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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 Solenoid Valves UK 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, commercial products 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.

Summary of Chemical Resistance Properties of Gasket and Housing Materials

Material	Designation	Chemical Resistance	Permissible Temperatures		
			long-term	short-term	Long-term
Housing Materials					
Stainless steel	1.4401 1.4571 1.4305 1.4104	See resistance tables (also 1.4404,1.4408, 1.4410) (also 1.4581) (also 1.4301,1.4303) (also 1.4105)	-4 (-20) to +752 (+400)		-4 (-20) to +302 (+150)
S.G. cast iron	GGG 40.3	For neutral fluids	-4 (-20) to +752 (+400)		
Brass	Ms	See resistance tables	-4 (-20) to +482 (+250)		

Chemical Resistance Guide

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Material	Designation	Chemical Resistance	Permissible Temperatures		
			long-term	short-term	Long-term
Plastic					
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Polypropylene	PP	Resistant to: Organic solvents, aqueous solutions of acids, bases and salts. Unsuitable for concentrated, oxidizing acids.	+32 (0) to +194 (+90)	+32 (0) to +230 (+110)	+32 (0) to +176 (+80)
Polyethylene	PE				
Polytetrafluoroethylene (Teflon)	PTFE	Resistant to nearly all chemicals. Unsuitable for liquid sodium and fluorine compounds.	-4 (-20) to +392 (+200)	-4 (-20) to +500 (+260)	-4 (-20) to +302 (+150)
Fluorine plastic	PFA				
Polyphenylsulfide	PPS	Resistant to: dilute mineral acids bases, aliphatic and aromatic hydrocarbons ketones, alcohols chlorinated hydrocarbons oils, fats, water, hydrolysis	to +392 (+200)	to +500 (+260)	

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Chemical Resistance Guide

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Material	Designation	Chemical Resistance	Permissible Temperatures		
			long-term	short-term	long-term
Materials					
Epoxy resin	EP	Resistant to nearly all chemicals. Unsuitable for short-chain organic acids of high concentration and for strong oxidizing substances.	-20 (-4) to +150 (+302)		
Gasket and Diaphragm					
Ethylene propylene rubber	EPDM	Good resistance to ozone and weathering. Particularly suitable for aggressive chemicals. Unsatisfactory for oils and fats.	-30 (-22) to +130 (+266)		Dependent on aggressiveness of the fluid and on mechanical load.
Nitrile rubber	NBR	Fairly resistant to oil and petrol. Unsatisfactory with oxidizing fluids.	-10 (+14) to +90 (+194)	-10 (+14) to +120 (+248)	
Perfluorinated elastomers (Simnz, Kalrez, Chemraz)	FFKM	Chemical properties superior to all other elastomers.	-50 (-58) to +500 to +260	to +320 (+608)	
Steel	1.4112		-20 (-4) to +450 (+842)		-20 (-4) to +150 (+302)

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Chemical Resistance Tables

Standard Chemicals

	NBR	EPDM	FKM	FFKM	CR	PVC	PP	PA	PVDF	PPS	PEEK	MS	RG	GG	GS	1.4401/1.4571	1.4305/1.4104
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www.Solenoidvalvesuk.com	-	+	0	0	0	0	+	0	0	0	+	+	+	0	0	+	+
Acetaldehyde - aqueous	-	+	0	0	0	0	+	0	0	0	+	+	+	0	0	+	+
www.Solenoidvalvesuk.com	-	0	-	0	-	0	0	0	+	+	+	-	0	0	0	0	0
Acetic acid - aqueous	-	0	-	0	-	0	0	0	+	+	+	-	0	0	0	0	0
Acetic acid ethyl ester (ethyl acetate)	-	0	-	+	-	-	0	0	0	+	+	0	+	0	0	+	+
Acetone - pure	-	+	-	+	-	-	0	+	-	+	+	+	+	+	+	+	+
Acetyl chloride	-	-	-	+	-			-	-	+		0	0	0	0	0	0
Acetylene	-	+	-		-	-	0	+		+		+		+	+	+	+
Acrylic acid ethyl ester - pure	-	0	-	+	-	-		0	+				+	+	+	+	+
Activin - aqueous (chloramine)	-	0	-	+	-	-		-		+			+	+	+	+	+
Albumin solutions	+	+	+		+	+	+	+				0	0	0	0	+	+
Alum - aqueous (potassium aluminium sulfate)	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	+	0
Aluminium chloride - aqueous	+	+	+	+	+	+	+	0	+	+	+	0	0	0	0	0	0
Aluminium sulfate - aqueous	+	+	+	+	+	+	+	0	+	+	+	-	-	-	-	0	0
Ammonia - anhydrous (liquid) (diffuses through EPDM; attacks epoxy materials)	-	0	0	+	+	0	+	+	-	0	+	0	0	+	+	+	+
Ammonia liquors (ammonium hydroxide + water)	-	+	0	0	+	0	+	+	-	0	+	-	-	+	+	+	+
Ammonium carbonate - aqueous	+	+	+	+	+	+	+	+	+	+		-	-	0	0	+	+
Ammonium citrate - aqueous	+	+	+	+	+	+	+	0		+		0	0	0	0	+	+
Ammonium fluorsilicate - aqueous	+	+	+	+	+	+	+	0		+		0	0	0	0	+	+
Ammonium hydroxide + water (ammonia liquors)	-	+	0	0	+	0	+	+	-	0	+	-	-	+	+	+	+
Ammonium oxalate - aqueous	+	+	+	+	+	+	+	0				0	0	0	0	+	+
Ammonium phosphate - aqueous	+	+	+	+	+	+	+	+	+	+		0	0	+	+	+	+
Ammonium sulfide - aqueous	+	+	0	+	+	+	+	+	+	+		-	-	0	0	+	+
Amyl acetate - pure	-	0	-	+	-	-	0	+	+	+	+	+	+	0	0	+	+

Chemical Resistance Tables

Standard Chemicals

	NBR	EPDM	FKM	FFKM	CR	PVC	PP	PA	PVDF	PPS	PEEK	MS	RG	GG	GS	1.4401/1.4571	1.4305/1.4104
Amyl alcohols - pure	+	0	+	+	+	+	+	+	+	+		+	+	0	0	+	+
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Aniline hydrochloride - aqueous																	
Anisole	0	0	-	+	-	-	-	+		+		+	+	+	+	+	+
Anthracene oil	-	-	-	+	-	-	-	+				+	+	+	+	+	+
Antimony chloride - aqueous (* acid resistant FKM compound)	0	+	+	+	+	+	+	-	+	+	+	0	0	0	0	-	-
Aqua regia	-	-	-	+	-	0	-	-	-	-	-	-	-	-	-	-	-
Argon	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Arsenic trichloride - aqueous	+	+	+	+	+	+	+	-				-	-	0	0	0	0
Aryl silicates - aqueous	0	0	0	+	0							+	+	+	+	+	+
Aspartic acid - aqueous	+	+	+	+	+	+	+	+		+		-	-	0	0	+	+
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Barium chlorate - aqueous	+	+	+	+	+	+	+	-		+		+	+	0	0	+	+
Barium hydroxide - aqueous	+	+	+	+	+	+	+	0	+	+		+	+	+	+	+	+
Benzaldehyde - aqueous	0	+	+	+	-	-	+	0	0	0	+	0	0	-		+	
Benzene sulfonic acid - aqueous	+	+	+	+	+	+	+		+	+	-	0	0	0	0	+	+
Benzoic acid - aqueous	+	+	+	+	+	+	+	-	+		+	0	0	0	0	+	+
Benzyl butyl phtalate - aqueous	-	-	-	+	-	-	0	+		0		+	+	+	+	+	+
Bisulfite - aqueous (sodium bisulfite)	0	+	+	+	+	+	+	0	+	+	+	0	0	-	-	+	0
Boric acid - aqueous	+	+	+	+	+	+	+	-	+		0	0	0	0	0	0	0
Brines	+	+	+	+	+	+	+	+	+	+	+	0	0	-	-	0	0
Butadiene	0	0	0	+	+	+	+	+	+	+		+	0	0	0	+	+
Butanediol - aqueous (10%)	+	+	0	0	0	0	0	+	+	+	+	+	+	+	0	+	+
Butinediol	0	0	0		0	0	+	+		+	+	+	+	+	0	+	+
Butyl acetate - pure	-	+	-	+	-	-	-	+	+	+	+	0	+	0	0	+	+

Chemical Resistance Tables

Standard Chemicals

	NBR	EPDM	FKM	FFKM	CR	PVC	PP	PA	PVDF	PPS	PEEK	MS	RG	GG	GS	1.4401/1.4571	1.4401/1.4571
Butyl phthalate	-	-	-	+	-	-	0	+		+		+	+	0	0	+	+
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Butyric acid - aqueous	0	0	0	0	0	0	-	0	+	+	+	0	0	-	-	+	0
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Calcium bisulfite - aqueous	+	+	+	+	+	+	+	-		+	+	-	-	0	-	+	0
Calcium hydroxide - aqueous	+	+	+	+	+	+	+	+	0	+	+	+	+	+	+	+	+
Calcium nitrate - aqueous	+	+	+	+	+	+	+	+	+	+	+	0	0	0	0	0	0
Camphor oil	+	-	+	0	-	+	-		0			0	0	0	0	+	+
Carbitol	0	0	0	+	0	+		+	+			+	+	+	+	+	+
Carbolineum	0	0	0	+	0	+	-	+				+	+	+	+	+	+
Carbon dioxide - wet	+	+	+	+	+	+	+	0	+	+	+	0	0	0	0	+	0
Carbon monoxide	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Carbonic acid - aqueous	+	+	+	+	+	+	+	0	+	+	+	0	0	0	0	+	+
Caustic potash - aqueous (potassium hydroxide)	0	+	0	+	+	0	+	0	-	0	+	0	0	0	0	+	+
Cellosolve (glycol ethyl ether)	-	-	-	+	-	-	-	+	+	+		+	+	+	+	+	+
Chloramines - aqueous (activin)	-	0	-	+	-	-	-	-	0					+	+	+	+
Chloric acid - aqueous	-	0	-	+	-	+	-	-	+			-	-	-	-	-	-
Chlorinated water (chlorine gas - wet)	-	-	0	0	-	+	-	-	+	-	-	-	-	-	-	-	-
Chlorine (gas) - wet (chlorinated water)	-	-	0	0	-	+	-	-	0	-	-	-	-	-	-	-	-
Chlorine dioxide - aqueous	-	-	-	0	-	+	0	-	0			-	-	0	0	0	0
Chloroacetic acid - aqueous	-	0	-	+	-	0	-	-	+	+	+	0	-	0	0	0	-
Chloroform - pure (trichloromethane)	-	-	0	+	-	-	-	-	+	0	+	0	0	0	0	+	0
Chlorophenol	-	-	-	+	-	0			0			+	+	0	0	+	+
Chlorosulfonic acid - pure	-	-	-	+	-	0	-	-	0	-	-	0	0	0	0	0	0
Choline chloride - aqueous	+	+	+		+	0	0					-	-	0	0		

Chemical Resistance Tables

Standard Chemicals

	NBR	EPDM	FKM	FFKM	CR	PVC	PP	PA	PVDF	PPS	PEEK	MS	RG	GG	GS	1.4401/1.4571	1.4305/1.4104
Chromium alum - aqueous	+	+	+	+	+	0	+	0	+			0	0	-	-	0	0
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Citral (citronella oil)	-	-	-		-		-	+		+		+	+	0	0	+	+
Copper acetate - aqueous	0	+	+	+	+	+	+	0	+	+	+	0	-	0	0	+	+
Copper sulfate - aqueous	+	+	+	+	+	+	+	0	+	+	+	0	0	0	0	0	0
Cyclohexane - pure	-	-	0	+	-	+	-	+	+	+	+	+	+	+	+	+	+
Cyclohexanone - pure (anone)	-	-	-	+	-	-	-	+	0	+	+	0	0	0	0	+	+
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Decahydronaphtalene (decalin) - pure	-	-	+	+	-	+	0	+		0		+	+	+	+	+	+
Diacetone alcohol - anhydrous	-	+	-	+	0			0		+		0	+	0	0	+	+
Dibutyl sebacate - pure	-	0	-	+	-	-	+	+	-	+		+	+	+	+	+	+
Dichlorethylene - pure	-	-	0	+	-	-	-	+	+	0	+	+	+	0	0	+	+
Dicyclohexyl-ammonium nitrite	+	+	+	+	+							0	0	0	+	+	+
Dimethyl amine	-	0	-	+	-	-	0	-	-	0		0	0	0	0	+	+
Dimethyl sulfoxide				+				0	-	+	0						
Dioxane - pure	-	0	-	+	-	-	-	+	-	+		+	+	+	+	+	+
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Essential oils	-	-	-	+	-	-	-	-		0		0	0	0	0	+	+
Ethanol - aqueous (ethyl alcohol)	+	+	0	+	+	+	+	0	+	+	+	+	+	+	+	+	+
Ether (diethyl ether)	-	-	-	+	0	-	+	+	+	+	+	+	+	+	+	+	+
Ethyl alcohol - aqueous (ethanol)	+	+	0	+	+	+	+	0	+	+	+	+	+	+	+	+	+
Ethyl alcohol - fermentation mash	+	+	+	+	+	+	+	0	+	+	+	+	+	0	0	+	+
Ethyl benzene - pure	-	-	0	+	-	-	-	+	+	0		+	+	+	+	+	+
Ethyl formiate	-	0	-	+	-	-	0	+	+	+		+	+	0	0	+	+
Ethylene diamine - pure	0	+	0	0	+	-	+	0	+	0		-	-	0	0	+	0

Chemical Resistance Tables

Standard Chemicals

	NBR	EPDM	FKM	FFKM	CR	PVC	PP	PA	PVDF	PPS	PEEK	MS	RG	GG	GS	1.4401/1.4571	1.4305/1.4104
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Ethylene dichloride (dichloroethane)	-	-	-	+	0	-	0	+	+	0	0	+	+	+	+	+	+
Ethylene oxide - liquid, pure	-	-	-	+	-	-	-	-	+			+	+	+	+	+	+
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Fat alcohol sulfates - aqueous	+	0	+	+	+	+	+	0	+			0	0	0	0	+	+
Ferrous/ferric chloride - aqueous	+	+	+	+	+	+	+	-	+	+	+	-	-	-	0	-	-
Fluoboric acid (borofluoric acid)	+	+	+	0	+	+	+	-	+	0		-	-	-	-	-	-
Fluorine (wet) - pure	-	-	-	0	-	0	-	-	-	-	-	-	-	-	0	0	0
Fluosilicic acid - aqueous	0	0	0	+	0	+	+	-	+	-		-	-	-	-	0	0
Formamide - pure	+	+	0	+	+	+	0	0		0		0	0	0	0	+	0
Formic acid - concentrated	-	0	-	0	+	+	+	-	+	+	0	0	0	-	-	+	0
Freon 113	+	+	+	0	+	+	0	+	+	+	+	+	+	+	+	+	+
Freon 13	+	0	0	0	0												
Freon 22	-	-	-	0	+	+	0	+		+	+	+	+	+	+	+	+
Freon 502	-	-	-	0	0	+	0	+	0		+	+	+	+	+	+	+
Freon substitute HFCKW 134a			-	-						+	+	+	+	+	+	+	+
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Gas liquor	+	-	0		-	0						-	-	0	0	+	+
Glucose - aqueous	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Glycocol - aqueous (aminoacetic acid)	0	+	+		+	+	+	0	+	+		0	0	0	0	+	+
Glycol ethyl ether (cellosolve)	-	-	-	+	-	-	-	+	+	+		+	+	+	+	+	+
Grape sugar - aqueous	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
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Helium	+	+	+	+	+	0	0	0	+	+	+	0	0	0	0	+	+
Hexamethylene tetramine - aqueous	+	+	+	+	+	+	+	+		0		0	0	0	0	+	+
Hydrazine hydrate - aqueous	-	+	+	+	-	+	+		0		+	-	0	0	0	0	0
Hydrochloric acid - aqueous	-	0	0	+	-	+	+	-	+	-	0	-	-	-	-	-	-

Chemical Resistance Tables

Standard Chemicals

	NBR	EPDM	FKM	FFKM	CR	PVC	PP	PA	PVDF	PPS	PEEK	MS	RG	GG	GS	1.4401/1.4571	1.4305/1.4104
Hydrochloric acid (gas) - pure www.Solenoidvalvesuk.com	0	0	0	+	0	+	+	-	+	-	+	0	0	0	0	0	0
Hydrofluoric acid - aqueous (* acid resistant FKM compound))	0	0	0*	0	0	0	+	-	+	-	-	-	-	-	-	0	-
Hydrogen peroxide 0,5%	0	+	+	+	-	+	+	+	+	0	+	-	-	-	-	0	+
Hydrogen sulfide - aqueous	0	+	+	+	0	0	0	-	+	0	+	0	0	0	0	+	0
Hydroxylamine sulfate - aqueous www.Solenoidvalvesuk.com	+	+	+	+	0	+	+	+				-	-	+	+	+	+
Illuminating gas	+	+	+	+	+	+		+	+			+	+	+	+	+	+
Iodine+Potassium Iodide - aqueous	0	0	0	+	0	0	0	-	+	-	0	-	-	0	0	0	0
Isooctane - pure www.Solenoidvalvesuk.com	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Kerosene www.Solenoidvalvesuk.com	+	-	+	+	+	+	0	+	+	+	+	+	+	0	0	+	+
Lactic acid	0	0	+	+	+	0	+	0	+	+	+	0	0	0	0	0	0
Lead acetate - aqueous	0	+	+	+	+	+	+	+	+	+	+	0	0	-	-	+	+
Lead tetraethyl - pure (tetraethyl lead)	0	0	+	+	0	+	+	+	+			0	0	+	+	+	+
Lithium chloride - aqueous www.Solenoidvalvesuk.com	+	+	+	+	0	+	+	0	+	+	+	0	0	0	0	0	0
Magnesium chloride - aqueous	+	+	+	+	0	+	+	0	+	+	+	0	0	0	0	0	0
Maleic acid - aqueous	+	+	+	+	+	+	+	0	+	+	+	0	0	0	0	+	0
Manganese sulfate	+	+	+	+	+	+	+	+	+	+		0	+	0	0	+	0
Mercaptanes	-	-	0	+	-	+		+	0			0	0	-	-	+	+
Mercury chloride	+	+	+	+	+	0	+	-	+	+	+	-	-	-	-	0	0
Methane - pure	+	-	+	+	+	+	0	+	+	+	+	+	+	0	0	+	+
Methoxybutanol	+	+	+	+	0	+	+			+		+	+	+	+	+	+
Methyl alcohol (methanol)	-	0	-	+	0	0	0	0	0	+	+	0	+	0	0	+	+
Methyl amine - aqueous	-	0	0	+	0	0	+	0	-	0	+	-	-	0	0	0	0
Methyl ethyl ketone - pure	-	0	-	+	-	-	-	0	-	0	0	+	+	0	0	+	+
Morpholine - pure	-	0	0	+	0	-	+		+	0		+	+	+	+	+	+

Chemical Resistance Tables

Standard Chemicals

	NBR	EPDM	FKM	FFKM	CR	PVC	PP	PA	PVDF	PPS	PEEK	MS	RG	GG	GS	1.4401/1.4571	1.4305/1.4104
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Natural gas	+	-	+	+	+	+	0	+	+	+	+	0	0	0	0	+	+
Nitric acid - aqueous (40%)	-	0	+	+	-	0	0	-	+	-	0	-	-	-	-	0	0
Nitrobenzoic acids - wässrig	+	+	+	+	+	+	+	+	+	+	+	+	+	0	0	+	+
Nitrogen oxides - gaseous, wet and dry (NO, NO ₂ , N ₂ O ₄)	-	0	-	0	-	0	0	-	0	+	-	-	-	-	0	+	+
Nitrous oxide	+	+	0	+	+	+	+	+	-	+	+	+	+	+	+	+	+
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Oleum (fuming sulfuric acid)	-	-	0	+	-	0	0	-	-	0	-	-	-	0	0	+	0
Oxygen (under pressure not permitted)	+	0	+	+	0	+	+	+	+	+	+	+	+	+	+	+	+
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Paraffin oil	+	-	+	+	0	0	+	+	+	+	+	+	+	+	+	+	+
Perchloroethylene (tetrachlorethylene) - pure	-	-	0	0	-	0	0	0	+	0	+	0	0	+	0	0	0
Petrolether	+	-	+	+	+	+	0	+	+	+	+	+	+	0	0	+	+
Phosgene (gaseous) - pure		-	+	+	-	+	-	0	+			+	+	+	+	+	+
Phosphor chloride - pure	-	-	0	+	-	-	+	-	+		+		0	0	0	0	0
Picric acid (trinitrophenol)	0	-	0	+	-	-	+		+		+	+	+	+	+	+	+
Potash (potassium carbonate)	+	+	+	+	0	+	+	0	-	+	+	0	0	0	0	+	+
Potassium bifluoride - aqueous	+	+	+		+	+	+	-				0	0	0	0	+	+
Potassium bromide - aqueous	+	+	+	+	+	+	+	-	+	+	+	+	+	0	0	0	0
Potassium chlorate - aqueous	0	0	0	+	0	+	+	0	0	-	+	0	0	0	0	0	0
Potassium chromate - aqueous	0	+	0	+	0	+	+	-	+	+		+	+	0	0	0	0
Potassium dichromate - aqueous	0	0	0	+	0	+	+	-	+	-	+	0	0	0	0	+	+
Potassium ferrocyanide (yellow potassium prussiate) - aqueous	+	+	+	+	+	+	+	+	+		+	+	+	0	0	0	-
Potassium hypochlorite - aqueous	-	0	0	+	-	+	0	-	+	-	+	0	0	0	0	0	0
Potassium nitrate - aqueous	+	+	+	+	0	0	+	+	+	+	+	0	0	0	0	0	0

Chemical Resistance Tables

Standard Chemicals

	NBR	EPDM	FKM	FFKM	CR	PVC	PP	PA	PVDF	PPS	PEEK	MS	RG	GG	GS	1.4401/1.4571	1.4305/1.4104
Potassium permanganate - aqueous	-	-	-	+	0	+	0	-	+	-	+	0	0	0	0	+	0
Potassium persulfate - aqueous	-	+	0	+	0	+	+	-	0	-	+	-	-	-	-	+	+
Potassium sulfate - aqueous	+	+	+	+	+	+	+	+	+	+	+	+	+	0	0	+	+
Potassium sulfite - aqueous	+	+	+	+	+	0	+	+			+	0	+	0	0	+	0
Propanol (isopropanol)	+	+	+	+	+	+	+	0	+	+	+	+	+	+	+	+	+
Pyridine - pure	-	-	-	+	-	-	0	0	0	0	+	+	+	+	+	+	0
www.Solenoidvalvesuk.com																	
Silicon oil	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Sodium arsenate, sodium arsenite	+	+	+	+	+	+	+					+	+	+	+	+	+
Sodium bicarbonate - aqueous	+	+	+	+	+	+	+	+	+	+	+	0	+	0	0	+	+
Sodium bisulfite - aqueous (bisulfite)	0	+	+	+	+	+	+	+	+		+	0	0	-	-	+	0
Sodium bromide - aqueous	+	+	+	+	+	+	+	-	+	+	+	0	0	0	0	0	0
Sodium chloride - aqueous (common salt)	+	+	+	+	+	+	+	+	+	+	+	0	0	0	0	0	0
Sodium chloroacetates	+	+	+	+	+	+	+					0	+	0	0	+	+
Sodium cyanide - aqueous	+	+	+	+	+	+	+	+	+		+	-	-	0	0	+	+
Sodium fluoride - aqueous	+	+	+	+	+	+	+	+	+			+	+	0	0	+	0
Sodium hydroxide - aqueous (caustic soda)	0	+	0	+	+	0	+	0	-	0	+	0	0	0	0	+	+
Sodium iodide - aqueous	+	+	+	+	+	0	+		+	0		0	0	0	0	0	0
Sodium nitrate - aqueous	+	+	+	+	0	0	+	+	+	+	+	0	0	0	0	0	0
Sodium pentachlorophenolate	+	+	+		+	+	+	+				+	+	0	0	+	+
Sodium persulfate - aqueous	0	+	+	+	+	+	+	-	+	-		-	-	-	-	+	0
Sodium pyrosulfite	0	+	+		+	+	+	+				0	0	-	-	+	0
Sodium stannate	+	+	+	+	+	+	+	0				0	0	+	+	+	+
Sodium sulfide - aqueous	+	+	+	+	+	+	+	+	0	+	+	0	-	0	0	+	+

Chemical Resistance Tables

Standard Chemicals

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	NBR	EPDM	FKM	FFKM	CR	PVC	PP	PA	PVDF	PPS	PEEK	MS	RG	GG	GS	1.4401/1.4571	1.4305/1.4104
Sodium tartrate	+	+	+	+	+	+	+	+				+	+	0	0	+	+
Sodium zincate	0	+	+		+									+	+	+	+
Solvent naphtha (Shellsol D 60 and D 70)	0	-	0	+	0	0	0	+	+	+	+	+	+	+	+	+	+
Steam (Rubber seals up to 130 °C, *acid resistant FKM compound)	0	+	+	+	0	-	-	-	+	0	+	0	+	+	+	+	+
Styrene	-	-	0	+	-	-	0	+	+		+	0	0	0	0	+	+
Sulfur chlorides and oxychlorides	-	-	+	+	-	-	-	-	+		+	0	0	0	0	+	-
Sulfur dioxide (gas) - wet	-	+	+	+	-	+	+	0	+	0	+	-	-	-	0	+	0
Sulfur hexafluoride	+		+	0	+	+	+	+	+		+	+	+	+	+	+	+
Sulfuric acid - concentrated	-	-	0	+	-	+	+	-	+	0	-	-	-	+	+	+	0
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Tall oil	0	0	0		0	+	+	+	+			-	-	-	-	+	0
Tar oil (carbolineum)	0	0	0	+	0	+	-	+				+	+	+	+	+	+
Tetrachloroethylene (perchloroethylene)	-	-	0	0	-	0	0	-	+	0	+	0	0	+	0	0	0
Tetrahydrofuran - pure	+	-	-	+	-	-	0	+	-	0	+					+	+
Thiophene - pure	-	-	-	+	-	-	0					0	0	0	0	+	+
Toluene - pure	-	-	-	+	-	-	0	+	0	0	+	0	0	0	0	+	+
Trichloroacetic acid - aqueous	0	0	-	+	0	+	0	-	0	+		-	-	-	-	-	-
Trichloromethane (chloroform)	-	-	0	+	-	-	-	-	+	0	+	0	0	0	0	+	0
Triethanolamine - pure	-	-	-	+	+	-	+	0	+			0	0	0	0	+	+
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Uranium hexafluoride	+	+	+	0	+	+	+	-						-	-	+	0
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Vinyl acetate - pure	+	+	+	+	+	-	+		0	+		0	0	0	0	+	+

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Chemical Resistance Tables

Standard Chemicals

	NBR	EPDM	FKM	FFKM	CR	PVC	PP	PA	PVDF	PPS	PEEK	MS	RG	GG	GS	1.4401/1.4571	1.4305/1.4104
www.Solenoidvalvesuk.com																	
Waste gases- with nitrous gases	0	+	+	+	+	+	+	-	+			-	-	0	0	+	+
Waste gases- with carbon monoxide	+	+	+	+	+	+	+	+	+	+		+	+	+	+	+	+
Waste gases- with hydrogen fluoride	+	+	+	+	+	+	+	0	+	-		0	0	0	0	0	0
Waste gases- with sulfur trioxide (dry)	0	+	+	+	+	+	+	+	+			0	0	0	+	+	+
Water - distilled	0	0	0	+	0	+	+	+	+	0	+	0	+	-	-	+	0
Wood tar, Wood oil (impregnating oils)	-	-	-	+	-	0	-	+		+		+	+	0	0	+	+
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Xenon	+	+	+	+	-	-	-	+	+	+	+	+	+	-	-	+	+
www.Solenoidvalvesuk.com																	
Yeast - aqueous	+	+	+	+	+	+	+	+	+		+	0	0	0	0	+	+
www.Solenoidvalvesuk.com																	
Zinc chloride - aqueous	+	+	+	+	+	+	+	-	+	+	+	-	-	-	-	0	-

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Chemical Resistance Tables

Commercial Chemicals

	NBR	EPDM	FKM	FFKM	CR	PVC	PP	PA	PVDF	PPS	PEEK	MS	RG	GG	GS	1.4401/1.4571	1.4305/1.4104
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Acronal dispersions (polyacrylic acid esters for adhesives)	-	+	+		+	-	+	0	+			0	0	0	0	+	+
Aniseed oil	0				-	-	-	+	0			+	+	0	0	+	+
Antifrogen-N	+	+	+		+	+	+	+	0			0	0	0	0	+	+
ASTM-fuel B	0	-	0	+	-	0	0	+				+	+	+	+	+	+
ASTM-oil no. 1	+	-	+	+	+	+	0	+				+	+	+	+	+	+
ASTM-oil no. 3	0	-	0	+	+	+	0	+	+			+	+	+	+	+	+
www.Solenoidvalvesuk.com																	
Beeswax	+	+	+		+	+	+	-	+			+	+	0	0	+	+
Brake fluid (ATE Brake fluid)	-	+	-	+	0	0	0	+	+	+		0	0	+	+	+	+
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Castor oil	0	-	0	+	0	0	0	+	+	+	+	0	0	0	0	+	+
Chlophene (chlorinated diphenyl)	+	0	+		-	-	+					+	+	0	+	+	+
Coconut oil	0	-	0	+	0	0	0	+	+	+	+	0	0	0	0	+	+
Common salt (sodium chloride)	+	+	+	+	+	+	+	+	+	+	+	0	0	0	0	0	0
Cyclanone (fatty alcohol sulfonate)	+	+	+		+	+	+	+						0	0	+	+
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Desmodur T (polyisocyanate)	-	-	+		-							+	+	+	+	+	+
Detergents (synt. detergents)	0	+	0	+	+	+	0	0	+	+		0	0	0	0	+	+
Diesel fuel - pure	+	-	+	+	0	0	0	+	+	+	+	+	+	+	+	+	+
www.Solenoidvalvesuk.com																	
Fats, fatty oils	0	-	0	+	0	0	0	+	+	+	+	0	0	0	0	+	+
Fuel oils	0	-	0	+	0	0	0	+	+	+		0	0	0	0	+	+
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Gelatine - aqueous	+	+	+	+	+	+	+	+	+		+	0	0	0	0	+	+
www.Solenoidvalvesuk.com																	
Hair shampoo	0	0	0		0	+	0	+	+		+	0	0	0	0	+	+
Hydraulic fluids, oil-in-water emulsions (HSA)	0	-	+	+	0	+	+	+	+		+	+	+	+	+	+	+
Hydraulic fluids, polyglycol-water solutions (HSC)	+	+	+	+	0	+	+	+			+	+	+	+	+	+	+

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Commercial Chemicals

	NBR	EPDM	FKM	FFKM	CR	PVC	PP	PA	PVDF	PPS	PEEK	MS	RG	GG	GS	1.4401/1.4571	1.4305/1.4104
--	-----	------	-----	------	----	-----	----	----	------	-----	------	----	----	----	----	---------------	---------------

www.Solenoidvalvesuk.com Impregnating oils (wood tar)	-	-	-	+	-	0	-	+		+		+	+	0	0	+	+
www.Solenoidvalvesuk.com Kerosene - pure	+	-	+	+	0	+	+	+	+	+	+	+	+	+	+	+	+
www.Solenoidvalvesuk.com Linseed oil	0	-	0	+	0	0	0	+	+	+	+	0	0	0	0	+	+
Lubricating oils for drills and saws	0	-	0	+	0	+	0	0				+	+	+	+	+	+
www.Solenoidvalvesuk.com Machine oils (see a) paraffin oil b) mineral oils; lubricating oils)	+	-	+	+	0	0	+	+	+	+	+	+	+	+	+	+	+
Mineral oils - free from aromatic hydrocarbons	+	-	+	+	0	0	+	+	+	+	+	+	+	+	+	+	+
www.Solenoidvalvesuk.com Nekal BX - aqueous (wetting agents for textiles)	+	+	+	0	+	+	+		0		0	0	0			+	+
www.Solenoidvalvesuk.com Olive oil	0	-	0	+	0	0	0	+	+	+	+	0	0	0	0	+	+
www.Solenoidvalvesuk.com Petrol (gasoline)-benzene mix (super/premium fuel + methanol)	-	-	0	+	-	-	-	0		+	+	0	0	+	+	+	+
Pine-needle oil	0	-	+	+	-	0	+		0		0	0				+	+
Pydraul-A 200	-	0	+		-			+				-	0	0		+	
Pydraul-F-9	-	+	+		-			-				-	0	0		+	
www.Solenoidvalvesuk.com Sagrotan (phenols)	0	0	0	+	0	+	+	-	0	+	0	0	0	0	0	+	+
Skydrol 7000	-	+	-	+	-	-		0				-	0	0	0	+	+
Soda (sodium carbonate)	+	+	+	+	0	+	+	+	0	+	+	0	0	0	0	+	+
Spruce oil	0	-	+	+	-	0	+		0		0	0				+	+
www.Solenoidvalvesuk.com Transformer oil (see mineral oils or if applicable chlophene)																	
Turpentine substitute	0	-	0	+	0	0	0	+	+	+	+	+	+	+	+	+	+
www.Solenoidvalvesuk.com UV - protective	-	+	-		-												
Vaseline oil (mineral oils)	+	-	+	+	0	0	+	+	+	+	+	+	+	+	+	+	+
Water-glass (sodium silicate)	+	+	+	+	+	+	+	+	+	+	+	0	0	+	+	+	+

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Chemical Resistance Tables

Food and Beverages

Apple juice, apple puree

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Beer

Buttermilk

Corn (maize) oil

Fruit juices

Milk

Orange juice

Rape-seed oil

Soya oil

Sugar solutions

Wines

	NBR	EPDM	FKM	FFKM	CR	PVC	PP	PA	PVDF	PPS	PEEK	MS	RG	GG	GS	1.4401/1.4571	1.4305/1.4104
Apple juice, apple puree						+	+	+			+	-			-	+	+
Beer	+	+	+		+	+	+	+	+	+	+	+	+	-	-	+	+
Buttermilk	+	+	+		+	+	0	-	+	+		0	0	-	-	+	+
Corn (maize) oil	0	-	0	+	0	0	0	+	+	+	+	0	0	0	0	+	+
Fruit juices	0	0	0		0	0	0	0	+		+	-	-	-	-	+	+
Milk	+	+	+		+	+	+	+	+	+	+	0	+	-	-	+	+
Orange juice						+											+
Rape-seed oil	0	-	0	+	0	0	0	+	+	+	+	0	0	0	0	+	+
Soya oil	0	-	0	+	0	0	0	+	+	+	+	0	0	0	0	+	+
Sugar solutions	+	+	+		+	+	+	+	+	+		+	+	0	0	+	+
Wines	+	+	+		+	+	+	-	+	+	+	-	-	-	-	+	+

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