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.

		Seal Material								
	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	×	\triangle		
	2,3-Dimethyl-butane	0	0	×	0	0	×	Δ		
	2,4-Dimethyl-pentane	0	0	×	0	0	×	×		
	2-Methyl-pentane	0	0	×	0	0	×	×		
3	3-Methyl-pentane	0	0	×	0	0	×	×		
Α	Acetaldehyde	\triangle	\triangle	0	×	\triangle	0	\triangle		
	Acetic acid	0	0	0	\triangle	0	\triangle	0		
	Acetic anhydride	\triangle	×	0	×	0	0	0		
	Acetone	×	×	0	×	0	×	×		
	Acetonitrile	×		×	\triangle	0	×	×		
	Acetophenone	×	×	0	×	0	×	×		
	Acetyl chloride	×	×	×	0	0	×	×		
	Acetylacetone	×	×	0	×	0	×	×		
	Acetylene	0	0	0	0	0	0	0		
	Air (50°C)	0	0	0	0	0	0	0		
	Aluminium bromide	0	0	0	0	0	0	0		
	Aluminium chloride	0	0	0	0	0	0	0		
	Aluminium nitrate	0	0	0	0	0	0	0		
	Aluminium sulfate	0	0	0	0	0	0	0		
	Amine mixture	×	×	0	×	×	0	0		
	Ammonia (anhydrous)	0	0	0	×	0	0	0		
	Ammonia (Liquid) (65°C)	\triangle			×	0		\triangle		
	Ammonia (Liquid) (Cool)	\triangle		0	×	0	0	0		
	Ammonia gas (Low temperature)	0	0	0	×	0	0	0		
	Ammonium carbonate	×	×	0	0	0	×	0		
	Ammonium chloride	0	0	0	0	0	×	0		
	Ammonium hydroxide	×	×	0	×	×	0	Δ		
	Ammonium magnesium sulfate	×		×	×		×	×		
	Ammonium nitrate (65°C)	0	0	0			0	0		
	Ammonium phosphate (65°C)	0		0	×	0	0	0		
	Ammonium sulfate	0	0	0	×	0	0	0		
	Ammonium sulfite	\triangle	\triangle	0	\triangle	0	0	0		
	Ammonium thiosulfate	\triangle	\triangle	0	\triangle	0	0	0		
	Amyl acetate	×	×	\triangle	×	0	×	×		
	Amyl alcohol	0	0	0	0	0	×	0		
	Aniline	×	×	0	\triangle	0	×	×		
	Animal oil (Lard)	0	0	0	0	0	0	0		
	Arsenic trichloride	\triangle		×	×	0	×	×		
	Asphalt	0	0	×	0	0	×	×		
В	Barium chloride	0	0	0	0	0	0	0		
	Barium hydroxide	0	0	0	0	0	0	0		
	Barium nitrate	Δ	\triangle	0	Δ	0	0	0		
	Barium sulfate (65°C)	0		0	0	0	0	0		
	Barium sulfide	0	0	0	0	0	0	0		
	Beer	0	0	0	0	0	0	0		
	Benzaldehyde	×	×	0	×	0	0	×		
	Benzene	×	×	×	0	0	×	×		
	Benzyl alcohol	×	×	0	0	0	Δ	0		
	Benzyl chloride	×	×	×	0	0	×	×		
	Brake oil	Δ	\triangle	0	×	0	Δ	0		
	Bromine	×	×	×	0	0	×	×		
	Bromine water	×	×	×	0	0	×	×		
455	CHOLO QUEX									

		Seal Material									
	Fluids	Nitrile rubber	Hydrogenated nitrile rubber	Ethylene-propylene rubber	Fluoro rubber	Perfluoro- elastomer	Silicone rubber	Chloroprene rubber			
В	Butadiene	×	×	×	0	0	×	×			
	Butane	0	0	×	0	0	×	\triangle			
	Butane (liquid)	0		×	0		×	0			
	Butanol (Butyl alcohol)	0	0	0	0	0	0	0			
	Butter and butter oil	0	0	0	0	0	0	×			
	Butyl acetate	×	×	0	×	0	×	×			
	Butyl stearate	0	0	×	0	0	×	×			
	Butylaldehyde	×	×	0	×	0	×	×			
	Butylene	0	0	×	0	0	×	Δ			
С	Cadmium cyanide	Δ	\triangle	0	\triangle	0	0	0			
	Calcium acetate	0	0	0	×	0	×	0			
	Calcium acetate (65°C)	0		0	×	0	×	0			
	Calcium carbide					0					
	Calcium carbonate	0	0	0	0	0	0	0			
	Calcium hydroxide	0	0	0	0	0	0	0			
	Calcium nitrate (65°C)	0		0	0	0	0	0			
	Calcium perchlorate	×		×	X		×	×			
	Calcium sulfate		\triangle	0	\triangle	0	0	0			
	Calcium sulfate (65°C)	×		0		0	0	0			
	Calcium sulfite	0	0	0	0	0	0	0			
	Carbitol	0	0	0	0	0	0	0			
		0		0	0		0	0			
	Carbon dioxide gas (65°C)	×	×	×	0		×	×			
	Carbon disulfide				_	0					
	Carbon monoxide (65°C)	0	0	0	0	0	0	0			
	Carbon tetrachloride	0	0	×	0	0	×	×			
	Castor oil	0	0	0	0	0	0	0			
	Chlorine (liquid)	×		×	X	0	×	×			
	Chlorine gas	0	0	×	0	0	×	×			
	Chlorine water			0	0	0	×	×			
	Chloroacetone	×	×	0	×	0	×	×			
	Chlorobenzene	×	×	×	0	0	×	×			
	Chloroform	×	×	×	0	0	×	×			
	Chlorophenol	×	×	×	0	0	×	×			
	Chromium hydroxide					0					
	Coconut oil	0	0	Δ	0	0	0	×			
	Cod liver oil	0		0	0	0	0	0			
	Coffee	0		×	×		×	×			
	Copper chloride	0	0	0	0	0	0	0			
	Copper cyanide	0	0	0	0	0	0	0			
	Copper sulfate	0	0	0	0	0	0	0			
	Corn oil	0	0		0	0	0				
	Cotton seed oil	0	0	Δ	0	0	0	Δ			
	Cresol (50°C)	×	×	×	0	0	×	×			
	Crude oil	0	0	×	0	0	×	×			
	Cyclohexane	0	0	×	0	0	×	×			
	Cyclohexanol	0	0	×	0	0	×	×			
D	Developer	0	0	0	0	0	0	0			
	Diacetone alcohol	×	×	0	×	0	×	0			
	Dibenzyl ether	×	×	0	×	0	×	×			
	Dichlorophenol	0	0	×	0	0	×	×			
	Diesel oil	0	0	×	0	0	×	×			
	Diethanolamine			0	Δ	0	0	0			
	Distribution										

Seal Material Selection Table for Reference

0 \bigcirc

× × 0

0 \bigcirc

X ×

× ×

× × ×

0 \bigcirc

 \triangle \triangle

× X × × X

× ×

× ×

> × \times

> × × \circ

 \circ \circ

×

×

×

×

0

 \bigcirc

× \bigcirc 0 0

 \bigcirc

×

×

0

×

 \bigcirc

Chloroprene rubber

Note: Contact us when the space is blank.

tables

How to read

© Practically no harm, and can be used (Excellent)
the selection

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.

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										Sea	l Material			
	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	
D	Diethylene glycol	0	0	0	0	0	0	0	М	Magnesium sulfate	0		0	0	0	0	
Е	Ethanol (Ethyl alcohol)	\triangle	\triangle	0	Δ	0	0	0		Maleic anhydride	×	×	0	×	0	×	
	Ethyl acetate	×		0	×		0	×		Mercury	0	0	0	0	0	×	
	Ethyl benzene	×	×	×	0	0	×	×		Methanol	×	×	0	×	0	0	
	Ethyl cellulose	0	0	0	×	0	0	0		Methyl bromide	0	0	×	0	0	×	
	Ethyl chloride	0	0	Δ	0	0	×	×		Methyl butyl ketone	×	×	0	×	0	×	
	Ethylene glycol	0	0	0	0	0	0	0		Methyl chloride	×	×	\triangle	0	0	×	
	Ethylene trichloride	X	×		0	0	×	×		Methyl ethyl ketone (MEK)	×	×	0	×	0	×	
F	Ferric sulfate	0	0	0	0	0	-	0		Methyl isobutyl ketone (MIBK)	×	×	<u></u>	×	0	×	
	Fish oil	0	0	×	0	0	0	×		Methyl propyl ketone	×		0	×		×	
	Fluorine (Gas)	×		×	×	0	×	×		Methyl salicylate	×	×	0	×	0	×	
	Formic aldehyde			0	×	0	0			Methylene bromide	×		×	0	0	×	
	Freon 11	0	×	×	0	0	×	×		Methylene chloride	×		×	0	0	X	
	Freon 12	0	0	^	Δ	0	×	0		Milk	0	0	0	0	0	0	
	Freon 22	×	×	Δ	×	0	×	0		Mineral oil	0	0	×	0	0	Δ	
	Fuel oil Furfural	© ×	×	×	© ×	0	×	×		Monobromobenzene	×	×	×	0	0	×	
G	Gasoline	0	0	×	0	0	×	×		Monochlorobenzene Monoethanolamine (MEA)	×	×	0	© ×	0	0	
G	Gelatin	0	0	0	0	0	^		N	n-amyl alcohol	×		×	×	9	×	
	Glucose	0	0	0	0	0	0		14	Naphtha		0	×	0	0	×	
	Glycerine (65°C)	0	0	0	0	0	0	0		Naphthalene	T ×	×	×	0	0	×	
	Grease (Petroleum-based)	0	0	×	0	0	×	×		Naphthenic oil			×	0		×	
Н	Helium	0	0	0	0	0	0	0		n-butyl alcohol	×		×	×		×	
	Heptane (n-heptane)	0	0	×	0	0	×	0		Nickel acetate	0	0	0	×	0	×	
	Hexane (n-hexane)	0	0	×	0	0	×			Nickel acetate (65°C)	×		0	×		×	
	Hexylene glycol	Δ		0	Δ	0	0	0		Nickel ammonium sulfate			0	Δ	0	0	
	Hydraulic oil (Petroleum-based)	0	0	×	0	0	0	×		Nickel chloride	0	0	0	0	0	0	
	Hydraulic oil (Phosphate ester series)	×	×	0	0	0	Δ	×		Nickel nitrate	Δ	Δ	0	Δ	0	0	
	Hydraulic oil (Synthetically-prepared)	0	0	×	0	0		×		Nickel sulfate	0	0	0	0	0	0	
	Hydraulic oil (Water-glycol series)	0	0	0	0	0	0	0		Nitrobenzene	×	×	\triangle	0	0	×	
	Hydraulic oil (Water-in-oil emulsion series)	0	0	×	0	0	Δ	×		Nitrogen (gas)	0	0	0	0	0	0	
	Hydrobromic acid	×	×	0	0	0	×	×	0	Octyl alcohol	0	0	\triangle	0	0	0	
	Hydrogen	0	0	0	0	0	Δ	0		Oleic acid		\triangle	×	0	0	×	
	Hydrogen peroxide (30%)	×			0		0	×		Olive oil	0	0	0	0	0	\triangle	
ı	Iron chloride	0		0	0		0	0		Ortho-dichlorobenzene	×	×	×	0	0	×	
	Iron nitrate (65°C)	0		0	0		0	0		Oxygen (gas)	0	0	0	0	0	0	
	Iron sulfite (100%)	0		×	×		×	×		Ozone	×		0	0	0	0	
	Isoamyl alcohol	×		×	×	_	×	×	P	Palm oil	×		×	×	_	×	
	Isooctane	0	0	×	0	0	×	0		Paradichlorobenzene	×	×	×	0	0	×	
	Isopropanol	0	0	0	0	0	0	0		Paraffin oil	0	0	×	0	0	×	
	Isopropyl acetate	×	×	0	X	0	×	×		Peanut oil	0		Δ	0		0	
	Isopropyl alcohol	0	0	0	0	0	0	0		Pentane (n-pentane)	0	0	X	0	0	X	
- V	Isopropyl ether	0	0	×	×	0	×	×		Phenol Phenol	×	×	×	0	0	×	
K	Kerosene	0	0	×	0	0	×	0		Phosphorous oxychloride (dry)	0		0	0		0	
L	Lard and lard oil	×	0	×	×		×	×		Phosphorus oxychloride (wet)	×		×	×	0	×	
	Liquefied petroleum gas (LPG)	×	0	×	×	0		×		Phosphorus Pine oil	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	0	×	×	0	×	
	Liquened petroleum gas (LPG)	0	0	0	0	0				Potassium acetate (65°C)		0	^ ©	×	0	×	
	Lubricating oil (SAE 10, 20, 30, 40, 50)	0	0	×	0	0	×	×		Potassium aluminium sulfate			0		0	0	
М	Magnesium chloride	0	0	0	0	0	0	0		Potassium bicarbonate			0		0	0	
	Magnesium hydroxide	0	0	0	0	0	×	0		Potassium bichromate	0		0	0	0	0	
	Magnesium nitrate	0		×	×		×	×		Potassium carbonate	Δ	Δ	0	Δ	0	0	

Seal Material Selection Table for Reference

		erial						
	Fluids	Nitrile rubber	Hydrogenated nitrile rubber	Ethylene-propylene rubber	Fluoro rubber	Perfluoro- elastomer	Silicone rubber	Chloroprene rubber
Р	Potassium cyanide	0	0	0	0	0	0	0
	Potassium hydroxide (50%)	0	0	0	×	0	Δ	0
	Potassium hyposulfite	0		0	0		0	0
	Potassium nitrate	0	0	0	0	0	0	0
	Potassium nitrite	\triangle	\triangle	0	\triangle	0	0	0
	Potassium phosphate	\triangle	\triangle	0	\triangle	0	0	0
	Potassium silicate	0	0	0	0	0	×	0
	Potassium sulfate	0	0	0	0	0	0	0
	Potassium thiosulfate	\triangle	\triangle	0	Δ	0	0	0
	Propane	0	0	×	0	0	×	0
	Propionaldehyde	\triangle	\triangle	0	\triangle	0	0	0
	Propionitrile	0	0	×	0	0	0	0
	Propyl acetate	×	×	0	×	0	×	×
	Propyl alcohol	0	0	0	0	0	0	0
	Propylene	Δ	Δ	×	0	0	×	×
	Pyridine	×		0	×	0	×	×
R	Rosin oil	0		×	×		×	×
S	Secondary butyl alcohol	0	0	0	0	0	0	0
	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	Δ	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)	Δ		0	Δ	0	0	0
	Sodium hypochlorite (1%)	0	0	0	0	0	0	0
	Sodium hypochlorite (178)	Δ	Δ	0	Δ	0	0	0
	Sodium iodide	Δ		0	Δ	0	0	0
	Sodium metaphosphate	0	0	0	0	0	×	0
	Sodium nitrate			0	Δ	0	×	0
	Sodium nitrite	0	0	0	×	0	×	0
			_	0	0	0	_	
	Sodium perborate	0	0	0	0	0	×	0
	Sodium peroxide Sodium phosphate	0	0	0	0	0	×	0
	• •		Δ		Δ			
	Sodium plumbate			0		0	0	0
	Sodium pyrosulfate	0	0	0	0	0	0	0
	Sodium silicate (Water glass)	0	0	0	0	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	0	0
	Spindle oil	0	0	X	0	0	Δ	×
	Starch	0		0	0		0	0
	Steam (100°C)	×	×	0	0	0	×	×
	Styrene monomer	X	×	×	0	0	X	×
	Sucrose solution	0	0	0	0	0	0	0
	Sulfur	×	×	0	0	0	0	0
	Sulfur chloride (dry)	×	×	×	0	0	Δ	×
	Sulfur dioxide	×	×	0	×	0	0	×
	Sulfur tetroxide	×		×	0		×	×

		Seal Material									
	Fluids	Nitrile rubber	Hydrogenated nitrile rubber	Ethylene-propylene rubber	Fluoro rubber	Perfluoro- elastomer	Silicone rubber	Chloroprene rubber			
S	Syrup	0									
Т	Tertiary butyl alcohol	0	0	0	0	0	0	0			
	Tetrachloroethylene	×	×	×	0	0	×	×			
	Tetraethyl lead	0	0	×	0	0	×	×			
	Tetralin	×	×	×	0	0	Δ	×			
	Titanium terachloride	0		×	0	0	×	×			
	Toluene (Toluol)	×	×	×	\triangle	0	X	×			
	Triethanolamine			0	×	0	×	0			
	Triphenyl phosphite	×		0	×		×	×			
.,	Tung oil	0	0	X	0	0	×	0			
٧	Vinyl acetate	×		0	×	0	×	0			
107	Vinyl chloride	0	0	×	0	0	0	×			
W	Water Whisky	0	0	0	0	0	0	0			
	Whisky	0	0	0	0	0	0	0			
Х	Xylene	×	×	×	0	0	×	×			
z	Zinc chloride	0	0	0	0	0	0	0			
_	Zinc sulfate	0	0	0	0	0	0	0			
			_	_		_	_				