



Chemical Resistance

Data on the
chemical
resistancy for
different materials

Chemical resistance

Page

General information regarding chemical resistance

-- Introduction 4

-- Instructions for the use of the chemical resistance list 4

List of chemical resistance

Chemical resistance 7

Chemical resistance

General information regarding chemical resistance

Introduction

Plastic materials are now widely used in pipeline construction. Pipes made from plastics are used not only for drinking water, water for general use and waste water, but also for the conveyance of aggressive liquids and gases. Expensive pipe materials such as lined metal, ceramic or glass, have largely been replaced by plastic pipes. It is, however, important that the most suitable plastic material is selected for each application.

The Chemical Resistance List in this section serves as a useful guide in this respect. The list is periodically revised to include the latest findings. It contains all the plastics and elastomers in the GF product range which can come into direct contact with the media. The information is based on experiments, immersion and, when available, on data from tests which include temperature and pressure as stress factors. The results achieved in immersion experiments cannot be applied without reservation to pipes under stress, i.e. internal pressure, as the factor stress corrosion cracking is often

not taken into consideration. In certain cases it can be of advantage to test the suitability under the planned working conditions. The tests referred to have been carried out partly by GF and partly by the Internal Standardisation Organisation (ISO) or national standards organisations.

Pure chemicals were used for the tests. If a mixture of chemicals is to be conveyed in practice, this may affect the chemical resistance of the plastic. It is possible in special cases to carry out appropriate tests with the specific mixture. Suitable test equipment is available at GF for this purpose, which we regard as part of our service to the customer. We are always willing to give individual advice at any time. In this connection it is worth mentioning that GF already possesses information concerning the behaviour towards plastics of a number of chemicals or mixtures of chemicals which are not yet included in this list.

Instructions for the use of the chemical resistance list

General

Following the assertions outlined in the introduction the attached list should be regarded as a valuable tool for finding the most suitable material for a given application.

Note: The list has been compiled based on ideal and mostly simplified conditions of laboratory testing; real life and field applications are subjected to working conditions that might be defined by more complex factors.

Consequently any statement quoted in our chemical resistance list should be regarded as a guiding value.

In particular, we would like to emphasize that such a list - by nature - cannot supply the following information:

- All relevant details of the respective experiment that has been the source for a given set of data
- Possible influence of dynamic effects
- Long-term effects
- Possible influence due to the method of processing, the thermal history as well as the exact formulation of the respective samples
- Behaviour of mixtures of different media or effects based on discontinuous service
- (Detailed) characterisation of the corrosion phenomenon / deterioration observed
- Derivation of the max. applicable service pressure
- Consideration of all chemicals

Contacting your GF representative

Thus, if it comes to material decisions and there is a need for selecting the proper polymer (grade), please do not hesitate to contact GF; based on decades of practical experience with polymer piping systems applied in industry and chemical engineering, GF has acquired an outstanding knowledge in:

Apart from that, GF is a very active member in a global network for all aspects of corrosion regarding polymers; all this enables us to support the individual enquiries of our customers efficiently.

However, we cannot exclude situations where the stock of available data will not completely answer a customer's enquiry. In such cases, a simple laboratory test installation under field test conditions is strongly recommended.

- Practical field testing, case studies
- Theoretical background (corrosion science, polymer formulations, possible influences of processing, etc.)
- Relevant literature

Classification

The customary classifications:

- resistant
- conditionally resistant and
- not recommended

are depicted by the signs: +, 0 and -, which allow simple presentation and application. These classifications are defined as:

Resistant: +

Within the acceptable limits of pressure and temperature the material is unaffected or only insignificantly affected.

Conditionally resistant: 0

The medium can attack the material or cause swelling. Restrictions must be made as regards pressure and/or temperature, taking the expected service life into account. The service life of the installation can be noticeably shortened. Further consultations with GF are recommended in any case.

Not recommended: -

The material cannot be used with the medium at all, or only under special conditions.

Solvent cement joints with Tangit/Dytex

Solvent cement joints on ABS, PVC-U or PVC-C made with Tangit cement are generally as resistant as the material of the piping system itself.

The use of Dytex solvent cement is recommended for cement jointing of PVC-U or PVC-C in connection with the following acids:

Medium	Up to % concentration
Sulphuric acid	≥ 70 % H ₂ SO ₄
Chromic-sulphuric acid mixture	≥ 70 % H ₂ SO ₄ + 5 % K ₂ Cr ₂ O ₇ / Na ₂ Cr ₂ O ₄
Chromic acid	≤ 10 % CrO ₃
Hydrochloric acid	≥ 25 % HCl
Nitric acid	≥ 20 % HNO ₃
Sodium hypochlorite (potassium hypochlorite)	≥ 6 % NaOCl
Hydrogen peroxide	≥ 5 % H ₂ O ₂
Hydrofluoric acid	≥ 0% HF

For all the media mentioned above in lower concentrations, Tangit solvent cement should be used.

Due to the effects of these acids on the pipe material, we recommend using pipes with a pressure rating PN 16. For the expected life time and compressive strength, please contact your GF representative.

Attention! Usually the allowable pressure must be decreased by one pressure rating (thus PN16 to PN10).

When using Dytex in PVC-C piping construction with the above mentioned acids, the pressure and temperature requirements for PVC-U must be adhered to.

Because Dytex is not gap-filling, a special cement jointing procedure is required and is described in the chapter on jointing technology.

Fusion joints

In the case of PE, PP and PVDF (SYGEF®) heat fusion joints have practically the same chemical resistance as the respective material. In conjunction with media which could cause stress cracking, the fused joints can be subjected to an increased risk due to residual stress

from the jointing process. In such cases a professionally executed welding is absolutely necessary. The sensitivity against tension fracture formation can be reduced substantially by a thermal retreatment (tempering).

Sealing materials

Depending upon the working conditions and the stress involved, the life span of the sealing materials can differ from that of the pipeline material. Seals in PTFE, which is not included in this list, are resistant to all the chemicals listed. The greater permeability of PTFE

should, however, be considered. Under certain working conditions, for example when conveying highly aggressive media such as hydrochloric acid, this material characteristic must be taken into account.

General summary and limits of applications

The following table includes all the materials contained in the GF product range, and their abbreviations. The summary gives preliminary information regarding the

general behaviour of the materials and the temperature limits.

Abbreviation	Material	Remarks	Maximum permissible temperature	
			Constant	Short term
PTFE	Polytetrafluoroethylene (e.g. Teflon®)	Resistant to all chemicals in this list	250 °C	300 °C
NBR	Nitrile Rubber	Good resistance to oil and petrol. Unsuitable for oxidising media	90 °C	120 °C
EPDM	Ehtylene Propylene Rubber	Good resistance to ozone and weather. Especially suitable for aggressive chemicals. Unsuitable for oils and fats	90 °C	120 °C
CR	Chloroprene Rubber (e.g. Neoprene®)	Chemical resistance very similar to that of PVC-U and between that of Nitrile and Butyl Rubber	80 °C	110 °C
FPM FFKM	Fluorine Rubber (e.g. Viton®, Kalrez®)	Has best chemical resistance to solvents of all elastomers	150 °C	200 °C
CSM	Chlorine sulphonyl Polyethylene (e.g. Hypalon®)	Chemical resistance similar to that of EPDM	100 °C	140 °C

Compressible media

When defining allowable operating conditions, special care is required in choosing chemically resistant piping and sealing materials when transporting compressible operating media (gases) or solutions of gases in fluids which have low boiling points (high vapour pressures) through plastic piping systems.

Suitable materials for compressible media are those that under standard conditions and at low temperatures do not tend toward brittle fractures owing to their ductility. Such materials include polyethylene (PE) and acrylonitrile-butadiene-styrene (ABS). All other raw materials such as polypropylene (PP-H), polyvinyl chloride (PVC-U/-C) or polyvinyliden fluoride (PVDF) are to be limited to ≤ 0.1 bar with respect to the operating pressure of gases. Higher pressures are possible if secondary containment piping systems are used (for environmental protection, brittle effects, gas shocks, intoxication)

For low boiling point fluids, such as liquid gas or

solutions of gases in liquids, for example, hydrochloric acid, the associated vapour pressure of the media has to be taken into account. Furthermore, outgassing (due to changes in the media composition) or vaporisation (due to an inadmissible, high pressure increase) are to be prevented by relevant limitation of the operating temperature or by preventing the vapour pressure from exceeding the operational pressure. It is important to point out that, in such cases of leakage, the sudden escape of large gas or vapour volumes is to be considered a dangerous condition.

Relatively high flow velocities must be assumed when transporting humid gases (aerosols) or following pressure drops in plastic piping systems carrying fluids having high vapour pressures. These can cause the development of high levels of electrostatic charge. Such a condition exhibits an additional source of danger if flammable media or mixtures which can explode when mixed with air are involved.

Note

The data are provided as is and there is no warranty or representation, neither express nor implied, that they are free from errors. We shall not be liable for any damages of any kind that may result from the use of this data.

The successful operation of valves does not only depend on the chemical resistance of their materials and the

seals, but a multiplicity of further factors are to be considered. Therefore it is not possible to transfer these data without restrictions also to the operation of valves made of same materials and/or material combinations.

This document serves only to provide technical information. We refer to our General Sales Terms. Subject to change without notice.

List of chemical resistance

Aggressive media					Chemical resistance											
Medium	Formula	Boiling point °C	Concentration	Temperature °C	PVC-U	PVC-C	ABS	PE	PP-H	PVDF	EPDM	FPM	NBR	CR	CSM	
Acetaldehyde	CH ₃ -CHO	21	40 %, aqueous solution	20	O	-	-	+	+	-	+	+	-	+	+	
	40			-	-	-	+	+	+	+	+	+	+	+	+	+
	60								O	O		O	O	O		O
	80									O		O	O			O
	100															
	120															
	140															
Acetaldehyde	CH ₃ -CHO	21	technically pure	20	-	-	-	+	O	-	+	O	-	-	O	
	40			-	-		O		O							
	60															
	80															
	100															
	120															
	140															
Acetic acid	CH ₃ COOH	50 %, aqueous		20	+	+	-	+	+	+	+	O	-	O	O	
	40			+			+	+	+							
	60			O			+	+	+							
	80															
	100															
	120															
	140															
Acetic acid	CH ₃ COOH	118	technically pure, glacial	20	O	-	-	+	+	+	+	-	-	O	O	
	40			-		+	+	O	O							
	60															
	80															
	100															
	120															
	140															
Acetic acid anhydride	(CH ₃ -CO) ₂ O	139	technically pure	20	-	-	-	+	+	-	O	-	-	-	+	
	40			-			O	O								
	60															
	80															
	100															
	120															
	140															
Acetic acid ethylester	CH ₃ COOC ₂ H ₅	77		20	-	-	-	+	+	+	+	O	O	O	O	
	40															
	60															
	80															
	100															
	120															
	140															
Acetic acid isobutyl ester	(CH ₂) ₂ -CH-(CH ₂) ₂ -CO ₂ H	117	technically pure	20	-	-	-	+	+	+	+	-	-	-	+	
	40															
	60															
	80															
	100															
	120															
	140															
Acetone	CH ₃ -CO-CH ₃		up to 10 %, aqueous	20	-	-	O	+	+	O	+	O	-	+	O	
	40									+	+	+	O		O	O
	60									+	+	O	+			O
	80															
	100															
	120															
	140															
Acetone	CH ₃ -CO-CH ₃	56	technically pure	20	-	-	-	+	+	-	+	-	-	-	O	
	40									+	+					O
	60									+	+					O
	80															
	100															
	120															
	140															

Aggressive media					Chemical resistance										
Medium	Formula	Boiling point °C	Concentration	Temperature °C	PVC-U	PVC-C	ABS	PE	PP-H	PVDF	EPDM	FPM	NBR	CR	CSM
Acetonitrile	CH ₃ CN	82	100 %	20 40 60 80 100 120 140	-	-	-	O	O	-	O	-	O	O	O
Acetophenone	CH ₃ -CO-C ₆ H ₅	202	100 %	20 40 60 80 100 120 140	-	-	-	O	O	-	+	-	-	-	+
Acrylic acid methyl ester	CH ₂ =CHCOOCH ₃	80	technically pure	20 40 60 80 100 120 140	-	-	-	O	-	O	O				
Acrylicethyl	CH ₂ =COOC ₂ H ₅	100	technically pure	20 40 60 80 100 120 140	-	-	-	O	-	O	O	-	-	O	O
Acrylonitrile	CH ₂ =CH-CN	77	technically pure	20 40 60 80 100 120 140	-	-	-	+	+	-	+	O	-	+	O
								+	O		+	O		+	O
								+			O	-		+	-
Adipic acid	HOOC-(CH ₂) ₄ -COOH	Fp., 153	saturated, aqueous	20 40 60 80 100 120 140	+	+	-	+	+	+	+	+	+	+	+
					+	+		+	+	+	+	+	+	+	+
					-	+		+	+	+	+	+	+	+	+
						+		+	+	+					
Allyl alcohol	H ₂ C=CH-CH ₂ -OH	97	96 %	20 40 60 80 100 120 140	O	O	-	+	+		+	O	+	O	+
					-			+	+		+	-	+	-	+
								+	O		O		+		+
										-			+		-
Aluminium salts, aqueous, inorganic	AlCl ₃ , Al(NO ₃) ₃ , Al(OH) ₃ , Al(SO ₄) ₃		saturated	20 40 60 80 100 120 140		+				+	+				
						+				+	+				
						+				+	+				
										+					
Ammonia	NH ₃	-33	gaseous, technically pure	20 40 60 80 100 120 140	+	-	-	+	+	+	+	+	+	+	+
					+			+	+	+		O			
					+			+	+	+					
										+					
										-					

Aggressive media					Chemical resistance											
Medium	Formula	Boiling point °C	Concentration	Temperature °C	PVC-U	PVC-C	ABS	PE	PP-H	PVDF	EPDM	FPM	NBR	CR	CSM	
Ammonium acetate	CH ₃ COONH ₄		aqueous, all	20	+	+	O	+	+	+	+	+	+	+	+	
				40	+	+		+	+	+	+	+	O	+	+	
				60	O	+		+	+	+	+	+			O	
				80		+			+	+	O					
				100					+	+						
				120												
				140												
Ammonium persulphate	(NH ₄) ₂ S ₂ O ₈			20	+	+		+	O	+	+	+	O	+	+	
				40	+	+				+	+					
				60	O	O				+	+					
				80		O				+	+					
				100						+						
				120												
				140												
Amonium salts, aqueous, inorganic			saturated	20	+	+		+	+	+	+	+	+	+	+	
				40	+	+		+	+	+	+	+	+	+	+	
				60	+	+		+	+	+	+	+	+	+	+	
				80		+				+	+					
				100						+						
				120												
				140												
Amyl acetate	CH ₃ (CH ₂) ₄ -COOCH ₃	141	technically pure	20	-	-	-	+	O	+	O	-	-	-	-	
				40				+	O							
				60				+	-	O						
				80												
				100												
				120												
				140												
Amyl alcohol	CH ₃ (CH ₂) ₃ -CH ₂ -OH	137	technically pure	20	+	-	-	+	+	+	+	O	+	+	O	
				40	+			+	+	+	+		+	+		
				60	O			+	+	+	+		+	+		
				80					+	+						
				100						+						
				120							O					
				140												
Aniline	C ₆ H ₅ NH ₂	182	technically pure	20	-	-	-	+	+	+	+	O	-	-	-	
				40				O	+	+	+	O				
				60					O	-	+	O				
				80												
				100												
				120												
				140												
Antimony trichloride	SbCl ₃		90 %, aqueous	20	+	+	-	+	+	+	+	+	-	+	+	
				40	+	+		+	+	+						
				60		+		+	+	+						
				80												
				100												
				120												
				140												
Aqua regia	HNO ₃ +HCl		mixing ratio	20	+	+	-	-	-	O	-	O	-	-	O	
				40	O											
				60												
				80												
				100												
				120												
				140												
Arsenic acid	H ₃ AsO ₄		80 %, aqueous	20	+	+	+	+	+	+	+	+	+	+	+	
				40	+	+	+	+	+	+	+	+	+	+	+	
				60	O	+	+	+	+	+	+	+	+	+	+	
				80		+			+	+	+	+	O	+	+	
				100					+	+	+	+				
				120												
				140												

Aggressive media					Chemical resistance										
Medium	Formula	Boiling point °C	Concentration	Temperature °C	PVC-U	PVC-C	ABS	PE	PP-H	PVDF	EPDM	FPM	NBR	CR	CSM
Barium salts, aqueous, inorganic			saturated	20	+	+	+	+	+	+	+	+	+	+	+
				40	+	+		+	+	+	+	+	+	+	
				60	+	+		+	+	+	+	+	+	+	
				80		+			+	+	+	+	+	+	
				100					+	+	+	+	+	+	
				120											
				140											
Beer			usual commercial	20	+	+	+	+	+	+		+	+	+	+
				40											
				60											
				80											
				100											
				120											
				140											
Benzaldehyde	C ₆ H ₅ -CHO	180	saturated, aqueous	20	-	-	-	+	+	+	+	+	O	-	-
				40				+	O	O	+	+	+	+	+
				60				O		-	O	+	+	+	+
				80											
				100											
				120											
				140											
Benzene	C ₆ H ₆	80	technically pure	20	-	-	-	O	O	+	-	+	O	-	-
				40				O	-	O					
				60						-					
				80											
				100											
				120											
				140											
Benzene sulfonic acid	C ₆ H ₅ SO ₃ H		technically pure	20	+	+		+	+	+	+	+			
				40				+	+	+	+	+			
				60				O	O	+	O				
				80						+					
				100						+					
				120											
				140											
Benzine (Gasoline)	C ₅ H ₁₂ to C ₁₂ H ₂₆	80-130	free of lead and aromatic compounds	20	+	+	-	+	O	+	-	+	+	-	O
				40	+	+		+		+		+	+		-
				60											
				80											
				100											
				120											
				140											
Benzoic acid	C ₆ H ₅ -COOH	Fp., 122	aqueous, all	20	+	+	+	+	+	+	+	+	+	+	+
				40	+	+	+	+	+	+	+	+	+	+	+
				60	O	+		+	+	+	+	+	+	+	+
				80		O			+	+	+	+	O		
				100				+	+	+					
				120					+	+					
				140						+					
Benzyl alcohol	C ₆ H ₅ -CH ₂ -OH	206	technically pure	20	O	-	-	+	+	+	+	+	-	+	O
				40				+	+	+	+			+	+
				60				O	O	O	O			+	+
				80						-					
				100											
				120											
				140											
Beryllium salts, aqueous, inorganic				20	+	+		+	+	+	+	+	+	+	+
				40	+	+		+	+	+	+	+	+	+	+
				60	+	+		+	+	+	+	+	+	+	+
				80		+			+	+	+	+	+	+	+
				100					+						
				120											
				140											

Aggressive media					Chemical resistance											
Medium	Formula	Boiling point °C	Concentration	Temperature °C	PVC-U	PVC-C	ABS	PE	PP-H	PVDF	EPDM	FPM	NBR	CR	CSM	
Borax	Na ₂ B ₄ O ₇		aqueous, all	20 40 60 80 100 120 140	+ + O + + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + O + + + + +	
Boric acid	H ₃ BO ₃		all, aqueous	20 40 60 80 100 120 140	+ + O + + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +	
Brine, containing chlorine	NaCl-Cl ₂		depressurised with GFK-reinforcing up to 95 °C	20 40 60 80 100 120 140	+ + + + + + +	+ + + + + + +	- + + + + + +	+ + + + + + +	O + O O O O +	+ + O O O O O +	O O O O O O +	+ + O O O O O +	O O O O O O +	O O O O O O +	O O O O O O +	
Bromine water	Br-H ₂ O		saturated, aqueous	20 40 60 80 100 120 140	+ + + + + + +	O O O O O O +	- - - - - - +	- - - - - - +	+ + + + + + +	- - - - - - +	- - - - - - +	+ + + + + + +	- - - - - - +	- - - - - - +	- - - - - - +	
Butadiene	H ₂ C=CH-CH=CH ₂	-4	technically pure	20 40 60 80 100 120 140	+ + + + + + +	+ + + + + + +	- - - - - - +	O O O O O O +	O O O O O O +	+ + + + + + +	- - - - - - +	+ + + + + + +	O O O O O O +	- - - - - - +	- - - - - - +	
Butane	C ₄ H ₁₀	0	technically pure	20 40 60 80 100 120 140	+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +	- - - - - - +	- - - - - - +	+ + + + + + +	O O O O O O +	O O O O O O +	O O O O O O +	
Butanediol	HO-(CH ₂) ₄ -OH	230	aqueous, 10 %	20 40 60 80 100 120 140	+ O + + + + +	+ + + + + + +	- - - - - - +	+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +	O - O O O O +	+ + + + + + +	
Butanol	C ₄ H ₉ OH	117	technically pure	20 40 60 80 100 120 140	+ + O + + + +	- - - - - - +	- - - - - - +	+ + + + + + +	+ + O + + + +	+ + + + + + +	+ + + + + + +	+ + O + + + +	+ + + + + + +	+ + O + + + +	+ + + + + + +	
Butyl acetate	CH ₃ COO(CH) ₃ CH ₂ CH ₂ CH ₃	126	technically pure	20 40 60 80 100 120 140	- - - - - - +	- - - - - - +	- - - - - - +	+ + + + + + +	O O O O O O +	+ O - - - - +	+ - - - - - +	O - - - - - +	- - - - - +	O - - - - - +	O - - - - - +	

Aggressive media					Chemical resistance										
Medium	Formula	Boiling point °C	Concentration	Temperature °C	PVC-U	PVC-C	ABS	PE	PP-H	PVDF	EPDM	FPM	NBR	CR	CSM
Butyl phenol, p-tertiary	(CH ₃) ₃ C-C ₆ H ₄ -OH	237	technically pure	20 40 60 80 100 120 140	O - - - - - -	O - - - - - -	- - - - - -	O - - - - - -	+ + + + + +	+ + + + + +	- - - - - -	O - - - - - -	- - - - - -	- - - - - -	- - - - - -
Butylene glycol	HO-CH ₂ -CH=CH-CH ₂ -OH	235	technically pure	20 40 60 80 100 120 140	+ + O + + +	+ + + + + +	- - - - - -	+ + + + + +	+ + + + + +	+ + + + + +	+ + O + + +	+ + + + + +	- - - - - -	+ + + + + +	O - - - - - -
Butylene liquid	C ₄ H ₈	51	technically pure	20 40 60 80 100 120 140	+ + + + + +	+ + + + + +	- - - - - -	- - - - - -	- - - - - -	+ + + + + +	O - - - - - -	+ + + + + +	+ + + + + +	+ + + + + +	O - - - - - -
Butyric acid	CH ₃ -CH ₂ -CH ₂ -COOH	163	technically pure	20 40 60 80 100 120 140	+ + + + + +	+ + + + + +	- - - - - -	+ + + + + +	+ + + + + +	+ + + + + +	O - - - - - -	O - - - - - -	- - - - - -	O - - - - - -	O - - - - - -
Cadmium salts, aqueous, inorganic			≤ saturated acid	20 40 60 80 100 120 140	+ + + + + +	+ + + + + +	- - - - - -	+ + + + + +	+ + + + + +	+ + + + + +	+ + + + + +	+ + + + + +	+ + + + + +	+ + + + + +	+ + + + + +
Caesium salts, aqueous, inorganic			≤ Saturated acid	20 40 60 80 100 120 140	+ + + + + +	+ + + + + +	- - - - - -	+ + + + + +	+ + + + + +	+ + + + + +	+ + + + + +	+ + + + + +	+ + + + + +	+ + + + + +	+ + + + + +
Calcium acetate	(CH ₃ COO) ₂ Ca		saturated	20 40 60 80 100 120 140	+ + + + + +	+ + + + + +	- - - - - -	+ + + + + +	+ + + + + +	+ + + + + +	+ + + + + +	+ + + + + +	+ + + + + +	+ + + + + +	+ + + + + +
Calcium hydroxid	Ca(OH) ₂	100	saturated, aqueous	20 40 60 80 100 120 140	+ + + + + +	O - - - - - -	- - - - - -	+ + + + + +	+ + + + + +	O - - - - - -	+ + + + + +	+ + + + + +	+ + O + +	+ + + + + +	+ + + + + +
Calcium lactate	(CH ₃ COO) ₂ Ca		saturated	20 40 60 80 100 120 140	+ + + + + +	+ + + + + +	- - - - - -	+ + + + + +	+ + + + + +	+ + + + + +	+ + + + + +	+ + + + + +	+ + + + + +	+ + + + + +	+ + + + + +

Aggressive media					Chemical resistance										
Medium	Formula	Boiling point °C	Concentration	Temperature °C	PVC-U	PVC-C	ABS	PE	PP-H	PVDF	EPDM	FPM	NBR	CR	CSM
Calcium salts, aqueous, inorganic			≤ Saturated acid	20	+	+	+	+	+	+	+	+	+	+	+
				40	+	+	+	+	+	+	+	+	+	+	
				60	+	+		+	+	+	+	+	+	+	
				80		+		+	+	+	+	+	+	+	
				100					+						
				120											
				140											
Carbon dioxide	CO ₂		technically pure, anhydrous	20	+	+		+	+	+	+	+	+	+	+
				40	+	+		+	+	+	+	+	+	+	
				60	+	+		+	+	+	+	+	+	+	
				80		+		+	+	+	+	+	+	+	
				100					+						
				120											
				140											
Carbon tetrachloride	CCl ₄	77	technically pure	20	-	-	-	-	-	+	-	+	-	-	-
				40											
				60											
				80											
				100											
				120											
				140											
Carbonic acid	H ₂ CO ₃			20	+	+		+	+	+	+	+	+	+	+
				40	+	+		+	+	+	+	+	+	+	
				60	+	+		+	+	+	+	+	+	+	
				80		+		+	+	+	+	+	+	+	
				100											
				120											
				140											
Caro's acid	H ₂ SO ₅			20	+	O				-		+			
				40											
				60											
				80											
				100											
				120											
				140											
Caustic potash solution (potassium hydroxide)	KOH	131	50 %, aqueous	20	+	O		+	+	-	+	-	O	O	+
				40	+			+	+		+		-		O
				60	O			+	O		+				O
				80							O				-
				100											
				120											
				140											
Caustic soda solution	NaOH		50 %, aqueous	20	+	O		+	+	-	+	-	O	-	+
				40	+	-		+	+		+				
				60	+			+	O		+				
				80											
				100											
				120											
				140											
Chloric acid	HClO ₃		10 %, aqueous	20	+	+	-	+	-	+	+	+	-	-	+
				40	+	+		+		+	+	+			+
				60	O	+				+	+	+			+
				80											
				100											
				120											
				140											
Chloric acid	HClO ₃		20 %, aqueous	20	+	+	-	O	-	+	O	+	-	-	+
				40	+	+				O	+	+			+
				60	O	+					+	+			
				80											
				100											
				120											
				140											

Aggressive media					Chemical resistance										
Medium	Formula	Boiling point °C	Concentration	Temperature °C	PVC-U	PVC-C	ABS	PE	PP-H	PVDF	EPDM	FPM	NBR	CR	CSM
Chlorine	Cl ₂		moist, 97 %, gaseous	20 40 60 80 100 120 140	-	+	-	-	-	-	-	+	-	-	O
Chlorine	Cl ₂		liquid, technically pure, as double pipe system	20 40 60 80 100 120 140	-	-	-	-	-	+	-	O	-	-	-
Chlorine	Cl ₂		anhydrous, technically pure, as double pipe system	20 40 60 80 100 120 140	-	-	-	O O -	-	+	O	+	-	-	O
Chlorine water	Cl ₂ -H ₂ O		saturated	20 40 60 80 100 120 140	+	+	O	O O	O	O	O	+	-	O	-
Chloroacetic acid, mono	ClCH ₂ COOH		50 %, aqueous	20 40 60 80 100 120 140	+	-	-	+	+	+	O	-	-	-	O
Chloroacetic acid, mono	ClCH ₂ COOH	188	technically pure	20 40 60 80 100 120 140	+	-	-	+	+	+	O	-	-	-	O
Chlorobenzene	C ₆ H ₅ Cl	132	technically pure	20 40 60 80 100 120 140	-	-	-	O	O	+	-	-	-	-	O
Chloroethanol	ClCH ₂ -CH ₂ OH	129	technically pure	20 40 60 80 100 120 140	-	-	-	+	+	+	O	-	-	-	O
Chlorosulphonic acid	ClSO ₃ H	158	technically pure	20 40 60 80 100 120 140	O	-	-	-	-	O	-	-	-	-	-

Aggressive media					Chemical resistance										
Medium	Formula	Boiling point °C	Concentration	Temperature °C	PVC-U	PVC-C	ABS	PE	PP-H	PVDF	EPDM	FPM	NBR	CR	CSM
Chromic acid	CrO ₃ H ₂ O		all, aqueous	20 40 60 80 100 120 140	O O	O	-	O	O	+ + + + O O		+ + O	-	-	O O O
Chromic acid + sulphuric acid + water	CrO ₃ H ₂ SO ₄ H ₂ O		50 g 15 g 35 g	20 40 60 80 100 120 140	+ + O	+ + O	-	-	-	+ + O	O O	+ +	-	-	O O
Chromium (II) - salts, aqueous, inorganic			≤ Saturated acid	20 40 60 80 100 120 140	+ + +					+ + + + +					
Compressed air, containing oil				20 40 60 80 100 120 140	-	-	-	+ +	O	+ + +	-	+ +	+ +	+ +	+ +
Copper salts, aqueous inorganic			≤ Saturated acid	20 40 60 80 100 120 140	+ + O +	+ + + +	+ + +	+ + +	+ + +	+ + + +	+ +	+ + +	+ + O	+ + +	+ + O
Cresol	HO-C ₆ H ₄ -CH ₃		cold saturated, aqueous	20 40 60 80 100 120 140	O	-	-	+ + O	+ O O O	+ O O O	O	+ +	O O	-	O
Crotonic aldehyde	CH ₃ -CH=CH-CHO	102	technically pure	20 40 60 80 100 120 140	-	-	-	+ +	+ +	+ O -	+ +	+ +	+ +	+ +	+ +
Cyclohexane	C ₆ H ₁₂	81	technically pure	20 40 60 80 100 120 140	-	-	-	+ + +	+ + +	+ + +	-	+ +	+ +	-	-
Cyclohexanol	C ₆ H ₁₂ O	161	technically pure	20 40 60 80 100 120 140	+ + +	+ + O	-	+ + +	+ + O	+ + O O -	-	+ +	O	+ +	+ +

Aggressive media					Chemical resistance										
Medium	Formula	Boiling point °C	Concentration	Temperature °C	PVC-U	PVC-C	ABS	PE	PP-H	PVDF	EPDM	FPM	NBR	CR	CSM
Cyclohexanone	C ₆ H ₁₀ O	155	technically pure	20 40 60 80 100 120 140	-	-	-	+ O O	+ O O	+ O -	O	-	-	-	-
Dextrine	(C ₆ H ₁₀ O ₅)n		usual commercial	20 40 60 80 100 120 140	+	+	+	+	+	+	+	+	+	+	+
Di isobutyl ketone	[(CH ₃) ₂ CHCH ₂] ₂ CO	124	technically pure	20 40 60 80 100 120 140	-	-	-	+ O	+ O	+ O	O O	-	-	-	-
Dibrombenzene	C ₆ H ₅ Br ₂		≤ Saturated acid	20 40 60 80 100 120 140	-	-	-	O	O	+	O	+	-	-	-
Dibutyl ether	C ₄ H ₉ OC ₄ H ₉	142	technically pure	20 40 60 80 100 120 140	-	-	-	O	O	+	-	+	+	-	O
Dibutyl phthalate	C ₆ H ₄ (COOC ₄ H ₉) ₂	340	technically pure	20 40 60 80 100 120 140	-	-	-	+ O O	+ O O	+ O	O	O	-	-	-
Dichloroacetic acid	Cl ₂ CHCOOH		50 %, aqueous	20 40 60 80 100 120 140	+	-	-	+ + O	+ + O	+ O	+	O O	-	+	O
Dichloroacetic acid	Cl ₂ CHCOOH	194	technically pure	20 40 60 80 100 120 140	+	-	-	+ + O	+ + O	+ O	+	O	-	-	O
Dichloroacetic acid methyl ester	Cl ₂ CHCOOCH ₃	143	technically pure	20 40 60 80 100 120 140	-	-	-	+ + +	+ + +	O	+	-	-	-	+

Aggressive media					Chemical resistance										
Medium	Formula	Boiling point °C	Concentration	Temperature °C	PVC-U	PVC-C	ABS	PE	PP-H	PVDF	EPDM	FPM	NBR	CR	CSM
Dichlorobenzene	C ₆ H ₄ Cl ₂	180	technically pure	20 40 60 80 100 120 140	-	-	-	O	O	+	O	+	O	O	O
Dichloroethylene	ClCH=CHCl	60	technically pure	20 40 60 80 100 120 140	-	-	-	-	-	+	-	O	-	-	-
Diesel oil				20 40 60 80 100 120 140	+	+	-	+	O	+	-	+	+	O	O
Diethyl ether	H ₅ C ₂ -O-C ₂ H ₅	35		20 40 60 80 100 120 140	-	-	-	-	-	-	-	-	-	-	-
Diethylamine	(C ₂ H ₅) ₂ NH	56	technically pure	20 40 60 80 100 120 140	-	-	-	+	+	+	O	-	-	-	-
Dimethyl formamide	(CH ₃) ₂ CHNO	153	technically pure	20 40 60 80 100 120 140	-	-	-	+	+	-	O	-	O	+	+
Dimethylamine	(CH ₃) ₂ NH	7	technically pure	20 40 60 80 100 120 140	-	-	-	+	-	-	O	-	-	-	-
Dioxane	C ₄ H ₈ O ₂	101	technically pure	20 40 60 80 100 120 140	-	-	-	+	O	-	O	-	O	-	-
Ethanolamine	C ₂ H ₇ NO			20 40 60 80 100 120 140	-	-	-	+	+	O	+	O	O	O	O

Aggressive media					Chemical resistance										
Medium	Formula	Boiling point °C	Concentration	Temperature °C	PVC-U	PVC-C	ABS	PE	PP-H	PVDF	EPDM	FPM	NBR	CR	CSM
Ethyl alcohol (Ethnase)	CH ₃ -CH ₂ -OH	78	technically pure, 96 %	20 40 60 80 100 120 140	+ + O + + + +	O + + + + + +	- + + + + + +	+ + + + + + +	+ + O - + + +	+ + O + + + +	+ O O + + + +	+ O O + + + +	O + + + + + +	+ + + + + +	+ + + + + +
Ethyl benzene	C ₆ H ₅ -CH ₂ CH ₃	136	technically pure	20 40 60 80 100 120 140	- - - - - - -	- - - - - - -	- - - - - - -	O O O O O O O	O O O O O O O	O O O O O O O	- + - - - - -	+ - - - - - -	- - - - - - -	- - - - - - -	- - - - - - -
Ethyl chloride (G)	C ₂ H ₅ Cl	12	technically pure	20 40 60 80 100 120 140	- - - - - - -	- - - - - - -	- - - - - - -	O O O O O O O	O O O O O O O	O O O O O O O	- O - - - - -	O - - - - - - -	- - - - - - -	- - - - - - -	- - - - - - -
Ethyl ether	CH ₃ CH ₂ -O-CH ₂ CH ₃	35	technically pure	20 40 60 80 100 120 140	- - - - - - -	- - - - - - -	- - - - - - -	+ O + + + + +	O + + + + + +	+ - - - - - -	- - - - - - -	- - - - - - -	- - - - - - -	- - - - - - -	- - - - - - -
Ethylene diamine	H ₂ N-CH ₂ -CH ₂ -NH ₂	117	technically pure	20 40 60 80 100 120 140	O + + + + + +	- - - - - - -	- - - - - - -	+ + + + + + +	+ + O O - + + +	O O O O - + + +	+ O O O - + + +	O O O O - + + +	+ O O O - + + +	+ O O O - + + +	O O O - + + +
Ethylene glycol	HO-CH ₂ -CH ₂ -OH	198	< 50 %	20 40 60 80 100 120 140	+ + + + + + +	O O O O O O O	O O O O O O O	+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + O + + + +	+ + O + + + +	+ + O + + + +
Ethylene glycol	HO-CH ₂ -CH ₂ -OH	198	technically pure	20 40 60 80 100 120 140	+ + + + + + +	O O O O O O O	- - - - - - -	+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + O + + + +	+ + O + + + +	+ + O + + + +
Ethylenediamine-tetraacetic acid (EDTA)	C ₁₀ H ₁₆ N ₂ O ₈			20 40 60 80 100 120 140				+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +				
Fluorine	F ₂		technically pure	20 40 60 80 100 120 140	- - - - - - -	- - - - - - -	- - - - - - -	- - - - - - -	- - - - - - -	- - - - - - -	- - - - - - -	- - - - - - -	- - - - - - -	- - - - - - -	- - - - - - -

Aggressive media					Chemical resistance											
		Boiling point °C		Temperature °C	PVC-U	PVC-C	ABS	PE	PP-H	PVDF	EPDM	FPM	NBR	CR	CSM	
Medium	Formula		Concentration													
Fluorosilicic acid	H ₂ SiF ₆		32 %, aqueous	20	+	+		+	+	+	+	O	O	O	+	
				40	+	+		+	+	+		'	'	'	O	
				60	+	O		+	+	+						
				80					+	+						
				100					+							
				120												
				140												
Formaldehyde	HCHO		40 %, aqueous	20	+	+		+	+	+	+	+	+	+	+	+
				40	+	+		+	+	+	+	+	+	+	+	+
				60				+		+	+		+	+	+	+
				80						+	+		+	+	+	+
				100							+					
				120												
				140												
Formamide	HCONH ₂	210	technically pure	20	-	-	-	+	+		+	O	+	+		
				40				+	+							
				60				+	+							
				80				+	+							
				100												
				120												
				140												
Formic acid	HCOOH		≤ 25 %	20	+	+		+	+	+	+					
				40	+	+		+	+	+	+					
				60	+	+		+	+	+	+					
				80					+	+						
				100												
				120												
				140												
Formic acid	HCOOH		up to 50 %, aqueous	20	+	-	O	+	+	+	+	+	-	+	+	+
				40	+			+	+	+	+	+	-	+	+	+
				60	O			+	O	+	O	'		O	+	+
				80					+	+	+				+	+
				100					+	+	+				+	+
				120												+
				140												+
Formic acid	HCOOH	101	technically pure	20	+	-	-	+	+	+	+	+	-	+	+	+
				40	O			+	O	+	+			O	+	+
				60	-			+	-	+	O			-	+	+
				80					+	+	O					O
				100						+						
				120												
				140												
Frigen 12 (Freon 12)	CCl ₂ F ₂	-30	technically pure	20	+	-	-	-	-	O	O	O	O	+	O	
				40												
				60												
				80												
				100												
				120												
				140												
Fuel oil				20	+	+	-	+	O	+	-	+	+	O	O	
				40	+	+			-	+	+	+	+		-	
				60												
				80												
				100												
				120												
				140												
Furfuryl alcohol	C ₅ H ₆ O ₂	171	technically pure	20	-	-	-	+	+	+	O	-	-	O	O	
				40				+		+						
				60				+	O	O						
				80						-						
				100												
				120												
				140												

Aggressive media					Chemical resistance										
Medium	Formula	Boiling point °C	Concentration	Temperature °C	PVC-U	PVC-C	ABS	PE	PP-H	PVDF	EPDM	FPM	NBR	CR	CSM
Gelatin			all, aqueous	20 40 60 80 100 120 140	+	+	+	+	+	+	+	+	+	+	+
Glucose	C ₆ H ₁₂ O ₆	Fp., 148	all, aqueous	20 40 60 80 100 120 140	+	+		+	+	+	+	+	+	+	+
Glycerol	HO-CH ₂ -CH(OH)-CH ₂ OH	290	technically pure	20 40 60 80 100 120 140	+	+		+	+	+	+	+	+	+	+
Glycin	NH ₂ -CH ₂ -COOH	Fp., 233	10 %, aqueous	20 40 60 80 100 120 140	+	+	+	+	+	+		+	+	+	+
Glycolic acid	HO-CH ₂ -COOH	Fp., 80	37 %, aqueous	20 40 60 80 100 120 140	+	-		+	+	+		+	+	+	+
Heptane	C ₇ H ₁₆	98	technically pure	20 40 60 80 100 120 140	+	+	-	+	O	+	-	+	+	-	O
Hexane	C ₆ H ₁₄	69	technically pure	20 40 60 80 100 120 140	+	+	-	+	O	+	-	+	+	-	O
Hydrazine hydrate	H ₂ N-NH ₂ -H ₂ O	113	aqueous	20 40 60 80 100 120 140	+	-	-	+	+	-	+	O	-	-	+
Hydrochloric acid	HCl		up to 30 %, aqueous	20 40 60 80 100 120 140	+	+		+	O	+	+	+	-	-	+

Aggressive media					Chemical resistance										
Medium	Formula	Boiling point °C	Concentration	Temperature °C	PVC-U	PVC-C	ABS	PE	PP-H	PVDF	EPDM	FPM	NBR	CR	CSM
Hydroquinone	C ₆ H ₄ (OH) ₂		30 %	20 40 60 80 100 120 140	+	+		+	+		+				
Iodine-potassium iodide solution (Lugol's solution)	I-KI			20 40 60 80 100 120 140	+	-	-	+	+	+	+	+		O	O
Iron salts, aqueous, inorganic			≤ Saturated acid	20 40 60 80 100 120 140	+	+	+	+	+	+	+	+	+	+	+
Isooctane	(CH ₃) ₃ -C-CH ₂ -CH-(CH ₃) ₂	99	technically pure	20 40 60 80 100 120 140	+	+	-	+	+	+		+	+	+	O
Isopropyl alcohol (ESC)	(CH ₃) ₂ -CH-OH	82	technically pure	20 40 60 80 100 120 140	+	-		+	+	+	+	+	+	+	+
Isopropyl ether	(CH ₃) ₂ -CH-O-CH-(CH ₃) ₂	68	technically pure	20 40 60 80 100 120 140	-	-	-	O	O	+	O	-	-	-	-
Lactic acid	CH ₃ CHOHCOOH		10 %, aqueous	20 40 60 80 100 120 140	+	+	+	+	+	+	+	+	-	-	O
Lead acetate	Pb(CH ₃ COO) ₂		aqueous, saturated	20 40 60 80 100 120 140	+	+	+	+	+	+	+	+	+	+	+
Lead salts, aqueous, inorganic			≤ Saturated acid	20 40 60 80 100 120 140	+	+		+	+	+	+	+	+	+	+

Aggressive media					Chemical resistance										
		Boiling point °C		Temperature °C	PVC-U	PVC-C	ABS	PE	PP-H	PVDF	EPDM	FPM	NBR	CR	CSM
Medium	Formula		Concentration												
Linseed oil			technically pure	20 40 60 80 100 120 140	+ + O 			+ + + 	+ + + + 	+ + + + 	+ + + 	+ + + 	+ + + 	O 	+
Lithium salts, aqueous, inorganic			≤ Saturated acid	20 40 60 80 100 120 140	+ + + 	+ + + 		+ + + 	+ + + + 	+ + + + 	+ + + 	+ + + 		+ 	+
Magnesium salts, aqueous, inorganic			≤ Saturated acid	20 40 60 80 100 120 140	+ + O 	+ + + 		+ + + 	+ + + + 	+ + + + 	+ + + + 	+ + + 	+ + + 	+ + + 	+ + +
Maleic acid	(CH-COOH) ₂	Fp., 131	cold saturated, aqueous	20 40 60 80 100 120 140	+ + O 	+ + 		+ + + 	+ + + + 	+ + + + 	+ + + 	+ + + 	- 	- 	-
Mercury	Hg	357	pure	20 40 60 80 100 120 140	+ + + 	+ 	+ 	+ + + 	+ + + + 	+ + + + 	+ + + 	+ + + 	+ + + 	+ + + 	+ + +
Mercury salts			≤ saturated	20 40 60 80 100 120 140	+ + O 	+ + + 		+ + + 	+ + + + 	+ + + + 	+ + + 	+ + + 	O O - 	O O - 	O O -
Methane (natural gas)	CH ₄	-16 1	technically pure	20 40 60 80 100 120 140	+ 	+ 	+ 	+ 	+ 			+ 	+ 	- 	-
Methanol	CH ₃ OH	65	all	20 40 60 80 100 120 140	+ + O 	- 	- 	+ + + 	+ + + 	+ O + 	+ + O 	O O O 	+ + + 	+ + O 	+ + +
Methyl acetate	CH ₃ COOCH ₃	56	technically pure	20 40 60 80 100 120 140	- 	- 	- 	+ 	+ 	+ 	+ 	- 	- 	- 	-

Aggressive media					Chemical resistance										
Medium	Formula	Boiling point °C	Concentration	Temperature °C	PVC-U	PVC-C	ABS	PE	PP-H	PVDF	EPDM	FPM	NBR	CR	CSM
Methyl amine	CH ₃ NH ₂	-6	32 %, aqueous	20 40 60 80 100 120 140	O	-	-	+	+	-	+	-	-	+	+
Methyl bromide	CH ₃ Br	4	technically pure	20 40 60 80 100 120 140	-	-	-	O	-	++ +	-	O	-	-	O
Methyl ethyl ketone	CH ₃ COC ₂ H ₅	80	technically pure	20 40 60 80 100 120 140	-	-	-	+	+	-	+	-	-	-	-
Methyl isobutyl ketone	C ₆ H ₁₂ O	116		20 40 60 80 100 120 140	-	-	-	+	+	-	+	-	-	-	-
Methyl methacrylate	C ₅ H ₈ O ₂			20 40 60 80 100 120 140	-	-	-	+	+	+	+	-	-	-	-
Methyl phenyl ketone (Acetophenon)	C ₈ H ₈ O	202		20 40 60 80 100 120 140	-	-	-	+	+	-	+	-	-	-	-
Milk				20 40 60 80 100 120 140	+	+	+	+	+	+		+	+	+	+
Mineral water				20 40 60 80 100 120 140	+	+	+	+	+	+	+	+	+	+	+
Mixed acids - nitric - hydrofluoric - sulphuric	15 % HNO ₃ 15 % HF 18 % H ₂ SO ₄		3 parts 1 part 2 parts	20 40 60 80 100 120 140	O	O	-	O	-	++ +	-	+ O	-	-	+ O

Aggressive media					Chemical resistance										
Medium	Formula	Boiling point °C	Concentration	Temperature °C	PVC-U	PVC-C	ABS	PE	PP-H	PVDF	EPDM	FPM	NBR	CR	CSM
Mixed acids - sulphuric - nitric - water	H ₂ SO ₄ HNO ₃ H ₂ O		10 % 20 % 70 %	20	+	+	-	+	-	+	-	+	-	O	+
				40	+	+				+		+			O
				60	+	+				+		+			
				80						+					
				100											
				120											
				140											
Mixed acids - sulphuric - nitric - water	H ₂ SO ₄ HNO ₃ H ₂ O		50 % 33 % 17 %	20	+	+	-	-	-	+	-	+	-	-	O
				40	O										
				60											
				80											
				100											
				120											
				140											
Mixed acids - sulphuric - nitric - water	H ₂ SO ₄ HNO ₃ H ₂ O		50 % 31 % 19 %	20	+	O	-	-	-	+	-	+	-	O	O
				40						+		+			
				60											
				80											
				100											
				120											
				140											
Mixed acids - sulphuric - nitric - water	H ₂ SO ₄ HNO ₃ H ₂ O		10 % 87 % 43 %	20	-	-	-	-	-	O	-	-	-	-	-
				40											
				60											
				80											
				100											
				120											
				140											
Mixed acids - sulphuric - nitric - water	H ₂ SO ₄ HNO ₃ H ₂ O		48 % 49 % 43 %	20	+	+	-	-	-	+	-	+	-	-	-
				40	O					+		+			
				60	-					+		+			
				80											
				100											
				120											
				140											
Mixed acids - sulphuric - phosphoric - phosphoric	H ₂ SO ₄ H ₃ PO ₄ H ₂ O		30 % 60 % 10 %	20	+	+	-	+	+	+	+	+	-	+	+
				40	+	+		+	+	+	+	+		O	O
				60	+	+		+	+	+	+	+			
				80						+					
				100											
				120											
				140											
N,N-Dimethylaniline	C ₆ H ₅ N(CH ₃) ₂	194	technically pure	20	-	-	-	+	+		+				
				40											
				60											
				80											
				100											
				120											
				140											
N-Methylpyrrolidon	C ₅ H ₉ NO	204		20	-	-	-	+	+	O	+	O			
				40											
				60											
				80											
				100											
				120											
				140											
Naphthalene	C ₁₀ H ₈	218	technically pure	20	-	-		+	+	+	-	+	+	-	O
				40											
				60											
				80											
				100											
				120											
				140											

Aggressive media					Chemical resistance										
Medium	Formula	Boiling point °C	Concentration	Temperature °C	PVC-U	PVC-C	ABS	PE	PP-H	PVDF	EPDM	FPM	NBR	CR	CSM
Nickel salts, aqueous, inorganic			≤ Saturated acid	20 40 60 80 100 120 140	+ + O 	+ + + 		+ + + 	+ + + 	+ + + + 	+ + + 	+ + + + 	+ + + 	+ + + 	+ + +
Nitrating acid	H ₂ SO ₄ HNO ₃ H ₂ O		65 % 20 % 15 %	20 40 60 80 100 120 140	+ O 	O 		- 	- 	+ 	- 	+ 	- 	- 	-
Nitric acid	HNO ₃		6.3 %, aqueous	20 40 60 80 100 120 140	+ + + 	+ + + + 		+ + + 	+ + O + + + 	+ + + + + 	+ O 	+ + + + O 	- 	- 	+ O -
Nitric acid	HNO ₃		≤ 25 %	20 40 60 80 100 120 140	+ + + 	+ + + 	-	+ + O 	+ O + + + + 	+ 	+ 	+ 			
Nitric acid	HNO ₃		65 %, aqueous	20 40 60 80 100 120 140	O O - 	+ + 	-	O - 	- 	+ + + O - 	- 	+ O - 	- 	- 	O -
Nitric acid	HNO ₃		85 %	20 40 60 80 100 120 140	- 	- 	-	- 	- 	+ + 	- 	+ 	- 	- 	-
Nitric acid	HNO ₃		100 %	20 40 60 80 100 120 140	- 	- 	-	- 	- 	- 	- 	- 	- 	- 	-
Nitrobenzene	C ₆ H ₅ -NO ₂	209	technically pure	20 40 60 80 100 120 140	- 	- 	-	+ 	+ 	+ 	O 	+ 	- 	- 	-
Nitrotoluene (o-, m-, p-)	C ₇ H ₇ NO ₂	222 - 238	technically pure	20 40 60 80 100 120 140	- 	- 	-	+ O 	O - 	+ + O - 	- 	O - 	O - 	- 	-

Aggressive media					Chemical resistance											
Medium	Formula	Boiling point °C	Concentration	Temperature °C	PVC-U	PVC-C	ABS	PE	PP-H	PVDF	EPDM	FPM	NBR	CR	CSM	
Nitrous acid	HNO ₂			20 40 60 80 100 120 140	+	+	-	+	-	+	+	+				
Nitrous gases (Nitric oxide)	NOx		diluted, moist, anhydrous	20 40 60 80 100 120 140	+	+	-	O	O	+	O	+	O	+	+	
Oleic acid	C ₁₇ H ₃₃ COOH		technically pure	20 40 60 80 100 120 140	+	O	-	+	+	+	-	+	O	-	-	
Oleum	H ₂ SO ₄ +SO ₃		10 % SO3	20 40 60 80 100 120 140	-	-	-	-	-	-	-	-	-	-	-	
Olive oil				20 40 60 80 100 120 140	+	-	-	+	+	+	-	+	+	+	+	
Oxygen	O ₂		technically pure	20 40 60 80 100 120 140	+	+		+	+	+	+	+	+	+	+	
Ozone	O ₃		up to 2 %, in air	20 40 60 80 100 120 140	+	O	-	O	O	O	O	+	-	O	+	
Ozone	O ₃		cold saturated, aqueous	20 40 60 80 100 120 140	+	O	-	O	O	O	-	+	-	O	+	
Palm oil, palm nut oil				20 40 60 80 100 120 140	+	O		+	+	+	-	+	+	+	O	

Aggressive media					Chemical resistance										
Medium	Formula	Boiling point °C	Concentration	Temperature °C	PVC-U	PVC-C	ABS	PE	PP-H	PVDF	EPDM	FPM	NBR	CR	CSM
Paraffin emulsions			usual commercial, aqueous	20 40 60 80 100 120 140	+	+		+	+	+	-	+	+	+	+
Paraffin oil				20 40 60 80 100 120 140	+	+	O	+	+	+	-	+	+	+	O
Perchlorid acid	HClO ₄		10 %, aqueous	20 40 60 80 100 120 140	+	+		+	+	+	+	+	-	-	+
Perchlorid acid	HClO ₄		70 %, aqueous	20 40 60 80 100 120 140	+	-	-		-	O	-	+	-	-	+
Perchloro-ethylene (Tetrachlorethylene)	Cl ₂ C=CCl ₂	121	technically pure	20 40 60 80 100 120 140	-	-		O	O	++ + O -	-	++ + +	O -	-	-
Phenol	C ₆ H ₅ -OH	182	up to 10 %, aqueous	20 40 60 80 100 120 140	+ O	O O	-	+ + O	+ + +	+ + +	+ + O	+ + O	-	-	-
Phenol	C ₆ H ₅ -OH		up to 90 %, aqueous	20 40 60 80 100 120 140	O	-	-	+ + O	+ + +	+ + O	-	+ O -	-	- O	-
Phosgene	COCl ₂		gaseous, technically pure	20 40 60 80 100 120 140	+ O O	-	-	O	O	+ +	+	+ + O	+ + +	+ O -	+ O
Phosgene	COCl ₂	8	liquid, technically pure	20 40 60 80 100 120 140	-	-	-	-	-	-	-	+	O	+	+

Aggressive media					Chemical resistance											
Medium	Formula	Boiling point °C	Concentration	Temperature °C	PVC-U	PVC-C	ABS	PE	PP-H	PVDF	EPDM	FPM	NBR	CR	CSM	
Phosphoric acid	H ₃ PO ₄		85 %, aqueous	20 40 60 80 100 120 140	+ + + + 	+ + + + 	 	+ + + + 	+ + + + 	+ + + + 	+ + + + 	+ + + + 	- 	+ + 	+ O + + 	
Phosphoric acid	H ₃ PO ₄		up to 95 %	20 40 60 80 100 120 140	+ + + 	+ + + 	- 	+ + 	+ + + + 	+ 	O + + 	+ 	- 	- 	- 	
Phosphorous chlorides: - ..trichloride - ..pentachloride - ..oxichloride	PCl ₃ PCl ₅ POCl ₃		175 162 105	technically pure	20 40 60 80 100 120 140	- 	- 	- 	- 	- 	- 	- 	- 	- 	- 	-
Photographic developer				usual commercial	20 40 60 80 100 120 140	+ + O 	+ + + O 	+ + O 	+ + O 	+ + + 	+ + + 	+ + + 	+ + + 	O O 	+ + + 	+ + +
Photographic emulsions					20 40 60 80 100 120 140	+ + 	+ + O 	+ + 	+ + + 	+ + + 	+ + + 	+ + + 	+ + + 	O 	+ + + 	+ + +
Photographic fixer				usual commercial	20 40 60 80 100 120 140	+ + O 	+ + + 	+ + O 	+ + + 	+ + + 	+ + + 	+ + + 	+ + + 	+ + + 	+ + + 	+ + +
Phthalic acid	C ₆ H ₅ (COOH) ₂		Fp., 208	saturated, aqueous	20 40 60 80 100 120 140	+ O - 	- 	- 	+ + + 	+ + + + 	+ + + + 	+ O 	- 	- 	+ + O 	+ + +
Potassicim hydroxide	KOH			50 %	20 40 60 80 100 120 140	+ + + 	O 	 	+ + + O 	+ + O 	- 	+ + + 	- 	O 	O 	+
Potassium aluminium salts (alum), aqueous, inorganic	KAl(SO ₄) ₂			≤ Saturated acid	20 40 60 80 100 120 140	+ + + 	+ + + + 	 	+ + + 	+ + + + 	+ + + + 	+ + + + 	 	- 	+ 	+

Aggressive media					Chemical resistance										
Medium	Formula	Boiling point °C	Concentration	Temperature °C	PVC-U	PVC-C	ABS	PE	PP-H	PVDF	EPDM	FPM	NBR	CR	CSM
Potassium persulphate (Potassium Peroxidsulfate)	K ₂ S ₂ O ₈		all, aqueous	20 40 60 80 100 120 140	+ + O + + + +	+ + + + + + +		+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +	- + + + + + +	+ + + + + + +	+ + + + + + +
Potassium-hypochlorite	KOCl			20 40 60 80 100 120 140	+ O + + + + +	O O O O O O O		O O O O O O O	O O O O O O O	O O O O O O O	+ + + + + + +	O O O O O O O	O O O O O O O	O O O O O O O	O O O O O O O
Propane	H ₃ C-CH ₂ -CH ₃		technically pure, gaseous	20 40 60 80 100 120 140	+ + + + + + +	+ + + + + + +		O O O O O O O	+ + + + + + +	+ + + + + + +		+ + + + + + +	O O O O O O O	O O O O O O O	O O O O O O O
Propane	H ₃ C-CH ₂ -CH ₃	-42	technically pure, liquid	20 40 60 80 100 120 140	+ + + + + + +	- - - - - - -		+ + + + + + +	+ + + + + + +	+ + + + + + +		+ + + + + + +	O O O O O O O	O O O O O O O	O O O O O O O
Propanol, n- and iso-	C ₃ H ₇ OH	97 bzw . 82	technically pure	20 40 60 80 100 120 140	+ O O O O O O	- - - - - - -		+ + O O O O O	+ + O O O O O	+ + O O O O O	+ + O O O O O	+ + O O O O O	+ + O O O O O	+ + O O O O O	+ + O O O O O
Propionic acid	CH ₃ CH ₂ COOH	141	50 %, aqueous	20 40 60 80 100 120 140	+ + O + + + +	O O O O O O O	- - - - - - -	+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +	O O O O O O O	- - - - - - -	O O O O O O O	O O O O O O O
Propionic acid	H ₃ C-CH ₂ -COOH	141	technically pure	20 40 60 80 100 120 140	+ O O O O O O	O O O O O O O	- - - - - - -	+ O O O O O O O	+ O O O O O O O	+ + O O O O O	+ O O O O O	+ + + + + + +	- - - - - - -	- - - - - - -	- - - - - - -
Propylene glycol	C ₃ H ₈ O ₂		< 50 %	20 40 60 80 100 120 140	+ + + + + + +	- - - - - - -		+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + O O O O O	+ + O O O O O	+ + + + + + +	+ + + + + + +
Propylene glycol	C ₃ H ₈ O ₂	188	technically pure	20 40 60 80 100 120 140	+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + O O O O O	+ + O O O O O	+ + + + + + +

Aggressive media					Chemical resistance										
Medium	Formula	Boiling point °C	Concentration	Temperature °C	PVC-U	PVC-C	ABS	PE	PP-H	PVDF	EPDM	FPM	NBR	CR	CSM
Pyridine	C ₅ H ₅ N	115	technically pure	20 40 60 80 100 120 140	-	-	-	+ O O O	O O O	+ - -	O	-	-	-	-
Salicylic acid	C ₆ H ₄ (OH)COOH		saturated	20 40 60 80 100 120 140	+	+		+	+	+	+	+	+	+	+
Sea water				20 40 60 80 100 120 140	+	+	+	+	+	+	+	+	+	+	+
Silicic acid	Si(OH) ₄			20 40 60 80 100 120 140	+	+		+	+		+	+	-	+	+
Silicone oil				20 40 60 80 100 120 140	+	+	+	+	+	+	+	+	+	+	+
Silver salts, aqueous, inorganic			≤ Saturated acid	20 40 60 80 100 120 140	+	+	+	+	+	+	+	+	+	+	+
Sodium chlorite	NaClO ₂		diluted, aqueous	20 40 60 80 100 120 140	+	O		O	O	O	O	+	-	O	+
Sodium hypochlorite	NaOCl		12.5 % active chlorine, aqueous	20 40 60 80 100 120 140	+	O	-	O O	O O	O	+	O	-	-	+
Sodium persulphate	Na ₂ S ₂ O ₈		cold saturated, aqueous	20 40 60 80 100 120 140	+	+		+	+	+	+	+	-	+	+

Aggressive media					Chemical resistance										
Medium	Formula	Boiling point °C	Concentration	Temperature °C	PVC-U	PVC-C	ABS	PE	PP-H	PVDF	EPDM	FPM	NBR	CR	CSM
Sodium salts, aqueous, inorganic			≤ Saturated acid	20 40 60 80 100 120 140	+	+		+	+	+	+	+	+	+	+
Stannous chloride	SnCl ₂		cold saturated, aqueous	20 40 60 80 100 120 140	+	+	+	+	+	+	+	+	+	+	+
Starch solution	(C ₆ H ₁₀ O ₅) _n		all, aqueous	20 40 60 80 100 120 140	+	+	+	+	+	+	+	+	+	+	+
Styrene	H ₅ C ₆ -CH=CH ₂	145		20 40 60 80 100 120 140	-	-	-			+		+			
Succinic acid	HOOC-CH ₂ -CH ₂ -COOH	Fp., 185	aqueous, all	20 40 60 80 100 120 140	+	+	+	+	+	+	+	+	+	+	+
Sulfurous acid	H ₂ SO ₃		saturated, aqueous	20 40 60 80 100 120 140	+	+		+	+	+	+	+	-	-	O
Sulfuryl chloride	SO ₂ Cl ₂	69	technically pure	20 40 60 80 100 120 140	-	-	-	-	-	O		+	-	O	+
Sulphur dioxide	SO ₂		technically pure, liquid	20 40 60 80 100 120 140	-	-	-	-	-	-	-	O	-	-	O
Sulphur dioxide	SO ₂		all, moist	20 40 60 80 100 120 140	+	+	-	+	+	+	+	+	-	-	O

Aggressive media					Chemical resistance										
Medium	Formula	Boiling point °C	Concentration	Temperature °C	PVC-U	PVC-C	ABS	PE	PP-H	PVDF	EPDM	FPM	NBR	CR	CSM
Sulphuric acid	H ₂ SO ₄	195	up to 80 %, aqueous	20 40 60 80 100 120 140	+ + + + + + +	+ + + + + + +	- + + + + + +	+ + O O + + +	+ + O O + + +	O O + + + + +	O O + + + + +	+ + O O + + +	- + + + + + +	- + + + + + +	+ O + + + + +
Sulphuric acid	H ₂ SO ₄		96 %, aqueous	20 40 60 80 100 120 140	+ + O + + + +	+ + + + + + +	- - - - - - -	- - - - - - -	- - - - - - -	- - - - - - -	- - - - - - -	+ + + + + + +	- - - - - - -	- - - - - - -	- - - - - - -
Sulphuric acid	H ₂ SO ₄	340	98 %	20 40 60 80 100 120 140	+ O + + + + +	+ + O + + + +	- - - - - - -	- - - - - - -	- - - - - - -	- - - - - - -	- - - - - - -	O + + + + + +	- - - - - - -	- - - - - - -	- - - - - - -
Tannic acid			all, aqueous	20 40 60 80 100 120 140	+ + + + + + +	+ + + + + + +	- - - - - - -	+ + + + + + +	+ + + + + + +	- - - - - - -	- - - - - - -	+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +
Tetrachlorethylene Perchloroethylene	Cl ₂ C-CCl ₂	121		20 40 60 80 100 120 140	- - - - - - -	- - - - - - -	- - - - - - -	- - - - - - -	- - - - - - -	+ + + + + + +	- - - - - - -	+ + + + + + +	- - - - - - -	- - - - - - -	- - - - - - -
Tetrachloroethane	Cl ₂ CH-CHCl ₂	146	technically pure	20 40 60 80 100 120 140	- - - - - - -	- - - - - - -	- - - - - - -	O O + + + + +	O O + + + + +	+ + + + + + +	- - - - - - -	O + + + + + +	- - - - - - -	- - - - - - -	- - - - - - -
Tetraethylene lead	(C ₂ H ₅) ₄ Pb		technically pure	20 40 60 80 100 120 140	+ + + + + + +	+ + + + + + +	- - - - - - -	+ + + + + + +	+ + + + + + +	+ + + + + + +	O O + + + + +	+ + + + + + +	+ + + + + + +	O O + + + + +	+ + + + + + +
Tetrahydrofurane	C ₄ H ₈ O	66	technically pure	20 40 60 80 100 120 140	- - - - - - -	- - - - - - -	- - - - - - -	O O + + + + +	O O + + + + +	- - - - - - -	O O + + + + +	- - - - - - -	- - - - - - -	- - - - - - -	- - - - - - -
Tin salts, aqueous, inorganic			≤ saturated acid	20 40 60 80 100 120 140	+ + + + + + +	+ + + + + + +	- - - - - - -	+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +

Aggressive media					Chemical resistance										
Medium	Formula	Boiling point °C	Concentration	Temperature °C	PVC-U	PVC-C	ABS	PE	PP-H	PVDF	EPDM	FPM	NBR	CR	CSM
Toluene	C ₆ H ₅ -CH ₃	111	technically pure	20 40 60 80 100 120 140	-	-	-	O	O	+	-	+	-	-	-
Trichloro- methane	CHCl ₃	61	100 %	20 40 60 80 100 120 140						+		+			
Trichloroacetic acid	Cl ₃ -C-COOH		50 %, aqueous	20 40 60 80 100 120 140	+ O	-	-	+ + +	+ + O	+ + O -	O	-	-	-	-
Trichloroacetic acid	Cl ₃ -C-COOH	196	technically pure	20 40 60 80 100 120 140	O	-	-	+ O -	+ + O	O	O	-	-	-	-
Trichloroethane	Cl ₃ -C-CH ₃	74	technically pure	20 40 60 80 100 120 140	-	-	-	O	O	+ +	-	+	-	-	-
Trichloroethylene	Cl ₂ C=CHCl	87	technically pure	20 40 60 80 100 120 140	-	-	-	-	O	+	-	+	-	-	-
Triethylamine	N(CH ₂ -CH ₃) ₃	89	technically pure	20 40 60 80 100 120 140	-	-	-	+	+	O -	-	-	-	-	-
Trifluoro acetic acid	F ₃ C-COOH		up to 50 %	20 40 60 80 100 120 140	-	-	-	+	+	+ O	O	-	-	-	-
Turpentine oil			technically pure	20 40 60 80 100 120 140	+ O	-	-	O O	-	+	-	+ + +	O	-	-

Aggressive media					Chemical resistance										
Medium	Formula	Boiling point °C	Concentration	Temperature °C	PVC-U	PVC-C	ABS	PE	PP-H	PVDF	EPDM	FPM	NBR	CR	CSM
Urea	H ₂ N-CO-NH ₂	Fp., 133	up to 30 %, aqueous	20 40 60 80 100 120 140	+ + O + + + +	+ + + O + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +
Urine				20 40 60 80 100 120 140	+ + O + + + +	+ + + + + + +		+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +
Vinyl acetate	CH ₂ =CHOOCCH ₃	73	technically pure	20 40 60 80 100 120 140	- - - - - - -	- - - - - - -	- - - - - - -	+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +	- - - - - - -	- - - - - - -	- - - - - - -	- - - - - - -
Vinyl chloride	CH ₂ =CHCl	-14	technically pure	20 40 60 80 100 120 140	- - - - - - -	- - - - - - -	- - - - - - -	- - - - - - -	- - - - - - -	+ + + + + + +	- - - - - - -	+ + + + + + +	- - - - - - -	- - - - - - -	- - - - - - -
Waste gases containing - Alkaline				20 40 60 80 100 120 140	+ + + + + + +	+ + + + + + +		+ + + + + + +	+ + + + + + +	O O + + + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +
Waste gases containing - Hydrochloric acid			all	20 40 60 80 100 120 140	+ + + + + + +	+ + + + + + +		+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +	O O + + + + +	+ + + + + + +	+ + + + + + +
Waste gases containing - Hydrogen fluoride			traces	20 40 60 80 100 120 140	+ + + + + + +	+ + + + + + +		+ + + + + + +	+ + + + + + +	+ + + + + + +	O O O O O O +	+ + + + + + +	+ + + + + + +	O O + + + + +	+ + + + + + +
Waste gases containing - Nitrous gases			traces	20 40 60 80 100 120 140	+ + + + + + +	+ + + + + + +		+ + + + + + +	O O O O O O +	+ + + + + + +	+ + + + + + +	+ + + + + + +	O O + + + + +	+ + + + + + +	+ + + + + + +
Waste gases containing - Sulphur dioxide			traces	20 40 60 80 100 120 140	O + + + + + +	O + + + + + +		+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +	+ + + + + + +	O O + + + + +	+ + + + + + +	+ + + + + + +

Aggressive media					Chemical resistance													
Medium	Formula	Boiling point °C	Concentration	Temperature °C	PVC-U	PVC-C	ABS	PE	PP-H	PVDF	EPDM	FPM	NBR	CR	CSM			
Water, drinking, chlorinated	H ₂ O	100	≤ 0.1 ppm Cl2	20	+	+	+	+	+	+	+	+	+	+	+			
				40	+	+	+	+	+	+	+	+	+	+	+			
				60	+	+	+	+	+	O	+	+	+	+	+			
				80				+	+		+	O			+			
				100					+									
				120							+							
				140							+							
Water - distilled - deionised				20	+	+	+	+	+	+	+	+	+	+	+	+	+	+
				40	+	+	+	+	+	+	+	+	+	+	+	+	+	+
				60	+	+	+	+		O	+	+	+	+	+	+	+	+
				80		+		+	+		+	+	+	+	+	+		+
				100				+	+		+	+	+	+	+	+		
				120							+		+					
				140							+							
Xylene	C ₆ H ₄ (CH ₃) ₂	138 - 144	technically pure	20	-	-	-	-	-	+	-	+	-	-	-			
				40														
				60						O								
				80														
				100														
				120														
				140														
Zinc salts, aqueous, inorganic			≤ Saturated acid	20	+	+	+	+	+	+	+	+	+	+	+	+	+	
				40	+	+		+	+	+	+	+	+	+	+	+	+	
				60	+	+		+	+	+	+	+	+	+	+	+	+	
				80		+			+	+	+	+	+	+	+	+	+	
				100						+								
				120														
				140														

GF Piping Systems → worldwide at home

Our sales companies and representatives ensure local customer support in over 100 countries.

www.piping.georgfischer.com



The technical data are not binding and not expressly warranted characteristics of the goods. They are subject to change. Our General Conditions of Sale apply.

Australia

George Fischer Pty Ltd
Kingsgrove NSW 2008
Phone +61(0)2/95 54 39 77
australia.ps@georgfischer.com
www.georgfischer.com.au

Austria

Georg Fischer
Rohrleitungssysteme GmbH
3130 Herzogenburg
Phone +43(0)2782/856 43-0
austria.ps@georgfischer.com
www.georgfischer.at

Belgium/Luxembourg

Georg Fischer NV/SA
1070 Bruxelles/Brüssel
Phone +32(0)2/556 40 20
be.ps@georgfischer.com
www.georgfischer.be

Brazil

George Fischer Ltda
04795-100 São Paulo
Phone +55(0)11/5687 1311
br.ps@georgfischer.com

China

Georg Fischer
Piping Systems Ltd Shanghai
Pudong, Shanghai 201319
Phone +86(0)21/58 13 33 33
china.ps@georgfischer.com
www.cn.piping.georgfischer.com

Denmark/Iceland

Georg Fischer A/S
2630 Taastrup
Phone +45 (0)70 22 19 75
info.dk.ps@georgfischer.com
www.georgfischer.dk

France

Georg Fischer S.A.S.
93208 Saint-Denis Cedex 1
Phone +33(0)1/492 21 34 1
fr.ps@georgfischer.com
www.georgfischer.fr

Germany

Georg Fischer GmbH
73095 Albershausen
Phone +49(0)7161/302-0
info.de.ps@georgfischer.com
www.vgd.georgfischer.de

India

Georg Fischer Piping Systems Ltd
400 093 Mumbai
Phone +91 224007 201
in.ps@georgfischer.com

Italy

Georg Fischer S.p.A.
20063 Cernusco S/N (MI)
Phone +39(0)2/921 861
it.ps@georgfischer.com
www.georgfischer.it

Japan

Georg Fischer Ltd
556-0011 Osaka,
Phone +81(0)6/6635 2691
jp.ps@georgfischer.com
www.georgfischer.jp

Malaysia

Georg Fischer (M) Sdn. Bhd.
47500 Subang Jaya
Phone +60 (0)3-8024 7879
conne.kong@georgfischer.com.my

Middle East

Georg Fischer Piping Systems
Dubai, United Arab Emirates
Phone +971 4 289 41 20
gfdubai@emirates.net.ae
www.piping.georgfischer.com

Netherlands

Georg Fischer N.V.
8161 PA Epe
Phone +31(0)578/678 222
nL.ps@georgfischer.com
www.georgfischer.nl

Norway

Georg Fischer AS
1351 Rud
Phone +47(0)67 18 29 00
no.ps@georgfischer.com
www.georgfischer.no

Poland

Georg Fischer Sp. z o.o.
02-226 Warszawa
Phone +48(0)22/313 10 50
poland.ps@georgfischer.com
www.georgfischer.pl

Romania

Georg Fischer
Rohrleitungssysteme AG
70000 Bucharest - Sector 1
Phone +40(0)1/222 91 36
ro.ps@georgfischer.com

Singapore

George Fischer Pte Ltd
528 872 Singapore
Phone +65(0)67 47 06 11
sgp.ps@georgfischer.com
www.georgfischer.com.sg

Spain/Portugal

Georg Fischer S.A.
28046 Madrid
Phone +34(0)91/781 98 90
es.ps@georgfischer.com
www.georgfischer.es

Sweden/Finland

Georg Fischer AB
12523 Älvsjö-Stockholm
Phone +46(0)8/506 775 00
info.se.ps@georgfischer.com
www.georgfischer.se

Switzerland

Georg Fischer
Rohrleitungssysteme (Schweiz) AG
8201 Schaffhausen
Phone +41(0)52 631 30 26
ch.ps@georgfischer.com
www.piping.georgfischer.ch

Taiwan

Georg Fischer Ltd.
2F, No. 88, Hsing Te Road
San Chung City
Taipei Hsien, Taiwan [R.O.C.]
Phone +886 2 8512 2822
Fax +886 2 8512 2823

United Kingdom/Ireland

George Fischer Sales Limited
Coventry, CV2 2ST
Phone +44(0)2476 535 535
uk.ps@georgfischer.com
www.georgfischer.co.uk

USA/Canada/Latin America/Caribbean

George Fischer Inc.
Tustin, CA 92780-7258
Phone +1(714) 731 88 00
Toll Free 800/854 40 90
us.ps@georgfischer.com
www.us.piping.georgfischer.com

Export

Georg Fischer
Piping Systems (Switzerland) Ltd.
8201 Schaffhausen
Phone +41 (0)52-631 30 26
Fax +41 (0)52-631 28 93
export.ps@georgfischer.com
www.piping.georgfischer.ch