

# TIFT-COMPOFLEX<sup>®</sup>

COMPOSITE HOSE PRODUCTS



2nd Edition



CHEMICAL



HYDROCARBON



MARINE



CRYOGENIC





*Romeoville, Illinois*

**ONE SOURCE FOR ALL YOUR FLEXIBLE HOSE NEEDS:  
Metal, Composite and Fluoropolymer hose and assemblies**

*For over 100 years, the US Hose Corporation has remained the prominent manufacturer of metal, fluoropolymer and composite hose products. As part of The United Flexible Group, our American factories in Romeoville, Illinois and Houston, Texas complement an impressive global network of specialty hose manufacturing facilities throughout North America and Europe.*

*Our diverse product line coupled with unparalleled engineering and customer service support enables our customers to provide a flexible hose solution for nearly any liquid and gaseous transfer application.*



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**Style designations (see product for specific availability):**

GG	Galvanized Steel inner and outer wires
PG	Polypropylene coated inner wire; Galvanized Steel outer wire
PP	Polypropylene Coated Steel inner and outer wire
PS	Polypropylene coated inner wire; T316 Stainless Steel outer wire
SG	T316 Stainless Steel inner wire; Galvanized Steel outer wire
SS	T316 Stainless Steel inner and outer wires
XX-F	above wire combinations with PTFE barrier layer

The point of transfer can be a vulnerable link in the chain of production, distribution and use of bulk chemicals.

For thousands of chemicals – for processing, transportation and bulk transfer applications — TIFT-Compoflex Composite Hoses are built to meet the critical requirements of chemicals and fluids handling.

### **CONSTRUCTION IS THE KEY**

#### **From bore liner to end fittings...**

TIFT-Compoflex products are engineered to deliver the maximum in chemical compatibility and on-the-job performance.

#### **The “Labyrinth Seal”...**

Multiple, tightly-wound component layers create a very long and complex course for fluids. Manufacturing techniques assure the proper gauge and pitch of the inner and outer wires. The “labyrinth seal” is self-energized by the internal pressure of liquids, and the action of all material components.

*The result is flexible composite hose...* that is seepage-free and leak-proof; that doesn't kink or collapse; that has great hoop strength, exceptional service life, and offers superior safety and performance.

#### **The “Barrier Layers”...**

TIFT-Compoflex Composite Hoses are built with multiple wraps of both polar and non-polar thermoplastic films. The barrier layer prevents permeation by both polar fluids (like methanol) and non-polar liquids (like gasoline).

*The result is composite hose...* with structural and cover layers that do not deteriorate due to chemical attack; that maintains maximum strength, flexibility and durability; that is compatible with the widest range of chemicals.

#### **Electrical Properties...**

Typically, most hose assemblies have full end-to-end electrical continuity (less than 10 ohms resistance) achieved by bonding both inner and outer wires to the end fittings.

Assemblies are also available with specified electrical resistance, semi-conductive or electrically discontinuous properties. For actual values, please contact US Hose Technical Department.

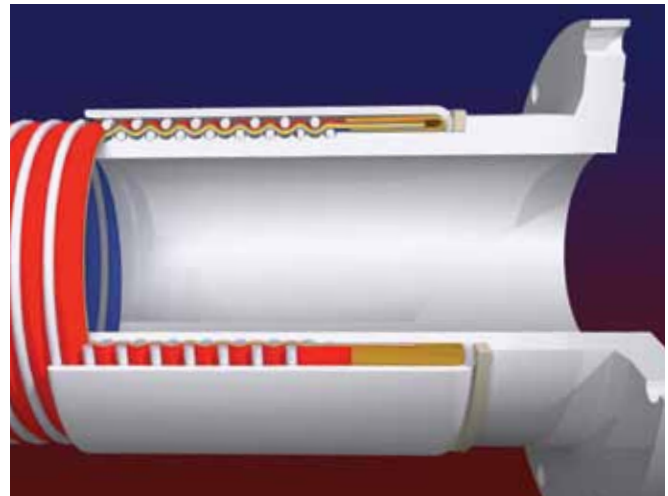
*The result is composite hose...* that prevents sparking and arc-over hazards and meets

the electrical properties requirements of your applications.

#### **Externally swaged end fittings...**

Each TIFT-Compoflex end fitting is specifically designed and manufactured to produce a perfect union with the hose. The ferrule and the tailpiece are permanently engaged by the external swage or crimp process.

*The result is...* hose and fittings perform to rated burst pressure and assure 100% performance of the complete hose assembly.



*Scrolled, double start” (dual helix) threading of hose to fitting assure secure attachment and maximum performance of hose assembly.*

### **REAL ADVANTAGES FOR YOUR APPLICATIONS**

#### **Compared to rubber hoses and metal hoses...**

TIFT-Compoflex Composite Hoses are light weight and flexible for easier handling. Their multi-layer construction prevents catastrophic failure. Flexibility is retained at low and even cryogenic temperatures. Hoses are protected from corrosion and attack by other liquids, UV and ozone by their tough, PVC-impregnated fabric cover.

#### **Engineered and Manufactured to high standards...**

TIFT-Compoflex Composite Hoses comply with various US and international standards including BS 5842, EN 13765 and US Coast Guard. Heavy-duty hoses for ocean going vessels can be approved to IMO Codes, BCH and IBC requirements.

#### **From Acetaldehyde to Zinc Halides...**

and thousands of liquids and compounds in between, TIFT-Compoflex composite hose are specifically engineered to meet your most challenging transfer applications.



**TOTALLY ENGINEERED FROM INNER WIRE TO COLOR CODED COVER FOR MAXIMUM SERVICE AND COMPATIBILITY...**

**Inner wire...** provides structural support and crush resistance.

High tensile strength Galvanized Steel, Stainless Steel or special polypropylene-covered inner wire available to provide optimum chemical compatibility and maximum hose service life.

**Inner fabric or film liner...** provides resistance to chemical attack and protects film layers and end fittings from abrasion. It provides axial strength and greater tensile strength.

Reinforced fabrics provide pressure capabilities and protect barrier film layers.

**Reinforcing fabrics and barrier films...** handle virtually all solvents, and are compatible with the vast majority

of commonly transported chemicals at normal transfer temperatures.

They are unaffected by 100% aromatics and prevent permeation by polar and non-polar liquids.

PTFE-PFA liners are available to handle more corrosive chemicals that would attack standard materials.

**PVC-impregnated cover...** prevents hose abrasion, and provides UV and ozone resistance.

**Stripe color-coded...** for corporate identification.

**Outer wire...** provides over-all hoop strength, structural integrity and double electrical continuity.

Galvanized Steel, Stainless Steel, or polypropylene coated is available.

**Externally swaged/crimped hose fittings...** Achieve perfect union and assure performance up to rated burst pressure.

**TIFT-COMPOFLEX HOSE ANATOMY**

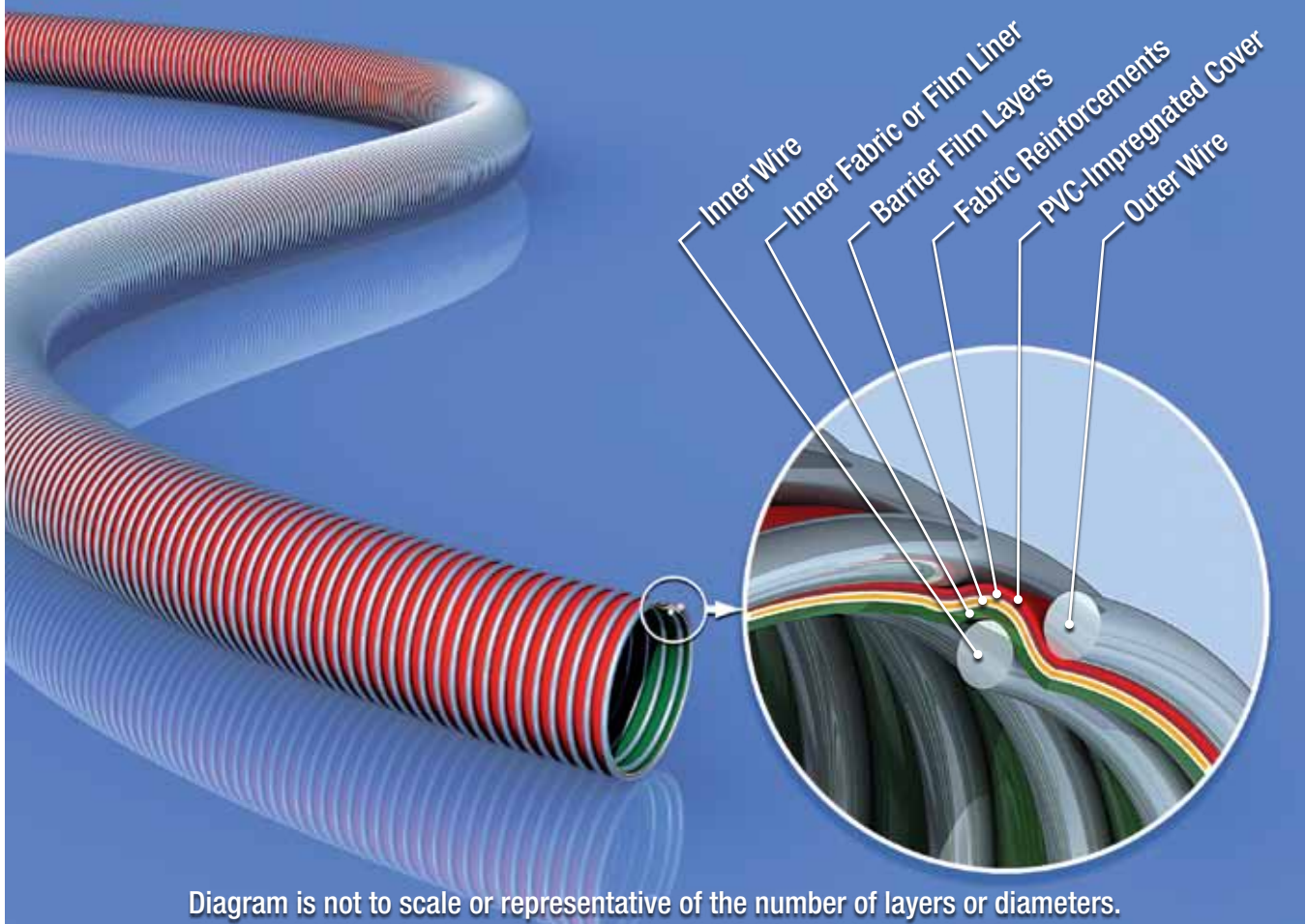


Diagram is not to scale or representative of the number of layers or diameters.

**CHEMICAL HOSES**

**CODE 949: CHEMIFLEX® PGL, PSL, SGL, SSL**



For low-pressure transfer applications in over-the-road vehicles, storage tank and rail car loading and unloading. Designed for use where light weight and flexibility are essential.

**Typical applications:** Tank-to-process chemicals handling, storage tank transfer and batching, drumming, manifolding, blending, etc., rail car and tank truck loading and delivery.

**Conveyants handled:** Suited for a wide range of inorganic and organic liquids and petroleum products at rated discharge pressure or full suction. Refer to the Chemical Compatibility Chart for specific recommendations.

**Features:**

- Light weight – easy to handle
- Flexible – even at low temperatures
- Tough PVC outer cover – resists dragging wear and abrasion
- Polypropylene liner with a polypropylene carcass – for maximum chemical resistance
- Safe and dependable – offers maximum flexibility
- Double end-to-end electrical continuity – prevents static electricity build-up and internal arcing
- Special polypropylene coated inner wire – fast dissipation of static electrical charges
- Rated for full vacuum

**Inner Wire**

- Polypropylene Coated Steel (T316 Stainless Steel available)

**Outer Wire**

- Galvanized Steel (T316 Stainless Steel available)

**Carcass**

- Polypropylene fabrics, films and polyester barrier layers

**Cover**

- Abrasion-resistant PVC-coated fabric

**Temperature Range**

- -22°F(-30°C) to +212°F(+100°C) (refer to Chemical Compatibility Chart)

**Color**

- Yellow with blue stripe

**Couplings**

- Externally swaged/crimped: NPT threaded; fixed, floating, reducing flanges; cam-and-groove quick-disconnect couplings, female lugs supplied per order

**CODE 949 – CHEMIFLEX® PGL, PSL, SGL, SSL:**

ID in (mm)	OD in (mm)	MAX WP* psi (bar)	MIN Bend Radius in (mm)	WEIGHT lb/ft (kg/m)	MAX LEN ft (m)
1 (25)	1½ (38)	200 (14)	4 (100)	0.6 (0.9)	60 (18)
1½ (38)	2 (50)	200 (14)	5 (125)	0.8 (1.2)	60 (18)
2 (50)	2½ (65)	200 (14)	7 (175)	1.2 (1.8)	75 (23)
3 (75)	3½ (88)	200 (14)	8 (200)	1.9 (2.9)	60 (18)
4 (100)	4½ (115)	150 (10.5)	12 (300)	2.7 (4.1)	60 (18)

\*4:1 safety factor



**CHEMICAL HOSES**

**CODE 951: CHEMIFLEX® PG, PS, SG, SS, PP**

A chemical utility hose for chemical plants, refineries, paint producers, paper mills and many other in-plant, liquid transfer operations as well as rail car loading and tank truck delivery, for robust operations.

**Typical applications:** Chemical plants, refineries, paint producers, paper mills, in-plant, rail car loading and tank truck delivery.

**Conveyants handled:** Highly corrosive acids and alkalis, aldehydes, amines, alephatics, aromatic fuels, chlorinated hydrocarbons, alcohols, esters, ketones, lacquers and petroleum products at rated discharge pressure or at full suction. Not recommended for service for many bromide, chloride or fluoride compounds. Refer to the Chemical Compatibility Chart for specific recommendations.

**Features:**

- Light weight – easy to handle
- Flexible – even at low temperatures
- Polypropylene liner with a heavy duty polypropylene carcass – for maximum chemical resistance and robustness
- Abrasion-resistant PVC-coated fabric outer cover – maximum durability and safety
- Double end-to-end electrical continuity – prevents static electricity build-up and internal arcing
- Choice of galvanized, Stainless Steel or polypropylene coated outer wire – for maximum durability depending on external environment
- Rated for full vacuum

- Inner Wire**
  - Polypropylene Coated Steel (T316 Stainless Steel available) (see Chemical Compatibility Chart for specific recommendations)
- Outer Wire**
  - Galvanized Steel (T316 Stainless Steel or polypropylene coated)
- Carcass**
  - All polypropylene fabrics and films barrier layers
- Cover**
  - Abrasion-resistant PVC-coated fabric
- Temperature Range**
  - -22°F(-30°C) to +212°F(+100°C) (refer to Chemical Compatibility Chart)
- Color**
  - Gray with blue stripe
- Couplings**
  - Externally swaged/crimped: NPT threaded; fixed, floating, reducing flanges; cam-and groove quick-disconnect couplings, female lugs supplied per order

**CODE 951 – CHEMIFLEX® PG, PS, SG, SS, PP:**

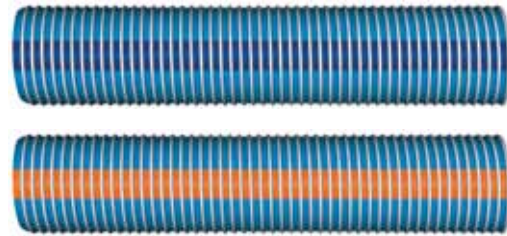
ID in (mm)	OD in (mm)	MAX WP* psi (bar)	MIN Bend Radius in (mm)	WEIGHT lb/ft (kg/m)	MAX LEN ft (m)
1 (25)	1½ (38)	250 (17.5)	4 (100)	0.6 (0.9)	60 (18)
1¼ (32)	1¾ (42)	250 (17.5)	5 (125)	0.75 (1.1)	60 (18)
1½ (38)	2 (50)	250 (17.5)	5 (125)	1.0 (1.5)	60 (18)
2 (50)	2½ (65)	250 (17.5)	6 (150)	1.5 (2.2)	75 (23)
2½ (65)	3 (75)	250 (17.5)	7 (175)	2.1 (3.1)	60 (18)
3 (75)	3½ (88)	250 (17.5)	8 (200)	2.3 (3.2)	60 (18)
4 (100)	4½ (115)	200 (14.0)	13 (325)	3.0 (4.5)	60 (18)

\*4:1 safety factor

**CHEMICAL HOSES**

**CODE 967 & CODE 968: CHEM-MASTER® PG, PS, SG, SS**

A chemical transfer hose constructed from an extra heavy weight polypropylene cast film liner, the liner is surrounded by multiple layers of chemical resistant polypropylene fabrics and films with special 100% aromatic resistant barrier layers embedded in the hose wall. Chem-Master® is available as a 200psi or 250psi hose, see chart below.



**Typical applications:** Chemical Transfer, Paint Transfers, Ink, Dye, Pigments, Solvents, Acids, Petroleum Products, Drumming, Tank Truck, Rail Car, Blending, Top Loading, Process Piping, Batch Processing, Storage Tank Transfer.

**End-Fittings:** Custom-made fittings available for every application. Available materials consist of carbon steel, T316 Stainless Steel, polypropylene, brass, and custom made specials with threaded, flanged, or quick-disconnect ends.

**Features:**

- Superior chemical resistance
- Easily cleaned
- Film liner allows for smoother, easier flow with less turbulence
- Light weight
- Flexible, even at low temperatures
- Easily handled and user friendly
- Lower cost alternative to hoses lined with PTFE
- Electrically continuous, prevents static electrical build-up and internal arcing
- U.V., abrasion, and ozone resistant outer cover
- Resistant to crushing and kinking
- Full or partial vacuum rated
- Long-term durability
- Fatigue resistant

**Inner Wire**

- Polypropylene Coated Steel (T316 Stainless Steel available)

**Outer Wire**

- Galvanized Steel (T316 Stainless Steel)

**Carcass**

- All polypropylene fabrics and film barrier layers

**Cover**

- Ozone, UV and abrasion resistant PVC cover

**Temperature Range**

- -22°F(-30°C) to +212°F(+100°C) (refer to Chemical Compatibility Chart)

**Color**

- Code 967: Sky blue with blue stripe, Code 968: Sky blue with dual orange and blue stripes

**Couplings**

- Externally swaged/crimped: NPT threaded; fixed, floating, reducing flanges; cam-and-groove quick-disconnect couplings, female lugs supplied per order

**CODE 967: CHEM-MASTER® PGL**

ID	OD	MAX WP*	MIN Bend Radius	WEIGHT	MAX LEN
in (mm)	in (mm)	psi (bar)	in (mm)	lb/ft (kg/m)	ft (m)
1 (25)	1½ (38)	200 (14)	4 (100)	0.6 (0.9)	60 (18)
1½ (38)	2 (50)	200 (14)	5 (125)	0.8 (1.2)	60 (18)
2 (50)	2½ (65)	200 (14)	7 (175)	1.2 (1.8)	75 (23)
3 (75)	3½ (88)	200 (14)	8 (200)	1.9 (2.9)	60 (18)
4 (100)	4½ (115)	150 (10.5)	12 (300)	2.7 (4.1)	60 (18)

**CODE 968: CHEM-MASTER® PG**

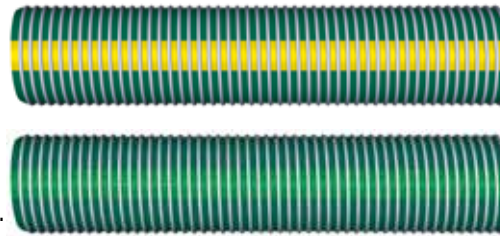
1 (25)	1½ (38)	250 (17.5)	4 (100)	0.6 (0.9)	60 (18)
1½ (38)	2 (50)	250 (17.5)	5 (125)	1.0 (1.5)	60 (18)
2 (50)	2½ (65)	250 (17.5)	6 (150)	1.5 (2.2)	75 (23)
3 (75)	3½ (88)	250 (17.5)	8 (200)	2.3 (3.2)	60 (18)
4 (100)	4½ (115)	200 (14.0)	13 (325)	3.0 (4.5)	60 (18)

\*4:1 Minimum Safety Factor



**CHEMICAL HOSES**  
**CODE 947: TEF-FLEX SG, SS**

TEF-FLEX SG hose is specially designed for in-plant transfer, rail and tank truck loading of many aggressive chemicals, solvents and acids including chloride and fluoride compounds. PTFE bore liner and special barrier layers assure maximum product life in applications where solvents and aromatics are transferred and electrical continuity and clean transfers are critical.



**Typical applications:** Chemical plants and refineries, chemical haulers, pharmaceutical manufacturers, DEF bulk deliveries.

**Conveyants handled:** Very aggressive or corrosive chemicals where a PTFE liner is mandatory at rated discharge pressure or at full suction. For extremely aggressive chemicals (butyl chloride, chlorosulphonic acid, oleum, >60% nitric acid, pentachlorethane) see Special Chemiflex® (page 10). Refer to the Chemical Compatibility Chart for specific recommendations.

**Features:**

- Light weight – easy to handle
- Flexible – even at low temperatures
- PTFE liner with a polypropylene and polyester carcass – for maximum chemical resistance
- Abrasion-resistant PVC-coated fabric outer cover – greater durability and safety
- Double end-to-end electrical continuity – prevents static electricity build-up and internal arcing
- Choice of galvanized or Stainless Steel outer wire – for maximum durability depending on external environment
- Rated for full vacuum

<b>Bore Liner</b>	• PTFE-PFA
<b>Inner Wire</b>	• T316 Stainless Steel (see Chemical Compatibility Chart for specific recommendations)
<b>Outer Wire</b>	• Galvanized Steel (T316 Stainless Steel available)
<b>Carcass</b>	• All polypropylene fabrics, films with polyester barrier layers
<b>Cover</b>	• Abrasion and ozone-resistant PVC-impregnated fabric
<b>Temperature Range</b>	• -22°F(-30°C) to +212°F(+100°C) (refer to Chemical Compatibility Chart)
<b>Color</b>	• Green with yellow stripe (SG), Green with green stripe (SS)
<b>Couplings</b>	• Externally swaged/crimped: NPT threaded; fixed, floating, reducing flanges; cam-and-groove quick disconnect couplings, sanitary tri-clover ends

**CODE 947 - TEF-FLEX SG, SS:**

ID in (mm)	OD in (mm)	MAX WP* psi (bar)	MIN Bend Radius in (mm)	WEIGHT lb/ft (kg/m)	MAX LEN ft (m)
1 (25)	1½ (38)	200 (14.0)	3.5 (89)	0.6 (0.9)	60 (18)
1½ (38)	2 (50)	200 (14.0)	4.5 (114)	1.0 (1.5)	60 (18)
2 (50)	2½ (65)	200 (14.0)	5.5 (140)	1.3 (2.0)	75 (23)
3 (75)	3½ (88)	200 (14.0)	8.5 (216)	2.1 (3.2)	60 (18)
4 (75)	4½ (115)	150 (10.5)	12.5 (318)	2.3 (3.5)	60 (18)

\*4:1 safety factor

**CHEMICAL HOSES**

**CODE 976/000: SPECIAL CHEMIFLEX® SG**

**CODE 976/001: SPECIAL CHEMIFLEX® SS**



SPECIAL CHEMIFLEX® hose is recommended in chemical production and transportation applications for chemicals that are not compatible with polypropylene materials.

**Typical applications:** Chemical plants and refineries, chemical haulers.

**Conveyants handled:** Conveyants handled: Very aggressive or corrosive chemicals where a PTFE liner is mandatory. Chemicals include: butyl chloride, chlorosulphonic acid, oleum and pentachlorethane at rated discharge pressure or at full suction. Refer to the Chemical Compatibility Chart for specific recommendations.

**Features:**

- Light weight – easy to handle
- Flexible – even at low temperatures
- PTFE films – maximum resistance to aggressive chemicals
- Abrasion-resistant PVC-impregnated fabric outer cover – greater durability and safety
- Double end-to-end electrical continuity – prevents static electricity build-up and internal arcing
- Choice of galvanized or Stainless Steel outer wire – for maximum durability depending on external environment
- Rated for full vacuum

**Bore Liner**

- Special PTFE and PFA films

**Inner Wire**

- T316 Stainless Steel (see Chemical Compatibility Chart for specific recommendations)

**Outer Wire**

- Galvanized Steel (T316 Stainless Steel available)

**Carcass**

- All polypropylene fabrics and films

**Cover**

- Abrasion-resistant PVC-impregnated fabric

**Temperature Range**

- -22°F(-30°C) to +212°F(+100°C) (refer to Chemical Compatibility Chart)

**Color**

- Red with blue stripe

**Couplings**

- Externally swaged/crimped: NPT threaded; fixed, floating, reducing flanges; cam-and-groove quick-disconnect couplings, female lugs supplied per order

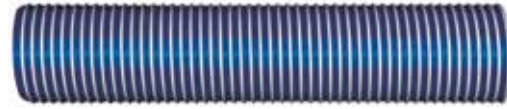
**CODE 976 - SPECIAL CHEMIFLEX® SG, SS:**

ID in (mm)	OD in (mm)	MAX WP* psi (bar)	MIN Bend Radius in (mm)	WEIGHT lb/ft (kg/m)	MAX LEN ft (m)
1 (25)	1½ (38)	250 (17.5)	4 (100)	0.6 (0.9)	60 (18)
1½ (38)	2 (50)	250 (17.5)	6 (150)	1.0 (1.5)	60 (18)
2 (25)	2½ (65)	250 (17.5)	7 (175)	1.4 (2.1)	75 (23)
3 (75)	3½ (88)	250 (17.5)	11 (275)	2.4 (3.6)	60 (18)
4 (100)	4½ (115)	200 (14)	14 (350)	3.0 (4.5)	60 (18)

\*4:1 safety factor



**HYDROCARBON HOSES**  
**CODE 954: FUELMASTER® GG**



FUELMASTER® GG hoses are designed for a wide range of fuel, oil and lubricant applications where lightweight and flexibility are essential.

**Typical applications:** Typical Applications: Rail car and tank truck loading and delivery, storage tank transfer, refinery process, drumming, manifolding, batching and blending.

**Conveyants handled:** Light distillates - gasoline, diesel fuel , paraffin, kerosene and 100% aromatics. Not recommended for corrosive and aggressive chemicals. Refer to the Chemical Compatibility Chart for specific recommendations.

**Features:**

- Complete product compatibility – for safe handling of all types of hydrocarbon conveyants
- Light weight – easy to handle in loading and delivery
- Flexible – even at low temperatures
- Tough PVC outer cover – resists dragging wear and abrasion
- Safe and dependable – tested to industry standard 1½ times rated working pressure
- Double end-to-end electrical continuity – prevents static electricity build-up and internal arcing
- Rated for full vacuum

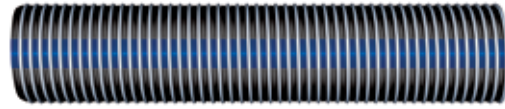
<b>Inner Wire</b>	• Galvanized Steel
<b>Outer Wire</b>	• Galvanized Steel
<b>Carcass</b>	• Multiple layers of Polypropylene fabrics, films and polyester barrier layers
<b>Cover</b>	• Abrasion-resistant PVC-impregnated fabric
<b>Temperature Range</b>	• -22°F(-30°C) to +212°F(+100°C) (refer to Chemical Compatibility Chart)
<b>Color</b>	• Blue with blue stripe
<b>Couplings</b>	• Externally swaged/cripped: NPT threaded; fixed, floating, reducing flanges; cam-and-groove quick-disconnect couplings, female lugs supplied per order

**CODE 954 - FUELMASTER® GG:**

ID in (mm)	OD in (mm)	MAX WP* psi (bar)	MIN Bend Radius in (mm)	WEIGHT lb/ft (kg/m)	MAX LEN ft (m)
1 (25)	1½ (38)	200 (14)	4 (100)	0.6 (0.9)	60 (18)
1½ (38)	2 (50)	200 (14)	5 (125)	0.8 (1.2)	60 (18)
2 (50)	2½ (65)	200 (14)	5 (125)	1.2 (1.8)	75 (23)
3 (75)	3½ (88)	200 (14)	7 (175)	1.8 (2.7)	60 (18)
4 (100)	4½ (115)	150 (10.5)	10 (250)	2.5 (37)	60 (18)

\*4:1 safety factor

**HYDROCARBON HOSES**  
**CODE 901: HEAVY DUTY FUELMASTER®**



HEAVY DUTY FUELMASTER® hoses are appropriate for transfer of conveyants from storage tanks, process piping or loading arms to rail cars and tank trucks.

**Typical applications:** Ideal for transfer from storage tanks, process piping or loading arms to rail car or tank truck, tank-to-process handling and manifolding/batching.

**Conveyants handled:** Light distillates - gasoline, diesel fuel, paraffin, kerosene and 100% aromatics as well as black oils and heavy lubricants. Not recommended for corrosive and aggressive chemicals. Refer to the Chemical Compatibility Chart for specific recommendations.

**Features:**

- Complete product compatibility – for safe handling of all types of hydrocarbon conveyants, 100% aromatics and other non-aggressive chemicals and solvents
- Durable – easy to handle
- Retains Flexibility – even at very low temperatures
- Tough PVC outer cover – resists dragging wear and abrasion
- Safe and dependable – tested to industry standard 1½ times rated working pressure
- Double end-to-end electrical continuity – prevents static electricity build-up and internal arcing
- Rated for full vacuum

<b>Inner Wire</b>	• Galvanized Steel
<b>Outer Wire</b>	• Galvanized Steel
<b>Carcass</b>	• Multiple layers of Polypropylene fabric, film and polyester barrier layers
<b>Cover</b>	• Abrasion-resistant PVC-impregnated fabric
<b>Temperature Range</b>	• -20F(-30°C) to +212°F(+100°C) (refer to Chemical Compatibility Chart)
<b>Color</b>	• Black with blue stripe
<b>Couplings</b>	• Externally swaged/crimped: NPT threaded; fixed floating, reducing flanges; cam-and-groove quick-disconnect couplings, female lugs supplied per order

**CODE 901 - HEAVY DUTY FUELMASTER®:**

ID	OD	MAX WP*	MIN Bend Radius	WEIGHT	MAX LEN
in (mm)	in (mm)	psi (bar)	in (mm)	lb/ft (kg/m)	ft (m)
1 (25)	1½ (38)	250 (17.5)	4 (100)	0.6 (0.9)	60 (18)
1½ (38)	2 (50)	250 (17.5)	5 (125)	1.0 (1.5)	60 (18)
2 (50)	2½ (65)	250 (17.5)	6 (150)	1.5 (2.3)	75 (23)
2½ (65)	3 (75)	250 (17.5)	7 (175)	2.1 (3.1)	60 (18)
3 (75)	3½ (88)	250 (17.5)	8 (200)	2.3 (3.5)	60 (18)
4 (100)	4½ (115)	200 (14)	13 (325)	3.0 (4.5)	60 (18)

\*4:1 safety factor



**HYDROCARBON HOSES**  
**CODE 901/401: BOTTOM LOADING HOSE**

BOTTOM LOADING HOSES are designed for production refinery and bulk distribution facilities in bottom loading operations.

**Typical applications:** Bottom loading at production refineries and bulk distribution terminals. Suitable for all hose loading arms.

**Conveyants handled:** Light distillates – gasoline, diesel fuel, paraffin, kerosene and 100% aromatics, MTBE (methyl tert-butyl ether) and MEK (methyl ethyl ketone). Also suitable for heavier lubricants. Not recommended for corrosive and aggressive chemicals. Refer to the Chemical Compatibility Chart for specific recommendations.

**Features:**

- Complete product compatibility – for safe handling of all types refined hydrocarbons
- Light and easy to handle – even at low temperatures
- Stays flexible under charge
- Fatigue resistant – doesn't collapse in regular use
- Mobility for easy connect/disconnect
- Safe and dependable – tested to industry standard 1½ times rated working pressure
- Double end-to-end electrical continuity – prevents static electricity build-up and internal arcing
- Flame retardant cover available on request

<b>Inner Wire</b>	• Galvanized Steel
<b>Outer Wire</b>	• Galvanized Steel
<b>Carcass</b>	• Aromatic resistant barrier layers with multiple layers of polypropylene fabric and film
<b>Cover</b>	• Abrasion-resistant PVC-impregnated fabric
<b>Temperature Range</b>	• -22°F(-30°C) to +212°F(+100°C) (refer to Chemical Compatibility Chart)
<b>Color</b>	• Black, red, blue, light green – other API colors available – with blue stripe
<b>Couplings</b>	• Fixed or floating TTMA flanged ends. Straight or 90 degree elbows available, in carbon or Stainless Steel

**Note:** For 901/401 Bottom Loading Hose measure the lengths as either “pressurized” or “empty” . The effect of elongation must be calculated in order to produce the correctly manufactured length and price.

**CODE 901/401 - BOTTOM LOADING HOSE:**

ID in (mm)	OD in (mm)	MAX WP* psi (bar)	MIN Bend Radius in (mm)	WEIGHT lb/ft (kg/m)	MAX LEN ft (m)
3 (75)	3½ (88)	200 (14)	8 (200)	2.3 (3.5)	Custom
4 (100)	4½ (115)	200 (14)	13 (325)	3.0 (4.5)	Custom

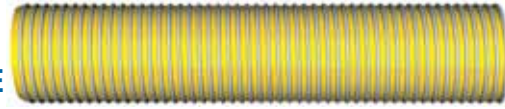
\*4:1 safety factor

**HYDROCARBON HOSES**

**CODE 944/002: CHEMIFLEX® 25 VAPOR RECOVERY HOSE**

**CODE 944: CHEMIFLEX® 25 MARINE VRH**

**GG, PG, SG, SS AND XX-F**



CHEMIFLEX® 25 VRH hoses are used for the recovery of volatile hydrocarbon vapors in rail car, truck unloading and in marine terminal applications.

**Typical applications:** 3” and 4” hoses are specifically designed for compliance with EPA Stage 1 requirements for recovering VOC vapors in rail car or tank truck loading at bulk terminals and unloading at gas stations. Chemiflex® 25 in larger diameters are specifically designed to meet and exceed the requirements of The United States Coast Guard regulations of marine vapor recovery, 33 CFR Section 154.810, Vapor Line Connections. Chemiflex® 25 can recover hydrocarbon and other light VOC’s during ship and barge loading at bulk storage terminals, refineries and other plant operations in a marine environment.

**Vapors handled:** Hydrocarbons and 100% aromatics

**Features:**

- Lightweight – easy to handle
- Excellent resistance to kinking or crushing
- Long-term durability
- Very flexible at low temperatures
- Abrasion resistant – stands up to dragging
- Double end-to-end electrical continuity – prevents static electricity build-up and internal arcing
- Rated for full vacuum
- Special short length, light weight couplings are used

**Inner Wire**

- Galvanized Steel

**Outer Wire**

- Galvanized Steel

**Carcass**

- Polypropylene bore fabric with multiple aromatic resistant film layers and reinforced fabric

**Cover**

- Abrasion-resistant PVC-impregnated fabric

**Temperature Range**

- -22°F(-30°C) to +212°F(+100°C) (refer to Chemical Compatibility Chart)

**Color**

- Yellow with a yellow stripe

**Couplings**

- Externally swaged/crimped nipples, flanges and threaded; quick couplers & victaulic fittings; supplied per order

**Options**

- PTFE lined with SS inner wire for aggressive chemical vapors and version for sewer by-pass back up systems

**CODE 944/002 - CHEMIFLEX® 25 VRH:**

ID in (mm)	OD in (mm)	MAX WP* psi (bar)	MIN Bend Radius in (mm)	WEIGHT lb/ft (kg/m)	MAX LEN ft (m)
3 (75)	3½ (88)	200 (14)	7 (175)	1.8 (2.7)	60 (18)
4 (100)	4½ (115)	150 (10.5)	10 (250)	2.5 (3.8)	60 (18)

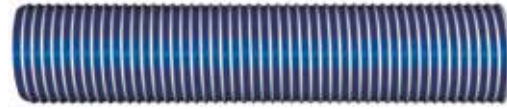
**CODE 944 - CHEMIFLEX® 25 MARINE VRH:**

ID in (mm)	OD in (mm)	MAX WP* psi (bar)	MIN Bend Radius in (mm)	WEIGHT lb/ft (kg/m)	MAX LEN ft (m)
6 (150)	7 (175)	110 (7.6)	17 (425)	3.7 (5.0)	66 (20)
8 (200)	9½ (238)	110 (7.6)	27 (675)	5.3 (8.0)	55 (17)
10 (250)	11½ (288)	110 (7.6)	33 (825)	8.0 (12.0)	40 (12)

\*4:1 safety factor



**MARINE HOSES (HYDROCARBON HOSES)  
CODE 982: HEAVY DUTY OILMASTER®**



HEAVY DUTY OILMASTER® hoses are designed for dockside and marine terminal transfer of fuels, lubricants and aromatics at rated discharge or at full suction. Meet IMO, BCH, IBC codes and current USCG regulations.

**Typical applications:** Ideal hose for loading and unloading barges, tankers, bunkering service and other dockside operations at marine terminals. Spiral-wound high tensile Galvanized Steel inner and outer wires provide strength and flexibility to maintain hose integrity under stress and strain of ship and barge movement.

**Compliance:** IMO type approval for working temperatures –4°F(–20°C) to + 140°F(+60°C) and pressure to 150 psi (10.5 bar). USCG tested and certified to 33 CFR, Section 154.500.

**Conveyants handled:** Gasoline, diesel fuel, paraffin, kerosene, lubricating oils and 100% aromatics as well as black oils and heavy lubricants and solvents. Not recommended for corrosive and aggressive chemicals. Refer to the Chemical Compatibility Chart for specific recommendations.

**Features:**

- Complete product compatibility – for safe handling of all types of oil-based, 100% aromatics and other non-aggressive chemicals
- Retains Flexibility – even at very low temperatures
- Tough PVC outer cover – resists dragging wear and abrasion
- Safe and dependable – tested to industry standard 1½ times rated working pressure required by US Coast Guard
- Designed, for IMO type approval, to a burst pressure 5 times rated working pressure (150 psi/10.5 bar) throughout working temperature range (to 140°F)
- Double end-to-end electrical continuity – prevents static electricity build-up and internal arcing
- Rated for full vacuum

<b>Inner Wire</b>	• High tensile strength Galvanized Steel
<b>Outer Wire</b>	• High tensile strength Galvanized Steel
<b>Carcass</b>	• Multiple layers of Polypropylene fabric, film and polyester barrier layers
<b>Cover</b>	• Abrasion-resistant PVC-impregnated fabric
<b>Temperature Range</b>	• –22°F(–30°C) to +212°F(+100°C) (refer to Chemical Compatibility Chart)
<b>Color</b>	• Marine blue with blue stripe
<b>Couplings</b>	• Externally swaged nipples; fixed, floating or reducing flanges, threaded males, and cam-and-groove couplers and victaulics

**CODE 982 - HEAVY DUTY OILMASTER®:**

ID	OD	MAX WP*	MAX WP**	MIN Bend Radius	WEIGHT	MAX LEN
in (mm)	in (mm)	psi (bar)	psi (bar)	in (mm)	lb/ft (kg/m)	ft (m)
4 (100)	5 (125)	250 (17.5)	200 (14)	16 (400)	5.3 (8.0)	60 (18)
6 (150)	7 (175)	250 (17.5)	200 (14)	20 (500)	7.3 (11.0)	66 (20)
8 (200)	9½ (238)	250 (17.5)	200 (14)	29 (725)	11.0 (16.5)	55 (17)
10 (250)	11½ (288)	200 (14)	150 (10.5)	36 (900)	14.0 (21)	40 (12)

\*4:1 safety factor

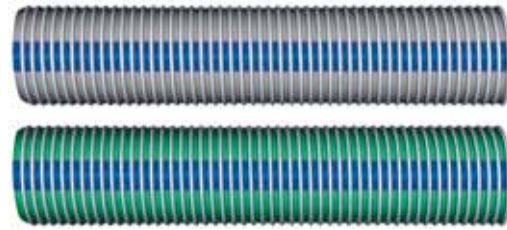
\*\*5: 1 safety factor

**MARINE HOSES (CHEMICAL HOSES)**

**CODE 998: HEAVY DUTY CHEMIFLEX® PG, PS**

**CODE 969: HEAVY DUTY CHEMIFLEX® SG, SS**

HEAVY DUTY CHEMIFLEX® hoses are ideal for marine service handling a wide range of aggressive chemicals.



**Typical applications:** Typical applications: Ideal hose for loading and unloading barges, tankers, bunkering service and other dockside operations at marine terminals. High tensile strength spiral-wound inner and outer wires provide strength and flexibility to maintain hose integrity under stress and strain of ship and barge movement.

**Compliance:** Factory fitted assemblies may be ordered with full third party certification of compliance with IMO Section 1.21. All assemblies are manufactured, tested and marked in compliance with US Coast Guard regulations. IMO type approval for working temperatures -4°F(-20°C) to + 140°F(+60°C) and pressure to 150 psi (10.5 bar).

**Conveyants handled:** Highly corrosive acids and alkalis, aldehydes, amines, aliphatics, aromatic fuels, chlorinated hydrocarbons, alcohols, esters, ketones, lacquers and petroleum products at rated discharge pressure or at full suction. Not recommended for service for many bromide, chloride or fluoride compounds. Refer to the Chemical Compatibility Chart for specific recommendations.

**Features:**

- Maximum chemical resistance - for safe handling of aggressive chemicals in dockside operations
- Retains Flexibility – even at very low temperatures
- Abrasion resistant – tough PVC-impregnated fabric cover resists dragging wear and abrasion
- Safe and dependable – tested to industry standard 1½ times rated working pressure
- Choice of galvanized or Stainless Steel outer wire – for maximum durability depending on external environment
- Designed, for IMO type approval, to a burst pressure 5 times rated working pressure (150 psi/10.5 bar) throughout working temperature range (+140°F)
- Double end-to-end electrical continuity – prevents static electricity build-up and internal arcing
- Rated for full vacuum

**Inner Wire**

- High tensile strength Polypropylene Coated Steel or T316 Stainless Steel

**Outer Wire**

- High tensile strength Galvanized Steel or T316 Stainless Steel

**Carcass**

- Multiple layers of heavy duty polypropylene fabric, film and polyester barrier layers

**Cover**

- Abrasion-resistant PVC-impregnated fabric

**Temperature Range**

- -22°F(-30°C) to +212°F(+100°C) (refer to Chemical Compatibility Chart)

**Color**

- Gray (PG, PS) or light green (SG, SS)

**Couplings**

- Externally swaged nipples; fixed , floating or reducing flanges and cam-and-groove couplers

**CODE 998 - HEAVY DUTY CHEMIFLEX® PG, PS:**

**CODE 969 - HEAVY DUTY CHEMIFLEX® SG, SS:**

ID in (mm)	OD in (mm)	MAX WP* psi (bar)	MAX WP** psi (bar)	MIN Bend Radius in (mm)	WEIGHT lb/ft (kg/m)	MAX LEN ft (m)
3 (75)	4 (100)	200 (14)	150 (10.5)	11 (275)	3.0 (4.5)	60 (18)
4 (100)	5 (125)	250 (17.5)	200 (14)	16 (400)	5.3 (8.0)	60 (18)
6 (150)	7 (175)	250 (17.5)	200 (14)	20 (500)	7.3 (10.9)	66 (20)
8 (200)	9½ (238)	250 (17.5)	200 (14)	29 (725)	11.0 (16.5)	55 (17)
10 (250)	11½ (288)	150 (10.5)	150 (10.5)	36 (900)	14.0 (21)	40 (12)

\*4:1 safety factor

\*\*5: 1 safety factor

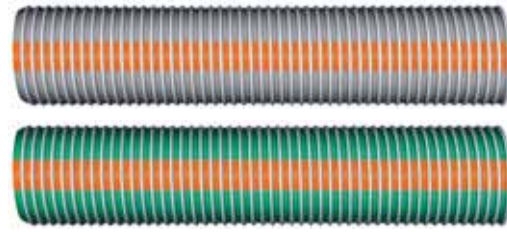


**MARINE HOSES (CHEMICAL HOSES)**

**CODE 998/005: HEAVY DUTY CHEMIFLEX® PG-F, PS-F**

**CODE 969/005: HEAVY DUTY CHEMIFLEX® SG-F, SS-F**

HEAVY DUTY CHEMIFLEX® hoses are ideal for marine service handling a wide range of aggressive chemicals, where additional chemical resistance is needed with a PTFE/PFA liner.



**Typical applications:** Typical applications: Ideal hose for loading and unloading barges, tankers, bunkering service and other dockside operations at marine terminals. High tensile strength spiral-wound inner and outer wires provide strength and flexibility to maintain hose integrity under stress and strain of ship and barge movement.

**Compliance:** All assemblies are manufactured, tested and marked in compliance with US Coast Guard regulations, 33 CFR Section 154.500.

**Conveyants handled:** Highly corrosive acids and alkalis, aldehydes, amines, alephatics, aromatic fuels, chlorinated hydrocarbons, alcohols, esters, ketones, lacquers and petroleum products at rated discharge pressure or at full suction. Not recommended for service for many bromide, chloride or fluoride compounds. Refer to the Chemical Compatibility Chart for specific recommendations.

**Features:**

- Maximum chemical resistance - for safe handling of aggressive chemicals in dockside operations
- Retains Flexibility – even at very low temperatures
- Abrasion resistant – tough PVC-impregnated fabric cover resists dragging wear and abrasion
- Safe and dependable – tested to industry standard 1½ times rated working pressure
- Choice of galvanized or Stainless Steel outer wire – for maximum durability depending on external environment
- PTFE/PFA lining – for easy cleaning and minimal entrapment
- Double end-to-end electrical continuity – prevents static electricity build-up and internal arcing
- Rated for full vacuum

<b>Inner Wire</b>	• High tensile strength Polypropylene Coated Steel or T316 Stainless Steel
<b>Outer Wire</b>	• High tensile strength Galvanized Steel or T316 Stainless Steel
<b>Carcass</b>	• Multiple layers of heavy duty polypropylene fabric, film and polyester barrier layers
<b>Cover</b>	• Abrasion-resistant PVC-impregnated fabric
<b>Temperature Range</b>	• -22°F(-30°C) to +212°F(+100°C) (refer to Chemical Compatibility Chart)
<b>Color</b>	• Gray with orange stripe (PG-F) or Light Green with orange stripe (SG-F)
<b>Couplings</b>	• Externally swaged nipples; fixed , floating or reducing flanges and cam-and-groove couplers

**CODE 998/005: HEAVY DUTY CHEMIFLEX® PG-F, PS-F**

**CODE 969/005: HEAVY DUTY CHEMIFLEX® SG-F, SS-F**

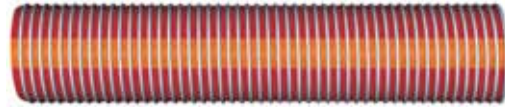
ID	OD	MAX WP*	MAX WP**	MIN Bend Radius	WEIGHT	MAX LEN
in (mm)	in (mm)	psi (bar)	psi (bar)	in (mm)	lb/ft (kg/m)	ft (m)
4 (100)	5 (125)	250 (17.5)	200 (14)	16 (400)	5.3 (8.0)	60 (18)
6 (150)	7 (175)	250 (17.5)	200 (14)	20 (500)	7.3 (10.9)	66 (20)
8 (200)	9½ (238)	250 (17.5)	200 (14)	29 (725)	11.0 (16.5)	55 (17)
10 (250)	11½ (288)	150 (10.5)	150 (10.5)	36 (900)	14.0 (21)	40 (12)

\*4:1 safety factor

\*\*5: 1 safety factor

**SPECIALTY HOSES**

**CODE 474: THERMMASTER® GG, SG, SS**



U.S. Hose Corporation TIFT Compoflex® ThermMaster® Code 474. A special composite hose manufactured with special high temperature thermoplastic films and fabrics with a standard fluoropolymer film liner and either a high tensile strength T316 Stainless Steel or Galvanized Steel inner and outer wire helixes.

**Typical applications:** Suitable for molten sulphur and hot lube oil applications.

**Conveyants handled:** Liquids to 325°F (162°C).

**Features:**

- Compatible with most general oils and chemicals at 325°F (162°C)
- For vacuum and pressure applications

**Inner Wire**

- High tensile strength Galvanized Steel or T316 Stainless Steel

**Outer Wire**

- High tensile strength Galvanized Steel or T316 Stainless Steel

**Carcass**

- Special fabrics and films

**Cover**

- Abrasion, ozone and UV resistant

**Temperature Range**

- -22°F(-30°C) to + 325°F(+162°C) (refer to Chemical Compatibility Chart)

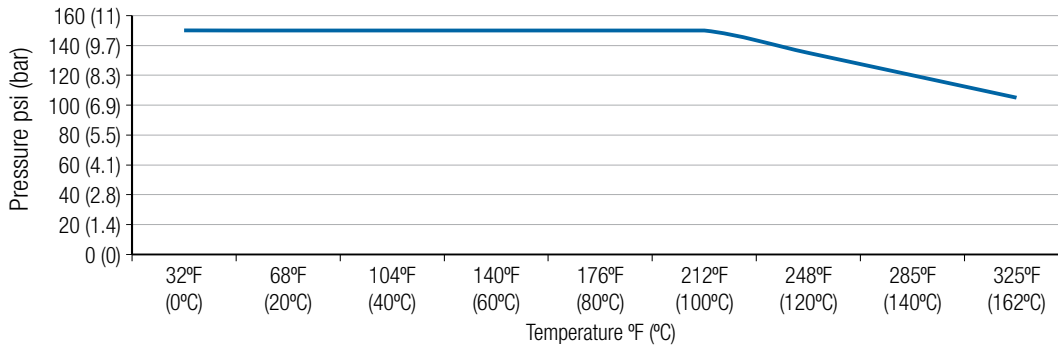
**Color**

- Red cover with an orange stripe

**Couplings**

- Externally swaged/crimped nipples, flanges, quick couplers, female lugs

**TEMPERATURE/PRESSURE DERATING GRAPH FOR THERMMASTER CODE 474 HOSE ONLY**



1. Hose must not be in constant use at limits of pressure, bend radius and temperature.
2. Performance is for hose under constant pressure. A further 50% derating factor must be applied for a hose that is subjected to pulsing pressure.
3. For Temperatures below 22°F (minus 30°C), please consult our Cryoflex products on page 26 onwards.

**Note: This is a factory assembled product only.**

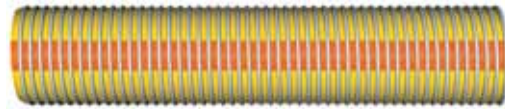
**CODE 474: THERMMASTER®**

ID in (mm)	OD in (mm)	MAX WP* psi (bar)	MIN Bend Radius in (mm)	WEIGHT lb/ft (kg/m)	MAX LEN ft (m)
1	1½ (38)	150 (10)	4 (102)	0.60 (0.73)	60 (18)
1½	2 (50)	150 (10)	5½ (140)	0.90 (1.10)	60 (18)
2	2½ (65)	150 (10)	7 (178)	1.30 (1.59)	75 (23)
3	3½ (88)	150 (10)	11½ (292)	1.90 (2.33)	60 (18)
4	4½ (115)	150 (10)	16 (406)	2.80 (3.43)	60 (18)



**SPECIALTY HOSES**

**CODE 959: BIOFUELMASTER™ PGL, SGL, SSL, PPL**



TIFT COMPOFLEX® BIOFUELMASTER™. The Alternative Fuel Hose. Alternative fuels like E85 and Biodiesel are being developed to supplement to the world’s existing fuel supplies. “BioFuelMaster™” provides excellent resistance for the safe transfer of these fuels and their derivatives.

Our TIFT Compoflex “BioFuelMaster™” is available in materials recommended by The National Biodiesel Board as well as our own propriety materials. Yellow cover with an orange stripe.

**Typical applications:** Tank truck deliveries, rail car top loading, drumming, blending transfers.

**Compliance:** Hydrostatically tested to 1½ times MAWP.

**Conveyants handled:** E85, 100% ethanol, Biofuels, biodiesel and B100.

**Features:**

- Light weight construction allows flexibility on cold days
- Abrasion, ozone and UV resistant
- Double end-to-end electrical continuity
- Specially marked for easy product identification
- Rated for full vacuum

**Inner Wire**

- Polypropylene Coated Steel or T316 Stainless Steel

**Outer Wire**

- Galvanized Steel or T316 Stainless Steel

**Carcass**

- Polypropylene fabric and films with barrier layer

**Cover**

- Abrasion, ozone and UV resistant

**Temperature Range**

- -20°F(-30°C) to + 212°F(+100°C) (refer to Chemical Compatibility Chart)

**Color**

- High-visibility yellow cover with orange stripe

**Couplings**

- Externally swaged/crimped threaded couplings, flanges, quick couplers

**CODE 959: BIOFUELMASTER™**

ID in (mm)	OD in (mm)	MAX WP* psi (bar)	MIN Bend Radius in (mm)	WEIGHT lb/ft (kg/m)	MAX LEN ft (m)
1 (25)	1½ (200)	250 (17.5)	4 (100)	0.6 (0.9)	60 (18)
1½ (38)	2 (200)	250 (17.5)	5 (125)	1.0 (1.5)	60 (18)
2 (50)	2½ (200)	250 (17.5)	6 (150)	1.5 (2.2)	75 (23)
3 (75)	3½ (200)	250 (17.5)	8 (200)	2.3 (3.2)	60 (18)
4 (100)	4¾ (150)	200 (14)	13 (325)	3.0 (4.5)	60 (18)

**SPECIALTY HOSES**

**CODE 949020: UHMW COVERED CHEMIFLEX®**

**UPG, UPS, USG, USS**



Chemiflex® is now available with an Ultra High Molecular Weight polyethylene cover. UHMW offers superior wear and impact resistance for the hoses exterior. High visibility purple offers easier identification in the field.

UHMW also offers excellent chemical resistance and is suitable for submersible pump and tank cleaning operations.

**Typical applications:** Chemical plants, paint producers, paper mills, tank truck deliveries, where high abrasion may take place.

**Conveyants handled:** Highly corrosive acids and alkalis, aldehydes, amines, aliphatics, aromatic fuels, chlorinated hydrocarbons, alcohols, esters, ketones, lacquers and petroleum products at rated discharge pressure or at full suction. Not recommended for service for many bromide, chloride or fluoride compounds. Refer to the Chemical Compatibility Chart for specific recommendations.

**Features:**

- Light weight – easy to handle
- Flexibility – even at very low temperatures
- Superior abrasion resistant UHMW cover
- Double end-to-end electrical continuity
- Rated for full vacuum or pressure applications

**Inner Wire**

- Polypropylene Coated Steel or T316 Stainless Steel

**Outer Wire**

- Galvanized Steel or T316 Stainless Steel

**Carcass**

- All polypropylene fabrics and films

**Cover**

- UHMW cover – super abrasion, UV and ozone resistant

**Temperature Range**

- -20°F(-30°C) to + 180°F(+82°C) (refer to Chemical Compatibility Chart)

**Color**

- Purple with a blue stripe

**Couplings**

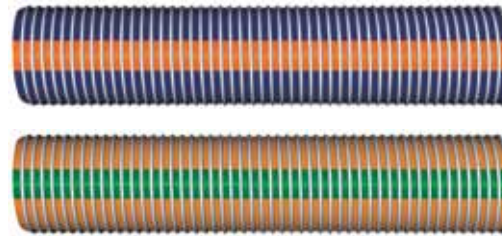
- Externally swaged/crimped threaded nipples, flanges, quick couplings, female lugs

**CODE 949020-CHEMIFLEX UPG, UPS, USG, USS**

ID in (mm)	OD in (mm)	MAX WP* psi (bar)	MIN Bend Radius in (mm)	WEIGHT lb/ft (kg/m)	MAX LEN ft (m)
1 (25)	1½ (38)	200 (14)	4 (100)	0.6 (0.9)	60 (18)
1½ (38)	2 (50)	200 (14)	5 (125)	0.8 (1.2)	60 (18)
2 (50)	2½ (65)	200 (14)	7 (175)	1.2 (1.8)	75 (23)
3 (75)	3½ (88)	200 (14)	8 (200)	1.9 (2.9)	60 (18)
4 (100)	4½ (115)	150 (10.5)	12 (300)	2.7 (4.1)	60 (18)



**MARINE HOSES (HYDROCARBON HOSES)**  
**CODE 982/018: HEAVY DUTY MTBE-MASTER**  
**CODE 901/017: MTBE-MASTER GG**



Heavy Duty MTBE-Master hoses are engineered to offer extra chemical resistance of PTFE for the transfer of 100% MTBE for markets outside of the USA, where MTBE and other additives are still used to enhance the performance of petroleum. The PTFE layers are protected by layers of special MTBE resistant, high strength mono-filament woven polypropylene to eliminate damaged caused by inner wire abrasion in normal flexing and bending.

**Typical applications:** For all ship, barge and dockside transfer operations.

**Compliance:** USCG certification and factory test certificate to 33 CFR, Section 154.500.

**Conveyants handled:** 100% MTBE (methyl tert-butyl ether) and 100% aromatics. Refer to the Chemical Compatibility Chart for specific recommendations.

**Features:**

- Retains flexibility – even at very low temperatures
- Tough, ozone-resistant PVC outer cover – resists dragging wear and abrasion
- Safe and dependable – tested to industry standard 1½ times rated working pressure
- Double end-to-end electrical continuity – prevents static electricity build-up and internal arcing
- Rated for full vacuum

**Inner Wire**

- High tensile strength Galvanized Steel, T316 Stainless Steel or Polypropylene Coated Steel available on request

**Outer Wire**

- High tensile strength Galvanized Steel

**Carcass**

- Multiple layers of polypropylene fabric, PTFE and polypropylene films, and polyester films

**Cover**

- Abrasion and ozone-resistant PVC-impregnated fabric

**Temperature Range**

- -22°F(-30°C) to +212°F(+100°C) (refer to Chemical Compatibility Chart)

**Color**

- Code 982: Blue with high-visibility orange stripe, Code 901: Orange with green stripe

**Couplings**

- Externally swaged nipples; fixed, floating or reducing flanges, threaded males, and cam-and-groove couplers

**CODE 982/018 - HEAVY DUTY MTBE-MASTER:**

ID in (mm)	OD in (mm)	MAX WP* psi (bar)	MIN Bend Radius in (mm)	WEIGHT lb/ft (kg/m)	MAX LEN ft (m)
4 (100)	5 (125)	250 (17.5)	16 (400)	5.3 (8.0)	60 (18)
6 (150)	7 (175)	250 (17.5)	20 (500)	7.3 (11.0)	66 (20)
8 (200)	9½ (238)	250 (17.5)	29 (725)	11.0 (16.5)	55 (17)
10 (250)	11½ (288)	150 (10.5)	36 (900)	14.0 (21.0)	40 (12)

**CODE 901/017 - MTBE-MASTER:**

1 (25)	1½ (38)	250 (17.5)	4 (100)	.6 (.9)	60 (18)
1½ (38)	2 (50)	250 (17.5)	5 (125)	1.0 (2.2)	60 (18)
2 (50)	2½ (65)	250 (17.5)	6 (150)	1.5 (2.3)	75 (23)
3 (75)	3½ (88)	250 (17.5)	8 (200)	2.3 (3.2)	60 (18)
4 (200)	4½ (115)	200 (14)	13 (325)	3.0 (4.5)	60 (18)

\*4:1 safety factor

**CRYOGENIC HOSES**  
**CODE 974: CRYOFLEX® 20 GG**



CRYOFLEX® 20 cryogenic hose is specially designed for the safe transfer of ambient liquefied petroleum gasses and related conveyants.

**Typical applications:** Liquefied petroleum gasses and related conveyants to –20°F(–30°C).

**Certification:** CSA 8.1-M86-CAN/C9A(R2005) Type 1 certification issued with Canadian Registration Number on factory built assemblies. Complete with standard hydrostatic testing and issued with a factory test certificate.

**Conveyants handled:** Butane, Butane/Propane mixtures, Propane, Refrigerant Gasses.

**Features:**

- Maximum compatibility – handles a wide range of temperatures and cryogenic conveyants
- Outer cover provides protection from abrasion
- Reliability – tested to industry standard 1½ times rated working pressures
- Double end-to-end electrical continuity – prevents static electricity build-up and internal arcing

**Inner Wire**

- High tensile strength Galvanized Steel

**Outer Wire**

- High tensile strength Galvanized Steel

**Carcass**

- Multiple layers of Polyamide fabrics and films

**Cover**

- Nylon cover. Rope lagging for extra protection and insulation available.

**Temperature Range**

- –20°F(–30°C) to +275°F(+135°C) (refer to Chemical Compatibility Chart)

**Color**

- White with yellow stripe

**Couplings**

- Specifically engineered, factory fitted end connections such as threaded males, fixed or swivel flanges or to any custom specification

**CODE 974 - CRYOFLEX® 20:**

ID in(mm)	MAXWP* psi (bar)	MIN Bend Radius in(mm)	WEIGHT lb/ft (kg/m)	MAX LEN ft (m)
1 (25)	350 (25)	3 (75)	0.3 (0.14)	60 (18)
1½ (38)	350 (25)	4 (100)	0.8 (0.36)	60 (18)
2 (50)	350 (25)	5.5 (140)	1.3 (0.59)	75 (23)
3 (75)	350 (25)	8 (200)	2.0 (0.91)	60 (18)

\*5: 1 safety factor



**CRYOGENIC HOSES**  
**CODE 940: CRYOFLEX® 50 SS**

CRYOFLEX® 50 cryogenic hose is specially designed for the safe transfer of fully refrigerated liquefied petroleum gasses and related conveyants.

**Typical applications:** Liquefied petroleum gasses and related conveyants to –128°F(–88°C).

**Certification:** Bore sizes 4”(100mm), 6”(150mm) and 8”(200mm) are certified by UK Department of Transport Marine Directorate as complying with IMO Gas Carrier Code and USCG regulations 33 CFR Section 127.1102.

**Conveyants handled:** Compatible with a wide range of low temperature fluids including the following per IMO Gas Carrier Code, Chapter XIX: Acetaldehyde, Ammonia (anhydrous), Butadiene, Butane, Butane/Propane mixture, Butylene, Diethylamine, Ethylamine, Ethyl Chloride, Methyl Acetylene/Propadiene, Methyl Bromide, Propane, Polypropylene, Propadiene, Refrigerant Gasses, Vinyl Chloride.

Also suitable for Liquid Ethane to –128°F(–88°C), and liquid CO<sub>2</sub>.

**Features:**

- Maximum compatibility – handles a wide range of low temperature and cryogenic conveyants
- Meet IMO Gas Carrier Code depending on construction (IMO type approval for working temperatures to –58°F(–50°C) and pressures to 150 psi (10.5 bar) and USCG regulations 33 CFR Section 127.1102
- Reliability – tested to industry standard 1½ times rated working pressures
- Durability – T316 Stainless Steel inner and outer wires for maximum chemical and wear resistance
- Fatigue resistant - developed in association with leading oil and gas companies for maximum durability, safety and performance
- Double end-to-end electrical continuity – prevents static electricity build-up and internal arcing

- |                          |   |
|--------------------------|---|
| <b>Inner Wire</b>        | • High tensile strength T316 Stainless Steel  |
| <b>Outer Wire</b>        | • High tensile strength T316 Stainless Steel  |
| <b>Carcass</b>           | • Multiple layers of Polyamide fabrics and films                                    |
| <b>Cover</b>             | • Nylon cover. Rope lagging for extra protection and insulation available.          |
| <b>Temperature Range</b> | • to –128°F(–88°C) (refer to Chemical Compatibility Chart)                          |
| <b>Color</b>             | • White with green stripe   |
| <b>Couplings</b>         | • Specifically engineered, factory-fitted end connections to customer specification |

**CODE 940 - CRYOFLEX® 50:**

ID in(mm)	MAXWP* psi (bar)	MIN Bend Radius in(mm)	WEIGHT lb/ft (kg/m)	END FITTING lb(kg)	MAX LEN ft(m)
1 (25)	350 (25)	6 (150)	0.6 (0.9)	–	60 (18)
1½ (38)	350 (25)	7 (175)	1.1 (1.6)	–	60 (18)
2 (50)	350 (25)	8 (200)	1.6 (2.4)	–	60 (18)
3 (75)	350 (25)	10 (250)	3.0 (4.5)	–	60 (18)
4 (100)	350 (25)	20 (500)	5.0 (7.5)	26 (11.8)**	60 (18)
6 (150)	350 (25)	26 (650)	9.3 (14.0)	51 (23.1)**	60 (18)
8 (200)	350 (25)	36 (900)	12.5 (18.8)	71 (32.2)**	50 (15)
10 (250)	200 (14)	98 (2450)	15.1 (22.3)	121 (54.9)**	40 (12)

\*5: 1 safety factor

\*\*End Fitting weights quoted are for ASA 150 welded neck flanges.

**CRYOGENIC HOSES**

**CODE 933: CRYOFLEX® 200 SS**



CRYOFLEX® 200 is designed specifically for the transfer of fully refrigerated petroleum and natural gasses and their related conveyants to -328°F (-200°C).

**Typical applications:** Fully refrigerated liquefied petroleum gasses and related conveyants to -328°F(-200°C).

**Certification:** Bore sizes 4”(100mm), 6”(150mm) and 8”(200mm) are certified as complying with paragraphs 5.7 of IMO Gas Carrier Code and 5.3 and 5.7 of IMO Chemical Carrier Code for working temperatures to -155°F (-104°C).

**Conveyants handled:** Compatible with a wide range of low temperature fluids including the following per IMO Gas Carrier Code, Chapter XIX: Butadiene, Butane, Butane/Propane mixture, Butylene, Diethylamine, Ethylamine, Ethyl Chloride, Methyl Acetylene/Propadiene, Methyl Bromide, Propane, Propadiene, Polypropylene, Refrigerant Gasses, Vinyl Chloride. Liquefied Natural Gas (LNG) and Liquid Nitrogen. Not suitable for conveying Ammonia. Suitable for Liquefied Natural Gas (LNG) at -325°F(-198°C) and Liquid Nitrogen at -380°F(-229°C) and Liquid Ethylene at -220°F(-105°C).

**Features:**

- Maximum compatibility – handles a wide range of low temperature and cryogenic conveyants
- Meet IMO Gas Carrier Code depending on construction (IMO type approval for working temperatures to -155°F (-104°C) and pressures to 150 psi (10.5 bar)
- Reliability – tested to industry standard 1½ times rated working pressures
- Durability – T316 Stainless Steel inner and outer wires for maximum chemical and wear resistance, inside and out
- Fatigue resistant – developed in association with leading oil and gas companies for maximum durability and safety
- Double end-to-end electrical continuity – prevents static electricity build-up and internal arcing

- Inner Wire** • T316 Stainless Steel
- Outer Wire** • T316 Stainless Steel
- Carcass** • Multiple layers of Polyester fabrics and BOPP films
- Cover** • Polyester fabric cover. Rope lagging for extra protection and insulation available.
- Temperature Range** • to -328°F(-200°C) (refer to Chemical Compatibility Chart)
- Color** • White
- Couplings** • Specifically engineered, factory-fitted end connections to customer specification

**CODE 933 - CRYOFLEX® 200:**

ID	MAXWP*	MIN Bend Radius	WEIGHT	END FITTING	MAX LEN
in(mm)	psi (bar)	in(mm)	lb/ft (kg/m)	lb(kg)	ft(m)
1 (25)	150 (10.5)	6 (150)	.45 (.48)	–	60 (18)
1½ (38)	150 (10.5)	7 (175)	.8 (1.2)	–	60 (18)
2 (50)	150 (10.5)	8 (200)	1.3 (2.0)	–	60 (18)
3 (75)	150 (10.5)	10 (250)	2.2 (3.3)	–	60 (18)
4 (100)	150 (10.5)	20 (500)	5.0 (7.5)	26 (11.8)**	60 (18)
6 (150)	150 (10.5)	26 (650)	9.3 (13.9)	51 (23.1)**	60 (18)
8 (200)	150 (10.5)	36 (900)	12.5 (18.8)	71 (32.2)**	50 (15)
10 (250)	150 (10.5)	98 (2450)	15.1 (22.3)	121 (54.9)**	40 (12)

\*5: 1 safety factor

\*\*End Fitting weights quoted are for ASA 150 welded neck flanges.



## HOSE COUPLINGS, ADAPTERS AND ACCESSORIES



**Fitting Styles...** Victaulic grooved tailpiece (12), Threaded tailpiece (13,16,10,3,4,6), Polypropylene ANSI drilled flanged tailpiece with steel backing ring (14,8), Aluminum female coupler tailpiece (15), Floating or swivel ANSI flange on a stub end tailpiece (11), Metallic ANSI RF fixed flange tailpiece (9), Self locking arm female coupler tailpiece (1,2), Quick disconnect male adapter tailpiece (5), Sanitary tailpiece (7)

**Fittings...** All fittings are designed assure 100% performance by each hose. Attachment methods are specifically developed for a perfect union and ensure performance up to rated burst pressure.

**Double start threads, scrolls or serrations...** engage the inner wire and ensure positive location of the outer wire after swaging. Precise machining assures maintenance of hose film pack and wire integrity.

**Raised sealing face...** is vital to a leakproof connection. Our external swage or crimp processes assures that the hose is permanently engaged and sealed to the fitting.

**Comprehensive range of fittings available...** Threaded or flanged stock connections, designed to current US and international standards. Fixed (weldneck or slip on) and swivel flanges to ANSI Class 150, 300 or DIN PN 10/16 or JIS 10K flanges are available. Proprietary quick release female couplers with self locking arms are available with male cam adapters. Sanitary fittings in both T316 Stainless Steel or polypropylene are available. With the ability to offer custom fittings designed for particular applications and compatibility requirements.

**Materials...** Carbon steel, Stainless Steel (T316 and T304), Brass, Aluminum, Hastelloy C-276, polypropylene and kynar are available.

**Slings...** Recommended for support in heavy dock and barge service. Full range of slings are warehoused and readily available.

**Scuff guard...** To protect hose from excessive abrasion in dockside and terminal operations. Available in 60-ft (18 meter) coils and can be cut, banded and clamped to hose.

## **INSPECTION, TESTING AND MAINTENANCE**

### **INSPECTION, TESTING AND CLEANING TIFT-COMPOFLEX HOSES**



#### **VISUAL INSPECTION – CHECK HOSES BEFORE EACH OPERATION AND BEFORE CONDUCTING HYDRAULIC TESTS...**

Hoses and hoses with rope lagging should be given a brief visual examination before each operation and a more thorough visual inspection at periods not exceeding six months. The inspection should pay attention to:

- Tears and abrasion of the hose cover or in the rope.
- Dents or kicks.
- Displacement of the hose reinforcing wires from their normal pitch or displacement and the rope exposing the hose below.
- Corrosion or abrasion of the hose outer wire.
- Signs of displacement of the end fittings or evidence of leakage at the ends.
- Any other abnormal features, including wear or damage to the end fittings.



#### **HYDROSTATIC TESTING – ANNUALLY OR MORE FREQUENTLY...**

At periods not exceeding one year hoses should be hydraulically tested as follows:

- Drain and thoroughly clean hose.
- Carry out visual inspection. Hoses failing the visual inspection due to displacement of the hose wires, severe abrasion of the cover, or significant corrosion of the outer wire should not be tested.
- Lay the hose straight out on supports which allow free movement under pressure.
- Blank off the ends and fill the hose completely with water, ensure trapped air is released from the hose.
- Pressurize the assembly to 1.1/2 times the maximum rated working pressure of the hose and hold this pressure for 10 minutes whilst examining for leaks. Also test for electrical continuity between the end connections.
- Reduce pressure and drain hose.
- On completion of this test the hose should be tested again for electrical continuity.

NOTE: Thermoplastic composite hoses elongate under pressure compared to rubber hose. Elongation under pressure is not an indication of hose condition or failure of reinforcements.

CAUTION: Do not test hoses that fail visual inspection.



## INSPECTION, TESTING AND MAINTENANCE



### **ELECTRICAL CONTINUITY TESTS – EVERY 6 MONTHS OR MORE FREQUENTLY...**

In order to prevent the accumulation of static charge generated in use, all metal parts of the assembly have been electrically bonded together during manufacture. At periods not exceeding six months the following test should be carried out.

- Lay the hose flat on the ground. Avoid contact on metallic parts to earth.
- Check that the hose is electrically continuous from end to end. This can be done using a simple battery and bulb test or alternatively using an ohm meter. Resistance should be 10 ohms or less.



### **CLEANING – AFTER USE OR PROLONGED STORAGE, BEFORE TESTING...**

- Hoses should be cleaned after use and certainly before prolonged storage or testing.
- Flushing out is sufficient in many circumstances using a variety of fluids, e.g. clean water, hot water detergents, common solvents at ambient temperature or seawater. If seawater is used for cleaning, this must be thoroughly drained out afterwards to minimize risk of corrosion on mild steel end fittings and on stainless or Galvanized Steel inner wires.
- Loose steam may be used but the hose must be open ended and the maximum working temperature must not be exceeded.
- Compressed air may be used but the hose must be open ended and the maximum working pressure must not be exceeded.
- During any cleaning operation the hose must be electrically earthed.
- Pigging must not be used under any circumstances.

**CAUTION:** High pressure steam or high pressure compressed air can be hazardous if hoses are restricted or clogged.



### **HOSE REPAIRS – CONSULT US HOSE CORP OR YOUR LOCAL DISTRIBUTOR...**

Depending on overall condition, it may be possible to repair hoses damaged in service. The repair of polypropylene hoses requires specialized knowledge and procedures.

**NOTE:** All repairs should be undertaken by trained and authorized personnel.

**ELECTRICAL PROPERTIES OF MARINE DOCK HOSE ASSEMBLIES**  
**ELECTRICALLY CONDUCTIVE HOSE ASSEMBLIES**

Low conductivity petroleum products and solvents such as gasoline & toluene become electrostatically charged when flowing through a pipeline and the pipeline itself acquires a charge of opposite polarity.

If the pipeline is earthed, the accumulated charge flows safely to ground. However, if the pipeline is not earthed, a charge could accumulate which may then be discharged instantaneously by an incendive spark to a nearby earthed conductor. If the spark has sufficient energy and an inflammable air/product mixture is present an explosion will result.

It is therefore normal practice for hoses generally to be specified that they be electrically conductive (with a maximum resistance of 10 ohms) so that the electrostatic charge is continuously drained away. Even so, it is common practice in the petroleum industry to specify a maximum flow velocity of 7m/sec when pumping low conductivity products to ensure that a charge is not generated more quickly than can be dissipated through normal arrangements.

Charges generated can be of many thousands of volts, but currents are of the order of a few microamps.

**INSUL-FLANGE: A CAST-NYLON INSULATING FLANGE FOR USE ON MARINE DOCKS AND TERMINALS**

If the piping system of a marine terminal is electrically conductive, an electrical charge flows along the piping because of dock/pier-side cathodic protection systems. With the potential inductive effect of the piping system, a spark could occur at the moment when the hose is disconnected.

**Insul-Flange controls undesirable electrical currents.** The Insul-Flange prevents the heavy electrical flow in the piping system and eliminates the risk of an electrical arc when the hose is disconnected.

**Construction:** Insul-Flange is constructed of cast nylon and is resistant to most common solvents, lubricants, hydrocarbons, esters, key tones and aqueous solutions of acids and alkalies at pH5 to pH 11. For more severe chemical service, PTFE lining is an option. Melting Point: 428°F/220°C. Elect. Resistivity: 1012 ohm/cm.

- Insul-Flange retains the properties of insulating flange gasket kits, but they are much easier to install and inspect for the properties of non-conductivity.
- Provides greater electrical resistance than regular insulating gasket kits.
- Prevents any possibility of an electric arc upon disconnection of the hose.
- Eliminates the need for separate bonding wire.
- Complies with several standards:
  - California State Lands Commission, M.F.D. § 2380
  - U.S.C.G. 154.810 Vapor Line Connections, Section G - Facility Vapor Connections
  - ISGOTT Chapter 6 - Electrical Insulation



**INSUL-FLANGE: ANSI CLASS 150 DRILLING**

Bore	O.D.	Length	No. of Bolts	Bolt Hole Diam.	Test Pressure (psi)	Longitudinal Stress (psi)
4	9	4¾	16	¾	750	600
6	11	9½	16	7/8	750	1221
8	13½	11¾	16	7/8	750	1333
10	16	14¼	24	1	750	1408
12	19	17	24	1	750	1273
16	23½	21¼	32	1½	750	1608

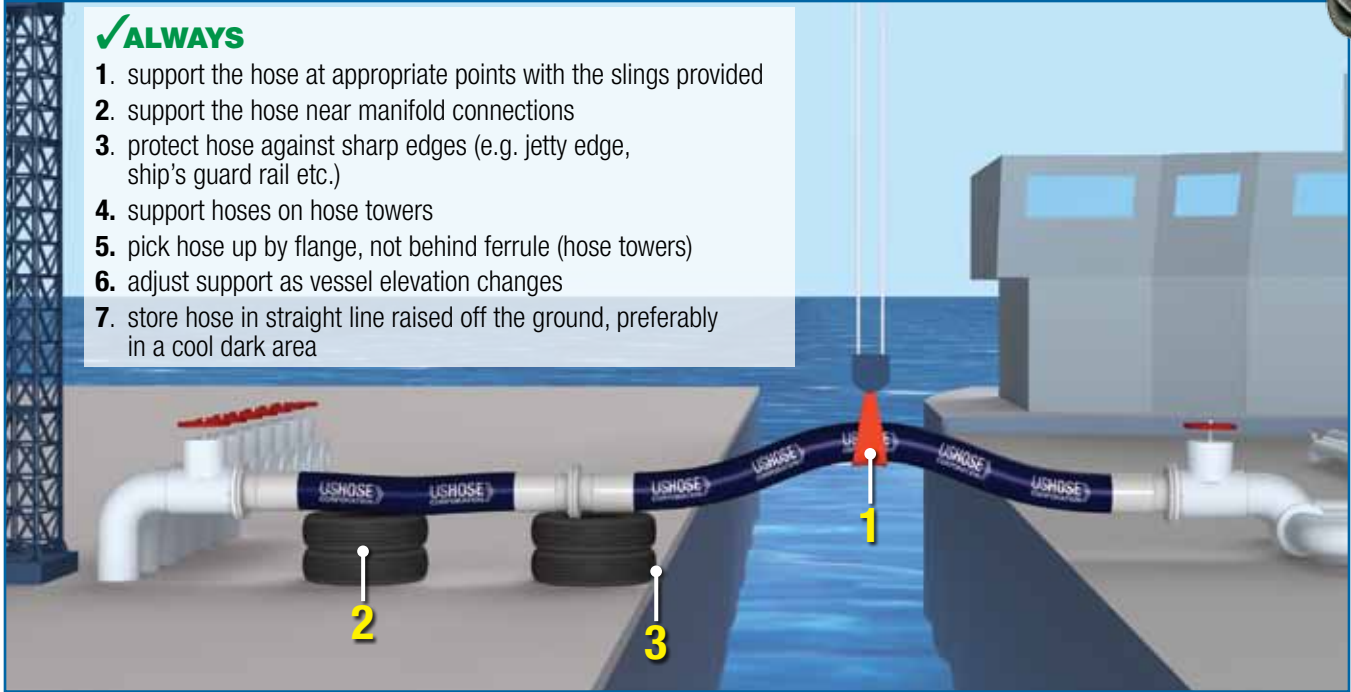


**COMPOFLEX® HOSE HANDLING GUIDE**

Compoflex® hose is manufactured to the highest technical standards to meet the most exacting service conditions. To maximize the service life of these quality hoses, we recommend that you follow these simple guidelines for either dock or hose tower operations.

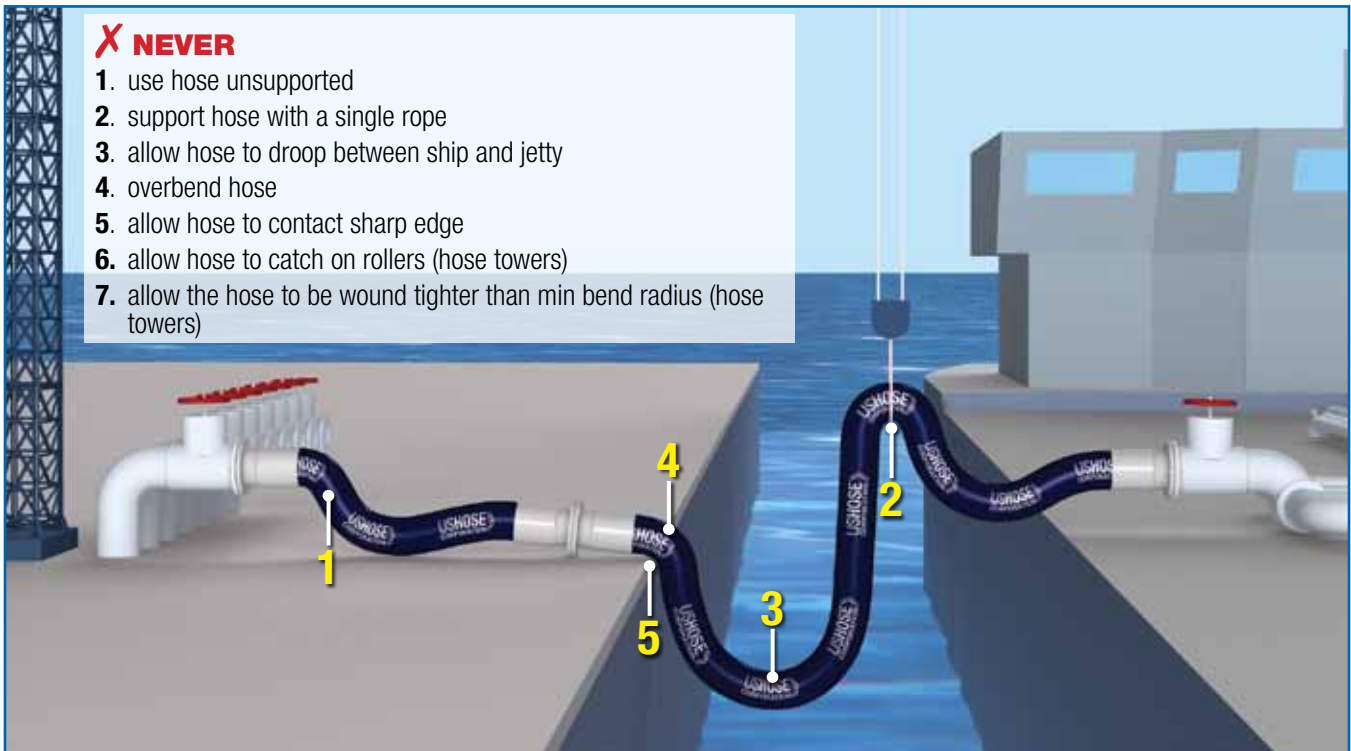
**✓ ALWAYS**

1. support the hose at appropriate points with the slings provided
2. support the hose near manifold connections
3. protect hose against sharp edges (e.g. jetty edge, ship's guard rail etc.)
4. support hoses on hose towers
5. pick hose up by flange, not behind ferrule (hose towers)
6. adjust support as vessel elevation changes
7. store hose in straight line raised off the ground, preferably in a cool dark area



**✗ NEVER**

1. use hose unsupported
2. support hose with a single rope
3. allow hose to droop between ship and jetty
4. overbend hose
5. allow hose to contact sharp edge
6. allow hose to catch on rollers (hose towers)
7. allow the hose to be wound tighter than min bend radius (hose towers)



**⚡ Compoflex® hoses are electrically continuous end to end through both inner and outer wires. Against specific demand, insulating flanges are also available.**

## CHEMICAL COMPATIBILITY CHART FOR TIFT-COMPOFLEX® POLYPROPYLENE AND PTFE PFA LINED COMPOSITE HOSES

The following charts shows the suitability of TIFT-Compoflex polypropylene and PTFE PFA lined hoses and end fittings for use with various fluids. The information is based on the best data available. Recommendations are given only as a guide and apply only to the chemical compatibility of the hose and end fitting material.

Please consult US Hose Engineering Department for recommendations on applications in excess of 140°F (60°C), or for other extreme service conditions outside the scope of the catalog ratings. Composite hose must be derated, i.e. lower maximum pressure as temperature rises, please consult with the US Hose Engineering Department for this information. Allowances must be made when selecting hoses for extreme service conditions. It is not advisable to select a hose which will be subjected simultaneously to pressure, temperatures and bending radii at the maximum ratings of the hose.

The description of a hose, or end fitting material, as "suitable" does not ensure that the hose complies with any regulations or operating requirements governing the handling of the chemical or the use of the hose.

A hose conveying a chemical having an oxidizing effect should be checked for internal discoloration particularly if the hose may be used on an application where color contamination is not permissible.

Clients who are unfamiliar with the characteristics of composite constructed hose may express concern with the amount of elongation or growth of these hose types during pressurization.

Unlike rubber hoses, elongation as an indication of deterioration cannot be applied to composite hose.

In a composite hose, much of the elongation is due to 'non-elastic elongation' and arises from the inherent compressibility of the hose wall normal to their plane. This is recognized in both British and International Standards, please contact the US Hose Engineering Department on details of these standards and engineering formulae related to it.

Contact the US Hose Engineering Department regarding the maximum flow velocity of TIFT-Compoflex composite hoses and calculations regarding pressure drop.

### Inner Wire composition of TIFT-Compoflex Polypropylene Hoses

- 1. Polypropylene Coated Carbon Steel – (PG, PGL, PS)**  
Such as: Standard Duty Chemiflex® PG, Chemiflex® PGL and Heavy Duty Chemiflex® PG.

- 2. T316 Stainless Steel – (SG, SS)** Such as: Standard Duty Chemiflex® SG and Heavy Duty Chemiflex® SG.
- 3. Galvanized Steel – (GG)** Such as: Standard Duty Fuelmaster, Heavy Duty Fuelmaster and Heavy Duty Oilmaster GG.
- 4. T316 Stainless Steel – (SG, SS)** with PTFE lining such as Tef-flex, Special Chemiflex® or Heavy Duty Special Chemiflex®.

### End Fitting Materials

CS Carbon Steel

SS T316 Stainless Steel

PP Polypropylene

Exotic materials and aluminum end fittings are also available. Contact factory for more details.

### Suitability

#### Hose

- A – SUITABLE for use at 140°F (60°C).
- B – SUITABLE for use at worldwide AMBIENT temperatures.
- C – SUITABLE for INTERMITTENT use at worldwide AMBIENT temperatures.
- D – UNSUITABLE or no data available.

### End Fittings

- – SUITABLE for the operating conditions applicable to the hose.
- X – UNSUITABLE or no data available.

For fluids that are not listed or service conditions outside the scope of those described, please consult US Hose Engineering Department.

US Hose Inc. reserves the right to change specifications and ratings without notice.

The conditions or methods of storage, handling, use and testing of our products are beyond our control. We do not therefore accept responsibility and expressly disclaim liability for any loss, damage or expense arising from the storage, handling, use, testing and disposal of the product.

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CHEMICAL	HOSE				FITTINGS			CHEMICAL	HOSE				FITTINGS		
	1	2	3	4	CS	SS	PP		1	2	3	4	CS	SS	PP
Acetaldehyde	C	C	D	A	X	•	•	Butanediol	B	B	B	A	•	•	•
Acetic acid (60%)	A	A	D	A	X	•	•	Butyl alcohol	A	A	A	A	•	•	•
Acetic acid (glacial)	B	B	D	A	X	•	•	n-Butyl acetate	C	C	C	A	•	•	•
Acetic anhydride	B	B	D	A	X	•	•	n-Butyl acrylate	B	B	B	A	•	•	•
Acetoacetic ester	C	C	D	A	•	•	•	n-Butylamine	B	B	D	A	•	•	•
Acetone	A	A	A	A	•	•	•	Butyl benzene	B	B	B	A	•	•	•
Acetone cyanohydrin	B	B	D	A	•	•	•	Butyl benzyl phthalate	B	B	B	A	•	•	•
Acetonitrile	B	B	B	A	•	•	•	Butyl bromide	D	D	D	A	X	•	X
Acetophenone	B	B	B	A	•	•	•	Butyl butyrate	B	B	B	A	•	•	•
Acetylacetone	B	B	B	A	•	•	•	Butyl carbitol	A	A	A	A	•	•	•
Acetyl chloride	D	D	D	A	X	•	X	Butyl carbitol acetate	C	C	C	A	•	•	•
Acetylene dichloride	B	B	B	A	•	•	•	Butyl cellosolve	A	A	A	A	•	•	•
Acetylene tetrachloride	C	C	C	A	•	•	•	Butyl cellosolve acetate	C	C	C	A	•	•	•
Acrolein (acrylaldehyde)	B	B	B	A	•	•	•	Butyl chloride	D	D	D	A	X	•	X
Acrylamide (50% in solution)	C	C	D	A	•	•	•	Butyl/decyl/cetyl-eicosylmethacrylate mixture	C	C	C	A	•	•	•
Acrylic acid	B	B	D	A	X	•	•	Butylene glycol	A	A	A	A	•	•	•
Acrylonitrile	A	A	D	A	•	•	•	n-Butyl ether	B	B	B	A	•	•	•
Adipic acid (aqueous)	A	A	A	A	X	•	•	Butyl ethyl ether	B	B	B	A	•	•	•
Adiponitrile	B	B	B	A	•	•	•	Butyl methacrylate	C	C	C	A	•	•	•
Alcohols	B	B	B	A	•	•	•	Butyl methoxyethyl ether	C	C	C	A	•	•	•
Alkyl acrylate vinyl pyridine copolymer in toluene	C	C	C	A	•	•	•	Butyl phthalate	A	A	A	A	•	•	•
Alkyl benzene sulphonic acid	C	C	D	A	X	•	•	Butyl stearate	B	B	B	A	•	•	•
Allyl alcohol	A	A	A	A	•	•	•	n-Butyraldehyde	C	C	D	A	•	•	•
Allyl bromide	C	C	C	A	•	•	•	Butyric acid (20%)	B	B	B	A	•	•	•
Allyl chloride	C	C	C	A	•	•	•	Butyrolactone	C	C	C	A	•	•	•
Alums (aqueous - saturated)	A	A	A	A	•	•	•	Calcium salts (excluding halides & hypochlorite - saturated)	A	B	D	A	•	•	•
Aluminum salts (excluding halides - saturated)	A	B	D	A	•	•	•	Calcium alkyl salicylate solution	A	A	D	A	•	•	•
Aluminum chloride (saturated)	A	D	D	X	X	•	•	Calcium chloride (saturated)	A	C	D	A	X	•	•
2- (2-Aminoethoxy) ethanol	C	C	D	A	•	•	•	Calcium hypochlorite (12.5% CL)	C	C	D	C	X	•	•
Aminoethyl ethanolamine	B	B	D	A	•	•	•	Calcium naphthenate in mineral oil	C	C	C	A	•	•	•
n-Aminoethylpiperazine	C	C	D	A	•	•	•	Camphor oil	C	C	C	A	•	•	•
Ammonia (28% in solution)	A	A	D	A	•	•	•	Caprylic acid	A	A	A	A	•	•	•
Ammonium chloride (saturated)	A	C	D	A	•	•	•	Carbinols	B	B	B	A	•	•	•
Ammonium nitrate (93% in solution)	D	C	C	A	X	•	X	Carbitol acetate	C	C	C	A	•	•	•
Ammonium salts (excluding halides - saturated)	A	B	D	A	•	•	•	Carbitols	B	B	B	A	•	•	•
Ammonium sulphide (<45% in solution)	C	C	D	A	X	•	•	Carbolic acid	A	A	D	A	X	•	•
Amyl acetate (commercial)	C	C	C	A	•	•	•	Carbolic oil (middle oil)	C	C	C	A	•	•	•
n-Amyl acetate	C	C	C	A	•	•	•	Carbon dioxide (liquid)	Use Cryoflex 50	x	•	x	•	•	•
sec-Amyl acetate	C	C	C	A	•	•	•	Carbon disulphide	C	C	C	D	•	•	•
Amyl alcohol	B	B	B	A	•	•	•	Carbonic acid	A	A	D	A	X	•	•
Amyl chloride	C	C	C	A	•	•	•	Carbon tetrachloride	C	C	C	A	•	•	•
Amyl Chloronaphthalene	D	D	d	A	x	•	x	Cashew nut shell oil	B	B	B	A	•	•	•
Anhydrous Ammonia	Use Cryoflex 50	x	•	x	•	•	•	Caustic potash (<50%)	A	B	D	A	•	•	•
Aniline (dedicated hose)	C	B	D	A	•	•	•	Caustic soda (<50%)	A	B	D	A	•	•	•
Animal oils	A	A	A	A	•	•	•	Cellosolve	B	B	B	A	•	•	•
Anisole	C	C	C	A	X	•	•	Cetyl-eicosyl methacrylate mixture	C	C	C	A	•	•	•
Antimony chloride	B	D	D	A	X	•	•	Chloroacetic acid (<80%)	B	D	D	D	X	•	•
Aqua regia	C	D	D	A	X	•	•	Chlorobenzene	C	C	C	A	•	•	•
Aviation fuel	C	C	C	A	•	•	•	Chlorobutane	C	C	C	A	•	•	•
Barium salts (saturated)	A	B	D	A	•	•	•	Chloroform	C	C	C	A	•	•	•
Benzaldehyde	C	C	D	A	X	•	•	Chlorohydrins (crude)	C	C	C	A	•	•	•
Benzene	C	C	C	A	•	•	•	o-Chloronitrobenzenes	C	C	C	A	•	•	•
Benzene sulphonyl chloride	D	D	D	X	X	X	X	Chloroprene	C	C	C	A	X	•	•
Benzene sulphonic acid	C	C	D	A	X	•	X	2- or 3-Chloropropionic acid	C	C	D	A	X	•	•
Benzoic acid	A	A	D	A	•	•	•	Chlorosulphonic acid	D	D	D	A	X	•	•
Benzoyl chloride	C	C	C	A	•	•	•	o- or m- or p-Chlorotoluene	C	C	C	A	•	•	•
Benzyl alcohol	A	A	A	A	•	•	•	Chlorotoluenes (mixed isomers)	C	C	C	A	•	•	•
Benzyl butyl phthalate	B	B	B	A	•	•	•	Chrome alum (saturated)	A	A	D	A	•	•	•
Benzyl chloride	C	C	C	A	X	•	•	Chromic acid (<50% - aqueous)	C	C	D	A	X	•	•
Biodiesel	C	C	D	A	•	•	•	Citric acid	A	A	D	A	X	•	•
Black liquor	C	C	D	A	X	•	•	Coal tar naphtha	B	B	B	A	•	•	•
Bleach (12.5%Cl)	C	C	D	A	•	•	•	Copper salts (excluding halides - saturated)	A	A	D	A	•	•	•
Borax (aqueous)	A	A	A	A	•	•	•	Copper chloride (saturated)	A	D	D	D	X	•	•
Boric acid (aqueous)	A	A	D	A	X	•	•	Corn Oil	A	A	D	A	X	•	•
Brine (saturated)	A	C	D	A	X	•	•	Corn Syrup	A	A	D	A	X	•	•
Bunker 'C' Fuel Oil	A	A	A	A	•	•	•	Creosote (wood or coal tar)	B	B	B	A	•	•	•
Bunker Oil	A	A	A	A	•	•	•	Cresols (<90% - mixed isomers)	A	A	A	A	•	•	•
Butadiene	B	B	B	A	•	•	•	Crotonaldehyde	C	C	C	A	•	•	•
Butane liquid	Use Cryoflex 50	•	•	•	•	•	•								

CHEMICAL	HOSE				FITTINGS			CHEMICAL	HOSE				FITTINGS		
	1	2	3	4	CS	SS	PP		1	2	3	4	CS	SS	PP
Cumene (Isopropyl Benzene)	B	B	B	A	•	•	•	Diethyl sulphate	B	B	D	A	•	•	•
Cutting Oil	A	A	A	A	•	•	•	Diglycidyl ether of bisphenol A	C	C	C	A	•	•	•
Cyclohexane	B	B	B	A	•	•	•	Diisobutylamine	B	B	B	A	•	•	•
Cyclohexanol	B	B	B	A	•	•	•	Diisobutylene	B	B	B	A	•	•	•
Cyclohexanone	C	C	C	A	•	•	•	Diisobutyl ketone	B	B	B	A	•	•	•
Cyclohexylamine	B	B	D	A	•	•	•	Diisobutyl phthalate	B	B	B	A	•	•	•
Cyclopentane	B	B	B	A	•	•	•	Diisooctyl adipate	B	B	B	A	•	•	•
p-Cymene	B	B	B	A	•	•	•	Diisooctyl phthalate	A	A	A	A	•	•	•
Decalin	D	D	D	A	X	•	X	Diisopropanolamine	B	B	D	A	•	•	•
Decene	C	C	C	A	•	•	•	Diisopropylamine	B	B	D	A	•	•	•
Decyl acrylate	B	B	D	A	•	•	•	Diisopropyl benzene (all isomers)	C	C	C	A	•	•	•
Decyl alcohol	B	B	B	A	•	•	•	Diisopropyl ether (DIPE)	B	B	B	A	•	•	•
Detergents	A	A	A	A	•	•	•	Diisopropyl ketone	B	B	B	A	•	•	•
Dextrin	A	A	A	A	•	•	•	Dimethylamine (<45% - aqueous)	B	B	D	A	•	•	•
Diacetone alcohol	B	B	B	A	•	•	•	Dimethylamine (45%-55% in solution)	C	C	D	A	•	•	•
Diaminoethylamine	B	B	C	A	•	•	•	Dimethylamine (55%-65% in solution)	C	C	D	A	•	•	•
Diamylamine	B	B	C	A	•	•	•	n,n-Dimethylcyclohexylamine	C	C	D	A	•	•	•
Dibromoethane	B	B	D	A	•	•	•	Dimethyl ethanolamine	B	B	D	A	•	•	•
Dibutylamine	B	B	C	A	•	•	•	Dimethyl formamide	A	A	A	A	•	•	•
Dibutyl ether	C	C	C	A	•	•	•	Dimethyl hydrogen phosphite	C	C	D	A	X	•	•
Dibutyl phthalate	B	B	B	A	•	•	•	Dimethyl ketone	A	A	A	A	•	•	•
Dibutyl sebacate	B	B	B	A	•	•	•	Dimethyl phthalate	B	B	B	A	•	•	•
Dichloroacetic acid	C	D	D	D	X	X	•	Dimethyl sulphate	B	B	D	A	•	•	•
o-Dichlorobenzene	C	C	C	A	•	•	•	Dimethyl sulphide	B	B	B	A	•	•	•
Dichlorobutane	C	C	C	A	•	•	•	Dinitrobenzene	C	C	C	A	•	•	X
Dichlorodifluoromethane	Use Cryoflex 50				x	•	x	Dinitrotoluene (molten)	D	D	D	D	X	X	X
1,1-Dichloroethane	C	C	C	A	•	•	•	Diocetylamine	B	B	B	A	•	•	•
Dichloroethylene	C	C	C	A	•	•	•	Diocetyl phthalate	B	B	B	A	•	•	•
Dichloroethyl ether	C	C	C	A	•	•	•	Diocetyl sebacate	B	B	B	A	•	•	•
2-2-Dichloroisopropyl ether	C	C	C	A	•	•	•	1 A-Dioxane	C	C	C	A	•	•	•
Dichloromethane	C	C	C	A	•	•	•	DIPE (See Diisopropyl ether)	B	B	B	A	•	•	•
2-4-Dichlorophenol	C	C	D	A	X	•	•	Dipentene	B	B	B	A	•	•	•
2,4-Dichlorophenoxyacetic acid, diethanolamine salt solution	C	C	D	A	•	•	•	Diphenyl ether	B	B	B	A	•	•	•
2,4-Dichlorophenoxyacetic acid, dimethyl amine salt solution (<70% dimethylamine salt)	C	C	D	A	•	•	•	Diphenylmethane diisocyanate	B	B	B	A	•	•	•
2,4-Dichlorophenoxyacetic acid, trisopropanolamine salt solution	C	C	D	A	•	•	•	Diphenyl phthalate	B	B	B	A	•	•	•
1,2-Dichloropropane	C	C	C	A	•	•	•	Diphenyl oxide/diphenyl phenyl ether mixture	D	D	D	D	X	X	X
1,3-Dichloropropane	C	C	C	A	•	•	•	Di-n-propylamine	B	B	B	A	•	•	•
Dichloropropane/dichloropropene mixtures	C	C	C	A	•	•	•	Dipropylene glycol	A	A	A	A	•	•	•
1,3-Dichloropropene	C	C	C	A	•	•	•	Dipropylene glycol monomethyl ether	C	C	C	A	•	•	•
2,2-Dichloropropionic acid	C	C	D	A	•	•	•	Disulphuric acid	D	D	D	A	X	•	X
Dichloropropylene	C	C	C	A	•	•	•	Dodecene (all isomers)	C	C	C	A	•	•	•
Dicyclopentadiene	D	D	D	D	X	X	X	Dodecyl alcohol	B	B	B	A	•	•	•
Diesel Emissions Fluid	B	B	A	A	X	•	•	Dodecyl benzene	B	B	B	A	•	•	•
Diesel oil	B	B	B	A	•	•	•	Dodecyl benzene sulphonic acid	C	C	D	A	X	•	•
Diethanolamine	A	A	D	A	•	•	•	Dodecyl diphenyl oxide disulphonate solution	C	C	C	A	•	•	•
Diethylamine	B	B	D	A	•	•	•	Dodecyl methacrylate	D	D	D	D	X	X	X
Diethylamino ethanol	B	B	C	A	•	•	•	Dodecyl-pentadecyl methacrylate mixture	C	C	C	A	•	•	•
Diethyl benzene	B	B	B	A	•	•	•	Dodecyl phenol	B	B	B	A	•	•	•
Diethylene dioxide	B	B	B	A	•	•	•	Epichlorohydrin	B	B	B	A	•	•	•
Diethylene glycol	A	A	A	A	•	•	•	Epoxy Resin	A	A	D	A	X	•	•
Diethylene glycol diethyl ether	B	B	B	A	•	•	•	Ethanol	B	B	B	A	•	•	•
Diethylene glycol methyl ether	C	C	C	A	•	•	•	Ethyl alcohol	A	A	A	A	•	•	•
Diethylene glycol monobutyl ether	C	C	C	A	•	•	•	Ethanolamine	A	A	B	A	•	•	•
Diethylene glycol monobutyl ether acetate	C	C	C	A	•	•	•	Ethoxy ethanol	C	C	C	A	•	•	•
Diethylene glycol monoethyl ether	C	C	C	A	•	•	•	2-Ethoxyethyl acetate	C	C	C	A	•	•	•
Diethylene glycol monoethyl ether acetate	C	C	C	A	•	•	•	Ethoxy propanol	C	C	C	A	•	•	•
Diethylene glycol monoethyl ether acetate	C	C	C	A	•	•	•	Ethyl acetate	C	C	C	A	•	•	•
Diethylene glycol monomethyl ether	C	C	C	A	•	•	•	Ethyl acrylate	B	B	B	A	•	•	•
Diethylene glycol monomethyl ether acetate	C	C	C	A	•	•	•	Ethyl aluminum dichloride	D	D	D	A	X	•	X
Diethylenetriamine	B	B	D	A	•	•	•	Ethylamine	B	B	C	A	•	•	•
Diethyl ethanolamine	B	B	D	A	•	•	•	Ethyl benzene	B	B	B	A	•	•	•
Diethyl ether	B	B	B	A	•	•	•	Ethyl butanol	B	B	B	A	•	•	•
Di(2-ethylhexyl) phosphoric acid	C	C	D	A	X	•	•	n-Ethyl butylamine	B	B	C	A	•	•	•
Diethyl ketone	B	B	B	A	•	•	•	Ethyl chloride	C	C	C	A	•	•	•
Diethyl oxalate	B	B	B	A	•	•	•	Ethyl cyclohexane	C	C	C	A	•	•	•
Diethyl phthalate	A	A	A	A	•	•	•	n-Ethyl cyclohexylamine	C	C	C	A	•	•	•
Diethyl sebacate	A	A	A	A	•	•	•	Ethylene carbonate	B	B	C	A	•	•	•
								Ethylene chloride	C	C	C	A	•	•	•
								Ethylene chlorohydrin	B	B	B	A	•	•	•

CHEMICAL	HOSE				FITTINGS			CHEMICAL	HOSE				FITTINGS		
	1	2	3	4	CS	SS	PP		1	2	3	4	CS	SS	PP
Ethylene cyanohydrin	B	B	B	A	•	•	•	Hexanol	A	A	A	A	•	•	•
Ethylene diamine	B	B	B	A	•	•	•	Hexene	A	A	A	A	•	•	•
Ethylene dibromide	B	B	C	A	•	•	•	Hexyl acetate	C	C	C	A	•	•	•
Ethylene dichloride	C	C	C	A	•	•	•	Hexylamine	B	B	D	A	•	•	•
Ethylene glycol	A	A	A	A	•	•	•	Hexylene glycol	A	A	A	A	•	•	•
Ethylene glycol methyl butyl ether	B	B	B	A	•	•	•	Hydrazine hydrate	B	B	D	A	X	•	•
Ethylene glycol monobutyl ether	A	A	A	A	•	•	•	Hydrobromic acid (<50%)	A	D	D	D	X	X	•
Ethylene glycol monobutyl ether acetate	B	B	B	A	•	•	•	Hydrochloric acid (<37%)	C	D	D	D	X	X	•
Ethylene glycol monoethyl ether	A	A	A	A	•	•	•	Hydrofluoric acid (<50%)	C	D	D	D	X	X	•
Ethylene glycol monomethyl ether	B	B	B	A	•	•	•	Hydrofluosilicic acid	A	A	D	A	X	•	•
Ethylene glycol monomethyl ether acetate	B	B	B	A	•	•	•	Hydrogen peroxide (<50%)	B	B	D	A	X	•	•
Ethylene glycol monophenyl ether	B	B	B	A	•	•	•	Hydrogen sulphide (aqueous - saturated)	A	D	D	D	X	•	•
Ethylene oxide (dedicated hose)	B	B	D	A	X	•	•	Hydroquinone	A	A	A	A	•	•	•
Ethylene oxide/propylene oxide mixtures (<30% ethylene oxide)	C	C	D	A	X	•	•	2-Hydroxyethyl acrylate	C	C	C	A	•	•	•
Ethyl ether	B	B	B	A	•	•	•	Ink	B	B	B	A	X	•	•
Ethyl formate	B	B	D	A	•	•	•	Iodine solution	B	D	D	D	•	•	•
Ethyl hexanoic acid	B	B	D	A	X	•	•	Iron halides	A	D	D	D	X	X	•
Ethyl hexyl alcohol	A	A	A	A	•	•	•	Iron salts (excluding halides - saturated)	A	B	D	A	•	•	•
2-Ethyl hexyl acrylate	B	B	C	A	•	•	•	Isoamyl acetate	B	B	B	A	•	•	•
2-Ethyl hexylamine	B	B	C	A	•	•	X	Isoamyl alcohol	B	B	B	A	•	•	•
Ethylidene norbornene	C	C	C	A	•	•	•	Isoamyl bromide	B	D	D	D	X	•	•
Ethyl iodide	C	C	C	A	•	•	•	Isoamyl butyrate	B	B	B	A	•	•	•
Ethyl isobutyl ether	B	B	D	A	•	•	•	Isoamyl chloride	C	C	D	A	X	•	•
Ethyl methacrylate	C	C	C	A	•	•	•	Isoamyl ether	B	B	B	A	•	•	•
2-Ethyl-3-propylacrolein	C	C	C	A	•	•	•	Isobutyl acetate	B	B	B	A	•	•	•
Ethyl propyl ether	B	B	B	A	•	•	•	Isobutyl acrylate	B	B	B	A	•	•	•
Ethyl propyl ketone	C	C	C	A	•	•	•	Isobutyl alcohol	A	A	A	A	•	•	•
Ethyl silicate	A	A	A	A	•	•	•	Isobutylamine	B	B	D	A	•	•	•
Ethyl sulphate	B	B	B	A	•	•	•	Isobutyl bromide	B	D	D	D	X	X	•
Ethyl vinyl ether	B	B	B	A	•	•	•	Isobutyl chloride	B	D	D	D	X	X	•
Fatty acids	A	A	D	A	X	•	•	Isobutyl ether	C	C	C	D	•	•	•
Fatty alcohols	A	A	A	A	•	•	•	Isobutyl formate	C	C	C	A	•	•	•
Ferrous, ferric salts (excluding halides)	A	B	D	A	•	•	•	Isobutyl methyl ketone	B	B	B	A	•	•	•
Fluorinated refrigerants	Use Cryoflex 50	D	D	D	X	•	X	Isobutyraldehyde	B	B	D	A	•	•	•
Fluorine	Use S/S Hose or PTFE	D	D	D	X	•	X	Isodecyl alcohol	A	A	A	A	•	•	•
Fluosilicic acid	A	D	D	D	X	•	•	Isooctane	C	C	C	A	•	•	•
Formaldehyde solution (<45%)	A	A	A	A	•	•	•	Isopentane	C	C	C	A	•	•	•
Formamide	A	B	D	A	X	•	•	Isopentene	C	C	C	A	•	•	•
Formic acid	A	A	D	A	X	•	•	Isophorone	B	B	B	A	•	•	•
Freons	Use Cryoflex 50	D	D	D	X	•	X	Isophorone diamine	C	C	D	A	•	•	•
Fructose	A	A	A	A	•	•	•	Isophorone diisocyanate	C	C	C	A	•	•	•
Fruit juices	A	A	D	A	•	•	•	Isoprene	B	B	B	A	•	•	•
Fuel oil	B	B	B	A	•	•	X	Isopropanolamine	B	B	D	A	•	•	•
Fumaric adduct of rosin (water dispersion)	C	C	C	A	•	•	•	Isopropyl acetate	C	C	C	A	•	•	•
Furfural	B	B	B	A	•	•	•	Isopropyl alcohol	A	A	A	A	•	•	•
Furfuryl alcohol	B	B	B	A	•	•	•	Isopropylamine	B	B	D	A	•	•	•
Gallic acid solution	A	A	C	A	•	•	•	Isopropyl benzene	B	B	B	A	•	•	•
Gasoline	B	B	B	A	•	•	•	Isopropyl chloride	B	D	D	A	X	•	•
Gelatine (aqueous)	A	A	A	A	•	•	•	Isopropyl ether	C	C	C	A	•	•	•
Gluconic acid	A	A	C	A	•	•	•	Isopropyl toluene	B	B	B	A	•	•	•
Glucose (aqueous)	A	A	A	A	•	•	•	Isovaleraldehyde	C	C	C	A	•	•	•
Glue	B	B	D	A	•	•	•	Jams	A	A	B	A	•	•	•
Gluteraldehyde solutions (50% or less)	C	C	C	A	•	•	•	Jet fuel	C	C	C	A	•	•	•
Glycerine	A	A	A	A	•	•	•	Kerosene	B	B	B	A	•	•	•
Glycidyl ester of C10 trialkylacetic acid	C	C	C	A	•	•	•	Ketones	B	B	B	A	•	•	•
Glycolic acid (<37% - aqueous)	A	A	D	A	•	•	•	Lacquers	B	B	D	A	X	•	•
Glycols (aqueous)	A	A	A	A	•	•	•	Lactic acid (<20%)	A	B	D	A	•	•	•
Grease	B	B	B	A	•	•	•	Lanolin	A	A	A	A	•	•	•
Green sulphate liquor	B	B	D	A	X	•	•	Lard	A	A	A	A	•	•	•
Heptane	B	B	B	A	•	•	•	Latex (low viscosity)	A	A	A	A	•	•	•
Heptanoic acid	B	B	D	A	X	•	•	Lauryl alcohol	B	B	B	A	•	•	•
Heptanol (all isomers)	A	A	A	A	•	•	•	Lead salts (saturated)	A	B	D	A	X	•	•
Heptanone	B	B	B	A	•	•	•	Ligroin	C	C	C	A	•	•	•
Heptene (mixed isomers)	A	A	A	A	•	•	•	Limonene	B	B	B	A	•	•	•
Hexamethylene diamine	B	B	D	A	•	•	•	Linseed oil	A	A	A	A	•	•	•
Hexamethyleneimine	C	C	D	A	•	•	•	Liquefied Carbon Dioxide	Use Cryoflex 50	x	•	x	•	•	•
Hexamethylene tetramine	B	B	D	A	•	•	•	Liquefied Petroleum Gas	Use Cryoflex	D	D	D	•	•	X
1-Hexane	B	B	B	A	•	•	•	Lubricating oil	B	B	B	A	•	•	•
								Magnesium salts (saturated)	A	B	D	A	X	•	•

CHEMICAL	HOSE				FITTINGS			CHEMICAL	HOSE				FITTINGS		
	1	2	3	4	CS	SS	PP		1	2	3	4	CS	SS	PP
Maleic acid solution	A	B	D	A	X	•	•	Nitrating acid (mixture of sulphuric & nitric acids)	D	D	D	D	X	X	X
Maleic anhydride solution	B	B	D	A	X	•	•	Nitric acid (<10%)	A	A	D	A	X	•	X
Malic acid solution	B	B	D	A	X	•	•	Nitric acid (10%-60%)	C	C	D	A	X	•	X
Manganese salts (saturated)	A	B	D	A	X	•	•	Nitric acid (>60%)	D	D	D	A	X	•	X
MBK (See Methyl butyl ketone)								Nitrobenzene	B	B	B	A	•	•	•
MEK (See Methyl ethyl ketone)								o-Nitrophenol solution	A	A	D	A	•	•	•
Mercaptobenzothiazol, sodium salt solution	C	C	C	A	•	•	•	o-Nitrophenol (molten)	D	D	D	D	X	X	•
Mercuric chloride (saturated)	A	D	D	D	X	X	•	1- or 2-Nitropropane	B	B	B	A	•	•	•
Mesityl oxide	A	A	B	A	•	•	•	Nitropropane/nitroethane (60/40 mixture)	C	C	C	A	•	•	•
Methacrylic acid	B	B	D	A	•	•	•	o-Nitrotoluene	B	B	B	A	•	•	X
Methacrylonitrile	C	C	C	A	•	•	•	p-Nitrotoluene	D	D	D	D	X	X	•
Methanol	C	C	C	A	•	•	•	Nonane	B	B	B	A	•	•	•
Methyl acetate	C	C	C	A	•	•	•	Nonyl alcohol	B	B	B	A	•	•	•
Methyl aceto acetate	C	C	D	A	X	•	•	Nonylphenol	B	B	C	A	•	•	•
Methyl acetone	B	B	B	A	•	•	•	Octane	B	B	B	A	•	•	•
Methyl acrylate	B	B	B	A	•	•	•	Octanol (all isomers)	B	B	B	A	•	•	•
Methyl alcohol	A	A	A	A	•	•	•	Octene (all isomers)	C	C	C	A	•	•	•
Methylamine	B	B	C	A	•	•	•	Octyl acetate	C	C	C	A	•	•	•
Methyl amyl acetate	C	C	C	A	•	•	•	Octyl acrylate	B	B	B	A	•	•	•
Methyl amyl alcohol	B	B	B	A	•	•	•	Olefins (straight chain mixtures)	C	C	C	A	•	•	•
Methyl amyl ketone	B	B	B	A	•	•	•	α-Olefin mixtures	C	C	C	A	•	•	•
Methyl butyl ketone (MBK)	B	B	B	A	•	•	•	Oils (most commercial)	B	B	B	A	•	•	•
Methyl butyraldehyde	D	D	D	A	X	•	X	Oleic acid	B	B	D	A	X	•	•
Methyl cellosolve	B	B	B	A	•	•	•	Oleum (Sulphuric acid - fuming)	D	D	D	A	X	•	•
Methyl cellosolve acetate	C	C	C	A	•	•	•	Oils (most commercial)	B	B	B	A	•	•	•
Methyl chloride	D	D	D	A	X	•	•	Oxalic acid (<50%)	B	B	D	A	X	•	•
Methyl cyanide	B	B	B	A	•	•	•	Paint	A	A	A	A	•	•	•
Methyl cyclohexane	B	B	B	A	•	•	•	Palm oil	B	B	B	A	•	•	•
Methylene bromide	C	C	D	A	•	•	•	Paraffin wax	A	A	A	A	•	•	•
Methylene chloride	C	C	C	A	•	•	•	Paraldehyde	C	C	C	A	•	•	•
Methyl ethyl ketone (MEK)	C	C	C	A	•	•	•	Paraxylene	C	C	C	A	•	•	•
Methyl ethylpyridine	C	C	C	A	•	•	•	Pentachloroethane	C	C	C	A	•	•	•
2-Methyl-5-ethylpyridine	C	C	C	A	•	•	•	1,3-Pentadiene	C	C	C	A	•	•	•
Methyl formate	C	C	C	A	•	•	•	n-Pentane	B	B	B	A	•	•	•
2-Methyl-2-hydroxy-3-butyno	C	C	C	A	•	•	•	Pentanol	A	A	A	A	•	•	•
Methyl isobutyl ketone	C	C	C	A	•	•	•	Pentanone	B	B	B	A	•	•	•
Methyl methacrylate	C	C	C	A	•	•	•	Pentene (all isomers)	B	B	B	A	•	•	•
Methyl nitrobenzene	B	B	B	A	•	•	•	Perchloric acid (<50%)	B	D	D	D	X	•	•
Methyl pentene	B	B	B	A	•	•	•	Perchloroethylene	C	C	C	A	X	•	•
2-Methyl-1-pentene	C	C	C	A	•	•	•	Petrolatum	A	A	A	A	•	•	•
2-Methyl pyridine	B	B	B	A	•	•	X	Petroleum	A	A	A	A	•	•	•
4-Methyl pyridine	C	C	C	A	•	•	X	Petroleum (to max 320F/160C)	Use ThermMaster			D	D	•	X
n-Methyl-2-pyrrolidone	C	C	C	A	•	•	X	Petroleum ether	C	C	C	A	•	•	•
Methyl salicylate	C	C	C	A	•	•	•	Petroleum naphtha	C	C	C	A	•	•	•
α-Methylstyrene	B	B	B	A	•	•	•	Phenol	C	A	B	A	X	•	•
Methyl tert-butyl ether (MTBE)								Phenoxyethanol	C	C	C	A	•	•	•
See also MTBE-Master								Phenylhydrazine	C	C	D	A	X	•	•
Mineral jelly	A	A	A	A	•	•	•	1-Phenyl-1-xylyl ethane	C	C	C	A	•	•	•
Mineral oil	B	B	B	A	•	•	•	Phosphoric acid (<95%)	A	A	D	A	X	•	•
Mineral spirits	B	B	B	A	•	•	•	Phosphorus (yellow or white)	D	D	D	D	X	X	X
Molasses	A	A	A	A	•	•	•	Phosphorus oxychloride	C	D	D	D	X	X	•
Molten Sulphur	See ThermMaster							Phosphorus pentoxide	A	B	D	A	X	•	X
Monochlorobenzene	D	D	D	A	X	•	X	Phosphorus trichloride	B	D	D	D	X	•	X
Monoethanolamine	A	A	B	A	•	•	•	Phthalic acid (<50%)	B	B	D	A	X	•	X
Monoethylamine	B	B	C	A	•	•	•	Phthalic anhydride	D	D	D	D	X	X	X
Monoisopropanolamine	B	B	D	A	•	•	•	Picric acid (1%)	B	B	D	A	X	•	•
Mononitrobenzene	B	B	B	A	•	•	•	Pinene	B	B	B	A	•	•	•
Morpholine	B	B	C	A	•	•	•	Pine oil	B	B	B	A	•	•	•
Motor fuel anti-knock compounds (unleaded)	B	B	B	A	•	•	•	Plasticisers (most commercial)	B	B	B	A	•	•	•
Motor Oil	A	A	A	A	•	•	•	Polyethylene glycol	B	B	B	A	•	•	•
MTBE (See Methyl tert-butyl ether)	A	A	A	A	•	•	•	Polyethylene polyamines	C	C	D	A	X	•	•
Naphtha	B	B	B	A	•	•	•	Polymethylene polyphenyl isocyanate	B	B	B	A	•	•	•
Naphtha solvent	C	C	C	A	•	•	•	Polypropylene glycol	B	B	B	A	•	•	•
Naphthalene solution	A	A	A	A	•	•	•	Potassium halides	A	D	D	D	X	•	•
Naphthalene (molten)	D	D	D	D	X	X	X	Potassium hydroxide solution	C	C	D	A	X	•	•
Neodecanoic acid	C	C	D	A	•	•	•	Potassium salts (excluding halides - saturated)	A	B	D	A	X	•	•
Neohexane	B	B	B	A	•	•	•	Propane	Use Cryoflex			D	D	•	X
Nickel chloride (saturated)	A	D	D	D	X	•	X	n-Propanolamine	C	C	D	A	X	•	•
Nickel salts (excluding chlorides - saturated)	A	B	D	A	X	•	•	Propenoic acid	B	B	D	A	X	•	•

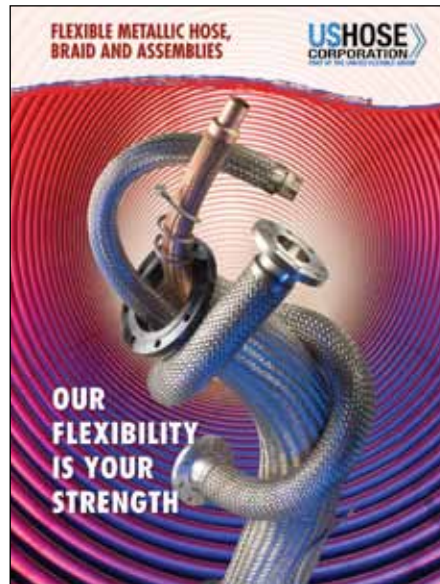
CHEMICAL	HOSE				FITTINGS			CHEMICAL	HOSE				FITTINGS		
	1	2	3	4	CS	SS	PP		1	2	3	4	CS	SS	PP
β-Propiolactone	C	C	C	A	•	•	•	Tetrahydronaphthalene	C	C	C	A	•	•	X
Propionaldehyde	C	C	C	A	•	•	•	Thionyl chloride	D	D	D	D	X	X	X
Propionic acid	B	B	D	A	X	•	•	Tin halides	A	D	D	D	X	X	•
Propionic anhydride	C	C	D	A	X	•	•	Tin salts (excluding halides - saturated)	A	B	D	A	•	•	•
Propionitrile	C	C	C	A	•	•	•	Titanium tetrachloride	C	D	D	D	X	X	•
Propyl acetate	C	C	C	A	•	•	•	Toluene	C	C	C	A	•	•	X
Propyl alcohol	A	A	A	A	•	•	•	Toluene diamine	D	D	D	D	X	X	•
Propylamine	B	B	D	A	•	•	•	Toluene diisocyanate	B	B	B	A	•	•	X
Propylene (tetramer & trimer)	C	C	C	A	X	•	•	o-Toluidine	B	B	C	A	•	•	•
Propylene dimer	C	C	C	A	•	•	•	Transformer oil	B	B	B	A	•	•	•
Propylene glycol	A	A	A	A	•	•	•	Transmission oil	B	B	B	A	•	•	•
Propylene glycol monoethyl ether	B	B	B	A	•	•	•	Tributylamine	B	B	B	A	•	•	•
Propylene glycol monomethyl ether	B	B	B	A	•	•	•	Tributyl phosphate	B	B	B	A	•	•	•
Propylene oxide (dedicated hose)	B	B	D	A	•	•	•	Trichloroacetic acid (10% or less)	A	B	D	D	X	X	•
Prussic acid	A	A	D	A	X	•	•	1,2,4-Trichlorobenzene	C	C	C	A	•	•	•
Pyridine	B	B	D	A	•	•	X	1, 1, 2-Trichloroethane	C	C	C	A	•	•	•
Pyrosulphuric acid	D	D	D	A	X	•	X	1, 1, 1-Trichloroethane	C	C	C	A	•	•	•
Rosin	C	C	C	A	•	•	•	Trichloroethylene	C	C	C	A	•	•	•
Rosin soap solution (disproportionated)	C	C	C	A	•	•	•	Trichloropropane	C	C	C	A	•	•	•
Salt solutions (excluding halides)	A	B	D	A	•	•	•	1, 1, 2-Trichloro-1, 2, 2-trifluoroethane	D	D	D	D	X	X	X
Sea water	A	D	D	A	X	•	•	Tricresyl phosphate (<1% ortho isomer)	B	B	B	A	•	•	•
Sewage	B	B	D	A	•	•	•	Tridecanol	B	B	B	A	•	•	•
Shellac	B	B	D	A	X	•	•	Triethanolamine	B	B	D	A	•	•	•
Silicon oil	A	A	A	A	•	•	•	Triethylamine	B	B	D	A	•	•	•
Silver halides (saturated)	A	D	D	D	X	X	•	Triethylbenzene	B	B	B	A	•	•	•
Silver salts (excluding halides - saturated)	A	B	D	A	•	•	•	Triethylene glycol	A	A	A	A	•	•	•
Soap solutions	A	A	B	A	•	•	X	Triethylene tetramine	B	B	D	A	•	•	•
Sodium borohydride/sodium hydroxide solution (15% or less sodium hydroxide)	C	C	D	A	•	•	•	Triethyl phosphite	C	C	D	A	X	•	•
Sodium chlorate solution (50% or less)	A	A	D	A	X	•	•	Triisopropanolamine	B	B	D	A	•	•	•
Sodium chloride (saturated)	A	B	D	A	X	•	•	Trimethyl acetic acid	A	A	D	A	•	•	•
Sodium chromate	B	B	B	A	•	•	•	1,2,4-Trimethylbenzene	B	B	B	A	•	•	•
Sodium dichromate solution (70% or less)	C	C	D	A	X	•	•	Trimethylhexamethylene diamine (2, 2, 4- & 2, 4, 4-isomers)	C	C	D	A	•	•	•
Sodium hydrosulphide solution (45% or less)	A	B	D	A	•	•	•	Trimethylhexamethylene diisocyanate (2, 2, 4- & 2, 4, 4-isomers)	C	C	C	A	•	•	•
Sodium hydrosulphidelammonium sulphide solution	C	C	D	A	X	•	•	2, 2, 4-Trimethyl-1, 3-pentanediol-1-isobutyrate	C	C	C	A	•	•	•
Sodium hypochlorite (<15%)	C	C	D	A	X	•	•	Trimethyl phosphite	C	C	C	A	•	•	•
Sodium hydroxide solution	A	A	C	A	•	•	•	Trioctyl phosphate	B	B	B	A	•	•	•
Sodium salts (excluding halides - saturated)	A	B	D	A	•	•	•	Tripolyene glycol	A	A	A	A	•	•	•
Stannous, stannic salts (excluding halides)	A	B	D	A	•	•	•	Tripolyene glycol monomethyl ether	C	C	C	A	•	•	•
Starch (aqueous)	A	A	B	A	•	•	•	Tritolyl phosphate	B	B	B	A	•	•	•
Styrene monomer	B	B	B	A	•	•	•	Trixylenyl phosphate	B	B	B	A	•	•	•
Sugar syrup	A	A	A	A	•	•	•	Tung Oil	B	B	B	A	x	•	•
Sulphamic acid	A	A	D	A	X	•	•	Turpentine	C	C	C	A	•	•	•
Sulpholane	D	D	D	D	X	X	X	1-Undecene	C	C	C	A	•	•	•
Sulphonyl chloride	D	D	D	D	X	X	X	Undecyl acid	C	C	C	A	•	•	•
Sulphur (molten)	D	D	D	X	X	X	X	Urea (aqueous)	A	B	B	A	•	•	•
Sulphur chloride	D	D	D	D	X	X	X	Urea/ammonia salt solutions	A	B	B	A	•	•	•
Sulphur dioxide	C	C	D	A	X	•	•	Urea/ammonia solutions	A	B	B	A	•	•	•
Sulphuric acid (<20%)	B	B	D	A	•	•	•	n-Valeraldehyde	C	C	C	A	•	•	•
Sulphuric acid (20%-85%)	B	D	D	D	X	X	•	Varsol	A	A	A	A	•	•	•
Sulphuric acid (>85%)	C	C	D	A	•	•	•	Vaseline	A	A	A	A	•	•	•
Sulphuric acid (fuming - see Oleum)								Vegetable oils	A	A	A	A	•	•	•
Sulphuric acid (spent)	C	C	D	A	X	•	•	Vinegar	A	A	D	A	X	•	•
Sulphurous acid	B	B	D	A	•	•	•	Vinyl acetate	B	B	C	A	•	•	•
Sulphuryl chloride	D	D	D	D	X	X	X	Vinyl chloride monomer (VCM) Use Cryoflex 50	D	D	D	x	•	•	x
TAAE (See Tertiary amyl ethyl ether)	C	C	C	A	•	•	•	Vinyl ethyl ether	C	C	C	A	•	•	•
Tall oil (crude and distilled)	A	A	A	A	•	•	•	Vinylidene chloride	C	C	C	A	•	•	•
Tall oil fatty acid (<20% resin acids)	C	C	C	A	X	•	•	Vinyl neodecanoate	C	C	C	A	•	•	•
Tallow	A	A	A	A	•	•	•	Vinyl toluene	B	B	C	A	•	•	•
TAME (See Tertiary amyl methyl ether)								Water	A	A	A	A	•	•	•
Tannic acid (<10%)	A	A	D	A	X	•	•	White spirit (low aromatic 15% - 20%)	B	B	B	A	•	•	•
Tartaric acid	A	B	D	A	X	•	X	Wine	B	B	D	A	X	•	•
Tertiary amyl ethyl ether (TAAE)	C	C	C	A	•	•	•	Xylene	C	C	C	A	•	•	•
Tertiary amyl methyl ether (TAME)	C	C	C	A	•	•	•	Xylenols	B	B	B	A	•	•	•
Tetrachloroethane	C	C	C	A	•	•	•	Yeast (aqueous)	A	A	D	A	X	•	•
Tetrachloroethylene	C	C	C	A	•	•	•	Zinc halides	A	D	D	D	X	X	•
Tetraethylene glycol	B	B	B	A	•	•	•	Zinc salts (excluding halides - aqueous)	A	B	D	A	•	•	•
Tetraethylene pentamine	C	C	D	A	•	•	•								
Tetrahydrofuran	C	C	C	A	•	•	X								

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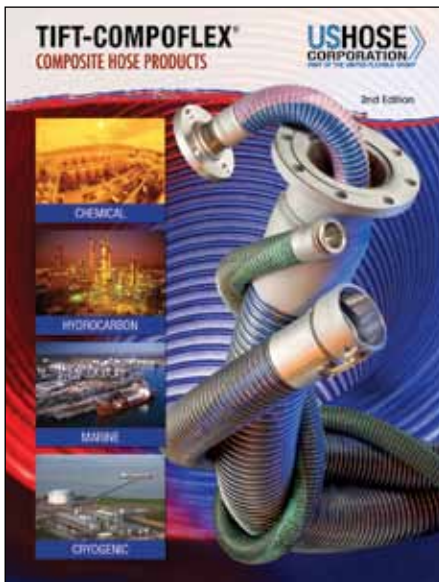
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