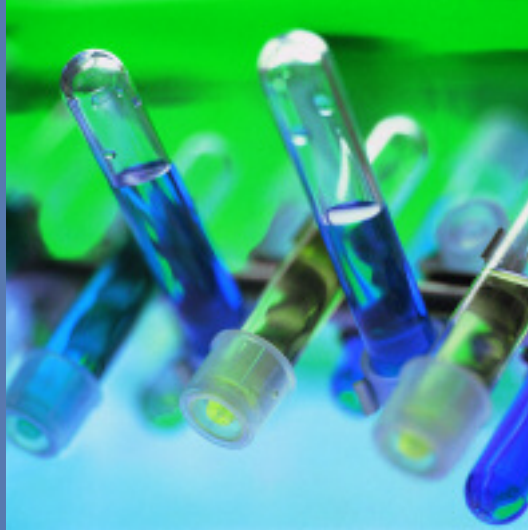




bürkert
FLUID CONTROL SYSTEMS

Chemical Resistance Chart

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1. General information and introduction

1.1 Introduction

When dealing with aggressive fluids the user is continuously faced with the problem of finding compatible materials.

In order to simplify the selection of suitable materials when using Bürkert products for aggressive fluids, the following tables provide useful information on the optimal choice of housing and gasket materials for a multitude of media.

Since corrosion performance is influenced by several factors, the information contained in this brochure should be treated only as a guide and is not necessarily valid for all operating conditions.

Increased temperatures, higher concentrations, and the inadvertent ingress of water in originally pure chemicals can all lead to accelerated corrosion. Dependent on the purity of the fluid as well as the compounding and nature of vulcanisation of the gasket materials, deviations can result which affect the suitability and durability of the plastics and elastomers.

The information quoted in this guide does not consider the effect of mechanical loading, which may also have a bearing on the material performance in the fluid. In cases of doubt when considering our products, we strongly recommend the prior testing of samples with various material combinations, in order to establish and check their suitability under the actual operating conditions of the application.

Where liquid food products are involved, the plastics and elastomers employed must normally conform with the local food and hygiene regulations.

It is emphasized that these resistance tables are intended only as a guide and that no guarantees can be given in respect of the information contained in this publication.

1.2 Structure and content of the chemical resistance charts

The following chemical resistance tables are divided into three categories. These are **basic chemicals** (chapter 2.2), **liquid commercial products** (chapter 2.3) and **liquid food ingredients** (chapter 2.4).

The resistance of these fluids is rated in detail for the elastomeric materials, plastics and metallic materials commonly used in Bürkert products. Rarely used materials such as CSM as well as aluminum are not described in the tables. Epoxy resin, which is commonly used in the construction of our products, but which is not mentioned, is resistant to most common chemicals.

Information regarding the chemical resistance of the unlisted materials is available on request, including chrome and nickel-plated parts. Please see the overview in chapter 2.1 for additional information regarding general chemical resistance of seal and body materials. For the most commonly used chemical substances the chemical formula is added in the charts.

The suffix "pure" means the technical pureness of the fluid, which in most cases exceeds 95% purity. As a rule, organic fluidic or gaseous media have this supplement. "Acetic acid - pure" means for example a 98% acetic acid.

The suffix "aqueous" is mostly used for water miscible substances (such as Ethanol) but also for aqueous solutions of inorganic salts. Due to the great number of possible concentrations, an average concentration is always assumed.

Saturated aqueous solutions are described only if explicitly noted and the reference temperature for all statements is room temperature. At higher temperatures a reduced chemical resistance must be considered.

1.3 Interpretation of Symbols

- + material is not affected or is slightly affected by the chemical: suitable
 - o various attack level depending on prevailing conditions: limited suitability
- material exhibits severe attack: unsuitable

If materials are rated as "limited suitability", the time of impact has to be considered. At a long period of impact these materials can be heavily attacked or even destroyed. Therefore these parts are rated as wear parts and are not included in the standard warranty conditions.

In many cases it is not possible to make a clear statement due to different service conditions. In these cases the rating should also be "limited suitability".

1.4 References

All the information quoted in these resistance tables is based on industrial experience (for example "DECHEMA -Werkstoff-Tabelle", Germany or "DECHEMA Corrosion Handbook"), the data of our material and compound manufacturers and Bürkert's own stringent laboratory tests.

2. Chemical resistance properties gasket and housing materials

2.1 Overview

Material	Designation	Chemical resistance	Permissible temperatures		
			Neutral fluids long-term °C(°F)	Neutral fluids short-term °C(°F)	Aggressive fluids long-term °C(°F)
Magnet encapsulation materials					
Epoxy resin	EP	Resistant to nearly all chemicals. Unsuitable for short-chain organic acids of high concentration and for strong oxidising substances.	-20 (-4) to +150 (+302)		
Polyamide	PA	See plastic housing materials			
Gasket and diaphragm materials					
Ethylene propylene diene rubber	EPDM	Good resistance to ozone and weathering. Particularly suitable for aggressive chemicals. Unsatisfactory for oils and fats.	-30 (-22) to +130 (+266)		Dependant on aggressive- ness of the fluid and on mechan- ical load.
Fluorine rubber	FKM	Chemical properties superior to all other elastomers.	-0 °C (+32) to +150 (+302)	-0 °C (+32) to +200 (+392)	
Nitrile rubber	NBR	Fairly resistant to oil and petrol. Unsatisfactory with oxidising fluids.	-10 (+14) to +90 (+194)	-10 (+14) to +120 (+248)	
Chloroprene rubber	CR	The chemical properties are very similar to those of PVC and are between those of NBR and EPDM.	-10 (+14) to +100 (+212)	-10 (+14) to +110 (+230)	
Perfluorinated elastomers	FFKM	Similar to PTFE (dependent on blend)	5 °C (+41) to +230 (+446)	5 °C (+41) to +230 (446)	
Poly tetrafluorethylene	PTFE	See plastic housing materials			
Steel	1.4112		-20 (-4) to +450 (+842)		-20 (-4) to +150 (+302)

Material	Designation	Chemical resistance	Permissible temperatures		
			Neutral fluids long-term °C(°F)	Neutral fluids short-term °C(°F)	Aggressive fluids long-term °C(°F)
Housing materials - Metal					
Stainless steel		See resistance tables	- 20 (-4) to +400 (+752)		-20 (-4) to +150 (+302)
	1.4401	Also 1.4404, 1.4408, 1.4409, 1.4401			
	1.4571	Also 1.4581			
	1.4305	Also 1.4301, 1.4303			
	1.4105	Also 1.4113			
Grey cast iron	GG 25	For neutral fluids	-20 (-4) to +180 (+356)		
S.G. cast iron	GGG 40.3	For neutral fluids	-20 (-4) to +400 (+752)		
Cast steel	GS – C C22, C25	For neutral fluids	-20 (-4) to +400 (+752)		
Brass	MS	See resistance tables	-20 (-4) to +250 (+482)		
Leaded red brass	RG	See resistance tables	-20 (-4) to +250 (+482)		
Housing materials - Plastic					
Rigid polyvinyl chloride	PVC	Resistant to most acids and bases, salt solutions, and water miscible, organic solvents.	0 (+32) to +60 (+140)	0 (+32) to +60 (+140)	0 (+32) to +40 (+104)
	PVC-HT	Non-resistant to aromatic and chlorinated hydrocarbons.	0 (+32) to +90 (+194)	0 (+32) to +110 (+230)	0 (+32) to +40 (+104)
Poly propylene Poly ethylene	PP PE	Resistant to organic solvents, aqueous solutions of acids, bases and salts. Unsuitable for concentrated, oxidising acids.	0 (+32) to +100 (+212)		0 (+32) to +60 (+140)
Poly amide	PA	Resistant to fats, oils, waxes, fuels, weak bases, aliphatic and aromatic hydrocarbons.	0 (+32) to +100 (+212)		0 (+32) to +60 (+140)
Poly tetrafluoro- ehtylene	PTFE	Resistant to nearly all chemicals. Unsuitable for liquid sodium and fluorine compounds.	-20 (-4) to +200 (+392)	-20 (-4) to +260 (+500)	-20 (-4) to +150(+302)
Poly vinylidene fluoride	PVDF	Unsuitable for hot solvents as well as for ketones, esters, and strong bases.	-20 (-4) to +100 (+212)		
Poly phenylene sulfide	PPS	Resistant to dilute mineral acids, bases, aliphatic and aromatic hydrocarbons, ketones, alcohols, chlorinated hydro- carbons, oils, fats, water, and to hydrolysis.	to +200 (+392)	to +260 (+500)	
Poly ether ether ketone	PEEK	Resistant to most chemicals. Unsuitable for concentrated sulfuric and nitric acid and certain chlorohydrocarbons.	to +220 (+428)	to +280 (+536)	

2.2 Resistance in basic chemicals

		NBR	EPDM	FKM	FFKM	CR	PTFE	PVC	PP	PA	PVDF	PPS	PEEK	MS	RG	GG, GS	1.4401/1.4571	1.4305/1.4105
A																		
Acetaldehyde - pure	CH ₃ CHO	-	+	o	+	-	+	-	o	o	+	o	+	+	+	-	+	+
Acetic acid ethyl ester (ethyl acetate) - pure	CH ₃ CO ₂ CH ₂ CH ₃	-	o	-	o	-	+	-	-	o	o	+	+	-	+	+	+	+
Acetic acid - pure	CH ₃ COOH	-	o	-	o	-	+	o	-	o	+	+	+	-	-	-	+	-
Acetic anhydride - pure	CH ₃ COOCOCH ₃	-	o	-	o	-	+	-	-	-	-	+		-	o	o	o	o
Acetoacetic ester (acid free, pure)	CH ₃ COCH ₂ CO ₂ C ₂ H ₅	-	-	-	+	-	+	-	-	+	-	+		o	o	o	+	+
Acetone - pure	CH ₃ COCH ₃	-	+	-	+	o	+	-	+	+	-	+	+	+	+	+	+	+
Acetophenone - pure	C ₆ H ₅ COCH ₃	-		-	+	-	+	-		+	o	o		+	+	+	+	+
Acetylacetone - pure	CH ₃ COCH ₂ COCH ₃	-	-	-	+	-	+	-	-	+	-			-	-	o	+	+
Acetyl chloride - pure	CH ₃ COCl	-	-	-	+	-	+			-	-	+		o	o	o	o	o
Acetylene - technical grade	HCCH	¹ -	¹ +	¹ -	¹ +	¹ -	+	o	o	+	+	+	+	² +	-	+	+	+
Acrylic acid ethyl ester - pure	CH ₂ CHCOOC ₂ H ₅	-	o	-	+	-	+				o	+				+	+	+
Acrylonitrile - pure	CH ₂ CHCN	-	-	-	+	-	+	-	+	o	-	+	+	+	+	+	+	+
Adipic acid - aqueous (saturated)	HO ₂ C(CH ₂) ₄ CO ₂ H	+	+	+	+	+	+	+	+	+	+	+				+	+	+
Albumin solutions		+	+	+		+	+	+	+	+				o	o	o	+	+
Alum (potassiumaluminiumsulphate)-aqueous (saturated)	KAl(SO ₄) ₂ *12 H ₂ O	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	+	o
Albumin - pure		+	+	+		+	+	+	+	+				o	o	o	+	+
Allyl alcohol - pure	CH ₂ CHCH ₂ OH	+	+	-	+	-	+	-	+	+	+	+		+	+	-	+	+
Aluminium acetate - aqueous (saturated)	Al(OOCCH ₃) ₃	o	+	+	+	+	+	o	+	+	+	+		o	o	-	+	+
Aluminium chloride - aqueous (saturated)	AlCl ₃	+	+	+	+	+	+	+	+	o	+	+	+	o	o	o	o	o
Aluminium fluoride - aqueous (saturated)	AlF ₃	+	+	+	+	+	+	+	+	+	+	+		+	+	o	-	-
Aluminium sulfate - aqueous (saturated)	Al ₂ (SO ₄) ₃	+	+	+	+	+	+	+	+	o	+	+	+	-	-	-	o	o
Aminoacetic acid (glycocoll)	NH ₂ CH ₂ COOH	o	+	+		+	+	+	+	o	+	+		o	o	o	+	+
Ammonia - anhydrous (liquid) - pure	NH ₃	-	³ o	-	o	-	+	-	-	-	-	o	+	o	o	+	+	+
Ammonia (gas) - pure	NH ₃	-	+	-	o	+	+	-	-	-	-	o	+	-	-	+	+	+
Ammonium hydroxide solution	NH ₄ OH	-	+	-	+	+	+	+	+	-	+	o	+	-	-	+	+	+
Ammonium acetate - aqueous	CH ₃ COONH ₄	+	+	+	+	+	+	+	+		+	+		o	o	o	+	+
Ammonium carbonate - aqueous	(NH ₄) ₂ CO ₃	+	+	+	+	+	+	+	+	+	+	+		-	-	o	+	+
Ammonium chlorid - aqueous	NH ₄ Cl	+	+	+	+	+	+	+	+	+	+	+	+	o	o	o	o	o
Ammonium citrate - aqueous		+	+	+	+	+	+	+	+	o		+		o	o	o	+	+
Ammonium fluoride - aqueous	NH ₄ F	+	+	+	o	o	+	+	+		+	+		o	o	o	o	o
Ammonium fluorsilicate - aqueous		+	+	+	+	+	+	+	+	o		+		o	o	o	+	+
Ammonium formiate - aqueous	HNCOONH ₄	+	+	+	+	+	+	+	+		+			o	o	o	+	+
Ammonium nitrate - aqueous (saturated)	NH ₄ NO ₃	+	+	+	+	+	+	+	+	+	+	+	+	-	-	o	+	+
Ammonium oxalate - aqueous	NH ₄ O ₂ CCO ₂ NH ₄	+	+	+	+	+	+	+	o					o	o	o	+	+
Ammonium persulfate - aqueous	(NH ₄) ₂ S ₂ O ₈	-	+	+	+	o	+	o	+	-		+		o	o	-	o	o
Ammonium phosphate - aqueous	(NH ₄) ₂ HPO ₄	+	+	+	+	+	+	+	+	+	+	+		o	o	+	+	+
Ammonium thiocyanate - aqueous	NH ₄ NCS	+	+	+		+	+	+	+	+				-	-	o	+	+

		NBR	EPDM	FKM	FFKM	CR	PTFE	PVC	PP	PA	PVDF	PPS	PEEK	MS	RG	GG, GS	1.4401/1.4571	1.4305/1.4105
Ammonium sulfate - aqueous	(NH ₄) ₂ SO ₄	+	+	+	+	+	+	+	+	o	+	+	+	+	-	-	o	o
Ammonium sulfide - aqueous	(NH ₄) ₂ S	+	+	o	+	+	+	+	+	+	+	+	+	-	-	o	+	+
Ammonium sulfite - aqueous	(NH ₄) ₂ SO ₃	+	+	+	+	+	+	+	+	+		+		-	-	o	+	o
Amyl acetate - pure	CH ₃ COO(CH ₂) ₄ CH ₃	-	o	-	+	-	+	-	o	+	+	+	+	+	+	o	+	+
Amyl alcohols - pure	H ₃ C(CH ₂) ₄ OH	+	o	+	+	+	+	+	+	+	+	+		+	+	o	+	+
Aniline - pure	C ₆ H ₅ NH ₂	-	+	o	o	-	+	-	o	-	+	o	+	-	-	+	+	+
Aniline hydrochloride - aqueous	C ₆ H ₅ NH ₃ Cl	o	+	o	+	o	+	o	o	-	+			-	-	-	-	-
Anisole - pure	C ₆ H ₅ OCH ₃	o	o	-	+	-	+	-	-	+		+		+	+	+	+	+
Anone (cyclohexanone) - pure	C ₆ H ₁₀ O	-	-	-	+	-	+	-	-	+	+	+	+	o	o	o	+	+
Anthracene oil - pure		-	-	-	+	-	+	-	-	+				+	+	+	+	+
Anthraquinone sulfonic acid - aqueous	C ₆ H ₄ COCOC ₆ H ₄ SO ₃ H	o	+	+	+	+	+	+	+	o				o	o	o	o	o
Antimony chloride - aqueous	SbCl ₃	o	+	+	+	+	+	+	+	-	+	+	+	o	o	o	-	-
Apple acid - aqueous	(HO)CH(COOH)CH ₂ COOH	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	+	+
Aqua regia	HNO ₃ + HCl	-	-	-	+	-	+	o	-	-	-	-	-	-	-	-	-	-
Arabic acid - aqueous		+	+	+	+	+	+	+	+					-	-	-	+	+
Argon - pure	Ar	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Arsenic acid - aqueous	H ₃ AsO ₄	+	+	+	+	+	+	+	+	o	+			-	o	-	+	+
Arsenic trichloride - aqueous	AsCl ₃	+	+	+	+	+	+	+	+	-				-	-	o	o	o
Arsenious acid - aqueous	H ₃ AsO ₃ (As ₂ O ₃ +H ₂ O)	+	+	+	+	+	+	+	+					o	o	-	+	+
Aryl silicates - aqueous		o	o	o	+	o	+							+	+	+	+	+
Ascorbic acid - aqueous		+	+	+	+	+	+	+	+				+	-	-	-		
Aspartic acid - aqueous	(HOOC)CH(NH ₂)CH ₂ COOH	+	+	+	+	+	+	+	+	+	+	+	+	-	-	o	+	+
B																		
Barium chlorate - aqueous	Ba(ClO ₃) ₂	+	+	+	+	+	+	+	+	-		+		+	+	o	+	+
Barium chloride - aqueous	BaCl ₂	+	+	+	+	+	+	+	+	+	+	+	+	+	+	o	+	o
Barium hydroxide - aqueous	Ba(OH) ₂	+	+	+	+	+	+	+	+	o	+	+		+	+	+	+	+
Barium sulfide and polysulfide - aqueous	BaS	+	+	+	+	+	+	+	+	-	+	+	+	o	o	o	+	+
Benzaldehyde - aqueous	C ₆ H ₅ CHO	o	+	+	+	-	+	-	+	o	o	o	+	o	o	-	+	
Benzene - pure	C ₆ H ₆	-	-	+	+	-	+	-	-	+	o	o	+	+	+	+	+	+
Benzene sulfonic acid -aqueous	C ₆ H ₅ SO ₃ H	+	+	+	+	+	+	+	+	+	+	+	-	o	o	o	+	+
Benzidine sulfonic acid - aqueous	(NH ₂)C ₆ H ₄ C ₆ H ₃ (SO ₃ H)(NH ₂)	+	+	+	+	+	+	+	+	+				+	+	+	+	+
Benzoic acid - aqueous (saturated)	C ₆ H ₅ COOH	+	+	+	+	+	+	+	+	-	+		+	o	o	o	+	+
Benzyl alcohol - pure	C ₆ H ₅ CH ₂ OH	-	+	o	+	o	+		+	o	+		+	+	+	o	+	+
Benzyl butyl phtalate - aqueous		-	-	-	+	-	+	-	o	+		o		+	+	+	+	+
Bergamot essence		-	-	-		-	+	-	-	-		+		o	o	o	+	+
Bisulfite (sodium bisulfite) - aqueous	NaHSO ₃	o	+	o	+	+	+	+	+	o	+	+	+	o	o	-	+	o

2.2 Resistance in basic chemicals

		NBR	EPDM	FKM	FFKM	CR	PTFE	PVC	PP	PA	PVDF	PPS	PEEK	MS	RG	GG, GS	1.4401/1.4571	1.4305/1.4105
Borax - aqueous	Na ₂ B ₄ O ₇	+	+	+	+	+	+	+	+	+	+	+	+	+	o	+	+	+
Borfluoric acid	HBF ₄	+	+	+	o	+	+	+	+	-	+			-	-	-	-	-
Boric acid - aqueous	H ₃ BO ₃	+	+	+	+	+	+	o	o	-	+		o	-	-	-	+	+
Brines		+	+	+	+	+	+	+	+	+	+	+	+	o	o	-	o	o
Bromine (liquid) - pure	Br ₂	-	-	-	+	-	+	o	-	-	+	-	-	-	o	o	o	o
Butadiene (gas) - pure	CH ₂ CHCHCH ₂	o	o	o	+	+	+	+	+	+	+	+		+	o	o	+	+
Butane (gas and liquid)	C ₄ H ₁₀	+	-	+	+	+	+	-	-	+	-	+	+	+	+	+	+	+
Butanediol - aqueous (10 %)	HO(CH ₂) ₄ OH	+	+	o	o	o	+	o	o	+	+	+	+	+	+	+	+	+
Butanol (butylalcohol) - aqueous	C ₄ H ₉ OH	o	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Butinediol - pure	HOCH ₂ C ₂ CH ₂ OH	o	o	o		o	+	o	+	+		+	+	+	+	o	+	+
Butoxyl (methoxybutyl acetate) - pure	CH ₃ OC ₄ H ₄ O ₂ CCH ₃	+	o	o		+	+	-	+					o	o	o	+	+
Butyl acetate - pure	CH ₃ (CH ₂) ₃ O ₂ CCH ₃	-	+	-	+	-	+	-	-	+	+	+	+	o	+	o	+	+
Butyl alcohol (butanol) - pure	CH ₃ (CH ₂) ₃ OH	o	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Butylene (liquid) - pure	H ₃ CCH ₂ CHCH ₂	+	o	+	+	+	+	+	+	+	+	+		+	+	o	+	+
Butyl phtalate - pure	C ₆ H ₄ (CO) ₂ (OCH ₂ CH ₂ CH ₂ CH ₃) ₂	-	-	-	+	-	+	-	o	+		+		+	+	o	+	+
Butyric acid - aqueous	H ₃ CCH ₂ CH ₂ COOH	o	o	o	o	o	+	o	-	o	+	+	+	o	o	-	+	o
C																		
Calcium bisulfite - aqueous	Ca(HSO ₃) ₂	+	+	+	+	+	+	+	+	-		+	+	-	-	-	+	o
Calcium chloride - aqueous	CaCl ₂	+	+	+	+	+	+	o	+	o	+	+	+	-	-	o	o	o
Calcium hydroxide - aqueous	Ca(OH) ₂	+	+	+	+	+	+	+	o	+	+	+	+	-	-	+	+	+
Calcium hypochlorite - aqueous	Ca(OCℓ) ₂	-	+	o	+	o	+	o	+	-	+	-	+	-	-	o	o	o
Calcium nitrate - aqueous	Ca(NO ₃) ₂	+	+	+	+	+	+	+	+	+	+	+	+	o	o	o	o	o
Camphor oil - pure		+	-	+	o	-	+	+	-			o		o	o	o	+	+
Car-battery fluid (20 % sulphuric acid, aqueous)	H ₂ SO ₄	o	+	+	+	o	+	+	+	-	+	+	o	-	-	-	+	o
Carbolic acid (phenol) - aqueous	C ₆ H ₅ OH	o	o	o	+	o	+	+	+	-	+	+	+	o	o	o	+	+
Carbolineum		o	o	o	+	o	+	+	-	+				+	+	+	+	+
Carbon dioxide - dry	CO ₂	+	o	+	+	o	+	+	+	+	+	+	+	+	+	+	+	+
Carbon dioxide - wet	CO ₂	+	o	+	+	o	+	o	o	o	+	+	+	o	o	o	+	+
Carbon disulfide - pure	CS ₂	-	-	+	+	-	+	-	+	o	+	+		-	-	-	+	o
Carbon monoxide	CO	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Carbon tetrachloride - pure	CCℓ ₄	-	-	+	+	-	+	-	-	+	+	o	+	o	o	-	+	+
Carbonic acid - aqueous	H ₂ CO ₃	+	+	+	+	+	+	o	+	o	+	+	+	o	o	o	+	+
Caro's acid - aqueous	H ₂ SO ₅	-	-	-		-	+	+	-	-				-	-	-	-	-
Caustic potash (potassium hydroxide) - aqueous	KOH	-	+	-	+	o	+	+	+	o	-	o	+	-	-	o	+	+
Caustic soda (sodium hydroxide) - aqueous	NaOH	o	+	o	+	+	+	o	+	o	-	o	+	o	o	o	+	+
Cellosolve (glycol ethyl ether) - pure	HO(CH ₂) ₂ OCH ₂ CH ₃	-	-	-	+	-	+	-	-	+	+	+		+	+	+	+	+

		NBR	EPDM	FKM	FFKM	CR	PTFE	PVC	PP	PA	PVDF	PPS	PEEK	MS	RG	GG, GS	1.4401/1.4571	1.4305/1.4105
Chloral hydrate (chloral) - aqueous	CCℓ ₃ CH(OH) ₂	-	o	o	+	-	+	-	-	-	-	o		o	o	o	o	o
Chlorbenzenes - pure	C ₆ H ₅ Cl	-	-	-	+	-	+	-	-	+	+	-	+	+	+	+	+	+
Chloric acid - aqueous	HClO ₃	-	o	-	+	-	+	+	-	-	+			-	-	-	-	-
Chlorine (gas) - dry	Cl ₂	-	-	o	+	-	+	-	-	-	o	-	+	-	-	-	+	-
Chlorine (gas) - wet (chlorinated water)	Cl ₂	-	-	o	o	-	+	-	-	-	o	-	-	-	-	-	-	-
Chlorine (liquid) - pure	Cl ₂	-	-	o	+	-	+	-	-	-	+	-	-	-	-	-	+	+
Chlorine dioxide - aqueous	ClO ₂	-	-	-	o	-	+	+	o	-	o			-	-	o	o	o
Chloroacetic acid - aqueous	ClCH ₂ COOH	-	o	-	+	-	+	o	-	-	+	+	+	o	-	o	o	-
Chloroethanol (ethylene chlorhydrine) - pure	ClCH ₂ CH ₂ OH	-	-	o	+	-	+	-	+	o	+	o	o	+	+	+	+	+
Chloride of lime (calcium hypochlorite) - aqueous	Ca(OCℓ) ₂	-	+	o	+	o	+	o	+	-	+	-	+	-	-	o	o	o
Chlorinated water (chlorine gas - wet)	Cl ₂	-	-	o	o	-	+	-	-	-	o	-	-	-	-	-	-	-
Chlormethane (methyl chloride) - pure	ClCH ₃	-	-	+	+	-	+	-	-	o	-	o	+	+	+	-	+	+
Chloronaphtalene - pure	C ₁₀ H ₇ Cl	-	-	o	+	-	+	-	-	+	o			+	+	+	+	+
Chloroform (trichloromethane) - pure	CHCl ₃	-	-	+	+	-	+	-	-	-	+	o	+	+	+	-	+	+
Chlorophenol - pure	C ₆ H ₄ (OH)(Cl)	-	-	-	+	-	+	o				o		+	+	o	+	+
Chlorophenoxyacetic acid	(OC ₆ H ₅)(Cl)CHCOOH	+	+	+		+	+	+	+							o	+	+
Chlorsulfonic acid - pure	ClSO ₃ H	-	-	-	o	-	+	o	-	-	o	-	-	o	o	o	o	o
Chlorxylenol - pure	C ₆ H ₂ (OH)(CH ₃) ₂ (Cl)	-	-	-	+	-	+	o						+	+	o	+	+
Choline chloride - aqueous	[HOCH ₂ CH ₂ N(CH ₃) ₃]Cl	+	+	+		+	+	o	o					-	-	o		
Chromic acid - aqueous	H ₂ CrO ₄	-	o	+	+	o	+	+	o	-	+	-	o	-	-	o	o	o
Chromium alum - aqueous	KCr(SO ₄) ₂ *12H ₂ O	+	+	+	+	+	+	o	+	o	+			o	o	-	o	o
Chromium sulfate - aqueous	Cr ₂ (SO ₄) ₃	+	+	+	+	+	+	+	+	o	+	+		o	o	-	o	o
Citral (citronella oil) - pure		-	-	-		-	+		-	+	+			+	+	o	+	+
Citric acid - aqueous		+	+	+	+	+	+	+	+	+	+	+	+	o	+	-	+	o
Cresol - aqueous (lysol)	C ₆ H ₄ (OH)(CH ₃)	-	-	o	+	-	+	o	o	-	o	+	+	+	+	o	+	o
Common salt (sodium chloride) - aqueous	NaCl	+	+	+	+	+	+	+	+	+	+	+	+	-	o	-	o	o
Copper acetate - aqueous	Cu(CH ₃ COO) ₂	o	+	+	+	+	+	+	+	o	+	+	+	o	-	o	+	+
Copper chloride - aqueous	CuCl ₂	+	+	+	+	+	+	+	+	o	+	+	+	o	o	o	-	-
Copper sulfate - aqueous	CuSO ₄	+	+	+	+	+	+	+	+	o	+	+	+	o	o	o	o	o
Cyclohexane - pure	C ₆ H ₁₂	-	-	o	+	-	+	+	-	+	+	+	+	+	+	+	+	+
Cyclohexanol - pure	C ₆ H ₁₁ OH	-	-	+	+	+	+	o	+	+	+	+	+	+	+	+	+	+
Cyclohexanone (anone) - pure	C ₆ H ₁₀ O	-	-	-	+	-	+	-	-	+	o	+	+	o	o	o	+	+
Cymene - pure	C ₆ H ₄ (CH ₃)[CH(CH ₃) ₂]	-	-	-		-	+	-	-	+	o			+	+	+	+	+
D																		
Decahydronaphtalene (decalin) - pure	C ₁₀ H ₁₈	-	-	+	+	-	+	+	o	+		o		+	+	+	+	+
Dextrose - aqueous	C ₆ H ₁₂ O ₆	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Diacetone alcohol - anhydrous	(CH ₃) ₂ C(OH)CH ₂ COCH ₃	-	+	-	+	o	+			o		+		o	+	o	+	+

2.2 Resistance in basic chemicals

		NBR	EPDM	FKM	FFKM	CR	PTFE	PVC	PP	PA	PVDF	PPS	PEEK	MS	RG	GG, GS	1.4401/1.4571	1.4305/1.4105
Dibutyl phthalate - pure	C ₆ H ₄ (COOC ₄ H ₉) ₂	-	o	-	+	-	+	o	o	+	-	+		+	+	+	+	+
Dibutyl sebacate - pure	(C ₄ H ₉ COO)(CH ₂) ₈ (OOC ₄ H ₉)	-	o	-	+	-	+	-	+	+	-	+		+	+	+	+	+
Dichlorethane (ethylene chloride) - pure	ClCH ₂ CH ₂ Cl	-	-	-	+	-	+	-	-	+	+	o	+	-	-	-	+	-
Dichlorethylene - pure	Cl ₂ CHCH ₃	-	-	o	+	-	+	-	-	+	+	o	+	+	+	o	+	+
Dichlormethane (methylene chloride) - pure	CH ₂ Cl ₂	-	-	o	+	-	+	-	-	-	-	o	o	+	+	-	+	+
Dicyclohexyl-ammonium nitrite - pure	[(C ₆ H ₁₁) ₂ NH ₂]NO ₂	+	+	+	+	+	+							o	o	o	+	+
Diethyl ether - pure	CH ₃ CH ₂ OCH ₂ CH ₃	-	-	-	+	-	+	-	-	+	+	+	+	+	+	+	+	+
Dimethyl amine - pure	(CH ₃) ₂ NH	-	o	-	+	-	+	-	o	-	-	o		o	o	o	+	+
Dimethyl formamide - pure	HCON(CH ₃) ₂	-	-	-	+	-	+	-	+	-	-	o	+	o	o	o	+	+
Dimethyl sulfoxide - pure	(CH ₃) ₂ SO				+		+			o	-	+	o					
Diocetyl phtalate - pure	C ₆ H ₄ (COOC ₈ H ₁₇) ₂	-	o	o	+	-	+	-	+	+	o	+		+	+	+	+	+
Dioxane - pure	C ₄ H ₈ O ₂	-	o	-	+	-	+	-	-	+	-	+		+	+	+	+	+
Diphenyl + diphenyloxide		-	-	-	+	-	+	-	-	+		+		+	+	+	+	+
Dissousgas (acetylene + acetone)		-	+	-		-	+	-	o	+		+		+		+	+	+
E																		
Ethane - pure	CH ₃ CH ₃	+	-	+	+	+	+	-	-	+	-	+	+	+	+	+	+	+
Ethanol (ethyl alcohol) - pure	CH ₃ CH ₂ OH	o	+	o	+	+	+	o	+	o	+	+	+	+	+	+	+	+
Ethanolamine - pure	NH ₂ CH ₂ CH ₂ OH	o	o	-	+	o	+	o	+	+	o	o		-	-	+	+	+
Ether (diethyl ether) - pure	CH ₃ CH ₂ OCH ₂ CH ₃	-	-	-	+	-	+	-	-	+	+	+	+	+	+	+	+	+
Ethyl acetate (acetic acid ethyl ester) - pure	CH ₃ CO ₂ CH ₂ CH ₃	-	o	-	o	-	+	-	-	o	o	+	+	-	+	+	+	+
Ethyl alcohol (ethanol) - pure	CH ₃ CH ₂ OH	o	+	o	+	+	+	o	+	o	+	+	+	+	+	+	+	+
Ethyl alcohol + acetic acid	CH ₃ CH ₂ OH + CH ₃ COOH	o	+	o	+	o	+	o	+	-	+	+	+	o	o	o	+	+
Ethyl alcohol - fermentation mash		+	+	+	+	+	+	+	+	o	+	+	+	+	+	o	+	+
Ethyl alcohol - denaturated (depending on denaturant)		o	o	o	+	o	+	+	+	o		+	+	o	o	+	+	+
Ethyl benzene - pure	C ₆ H ₅ CH ₂ CH ₃	-	-	o	+	-	+	-	-	+	+	o		+	+	+	+	+
Ethyl chloride - pure	CH ₃ CH ₂ Cl	+	+	+	+	+	+	-	-	+	+	o		-	-	-	+	+
Ethyl formiate	HCOOCH ₂ CH ₃	-	o	-	+	-	+	-	o	+	+	+		+	+	o	+	+
Ethylene - pure	CH ₂ CH ₂	+	-	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+
Ethylene chlorhydrine (chloroethanol) - pure	ClCH ₂ CH ₂ OH	-	-	o	+	-	+	-	+	o	+	o	o	+	+	+	+	+
Ethylene diamine - pure	NH ₂ CH ₂ CH ₂ NH ₂	o	+	o	o	+	+	-	+	o	+	o		-	-	o	+	o
Ethylene dibromide - anhydrous	CH ₂ CHBr	-	-	-	+	-	+	-	-	+	+	o	-	+	+	o	+	+
Ethylene dichloride (dichloroethane) - pure	ClCH ₂ CH ₂ Cl	-	-	-	+	-	+	-	-	+	+	o	+	-	-	-	+	-
Ethylene glycol (glycol) - pure	HOCH ₂ CH ₂ OH	+	+	+	+	+	+	+	+	o	+	+	+	o	o	o	+	+
Ethylene oxide (liquid) - pure	CH ₂ CH ₂ O	-	-	-	o	-	+	-	-	-	+			-	-	-	+	+
Essential oils		-	-	-	+	-	+	-	-	-		o		o	o	o	+	+

		NBR	EPDM	FKM	FKM	CR	PTFE	PVC	PP	PA	PVDF	PPS	PEEK	MS	RG	GG, GS	1.4401/1.4571	1.4305/1.4105
F																		
Fat alcohols		+	o	+	+	+	+	+	o	+		+		+	+	o	+	o
Fat alcohol sulfates - aqueous		+	o	+	+	+	+	+	+	o	+			o	o	o	+	+
Ferrous/ ferric chloride - aqueous (saturated)	FeCl ₃	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-
Ferrous/ ferric sulfate - aqueous	FeSO ₄	+	+	+	+	+	+	+	+	+	+	+	+	o	o	-	+	+
Fluorine (dry) - pure	F ₂	-	-	+	o	-	+	o	-	-	o	-	-	o	o	-	+	+
Fluorine (wet) - pure	F ₂	-	-	-	-	-	o	o	-	-	-	-	-	-	-	-	o	o
Fluoboric acid (borofluoric acid)	HBF ₄	+	+	+	o	+	+	+	+	-	+	o		-	-	-	-	-
Fluorocarbons (see freon)							+			+	o	o	+					
Fluosilicic acid - aqueous		o	o	o	+	o	+	+	+	-	+	-		-	-	-	o	o
Formaldehyde - aqueous	CH ₂ O	o	o	o	+	o	+	+	+	+	+	o	o	-	+	-	+	+
Formaldehyde - pure	CH ₂ O	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Formamide - pure	HCONH ₂	+	+	o	o	+	+	+	o	o		o		o	o	o	+	o
Freon 12 B1	CBrClF ₂	+	-	o	+	+	+	-	-	+	+	+	+	+	+	+	+	+
Freon 13	CClF ₃	+	-	o	o	+	+	-	-		-	+	+	+	+	o	+	+
Freon 13 B1 (Halon 1301)	CBrF ₃	+	-	o	+	+	+	-	-	+	o			+	+	+	+	+
Freon 22	CHClF ₂	-	-	-	o	-	+	-	-	+	-	+	+	+	+	+	+	+
Freon 23	CHF ₃	+	-	o	-	+	+	-	-		o			+	+	o	+	+
Freon 502	C ₆ H ₁₂ O	-	-	-	o	o	+	+	o	+	o		+	+	+	+	+	+
Freon substitute HFCKW 123		-	-	-	-	-	+							+	+	+	+	+
Freon substitute HFCKW 134a				-	-		+					+	+	+	+	+	+	+
Freon TF (Freon 113)	Cl ₃ FCCClF ₃	+	-	-	-	+	+	-	-	+	+	o	+	+	+	+	+	+
Formic acid - aqueous	HCO ₂ H	-	o	-	-	o	+	-	-	-	+	+	+	-	-	-	+	o
Formic acid - pure	HCO ₂ H	-	o	-	o	o	+	o	-	-	+	+	o	-	-	-	+	-
G																		
Gas liquor		+	-	o		-	+	o						-	-	o	+	+
Glucose - aqueous	C ₆ H ₁₂ O ₆	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Glycerin - aqueous	HOCH ₂ CH(OH)CH ₂ OH	+	+	+	+	+	+	o	o	+	+	+	+	o	o	o	+	o
Glycerin - pure	HOCH ₂ CH(OH)CH ₂ OH	o	+	+	+	o	+	o	o	+	+	+	+	o	o	o	+	o
Glycocoll (aminoacetic acid) - aqueous	NH ₂ CH ₃ CHCO ₂ H	o	+	+		+	+	+	+	o	+	+		o	o	o	+	+
Glycol - aqueous	HOCH ₂ CH ₂ OH	+	+	+	+	+	+	+	+	o	+	+	+	o	o	o	+	+
Glycol ethyl ether (cellosolve)	HO(CH ₂) ₂ OCH ₂ CH ₃	-	-	-	+	-	+	-	-	+	+	+		+	+	+	+	+
Glycolic acid - aqueous	HOCH ₂ COOH	+	+	+	+	+	+	+	+	-	+	+		o	o	o	o	o

2.2 Resistance in basic chemicals

		NBR	EPDM	FKM	FFKM	CR	PTFE	PVC	PP	PA	PVDF	PPS	PEEK	MS	RG	GG, GS	1.4401/1.4571	1.4305/1.4105
H																		
Helium	He	+	+	+	+	+	+	+	+	+	+	+	+	o	o	o	+	+
Heptane, Hexane (petrol) - pure		o	-	+	+	+	+	+	o	+	+	+	+	+	+	+	+	+
Hexamethylene tetramine - aqueous		+	+	+	+	+	+	+	+	+		o		o	o	o	+	+
Humic acids		+	+	+		+	+	+	+	-				+	+	o	+	+
Hydrazine hydrate - aqueous	NH ₂ NH ₂ *2 H ₂ O	-	+	+	+	-	+	+	-		o		+	-	-	-	-	o
Hydrobromic acid - aqueous	HBr	-	+	+	+	o	+	+	+	-	+	-	-	-	-	-	-	-
Hydrochloric acid (gas) - pure	HCl	o	o	⁴ +	+	o	+	+	+	-	+	-	+	-	-	-	+	o
Hydrochloric acid - aqueous (36 %)	HCl	-	o	⁴ +	+	-	+	+	+	-	+	-	o	-	-	-	o	o
Hydrocyanic acid - aqueous	HCN	o	o	+	+	+	+	+	+	-	+	+		+	+	o	+	o
Hydrofluoric acid - aqueous	HF	-	-	-	-	-	o	o	o	-	+	-	-	-	-	-	o	-
Hydrogen peroxide 0,5 %	H ₂ O ₂	o	+	+	+	+	+	-	-	+	+	o	+	-	-	-	+	o
Hydrogen peroxide 30 %	H ₂ O ₂	-	o	⁴ +	+	-	+	-	-	-	+	o	+	-	-	-	o	-
³ Hydrogen - pure	H ₂	+	+	+	+	+	+	-	-	-	-	+	+	+	+	+	+	+
Hydrogen sulfide - aqueous	H ₂ S	o	+	-	-	o	+	o	o	-	+	o	+	o	o	o	+	+
Hydroquinone - aqueous	C ₆ H ₄ (OH) ₂	+	+	+	+	o	+	+	+	-	+	o				o	o	+
Hydroxylamine sulphate - aqueous	(NH ₃ OH) ₂ SO ₄	+	+	+	+	o	+	+	+	+				-	-	+	+	+
I																		
Inert gases		+	+	+	+	+	+	+	+	+	+	+	+	o	o	o	o	+
Illuminating gas		+	+	+	+	+	+	+		+	+			+	+	+	+	+
Iodine + Potassium iodide - aqueous	I ₂ + KI	o	o	o	+	o	+	o	o	-	+	-	o	-	-	o	o	o
Isobutyl alcohol - pure	(CH ₃) ₂ CHCH ₂ OH	o	+	+	+	+	+	-	+	+	+	+	+	+	+	+	+	+
Isooctane - pure	CH ₃ C(CH ₃) ₂ CH ₂ CH(CH ₃)CH ₃	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Isopropanol (propanol) - pure	CH ₃ CH(OH)CH ₃	o	+	+	+	+	+	+	+	o	+	+	+	+	+	+	+	+
K																		
Kerosene (petroleum spirit, benzine)		+	-	+	+	+	+	+	o	+	+	+	+	+	+	o	+	+
L																		
Lactic acid - aqueous		o	o	+	+	+	+	o	+	o	+	+	+	o	o	o	o	o
Laughing gas (nitrous oxide)	N ₂ O	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Lead acetate - aqueous	Pb(CH ₃ COO) ₂	o	+	+	+	+	+	+	+	+	+	+	+	o	o	-	+	+
Lead nitrate - aqueous	Pb(NO ₃) ₂	+	+	+	+	+	+	+	+			+		-	-	o	+	+
Lead tetraethyl (tetraethyl lead) - pure	Pb(CH ₂ CH ₃) ₄	o	o	+	+	o	+	+	+	+	+			o	o	+	+	+
Linoleic acid		o	-	o	+	-	+	+	-		+	+		o	o	o	+	o
Lithium chloride - aqueous	LiCl	+	+	+	+	o	+	+	+	o	+	+		o	o	o	o	o

		NBR	EPDM	FKM	FFKM	CR	PTFE	PVC	PP	PA	PVDF	PPS	PEEK	MS	RG	GG, GS	1.4401/1.4571	1.4305/1.4105
M																		
Magnesium chloride - aqueous	MgCl ₂	+	+	+	+	+	+	+	+	o	+	+	+	o	o	o	o	o
Magnesium sulfate - aqueous	MgSO ₄	+	+	+	+	+	+	o	o	o	+	+	+	+	+	-	+	+
Maleic acid - aqueous		+	+	+	+	+	+	+	+	o	+	+	+	o	o	o	+	o
Manganese chloride - aqueous	MnCl ₂	+	+	+	+	+	+	+	+	+		+		o	o	o	o	o
Manganese sulfate - aqueous	MnSO ₄	+	+	+	+	+	+	+	+	+	+	+		o	+	o	+	o
Mercaptanes		-	-	o	+	-	+	+		+	o			o	o	-	+	+
Methane (marsh gas) - pure	CH ₄	+	-	+	+	-	+	o	o	+	o	+	+	+	+	+	+	+
Methanol (methyl alcohol)	CH ₃ OH	-	+	-	+	+	+	+	o	o	o	+	+	o	o	o	+	o
Methoxybutanol - pure	CH ₃ O(CH ₂) ₃ CH ₂ OH	+	+	+	+	o	+	+	+			+		+	+	+	+	+
Methyl acetate - pure	CH ₃ COOCH ₃	-	o	-	+	-	+	-	+	+	o	+	+	o	+	o	o	o
Methyl alcohol (methanol) - pure	CH ₃ OH	-	+	-	+	+	+	+	o	o	o	+	+	o	o	o	+	o
Methyl amine - aqueous	CH ₃ NH ₂	-	o	o	-	o	+	o	+	o	-	o	+	-	-	o	o	o
Methyl chloride (chloromethane) - pure	CH ₃ Cl	-	-	+	+	-	+	-	-	o	-	o	+	+	+	-	+	+
Methylene chloride (dichloromethane) - pure	CH ₂ Cl ₂	-	-	o	+	-	+	-	-	-	-	o	o	+	+	-	+	+
Methyl ethyl ketone - pure	CH ₃ COCH ₂ CH ₃	-	o	-	+	-	+	-	-	o	-	o	o	+	+	o	+	+
Mercury	Hg	+	+	+	+	+	+	+	+	+	+	+	+	-	-	+	o	+
Mercury chloride	HgCl ₂	+	+	+	+	+	+	o	+	-	+	+	+	-	-	-	o	o
Mercury salts - aqueous		+	+	+	+	+	+	+	+	-	+	+	+	-	-	-	+	+
Morpholine - pure		-	o	o	o	o	+	-	+		+	o		+	+	+	+	+
N																		
Natural gas		o	-	+	+	+	+	o	o	+	+	+	+	o	o	o	+	+
Nickel sulfate - aqueous	Ni(SO ₄) ₂	+	+	+	+	+	+	+	+	+	+	+	+	-	o	-	o	o
Nitric acid - aqueous (40 %)	HNO ₃	-	-	4+	+	-	+	o	o	-	+	-	o	-	-	-	+	-
Nitrobenzoic acids - aqueous		+	+	+	+	+	+	+	+	+		+		+	+	o	+	+
Nitrobenzenes - pure	C ₆ H ₅ NO ₂	-	-	o	+	-	+	-	o	-	o	o	o	+	+	o	+	+
Nitrogen oxides - gaseous, wet and dry	(NO, NO ₂ , N ₂ O ₄)	-	o	-	o	-	+	o	o	-	o		+	-	-	-	+	+
Nitrotoluenes (o-, m-, p) - pure	C ₆ H ₄ (NO ₃)(CH ₃)	o	-	o	o	-	+	-	+	-	+	o	o	+	+	+	+	+
Nitrogen oxides		-	-	-	o	-	+	-	-	-	o	o	+	-	-	-	o	-
Nitrogen	N ₂	+	+	+	+	+	+	o	o	+	+	+	+	+	+	+	+	+
Nitrous oxide	N ₂ O	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
O																		
Oleum (fuming sulfuric acid)	H ₂ SO ₄	-	-	o	+	-	+	o	o	-	-	o	-	-	-	o	+	o
Oxalic acid - aqueous (saturated)	HOOC-COOH	o	+	+	+	+	+	+	+	-	+	+	+	-	-	-	+	o
°Ozon - wet and dry	O ₃	-	o	o	o	-	+	+	-	-	+	-	o	o	o	o	+	+

2.2 Resistance in basic chemicals

		NBR	EPDM	FKM	FFKM	CR	PTFE	PVC	PP	PA	PVDF	PPS	PEEK	MS	RG	GG, GS	1.4401/1.4571	1.4305/1.4105
Oxygen	O ₂	o	o	² +	+	o	+	-	-	+	-	⁵ +	+	+	+	-	+	+
P																		
Paraffin oil		+	-	+	+	o	+	o	+	+	+	+	+	+	+	+	+	+
Perchloroethylene (tetrachlorethylene) - pure	Cl ₂ CCCl ₂	-	-	o	o	-	+	-	-	o	+	o	+	o	o	o	+	+
Peracetic acid - aqueous (6 %)	CH ₃ CO ₃ H	-	+	+	+		+	+		-		-		-	-	-	+	+
Petrol (gasoline) - pure	C ₆ H ₁₄	o	-	+	+	+	+	+	o	+	+	+	+	+	+	+	+	+
Petrolether		+	-	+	+	+	+	+	o	+	+	+	+	+	+	o	+	+
Phenol - aqueous (saturated)	C ₆ H ₅ OH	o	o	o	+	o	+	+	+	-	o	+	o	o	o	o	+	+
Phosgene (liquid) - pure	COCl ₂		-	o	+	-	+	o	o	o				+	+	+	+	+
Phosgene (gaseous) - pure	COCl ₂		-	+	+	-	+	+	-	o	+			+	+	+	+	+
Phosphor chloride - pure		-	-	o	+	-	+	-	+	-	+	+	+		o	o	o	o
Phosphoric acid - aqueous	H ₃ PO ₄	o	o	+	+	-	+	+	+	-	+	+	+	-	-	-	+	-
Picric acid (trinitrophenol) - pure	C ₆ H ₂ (OH)(NO ₂) ₃	o	-	o	+	-	+	-	+	+	+	+	+	+	+	+	+	+
Pinene (turpentine oil) - pure		o	-	o	+	-	+	o	-	+	+	+	+	o	o	+	+	+
Potash (potassium carbonate) - aqueous	K ₂ CO ₃	+	+	+	+	o	+	+	+	o	-	+	+	o	o	o	+	+
Potassium aluminium sulfate (alum) - aqueous	KAl(SO ₄) ₂ *12 H ₂ O	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	+	o
Potassium bifluoride - aqueous	KHF ₂	+	+	+		+	+	+	+	-				o	o	o	+	+
Potassium bromate - aqueous	KBrO ₃	+	+	+	+	+	+	+	+		+	-		-	o	o	+	o
Potassium bromide - aqueous	KBr	+	+	+	+	+	+	+	+	-	+	+	+	+	+	o	o	o
Potassium carbonate (potash) - aqueous	K ₂ CO ₃	+	+	+	+	o	+	+	+	o	-	+	+	o	o	o	+	+
Potassium chlorate - aqueous	KClO ₃	o	o	o	+	o	+	+	+	o	o	-	+	o	o	o	o	o
Potassium chloride - aqueous	KCl	+	+	+	+	+	+	+	+	+	+	+	+	o	o	o	o	o
Potassium chromate - aqueous	K ₂ CrO ₄	o	+	o	+	o	+	+	+	-	+	+		+	+	o	o	o
Potassium cyanide - aqueous	KCN	+	+	+	+	+	+	+	+	+	+	o	+	-	-	o	+	+
Potassium dichromate - aqueous	K ₂ Cr ₂ O ₇	o	o	o	+	o	+	+	+	-	+	-	+	o	o	o	+	+
Potassium ferricyanide (potassium cyano ferrat III)																		
- (red potassium prussiate) - aqueous	KFeCN ₄	+	+	+	+	+	+	+	+	+	+	o	+	-	-	o	+	+
Potassium ferrocyanide (potassium cyano ferrat II)																		
- (yellow potassium prussiate) - aqueous	KFeCN ₃	+	+	+	+	+	+	+	+	+	+		+	+	+	o	o	-
Potassium hydroxide (caustic potash) - aqueous	KOH	-	+	-	+	o	+	+	+	o	-	o	+	-	-	o	+	+
Potassium hypochlorite - aqueous	KOCl	-	+	o	+	-	+	+	o	-	+	-	+	o	o	o	o	o
Potassium iodide - aqueous	KI	+	+	+	+	+	+	o	+		+			o	o	o	o	o
Potassium nitrate - aqueous	KNO ₃	+	+	+	+	o	+	o	+	+	+	+	+	o	o	o	o	o
Potassium nitrite - aqueous	KNO ₂	+	+	+	+	+	+	+	+	+	+		+	+	+	+	+	+
Potassium permanganate - aqueous	KMnO ₄	-	-	-	+	o	+	+	o	-	+	-	+	o	o	o	+	o
Potassium peroxide - aqueous	K ₂ O ₂	-	-	-	+	-	+	o	o	-		-	+	-	-	o	+	+
Potassium persulfate - aqueous	K ₂ S ₂ O ₈	-	+	o	+	o	+	+	+	-	o	-	+	-	-	-	+	+

		NBR	EPDM	FKM	FFKM	CR	PTFE	PVC	PP	PA	PVDF	PPS	PEEK	MS	RG	GG, GS	1.4401/1.4571	1.4305/1.4105
Potassium phosphate - aqueous		+	+	+	+	+	+	+	+	o	+	+	+	o	o	o	+	+
Potassium sulfate - aqueous	K ₂ SO ₄	+	+	+	+	+	+	+	+	+	+	+	+	+	+	o	+	+
Potassium sulfide - aqueous	K ₂ S	+	+	+	+	+	+	+	+	o	o	+	+	o	-	o	+	+
Potassium sulfite - aqueous	K ₂ SO ₃	+	+	+	+	+	+	o	+	+		+	o	+	+	o	+	o
Propane (liquid and gas) - pure	C ₃ H ₈	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Propanol (isopropanol) - pure	CH ₃ CH(OH)CH ₃	-	+	+	+	+	+	+	+	o	+	+	+	+	+	+	+	+
Propylenglycol - pure	HOCH ₂ CH ₂ CH ₂ OH	+	+	+	+	+	+	+	+	o	+	+	+	+	o	+	+	+
Pyridine - pure	C ₅ H ₅ N	-	-	-	+	-	+	-	o	+	o	o	+	+	+	+	+	o
S																		
Silicon oil		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Silver nitrate - aqueous	AgNO ₃	o	+	+	+	+	+	o	+	+	+	+	+	-	-	-	+	+
Sodium arsenate, sodium arsenite - pure	Na ₃ AsO ₄ u. Na ₃ AsO ₃	+	+	+	+	+	+	+	+					+	+	+	+	+
Sodium benzoate - aqueous	C ₆ H ₅ COONa	+	+	+	+	+	+	+	+	+	+			+	+	+	+	+
Sodium bicarbonate - aqueous	NaHCO ₃	+	+	+	+	+	+	+	+	+	+	+	+	+	o	+	o	+
Sodium bisulfate - aqueous	NaHSO ₄	+	+	+	+	+	+	+	+	+	+			o	o	o	o	o
Sodium bisulfite - aqueous (bisulfite)	NaHSO ₃	o	+	+	+	+	+	+	+	+	+	+	+	o	o	-	+	o
Sodium bromate - aqueous	NaBrO ₃	+	+	+	+	+	+	+	+	o	+	-	o	-	o	o	+	o
Sodium bromide - aqueous	NaBr	+	+	+	+	+	+	+	+	-	+	+	+	o	o	o	o	o
Sodium carbonate (soda) - aqueous	Na ₂ CO ₃	+	+	+	+	o	+	+	+	+	o	+	+	o	o	o	+	+
Sodium chloroacetates		+	+	+	+	+	+	+	+					o	+	o	+	+
Sodium chlorate - aqueous	NaClO ₃	o	o	o	+	o	+	+	+	o	+	-	+	o	o	o	o	o
Sodium chloride (common salt) - aqueous	NaCl	+	+	+	+	+	+	+	+	+	+	+	+	-	o	-	o	o
Sodium chlorite - aqueous	NaClO ₂	-	o	o	+	-	+	o	o	-	+			o	o	-	o	-
Sodium chromate - aqueous	NaCrO ₄	o	+	o	+	o	+	+	+	-	+	+	o	+	+	o	o	o
Sodium cyanide - aqueous	NaCN	+	+	+	+	+	+	+	+	+	+		+	-	-	o	+	+
Sodium dodecylbenzene sulfonate - aqueous		+	+	+		+	+	+	o	+				o	o	o	+	+
Sodium fluoride - aqueous	NaF	+	+	+	+	+	+	+	+	+	+			+	+	o	+	o
Sodium glutamate - aqueous		+	+	+	+	+	+	+	+							o	+	+
Sodium hydroxide (caustic soda) - aqueous	NaOH	-	+	-	+	+	+	+	+	+	-	o	+	-	-	o	+	+
Sodium hypochlorite (chlorine bleach)	NaOCl	-	+	o	+	-	+	+	o	-	o	-	+	o	o	o	o	o
Sodium iodide - aqueous	NaI	+	+	+	+	+	+	o	+		+	o		o	o	o	o	o
Sodium mercaptobenzothiazol - pure		o	o	+	+	o	+	+	+					+	+	+	+	+
Sodium nitrate - aqueous	NaNO ₃	+	+	+	+	+	+	o	o	+	+	+	+	-	-	-	+	-
Sodium nitrite - aqueous	NaNO ₂	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Sodium pentachlorphenolate - pure	C ₆ Cl ₅ ONa	+	+	+		+	+	+	+	+				+	+	o	+	+
Sodium perborate - aqueous	NaBO ₃	o	+	+	+	+	+	+	+		+	-		o	o	o	+	+

2.2 Resistance in basic chemicals

		NBR	EPDM	FKM	FFKM	CR	PTFE	PVC	PP	PA	PVDF	PPS	PEEK	MS	RG	GG, GS	1.4401/1.4571	1.4305/1.4105
Sodium persulfate - aqueous	K ₂ S ₂ O ₈	○	+	+	+	+	+	+	+	-	+	-		-	-	-	+	○
Sodium phosphate - aqueous	Na ₃ PO ₄	+	+	+	+	+	+	+	+	+	+			○	○	○	○	○
Sodium propionate - aqueous	CH ₃ CH ₂ COONa	+	+	+		+	+	+	+	+	+			+	+	+	+	+
Sodium pyrosulfite - aqueous	Na ₂ S ₂ O ₅	○	+	+		+	+	+	+	+				○	○	-	+	○
Sodium silicate - aqueous		+	+	+	+	+	+	+	+	+	+	+	+	○	○	+	+	+
Sodium stannate - aqueous	Na ₂ SnO ₃	+	+	+	+	+	+	+	+	○				○	○	+	+	+
Sodium sulfate - aqueous	Na ₂ SO ₄	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	+	+
Sodium sulfide - aqueous	Na ₂ S	+	+	+	+	+	+	+	+	+	○	+	+	○	-	○	+	+
Sodium sulfite - aqueous	Na ₂ SO ₃	+	+	+	+	+	+	○	+	+	+		+	○	+	○	+	○
Sodium tartrate - aqueous		+	+	+	+	+	+	+	+	+				+	+	○	+	+
Sodium thiosulfate - aqueous	Na ₂ S ₂ O ₃	+	+	+	+	+	+	+	+	+	+	+		○	-	○	○	○
Sodium zincate - aqueous	Na ₂ [Zn(OH) ₄]	○	+	+		+	+									+	+	+
Solvent naphtha (Shellsol D 60 and D 70)		○	-	○	+	○	+	○	○	+	+	+	+	+	+	+	+	+
Starch solutions - aqueous		+	+	+	+	+	+	+	+	+	+	+	+	○	○	○	+	+
Steam (rubber seals up to 130 °C)	H ₂ O	○	+	+	+	○	+	-	-	-	+	○	+	○	+	+	+	+
Stearic acid	C ₁₈ H ₃₇ COOH	+	+	+	+	+	+	+	+	+	+	+		○	+	-	+	+
Styrene	C ₆ H ₅ CHCH ₂	-	-	○	+	-	+	-	○	+	+		+	○	○	○	+	+
Succinic acid - aqueous	HOOCCH ₂ CH ₂ COOH	+	+	+	+	+	+	+	+		+	+		+	+	○	+	+
Sulfur chlorides and oxychlorides - pure		-	-	+	+	-	+	-	-	-	+		+	○	○	○	+	-
Sulfur dioxide (gas, wet)	SO ₂	-	+	+	+	-	+	○	○	○	+	○	+	-	-	-	+	○
Sulfur dioxide (gas, dry) - pure	SO ₂	-	+	+	+	-	+	○	○	○	+	+	+	○	○	○	+	○
Sulfur dioxide (liquid) - pure	SO ₂	-	+	+	+	-	+	-	-	-	+	+	+	+	+	+	+	+
Sulfur hexafluoride - pure	SF ₆	+	+	○	○	+	+	+	+		+		+	+	+	+	+	+
Sulfuric acid - aqueous (30 %)	H ₂ SO ₄	○	+	+	+	○	+	+	+	-	+	○	○	-	-	-	-	-
Sulfuric acid - concentrated (96 %)	H ₂ SO ₄	-	-	○	+	-	+	-	-	-	+	○	-	-	-	-	-	-
Sulfurous acid - aqueous	H ₂ SO ₃	-	+	+	+	+	+	+	+	-	+	○	+	-	-	-	+	-

		NBR	EPDM	FKM	FFKM	CR	PTFE	PVC	PP	PA	PVDF	PPS	PEEK	MS	RG	GG, GS	1.4401/1.4571	1.4305/1.4105
Thiophene - pure	C ₄ H ₄ S	-	-	-	+	-	+	-	o					o	o	o	+	+
Tin chlorides (stannous and stannic chlorides) - aqueous		+	+	+	+	+	+	+	+	o	+	+	+	-	-	o	o	-
Toluene - pure	C ₆ H ₅ CH ₃	-	-	o	+	-	+	-	-	+	o	o	+	+	+	+	+	+
Tributyl phosphate - pure (phosphoric acid tributylester)	PO(OC ₄ H ₉) ₃	-	-	-	-	-	+	-	-		-	+		+	+	-	+	+
Trichloroacetic acid - aqueous	(Cl) ₃ CCOOH	o	o	-	+	o	+	+	o	-	o	+		-	-	-	-	-
Trichloroethylene - pure	Cl ₂ CCCl	-	-	o	+	-	+	-	-	-	+	o	+	-	-	-	+	+
Trichloromethane (chloroform)	CHCl ₃	-	-	+	+	-	+	-	-	-	+	o	+	+	+	-	+	+
Tricresyl phosphate - pure		-	-	-	+	-	+	-	o	+	-	+		o	o	o	+	+
Triethanolamine - pure	N(CH ₂ CH ₂ OH) ₃	-	-	-	+	+	+	-	+	o	+			o	o	o	+	+
U																		
Uranium hexafluoride - pure	UF ₆	+	+	+	o	+	+	+	+	-						-	+	o
Urea - aqueous	NH ₂ CONH ₂	+	+	+	+	+	+	+	+	+	+		+	o	o	o	o	o
V																		
Vinyl acetat - pure	CH ₂ CHOOCH ₂ CH ₃	+	+	+	+	+	+	-	+		o	+		o	o	o	+	+
Vinyl chloride - pure	CH ₂ CHCl	-	o	+	+	-	+	-	o	+	+	o		-	-	o	o	o
W																		
Waste gases - with carbon dioxide		+	+	+	+	+	+	+	+	+	+	+	+	+	+	o	+	o
Waste gases - with carbon monoxide		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Waste gases - with hydrochloric acid		+	+	+	+	+	+	+	+	-	+	-	o	o	o	-	o	-
Waste gases - with hydrogen fluoride		+	+	+	+	+	+	+	+	o	+	-	-	o	o	o	o	o
Waste gases - with nitrous gases		o	+	+	+	+	+	+	+	-	+		+	-	-	o	+	+
Waste gases - with sulfur dioxide (dry)		o	+	+	+	+	+	+	+	o	+	+	+	+	+	+	+	+
Waste gases - with sulfuric acid - (sulfur trioxide wet)		o	+	+	+	+	+	+	+	-	+	o	-	-	-	-	+	o
Waste gases - with sulfur trioxide (dry)		o	+	+	+	+	+	+	+	+	+		+	o	o	o	+	+
Water - distilled	H ₂ O	+	+	+	+	+	+	+	+	+	+	o	+	o	+	-	+	o
Water - seawater	H ₂ O	+	+	+	+	+	+	+	+	+	+	+	+	o	o	o	o	o
Wood tar, Wood oil (impregnating oils)		-	-	-	+	-	+	o	-			+		+	+	o	+	+
X																		
Xenon	Xe	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Xylene - pure	C ₆ H ₄ (CH ₃) ₂	-	-	+	+	-	+	-	-	+	o	o	+	+	+	+	+	+
Y																		
Yeast - aqueous		+	+	+	+	+	+	+	+	+	+		+	o	o	o	+	+
Z																		
Zinc chloride - aqueous	ZnCl ₂	+	+	+	+	+	+	+	+	-	+	+	+	-	-	-	o	-
Zinc sulfate - aqueous	ZnSO ₄	+	+	+	+	+	+	+	+		+	+	+	-	-	-	+	-

2.3 Resistance in commercial products

	NBR	EPDM	FKM	FFKM	CR	PTFE	PVC	PP	PA	PVDF	PPS	PEEK	MS	RG	GG, GS	1.4401/1.4571	1.4305/1.4105
A																	
Acronal dispersions (polyacrylic acid esters for adhesives)	-	+	+		+	+	-	+	o		+		o	o	o	+	+
Acronal solutions	-	o	-		-	+	-	o	o		+		o	o	o	+	+
Anti-freeze (ethylene glycol)	o	+	+	+	+	+	+	+		+	o	+	+	+	+		
Aniseed oil	o				-	+	-	-	+		o		+	+	o	+	+
Antifrogen-N	+	+	+		+	+	+	+	+		o		o	o	o	+	+
ASTM-oil JRM 901	o	-	+	+	+	+	+	o	+				+	+	+	+	+
ASTM-oil JRM 902	o	-	o	+	+	+	+	o	+		+		+	+	+	+	+
ASTM-oil JRM 903	o	-	o	+	+	+	+	o	+		+		+	+	+	+	+
ASTM-fuel A	o	-	o	+	o	+	+	o	+				+	+	+	+	+
ASTM-fuel B	o	-	o	+	-	+	o	o	+		+		+	+	+	+	+
ASTM-fuel C	o	-	o	+	-	+	o	o	+		+		+	+	+	+	+
ATE Brake fluid	-	+	-	+	o	+	o	o	+		+	+	o	o	+	+	+
B																	
Beeswax	+	+	+		+	+	+	+	-		+		+	+	o	+	+
Bone oil	o	-	+	+	o	+	o	+	+		+		+	+	+	+	+
Bore oils (cutting oils)	o	-	o	+	o	+	+	o	o				+	+	+	+	+
Brake fluid (ATE Brake fluid)	-	+	-	+	o	+	o	o	+		+	+	o	o	+	+	+
C																	
Cellulose varnishes	-	o	-	+	-	+	-	o	+		+		o	o	o	+	+
Chlophene (chlorinated diphenyl)	+	o	+		-	+	-	+					+	+	o	+	+
Chlorine bleach (sodium hypochlorite)	-	+	o	+	-	+	+	o	-	-	-	+	o	o	o	o	o
Coating agents for the printing industry (Nekal BX)	+	+	+		+	+	+	+					o	o	o	+	+
Coconut oil	o	-	o	+	o	+	o	o	+	+	+	+	o	o	o	+	+
Cod-liver oil	o	o	+	+	+	+	+	+			+		o	o	o	+	+
Common salt (sodium hypochlorite)	+	+	+	+	+	+	+	+	+	+	+	+	-	o	-	o	o
Cottonseed oil	o	-	o	+	o	+	+	-		+	+		+	+		+	+
Cyclanone (fatty alcohol sulfonate)	+	+	+		+	+	+	+	+						o	+	+
D																	
Desmodur T (polyisocyanate)	-	-	+		-	+							+	+	+	+	+
Desmophen (saturated polyester)	+	+	+		+	+									+	+	+
Detergents (synt. detergents)	o	+	o	+	+	+	+	o	o	+	+		o	o	o	+	+
Dextrin - aqueous	+	+	+	+	+	+	+	+	+	+	+		+	+	+	+	+
Diesel fuel - pure	o	-	+	+	-	+	o	o	+	+	+	+	+	+	+	+	+

	NBR	EPDM	FKM	FFKM	CR	PTFE	PVC	PP	PA	PVDF	PPS	PEEK	MS	RG	GG, GS	1.4401/1.4571	1.4305/1.4105
F																	
Fats, fatty oils	o	-	o	+	o	+	o	o	+	+	+	+	o	o	o	+	+
Fruit tree carbolineum	o	o	o	+	o	+	+	-	+		o		+	+	+	+	+
Fuel oils	o	-	+	+	o	+	o	o	+	+	+		+	+	+	+	+
G																	
Gelatine - aqueous	+	+	+	+	+	+	+	+	+	+		+	o	o	o	+	+
H																	
Hair shampoo	o	o	o		o	+	+	o	+		+		o	o	o	+	+
Hydraulic fluids, mineral oils (H, H-L, H-LP)	o	-	o	+	o	+	+	+	+		+		+	+	+	+	+
Hydraulic fluids, oil-in-water emulsions (HSA)	o	-	+	+	o	+	+	+	+		+		+	+	+	+	+
Hydraulic fluids, polyglycol-water solutions (HSC)	+	+	+	+	o	+	+	+	+				+	+	+	+	+
Hydraulic fluids, phosphoric ester (HSD)	-	o	o	+	-	+	-	-	-		+		+	+	+	+	+
Hydraulic fluids, water-in-oil emulsions (HSB)	o	-	+	+	o	+	+	+	+		+		+	+	+	+	+
I																	
Impregnating oils (wood tar)	-	-	-	+	-	+	o	-			+		+	+	o	+	+
Iodine tincture	o	o	o	o	o	+	-	o	-	+		o	o	o	o	o	o
K																	
Kerosene - pure	+	-	+	+	o	+	+	+	+	+	+	+	+	+	+	+	+
L																	
Linseed oil	o	-	o	+	o	+	o	o	+	+	+	+	o	o	o	+	+
Lubricating oils (mineral oils, machine oils)	+	-	+	+	o	+	o	+	+	+	+	+	+	+	+	+	+
Lubricating oils for drills and saws	+	-	+	+	o	+	o	+	+	+	+	+	+	+	+	+	+
Lysol (cresols)	-	-	o	+	-	+	o	o	-	o	+	+	+	+	o	+	o
M																	
Machine oils, see a) paraffin oils b) mineral oils c) lubricating oils	+	-	+	+	o	+	o	+	+	+	+	+	+	+	+	+	+
Mersols (alkane sulfonic acid chloride)	+	o	+		+	+	+	o					o	o	o	o	o
Mineral oils - free from aromatic hydrocarbons	+	-	+	+	o	+	o	+	+	+	+	+	+	+	+	+	+
Molasses	+	+	+	+	+	+	+	+	+	+	+	+	o	o	o	+	+

2.3 Resistance in commercial products

[illegible]

2.4 Resistance in liquid foods and beverages

	NBR	EPDM	FKM	FFKM	CR	PTFE	PVC	PP	PA	PVDF	PPS	PEEK	MS	RG	GG, GS	1.4401/1.4571	1.4305/1.4105
A																	
Apple juice, apple puree						+	+	+	+			+	-			+	+
Apricot juice						+							+	+		+	+
B																	
Beer	+	+	+		+	+	+	+	+	+	+	+	+	+	-	+	+
Butter	+	+	+		+	+	+	+	+	+	+		-	-	-	+	+
Buttermilk	+	+	+		+	+	+	o	-		+		o	o	-	+	+
C																	
Castor oil	o	-	o	+	o	+	o	o	+	+	+	+	o	o	o	+	+
Cidre	+	+	+			+	+	+	+	+	+				-	+	+
Corn (maize) oil	o	-	o	+	o	+	o	o	+	+	+	+	o	o	o	+	+
E																	
Edible fats and oils	o	-	o	+	o	+	o	o	+	+	+	+	o	o	o	+	+
Edible oil	o	-	o	+	o	+	o	o	+	+	+	+	o	o	o	+	+
F																	
Fruit juices	o	o	o		o	+	o	o	o			+	-	-	-	+	+
L																	
Lemon juice																	
M																	
Milk	+	+	+		+	+	+	+	+	+	+	+	o	+	-	+	+
Mineral water	+	+	+		+	+	+	+	+	+	+	+	o	o	o	o	o
O																	
Olive oil	o	-	o	+	o	+	o	o	+	+	+	+	o	o	o	+	+
Orange juice						+	+										+
P																	
Pineapple juice					-	+	+						-	-	-	+	+

	NBR	EPDM	FKM	FFKM	CR	PTFE	PVC	PP	PA	PVDF	PPS	PEEK	MS	RG	GG, GS	1.4401/1.4571	1.4305/1.4105
R																	
Rape-seed oil	o	-	o	+	o	+	o	o	+	+	+	+	o	o	o	+	+
S																	
Saccharin (sweetener)	+	+	+		+	+	+	+			o		+	+	o	+	+
Soya oil	o	-	o	+	o	+	o	o	+	+	+	+	o	o	o	+	+
Spirits - depending on constituents and aroma additives	o	o	o		o	+	+	+		+	+	+	-	-	o	+	+
Sugar solutions	+	+	+		+	+	+	+	+	+	+	+	+	+	o	+	+

¹ Technical acetylene contains solvents like alkanes, dimethyl formamide or acetone. Bürkert generally does not know what solvent lack is used in the gas suppliers acetylene. The chemical resistance of the gasket materials has to be proved according to the german specification DIN 9539.

² brass with up to 58 % Cu

³ diffuses through EPDM; attacks epoxy materials

⁴ acid resistant FKM compound

⁵ Hydrogen can lead to an embrittlement of metals.

⁶ Most of the polymer materials get damaged by ozone. Therefore the resistances have to be put into perspective.

⁷ under pressure permitted according to the BAM (Federal Institute for Materials Research and Testing)

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