ASTM Codes
Butyl	Isobutylene-Isoprene	IIR
CPE	Chlorinated Polyethylene	CM
EPDM	Ethylene-Propylene-Diene	EPDM
Hypalon	Chlorosulfonated Polyethylene	CSM
Hytrel	Thermoplastic Polyester	TPC-ET
Natural	Natural Rubber	NR
Neoprene	Polychloropren	CR
Nitrile	Acrylonitrile	NBR
Nylon	Nylon Polymer	-
SBR	Styrene-Butadiene	SBR
Teflon	Fluorocarbon Resin	PTFE
UHMW	Ultra-High Molecular Weight Polyethylene	-
Viton	Floroelastomer	FKM
XLPE	Cross-Linked Polyethylene	XPE

* compounds not in catalogue. Ask Parker for right solution

KEY
E = Excellent
G = Good
C = Conditional
X = Unsatisfactory

Chemical or Material Conveyed	Butyl	CPE	EPDM	CSM	TPC-ET	Natural	Neoprene	Nitrile	Nylon	SBR	TPV	PTFE	UHMW
1 UNDECANOL	E			E		E		E				E	
1,4-DIOXANE	G		G	X		X	X	X	E	X		E	
1-AMINO-2-PROPANOL	E			C		G		G				E	
1-AMINOBUTANE	X		C	C		X	X	C		X		E	
1-AMINOPENTANE	G		X	G		G	X	C				E	
1-BROMO-2 METHYL PROPANE	X			X		X	X	X				E	
1-BROMO-3 METHYL BUTANE	X		X	X		X	X	X				E	
1-BROMOBUTANE	X			X		X		X				E	
1-CHLORO-2-METHYL PROPANE	X			X		X		X				E	
1-CHLORO-3-METHYL BUTANE	C		X	X		X	X	X	E			E	
1-DECANOL	C			E		C	X	E				E	
1-HENDACONAL		E											
2 (2AMINOETHYLAMINO) ETHANOL	E			G		G		G					
2 (2ETHOXYETHOXY) ETHANOL	E		G	G		C	C	G	E	G		E	
2 (2ETHOXYETHOXY) ETHYL ACETATE	G		X	G		X	X	C		X		E	
2,4-DI-SEC-PENTYLPHENOL		E											
2-AMINOETHANOL	E		G	G		G	G	G				E	
2-CHLORO-1-HYDROXY-BENZENE		C											
2-CHLOROPHENOL	G	G	X	C	X	X	X	X	X	X	X	E	
2-CHLOROPROPANE	X		X	X		X	X	X	X	X		E	
2-ETHOXYETHANOL	G		G	C		C	C	G		X		E	
2-ETHOXYETHYL ACETATE	G	X	G	X	X	X	X	X	G	X		E	
2-ETHYL (BUTYRALDEHYDE)	G			X		X		X				E	
2-ETHYL-1-HEXANOL	E		E	E		E	E	E		E	E	E	
2-ETHYLHEXANOIC ACID	C			G		C		C				E	
2-ETHYLHEXYL ACETATE	E			E		X		X				E	
2-OCTANONE	G			X		X		X				E	
3-BROMOPROPENE	X			X		X	X	X				E	
3-CHLORO-2-METHYL PROPANE		G											
3-CHLOROPROPENE	C		X	X		X	X	G		E		E	
4-HYDROXY-4-METHYL-2-PENTANONE	E		E	C	C	C	C	X	G	C		E	
ACETALDEHYDE	E		E	C	G		X	X	E	X	E	E	G
ACETAMIDE			E				G						E
ACETIC ACID, GLACIAL	G	E	G	C	E	X	X	G	X	C	G	E	E
ACETIC ACID 10 %	E	E	E	E	X	B	B	X	E	F	B	E	E
ACETIC ACID 30 %			E				G						E
ACETIC ACID 50 %	E	E	E	E	C	X	C	C	C	X		G	E
ACETIC ANHYDRIDE	G	E	G	E	C	C	G	X	X	X	G	E	G
ACETIC OXIDE	G		B	E		X					B	E	
ACETONE	E	G	E	X	C	C	X	X	E	C	E	E	E
ACETONE CYANOHYDRIN	E			C		C	B	X			E	E	G
ACETONITRILE	E		E	G		B	E	C			E	E	
ACETOPHENONE	G		E	X		X	X	X		X	E	F	X
ACETYL ACETONE	E	G	E	X		X	X	X		X	E	E	E
ACETYL CHLORIDE	X	E	C		X		X	X	X	X	C	E	G
ACETYL OXIDE	E		G	X		C		X			G	E	E
ACETYLENE	E	G	E	C	G	G	E	E	E	C	E	E	E
ACETYLENE DICHLORIDE	C		C	X		X	X	X				E	
ACETYLENE TETRACHLORIDE	X		X	X		X	X	X				E	
ACROLEIN	E		E	G		G	C	C		C		E	X
ACRYLIC ACID		E											
ACRYLONITRILE	X	E	X	C		C			E	C		E	C
ADIPIC ACID			E			E	E	E				E	
AIR +149 °C (+300 °F)	G		G	G		X	G	G		X	E		X
ALK-TRI	X			X		X		X				E	
ALLYL ALCOHOL	E		E	E		E	E	E				E	E
ALLYL BROMIDE	X			X		X						E	G
ALLYL CHLORIDE		G		X		X		G		G		E	G
ALUM	E	E	E	E		E	E	E	G			E	E
ALUMINUM ACETATE (AQ)	G	E	E			E	G	G		X		E	E
ALUMINUM CHLORIDE (AQ) 40 %	G	C				E	E	G	X				E
ALUMINUM FLUORIDE	E		E	E		E	E	E	G	E		E	E
ALUMINUM FORMATE	G			X		X						E	E
ALUMINUM HYDROXIDE	E		E	G		E	E	E	G	G		E	E
ALUMINUM NITRATE (AQ)	E	E	E	E		E	E	E		E		E	E
ALUMINIUM PHOSPATE			E				E						B

E = excellent; G = good; C = conditional; X = unsatisfactory

* compounds not in catalogue. Ask Parker for right solution

Chemical Resistance Table

Chemical or Material Conveyed	Butyl	CPE	EPDM	CSM	TPC-ET	Natural	Neoprene	Nitrile	Nylon	SBR	TPV	PTFE	UHMW
ALUMINUM SULFATE (AQ)	E	E	E	E	G	E	E	E	E	G	E	E	E
ALUMS-NH3-CR-K	E		E	E		E	E	E	C	E		E	E
AMINES – MIXED	G		G	X	G	G		X		G			
AMINO XYLENE	G		C										
AMINOBENZENE		G							C				
AMINODIMETHYLBENZENE	G	C										E	
AMINOETHANE	G		E	C		C	X	X		C		E	
AMMONIA LIQUID			E				E						G
AMMONIUM ANHYDROUS			E				E						G
AMMONIUM CARBONATE (AQ)	E		E	G		E	E	G	G	E		E	
AMMONIUM CHLORIDE (AQ)	E	G	E	G	E	E	E	G		E	E	E	E
AMMONIUM HYDROXIDE	E	E	E	E								E	E
AMMONIUM NITRATE (AQ)	E	G	E	E	G	E	E	E	G	E		E	E
AMMONIUM PHOSPHATE, DIBASIC	E	E	E	E		E	E	E	E	E		E	E
AMMONIUM SULPHATE (AQ)	E	E	E	E	G	E	E	E	G	G		E	E
AMMONIUM SULPHITE	E		E	E		E	E	E		E		E	
AMMONIUM THIOSULPHATE	E		E	E		E	E	E				E	
AMYL ACETATE	G		E	X	C	X	X	X	G	X	X	E	E
AMYL ACETONE	G			X		X						E	
AMYL ALCOHOL	E	E	E	E	E	E	E	G	E	E	E	E	E
AMYL AMINE	G			C		C		C				E	
AMYL BROMIDE												E	
AMYL CHLORIDE	X	C	X	X		X	X		E	X		E	E
AMYL ETHER				C				C				E	
ANETHOL	X	X		X		X			G			E	G
ANILINE	E	G	G	X	X	X	X	X	C	X		E	E
ANILINE DYES	G		G	G		G	C	X	X	G		E	E
ANILINE OIL	G	G	C									E	
ANIMAL FATS	C		E	C	G		G	E	E	X	E	E	E
ANTIMONY CHLORIDES	E		E	G			X	G				E	
AQUA REGIA	X		G	X		X	X	X		X		E	X
ARGON	G		E	X	E	X	X	E	E	X		E	E
AROMATIC HYDROCARBONS													C
ARSENIC ACID	E	E	E	E		G	E	E	G	E		G	E
ASPHALT	X		X	X	C	X	X	X	E	X	E	E	X
ASTM FUEL A	X	E	X	G	E	X	G	E	E	X	X	E	G
ASTM FUEL B	X	G	X	X	E	X	X	X	E	X	X	E	G
ASTM FUEL C	X	C	X	X	E	X	X		E	X	X	E	G
ASTM OIL NO. 2	X	E	X	X	E	X	G	E	E	X	X	E	E
ASTM OIL NO. 3	X		X	G	E	X	C	E	E	X	X	E	E
ASTM OIL NO. 4	X		X	X		X	X	G		X			E
ASTM OIL NO. 1	X	E	X	G	E	X	E	E	E	X	X	E	E
AUTOMATIC TRANSMISSION FLUID	X		X	C	E	X	G	E	G	X	X	E	E
BANANA OIL			G	C				X		X		E	E
BARIUM CHLORIDE (AQ)	E	G	E	E	G	E	E	E	G	E		E	E
BARIUM HYDROXIDE (AQ)	E	G	E	E	G	E	E	E	G	E		E	E
BARIUM SULFIDE (AQ)	E		E	E		E	E	E		G		E	E
BEER	E		E	E		E	G	E		E		E	E
BEET SUGAR LIQUORS	E	G	E	E	G	E	G	E	E	E		E	E
BENZAL CHLORIDE	G											E	E
BENZALDEHYDE	G		E	X	G	X	X	X	E	X	X	E	E
BENZENE	X	C	X	X	C	X	X	X	G	X	X	E	G
BENZENE CARBOXYLIC ACID	E			X			E	X				E	
BENZINE	X		X	X		X	C	C	G	X		E	
BENZOIC ACID	X					X	E	X	E	X		E	E
BENZOL		C	X		C			X	G			E	G
BENZOTRICHLORIDE												E	G
BENZYL ACETATE	E			G		X						E	E
BENZYL ALCOHOL	G		G	G	C	X	X	X	C	X	X	E	E
BENZYL CHLORIDE	X	X	X	X		X	X	X		X		E	E
BENZYL ETHER	G		C	X		X	X	X		X		E	
BIS (2-CLOROETHYL) ETHER	X			X		X		X		X		E	
BLACK SULFATE LIQUOR	G	C	G	G	G	G	G	G	C	G		E	E
BLEACH (2 – 15 %)	G		E	E	G	X	X	X	C	X		E	E
BORAX SOLUTION	E	G	E	E	E	G	E	G	G	G		E	E
BORIC ACID	E		E	E	E	E	E	E	G	E	E	E	E

E = excellent; G = good; C = conditional; X = unsatisfactory

* compounds not in catalogue. Ask Parker for right solution

Chemical or Material Conveyed	Butyl	CPE	EPDM	CSM	TPC-ET	Natural	Neoprene	Nitrile	Nylon	SBR	TPV	PTFE	UHMW
BRAKE FLUID (HD-557) 12 DAYS	G	E	E	G			G	C	E	E		E	
BRINE	E	G	E	E	G	E	G	E	G			E	E
BROMACIL			E										
BROMOBENZENE	X	X	X	X		X	X	X		X		E	C
BROMOCHLOROMETHANE	X	X	G	X		X	X	X				E	
BROMOETHANE	X		X	X		C	X	G		X		E	
BROMOTOLUENE	X	X		X		X				X		E	
BUGDIOXANE													
BUNKER OIL	X		X	X		X	X	E		X		E	E
BUTADIENE	X		X	X		X	X	X		X		E	E
BUTANE	X		X	X	E	X	C	E	E	X		E	E
BUTANOIC ACID			G	C								E	
BUTANOL (BUTYL ALCOHOL)	G	G	G	E	G	E	E	E	G	E	G	E	E
BUTANONE	E	G	E	X	E			X	G		X	G	E
BUTOXYETHANOL	E		E	X		X	X	C				E	
BUTYL ACETATE	X	C	X	X	C	X	X	X	G	X		X	E
BUTYL ACRYLATE	X		X	X		X	X	X				E	G
BUTYL ALCOHOL	G	G	G	E	G	E	E	E	G	E	G	E	E
BUTYL ALDEHYDE	G		G	C			C				G	E	E
BUTYL BENZYL PHTHALATE	E			X		X				X		E	E
BUTYL CARBITOL	E		E	X		X	C	X		X		E	E
BUTYL CELLOSOLVE	E		G	X		X	X	C		X	E	E	E
BUTYL CHLORIDE	C			X		X						E	C
BUTYL ETHER	X		X	X		X	X	X		X		E	E
BUTYL ETHER ACETALDEHYDE	G			X		X			X			E	E
BUTYL ETHYL ETHER	X			X		X		G				E	E
BUTYL OLEATE	G		G	X		X	X	X		X		E	
BUTYL PHTHALATE	G		E	X		X				X		E	
BUTYL STEARATE	X		X	X		X	X	G		X		E	E
BUTYLENE	X		X	X	G	X	C	E	G	X		E	
BUTYRALDEHYDE	G		C			X	X	X		X			E
BUTYRIC ACID	G		G	C		X	X	X		X		E	E
BUTYRIC ANHYDRIDE	C			G		C		C				E	
CADMIUM ACETATE	E			E		X						E	E
CALCIUM ACETATE	E			C		E	G	G		X		E	E
CALCIUM ALUMINATE	E			E		E		E				E	
CALCIUM BICHROMATE	E			C								E	
CALCIUM BISULFIDE			X		G		C	E	G	G		E	
CALCIUM CHLORATE			E				E						E
CALCIUM CHLORIDE	E	G	E	E	E	E	E	E	E	E		E	E
CALCIUM HYDROXIDE	E	G	E	G	E	E	E	E	E	E		E	E
CALCIUM HYPOCHLORITE	E	G	E	E	C	X	C	X	X	X		E	C
CALCIUM NITRATE	E		E	E		E	E	E	E	E		E	E
CALCIUM SULFIDE	E	X	E	E		X	E	E	E	X		E	E
CAPRILIC ACID	C			G		C		C				E	E
CARBAMIDE	G			E		E	G	G				E	
CARBITOL	E		G	G		X	C	G	E	G		E	E
CARBOLIC ACID (PHENOL)	G	G	X	X		X	X	X	X	X	X	E	E
CARBON DIOXIDE	G		G	G		G	G	E	E	G		E	E
CARBON DISULFIDE	X		X	X		X	X	X	X	X		E	E
CARBON MONOXIDE	E	G	E	E	E	C	E	E	E	G	E	E	E
CARBON TETRACHLORIDE	X	C	X	X	X	X	X	C	X	X	X	E	G
CARBON TETRAFLUORIDE			G										B
CARBONIC ACID	E	X	E	E	X	E	G	G	G	G	X	E	
CASTOR OIL	G	G	G	E	C	E	E	E	G	E	C	E	E
CAUSTIC SODA (SEE SODIUM HYDROXIDE)	E		E		C		E		G		E	E	
CELLOSOLVE ACETATE	G		G	X		X	X	X	G	X		E	E
CELLUGUARD	E		E	X		E	E	E	G	E		E	
CELLULOSE ACETATE							X						B
CETYLIC ACID	G	G	G	C	E	E	G	E	C	B	E	E	
CHINA WOOD OIL (TUNG OIL)	X	C	X	E	G	X	E	E	G	X		E	
CHLORDANE	X		X	C	C	X	C	G	G	X			
CHLORINATED SOLVENTS	X	X	X	X		X	X	X	X	X		E	
CHLORINE GAS (DRY)							C						C
CHLORINE WATER SOLUTION (MAX. 3 %) + G108													E
CHLORO-2-PROPANONE	X		E	X		X	C	X		X		E	

E = excellent; G = good; C = conditional; X = unsatisfactory

* compounds not in catalogue. Ask Parker for right solution

Chemical Resistance Table

Chemical or Material Conveyed	Butyl	CPE	EPDM	CSM	TPC-ET	Natural	Neoprene	Nitrile	Nylon	SBR	TPV	PTFE	UHMW
CHLOROACETIC ACID	G		G	G	X	X	X	X	X	X	X	E	E
CHLOROACETONE	X		E	X		X	C	X		X		E	E
CHLOROBENZENE, MONO, DI, TRI	X		X	X	X	X	X	X	E	X	X	E	G
CHLOROBUTANE	C			X		X		X				E	G
CHLOROETHYLBENZENE	X	X	X	X		X				X		E	E
CHLOROFORM	X	X	X	X	X	X	X	X	X	X	X	E	E
CHLOROPENTANE	C			X		X				X		E	E
CHLOROPHENOL													B
CHLOROSULFONIC ACID	X	X	X	X	X	X	X	X	X	X	X	E	X
CHLOROTOLUENE	X		X	X		X	X	X		X		E	G
CHLOROX	G		G	G		X	G	G		X		E	G
CHROME PLATING SOLUTIONS	X		X	X		X	X	X		X		E	
CHROMIC ACID	G	X	X	X	X	X	X	X	X	X	X	E	
CHROMIUM TRIOXIDE	G	X	X	X	X	X	X	X	X	X	X	E	
CINNAMENE	X		X	X	X	X	X	X		X		E	
CIS-9-OCTADECENOIC ACID	X	X	C	G	E	X	C	E	E	X		E	
CITRIC ACID	E	X	E	E	G	E	E	E	G	E	E	E	E
COAL OIL	X		X	C		X	G	E	E		X	E	E
COAL TAR	X		X	X	X	X	C	G		X	X	E	E
COAL TAR NAPHTHA	X		X	X		X		X		X		E	
COCONUT OIL	G		G	C		X	C	E		X		E	E
COKE OVEN GAS	X		X	X		X	X	X	E	X		C	
COOLANOL (MONSANTO)	X		X	G	X	X	G	E		X			
COPPER CHLORIDE	E	X	E	G	E	G	G	E	C	E		E	E
COPPER CYANIDE	E		E	G		E	E	E	G	E		E	E
COPPER HYDRATE	E			G		C		G				E	E
COPPER HYDROXIDE	E			G		C		G		G		E	
COPPER NITRATE			E				E						E
COPPER SULFATE	E	X	E	E	E	G	E	E	G	G		E	E
CORN OIL	G		X	G	E	X	C	E	G	X	E	E	E
COTTONSEED OIL	C	G	C	G	E	X	C	G	E	X		E	E
CREOSOTE	X		X	X		X	X	G	X	X		E	E
CRESOLS	X		X	X	X	X	X	X	X	X	X	E	E
CRESYLIC ACID	X		X	X		X	X	X		X		E	E
CROTONALDEHYDE	E		E	X		X	X	X		C		E	E
CRUDE OIL			X				X	G	E	X		E	E
CUMENE	X		X	X		X	X	X		X		E	E
CUPRIC CARBONATE	E			E		C	E	E				E	E
CUPRIC HYDROXIDE	E			G		C		G				E	
CUPRIC NITRATE	E		E	E		G	E	E				E	E
CUPRIC SULFATE	E		E	E		G	E	E		E		E	E
CUTTING OIL	X		X	G		X	G	E		X		E	
CYCLOHEXANE	X		X	X	E	X	X	G	G	X	X	E	E
CYCLOHEXANOL	X		X	B		X	G	G	G	X	X	E	E
CYCLOHEXANONE	X		C	X		X	X	X	G	X	X	E	E
CYCLOPENTANE	X		X	X		X	E	G				E	E
CYCLOPENTANOL	X			X		X		G		X			E
CYCLOPENTANONE	X			X		X		X				E	
CYCLOPENTYL ALCOHOL	X			X		X		G		X			E
DDT IN DEIONIZED KEROSENE	X		X	X		X	C	E	E	X		E	
DECAHYDRONAPTHALENE	X		X	X		X	X	X	G	X	X	E	
DECAHYDROXYNAPTHALENE		C											
DECALIN	X		X	X		X	X	X	G	X	X	E	X
DECYL ALCOHOL	X			E		X	X	E				E	E
DECYL ALDEHYDE	C			X		X						E	E
DECYL BUTYL PHTHALATE	E			X		X		X				E	E
DECYL CARBINOL	E			E		E		E				E	
"DETERGENT, WATER SOLUTION"	E		E		G		G	E		G		E	E
DEVELOPING FLUID (PHOTO)	G		G	E	X	E	E	E		G		E	
DEXTRON	X		X	X		X	G	E		X			
DI(2ETHYLHEXYL) ADIPATE	E		G	X		X	X	X				E	
DI(2ETHYLHEXYL) PHTHALATE	G		G	X	E	X	X	X	E	X		E	
DIACETONE ALCOHOL	E		E	X	C	X	X	X		X		E	E
DIACETYLMETHANE	E	G	E	X		X	X	X		X	E	E	
DIALLYLPHTHALATE		G											
DIAMMONIUM PHOSPHATE	E	E	E	E		E	E	E		E		E	

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Chemical or Material Conveyed	Butyl	CPE	EPDM	CSM	TPC-ET	Natural	Neoprene	Nitrile	Nylon	SBR	TPV	PTFE	UHMW
DIAMYL NAPTHALENE	E			X		X						E	
DIAMYL PHENOL	X			X		X		X		X		E	
DIAMYLAMINE	E		E	C		G		G		X		E	
DIAMYLENE	X			X		X	X	C	G			E	
DIBENZYL ETHER	G		C	X		X	X	X		X		E	E
DIBROMOBENZENE	X			X		X						E	G
DIBROMOMETHANE	X		C	X		X	X	X			X	E	
DIBUTYL ETHER	X		X	X		X	X	X		X		E	E
DIBUTYL PHTHALATE	C		E	X	G	X	X	X	E	X		E	E
DIBUTYL SEBACATE	G		G	X	G	X	X	X		X		E	E
DIBUTYLAMINE	X		X	X		X	X	X		X		E	E
DICALCIUM PHOSPHATE	E			E		E		E				E	
DICHLORO DIFLUORO METHANE	X	C	C	E	E	X	G	C	G	E	X	E	
DICHLORO ETHYLENE	C		X	X	X		X		C		X	E	
DICHLOROACETIC ACID	C			X		G						E	E
DICHLOROBUTANE	X		C	X		X	X	G		X		E	E
DICHLOROETHANE	C	X	X	X	X	X	X	X	C	X	X	E	
DICHLOROETHYL ETHER	X			X		X		X		X		E	
DICHLOROFLUOROMETHANE													E
DICHLOROHEXANE	X			X		X						E	E
DICHLOROMETHANE	X		C	X	X	X	G	X	C	X	X	E	E
DICHLOROPENTANE	X			X		X	X	X		X		E	E
DICHLOROPROPANE	X			X		X	X	X				E	E
DICHLOROPROPENE												E	E
DICHLOROTOLUENE		X											
DIESEL OIL	X	E	X	C	G	X	C	E	E	X	X	E	E
DIETHANOLAMINE	E		E	C	X	G			G	X		E	E
DIETHYL ETHER	X		X	X	C	X	X	X	E	X	E	E	
DIETHYL KETONE	G		E	X		X	X					E	
DIETHYL OXALATE	X		X	X		X	X	X				E	
DIETHYL PHTHALATE	E			X		X						E	E
DIETHYL SEBACATE	G		G	C	E	X	X	X		X	E	E	
DIETHYL SULFATE	G		E	X		X	E	X		E		E	
DIETHYL TRIAMINE	E			C		G		G				E	
DIETHYLAMINE	G		G	C		G	G	C		G		E	E
DIETHYLBENZENE	X		X	X		X	X	X		X		E	E
DIETHYLENE GLYCOL	E		E	E	E	E	E	E		E		E	E
DIETHYLENE OXIDE	X		E									E	
DIETHYLENE TRIAMINE	E		E	C		G				X	E	E	E
DIHYDROXY DIETHYL ETHER	E		E	E		E	E	E				E	
DIHYDROXY SUCCINIC ACID	G		G	E		E	C	G				E	
DIISOBUTYL KETONE	G		E	X		X	X	X		X		E	E
DIISOBUTYLENE	X		X	X		X	C	E		X		E	
DIISODECTYL PHTHALATE	E		E	X		X				X		E	E
DIISODECYL PHTHALATE	E		E	X		X	X	X				E	
DIISOOCTYL ADIPATE	E			X		X		X		X		E	E
DIISOOCTYL PHTHALATE	E		G	X		X						E	E
DIISOPROPANOLAMINE	E			C		G		G				E	
DIISOPROPYL ETHER	X		X	C		X	X	G		X		E	
DIISOPROPYL KETONE	E		E	X		X	X	X		X		E	
DIMETHYL PHTHALATE	G		G	X	E	X	X	X		X	G	E	E
DIMETHYL SULFATE	G			X				X				E	E
DIMETHYL SULFIDE	C					X		X				E	
DIMETHYLAMINE	G		X	X			X	X				E	E
DIMETHYLANILINE	X	C	G	X			X	X		X		E	G
DIMETHYLBENZENE	X	C	X	X	X		X	X	G	X	X	X	E
DIMETHYLBUTANE		G											
DIMETHYLCARBINOL	E		G	E		E	E	G				E	E
DIMETHYLFORMAMIDE			G										E
DIMETHYLKETONE	E	G	E	X	C		X	X	E	C	E	E	E
DIOCTYL ADIPATE	E		G	X		X	X	X				E	E
DIOCTYL PHTHALATE	G		G	X	E	X	X	X	E	X		E	E
DIOXALANES	X		G	X		X	X	X		X		E	E
DIOXANE	G		G	X		X	X	X	E	X		E	E
DIPENTENE	X		X	X		X	X	G		X		E	
DIPENTYLAMINE	E		E	C		G		G		X		E	

E = excellent; G = good; C = conditional; X = unsatisfactory

* compounds not in catalogue. Ask Parker for right solution

Chemical Resistance Table

Chemical or Material Conveyed	Butyl	CPE	EPDM	CSM	TPC-ET	Natural	Neoprene	Nitrile	Nylon	SBR	TPV	PTFE	UHMW
DI-P-MENTHA-1,8-DIENE	X		X	X		X	X	G		X		E	
DIPROPYLAMINE	E			C		G		G				E	
DIPROPYLENE GLYCOL	E			E		E		E				E	
DISODIUM PHOSPHATE	E		E	E		E		E				E	E
DIVINYL BENZENE	X			X		X				X		E	E
DOWELL INHIBITOR		G											
DOWFAX 2A1 SOLVENT		E											
DOWFAX 2A1 TA		E											
DOWFAX 6A1 SOLVENT		G											
DOWFAX 6A1 TA		E											
"DOWTHERM, A AND E"	X	X	X	X	G	X	X	X	X	X		C	E
DRY CLEANING FLUIDS	X		X	X			X	C		X		E	
DUCGKIRIOEBAANE	X												
DURO AW16, 31			X					E	E			E	
DURO FR-HD			X					E	E			E	
EHTYL BUTYL ACETATE	E			G		X		X				E	E
EHTYL DICHLORIDE	C		C	X		X	X	X		X		E	
EHTYLENE DIBROMIDE	X		C	X		X	X	X		X		E	G
EPICHLOROHYDRIN			C										B
ETHANOIC ACID	G	E	E	C	C	X	G	C	C	G	C	E	
ETHANOL (GRAIN ALCOHOL)	E	G	E	E	E	E	E	E	X	E	E	E	E
ETHANOLAMINE	G		G	X		G	G	G		X		E	E
ETHERS	X	G	C	X	X	X	X	X	E	X		E	
ETHYL ACETATE	G	G	E	X	C	X	X	X	E	X	E	E	E
ETHYL ACETOACETATE	G		G	X		C	X	X		C		E	E
ETHYL ACETONE	G		G	X		X	X	X		X		E	
ETHYL ACRYLATE	G		G	X		X	X	X		X		E	E
ETHYL ALCOHOL	E	G	E	E	E	E	E	E	X	E	E	E	E
ETHYL ALDEHYDE	G		E	C		X	X	X				E	E
ETHYL ALUMINUM DICHLORIDE	X			X		X		X				E	
ETHYL BENZENE	X		X	X		X	X	X		X		E	E
ETHYL BROMIDE	X		X	X		C	X	G		X		E	
ETHYL BUTANOL	E			E		E		E				E	E
ETHYL BUTYL KETONE	G			X		X		X				E	
ETHYL CELLULOSE	G		G	G	G	G	G	G	C	G		E	E
ETHYL CHLORIDE	E	X	E	C	X	C	X	E	E	G	X	E	G
ETHYL DIISOBUTYLTHIO-CARBAMATE						E				E			E
ETHYL ETHER	X	G	X	X		X	X	X	E	X		E	E
ETHYL FORMATE	G		G	G		X	G	X		X		E	E
ETHYL IODIDE	C		C	X		X	X	X				E	G
ETHYL OXALATE	X		C	X		C	X	X		X		E	E
ETHYL PHTHALATE	E			X		X		X				E	E
ETHYL SILICATE	E		E	G		G	E	E		G		E	E
ETHYLAMINE	G		E	C		C	X	X		C		E	E
ETHYLENE													E
ETHYLENE BROMIDE			C										B
ETHYLENE CHLORIDE													G
ETHYLENE CHLOROHYDRIN	G		G	C		C	G	X				E	E
ETHYLENE DIAMINE	E		E	G		G	E	G		G		E	E
ETHYLENE DIBROMIDE													B
ETHYLENE DICHLORIDE	C	X	X	C	X	X	X	X	C	X	X	E	G
ETHYLENE G MONOETHYL E ACETATE	E		E	X		C	X	C				E	
ETHYLENE G. MONOBUTYL ETHER	E		E	C		X	C	C		X		E	
ETHYLENE G. MONOHEXYL ETHER													
ETHYLENE G. MONOMETHYL ETHER	E		G	G		X	E	C				E	
ETHYLENE GLYCOL	E	G	E	E	E	E	E	E	E	E	E	E	E
ETHYLENE OXIDE	X	X	C	X	E	X	X	X	G	X		E	
FATTY ACIDS	X		X	C	G	X	G	E	E	X	X	E	E
FERRIC BROMIDE	E			E		E		E				E	E
FERRIC CHLORIDE	E	X	E	E	G	E	E	E	C	E		E	E
FERRIC NITRATE	E		E	E		E	E	E	E	E		E	E
FERRIC SULFATE	E	X	E	E	E	E	E	E	E	E		E	E
FERROUS ACETATE	E			E		X		X				E	
FERROUS CHLORIDE	G		E	G	E	E	G	E	E			E	E
FERROUS SULFATE	E		E	E	E	E	E	E	E	E		E	E
FLOUROSILIC ACID	E		E	E		E	E	E		G	C	E	C

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Chemical or Material Conveyed	Butyl	CPE	EPDM	CSM	TPC-ET	Natural	Neoprene	Nitrile	Nylon	SBR	TPV	PTFE	UHMW
FLUOBORIC ACID	G		E	E		E	E	E		E		E	C
FLUORINE	X		E	X	X	X	X	X	X			G	X
FORMALDEHYDE	E	G	E	G	C		G	C	E	C	E	E	E
FORMALIN	E	G	E	G	C		G	C	E	C	E	E	
FORMIC ACID	E	X	E	E	C	C	E	C	X	E	E	E	E
FREON 113	X		X	E	E	X	E	E	X	G	X	E	
FREON 12	C	C	C	E	E	C	E	E	G	E	X	E	
FREON 22	X	C	E	E	X	C	E	X	G	E	X	E	
FREON 502	E		E			E	E	G	E	E			
FUEL A (ASTM)	X	E	X	G	E	X	G	E	E	X	X	E	G
FUEL B (ASTM)	X	G	X	X	E	X	X	X	E	X	X	E	G
FUEL C (ASTM)			X				C						G
FUEL OIL	X	E	X	C	G	X	G	E	G	X		E	E
FURALDEHYDE	E	E	G	C	G	X	C	X	C	X	E	E	
FURAN	X		X	X		X	X	X		X		E	
FURFURAL	E	E	G	C	G	X	C	X	C	X	E	E	E
FURFURAN	X		X	X		X	X	X		X		E	
FURFURYL ALCOHOL	G		G	X	G	X	X	X	G	X	E	E	E
GALLIC ACID	G		G	G	X	E	G	G	G	G		E	E
GALLOTANNIC ACID	G		E	E		E	E	E				E	
GAS, 100 OCTANE	X		X	X	E	X	C	E	G	X	X	E	C
GAS, COAL			E		G		E	X	E				
GASOLINE	X	E	X	X	E	X	X	E	G	X		E	G
GLACIAL ACRYLIC ACID													
GLUCONIC ACID	C			G		X		C				E	E
GLUCOSE	E		E	E	G	E	G	E	G	E		E	E
GLYCERINE	E	E	E	E	E	E	E	E	G	E	X	E	A
GLYCEROL	E	E	E	E	E	E	E	E	G	E	X	E	
GLYCOGENIC ACID	C			G		X		C				E	
GLYCOLS	E		E	E	C	E	E	E	G	E	G	E	E
GLYCONIC ACID	C			G		X		C				E	E
GLYCYL ALCOHOL	E	E	E	E	E	E	E	E	G	E	X	E	
GREASE, PETROLEUM BASE	X	E	X	X	E	X	C	E	E	X	X	E	E
GREEN SULFATE LIQUOR	E		E	G	X	G	G	G	X	G		E	E
HALON 1211							E	E					
HELIUM	E		E	E		E	E	E	E	E		E	
HEPTALDEHYDE	X			X		X		E				E	
HEPTANAL	X			X		X		E				E	E
HEPTANE	X	E	X	G	G	X	G	E	E	X		E	E
HEPTANE CARBOXYLIC ACID	C			G		X		C				E	
HEPTANOIC ACID		E											
HEPTANONE		C											
HEXADECANOIC ACID	G	G	G	C	E	E	G	E	C	B	E	E	
HEXALDEHYDE	G		E	C		X	E	X		X		E	E
HEXANE	X		X	E	E	X	E	E	E	X	E	E	G
HEXANOL	C		G	G		E	G	E		E		E	E
HEXENE	X		X	G		X	G	G		X		E	
HEXYL ALCOHOL	C		G	G		E	G	G		E		E	E
HEXYL METHYL KETONE	G			X		X		X				E	
HEXYLAMINE	G			C		C		C				E	
HEXYLENE GLYCOL	E		C	E		E	E	E				E	
HISTOWAX		E											
HYDRAULIC OIL, PETROLEUM		E	X	G	E	X	G	E	E		X	E	E
HYDRAULIC FLUID (PHOSPHATE ESTER BASE)			E				X						X
HYDRAULIC FLUID (POLYALKYLENE GLICOL BASE)			C				G						E
HYDRAZINE	E		E	G	X	X	G	G	X	G		E	
HYDROBROMIC ACID	E	X	E	E		E	X	X	X	X		E	G
HYDROCHLORIC ACID	E	X	C	C	C	C	C	C	C	X	E	E	E
HYDROCYANIC ACID	G	X	E	E	X	G	G	G	X	G	E	E	E
HYDROFLUORIC ACID	G	X	C	E	X	C	C	C	X	C	X	E	E
HYDROFLUOSILICIC ACID	E	X	E	E	G	E	G	G	X	G		E	G
HYDROGEN CHLORIDE ANHYDROUS		E											
HYDROGEN DIOXIDE (10 %)	C		G	G		G	X	C				E	
HYDROGEN GAS	E	C	E	E	E	G	E	E	E	G		E	E
HYDROGEN PEROXIDE 10 %	G		G	E	X	G	X	C	G	C		E	G
HYDROGEN PEROXIDE OVER 10 %	X	X	C	G	X	X	X	X	X	X		E	E

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Chemical Resistance Table

Chemical or Material Conveyed	Butyl	CPE	EPDM	CSM	TPC-ET	Natural	Neoprene	Nitrile	Nylon	SBR	TPV	PTFE	UHMW
HYDROGEN SULFIDE (WET)	E	X	E	E	E	X	E	C	X	X		E	E
HYDROXY BENZENE	G		C	C		X	X	X				E	
HYDROXYISOBUTYRONITRILE		E											
HYDROXYTOLUENE		E											
HYVAR XL			E										
IMINODI-2-PROPANOL		E											
IMINODIETHANOL		E											
IODINE	G		G	G		X	X	G	E	G		E	G
IODINE PENTAFLUORIDE	X		X	X		X	X	X		X		E	C
IODOFORM			X			X	X	E		X			
ISOBUTANAL		G											
ISOBUTANE							X						E
ISOBUTANOL (ISOBUTYL ALCOHOL)			E				E						E
ISOBUTYL ACETATE			C										B
ISOBUTYLAMINE	E			C		C		X				E	
ISOBUTYLBROMIDE	X			X		X		X				E	
ISOBUTYLCARBINOL	E		E	E		E	E	E				E	
ISOBUTYLENE													E
ISOCYANATES					G			G	G				E
ISOOCTANE	X	E	X	G	E	X	G	E	E	X	X	E	E
ISOPROPANOL			E				E						E
ISOPROPYL ACETATE	G		G	X	C	X	X	X	G	X		E	E
ISOPROPYL ALCOHOL	E		E	E	E	E	G	E	E	E		E	E
ISOPROPYL ETHER	X		X	C		X	X	G		X		E	E
JET FUELS	X		X	X		X	X	E	C	X	X	E	E
JP-4 OIL	X		X	X	E	X	X	E	C	X	X	E	
KEROSENE	X	G	X	X	E	X	C	E	E	X	X	E	E
KETONES	G	G	E	C	X	C	X	X	E	G	X	E	E
LACQUER SOLVENTS	X	C	X	X	C	X	X	X	E	X		E	G
LACTIC ACID – COLD	E	X	E	E	X	E	E	E	E	E		E	E
LACTIC ACID – HOT			X	C	C	X	X	X	X	X		E	
LARD	C		G	G	G	X	G	E	E	X	E	E	G
LAVENDER OIL	X		X	X		X	X	G		X		E	G
LEAD ACETATE	E		E	C		E	G	G		X		E	E
LEAD NITRATE	E		E	C		E	E	E		E		E	
LEAD SULFATE	E		E	E	G	E	G	E	G			E	E
LIME	E		E	E	G	E	E	E	G			E	
LIME BLEACH	E		E	G		E	G	E		E		E	
LIME SULFUR, WET	E		C	G		C	E	E				E	E
LIMONENE	X		X	X		X	X	X				E	
LINOLEIC ACID	X		X	X		X	C	G		X		E	
LINSEED OIL	G	G	C	G	G	X	E	E	E	X		E	E
LIQUID PETROLEUM GAS							C						E
LIQUID SOAP			E				E						B
LUBRICATING OILS, SAE	X	G	X	X	E	X	C	E	E	X	X	E	E
LYE SOLUTIONS	E	C	E	E	C	E	E	C	G	G	C	E	
M E X	G	C	E	X	C	X	X	X	E	X	X	E	E
MAGNESIUM ACETATE	E		E	E		X	X	X		X		E	
MAGNESIUM CARBONATE			E				E						G
MAGNESIUM CHLORIDE	E	G	E	E	G	E	E	E	E	E		E	E
MAGNESIUM HYDRATE	E		E	E		E	G	G				E	E
MAGNESIUM HYDROXIDE	E	G	E	E	C	E	E	E	E	G		E	E
MAGNESIUM SULFATE	E	G	E	E	G	G	E	E	E	G		E	E
MAGNESIUM SULFITE	E		E	E		G	E	E		G			
MALEIC ACID	X		E	X		X	X	C		X		E	E
MALEIC ANHYDRIDE	X		X	X		X	X	X		X		E	
MALIC ACID	X		X	G		E	G	E	E	G		E	E
MANGANESE SULFATE	G		E	E		G	E	E				E	E
MAPP			G				E	E		G			
MERCURY	E	G	E	E	E	E	E	E	E	E		E	E
MERCURY VAPORS	E		E	E		C	C	E		E		E	
MESITYL OXIDE	C		G	X		X	X	X		X		E	E
METHALLYL ALCOHOL	E			E		E		E				E	
METHALLYL CHLORIDE		C											
METHANE			X				G						E
METHANE CARBOXYLIC ACID							SEE ACETIC ACID						

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Chemical or Material Conveyed	Butyl	CPE	EPDM	CSM	TPC-ET	Natural	Neoprene	Nitrile	Nylon	SBR	TPV	PTFE	UHMW
METHANOIC ACID	E	X	E	E	C	C	E	C	X	E	E	E	
METHANOL (METHYL ALCOHOL)	E	G	E	E	E	E	E	E	G	E	E	E	E
METHANOL (WOOD ALCOHOL)	E	G	E	E	E	E	E	E	G	E	E	E	E
METHOXY ETHANOL		E											
METHOXYETHOXY ETHANOL		E											
METHYL 1-2, 4-PENTANEDIOL		E											
METHYL ACETATE	G		G	C	C	X	C	X	E	X		E	E
METHYL ACETOACETATE	G		G	X		X	X	X				E	
METHYL ACETONE	G		E	X		C	X	X				E	E
METHYL ACETYLENE PROPADIENE			G				E	E		G			
METHYL ACRYLATE			G										B
METHYL ACRYLATE STAB.			G										B
METHYL ALCOHOL	E	G	E	E	E	E	E	E	G	E	E	E	E
METHYL ALLYL ALCOHOL	E			E		E		E				E	
METHYL ALLYL CHLORIDE	F	C		X		X				X			
METHYL AMYL CARBINOL	E			E		E		E				E	
METHYL BENZENE	X	C	X	X	C	X	X	X	E	X	X	E	
METHYL BROMIDE	C		C	X	X	X	X	G	G	X	X	E	G
METHYL BUTANE	X		X	X			X	E				E	
METHYL BUTANOL	E	E	E	E	E	E	E	E	E	G	E	E	
METHYL BUTYL KETONE	E		E	X		X	X	X		X		E	E
METHYL CARBITOL	E			E		X		C				E	
METHYL CELLOSOLVE	G		G	C		X	G	C		X		E	E
METHYL CHLORIDE	X	C	X	X	X	X	X	X	C	X	X	E	E
METHYL CYANIDE	E		E	G		G	E	C				E	
METHYL ETHYL KETONE	E	G	E	X	E	X	X	X	G	X	C	E	E
METHYL HEXANOL	E			E		E		E				E	E
METHYL ISOAMYL KETONE		C											
METHYL ISOBUTYL KETONE (MIBK)			G										G
METHYL METHACRYLATE	C		X	X		X	X	X	C	X	C	E	G
METHYL NORMAL AMYL KETONE	G			X		X		X				E	
METHYL PROPYL ETHER	X			G		X		X				E	
METHYL SALICYLATE	G		C			X	X	X				E	
METHYL STYRENE		C											
METHYL SULFIDE	C			X		X		X				E	
METHYL TERTIARY BUTYL ETHER	G	X					X	X		X		G	G
METHYL-1-PROPANOL	E		E	E		E	E	G		E		E	
METHYL-2-BUTANOL	E	E		E		E				E			
METHYL-2-BUTANONE	G	X	C	X	X	X	X	X	E	X		E	
METHYL-2-HEXANONE	G	C		X		X				X			
METHYL-2-PENTANOL	E		E	E		G	E	G				E	
METHYL-2-PENTANONE	C	X	G	X	X	X	X	X	G	X	X	E	
METHYL-2-PROPEN-1-OL	E		E	E		G	E	G				E	
METHYL-3-PENTEN-1-ONE		C											
METHYL-4-ISOPROPYL BENZENE		C											
METHYLALLYL ACETATE	E			G		X		X				E	
METHYLAMYL ALCOHOL	E		E	E		G	E	G				E	
METHYLCYCLOHEXANE	X			X		X		X				E	
METHYLENE BROMIDE	X		X	X		X	X	X				E	G
METHYLENE CHLORIDE	X		C	X	X	X	X	X	C	X	X	E	E
METHYLETHYL KETONE	E	G	E	X	E	X	X	X	G	X	C	E	E
METHYLHEXYL KETONE	G			X		X		X				E	
METHYLISOBUTYL CARBINOL	E		E	E		G	E	G				E	
METHYLISOBUTYL KETONE	C	X	G	X	X	X	X	X	G	X	X	E	E
METHYLISOPROPYL KETONE	G	X	C	X	X	X	X	X	E	X		E	
METHYLLACTONITRILE	E			C		C	B	X			E	E	
METHYLPHENOL	X		X	C		X	X	X				E	
METHYLPROPYL CARBINOL	E			E		E		E				E	
METHYLPROPYL KETONE	G		G	X		X	X	X		X		E	
MIL-A-6091	E		E	E		E	E	G		E			
MIL-E-9500	E		E	E		E	E	E		E			
MIL-F-16884	X		X	C		X	C	E		X			
MIL-F-17111	X		X	X		X	G	E		X			
MIL-F-25558B	X		X	G		X	G	E		X			
MIL-F-25576C	X		X	C		X	C	E		X			
MIL-F-7024A	X		X	X		X	X	E		X			

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Chemical Resistance Table

Chemical or Material Conveyed	Butyl	CPE	EPDM	CSM	TPC-ET	Natural	Neoprene	Nitrile	Nylon	SBR	TPV	PTFE	UHMW
MIL-G-10924B	X		X	G		X	X	E		X			
MIL-G-25013D	X		X	G		X	G	E		X			
MIL-G-25537A	X		X	G		X	G	E		X			
MIL-G-4343B	C		C	G		C	G	G		C			
MIL-G-5572	X		X	X		X	X	E		X			
MIL-G-7711A	X		X	X		X	X	E		X			
MIL-H-13910B	G		E	G		G	G	G		E			
MIL-H-19457B	E		E	X		X	X	X		X			
MIL-H-22251	E		E	G			G	G		G			
MIL-H-27601A	X		X	C		X	G	G		X			
MIL-H-5606B	X		C	G		X	G	E		X			
MIL-H-6083C	X		X	G		C	G	E		X			
MIL-H-8446B	X		X	C		X	G	G		X			
MIL-J-5161F	X		X	X		X	X	G		X			
MIL-J-5624G (JP-3, JP-4, JP-5)	X		X	X		X	X	E		X			
MIL-L-15016	X		X	G		X	G	E		X			
MIL-L-17331D	X		X	G		X	G	E		X			
MIL-L-2104B	X		X	C		X	G	E		X			
MIL-L-21260	X		X	G		X	G	E		X			
MIL-L-23699A	X		X	C		X	C	G		X			
MIL-L-25681C	E		E	G		G	G	G		G			
MIL-L-3150A	X		X	G		X	G	E		X			
MIL-L-3545B	X		X	C		C	G	G		X			
MIL-L-4339C	X		X	X		X	X	E		X			
MIL-L-6082C	X		X	G		X	G	E		X			
MIL-L-6085A	X		X	X		X	X	G		X			
MIL-L-7870A	X		X	X		X	G	E		X			
MIL-L-9000F	X		X	C		X	G	E		X			
MIL-L-9236B	X		X	X		X	X	G		X			
MIL-O-5606								E					
MIL-O-7808	X		X	X		X	X	G		X		E	
MIL-P-27402	E		E	G			G	G		G			
MIL-S-3136B TYPE 1 FUEL	X		X	G		X	G	E		X			
MIL-S-3136B TYPE 2 FUEL	X		X	X		X	X	C		X			
MIL-S-3136B TYPE 3 FUEL	X		X	X		X	X	C		X			
MIL-S-3136B TYPE 4 OIL, LOWSWELL	X		X	E		X	E	E		X			
MIL-S-3136B TYPE 5 OIL, MEDSWELL	X		X	G		X	G	E		X			
MIL-S-3136B TYPE 6 OIL, HI SWELL	X		X	X		X	X	E		X			
MIL-S-81087	E		E	E		E	E	E		E			
MINERAL OIL	X	G	X	E	E	X	E	E	E	X	X	E	E
MINERAL SPIRITS	X		X	G		X	X	E		X		E	E
MOBILE HFA			X					E	E			E	
MOLTEN SULFUR	G		E	E		G	E	G				E	X
MONOBUTYL ETHER	X		X	X		X	C	C		X		E	
MONO-CHLOROACETIC ACID	G	X	C	X	X	C	E	X	X	X	X	E	
MONOCHLOROBENZENE	X		X	X	C	X	X	X	G	X	X	E	G
MONOCHLORODIFLUOROMETHANE	X	C	E	E	X	C	E	X		E	X	E	
MONOETHANOL AMINE	G		G	C		G	G	G		G		E	E
MONOETHYL AMINE	G		E	C		C	X	X		C		E	
MONOMETHYLAMINE	C		E	C		C	C	G				E	
MONOVINYL ACETATE			G										B
MORPHOLINE			X				X	X	X			E	
MOTOR OIL			X	G	G		G	E	G			E	E
MTBE	G	X					X	X		X		G	G
MURIATIC ACID	C	X	C	C	C	C	C	C	X	X	E	E	E
NA-K			X					X				X	
NAPHTHA	X	E	X	X	E	X	X	E	E	G	X	E	E
NAPHTHALENE	X	C	X	X	C	X	X	X	G	X	C	E	E
NAPTHENIC ACIDS		E	X	X		X	X	G		X		E	
N-BUTANAL	G		G	C		X	C	X				E	
N-BUTYLAMINE	X		C	X		X	X	X		X		E	
N-BUTYLBENZENE				X		X		X				E	
N-BUTYLBROMIDE	X			X		X		X				E	
N-BUTYLBUTYRATE	E		E	X		X	X	X		X		E	
N-BUTYLCARBINOL	E	E	E	E	E	E	E	G	E	E	E	E	
NEOHEXANE	X			X		X		E				E	

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Chemical or Material Conveyed	Butyl	CPE	EPDM	CSM	TPC-ET	Natural	Neoprene	Nitrile	Nylon	SBR	TPV	PTFE	UHMW
NEON GAS	E		E	E		E	E	E	E	E	E	E	
NEU-TRI	X			X		X		X				E	
NICKEL ACETATE	E		E	X		E	G	G		X		E	E
NICKEL CHLORIDE	E	X	E	E	C	E	G	E	C	E		E	E
NICKEL NITRATE	E		E	E		E	E	E				E	E
NICKEL SULFATE	E	X	E	E	C	G	E	E	C	G		E	E
NIETYLENE						E							
NITRIC ACID, 10 %	E	X	E	G	C	X	G	X	C	X	E	E	E
NITRIC ACID, 13N	X	X	X	X	X	X	X	X	X	X		E	
NITRIC ACID, 13N + 5 %	X	X	X	X	X	X	X	X	X	X		E	
NITRIC ACID, UP TO 25 %	G	X	E	G	X	X	X	X	X	X		E	E
NITRIC ACID, 25 % – 40 %	C	X	G	C	X	X	X	X	X	X		E	G
NITRIC ACID, 40 % – 60 %	X	X	X	X	X	X	X	X	X	X		E	C
NITRIC ACID, CONC (16N)	X	X	X	X	X	X	X	X	X	X	X	E	E
NITRIC ACID, RED FUMING	C	X	X	X	X	X	X	X	X	X	X	E	X
NITRILOTRIETHANOL	G		E	E	X	G	X	C		G		E	
NITROBENZENE	G	C	X	X	X	X	X	X	C	X		E	E
NITROETHANE	G		G	C		G	C	X		G	E	E	E
NITROGEN	E		E	E		E	E	E		E		E	E
NITROMETHANE	G		G	C	C	G	X	X		C		E	E
NITROPROPANE			G										E
NITROUS OXIDE GAS	E		E	E		E	G	E	C			E	E
N-NONYL ALCOHOL	E			E		E		E				E	
N-OCTANE	X		X	X		X	C	E		X		E	G
NONANOIC ACID	E			X		X		E				E	
NONANOL	E			E		E		E				E	
N-SERV (75 % XYLENE)									E			E	
NUTO H			X					E	E			E	
NYVAC LIGHT			E					X	E			E	
O-AMINOTOLUENE		G											
OCTANOIC ACID	C			G		C		C				E	
OCTANOL	G		E	G		G	G	G		G		E	E
OCTYL ACETATE	E			E		X		X				E	E
OCTYL ALCOHOL	G		G	G		G	G	G		G		E	E
OCTYL ALDEHYDE	C			X		X		X				E	
OCTYL AMINE	E			C		C		C				E	
OCTYL CARBINOL	E			E		E		E				E	
OCTYLENE GLYCOL	E			E		E		E				E	
OIL-PETROLEUM	X	G	X	G	E	X	G	E	G	X	C	E	E
OLEIC ACID	X	X	C	G	E	X	C	E	E	X		E	E
OLEUM (FUMING SULFURIC ACID)	X	X	X	X	X	X	X	X	X	X		E	X
OLIVE OIL	G		G	G		X	G	E	E	X		E	G
ORTHO-DICHLOROBENZENE	X		X	X	X	X	X	X	E	X	X	E	
ORTHO-DICHLOROBENZOL	X		X	X	X	X	X	X	E	X	X	E	
ORTHOXYLENE	X	C	C	X	C	X	X	X	G	X	X	E	
OXALIC ACID	E	X	E	E	X	C	G	G	G	G	E	E	E
OXYDIETHANOL		E											
OXYGEN COLD			E				E						E
OZONE	G		E	E	C	X	C	X	C	X		E	C
PAINT THINNER	X		X	X		X	X	X	G	X		E	E
PALM OIL													E
PALMITIC ACID	G	G	G	C	E	E	G	E	C	B	E	E	E
PAPERMAKERS ALUM	E			E		E	E	E				E	G
PARA METHOXYPROPENYL BENZENE	X	X		X		X			G			E	
PARA-DICHLOROBENZENE	X		X	X		X	X	X		X		E	
PARAFFIN WAX	X		X	X		X	G	E		E			E
PARALDEHYDE	E		E	X		C	C	C				E	
PARAXYLENE	X		X	X		X	X	C				E	
PCB												E	
P-CYMENE	X	X	X	X		X	X	X		X		E	E
PELARGONIC ALCOHOL	E			E		E		E				E	
PENTACHLOROETHANE	X			X		X	X	X				E	
PENTADIONE		G											
PENTAMETHYLENE	X		X	X		X	E	G				E	
PENTANE	X		X	C	G	X	C	E	G	X		E	G
PENTANOL	E		E	E		E	E	E				E	

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Chemical Resistance Table

Chemical or Material Conveyed	Butyl	CPE	EPDM	CSM	TPC-ET	Natural	Neoprene	Nitrile	Nylon	SBR	TPV	PTFE	UHMW
PENTANONE	G		G	X		X	X	X				E	
PENTASOL	E		E	E		E	E	G		G		E	
PENTYL ACETATE	G		E	X	C	X	X	X	G	X	X	E	
PENTYL ALCOHOL	E	E	E	E	E	E	E	G	E	E	E	E	
PENTYL BROMIDE												E	
PENTYL CHLORIDE	X	C	X	X		X	X		E	X		E	
PENTYL ETHER				C				C				E	
PENTYLAMINE	G		X	C		C	X	C				E	
PERCHLORIC ACID-2N	G		G	G	X	X	G	X	X	X	X	E	
PERCHLOROETHYLENE	X	C	X	X	X	X	X	C	C	X	X	E	G
PERCHLOROMETHANE	X					X	X	X				E	
PETROLEUM CRUDE	X		X	G	C	X	G	E	G	X		E	E
PETROLEUM ETHER	X		X	X		X	C	E	E	X		E	
PETROLEUM OILS	X	G	X	G	E	X	G	E	G	X	C	E	E
PHENBO													E
PHENOL	G			X	X	X	X	X	X	X	X	E	E
PHENOLSULFONIC ACID	C			X		X		X				E	G
PHENYLAMINE	E		G	X		X	X	X				E	
PHENYLBROMIDE	X		X	X		X	X	X				E	
PHENYLBUTANE		C											
PHENYLCHLORIDE	X		X	X		X	X	X				E	
PHENYLETHYLENE	X		X	X	X	X	X	X		X		E	
PHENYLMETHANE	X		X	X		X	X	X				E	
PHENYLMETHANOL	G		G	G	C	X	X	X	C	X	X	E	E
PHENYLMETHYL ACETATE	E			G		X						E	E
PHOSPAHTE ESTERS	E	G	E	X	C	X	X	X	E	X	E	E	
PHOSPHORIC ACID 10 %	G	X	E	E			E	E	E	G	E	E	E
PHOSPHORIC ACID 10 % – 85 %	G	X	E	E	X	G	E	X	C	G		E	E
PHOSPHORUS TRICHLORIDE ACID	E		E	X		X	X	X		X		E	
PHTALIC ANHYDRIDE			E				E						
PICRIC ACID, H2O SOLUTION	C	X	C	E	X	C	C	C	X	G	X	C	
PINE OIL	X		X	X		X	X	G		X		E	E
PINENE	X		X	X		X	X	G		X		E	E
POLY CHLORINATED BIPHENOL												E	
POLYETHYLENE GLYCOL E-400	E	E		E		E				E			E
POLYOL ESTER					X		G		G				
POLYPROPYLENE GLYCOL	E			E		E		E				E	
POLYVINYL ACETATE EMULSION (PVA)			E				G						B
POTASSIUM ACETATE	E		E	C		E	G	G	G	X		E	E
POTASSIUM BICARBONATE			E				E						E
POTASSIUM BISULFATE	E		E	E		E	E	E	G	G		E	E
POTASSIUM BISULFITE	E		E	E		E	E	E	G	G		E	E
POTASSIUM CARBONATE	E		E	E	X	E	E	E	C	E		E	E
POTASSIUM CHLORIDE	E	G	E	E	G	E	E	E	E	E		E	E
POTASSIUM CHROMATE	G		E	C		G	E	E	G	G		E	G
POTASSIUM CYANIDE	E	G	E	E	G	E	G	E	E	E		E	E
POTASSIUM DICHROMATE	E	X	E	E		C	E	E	G	G		E	G
POTASSIUM HYDRATE	E		G	E		G	G	G	G	G		E	
POTASSIUM HYDROXIDE	G	X	E	E	C	G	G	G	G	G	G	E	G
POTASSIUM NITRATE	E		E	E	G	E	E	E	G	E		E	E
POTASSIUM PERMANGANATE 5 %	E		E	G	X	E	E	C	X	G		E	E
POTASSIUM SILICATE	E		E	E		E	E	E	G	E		E	
POTASSIUM SULFATE	E		E	E	G	E	E	E	E	G		E	E
POTASSIUM SULFIDE	E		E	E		G	E	E	E	G		E	E
POTASSIUM SULFITE	E		E	E		G	E	E	E	G		E	
PRESTONE ANTIFREEZE	E	G	E	E	G	E	C	E	G	E	E	E	
PRODUCER GAS	X		X	G		X	G	E		X		E	
PROPANEDIOL	C		E	E		E	C	E		E		E	
PROPANETRIOL	E	E	E	E	E	E	E	E	G	E	X	E	
PROPANOL	E		E	E		E	E	E		E	E	E	
PROPANOLAMINE		E											
PROPANONE	E	G	E	X	C	C	X	X	E	C	E	E	
PROPEN-1-OL	E		E	E		E	E	E				E	E
PROPENEDIAMENE		E											
PROPENENITRILE	X					G	X	X				E	
PROPENYL ALCOHOL	E		E	E		E	E	E				E	E

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* compounds not in catalogue. Ask Parker for right solution

Chemical or Material Conveyed	Butyl	CPE	EPDM	CSM	TPC-ET	Natural	Neoprene	Nitrile	Nylon	SBR	TPV	PTFE	UHMW
PROPENYLANISOLE	X			X		X		X				E	
PROPIONIC ACID	E		E	G		E	C	C		X		E	
PROPIONITRILE	E		E			E	G	X			X	E	
PROPYL ACETATE	G		E	X		X	X	X		X		E	E
PROPYL ALCOHOL	E		E	E		E	E	E		E	E	E	E
PROPYL ALDEHYDE	G			X		C		X				E	E
PROPYL BENZENE		C											
PROPYL CHLORIDE	C			X		X		X				E	E
PROPYL ETHER		E											
PROPYL NITRATE	G		G	X		X	X	X		X		E	
PROPYLENE	X		X	X		X	X	X		X		E	
PROPYLENE DIAMINE	E			C		G		G				E	
PROPYLENE DICHLORIDE													C
PROPYLENE GLYCOL	C		E	E		E	C	E		E		E	E
PYDRAUL, 'E' SERIES	G		G	X	G	X	X	X	G	X		E	E
PYDRAULIC 'C'	X		X	X	C	X	X	X	E	X	E	E	
PYRIDINE			G										C
PYROLIGNEOUS ACID			G										G
RESIN OIL							X						B
QUINTOLUBRIC 822 SERIES	X		X			X	X	G					
RED OIL	X	X	C	G	E	X	C	E	E	X		E	
REFRIGERANT 11	X		X	E	E	X	X	G		X		E	
REFRIGERANT 12	C	C	C	E	E	C	E	E	G	E	X	E	
REFRIGERANT 22	X	C	E	E	X	C	E	X	G	E	X	E	
RESORCINOL			G		X		X		X	G	X	E	
SAE NO. 10 OIL	X	G	X	X	E	X	C	E	E	X	X	E	
SAL AMMONIAC	E	G	E	E	E	E	E	E	C	E		E	
SEA WATER	E		E	E	E	E	G	E	E	E	E	E	E
SEWAGE	G		E	E	G	G	G	E	E	G	G	E	E
SILICATE ESTERS	C		X	G	C	X	E	G	G	X		E	
SILICATE OF SODA	E		E	E		E	E	E				E	
SILICONE GREASE	E		E	E	E	E	E	E	E	E		E	
SILICONE OIL	E		E	E	G	C	E	E	E	E		E	E
SILVER NITRATE	E		E	E		E	E	G	E	E		E	E
SKYDROL 500 TYPE 2	G	G	E	X	G	X	X	X	G	X	E	E	
SKYDROL 500B	G	G	E	X	E		X		E		E	E	
SKYDROL 500C	G	G		X	E		X					E	
SKYDROL 7000 TYPE 2	E	G	E	X	X	X	X	X	E	X		E	
SOAP SOLUTIONS	G	G	E	E	E	G	G	E	E	G	E	E	E
SODA ASH	E	G	E	E	G	E	E	E	G	E		E	E
SODA LIME	E		E	G		E	G	G				E	E
SODA NITER	E	G	E	E	G	G	G	G	E	G		E	
SODA, CAUSTIC	E	C	E	E	C	G	E	C	G	E	C	E	E
SODIUM ACETATE	E		E	C		E	G	G	G	X		E	E
SODIUM ALUMINATE	E		E	E		G	E	E	G	G		E	E
SODIUM BICARBONATE	E		E	E	G	E	E	E	E	E		E	E
SODIUM BISULFATE	E	X	E	E	C	E	E	G	C	G		E	E
SODIUM BISULFITE	E		E	E	G	E	E	E	E	G		E	E
SODIUM BORATE	E		E	E	G	E	E	E	E	E		E	E
SODIUM CARBONATE 10 % – 15 %	G	G	E	E	G	E	E	E	G	E		E	E
SODIUM CHLORATE			E										
SODIUM CHLORIDE	G	G	E	E	E	E	E	E	G	E	C	E	E
SODIUM CYANIDE	E	G	E	E	G	E	E	E	E	E		E	E
SODIUM DICHROMATE	E		C	G		X	C	E	G	G		E	E
SODIUM FLUORIDE			E				E						C
SODIUM HYDRATE	E		E	G		E	G	G	G	G		E	
SODIUM HYDROCHLORITE	G		G	E		C	C	C	G	G		E	
SODIUM HYDROXIDE (CAUSTIC SODA)	E	C	E	E	C	E	G	C	G	G	C	E	E
SODIUM HYPOCHLORITE	G	X	G	G	C	X	C	X	X	C	C	E	E
SODIUM METAPHOSPHATE	G		E	G		E	G	E	E	E		E	E
SODIUM NITRATE	E	G	E	E	G	G	G	G	E	G		E	E
SODIUM PERBORATE	E	X	E	G	G	G	G	G	E	G		E	E
SODIUM PEROXIDE	E	X	E	G	G	G	G	G	X	G		E	E
SODIUM PHOSPHATE	E		E	E	G	E	C	E	C	E		E	E
SODIUM SILICATE	E	G	E	E	G	E	E	E	E	E		E	E
SODIUM SULFATE	E	G	E	E	G	G	E	E	E	G		E	E

E = excellent; G = good; C = conditional; X = unsatisfactory

* compounds not in catalogue. Ask Parker for right solution

Chemical Resistance Table

Chemical or Material Conveyed	Butyl	CPE	EPDM	CSM	TPC-ET	Natural	Neoprene	Nitrile	Nylon	SBR	TPV	PTFE	UHMW
SODIUM SULFIDE	E	G	E	E	G	G	E	E	E	G		E	
SODIUM SULFITE	E		E	E		G	E	E	E	G		E	E
SODIUM THIOSULFATE	E		E	E		E	E	E	G	G		E	E
SOYBEAN OIL	C	G	X	E	G	X	E	E	E	X		E	E
STANNIC CHLORIDE	G	X	E	C	G	G	C	E	C	E		E	E
STANNIC SULFIDE	E			E		E		E				E	
STANNOUS CHLORIDE	G		C	E	G	E	E	E	C	E		E	E
STANNOUS SULFIDE	E			E		E		E				E	
STEARIC ACID	G	G	G	C	G	C	G	E	E	G	E	E	E
STODDARD SOLVENT	X	G	X	X	E	X	C	E	E	X	X	E	E
STYRENE MONOMER	X		X	X	X	X	X	X		X		E	G
SULFAMIC ACID	E		X	E		G	G	C				E	
SULFUR	F		F	F		X	X	X		X		E	E
SULFUR CHLORIDE	X	G	X	C	C	X	C	C	C	X		E	E
SULFUR DIOXIDE	G		E	C	X	C	X	X	X	C		E	G
SULFUR TRIOXIDE, DRY	G		G	C	X	C	X	X		X		E	X
SULFURIC ACID 60 % +93 °C (+200 °F)	X	X	X		X		X	X	X	X			X
SULFURIC ACID, 25 %	G	X	E	E	E	G	E	E	X	G	E	E	E
SULFURIC ACID, 25 % – 50 %	G	X	E	G	G	G	E	E	X	G		E	E
SULFURIC ACID, 50 % – 96 %	X	X	G	C	X	X	C	C	X	X		E	E
SULFURIC ACID, CONC. 96 % – 98 %	X	X	X	X	X	X	X	X	X	X		E	E
SULFURIC ACID, FUMING	X	X	X	X	X	X	X	X	X	X		E	X
SULFUROUS ACID, 10 %	E	X	E	E	C	G	G	C	C	G		E	E
SULFUROUS ACID, 10 % – 85 %	E	X	G	E	C	G	C	C	X	C		E	E
SUTAN												E	
TALL OIL	X		X	C		X	C	E		X		E	E
TALLOW	G		E	C		C	G	E		X		E	E
TANNIC ACID	E	X	E	E	G	E	E	E	G	G	E	E	E
TAR, BITUMINOUS	X	G	X	C	G	C	C	G	G	X		E	
TAR, CAMPHOR	X	C	X	X	C	X	X	X	G	X	C	E	X
TARTARIC ACID	G	X	C	E	G	E	E	E	E	G	E	E	E
T-BUTYL AMINE			G	X									
TELONE 2													
TERPINOL	C	E	C	X		X	X	G		X		E	G
TERTIARY BUTYL ALCOHOL	G		G	G		G	G	G		G		E	E
TERTIARY BUTYL AMINE			G	X									
TERTIARY BUTYL MERCAPTAN	X		X	X		X	X	X		X		E	
TETRACHLOROBENZENE	X			X		X		X				E	
TETRACHLOROETHANE	X		X	X		X	X	X		X	C	E	C
TETRACHLOROETHYLENE	X		X	X		X	X	C	C	X		E	G
TETRACHLOROMETHANE	X		X	X		X	X	X				E	
TETRACHLORONAPHTHALENE	X			X		X		X				E	
TETRAETHYLENE GLYCOL	E			E		E		E				E	
TETRAETHYLORTHOSILICATE	E					X	X	X				E	
TETRAHYDROFURAN	G		X	X	C	X	X	X	G	X	X	E	G
THF	G		X	X	C	X	X	X	G	X	X	E	G
TIN CHLORIDES	G		E	E		E	C	E				E	E
TITANIUM TETRACHLORIDE	X		X	X		X	X	C		X		E	G
TOLUENE	X	C	X	X	C	X	X	X	E	X	X	E	E
TOLUENE DIISOCYANATE (TDI)			E										B
TOLUIDINE	X			X		X		X				E	
TOLUOL	X	C	X	X	C	X	X	X	E	X	X	E	
TRANSFORMER OIL	X		X	C		X	G	E		X		E	E
TRANSMISSION 'A' OIL	X		X	G	G	X	G	E	G	X		E	
TRI (2-HYDROXYETHYL) AMINE	G		E	E	X	G	X	C		G		E	
TRIBUTYL AMINE	E			C		G		G				E	
TRIBUTYL PHOSPHATE	G		E	X	C	C	X	X	G	X		E	E
TRICHLOROACETIC ACID	G		G	C	X	C	X	C	X	X		E	E
TRICHLOROBENZENE	X			X		X	X	X		X		E	
TRICHLOROETHANE	X		X	X		X	X	X	X	X		E	
TRICHLOROETHYLENE	X	C	X	X	X	X	X	X	C	X	X	E	G
TRICHLOROMETHANE	X	X	X	X	X	X	X	X	C	X	X	E	
TRICHLOROTOLUENE								X				E	
TRICRESYL PHOSPHATE	E		E	X	C	C	C	X	G	X		E	E
TRIETHANOLAMINE	G		E	E	X	G	X	C		G		E	E
TRIETHYLAMINE	C		E			G	G	E		X		E	

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Chemical or Material Conveyed	Butyl	CPE	EPDM	CSM	TPC-ET	Natural	Neoprene	Nitrile	Nylon	SBR	TPV	PTFE	UHMW
TRIETHYLENE GLYCOL	E			E		E		E				E	
TRIHYDROXYBENZOIC ACID	G		G	G	X	E	G	G	G	G		E	
TRIMETHYL PENTANES (MIXED)	X	E	X	C	E	X	C	E	E	X	X	E	
TRIMETHYL PENTENE		E											
TRIMETHYLAMINE		E										E	E
TRINITROTOLUENE (TNT)							G						
TRISODIUM PHOSPHATE	E		E	E	E	E	E	E	E	E		E	
TRITOYL PHOSPHATE	E		E	X	C	X	X	X	G	X		E	
TUNG OIL	X	C	X	E	G	X	E	E	G	X		E	E
TUNG OIL (CHINA OIL)	C	C	X	E	G	X	E	E	G	X		E	E
TURBINE OIL			X				C						B
TURPENTINEX	X	G	X	X		X	X	X	E	X	X	E	G
UDMH	E		E	E		E	G	G		X		E	
UNDECYL ALCOHOL	E			E		E		E				E	
UREA	E		E	E	G	E	G	G	E			E	E
URETHANE FORMULATIONS								E	E			E	
URIC ACID					X				G		E	E	
VARNISH	X	C	X	X		X	X	G	E	X		E	
VEGETABLE OILS	C		C	G		X	C	E	G	X		E	E
VERSILUBE F44	E		E	E		E	E	E	E	E		E	
VERSILUBE F55	E		X	E		E	E	E	E	E		E	
VINEGAR	E		E	E	C	G	G	G	E	G		E	X
VINEGAR ACID		G											
VINYL ACETATE	E		G	C		X	X	X		X		X	E
VINYL BENZENE	X		X	X	X	X	X	X		X		E	E
VINYL CHLORIDE (GAS)	X		G			G						E	E
VINYL CYANIDE	X	E	X	C		C	C	X	E	C	X	E	
VINYL ETHER	X			G		X		G				E	E
VINYL STYRENE	X			X		X				X		E	E
VINYL TOLUENE	X			X		X		X				E	E
VINYL TRICHLORIDE	X			X		X	X	X				E	E
VITAL, 4300, 5310			X					X	E			E	
VM&P NAPHTHA	X		X	X		X	C	C				E	
WATER	E	G	E	E	E	E	G	E	E	G	E	E	E
WATER, BOILING	E		E	E	C		G	G	X	G	G	G	X
WATER, SODA					E				E		E	E	
WEMCO C	X		X	X		X	G	E		X			
WHISKEY	E		E	E	G	E	E	E	E	E		E	X
WHITE OIL	X		X	X		X	G	E		X		E	E
WHITE PINE OIL	X		X	X		X	X	G		X			
WINES	E		E	E	G	E	E	E	E	E		E	X
WOOD ALCOHOL	E		E	E		E	E	E		E		E	E
WOOD OIL	C		X	C	G	X	G	E	G	X		E	E
XENON	E		E	E		E	E	E		E		E	
XYLENE, XYLOL	X	C	X	X	C	X	X	X	G	X	X	E	C
XYLIDINE	G		C	X		X	X	C		X		E	G
ZEOLITES	E		E	E		E	E	E		E			
ZINC ACETATE	E		E	C		E	G	G		X		E	
ZINC CARBONATE	E		E	E		E	E	E				E	E
ZINC CHLORIDE	E	X	E	E	E	E	E	E	E	E		E	E
ZINC CHROMATE	E			C								E	
ZINC SULFATE	E	X	E	E	C	E	E	E	X	G		E	E

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Chemical Resistance Guide for Silicone Hose

Chemical	*
Acetic acid, dilute, 10%	B
Acetic acid glacial	C
Acetic acid anhydride	I
Acetone	X
Acetylene	C
Air 68 °F (20 °C)	A
Air 150 °F (65 °C)	A
Aluminum chloride 150 °F (65 °C)	A
Aluminum fluoride 150 °F (65 °C)	B
Aluminum sulfate 150 °F (65 °C)	A
Alums 150 °F (65 °C)	A
Ammonia gas, anhydrous	I
Ammonia 10%water solution	A
Ammonia 30%water solution	C
Ammonium chloride	C
Ammonium hydroxide	C
Ammonium nitrate	A
Ammonium phosphate monobasic	A
Ammonium phosphate dibasic	A
Ammonium phosphate tribasic	A
Ammonium sulfate	A
Amyl acetate	X
Amyl alcohol	X
Aniline, Aniline oil	X
Aniline, dyes	X
Asphalt	I
Barium chloride 150 °F (65 °C)	A
Barium hydroxide 150 °F (65 °C)	A
Barium sulfide 150 °F (65 °C)	A
Beer	A
Beet sugar liquors	A
Benzene, Benzol	X
Benzine, petroleum ether	X
Benzine, petroleum naphtha	X
Black sulfate liquor	A
Blast furnace gas	A
Borax	B
Boric acid	A
Bromine	X
Butane	X
Butyl acetate	X
Butyl alcohol, Butanol	C
Calcium bisulfate	C
Formaldehyde	B
Formic acid	C
Fuel oil	X
Furfural	X
Gasoline, unleaded	X
Gasoline + MTBE	X
Gasoline Hi Test + MTBE	X
Gelatin	A
Glucose	A
Glue	A
Glycerine, glycerol	A
Green sulfate liquor	A
HFC-134	I
Hydraulic fluids: Petroleum	C
Hydraulic fluids: Phosphate ester alkyl	X
Hydraulic fluids: Phosphate ester aryl	X
Hydraulic fluids: Phosphate ester blends	X
Hydraulic fluids: Silicate ester	X
Hydraulic fluids: Water glycol	A
Hydrobromic acid	X
Hydrochloric acid	X
Hydrocyanic acid	B
Hydrofluoric acid	X
Hydrofluosilicic acid	I
Hydrogen gas 140 °F (60 °C)	C
Hydrogen peroxide	A
Hydrogen sulfide, dry	X
Hydrogen sulfide, wet	X

Chemical	*
Isobutyl alcohol	A
Isopropyl alcohol	A
Isooctane	X
Kerosene	X
Lacquers	X
Lacquers solvents	X
Lactic acid	A
Linseed oil	A
Lubricating oil, crude	C
Lubricating oil, refined	C
Magnesium chloride 150 °F (65 °C)	A
Magnesium hydroxide 150 °F (65 °C)	B
Magnesium sulfate 150 °F (65 °C)	A
Mercuric chloride	A
Mercury	A
Methyl alcohol, methanol	A
Methyl chloride	X
Calcium chloride	A
Calcium hydroxide	A
Calcium hypochlorite	C
Caliche liquors	B
Cane sugar liquors	A
Carbolic acid, phenol	X
Carbon dioxide, dry-wet	A
Carbon disulfide	X
Carbon monoxide 140 °F (60 °C)	A
Carbon tetrachloride	X
Castor oil	A
Cellosolve acetate	X
CFC-12	I
China wood oil, tung oil	X
Chlorine, dry/wet	X
Chlorinated solvents	X
Chloroacetic acid	I
Chlorosulfonic acid	X
Chromic acid	C
Citric acid	A
Coke oven gas	B
Copper chloride 150 °F (65 °C)	A
Copper sulfate 150 °F (65 °C)	A
Corn oil	A
Cottonseed oil	A
Creosote, coal tar	C
Creosote, coal tar wood	X
Creosols, cresylic acid	I
Dichlorobenzene	X
Dichloroethylene	X
Diesel fuel	X
Diethanolamine 20%	X
Diethylamine	B
Diisopropylamine	I
Dioctylphthalate	X
Ethers	X
Ethyl acetate	B
Ethyl alcohol	A
Ethyl cellulose	C
Ethyl chloride	C
Ethyl glycol	A
Ferric chloride 150 °F (65 °C)	A
Ferric sulfate 150 °F (65 °C)	B
Methyl ethyl ketone	X
Methyl isopropyl ketone	C
Milk	A
MTBE	I
Mineral oils	A
Natural gas	C
Nickel chloride 150 °F (65 °C)	A
Nickel sulfate 150 °F (65 °C)	A
Nitric acid, crude	X
Nitric acid, diluted 10%	C
Nitric acid, concentrated 70%	X

Chemical	*
Nitrobenzene	C
Oleic acid	X
Oleum	I
Oxalic acid	B
Oxygen	X
Palmitic acid	X
Perchlorethylene	C
Petroleum oils and crude 200 °F (95 °C)	X
Phosphoric acid, crude	C
Phosphoric acid, pure 45%	C
Picric acid, molten	X
Picric acid, water solution	I
Potassium chlorite	A
Potassium cyanide	A
Potassium hydroxide	C
Potassium sulfate	A
Propane	X
Sewage	B
Soap solution	A
Soda ash, sodium carbonate	A
Sodium bicarbonate, baking soda	A
Sodium bisulfate	A
Sodium chloride	A
Sodium cyanide	A
Sodium hydroxide to 50% at 140 °F	A
Sodium hypochlorite	B
Sodium metaphosphate	A
Sodium nitrate	X
Sodium perborate	B
Sodium peroxide	C
Sodium phosphate, monobasic	X
Sodium phosphate, dibasic	X
Sodium phosphate, tribasic	X
Sodium silicate	A
Sodium sulfate	A
Sodium sulfide	A
Sodium thiosulfate, hypo	I
Soybean oil	A
Stannic chloride	B
Steam 450 °F (230 °C)	I
Stearic acid	A
Sulfur	B
Sulfur chloride	C
Sulfur dioxide, dry	B
Sulfur trioxide, dry	B
Sulfuric acid, 10%	X
Sulfuric acid, 11% - 75%	X
Sulfuric acid, 76% - 95%	X
Sulfuric acid, fuming	X
Sulfurous acid	X
Tannic acid	B
Tar	B
Tartaric acid	A
Toluene, Toluol	X
Trichloroethylene	X
Turpentine	X
Urea, water solution	A
Vinegar	A
Vinyl acetate	X
Water, acid mine	A
Water, fresh	A
Water, distilled	A
Whiskey and wines	A
Xylene, xylol	X
Zinc chloride	A
Zinc sulfate	A

*** Resistance**

A = Good Resistance
B = Fair Resistance
C = Poor Resistance

Rubber Hose Dimensional Tolerances

According to norms

EN ISO 7840	
On inside diameter	
I.D. 5 mm	± 0.50 mm
I.D. 8 – 19 mm	± 0.75 mm
I.D. 25 mm	± 1.25 mm
I.D. 38 – 50 mm	± 1.50 mm
Length tolerance	± 1%

EN 12115	
On inside diameter	
I.D. 19 – 38 mm	± 0.50 mm
I.D. 50 mm	± 0.70 mm
I.D. 63.5 – 100 mm	± 0.80 mm
On outside diameter	
O.D. 31 – 51 mm	± 1.00 mm
O.D. 66 – 91 mm	± 1.20 mm
O.D. 116 mm	± 1.60 mm
Length tolerance	± 1%

EN ISO 3821	
On inside diameter	
I.D. 6.3 mm	± 0.40 mm
I.D. 8 – 10 mm	± 0.50 mm
Length tolerance	± 1%

EN ISO 6134	
On inside diameter	
≤ I.D. 38 mm	± 0.50 mm
> I.D. 38 mm	± 0.70 mm
On outside diameter	
≤ O.D. 48 mm	± 1.00 mm
O.D. 54 mm	± 1.20 mm
O.D. 69 mm	± 1.40 mm
Length tolerance	± 1%

SAE J 30 R7	
On inside diameter	
I.D. ≤ 9.5 mm	± 0.40 mm
I.D. > 9.5 mm	± 0.60 mm
On outside diameter	
O.D. ≤ 15.9 mm	± 0.60 mm
O.D. > 15.9 mm	± 0.80 mm
Length tolerance	± 1 %

UNI 7140	
On inside diameter	± 0.50 mm
Length tolerance	± 1%

UNI EN ISO 1307	
On inside diameter	
I.D. ≤ 5 mm	± 0.60 mm
I.D. 6 – 20 mm	± 0.80 mm
I.D. > 20 – 25 mm	± 1.20 mm
I.D. > 25 mm	± 1.60 mm
Length tolerance	± 1%

RMA steel mandrel	
On inside diameter	
I.D. ≤ 38 mm	± 0.79 mm
I.D. 40 – 120 mm	± 1.59 mm
I.D. > 120 mm	± 2.00 mm
On outside diameter	
O.D. ≤ 125 mm	± 1.59 mm
O.D. > 125 mm	± 2.00 mm
Tolerances on outside diameter are valid for hoses without a built-in helix only.	
Length tolerance	± 1%

PVC Hose Dimensional Tolerances

ASPIREX	
On inside diameter	± 4 %
On wall thickness	± 0.50 mm
Length tolerance	± 1 %

MULTIREX, ENOREX	
On inside diameter	
I.D. ≤ 50 mm	± 0.50 mm
I.D. > 50 mm	± 1.00 mm
On wall thickness	± 0.50 mm
Length tolerance	± 1 %

APERSPIR	
On inside diameter	± 1 %
On wall thickness	± 0.50 mm
Length tolerance	± 1 %

APERFRUT	
On inside diameter	
I.D. ≤ 16 mm	± 0.50 mm
I.D. > 16 mm	± 1.00 mm
Length tolerance	± 2 %

VINITRESS	
On inside diameter	
I.D. ≤ 15 mm	± 0.50 mm
I.D. 16 – 19 mm	± 0.80 mm
I.D. > 19 mm	± 1.00 mm
On wall thickness	± 0.50 mm
Length tolerance	± 1 %

All other technical data are subject to a ± 5 % tolerance

Parker safety guide for selecting and using hose, tubing, fittings and related accessories

Parker Publication No. 4400-B.1 / Revised: September, 2015

WARNING

Failure or improper selection or improper use of hose, tubing, fittings, assemblies, valves, connectors, conductors or related accessories ("Products") can cause death, personal injury and property damage. Possible consequences of failure or improper selection or improper use of these Products include but are not limited to:

- **Fittings thrown off at high speed.**
- **High velocity fluid discharge.**
- **Explosion or burning of the conveyed fluid.**
- **Electrocution from high voltage electric powerlines.**
- **Contact with suddenly moving or falling objects that are controlled by the conveyed fluid.**
- **Injections by high-pressure fluid discharge.**
- **Dangerously whipping Hose.**
- **Tube or pipe burst.**
- **Weld joint fracture.**
- **Contact with conveyed fluids that may be hot, cold, toxic or otherwise injurious.**
- **Sparking or explosion caused by static electricity buildup or other sources of electricity.**
- **Sparking or explosion while spraying paint or flammable liquids.**
- **Injuries resulting from inhalation, ingestion or exposure to fluids.**

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

1.0 GENERAL INSTRUCTIONS

Scope: This safety guide provides instructions for selecting and using (including assembling, installing, and maintaining) these Products. For convenience, all rubber and/or thermoplastic products commonly called "hose" or "tubing" are called "Hose" in this safety guide. Metallic tube or pipe are called "tube". All assemblies made with Hose are called "Hose Assemblies". All assemblies made with Tube are called "Tube Assemblies". All products commonly called "fittings", "couplings" or "adapters" are called "Fittings". Valves are fluid system components that control the passage of fluid. Related accessories are ancillary devices that enhance or monitor performance including crimping, flaring, flanging, presetting, bending, cutting, deburring, swaging machines, sensors, tags, lockout handles, spring guards and associated tooling. This safety guide is a supplement to and is to be used with the specific Parker publications for the specific Hose, Fittings and Related Accessories that are being considered for use. Parker publications are available at www.parker.com. SAE J1273 (www.sae.org) and ISO 17165-2 (www.ansi.org) also provide recommended practices for hydraulic Hose Assemblies, and should be followed.

1.1 Fail-Safe: Hose, Hose Assemblies, Tube, Tube Assemblies and Fittings can and do fail without warning for many reasons. Design all systems and equipment in a fail-safe mode, so that failure of the Hose, Hose Assembly, Tube, Tube Assembly or Fitting will not endanger persons or property.

1.2 Distribution: Provide a copy of this safety guide to each person responsible for selecting or using Hose, Tube and Fitting products. Do not select or use Parker Hose, Tube or Fittings without thoroughly reading and understanding this safety guide as well as the specific Parker publications for the Products.

1.3 User Responsibility: Due to the wide variety of operating conditions and applications for Hose, Tube and Fittings, Parker does not represent or warrant that any particular Hose, Tube or Fitting is suitable for any specific end use system. This safety guide does not analyze all technical parameters that must be considered in selecting a product. The user, through its own analysis and testing, is solely responsible for:

- Making the final selection of the Products.
- Assuring that the user's requirements are met and that the application presents no health or safety hazards.
- Following the safety guide for Related Accessories and being trained to operate Related Accessories.
- Providing all appropriate health and safety warnings on the equipment on which the Products are used.
- Assuring compliance with all applicable government and industry standards.

1.4 Additional Questions: Call the appropriate Parker technical service department if you have any questions or require any additional information. See the Parker publication for the Products being considered or used, or call 1-800-CPARKER, or go to www.parker.com, for telephone numbers of the appropriate technical service department.

2.0 HOSE, TUBE AND FITTINGS SELECTION INSTRUCTIONS

2.1 Electrical Conductivity: Certain applications require that the Hose be nonconductive to prevent electrical current flow. Other applications require the Hose and the Fittings and the Hose/Fitting interface to be sufficiently conductive to drain off static electricity. Extreme care must be exercised when selecting Hose, Tube and Fittings for these or any other applications in which electrical conductivity or nonconductivity is a factor. The electrical conductivity or nonconductivity of Hose, Tube and Fittings is dependent upon many factors and may be susceptible to change. These factors include but are not limited to the various materials used to make the Hose and the Fittings, Fitting finish (some Fitting finishes are electrically conductive while others are nonconductive), manufacturing methods (including moisture control), how the Fittings contact the Hose, age and amount of deterioration or damage or other changes, moisture content of the Hose at any particular time, and other factors. The following are considerations for electrically nonconductive and conductive Hose. For other applications consult the individual catalog pages and the appropriate industry or regulatory standards for proper selection.

2.1.1 Electrically Nonconductive Hose: Certain applications require that the Hose be nonconductive to prevent electrical current flow or to maintain electrical isolation. For applications that require Hose to be electrically nonconductive, including but not limited to applications near high voltage electric lines, only special nonconductive Hose can be used. The manufacturer of the equipment in which the nonconductive Hose is to be used must be consulted to be certain that the Hose, Tube and Fittings that are selected are proper for the application. Do not use any Parker Hose or Fittings for any such application requiring nonconductive Hose, including but not limited to applications near high voltage electric lines or dense magnetic fields, unless (i) the application is expressly approved in the Parker technical publication for the product, (ii) the Hose is marked "nonconductive", and (iii) the manufacturer of the equipment on which the Hose is to be used specifically approves the particular Parker Hose, Tube and Fittings for such 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. All hoses that convey fuels must be grounded. Parker manufactures a special Hose for

certain compressed natural gas ("CNG") applications where static electricity buildup may occur. Parker CNG Hose assemblies comply with the requirements of ANSI/IAS NGV 4.2; CSA 12.52, "Hoses for Natural Gas Vehicles and Dispensing Systems" (www.ansi.org). This Hose is labeled "Electrically Conductive for CNG Use" on its layline and packaging. This Hose must be properly connected to the appropriate Parker Fittings and properly grounded in order to dissipate dangerous static charge buildup, which occurs in, for example, high velocity CNG dispensing or transfer. Do not use any other Hose for CNG applications where static charge buildup may occur, even if electrically conductive. Use of other Hoses in CNG applications or failure to properly connect or ground this Hose can cause a fire or an explosion resulting in death, personal injury, and property damage. Care must also be taken to protect against CNG permeation through the Hose wall. See section 2.6, Permeation, for more information. Parker CNG Hose is intended for dispenser and vehicle use within the specified temperature range. Parker CNG Hose should not be used in confined spaces or unventilated areas or areas exceeding the specified temperature range. Final assemblies must be tested for leaks. CNG Hose Assemblies should be tested on a monthly basis for conductivity per ANSI/IAS NGV 4.2; CSA 12.52. Parker manufactures special Hose for aerospace in-flight applications. Aerospace in-flight applications employing Hose to transmit fuel, lubricating fluids and hydraulic fluids require a special Hose with a conductive inner tube. This Hose for in-flight applications is available only from Parker's Stratoflex Products Division. Do not use any other Parker Hose for in-flight applications, even if electrically conductive. Use of other Hoses for in-flight applications or failure to properly connect or ground this Hose can cause a fire or an explosion resulting in death, personal injury and property damage. These Hose assemblies for in-flight applications must meet all applicable aerospace industry, aircraft engine and aircraft requirements.

2.2 Pressure: Hose, Tube and Fitting selection must be made so that the published maximum working pressure of the Hose, Tube and Fittings are equal to or greater than the maximum system pressure. The maximum working pressure of a Hose, or Tube Assembly is the lower of the respective published maximum working pressures of the Hose, Tube and the Fittings used. Surge pressures or peak transient pressures in the system must be below the published maximum working pressure for the Hose, Tube and Fitting. Surge pressures and peak pressures can usually only be determined by sensitive electrical instrumentation that measures and indicates pressures at millisecond intervals. Mechanical pressure gauges indicate only average pressures and cannot be used to determine surge pressures or peak transient pressures. Published burst pressure ratings for Hose is for manufacturing test purposes only and is no indication that the Product can be used in applications at the burst pressure or otherwise above the published maximum recommended working pressure.

2.3 Suction: Hoses used for suction applications must be selected to insure that the Hose will withstand the vacuum and pressure of the system. Improperly selected Hose may collapse in suction application.

2.4 Temperature: Be certain that fluid and ambient temperatures, both steady and transient, do not exceed the limitations of the Hose, Tube, Fitting and Seals. Temperatures below and above the recommended limit can degrade Hose, Tube, Fittings and Seals to a point where a failure may occur and release fluid. Tube and Fittings performances are normally degraded at elevated temperature. Material compatibility can also change at temperatures outside of the rated range. Properly insulate and protect the Hose Assembly when routing near hot objects (e.g. manifolds). Do not use any Hose in any application where failure of the Hose could result in the conveyed fluids (or vapors or mist from the conveyed fluids) contacting any open flame, molten metal, or other potential fire ignition source that could cause burning or explosion of the conveyed fluids or vapors.

2.5 Fluid Compatibility: Hose, and Tube Assembly selection must assure compatibility of the Hose tube, cover, reinforcement, Tube, Plating and Seals with the fluid media used. See the fluid compatibility chart in the Parker publication for the product being considered or used. This information is offered only as a guide. Actual service life can only be determined by the end user by testing under all extreme conditions and other analysis. Hose, and Tube that is chemically compatible with a particular fluid must be assembled using Fittings and adapters containing likewise compatible seals. Flange or flare processes can change Tube material properties that may not be compatible with certain requirements such as NACE

2.6 Permeation: Permeation (that is, seepage through the Hose or Seal) will occur from inside the Hose or Fitting to outside when Hose or Fitting is used with gases, liquid and gas fuels, and refrigerants (including but not limited to such materials as helium, diesel fuel, gasoline, natural gas, or LPG). This permeation may result in high concentrations of vapors which are potentially flammable, explosive, or toxic, and in loss of fluid. Dangerous explosions, fires, and other hazards can result when using the wrong Hose for such applications. The system designer must take into account the fact that this permeation will take place and must not use Hose or Fitting if this permeation could be hazardous. The system designer must take into account all legal, government, insurance, or any other special regulations which govern the use of fuels and refrigerants. Never use a Hose or Fitting even though the fluid compatibility is acceptable without considering the potential hazardous effects that can result from permeation through the Hose or Tube Assembly. Permeation of moisture from outside the Hose or Fitting to inside the Hose or Fitting will also occur in Hose or Tube assemblies, regardless of internal pressure. If this moisture permeation would have detrimental effects (particularly, but not limited to refrigeration and air conditioning systems), incorporation of sufficient drying capacity in the system or other appropriate system safeguards should be selected and used. The sudden pressure release of highly pressurized gas could also result in Explosive Decompression failure of permeated Seals and Hoses.

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

2.8 Routing: Attention must be given to optimum routing to minimize inherent problems (kinking or flow restriction due to Hose collapse, twisting of the Hose, proximity to hot objects or heat sources). For additional routing recommendations see SAE J1273 and ISO 17165-2. Hose Assemblies have a finite life and should be installed in a manner that allows for ease of inspection and future replacement. Hose because of its relative short life, should not be used in residential and commercial buildings inside of inaccessible walls or floors, unless specifically allowed in the product literature. Always review all product literature for proper installation and routing instructions.

2.9 Environment: Care must be taken to insure that the Hose, Tube and Fittings are either compatible with or protected from the environment (that is, surrounding conditions) to which they are exposed. Environmental conditions including but not limited to ultraviolet radiation, sunlight, heat, ozone, moisture, water, salt water, chemicals and air pollutants can cause degradation and premature failure.

2.10 Mechanical Loads: External forces can significantly reduce Hose, Tube and Fitting life or cause failure. Mechanical loads which must be considered include excessive flexing, twist, kinking, tensile or side loads, bend radius, and vibration. Use of swivel type Fittings or adapters may be required to insure no twist is put into the Hose. Use of proper Hose or Tube clamps may also be required to reduce external mechanical loads. Unusual applications may require special testing prior to Hose selection.

2.11 Physical Damage: Care must be taken to protect Hose from wear, snagging, kinking, bending smaller that minimum bend radius and cutting, any of which can cause premature Hose failure. Any Hose that has been kinked or bent to a radius smaller than the minimum bend radius, and any Hose that has been cut or is cracked or is otherwise damaged should be removed and discarded. Fittings with damages such as scratches on sealing surfaces and deformation should be replaced.

2.12 Proper End Fitting: See instructions 3.2 through 3.5. These recommendations may be substantiated by testing to industry standards such as SAE J517 for hydraulic applications, or MIL-A-5070, AS1339, or AS3517 for Hoses from Parker's Stratoflex Products Division for aerospace applications.

2.13 Length: When determining the proper Hose or Tube length of an assembly, be aware of Hose length change due to pressure, Tube length change due to thermal expansion or contraction, and Hose or Tube and machine tolerances and movement must be considered. When routing short hose assemblies, it is recommended that the minimum free hose length is always used. Consult the hose manufacturer for their minimum free hose length recommendations. Hose assemblies should be installed in such a way that any motion or flexing occurs within the same plane.

2.14 Specifications and Standards: When selecting Hose, Tube and Fittings, government, industry, and Parker specifications and recommendations must be reviewed and followed as applicable.

2.15 Hose Cleanliness: Hose and Tube components may vary in cleanliness levels. Care must be taken to insure that the Hose and

Tube Assembly selected has an adequate level of cleanliness for the application.

2.16 Fire Resistant Fluids: Some fire resistant fluids that are to be conveyed by Hose or Tube require use of the same type of Hose or Tube as used with petroleum base fluids. Some such fluids require a special Hose, Tube, Fitting and Seal, while a few fluids will not work with any Hose at all. See instructions 2.5 and 1.5. The wrong Hose, Tube, Fitting or Seal may fail after a very short service. In addition, all liquids but pure water may burn fiercely under certain conditions, and even pure water leakage may be hazardous.

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

2.18 Welding or Brazing: When using a torch or arc welder in close proximity to hydraulic lines, the hydraulic lines should be removed or shielded with appropriate fire resistant materials. Flame or weld spatter could burn through the Hose or Seal and possibly ignite escaping fluid resulting in a catastrophic failure. Heating of plated parts, including Hose Fittings and adapters, above 450°F (232°C) such as during welding, brazing or soldering may emit deadly gases. Any elastomer seal on fittings shall be removed prior to welding or brazing, any metallic surfaces shall be protected after brazing or welding when necessary. Welding and brazing filler material shall be compatible with the Tube and Fitting that are joined.

2.19 Atomic Radiation: Atomic radiation affects all materials used in Hose and Tube assemblies. Since the long-term effects may be unknown, do not expose Hose or Tube assemblies to atomic radiation. Nuclear applications may require special Tube and Fittings.

2.20 Aerospace Applications: The only Hose, Tube and Fittings that may be used for in-flight aerospace applications are those available from Parker's Stratoflex Products Division. Do not use any other Hose or Fittings for 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 Fittings with quick disconnect ability can unintentionally disconnect if they are dragged over obstructions, or if the sleeve or other disconnect member, is bumped or moved enough to cause disconnect. Threaded Fittings should be considered where there is a potential for accidental uncoupling.

3.0 HOSE AND FITTINGS ASSEMBLY AND INSTALLATION INSTRUCTIONS

3.1 Component Inspection: Prior to assembly, a careful examination of the Hose and Fittings must be performed. All components must be checked for correct style, size, catalog number, and length. The Hose must be examined for cleanliness, obstructions, blisters, cover looseness, kinks, cracks, cuts or any other visible defects. Inspect the Fitting and sealing surfaces for burrs, nicks, corrosion or other imperfections. Do NOT use any component that displays any signs of nonconformance.

3.2 Hose and Fitting Assembly: Do not assemble a Parker Fitting on a Parker Hose that is not specifically listed by Parker for that Fitting, unless authorized in writing by the engineering manager or chief engineer of the appropriate Parker division. Do not assemble a Parker Fitting on another manufacturer's Hose or a Parker Hose on another manufacturer's Fitting unless (i) the engineering manager or chief engineer of the appropriate Parker division approves the Assembly in writing or that combination is expressly approved in the appropriate Parker literature for the specific Parker product, and

(ii) the user verifies the Assembly and the application through analysis and testing. For Parker Hose that does not specify a Parker Fitting, the user is solely responsible for the selection of the proper Fitting and Hose Assembly procedures. See instruction 1.4. To prevent the possibility of problems such as leakage at the Fitting or system contamination, it is important to completely remove all debris from the cutting operation before installation of the Fittings. The Parker published instructions must be followed for assembling the Fittings on the Hose. These instructions are provided in the Parker Fitting catalog for the specific Parker Fitting being used, or by calling 1-800-CPARKER, or at www.parker.com.

3.3 Related Accessories: Do not crimp or swage any Parker Hose or Fitting with anything but the listed swage or crimp machine and dies in accordance with Parker published instructions. Do not crimp or swage another manufacturer's Fitting with a Parker crimp or swage die unless authorized in writing by the engineering manager or chief engineer of the appropriate Parker division.

3.4 Parts: Do not use any Parker Fitting part (including but not limited to socket, shell, nipple, or insert) except with the correct Parker mating parts, in accordance with Parker published instructions, unless authorized in writing by the engineering manager or chief engineer of the appropriate Parker division.

3.5 Field Attachable/Permanent: Do not reuse any field attachable Hose Fitting that has blown or pulled off a Hose. Do not reuse a Parker permanent Hose Fitting (crimped or swaged) or any part thereof. Complete Hose Assemblies may only be reused after proper inspection under section 4.0. Do not assemble Fittings to any previously used hydraulic Hose that was in service, for use in a fluid power application.

3.6 Pre-Installation Inspection: Prior to installation, a careful examination of the Hose Assembly must be performed. Inspect the Hose Assembly for any damage or defects. DO NOT use any Hose Assembly that displays any signs of nonconformance.

3.7 Minimum Bend Radius: Installation of a Hose at less than the minimum listed bend radius may significantly reduce the Hose life. Particular attention must be given to preclude sharp bending at the Hose to Fitting juncture. Any bending during installation at less than the minimum bend radius must be avoided. If any Hose is kinked during installation, the Hose must be discarded.

3.8 Twist Angle and Orientation: Hose Assembly installation must be such that relative motion of machine components does not produce twisting.

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

3.10 Proper Connection of Ports: Proper physical installation of the Hose Assembly requires a correctly installed port connection insuring that no twist or torque is transferred to the Hose when the Fittings are being tightened or otherwise during use.

3.11 External Damage: Proper installation is not complete without insuring that tensile loads, side loads, kinking, flattening, potential abrasion, thread damage or damage to sealing surfaces are corrected or eliminated. See instruction 2.10.

3.12 System Checkout: All air entrapment must be eliminated and the system pressurized to the maximum system pressure (at or below the Hose maximum working pressure) and checked for proper function and freedom from leaks. Personnel must stay out of potential hazardous areas while testing and using.

3.13 Routing: The Hose Assembly should be routed in such a manner so if a failure does occur, the escaping media will not cause personal injury or property damage. In addition, if fluid media comes in contact with hot surfaces, open flame or sparks, a fire or explosion may occur. See section 2.4.

3.14 Ground Fault Equipment Protection Devices (GFEPDs): WARNING! Fire and Shock Hazard. To minimize the danger of fire if the heating cable of a Multitube bundle is damaged or improperly installed, use a Ground Fault Equipment Protection Device. Electrical fault currents may be insufficient to trip a conventional circuit breaker. For ground fault protection, the IEEE 515: (www.ansi.org) standard for heating cables recommends the use of GFEPDs with a nominal 30 milliampere trip level for "piping systems in classified areas, those areas requiring a high degree of maintenance, or which may be exposed to physical abuse or corrosive atmospheres".

4.0 TUBE AND FITTINGS ASSEMBLY AND INSTALLATION INSTRUCTIONS

4.1 Component Inspection: Prior to assembly, a careful examination of the Tube and Fittings must be performed. All components must be checked for correct style, size, material, seal, and length. Inspect the Fitting and sealing surfaces for burrs, nicks, corrosion, missing seal or other imperfections. Do NOT use any component that displays any signs of nonconformance.

4.2 Tube and Fitting Assembly: Do not assemble a Parker Fitting with a Tube that is not specifically listed by Parker for that Fitting, unless authorized in writing by the engineering manager or chief engineer of the appropriate Parker division. The Tube must meet the requirements specified to the Fitting. The Parker published instructions must

be followed for assembling the Fittings to a Tube. These instructions are provided in the Parker Fitting catalog for the specific Parker Fitting being used, or by calling 1-800-CPARKER, or at www.parker.com.

4.3 Related Accessories: Do not preset or flange Parker Fitting components using another manufacturer's equipment or procedures unless authorized in writing by the engineering manager or chief engineer of the appropriate Parker division. Tube, Fitting component and tooling must be check for correct style, size and material. Operation and maintenance of Related Accessories must be in accordance with the operation manual for the designated Accessory.

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

4.5 Proper Connection of Ports: Proper physical installation of the Tube Assembly requires a correctly installed port connection insuring that no torque is transferred to the Tube when the Fittings are being tightened or otherwise during use.

4.6 External Damage: Proper installation is not complete without insuring that tensile loads, side loads, flattening, potential abrasion, thread damage or damage to sealing surfaces are corrected or eliminated. See instruction 2.10.

4.7 System Checkout: All air entrapment must be eliminated and the system pressurized to the maximum system pressure (at or below the Tube Assembly maximum working pressure) and checked for proper function and freedom from leaks. Personnel must stay out of potential hazardous areas while testing and using.

Routing: The Tube Assembly should be routed in such a manner so if a failure does occur, the escaping media will not cause personal injury or property damage. In addition, if fluid media comes in contact with hot surfaces, open flame or sparks, a fire or explosion may occur. See section 2.4.

5.0 HOSE AND FITTING MAINTENANCE AND REPLACEMENT INSTRUCTIONS

5.1 Even with proper selection and installation, Hose life may be significantly reduced without a continuing maintenance program. The severity of the application, risk potential from a possible Hose failure, and experience with any Hose failures in the application or in similar applications should determine the frequency of the inspection and the replacement for the Products so that Products are replaced before any failure occurs. Certain products require maintenance and inspection per industry requirements. Failure to adhere to these requirements may lead to premature failure. A maintenance program must be established and followed by the user and, at minimum, must include instructions 5.2 through 5.7

5.2 Visual Inspection Hose/Fitting: Any of the following conditions require immediate shut down and replacement of the Hose Assembly:

- Fitting slippage on Hose;
- Damaged, cracked, cut or abraded cover (any reinforcement exposed);
- Hard, stiff, heat cracked, or charred Hose;
- Cracked, damaged, or badly corroded Fittings;
- Leaks at Fitting or in Hose;
- Kinked, crushed, flattened or twisted Hose; and
- Blistered, soft, degraded, or loose cover.

5.3 Visual Inspection All Other: The following items must be tightened, repaired, corrected or replaced as required:

- Leaking port conditions;
- Excess dirt buildup;
- Worn clamps, guards or shields; and
- System fluid level, fluid type, and any air entrapment.

5.4 Functional Test: Operate the system at maximum operating pressure and check for possible malfunctions and leaks. Personnel must avoid potential hazardous areas while testing and using the system. See section 2.2.

5.5 Replacement Intervals: Hose assemblies and elastomeric seals used on Hose Fittings and adapters will eventually age, harden, wear and deteriorate under thermal cycling and compression set. Hose Assemblies and elastomeric seals should be inspected and replaced at specific replacement intervals, based on previous service life, government or industry recommendations, or when failures could result in unacceptable downtime, damage, or injury risk. See section 1.2. Hose and Fittings may be subjected to internal mechanical and/or chemical wear from the conveying fluid and may fail without warning. The user must determine the product life under such circumstances by testing. Also see section 2.5.

5.6 Hose Inspection and Failure: Hydraulic power is accomplished by utilizing high pressure fluids to transfer energy and do work. Hoses, Fittings and Hose Assemblies all contribute to this by transmitting fluids at high pressures. Fluids under pressure can be dangerous and potentially lethal and, therefore, extreme caution must be exercised when working with fluids under pressure and handling the Hoses transporting the fluids. From time to time, Hose Assemblies will fail if they are not replaced at proper time intervals. Usually these failures are the result of some form of misapplication, abuse, wear or failure to perform proper maintenance. When Hoses fail, generally the high pressure fluids inside escape in a stream which may or may not be visible to the user. Under no circumstances should the user attempt to locate the leak by "feeling" with their hands or any other part of their body. High pressure fluids can and will penetrate the skin and cause severe tissue damage and possibly loss of limb. Even seemingly minor hydraulic fluid injection injuries must be treated immediately by a physician with knowledge of the tissue damaging properties of hydraulic fluid.

If a Hose failure occurs, immediately shut down the equipment and leave the area until pressure has been completely released from the Hose Assembly. Simply shutting down the hydraulic pump may or may not eliminate the pressure in the Hose Assembly. Many times check valves, etc., are employed in a system and can cause pressure to remain in a Hose Assembly even when pumps or equipment are not operating. Tiny holes in the Hose, commonly known as pinholes, can eject small, dangerously powerful but hard to see streams of hydraulic fluid. It may take several minutes or even hours for the pressure to be relieved so that the Hose Assembly may be examined safely. Once the pressure has been reduced to zero, the Hose Assembly may be taken off the equipment and examined. It must always be replaced if a failure has occurred. Never attempt to patch or repair a Hose Assembly that has failed. Consult the nearest Parker distributor or the appropriate Parker division for Hose Assembly replacement information. Never touch or examine a failed Hose Assembly unless it is obvious that the Hose no longer contains fluid under pressure. The high pressure fluid is extremely dangerous and can cause serious and potentially fatal injury.

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

5.8 Refrigerant gases: Special care should be taken when working with refrigeration systems. Sudden escape of refrigerant gases can cause blindness if the escaping gases contact the eye and can cause freezing or other severe injuries if it contacts any other portion of the body.

5.9 Compressed natural gas (CNG): Parker CNG Hose Assemblies should be tested after installation and before use, and at least on a monthly basis per instructions provided on the Hose Assembly tag. The recommended procedure is to pressurize the Hose and check for leaks and to visually inspect the Hose for damage and to perform an electrical resistance test.

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

6.0 HOSE STORAGE

6.1 Age Control: Hose and Hose Assemblies must be stored in a manner that facilitates age control and first-in and first-out usage based on manufacturing date of the Hose and Hose Assemblies. Unless otherwise specified by the manufacturer or defined by local laws and regulations:

6.1.1 The shelf life of rubber hose in bulk form or hose made from two or more materials is 28 quarters (7 years) from the date of manufacture, with an extension of 12 quarters (3 years), if stored in accordance with ISO 2230;

6.1.2 The shelf life of thermoplastic and polytetrafluoroethylene hose is considered to be unlimited;

6.1.3 Hose assemblies that pass visual inspection and proof test shall not be stored for longer than 2 years.

6.1.4 Storage: Stored Hose and Hose Assemblies must not be subjected to damage that could reduce their expected service life and must be placed in a cool, dark and dry area with the ends capped. Stored Hose and Hose Assemblies must not be exposed to temperature extremes, ozone, oils, corrosive liquids or fumes, solvents, high humidity, rodents, insects, ultraviolet light, electromagnetic fields or radioactive materials.

Critical Applications

Saftey Overview

It is important to employ safe practices in the use of industrial hose due to the number of potentially dangerous applications encountered and products conveyed, and the number of people that may be involved or exposed. Strictly observe these simple practices to help avoid accidents.

- **Training:** Train all operators thoroughly
- **Evaluation:** Evaluate the application to determine the hose performance requirements
- **Selection:** Select the most appropriate hose and couplings for the application; ensure that the couplings are compatible with the media and hose, and securely attached to the hose
- **Service:** Regularly inspect and maintain both the hose and couplings while in service

While many industrial hose applications are potentially dangerous, some are of particular concern because their danger may not be readily apparent. This is especially true for applications involving untrained or inexperienced operators.

Aircraft Fueling Hose

Use only API/ISO qualified hose for aircraft fueling applications. Aircraft fueling hose incorporates high grade rubber compounds that dissipate static charges and will not contaminate fuel.

Note: To avoid fuel contamination do not use gasoline dispenser or farm pump hose to fuel aircraft.

Anhydrous Ammonia (NH3) Hose

Many accidents involving anhydrous ammonia occur due to selection of an incorrect hose for the application. Anhydrous ammonia hose must be specially designed and compounded to handle the media, with a perforated cover to prevent gas build-up amidst the layers of hose.

WARNING! Use ONLY anhydrous ammonia hose for anhydrous ammonia service. Contact with anhydrous ammonia in its liquid or gaseous (vapor) phase will burn skin, eyes and lungs, causing serious bodily injury or death.

- Do not use anhydrous ammonia hose for LPG service. It may fail suddenly and quickly. Anhydrous ammonia hose and LPG hose are frequently used in proximity and may be accidentally switched.
- Do not use with couplings containing o-rings, which may dry out, crack and fail over time. Do not use with male swivel couplings or other couplings containing hidden o-rings.

Anhydrous ammonia hose is designed to allow a limited amount of permeation of gas through the wall of the hose when in service, and staining of the hose cover in the pinpricked areas does not necessarily indicate leakage for a hose in service. However, a visible gas mist escaping through the hose is an indication of leakage. To verify the integrity of a hose in service, perform a hydrostatic test on the assembly; immediately remove from service any that fail the test.

Note: For non-agricultural or refrigeration applications, contact Parker.

Chemical Hose

A chemical hose system failure could cause the release of poisonous, corrosive, or flammable material resulting in property damage, serious bodily injury or death. All reputable manufacturers of chemical hose recommend specific hose constructions to handle various chemicals.

Refer to the chemical guides in this catalog, or contact Parker for technical assistance before using or recommending a hose product.

Handling

- Use care to prevent mishandling. Crushing or kinking of the hose can cause severe damage to the reinforcement.
- Use proper hose suspension equipment when lifting or dragging a hose to ensure that the recommended curvature is not exceeded. Avoid sharp bends at the end fittings and at manifold connections.

Operation

- Use safety precautions such as wearing eye or face protection, rubber gloves, boots, and other types of protective clothing.
- Monitor pressures and temperatures to ensure that the hose is not exposed to conditions above specified limits.
- Do not allow chemicals to contact the exterior of the hose or allow hose to lie in a pool of chemicals since the hose cover may not have the same level of corrosion resistance as the tube. Corrosive materials that come into contact with the reinforcing material will cause reduced service life and premature hose failure.

Temperature

Do not use chemical hose at pressures or temperatures exceeding those as specified for the product. Many chemical resistance guides are based on temperatures of 70°F (21°C). Elevated temperatures can change the chemical resistance ratings. Many chemicals will become more aggressive as temperatures increase, reducing the ability of hose compounds to withstand them. Contact Parker for chemical compatibility data at elevated temperatures. If no data exists, end users are required to perform compatibility testing at the desired temperature.

Gasoline Dispenser Hose

Millions of consumers operate gasoline pumps every day, increasing the concern for the safe use of dispensing equipment, including the hose. Since gasoline dispenser hoses are subject to frequent abuse, hose selection must include consideration of the rigors of the application. For maximum service life, select only the highest quality.

Note: To avoid fuel contamination do not use gasoline dispenser or farm pump hose to fuel aircraft.

LP Gas (Propane) Hose

Many accidents involving LP Gas occur due to selection of an incorrect hose for the application. LP Gas hose must be specially designed and compounded to handle the media, with a perforated cover to prevent gas build-up amidst the layers of the hose.

WARNING! Use ONLY LP Gas hose for LP Gas service. LP Gas possesses volatile characteristics that may produce fire or explosions causing property damage, serious bodily injury or death.

- Do not use LP Gas hose for anhydrous ammonia service. It may fail suddenly and quickly. Anhydrous ammonia hose and LPG hose are frequently used in proximity and may be accidentally switched.
- Do not use with couplings containing o-rings, which may dry out, crack and fail over time. Do not use with male swivel couplings or other couplings containing hidden o-rings.

LP Gas hose is designed to allow a limited amount of permeation of LP Gas through the wall of the hose when in service. The permeation is apparent when the hose is moist or in water, and bubbles may be perceived as leakage. However, a legitimate propane leak creates a frosting or icing on the surface of the hose or coupling.

To verify the integrity of a hose in service, perform a hydrostatic test on the assembly; immediately remove from service any hose that fails the test.

Natural Gas and LP Gas Hose

The molecules of natural gas are small, enhancing their ability to permeate through standard rubber or PVC hose constructions. The permeation process is more rapid as the working pressure increases, and natural gas accumulates with potentially dangerous consequences.

- Use only in a well-ventilated environment: Outdoors, or indoors with significant continuous air movement.
- Do not use LP Gas hose to replace fixed/rigid pipe where that material is more appropriate due to reduced permeation, overall strength and durability. Use rigid pipe, non-permeable tubing or hose with barrier constructions to convey natural gas whenever possible.

Petroleum Transfer Hose

- Do not use for oil or fuel transfer service in or on open water. Hose damage or failure may result in spillage and environmental damage. Use hose specifically designed for this application.
- Do not immerse in fuel. The hose cover compound may not be of sufficient grade to resist attack by the fuel. Use hose specifically designed for this application.

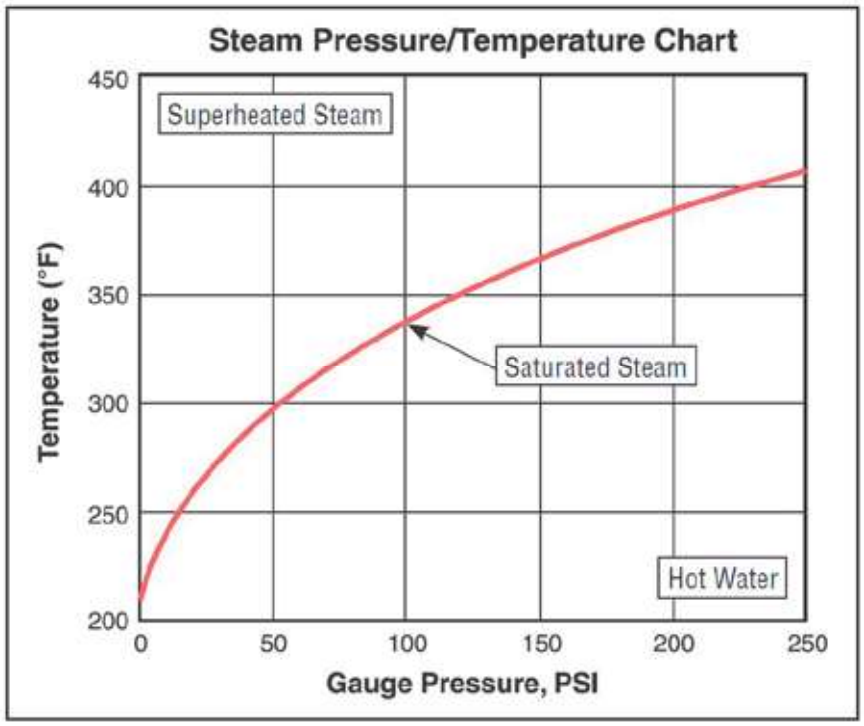
Steam Hose

Water changes to hot water and phases of steam when subjected to heat and pressure. The greater the pressure, the higher the temperature required to achieve and maintain a steam phase. If steam escapes, dangerous quantities of heat may be released very suddenly.

WARNING! Hot water, low pressure steam and high pressure steam may escape explosively and will scald skin, eyes and lungs, which may lead to severe bodily injury or death.

- Many steam systems incorporate detergents or rust inhibitors which may attack steam hose. Prior to using a steam hose with detergents or rust inhibitors, refer to the chemical guides in this catalog, or contact Parker.
- Drain steam hose after each use to reduce the possibility of hose popcorning while in service.

  The chart at the right represents the three forms of water when subjected to various combinations of heat and pressure. The red line represents the point at which hot water becomes saturated steam. The area below the red line is hot water; the area above the red line is superheated steam.



Welding Hose

Many accidents involving welding hose occur due to selection of an incorrect hose for the application. Welding hose must be specially designed and compounded to handle the media. Due to the extreme volatility of gases, the varying compatibility of gases with the various grades of hose, and the rough environment of many welding applications, it is crucial to select the correct welding hose.

WARNING! Welding gases possess volatile characteristics that may produce fire or explosions causing property damage, serious bodily injury or death.

- Replace all assemblies that show signs of abrading, abuse, age, damage or fatigue. Do not attempt to recouple, repair or splice hose assemblies.
- Fabricate hose assemblies using only crimped-on ferrules at least 25 mm long to ensure coverage and support of the coupling stem inside the hose.
- Couplings attached with bands or clamps may reduce the working pressure of the hose assembly to less than the maximum rated working pressure of the hose.

PVC / Thermoplastic Hose

Thermoplastic polymer compounds are designed to resist deterioration when exposed to a wide range of commercial chemicals and environmental conditions. The resistance to attack is based on many factors, including temperature, pressure, chemical concentration, exposure to ultraviolet light, velocity of the media and duration of exposure/ service (intermittent or constant). The user is solely responsible for making the final selection of the hose and tubing, and meeting all endurance, maintenance, performance, safety and warning requirements of the application.

WARNING! As temperature increases or decreases, burst pressure, safe working pressure, coupling retention properties, and other safety characteristics of the hose can significantly decrease. Failure to consider how temperature and other conditions affect hose performance may cause property damage, serious bodily injury or death.