Composite Hose (Section II)

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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.

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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.



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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

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† 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.

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No. CGG PETROLEUM COMPOSITE HOSES BOTTOM LOADING COMPOSITE HOSES



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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

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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.



Part Number	Diameter	Diameter	Bend Radius	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

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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.

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Accord International, Inc. 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

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Outer Wire: G = Galvanized steel

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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

Main

Liner: Polypropylene and polyester.

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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

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Liner: Polypropylene and polyester.

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

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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.

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



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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:

Closer wire pitch. This increases the impact resistance of the hose and reduces the risk of over-bending.
 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.
 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.

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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 **Liner:** Polypropylene and polyester.

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

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.

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Main

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 **Liner:** Polypropylene and polyester.

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

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.

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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

Main

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.



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.

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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).

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INSPECTION, TESTING AND MAINTENANCE OF COMPOSITE HOSES

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

Visual inspection should note:

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- · 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.

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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.

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• 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.

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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:

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- 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	Р	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	Х			A	Х	U	S	S	
Acetic acid	60	Х	A	A	A	Х	U	S	S	
Acetic acid	20	Х	A	A	A	-	U	S	U	
Acetic acid	Glacial	Х	В	A	A	Х	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	100	B	B	B	A	В	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	В	B	B	A	-	S	S	S	
Acrolein	100	B	B	B	A	-	8	5	5	
Acrylic acid	100	X	B	B	B	-		5	5	
	100 Seturated		A	A	A	A		<u> </u>	5	
		A			A			0	0	
Allyl bromido	100	A			R		<u> </u>	0 0	3	
Allyl chloride	100				B		5	5		
Alums	Saturated	Δ	Δ	Δ	Δ	Δ	<u>S</u>	S	S	
Adiponitrile	100	B	B	B	Δ	-	<u>S</u>	S	<u>S</u>	
	Saturated	X	B	B	Δ	X	<u>S</u>	S		
Aluminium chloride *	Saturated	X	B	B	A	X	U *	U*	U*	
Aminoethyl ethanolamine	Caldrated	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	Ŭ	
Ammonium chloride	Saturated	X	A			A	Ŭ	Ŭ	Ŭ	
Amyl acetate	100			A	A	B	S	S	S	
Amyl alcohol	100	B	B	A	A	A	S	S	S	
Amyl chloride	100	1	1	1	A		S	S	S	
Aniline	100	А	A	A	A	Х	S	S	U	
Animal oil	100	А	A	A	A	A	S	S	S	
Anisole	100				А	-	U	S	U	
Antifreeze	100	А	A	A	A	B	S	S	S	
Antimony chloride	All	Х	B	В	В	Х	U	S	S	
Apple Juice	100	Х	A	Х	A	Х	U	S	U	
Aqua regia *		Х		Х	Х		U *	U *	U*	
Arsenic acid	80	Х	В	В	A	Х	U	S	S	
Asphalt	100	Х	Х	Х	A	Х	S	S	S	
Aviation fuel	100				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			A	X	0	S	U	
Benzene	100	X			A	A	S	S	S	
Benzene sulphonic acid	100	X		X	B	X	0	S	U	
Benzoic acid	100	X	A	A	A	X	S	S	0	
Benzoyl chloride	100			B	A	B	S	S	S	
Benzyl alconol	100 Detureted	B	B	A	A	A	5	5	5	
Bismuth carbonate	Saturated		A		A		5	5		
Durax	Saturated		A				5	5		
Dille			A							
Butadiana	100						0 0	0 0	0	
Buttor	100	V V						0 0		
Butyl bromido	100	× ×					6	0 0	0	
Butyl carbitol acetate	100						<u>S</u>	<u>S</u>	<u>S</u>	
Butyl cellulose		Δ	Δ	Δ	Δ	_	<u>S</u>	S	S	
Butyl cellulose acetate					Δ	_	<u>S</u>	S		
Butyl/decyl/cetyl-eicosyl methacrylite mixture		X	X	X	B	_	11	S	U	
Butylene alvcol	100	A	A	A	A		S	S	S	
Butyl ether	100	B	B	B	A	Α	S	S	S	
Butyl ethyl ether		B	B	B	Δ	Δ	5	S	S	
Butyl methacrylate		1	1	1	A	-	5	S	S	
Butyl methoxethyl ether		i	i i	i	A	-	5	S	S	
Butyl othalate	1	A	A	A	A	Α	S	S	S	
Butyl stearate		B	B	B	A	A	Š	ŝ	ŝ	
Butraldehvde		X	X	X	A	-	Ŭ	ŝ	Ŭ	

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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

Chemical/Product Conveyed Concentration 1 2 3 4 5 Midel Name Status Status Calcium shifts Status Status Calcium shifts Calcium shifts			Hose Type					Coupling Type		
Bufvicacid 20 B B B A - S S S Calcium able Saturated X A A A X X S S Calcium able Saturated X A A A X S S S Calcium able Saturated X A A A X S S S Camptor oli 20 X B B A A X S S S Carpinos B B B A - S S S S Cation for B B B A - S	Chemical/Product Conveyed	Concentration	1	2	3	4	5	Mild Steel	Stain- less	Brass
Butymacetone I I I I I I I I A A A C S S Calcum saits Saturated X A <t< td=""><td>Butyric acid</td><td>20</td><td>В</td><td>В</td><td>В</td><td>Α</td><td>-</td><td>S</td><td>S</td><td>S</td></t<>	Butyric acid	20	В	В	В	Α	-	S	S	S
Calcum alsy asing Saturated X A B B Calcum hypothorite Z S	Butyrolacetone					A	-	S	S	S
Calcium alkyl salicylate soln X A B I I X S S S S Cathonic of Composition A A A A A A A A A A S S S Cathonic of Composition B B B A	Calcium salts	Saturated	Х	A	A	A	Х	S	S	
Calcum hypochiorite Saturated X A I I X S S Campulc add A I I I I I X U S S S Campulc add A B B A A X S S S Carbitol actite B B B A - S S S Carbon disulphide 100 X X X A A X S S Carbon disulphide 100 X X X A A X U S S Carbon disulphide 100 B B A A A S S S U Carbon disulphide 100 R B A A A S S S U U U U U U U U U U U	Calcium alkyl salicylate soln		X	A	A	A	_	S	S	S
Catalum hypochorine 20 X B I I X U S U Camphor oll A A S Catholi calidicacidia I I I A A X S S S Catholi calidia I I I A A A S S S S S Catholi calidia I I I I A A A S S S U Catholi calidia I I I A A A X U U U U U U I I	Calcium chloride	Saturated	X	A			X	S	S	S
Cample cald I I I A A A S S S Carbinols B B B A A X S Carbon is acid S S S S S Carbon is acid S S S S S S Carbon is acid S S S S S S S S S S	Calcium hypochlorite	20	X	B			X	U	S	U
Captyneis acid A A A A A A A A A A S S S Carbinols B B B B A - S S S Carbon terricholde 1 1 1 A - S S S Carbon terricholde 100 X X X A A S S S Carbon terricholde 1 1 1 A A S S S Castew rut shell oil 0 B B A A S S U Caustic potash 50 1 A A A X U U U U Caustic potash S </td <td>Camphor oil</td> <td></td> <td></td> <td></td> <td></td> <td><u>A</u></td> <td>A</td> <td>S</td> <td>S</td> <td>S</td>	Camphor oil					<u>A</u>	A	S	S	S
Garantols B B B B A - S S S Carbitols I I I I A - S Catacit oridit S S S S S S S S S S S S S <t< td=""><td>Caprylic acid</td><td></td><td>A</td><td>A</td><td>A</td><td>A</td><td>X</td><td>S</td><td>5</td><td>5</td></t<>	Caprylic acid		A	A	A	A	X	S	5	5
Gartonia B B A - S S S Carbon declate 1 1 1 1 1 A - S Cathom tetrachiotide N N A A A A S S S Cathom tetrachiotide S S S S Cathom tetrachiotide S S S Catastic potash S S S S S S S S S S S	Carbinois		В	В	В	A	-	5	5	8
Garbaile of advance I I I I A - S S S Carboile of dsuphide 100 X X X A - S Catacite code S S S S U Catacite code S S U Catacite code S S U Catacite code S U U U Catacite code S U <td>Carbitols</td> <td></td> <td>B</td> <td>B</td> <td>B</td> <td>A</td> <td>-</td> <td>5</td> <td>5</td> <td>5</td>	Carbitols		B	B	B	A	-	5	5	5
Gattori disuphide I						A	_	5	5	5
Galloti disulptique Itou A B B B A A A B S S C U Causic socia 50 I A A A A X X U U U U Chorobacia I <td>Carbon disulphide</td> <td>100</td> <td>I V</td> <td></td> <td></td> <td>A</td> <td></td> <td>3</td> <td><u> </u></td> <td>3</td>	Carbon disulphide	100	I V			A		3	<u> </u>	3
CalLoS light ad Linking Image: Amount of the linking and the linking additional and the linking additional additionadditionadditinal additional additional additionadditinadditional		100				A		0	0	0 0
Obstimute B B B A A S S S Castor oil 100 B B A A A S S U Caustic coda 50 I A A A X S S U Cloronic water Saturated X I X X U			Y		Δ	Α	X X		<u> </u>	<u> </u>
Data from 0. D D D A A S S D Cassific soda 50 I A A A X S S U Cassific soda 50 I A A A X S S U Chorobacta cal * Saturated X I X X X U	Cashew put shell oil		B	R	R			<u> </u>	<u>S</u>	<u> </u>
Caustic boats 50 I A A A X S S U Chlorine water Saturated 50 I A A A X X X U U U Chlorotie water Saturated X I X X X U U U U Chlorobianzane I I I A B S S S S Chlorobianzane I I I I A B S S S S Chlorobianzan I I I I A A S U	Castor oil	100	B	B	Δ	Δ	B	S	S	U U
Caustic soda 50 I A A A A X S S U Chlorine water Saturated X I X X U U U Chlorobatane I I I A B S S S Chlorobutane I I I A B S S S Chlorobutane I I I A B S S S Chloropropionic acid I I I A A - U S S Chloropropionic acid T X X X X U U U U Chloropropionic acid I I I A A X X X U U U U U U U U U U U U U U U U U U	Caustic potash	50	1	A	A	A	X	S	S	Ŭ
Chlorine water Saturated X I X X X U U U Chlorobenzene 100 X B X X U U U U Chlorobenzene I I I I A B S S S Chlorobutane I I I I A B S S S Chlorobutane I I I I A - U S S Chlorobutane I I I I A - U S S Chlorobutane 100 X X X X U U U U U Chrosobutane S S S U I X X X X U U U U U U U U U U U U U U	Caustic soda	50		A	A	A	X	S	S	Ű
Chloroperate acid * 100 X B X X U	Chlorine water	Saturated	X	1	X	X	X	U	U	Ŭ
Chlorobenzene I <	Chloroatic acid *	100	X	B	X	X	X	U*	U*	U*
Chlorobutane I <t< td=""><td>Chlorobenzene</td><td></td><td>1</td><td></td><td>1</td><td>A</td><td>B</td><td>S</td><td>S</td><td>S</td></t<>	Chlorobenzene		1		1	A	B	S	S	S
Chlorodram I	Chlorobutane					А	В	S	S	S
Chlorophydrins I	Chloroform		I	1	I	А	В	S	S	S
Chloroprionic acid I I I X I X U U U Construction X I I B A A X I I B A X I I I I I I I I I I I I I I I I	Chlorohydrins		I	1	I	А	-	U	S	U
Chlorogropionic acid N X I X X U U.* U.* Chlorosulphonic acid 100 X X X X X U U U Chronolic acid aqueous 50 X I I B X U S S Chronic acid aqueous 50 X I I B X U S S Citra caid 100 X A A A X U S S Colve oil 100 I I B A A S S S Copper salts Saturated X A X X U' U' U' Cresols (word or coaltar) 100 B B A X S S S Cresols S S S Cresols S S S S S S S S S S	Chloroprene		I	1	I	А	-	U	S	S
Chlorosulphonic acid 100 X X X X X X X X X X X X X X X X X A B S S U Chrome alum Saturated X A A A A A X U S S Chrome alum 100 X A A A X U S S Citric acid 100 I I B B A A S S S Copper chloride Saturated X B B A A S S S S Cresols S0 B B B A X S	Chloropropionic acid *		Х		Х	Х	Х	U *	U *	U *
Chlorotoluene 100 X X A A B S S U Chroma cid aqueous 50 X I I B X U S S Chroma cid aqueous 50 X I I B X U S S Citra caid 100 X A A A X U S S Coal tar naphtha B B B B A A S S S Copper salts Saturated X A X X U U*	Chlorosulphonic acid	100	Х	Х	Х	Х	Х	U	U	U
Chrome alum Saturated X A A A A A A A A A A A A A A A A X U S S Citric acid 100 1 I B B A A A A A A A X U S S Color onlight 100 1 I B B A A S S S S Copper chloride * Saturated X B B A A S S S S S C Copper chloride * S	Chlorotoluene	100	Х	Х	Х	А	В	S	S	U
Chromic acid aqueous 50 X I I B X U S S Cibric acid 100 I I B A A X U S S Colve oil 100 I I B A A S S S Copper salts Saturated X B B A A S S U <td>Chrome alum</td> <td>Saturated</td> <td>Х</td> <td>А</td> <td>A</td> <td>А</td> <td>Х</td> <td>S</td> <td>S</td> <td>S</td>	Chrome alum	Saturated	Х	А	A	А	Х	S	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 chloride * Saturated X B B A X U U*	Chromic acid aqueous	50	Х		I	В	Х	U	S	S
Clove oil 100 I I B A B S S Coal tar naphtha B B B B A A S S S Copper salts Saturated X B B A X S S U Cresoste (wood or coaltar) 100 B B B A X S S S Cresols 90 B B B A X S S S Crotonaldehyde 100 X X A X S S S Cyclohexane 100 B B B A X S S S Cyclohexanone 100 I I I A - S S S Cyclohexanone 100 B B B A A S S S Cyclohexanone 100	Citric acid	100	Х	A	A	A	Х	U	S	S
Coal tar naphtha B B B A A S S Copper sails Saturated X B B A X S S U Copper chloride * Saturated X A X X X U* U* U* Cresols 90 B B B A X S S S Cretosols 90 B B B A X S S S Cretonaldehyde 100 X X X A X S S S Cyclohexanol 100 B B B A X S S S Cyclohexanol 100 B B B A A S S S Cyclohexanol 100 B B B A A S S S Cyclohexanol 100 <t< td=""><td>Clove oil</td><td>100</td><td></td><td></td><td>В</td><td>A</td><td>В</td><td>S</td><td>S</td><td>S</td></t<>	Clove oil	100			В	A	В	S	S	S
Copper salts Saturated X A X X X U U ⁺ U ⁺ U ⁺ Creposols 90 B B B A X S S S Cresols 90 B B B A X S S S Cresvic acids 90 B B B A X S S S Crotonaldehyde 100 X X X A X S S S Cyclohexane 100 B B B A A S S S Cyclohexanol 100 B B B A A S S S Cyclohexanone 100 B B B A A S S S Cyclohexanone 100 B B B A - S S S <t< td=""><td>Coal tar naphtha</td><td></td><td>В</td><td>В</td><td>В</td><td>A</td><td>A</td><td>S</td><td>S</td><td>S</td></t<>	Coal tar naphtha		В	В	В	A	A	S	S	S
Copper chloride* Saturated X X X V U* U* <td>Copper salts</td> <td>Saturated</td> <td>X</td> <td>B</td> <td>B</td> <td>A</td> <td>X</td> <td>S</td> <td>S</td> <td>U</td>	Copper salts	Saturated	X	B	B	A	X	S	S	U
Creesole (wood or coaltar) 100 B B B A X S S S Cresols 90 B B B B A X S S S Cresylic acids 90 B B B A X S S S Crotonaldehyde 100 X X A A S S U Cumene 100 B B B A X S S S Cyclohexane 100 B B B A A S S S Cyclohexanone 100 I I I A A S S S Cyclohexanone 100 B B B A A S S S Cyclohexanone 100 B B B A A S S S Cyclohexanone	Copper chloride *	Saturated	X	A	X	X	X	<u>U*</u>	<u>U*</u>	<u>U*</u>
Cressis 90 B B B A X S S C Cresylic acids 90 B B B B A X S S S S Crotonaldehyde 100 X X X A X S S S U Cumene 100 B B B A X S <td>Creosote (wood or coaltar)</td> <td>100</td> <td>B</td> <td>B</td> <td>B</td> <td>A</td> <td>X</td> <td>S</td> <td>S</td> <td>S</td>	Creosote (wood or coaltar)	100	B	B	B	A	X	S	S	S
Oresylic acids 90 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 Cyclohexanone 100 I I I A A S S S Cyclohexylamine 100 B B B A A S S S Cyclopentane 100 B B B A A S S S Decyl alcohol 100 B B B A - S S S Decyl alcohol 100 A A A A A S S S Decyl acrylate 100	Cresols	90	В	В	В	<u>A</u>	X	S	S	S
Ordonadenyde 100 X X X A X S S D Cumene 100 B B B A A S	Cresylic acids	90	B	B	В	A	X	S	5	S
Curlenter 100 B B B A X S S S Cyclohexanon 100 B B B A A S S S Cyclohexanone 100 I I I I A A S S S Cyclohexanone 100 B B B A A S S S Cyclohexylamine 100 B B B A A S S S Cyclohexylamine 100 B B B A A S S S Cyclohexylamine 100 B B B A A S <td>Crotonaldenyde</td> <td>100</td> <td>X</td> <td>X</td> <td>X</td> <td>A</td> <td>X</td> <td>5</td> <td>5</td> <td>0</td>	Crotonaldenyde	100	X	X	X	A	X	5	5	0
Cyclonexanol 100 B B B A A S S S Cyclohexanone 100 I I I A B S S S Cyclohexanone 100 I I I A A B S S S Cyclohexylamine 100 B B B A A S S S Cyclopentane 100 B B B A A S S S Decalin 100 K X X A A U S U Decyl alcohol 100 B B B A - S	Currene	100	В	B	B	A	X	5	5	5
Cyclohexation 100 B B B A B S S S S Cyclohexation Cyclohexanone 100 B B B A X S S S S Cyclohexanone 100 B B B A A S S S Cyclopentane 100 B B B A A S S S P.Cymene 100 B B B A - S S S S Decyl alcohol 100 B B B A - S	Cyclonexane	100				A	A D	<u> </u>	<u> </u>	5
Oyclohexatione 100 1	Cyclohexanon	100				A 	D	<u> </u>	<u> </u>	<u> </u>
Oycionexynamine Do D D A A S S S P.Cymene 100 B B B A A S S S Decyl alcohol 100 X X X A A U S U Decyl alcohol 100 B B B A - S S S Decyl alcohol 100 B B B A - S S S Decyl alcohol 100 A A A A A S S S Detergents 5 A A A A A S	Cyclohexylamine	100	B	B	B	Α	- Y	<u> </u>	<u> </u>	<u> </u>
Decylopentality 100 B B A A A A S S S Decalin 100 K X X X A A U S U Decyl alcohol 100 B B B A - S S S S Decyl alcohol 100 B B B A - S		100	B	B	B	Α		<u> </u>	<u> </u>	<u> </u>
Internation Internation <thinternation< th=""> <thinternation< th=""></thinternation<></thinternation<>	PCymene	100	B	B	B	Δ	_	S	S	S
Decyl alcohol 100 B B B A B B A A S S S S S S S S S S S	Decalin	100	X	X	X	A	Α	U	S	U U
Decyl acrylate 100 B B B A - S S S Decyl acrylate 100 B B B B A - S S S S Detergents 5 A A A A A A S S S Diaxetone alcohol 100 A 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 Dibromoethane 100 X B B A X S S S Dibutylamine 100 I B A X S S S Dibutylamine 100 I I A A S S S	Decyl alcohol	100	B	B	B	A	_	Š	S	š
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 Diacetone alcohol 100 X B B A - S S S Diaminoethylamine 100 X B B A X S S S Dibromoethane 100 X B B A X S S S Dibutylamine 100 I B A X S S S S Dibutylamine 100 I B A X S S S S Dibutylathate 100 I I A A S S S S S S <	Decyl acrylate	100	B	B	B	A	_	S	S	S
Desytrin 100 A B B B A X S S S S S Dibity I Distributy I I A A B B A X S S S S S S S S S S S S S S S </td <td>Detergents</td> <td>5</td> <td>A</td> <td>A</td> <td>A</td> <td>A</td> <td>А</td> <td>S</td> <td>S</td> <td>S</td>	Detergents	5	A	A	A	A	А	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 X S S S Dibutylamine 100 I B A X S S S S Dibutylamine 100 I B A X S S S S Dibutylamine 100 I I A A A S S S Dibutylether 100 B B B A A S S S Dibutylethalate 100 B B B A - S S S Dichlorobenz	Dexvtrin	100	A	A	A	A	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 X S S S Dibutylamine 100 I B A X S S S S Dibutylether 100 I B A X S S S S Dibutylethalate 100 B B B A A S S S Dibutyl sebacate 100 B B B A - S S S Dichlorobenzene 100 X I X X U* U* U* Dichlorobenzene 100 I I I A A S S S Dichlorobetnzene	Diacetone alcohol	100	В	В	В	А	-	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 S Dibutylamine 100 I B A X S S S S Dibutyl ether 100 I I A A A S S S Dibutyl sebacate 100 B B B A - S S S Dichlorobenzene 100 X I X X U* U* U* Dichlorobutane 100 I I I A A S S S Dichloroethylene 100 I I I A A S S S Dichloroethylene	Diaminoethylamine	100	Х	В	В	А	Х	S	S	S
Dibromoethane 100 X B B A B S S S Dibutylamine 100 I B A X S S S S Dibutyl ether 100 I I A A A S S S S Dibutyl ether 100 I I A A A S S S S Dibutyl sebacate 100 B B B A A S S S Dichloroacetic acid * 100 X I X X U* U* U* Dichlorobenzene 100 X I X X X U* U* U* Dichlorobutane 100 I I I A A S S S Dichloroethylene 100 I I I A A S S S </td <td>Diamylamine</td> <td>100</td> <td>Х</td> <td>В</td> <td>В</td> <td>А</td> <td>Х</td> <td>S</td> <td>S</td> <td>S</td>	Diamylamine	100	Х	В	В	А	Х	S	S	S
Dibutylamine 100 I B A X S S S Dibutyl ether 100 I I A A A S S S Dibutyl ether 100 I I A A A S S S Dibutyl ether 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 U* U* U* Dichlorobenzene 100 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 Dichloroethylene 100 <td< td=""><td>Dibromoethane</td><td>100</td><td>Х</td><td>В</td><td>В</td><td>А</td><td>В</td><td>S</td><td>S</td><td>S</td></td<>	Dibromoethane	100	Х	В	В	А	В	S	S	S
Dibutyl ether 100 I I A A A S S S Dibutylpthalate 100 B B B B A A S S S Dibutylpthalate 100 B B B B A A S S S Dibutyl sebacate 100 B B B B A - S S S Dichloroacetic acid * 100 X I 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 Dichloroethylene 100 I I I A A S S	Dibutylamine	100		В	A	Х	S	S	S	
Dibutylpthalate 100 B B B A A S S S Dibutyl sebacate 100 B B B B A - S S S Dichloroacetic acid * 100 X I 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 A S S S Dichloroethylether 100 I I I A A S S S Dichloroethylether 100 I I I A A S S S	Dibutyl ether	100	I		A	Α	A	S	S	S
Dibutyl sebacate 100 B B B A - S S S Dichloroacetic acid * 100 X I X X U* 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 Dichloroethylene 100 I I I A A S S S Dichloroethylether 100 I I I A A S S S Dichloromethane 100 I I I A A S S S	Dibutylpthalate	100	В	В	В	A	A	S	S	S
Dichloroacetic acid* 100 X I 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 Dichloroethylene 100 I I I A A S S S Dichloroethylether 100 I I I A A S S S Dichloromethane 100 I I I A A S S S	Dibutyl sebacate	100	В	В	В	A	-	S	S	S
Dichlorobenzene 100 I I I A - S S S Dichlorobutane 100 I I I A 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	Dichloroacetic acid *	100	Х		Х	Х	Х	U *	U *	U *
Dichlorobutane100IIIAASSDichloroethylene100IIIAASSSDichloroethylether100IIIAASSSDichloromethane100IIIAASSS	Dichlorobenzene	100				Α		S	S	S
Dichloroethylene100IIIAASSDichloroethylether100IIIA-SSDichloromethane100IIIAASS	Dichlorobutane	100				A	A	S	S	S
Dichloroethylether100IIIA-SSDichloromethane100IIIAASS	Dichloroethylene	100				A	A	S	S	S
Dichloromethane 100 I I A A S S S	Dichloroethylether	100	1			A	-	S	S	S
	Dichloromethane	100				A	A	S	S	S

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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 Cou					upling Ty	/pe	
Chemical/Product Conveyed	Concentration	1	2	3	4	5	Mild Steel	Stain- less	Brass
Dichloropropane	100				A	A	S	S	S
Dichloropropylene	100				A	A	S	S	S
Dichloropropionic acid		X				X	U	S	U
Dicyclopentadiene	100	X	X	X	X	X	<u> </u>	<u> </u>	U
Diethonolomine	100	В	B	B	A	A	5	5	5
Diethylamine	100	I V	A	A	A		<u> </u>	<u> </u>	3 C
Diethylaminoothanol	100		R	R	A		<u> </u>	<u> </u>	<u> </u>
Diethylannoethanor	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		1			А	-	S	S	S
Diethylene-glycol monoethyl ether					A	_	S	S	S
Diethylene-glycol monoethyl ether acetate					A	-	S	S	S
Diethylene-glycol monomethyl ether					A	-	S	S	S
Dimethylamine	100	В	В	B	A	X	S	S	S
Dimethyl ethanolamine	100		В	B	A	X	S	S	S
Dimethyl formamida	100			A	A	B	<u> </u>	<u> </u>	5
Dimethyl officiality	100	B	R R	B	Δ		<u> </u>	<u> </u>	<u> </u>
Dimethyl sulphate	100	X	B	B	A	_	S	S	S
Dimethyl sulphide	100	B	B	B	A	_	S	S	S
Dinitrobenzene	100	1	Ī	Ī	A	_	S	S	S
Dioctylphalate	100	В	В	В	A	A	S	S	S
Dioctyl sebacate	100	В	В	В	A	-	S	S	S
Dioxane	100	В	В	В	A	A	S	S	S
Dipentene	100	B	B	B	A	A	S	S	S
Diphenyl ether	100	В	В	В	A	X	5	5	S
Dipropulamino	100	B	B	B	A		8	5	8
	100				A		<u> </u>	3 9	3 9
Monomethyl ether	100	1	1	1 Î	A	_	S	S	S
Dodecyl alcohol	100	B	B	B	A	Α	S	S	S
Diethylene glycol monomethyl ether acetate			1		А	_	S	S	S
Diethylenetriamine	100	Х	В	В	A	Х	S	S	S
Diethyl ethanolamine		Х	В	В	A	Х	S	S	S
Diethyl ether	100	B	B	B	A	A	S	S	S
Diethyl ketone	100	B	В	B	A	A	S	S	S
Diethyl oxalate	100	B	B	B	A	-	<u> </u>	<u> </u>	5
Diethyl sebacate	100	Δ	Δ	Δ	Δ		<u> </u>	<u> </u>	<u> </u>
Diethyl sulphate	100	X	B	B	A	_	S	S	S
Diisobutvlene		1			A	Α	S	S	S
Diisobtyl ketone	100	В	В	В	А	А	S	S	S
Diisobutyl phthalate	100	В	В		A	A	S	S	S
Diisooctyl adipate	100	В	В	В	A	A	S	S	S
Diisooctyl phthalate	100	A	A	A	A	A	S	S	S
Disopropanolamine	100	B	В	B	A	X	S	S	S
Disopropylamine	100				A		<u> </u>	<u> </u>	3 6
Disopropyl etter	100	B	B	B	Δ	A A	<u> </u>	<u> </u>	<u>S</u>
Dodecyl benzene	100	B	B	B	A	_	S	S	S
Dodecyl phenol	100	B	B	B	A	Х	S	S	S
Epichlorohydrin	100	В	В	В	А	-	S	S	S
Ethanol	100	A	A	A	A	A	S	S	S
Ethanolamine	100	В	A	A	A	Х	S	S	S
Ethoxy ethanol		X			A	-	S	S	S
Ethoxy propanol	100	X			A	-	S	S	S
Ethyl acetate	100	X			A	A	S	S	S
Ethyl aluminium dichlorida	100	A	A	A	A	A V			
Ethylamine	100		R	R R		X	<u> </u>	<u> </u>	<u> </u>
Ethylbenzene	100	B	B	B	A	A	S	S	S
Ethyl butanol	100	B	B	B	A	A	S	S	Š
Ethyl chloride	100				Α	Α	S	S	S
Ethyl cyclohexane		I		I	A	_	S	S	S

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Chemical/Poduct ConveyedConcentration12345MiledStarsEthydene chronhydrin1001BBA-SSSEthydene chronhydrin100XIIIA-SSSEthydene chronhydrin100XIIIA-SSSEthydene chronhydrin100XIIIAASSSEthydene chronhydrin100AIIIAAASSSEthydene chronhydrin100AIIAAAASSSEthydene chronhydrin100AAAAAASSSSEthydene chronhy divid ether100ABBBA-SS <t< th=""><th></th><th></th><th colspan="4">Hose Type</th><th></th><th colspan="3">Coupling Type</th></t<>			Hose Type					Coupling Type		
Eltviene cationate 100 1 B B A - S S S S Eltviene chiorolydin 100 B B B A - S S S S S Eltviene chiorolydin 100 B B B A - S <th>Chemical/Product Conveyed</th> <th>Concentration</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> <th>Mild Steel</th> <th>Stain- less</th> <th>Brass</th>	Chemical/Product Conveyed	Concentration	1	2	3	4	5	Mild Steel	Stain- less	Brass
Ethylane chiode 100 I	Ethylene carbonate	100		В	В	A	-	S	S	S
Ethylene cylonomydnin 100 B B B A - S S Ethylene cylonomydnin 100 B B B A A S S S Ethylene cibromide 100 A A A U S S Ethylene cibromide 100 A A A A U S S Ethylene cibromide 100 A A A A A S S Ethylene givcol monbuly lether 100 A A A A A S S S Ethylene givcol monbuly lether 100 A A A A A S <t< td=""><td>Ethylene chloride</td><td>100</td><td></td><td></td><td></td><td>A</td><td>В</td><td>S</td><td>S</td><td>S</td></t<>	Ethylene chloride	100				A	В	S	S	S
Effwahe dyaforyarin 100 X 1 I A - S S S Effwahe dyaforyarin 100 I B B A A S S S Effwahe dyafor 100 A A A A A S S S Effwahe dyafor 100 A A A A A A S S Effwahe dyafor 100 A A A A A - S S S Effwahe dyafor 100 A A A - - S S S Effwahe dyafor 100 X B B A - S S S Effwahe dyafor 100 X B B A A U S S S S S S S S S S S S S S	Ethylene chlorohydrin	100	B	B	B	A	_	S	S	S
Entypere domining DO D D D D D D D D D A A A S S S Ethylane dycol 100 A	Ethylene cyanohydrin	100	X			A	- V	S	S	S
Entymes working DO A A A D S S Ethylene glycol 1000 A A A A A S S S Ethylene glycol 1000 A A A A A A S S S Ethylene glycol monobly tether 1 B B A - S S S Ethylene glycol monobly tether 100 A A A - S S S Ethylene glycol monobly tether 100 X B B A - S S S Ethylene glycol 100 X B B A - S	Ethylene diamine	100	B	B	B	A	X A	5	5	5
Eltipres aluciante 100 A I I A A B B A - S S S Ethylene glucol methyl bulyl ether 100 A B B A A D S	Ethylene dibloride	100	I V			A	A		<u> </u>	<u> </u>
Ethylens glucol membry bury letter 100 A B B A A B B A A B B A A B B A A B B A A B B A A B B A A B B B B B B	Ethylene divol	100			Δ	A	Α	<u> 0</u>	<u> </u>	<u> </u>
Ethylene glucol methyl bulyl ether acetate No I B B A - S S S Ethylene glucol monbulyl ether acetate 100 A A A A - S S S Ethylene oxide 100 X B B A - S S S Ethylene oxide 100 X B B A - S S S Ethyl acetate 100 X B B A - S S S Ethyl acetate 100 I I I A B S S S Ethyl acetate 100 X B B A A S S S Ethyl acetate 100 B B A A S S S S Ethyl acetate 100 B B B A A S S <td< td=""><td>Ethylene glycol monobutyl ether</td><td>100</td><td>Δ</td><td>Δ</td><td>Δ</td><td>Δ</td><td></td><td>S</td><td>S</td><td>S</td></td<>	Ethylene glycol monobutyl ether	100	Δ	Δ	Δ	Δ		S	S	S
Ethylene divod monobulyl ether acetate B B A - S S S Ethyl monoethyl ether 100 A A A - S S S Ethyl formate 100 X B B A - S S S Ethyl nex vide 100 X B B A A U S S S Ethyl nex vide 100 I I I A A S S S Ethyl nex vide 100 I I I A A S S S Ethyl nex vide 100 I I I A A S S S Ethyl nex vide 100 B B B A A S S S Ethyl nex vide 100 A A A A S S S Ethyl nex vide 1000	Ethylene glycol methyl butyl ether	100		B	B	A	_	S	S	S
Monochylether 100 A A A A A A A B S S S Ethylene axide 100 X B B A A U S U Ethylene axiderylate 100 X B B A A U S S Ethyl lexiderylate 1 I B B A X S S Ethyl insolutij ether 100 X B B A A S S S Ethyl insolutij ether 100 B B A A S S S Ethyl insolutij ether 100 B B B A A B S	Ethylene glycol monobutyl ether acetate		B	B	B	A	_	S	S	S
Ethylene xide 100 X B B A - S S U Ethylene xide 100 X B B A A U S U Ethyl lexviacrylate 100 I I I A A S S S Ethyl lexviarrylamine 1 I I I A A S S S Ethyl lexviarrylamine 100 I I I A A S S S Ethyl lexviarrylapprophylacrelin 1 I I A A B B A A S S S Ethyl prophylerolein 100 B B B A A S	Monoethyl ether	100	А	A	А	А	-	S	S	S
Ethylenexide 100 X B B A U S U Ethyl hexylarpine 100 X B B A - S S S 2-Ethyl hexylamine 100 I I I A B S S S Ethyl isobutyl ether 100 B B A A S S S Ethyl isobutyl ether 100 B B A A S S S Ethyl isobutyl ether 100 B B B A A S S S Ethyl isopyl ether 100 A A A A S	Ethyl formate	100	Х	В	В	A	_	S	S	S
Ethyl hexylacrylate 100 X B B A - S S S Ethyl lockuly ether 100 I I I A A S S S Ethyl lockuly ether 100 I I I A A S S S Ethyl methacrylate - I I I A A B S S S Ethyl nopyl ketone 100 B B A A B S	Ethylene oxide	100	Х	В	В	A	A	U	S	U
2-Ethyl hexylamine I B A X S S Ethyl isobutyl ether 100 X B B A A S S S Ethyl methacrylate I I I A A S S S Ethyl ofeate 100 B B A A B S S S Ethyl propyl ether 100 B B B A A S <t< td=""><td>Ethyl hexylacrylate</td><td>100</td><td>X</td><td>В</td><td>В</td><td>A</td><td>_</td><td>S</td><td>S</td><td>S</td></t<>	Ethyl hexylacrylate	100	X	В	В	A	_	S	S	S
Ethyl icoduly either 100 I I I I A B S S S S Ethyl inethacrylate I I I I I A A S S S Ethyl inethacrylate I I I I A A B S S S S Ethyl approximation I I I I A A S S S S S Ethyl solicate 100 B B B A A S	2-Ethyl hexylamine			B	B	A	<u>X</u>	S	S	S
Ethyl isodulyi ether 100 X B A A S S S Ethyl ineflacylate 1 I I I A - S S S Ethyl ineflacylarolein - I I I A - S S S Ethyl propyl ether 100 B B A A B S S S S S Ethyl solphate 100 A A A A S	Ethyl iodide	100				A	B	S	S	S
Ethyl inder darysete 1	Ethyl isobutyl ether	100	X	B	B	A	A	5	<u>S</u>	<u>S</u>
Linu rotate 100 D A A B S <	Ethyl methacrylate	100				A		<u> </u>	5	5
L.L.UP-DODYNAM I	2-Ethyl-3-propulacrolein	100				A		<u> </u>	<u> </u>	3 9
Ethy inspirit leade Ioo I I I A B C C C Ethy subhate 100 A	Ethyl propyl ether	100	B	B	B	Δ	Δ	<u>S</u>	<u>S</u>	<u>S</u>
Ethy islicate 100 A C S	Ethyl propyl ketone	100	1	1	1	A	B	S	S	S
Ethy isuphate 100 B B B A - S S S Ethy vinyi ether 100 B B B A A S S S Ethy vinyi ether 100 X A A A S S S Flourine 100 X A A A - S S Flourine	Ethyl silicate	100	A	A	A	A	_	S	S	S
Ethy infu actate 100 B B A A S S S Ethoxyethy lacetate 100 B B A A A - U S S Fluronated refrigerants - Consult Technical Sales - U S S Fluronated refrigerants - Consult Technical Sales - Consult Technical Sales Formatdehyde soln 45 X A A X S S Formatode figurantic 100 X A B B U S S Fromatode figurantic 100 X A B B U S S Frectose 100 X A A A A S S S Furfural alcohol 100 I I I A A A S S S Galic acid soln All X A A A	Ethyl sulphate	100	B	B	B	A	-	S	S	S
Ethowspehyl acetate 100 B B A - S S S Fatty acids 100 X A A A - U S S Fluronated refrigerants S S Fluronated refrigerants . X A A A X S S Formanide 100 X A B B U S S Formanide 100 X A B B U S S Formanide 100 X A A A A S S S Formanide 100 X A A A A S S S Fructose 100 A A A A A S S S Furfural 100 B A A A A	Ethyl vinyl ether	100	В	В	В	А	А	S	S	S
Fatty acids 100 X A <	Ethoxyethyl acetate	100	В	В	В	А	-	S	S	S
Fluronated refrigerants Consult Technical Sales Consult Technical Sales Flourine Consult Technical Sales Consult Technical Sales Findidehyde soln 45 X A A X S S Formanide 100 X A B B U S S Formic acid 100 X A B B X U S S Freens Consult Technical Sales Consult Technical Sales S S S Fructose 100 A A A A S S S Fuel oil 100 B B B A A S S S Furfural alcohol 100 I I I A A S S S Galiconic acid All X A A A S S S Galuconic acid All A A A A	Fatty acids	100	Х	A	A	A	-	U	S	S
Flourine X A A X A A X S S S Formaldehyde soln 45 X A A A X S S S Formaldehyde soln 100 X A B B U S S Formaide 100 X A B B Y U S S Front Lices	Fluronated refrigerants				Co	onsult Tec	hnical Sa	les		
Fluosilic acid A A A A A X S S Formalide/yde soln 100 X A B B U S S Formalide/yde soln 100 X A B B U S S Freons 100 X A A A - S S S Fructose 100 A A A A S S S Furdrual 100 B B B A A S S S Furdrual acohol 100 I I I A A A S	Flourine				Co	onsult Tec	hnical Sa	les		
Formatide 45 X A A A X S S S Formic acid 100 X A B B U S S From acid 100 X A B B X U S S Front juices X A A A A A S S S Fuel oil 100 A A A A S S S Furfural alcohol 100 I I I A - S S S Galitic acid soln AII X A A A A S S S Gasoline 100 B A A A A S S S S Gasoline aqueous AII A A A A A S S S S S Gluconic ac	Fluosilic acid	15	X	A	A	A	X	0	0	0
Portmaining 100 X A B B U S S Froms Consult Technical Sales Fruit Juices X A A A A S S S Fructose 100 A A A A A S S S Furbraid 100 B B B A A S S S Furbraid 100 I I I A A S S S Furbraid 100 I I I A A S S S Galific acid soln AII X A A A A S S S Gasoline 100 B B A A A A S S S Gasoline 100 B B A A A A S S	Formaldenyde soln	45	X	A	A	A	X	5	5	S
Initia add Indo A A B B Consult Technical Sales Fruit julces X A A A A A S S S Fruit julces 100 A A A A A S S S Fuel oil 100 I I I A A S S S Furfural alcohol 100 I I I A - S S S Gallic acid soln All X A A A A S S S Gasoline 100 B B A A A S S S Gasoline aqueous All A A A A A S S S Gluconic acid All A A A A S S S Glycoerine All A A	Formanide	100	X	A	B	B			<u> </u>	6
Truit juices X A S S S Furtural 100 B B B A A S	Freens	100	~	A		nsult Tec	hnical Sa	 AS	3	- 3
Fructose 100 A A A A A A A S S S Fuel oil 100 B B B A A A S S S Furfural 100 I I I I A A S S S Furfural alcohol 100 I I I A A A S S S S Galic acid soln AII X A A A A S S S S Gasoil 100 B A A A A S S S S Gluconic acid AII A A A A A S S S Glucose aqueous AII A A A A A S S S Glycosic acid Saturated X A A	Fruit juices		Х	Α	A		_	S	S	S
Fuel oil 100 B B A A S S Furfural 100 I I I A A S S S Furfural alcohol 100 I I I A - S S S Gallic acid soln All X A A A A - S S S Gasoline 100 B A A A A A S S S Gasoline 100 B B B A A A S	Fructose	100	A	A	A	A	А	S	S	S
Furfural 100 I I I I A S S S Furfural alcohol 100 I I I A S S S S S G Gallic acid soln All X A A A A A A S S S S Gasoil 100 B A A A A A S S S S S Gasoil 100 B A A A A A A S S S S G Gasoin All A A A A A A S S S S G Gluconic acid All A A A A A A S S S S S G Glycoin acid Saturated X A <td>Fuel oil</td> <td>100</td> <td>В</td> <td>B</td> <td>B</td> <td>A</td> <td>A</td> <td>S</td> <td>S</td> <td>S</td>	Fuel oil	100	В	B	B	A	A	S	S	S
Furfural alcohol 100 1 1 1 A S S S Gallic acid soln All X A A A A S S S Gas oil 100 B A A A A A S S S Gasoil 100 B B B B A A A S S S Galaconic acid All A A A A A S S S Gluconic acid All A A A A A S S S Glycoic acid Saturated X A X A X B S S S Heptane B B B A A A S S S Heptanoic acid 100 A A A A S S </td <td>Furfural</td> <td>100</td> <td></td> <td></td> <td></td> <td>А</td> <td>-</td> <td>S</td> <td>S</td> <td>S</td>	Furfural	100				А	-	S	S	S
Gallic acid soln All X A A A A A A A A A A A S S S Gas oil 100 B B B A A A S S S S Gelatine aqueous All A A A A A A S S S Glucose aqueous All A A A A A A A S S S Glycoria adueous All A A A A A A S S S S Glycosi aqueous All A A A A A A A A S	Furfural alcohol	100				A	_	S	S	S
Gas oll 100 B A A A A S S S Gasoline 100 B B B A A S S S Galatine aqueous All A	Gallic acid soln	All	Х	A	A	A	-	S	S	S
Gasoline 100 B B B A A S S S Gelatine aqueous All A<	Gas oil	100	B	A	A	A	A	S	S	S
Gelatine aqueous All A	Gasoline	100	B	B	B	A	A	S	S	S
Gluconic acid All I A A A - S S S Glucose aqueous All A <t< td=""><td>Gelatine aqueous</td><td>All</td><td>A</td><td>A</td><td>A</td><td>A</td><td>-</td><td>S</td><td>S</td><td>S</td></t<>	Gelatine aqueous	All	A	A	A	A	-	S	S	S
All A B B A A S S S S S S S S S S S S S S S S S S S				A	A	A	_	<u> </u>	<u> </u>	<u> </u>
Chycolic acid Saturated X A X A X U S U Glycolic acid ALL A A X A X U S U Glycolic acid ALL A A A A X U S U Glycolic acid ALL A A A A S S S Heptane B B B A A A S S S Heptanoic acid T X B B A A A S S S Heptanone 100 A A A A S S S S Hexane 100 B B B A A S S S S Hexane 100 A A A A S S S S S S <td< td=""><td>Glycerine</td><td></td><td></td><td>Δ</td><td>Δ</td><td>Δ</td><td>Δ</td><td><u>S</u></td><td><u>S</u></td><td><u>S</u></td></td<>	Glycerine			Δ	Δ	Δ	Δ	<u>S</u>	<u>S</u>	<u>S</u>
Construction And the	Glycolic acid	Saturated	X	A	X	A	X	<u> </u>	S	<u> </u>
Heptane B 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 Heptanol 100 B B B A - S S S Heptanone 100 B B B A - S S S Heptanone 100 B B B A A S S S Heptanone 100 B B B A A S S S Hexane 100 A A A A S S S Hexylamine 100 X B B A A S S S Hexylene glycol 100 A A A </td <td>Glycols aqueous</td> <td>ALL</td> <td>A</td> <td>A</td> <td>A</td> <td>A</td> <td>A</td> <td>S</td> <td>S</td> <td>S</td>	Glycols aqueous	ALL	A	A	A	A	A	S	S	S
Heptanoic acid X B B A U S U Heptanol 100 A 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 Hexane 100 A A A A S S S Hexanol 100 A A A A S S S Hexylamine 100 X B B A A S S S Hexylene glycol 100 A A A A S S S Hydrazine hydrate X X B B <	Heptane		В	В	В	A	А	S	S	S
Heptanol 100 A A A A A A S S S Heptanone 100 B B B B A S S S Heptene 100 B B B B A A S S S Hexane 100 B B B A A S S S Hexanol 100 A A A A S S S Hexylamine 100 A A A A S S S Hexylene 100 X B B A A S S S Hexylene glycol 100 A A A A A S S S Hydrazine hydrate 100 A A A A A S S U Hydrobromic acid * 50 X A X X X U * U* U*	Heptanoic acid		Х	В	В	A	—	U	S	U
Heptanone 100 B B B A S S S Heptene 100 B B B B A A S S S Hexane 100 B B B B A A S S S Hexanol 100 A A A A S S S Hexanol 100 A A A A S S S Hexalene 100 X B B A A S S S Hexylamine 100 X B B A A S S S Hexylene 100 A A A A S S S Hydrazine hydrate 100 A A A A - S S U Hydrobromic acid * 50 X A X X U U* U* Hydrochloric acid * 30 <	Heptanol	100	A	A	A	A	A	S	S	S
Heptene 100 B B B A A S S S Hexane 100 B B B B A A S S S Hexanol 100 A A A A S S S Hexanol 100 A A A A S S S Hexylamine 100 X B B A A 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 100 A A A A A S S S Hydrobromic acid * 50 X A A X U S U Hydrochloric acid * 30 X B X	Heptanone	100	В	В	В	Α	_	S	S	S
Hexane 100 B B B A A S S S Hexanol 100 A A A A A S S S S Hexanol 100 X B B A A S S S Hexylene 100 X B B A A 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 100 A A A A - S S U Hydrobromic acid * 50 X A A X U U* U* Hydrochloric acid * 30 X B X X U U* U* Hydrochloric acid * 30 X	Heptene	100	B	B	B	A	A	S	S	S
Hexanol 100 A A A A A A A A S S S Hexylamine 100 X B B A X S 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 100 A A A A - S S S Hydrobromic acid * 50 X A X X U V U* U* Hydrochloric acid * 30 X B X X U U* U* Hydrochloric acid aqueous 37 X I X X U S U Hydrochloric acid Saturated X A X X U S U Hydrofluoric acid * 60 X B X X U* U* U* <td>Hexane</td> <td>100</td> <td>B</td> <td>B</td> <td>B</td> <td>A</td> <td><u>A</u></td> <td><u>S</u></td> <td>S</td> <td>S</td>	Hexane	100	B	B	B	A	<u>A</u>	<u>S</u>	S	S
Hexylene 100 A B B A A 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 100 A A A A - S S S Hydrobromic acid * 50 X B B B X U S U Hydrochloric acid * 30 X B X X U U* U* Hydrochloric acid aqueous 37 X I X X U S U Hydrochloric acid Saturated X A X X U S U Hydrofluoric acid * 60 X B X X U* U* U* Hydrofluoric acid * 40 X A X X U* U* U*		100	A	A	A	A	A	5	5	5
Hexylene glycol 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 U* U* U* Hydrochloric acid * 30 X B X X U U* U* Hydrochloric acid aqueous 37 X I X X U S U Hydrochloric acid Saturated X A X X U S U Hydrofluoric acid * 60 X B X X U* U* U* Hydrofluoric acid * 40 X A X X U* U* U*		100	R	B	B	A	Λ 	<u> </u>	<u> </u>	<u> </u>
Hydrazine hydrate X B B B X U S U Hydrobromic acid * 50 X A X X U* U* U* Hydrochloric acid * 30 X B X X U* U* U* Hydrochloric acid * 30 X B X X U* U* U* Hydrochloric acid aqueous 37 X I X X U S U Hydrochloric acid 30 X B X X U* U* U* Hydrochloric acid aqueous 37 X I X X U S U Hydrochloric acid Saturated X A X A X U* U* Hydrofluoric acid* 60 X B X X U* U* U* Hydrofluoric acid* 40 X A X X U* U* U*	Hexylene alvcol	100	Δ	Δ	Δ	A	A	5	5	5
Hydrobromic acid * 50 X A X X U* U* U* Hydrobromic acid * 30 X B X X U* U* U* U* Hydrochloric acid * 30 X B X X U U* U* Hydrochloric acid aqueous 37 X I X X U S U Hydrocyonic acid Saturated X A X A X U S U Hydrofluoric acid * 60 X B X X U* U* U* Hydrofluoric acid * 40 X A X X U* U* U*	Hydrazine hydrate	100	X	B	B	B	X	<u> </u>	S	<u> </u>
Hydrochloric acid * 30 X B X X U* U* U* Hydrochloric acid * 30 X B X X U* U* U* Hydrochloric acid aqueous 37 X I X X U S U Hydrochloric acid Saturated X A X A U S U Hydrofluoric acid * 60 X B X X U* U* U* Hydrofluoric acid * 40 X A X X U* U* U*	Hydrobromic acid *	50	X	A	X	X	X	U*	U*	U*
Hydrochloric acid aqueous37XIXXUSUHydrocyonic acidSaturatedXAXAXUSUHydrofluoric acid *60XBXXUVU*U*Hydrofluoric acid *40XAXXUU*U*	Hydrochloric acid *	30	X	B	X	X		Ŭ*	U *	U*
Hydrocyonic acid Saturated X A X A X U S U Hydrofiluoric acid * 60 X B X X U* U* U* Hydrofiluoric acid * 40 X A X X U* U* U*	Hydrochloric acid aqueous	37	X	Ī	X	X	Х	Ū	S	Ū
Hydrofluoric acid * 60 X B X X U * U * Hydrofluoric acid * 40 X A X U * U * U *	Hydrocyonic acid	Saturated	Х	A	Х	A	Х	U	S	U
Hydrofluoric acid * 40 X A X X U* U* U*	Hydrofluoric acid *	60	Х	В	Х	Х	Х	U *	U *	U *
	Hydrofluoric acid *	40	Х	A	X	X		U *	U *	U *

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Main

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

			ŀ	lose Typ	е		Coupling Type			
Chemical/Product Conveyed	Concentration	1	2	3	4	5	Mild Steel	Stain- less	Brass	
Hydrofluosilicic acid	20	Х	А	A	A	Х	U	S	S	
Hydrogen bromide		Х		Х	Х	Х	U	U	U	
Hydrogen chloride		Х		Х	Х	Х	U	U	U	
Hydrogen peroxide aqueous	90	X	В	B	B	X	U	S	U	
Hydrogen sulphide aqueous *	Saturated	X	A	B	B	X	U *	S	U *	
2-Hydroxylethyl acrylate					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	5	5	
Hydroquinone	100	A	A	A	A	A	5	5	5	
Hydroxy etnyl etnylene diamine	100 Seturated				A			5	5	
Iouine Solution	Saturated		A				U	0		
Iron balidos *	Saturated		A A	A V	A V		11*		U 11 *	
Isoamyl acetate	Jaiuraieu		- <u>^</u>		Δ	Δ	ŝ	ŝ	ŝ	
Isoamyl alcohol	100	B	B	Δ	Δ	Δ	S	S	S	
Isoamyl bromide	100	X	B	X	X	X	Ŭ	S	U U	
Isoamyl butvrate	100	X	B	B	A	-	S	S	S	
Isoamyl chloride	100	Х	Ī	Ī	A	Х	Ŭ	S	Ŭ	
Isoamyl ether	100	В	В	В	A	A	S	S	S	
Isobutyl alcohol	100	А	А	А	А	А	S	S	S	
Isobutyl acetate	100				A	A	S	S	S	
Isobutyl acrylate	100	В	В	В	A	В	S	S	S	
Isobutylamine	100	Х	В	В	A	Х	S	S	S	
Isobutyl bromide	100	Х	В	Х	Х	-		S		
Isobutyl chloride	100	X	В	Х	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				A	A	S	S	S	
Isooctane	100				A	A	5	5	5	
	100	A	A	A	A	A	5	<u> </u>	5	
	100				A	A	<u> </u>	<u> </u>	<u> </u>	
Isophorone	100	X	B	X		X		S	<u> </u>	
Isophorone diamine	100	X	1	X	B	X	Ŭ	S	U U	
Isoprene	100	B	B	B	A	X	Ŭ	S	U U	
Isopropyl alcohol	100	A	A	A	A	A	S	S	S	
Isopropanolamine	100	Х	В	В	А	Х	S	S	S	
Isopropylacetate	100	I	1	1	A	A	S	S	S	
Isopropylamine	100	Х	В	В	А	Х	S	S	S	
Isopropyl chloride	100	Х	В	В	Х	A	U	S	S	
Isopropyl ether	100	Х	В	В	Х	A	S	S	S	
Isovaleraldehyde	100				A	-	S	S	S	
Jams	100	X	A	A	A	X	S	S	S	
Jet fuel	100				A	A	S	S	S	
Kerosene	100	В	В	В	A	A	S	S	S	
Lacquer	100			A	A	B	5	5	5	
	100	I V		A D	A		<u> </u>	<u> </u>	<u> </u>	
	20				A	^	0 0	0 0	3 9	
Lard		Α				Δ	<u> </u>	<u> </u>	<u> </u>	
Latex		Δ					S	S	S	
Lead salts	Saturated	X	A	B	B	X	Ŭ	S	Ŭ	
Lemon oil	100	1		A	A	B	S	S		
Ligroin (See Petroleum Naptha)		-								
Limonene (See Dipentene)										
Linseed oil	100	А	А	А	А	А	S	S	S	
Lubricating oil	100	В	В	В	Α	A	S	S	S	
Machine oil	100	A	A	A	A	A	S	S	S	
Magnesium salts	Saturated	Х	Α	В	В	Х	U	S	U	
Maleic acid	100	Х	Α	В	В	Х	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*	
Viesityl Oxide	100 Seturated	B	В	В	A	- V	S	5	S	
	Saturated	<u>۸</u>	В	<u>В</u>	A A	X D	5	5 0	5	
	100	А	А		А		<u> </u>	3	3	

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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				А	А	S	S	S	
Methyl aceto actate	100	Х			В	-	U	S	S	
Methyl acetone	100	В	В	B	A	A	S	S	S	
Methyl acrylate	100	В	В	В	A	_	S	S	S	
Methyl amine			В	В	В	Х	S	S	S	
Methylamyl acetate	100				A	A	S	S	S	
Methylamyl alcohol	100	В	В	В	A	A	S	S	S	
Methylamyl ketone	100	В	В	В	A	A	S	S	S	
Methyl tert-butyl ether					A	A	S	S	S	
Methyl butyl-ketone	100	В	В	В	A	A	S	S	S	
Methyl butyraldehyde		Х	Х	Х	A	_	U	S	U	
Methyl cellulose	100	B	B	B	A	-	S	S	S	
Methyl cellulose acetate	100				A	_	S	S	S	
Methyl chloride	100				A	В	S	S	S	
Methyl cyanide	100	B	B	B	A	-	S	S	S	
	100	В	В	В	A	A	5	5	8	
2-Methyl pentene	100				A	A	5	5	5	
Methylene chionde	100			A	A	B	5	5	5	
Methylene bromide	100			A	A	B	5	5	5	
Methyl ethylpriding	100				A D	A	<u> </u>	<u> </u>	5	
Methyl isobutyl kotopo						_	0	<u> </u>	9	
Methyl mothachylate	100				A	A	<u> </u>	<u> </u>	<u> </u>	
Methylstyropo	100	B	B	B	A 	Δ	0	0 0	<u> </u>	
Mineral oil	100	B	B	B	Α Δ	Α	9	<u> </u>	<u> </u>	
Mineral spirits	100	B	B	B	Α Δ		<u>S</u>	<u> </u>	<u> </u>	
Molasses	100					Δ	<u>S</u>	<u>S</u>	5 S	
Monoethanolamine		B	Δ	Δ	Δ	X	S	S	S	
Monoethylamine		1	B	B	Δ	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					A	A	S	S	S	
Naphthalene (in soln)	100	Â	A	A	A	A	S	S	S	
Neohexane	100	В	В	В	А	А	S	S	S	
Nickel chloride *	Saturated	Х	A	Х	Х	Х	U *	U *	U *	
Nickel salts	Saturated	Х	А	В	В	Х	U	S	U	
Nitric acid	10	Х	A	A	A	Х	U	S	U	
Nitric acid	60	Х			В	Х	U	S	U	
Nitric acid	30	Х	В	В	В		U	S	U	
Nitric acid	70	Х	Х	Х		Х	U	S	U	
Nitrobenzene	100	В	В	В	A	Х	S	S		
0-Nitrophenol	100	Х	A	A	A	Х	S	S	S	
Nitropropane	100				A	X	S	S	S	
Nitrotoluene	100	В	В	B	A	X	S	S	S	
Nonane	100	B	B	B	A	A	S	S	S	
Nonyl alcohol	100	В	В	В	A	A	S	S	S	
Nonylphenol	100				A	X	S	S	S	
	100	X	X	X	A	X	0	5	0	
Octane	100	В	В	B	A	A	5	5	8	
	100	B	B	B	A	A	5	5	5	
	100				A	A	5	5	5	
Olla					A	A	5	5	5	
					A	A V		<u> </u>	5	
					R			<u> </u>		
	100	X	A Y	A Y	Δ	×		9		
Ovalic acid	45	X	R	R	A	X		9		
Palmoil	100	B	B	B	Δ	Δ	S	S	S	
1.3-/Pentadiene	100	1			Δ	_	8	5	S	
Pentane	100	B	B	B	Δ	Δ	S	S	S	
Pentanol	100	Δ	Δ	Δ	Δ		5	S	S	
Pentanone	100	B	B	B	A	_	S	S	S	
Pentene	100	B	B	B	A	Α	S	S	ŝ	
Perchloroethylene	100	1	1	A	A	B	S	S	S	
Perchloric acid *	50	X	B	X	X	_	U*	U*	U*	
								-		

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Main

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
Petrolatum	100	Α	A	A	A	A	S	S	S
Petroleum	100	A	A	A	A	A	S	S	S
Petroleum naphtha	100				A	A	S	S	S
Phenol	100		A	B	A	-	S	S	0
Phenoxyethanol	100				B			5	5
Phenyinyurazine Phosphoric acid	25					^		<u> </u>	
Phosphoric acid	96	X			Δ	X		<u>S</u>	
Phosphorus oxychloride *			X	X	X	X	U*	U*	<u> </u>
Phosphorus pentoxide		X	A	B	B	X	U	S	U
Phosphorus trichloride *	100	Х	В	Х	Х	Х	U *	U *	U *
Phosphorus		Х	Х	Х	Х	Х	U	U	U
Phthalic acid	50	Х	В	В	A	Х	U	S	U
Picric acid aqueous	1	Х	В	В	В	Х	U	S	U
Pinene		В	В	В	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	В	В	A	- -	S	S	S
Polyetnylene polyamines	100	X D			B	X	5	5	5
Polypropylerie glycol	100				A	-	<u> </u>	<u> </u>	<u> </u>
Potaccium calte	Saturated				R			<u> </u>	<u> </u>
Pronyl alcohol	100						S	S	S
Propanoic acid	100	X	B	B	A	X	S	S	S
Propiolactone					A	-	S	S	S
Propionaldehvde	100	X	·	i	A	Х	S	S	S
Propionic acid	100	X	B	B	A	X	Ŭ	S	S
Propionic anhydride		Х	1		В	Х	U	S	S
Propylacetate	100				А	А	S	S	S
Propylamine		Х	В	В	A	Х	S	S	S
Propylene dichloride	100			A	A	В	S	S	S
Propylene glycol monomethyl ether		В	В	В	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)					B	A	U	5	0
Prussic acid	100	X	A	B	A	X	0	5	0
Salt solutions	100	× Y	B		A	× ×	<u> </u>	<u> </u>	3 9
Sea water		X		B	B	X		<u>S</u>	<u>S</u>
Sewage		B	B	B	B	X	S	S	S
Silicon oil		A	A	A	A	A	Š	S	S
Silver salts	Saturated	Х	A	B	B	X	S	S	S
Silver halides *	Saturated	Х	A	Х	Х	Х	U *	U *	U *
Soap solutions		В	A	A	А	Х	S	S	S
Sodium salts	Saturated	Х	A	A	A	Х	S	S	S
Sodium chloride *	Saturated	Х	A		В	Х	U	U	S
Sodium hydrosulphide		<u>X</u>	A	B	B	X	S	S	S
Sodium hypochlorite *	20	X				X	<u>U*</u>	<u> </u>	<u> </u>
Sodium hydroxide	00	X	A		A	X	S	5	<u>S</u>
Storeh aguagua	20		A	B	B	X		<u> </u>	0
Starch aqueous	100		R		A	-	<u> </u>	<u> </u>	3 9
Sugar syrup	100					X	<u>S</u>	<u>S</u>	5 S
Sulphamic acid		X	Δ	X	Δ	X	U U	S	U U
Sulphur liquid	HOSE TYPE SS		X	S	S	U U	Ŭ		
Sulphuric acid	Up to 20	X	B	B	B	X	S	S	U
Sulphuric acid *	20-85	X	Ī	1	Ī	X	U*	U *	U *
Sulphuric acid	Over 85	Х		В	В	Х	S	S	U
Sulphurous acid		Х	В		В	Х	S	S	U
Sulphuryl chloride		Х	Х	Х	Х	Х	U	U	U
Tall oil	100	Α	A	A	Α	Α	S	S	S
Tallow	100	A	A	A	A	A	S	S	S
Iannic acid aqueous	10	X	A	A	A	X	U	S	S
Iartaric acid		X	A	A	A		U	S	S
					A	В	S	5	S
retrachioroethylene					A	В	5	5	5

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Main

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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	В	В	В	А	-	S	S	S
Tetraethylene pentamine		Х	В	В	В	Х	S	S	S
Tetrahydrofuran	1	Х	Х	Х	Α				
Tetrahydronaphthalene	1	1		1	A		S	S	S
Tetralin	100	X		X	A	Х	Ŭ	S	Ŭ
Tin salts (not halides)	Saturated	Х	А	В	В	Х	S	S	S
Tin halides *		Х	А	Х	Х	Х	U*	U *	U *
Titanium tetrachloride *		Х		Х	Х	Х	U *	U *	U *
Toluene	100	1	i i	1	A	A	S	S	S
Toluene diisocvanate	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	А	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	Х	U*	U*	U*
Trichlorobenzene	100	X			A	-	S	S	S
Trichloroethane	100	1	· ·	<u>i</u>	A	Α	S	S	S
Trichloroethylene	100	1			A	A	S	S	S
Trichloropropage	100	<u> </u>		1	Δ	Δ	S	S	S
Tricresylphosphate	100	B	B	B	Δ	_	S	S	S
Tridecanol	100	B	B	B	Δ	_	S	S	S
Triethanolamine	100	X	B	B	Δ	X	S	S	S
Triethylamine	100	X X	B	B	B	X	S	S	S
Triethylbenzene	100	B	B	B		Δ	S	S	S
Triethylene glycol	100	Δ			Δ		6	<u> </u>	<u>S</u>
Triethylene tetramine	100	Y Y	R	B	Δ	Y	6	<u> </u>	<u> </u>
Trimethyl benzene	100		B	B			<u>S</u>	<u>S</u>	<u>S</u>
Trioctyl phosphate	100	B	B	B	Δ		S	S	S S
Tripopylene glycol	100						<u> </u>	<u>S</u>	<u>S</u>
Tripopylene glycol monomethyl ether	100	1			Δ		S	S	S
Tritolyl phosphate	100	B	B	B			<u>S</u>	<u> </u>	<u>S</u>
Trivulenyl phosphate	100	B	B				<u>S</u>	<u> </u>	<u>S</u>
Turpontino	100						0	0 0	9
	100	B	Δ				<u> </u>	<u> </u>	
Urea/ammonia salt solution		B				X X	<u>S</u>	<u> </u>	
		B					0	<u> </u>	
Valoraldohydo		<u> </u>					0	<u> </u>	0 0
Vaseline	100	B	B	Δ			<u>S</u>	<u> </u>	<u>S</u>
Vagetable oile	100						0	0	6
Vincear	100	 				× ×	11	0 0	9
Vinul acetate		X				X X		<u> </u>	<u>S</u>
Vinyl ethyl ether							9	S	S
Vinylidono chlorido					A 		0	0 0	0
Vinyl toluono					A	_	0	0	0
Vinyl poodocapoato					A	A	0 0	<u> </u>	<u> </u>
Weter		<u>ا</u>			A	_	0	0	0
Walei	100				A	A	0	<u> </u>	0
Wine Spint	100		D		A	A	3	5	3
Wille Vulopo	100	<u> </u>			A	X 		<u> </u>	U S
	100				A	A	5	<u>১</u>	3
	100	<u>В</u>	B A	B	A	A		<u> </u>	5
Zine selte squeeue (net helidee)		×	A	A	A	X		5	5
Zine saits aqueous (not nances)		X	A	A V				3 *	3

Main