COVNA AUTOMATION

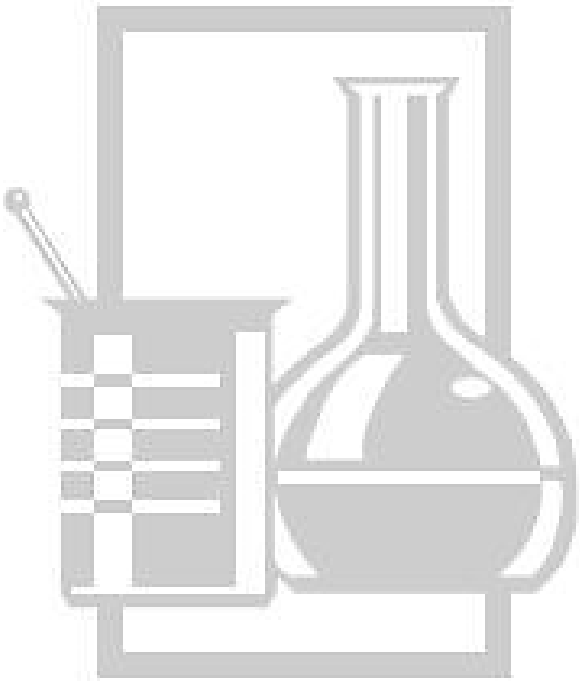
科威納 COVNA® VALVE

CORROSION DATA

Solve your technical questions
with solid experience.

Chemical Resistance Guide

Solve your technical questions
with solid experience.



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 COVNA products for aggressive fluids, the following tables provide useful information on the optimal choice of housing and gasket materials.

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 accelerate corrosion. Dependent on the purity of the fluid as well as the compounding and nature of vulcanization 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 to 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.

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Interpretation of Symbols

+	Material little or not affected by chemical: suitable
0	Various attack grades depending on conditions: limited suitability
-	Material shows severe attack: unsuitable this guide assumes in the most cases a temperature of 68° F (20° C). The chemical resistance of materials decreases generally with increasing temperature. If the chemical resistance of a material changes from good to poor depending on the operating conditions (temperature, pressure) or on the concentration and purity of the chemical then the rating 0 will be given.

References

All the information quoted in these resistance tables is based on industrial experience or other providers and supplemented by Internet searches and other sources of information own.

The following chemical resistance tables are divided into three categories, standard chemicals, Industrial Chemicals and liquid foods and beverages. Materials used seldom in our products (e.g. aluminum) are not described in detail in the tables. In such cases, chemical resistance information related to a particular application or product should be requested. The same applies to nickel-plated and chromium-plated components. The materials PTFE (Teflon) and epoxy resin are also excluded. Both are resistant to most common chemicals and can be employed in the majority of applications. Chemicals to which these materials are not resistant are mentioned in the following summary.

Chemical Resistance Chart A-A

Medium	EPDM	FKM	NBR	Nylon (PA)	Brass	SS (316)	SS (304)
Acetaldehyde - aqueous	+	0	-	0	+	+	+
Acetaldehyde - pure	+	-	-	0	+	+	+
Acetic acid - aqueous	0	-	-	0	-	0	0
Acetic anhydride - pure	0	-	-	-	-	0	0
Acetic acid ethyl ester (ethyl acetate)	0	-	-	0	0	+	+
Acetoacetic ester - acid free	-	-	-	+	0	+	+
Acetone - pure	+	-	-	+	+	+	+
Acetophenone		-	-	+	+	+	+
Acetyl chloride	-	-	-	-	0	0	0
Acetylacetone	-	-	-	+	-	+	+
Acetylene	+	+	+	+	+	+	+
Acrylic acid ethyl ester - pure	0	-	-			+	+
Acrylonitrile - pure	-	-	-	0	+	+	+
Activin - aqueous (chloramine)	0	-	-	-		+	+
Adipic acid - aqueous	+	+	+	+		+	+
Albumin solutions	+	+	+	+	0	+	+
Allyl alcohol - aqueous	0	0	+	+	+	+	+
Alum - aqueous (potassium aluminium sulfate)	+	+	+	+	-	+	0
Aluminium acetate - aqueous	+	+	0	+	0	+	+
Aluminium chloride - aqueous	+	+	+	0	0	0	0
Aluminium fluoride - aqueous	+	+	+	+	+	-	-
Aluminium sulfate - aqueous	+	+	+	0	-	0	0
Aminoacetic acid (glycocoll, glycin)	+	+	0	0	0	+	+
Ammonia - anhydrous (liquid) (diffuses through EPDM; attacks epoxy materials)	0	0	-	+	0	+	+
Ammonia (gas) - pure	+	-	-	+	0	+	+
Ammonia liquors (ammonium hydroxide + water)	+	0	-	+	-	+	+
Ammonium acetate - aqueous	+	+	+		0	+	+
Ammonium carbonate - aqueous	+	+	+	+	-	+	+
Ammonium chloride - aqueous	+	+	+	+	0	0	0
Ammonium citrate - aqueous	+	+	+	0	0	+	+
Ammonium fluoride - aqueous	+	+	+		0	0	0
Ammonium fluorsilicate - aqueous	+	+	+	0	0	+	+
Ammonium formiate - aqueous	+	+	+	+	0	+	+
Ammonium hydroxide + water (ammonia liquors)	+	0	-	+	-	+	+
Ammonium nitrate - aqueous	+	+	+	+	-	+	+
Ammonium oxalate - aqueous	+	+	+	0	0	+	+

Chemical Resistance Chart A-B

Medium	EPDM	FKM	NBR	Nylon (PA)	Brass	SS (316)	SS (304)
Ammonium persulfate - aqueous	+	+	-	-	0	0	0
Ammonium phosphate - aqueous	+	+	+	+	0	+	+
Ammonium sulfate - aqueous	+	+	+	0	-	0	0
Ammonium sulfide - aqueous	+	0	+	+	-	+	+
Ammonium sulfite - aqueous	+	+	+	+	-	+	0
Ammonium thiocyanate - aqueous	+	+	+	+	-	+	+
Amyl acetate - pure	0	-	-	+	+	+	+
Amyl alcohols - pure	0	+	+	+	+	+	+
Aniline - pure	-	0	-	-	0	+	+
Aniline hydrochloride - aqueous (* acid resistant FKM compound)	+	0*	0	-	-	-	-
Anisole	0	-	0	+	+	+	+
Anone (cyclohexanone)	-	-	-	+	0	+	+
Anthracene oil	-	-	-	+	+	+	+
Anthraquinone sulfonic acid - aqueous	+	+	0	0	0	0	0
Antimony chloride - aqueous (* acid resistant FKM compound)	+	+*	0	-	0	-	-
Apple acid - aqueous	+	+	+	+	-	+	+
Aqua regia	-	-	-	-	-	-	-
Arabic acid - aqueous	+	+	+		-	+	+
Argon	+	+	+	+	+	+	+
Arsenic acid - aqueous	+	+	+	0	-	+	+
Arsenic trichloride - aqueous	+	+	+	-	-	0	0
Arsenious acid - aqueous	+	+	+		0	+	+
Aryl silicates - aqueous	0	0	0		+	+	+
Ascorbic acid - aqueous	+	+	+		-		
Aspartic acid - aqueous	+	+	+	+	-	+	+
Barium chlorate - aqueous	+	+	+	-	+	+	+
Barium chloride - aqueous	+	+	+	+	+	+	0
Barium hydroxide - aqueous	+	+	+	0	+	+	+
Barium sulfide and polysulfide - aqueous	+	+	+	-	0	+	+
Benzaldehyde - aqueous	+	+	0	0	0	+	
Benzene - pure	-	-	0	+	0	+	+
Benzene sulfonic acid - aqueous	+	+	+		0	+	+
Benzidine sulfonic acid - aqueous	+	+	+	+	+	+	+
Benzoic acid - aqueous	+	+	+	-	0	+	+
Benzyl alcohol - pure	+	0	-	0	+	+	+
Benzyl butyl phtalate - aqueous	-	-	-	+	+	+	+

Chemical Resistance Chart B-C

Medium	EPDM	FKM	NBR	Nylon (PA)	Brass	SS (316)	SS (304)
Bergamot essence	-	-	-	-	0	+	+
Bisulfite - aqueous (sodium bisulfite)	+	+	0	0	0	+	0
Borax - aqueous	+	+	+	+	+	+	+
Boric acid - aqueous	+	+	+	-	0	0	0
Borofluoric acid	+	+	+	-	-	-	-
Brines	+	+	+	+	0	0	0
Bromine (liquid) - pure	-	-	-	-	-	0	0
Butadiene	0	0	0	+	+	+	+
Butane (gas and liquid)	-	+	0	+	0	+	+
Butanediol - aqueous (10%)	+	0	+	+	+	+	+
Butanol - aqueous (butylalcohol)	+	0	+	+	+	+	+
Butinediol	0	0	0	+	+	+	+
Butoxyl (methoxybutyl acetate)	0	0	+		0	+	+
Butyl acetate - pure	+	-	-	+	0	+	+
Butyl alcohol (butanol) - aqueous	+	0	+	+	+	+	+
Butyl phtalate	-	-	-	+	+	+	+
Butylene (liquid) - pure	0	+	+	+	+	+	+
Butyric acid - aqueous	0	0	0	0	0	+	0
Calcium bisulfite - aqueous	+	+	+	-	-	+	0
Calcium chloride - aqueous	+	+	+	0	-	0	0
Calcium hydroxide - aqueous	+	+	+	+	+	+	+
Calcium hypochlorite - aqueous	+	0	-	-	-	0	0
Calcium nitrate - aqueous	+	+	+	+	0	0	0
Calcium sulfaminate - aqueous	+	+	+	+		+	+
Camphor oil	-	+	+		0	+	+
Car-battery fluid (20% sulfuric acid)	+	+	0	-	-	+	0
Carbitol	0	0	0	+	+	+	+
Carbolic acid - aqueous (phenol)	0	0	0	-	0	+	+
Carbolineum	0	0	0	+	+	+	+
Carbon dioxide - dry	+	+	+	+	+	+	0
Carbon dioxide - wet	+	+	+	0	0	+	0
Carbon disulfide	-	0	-	0	0	+	+
Carbon monoxide	+	+	+	+	+	+	+
Carbon tetrachloride - pure	-	0	-	+	0	+	+
Carbonic acid - aqueous	+	+	+	0	0	+	+
Caro's acid - aqueous	-	-	-	-	-	-	-
Caustic potash - aqueous (potassium hydroxide)	+	0	0	0	0	+	+

Chemical Resistance Chart C-D

Medium	EPDM	FKM	NBR	Nylon (PA)	Brass	SS (316)	SS (304)
Caustic soda - aqueous (sodium hydroxide)	+	0	0	0	0	+	+
Cellosolve (glycol ethyl ether)	-	-	-	+	+	+	+
Chloral hydrate (Chloral) - aqueous	0	0	-	-	0	0	0
Chloramines - aqueous (activin)	0	-	-	-		+	+
Chlorbenzenes - pure	-	-	-	+	+	+	+
Chloric acid - aqueous	0	-	-	-	-	-	-
Chloride of lime - aqueous (calcium hypochlorite)	+	0	-	-	-	0	0
Chlorinated water (chlorine gas - wet)	-	0	-	-	-	-	-
Chlorine (gas) - dry	-	0	-	-	+	+	+
Chlorine (gas) - wet (chlorinated water)	-	0	-	-	-	-	-
Chlorine (liquid) - pure	-	0	-	-	+	+	+
Chlorine dioxide - aqueous	-	-	-	-	-	0	0
Chlormethane (methyl chloride)	-	-	-	+	0	0	0
Chloroacetic acid - aqueous	0	-	-	-	0	0	-
Chloroethanol (ethylene chlorhydrine)	-	0	-	0	+	+	+
Chloroform - pure (trichloromethane)	-	0	-	-	0	+	0
Chloronaphtalene	-	0	-	+	+	+	+
Chlorophenol	-	-	-		+	+	+
Chlorophenoxyacetic acid	+	+	+			+	+
Chlorosulfonic acid - pure	-	-	-	-	0	0	0
Chlorxylenol	-	-	-		+	+	+
Choline chloride - aqueous	+	+	+		-		
Chromic acid - aqueous	0	+	-	-	-	0	0
Chromium alum - aqueous	+	+	+	0	0	0	0
Chromium sulfate - aqueous	+	+	+	0	0	0	0
Citral (citronella oil)	-	-	-	+	+	+	+
Citric acid - aqueous	+	+	+	+	0	+	0
Copper acetate - aqueous	+	+	0	0	0	+	+
Copper chloride - aqueous	+	+	+	0	0	-	-
Copper sulfate - aqueous	+	+	+	0	0	0	0
Cresol - aqueous (lysol)	-	0	-	-	+	+	0
Cyclohexane - pure	-	0	-	+	+	+	+
Cyclohexanol - pure	-	+	-	+	+	+	+
Cyclohexanone - pure (anone)	-	-	-	+	0	+	+
Cymene	-	-	-	+	+	+	+
Decahydronaphtalene (decalin) - pure	-	+	-	+	+	+	+

Chemical Resistance Chart D-F

Medium	EPDM	FKM	NBR	Nylon (PA)	Brass	SS (316)	SS (304)
Dextrose - aqueous	+	+	+	+	+	+	+
Diacetone alcohol - anhydrous	+	-	-	0	0	+	+
Dibutyl phthalate - pure	0	-	-	+	+	+	+
Dibutyl sebacate - pure	0	-	-	+	+	+	+
Dichlorethane (ethylene chloride)	-	-	-	+	+	+	+
Dichlorethylene - pure	-	0	-	+	+	+	+
Dichlormethane (methylene chloride)	-	0	-	0	0	0	0
Dicyclohexyl-ammonium nitrite	+	+	+		0	+	+
Diethyl ether	-	-	-	+	+	+	+
Dimethyl amine	0	-	-	-	0	+	+
Dimethyl formamide - pure	-	-	-	-	0	+	+
Dimethyl sulfoxide				0			
Dioctyl phtalate - pure	0	0	-	+	+	+	+
Dioxane - pure	0	-	-	+	+	+	+
Diphenyl + diphenyloxide	-	-	-	+	+	+	+
Essential oils	-	-	-	-	0	+	+
Ethane	+	+	+	+	+	+	+
Ethanol - aqueous (ethyl alcohol)	+	0	+	0	+	+	+
Ethanolamine	0	-	0	+	-	+	+
Ether (diethyl ether)	-	-	-	+	+	+	+
Ethyl acetate - pure (acetic acid ethyl ester)	0	-	-	0	0	+	+
Ethyl alcohol - aqueous (ethanol)	+	0	+	0	+	+	+
Ethyl alcohol – denaturated (depending on denaturant)	0	0	0	0	0	+	+
Ethyl alcohol - fermentation mash	+	+	+	0	+	+	+
Ethyl alcohol + acetic acid	+	0	0	-	0	+	+
Ethyl benzene - pure	-	0	-	+	+	+	+
Ethyl chloride - pure	-	0	-	+	0	+	0
Ethyl formiate	0	-	-	+	+	+	+
Ethylene	+	+	+	+	+	+	+
Ethylene chlorhydrine (chloroethanol)	-	0	-	0	+	+	+
Ethylene diamine - pure	+	0	0	0	-	+	0
Ethylene dibromide - anhydrous	-	-	-	+	+	+	+
Ethylene dichloride (dichloroethane)	-	-	-	+	+	+	+
Ethylene glycol - aqueous (glycol)	+	+	+	0	0	+	0
Ethylene oxide - liquid, pure	-	-	-	-	+	+	+
Fat alcohol sulfates - aqueous	0	+	+	0	0	+	+

Chemical Resistance Chart F-H

Medium	EPDM	FKM	NBR	Nylon (PA)	Brass	SS (316)	SS (304)
Fat alcohols	0	+	+	+	+	+	0
Ferrous/ferric chloride - aqueous	+	+	+	-	-	-	-
Ferrous/ferric sulfate - aqueous	+	+	+	+	0	+	+
Fluoboric acid (borofluoric acid)	+	+	+	-	-	-	-
Fluorine (dry) - pure	-	0	-	-	0	0	0
Fluorine (wet) - pure	-	-	-	-	-	0	0
Fluorocarbons (see Freon)				+			
Fluosilicic acid - aqueous	0	0	0	-	-	0	0
Formaldehyde - aqueous	+	+	0	+	0	+	0
Formamide - pure	+	0	+	0	0	+	0
Formic acid - aqueous	0	+	-	-	0	+	0
Formic acid - concentrated	0	-	-	-	0	+	0
Freon TF (Freon 113)	+	+	+	+	+	+	+
Freon 113	+	+	+	+	+	+	+
Freon 12	0	0	+	+	+	+	+
Freon 13	0	0	+				
Freon 13 B 1 (Halon)	0	0	+	+	+	+	+
Freon 22	-	-	-	+	+	+	+
Freon 23	0	0	0				
Freon 502	-	-	-	+	+	+	+
Freon substitude HFCKW 123	-	-	-		+	+	+
Freon substitude HFCKW 134a		-			+	+	+
Gas liquor	-	0	+		-	+	+
Gasoline (petrol)	-	+	+	+	+	+	+
Glucose - aqueous	+	+	+	+	+	+	+
Glycerin - aqueous	+	+	+	+	0	+	0
Glycocoll - aqueous (aminoacetic acid)	+	+	0	0	0	+	+
Glycol - aqueous	+	+	+	0	0	+	0
Glycol ethyl ether (cellosolve)	-	-	-	+	+	+	+
Glycolic acid - aqueous	+	+	+	-	0	0	0
Grape sugar - aqueous	+	+	+	+	+	+	+
Helium	+	+	+	0	0	+	+
Heptane, Hexane (petrol) - pure	-	+	+	+	+	0	0
Hexamethylene tetramine - aqueous	+	+	+	+	0	+	+
Humic acids	+	+	+	-	+	+	+
Hydrazine hydrate - aqueous	+	+	-		-	0	0
Hydrobromic acid - aqueous	+	+	-	-	-	-	

Chemical Resistance Chart H-M

Medium	EPDM	FKM	NBR	Nylon (PA)	Brass	SS (316)	SS (304)
Hydrochloric acid - aqueous	0	0	-	-	-	-	-
Hydrochloric acid (gas) - pure	0	0	0	-	0	0	0
Hydrocyanic acid	0	+	0	-	+	+	0
Hydrofluoric acid - aqueous (* acid resistant FKM compound))	0	0*	0	-	-	0	-
Hydrogen - pure	+	+	+	+	+	+	+
Hydrogen peroxide 0,5%	+	+	0	+	-	0	+
Hydrogen peroxide 30% (* acid resistant FKM compound)	0	+*	-	-	-	-	0
Hydrogen sulfide - aqueous	+	+	0	-	0	+	0
Hydroquinone - aqueous	+	+	+	-		+	+
Hydroxylamine sulfate - aqueous	+	+	+	+	-	+	+
Illuminating gas	+	+	+	+	+	+	+
Inert Gases	+	+	+	+	+	+	+
Iodine+Potassium Iodide - aqueous	0	0	0	-	-	0	0
Isobutyl alcohol - pure	+	+	0	+	+	+	+
Isooctane - pure	-	+	+	+	+	+	+
Isopropanol - pure (propanol)	+	+	+	0	+	+	+
Kerosene	-	+	+	+	+	+	+
Lactic acid	0	+	0	0	0	0	0
Laughing gas (nitrous oxide)	+	0	+	+	+	+	+
Lead acetate - aqueous	+	+	0	+	0	+	+
Lead nitrate - aqueous	+	+	+		-	+	+
Lead tetraethyl - pure (tetraethyl lead)	0	+	0	+	0	+	+
Linoleic acid	-	0	0		0	+	0
Lithium chloride - aqueous	+	+	+	0	0	0	0
Magnesium chloride - aqueous	+	+	+	0	0	0	0
Magnesium sulfate - aqueous	+	+	+	0	+	0	0
Maleic acid - aqueous	+	+	+	0	0	+	0
Manganese chloride	+	+	+	+	0	0	0
Manganese sulfate	+	+	+	+	0	+	0
Marsh gas (methane)	-	+	+	+	+	+	+
Mercaptanes	-	0	-	+	0	+	+
Mercury	+	+	+	+	-	0	+
Mercury chloride	+	+	+	-	-	0	0
Mercury salts - aqueous	+	+	+	-	-	+	+
Methane - pure	-	+	+	+	+	+	+

Chemical Resistance Chart M-P

Medium	EPDM	FKM	NBR	Nylon (PA)	Brass	SS (316)	SS (304)
Methanol (methyl alcohol)	0	-	-	0	0	+	+
Methoxybutanol	+	+	+		+	+	+
Methyl acetate - pure	0	-	-	+	0	0	0
Methyl alcohol (methanol)	0	-	-	0	0	+	+
Methyl amine - aqueous	0	0	-	0	-	0	0
Methyl chloride (chloromethane)	-	-	-	0	0	0	0
Methyl ethyl ketone - pure	0	-	-	0	+	+	+
Methylene chloride (dichloromethane)	-	0	-	-	0	0	0
Morpholine - pure	0	0	-		+	+	+
Natural gas	-	+	+	+	0	+	+
Nickel sulfate - aqueous	+	+	+	+	-	0	0
Nitric acid - aqueous (40%)	0	+	-	-	-	0	0
Nitrobenzenes - pure	-	0	-	-	+	+	+
Nitrobenzoic acids - aqueous	+	+	+	+	+	+	+
Nitrogen	+	+	+	+	+	+	+
Nitrogen oxides - gaseous, wet and dry (NO, NO2, N2O4)	0	-	-	-	-	+	+
Nitrotoluenes (0-, m-, p) - pure	-	0	0	-	+	+	+
Nitrous oxide	+	0	+	+	+	+	+
Oleum (fuming sulfuric acid)	-	0	-	-	-	+	0
Oxalic acid - aqueous	+	+	+	-	0	0	0
Oxygen (under pressure not permitted)	0	+	+	+*	+	+	+
Ozone - wet and dry	0	0	-	-	0	+	+
Paraffin oil	-	+	+	+	+	+	+
Peracetic acid -aqueous (6%)	+	+	-	-	-	+	+
Perchloroethylene (tetrachlorethylene) - pure	-	0	-	0	0	0	0
Petrol (gasoline)	-	+	+	+	+	+	+
Petrolether	-	+	+	+	+	+	+
Phenol - aqueous	0	0	0	-	0	+	+
Phosgene (gaseous) - pure	-	+		0	+	+	+
Phosgene (liquid) - pure	-	0		0	+	+	+
Phosphor chloride - pure	-	0	-	-		0	0
Phosphoric acid - aqueous	+	+	0	-	0	0	0
Picric acid (trinitrophenol)	-	0	0		+	+	+
Pinene (turpentine oil)	-	0	0	+	0	+	+
Potash (potassium carbonate)	+	+	+	0	0	+	+
Potassium aluminium sulfate - aqueous (alum)	+	+	+	+	-	+	0

Chemical Resistance Chart P-S

Medium	EPDM	FKM	NBR	Nylon (PA)	Brass	SS (316)	SS (304)
Potassium bifluoride - aqueous	+	+	+	-	0	+	+
Potassium bromate - aqueous	+	+	+		-	+	0
Potassium bromide - aqueous	+	+	+	-	+	0	0
Potassium carbonate - aqueous (potash)	+	+	+	0	0	+	+
Potassium chlorate - aqueous	0	0	0	0	0	0	0
Potassium chloride - aqueous	+	+	+	+	0	0	0
Potassium chromate - aqueous	+	0	0	-	+	0	0
Potassium cyanide - aqueous	+	+	+	+	-	+	+
Potassium dichromate - aqueous	0	0	0	-	0	+	+
Potassium ferricyanide (red potassium prussiate) - aqueous	+	+	+	+	-	+	+
Potassium ferrocyanide (yellow potassium prussiate) - aqueous	+	+	+	+	+	0	-
Potassium hydroxide - aqueous (caustic potash)	+	0	0	0	0	+	+
Potassium hypochlorite - aqueous	0	0	-	-	0	0	0
Potassium iodide - aqueous	+	+	+		0	0	0
Potassium nitrate - aqueous	+	+	+	+	0	0	0
Potassium nitrite - aqueous	+	+	+	+	+	+	+
Potassium permanganate - aqueous	-	-	-	-	0	+	0
Potassium peroxide - aqueous	-	-	-	-	-	+	+
Potassium persulfate - aqueous	+	0	-	-	-	+	+
Potassium phosphate - aqueous	+	+	+	0	0	+	+
Potassium sulfate - aqueous	+	+	+	+	+	+	+
Potassium sulfide - aqueous	+	+	+	0	0	+	+
Potassium sulfite - aqueous	+	+	+	+	0	+	0
Propane (liquid and gas) - pure	-	+	+	+	0	+	+
Propanol (isopropanol)	+	+	+	0	+	+	+
Propylenglykol - pure	+	+	+	0	+	+	+
Pyridine - pure	-	-	-	0	+	+	0
Silicon oil	+	+	+	+	+	+	+
Silver nitrate - aqueous	+	+	0	+	-	+	+
Sodium arsenate, sodium arsenite	+	+	+		+	+	+
Sodium benzoate - aqueous	+	+	+	+	+	+	+
Sodium bicarbonate - aqueous	+	+	+	+	0	+	+
Sodium bisulfate - aqueous	+	+	+	+	0	0	0
Sodium bisulfite - aqueous (bisulfite)	+	+	0	+	0	+	0
Sodium bromate - aqueous	+	+	+	0	-	+	0

Chemical Resistance Chart S-S

Medium	EPDM	FKM	NBR	Nylon (PA)	Brass	SS (316)	SS (304)
Sodium bromide - aqueous	+	+	+	-	0	0	0
Sodium chlorate - aqueous	0	0	0	0	0	0	0
Sodium chloride - aqueous (common salt)	+	+	+	+	0	0	0
Sodium chlorite - aqueous	0	0	-	-	0	0	-
Sodium chloroacetates	+	+	+		0	+	+
Sodium chromate - aqueous	+	0	0	-	+	0	0
Sodium cyanide - aqueous	+	+	+	+	-	+	+
Sodium dodecylbenzene sulfonate	+	+	+	+	0	+	+
Sodium fluoride - aqueous	+	+	+	+	+	+	0
Sodium glutamate	+	+	+			+	+
Sodium hydroxide - aqueous (caustic soda)	+	0	0	0	0	+	+
Sodium hypochlorite (chlorine bleach)	0	0	-	-	0	0	0
Sodium iodide - aqueous	+	+	+		0	0	0
Sodium mercaptobenzothiazol	0	+	0		+	+	+
Sodium nitrate - aqueous	+	+	+	+	0	0	0
Sodium nitrite - aqueous	+	+	+	+	+	+	+
Sodium pentachlorphenolate	+	+	+	+	+	+	+
Sodium perborate - aqueous	+	+	0		0	+	+
Sodium persulfate - aqueous	+	+	0	-	-	+	0
Sodium phosphate - aqueous	+	+	+	+	0	0	0
Sodium propionate	+	+	+	+	+	+	+
Sodium pyrosulfite	+	+	0	+	0	+	0
Sodium silicate - aqueous	+	+	+	+	0	+	+
Sodium stannate	+	+	+	0	0	+	+
Sodium sulfate - aqueous	+	+	+	+	+	+	+
Sodium sulfide - aqueous	+	+	+	+	0	+	+
Sodium sulfite - aqueous	+	+	+	+	0	+	+
Sodium tartrate	+	+	+	+	+	+	+
Sodium thiosulfate - aqueous	+	+	+	+	0	0	0
Sodium zincate	+	+	0			+	+
Sodium carbonate (soda)	+	+	+	+	0	+	+
Solvent naphtha (Shellsol D 60 and D 70)	-	0	0	+	+	+	+
Starch solutions	+	+	+	+	0	+	+
Steam							
(Rubber seals up to 130° C, *acid resistant FKM compound)	+	+*	0	-	0	+	+
Stearic acid	+	+	+	+	0	+	+

Chemical Resistance Chart S-W

Medium	EPDM	FKM	NBR	Nylon (PA)	Brass	SS (316)	SS (304)
Styrene	-	0	-	+	0	+	+
Succinic acid - aqueous	+	+	+		+	+	+
Sulfur chlorides and oxychlorides	-	+	-	-	0	+	-
Sulfur dioxide (gas) - dry	+	+	-	+	0	+	0
Sulfur dioxide (gas) - wet	+	+	-	0	-	+	0
Sulfur dioxide (liquid) - anhydrous	0	0	-		0	+	0
Sulfur hexafluoride		+	+	+	+	+	+
Sulfuric acid - aqueous	+	+	0	-	-	+	0
Sulfuric acid - concentrated	-	0	-	-	-	+	0
Sulfurous acid - aqueous	+	+	0	-	-	0	-
Tall oil	0	0	0	+	-	+	0
Tannic acid	+	+	+	+	0	+	+
Tar oil (carbolineum)	0	0	0	+	+	+	+
Tartaric acid - aqueous	+	+	+	0	-	+	+
Tetrachloroethylene (perchloroethylene)	-	0	-	-	0	0	0
Tetraethyl lead	0	+	0	+	0	+	+
Tetrahydrofuran - pure	-	-	+	+		+	+
Tetrahydronaphtalene (tetralin) - pure	-	+	-	+	+	+	+
Thiophene - pure	-	-	-		0	+	+
Tin chlorides (stannous and stannic chlorides) - aqueous	+	+	+	0	-	0	-
Toluene - pure	-	-	-	+	0	+	+
Tributyl phosphate – pure (phosphoric acid tributylester)	-	-	-		+	+	+
Trichloroacetic acid - aqueous	0	-	0	-	-	-	-
Trichloroethylene - pure	-	0	-	-	+	+	+
Trichloromethane (chloroform)	-	0	-	-	0	+	0
Tricresyl phosphate - pure	-	-	-	+	0	+	+
Triethanolamine - pure	-	-	-	0	0	+	+
Uranium hexafluoride	+	+	+	-		+	0
Urea - aqueous	+	+	+	+	0	0	0
Vinyl acetate - pure	+	+	+		0	+	+
Vinyl chloride - pure	0	+	-	+	-	0	0
Waste gases- with nitrous gases	+	+	0	-	-	+	+
Waste gases- with carbon dioxide	+	+	+	+	+	+	0
Waste gases- with carbon monoxide	+	+	+	+	+	+	+
Waste gases- with hydrochloric acid	+	+	+	-	0	0	-

Chemical Resistance Chart W-Z

Medium	EPDM	FKM	NBR	Nylon (PA)	Brass	SS (316)	SS (304)
Waste gases- with hydrogen fluoride	+	+	+	0	0	0	0
Waste gases- with sulfur dioxide (dry)	+	+	0	0	+	+	+
Waste gases- with sulfur trioxide (dry)	+	+	0	+	0	+	+
Waste gases- with sulfuric acid - (sulfur trioxide wet)	+	+	0	-	-	+	0
Water - distilled	0	0	0	+	0	+	0
Water - tap water	+	+	+	+	+	+	+
Seawater - Salt water	+	+	+	+	-	+	+
Wood tar, Wood oil (impregnating oils)	-	-	-	+	+	+	+
Xenon	+	+	+	+	+	+	+
Xylene - pure	-	-	-	+	0	+	0
Yeast - aqueous	+	+	+	+	0	+	+
Zinc chloride - aqueous	+	+	+	-	-	0	-
Zinc sulfate - aqueous	+	+	+		-	+	-

Industrial Chemicals A-H

Medium	EPDM	FKM	NBR	Nylon (PA)	Brass	SS (316)	SS (304)
Acronal dispersions (polyacrylic acid esters for adhesives)	+	+	-	0	0	+	+
Acronal solutions	0	-	-	0	0	+	+
Aniseed oil			0	+	+	+	+
Anti-freeze (ethylene glycol)	+	+	0		+		
Antifrogen-N	+	+	+	+	0	+	+
ASTM-fuel A	-	0	0	+	+	+	+
ASTM-fuel B	-	0	0	+	+	+	+
ASTM-fuel C	-	0	0	+	+	+	+
ASTM-oil no. 1	-	+	+	+	+	+	+
ASTM-oil no. 2	-	+	0	+	+	+	+
ASTM-oil no. 3	-	0	0	+	+	+	+
ATE Brake fluid	+	-	-	+	0	+	+
Beeswax	+	+	+	-	+	+	+
Bone oil	-	+	0	+	+	+	+
Brake fluid (ATE Brake fluid)	+	-	-	+	0	+	+
Castor oil	-	0	0	+	0	+	+
Cellulose varnishes	0	-	-	+	0	+	+
Chlophene (chlorinated diphenyl)	0	+	+		+	+	+
Chlorine bleach (sodium hypochlorite)	0	0	-	-	0	0	0
Coconut oil	-	0	0	+	0	+	+
Cod-liver oil	0	+	0		0	+	+
Common salt (sodium chloride)	+	+	+	+	0	0	0
Compressed air	-	+	+	0	+	+	+
Cottonseed oil	-	0	0		+	+	+
Cyclanone (fatty alcohol sulfonate)	+	+	+	+		+	+
Demineralized water (demi water)	+	0	0	+	0	+	+
Desmodur T (polyisocyanate)	-	+	-		+	+	+
Desmophen (saturated polyester)	+	+	+			+	+
Detergents (synt. detergents)	+	0	0	0	0	+	+
Dextrin - aqueous	+	+	+	+	+	+	+
Diesel fuel - pure	-	+	+	+	+	+	+
Fats, fatty oils	-	0	0	+	0	+	+
Fruit tree carbolineum	0	0	0	+	+	+	+
Fuel oils	-	0	0	+	0	+	+
Gelatine - aqueous	+	+	+	+	0	+	+
Hair shampoo	0	0	0	+	0	+	+

Industrial Chemicals H-S

Medium	EPDM	FKM	NBR	Nylon (PA)	Brass	SS (316)	SS (304)
Hydraulic fluids, mineral oils (H, H-L, H-LP)	-	0	0	+	+	+	+
Hydraulic fluids, oil-in-water emulsions (HSA)	-	+	0	+	+	+	+
Hydraulic fluids, phosphoric ester (HSD)	0	0	-	-	+	+	
Hydraulic fluids, polyglycol-water solutions (HSC)	+	+	+	+	+	+	+
Hydraulic fluids, water-in-oil emulsions (HSB)	-	+	0	+	+	+	+
Hydraulic oil (petroleum)	-	+	+	+	+	+	+
Impregnating oils (wood tar)	-	-	-	+	+	+	+
Iodine tincture	0	0	0	-	0	0	0
Kerosene - pure	-	+	+	+	+	+	+
Linseed oil	-	0	0	+	0	+	+
Lubricating oil (mineral oils; machine oils)	-	+	+	+	+	+	+
Lubricating oils for drills and saws	-	0	0	0	+	+	+
Lysol (cresols)	-	0	-	-	+	+	0
Machine oils (see paraffin oil, or mineral oils; lubricating oils)	-	+	+	+	+	+	+
Mersols (alkane sulfonic acid chloride)	0	+	+		0	0	0
Mineral oils - free from aromatic hydrocarbons	-	+	+	+	+	+	+
Molasses	+	+	+	+	0	+	+
Nekal BX - aqueous (wetting agents for textiles) Nickel baths	+ +	+ +	+ +	+	0 -	+ +	0
Olive oil	-	0	0	+	0	+	+
Petrol (gasoline)-benzene mix (super/premium fuel + methanol)	-	0	-	0	0	+	+
Photo-emulsions, developers, fixers	0	0	0				
Pine-needle oil	-	+	0		0	+	+
Pydraul-A 150	0	+	-	+	-	+	
Pydraul-A 200	0	+	-	+	-	+	
Pydraul-AG	+	+	-	+	-	+	
Pydraul-F-9	+	+	-	-	-	+	
Sagrotan (phenols)	0	0	0	-	0	+	+
Skydrol 500	+	0	-	0	-	+	+
Skydrol 7000	+	-	-	0	-	+	+
Soap solution - aqueous	0	0	0	0	0	+	+
Soda (sodium carbonate)	+	+	+	+	0	+	+
Spindle oil (mineral oils)	-	+	+	+	+	+	+
Spruce oil	-	+	0		0	+	+

Industrial Chemicals T-W

Medium	EPDM	FKM	NBR	Nylon (PA)	Brass	SS (316)	SS (304)
Transformer oil (see mineral oils or if applicable chlophene)							
Turpentine (oil of turpentine) - pure	-	0	0	+	0	+	+
Turpentine substitute	-	0	0	+	+	+	+
UV - protective	+	-	-				
Varnishes	-	+	0	+	+	+	+
Vaseline oil (mineral oils)	-	+	+	+	+	+	+
Vinegar	+	+	+	-	-	+	+
Water-glass (sodium silicate)	+	+	+	+	0	+	+
Wetting agents for textiles (Nekal BX)	+	+	+		0	+	+

Food and Beverages

Medium	EPDM	FKM	NBR	Nylon (PA)	Brass	SS (316)	SS (304)
Apple juice, apple puree				+	-	+	+
Apricot juice					+	+	+
Beer	+	+	+	+	+	+	+
Butter	+	+	+	+	-	+	+
Buttermilk	+	+	+	-	0	+	+
Cider	+	+	+	+		+	+
Corn (maize) oil	-	0	0	+	0	+	+
Edible fats and oils	-	0	0	+	0	+	+
Fruit juices	0	0	0	0	-	+	+
Lemon juice	+	+	0	+	0	+	0
Milk	+	+	+	+	0	+	+
Mineral water	+	+	+	+	0	0	0
Orange juice							+
Pineapple juice					-	+	+
Rape-seed oil	-	0	0	+	0	+	+
Saccharin (sweetener)	+	+	+		+	+	+
Soya oil	-	0	0	+	0	+	+
Spirits - depending on constituents and aroma additives	0	0	0		-	+	
Sugar solutions	+	+	+	+	+	+	+
Wine vinegar (acetic acid)	0	-	-	0	-	0	0
Wines	+	+	+	-	-	+	+

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