

# Material Using Range According To Anti-Chemicals

Refer to the following statement.

## ★ANTI-CHEMICALS LIST(Reference)

Name of Chemicals (Density of weight %, Temperature °C)	Tube Type				Fitting						Seal Quality		
	Urethane	Nylon	Polyolefin	Fluore	Brass	SUS304	SUS316	POM	PBT	PP	NBR	EPDM	FKM
Caustic soda (10% 20°C)	×	○	○	◎	△	△	○	◎	△	○	○	◎	○
Caustic soda (30% 20°C)	×	○	○	◎	-	-	-	◎	×	○	-	-	-
Caustic soda (30% 70°C)	×	×	△	○	-	-	-	○	×	△	-	-	-
Gasoline	○	◎	△	◎	○	○	◎	◎	◎	△	◎	×	◎
Air	○	○	○	○	◎	◎	◎	◎	◎	◎	◎	◎	◎
Sodium perborate	-	○	○	◎	×	-	○	○	◎	◎	○	◎	◎
Sodium peroxide	-	×	○	◎	×	-	○	-	-	○	○	◎	◎
Hydrogen peroxide (5% 20°C)	○	◎	◎	◎	×	○	○	○	○	◎	-	-	-
Hydrogen peroxide (5% 20°C)	△	△	◎	◎	×	○	○	△	○	◎	-	-	-
Hydrogen peroxide (30% 20°C)	×	×	○	◎	×	○	○	×	○	○	-	-	-
Perchloric acid	×	×	○	○	×	×	×	×	○	○	-	○	◎
Grease	○	◎	△	◎	○	◎	◎	◎	◎	△	◎	×	◎
Sodium silicate	◎	◎	◎	◎	△	-	○	◎	◎	◎	◎	◎	◎
Glycerin	○	◎	◎	◎	○	◎	◎	◎	◎	◎	◎	◎	◎
Naphtha	△	○	△	◎	△	○	○	◎	○	△	△	×	◎
Naphthalene	△	◎	△	◎	△	-	△	◎	○	○	×	×	◎
Nitropropane	-	-	○	○	-	-	-	○	-	○	-	-	-
Kerosene	◎	◎	△	◎	◎	◎	◎	◎	◎	△	◎	×	◎
Dichloro benzene	×	△	×	◎	△	-	-	△	△	△	-	-	-
Linoleic acid	-	△	△	○	-	-	-	○	-	△	○	×	○
Maleic acid	△	◎	◎	◎	-	△	△	-	-	◎	-	△	◎
Cottonseed oil	◎	◎	○	◎	△	○	○	◎	-	○	◎	◎	◎
Methane	◎	◎	◎	◎	○	-	△	◎	◎	◎	◎	×	◎
Methyl alcohol (Methanol)	△	○	○	◎	○	△	○	○	○	◎	◎	◎	△
Methyl ethyl ketone(MEK)	×	○	○	○	◎	△	○	○	○	◎	×	◎	×
Methyl isobutyl ketone(MBK)	×	○	○	◎	△	-	△	○	○	○	×	△	×
Monochloroamine	-	○	△	○	-	-	△	○	-	○	×	○	×
Monochlorobenzene	×	×	×	○	-	-	-	○	-	×	×	×	◎
Chloroacetic acid	×	×	×	○	-	-	-	△	△	×	-	-	-
Hydrofluoric acid Anhydride	×	×	×	○	×	-	×	×	-	×	-	○	-
Acetic Anhydride	×	×	△	○	×	○	○	×	-	△	△	○	×
Water (24°C)	◎	◎	◎	◎	○	○	○	◎	○	◎	◎	◎	◎
Water (100°C)	△	△	△	◎	×	○	○	△	×	△	-	-	-
Sea Water	◎	◎	◎	◎	△	○	○	◎	○	◎	-	-	-
Bunker oil	-	○	○	-	△	-	○	-	-	○	◎	-	◎
Benzene(Benzo)	×	○	×	◎	×	△	△	○	○	△	×	×	◎
Butane	-	○	△	◎	◎	◎	◎	◎	◎	◎	◎	×	◎
Fluorine	×	-	×	×	×	×	△	×	-	×	-	△	○
Borax	◎	◎	◎	◎	×	-	○	-	-	◎	○	◎	◎
Boric acid	◎	◎	◎	◎	○	○	○	○	○	◎	◎	◎	◎
Amyl borate	-	-	△	○	-	-	-	○	-	△	◎	×	◎
Bromine	×	×	×	◎	×	-	×	×	×	△	-	-	◎
Arsenic acid	-	△	○	○	△	○	○	-	-	○	-	-	-
Carbon tetrachloride	×	△	×	◎	△	△	△	○	○	△	△	×	◎
Oxygen	○	○	○	◎	◎	◎	◎	○	○	○	○	◎	◎

## JUDGEMENT STANDARD

◎ : Excellent ○ : Good △ : Require Confirmation × : Incongruity - : No data

- Although the result(using environment, using condition, using period) proves to be "good", it may not be suitable in some cases.
- Secure the conditions below before using.

Name of Chemicals (Density of weight %, Temperature °C)	Tube Type				Fitting						Seal Quality		
	Urethane	Nylon	Polyolefin	Fluore	Brass	SUS304	SUS316	POM	PBT	PP	NBR	EPDM	FKM
Petroleum	◎	◎	×	◎	-	-	-	○	○	×	◎	×	◎
Salt Water	-	○	○	○	×	△	△	◎	○	○	-	-	-
Soda water	○	○	○	○	-	-	-	◎	○	○	-	-	-
Soda ash--Sodium carbonate	◎	◎	◎	◎	○	△	△	◎	○	◎	◎	◎	◎
Pine oil	-	×	○	○	△	○	◎	-	○	○	○	×	◎
Oxalic acid	△	◎	◎	◎	△	△	△	×	○	◎	○	◎	◎
Ethylxalate	×	○	×	○	-	-	-	○	○	×	×	◎	◎
Magnesium hydroxide	△	◎	◎	◎	△	-	△	◎	×	○	○	◎	◎
Barium hydroxide	-	○	○	◎	×	-	◎	◎	△	○	◎	◎	◎
Ammonium hydroxide	△	○	◎	◎	×	△	○	◎	×	◎	×	◎	○
Potassium hydroxide	△	△	◎	◎	△	△	△	◎	×	○	○	◎	○
Calcium hydroxide	△	◎	◎	◎	△	△	△	◎	×	○	◎	◎	◎
Hydrogen	◎	◎	◎	◎	△	◎	◎	◎	◎	◎	◎	◎	◎
Mercury	-	○	○	○	×	-	△	-	-	◎	◎	◎	◎
Steam (150°C over)	×	×	×	○	○	-	○	△	△	×	×	◎	×
Steam (150°C below)	×	×	×	○	-	-	-	×	×	△	×	○	×
Vegetable oil	-	○	○	○	-	-	-	○	○	○	◎	◎	◎
Salt water	○	◎	◎	◎	△	△	△	◎	○	◎	-	-	-
Silicone greases	-	○	△	○	-	-	-	◎	◎	△	◎	◎	◎
Silicone oil	-	○	△	○	-	-	-	◎	◎	△	◎	◎	◎
Glue	-	○	○	◎	△	-	△	-	-	◎	-	-	-
Aniline	×	×	×	○	×	△	△	○	○	△	×	○	△
Amyl naphthalene	-	-	△	○	-	-	-	◎	◎	△	×	×	◎
Amyl alcohol	○	○	○	○	○	△	△	◎	◎	○	○	◎	○
Acetone	×	○	△	○	◎	△	○	○	○	△	×	◎	×
Acetamide	-	-	△	○	-	-	-	○	○	△	◎	◎	○
Acetaldehyde	○	○	△	○	◎	○	◎	○	○	○	×	◎	×
Acetylene	◎	◎	◎	◎	×	○	◎	○	◎	◎	○	◎	◎
Sulfurous acid	×	×	○	◎	×	△	△	×	○	○	○	○	◎
Sulfurous acid gas	×	×	△	◎	-	-	○	△	○	○	○	○	◎
Sodium sulfite	-	△	○	◎	○	◎	◎	◎	○	○	-	-	-
Ammonia	-	○	○	◎	△	◎	◎	○	△	○	◎	◎	×
Ammonia gas	×	△	△	○	×	○	○	○	△	△	◎	◎	×
Ammonia gas	×	×	×	○	×	○	○	○	×	×	◎	◎	×
Liquid Ammonia	-	○	○	○	○	◎	◎	○	△	○	-	-	-
Chlorine Liquide	×	×	×	○	-	-	-	×	○	×	-	-	-
Liquefied petroleum gas(LPG)	-	○	△	○	◎	◎	◎	◎	◎	△	◎	×	◎
Ethandamine	-	△	△	○	-	-	-	◎	△	△	○	○	×
Ethylene glycol	◎	◎	◎	◎	△	△	△	◎	○	◎	◎	◎	◎
Ethylcellulose	-	-	○	◎	-	-	△	◎	◎	◎	-	○	×
Ethylalcohol(Ethanol)	△	○	○	◎	◎	◎	◎	◎	◎	○	◎	◎	◎
Lye solution	-	○	○	○	-	-	-	◎	○	○	○	◎	○
Hydrochloric acid(10%, 20°C)	△	○	◎	◎	×	×	×	×	○	◎	-	-	-
Hydrochloric acid (20%, 20°C)	×	×	○	◎	×	×	×	×	△	○	-	-	-
Hydrochloric acid (20%, 80°C)	×	×	×	○	×	×	×	×	×	×	×	△	◎

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	Urethane	Nylon	Polyolefin	Fluore	Brass	SUS304	SUS316	POM	PBT	PP	NBR	EPDM	FKM
Hydrochloric acid (38%, 20°C)	×	×	○	◎	×	×	×	×	△	○	○	◎	◎
Magnesium chloride	◎	◎	◎	◎	△	△	○	◎	○	◎	◎	◎	◎
Methyl chloride	×	△	×	○	○	○	◎	◎	-	×	×	△	◎
Barium chloride	◎	◎	◎	◎	×	-	○	-	○	◎	◎	◎	◎
Zinc chloride	◎	○	◎	◎	×	△	○	×	○	◎	◎	◎	◎
Acetyl chloride	×	×	×	-	-	-	△	×	-	×	-	-	◎
Aluminium chloride	-	△	○	◎	×	×	×	-	○	◎	◎	◎	◎
Ammonium chloride	○	◎	◎	◎	×	△	△	◎	○	◎	◎	◎	◎
Ethyl chloride	×	◎	×	-	○	◎	◎	◎	-	×	◎	◎	◎
Sulfur chloride	-	-	△	◎	×	-	△	-	-	△	×	◎	◎
Potassium chloride	○	◎	◎	◎	△	△	○	◎	○	◎	◎	◎	◎
Calcium chloride	○	◎	◎	◎	○	△	△	◎	○	◎	◎	◎	◎
Ozone	△	○	△	◎	○	○	○	△	◎	△	○	◎	◎
Oleic acid	△	○	△	◎	△	△	△	△	◎	△	○	○	○
Olive oil	○	○	○	◎	△	◎	◎	◎	◎	○	◎	○	◎
Uric acid	×	○	-	○	-	-	-	○	○	-	-	-	-
Aqua acid	×	×	×	○	-	-	-	×	-	△	-	△	○
Lactic acid	-	○	○	◎	×	△	△	○	○	◎	◎	◎	◎
Sulfur	△	○	◎	◎	×	○	○	◎	-	◎	×	◎	◎
Lubricating oil(Petroleum base)	◎	◎	×	◎	◎	◎	◎	◎	◎	×	◎	×	◎
Lubricating oil(Ester base)	×	○	×	○	◎	◎	◎	◎	○	×	-	-	-
Isooctane	△	○	×	○	◎	○	○	◎	◎	×	◎	×	◎
Isopropyl alcohol	-	△	◎	◎	○	○	○	◎	○	◎	○	×	◎
Isopropyl ether	-	△	△	◎	○	○	○	◎	○	◎	○	×	◎
Carbon disulfide	×	○	×	○	○	○	○	○	-	×	△	×	◎
Phenyl disulfide	△	○	-	○	-	-	-	-	-	-	-	-	-
Carbon monoxide	◎	◎	◎	◎	◎	◎	◎	◎	○	◎	◎	◎	◎
Gelatin	○	○	○	○	◎	◎	◎	◎	○	◎	◎	◎	◎
Heavy water	◎	◎	◎	◎	-	-	-	◎	○	◎	-	-	-
Soap solutions	○	◎	△	◎	◎	◎	◎	◎	○	◎	◎	◎	◎
Sodium nitrate	○	◎	◎	◎	○	○	◎	◎	○	◎	○	◎	-
Aluminium nitric	△	○	○	◎	-	-	△	○	○	◎	◎	◎	-
Ammonium nitric	○	◎	◎	◎	×	○	○	○	◎	◎	◎	◎	-
Potassium nitric	◎	○	◎	◎	△	△	△	○	◎	◎	◎	◎	◎
Calcium nitric	-	○	○	◎	-	-	-	○	◎	◎	◎	◎	◎
Nitrogen	○	○	○	◎	○	◎	◎	◎	○	◎	◎	◎	◎
Natural gas	-	○	○	○	◎	◎	◎	◎	◎	○	◎	×	◎
Acetic acid (10%, 20°C)	×	△	◎	◎	×	○	◎	△	○	◎	○	◎	○
Acetic acid (50%, 20°C)	×	×	○	○	×	○	○	×	○	○	-	-	-
Acetic acid (50%, 70°C)	×	×	×	○	×	○	○	×	△	×	-	-	-
Acetic acid (100%, 20°C)	×	×	×	○	×	△	△	×	△	×	-	-	-
Lead acetate	-	○	○	○	-	△	-	-	○	◎	○	◎	-
Nickel acetate	-	○	○	◎	-	-	△	-	○	◎	○	◎	×
Zinc acetate	-	○	○	○	-	-	-	○	○	◎	◎	◎	×
Aluminium acetate	-	○	○	○	-	-	-	○	○	◎	◎	◎	-

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- Secure the conditions below before using.

Name of Chemicals (Density of weight %, Temperature °C)	Tube Type				Fitting						Seal Quality		
	Urethane	Nylon	Polyolefin	Fluore	Brass	SUS304	SUS316	POM	PBT	PP	NBR	EPDM	FKM
Calcium acetate	○	○	○	◎	△	-	△	○	○	◎	○	◎	×
Cresol	×	×	△	◎	○	△	◎	△	○	○	△	×	◎
Chlorosulfonic acid	-	×	×	○	△	×	×	×	○	×	×	×	△
Chloroacetone	-	-	×	-	-	-	-	-	-	×	×	◎	×
Chlorotoluene	-	×	×	○	-	-	-	○	○	×	×	×	◎
Chloroform	×	○	×	◎	○	○	○	△	△	×	×	×	◎
Soybean oil	-	○	○	◎	△	○	○	◎	◎	○	◎	△	◎
Tannic acid	△	◎	◎	◎	×	△	△	○	-	◎	◎	◎	◎
Tar	◎	◎	○	◎	△	◎	◎	-	-	○	○	×	◎
Carbonic acid	△	◎	○	◎	○	△	△	-	-	○	◎	◎	◎
Carbon dioxide	○	○	○	◎	○	○	○	◎	◎	◎	-	-	-
Sodium carbonate	◎	◎	◎	◎	○	△	△	◎	○	◎	-	-	-
Ammonium carbonate	-	○	○	◎	-	△	△	◎	○	◎	×	◎	-
Toluene	△	○	△	○	◎	◎	◎	○	△	△	×	×	◎
Triacetin	-	-	○	-	-	-	-	-	-	○	○	◎	×
Phenol	×	×	○	◎	○	○	○	×	○	○	-	○	◎
Glucose	○	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
Freon11	-	○	-	○	◎	◎	◎	◎	◎	-	◎	×	◎
Freon12	-	○	-	○	◎	◎	◎	◎	◎	-	◎	○	○
Freon21	-	○	-	○	◎	◎	◎	◎	◎	-	×	×	×
Freon22	-	○	-	○	◎	◎	◎	◎	◎	-	×	◎	×
Freon113	-	○	-	○	◎	◎	◎	◎	◎	-	◎	×	○
Freon114	-	○	-	○	◎	◎	◎	◎	◎	-	◎	◎	○
Propane	○	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	×	◎
Propylene	-	○	-	○	◎	◎	◎	◎	◎	-	×	×	◎
Castor oil	△	◎	◎	◎	○	○	○	○	○	◎	◎	○	◎
Hexane	○	◎	×	◎	○	○	○	◎	◎	△	◎	×	◎
Sulfuric acid(10%, 20°C)	×	○	○	◎	×	×	×	×	○	○	×	○	◎
Sulfuric acid (10%, 70°C)	×	×	△	◎	×	×	×	×	×	△	-	-	-
Sulfuric acid (30%, 20°C)	×	×	○	◎	×	×	×	×	△	○	-	-	-
Sulfuric acid (30%, 70°C)	×	×	△	○	×	×	×	×	×	△	-	-	-
Sulfuric acid (98%, 20°C)	×	×	×	○	×	×	×	×	×	×	-	-	-
Sulfuric acid (70°C)	×	×	×	○	×	×	×	×	×	×	-	-	-
Sodium sulfate	◎	◎	◎	◎	○	△	○	◎	○	◎	◎	◎	◎
Nickel sulfate	-	○	○	◎	-	△	○	-	○	◎	◎	◎	◎
Copper sulfate	◎	◎	◎	◎	○	△	○	◎	○	◎	◎	◎	◎
Magnesium sulfate	◎	◎	◎	◎	○	○	◎	-	○	◎	◎	◎	◎
Methylsulfate	×	△	×	◎	-	-	-	-	○	×	-	-	-
Barium sulfate	-	○	○	◎	△	○	○	-	○	◎	◎	◎	◎
Aluminium sulfate	-	◎	◎	◎	×	○	○	◎	○	◎	◎	◎	◎
Ammonium sulfate	◎	◎	◎	◎	△	△	△	◎	○	◎	◎	◎	-
Lead sulfate	○	○	○	◎	△	-	△	-	○	○	-	-	-
Sodium sulfide	○	○	○	◎	×	△	△	○	○	◎	○	◎	◎
Barium sulfide	-	○	○	◎	-	-	○	○	○	◎	◎	◎	◎
Zinc sulfide	△	×	◎	◎	△	○	○	○	◎	◎	-	-	-
Calcium sulfide	-	○	○	◎	-	-	△	○	○	◎	○	◎	◎