

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	Chloroprene rubber	Fluoro rubber	Ethylene-propylene rubber	Perfluoroelastomer	Silicon rubber	
A	Acetaldehyde	—	—	—	○	◎	—	
	Acetic acid	○	◎	◎	◎	◎	◎	
	Acetic anhydride	—	○	—	○	◎	○	
	Acetone	—	—	—	△	◎	—	
	Acetonitrile	—	—	—	◎	—	—	
	Acetophenone	—	—	—	◎	◎	—	
	Acetyl chloride	—	—	◎	—	—	◎	
	Acetylacetone	—	—	—	◎	◎	—	
	Acetylene	◎	○	◎	◎	—	△	
	Air (50°C)	◎	◎	◎	◎	—	◎	
	Aluminium bromide (65°C)	◎	◎	◎	◎	—	○	
	Aluminium chloride (65°C)	◎	◎	◎	◎	—	◎	
	Aluminium nitrate (65°C)	◎	○	—	◎	—	○	
	Aluminium sulfate (65°C)	◎	◎	◎	◎	—	◎	
	Amine	—	○	—	○	—	—	
	Ammonia (65°C)	—	○	—	○	—	◎	
	Ammonia (anhydrous)	○	◎	—	◎	—	○	
	Ammonia (cool)	◎	◎	—	◎	—	◎	
	Ammonia gas	◎	◎	—	◎	—	◎	
	Ammonium carbonate	—	◎	—	◎	—	—	
	Ammonium chloride	◎	◎	—	◎	—	—	
	Ammonium hydroxide	—	◎	○	◎	—	◎	
	Ammonium nitrate (65°C)	◎	○	—	◎	—	○	
	Ammonium phosphate (65°C)	◎	◎	—	◎	—	◎	
	Ammonium sulfate (65°C)	◎	◎	—	◎	—	—	
	Ammonium sulfite	—	—	—	◎	—	—	
	Ammonium thiosulfate	○	◎	◎	◎	—	◎	
	Amyl acetate	—	—	—	△	—	—	
	Amyl alcohol	○	○	○	◎	—	△	
	Aniline	—	—	△	○	◎	—	
	Animal oil	◎	○	◎	○	—	○	
	Arsenic trichloride	—	—	—	—	—	—	
	Asphalt	○	○	◎	—	—	○	
	B	Barium chloride	◎	◎	◎	◎	—	◎
		Barium hydroxide (65°C)	◎	◎	◎	◎	—	◎
		Barium nitrate (65°C)	—	—	◎	—	—	—
		Barium sulfate (65°C)	◎	◎	—	—	—	◎
		Barium sulfide	◎	◎	◎	◎	—	◎
Beer		△	○	◎	◎	—	◎	
Benzaldehyde		—	—	—	◎	—	—	
Benzene		—	—	◎	—	—	—	
Benzyl alcohol (65°C)		—	◎	◎	○	—	—	
Benzyl chloride		—	—	◎	—	—	—	
Brake oil		—	—	○	◎	—	—	
Bromine		—	—	◎	—	—	—	
Bromine water		—	—	◎	—	—	—	
Butadiene		—	○	○	△	—	—	
Butane		○	○	◎	—	—	—	
Butane (2,2-, 3-dimethyl)		◎	○	◎	—	—	—	
Butane (liquid)		◎	○	◎	—	—	—	
Butanol (Butyl alcohol)		◎	◎	◎	○	—	○	
Butter and butter oil		◎	—	◎	○	—	○	

	Fluids	Seal Material						
		Nitrile rubber	Chloroprene rubber	Fluoro rubber	Ethylene-propylene rubber	Perfluoroelastomer	Silicon rubber	
B	Butyl acetate	—	—	—	○	—	—	
	Butyl stearate	○	—	◎	—	—	—	
	Butylene	○	△	◎	—	—	—	
	Butyraldehyde	△	—	—	○	—	△	
	C	Cadmium cyanide	◎	◎	◎	◎	—	◎
		Calcium acetate	○	○	—	◎	—	—
Calcium acetate (65°C)		○	○	—	◎	—	—	
Calcium carbide		—	—	—	—	—	—	
Calcium carbonate		—	—	—	—	—	—	
Calcium hydroxide (65°C)		◎	◎	◎	◎	—	—	
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		—	—	◎	—	—	—	
Coconut oil		◎	—	◎	◎	—	—	
Cod liver oil		—	—	—	—	—	—	
Coffee		◎	—	—	—	—	—	
Copper chloride (65°C)		◎	○	◎	◎	—	—	
Copper cyanide		◎	◎	◎	◎	—	◎	
Copper sulfate		◎	◎	◎	◎	—	◎	
Corn oil	◎	○	◎	△	—	◎		
Cotton seed oil	◎	○	◎	△	—	△		
Cresol (50°C)	—	—	◎	—	—	—		
Crude oil	○	—	◎	—	—	—		
D	Diacetone alcohol	—	◎	—	◎	◎	—	
	Dibenzyl ether	—	—	—	○	—	—	
	Dichlorophenol	—	—	◎	—	—	—	
	Diesel oil	◎	△	◎	—	—	—	
	Diethanolamine	○	○	—	○	—	○	
	Diethylene glycol	◎	◎	◎	◎	—	○	
E	Ethanol	◎	◎	◎	◎	—	◎	
	Ethyl acetate	—	—	—	○	—	○	
	Ethyl alcohol	◎	◎	◎	◎	◎	○	
	Ethyl benzene	—	—	◎	—	◎	—	
	Ethyl cellulose	○	○	—	○	—	○	
	Ethyl chloride	◎	○	◎	◎	—	—	
	Ethylene glycol	◎	◎	◎	◎	◎	○	
	Ethylene trichloride	△	—	◎	—	—	—	

■ 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.

	Fluids	Seal Material					
		Nitrile rubber	Chloroprene rubber	Fluoro rubber	Ethylene-propylene rubber	Perfluoroelastomer	Silicon rubber
F	Fish oil	⊙	—	⊙	—	—	⊙
	Fluorine (dry)	—	—	—	—	—	—
	Formaldehyde	○	⊙	—	—	—	—
	Freon 11	⊙	—	○	—	—	—
	Freon 12	⊙	⊙	⊙	○	—	—
	Freon 22	—	⊙	—	⊙	—	—
	Fruits	—	—	—	—	—	—
	Fuel oil	⊙	○	⊙	—	—	—
	Furfural	—	—	—	○	⊙	—
	G	Gasoline	⊙	—	⊙	—	—
Gelatin		⊙	⊙	⊙	⊙	—	⊙
Glucose		⊙	⊙	⊙	⊙	—	⊙
Glycerine (65°C)		⊙	⊙	⊙	⊙	—	⊙
Glycol		⊙	⊙	⊙	⊙	—	⊙
Grease (65°C)		⊙	⊙	⊙	—	—	⊙
H		Helium	⊙	⊙	⊙	⊙	—
	Heptane	—	—	—	—	—	—
	Hexane	—	—	—	—	⊙	—
	Hydraulic fluid (oil base)	⊙	△	⊙	—	—	△
	Hydraulic fluid (water base)	⊙	△	⊙	△	—	△
	Hydrogen	⊙	⊙	⊙	⊙	—	△
	Hydrogen bromide	⊙	—	—	—	—	—
	Hydrogen peroxide (30%)	○	○	○	○	—	⊙
	I	Iron chloride	⊙	⊙	⊙	⊙	—
Iron nitrate (65°C)		⊙	⊙	⊙	⊙	—	○
Iron sulfate (10%)		⊙	⊙	—	—	—	○
Iron sulfite (100%)		⊙	—	—	—	—	—
Isoamyl alcohol		—	—	—	—	—	—
Isooctane		⊙	○	⊙	—	⊙	—
Isopropyl acetate		—	—	—	○	—	—
Isopropyl alcohol		○	○	⊙	⊙	—	⊙
Isopropyl ether		○	△	—	—	—	—
K		Kerosene	⊙	○	⊙	—	—
	L	Lard and lard oil	⊙	—	—	—	—
Latex		—	—	—	—	—	—
Liquefied petroleum gas (LPG)		⊙	○	⊙	—	—	△
Liquid glass (Sodium silicate)		—	—	—	—	—	—
Liquors (beet)		⊙	⊙	⊙	⊙	—	⊙
Liquors (sucrose)		⊙	⊙	⊙	⊙	—	⊙
Lubricating oil		⊙	△	⊙	—	—	○
M		Magnesium chloride (65°C)	⊙	⊙	⊙	⊙	—
	Magnesium hydroxide (65°C)	○	○	⊙	⊙	—	—
	Magnesium nitrate	⊙	—	—	—	—	—
	Magnesium sulfate (65°C)	⊙	⊙	⊙	⊙	—	⊙
	Maleic anhydride	—	—	⊙	—	—	—
	Mercury	⊙	⊙	⊙	⊙	—	—
	Methanol	⊙	⊙	—	⊙	—	⊙
	Methyl bromide	○	—	⊙	—	—	—
	Methyl butyl ketone	—	—	—	⊙	—	—
	Methyl propyl ketone	—	—	—	○	—	—
	Methyl chloride	—	—	⊙	△	—	—
	Methyl ethyl ketone	—	—	—	⊙	⊙	—

	Fluids	Seal Material						
		Nitrile rubber	Chloroprene rubber	Fluoro rubber	Ethylene-propylene rubber	Perfluoroelastomer	Silicon rubber	
M	Methyl salicylate	—	—	—	○	—	—	
	Methylene bromide	—	—	○	—	—	—	
	Methylene chloride	—	—	⊙	△	⊙	—	
	Milk	⊙	⊙	⊙	⊙	—	⊙	
	Mineral oil	⊙	△	⊙	—	—	△	
	Molasses	—	—	—	—	—	—	
	Monobromobenzene	—	—	⊙	—	—	—	
	Monochlorobenzene	—	—	—	—	—	—	
	Monoethanolamine	—	—	—	○	—	○	
	N	Naphtha	○	—	⊙	—	—	—
		Naphthalene	—	—	⊙	—	—	—
		Naphthenic oil	⊙	—	⊙	—	—	—
		Nickel acetate	○	○	—	⊙	—	—
Nickel acetate (65°C)		—	—	—	⊙	—	—	
Nickel ammonium sulfate		—	—	—	—	—	—	
Nickel chloride		⊙	⊙	⊙	⊙	—	⊙	
Nickel nitrate		—	—	—	—	—	—	
Nickel sulfate		—	—	—	—	—	—	
Nitrobenzene		—	—	○	—	⊙	—	
Nitrogen (gas)		⊙	⊙	⊙	⊙	—	⊙	
Normal heptane		⊙	○	⊙	—	—	—	
Normal pentane		⊙	⊙	⊙	—	—	—	
O		Octyl alcohol	○	○	⊙	⊙	—	○
	Oleic acid (65°C)	△	—	○	—	—	—	
	Olive oil	⊙	○	⊙	○	—	—	
	Ortho-dichlorobenzene	—	—	⊙	—	—	—	
	Oxygen (gas)	○	⊙	⊙	⊙	—	⊙	
	Ozone	—	△	⊙	⊙	—	⊙	
	P	Palm oil	—	—	—	—	—	—
Paraffin oil		⊙	—	⊙	—	—	—	
Peanut oil		⊙	○	⊙	△	—	⊙	
Pentane (2-,3-,4-methyl)		—	—	—	—	—	—	
Phenol		—	—	⊙	—	—	—	
Phosphorous oxychloride (dry)		○	○	⊙	⊙	—	○	
Phosphorous oxychloride (wet)		○	○	⊙	⊙	—	○	
Phosphorus		—	—	—	—	—	—	
Phthalic anhydride		—	—	—	—	—	—	
Pine oil		○	—	⊙	—	—	—	
Potassium acetate (65°C)		○	○	—	⊙	—	—	
Potassium bichromate		⊙	⊙	⊙	⊙	—	⊙	
Potassium carbonate		—	—	—	—	—	—	
Potassium cyanide		⊙	⊙	⊙	⊙	—	⊙	
Potassium hydroxide (65°C)		○	⊙	—	⊙	—	△	
Potassium nitrate (65°C)		⊙	⊙	⊙	⊙	—	⊙	
Potassium nitrite		—	—	—	⊙	—	—	
Potassium phosphate		—	—	—	—	—	—	
Potassium silicate		⊙	⊙	⊙	⊙	—	—	
Potassium sulfate		⊙	⊙	⊙	⊙	—	⊙	
Potassium thiosulfate		—	—	—	—	—	—	
Printing ink	⊙	—	—	—	—	—		
Propane	△	○	⊙	—	—	—		
Propionaldehyde	△	△	—	○	—	○		

Body Material Selection Table

The selection of appropriate body material for the Cupla is closely related to its usage application, the type of fluid run through, its concentration (%), the pressure, its working environment, etc. So the material must be carefully considered in order to use the Cupla efficiently and obtain its full performance. Since there are some metals that should not be used with certain fluids, please refer to this table when making your selection.

○ Suitable △ Not suitable under certain conditions

	Fluids	Brass	Stainless Steel	Steel	
A	Acetic acid	△	○		
	Acetic anhydride		○		
	Acetone	○	○	○	
	Air	○	○	○	
	Aluminium fluoride				
	Aluminum chloride		△		
	Aluminum sulfate		△		
	Ammonia		○		
	Ammonium nitrate		○		
	Ammonium phosphate		○		
	Ammonium sulfate				
	Aniline		○		
	Arsenic acid		○		
	B	Barium chloride			
		Barium hydroxide		○	
Barium sulfide			○	○	
Beer		○	○		
Benzene		○	○	○	
Benzine		○	○	○	
Boric acid			○		
Butane		○	○	○	
Butyl acetate		○	○	○	
C		Calcium chloride			
		Calcium hydroxide	○	○	○
		Carbon dioxide	○	○	○
	Carbon disulfide	○	○	○	
	Carbon tetrachloride		○		
	Carbonic acid		○		
	Caustic soda		○		
	Chlorine		○	○	
	Chromic acid		○		
	Citric acid		○		
	Cresol acid	○	○	○	
	D	Diesel fuel	○	○	○
		Dowtherm		○	
Drinking water		△	○		
E	Ether	○	○	○	
	Ethyl acetate	○	○	○	
	Ethyl alcohol	○	○	○	
	Ethylene chloride				
	Ethylene glycol	○	○	○	
F	Fatty acid		○		
	Ferric chloride				
	Ferric sulfate		△		
	Formaldehyde		○		
	Formalin		○		
	Formic acid		○		

	Fluids	Brass	Stainless Steel	Steel
F	Freon	○	○	○
G	Glycerine	○	○	○
H	Hexane	○	○	
	Hydrobromic acid			
	Hydrochloric acid			
	Hydrofluoric acid			○
	Hydrogen	○	○	○
	Hydrogen peroxide			○
I	Hydrogen sulfide		△	
	Industrial water	○	○	△
J	Jet fuel		○	△
L	Lactic acid		○	
	Liquefied petroleum gas (LPG)	○	○	○
M	Magnesium chloride			
	Mercury		○	○
	Methyl alcohol	○	○	○
N	Naphtha	○	○	○
	Naphthalene	○	○	○
	Natural gas	○	○	○
	Nickel chloride		○	○
	Nitric acid			△
	Nitrobenzene			○
O	Octane			
	Oxygen	○	○	○
P	Paraffin	○	○	○
	Phenol		○	
	Phosphoric acid		○	
	Potassium chloride			△
	Potassium hydroxide			○
	Pure water	△	○	
	R	Refined gasoline	○	○
Refined petroleum		○	○	○
S	Salt water		△	
	Sodium carbonate		○	○
	Sodium chloride	○	○	○
	Sodium hydroxide			○
	Sodium nitrate			○
	Sodium phosphate			△
T	Sodium sulfate	○	○	
	Sulfuric acid			
	Sulfurous acid			
T	Tannic acid		○	
W	Wine		○	
Z	Zinc chloride			

Notes: 1. Since fluid concentration (%) and conditions of use may affect the performance, detailed study is necessary when choosing materials.

Notes: 2. For the cells that have no symbol marks, please consult us for appropriate body material.