

Stainless Steel Flexible Hose Chemical Resistance Table

NOTE: The figures quoted in this table present the following categories of resistance to corrosion. Unless otherwise stated.

Resistance is quoted at ambient temperature :

Category 1: Recommended; Category 2: Partially resistant; Category 3: Not recommended.

Service Condition	Hose and end fittings					End fitting	
	Austenitic steels			Bronze	Nickel Alloy NA 13	Carbon Steels	Copper based alloys
	304S11	316S11	321S31				
Acetic acid							
• 5% to 20% agitated or aerated	1	1	1	3	2	3	3
• 50%, 20°C	1	1	1	3	3	3	3
• 50% to 80%, boiling	3	2	3	3	3	3	3
• 80%, 20°C	1	1	1	3	1	3	3
• 100%, 20°C	1	1	1	3	1	3	3
• 100%, boiling	3	2	3	3	2	3	3
Acetic anhydride	1	1	1	3	2	3	3
Acetone, boiling	1	1	1	1	1	3	1
Acetyl chloride, boiling	2	2	2	2	1	3	2
Acetylene							
• concentrated	1	1	1	3	1	1	3
• commercially pure	1	1	1	3	1	1	3
Acid salt mixture	1	1	1	3	3	3	3
Air	1	1	1	1	1	1	1
Aluminium acetate, saturated	1	1	1	3	1	3	3
Aluminium chloride							
• 10%, quiescent	3	3	3	3	2	3	3
• 25%, quiescent	1	1	1	3	2	3	3
Aluminium hydroxide, saturated	1	1	1	1	1	1	1
Aluminium sulphate							
• 5%	1	1	1	3	1	3	3
• 10%, 20°C	1	1	1	3	1	3	3
• 10%, boiling	2	1	2	3	1	3	3
• saturated, 20°C	1	1	1	3	1	3	3
• saturated, boiling	2	1	2	3	1	3	3
Aluminium potassium sulphate (alum.)							
• 2% to 1%, 20°C	1	1	1	2	2	3	2
• 10%, boiling	2	1	2	3	2	3	3
• saturated	3	2	3	3	2	3	3
Ammonia (anhydrous)							
• all concentrations	1	1	1	1	1	1	1
• hot gas	3	3	3	3	3	3	3
Ammonia liquor							
• 20°C	1	1	1	3	3	3	3
• boiling	1	1	1	3	3	3	3
Ammonium bromide	2	1	2	3	2	3	3

Service Condition	Hose and end fittings					End fitting	
	Austenitic steels			Bronze	Nickel Alloy NA 13	Carbon Steels	Copper based alloys
	304S11	316S11	321S31				
Ammonium carbonate, 1% and 5%	1	1	1	3	3	1	3
Ammonium chloride							
• 1%	1	1	1	3	1	2	3
• 10%	1	1	1	3	2	3	3
• 28%	2	1	2	3	2	3	3
• 50%	2	1	2	3	2	3	3
Ammonium dihydrogen orthophosphate							
• (Ammonium phosphate) 5%	1	1	1	3	3	2	3
Ammonium hydrogen carbonate							
• (Ammonium bicarbonate) hot	1	1	1	3	2	3	3
Ammonium monophosphate	1	1	1	3	2	2	3
Ammonium nitrate, boiling	1	1	1	3	2	3	3
Ammonium oxalate, 5%	1	1	1	3	3	2	3
Ammonium perchlorate, 10%, boiling	1	1	1	3	3	2	3
Ammonium peroxodisulphate							
• (Ammonium persulphate) 5%	1	1	1	3	3	3	3
Ammonia solution (Ammonium Hydroxide)							
• all concentrations	1	1	1	3	3	2	3
Ammonium sulphate							
• 1%, aerated or agitated	1	1	1	3	2	3	3
• 5%, aerated and agitated	1	1	1	3	2	3	3
• 10%, saturated	2	1	2	3	2	3	3
Ammonium sulphite, 20°C, boiling	1	1	1	3	3	3	3
Amyl acetate, concentrate	1	1	1	1	1	2	1
Amyl chloride	1	1	1	2	2	3	2
Aniline							
• 3%	1	1	1	3	2	2	3
• concentrated crude	1	1	1	3	2	1	3
Argon (refrigerated liquid)	1	1	1	1	1	3	1
Barium carbonate	1	1	1	1	2	2	1
Barium chloride, 5%, saturated	1	1	1	2	2	3	2
Barium hydroxide, aqueous solution, hot	1	1	1	1	2	2	1
Barium nitrate, aqueous solution, hot	1	1	1	3	3	2	3
Barium sulphate (Barytes-blanc fixe)	1	1	1	1	2	3	1
Barium sulphide, saturated solution	1	1	1	3	3	3	3
Barium sulphide, saturated solution	1	1	1	3	3	3	3
Benzene (Benzol) 20°C or hot	1	1	1	1	2	2	1
Benzoic acid	1	1	1	1	3	1	1
Bitumen	1	1	1	1	1	1	1
Butane							
• -50°C	1	1	1	1	1	3	1
• 20°C	1	1	1	1	1	2	1

Service Condition	Hose and end fittings					End fitting	
	Austenitic steels			Bronze	Nickel Alloy NA 13	Carbon Steels	Copper based alloys
	304S11	316S11	321S31				
Butyl acetate	1	1	1	3	2	2	3
Butyric acid							
• 5%	1	1	1	2	2	3	2
• aqueous solution, dilution of 0.964 g/L	1	1	1	3	2	3	3
Calcium carbonate	1	1	1	3	1	1	3
Calcium chlorate, dilute solution	1	1	1	3	2	2	3
Calcium chloride, dilute or concentrated	2	1	2	2	3	3	2
• solution							
Calcium hypochlorite, 2%	2	1	2	2	3	3	2
Calcium hydroxide, 10% to 20%	1	1	1	1	1	3	1
Calcium sulphate, saturated	1	1	1	1	2	3	1
Carbonated water	1	1	1	2	3	3	2
Carbonic acid, saturated solution	1	1	1	1	3	3	3
Carbon dioxide							
• dry	1	1	1	1	1	1	3
• moist	1	1	1	3	1	2	3
Carbon disulphide (Carbon bisulphide)	1	1	1	2	2	2	1
Carbon tetrachloride							
• CP	1	1	1	1	1	2	1
• dry CP	1	1	1	1	2	2	1
• commercial + 1% water	3	3	3	2	2	3	2
Cellulose	1	1	1	3	1	3	3
Chloracetic acid	3	3	3	2	2	3	2
Chlorbenzol, concentrated, pure, dry	1	1	1	2	2	2	2
Chlorine gas							
• dry	3	3	3	2	2	2	2
• moist	3	3	3	3	3	3	3
Chlorinated water, saturated	1	1	1	1	1	1	1
Chloroform	1	1	1	1	1	1	1
Chromium (VI) oxide (Chromic acid)							
• 5% CP	1	1	1	3	3	3	3
• 10%	3	2	3	3	3	3	3
Chromium plating bath	1	1	1	3	3	2	3
1-chloro-2,4-dinitrobenzene							
• (Dinitrochlorobenzene)							
• melted and solidified	1	1	1	3	3	3	3
Chloroethane (Ethyl chloride)	1	1	1	2	1	2	2
Citric acid							
• 5%, still	1	1	1	1	2	3	2
• 15%, still, 20°C	1	1	1	2	2	3	3
• 15%, boiling	2	1	2	2	3	3	3
Copper (II) acetate, saturated solution	1	1	1	3	2	3	3
Copper (III) carbonate, saturated solution							

Service Condition	Hose and end fittings				End fitting		
	Austenitic steels			Bronze	Nickel Alloy NA 13	Carbon Steels	Copper based alloys
	304S11	316S11	321S31				
• in 50% NH4OH	1	1	1	3	3	3	3
Copper (II) cyanide, saturated solution	1	1	1	3	2	3	3
Copper (II) nitrate							
• 1% still, agitated and aerated	1	1	1	3	3	3	3
• 5% still, agitated and aerated	1	1	1	3	3	3	3
• 50% aqueous solution	1	1	1	3	3	3	3
Copper (II) sulphate							
• 5% agitated, still or aerated	1	1	1	2	3	3	2
• saturated solution	1	1	1	2	3	3	2
Creosote (coal tar)	1	1	1	1	2	2	1
Creosote oil	1	1	1	2	2	2	2
Cyanogen gas	1	1	1	3	3	3	3
Developing solutions	1	1	1	3	3	3	3
1,2-Dichloroethylene (Dichloroethane) dry	1	1	1	3	2	3	3
Diethyl ether (Ether)	1	1	1	1	2	2	1
Disodium tetraborate (Borax) 5%	1	1	1	1	2	2	1
Distillery wort	1	1	1	3	3	3	3
Dyewood liquor	1	1	1	3	2	3	3
Ethanediol (Ethylene glycol)	1	1	1	1	1	2	1
Ethanol (Ethyl alcohol) 20°C and boiling	1	1	1	1	1	1	1
Ethyl acetate, concentrated solution	1	1	1	1	2	2	1
Ethylene chloride	1	1	1	2	1	2	2
Fluorine (gas) moist	3	3	3	3	3	3	3
Fluorosilicic (Hydrofluosilicic) acid	3	3	3	2	2	3	2
Formaldehyde, 40% solution	1	1	1	1	1	2	1
Formic acid							
• 5%, still, 20°C	2	1	2	2	2	3	2
• 5%, still, 66°C	2	1	2	2	3	3	2
Fuel oil	1	1	1	1	2	2	1
• containing sulphuric acid	3	2	3	3	2	3	3
• 2-Furaldehyde (Furfural)	1	1	1	1	2	2	1
Gelatin	1	1	1	1	1	3	1
Glue							
• dry	1	1	1	2	2	1	2
• solution, acid	2	1	2	3	2	2	3
Glycerol (Glycerine)	1	1	1	1	1	2	1
Hydrochloric acid, all concentrations	3	3	3	3	3	3	3
Hydrocyanic acid	1	1	1	3	2	3	3
Hydrofluoric acid	3	3	3	3	1	3	3
Hydrogen peroxide							
• 20°C	2	1	2	3	2	3	3
• boiling	2	1	2	3	2	3	3

Service Condition	Hose and end fittings					End fitting	
	Austenitic steels			Bronze	Nickel Alloy NA 13	Carbon Steels	Copper based alloys
	304S11	316S11	321S31				
Hydrogen sulphide							
• dry	1	1	1	1	3	2	1
• wet	2	1	2	3	3	3	3
Ink	2	1	2	3	1	3	3
Iodoform	1	1	1	3	2	3	3
Iron (II) chloride							
• (Ferrous chloride) saturated solution	3	1	3	2	3	3	2
Iron (III) chloride (Ferric chloride)							
• 1% solution, 20°C	2	1	2	3	3	3	3
• 1% solution, boiling	3	3	3	3	3	3	3
• 5% solution agitated, aerated	3	3	3	3	3	3	3
Iron (III) hydroxide							
• (Ferric hydroxide) (hydrated iron oxide)	1	1	1	3	2	3	3
Iron (III) nitrate (Ferric nitrate)							
• 1% to 5% quiescent or agitated	1	1	1	3	3	3	3
• 1% to 5% aerated	1	1	1	3	3	3	3
Iron (II) sulphate (Ferrous sulphate) dilute							
• solution	1	1	1	2	3	3	2
Iron (III) sulphate (Ferric sulphate)							
• 1% to 5% quiescent or agitated	1	1	1	3	3	3	3
• 1% to 5% aerated	1	1	1	3	3	3	3
• 10%	1	1	1	3	3	3	3
Kerosene	1	1	1	1	2	2	1
Lactic acid							
• 1%, 20°C	1	1	1	2	2	3	2
• 1%, boiling	1	1	1	3	2	3	3
• 5%, 20°C	1	1	1	2	2	3	2
• 5%, boiling	2	1	2	3	2	3	3
• 10%, 20°C	2	1	2	3	2	3	2
• 10%, boiling	3	2	3	3	2	3	3
• concentrated, 20°C	2	1	2	2	2	3	2
• concentrated, boiling	3	2	3	3	2	3	3
Lead diacetate (Lead acetate) 5%	1	1	1	3	2	3	3
Linseed oil	1	1	1	2	1	2	2
Magnesium chloride							
• 1%, quiescent, 20°C	1	1	1	2	1	3	2
• 1%, quiescent, hot	3	2	3	2	1	3	2
• 5%, quiescent, 20°C	1	1	1	2	1	3	2
• 5%, quiescent, hot	3	2	3	2	1	3	2
Magnesium sulphate	1	1	1	1	1	3	1
Malic acid	2	1	2	3	2	3	3
Mash	1	1	1	3	2	3	3
Mercury	1	1	1	3	3	1	3

Service Condition	Hose and end fittings				End fitting		
	Austenitic steels			Bronze	Nickel Alloy NA 13	Carbon Steels	Copper based alloys
	304S11	316S11	321S31				
Methane (refrigerated liquid)	1	1	1	1	1	3	1
Methanol (Methyl alcohol) boiling	3	2	3	1	1	3	1
Mixed acids, 53% H ₂ SO ₄ + 45% HNO ₃	1	1	1	3	3	3	3
Molasses	1	1	1	1	1	2	2
Mustard	1	1	1	3	2	3	3
Naphtha							
• crude	1	1	1	2	1	2	2
• pure	1	1	1	2	1	2	2
Naphthalene sulphonic acid	1	1	1	3	1	3	3
Nickel chloride solution	1	1	1	2	2	3	3
Nickel sulphate	1	1	1	1	1	3	3
Nitre cake	2	1	2	3	2	3	3
Nitric acid							
• 5%, 50%, 70%, boiling	1	1	1	3	3	3	3
• 65%, 20°C	1	1	1	3	3	3	3
• 65%, boiling	2	2	2	3	3	3	3
• concentrated, 20°C	1	1	1	3	3	3	3
• concentrated, boiling	3	3	3	3	3	3	3
• fuming concentrated, 43°C	1	1	1	3	3	3	3
• fuming concentrated, boiling	3	3	3	3	3	3	3
Nitrogen (refrigerated liquid)	1	1	1	1	1	3	1
Nitrous acid, 5%	1	1	1	3	3	3	3
Oils, crude	1	1	1	2	1	3	2
Oils, vegetable, mineral	1	1	1	2	1	3	2
Oleic acid	1	1	1	2	2	2	2
Orthoboric acid (Boric acid)							
• 5% solution, 20°C	1	1	1	1	2	3	1
• 5% solution, boiling	1	1	1	1	2	3	2
• saturated solution, 20°C	1	1	1	2	2	3	3
• saturated solution, boiling	1	1	1	3	2	3	3
Orthophosphoric acid (Phosphoric acid)							
• 1%, 20°C	1	1	1	3	2	3	3
• 1%, boiling	1	1	1	3	2	3	3
• 1% 3.1 bar, 140°C	1	1	1	3	2	3	3
• 5% quiescent, or agitated	1	1	1	3	2	3	3
• 5% aerated	1	1	1	3	2	3	3
• 10% quiescent	3	1	3	3	2	3	3
• 10% agitated or aerated	3	2	3	3	2	3	3
• 10%, 50%, boiling	1	1	1	3	3	3	3
• 80%, 20°C	3	3	3	3	2	3	3
• 80%, 110°C	3	3	3	3	3	3	3
• 85%, boiling	3	3	3	3	3	3	3
Oxalic acid							
• 5%, 10%, 20°C	1	1	1	2	2	3	3

Service Condition	Hose and end fittings					End fitting	
	Austenitic steels			Bronze	Nickel Alloy NA 13	Carbon Steels	Copper based alloys
	304S11	316S11	321S31				
• 10%, boiling	3	3	3	2	2	3	3
• 25%, 50%, boiling	3	3	3	2	1	3	3
Oxygen (refrigerated liquid)	1	1	1	1	1	3	1
Paraffin, hot	1	1	1	1	1	2	1
Petrol	1	1	1	1	1	2	1
Petroleum ether	1	1	1	3	2	2	3
Phenol	1	1	1	3	2	2	1
Picric acid	1	1	1	3	3	3	3
Potassium bromide	2	1	2	2	2	3	2
Potassium carbonate							
• 1%, 20°C	1	1	1	2	1	2	2
• hot	1	1	1	3	1	2	3
Potassium chlorate saturated at 100°C	1	1	1	3	3	2	3
Potassium chloride							
• 1%, quiescent	1	1	1	2	1	3	3
• 1%, agitated or aerated	1	1	1	2	1	3	3
• 5%, quiescent	1	1	1	2	1	3	3
• 5%, agitated or aerated	1	1	1	2	1	3	3
• 5%, boiling	1	1	1	2	1	3	3
Potassium chromium sulphate							
• 5%	1	1	1	2	3	3	3
• dilution of 1.6 g/L	3	3	3	3	3	3	3
Potassium cyanide	1	1	1	3	2	2	3
Potassium dichromate (Potassium bichromate)							
• 25%, 20°C	1	1	1	3	2	3	3
• 25%, boiling	1	1	1	3	2	3	3
Potassium hexacanoferate (III)							
• (Potassium ferricyanide)							
• 5%, 25%, 20°C	1	1	1	3	2	3	3
• 25%, boiling	1	1	1	3	2	3	3
Potassium hexacyanoferrate (II)							
• (Potassium ferrocyanide)							
• 5%	1	1	1	3	2	3	3
Potassium hydrogen oxalate (Potassium oxalate)	1	1	1	3	3	3	3
Potassium hydroxide							
• 5%	1	1	1	2	1	2	3
• 27%	1	1	1	2	1	2	3
• 50%	2	1	2	2	1	3	3
Potassium hypochlorite	2	2	2	3	3	3	3
Potassium nitrate							
• 1%, 5% still or agitated	1	1	1	2	1	3	2
• 1%, 5% aerated	1	1	1	2	1	3	2

Service Condition	Hose and end fittings				End fitting		
	Austenitic steels			Bronze	Nickel Alloy NA 13	Carbon Steels	Copper based alloys
	304S11	316S11	321S31				
• 50%, 20°C	1	1	1	2	1	3	2
• 50%, boiling	1	1	1	3	1	3	3
• molten	1	1	1	3	3	3	3
Potassium permanganate, 5%	1	1	1	3	3	2	3
Potassium sulphate							
• 1%, 5% still or agitated	1	1	1	1	2	2	2
• 1%, 5% aerated, 20°C	1	1	1	1	2	2	2
• hot	1	1	1	1	2	3	2
Potassium sulphite (salt)	1	1	1	3	3	3	3
Propane							
• -50°C	1	1	1	1	1	3	1
• 20°C	1	1	1	1	1	2	1
Pyrogallol (Pyrogallol acid)	1	1	1	3	3	2	3
Quinine bisulphate, dry	2	1	2	3	3	3	3
Quinine sulphate, dry	1	1	1	2	2	3	2
Resin	1	1	1	1	1	3	1
Sea water	3	2	3	2	2	3	2
Silver bromide	2	1	2	3	3	3	3
Silver nitrate	1	1	1	3	3	3	3
Soap	1	1	1	1	1	2	1
Sodium acetate, moist	1	1	1	3	2	3	3
Sodium carbonate							
• 5%, 66°C	1	1	1	2	1	2	2
• 5%, 50%, boiling	1	1	1	2	1	2	2
• molten	3	3	3	3	1	3	3
Sodium chloride							
• 5%, still	1	1	1	2	1	3	3
• 20%, aerated	1	1	1	2	1	3	3
• saturated, 20°C	1	1	1	2	1	3	3
• saturated, boiling	2	1	2	2	1	3	3
Sodium cyanide	1	1	1	3	3	2	3
Sodium fluoride, 5% solution	2	1	2	1	1	3	1
Sodium hydrogen carbonate (Sodium bicarbonate)							
• all concentrations, 20°C	1	1	1	2	1	3	2
• 5% still, 66°C	1	1	1	2	1	3	2
Sodium hydrogen sulphate (Sodium bisulphate)							
• solution	1	1	1	2	2	3	3
• saturated solution	3	3	3	2	2	3	3
Sodium hydroxide	1	1	1	2	1	2	3
Sodium hypochlorite	3	3	3	3	3	3	3
Sodium nitrate	1	1	1	1	2	2	1
Sodium perchlorate, 10%	1	1	1	3	3	3	3
Sodium phosphate	1	1	1	2	2	2	2

Service Condition	Hose and end fittings					End fitting	
	Austenitic steels			Bronze	Nickel Alloy NA 13	Carbon Steels	Copper based alloys
	304S11	316S11	321S31				
Sodium sulphate							
• 5% still	1	1	1	1	1	3	1
• all concentrations	1	1	1	1	1	3	1
Sodium sulphide (disodium sulphide),							
• saturated	2	1	2	3	2	3	3
Sodium sulphite							
• 5%	1	1	1	2	2	3	3
• 10%	1	1	1	2	2	3	3
Sodium thiosulphate							
• saturated solution	1	1	1	3	1	3	3
• acid fixing bath (hypo)	1	1	1	3	2	3	3
• 25% solution	1	1	1	3	2	3	3
Sodium thiosulphite (Sodium	1	1	1	3	1	3	3
Steam	1	1	1	1	1	3	2
Stearic acid	1	1	1	2	2	3	3
Starch, aqueous solution	1	1	1	3	2	3	3
Strontium hydroxide	1	1	1	3	3	3	3
Strontium nitrate solution	1	1	1	3	2	3	3
Sulphur							
• moist	2	1	2	3	2	3	3
• molten	1	1	1	3	1	3	3
Sulphur chloride, dry	3	3	3	1	2	3	1
Sulphur dioxide gas							
• moist	2	1	2	2	3	3	2
• dry	1	1	1	1	2	3	1
Sulphuric acid							
• 5%, 10%	3	2	3	2	3	3	3
• 50%	3	3	3	3	3	3	3
• concentrated, 20°C	1	1	1	2	3	3	3
• concentrated, boiling	3	3	3	2	3	3	3
Sulphurous acid							
• saturated	3	2	3	2	3	3	3
• saturated, 4 bar pressure	3	2	3	2	3	3	3
• saturated, 8 bar pressure	3	2	3	2	3	3	3
• 10 bar pressure	3	2	3	2	3	3	3
Tannic acid							
• 20°C	1	1	1	1	3	3	2
• 66°C	1	1	1	1	3	3	2
Tanning liquor	1	1	1	3	1	3	3
Tar	1	1	1	1	3	2	1
Tartaric acid							
• 10%, 20°C	1	1	1	1	2	3	2
• 10%, 50%, boiling	2	1	2	1	2	3	2

Service Condition	Hose and end fittings				End fitting		
	Austenitic steels			Bronze	Nickel Alloy NA 13	Carbon Steels	Copper based alloys
	304S11	316S11	321S31				
Tin (IV) chloride (Stannic chloride solution)							
• (dilution of 1.21 g/L	3	3	3	3	3	3	3
Tin (II) chloride (Stannous chloride)							
• saturated	3	1	3	3	3	3	3
Trichloroacetic acid	3	3	3	2	3	3	3
Trichloroethylene							
• dry	1	1	1	1	1	3	1
• moist	3	3	3	2	3	3	2
3,4,5 Trihydroxybenzoic acid (Gallic Acid)							
• 5%	1	1	1	3	2	3	3
• saturated	1	1	1	3	2	3	3
Varnish	1	1	1	1	1	2	1
Vegetable juices	1	1	1	2	2	2	3
Vinegar fumes	2	1	2	2	3	3	3
Vinegar, still, agitated or aerated	1	1	1	2	3	3	3
Water, potable	1	1	1	1	1	2	1
Whisky	1	1	1	1	1	3	2
Wine, all phases of processing and storing	1	1	1	3	2	3	3
Yeast	1	1	1	3	1	3	3
Zinc chloride							
• 5% still	1	1	1	3	2	3	3
• 20°C boiling	2	2	2	3	2	3	3
Zinc cyanide, moist	1	1	1	3	3	3	3
Zinc nitrate, solution	1	1	1	3	3	3	3
Zinc sulphate							
• 4%	1	1	1	2	2	3	3
• 25%	1	1	1	2	2	3	3
• saturated	1	1	1	2	2	3	3