Seal Material Selection Table for Reference

For seal parts in CUPLA (the important parts that prevent leaking to the outside), it is important to select the most appropriate seal material to suit the property and temperature of the fluid. It is so important that wrong selection may not only impair the function of CUPLA but also cause an unexpected accident.

When the fluid in question is not listed in "Seal Material Selection Table (For reference)," the seal material that you select should be tested under actual environment. Even if the fluid is stated in the following list, the test could be required in some cases.

				Sea	Seal Mat	erial							Sea	I Mate	erial		
	Fluids	Nitrile rubber	Hydrogenated nitrile rubber	Ethylene-propylene rubber	Fluoro rubber	Perfluoro- elastomer	Silicone rubber	Chloroprene rubber		Fluids	Nitrile rubber	Hydrogenated nitrile rubber	Ethylene-propylene rubber	Fluoro rubber	Perfluoro- elastomer	Silicone rubber	Chloroprene rubber
2	2,2-Dimethyl-butane	0	0	×	0	0	×		в	Butadiene	×	×	×	0	0	×	×
	2,3-Dimethyl-butane	0	0	×	0	0	×	\bigtriangleup		Butane	0	0	×	0	0	×	
	2,4-Dimethyl-pentane	0	0	×	0	0	×	×		Butane (liquid)	0		×	0		×	0
	2-Methyl-pentane	0	0	×	O	0	×	×		Butanol (Butyl alcohol)	0	0	0	0	O	0	0
3	3-Methyl-pentane	0	0	×	O	0	×	×		Butter and butter oil	0	0	O	0	O	0	×
Α	Acetaldehyde			0	×		0	\bigtriangleup		Butyl acetate	×	×	0	×	O	×	×
	Acetic acid	0	0	0		O	\bigtriangleup	0		Butyl stearate	0	0	×	O	\bigcirc	×	×
	Acetic anhydride		×	0	×	O	0	0		Butylaldehyde	×	×	0	×	0	×	×
	Acetone	×	×	O	×	O	×	×		Butylene	0	0	×	0	O	×	
	Acetonitrile	×		×		O	×	\times	С	Cadmium cyanide			O		O	0	0
	Acetophenone	×	×	O	×	0	×	×		Calcium acetate	0	0	O	×	O	×	0
	Acetyl chloride	×	×	×	O	O	×	\times		Calcium acetate (65°C)	0		O	×	O	\times	0
	Acetylacetone	×	×	O	×	0	×	×		Calcium carbide					O		
	Acetylene	O	0	O	O	O	0	0		Calcium carbonate	0	O	O	O	O	\bigcirc	O
	Air (50°C)	O	O	O	O	O	O	O		Calcium hydroxide	0	O	O	0	O	\bigcirc	O
	Aluminium bromide	O	O	O	O	O	O	\bigcirc		Calcium nitrate (65°C)	0		O	O	O	\bigcirc	O
	Aluminium chloride	O	O	O	O	O	0	O		Calcium perchlorate	×		×	×		×	×
	Aluminium nitrate	O	O	O	O	O	0	O		Calcium sulfate			O		O	0	0
	Aluminium sulfate	O	O	O	O	O	O	0		Calcium sulfate (65°C)	×		O		\bigcirc	0	O
	Amine mixture	×	×	0	×	×	0	0		Calcium sulfite	O	O	O	O	\bigcirc	\bigcirc	0
	Ammonia (anhydrous)	0	0	O	×	0	0	O		Carbitol	0	0	0	0	\bigcirc	0	0
	Ammonia (Liquid) (65°C)				×	O		\bigtriangleup		Carbon dioxide gas (65°C)	O		0	0		0	0
	Ammonia (Liquid) (Cool)			O	×	0	0	0		Carbon disulfide	×	×	×	O	O	×	×
	Ammonia gas (Low temperature)	O	O	O	×	O	O	\bigcirc		Carbon monoxide (65°C)	O	O	O	O	\bigcirc	\bigcirc	0
	Ammonium carbonate	×	×	O	O	O	×	O		Carbon tetrachloride	0	0	×	O	O	×	×
	Ammonium chloride	0	0	O	O	0	×	O		Castor oil	0	0	0	O	O	\bigcirc	0
	Ammonium hydroxide	×	×	O	×	×	O	\bigtriangleup		Chlorine (liquid)	×		×	×	0	\times	×
	Ammonium magnesium sulfate	×		×	×		×	×		Chlorine gas	0	0	×	O	O	×	×
	Ammonium nitrate (65°C)	O	O	O			0	O		Chlorine water			0	O	\bigcirc	×	×
	Ammonium phosphate (65°C)	O		O	×	O	0	O		Chloroacetone	×	×	O	×	\bigcirc	×	×
	Ammonium sulfate	0	0	0	×	0	0	0		Chlorobenzene	×	×	×	0	O	×	×
	Ammonium sulfite		\bigtriangleup	O	\bigtriangleup	O	0	\bigcirc		Chloroform	×	×	×	O	\bigcirc	×	×
	Ammonium thiosulfate	\bigtriangleup	\bigtriangleup	O	\bigtriangleup	O	0	O		Chlorophenol	×	×	×	O	\bigcirc	×	×
	Amyl acetate	×	×		×	0	×	\times		Chromium hydroxide					O		
	Amyl alcohol	0	0	O	0	0	×	0		Coconut oil	0	0	\bigtriangleup	O	O	O	×
	Aniline	×	×	0	\bigtriangleup	O	×	×		Cod liver oil	0		O	0	\bigcirc	0	0
	Animal oil (Lard)	0	0	0	O	0	0	0		Coffee	0		×	×		×	×
	Arsenic trichloride			×	×	0	×	×		Copper chloride	0	O	O	0	O	\bigcirc	0
	Asphalt	0	0	×	0	0	×	×		Copper cyanide	0	0	O	0	O	O	0
В	Barium chloride	O	O	O	O	0	0	O		Copper sulfate	0	O	O	0	O	\bigcirc	0
	Barium hydroxide	0	0	O	0	0	0	O		Corn oil	0	0		0	O	O	
	Barium nitrate			O		0	0	O		Cotton seed oil	0	0	\bigtriangleup	0	O	O	
	Barium sulfate (65°C)	0		0	0	0	0	0		Cresol (50°C)	×	×	×	0	O	×	×
	Barium sulfide	O	0	O	0	0	0	O		Crude oil	0	0	×	0	O	×	×
	Beer	0	0	0	0	0	0	0		Cyclohexane	0	0	×	0	O	×	×
	Benzaldehyde	×	×	O	×	O	0	×		Cyclohexanol	0	0	×	0	O	×	×
	Benzene	×	×	×	0	0	×	×	D	Developer	0	0	0	0	O	O	0
	Benzyl alcohol	×	×	0	O	O	\triangle	0		Diacetone alcohol	×	×	O	×	O	×	0
	Benzyl chloride	×	×	×	0	0	×	×		Dibenzyl ether	×	×	0	×	0	×	×
	Brake oil			0	×	0	\triangle	O		Dichlorophenol	0	0	×	0	O	×	×
	Bromine	×	×	×	0	0	×	×		Diesel oil	0	0	×	0	0	×	×
	Bromine water	×	×	×	0	0	×	×		Diethanolamine			O		0	0	0

183 NITTO KOHKI CO., LTD. CUPLA

Seal Material Selection Table for Reference

Note: Contact us when the space is blank.

 How to read
 O Practically no harm, and can be used (Excellent)

 the selection
 O Some harm may be inevitable but can be used under restrictions (Good)

 tables
 A Should be avoided if at all possible (Not recommended)

 × Should not be used (Unsuitable)

Note: When selecting the seal material, please consider the following suggestions carefully: If there is no comment in the column of the fluid name, the condition of the fluid is under saturation at room temperature.
 Please check with us for applications at a high fluid temperature or with different fluid concentrations.
 For applications related to foods, please order separately specifing the detailed applications.

		Seal Material									
	Fluids	Nitrile rubber	Hydrogenated nitrile rubber	Ethylene-propylene rubber	Fluoro rubber	Perfluoro- elastomer	Silicone rubber	Chloroprene rubber			
D	Diethylene glycol	0	O	0	0	0	0	0			
Е	Ethanol (Ethyl alcohol)	\bigtriangleup		O	\bigtriangleup	0	0	0			
	Ethyl acetate	×		0	×		0	×			
	Ethyl benzene	×	×	×	O	0	×	×			
	Ethyl cellulose	0	0	0	×	0	0	0			
	Ethyl chloride	0	0		0	0	×	×			
	Ethylene glycol	0	0	0	0	0	0	0			
-	Ethylene trichloride	×	×		0	0	×	×			
F	Ferric sulfate	0	0	0	0	0		0			
	Fish oil	0 X	0	×	© ×		© ×	×			
	Fluorine (Gas)			0	×		0				
	Formic aldehyde Freon 11	0	×	×	$\hat{\mathbf{O}}$		×	×			
	Freon 12	0	$\hat{\mathbf{O}}$			0	×				
	Freon 22	×	×		×		×	0			
	Fuel oil	0		×	0	0	×	0			
	Furfural	×	×	0	×	0	×	×			
G	Gasoline	0	0	×	O	0	×	×			
Ĩ	Gelatin	0	0	0	0	0	0	0			
	Glucose	0	0	0	0	0	0	0			
	Glycerine (65°C)	0	0	0	0	0	0	0			
	Grease (Petroleum-based)	0	0	×	0	0	×	×			
н	Helium	0	0	0	0	0	0	0			
	Heptane (n-heptane)	0	0	×	0	0	×	0			
	Hexane (n-hexane)	0	0	×	0	0	×	0			
	Hexylene glycol	\bigtriangleup		O	\triangle	0	0	0			
	Hydraulic oil (Petroleum-based)	0	0	×	0	0	0	×			
	Hydraulic oil (Phosphate ester series)	×	×	0	O	O		×			
	Hydraulic oil (Synthetically-prepared)	0	0	×	O	0		×			
	Hydraulic oil (Water-glycol series)	O	0	O	0	0	0	O			
	Hydraulic oil (Water-in-oil emulsion series)	\bigcirc	O	×	O	O	\bigtriangleup	×			
	Hydrobromic acid	×	×	O	O	O	×	×			
	Hydrogen	O	0	0	O	0		O			
	Hydrogen peroxide (30%)	×			O		O	×			
Т	Iron chloride	0		0	O		0	O			
	Iron nitrate (65°C)	0		0	O		0	0			
	Iron sulfite (100%)	0		×	×		×	×			
	Isoamyl alcohol	×		×	×		×	×			
	Isooctane	0	0	×	0	0	×	0			
	Isopropanol	0	0	0	0	0	0	0			
	Isopropyl acetate	×	×	0	×	0	×	×			
	Isopropyl alcohol	0	0	0	0	0	0	0			
к	Isopropyl ether	0	0	×	×	0	×	×			
K L	Kerosene	0	0	×	0		×	0			
L	Lard and lard oil Latex	×		×	×		×	×			
	Latex Liquefied petroleum gas (LPG)	~ 0	0	×	0	0		×			
	Liquors (beet)	0		0	0		0	0			
	Lubricating oil (SAE 10, 20, 30, 40, 50)	0		×	0		×	×			
м	Magnesium chloride	0			0		0	0			
	Magnesium hydroxide	0		0	0	0	×	0			
	Magnesium nitrate	0		×	×		×	×			
	magnesium mitate	0		^	^		^	^			

		Seal Material									
	Fluids	Nitrile rubber	Hydrogenated nitrile rubber	Ethylene-propylene rubber	Fluoro rubber	Perfluoro- elastomer	Silicone rubber	Chloroprene rubber			
М	Magnesium sulfate	0		O	O	0	O	O			
	Maleic anhydride	×	×	0	×	O	×	×			
	Mercury	0	0	O	O	O	×	O			
	Methanol	×	×	O	×	O	O	O			
	Methyl bromide	0	0	×	0	0	×	×			
	Methyl butyl ketone	×	×	O	×	O	\times	×			
	Methyl chloride	×	×		0	0	×	×			
	Methyl ethyl ketone (MEK)	×	×	0	×	0	×	×			
	Methyl isobutyl ketone (MIBK)	×	×		×	0	×	×			
	Methyl propyl ketone	X		0	×		×	×			
	Methyl salicylate	×	×	0	×	0	×				
	Methylene bromide	X		X	0	0	×	X			
	Methylene chloride	×		×	0	0	×	×			
	Milk Mineral oil	0	0	© ×	0	0					
	Monobromobenzene	×		×	0	0	×	X			
	Monochlorobenzene	×	×	×	0	0	×	×			
	Monoethanolamine (MEA)	×	×	0	×	0	0	×			
N	n-amyl alcohol	×		×	×		×	×			
	Naphtha	0	0	×	0	0	×	×			
	Naphthalene	×	×	×	0	0	×	×			
	Naphthenic oil	0		×	0		×	×			
	n-butyl alcohol	×		×	×		×	×			
	Nickel acetate	0	0	O	×	0	×	0			
	Nickel acetate (65°C)	×	-	0	×	_	×	×			
	Nickel ammonium sulfate	\triangle		0	\bigtriangleup	0	0	0			
	Nickel chloride	0	0	O	0	0	0	0			
	Nickel nitrate	\bigtriangleup		O	\bigtriangleup	O	0	O			
	Nickel sulfate	0	0	0	O	0	0	0			
	Nitrobenzene	×	×	\bigtriangleup	0	O	×	×			
	Nitrogen (gas)	0	0	O	O	O	O	O			
0	Octyl alcohol	0	0	\bigtriangleup	O	O	0	0			
	Oleic acid	\bigtriangleup		×	0	O	×	×			
	Olive oil	O	O	0	O	O	\bigtriangleup	×			
	Ortho-dichlorobenzene	×	×	×	O	O	×	×			
	Oxygen (gas)	0	0	O	O	O	\bigcirc	0			
	Ozone	×		O	O	O	O	×			
P	Palm oil	×		×	×		×	×			
	Paradichlorobenzene	×	×	×	0	0	×	×			
	Paraffin oil	0	0	×	0	O	×	×			
	Peanut oil	0			0		0	0			
	Pentane (n-pentane)	0	0	×	0	0	×	0			
	Phenol	×	×	×	0	0	×	×			
	Phosphorous oxychloride (dry)	0		0	0		0	0			
	Phosphorous oxychloride (wet)	0		0	0		0	0			
	Phosphorus	×		X	×	0	×	X			
	Pine oil	0	0	×	0	0	×	×			
	Potassium acetate (65°C)	0	0	0	×	0	×	0			
	Potassium aluminium sulfate			0		0	0	0			
	Potassium bicarbonate			0		0	0	0			
	Potassium bichromate			0		0	0	0			
	Potassium carbonate			O	\bigtriangleup	O	0	O			

		Seal Material									
	Fluids	Nitrile rubber	Hydrogenated nitrile rubber	Ethylene-propylene rubber	Fluoro rubber	Perfluoro- elastomer	Silicone rubber	Chloroprene rubber			
Ρ	Potassium cyanide	0	0	O	O	O	O	O			
	Potassium hydroxide (50%)	0	0	O	×	O	\bigtriangleup	0			
	Potassium hyposulfite	0		O	O		O	0			
	Potassium nitrate	O	0	0	O	0	O	O			
	Potassium nitrite			0		0	0	0			
	Potassium phosphate			O		O	0	0			
	Potassium silicate	0	0	0	0	0	×	0			
	Potassium sulfate	0	0	0	0	0	0	0			
	Potassium thiosulfate			0		0	0	0			
	Propane	0	Ô	X	Ô	0	×	0			
	Propionaldehyde			0		0	0	0			
	Propionitrile	0	0	×	0	0	0	0			
	Propyl acetate Propyl alcohol	×	×	0	×	0	×	×			
				×	0	0	×	×			
	Propylene	×		0	×	0	×	×			
R	Pyridine Rosin oil	0		×	×		×	×			
S	Secondary butyl alcohol	0	0	0	0	0	0	$\hat{\mathbf{O}}$			
3	Soapy water (65°C)	0	0	0	0	0	0	0			
	Sodium acetate	0	0	0	×	0	×	0			
	Sodium aluminate			0		0	0	0			
	Sodium bicarbonate	0	0	0	0	0	0	0			
	Sodium bichromate			0		0	0	0			
	Sodium carbonate	0	0	0	0	0	0	0			
	Sodium chloride	0	0	0	0	0	0	0			
	Sodium chloride (salt water)	0	0	0	0	0	0	0			
	Sodium cyanide	0	0	0	0	0	0	0			
	Sodium hydroxide (Caustic Soda)			O		O	0	O			
	Sodium hypochlorite (1%)	0	0	0	0	0	0	0			
	Sodium hyposulfite			O		O	0	O			
	Sodium iodide			0		0	0	0			
	Sodium metaphosphate	O	0	O	O	O	×	0			
	Sodium nitrate			O	\bigtriangleup	O	×	O			
	Sodium nitrite	0	0	O	×	O	×	0			
	Sodium perborate	0	0	O	O	O	0	0			
	Sodium peroxide	0	0	O	O	O	×	0			
	Sodium phosphate	0	0	0	O	0	×	0			
	Sodium plumbate			0	\bigtriangleup	0	0	0			
	Sodium pyrosulfate	0	0	0	O	0	0	0			
	Sodium silicate (Water glass)	0	0	0	O	0	×	0			
	Sodium sulfate	0	0	0	0	0	0	0			
	Sodium sulfide	0	0	0	0	0	0	0			
	Sodium sulfite	0	0	0	0	0	Ô	0			
	Spindle oil	0	0	X	0	0		×			
	Starch	0		0	0		0	0			
	Steam (100°C)	×	×	0	0	0	×	×			
	Styrene monomer	×	×	×	0	0	×	×			
	Sucrose solution			0	0	0	0	0			
	Sulfur	×	×	0	0	0		© ×			
	Sulfur chloride (dry) Sulfur dioxide	×	×	×	© ×	0	-	×			
		×	^		× ©		0 ×				
	Sulfur tetroxide	×		×	0		×	\times			

		Seal Material									
	Fluids	Nitrile rubber	Hydrogenated nitrile rubber	Ethylene-propylene rubber	Fluoro rubber	Perfluoro- elastomer	Silicone rubber	Chloroprene rubber			
_	Currue .	~	- -	击	ш		Si	-			
S T	Syrup	0	0	0	O	0	0	0			
1	Tertiary butyl alcohol Tetrachloroethylene	×	×	×	0	0	×	×			
	Tetraethyl lead	0	0	×	0	0	×	×			
	Tetralin	×	×	×	0	0		×			
	Titanium terachloride	0	~	×	0	0	×	×			
	Toluene (Toluol)	×	×	×		0	×	×			
	Triethanolamine			0	×	0	×	0			
	Triphenyl phosphite	×		0	×		×	×			
	Tung oil	0	0	×	0	0	×	0			
v	Vinyl acetate	×		0	×	0	×	0			
•	Vinyl chloride	0	0	×	0	0	0	×			
w	Water	0	0	0	0	0	0	0			
	Whisky	0	0	0	0	0	0	0			
	Wine	0	0	0	0	0	0	0			
х	Xylene	×	×	×	0	0	×	×			
z	Zinc chloride	0	©	0	0	0	0	0			
_	Zinc sulfate	0	0	0	0	0	0	0			

185 NITTO KOHKI CO., LTD. CUPLA