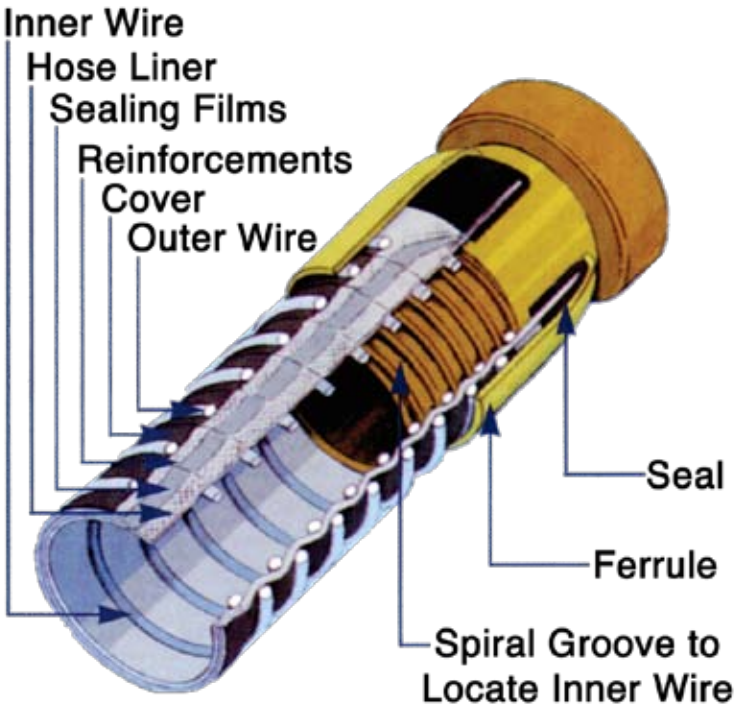
Composite Hose (Section II)

Composite Hose - The Flexible Connection

Composite hose, like other hose provides the vital flexible connection to compensate for vibration, movement or misalignment in a fluid transfer system.

Composite hose has a spiral internal metal supporting wire which can be galvanized steel, stainless steel, aluminum or polypropylene coated steel with a spiral external wire which is generally galvanized or stainless steel. In between the wires there are layers of thermoplastic fabrics and film.

The functions of the various components are basically as follows: ***Internal wire spiral*** supports the hose wall and provides resistance to vacuum for suction applications. ***External wire spiral*** armors the hose against abrasion and impact damage and binds the layers of fabrics and films tightly together. ***Fabric layers*** act as strength members against internal pressure. It is also a common feature of many composite hoses to have as the external layer PVC coated fabric. This provides an easily cleanable color coded surface and gives additional abrasion resistance. ***Film layers*** act as a sealing medium to ensure that no product escapes from the hose. Films and fabrics can be polypropylene, polyamide, PTFE, polyester polyaramid or glass. By combining these alternative components in various ways it is possible to produce hoses with a wide range of chemical resistance, working temperatures and pressures.



End fittings, as with all types of hose a composite hose assembly depends on the strength and reliability of its coupling system. Accord has developed its own unique fitting configuration and swaging system which uses high quality rubber seals; steel or stainless steel ferrules and couplings to ensure that when prototype tests are conducted, the hose will burst before the end fitting is expelled. This ensures the maximum strength of the hose is fully achieved. Accord's swaging system gives superior results to wire whipping or clamping methods of attachment, and guarantees electrical continuity to ensure static is fully discharged.

The inner wire is permanently in contact with the coupling. The outer wire is normally in electrical contact but should either of the wires be broken Accord uses electrically conductive seals to guarantee continuity. In order to provide the widest range of chemical resistance Accord swage seals are available in nitrile, butyl or Viton® elastomers.

All the composite hoses in our catalog are available as complete assemblies with a wide variety of end fittings such as flanges, quick couplers, NPT nipples and dry break couplings. Common end fitting materials are carbon steel, stainless steel, bronze, aluminum and polypropylene, although many other materials are also available.

Unless otherwise specified all Accord composite hose assemblies are swaged with carbon steel ferrules and nitrile rubber seals. Stainless steel ferrules and Viton or butyl seals can be supplied if requested.

Temperature versus pressure. Working pressures are calculated on a minimum safety factor of 5:1 burst pressure to working pressure as specified in USCG 154.500 for heavy duty 4" ID and larger hose assemblies . Composite hose is manufactured from thermoplastics and accordingly its working pressure will be reduced at elevated temperatures. Consult Accord personnel for advice on use at high temperatures.

No. CNG9, CAG9, CSG9
BIOFUEL and BIODIESEL COMPOSITE HOSES

Part Number	Inside Diameter	Outside Diameter	Bend Radius	Weight LB/FT	Working Pressure	Standard Length	Available Length
CNG-100	1”	1-1/2”	4”	.5	200 PSI	60’	80’
CNG-150	1-1/2”	2”	5-1/2”	.8	200 PSI	60’	80’
CNG-200	2”	2-1/2”	7”	1.3	200 PSI	60’	80’
CNG-250	2-1/2”	3”	8”	1.7	200 PSI	66’	80’
CNG-300	3”	3-1/2”	11”	3.0	200 PSI	60’	80’
CNG-400	4”	4-1/2”	15-1/2”	3.2	200 PSI	60’	80’
CNG-400 †	4”	5”	16”	4.3	200 PSI	60’	80’
CNG-600 †	6”	7”	20”	7.2	200 PSI	60’	100’
CNG-800 †	8”	9-1/2”	30”	10.0	200 PSI	60’	80’

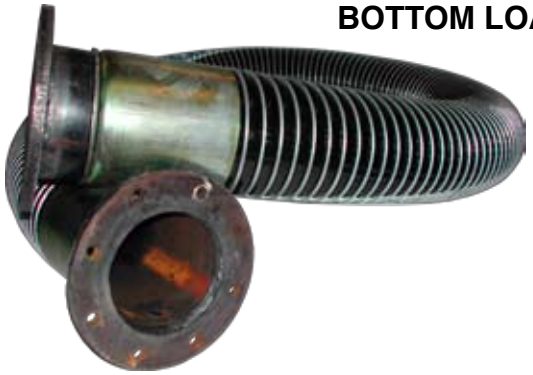
† Meets BS5842: 1980 & USCG, IMO, ECH, IBC Codes and Regulations

Inner Wire: N = Nylon coated steel, A = Aluminum, S = 316 Stainless Steel; **Outer Wire:** G = Galvanized steel
Liner: Polyamide, Nylon.
Carcass: Multiple layers of polypropylene fabrics and films.
Cover: Abrasion resistant PVC-impregnated fabric.
Temperature & Range: -20°C to +80°C, refer to Chemical Compatibility Chart.
Lengths: Standard, cut and coupled to client’s individual requirements. Longer lengths available upon request.
Couplings: Externally swaged: NPT threaded; cam & groove, fixed, floating, reducing flanges, etc..
Note: Nitrile, polypropylene, polyvinyl, and tygon materials are vulnerable to problems with used with Biofuels. Brass, bronze, copper, lead, tin and zinc may accelerate the oxidation of diesel and biodiesel fuels, and create fuel insolubles (sediments), or gels and salts when reacted with some fuel components. All lead solders, zinc linings, copper pipes, brass regulators, and any copper fittings should be avoided.
Recommended: End fitting material should be stainless steel, carbon steel, or aluminum.

Conveyants Handled: Can handle BioDiesel, Biofuel, and, Bioethanol. Composite hose, lined with polyamide (Nylon), provides excellent resistance to both mineral oils, alcohols and the component chemicals which constitute typical Biofuels.

Recommended For: Sizes 1” to 8” are lightweight and flexibility are essentially designed for chemical utility hose for chemical plants, refineries, and many other in-plant, liquid transfer operations, also rail car loading and tank truck loading and delivery, storage tank transfer, refinery process, drumming, manifolding, batching and blending. 4:1 Safety Factor, ISO Approved. The hose we offer for these media is the Danoil 9 NG, AG, or SG hose which is available from 1” to 8” bore, maximum working pressure is to 14-Bar (200 PSI) and with its nylon lining possesses excellent resistance to Biodiesel and alcohols.

No. CGG
PETROLEUM COMPOSITE HOSES
BOTTOM LOADING COMPOSITE HOSES



Part Number	Inside Diameter	Outside Diameter	Bend Radius	Weight LB/FT	Working Pressure	Standard Length	Available Length
CGG-100	1”	1-1/2”	4”	.5	200 PSI	60’	80’
CGG-150	1-1/2”	2”	5-1/2”	.8	200 PSI	60’	80’
CGG-200	2”	2-1/2”	7”	1.3	200 PSI	60’	80’
CGG-250	2-1/2”	3”	8”	1.7	200 PSI	60’	80’
CGG-300	3”	3-1/2”	11”	2.0	200 PSI	60’	80’
CGG-300 †	3”	4-1/2”	11”	3.0	200 PSI	60’	80’
CGG-400	4”	4-1/2”	15-1/2”	3.5	200 PSI	60’	80’
CGG-400 †	4”	5”	16”	4.3	200 PSI	60’	80’
CGG-600 †	6”	7”	20”	7.2	200 PSI	60’	100’
CGG-800 †	8”	9-1/2”	30”	10.0	200 PSI	60’	80’
CGG-1000 †	10”	11-1/2”	36”	13.7	150 PSI	40’	50’

† Meets BS5842: 1980 & USCG, IMO, ECH, IBC Codes and Regulations

Inner Wire: G = Galvanized steel **Outer Wire:** G = Galvanized steel
Liner: Polypropylene and polyester.
Carcass: Multiple layers of polypropylene fabrics, films and polyester barrier layers.
Cover: Abrasion resistant PVC-impregnated fabric.
Temperature & Range: -20°C to +80°C, refer to Chemical Compatibility Chart.
Lengths: Standard, cut and coupled to client’s individual requirements. Longer lengths available upon request.
Couplings: Externally swaged: NPT threaded; cam & groove, fixed, floating, reducing flanges, etc..

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

Recommended For: Sizes 1” to 4” are designed for a wide range of fuel, oil and lubricant applications where lightweight and flexibility are essential, i.e. rail car and tank truck loading and delivery, storage tank transfer, refinery process, drumming, manifolding, batching and blending. 4:1 Safety Factor, ISO Approved.
**** Note: CGG-400, 4” ID hoses are often used for bottom loading and are suitable for all hose loading arms. Fitted with fixed or floating TTMA flanged ends. Straight or 90° elbows are available.**

Sizes 3” to 10” designed for dockside and marine terminal transfer of fuels, lubricants and aromatics at rated discharge or at full suction. Ideal hose for loading and unloading barges, tankers, bunkering service and other dockside operations at marine terminals. Spiral-wound inner and outer wires provide strength and flexibility to maintain hose integrity under stress and strain of ship and barge movement. IMO type approval.

No. CGG-xxx-M
MTBE & PETROLEUM COMPOSITE HOSES

Part Number	Inside Diameter	Outside Diameter	Bend Radius	Weight LB/FT	Working Pressure	Standard Length	Available Length
CGG-100-M	1”	1-1/2”	4”	.5	200 PSI	60’	80’
CGG-150-M	1-1/2”	2”	5-1/2”	.8	200 PSI	60’	80’
CGG-200-M	2”	2-1/2”	7”	1.3	200 PSI	60’	80’
CGG-250-M	2-1/2”	3”	8”	1.7	200 PSI	60’	80’
CGG-300-M	3”	3-1/2”	11”	2.0	200 PSI	60’	80’
CGG-300-M †	3”	4-1/2”	11”	3.0	200 PSI	60’	80’
CGG-400-M	4”	4-1/2”	15-1/2”	3.5	200 PSI	60’	80’
CGG-400-M †	4”	5”	16”	4.3	200 PSI	60’	80’
CGG-600-M †	6”	7”	20”	7.2	200 PSI	60’	100’
CGG-800-M †	8”	9-1/2”	30”	10.0	200 PSI	60’	80’
CGG-1000-M †	10”	11-1/2”	36”	13.7	150 PSI	40’	50’

† Meets BS5842: 1980 & USCG, IMO, ECH, IBC Codes and Regulations

Inner Wire: G = Galvanized steel **Outer Wire:** G = Galvanized steel
Liner: Polypropylene and polyamide.
Carcass: Multiple layers of polypropylene fabrics, films and polyester barrier layers.
Cover: Abrasion resistant PVC-impregnated fabric.
Temperature & Range: -20°C to +80°C, refer to Chemical Compatibility Chart.
Lengths: Standard, cut and coupled to client’s individual requirements. Longer lengths available upon request.
Couplings: Externally swaged: NPT threaded; cam & groove, fixed, floating, reducing flanges, etc..

Conveyants Handled: MTBE, gasoline, diesel fuel, paraffin, kerosene, lubricating oils, 100% aromatics and black oils and heavy lubricants and solvents. Not recommended for corrosive and aggressive chemicals. Refer to Chemical Compatibility Chart for specific recommendations.

Recommended For: Sizes 1” to 4” are designed for a wide range of fuel, oil and lubricant applications where lightweight and flexibility are essential, i.e. rail car and tank truck loading and delivery, storage tank transfer, refinery process, drumming, manifolding, batching and blending. 4:1 Safety Factor, ISO Approved.

Sizes 3” to 10” designed for dockside and marine terminal transfer of fuels, lubricants and aromatics at rated discharge or at full suction. Ideal hose for loading and unloading barges, tankers, bunkering service and other dockside operations at marine terminals. Spiral-wound inner and outer wires provide strength and flexibility to maintain hose integrity under stress and strain of ship and barge movement. IMO type approval.

No. CGG-xxx-FS
FIRESAFE MTBE & PETROLEUM COMPOSITE HOSES

Part Number	Inside Diameter	Outside Diameter	Bend Radius	Weight LB/FT	Working Pressure	Standard Length	Available Length
CGG-100-FS	1”	1-1/2”	4”	.5	200 PSI	60’	80’
CGG-150-FS	1-1/2”	2”	5-1/2”	.8	200 PSI	60’	80’
CGG-200-FS	2”	2-1/2”	7”	1.3	200 PSI	60’	80’
CGG-250-FS	2-1/2”	3”	8”	1.7	200 PSI	60’	80’
CGG-300-FS	3”	3-1/2”	11”	2.0	200 PSI	60’	80’
CGG-400-FS	4”	4-1/2”	15-1/2”	3.5	200 PSI	60’	80’
CGG-400-FS †	4”	5”	16”	4.3	200 PSI	60’	80’
CGG-600-FS †	6”	7”	20”	7.2	200 PSI	60’	100’
CGG-800-FS †	8”	9-1/2”	30”	10.0	200 PSI	60’	80’
CGG-1000-FS †	10”	11-1/2”	36”	13.7	150 PSI	40’	50’

† Meets BS5842: 1980 & USCG, IMO, ECH, IBC Codes and Regulations

FIRESAFE composite hose utilize a series of non-asbestos barriers to conductive and radiative heat to achieve outstanding fire retardant ability. After 30 minutes of severe fire attack, the hose carcass is still intact and capable of holding product. Even after loss of integrity, this hose will not fail catastrophically, instead it will gradually burn off the product as it presents itself to atmosphere.

Inner Wire: G = Galvanized steel **Outer Wire:** G = Galvanized steel
Liner: Polypropylene and polyamide.
Carcass: Multiple layers of polypropylene fabrics, films and polyester barrier layers.
Cover: Abrasion resistant PVC-impregnated fabric.
Temperature & Range: -20°C to +80°C, refer to Chemical Compatibility Chart.
Lengths: Standard, cut and coupled to client’s individual requirements. Longer lengths available upon request.
Couplings: Externally swaged: NPT threaded; cam & groove, fixed, floating, reducing flanges, etc..

Conveyants Handled: MTBE, gasoline, diesel fuel, paraffin, kerosene, lubricating oils, 100% aromatics and black oils and heavy lubricants and solvents. Not recommended for corrosive and aggressive chemicals. Refer to Chemical Compatibility Chart for specific recommendations.

Recommended For: Sizes 1” to 4” are designed for a wide range of fuel, oil and lubricant applications where lightweight and flexibility are essential, i.e. rail car and tank truck loading and delivery, storage tank transfer, refinery process, drumming, manifolding, batching and blending. 4:1 Safety Factor, ISO Approved.

Sizes 4” to 10” designed for dockside and marine terminal transfer of fuels, lubricants and aromatics at rated discharge or at full suction. Ideal hose for loading and unloading barges, tankers, bunkering service and other dockside operations at marine terminals. Spiral-wound inner and outer wires provide strength and flexibility to maintain hose integrity under stress and strain of ship and barge movement. IMO type approval.

No. CPG
CHEMICAL COMPOSITE HOSES

Part Number	Inside Diameter	Outside Diameter	Bend Radius	Weight LB/FT	Working Pressure	Standard Length	Available Length
CPG-100	1”	1-1/2”	4”	.5	200 PSI	60’	80’
CPG-150	1-1/2”	2”	5-1/2”	.8	200 PSI	60’	80’
CPG-200	2”	2-1/2”	7”	1.3	200 PSI	60’	80’
CPG-250	2-1/2”	3”	8”	1.7	200 PSI	60’	80’
CPG-300	3”	3-1/2”	11”	3.0	200 PSI	60’	80’
CPG-300 †	3”	4”	11”	2.0	150 PSI	60’	80’
CPG-400	4”	4-1/2”	15-1/2”	3.5	200 PSI	60’	80’
CPG-400 †	4”	5”	16”	4.3	200 PSI	60’	80’
CPG-600 †	6”	7”	20”	7.2	200 PSI	60’	100’
CPG-800 †	8”	9-1/2”	30”	10.0	200 PSI	60’	80’
CPG-1000 †	10”	11-1/2”	36”	13.7	150 PSI	40’	50’

† Meets BS5842: 1980 & USCG, IMO, ECH, IBC Codes and Regulations

Inner Wire: P = Polypropylene coated steel **Outer Wire:** G = Galvanized steel
Liner: Polypropylene and polyester.
Carcass: Multiple layers of polypropylene fabrics, films and polyester barrier layers.
Cover: Abrasion resistant PVC-impregnated fabric.
Temperature & Range: -20°C to +80°C, refer to Chemical Compatibility Chart.
Lengths: Standard, cut and coupled to client’s individual requirements. Longer lengths available upon request.
Couplings: Externally swaged: NPT threaded; cam & groove, fixed, floating, reducing flanges, etc..

Conveyants Handled: Can handle highly corrosive acids, alkalies, aldehydes, amines, aliphatic, aromatic fuels, chlorinated hydrocarbons, alcohol’s, esters, ketones, lacquers and petroleum products at rated discharge pressure or at full suction. Not recommended for service of many bromide, chloride, or fluoride compounds.

Recommended For: Sizes 1” to 4” are lightweight and flexibility are essentially designed for chemical utility hose for chemical plants, refineries, paint producers, paper mills and many other in-plant, liquid transfer operations, also rail car loading and tank truck loading and delivery, storage tank transfer, refinery process, drumming, manifolding, batching and blending. 4:1 Safety Factor, ISO Approved.

Sizes 3” to 10” designed for loading and unloading barges, tankers, bunkering service and other dockside operations at marine terminals. Spiral-wound inner and outer wires provide strength and flexibility to maintain hose integrity under stress and strain of ship and barge movement. IMO type approval.

No. CSG/SS
CHEMICAL COMPOSITE HOSES

Part Number	Inside Diameter	Outside Diameter	Bend Radius	Weight LB/FT	Working Pressure	Standard Length	Available Length
CSG/SS-100	1”	1-1/2”	4”	.5	200 PSI	60’	80’
CSG/SS-150	1-1/2”	2”	5-1/2”	.8	200 PSI	60’	80’
CSG/SS-200	2”	2-1/2”	7”	1.3	200 PSI	60’	80’
CSG/SS-250	2-1/2”	3”	8”	1.7	200 PSI	60’	80’
CSG/SS-300	3”	3-1/2”	11”	3.0	200 PSI	60’	80’
CSG/SS-300 †	3”	4”	11”	2.0	150 PSI	60’	80’
CSG/SS-400	4”	4-1/2”	15-1/2”	3.5	200 PSI	60’	80’
CSG/SS-400 †	4”	5”	16”	4.3	200 PSI	60’	80’
CSG/SS-600 †	6”	7”	20”	7.2	200 PSI	60’	100’
CSG/SS-800 †	8”	9-1/2”	30”	10.0	200 PSI	60’	80’
CSG/SS-1000 †	10”	11-1/2”	36”	13.7	150 PSI	40’	50’

† Meets BS5842: 1980 & USCG, IMO, ECH, IBC Codes and Regulations

Inner Wire: S = 316 Stainless steel **Outer Wire:** G = Galvanized steel, S = 316 Stainless steel
Liner: Polypropylene and polyester.
Carcass: Multiple layers of polypropylene fabrics, films and polyester barrier layers.
Cover: Abrasion resistant PVC-impregnated fabric.
Temperature & Range: -20°C to +80°C, refer to Chemical Compatibility Chart.
Lengths: Standard, cut and coupled to client’s individual requirements. Longer lengths available upon request.
Couplings: Externally swaged: NPT threaded; cam & groove, fixed, floating, reducing flanges, etc..

Conveyants Handled: Can handle highly corrosive acids, alkalies, aldehydes, amines, aliphatic, aromatic fuels, chlorinated hydrocarbons, alcohol’s, esters, ketones, lacquers and petroleum products at rated discharge pressure or at full suction. Not recommended for service of many bromide, chloride, or fluoride compounds.

Recommended For: Sizes 1” to 4” are lightweight and flexibility are essentially designed for chemical utility hose for chemical plants, refineries, paint producers, paper mills and many other in-plant, liquid transfer operations, also rail car loading and tank truck loading and delivery, storage tank transfer, refinery process, drumming, manifolding, batching and blending. 4:1 Safety Factor, ISO Approved.

Sizes 3” to 10” designed for loading and unloading barges, tankers, bunkering service and other dockside operations at marine terminals. Spiral-wound inner and outer wires provide strength and flexibility to maintain hose integrity under stress and strain of ship and barge movement. IMO type approval.

No. CSG/SS-xxx-T
PTFE LINED CHEMICAL COMPOSITE HOSES

Part Number	Inside Diameter	Outside Diameter	Bend Radius	Weight LB/FT	Working Pressure	Standard Length	Available Length
CSG/SS-100-T	1”	1-1/2”	4”	.5	200 PSI	60’	80’
CSG/SS-150-T	1-1/2”	2”	5-1/2”	.8	200 PSI	60’	80’
CSG/SS-200-T	2”	2-1/2”	7”	1.3	200 PSI	60’	80’
CSG/SS-250-T	2-1/2”	3”	8”	1.7	200 PSI	60’	80’
CSG/SS-300-T	3”	3-1/2”	11”	3.0	200 PSI	60’	80’
CSG/SS-300-T †	3”	4”	11”	2.0	150 PSI	60’	80’
CSG/SS-400-T	4”	4-1/2”	15-1/2”	3.5	200 PSI	60’	80’
CSG/SS-400-T †	4”	5”	16”	4.3	200 PSI	60’	80’
CSG/SS-600-T †	6”	7”	20”	7.2	200 PSI	60’	100’
CSG/SS-800-T †	8”	9-1/2”	30”	10.0	200 PSI	60’	80’
CSG/SS-1000-T †	10”	11-1/2”	36”	13.7	150 PSI	40’	50’

† Meets BS5842: 1980 & USCG, IMO, ECH, IBC Codes and Regulations

Inner Wire: S = 316 Stainless steel **Outer Wire:** G = Galvanized steel, S = 316 Stainless steel

Liner: PTFE-FEP.

Carcass: Multiple layers of polypropylene fabrics, films and polyester barrier layers.

Cover: Abrasion resistant PVC-impregnated fabric.

Temperature & Range: -20°C to +80°C, refer to Chemical Compatibility Chart.

Lengths: Standard, cut and coupled to client’s individual requirements. Longer lengths available upon request.

Couplings: Externally swaged: NPT threaded; cam & groove, fixed, floating, reducing flanges, etc..

Conveyants Handled: Can handle very aggressive and corrosive chemicals, generally used where the chemical resistance of polypropylene is inadequate. Chemicals include: butyl chloride, chlorosulphonic acid, oleum and pentachlorethane at rated discharge pressure or at full suction.

Recommended For: Sizes 1” to 4” are lightweight and flexibility are essentially designed for chemical utility hose for chemical plants, refineries, paint producers, paper mills and many other in-plant, liquid transfer operations, rail car loading and tank truck loading and delivery, storage tank transfer, refinery process, drumming, manifolding, batching and blending. 4:1 Safety Factor, ISO Approved.

Sizes 3” to 10” designed for loading and unloading barges, tankers, bunkering service and other dockside operations at marine terminals. Spiral-wound inner and outer wires provide strength and flexibility to maintain hose integrity under stress and strain of ship and barge movement. IMO type approval.

DANTEC - SUPER-FLEX; No. CECTFExx-xxx
ECTFE LINED CHEMICAL COMPOSITE HOSES

Part Number	I.D.	O.D.	Bend Radius	Weight LB/FT	Working Pressure	Std. Lgth	Max. Lgth.
CECTFE-400 †	4”	5”	16”	4.6	250 PSI	60’	80’
CECTFE-600 †	6”	7”	20”	7.6	250 PSI	60’	100’
CECTFE-800 †	8”	9.5”	30”	11	250 PSI	60’	80’

† Meets BS5842: 1980 & USCG, IMO, ECH, IBC Codes and Regulations

Inner Wire: S = 316 Stainless steel; **Outer Wire:** S = 316 Stainless steel
Liner: Low permeability ECTFE flouropolymer.
Carcass: Multiple layers of polypropylene fabrics, films and polyester barrier layers.
Cover: Abrasion resistant PVC-impregnated fabric.
Temperature & Range: -20°C to +100°C, refer to Chemical Compatibility Chart.
Lengths: Standard, cut and coupled to client’s individual requirements. Longer lengths available upon request.
Couplings: Externally swaged: NPT threaded; cam & groove, fixed, floating, reducing flanges, etc..

Conveyants Handled: Can handle dense products such as sulphuric acid, products conveyed hot such as palm oil, long unsupported lengths such as are required by hose towers and hoses which must be cleaned with low pressure steam.

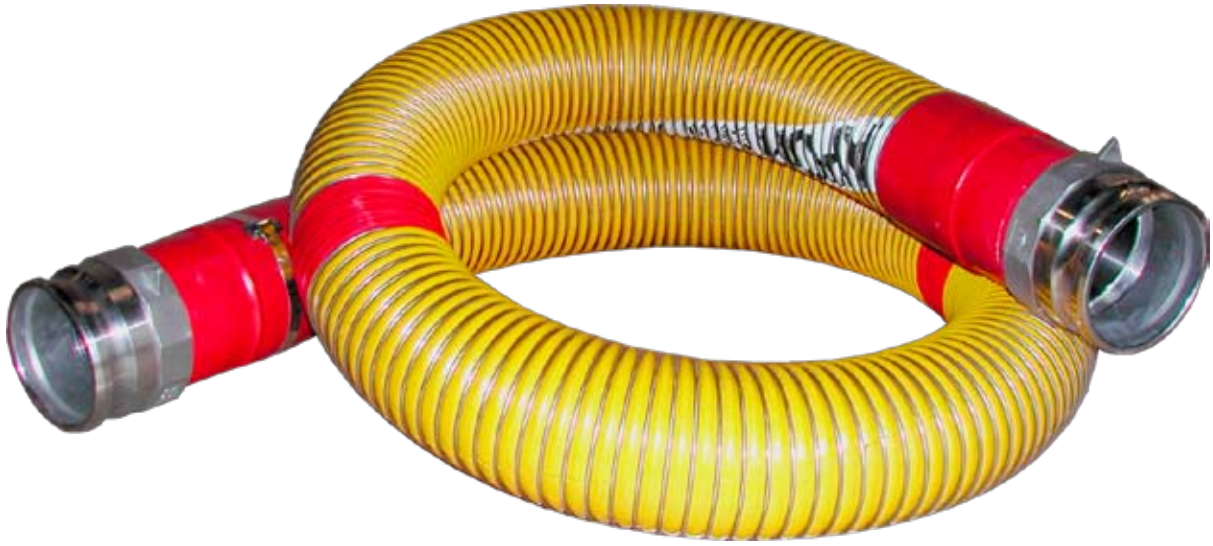
Recommended For: Applications where standard composite hose has a limited life or a new application which you feel may be arduous try Dantec SuperFlex Hose. Sizes are 4”, 6” and 10”. 5:1 Safety Factor, ISO Approved.

The key improvements in SuperFlex Hose construction are:
1. Closer wire pitch. This increases the impact resistance of the hose and reduces the risk of over-bending.
2. Multiple high temperature tension members built into the wall of the hose. These high tensile strength layers reduce considerably elongation and plastic deformation of the hose wall particularly near the ends is negligible.
3. ECTFE lining. This “high tech” fluoropolymer has chemical resistance properties virtually identical to PTFE but its mechanical strength is many times greater and its permeability to gases including steam is much lower.
The result of these innovations is a hose which supports its own weight better, will last longer when steam cleaned and resist better overbending better. Applications where we recommend customers consider its use are dense products such as sulphuric acid, products conveyed hot such as palm oil, long unsupported lengths such as are required by hose towers and hoses which must be cleaned with low pressure steam. If you have an application where standard composite hose has a limited life or a new application which you feel may be arduous try Dantec SuperFlex Hose.

Dantec SuperFlex Composite Hose has many advantages over rubber and stainless steel hoses for ship to shore transfer operations, particularly, light weight, high flexibility, wide chemical resistance and robust construction. However there is no such thing as a perfect hose and composite hose has some weaknesses. These result from the very nature of the thermoplastic materials used in the construction of all composite hoses. Thermoplastics are heat sensitive in that as temperatures rise they lose strength and rigidity. They are also prone to plastic deformation i.e. hoses will elongate under load non-elastically particular at elevated temperatures.

These properties mean that composite hoses need careful support especially when products are transferred at temperatures in excess of 60 deg C. If not fully supported composite hose may be over-bent especially near to the couplings. Over-bending can result in displacement of the wire helices from their correct pitch and cause a collapse of the hose. Finally high temperature cleaning of composite hoses using low pressure steam can quickly damage the sealing film and fabric reinforcing layers.

No. CGG-xxxVR
VAPOR RECOVERY COMPOSITE HOSES



Part Number	Inside Diameter	Outside Diameter	Bend Radius	Weight LB/FT	Working Pressure	Standard Length	Available Length
CGG-300VR	3”	4”	4”	1.6	100 PSI	60’	80’
CGG-400VR	4”	5”	5-1/2”	2.3	100 PSI	60’	80’
CGG-600VR	6”	7”	7”	5.6	100 PSI	60’	100’
CGG-800VR	8”	9-1/2”	8”	8.4	100 PSI	60’	80’
CGG-1000VR	10”	11-1/2”	11”	10.7	100 PSI	40’	50’

Inner Wire: G = Galvanized steel **Outer Wire:** G = Galvanized steel, S = 316 Stainless steel
Liner: Polypropylene and polyester.
Carcass: Polypropylene bore fabrics, with multiple aromatic resistant films layers and reinforced fabric.
Cover: Abrasion resistant PVC-impregnated fabric.
Temperature & Range: -20°C to +80°C, refer to Chemical Compatibility Chart.
Lengths: Standard, cut and coupled to client’s individual requirements. Longer lengths available upon request.
Couplings: Externally swaged: NPT threaded; cam & groove, fixed, floating, reducing flanges, etc..
Color: High visibility yellow with required red, yellow, red bands marked “VAPOR” at both ends of hose assembly to USCG regulations.

Compliance: Meet or exceed the requirements of U.S. Coast Guard 33CFR,154.810, paragraph (d), vapor line connections.

Vapors Handled: Chemical and hydrocarbon vapors and 100% aromatics

Recommended For: The recovery of volatile hydrocarbon vapors in rail car and truck loading terminals, and unloading at service stations. Designed for compliance with EPA Stage 1 requirements for recovering volatile hydrocarbon vapors in rail car or tank truck loading at bulk terminals, and unloading at service stations. Designed to meet the demands for light weight, flexibility and strength imposed on these hoses in the marine environment in vapor recovery operations. Designed to meet USCG requirements for recovering certain chemical and volatile hydrocarbon vapors during ship and barge loading at bulk storage terminals, plants, refineries and other transfer operation in a marine environment.

*5:1 Safety Factor ISO Approved

No. CSG/SS-xxxVR
VAPOR RECOVERY COMPOSITE HOSES

Part Number	Inside Diameter	Outside Diameter	Bend Radius	Weight LB/FT	Working Pressure	Standard Length	Available Length
CSG/SS-300VR	3”	4”	4”	1.6	100 PSI	60’	80’
CSG/SS-400VR	4”	5”	5-1/2”	2.3	100 PSI	60’	80’
CSG/SS-600VR	6”	7”	7”	5.6	100 PSI	60’	100’
CSG/SS-800VR	8”	9-1/2”	8”	8.4	100 PSI	60’	80’
CSG/SS-1000VR	10”	11-1/2”	11”	10.7	100 PSI	40’	50’

Inner Wire: S = 316 Stainless steel **Outer Wire:** G = Galvanized steel, S = 316 Stainless steel
Liner: Polypropylene and polyester.
Carcass: Polypropylene bore fabrics, with multiple aromatic resistant films layers and reinforced fabric.
Cover: Abrasion resistant PVC-impregnated fabric.
Temperature & Range: -20°C to +80°C, refer to Chemical Compatibility Chart.
Lengths: Standard, cut and coupled to client’s individual requirements. Longer lengths available upon request.
Couplings: Externally swaged: NPT threaded; cam & groove, fixed, floating, reducing flanges, etc..
Color: High visibility yellow with required red, yellow, red bands marked “VAPOR” at both ends of hose assembly to USCG regulations.

Compliance: Meet or exceed the requirements of U.S. Coast Guard 33CFR,154.810, paragraph (d), vapor line connections.

Vapors Handled: Chemical and hydrocarbon vapors and 100% aromatics

Recommended For: The recovery of volatile hydrocarbon vapors in rail car and truck loading terminals, and unloading at service stations. Designed for compliance with EPA Stage 1 requirements for recovering volatile hydrocarbon vapors in rail car or tank truck loading at bulk terminals, and unloading at service stations. Designed to meet the demands for light weight, flexibility and strength imposed on these hoses in the marine environment in vapor recovery operations. Designed to meet USCG requirements for recovering certain chemical and volatile hydrocarbon vapors during ship and barge loading at bulk storage terminals, plants, refineries and other transfer operation in a marine environment.

*5:1 Safety Factor ISO Approved

No. CSS-xxxPC
SUBMERSIBLE PLAIN COVER CHEMICAL COMPOSITE HOSES

Part Number	Inside Diameter	Outside Diameter	Bend Radius	Weight LB/FT	Working Pressure	Standard Length	Available Length
CSS-300PC	3”	4”	11”	2.0	150 PSI	60’	80’
CSS-400PC	4”	5”	16”	4.3	200 PSI	60’	80’
CSS-600PC	6”	7”	20”	7.2	200 PSI	60’	100’

Meets BS5842: 1980 & USCG, IMO, ECH, IBC Codes and Regulations
Additional sizes are available upon request.

Inner Wire: S = 316 Stainless steel **Outer Wire:** S = 316 Stainless steel
Liner: Polypropylene fabrics.
Carcass: Multiple layers of polypropylene fabrics, films and polyester barrier layers.
Cover: Polypropylene fabrics.
Temperature & Range: -20°C to +80°C, refer to Chemical Compatibility Chart.
Lengths: Standard, cut and coupled to client’s individual requirements. Longer lengths available upon request.
Couplings: Externally swaged: Sandvik ,NPT threaded; cam & groove, fixed, floating, reducing flanges, etc..

Conveyants Handled: Can handle corrosive acids, alkalies, aldehydes, amines, aliphatic, aromatic fuels, chlorinated hydrocarbons, alcohol’s, esters, ketones, lacquers and petroleum products at rated discharge pressure or at full suction. Not recommended for service of many bromide, chloride, or fluoride compounds.

Recommended For: Shipboard applications.

IMO type approval.

No. CCSS
CRYOGENIC COMPOSITE HOSES

Part Number	Inside Diameter	Bend Radius	Weight LB/FT	Working Pressure	Standard Length	Available Length
CCSS-050	1/2”	5”	.2	150 PSI	60’	80’
CCSS-100	1”	5.5”	.7	370 PSI	60’	80’
CCSS-150	1-1/2”	6”	1.0	370 PSI	60’	80’
CCSS-200	2”	7”	1.7	370 PSI	60’	80’
CCSS-250	2-1/2”	8”	2.2	370 PSI	60’	80’
CCSS-300	3”	10”	3.0	370 PSI	60’	80’
CCSS-400	4”	20”	5	300 PSI	60’	80’
CCSS-600	6”	26”	9.3	300 PSI	60’	100’
CCSS-800	8”	36”	12.5	225 PSI	60’	80’
CCSS-1000	10”	30”	15.1	150 PSI	40’	50’

Inner Wire: S = 316 Stainless steel **Outer Wire:** S = 316 Stainless steel
Liner: Polyester, polyamide.
Carcass: Multiple layers of low temperature thermoplastic fabrics and films.
Cover: Polyester fabric cover. Rope lagging for extra protection and insulation available.
Temperature & Range: -328°F to +80°C, refer to Chemical Compatibility Chart.
Lengths: Standard, cut and coupled to client’s individual requirements.

Couplings: Supplied with specifically engineered factory-fitted end connections to client’s requirement.
Electrical Properties: Full electrical continuity is achieved by bonding the twin wire spirals to the end fitting. Static electrical charges which may be generated during transfer of fluids and vapors are thus safely dissipated.

Conveyants Handled: Compatible with a wide range of low temperature fluids including the following per IMO Gas Carrier Code, Chapter XIX: Butadiene, 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.

Certification: Bore sizes 4”, 6” and 8” 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).

Recommended For: And designed specifically for the transfer of fully refrigerated liquefied petroleum gasses and related conveyants to -328°F(-200°C).

*5:1 Safety Factor ISO Approved

INSPECTION, TESTING AND MAINTENANCE OF COMPOSITE HOSES

Visual inspection - check hoses before each operation and before conducting hydrostatic test...

Visual inspection should note:
- Dents (collapsed or crushed places) or kinks in hose
- Breaks in outer reinforcing wire
- Displacement of inner and outer reinforcing wires from normal pitch
- Displacement of end fittings and signs of fitting leakage
- Wear or damage to end fittings
- Chemical attack, deterioration and physical damage to outer cover and carcass

Moderate abrasion to the outer cover is acceptable if reinforcing fabrics below the cover are undamaged.

NOTE: More thorough inspection at least every 6 months.

CAUTION: Hoses with significant defects of the above types should be retired from service.

Hydrostatic testing - annually or more frequently...

Hoses should be tested as follows:
- Drain and thoroughly clean hose per recommended procedure.
- Test electrical continuity per recommended procedure.
- Inspect hoses visually per recommended procedure. Lay hose straight out on supports or on roller bed that allows free movement under pressure.
- Blank off ends. Fill hose completely with water. Make sure trapped air is released by tilting slightly at one end.
- Pressurize assembly to 1-1/2 times the maximum working pressure.
- Hold at this pressure and examine for leaks.
- Test electrical continuity while under pressure. It should be same as for unpressurized hose.
- Release pressure - carefully! Drain hose.
- Test for electrical continuity upon completion of pressure test.

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.

Electrical continuity tests - every 6 months or more frequently...

To check electrical continuity:
- Lay hose flat on ground.
- Check electrical continuity with battery/bulb continuity indicator or with an ohm meter (resistance should be 10 ohms or less).

NOTE: Hoses that are not electrically continuous should be retired from service.

CAUTION: Hoses that are not electrically continuous present a significant sparking or internal arc over hazard.

INSPECTION, TESTING AND MAINTENANCE OF COMPOSITE HOSES

Cleaning - after use or prolonged storage, before testing...

Most appropriate cleaning method depends on use and location.

- Thoroughly drain strong acid conveyants, or other reactive conveyants, before cleaning to avoid exothermic reactions.
- Electrically ground hose during cleaning to avoid static charge build-up - especially in the presence of flammable liquids or vapors.
- Flush with fluids like fresh or sea water, hot water, detergents, common solvents at ambient temperatures.
- Drain thoroughly after flushing, especially if sea water is used, to minimize inner wire and fittings corrosion.
- Fully drain of any cleaning fluids/solvent to avoid any chemical reactions when hose is put back in service.

Loose steam or compressed air may be used to clean hoses.

- Hoses must be open-ended (no restrictions).
- Lay hose out flat and straight.
- Do not exceed maximum working temperature to avoid damage to carcass materials.

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

Hose repairs - consult Accord International, Inc.

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.

COMPOSITE, METAL & RUBBER TRANSFER HOSE GUIDE

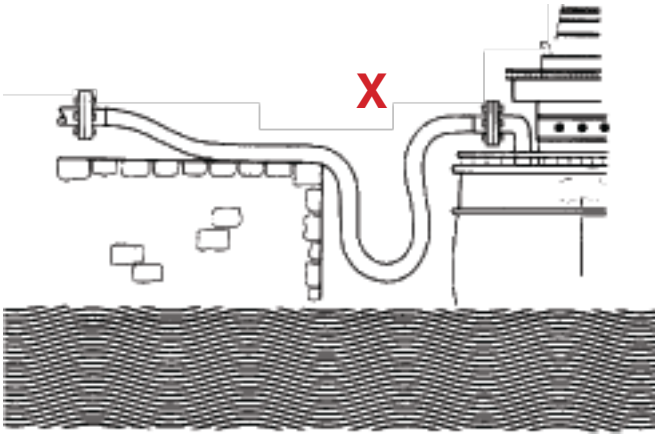
Incorrect

Never use hose unsupported

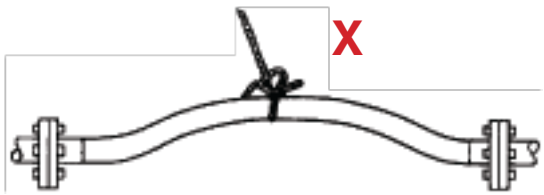
Never use hose unsupported

Protect against sharp edges, quay edge, ship's guard rail, etc.

Never use hose unsupported



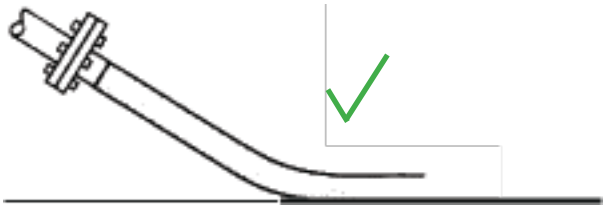
Never over bend hose or allow hose to hang between quay and ship



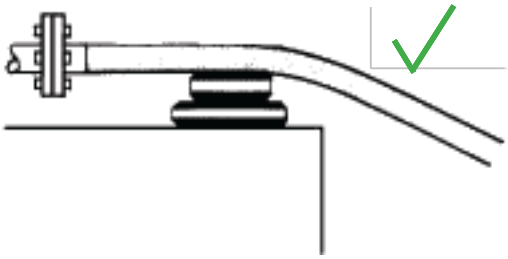
Never support hose with single rope

Correct

Always support hose near coupling



Acceptable



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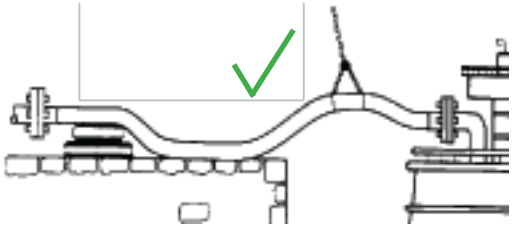
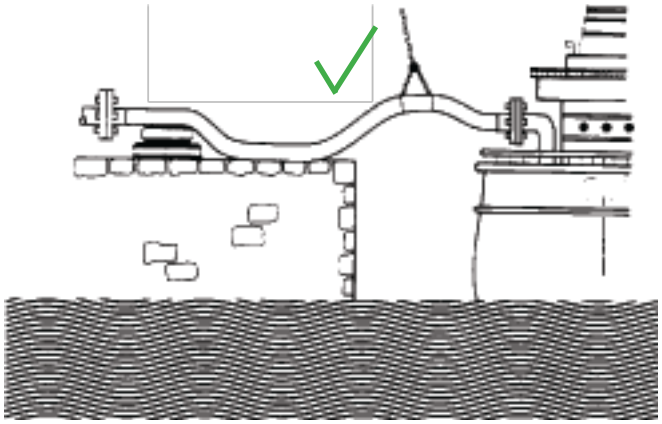


Support hose with slings where appropriate



Support hose with slings where appropriate

Composite Hose Chemical Resistance Chart

The following chart shows the suitability of composite hoses and end fittings for use with various fluids. The information is based on the best available data. Recommendations are given only as a guide and apply only to the chemical compatibility of the hose and end fitting material.

Please consult the engineering department for recommendation on applications in excess of 140°F (60°C) or for other extreme service conditions outside the scope of catalog rating. 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 contamination is not permissible. Accord International, Inc. reserves the right to change specifications and ratings without notice.

Suitability is indicated by the following categories:

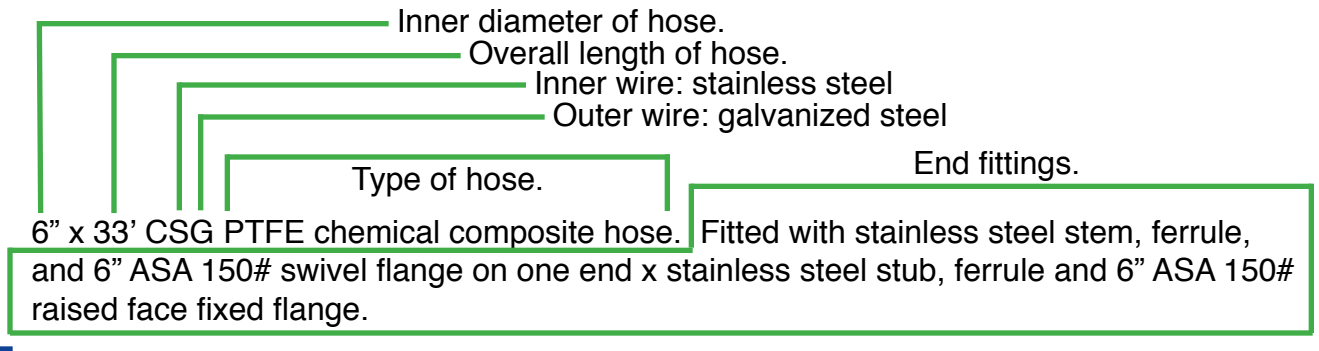
Key for composite hose:
A = Suitable for use at 140°F
B = Suitable for use at worldwide ambient temperatures
I = Suitable for Intermittent use only at worldwide ambient temperatures Intermittent use is defined as typical of ship to shore or road tanker transfer operations where the hose is not left full of product after use.
X = Unsuitable - Do not use.

Key for couplings of composite hose:
S = Couplings suitable for the operating conditions applicable to the hose.
– = Insufficient information
U = Couplings are unsuitable or no data available.
* = Polypropylene couplings

Hose Type	Inner Liner	Inner Wire	Outer Wire
1	Polypropylene	G	G
2	Polypropylene	P	G, S
3	Polypropylene	S	G, S
4	PTFE/FEP	S	G, S
5	Polypropylene & polyamide	G	G

Wire Designation
G = Galvanized mild steel
P = Polypropylene coated mild steel
S = 316L Stainless Steel

SAMPLE HOSE SPECIFICATION



Composite Hose Chemical Resistance Chart

Hose Key: A = suitable up to 140°F; B = suitable at ambient; I = suitable for intermittent at ambient; X = unsuitable, do not use

Coupling Key: S = suitable; - = insufficient information; U = unsuitable or no data available, * = Polypropylene couplings

		Hose Type					Coupling Type		
Chemical/Product Conveyed	**Concentration**	**1**	**2**	**3**	**4**	**5**	**Mild Steel**	**Stain-less**	**Brass**
Acetaldehyde	100	X	I	I	A	X	U	S	S
Acetic acid	60	X	A	A	A	X	U	S	S
Acetic acid	20	X	A	A	A	–	U	S	U
Acetic acid	Glacial	X	B	A	A	X	U	S	S
Acetic anhydride	100	X	B	B	A	X	U	S	S
Acetone	100	A	A	A	A	A	S	S	S
Acetone cyanohydrin		X	B	B	A	–	S	S	U
Acetonitrile		B	B	B	A	B	S	S	S
Acetophenone	100	B	B	B	A	–	S	S	S
Acetylacetone	100	B	B	B	A	A	S	S	S
Acetylene dichloride	100	B	B	B	A	–	S	S	S
Acrolein	100	B	B	B	A	–	S	S	S
Acrylic acid		X	B	B	B	–	U	S	S
Acrylonitrile	100	X	A	A	A	A	U	S	S
Adipic acid	Saturated	A	A	A	A	A	U	S	S
Allyl alcohol	100	A	A	A	A	A	S	S	S
Allyl bromide	100	I	I	I	B	I	S	S	U
Allyl chloride	100	I	I	I	B	I	S	S	U
Alums	Saturated	A	A	A	A	A	S	S	S
Adiponitrile	100	B	B	B	A	–	S	S	S
Aluminium nitrate	Saturated	X	B	B	A	X	S	S	U
Aluminium chloride *	Saturated	X	B	B	A	X	U *	U *	U *
Aminoethyl ethanolamine		X	B	B	A	X	S	S	S
Ammonia solution		X	A	A	A	X	S	S	U
Ammonium salts	Saturated	X	A	B	B	A	S	S	U
Ammonium chloride	Saturated	X	A	I	I	A	U	U	U
Amyl acetate	100	I	I	A	A	B	S	S	S
Amyl alcohol	100	B	B	A	A	A	S	S	S
Amyl chloride	100	I	I	I	A	I	S	S	S
Aniline	100	A	A	A	A	X	S	S	U
Animal oil	100	A	A	A	A	A	S	S	S
Anisole	100	I	I	I	A	–	U	S	U
Antifreeze	100	A	A	A	A	B	S	S	S
Antimony chloride	All	X	B	B	B	X	U	S	S
Apple Juice	100	X	A	X	A	X	U	S	U
Aqua regia *		X	I	X	X		U *	U *	U *
Arsenic acid	80	X	B	B	A	X	U	S	S
Asphalt	100	X	X	X	A	X	S	S	S
Aviation fuel	100	I	I	I	B	A	S	S	S
Barium salts	Saturated	X	A	A	A	A	S	S	U
Beer		X	A	A	A	X	S	S	S
Benzaldehyde		X	I	I	A	X	U	S	U
Benzene		X	I	I	A	A	S	S	S
Benzene sulphonic acid	100	X	I	X	B	X	U	S	U
Benzoic acid		X	A	A	A	X	S	S	U
Benzoyl chloride	100	I	I	B	A	B	S	S	S
Benzyl alcohol	100	B	B	A	A	A	S	S	S
Bismuth carbonate	Saturated	X	A	X	A	X	S	S	U
Borax	Saturated	X	A	X	A	X	S	S	U
Brine	Saturated	X	A	X	B	X	U	S	U
Bromine	100	X	X	X	X	X	U	U	U
Butadiene	100	B	B	A	A	B	S	S	S
Butter	100	X	X	X	X	X	U	S	U
Butyl bromide	100	X	X	A	A	B	S	S	S
Butyl carbitol acetate		I	I	I	A	–	S	S	S
Butyl cellulose		A	A	A	A	–	S	S	S
Butyl cellulose acetate		I	I	I	A	–	S	S	U
Butyl/decyl/cetyl-eicosyl methacrylite mixture		X	X	X	B	–	U	S	U
Butylene glycol	100	A	A	A	A	I	S	S	S
Butyl ether		B	B	B	A	A	S	S	S
Butyl ethyl ether		B	B	B	A	A	S	S	S
Butyl methacrylate		I	I	I	A	–	S	S	S
Butyl methoxethyl ether		I	I	I	A	–	S	S	S
Butyl pthalate		A	A	A	A	A	S	S	S
Butyl stearate		B	B	B	A	A	S	S	S
Butraldehyde		X	X	X	A	–	U	S	U

Composite Hose Chemical Resistance Chart

Hose Key: A = suitable up to 140°F; B = suitable at ambient; I = suitable for intermittent at ambient; X = unsuitable, do not use

Coupling Key: S = suitable; - = insufficient information; U = unsuitable or no data available, * = Polypropylene couplings

		Hose Type					Coupling Type		
Chemical/Product Conveyed	**Concentration**	**1**	**2**	**3**	**4**	**5**	**Mild Steel**	**Stain-less**	**Brass**
Butyric acid	20	B	B	B	A	–	S	S	S
Butyrolacetone		I	I	I	A	–	S	S	S
Calcium salts	Saturated	X	A	A	A	X	S	S	
Calcium alkyl salicylate soln		X	A	A	A	–	S	S	S
Calcium chloride	Saturated	X	A	I	I	X	S	S	S
Calcium hypochlorite	20	X	B	I	I	X	U	S	U
Camphor oil		I	I	I	A	A	S	S	S
Caprylic acid		A	A	A	A	X	S	S	S
Carbinols		B	B	B	A	–	S	S	S
Carbitols		B	B	B	A	–	S	S	S
Carbitol acetate		I	I	I	A	–	S	S	S
Carbolic oil		I	I	I	A	–	S	S	S
Carbon disulphide	100	X	X	X	A	X	S	S	S
Carbon tetrachloride		I	I	I	A	A	S	S	S
Carbonic acid		X	A	A	A	X	U	S	S
Cashew nut shell oil		B	B	B	A	A	S	S	S
Castor oil	100	B	B	A	A	B	S	S	U
Caustic potash	50	I	A	A	A	X	S	S	U
Caustic soda	50	I	A	A	A	X	S	S	U
Chlorine water	Saturated	X	I	X	X	X	U	U	U
Chloroatic acid *	100	X	B	X	X	X	U *	U *	U *
Chlorobenzene		I	I	I	A	B	S	S	S
Chlorobutane		I	I	I	A	B	S	S	S
Chloroform		I	I	I	A	B	S	S	S
Chlorohydrins		I	I	I	A	–	U	S	U
Chloroprene		I	I	I	A	–	U	S	S
Chloropropionic acid *		X	I	X	X	X	U *	U *	U *
Chlorosulphonic acid	100	X	X	X	X	X	U	U	U
Chlorotoluene	100	X	X	X	A	B	S	S	U
Chrome alum	Saturated	X	A	A	A	X	S	S	S
Chromic acid aqueous	50	X	I	I	B	X	U	S	S
Citric acid	100	X	A	A	A	X	U	S	S
Clove oil	100	I	I	B	A	B	S	S	S
Coal tar naphtha		B	B	B	A	A	S	S	S
Copper salts	Saturated	X	B	B	A	X	S	S	U
Copper chloride *	Saturated	X	A	X	X	X	U *	U *	U *
Creosote (wood or coaltar)	100	B	B	B	A	X	S	S	S
Cresols	90	B	B	B	A	X	S	S	S
Cresylic acids	90	B	B	B	A	X	S	S	S
Crotonaldehyde	100	X	X	X	A	X	S	S	U
Cumene	100	B	B	B	A	X	S	S	S
Cyclohexane	100	B	B	B	A	A	S	S	S
Cyclohexanol	100	B	B	B	A	B	S	S	S
Cyclohexanone	100	I	I	I	A	–	S	S	S
Cyclohexylamine	100	B	B	B	A	X	S	S	S
Cyclopentane	100	B	B	B	A	A	S	S	S
P.Cymene	100	B	B	B	A	–	S	S	S
Decalin	100	X	X	X	A	A	U	S	U
Decyl alcohol	100	B	B	B	A	–	S	S	S
Decyl acrylate	100	B	B	B	A	–	S	S	S
Detergents	5	A	A	A	A	A	S	S	S
Dexytrin	100	A	A	A	A	A	S	S	S
Diacetone alcohol	100	B	B	B	A	–	S	S	S
Diaminoethylamine	100	X	B	B	A	X	S	S	S
Diamylamine	100	X	B	B	A	X	S	S	S
Dibromoethane	100	X	B	B	A	B	S	S	S
Dibutylamine	100	I	B	A	X	S	S	S	
Dibutyl ether	100	I	I	A	A	A	S	S	S
Dibutylpthalate	100	B	B	B	A	A	S	S	S
Dibutyl sebacate	100	B	B	B	A	–	S	S	S
Dichloroacetic acid *	100	X	I	X	X	X	U *	U *	U *
Dichlorobenzene	100	I	I	I	A	–	S	S	S
Dichlorobutane	100	I	I	I	A	A	S	S	S
Dichloroethylene	100	I	I	I	A	A	S	S	S
Dichloroethylether	100	I	I	I	A	–	S	S	S
Dichloromethane	100	I	I	I	A	A	S	S	S

Composite Hose Chemical Resistance Chart

Hose Key: A = suitable up to 140°F; B = suitable at ambient; I = suitable for intermittent at ambient; X = unsuitable, do not use

Coupling Key: S = suitable; - = insufficient information; U = unsuitable or no data available, * = Polypropylene couplings

		Hose Type					Coupling Type		
Chemical/Product Conveyed	**Concentration**	**1**	**2**	**3**	**4**	**5**	**Mild Steel**	**Stain-less**	**Brass**
Dichloropropane	100	I	I	I	A	A	S	S	S
Dichloropropylene	100	I	I	I	A	A	S	S	S
Dichloropropionic acid		X	I	I	I	X	U	S	U
Dicyclopentadiene		X	X	X	X	X	U	U	U
Diesel oil	100	B	B	B	A	A	S	S	S
Diethanolamine	100	I	A	A	A	X	S	S	S
Diethylamine	100	X	A	A	A	X	S	S	S
Diethylaminoethanol	100	I	B	B	A	X	S	S	S
Diethylbenzene	100	B	B	B	A	A	S	S	S
Diethylene glycol	100	A	A	A	A	A	S	S	S
Diethylene-glycol diethyl ether		B	B	B	A	–	S	S	S
Diethylene-glycol monobutyl ether		I	I	I	A	–	S	S	S
Diethylene-glycol monoethyl ether		I	I	I	A	–	S	S	S
Diethylene-glycol monoethyl ether acetate		I	I	I	A	–	S	S	S
Diethylene-glycol monomethyl ether		I	I	I	A	–	S	S	S
Dimethylamine	100	B	B	B	A	X	S	S	S
Dimethyl ethanolamine		I	B	B	A	X	S	S	S
Dimethyl ether	100	I	I	A	A	B	S	S	S
Dimethyl formamide	100	A	A	A	A	X	S	S	S
Dimethyl phthalate	100	B	B	B	A	A	S	S	S
Dimethyl sulphate		X	B	B	A	–	S	S	S
Dimethyl sulphide	100	B	B	B	A	–	S	S	S
Dinitrobenzene	100	I	I	I	A	–	S	S	S
Dioctylphalate	100	B	B	B	A	A	S	S	S
Dioctyl sebacate	100	B	B	B	A	–	S	S	S
Dioxane	100	B	B	B	A	A	S	S	S
Dipentene	100	B	B	B	A	A	S	S	S
Diphenyl ether	100	B	B	B	A	X	S	S	S
Diphenyl phthylate	100	B	B	B	A	–	S	S	S
Dipropylamine	100	B	B	B	A	X	S	S	S
Dipropylene glycol	100	A	A	A	A	A	S	S	S
Monomethyl ether	100	I	I	I	A	–	S	S	S
Dodecyl alcohol	100	B	B	B	A	A	S	S	S
Diethylene glycol monomethyl ether acetate		I	I	I	A	–	S	S	S
Diethylenetriamine	100	X	B	B	A	X	S	S	S
Diethyl ethanolamine		X	B	B	A	X	S	S	S
Diethyl ether	100	B	B	B	A	A	S	S	S
Diethyl ketone	100	B	B	B	A	A	S	S	S
Diethyl oxalate	100	B	B	B	A	–	S	S	S
Diethyl phthalate	100	A	A	A	A	A	S	S	S
Diethyl sebacate	100	A	A	A	A	–	S	S	S
Diethyl sulphate	100	X	B	B	A	–	S	S	S
Diisobutylene		I	I	I	A	A	S	S	S
Diisobtyl ketone	100	B	B	B	A	A	S	S	S
Diisobutyl phthalate	100	B	B	I	A	A	S	S	S
Diisooctyl adipate	100	B	B	B	A	A	S	S	S
Diisooctyl phthalate		A	A	A	A	A	S	S	S
Diisopropanolamine	100	B	B	B	A	X	S	S	S
Diisopropylamine	100	B	B	B	A	X	S	S	S
Diisopropyl ether	100	B	B	B	A	A	S	S	S
Diisopropyl ketone	100	B	B	B	A	A	S	S	S
Dodecyl benzene	100	B	B	B	A	–	S	S	S
Dodecyl phenol	100	B	B	B	A	X	S	S	S
Epichlorohydrin	100	B	B	B	A	–	S	S	S
Ethanol	100	A	A	A	A	A	S	S	S
Ethanolamine	100	B	A	A	A	X	S	S	S
Ethoxy ethanol		X	I	I	A	–	S	S	S
Ethoxy propanol		X	I	I	A	–	S	S	S
Ethyl acetate	100	X	I	I	A	A	S	S	S
Ethyl acrylate	100	A	A	A	A	A	S	S	S
Ethyl aluminium dichloride		X	X	X	X	X	U	U	U
Ethylamine	100	I	B	B	A	X	S	S	S
Ethylbenzene	100	B	B	B	A	A	S	S	S
Ethyl butanol	100	B	B	B	A	A	S	S	S
Ethyl chloride	100	I	I	I	A	A	S	S	S
Ethyl cyclohexane		I	I	I	A	–	S	S	S

Composite Hose Chemical Resistance Chart

Hose Key: A = suitable up to 140°F; B = suitable at ambient; I = suitable for intermittent at ambient; X = unsuitable, do not use

Coupling Key: S = suitable; - = insufficient information; U = unsuitable or no data available, * = Polypropylene couplings

		Hose Type					Coupling Type		
Chemical/Product Conveyed	**Concentration**	**1**	**2**	**3**	**4**	**5**	**Mild Steel**	**Stain-less**	**Brass**
Ethylene carbonate	100	I	B	B	A	–	S	S	S
Ethylene chloride	100	I	I	I	A	B	S	S	S
Ethylene chlorohydrin	100	B	B	B	A	–	S	S	S
Ethylene cyanohydrin	100	X	I	I	A	–	S	S	S
Ethylene diamine	100	B	B	B	A	X	S	S	S
Ethylene dibromide	100	I	B	B	A	A	U	S	S
Ethylene dichloride	100	X	I	I	A	A	U	S	S
Ethylene glycol	100	A	A	A	A	A	S	S	S
Ethylene glycol monobutyl ether	100	A	A	A	A	–	S	S	S
Ethylene glycol methyl butyl ether		I	B	B	A	–	S	S	S
Ethylene glycol monobutyl ether acetate		B	B	B	A	–	S	S	S
Monoethyl ether	100	A	A	A	A	–	S	S	S
Ethyl formate	100	X	B	B	A	–	S	S	S
Ethylene oxide	100	X	B	B	A	A	U	S	U
Ethyl hexylacrylate	100	X	B	B	A	–	S	S	S
2-Ethyl hexylamine		I	B	B	A	X	S	S	S
Ethyl iodide	100	I	I	I	A	B	S	S	S
Ethyl isobutyl ether	100	X	B	B	A	A	S	S	S
Ethyl methacrylate		I	I	I	A	–	S	S	S
Ethyl oleate	100	B	B	A	A	B	S	S	S
2-Ethyl-3-propylacrolein		I	I	I	A	–	S	S	S
Ethyl propyl ether	100	B	B	B	A	A	S	S	S
Ethyl propyl ketone	100	I	I	I	A	B	S	S	S
Ethyl silicate	100	A	A	A	A	–	S	S	S
Ethyl sulphate	100	B	B	B	A	–	S	S	S
Ethyl vinyl ether	100	B	B	B	A	A	S	S	S
Ethoxyethyl acetate	100	B	B	B	A	–	S	S	S
Fatty acids	100	X	A	A	A	–	U	S	S
Fluronated refrigerants		Consult Technical Sales							
Flourine		Consult Technical Sales							
Fluosilic acid		X	A	A	A	X			
Formaldehyde soln	45	X	A	A	A	X	S	S	S
Formamide	100	X	A	B	B	U	S	S	
Formic acid	100	X	A	B	B	X	U	S	S
Freons		Consult Technical Sales							
Fruit juices		X	A	A	A	–	S	S	S
Fructose	100	A	A	A	A	A	S	S	S
Fuel oil	100	B	B	B	A	A	S	S	S
Furfural	100	I	I	I	A	–	S	S	S
Furfural alcohol	100	I	I	I	A	–	S	S	S
Gallic acid soln	All	X	A	A	A	–	S	S	S
Gas oil	100	B	A	A	A	A	S	S	S
Gasoline	100	B	B	B	A	A	S	S	S
Gelatine aqueous	All	A	A	A	A	–	S	S	S
Gluconic acid	All	I	A	A	A	–	S	S	S
Glucose aqueous	All	A	A	A	A	A	S	S	S
Glycerine	All	A	A	A	A	A	S	S	S
Glycolic acid	Saturated	X	A	X	A	X	U	S	U
Glycols aqueous	ALL	A	A	A	A	A	S	S	S
Heptane		B	B	B	A	A	S	S	S
Heptanoic acid		X	B	B	A	–	U	S	U
Heptanol	100	A	A	A	A	A	S	S	S
Heptanone	100	B	B	B	A	–	S	S	S
Heptene	100	B	B	B	A	A	S	S	S
Hexane	100	B	B	B	A	A	S	S	S
Hexanol	100	A	A	A	A	A	S	S	S
Hexylamine	100	X	B	B	A	X	S	S	S
Hexylene	100	B	B	B	A	A	S	S	S
Hexylene glycol	100	A	A	A	A	–	S	S	S
Hydrazine hydrate		X	B	B	B	X	U	S	U
Hydrobromic acid *	50	X	A	X	X	X	U *	U *	U *
Hydrochloric acid *	30	X	B	X	X		U *	U *	U *
Hydrochloric acid aqueous	37	X	I	X	X	X	U	S	U
Hydrocyonic acid	Saturated	X	A	X	A	X	U	S	U
Hydrofluoric acid *	60	X	B	X	X	X	U *	U *	U *
Hydrofluoric acid *	40	X	A	X	X		U *	U *	U *

Composite Hose Chemical Resistance Chart

Hose Key: A = suitable up to 140°F; B = suitable at ambient; I = suitable for intermittent at ambient; X = unsuitable, do not use

Coupling Key: S = suitable; - = insufficient information; U = unsuitable or no data available, * = Polypropylene couplings

		Hose Type					Coupling Type		
Chemical/Product Conveyed	**Concentration**	**1**	**2**	**3**	**4**	**5**	**Mild Steel**	**Stain-less**	**Brass**
Hydrofluosilicic acid	20	X	A	A	A	X	U	S	S
Hydrogen bromide		X	I	X	X	X	U	U	U
Hydrogen chloride		X	I	X	X	X	U	U	U
Hydrogen peroxide aqueous	90	X	B	B	B	X	U	S	U
Hydrogen sulphide aqueous *	Saturated	X	A	B	B	X	U *	S	U *
2-Hydroxylethyl acrylate		I	I	I	A	X	S	S	S
Hexamethylene diamine	100	X	B	B	A	X	S	S	S
Hexamethylene tetramine	100	X	B	B	A	X	S	S	S
Hydroquinone	100	A	A	A	A	A	S	S	S
Hydroxy ethyl ethylene diamine	100	I	I	I	A	X	S	S	S
Iodine solution *	Saturated	X	A	X	X	X	U *	U *	U *
Iron salts (not halides)	Saturated	X	A	A	A	X	S	S	U
Iron halides *	Saturated	X	A	X	X	X	U *	U *	U *
Isoamyl acetate		I	I	I	A	A	S	S	S
Isoamyl alcohol	100	B	B	A	A	A	S	S	S
Isoamyl bromide	100	X	B	X	X	X	U	S	U
Isoamyl butyrate	100	X	B	B	A	–	S	S	S
Isoamyl chloride	100	X	I	I	A	X	U	S	U
Isoamyl ether	100	B	B	B	A	A	S	S	S
Isobutyl alcohol	100	A	A	A	A	A	S	S	S
Isobutyl acetate	100	I	I	I	A	A	S	S	S
Isobutyl acrylate	100	B	B	B	A	B	S	S	S
Isobutylamine	100	X	B	B	A	X	S	S	S
Isobutyl bromide	100	X	B	X	X	–		S	
Isobutyl chloride	100	X	B	X	X	–		S	
Isobutyl methyl ketone	100	B	B	B	A	A	S	S	S
Isobutyraldehyde	100	X	X	X	A	X	S	S	S
Isobutyl ether	100	I	I	I	A	A	S	S	S
Isooctane	100	I	I	I	A	A	S	S	S
Isodecyl alcohol	100	A	A	A	A	A	S	S	S
Isopentane	100	I	I	I	A	A	S	S	S
Isopentene	100	I	I	I	A	A	S	S	S
Isophorone	100	X	B	X	A	X	U	S	U
Isophorone diamine	100	X	I	X	B	X	U	S	U
Isoprene	100	B	B	B	A	X	U	S	U
Isopropyl alcohol	100	A	A	A	A	A	S	S	S
Isopropanolamine	100	X	B	B	A	X	S	S	S
Isopropylacetate	100	I	I	I	A	A	S	S	S
Isopropylamine	100	X	B	B	A	X	S	S	S
Isopropyl chloride	100	X	B	B	X	A	U	S	S
Isopropyl ether	100	X	B	B	X	A	S	S	S
Isovaleraldehyde	100	I	I	I	A	–	S	S	S
Jams	100	X	A	A	A	X	S	S	S
Jet fuel	100	I	I	I	A	A	S	S	S
Kerosene	100	B	B	B	A	A	S	S	S
Lacquer	100	I	I	A	A	B	S	S	S
Lacquer solvents	100	I	I	A	A	B	S	S	S
Lactic acid	20	X	B	B	A	X	S	S	S
Lanolin		A	A	A	A	–	S	S	S
Lard		A	A	A	A	A	S	S	S
Latex		A	A	A	A	A	S	S	S
Lead salts	Saturated	X	A	B	B	X	U	S	U
Lemon oil	100	I	I	A	A	B	S	S	
Ligroin (See Petroleum Naptha)									
Limonene (See Dipentene)									
Linseed oil	100	A	A	A	A	A	S	S	S
Lubricating oil	100	B	B	B	A	A	S	S	S
Machine oil	100	A	A	A	A	A	S	S	S
Magnesium salts	Saturated	X	A	B	B	X	U	S	U
Maleic acid	100	X	A	B	B	X	U	S	S
Malic acid	100	X	B	B	B	X	U	S	U
Manganese salts	Saturated	X	A	B	B	X	U	S	U
Mercuric chloride *	Saturated	X	A	X	X	X	U *	U *	U *
Mesityl oxide	100	B	B	B	A	–	S	S	S
Methacrylic acid	Saturated	X	B	B	A	X	S	S	S
Methanol	100	A	A	A	A	B	S	S	S

Composite Hose Chemical Resistance Chart

Hose Key: A = suitable up to 140°F; B = suitable at ambient; I = suitable for intermittent at ambient; X = unsuitable, do not use

Coupling Key: S = suitable; - = insufficient information; U = unsuitable or no data available, * = Polypropylene couplings

		Hose Type					Coupling Type		
Chemical/Product Conveyed	**Concentration**	**1**	**2**	**3**	**4**	**5**	**Mild Steel**	**Stain-less**	**Brass**
Methyl acetate	100	I	I	I	A	A	S	S	S
Methyl aceto actate	100	X	I	I	B	–	U	S	S
Methyl acetone	100	B	B	B	A	A	S	S	S
Methyl acrylate	100	B	B	B	A	–	S	S	S
Methyl amine		I	B	B	B	X	S	S	S
Methylamyl acetate	100	I	I	I	A	A	S	S	S
Methylamyl alcohol	100	B	B	B	A	A	S	S	S
Methylamyl ketone	100	B	B	B	A	A	S	S	S
Methyl tert-butyl ether		I	I	I	A	A	S	S	S
Methyl butyl-ketone	100	B	B	B	A	A	S	S	S
Methyl butyraldehyde		X	X	X	A	–	U	S	U
Methyl cellulose	100	B	B	B	A	–	S	S	S
Methyl cellulose acetate	100	I	I	I	A	–	S	S	S
Methyl chloride	100	I	I	I	A	B	S	S	S
Methyl cyanide	100	B	B	B	A	–	S	S	S
Methyl cyclohexane	100	B	B	B	A	A	S	S	S
2-Methyl pentene		I	I	I	A	A	S	S	S
Methylene chloride	100	I	I	A	A	B	S	S	S
Methylene bromide	100	I	I	A	A	B	S	S	S
Methyl ethyl ketone	100	I	I	I	A	A	S	S	S
Methyl ethylpridine		I	I	I	B	–	S	S	U
Methyl isobutyl ketone		I	I	I	A	A	S	S	S
Methyl methacrylate	100	I	I	I	A		S	S	S
Methylstyrene	100	B	B	B	A	A	S	S	S
Mineral oil	100	B	B	B	A	A	S	S	S
Mineral spirits	100	B	B	B	A	–	S	S	S
Molasses		A	A	A	A	A	S	S	S
Monoethanolamine		B	A	A	A	X	S	S	S
Monoethylamine		I	B	B	A	X	S	S	S
Monoitrobenzene		B	B	B	A	X	S	S	S
Morpholine	100	B	B	B	A	X	S	S	S
Naphtha	100	B	B	B	A	A	S	S	S
Naphtha solvent		I	I	I	A	A	S	S	S
Naphthalene (in soln)	100	A	A	A	A	A	S	S	S
Neohexane	100	B	B	B	A	A	S	S	S
Nickel chloride *	Saturated	X	A	X	X	X	U *	U *	U *
Nickel salts	Saturated	X	A	B	B	X	U	S	U
Nitric acid	10	X	A	A	A	X	U	S	U
Nitric acid	60	X	I	I	B	X	U	S	U
Nitric acid	30	X	B	B	B		U	S	U
Nitric acid	70	X	X	X	I	X	U	S	U
Nitrobenzene	100	B	B	B	A	X	S	S	
0-Nitrophenol	100	X	A	A	A	X	S	S	S
Nitropropane	100	I	I	I	A	X	S	S	S
Nitrotoluene	100	B	B	B	A	X	S	S	S
Nonane	100	B	B	B	A	A	S	S	S
Nonyl alcohol	100	B	B	B	A	A	S	S	S
Nonylphenol	100	I	I	I	A	X	S	S	S
Nutmeg oil	100	X	X	X	A	X	U	S	U
Octane	100	B	B	B	A	A	S	S	S
Octanol	100	B	B	B	A	A	S	S	S
Octylacetate	100	I	I	I	A	A	S	S	S
Octylacrylate		B	B	B	A	A	S	S	S
Oils		B	B	B	A	A	S	S	S
Oleic acid		X	B	B	A	X	U	S	U
Oleum		X	X	X	B	X	U	S	U
Olive oil	100	X	X	X	A	X	U	S	U
Oxalic acid	45	X	B	B	A	X	U	S	U
Palm oil	100	B	B	B	A	A	S	S	S
1.3-/Pentadiene		I	I	I	A	–	S	S	S
Pentane	100	B	B	B	A	A	S	S	S
Pentanol	100	A	A	A	A	–	S	S	S
Pentanone	100	B	B	B	A	–	S	S	S
Pentene	100	B	B	B	A	A	S	S	S
Perchloroethylene	100	I	I	A	A	B	S	S	S
Perchloric acid *	50	X	B	X	X	–	U *	U *	U *

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Hose Key: A = suitable up to 140°F; B = suitable at ambient; I = suitable for intermittent at ambient; X = unsuitable, do not use

Coupling Key: S = suitable; - = insufficient information; U = unsuitable or no data available, * = Polypropylene couplings

		Hose Type					Coupling Type		
Chemical/Product Conveyed	**Concentration**	**1**	**2**	**3**	**4**	**5**	**Mild Steel**	**Stain-less**	**Brass**
Petrolatum	100	A	A	A	A	A	S	S	S
Petroleum	100	A	A	A	A	A	S	S	S
Petroleum naphtha	100	I	I	I	A	A	S	S	S
Phenol	100	I	A	B	A	–	S	S	U
Phenoxyethanol		I	I	I	B	–	S	S	S
Phenylhydrazine	100	X	I	I	B	X	U	S	U
Phosphoric acid	25	X	A	A	A		U	S	U
Phosphoric acid	96	X	A	A	A	X	U	S	U
Phosphorus oxychloride *		I	X	X	X	X	U *	U *	U *
Phosphorus pentoxide		X	A	B	B	X	U	S	U
Phosphorus trichloride *	100	X	B	X	X	X	U *	U *	U *
Phosphorus		X	X	X	X	X	U	U	U
Phthalic acid	50	X	B	B	A	X	U	S	U
Picric acid aqueous	1	X	B	B	B	X	U	S	U
Pinene		B	B	B	A	–	S	S	S
Pine oil	100	B	B	B	A	–	S	S	S
Plasticisers	100	B	B	B	A	–	S	S	S
Polyethylene glycol	100	B	B	B	A	–	S	S	S
Polyethylene polyamines		X	I	I	B	X	S	S	S
Polypropylene glycol	100	B	B	B	A	–	S	S	S
Polymethylene polyphenyl isocyanate		B	B	B	A	–	S	S	S
Potassium salts	Saturated	X	A	B	B	X	U	S	U
Propyl alcohol	100	A	A	A	A	A	S	S	S
Propanoic acid		X	B	B	A	X	S	S	S
Propiolactone		I	I	I	A	–	S	S	S
Propionaldehyde	100	X	I	I	A	X	S	S	S
Propionic acid	100	X	B	B	A	X	U	S	S
Propionic anhydride		X	I	I	B	X	U	S	S
Propylacetate	100	I	I	I	A	A	S	S	S
Propylamine		X	B	B	A	X	S	S	S
Propylene dichloride	100	I	I	A	A	B	S	S	S
Propylene glycol monomethyl ether		B	B	B	A	–	S	S	S
Propylene glycol monoethyl ether		B	B	B	A	–	S	S	S
Propylene oxide	100	X	B	B	B	X	S	S	S
Propylene (tetramer & trimer)		I	I	I	B	A	U	S	U
Prussic acid		X	A	B	A	X	U	S	U
Pyridene	100	X	B	B	A	X	S	S	S
Salt solutions		X	B	B	A	X	S	S	S
Sea water		X	A	B	B	X	U	S	S
Sewage		B	B	B	B	X	S	S	S
Silicon oil		A	A	A	A	A	S	S	S
Silver salts	Saturated	X	A	B	B	X	S	S	S
Silver halides *	Saturated	X	A	X	X	X	U *	U *	U *
Soap solutions		B	A	A	A	X	S	S	S
Sodium salts	Saturated	X	A	A	A	X	S	S	S
Sodium chloride *	Saturated	X	A	I	B	X	U	U	S
Sodium hydrosulphide		X	A	B	B	X	S	S	S
Sodium hypochlorite *	20	X	I	I	I	X	U *	U *	U *
Sodium hydroxide		X	A	A	A	X	S	S	S
Sodium thiosulphate	20	X	A	B	B	X	U	S	U
Starch aqueous		B	A	A	A	–	S	S	S
Styrene monomer	100	B	B	B	A	A	S	S	S
Sugar syrup		A	A	A	A	X	S	S	S
Sulphamic acid		X	A	X	A	X	U	S	U
Sulphur liquid	**HOSE TYPE SS ONLY**		X	S	S	U			
Sulphuric acid	Up to 20	X	B	B	B	X	S	S	U
Sulphuric acid *	20-85	X	I	I	I	X	U *	U *	U *
Sulphuric acid	Over 85	X	I	B	B	X	S	S	U
Sulphurous acid		X	B	I	B	X	S	S	U
Sulphuryl chloride		X	X	X	X	X	U	U	U
Tall oil	100	A	A	A	A	A	S	S	S
Tallow	100	A	A	A	A	A	S	S	S
Tannic acid aqueous	10	X	A	A	A	X	U	S	S
Tartaric acid		X	A	A	A	X	U	S	S
Tetrachloroethane		I	I	I	A	B	S	S	S
Tetrachloroethylene		I	I	I	A	B	S	S	S

Composite Hose Chemical Resistance Chart

Hose Key: A = suitable up to 140°F; B = suitable at ambient; I = suitable for intermittent at ambient; X = unsuitable, do not use

Coupling Key: S = suitable; - = insufficient information; U = unsuitable or no data available, * = Polypropylene couplings

		Hose Type					Coupling Type		
Chemical/Product Conveyed	**Concentration**	**1**	**2**	**3**	**4**	**5**	**Mild Steel**	**Stain-less**	**Brass**
Tetraethylene glycol	100	B	B	B	A	–	S	S	S
Tetraethylene pentamine		X	B	B	B	X	S	S	S
Tetrahydrofuran		X	X	X	A				
Tetrahydronaphthalene		I	I	I	A		S	S	S
Tetralin	100	X	I	X	A	X	U	S	U
Tin salts (not halides)	Saturated	X	A	B	B	X	S	S	S
Tin halides *		X	A	X	X	X	U *	U *	U *
Titanium tetrachloride *		X	I	X	X	X	U *	U *	U *
Toluene	100	I	I	I	A	A	S	S	S
Toluene diisocyanate	100	B	B	B	A	–	S	S	S
Transformer oil	100	B	B	B	A	–	S	S	S
Transmission oil	100	B	B	B	A	A	S	S	S
Tributylamine	100	B	B	B	A	X	S	S	S
Tributyl phosphate	100	B	B	B	A	–	S	S	S
Trichloroacetic acid *	10	X	A	X	X	X	U *	U *	U *
Trichlorobenzene	100	X	I	I	A	–	S	S	S
Trichloroethane	100	I	I	I	A	A	S	S	S
Trichloroethylene	100	I	I	I	A	A	S	S	S
Trichloropropane	100	I	I	I	A	A	S	S	S
Tricresylphosphate	100	B	B	B	A	–	S	S	S
Tridecanol	100	B	B	B	A	–	S	S	S
Triethanolamine	100	X	B	B	A	X	S	S	S
Triethylamine	100	X	B	B	B	X	S	S	S
Triethylbenzene	100	B	B	B	A	A	S	S	S
Triethylene glycol	100	A	A	A	A	–	S	S	S
Triethylene tetramine	100	X	B	B	A	X	S	S	S
Trimethyl benzene	100	B	B	B	A	A	S	S	S
Trioctyl phosphate	100	B	B	B	A	–	S	S	S
Tripopylene glycol	100	A	A	A	A	–	S	S	S
Tripopylene glycol monomethyl ether		I	I	I	A	–	S	S	S
Tritolyl phosphate	100	B	B	B	A	–	S	S	S
Trixylenyl phosphate	100	B	B	I	A	–	S	S	S
Turpentine	100	I	I	A	A	X	S	S	S
Urea aqueous saturated		B	A	A	A	A	S	S	U
Urea/ammonia salt solution		B	A	A	A	X	S	S	U
Urea/ammonia solution		B	A	A	A	X	S	S	U
Valeraldehyde		I	I	I	A	X	S	S	S
Vaseline	100	B	B	A	A	A	S	S	S
Vegetable oils	100	A	A	A	A	A	S	S	S
Vinegar		X	A	A	A	X	U	S	S
Vinyl acetate		X	A	A	A	X	U	S	S
Vinyl ethyl ether		I	I	I	A	A	S	S	S
Vinylidene chloride		I	I	I	A	–	S	S	S
Vinyl toluene		B	B	B	A	A	S	S	S
Vinyl neodecanoate		I	I	I	A	–	S	S	S
Water		A	A	A	A	A	S	S	S
White spirit	100	B	B	B	A	A	S	S	S
Wine		X	B	B	A	X	U	S	U
Xylene	100	B	B	B	A	A	S	S	S
Xylenol	100	B	B	B	A	A	S	S	S
Yeast aqueous		X	A	A	A	X	U	S	S
Zinc salts aqueous (not halides)		X	A	A	B	X	S	S	S
Zinc halides aqueous *		X	A	X	X	X	U *	U *	U *