Table of fitting material chemical resistance

The table of chemical resistance is a guide to the initial selection of fitting and coupling material suitable for given operating conditions. The characteristics given in the table apply to the resistance at +20°C.
Please contact Sales or Technical Department of TUBES INTERNATIONAL® to match the fitting material correctly with the application.

symbol	material	characteristics
AL	aluminium	light, limited corrosion resistance, not suitable for acids and high pressure
MS	brass	heavy, limited corrosion resistance, not suitable for acids
BR	bronze	heavy, limited corrosion resistance, not suitable for acids
ST	carbon steel	high tensile strength, not expensive, limited corrosion resistance
MON	monel	high corrosion resistance, very expensive, suitable for alkaline compounds
304	AISI 304 steel	corrosion resistant, heat resistant, readily weldable, suitable for foodstuffs
316L	AISI 316L steel	enhanced corrosion resistance in chemical environment, heat resistant, readily weldable, suitable for foodstuffs
PP	polypropylene	light, for low pressure, corrosion resistance, suitable for acids, not recommended for foodstuffs

A - excellent resistance, suitable for continuous operation
B - moderate resistance, intermittent operation
C - limited resistance, limited use
X - no resistance
- - no data

SUBSTANCE	AL	MS	BR	ST	MON	304	316L	PP
Acetic acid 10% ÷ 50%	B	X	X	X	B	A	A	A
Acetic acid 80%	B	X	X	X	A	A	A	A
Acetic anhydride	A	X	B	B	B	A	A	A
Acetone	A	B	B	B	A	A	A	A
Acetylene	A	X	X	B	B	A	A	X
Aluminium chloride (solution)	X	X	X	X	X	X	X	A
Aluminium fluoride	C	X	X	X	A	X	C	X
Aluminium nitrate (saturated)	C	X	A	X	A	B	B	A
Aluminium potassium sulphate (alum)	X	X	X	X	A	X	A	A
Aluminium sulphate	X	X	C	X	B	A	A	A
Ammonium bifluoride	X	X	X	X	B	X	X	-
Ammonium carbonate	X	B	-	C	A	A	A	-
Ammonium caseinate	A	A	A	A	A	A	A	-
Ammonium chloride (dry)	X	X	B	X	B	B	B	A
Ammonium hydroxide	X	X	A	A	A	A	A	A
Ammonium nitrate	B	X	X	X	X	A	A	A
Ammonium perchlorate	X	-	-	X	A	A	A	X
Ammonium phosphate 10 ÷ 40%	X	X	X	X	B	A	A	A
Ammonium sulphate	X	X	C	X	A	X	A	A
Anhydrous ammonia	-	X	X	A	X	A	A	A
Aniline (aminobenzene)	A	X	B	X	B	A	A	A
Aqua ammonia - ammonia water	A	X	X	A	X	A	A	A
Arsenic acid	X	X	X	X	A	A	A	A
Asphalt	A	A	A	B	A	A	A	X
Barium carbonate	X	A	B	B	A	B	B	A
Barium chloride (saturated)	X	B	B	A	B	B	A	A

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Barium hydroxide	X	C	C	X	A	A	A	A
Barium sulphate	B	B	B	C	B	A	A	-
Barium sulphide	X	X	A	X	A	A	A	-
Benzaldehyde	B	B	B	X	B	B	A	-
Benzene	A	A	A	A	A	A	A	X
Benzoic acid	B	X	X	X	A	A	A	-
Benzol	A	B	B	B	B	A	A	X
Benzyl alcohol	B	B	B	B	A	A	A	-
Bleacher (12.5% of active chlorine)	X	X	X	X	X	X	X	A
Borax	X	B	B	B	A	A	A	A
Boric acid	B	X	B	X	B	A	A	A
Brine	X	X	B	X	A	B	A	A
Bromic acid	X	X	X	X	X	X	X	-
Butadiene, butylene	A	A	B	B	A	A	A	X
Butane	A	A	A	A	A	A	A	X
Butanoic acid (butyric)	X	A	A	X	A	B	A	A
Butene	A	A	A	A	A	A	A	X
Butyl acetate (dry)	A	B	A	A	A	A	A	X
Butyl alcohol	A	B	A	B	A	A	A	A
Calcium acetate	B	-	B	B	A	A	A	A
Calcium carbonate	A	A	A	A	A	A	-	A
Calcium chloride (saturated)	X	B	A	B	X	B	A	A
Calcium disulphide	X	X	B	X	X	A	B	A
Calcium hydroxide	C	X	X	B	A	A	A	A
Calcium hypochlorite	X	X	X	X	X	X	X	A
Calcium sulphate	X	A	X	X	A	A	A	-
Calcium sulphide	X	X	C	C	B	A	A	-
Carbon (II) oxide (carbon monoxide)	A	A	A	A	A	A	A	-
Carbon dioxide (dry)	A	A	A	A	A	A	A	A
Carbon dioxide (wet)	B	C	C	C	A	A	A	A
Carbon disulphide	A	X	X	B	B	A	A	X
Carbon tetrachloride	X	A	A	A	A	A	A	X
Carbonic acid	A	B	B	B	A	A	A	A
Castor oil	A	A	A	A	A	A	A	A
Caustic potassium KOH	X	X	X	X	A	A	A	A
Caustic soda NaOH	X	X	X	X	A	A	A	A
Chlorine	contact Sales or Technical Department for proper fitting selection							
Chloroform, dry	X	A	A	X	A	A	A	X
Chlorosulphonic acid	X	X	X	X	B	B	B	-
Chromic acid 50%	X	X	X	X	X	X	X	B
Citric acid	C	X	X	X	B	A	A	A
Clorox (sodium hypochlorite 15%)	X	X	X	X	X	X	X	A
Coolant (glycol based)	A	A	A	A	A	A	A	A
Copper (II) chloride (dry)	X	X	X	X	X	X	X	A
Copper cyanide	X	X	X	A	X	B	B	-
Copper sulphate	X	X	X	X	X	A	A	A
Crude oil	A	A	A	A	A	A	A	X

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Cyclohexane	A	A	A	A	A	A	A	X
Detergents	B	B	B	B	A	A	A	A
Dextrose	A	A	A	A	A	A	A	A
Diacetone alcohol	A	A	B	B	A	B	B	-
Diesel oil	A	A	A	A	A	A	A	B
Diethyl sebacate	-	-	-	-	-	-	-	X
Diethylamine	B	X	X	X	A	A	A	A
Disodium phosphate	X	C	A	B	A	A	A	A
Distilled water	X	B	B	X	A	A	A	A
Ethanolamine	A	-	-	A	A	A	A	A
Ethers	B	B	B	B	B	B	B	X
Ethyl acetate	A	A	A	A	A	A	A	X
Ethyl alcohol	A	B	B	B	B	A	A	A
Ethyl chloride (dry)	B	B	B	B	B	A	A	X
Ethylene chloride	B	B	B	B	B	A	A	X
Ethylene dichloride, dry	X	X	X	X	A	X	X	X
Ethylene glycol	A	A	A	A	A	A	A	A
Ethylene oxide	A	X	X	B	A	A	A	-
Extraction naphtha	A	A	B	B	B	A	A	-
Fluoroboric acid	X	X	X	X	B	X	X	A
Fluosilicic acid <30%	X	X	B	X	A	X	X	-
Formaldehyde 100%	A	B	B	X	B	A	A	A
Formalin (formaldehyde 40%)	A	C	B	X	A	A	A	A
Formic acid <85%	A	C	C	X	B	A	A	A
Gear oil	A	A	A	A	A	A	A	A
Gelatine	A	X	X	X	A	A	A	A
Glucose	B	A	B	B	B	A	A	A
Glycerine	A	A	A	A	A	A	A	A
Glycol ethers (polyols)	-	-	-	A	-	A	A	A
Heating oil	A	A	A	A	A	A	A B	B
Heptane	A	A	A	A	A	A	A	-
Hexane	A	A	A	A	A	A	A	-
Hexyl alcohol (hexanol)	A	A	A	A	A	A	A	-
Hydraulic oil	A	A	A	A	A	A	A	A
Hydrobromic acid <50%	X	X	X	X	X	X	X	A
Hydrochloric acid (muriatic) <37%	X	X	X	X	X	X	X	A
Hydrocyanic acid	A	X	X	X	A	A	A	A
Hydrogen (gas)	A	A	A	A	A	A	A	A
Hydrogen chloride gas, dry	X	B	A	A	A	A	A	A
Hydrogen peroxide 30%	A	X	X	X	A	A	B	A
Hydrogen sulphide (moist)	A	X	C	X	C	B	A	A
Hypochlorous acid 20%	X	X	X	X	X	X	X	A
Iodine, dry 100%	X	X	X	X	A	B	B	X
Iron (II) sulphate	X	X	X	X	X	A	A	-
Iron (III) sulphate	X	X	X	X	B	A	A	A
Iron hydroxide	A	A	A	A	A	A	A	A
Iron II chloride	X	X	X	X	X	X	X	A

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Iron III chloride	X	X	X	X	X	X	X	A
Iron nitrate 10 ÷ 50%	X	X	X	X	X	B	B	A
Isobutyl acetate	A	B	A	A	A	A	A	X
Isobutyl alcohol (isobutanol)	A	A	A	A	A	A	A	-
Isopropyl acetate	A	A	A	A	A	A	A	X
Isopropyl alcohol (isopropanol)	B	B	B	B	B	A	A	A
Isopropyl ether	A	B	B	A	A	A	A	-
Jet fuel Jet A1	A	A	A	A	A	A	A	X
Ketones	B	B	B	B	B	B	B	-
Lactic acid 25%	X	B	B	X	A	A	A	A
Lactic acid 80%	X	B	X	X	A	A	A	A
Lead (II) acetate	X	X	X	X	B	A	A	A
Lead (II) chloride	X	X	X	X	X	X	X	B
Lead sulphate	X	B	B	X	B	B	A	-
Lime sulphur	X	X	X	X	B	B	B	A
Linolic acid	B	X	C	X	A	A	A	A
Liquid bromine	X	X	X	X	X	X	X	X
Magnesium carbonate	B	-	-	C	A	A	A	A
Magnesium chloride	X	X	B	X	A	B	A	A
Magnesium hydroxide	X	B	A	A	A	A	A	A
Magnesium nitrate	B	B	B	B	B	B	B	A
Magnesium oxide	A	A	A	A	A	A	A	-
Magnesium sulphate	B	A	B	C	A	A	A	A
Maleic acid	A	X	C	X	A	A	A	-
Mercury	X	X	X	B	A	A	A	A
Mercury (II) chloride	X	X	X	X	X	X	X	A
Mercury (II) cyanide	X	X	X	X	B	B	B	-
Methane	A	A	A	A	A	A	A	B
Methyl alcohol (methanol)	B	B	B	B	B	A	A	A
Methyl bromide	X	A	A	B	A	B	A	-
Methyl ethyl ketone (MEK)	A	A	A	B	A	A	A	A
Methyl isobutyl ketone	A	A	A	B	A	A	A	-
Methyl methacrylate	A	-	B	A	A	A	A	-
Methylene chloride	A	B	B	B	A	A	A	X
Milk	A	X	X	X	X	A	A	A
Mine water	X	X	X	X	B	A	A	A
Mineral grease	A	A	A	A	A	A	A	-
Mineral oil	A	A	A	A	A	A	A	A
Monosodium phosphate	X	C	-	B	A	A	A	A
Naphtha	A	A	B	B	B	A	A	-
Naphtha	A	A	A	A	A	A	A	X
Naphthalene	A	A	A	A	A	A	A	X
Nickel sulphate	X	C	C	X	A	A	A	A
Nitric acid 30%	X	X	X	X	X	A	A	A
Nitric acid 65%	X	X	X	X	X	A	A	X
Nitric acid 99%	A	X	X	X	X	B	B	X
Nitrobenzene	A	X	X	A	A	A	A	X

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Nitrogen	A	A	A	A	A	A	A	A
Octyl alcohol (octanol)	A	A	A	A	A	A	A	-
Oleic acid	B	C	B	B	A	A	A	A
Oxalic acid <10%	B	C	B	X	A	A	A	A
Oxygen	X	A	A	X	A	A	A	A
Palmitic acid (saturated)	B	C	B	C	A	A	A	A
Paraffin	A	A	A	A	A	A	A	A
Pentanol (amyl alcohol)	B	A	A	B	A	A	A	A
Phenol	A	C	X	B	A	A	A	X
Phosphoric acid <50%	X	X	X	X	A	A	A	A
Phosphoric acid <85%	X	X	X	X	C	A	A	A
Photographic solutions	A	A	A	X	A	A	A	A
Picric acid	X	X	X	X	X	B	B	X
Potassium acetate	X	-	-	B	A	A	A	A
Potassium bicarbonate	X	B	B	B	A	A	A	A
Potassium carbonate	X	C	C	B	A	A	A	A
Potassium chlorate 8%	B	X	X	B	A	A	A	-
Potassium chloride 30%	X	X	B	X	A	A	A	A
Potassium chromate 30%	B	A	A	B	A	B	B	-
Potassium cyanide 30%	X	X	X	B	B	B	A	A
Potassium dichromate 30%	A	B	B	B	B	A	A	A
Potassium hydroxide <50%	X	X	X	X	A	A	A	A
Potassium nitrate 80%	A	B	B	B	B	B	B	A
Potassium permanganate	B	B	B	X	B	A	A	-
Potassium sulphate	B	B	B	B	A	A	A	A
Propane	AA	A	A	A	A	A	A	X
Propyl alcohol (propanol)	B	B	B	B	B	A	A	-
Propylene glycol	A	A	A	A	A	A	A	A
Propylene oxide	C	X	X	B	X	A	A	-
Pyridine	A	A	A	A	A	A	A	-
Pyrogallol $C_6H_3(OH)_3$	B	B	B	B	B	B	A	-
Refined oil	A	A	A	A	A	A	A	X
Seawater	X	X	B	X	B	B	B	A
Silicone oil	A	A	A	A	A	A	A	A
Silver nitrate	X	X	X	X	X	B	A	A
Soap solutions	B	B	B	B	B	A	A	A
Sodium acetate	X	-	-	B	A	A	A	A
Sodium bicarbonate	X	B	B	B	A	A	A	A
Sodium bisulphate	X	X	C	X	B	X	B	A
Sodium bisulphite	X	X	C	X	B	B	A	A
Sodium borate	B	B	B	C	B	B	B	A
Sodium carbonate	X	C	C	B	A	A	A	A
Sodium chlorate 50%	X	B	B	X	A	A	A	-
Sodium chloride 30%	X	B	B	X	A	B	A	A
Sodium cyanide	X	X	X	B	X	A	A	A
Sodium dichromate 10%	B	X	X	B	A	B	B	A
Sodium hydroxide <50%	X	X	X	X	A	A	A	A

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Sodium hydroxide, dry, 100%	X	X	X	X	A	A	A	A
Sodium hypochlorite <20%	X	X	X	X	X	X	X	A
Sodium metaphosphate	X	X	B	X	A	A	A	A
Sodium nitrate 40%	A	B	A	B	B	A	A	A
Sodium perborate 10%	A	-	X	X	X	X	A	A
Sodium peroxide	X	X	X	X	B	A	A	A
Sodium silicate (water glass)	X	C	C	B	A	A	A	-
Sodium sulphate	B	B	B	B	A	A	A	A
Sodium sulphide	X	X	X	X	A	B	A	A
Sodium thiosulphate	A	X	X	X	B	A	A	A
Steam	A	A	A	A	A	A	A	X
Stearic acid	B	C	B	C	C	A	A	A
Styrene	A	A	A	A	A	A	A	X
Sulphur chloride (monochloride)	X	X	X	X	X	X	X	-
Sulphur dioxide (dry)	B	C	C	B	X	A	A	-
Sulphur trioxide	B	X	X	B	B	A	A	A
Sulphuric acid <20%	X	X	X	X	X	X	A	A
Sulphuric acid >96%	X	X	X	B	X	A	A	C
Sulphuric acid 21% ÷ 95%	X	X	X	X	X	X	X	B
Sulphurous acid 20%	X	X	X	X	X	X	B	A
Tannic acid - tannin	X	A	X	X	B	B	B	A
Tartaric acid	A	A	B	B	A	A	A	A
Tetrachloroethylene	A	B	C	C	A	A	A	X
Tetrahydrofuran	X	-	-	A	B	A	A	-
Tin (II) chloride 15%	X	X	X	X	-	X	X	A
Tin (IV) chloride	X	X	X	X	X	X	X	A
Titanium tetrachloride (dry)	X	X	X	B	B	A	A	A
Toluene (methylbenzene)	A	A	A	A	A	A	A	X
Trichloroethylene, dry	A	A	A	B	A	A	A	X
Triethanolamine	B	-	-	B	A	A	A	A
Triethylamine	A	-	-	A	A	A	A	-
Trisodium phosphate	X	C	A	B	A	A	A	A
Turpentine	B	X	B	C	A	A	A	
Urea	A	A	B	B	A	A	A	A
Vegetable oil	A	B	A	B	A	A	A	A
Vinegar (acetic acid <10%)	B	X	X	X	B	A	A	A
Xylene	A	A	A	A	A	A	A	X
Zinc chloride	X	X	X	X	A	X	X	A
Zinc nitrate	A	A	A	A	A	B	B	A
Zinc sulphate	X	B	B	X	B	A	A	-