

Explanation of the symbols used

“+” The material can be used in the fluid handled across the entire concentration range and up to its boiling point.

The corrosion rates are < 0.1 mm/year, and local peak values attributed to crevice corrosion, pitting corrosion, stress corrosion or corrosion fatigue (see Corrosion) are not expected. If concentrations or temperatures are explicitly mentioned, the material can also be used up to and including these limits.

“-” The material cannot be used in the fluid handled as either the corrosion rates are > 0.1 mm/year or types of corrosion can occur that can compromise functionality.

“o” The material can only be used under very specific conditions in selected concentration or temperature ranges of the fluid handled. Consultation with the corresponding specialist departments required.

“Blank field” The material can be used with the fluid handled without any restrictions. Specialist departments can be contacted in case of doubt, particularly with respect to wear-resistant materials ERN, NORIHARD® NH 15 3 and NORILOY® NL 25 2.

The grid below illustrates the symbols used in the resistance table. Orange arrows point from the explanatory text on the left to corresponding cells in the grid.

Resistance table 1: The table on the following pages references only castable metallic materials as they are used by KSB for pump casings and impellers.

Chemical resistance table

+ Can be used (note limit values)

- Cannot be used

o Can only be used under very specific conditions

"Blank field" Can be used with no restrictions

Fluid handled		GJL-250	GJS-400-15, GJS-400-18	GP240GH+N	ERN	NORHARD [®] NH 15 3	NORILOY [®] NL 25 2	1.4008	1.4308	NORINOX [®] , 1.4408	NORILUM [®]	NORCID [®] 9.4306	NORIDUR [®] 1.4593	NORICLOR [®] 1.4573	NORICROM [®] 1.4475	CuAl10Fe5Ni5-C-GS	Special materials/comments
Acetaldehyde	CH ₃ -CHO	-	-	-				+	+	+	+		+	+		+	Combustible, toxic, polymerised
Acetone	CH ₃ COCH ₃	+	+	+				+	+	+	+		+	+		+	Combustible
Acrylonitrile	CH ₂ =CHCN	+	+	+				+	+	+	+		+	+		+	Polymerised, combustible, explosive, toxic
Acrylic acid	CH ₂ =CHCOOH							-	+	+	+		+	+		-	Polymerised, combustible
Caustic potash	KOH																See Potassium hydroxide
Quicklime	Ca(OH) ₂																See Calcium hydroxide
Caustic soda	NaOH																See Sodium hydroxide
Alkacide lye, cold		+	+	+				+	+	+	+		+	+		o	
Alkacide lye, hot		-	-	-				o	+	+	+		+	+		-	
Aluminium acetate	Al(CH ₃ COO) ₃	-	-	-				+	+	+	+		+	+		+	
Aluminium chloride	AlCl ₃	-	-	-				-	-	o	o		o	o		o	
Aluminium hydroxide Suspension (white sludge)		-	-	-	-	+	o									-	Up to 80 °C
Aluminium sulphate	Al ₂ (SO ₄) ₃	-	-	-									+	+		o	
Formic acid	HCOOH																Note isocorrosion curves!
Concentration 10 %, 30 °C		-	-	-	-	-	-	-	o	+	+		+	+			
Concentration 10 %, 80 °C		-	-	-				-	-	-	+	+	+	+			
Concentration 60 %, 30 °C		-	-	-				-	-	o	+	+	+	+			
Concentration 60 %, 60 °C		-	-	-				-	-	-	+	+	+	+			
Concentration 90 %, 20 °C		-	-	-				-	o	+	+	+	+	+			
Concentration 90 %, 60 °C		-	-	-				-	-	-	+	+	+	+			
Ammonia, liquid	NH ₃	-	-	+				+	+	+	+	+	+	+		-	
Ammonia water, boiling	NH ₃ OH	-	-	-				o	o	+	+	-	+	+		-	

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Fluid handled

		GJL-250	GJS-400-15; GJS-400-18	GP240GH+N	ERN	NORIHARD* NH 15 3	NORLOY® NL 25 2	1.4008	1.4308	NORINOX®, 1.4408	NORILUM®	NORICID® 9.4306	NORIDUR® 1.4593	NORICLOR® 1.4573	NORICROM® 1.4475	CUA110Fe5Ni5-C-GS	Special materials/comments
Ammonium chloride, 32 %	NH ₄ Cl	-	-	-				-	-	o	o		+	+			Hard rubber (23 % up to 80 °C), plastic
Ammonium hydroxide	NH ₄ OH																See Ammonia water
Ammonium carbonate	(NH ₄) ₂ CO ₃	-	-	-				o	+	+	+		+	+			
Ammonium nitrate	NH ₄ NO ₃	-	-	-				-	+	+	+	o	+	+			
Ammonium oxalate	(COONH ₄) ₂	-	-	-				+	+	+	+		+	+			
Ammonium rhodanide, 25 °C	NH ₄ SCN	-	-	-				o	+	+	+		+	+			
Ammonium sulphate	(NH ₄) ₂ SO ₄	-	-	-				o	+	+	+		+	+			
Ammonium sulphite	(NH ₄) ₂ SO ₃	-	-	-				o	+	+	+		+	+			
Amyl acetate	CH ₃ COOC ₅ H ₁₁																See Acetic acid pentylester, combustible
Amyl alcohol	C ₅ H ₁₁ OH																See Pentanol, combustible
Aniline (= aminobenzene)	C ₆ H ₅ NH ₂	o	o	o				+	+	+	+		+	+			Temperature must be known, combustible
Barium chloride	BaCl ₂	-	-	-				-	-	o	o		+	+			
Bauxite suspension		-	-	-	-	+	o								o		Up to 80 °C
Petrol		+	+	+				+	+	+	+		+	+			Combustible
Benzoic acid, aqueous	C ₆ H ₅ COOH	-	-	-				+	+	+	+		+	+			
Benzene	C ₆ H ₆	+	+	+				+	+	+	+		+	+			Combustible, toxic
Benzenesulphonic acid	C ₆ H ₅ SO ₃ H	-	-	-				-	o	+	+		+	+			
Benzyl acetate (= benzoic acid ethyl ester)	CH ₃ -COO-CH ₂ -C ₆ H ₅	o	o	o				+	+	+	+		+	+			Combustible
Beer		o	o	o				+	+	+	+		+	+			
Beer mash, beer wort		+	+	+				+	+	+	+	+	+	+			For increased purity requirements, 1.4408/1.4593
Prussic acid (= hydrogen cyanide)	HCN	o	o	o				o	o	+	+		+	+			Toxic
Bleaching solution	HCN																See Sodium hypochlorite

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Fluid handled		GJL-250	GJS-400-15, GJS-400-18	GP240GH+N	ERN	NORIHARD* NH 15 3	NORLOY* NL 25 2	1.4008	1.4308	NORINOX*, 1.4408	NORILIUM*	NORICID* 9.4306	NORIDUR* 1.4593	NORICLOR* 1.4573	NORICROM* 1.4475	CuAl10Fe5Ni5-C-G5	Special materials/comments
Binder solution		-	-	-				-	o	+	+		+	+		-	
Boric oxide, aqueous	H ₃ BO ₃	-	-	-	-			o	+	+	+		+	+		o	
Hydrobromic acid	HBr	-	-	-	-			-	-	-	-		-	-		-	Hastelloy B, plastic
Butane (liquefied gas)	C ₄ H ₁₀	o	o	+				+	+	+	+		+	+		+	Combustible
Butadiene, liquid	CH ₂ =(CH ₂) ₂ =CH ₂	o	o	+				+	+	+	+		+	+		+	Combustible
Buttersäure	CH ₃ -CH ₂ -CH ₂ -COOH	-	-	-	-	-	-	o	o	+	+		+	+		o	
Butylacetat (= Buttersäureethylester)	CH ₃ COOC ₄ H ₉	o	o	o				+	+	+	+		+	+		o	brennbar
Butylalkohol (Butanol 1)	C ₄ H ₉ (CH ₂) ₂ OH	o	o	o				+	+	+	+		+	+		+	brennbar
Calciumbisulfatlauge	Ca(HSO ₃) ₂	-	-	-				-	o	+	+		+	+		o	
Calciumchlorid (= Kühlsole)	CaCl ₂	-	-	-			o	-	-	-	o		o	o	o	o	Hartgummi, Titan, Hastelloy
Calciumhydroxid (≤ 80 °C)	Ca(OH) ₂	o	o	o	+	+		o	+	+	+		+	+		-	konzentrationsabhängig
Calciumhypochlorit	Ca(OCl) ₂	-	-	-				-	-	-	o		o	o		-	Hartgummi (Genakor 08 bis 35 g/l Cl ₂), Titan, Hastelloy C, Kunststoff
Calciumnitrat	Ca(NO ₃) ₂	-	-	-				+	+	+	+		+	+		-	
Calciumsulfat-Suspension	CaSO ₄ + Feststoff	-	-	-	o	o	o	o	-	-	-		o	o	o	-	
Chlor, trocken	Cl ₂	o	+	+				+	+	+	+		+	+		-	≤ 30 °C
Chlor, feucht	Cl ₂	-	-	-				-	-	-	-		-	-		-	Hartgummi (≤ 80 °C), Titan, Hastelloy C, (≤ 50 °C)
Chlorbenzol	C ₆ H ₅ Cl	o	o	o				o	o	o	+		+	+		o	brennbar
Chlorethan (ADIP)	C ₂ H ₅ Cl	+	+	+				+	+	+	+		+	+		+	nur, wenn wasserfrei
Chloroform (Trichlormethan)	CHCl ₃	o	+	+				+	+	+	+		+	+		+	wasser- und säurefrei
Chlorsulfonsäure, wässrige Lösung	SO ₂ (OH)Cl	-	-	-				-	-	-	-		-	-		-	Hastelloy B, Kunststoff
Chlorwasserstoff, wässrige Lösung	HCl																siehe Salzsäure

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Fluid handled		GJL-250	GJS-400-15, GJS-400-18	GP240GH+N	ERN	NORIHARD*NH 15 3	NORILLOY* NL 25 2	1.4008	1.4308	NORINOX*, 1.4408	NORILIUM®	NORICID* 9.4306	NORIDUR* 1.4593	NORICLOR* 1.4573	NORICROM* 1.4475	CuAl10Fe5Ni5-C-G5	Special materials/comments
Binder solution		-	-	-				-	o	+	+		+	+			
Boric oxide, aqueous	H ₃ BO ₃	-	-	-	-			o	+	+	+		+	+			o
Hydrobromic acid	HBr	-	-	-	-			-	-	-	-		-	-			Hastelloy B, plastic
Butane (liquefied gas)	C ₄ H ₁₀	o	o	+				+	+	+	+		+	+			Combustible
Butadiene, liquid	CH ₂ =(CH ₂) ₂ =CH ₂	o	o	+				+	+	+	+		+	+			Combustible
Butanoic acid	CH ₃ -CH ₂ -CH ₂ -COOH	-	-	-	-	-	-	o	o	+	+		+	+			o
Butyl acetate (= butyl ethanoate)	CH ₃ COOC ₄ H ₉	o	o	o				+	+	+	+		+	+			o
Butyl alcohol (butanol 1)	C ₄ H ₉ (CH ₂) ₂ OH	o	o	o				+	+	+	+		+	+			+
Calcium bisulphite lye	Ca(HSO ₃) ₂	-	-	-				-	o	+	+		+	+			o
Calcium chloride (= cooling brine)	CaCl ₂	-	-	-			o	-	-	-	o		o	o	o	o	o
Calcium hydroxide (< 80 °C)	Ca(OH) ₂	o	o	o	+	+		o	+	+	+		+	+			-
Calcium hypochlorite	Ca(OCl) ₂	-	-	-				-	-	-	o		o	o			-
Calcium nitrate	Ca(NO ₃) ₂	-	-	-				+	+	+	+		+	+			-
Calcium sulphate suspension	CaSO ₄ + solid	-	-	-	o	o	o	o	-	-	-		o	o	o		-
Chlorine, dry	Cl ₂	o	+	+				+	+	+	+		+	+			-
Chlorine, wet	Cl ₂	-	-	-				-	-	-	-		-	-			-
Chlorobenzene	C ₆ H ₅ Cl	o	o	o				o	o	o	+		+	+			o
Chloroethane (ADIP)	C ₂ H ₅ Cl	+	+	+				+	+	+	+		+	+			+
Chloroform (trichloromethane)	CHCl ₃	o	+	+				+	+	+	+		+	+			+
Chlorosulphonic acid, aqueous solution	SO ₂ (OH)Cl	-	-	-				-	-	-	-		-	-			-
Hydrogen chloride, aqueous solution	HCl																
																	See Hydrochloric acid

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Acetic acid	CH₃COOH																Note isocorrosion curves!
Concentration, 10 %, 25 °C		-	-	-			-	O	+	+	+		+	+			
Concentration, 10 %, 100 °C		-	-	-			-	O	O	+	+		+	+			
Concentration, 40 %, 25 °C		-	-	-			-	O	+	+	+		+	+			
Concentration, 40 %, 100 °C		-	-	-			-	-	-	+	+		+	+			
Concentration, 80 %, 25 °C		-	-	-			-	O	+	+	+		+	+			
Concentration, 80 %, 100 °C		-	-	-			-	-	-	+	+		+	+			
Acetic anhydride, aqueous	(CH ₃ -CO) ₂ O	-	-	-				-	O	O	+		O	O			
Acetic acid pentylester	CH ₃ CaOC ₅ H ₁₁	-	-	-				+	+	+	+		+	+		+	Combustible
Ether (diethylether)	(C ₂ H ₅) ₂ O	+	+	+				+	+	+	+		+	+		+	Highly combustible
Ethyl acetate, pure	CH ₃ COOC ₂ H ₅	+	+	+				+	+	+	+		+	+		+	
Ethyl alcohol (ethanol)	C ₂ H ₅ OH	O	+	+				+	+	+	+		+	+		+	Combustible
Ethylamine	C ₂ H ₅ NH ₂	-	-	-				+	+	+	+		+	+		-	
Ethylene, liquid	CH ₂ =CH ₂	-	-	-				-	+	-	-		-	-		-	
Ethylene carbonate	(CH ₂) ₂ CO ₃	+	+	+				+	+	+	+		+	+		+	
Ethylene glycol, aqueous, inhibited	CH ₂ OH-CH ₂ OH	+	+	+				+	+	+	+		+	+		+	
Ethylene oxide	(CH ₂) ₂ O	O	+	+	+	+	+	+	+	+	+		+	+		+	Combustible
Dye liquor (alkaline to acidic)		O	O	O	O	O	O	O	O	O	O	O	+	+		-	Consultation due to composition
Fatty alcohol and fat		O	O	+				+	+	+	+		+	+		+	Combustible
Fatty acids	C _n H _{2n-1} (COOH)	-	-	-				-	O	O	+		+	+		-	
Fluoric acid (hydrogen fluoride), aqueous soln.		-	-	-				-	-	-	-		-	-		-	Hard rubber (< 40 °C), plastic
Formaldehyde, 40 %, aqueous solution	CH ₂ O	-	-	-				O	+	+	+		+	+		O	

Chemical resistance table

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Fluid handled		GJL-250	GJS-400-15, GJS-400-18	GP240GH+N	ERN	NORIHARD* NH 15 3	NORILLOY* NL 25 2	1.4008	1.4308	NORINOX* 1.4408	NORILUM*	NORCID* 9.4306	NORIDUR* 1.4593	NORICLOR* 1.4573	NORICROM* 1.4475	CuAl10Fe5Ni5-C-G5	Special materials/comments
Freon, Frigene 12	F12: CF ₂ Cl ₂	-	o	o				-	+	+	+		+	+		-	
Fruit juices		-	-	-				-	+	+	+		+	+		-	
Furfural	(CH ₂) ₃ OCCCHO	o	o	o				o	+	+	+		+	+		o	Combustible
Furfuryl alcohol	(CH ₂) ₃ OCCCH ₂ OH	o	o	o				o	+	+	+		+	+		o	Combustible
Tannic acid (tannin)	C ₇₆ H ₅₂ O ₄₆	-	-	-				o	o	+	+		+	+		-	
Glucose (dextrose)	C ₆ H ₁₂ O ₆	+	+	+				+	+	+	+		+	+		+	
Glycerin	CH ₂ OH-CHOH-CH ₂ OH	o	o	+				+	+	+	+		+	+		+	
Glycol (ethylene glycol), aqueous, inhibited	(CH ₂ OH) ₂	+	+	+				+	+	+	+		+	+		+	
Green liquor																	Exact analysis required
Urea (carbamide)	CO(NH ₂) ₂	o	o	o				o	+	+	+		+	+		-	
Fuel oil		o	o	+	o	o	o	+	+	+	+		+	+		o	Combustible
Hexane	C ₆ H ₁₄	o	o	+				+	+	+	+		+	+		o	Combustible
Isobutanol	(CH ₃) ₂ CHCH ₂ OH	o	o	+				+	+	+	+		+	+		+	Combustible
Isopropanol	(CH ₃) ₂ CHOH	o	o	+				+	+	+	+		+	+		+	Combustible
Aluminium potassium sulphate	KAl(SO ₄) ₂	-	-	-				o	o	+	+		+	+		o	
Potassium chloride	KCl	-	-	-				-	-	o	o		+	+	o	o	pH≥7
Potassium chromate	K ₂ CrO ₄	o	o	o				o	+	+	+		+	+		-	Toxic
Potassium chromium sulphate	KCr(SO ₄) ₂	-	-	-				o	o	+	+		+	+		o	
Potassium cyanide	KCN	o	o	o				o	+	+	+		+	+		-	Toxic

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Potassium hydroxide	KOH																
Concentration 30 %, cold		+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	
Concentration 30 %, 80 °C		o	o	o	o	o	+	+	+	+	+	+	+	+	+	-	
Concentration 50 %, cold		-	-	-	+	+	+	+	+	+	+	+	+	+	+	-	
Concentration 30 %, 80 °C		-	-	-	-	-	-	-	+	+	+	+	+	+	+	-	
Potassium hypochlorite	KOCl	-	-	-				-	-	-	o		o	o		-	Hard rubber (Genakor 08 up to 80 g/l Cl2 < 60 °C), plastic
Potassium carbonate (potash)	K ₂ CO ₃	+	+	+				+	+	+	+		+	+		+	
Potassium nitrate, aqueous	KNO ₃	o	o	o				+	+	+	+		+	+		o	
Potassium oxalate	(COOK) ₂	-	-	-				o	+	+	+		+	+		-	
Potassium permanganate	KMnO ₄	o	o	o				o	+	+	+		+	+		o	
Potassium silicate (potassium metasilicate)	K ₂ SiO ₄	o	o	o		+		+	+	+	+		+	+	+	o	
Potassium sulphate	K ₂ SO ₄	-	-	-				+	+	+	+		+	+		o	
Kerosene (jet fuel)		o	o	+				+	+	+	+		+	+		o	Combustible
Cooker liquor (calcium bisulphite solution)	Ca(HSO ₃) ₂	-	-	-	-	-	-			+	+		+	+			
Carbon dioxide (aqueous solution)	H ₂ CO ₃	-	-	-				+	+	+	+		+	+		o	
Cresol	C ₆ H ₄ (CH ₃)OH	o	o	o				+	+	+	+		+	+		+	
Copper sulphate	CuSO ₄	-	-	-				o	o	+	+		+	+		o	
Copper sulphate + 4 % H ₂ SO ₄		-	-	-				-	o	o	+		+	+		-	
Latex		+	+	+				+	+	+	+		+	+		+	
Laurolactam		-	-	-				o	o	+	+		+	+		o	
Linseed oil		o	o	+	o	o	o	+	+	+	+		+	+		o	Combustible
Magnesium chloride	MgCl ₂	-	-	-				-	-	-	o		o	o	o	o	Hard rubber (< 80 °C), plastic

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Magnesium sulphate	Mg ₂ SO ₄	-	-	-				+	+	+	+		+	+		O		
Maleic acid	(HOOC) ₂ (CH) ₂	-	-	-				-	O	+	+		+	+			-	
Manganese chloride	MnCl ₂	-	-	-				-	-	O	O		-	O	O		O	Hard rubber (< 80 °C), plastic
Seawater																		See Water
Molasses		O	O	O	O	O	O	O	+	+	+		+	+		O		
Methyl acetate	CH ₃ COOCH ₃	-	-	-				O	+	+	+		+	+		O		Combustible
Methyl alcohol (methanol)	CH ₃ OH	O	O	+				+	+	+	+		+	+		+		brennbar Combustible
Methylene chloride	CH ₂ Cl ₂	+	+	+				+	+	+	+		+	+		+		Anhydrous and acid-free
Milk		-	-	-				+	+	+	+		+	+		O		
Lactic acid	H ₃ CCHOH COOH	-	-	-				O	O	+	+		+	+		O		
Mixed acid (nitrosulphuric acid)	HNO ₃ +H ₂ SO ₄	-	-	-				-	O	O	O	O	O	O		-		Analysis required
Monoethanolamine (MEA)	H ₂ N-CH ₂ -CH ₂ OH	+	+	+					+	+	+	+	+	+		-		For purity reasons: 1.4408/1.4593
Naphthalene	C ₁₀ H ₈	O	O	+				+	+	+	+		+	+		+		
Sodium acetate, aqueous solution	Na CH ₃ COO	-	-	-				O	O	+	+		+	+		O		
Sodium aluminate, aqueous solution	Na ₃ [Al(OH) ₆]																	
Concentration < 20 % Na ₂ O, 25 °C		+	+	+	+	+	+	+	+	+	+		+	+		O		
Concentration < 20 % Na ₂ O, 80 °C		O	O	O	O	O		+	+	+	+		+	+		-		
Concentration > 31.5 % Na ₂ O, 25 °C		+	+	+				+	+	+	+		+	+		-		
Concentration > 31.5 % Na ₂ O, 80 °C		O	O	O	O	O	O	+	+	+	+							
Sodium chloride, aqueous solution	NaCl	-	-	-			O	-	-	O	O		+	+	O	O	pH≥7	
Sodium hydrosulphate	NaHSO ₄	-	-	-				-	+	+	+		+	+		O		
Sodium hydrogen sulphite, 25 °C	NaHSO ₃	-	-	-				-	+	+	+		+	+		+		

Chemical resistance table

“+” Can be used (note limit values)

“-” Cannot be used

“O” Can only be used under very specific conditions

“Blank field” Can be used with no restrictions

Fluid handled

Sodium hydroxide, aqueous solution

NaOH

Concentration 30 %, 25 °C

+ + + + + + + + + + + + +

Concentration 30 %, 80 °C

O O O O O O + + + + + + +

Concentration 50 %, 25 °C

- - - + + + + + + + + + + +

Concentration 50 %, 80 °C

- - - - - + + + + + + + +

Note isocorrosion curves!

Sodium hypochlorite

NaOCl

Concentration < 80 g/l, 25 °C

- - - O - O O O O O O O O

Free chlorine (Cl₂), boiling

- - - - - - - - - - O O -

Hard rubber, plastic

Plastic

Sodium carbonate, aqueous solution

Na₂CO₃

O O O + + + + + + + + +

Sodium nitrate, aqueous

NaNO₃

O O O + + + + + + + + + O

Sodium perborate

NaBO₃ H₂O₂

- - - - + + + + + + + +

Sodium silicate

Na₂O xSiO₂

O O O O + + + + + + + + O

Sodium sulphate, aqueous solution

Na₂SO₄

- - - + + + + + + + + +

Sodium sulphide, aqueous solution

Na₂S

- - - - + + + + + + + + -

Sodium sulphite, aqueous solution

Na₂SO₃

- - - - + + + + + + + + +

Sodium thiosulphate

Na₂S₂O₄

- - - - + + + + + + + + -

Nickel chloride, cold 25 %

NiCl₂

Concentration < 20 %

- - - - O O + + + + +

Concentration > 20 %

- - - - - O + + + + + -

Hard rubber, plastic

Nickel sulphate, cold 25 °C

NiSO₄

- - - - + + + + + + + + -

Nickel sulphate (pure solution), 70 °C

- - - - - + + + + + + + -

Nitrosulphuric acid

H₂SO₄/HNO₃

- - - - O O O O O O O -

Analysis required

Special materials/comments

Chemical resistance table

„+“ Can be used (note limit values)

„-“ Cannot be used

„O“ Can only be used under very specific conditions //endbar

“Blank field” Can be used with no restrictions

Fluid handled

| | | GIL-250 | GJS-400-15; GJS-400-18 | GP240GH+N | ERN | NORIHARD [®] NH 15 3 | NORILY [®] NL 25 2 | 1.4008 | 1.4308 | NORINOX [®] 1.4408 | NORILUM [®] | NORICID [®] 9.4306 | NORIDUR [®] 1.4593 | NORICLOR [®] 1.4573 | NORICROM [®] 1.4475 | CuAl10Fe5Ni5-C-GS | Special materials/comments |
|---|------------------|---------|------------------------|-----------|-----|-------------------------------|-----------------------------|--------|--------|-----------------------------|----------------------|-----------------------------|-----------------------------|------------------------------|------------------------------|-------------------|---|
| Nitrobenzene | $C_6H_5NO_2$ | + | + | + | | | | + | + | + | + | + | + | + | + | + | Anhydrous |
| Nitrophenol | $C_6H_4(OH)NO_2$ | + | + | + | | | | + | + | + | + | + | + | + | + | + | Anhydrous |
| Nitrocellulose | | + | + | + | | | | + | + | + | + | + | + | + | + | + | In case of impact(s): generation of sparks, risk of explosion |
| Oils, pure | | + | + | + | | | + | + | + | + | + | + | + | + | + | + | |
| Oleum (20 % free SO ₂) | | - | - | - | | | | (+) | + | + | + | + | + | + | | | (+)cold only, otherwise < 80 °C |
| Oxalic acid | $(COOH)_2$ | - | - | - | | | | - | O | O | O | O | O | O | | - | Note isocorrosion curves! |
| Paraffins | | + | + | + | | | + | + | + | + | + | + | + | + | + | + | |
| Pentanol | $C_5H_{11}OH$ | + | + | + | | | | + | + | + | + | + | + | + | + | + | Combustible |
| Vegetable oils | | + | + | + | | | | + | + | + | + | + | + | + | + | + | For purity reasons: 1.4408/1.4593 |
| Phenol, aqueous solution | C_6H_5OH | - | - | - | | | | - | O | O | + | + | + | + | | - | |
| Phenolsulfonic acid | $HOOC_6H_4SO_3H$ | - | - | - | | | | - | + | + | + | + | + | + | | - | |
| Phosphoric acid, pure | H_3PO_4 | | | | | | | | | | | | | | | | Note isocorrosion curves! |
| Concentration 85 %, 25 °C | | - | - | - | | | | - | + | + | | | + | + | | | |
| Concentration 85 %, 80 °C | | - | - | - | | | | - | + | + | + | | + | + | | | |
| Phosphoric acid, technical (wet fusion) | | | | | | | | | | | | | | | | | Depending on the H ₂ SO ₄ content and concentration of contaminants (Cl, F) |
| Concentration < 75 %, 25 °C | | - | - | - | | | | - | - | - | | | + | + | | | |
| Concentration < 75 %, 80 °C | | - | - | - | | | | - | - | - | | | O | O | | | |
| Phthalic anhydride | $C_8H_4(CO)_2O$ | O | O | O | | | | + | + | + | + | + | + | + | + | + | |
| Propionic acid, aqueous | C_2H_5COOH | - | - | - | | | | - | O | + | + | O | + | + | | - | |
| Pyridine | C_5H_5N | + | + | + | | | | + | + | + | + | + | + | + | | O | |
| Pyrrolidone | $HN(CH_2)_2CO$ | + | + | + | | | | + | + | + | + | + | + | + | | - | |
| Mercury | Hg | + | + | + | | | | + | + | + | + | + | + | + | | - | |

Chemical resistance table

„+“ Can be used (note limit values)

„-“ Cannot be used

„O“ Can only be used under very specific conditions

“Blank field” Can be used with no restrictions

Fluid handled

Nitric acid, pure

HNO₃

Concentration < 60 %, 25 °C

Concentration < 60 %, 80 °C

Concentration < 90 %, 25 °C

Concentration < 90 %, boiling

Concentration 98 %, 25 °C

Concentration 98 %, boiling

Nitric acid, technical

Hydrochloric acid

HCl

Black liquor

Sulphur, molten

S

Sulphur dioxide, aqueous solution

H₂SO₃

Sulphuric acid, pure

H₂SO₄

Concentration 10 %, < 20 °C

Concentration 10 %, < 80 °C

Concentration 40 %, < 30 °C

Concentration 40 %, < 40 °C

Concentration 55-80 %, < 30 °C

Concentration 90 %, < 20 °C

Concentration 90 %, < 40 °C

Concentration 98 %, < 20 °C

Concentration 98 %, < 70 °C

GJL-250

GJS-400-15, GJS-400-18

GP240GH+N

ERN

NORIHARD®NH 15 3

NORLOY® NL 25 2

1.4008

1.4308

NORINOX®, 1.4408

NORILIUM®

NORICID® 9.4306

NORIDUR® 1.4593

NORICLOR® 1.4573

NORICROM® 1.4475

CuAl10Fe5Ni5-C-6S

Special materials/comments

Note isocorrosion curves!

Ensure that you enquire!

Hard rubber < 80 °C, plastic

Exact analysis required

< 130 °C

Isokorrosionskurven beachten!

NORIDUR 1.4593 resistant in flowing acid (v = 10 m/s)!

Chemical resistance table

„+“ Can be used (note limit values)

„-“ Cannot be used

„O“ Can only be used under very specific conditions

„Blank field“ Can be used with no restrictions

Fluid handled

| | | GJL-250 | GJS-400-15; GJS-400-18 | GP240GH+N | ERN | NORIHARD*
NH 15 3 | NORLOY*
NL 25 2 | 1.4008 | 1.4308 | NORINOX*
1.4408 | NORILUM* | NORICID*
9.4306 | NORIDUR*
1.4593 | NORICLOR*
1.4573 | NORICROM*
1.4475 | CuAl10Fe5Ni5-C-G5 | Special materials/comments |
|---|---|---------|------------------------|-----------|-----|----------------------|--------------------|--------|--------|--------------------|----------|--------------------|--------------------|---------------------|---------------------|-------------------|--|
| Sulphuric acid, technical | H ₂ SO ₄ | - | - | - | | | - | - | o | o | o | o | o | o | | - | Ensure that you enquire! |
| Sulphurous acid | H ₂ SO ₃ | - | - | - | | | | - | - | + | + | + | + | + | | - | |
| Selexol | | o | o | o | | | | + | + | + | + | + | + | + | | - | |
| Silver nitrate, aqueous solution | AgNO ₃ | - | - | - | | | | o | + | + | + | + | + | + | | - | |
| Silicone oil | | + | + | + | + | + | + | + | + | + | + | + | + | + | | + | |
| Slop (distillation residue) | | o | o | + | | | | + | + | + | + | + | + | + | | o | Combustible |
| Soda | | | | | | | | | | | | | | | | | See Sodium carbonate |
| Brine (anolyte with > 30 mg Cl ₂ /l) | | - | - | - | | - | - | - | - | - | - | - | - | o | o | - | Titanium, hard rubber (query), plastic |
| Spinning bath acid (with H ₂ S and CS ₂) | | - | - | - | | | | - | - | - | - | - | - | - | - | - | Hard rubber (with restrictions), plastic |
| Stretford lye | | o | o | o | | | | + | + | + | + | + | + | + | | - | |
| Styrene | C ₆ H ₅ -CH=CH ₂ | o | o | + | | | | + | + | + | + | + | + | + | | + | Combustible |
| Tar, tar oils | | o | o | + | o | o | o | + | + | + | + | + | + | + | | o | |
| Terephthalic acid | C ₆ H ₄ (COOH) ₂ | - | - | - | | | | o | o | + | + | o | + | + | | - | |
| Tetrachloromethane | CCl ₄ | + | + | + | + | + | + | + | + | + | + | + | + | + | | + | Anhydrous and acid-free |
| Titanium dioxide suspension | TiO ₂ | - | - | - | - | - | - | - | - | - | - | - | + | + | | - | With specification of analysis |
| Toluene | C ₆ H ₅ -CH ₃ | o | o | + | | | | + | + | + | + | + | + | + | | + | Combustible |
| Trichloroacetic acid | CCl ₃ -COOH | - | - | - | - | - | - | - | - | - | - | - | - | - | | - | Plastic |
| Trichloroethylene | CHCl=CCl ₂ | + | + | + | | | | + | + | + | + | + | + | + | | + | Anhydrous and acid-free |
| Trisodium phosphate | Na ₃ PO ₄ | o | o | o | o | o | + | + | + | + | + | + | + | + | | o | |
| Vinyl chloride, dry | CH ₂ =CHCl | o | o | + | o | o | + | + | + | + | + | + | + | + | | - | |
| Heat transfer oil | | o | o | + | o | o | + | + | + | + | + | + | + | + | | o | |

Chemical resistance table

- +* Can be used (note limit values)
 - Cannot be used
 ○ Can only be used under very specific conditions
 "Blank field" Can be used with no restrictions

Fluid handled

Water

H₂O

| | | GIL-250 | GJS-400-15, GJS-400-18 | GP240GH+N | ERN | NORIHARD* ¹ NH 15 3 | NORILLOY [®] NL 25 2 | 1.4008 | 1.4308 | NORINOX [®] , 1.4408 | NORILIUM [®] | NORICID [®] 9.4306 | NORIDUR [®] 1.4593 | NORICLOR [®] 1.4573 | NORICROM [®] 1.4475 | CuAl10Fe5Ni5-C-G5 | Special materials/comments |
|---------------------------------------|--|---------|------------------------|-----------|-----|--------------------------------|-------------------------------|--------|--------|-------------------------------|-----------------------|-----------------------------|-----------------------------|------------------------------|------------------------------|-------------------|--|
| Municipal waste water | | ○ | ○ | ○ | ○ | ○ | + | + | + | + | + | + | + | + | ○ | | |
| Industrial waste water | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | Fluid analysis |
| Brackish water | | - | - | - | - | - | - | - | + | + | - | + | + | | ○ | | |
| Brackish water with sand | | - | - | - | - | - | ○ | - | - | - | - | - | ○ | ○ | + | - | Heavily dependent on the type and composition of the sand |
| Chemical waste water | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | Fluid analysis |
| Demineralised water = deionised water | | - | - | - | | | | + | + | + | + | + | + | + | | + | |
| Distilled water | | - | - | - | | | | + | + | + | + | + | + | + | | + | |
| Fire-fighting water (fresh water) | | ○ | ○ | ○ | ○ | | + | ○ | ○ | + | + | ○ | + | + | | ○ | |
| Heating water | | ○ | ○ | + | | | | + | + | + | + | + | + | + | | ○ | Conditioned |
| Boiler feed water | | ○ | ○ | + | | | | + | + | + | + | + | + | + | | ○ | Conditioned (see Guidelines) |
| Condensate | | ○ | ○ | + | | | | + | + | + | + | + | + | + | | ○ | Conditioned |
| Condensate (not boiler) | | - | - | - | | | | + | + | + | + | + | + | + | | + | |
| Cooling water | | ○ | ○ | ○ | ○ | | + | ○ | ○ | + | + | ○ | + | + | | ○ | |
| Seawater | | - | - | - | - | - | ○ | - | - | ○ | ○ | - | + | + | | ○ | |
| Seawater with sand | | - | - | - | - | - | ○ | - | - | - | - | - | ○ | ○ | + | - | |
| Pure water, ultra-pure water | | + | + | + | + | + | + | + | + | + | + | + | + | + | | + | Neutral with regard to chemical corrosion |
| Raw water | | ○ | ○ | ○ | ○ | ○ | + | ○ | ○ | + | + | ○ | + | + | | ○ | Fluid analysis required |
| Lime water | | - | - | - | ○ | + | + | | | | | | | | + | | Fluid analysis required with regard to chemical corrosion, neutral |
| Partly desalinated water | | - | - | - | | | | ○ | ○ | + | + | ○ | + | + | | + | |
| Drinking water | | + | + | + | + | + | + | + | + | + | + | + | + | + | | + | Neutral with regard to chemical corrosion |
| Fully desalinated water | | - | - | - | - | - | + | + | + | + | + | + | + | + | | + | |

Chemical resistance table

→+ Can be used (note limit values)

→- Cannot be used

○ Can only be used under very specific conditions

"Blank field" Can be used with no restrictions

Fluid handled

| | | GJL-250 | GJS-400-15; GJS-400-18 | GP240GH+N | ERN | NORIHARD* NH 15 3 | NORLOY® NL 25 2 | 1.4008 | 1.4308 | NORINOX®, 1.4408 | NORILUM® | NORICID® 9.4306 | NORIDUR® 1.4593 | NORICLOR® 1.4573 | NORICROM® 1.4475 | CuAl10Fe5Ni5-C-GS | Special materials/comments |
|---------------------------------|---|---------|------------------------|-----------|-----|-------------------|-----------------|--------|--------|------------------|----------|-----------------|-----------------|------------------|------------------|-------------------|-------------------------------------|
| Hydrogen peroxide | H ₂ O ₂ | - | - | - | - | - | - | - | + | ○ | ○ | + | ○ | ○ | | - | |
| Wine | | - | - | - | - | - | - | ○ | + | + | + | + | + | + | | - | |
| Tartaric acid, aqueous solution | (CHOH) ₂ (COOH) ₂ | - | - | - | - | - | - | ○ | ○ | + | + | ○ | + | + | | - | |
| Zinc chloride solution | ZnCl ₂ | | | | | | | | | | | | | | | | |
| Concentration 20 %, cold | | - | - | - | | | ○ | ○ | ○ | + | + | ○ | + | + | | - | Hard rubber, plastic |
| Concentration 20 %, 80 °C | | - | - | - | | | ○ | - | - | ○ | ○ | - | + | + | | - | Hard rubber, plastic |
| Concentration 60 %, cold | | - | - | - | | | ○ | - | ○ | ○ | ○ | ○ | + | + | | - | Hard rubber, plastic |
| Concentration 60 %, 80 °C | | - | - | - | | | - | - | - | ○ | ○ | - | + | + | | | Hard rubber, plastic |
| Zinc sulphate | ZnSO ₄ | - | - | - | - | - | ○ | ○ | ○ | ○ | + | ○ | + | + | | ○ | H ₂ SO ₄ free |
| Citric acid, aqueous solution | (CH ₂ COOH) C(OH) COOH | - | - | - | - | - | - | ○ | ○ | + | + | ○ | + | + | | ○ | |
| Sugar juice | | ○ | ○ | ○ | ○ | ○ | + | + | + | + | + | + | + | + | | ○ | |