

Seal Material Selection Table for Reference

For seal parts in the 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 completely malfunction the 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.

	Fluids	Seal Material						
		Nitrile rubber	Hydrogenated nitrile rubber	Ethylene-propylene rubber	Fluoro rubber	Perfluoro-elastomer	Silicone rubber	Chloroprene rubber
2	2,2-Dimethyl-butane	○	○	×	○	○	×	△
	2,3-Dimethyl-butane	○	○	×	○	○	×	△
	2,4-Dimethyl-pentane	○	○	×	○	○	×	×
	2-Methyl-pentane	○	○	×	○	○	×	×
3	3-Methyl-pentane	○	○	×	○	○	×	×
A	Acetaldehyde	△	△	○	×	△	○	△
	Acetic acid	○	○	○	△	○	△	○
	Acetic anhydride	△	×	○	×	○	○	○
	Acetone	×	×	○	×	○	×	×
	Acetonitrile	×		×	△	○	×	×
	Acetophenone	×	×	○	×	○	×	×
	Acetyl chloride	×	×	×	○	○	×	×
	Acetylacetone	×	×	○	×	○	×	×
	Acetylene	○	○	○	○	○	○	○
	Air (50°C)	○	○	○	○	○	○	○
	Aluminium bromide	○	○	○	○	○	○	○
	Aluminium chloride	○	○	○	○	○	○	○
	Aluminium nitrate	○	○	○	○	○	○	○
	Aluminium sulfate	○	○	○	○	○	○	○
	Amine mixture	×	×	○	×	×	○	○
	Ammonia (anhydrous)	○	○	○	×	○	○	○
	Ammonia (Liquid) (65°C)	△			×	○		△
	Ammonia (Liquid) (Cool)	△		○	×	○	○	○
	Ammonia gas (Low temperature)	○	○	○	×	○	○	○
	Ammonium carbonate	×	×	○	○	○	×	○
	Ammonium chloride	○	○	○	○	○	×	○
	Ammonium hydroxide	×	×	○	×	×	○	△
	Ammonium magnesium sulfate	×		×	×		×	×
	Ammonium nitrate (65°C)	○	○	○			○	○
	Ammonium phosphate (65°C)	○		○	×	○	○	○
	Ammonium sulfate	○	○	○	×	○	○	○
	Ammonium sulfite	△	△	○	△	○	○	○
	Ammonium thiosulfate	△	△	○	△	○	○	○
	Amyl acetate	×	×	△	×	○	×	×
	Amyl alcohol	○	○	○	○	○	×	○
	Aniline	×	×	○	△	○	×	×
	Animal oil (Lard)	○	○	○	○	○	○	○
	Arsenic trichloride	△		×	×	○	×	×
	Asphalt	○	○	×	○	○	×	×
	B	Barium chloride	○	○	○	○	○	○
		Barium hydroxide	○	○	○	○	○	○
		Barium nitrate	△	△	○	△	○	○
		Barium sulfate (65°C)	○		○	○	○	○
		Barium sulfide	○	○	○	○	○	○
		Beer	○	○	○	○	○	○
		Benzaldehyde	×	×	○	×	○	×
		Benzene	×	×	×	○	○	×
		Benzyl alcohol	×	×	○	○	△	○
		Benzyl chloride	×	×	×	○	○	×
		Brake oil	△	△	○	×	○	○
		Bromine	×	×	×	○	○	×
		Bromine water	×	×	×	○	○	×

	Fluids	Seal Material							
		Nitrile rubber	Hydrogenated nitrile rubber	Ethylene-propylene rubber	Fluoro rubber	Perfluoro-elastomer	Silicone rubber	Chloroprene rubber	
B	Butadiene	×	×	×	○	○	×	×	
	Butane	○	○	×	○	○	×	△	
	Butane (liquid)	○		×	○		×	○	
	Butanol (Butyl alcohol)	○	○	○	○	○	○	○	
	Butter and butter oil	○	○	○	○	○	○	×	
	Butyl acetate	×	×	○	×	○	×	×	
	Butyl stearate	○	○	×	○	○	×	×	
	Butylaldehyde	×	×	○	×	○	×	×	
	Butylene	○	○	×	○	○	×	△	
	C	Cadmium cyanide	△	△	○	△	○	○	○
		Calcium acetate	○	○	○	×	○	×	○
		Calcium acetate (65°C)	○		○	×	○	×	○
		Calcium carbide					○		
		Calcium carbonate	○	○	○	○	○	○	○
Calcium hydroxide		○	○	○	○	○	○	○	
Calcium nitrate (65°C)		○		○	○	○	○	○	
Calcium perchlorate		×		×	×		×	×	
Calcium sulfate		△	△	○	△	○	○	○	
Calcium sulfate (65°C)		×		○	△	○	○	○	
Calcium sulfite		○	○	○	○	○	○	○	
Carbitol		○	○	○	○	○	○	○	
Carbon dioxide gas (65°C)		○		○	○		○	○	
Carbon disulfide		×	×	×	○	○	×	×	
Carbon monoxide (65°C)		○	○	○	○	○	○	○	
Carbon tetrachloride		○	○	×	○	○	×	×	
Castor oil		○	○	○	○	○	○	○	
Chlorine (liquid)		×		×	×	○	×	×	
Chlorine gas		○	○	×	○	○	×	×	
Chlorine water		△	△	○	○	○	×	×	
Chloroacetone		×	×	○	×	○	×	×	
Chlorobenzene		×	×	×	○	○	×	×	
Chloroform		×	×	×	○	○	×	×	
Chlorophenol		×	×	×	○	○	×	×	
Chromium hydroxide						○			
Coconut oil		○	○	△	○	○	○	×	
Cod liver oil	○		○	○	○	○	○		
Coffee	○		×	×		×	×		
Copper chloride	○	○	○	○	○	○	○		
Copper cyanide	○	○	○	○	○	○	○		
Copper sulfate	○	○	○	○	○	○	○		
Corn oil	○	○	△	○	○	○	△		
Cotton seed oil	○	○	△	○	○	○	△		
Cresol (50°C)	×	×	×	○	○	×	×		
Crude oil	○	○	×	○	○	×	×		
Cyclohexane	○	○	×	○	○	×	×		
Cyclohexanol	○	○	×	○	○	×	×		
D	Developer	○	○	○	○	○	○		
	Diacetone alcohol	×	×	○	×	○	×		
	Dibenzyl ether	×	×	○	×	○	×		
	Dichlorophenol	○	○	×	○	○	×		
	Diesel oil	○	○	×	○	○	×		
	Diethanolamine	△	△	○	△	○	○		

Seal Material Selection Table for Reference

How to read the selection tables

- ⊙ Practically no harm, and can be used (Excellent)
- Some harm may be inevitable but can be used under restrictions (Good)
- △ 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:

1. If there is no comment in the column of the fluid name, the condition of the fluid is under saturation at room temperature.
2. Please check with us for applications at a high fluid temperature or with different fluid concentrations.
3. For applications related to foods, please order separately specifying the detailed applications.

Note: Contact us when the space is blank.

	Fluids	Seal Material						
		Nitrile rubber	Hydrogenated nitrile rubber	Ethylene-propylene rubber	Fluoro rubber	Perfluoro-elastomer	Silicone rubber	Chloroprene rubber
D	Diethylene glycol	⊙	⊙	⊙	⊙	⊙	○	⊙
E	Ethanol (Ethyl alcohol)	△	△	⊙	△	⊙	○	⊙
	Ethyl acetate	×		○	×		○	×
	Ethyl benzene	×	×	×	⊙	⊙	×	×
	Ethyl cellulose	○	○	○	×	⊙	○	○
	Ethyl chloride	⊙	⊙	△	⊙	⊙	×	×
	Ethylene glycol	⊙	⊙	⊙	⊙	⊙	⊙	⊙
	Ethylene trichloride	×	×	△	⊙	⊙	×	×
F	Ferric sulfate	⊙	⊙	⊙	⊙	⊙		⊙
	Fish oil	○	○	×	⊙	⊙	⊙	×
	Fluorine (Gas)	×		×	×	○	×	×
	Formic aldehyde	△	△	○	×	⊙	○	△
	Freon 11	○	×	×	○	○	×	×
	Freon 12	⊙	○	△	△	○	×	⊙
	Freon 22	×	×	△	×	⊙	×	⊙
	Fuel oil	⊙		×	⊙	⊙	×	○
	Furfural	×	×	○	×	⊙	×	×
G	Gasoline	⊙	⊙	×	⊙	⊙	×	×
	Gelatin	⊙	⊙	⊙	⊙	⊙	⊙	⊙
	Glucose	⊙	⊙	⊙	⊙	⊙	⊙	⊙
	Glycerine (65°C)	⊙	⊙	⊙	⊙	⊙	⊙	⊙
	Grease (Petroleum-based)	⊙	⊙	×	⊙	⊙	×	×
H	Helium	⊙	⊙	⊙	⊙	⊙	⊙	⊙
	Heptane (n-heptane)	⊙	⊙	×	⊙	⊙	×	○
	Hexane (n-hexane)	⊙	⊙	×	⊙	⊙	×	○
	Hexylene glycol	△	△	⊙	△	⊙	○	⊙
	Hydraulic oil (Petroleum-based)	⊙	⊙	×	⊙	⊙	○	×
	Hydraulic oil (Phosphate ester series)	×	×	○	⊙	⊙	△	×
	Hydraulic oil (Synthetically-prepared)	○	○	×	⊙	⊙		×
	Hydraulic oil (Water-glycol series)	⊙	⊙	⊙	○	⊙	○	⊙
	Hydraulic oil (Water-in-oil emulsion series)	⊙	⊙	×	⊙	⊙	△	×
	Hydrobromic acid	×	×	⊙	⊙	⊙	×	×
	Hydrogen	⊙	⊙	⊙	⊙	⊙	△	⊙
	Hydrogen peroxide (30%)	×			⊙	⊙		×
I	Iron chloride	⊙		⊙	⊙		○	⊙
	Iron nitrate (65°C)	⊙		⊙	⊙		○	⊙
	Iron sulfite (100%)	⊙		×	×		×	×
	Isoamyl alcohol	×		×	×		×	×
	Isooctane	⊙	⊙	×	⊙	⊙	×	○
	Isopropanol	○	○	⊙	⊙	⊙	⊙	○
	Isopropyl acetate	×	×	○	×	⊙	×	×
	Isopropyl alcohol	○	○	⊙	⊙	⊙	⊙	○
	Isopropyl ether	○	○	×	×	⊙	×	×
K	Kerosene	⊙	⊙	×	⊙	⊙	×	○
L	Lard and lard oil	⊙	⊙	○	⊙	⊙	○	○
	Latex	×		×	×		×	×
	Liquefied petroleum gas (LPG)	⊙	⊙	×	⊙	⊙	△	×
	Liquors (beet)	⊙	⊙	⊙	⊙	⊙	⊙	⊙
	Lubricating oil (SAE 10, 20, 30, 40, 50)	⊙	⊙	×	⊙	⊙	×	×
M	Magnesium chloride	⊙	⊙	⊙	⊙	⊙	⊙	⊙
	Magnesium hydroxide	○	○	⊙	⊙	⊙	×	○
	Magnesium nitrate	⊙		×	×		×	×

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

