BLÜCHER®
A WATTS Brand

TECHNICAL SHEET

CHEMICAL RESISTANCE TABLE

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 BLÜCHER products for aggressive fluids, the following tables provide useful information on the optimal choice of the stainless steel grade and gasket material for a multitude of media.

Since corrosion performance is influenced by several factors, the information contained in this document 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.

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 BLÜCHER products, we strongly recommend the prior testing of material samples 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 emphasised 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.

BLÜCHER does not assume any liability for your selection. No claims on the basis of an incorrect advice can be made from the use of the Chemical Resistance Chart. Neither warranty claims, guarantee claims, nor claims for damages can be derived. We also reserve the right to change, update, or modify all information in this chart without notice.

STRUCTURE AND CONTENT OF THE CHEMICAL RESISTANCE CHARTS

The following chemical resistance tables are divided into three categories. These are basic chemicals, liquid commercial products, and liquid food ingredients.

The resistance of these fluids is rated in detail for the materials commonly used in BLÜCHER products.

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 con- sidered.

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CHEMICAL RESISTANCE TABLE

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

CHEMICALS	FORMULA	NBR	EPDM	FPM	AISI 316L	AISI 304
A						
Acetaldehyde – aqueous	CH_3CHO	-	+	O	+	+
Acetaldehyde – pure	CH_3CHO	-	+	-	+	+
Acetic acid – pure	CH_3COOH	-	O	-	O	O
Acetic anhydride – pure	$CH_3COOCOCH_3$	-	O	-	O	O
Acetoacetic ester (acid-free) – pure	$CH_3COCH_2COOC_2H_5$	-	-	-	+	+
Acetone – pure	CH_3COCH_3	-	+	-	+	+
Acetophenone – pure	$C_6H5COCH_3$	-		-	+	+
Acetylacetone – pure	$CH_3COCH_2COCH_3$	-	-	-	+	+
Acetylchloride – pure	CH_3COCl	-	-	-	O	O
Acetylene – technical	$HCCH$	-	+	-	+	+
Acrylonitrile – pure	CH_2CHCN	-	-	-	+	+
Adipic acid – aqueous	$HOOC(CH_2)_4COOH$	+	+	+	+	+
Albumin – pure		+	+	+	+	+
Allyl alcohol – pure	CH_2CHCH_2OH	+	+	O	+	+
"Alum (potassium aluminium sulphate) – aqueous"	$KAl(SO_4)_2 \times 12\ H_2O$	+	+	+	+	O
Aluminium acetate – aqueous	$Al(OOCCH_3)_3$	O	+	+	+	+
Aluminium chloride – aqueous	$AlCl_3$	+	+	+	O	O
Aluminium fluoride – aqueous	AlF_3	+	+	+	-	-
Aluminium sulphate – aqueous	$Al(SO_4)_3$	+	+	+	O	O
Aminoacetic acid (glycine) – aqueous	NH_2CH_2COOH	O	+	+	+	+
Ammonia (gaseous) – pure	NH_3	-	+	O	+	+
Ammonia (liquid) – pure	NH_3	-	O	O	+	+
Ammonia water (ammonia solution, ammonium hydroxide)	NH_4OH	-	+	O	+	+
Ammonium acetate – aqueous	CH_3COONH_4	+	+	+	+	+
Ammonium carbonate – aqueous	$(NH_4)_2CO_3$	+	+	+	+	+
Ammonium chloride – aqueous	NH_4Cl	+	+	+	O	O
Ammonium citrate – aqueous		+	+	+	+	+
Ammonium fluoride – aqueous	NH_4F	+	+	+	O	O
Ammonium fluosilicate – aqueous		+	+	+	+	+
Ammonium formate – aqueous	$HNCOONH_4$	+	+	+	+	+
Ammonium hydroxide (ammonia solution, ammonia water) – aqueous	NH_4OH	-	+	O	+	+
Ammonium nitrate – aqueous	NH_4NO_3	+	+	+	+	+
Ammonium oxalate – aqueous	$NH_4OOCCOONH_4$	+	+	+	+	+
Ammonium persulphate – aqueous	$(NH_4)_2S_2O_8$	-	+	+	O	O
Ammonium phosphate – aqueous	$(NH_4)_2HPO4$	+	+	+	+	+
Ammonium sulphate – aqueous	$(NH_4)_2SO_4$	+	+	+	O	O
Ammonium sulphide – aqueous	$(NH_4)_2S$	+	+	O	+	+
Ammonium sulphite – aqueous	$(NH_4)_2SO_3$	+	+	+	+	O
mmonium thiocyanate – aqueous	NH_4NCS	+	+	+	+	+
Amyl acetate – pure	$CH_3COO(CH_2)4CH_3$	-	O	-	+	+
Amyl alcohol – pure	$H_3C(CH_2)4OH$	+	O	+	+	+
Aniline hydrochloride – aqueous	C_6H5NH_3Cl	O	+	O	-	-
Aniline – pure	C_6H5NH_2	-	O	O	+	+
Anisole (methoxybenzene) – pure	C_6H5OCH_3	O	O	-	+	+
Anone (cyclohexanone) – pure	$C_6H_{10}O$	-	-	-	+	+
Anthracene oil – pure		-	-	-	+	+
"Anthraquinone sulphonic acid – aqueous"	$C_6H_4COCOC_6H_4SO_3H$	O	+	+	O	O
Antimony chloride – aqueous	$SbCl_3$	O	+	+	-	-
Aqua regia	HNO_3 + HCl	-	-	-	-	-
Arabic acid – aqueous		+	+	+	+	+
Argon – pure	Ar	+	+	+	+	+
Arsenic acid – aqueous	H_3ASO_4	+	+	+	+	+
Arsenic trichloride – aqueous	$AsCl_3$	+	+	+	O	O
Arsenious acid – aqueous	H_3AsO_3	+	+	+	+	+
Arylsilicate – aqueous	O	O	O	+	+	
Ascorbic acid – aqueous	$C_6H_8O_6$	+	+	+		
Aspartic acid – aqueous	$HOOCCHNH_2CH_2$-COOH	+	+	+	+	+
B						
Barium chlorate – aqueous	$Ba(ClO_3)_2$	+	+	+	+	+
Barium chloride – aqueous	BaCl2	+	+	+	+	O
Barium hydroxide – aqueous	$Ba(OH)_2$	+	+	+	+	+
"Barium sulphide and polysulfide – aqueous"	BaS	+	+	+	+	+
Battery acid (sulphuric acid 20%)	H_2SO_4	O	+	+	+	O
Benzaldehyde – aqueous	C_6H_5CHO	O	+	+	+	
Benzene – pure	C_6H6	-	-	-	+	+
Benzenesulfonic acid – aqueous	$C_6H_5SO_3H$	+	+	+	+	+
Benzidine sulphonic acids – aqueous	$NH_2C_6H4C_6H_3$- SO_3HNH_2	+	+	+	+	+
Benzine (heptane, hexane) – pure		+	-	+	+	+
Benzoic acid – aqueous	C_6H_5COOH	+	+	+	+	+
Benzyl alcohol – pure	$C_6H_5CH_2OH$	-	+	O	+	+
Bergamot oil		-	-	-	+	+

CHEMICALS	FORMULA	NBR	EPDM	FPM	AISI 316L	AISI 304
"Bisulphite (sodium bisulphite, sodium hydrogen sulphide) – aqueous"	$NaHSO_3$	O	+	+	+	O
Borax – aqueous	$N_2B_4O_7$	+	+	+	+	+
Boron hydrofluoric acid (fluoroboric acid) – pure	HBF_4	+	+	+	-	-
Boric acid – aqueous	H_3BO_3	+	+	+	O	O
Brine (cooling brine)		+	+	+	O	O
Bromine (liquid) – pure	Br_2	-	-	-	O	O
Butadiene – pure	$CH_2(CH)_2CH_2$	O	O	O	+	+
Butane (gaseous and liquid) – pure	C_4H_{10}	+	-	+	+	+
Butanediol – aqueous (10%)	$HO(CH_2)_4OH$	+	+	O	+	+
Butanol (butyl alcohol) – pure	$CH_3(CH_2)_3OH$	O	+	+	+	+
Butoxyl (methoxybutyl acetate) – pure	$CH_3OC_4H_4O_2CCH_3$	+	O	O	+	+
Butyl acetate – pure	$CH_3(CH_2)_3O_2CCH_3$	-	+	-	+	+
Butyl alcohol (butanol) – pure	$CH_3(CH_2)_3OH$	O	+	+	+	+
Butylbenzyl phthalate – aqueous		-	-	-	+	+
Butylene (liquid) – pure	$H_3CCH_2CHCH_2$	+	O	+	+	+
Butyl phthalate – pure	$C_6H4(CO)_2(O(CH_2)_3CH_3)_2$	-	-	-	+	+
Butynediol – pure	$HOCH_2C_2CH_2OH$	O	O	O	O	+
Butyric acid – aqueous	$H_3C(CH_2)_2COOH$	O	O	O	+	O
C						
Calcium chloride – aqueous	$CaCl^2$	+	+	+	O	O
Calciumhydrogensulphite – aqueous	$Ca(HSO_3)_2$	+	+	+	+	O
"Calcium hydroxide (lime water) – aqueous"	$Ca(OH)_2$	+	+	+	+	+
"Calcium hypochlorite (chlorinated lime) – aqueous"	$Ca(OCl)_2$	-	+	O	O	O
Calcium nitrate – aqueous	$Ca(NO_3)_2$	+	+	+	O	O
"Carbitol (2-(2-ethoxyethoxy)ethanol) – pure"	$CH_3CH_2O(CH_2)_2$-$O(CH_2)_2OH$	O	O	O	+	+
Carbolineum (creosote) – pure	O	O	O	+	+	
"Carbolic acid (phenol, hydroxybenzene) – aqueous"	C_6H_5OH	O	O	O	+	+
Carbon dioxide (dry) – pure	CO_2	+	O	+	+	+
Carbon dioxide (humid)	CO_2	+	O	O	+	+
Carbon disulphide – pure	CS_2	-	-	+	+	O
Carbonic acid – aqueous	$H2CO_3$	+	+	+	+	+
"Carbonyl chloride (phosgene) [liquid] – pure"	$COCl_2$	-	O	+	+	
"Carbonyl chloride (phosgene) [gaseous] – pure"	$COCl_2$	-	+	+	+	
Carbon monoxide – pure	CO	+	+	+	+	+
Carbon tetrachloride – pure	CCl4	-	-	+	+	+
"Caustic potash (potassium hydoxide) – aqueous"	KOH	-	+	-	+	+
Cellosolve (glycol ethyl ether) – pure	$HO(CH_2)_2OCH_2CH_3$	-	-	-	+	+
Champhor oil – pure	+	-	+	+	+	
Chloral hydrate (chloral) – aqueous	$CCl_3CH(OH)_2$	-	O	O	O	O
Chloric acid – aqueous	$HClO_3$	-	O	-	-	-
"Chlorinated lime (calcium hypochlorite) – aqueous"	$Ca(OCl)_2$	-	+	O	O	O
"Chlorine bleaching lye (sodium hypochlorite) – aqueous"	NaOCl	-	O	O	O	O
Chlorine dioxide – aqueous	ClO_2	-	-	O	O	O
Chlorine (gaseous and dry)	Cl_2	-	-	O	O	O
Chlorine (gaseous and humid)	Cl_2	-	-	O	-	-
Chlorine (liquid) – pure	Cl_2	-	-	O	+	+
Chlorine water (humid)	Cl_2	-	-	O	-	-
Chloroacetic acid – aqueous	$ClCH_2COOH$	-	O	-	O	-
Chlorobenzene – pure	C_6H_5Cl	-	-	-	+	+
"Chloroethanol (ethylene chlorohydrine) – pure"	$ClCH_2CH_2OH$	-	-	O	+	+
Chlorofluorocarbons (frigenes)						
Chloroform (trichloromethane) – pure	$CHCl_3$	-	-	O	+	+
Chloromethane (methyl chloride) – pure	CH_3Cl	-	-	O	+	+
Chloronaphthalone – pure	$C_{10}H_7Cl$	-	-	O	+	+
Chlorophenole – pure	C_6H_4OHCl	-	-	-	+	+
Chlorophenoxyacetic acid – aqueous	$ClC_6H_4OCHOOH$	+	+	+	+	+
Chlorosulfonic acid – pure	$ClSO_3H$	-	-	-	O	O
Chloroxylenol (4-Chloro-$_3$,5-dimethyl- phenol) – pure	$C_6H_2OH(CH_3)_2Cl$	-	-	-	+	+
Choline chloride – aqueous	$[HOCH_2CH_2N(CH_3)_3]Cl$	+	+	+		

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CHEMICALS	FORMULA	NBR	EPDM	FPM	AISI 316L	AISI 304
Chrome alum (chromium(III) – potassium sulphate) – aqueous	$KCr(SO_4)_2$ x 12 H_2O	+	+	+	O	O
Chromic acid – aqueous	H_2CrO_4	-	O	+	O	O
Chromium sulphate – aqueous	$Cr_2(SO_4)_3$	+	+	+	O	O
Citral (citronella oil) – pure		-	-	-	+	+
Citric acid – aqueous	$C_6H_8O_7$	+	+	+	+	O
Colophonium (tall oil) (liquid)		O	O	O	+	O
Cooling brine (brine)		+	+	+	O	O
Copper acetate – aqueous	$Cu(CH_3COO)_2$	O	+	+	+	+
Copper chloride – aqueous	$CuCl_2$	+	+	+	-	-
Copper sulphate – aqueous	$CuSO_4$	+	+	+	O	O
Creosote (carbolineum) – pure	O	O	O	+	+	
Cresol – aqueous	$C_6H_4(OH)(CH_3)$	-	-	O	+	O
Cyclohexane – pure	C_6H_{12}	-	-	O	+	+
Cyclohexanol – pure	$C_6H_{11}OH$	-	-	+	+	+
Cyclohexanone (anone) – pure	$C_6H_{10}O$	-	-	-	+	+
Cymene – pure	$C_6H4(CH_3)[CH(CH_3)_2]$	-	-	-	+	+
D						
Decahydronaphthalene (decalin) – pure	$C_{10}H_{18}$	-	-	+	+	+
Dextrose (glycose) – aqueous	$C_6H_{12}O_6$	+	+	+	+	+
Diacetone alcohol (anhydrous) – pure	$(CH_3)_2COHCH_2COCH_3$	-	+	-	+	+
Dibutyl phthalate – pure	$C_6H_4(COOC_4H_9)_2$	-	O	-	+	+
Dibutyl sebacate (DBS) – pure	"$(C_4H_9COO)(CH_2)_8$-(OOC_4H9)"	-	O	-	+	+
"Dichloroethane (ethylene chloride) – pure"	$ClCH_2CH_2Cl$	-	-	-	+	-
Dichloroethene – pure	Cl_2CHCH_3	-	-	O	+	+
"Dichloromethane (methylene chloride) – pure"	CH_2Cl_2	-	-	O	+	+
Dicyclohexylammonium nitrate – pure	$[(C_6H11)_2NH_2]NO_2$	+	+	+	+	+
Diethyl ether (ether) – pure	$CH_3CH_2OCH_2CH_3$	-	-	-	+	+
Dimethylamine – pure	$(CH_3)_2NH$	-	O	-	+	+
Dimethylformamide (DMF) – pure	$HCON(CH_3)_2$	-	-	-	+	+
Dimethyl sulfoxide (DMSO) – pure	$(CH_3)_2SO$					
Dinitrogen monoxide (laughing gas, nitrous oxide) – pure	N_2O	+	+	+	+	+
Di-octyl-phthalate (DOP) – pure	$C_6H4(COOC8H17)_2$	-	O	O	+	+
Dioxane – pure	C_4H_8O	-	O	-	+	+
Diphenyl + diphenyl oxide – pure	-	-	-	+	+	
Dissous gas (acetylene + acetone)	C_2H_2+ CH_3COCH_3	-	+	-	+	+
E						
Essential oils		-	-	-	+	+
Ethane – pure	CH_3CH_3	+	-	+	+	+
Ethanedioic acid – aqueous (saturated)	HOOCCOOH	O	+	+	+	O
Ethanol (ethyl alcohol) – pure	CH_3CH_2OH	O	+	O	+	+
Ethanolamine – pure	$NH_2CH_2CH_2OH$	O	O	-	+	+
Ether (diethyl ether) – pure	$CH_3CH_2OCH_2CH_3$	-	-	-	+	+
Ethyl acetate – pure	$CH_3CO_2CH_2CH_3$	-	O	-	+	+
Ethyl acrylate – pure	$CH_2CHCOOC2H5$	-	O	-	+	+
Ethyl alcohol (ethanol) – pure	CH_3CH_2OH	O	+	O	+	+
Ethyl alcohol + acetic acid	CH_3CH_2OH+ CH_3COOH	O	+	O	+	+
Ethyl alcohol – fermented mash		+	+	+	+	+
Ethyl alcohol – methylated (spirit)		O	O	O	+	+
Ethylbenzene – pure	$C_6H_5CH_2CH_3$	-	-	O	+	+
Ethyl chloride – pure	CH_3CH_2Cl	+	+	+	+	+
Ethylene – pure	CH_2CH_2	+	-	+	+	+
Ethylene bromide (anhydrous) – pure	CH_2CHBr	-	-	-	+	+
"Ethylene chlorohydrin (chloroethanol) – pure"	$ClCH_2CH_2OH$	-	-	O	+	+
"Ethylene chloride (dichloroethane) – pure"	$ClCH_2CH_2Cl$	-	-	-	+	-
Ethylenediamine – pure	$NH_2CH_2CH_2NH_2$	O	+	O	+	O
Ethylene glycol (glycol) – pure	$HOCH_2CH_2OH$	+	+	+	+	+
Ethylene oxide – pure	CH_2CH_2O	-	-	-	+	+
Ethyl formate – pure	$HCOOCH_2CH_3$	-	O	-	+	+
"Exhaust fumes – containing hydrogen fluoride"		+	+	+	O	O
Exhaust fumes – containing carbon dioxide		+	+	+	+	O
Exhaust fumes – containing carbon monoxide		+	+	+	+	+
Exhaust fumes – containing nitrous gases		O	+	+	+	+

CHEMICALS	FORMULA	NBR	EPDM	FPM	AISI 316L	AISI 304
Exhaust fumes – containing hydrochloric acid		+	+	+	O	-
Exhaust fumes – containing sulphur dioxide (dry)		O	+	+	+	+
Exhaust fumes – containing sulphuric acid (humid)		O	+	+	+	O
Exhaust fumes – containing sulphur trioxide (dry)		O	+	+	+	+
F						
Fatty alcohols		+	O	+	+	O
Fatty alcohol sulphates – aqueous		+	O	+	+	+
Ferric chloride – aqueous (saturated)	$FeCl_3$	+	+	+	-	-
Fluorine (dry) – pure	F_2	-	-	O	+	+
Fluorine (humid) – pure	F_2	-	-	-	O	O
"Fluoroboric acid (boron hydrofluoric acid)"	HBF_4	+	+	+	-	-
Fluosilicic acid – aqueous	H_2SiF_6	O	O	O	O	O
"Formaldehyde solution (formalin) – aqueous"	CH_2O	O	O	O	+	+
Formamide – pure	$HCONH_2$	+	+	O	+	O
Formic acid – pure	HCOOH	-	O	-	+	O
Formic acid – aqueous	HCOOH	-	O	O	+	O
Frigene 12 (R-12) – pure	CCl_2F_2	+	-	O	+	+
Frigene 13 (R-13) – pure	$CClF_3$	+	-	O	+	+
"Frigene 13 B 1 (R-13B1; halon 1301) – pure"	$CBrF_3$	+	-	O	+	+
Frigene 22 (R-22) – pure	$CHClF_2$	-	-	-	+	+
Frigene 23 (R-23) – pure	CHF_3	+	-	O	+	+
Frigene 113 (R-113) – pure	$Cl_2FCCClF_2$	+	-	-	+	+
Frigene 502 (R-502) – pure	C_2F_5Cl+CHF_2Cl	-	-	-	+	+
"Frigene substitute HFCKW 123 (R-123) – pure"	F_3CCHCl_2	-	-	-	+	+
"Frigene substitute HFCKW 134a (R-134a) – pure"	F_3CCH_2F	-	+	+		
Fuming sulphuric acid (Oleum) – pure	H_2SO_4	-	-	O	+	O
G						
Glycerine – aqueous	$HOCH_2CH(OH)$- CH_2OH	+	+	+	+	O
Glycerine – pure	$HOCH_2CH(OH)$- CH_2OH	O	+	+	+	O
Glycine (aminoacetic acid) – aqueous	NH_2CH_2COOH	O	+	+	+	+
Glycol (ethylene glycol) – pure	$HOCH_2CH_2OH$	+	+	+	+	+
Glycol ethyl ether (cellosolve) – pure	$HO(CH_2)_2OCH_2CH_3$	-	-	-	+	+
Glycolic acid – aqueous	$HOCH_2COOH$	+	+	+	O	O
Glycose (dextrose) – aqueous	$C_6H_{12}O_6$	+	+	+	+	+
Grid gas (illuminating gas, town gas)	+	+	+	+	+	
H						
Helium – pure	He	+	+	+	+	+
Heptane (hexane, benzine) – pure		+	-	+	+	+
"Hexamethylene tetramine (Urotropin) – aqueous"	C_6H_{12} N_4	+	+	+	+	+
Humic acids		+	+	+	+	+
Hydrazine hydrate – aqueous	NH_2NH_2 x $_2H_2O$	-	+	+	-	O
Hydrobromid acid – aqueous	HBr	-	+	+	-	-
Hydrochloric acid – aqueous (36%)	HCl	-	O	+	O	O
Hydrocyanic acid – aqueous	HCN	O	O	+	+	O
Hydrofluoric acid – aqueous	HF	-	-	-	O	-
Hydrogen chloride gas – pure	HCl	O	+	+	+	O
Hydrogen peroxide 0.5%	H_2O_2	O	+	+	+	O
Hydrogen peroxide 30%	H_2O_2	-	O	+	O	-
Hydrogen – pure	H_2	+	+	+	+	+
Hydrogen sulphide – aqueous	H_2S	O	+	-	+	+
Hydroquinone – aqueous	$C_6H_4(OH)_2$	+	+	+	O	+
"Hydroxybenzene (carbolic acid, phenol) – aqueous"	C_6H5OH	O	O	O	+	+
Hydroxylamine sulphate – aqueous	$(NH_3OH)_2SO_4$	+	+	+	+	+
I						
Illuminating gas (town gas, grid gas)		+	+	+	+	+
Inert gases – pure		+	+	+	O	+
Iodine + potassium iodine – aqueous	I_2+ KI	O	O	O	O	O
Iron sulphate – aqueous	$FeSO_4$	+	+	+	+	+
Isobutanol – pure	$(CH_3)_2CHCH_2OH$	O	+	+	+	+
Isooctane – pure	$CH_3C(CH_3)_2CH_2CH(CH_3)CH_3$	+	-	+	+	+
Isopropanol (2-propanol) – pure	$CH_3CH(OH)CH_3$	O	+	+	+	+

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CHEMICALS	FORMULA	NBR	EPDM	FPM	AISI 316L	AISI 304
K						
Kerosene		+	-	+	+	+
L						
Lactic acid – aqueous	$HOOCCH(OH)CH_3$	O	O	+	O	O
Laughing gas (dinitrogen monoxide, nitrous oxide) – pure	N_2O	+	+	+	+	+
Lead acetate – aqueous	$Pb(CH_3COO)_2$	O	+	+	+	+
Lead nitrate – aqueous	$Pb(NO_3)_2$	+	+	+	+	+
Lead tetraethyl (tetraethyl lead) – pure	$Pb(CH_2CH_3)4$	O	O	+	+	+
Light petroleum (petroleum spirit)		+	-	+	+	+
"Lime water (calcium hydroxide) – aqueous"	$Ca(OH)_2$	+	+	+	+	+
Linoleic acid – pure	$C_{18}H_{32}O$	O	-	O	+	O
Lithium chloride – aqueous	LiCl	+	+	+	O	O
M						
Magnesium chloride – aqueous	$MgCl_2$	+	+	+	O	O
Magnesium sulphate – aqueous	$MgSO_4$	+	+	+	+	+
Maleic acid – aqueous	HOOCCHCHCOOH	+	+	+	+	O
Malic acid – aqueous	$HOOCCH_2CHOH$-COOH	+	+	+	+	+
Manganese chloride – aqueous	$MnCl_2$	+	+	+	O	O
Manganese sulphate – aqueous	$MnSO_4$	+	+	+	+	O
Marsh gas (methane, mine gas)	CH_4	+	-	+	+	+
Mercaptane		-	-	O	+	+
Mercury – pure	Hg	+	+	+	O	+
Mercury chloride – aqueous	$HgCl_2$	+	+	+	O	O
Mercury salts – aqueous		+	+	+	+	+
Methane (mine gas, marsh gas)	CH_4	+	-	+	+	+
Methanol (methyl alcohol) – pure	CH_3OH	-	+	-	+	O
Methoxybenzene (Anisole) – pure	$C_6H_5OCH_3$	O	O	-	+	+
Methoxybutanol – pure	$CH_3O(CH_2)3CH_2OH$	+	+	+	+	+
Methoxybutyl acetate (butoxyl) – pure	$CH_3OC_4H_4O_2CCH_3$	+	O	O	+	+
Methyl acetate – pure	CH_3COOCH_3	-	O	-	O	O
Methyl alcohol (methanol) – pure	CH_3OH	-	+	-	+	O
Methylamine – aqueous	CH_3NH_2	-	O	O	O	O
Methyl chloride (chloromethane) – pure	CH_3Cl	-	-	+	+	+
"Methylene chloride (dichloromethane) – pure"	CH_2Cl2	-	-	O	+	+
Methyl ethyl ketone (2-butanon) – pure	$CH_3COCH_2CH_3$	-	O	-	+	+
Mine gas (methane, marsh gas)	CH_4	+	-	+	+	+
Monosodium glutamate – aqueous	$C_5H_8NNaO_4$	+	+	+	+	+
Morpholine – pure	C_4H_9NO	-	O	O	+	+
N						
Natural gas		+	-	+	+	+
Nickel sulphate – aqueous	$NiSO_4$	+	+	+	O	O
Nitrogen oxides (nitrous fumes)	"(NO, NO_2, N_2O_3 , N_2O_4, etc.)"	-	O	-	O	-
Nitrogen – pure	N_2	+	+	+	+	+
Nitrous oxide (laughing gas, dinitrogen monoxide) – pure	N_2O	+	+	+	+	+
Nitric acid – aqueous (40%)	HNO_3	-	-	+	+	-
Nitrobenzene – pure	$C_6H_5NO_2$	-	-	O	+	+
Nitrobenzoic acids – aqueous	$C_7H_5NO_4$	+	+	+	+	+
Nitrous fumes (nitrogen oxides)	"(NO, NO_2, N_2O_3 , N_2O_4, etc.)"	-	O	-	O	-
Nitrotoluenes (o-, m-, p) – pure	$C_6H_4(NO_3)(CH_3)$	O	-	O	+	+
O						
Oleum (fuming sulphuric acid) – pure	H_2SO_4	-	-	O	+	O
Oxygen – pure	O2	O	O	+	+	+
Ozone (humid and dry)	O_3	-	O	O	+	+
P						
Paraffin oil		+	-	+	+	+
Peracetic acid – aqueous (6%)	CH_3CO_3H	-	O	-	+	+
"Perchloroethylene (tetrachloroethylene) – pure"	Cl_2CCCl_2	-	-	O	+	+
Peroxomonosulphuric acid – aqueous	H_2SO_5	-	-	-	-	-
Petroleum spirit (light petroleum)		+	-	+	+	+

CHEMICALS	FORMULA	NBR	EPDM	FPM	AISI 316L	AISI 304
"Phenol (hydroxybenzene, carbolic acid) – aqueous"	C_6H_5OH	O	O	O	+	+
Phosgene (carbonyl chloride) [liquid] – pure	$COCl_2$	-	O	+	+	
"Phosgene (carbonyl chloride) [gaseous] – pure"	$COCl_2$	-	+	+	+	
Phosphoric acid – aqueous	H_3PO_4	O	O	+	+	-
Phosphorus chlorides – pure	PCl_2, PCl_3, PCl_5	-	-	O	O	O
Picric acid (trinitrophenol) – pure	$C_6H_2(OH)(NO_2)_3$	O	-	O	+	+
Pinene (turpentine oil) – pure	O	-	O	+	+	
"Potash (potassium carbonate) – aqueous"	K_2CO_3	+	+	+	+	+
"Potassium aluminium sulphate (alum) – aqueous"	$KAl(SO_4)_2$ x 12 H_2O	+	+	+	+	O
Potassium bromate – aqueous	$KBrO_3$	+	+	+	+	O
Potassium bromide – aqueous	KBr	+	+	+	O	O
"Potassium carbonate (potash) – aqueous"	K_2CO_3	+	+	+	+	+
Potassium chlorate – aqueous	$KClO_3$	O	O	O	O	O
Potassium chloride – aqueous	KCl	+	+	+	O	O
Potassium chromate – aqueous	K_2CrO_4	O	+	O	O	O
Potassium cyanide – aqueous	KCN	+	+	+	+	+
Potassium dichromate – aqueous	K_2Cr2O7	O	O	O	+	+
Potassium ferrocyanide (II) (yellow prussiate of potash) – aqueous	$K_4[Fe(CN)6]$	+	+	+	O	-
Potassium ferrocyanide (III) (red prussiate of potash) – aqueous	$K_3[Fe(CN)_6]$	+	+	+	+	+
Potassium hydrogen fluoride – aqueous	KHF_2	+	+	+	+	+
Potassium hydroxide (caustic potash) – aqueous	KOH	-	+	-	+	+
Potassium hypochlorite – aqueous	KOCl	-	+	O	O	O
Potassium iodide – aqueous	KI	+	+	+	O	O
Potassium nitrate – aqueous	KNO_3	+	+	+	O	O
Potassium nitrite – aqueous	KNO_2	+	+	+	+	+
Potassium permanganate – aqueous	$KMnO_4$	-	-	-	+	O
Potassium peroxide – aqueous	K_2O_2	-	-	-	+	+
Potassium persulphate – aqueous	$K_2S_2O_8$	-	+	O	+	+
Potassium phosphate – aqueous	K_3PO4	+	+	+	+	+
Potassium sulphate – aqueous	K_2SO_4	+	+	+	+	+
Potassium sulphide – aqueous	K_2S	+	+	+	+	+
Potassium sulphite – aqueous	K_2SO_3	+	+	+	+	O
Propane (liquid and gaseous) – pure	C_3H_8	+	-	+	+	+
Propanol – pure	$CH_3CH_2CH_2OH$	-	+	+	+	+
Propylene glycol – pure	$HOCH_2CH_2CH_2OH$	+	+	+	+	+
Protein solutions		+	+	+	+	+
Pyridine – pure	C_5H_5N	-	-	-	+	O
R						
"Red prussiate of potash (Potassium ferrocyanide (III)) – aqueous"	$K_3[Fe(CN)_6]$	+	+	+	+	+
S						
Shellsol D (turpentine substitute, white spirit) – pure		O	-	O	+	+
Silicone oil		+	+	+	+	+
Silver nitrate – aqueous	$AgNO_3$	O	+	+	+	+
Soda lye (sodium hydroxide) – aqueous	NaOH	O	+	O	O	O
Sodium arsenate – aqueous	Na_3ASO_4	+	+	+	+	+
Sodium arsenite – aqueous	Na_3ASO_3	+	+	+	+	+
Sodium benzoate – aqueous	C_6H_5COONa	+	+	+	+	+
Sodium bicarbonate (sodium hydrogen carbonate) – aqueous	$NaHCO_3$	+	+	+	+	+
Sodium bisulphate (sodium hydrogen sulphate) – aqueous	$NaHSO_4$	+	+	+	O	O
Sodium bisulphite (bisulphite, sodium hydrogen sulphide) – aqueous	$NaHSO_3$	O	+	+	+	O
Sodium bromate – aqueous	$NaBrO_3$	+	+	+	+	O
Sodium bromide – aqueous	NaBr	+	+	+	O	O
Sodium carbonate (soda) – aqueous	Na_2CO_3	+	+	+	+	+
Sodium chlorate – aqueous	$NaClO_3$	O	O	O	O	O
Sodium chloride (table salt) – aqueous	NaCl	+	+	+	O	O
Sodium chlorite – aqueous	$NaClO_2$	-	O	O	O	-
Sodium chloroacetate – aqueous	$NaCH_2ClCOO$	+	+	+	+	+
Sodium chromate – aqueous	$NaCrO_4$	O	+	O	O	O
Sodium cyanide – aqueous	NaCN	+	+	+	+	+

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TECHNICAL SHEET

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Interpretation of Symbols
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CHEMICALS	FORMULA	NBR	EPDM	FPM	AISI 316L	AISI 304
"Sodium disulphite (sodium metabisulphite) – aqueous"	$Na_2S_2O_5$	O	+	+	+	O
"Sodium dodecylbenzenesulfonate – aqueous"	$C_{18}H_{29}NaO_3S$	+	+	+	+	+
Sodium fluoride – aqueous	NaF	+	+	+	+	O
Sodium hydrogen carbonate (sodium bicarbonate) – aqueous	$NaHCO_3$	+	+	+	+	+
Sodium hydrogen sulphate (sodium bisulphate) – aqueous	$NaHSO_4$	+	+	+	O	O
"Sodium hydrogen sulphide (sodium bisulphite, bisulphite) – aqueous"	$NaHSO_3$	O	+	+	+	O
Sodium hydroxide (soda lye) – aqueous	NaOH	O	+	O	O	O
"Sodium hypochlorite (chlorine bleaching lye) – aqueous"	NaOCl	-	O	O	O	O
Sodium iodide – aqueous	NaI	+	+	+	O	O
Sodium mercaptobenzothiazole – pure	$C_7H_5NS_2$	O	O	+	+	+
Sodium metabisulphite (sodium disulphite) – aqueous	$Na_2S_2O_5$	O	+	+	+	O
Sodium nitrate – aqueous	$NaNO_3$	+	+	+	+	-
Sodium nitrite – aqueous	$NaNO_2$	+	+	+	+	+
"Sodium pentachlorophenolate – aqueous"	C_6Cl_5NaO	+	+	+	+	+
Sodium perborate – aqueous	$NaBO_3$ x NH_2O	O	+	+	+	+
Sodium peroxodisulphate – aqueous	$Na_2S_2O_4$	O	+	+	+	O
Sodium phosphate – aqueous	Na_3PO_4	+	+	+	O	O
Sodium propionate – aqueous	CH_3CH_2COONa	+	+	+	+	+
"Sodium silicate (soluble glass) – aqueous"		+	+	+	+	+
Sodium stannate – aqueous	Na_2SnO_3	+	+	+	+	+
Sodium sulphate – aqueous	Na_2SO_4	+	+	+	+	+
Sodium sulphide – aqueous	Na_2S	+	+	+	+	+
Sodium sulphite – aqueous	Na_2SO_3	+	+	+	+	O
Sodium tartrate – aqueous	$C_4H_4O_6Na_2$	+	+	+	+	+
Sodium thiosulphate – aqueous	$Na_2S_2O_3$	+	+	+	O	O
Sodium zincate – aqueous	$Na_2[Zn(OH)4]$	O	+	+	+	+
Spirit (ethyl alcohol)		O	O	O	+	+
Starch solution – aqueous		+	+	+	+	+
Stearic acid – pure	$C_{18}H_{37}COOH$	+	+	+	+	+
Styrene – pure	$C_6H_5CHCH_2$	-	-	O	+	+
Succinic acid – aqueous	$HOOCCH_2CH_2COOH$	+	+	+	+	+
Sulphur chloride – pure	S_2Cl_2, SCl_2, SCl_4	-	-	+	+	-
Sulphur dioxide (liquid) – pure	SO_2	-	+	+	+	+
Sulphur dioxide (gaseous and humid)	SO_2	-	+	+	+	O
"Sulphur dioxide (gaseous and dry) – pure"	SO_2	-	+	+	+	O
Sulphur hexafluoride – pure	SF_6	O	+	O	+	+
Sulphuric acid – concentrated (96%)	H_2SO_4	-	-	O	-	-
Sulphuric acid – aqueous (30%)	H_2SO_4	O	+	+	-	-
Sulphurous acid – aqueous	H_2SO_3	-	+	+	+	-

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CHEMICALS	FORMULA	NBR	EPDM	FPM	AISI 316L	AISI 304
T						
Table salt (sodium chloride) – aqueous	NaCl	+	+	+	O	O
Tall oil (colophonium) (liquid)		O	O	O	+	O
Tannic acid (tannin) – aqueous		+	+	+	+	+
Tartaric acid – aqueous	$C_4H_6O_6$	+	+	+	+	+
"Tetrachloroethylene (perchloroethylene) – pure"	Cl_2CCCl_2	-	-	O	+	+
Tetraethyl lead (lead tetraethyl) – pure	$Pb(CH_2CH_3)4$	O	O	+	+	+
Tetrahydrofuran – pure	C_4H8O	-	-	-	+	+
Tetrahydronaphthalene (tetralin) – pure	$C_{10}H_{12}$	-	-	+	+	+
Thiophene – pure	C_4H_4S	-	-	-	+	+
Tin chlorides – aqueous	$SnCl_2$, SnCl4	+	+	+	O	-
Toluene – pure	$C_6H_5CH_3$	-	-	O	+	+
Town gas (grid gas, illuminating gas)		+	+	+	+	+
Tributyl phosphate – pure	$(C_4H9O)_3PO$	-	-	-	+	+
Trichloroacetic acid – aqueous	Cl_3CCOOH	O	O	-	-	-
Trichloroethylene – pure	C_2HCl_3	-	-	O	+	+
Trichloromethane (chloroform) – pure	$CHCl_3$	-	-	O	+	+
Tricresylphosphate – pure	$C_{21}H_{21}O_4P$	-	-	-	+	+
Triethanolamine – pure	$(CH_2CH_2OH)_3N$	-	-	-	+	+
Trinitrophenol (picric acid) – pure	$C_6H_2(OH)(NO_2)_3$	O	-	O	+	+
U						
Uranium hexafluoride – pure	UF_6	+	+	+	+	O
Urea – aqueous	NH_2CONH_2	+	+	+	O	O
"Urotropin (hexamethylene tetramine) – aqueous"	C_6H_{12} N_4	+	+	+	+	+
V						
Vinyl acetate – pure	$CH_2CHOOCH_2CH_3$	+	+	+	+	+
Vinyl chloride – pure	CH_2CHCl	-	O	+	O	O
W						
Water – distilled	H_2O	+	+	+	+	O
Water (seawater)	H_2O	+	+	+	O	O
Water vapour (130 °C)	H_2O	O	+	+	+	+
"White spirit (Shellsol D, turpentine substitute) – pure"	O	-	O	+	+	
Wood tar (impregnating oils)	-	-	-	+	+	
X						
Xenon – pure	Xe	+	+	+	+	+
Xylene – pure	$C_6H4(CH_3)_2$	-	-	O	+	+
Y						
Yeast – aqueous	+	+	+	+	+	
Yellow prussiate of potash (Potassium ferrocyanide (II)) – aqueous	$K_4[Fe(CN)_6]$	+	+	+	O	-
Z						
Zinc chloride – aqueous	$ZnCl_2$	+	+	+	O	-
Zinc sulphate – aqueous	$ZnSO_4$	+	+	+	+	-

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FORMULA	NBR	EPDM	FPM	AISI 316L	AISI 304
COMMERCIAL PRODUCTS					
A					
Acronal dispersions (polyacrylates)	-	+	+	+	+
Acronal solutions	-	O	-	+	+
Alkane sulfonic acid chlorides (mersoles)	+	O	+	O	O
Anise oil	O	+	+		
Antifrogen-N	+	+	+	+	+
ASTM fuel A	O	-	O	+	+
ASTM fuel B	O	-	O	+	+
ASTM fuel C	O	-	O	+	+
ASTM oil IRM 901	+	-	+	+	+
ASTM oil IRM 902	O	-	+	+	+
ASTM oil IRM 903	O	-	O	+	+
ATE brake fluid (brake fluid)	-	+	-	+	+
B					
Beeswax	+	+	+	+	+
Biodiesel (fatty acid methyl ester)	O	-	+	+	+
Bone oil	O	-	+	+	+
Brake fluid (ATE brake fluids)	-	+	-	+	+
C					
Car antifreeze	O	+	+		
Cellulose lacquers	-	O	-	+	+
Chlophene (chlorodiphenyl)	+	O	+	+	+
Coconut oil	O	-	O	+	+
Cotton seed oil	O	-	+	+	+
Cutting oil (drilling oil)	O	-	O	+	+
Cyclanone (fatty alcohol sulfonate)	+	+	+	+	+
D					
Desmodur T	-	-	+	+	+
Desmophen	+	+	+	+	+
Detergent (synth. laundry detergent)	O	+	O	+	+
Dextrin – aqueous	+	+	+	+	+
Diesel oil – pure	O	-	+	+	+
Drilling oil (cutting oil)	O	-	O	+	+
Dyeworks wetting agent (Nekal BX)	+	+	+	+	+
E					
Engine oils (machine oils, paraffin oils, mineral oils)	+	-	+	+	+
F					
Fatty acid methyl ester (biodiesel)	O	-	+	+	+
Fatty alcohol sulfonate (cyclanone)	+	+	+	+	+
Fatty oils (greases)	O	-	O	+	+
Fish liver oil	O	O	+	+	+
Fruit tree carbolineum	O	O	O	+	+
Fuel oils	O	-	+	+	+
G					
Gelatine – aqueous	+	+	+	+	+
Greases (fatty oils)	O	-	O	+	+
H					
Hair shampoo	O	O	O	+	+
Hydraulic fluid (Skydrol 500)	-	+	O	+	+
Hydraulic fluid (Skydrol 7000)	-	+	-	+	+
Hydraulic fluids – chlorinated hydrocarbons	-	O	+	+	
Hydraulic fluids – mineral oil based (H, H-L, H-LP)	O	-	O	+	+
Hydraulic fluids – phosphoric acid ester (HSD)	-	O	-	+	
Hydraulic fluid – polyglykol water (HSC)	+	+	+	+	+
Hydraulic fluids – water in oil (HSB)	O	-	+	+	+
Hydraulic fluids – water-oil emulsions (HSA)	O	-	+	+	+

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FORMULA	NBR	EPDM	FPM	AISI 316L	AISI 304
COMMERCIAL PRODUCTS					
I					
Impregnating oils (wood tar)	-	-	-	+	+
Iodine tincture	O	O	O	O	O
L					
Linseed oil	O	-	O	+	+
Lubricating oils	+	-	+	+	+
Lysol	-	-	O	+	O
M					
Machine oils (paraffin oils, mineral oils, engine oils)	+	-	+	+	+
Mersoles (alkane sulfonic acid chlorides)	+	O	+	O	O
Mineral oils (paraffin oils, machine oils, engine oils)	+	-	+	+	+
Molasses (molasses-based flavour)	+	+	+	+	+
N					
Nekal BX (dyeworks wetting agent) – aqueous	+	+	+	+	+
Nickel baths	+	+	+	+	O
P					
Paraffin oils (machine oils, mineral oils, engine oils)	+	-	+	+	+
Petroleum – pure	+	-	+	+	+
Petroleum benzole spirit (premium grade petrol-ethanol mixture)	-	-	O	+	+
Photograph emulsions, developers, fixing baths	O	O	O		
Pine needle oil (spruce needle oil)	O	-	+	+	+
Polyacrylates (acronal dispersions)	-	+	+	+	+
Premium grade petrol-ethanol mixture (petroleum benzole spirit)	-	-	O	+	+
S					
Skydrol 500 (hydraulic fluid)	-	+	O	+	+
Skydrol 7000 (hydraulic fluid)	-	+	-	+	+
Soap solution – aqueous	O	O	O	+	+
Soda (sodium carbonate) – aqueous	+	+	+	+	+
Soluble glass (sodium silicates)	+	+	+	+	+
Spindle oils	+	-	+	+	+
Spruce needle oil	O	-	+	+	+
Synth. Laundry detergent (detergent)	O	+	O	+	+
T					
Table salt (sodium chloride)	+	+	+	O	O
Transformer oil	+	-	+	+	+
Turpentine oil (pinene) – pure	O	-	O	+	+
Turpentine substitute (white spirit, Shellsol D) – pure	O	-	O	+	+
U					
UV paint	-	+	-		
V					
Varnishes	O	-	+	+	+
Vinegar 5% (grape vinegar)	-	+	O	O	+

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TECHNICAL SHEET

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FOODSTUFF						
A						
Apple juice (apple sauce)		+	+	+	+	+
Apricot juice		+	+	-	+	+
			O	+	O	O
B			+	+		
Beer		+	+	+	+	+
Butter		+	+	+	+	+
Buttermilk		+	+	+	+	+
C						
Cider		+	+	+	+	+
Corn oil		O	-	O	+	+
E						
Edible oil		O	-	O	+	+
F						
Fruit juices		O	O	O	+	+
Food fats and oils		O	-	O	+	+
G						
Grape vinegar (vinegar 5%)		-	+	O	O	+
L						
Lemon juice		O	+	+	+	O

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FOODSTUFF						
M						
Milk		+	+	+	+	+
Mineral water		+	+	+	O	O
O						
Olive oil		O	-	O	+	+
Orange juice		+	+	+	+	O
P						
Pineapple juice		+	+	+	+	O
R						
Rape seed oil		O	-	O	+	+
S						
Saccharine (sweetener)		+	+	+	+	+
Soybean oil		O	-	O	+	+
Spirits (dependent on their ingredients)		O	O	O	+	+
Sugar solutions		+	+	+	+	+
Sweetener (saccharine)		+	+	+	+	+
W						
Wines		+	+	+	+	+