Material Compatibility with Selected Chemicals

Chemical	304/321 SS	316 SS	Bronze	Monel	Carbon Steel
Acetic acid 100%, 70°F	1	1	3	1	3
Acetic acid 100%, boiling	3	2	3	2	3
Acetic acid 5% to 20%, aerated or agitated	1	1	3	2	3
Acetic acid 50% to 80%, boiling	3	2	3	3	3
Acetic acid 50%, 70°F	1	1	3	3	3
Acetic acid 80%, 70°F	1	1	3	1	3
Acetic anhydride	1	1	3	2	3
Aceton, boiling	1	1	1	1	3
Acetyl chloride, boiling	2	2	2	1	3
Acetylene, commercially pure	1	1	3	1	1
Acetylene, concentrated	1	1	3	1	1
Acid salt mixture	1	1	3	3	3
Air	1	1	1	1	1
Alum 10%, boiling	2	1	3	2	3
Alum 2% to 1%, 70°F	1	1	2	2	3
Alum, saturated	3	2	3	2	3
Aluminium acetate, saturated	1	1	3	1	3
Aluminium chloride 10%, quiescent	3	3	3	2	3
Aluminium chloride 25%, quiescent	1	1	3	2	3
Aluminium hydroxide, saturated	1	1	1	1	1
Aluminium sulfate 10%, 70°F	1	1	3	1	3
Aluminium sulfate 10%, boiling	2	1	3	1	3
Aluminium sulfate 5%	1	1	3	1	3
Aluminium sulfate, saturated, 70°F	1	1	3	1	3
Aluminium sulfate, saturated, boiling	2	1	3	1	3
Ammonia liquor, 70°F	1	1	3	3	3
Ammonia liquor, boiling	1	1	3	3	3
Ammonium bicarbonate, hot	1	1	3	2	3

Chemical	304/321 SS	316 SS	Bronze	Monel	Carbon Steel
Ammonium bromide	2	1	3	2	3
Ammonium carbonate 1% and 5%	1	1	3	3	1
Ammonium chloride 1%	1	1	3	1	2
Ammonium chloride 10%	1	1	3	2	3
Ammonium chloride 28%	2	1	3	2	3
Ammonium chloride 50%	2	1	3	2	3
Ammonium hydroxide	1	1	3	3	2
Ammonium monophosphate	1	1	3	2	2
Ammonium oxalate 5%	1	1	3	3	2
Ammonium perchlorate 10%, boiling	1	1	3	3	2
Ammonium persulfate 5%	1	1	3	3	3
Ammonium phosphate 5%	1	1	3	3	2
Ammonium sulfate 1%, aerated or agitated	1	1	3	2	3
Ammonium sulfate 10%, saturated	2	1	3	2	3
Ammonium sulfate 5%, aerated and agitated	1	1	3	2	3
Ammonium sulfate 70°F, boiling	1	1	3	3	3
Amyl acetate, concentrate	1	1	1	1	2
Amyl chloride	1	1	2	2	3
Anhydrous ammonia	1	1	1	1	1
Anhydrous ammonia, hot gas	3	3	3	3	3
Aniline 3%	1	1	3	2	2
Aniline, concentrated crude	1	1	3	2	1
Argon, refrigerated liquid	1	1	1	1	3
Barium carbonate	1	1	1	2	2
Barium chloride 5%, saturated	1	1	2	2	3
Barium hydroxide, aqueous solution, hot	1	1	1	2	2
Barium nitrate, aqueous solution, hot	1	1	1	2	2
Barium sulfate	1	1	1	2	3

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Material Compatibility with Selected Chemicals

Chemical	304/321 SS	316 SS	Bronze	Monel	Carbon Steel
Barium sulfide, saturated solution	1	1	3	3	3
Benzoic acid	1	1	1	3	1
Benzol, 70°F or hot	1	1	1	2	2
Bitumen	1	1	1	1	1
Borax 5%	1	1	1	2	2
Boric acid 5% solution, 70°F	1	1	1	2	3
Boric acid 5% solution, boiling	1	1	1	2	3
Boric acid, saturated solution, 70°F	1	1	2	2	3
Boric acid, saturated solution, boiling	1	1	3	2	3
Butane, -58°F	1	1	1	1	3
Butane, 70°F	1	1	1	1	2
Butyl acid 5%	1	1	2	2	3
Calcium carbonate	1	1	3	1	1
Calcium chlorate, dilute solution	1	1	3	2	2
Calcium chlorite, dilute or concentrate solution	2	1	2	3	3
Calcium hydroxide 10% to 20%	1	1	1	1	3
Calcium hypochlorite 2%	2	1	2	3	3
Calcium sulfate, saturated	1	1	1	2	3
Carbon bisulfide	1	1	2	2	2
Carbon dioxide, dry	1	1	1	1	1
Carbon dioxide, moist	1	1	3	1	2
Carbon tetrachloride, commercially pure	1	1	1	1	2
Carbon tetrachloride, commercially pure with 1% water	3	3	2	2	3
Carbon tetrachloride, dry, commercially pure	1	1	1	2	2
Carbonated water	1	1	2	3	3
Carbonic acid, saturated solution	1	1	1	3	3
Cellulose	1	1	3	1	3
Chloracetic acid	3	3	2	2	3

Chemical	304/321 SS	316 SS	Bronze	Monel	Carbon Steel
Chlorbenzol, concentrated, pure, dry	1	1	2	2	2
Chlorinated water, saturated	1	1	1	1	1
Chlorine gas, dry	3	3	2	2	2
Chlorine gas, moist	3	3	3	3	3
Chloroform	1	1	1	1	1
Chromic acid 10%	3	2	3	3	3
Chromic acid 5%, commercially pure	1	1	3	3	3
Chromium plating bath	1	1	3	3	2
Citric acid 15%, boiling	2	1	2	3	3
Citric acid 15%, still, 70°F	1	1	2	2	3
Citric acid 5%, still	1	1	1	2	3
Coal tar	1	1	1	2	2
Copper (II) acetate, saturated solution	1	1	3	2	3
Copper (II) cyanide, saturated solution	1	1	3	2	3
Copper (II) nitrate 1%, still, agitated and aerated	1	1	3	3	3
Copper (II) nitrate 5%, still, agitated and aerated	1	1	3	3	3
Copper (II) nitrate 50%, aqueous solution	1	1	3	3	3
Copper (II) sulfate 5%, agitated, still or aerated	1	1	2	3	3
Copper (II) sulfate, saturated solution	1	1	2	3	3
Copper (III) carbonate, saturated solution in 50% NH4OH	1	1	3	3	3
Creosote oil	1	1	2	2	2
Cyanogen gas	1	1	3	3	3
Developing solutions	1	1	3	3	3
Dichloroethane, dry	1	1	3	2	3
Diesel	1	1	1	1	1
Distillery wort	1	1	3	3	3
Dyewood liquor	1	1	3	2	3
Ether	1	1	1	2	2

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Material Compatibility with Selected Chemicals

Chemical	304/321 SS	316 SS	Bronze	Monel	Carbon Steel
Ethyl acetate, concentrated solution	1	1	1	2	2
Ethyl alcohol, 70°F, boiling	1	1	1	1	1
Ethyl chloride	1	1	2	1	2
Ethylene chloride	1	1	2	1	2
Ethylene glycol	1	1	1	1	2
Ferric chloride 1% solution, 70°F	2	1	3	3	3
Ferric chloride 1% solution, boiling	3	3	3	3	3
Ferric chloride 5% solution agitated, aerated	3	3	3	3	3
Ferric hydroxide	1	1	3	2	3
Ferric nitrate 1% to 5%, aerated	1	1	3	3	3
Ferric nitrate 1% to 5%, quiescent or agitated	1	1	3	3	3
Ferric sulfate 1% to 5%, quiescent or aerated	1	1	3	3	3
Ferric sulfate 1% to 5%, quiescent or agitated	1	1	3	3	3
Ferric sulfate 10%	1	1	3	3	3
Ferrous chloride, saturated solution	3	1	2	3	3
Ferrous sulfate, dilute solution	1	1	2	3	3
Fluorine gas, moist	3	3	3	3	3
Formaldehyde 40% solution	1	1	1	1	2
Fuel oil	1	1	1	2	2
Fuel oil containing sulfuric acid	3	2	3	2	3
Furfural	3	2	3	2	3
Gallic acid 5%	1	1	3	2	3
Gallic acid, saturated	1	1	3	2	3
Gelatin	1	1	1	1	3
Glue solution, acid	2	1	3	2	2
Glue, dry	1	1	2	2	1
Glycerine	1	1	1	1	2
Hydrochloric acid, all concentrations	3	3	3	3	3

Chemical	304/321 SS	316 SS	Bronze	Monel	Carbon Steel
Hydrocyanic acid	1	1	3	2	3
Hydrofluoric acid	3	3	3	1	3
Hydrofluosilicid acid	3	3	2	2	3
Hydrogen peroxide, 70°F	2	1	3	2	3
Hydrogen peroxide, boiling	2	1	3	2	3
Hydrogen sulfide, dry	1	1	1	3	2
Hydrogen sulfide, wet	2	1	3	3	3
Ink	2	1	3	1	3
Iodoform	1	1	3	2	3
Kerosene	1	1	1	2	2
Lactic acid 1%, 70°F	1	1	2	2	3
Lactic acid 1%, boiling	1	1	3	2	3
Lactic acid 10%, 70°F	2	1	3	2	3
Lactic acid 10%, boiling	3	2	3	2	3
Lactic acid 5%, 70°F	1	1	2	2	3
Lactic acid 5%, boiling	2	1	3	2	3
Lactic acid, concentrated, 70°F	2	1	2	2	3
Lactic acid, concentrated, boiling	3	2	3	2	3
Lead acetate 5%	1	1	3	2	3
Linseed oil	1	1	2	1	2
Magnesium chloride 1%, quiescent, 70°F	1	1	2	1	3
Magnesium chloride 1%, quiescent, hot	3	2	2	1	3
Magnesium chloride 5%, quiescent, 70°F	1	1	2	1	3
Magnesium chloride 5%, quiescent, hot	3	2	2	1	3
Magnesium sulfate	1	1	1	1	3
Malice acid	2	1	3	2	3
Mash	1	1	3	2	3
Mercury	1	1	3	3	1

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Material Compatibility with Selected Chemicals

Chemical	304/321 SS	316 SS	Bronze	Monel	Carbon Steel
Methane, refrigerated liquid	1	1	1	1	3
Methyl alcohol, boiling	3	2	1	1	3
Mixed acids 53% H2SO4 and 45% HNO3	1	1	3	3	3
Molasses	1	1	1	1	2
Mustard	1	1	3	2	3
Naphtha crude	1	1	2	1	2
Naphtha pure	1	1	2	1	2
Naphthalene sulfonic acid	1	1	3	1	3
Natural gas	1	1	1	1	2
Nickel chloride solution	1	1	2	2	3
Nickel sulfate	1	1	1	1	3
Nitre cake	2	1	3	2	3
Nitric acid 5%, 50%, 70%, boiling	1	1	3	3	3
Nitric acid 65%, 70°F	1	1	3	3	3
Nitric acid 65%, boiling	2	2	3	3	3
Nitric acid, concentrated, 70°F	1	1	3	3	3
Nitric acid, concentrated, boiling	3	3	3	3	3
Nitric acid, fuming, concentrated, 110°F	1	1	3	3	3
Nitric acid, fuming, concentrated, boiling	3	3	3	3	3
Nitrogen, refrigerated liquid	1	1	1	1	3
Nitrous acid 5%	1	1	3	3	3
Oils, crude	1	1	2	1	3
Oils, vegetable, mineral	1	1	2	1	3
Oleic acid	1	1	2	2	2
Oxalic acid 10%, boiling	3	3	2	2	3
Oxalic acid 25%, 50%, boiling	3	3	2	1	3
Oxalic acid 5%, 10%, 70°F	1	1	2	2	3
Oxygen, refrigerated liquid	1	1	1	1	3

Chemical	304/321 SS	316 SS	Bronze	Monel	Carbon Steel
Paraffin, hot	1	1	1	1	2
Petrol	1	1	1	1	2
Petroleum ether	1	1	3	2	2
Phenol	1	1	3	2	2
Phosphoric acid 1% to 3%, 15 psi, 285°F	1	1	3	2	3
Phosphoric acid 1%, 70°F	1	1	3	2	3
Phosphoric acid 1%, boiling	1	1	3	2	3
Phosphoric acid 10% to 50%, boiling	1	1	3	3	3
Phosphoric acid 10%, agitated or aerated	3	2	3	2	3
Phosphoric acid 10%, quiescent	3	1	3	2	3
Phosphoric acid 5%, aerated	1	1	3	2	3
Phosphoric acid 5%, quiescent, or agitated	1	1	3	2	3
Phosphoric acid 80%, 230°F	3	3	3	3	3
Phosphoric acid 80%, 70°F	3	3	3	2	3
Phosphoric acid 85%, boiling	3	3	3	3	3
Picric acid	1	1	3	3	3
Potassium bichromate 25%, 70°F	1	1	3	2	3
Potassium bichromate 25%, boiling	1	1	3	2	3
Potassium bromide	2	1	2	2	3
Potassium carbonate 1%, 70°F	1	1	2	1	2
Potassium carbonate 1%, hot	1	1	3	1	2
Potassium chlorade, saturated, 212°F	1	1	3	3	2
Potassium chloride 1%, agitated or aerated	1	1	2	1	3
Potassium chloride 1%, quiescent	1	1	2	1	3
Potassium chloride 5%, agitated or aerated	1	1	2	1	3
Potassium chloride 5%, boiling	1	1	2	1	3
Potassium chloride 5%, quiescent	1	1	2	1	3
Potassium chromium sulfate 5%	1	1	2	3	3

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Material Compatibility with Selected Chemicals

Chemical	304/321 SS	316 SS	Bronze	Monel	Carbon Steel
Potassium cyanide	1	1	3	2	2
Potassium ferrocyanide 25%, boiling	1	1	3	2	3
Potassium ferrocyanide 5%	1	1	3	2	3
Potassium ferrocyanide 5%, 25%, 70°F	1	1	3	2	3
Potassium hypochlorite	2	2	3	3	3
Potassium nitrate 1%, 5%, aerated	1	1	2	1	3
Potassium nitrate 1%, 5%, still or agitated	1	1	2	1	3
Potassium nitrate 50%, 70°F	1	1	2	1	3
Potassium nitrate 50%, boiling	1	1	2	1	3
Potassium nitrate 50%, molten	1	1	2	3	3
Potassium oxalate 27%	1	1	2	1	2
Potassium oxalate 5%	1	1	2	1	2
Potassium oxalate 50%	2	1	2	1	3
Potassium permanganate 5%	1	1	3	3	2
Potassium sulfate (salt)	1	1	3	3	3
Potassium sulfate 1%, 5%, aerated, 70°F	1	1	1	2	2
Potassium sulfate hot	1	1	1	2	3
Propane, -58°F	1	1	1	1	3
Propane, 70°F	1	1	1	1	2
Propyl Bromide	3	2	2	2	3
Pyrogallic acid	1	1	3	3	2
Quinine bisulfate, dry	2	1	3	3	3
Quinine sulfate, dry	1	1	2	2	3
Resin	1	1	1	1	3
Sea water	3	2	2	2	3
Silver bromide	2	1	3	3	3
Silver nitrate	1	1	3	3	3
Soap	1	1	1	1	2

Chemical	304/321 SS	316 SS	Bronze	Monel	Carbon Steel
Sodium acetate, moist	1	1	3	2	3
Sodium bisulfate saturated solution	3	3	2	2	3
Sodium bisulfate solution	1	1	2	2	3
Sodium carbonate 5%, 150°F	1	1	2	1	2
Sodium carbonate 5%, 50%, boiling	1	1	2	1	2
Sodium carbonate, molten	3	3	3	1	3
Sodium chloride 20%, aerated	1	1	2	1	3
Sodium chloride 5%, still	1	1	2	1	3
Sodium chloride, saturated, 70°F	1	1	2	1	3
Sodium chloride, saturated, boiling	2	1	2	1	3
Sodium cyanide	1	1	3	3	2
Sodium fluoride 5%	2	1	1	1	3
Sodium hydroxide	1	1	2	1	2
Sodium hypochlorite	3	3	3	3	3
Sodium hyposulfite	1	1	3	2	3
Sodium nitrate	1	1	1	2	2
Sodium perchlorate 10%	1	1	3	3	3
Sodium phosphate	1	1	2	2	2
Sodium sulfat 10%	1	1	2	2	3
Sodium sulfate 5%	1	1	2	2	3
Sodium thiosulfate 25%	1	1	3	2	3
Sodium thiosulfate acid fixing bath	1	1	3	2	3
Sodium thiosulfate saturated solution	1	1	3	1	3
Stannous chloride, saturated	3	1	3	3	3
Starch, aqueous solution	1	1	3	2	3
Steam	1	1	1	1	3
Stearic acid	1	1	2	2	3
Strontium hydroxide	1	1	3	3	3

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Material Compatibility with Selected Chemicals

Chemical	304/321 SS	316 SS	Bronze	Monel	Carbon Steel
Strontium nitrate solution	1	1	3	2	3
Sulfur acid 5%, 10%	3	2	2	3	3
Sulfur acid 50%	3	3	3	3	3
Sulfur acid, concentrated, 70°F	1	1	2	3	3
Sulfur acid, concentrated, boiling	3	3	2	3	3
Sulfur chloride, dry	3	3	1	2	3
Sulfur dioxide gas, dry	1	1	1	2	3
Sulfur dioxide gas, moist	2	1	2	3	3
Sulfur moist	2	1	3	2	3
Sulfur molten	1	1	3	1	3
Sulfurous acid, saturated	3	2	2	3	3
Sulfurous acid, saturated, 120 psi pressure	3	2	2	3	3
Sulfurous acid, saturated, 150 psi pressure	3	2	2	3	3
Sulfurous acid, saturated, 60 psi pressure	3	2	2	3	3
Tannic acid, 150°F	1	1	1	3	3
Tannic acid, 70°F	1	1	1	3	3
Tanning liquor	1	1	3	1	3
Tar	1	1	1	3	2
Tartaric acid 10%, 50%, boiling	2	1	1	2	3
Tartaric acid 10%, 70°F	1	1	1	2	3
Trichloroacetic acid	3	3	2	3	3
Trichloroethylene, dry	1	1	1	1	3
Trichloroethylene, moist	3	3	2	3	3
Varnish	1	1	1	1	2
Vegetable juices	1	1	2	2	2
Vinegar fumes	2	1	2	3	3
Vinegar, still, agitated or aerated	1	1	2	3	3
Water, potable	1	1	1	1	2

Chemical	304/321 SS	316 SS	Bronze	Monel	Carbon Steel
Whisky	1	1	1	1	3
Wine	1	1	3	2	3
Yeast	1	1	3	1	3
Zinc chloride 5%, still	1	1	3	2	3
Zinc chloride, 70°F, boiling	2	2	3	2	3
Zinc cyanide, moist	1	1	3	3	3
Zinc nitrate, solution	1	1	3	3	3
Zinc sulfate 25%	1	1	2	2	3
Zinc sulfate 4%	1	1	2	2	3
Zinc sulfate, saturated	1	1	2	2	3

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