

CORROSION TABLES

CARBON STEEL AND BRONZE ARE SHOWN FOR COMPARISON PURPOSES

| MEDIA | CARBON STEEL | BRONZE | AISI 304 | AISI 316, 347, 321 | ALLOY 20 | HASTELLOY | MONEL-INCONEL | MEDIA | CARBON STEEL | BRONZE | AISI 304 | AISI 316, 347, 321 | ALLOY 20 | HASTELLOY | MONEL-INCONEL |
|------------------------------|--------------|--------|----------|--------------------|----------|-----------|---------------|---------------------------|--------------|--------|----------|--------------------|----------|-----------|---------------|
| acetaldehyde | O | O | E | E | E | E | | borac acid | O | G | G | G | | E | G |
| acetic acid aerated | O | O | E | E | E | E | | bromine(dry) | O | O | O | O | E | E | E |
| acetic acid(air free) | O | O | E | E | E | E | | bromine(wet) | O | O | O | O | O | E | E |
| acetic anhydride | O | F | G | G | E | E | | butadiene | F | O | G | O | | | |
| acetone | E | E | E | E | E | E | E | butane | G | E | G | G | G | E | G |
| acetylene | E | G | E | E | E | E | E | buttermilk | O | O | E | E | | E | |
| air | E | E | E | E | E | | | butyric acid | O | O | G | G | E | E | G |
| alcohols | G | G | E | E | E | E | E | calcium bisulfite | O | G | F | G | E | | |
| aluminium acetate | O | O | E | E | E | E | G | calcium carbonate | O | F | E | E | E | E | G |
| aluminium chloride 10% | O | O | O | O | E | O | E | calcium chloride | F | G | F | G | G | E | G |
| aluminium chloride 10% | O | O | O | O | F | O | E | calcium hydroxide | F | O | E | E | E | E | E |
| aluminium fluoride | O | O | G | G | E | G | E | calcium hypochlorite | O | O | F | F | F | E | |
| aluminium hydroxide | O | O | E | E | E | G | | calcium sulfate | O | E | E | E | E | G | G |
| aluminium oxalate | O | O | | | E | G | E | carbolic acid | O | G | G | G | E | E | G |
| aluminium potassium sulphate | O | O | E | E | E | G | G | carbon bisulfide | G | F | G | G | E | | G |
| aluminium sulfate(alums) | O | F | F | G | E | E | F | carbon tetrachloride(dry) | F | F | G | E | E | | G |
| amines | G | O | E | E | E | | | carbonated water | O | G | E | E | E | | G |
| ammonia(aqueous) | E | E | E | E | E | G | E | carbonic acid | O | O | G | G | E | | E |
| ammonia(anhydrous liquid) | G | O | G | G | G | G | E | castor oil | G | E | E | E | E | | E |
| ammonium bicarbonate | F | O | G | G | G | | | china wood oil(tung) | F | F | E | E | E | | E |
| ammonium carbonate | G | O | G | G | G | G | | chlorinated solvents | F | F | E | E | E | | G |
| ammonium chloride | O | O | F | F | E | G | G | chlorine gas(dry) | G | F | G | G | E | | G |
| ammonium hydroxide(28%) | O | O | G | G | E | E | | chloroacetic acid | O | O | O | O | O | | G |
| ammonium hydroxide(conc) | O | O | G | G | E | E | | chlorobenzene(dry) | F | F | E | E | F | | F |
| ammonium monophosphate | O | O | G | G | E | E | | chloroform(dry) | O | G | E | E | E | | E |
| ammonium nitrate | O | O | G | G | E | E | | chromic acid | O | O | E | E | E | | |
| ammonium phosphate | O | O | G | G | E | E | | citrus juices | O | O | E | E | E | | G |
| ammonium sulfate | F | G | G | G | E | G | G | coca-cola syrup(pure) | O | O | E | E | | | |
| amyl acetate | F | G | G | G | E | G | G | coconut oil | O | O | G | G | G | | G |
| aniline | F | F | G | G | G | G | G | copper chloride | O | F | O | O | E | | G |
| aniline dyes | F | O | E | E | E | | | cooking oil | O | G | E | E | E | | |
| antimony trichloride | O | O | O | O | O | E | G | copper nitrate | O | O | E | E | E | | O |
| apple juice | O | O | G | O | O | | | copper sulfate | O | O | G | G | E | G | E |
| arsenic acid | O | O | G | G | G | | | corn oil | F | | G | G | G | G | E |
| asphalt emulsion | G | G | E | E | E | E | | cottonseed oil | F | | G | G | G | G | E |
| asphalt liquid | G | G | E | E | E | | | creosote oil | G | G | G | G | G | | E |
| barium carbonate | G | G | E | E | E | E | | creylic acid | F | F | G | G | G | G | G |
| barium chloride | F | G | G | G | F | E | G | cupric chloride | O | O | O | O | O | O | E |
| barium hydroxide | F | O | G | G | E | E | | diesel fuels | E | E | E | E | | | E |
| barium sulfate | F | F | E | E | E | | G | dowtherm | G | | E | E | | | |
| barium sulfide | F | F | G | G | G | | F | drying oil | | | G | G | G | G | |
| beer | O | E | E | E | G | E | E | epsom salt | F | G | G | G | G | | |
| beet sugar liquors | G | E | E | E | G | | E | ethers | G | G | E | E | E | G | E |
| benzene(benzol) | G | G | E | E | E | G | G | ethyl acetate | G | F | G | G | G | E | G |
| benzoid acid | O | O | E | E | E | E | G | ethyl alcohol | G | G | G | G | G | G | G |
| borax liquors | F | O | E | E | E | E | G | ethyl chloride(dry) | G | G | E | E | E | G | G |

CODE

E - Excellent

F - Fair

G - Good

O - Not recommended

Blank - No data

CORROSION TABLES

CARBON STEEL AND BRONZE ARE SHOWN FOR COMPARISON PURPOSES

| MEDIA | CARBON STEEL | BRONZE | AISI 304 | AISI 316, 347, 321 | ALLOY 20 | HASTELLOY | MONEL-INCONEL | MEDIA | CARBON STEEL | BRONZE | AISI 304 | AISI 316, 347, 321 | ALLOY 20 | HASTELLOY | MONEL-INCONEL |
|-----------------------------|--------------|--------|----------|--------------------|----------|-----------|---------------|---------------------|--------------|--------|----------|--------------------|----------|-----------|---------------|
| ethylene glycol | G | G | G | G | E | G | | lactic acid | O | G | E | E | E | G | E |
| ethylene oxide | G | E | G | G | G | | | large oil | | E | E | G | G | G | |
| fatty acids | O | | G | E | E | G | E | lead acetate | O | | E | E | E | G | E |
| ferric chloride | O | O | O | O | O | O | E | linseed oil | E | G | E | E | E | E | E |
| ferric nitrate | O | | G | G | E | O | E | lubricating oil | E | | | | | | |
| ferric sulfate | O | O | G | G | E | | E | magnesium chloride | G | G | F | E | E | G | E |
| ferrous chloride | O | G | O | O | O | O | G | magnesium hydroxide | G | G | E | E | E | G | E |
| ferrous sulfate | O | G | E | E | E | G | G | magnesium sulfate | G | G | E | E | E | E | E |
| fish oils | | | | G | | | | maleic acid | | G | G | G | E | | E |
| fluorine | | | | | | | E | malic acid | | | E | E | E | G | E |
| formaldehyde | O | F | O | F | F | F | E | mayonnaise | | | E | E | | G | |
| formic acid | O | G | F | G | G | G | E | mercury | E | O | E | E | E | G | E |
| fruit juices | | G | E | E | E | E | E | methyl alcohol | G | G | G | G | G | E | |
| fuel oil | | G | E | E | E | G | E | methyl chloride | G | E | G | E | E | G | G |
| furfural | G | F | G | E | E | G | E | methyl ethyl ketone | E | E | E | E | E | E | |
| gallic acid | O | F | E | E | E | E | E | milk | O | E | E | E | | G | E |
| gas-manufactured | G | G | | | | | | mine waters(acid) | | F | G | G | E | O | E |
| gas-natural | G | G | E | E | E | | | mineral oil | | | E | | | | |
| gasoline(lead) | E | E | E | E | E | E | | molasses, edible | F | | E | E | E | G | E |
| gasoline(unlead) | E | E | E | E | E | E | | molasses, crude | E | E | E | E | E | E | |
| gelatin | | | E | E | E | | | mustard | O | O | F | E | | G | E |
| glucose | | E | E | E | | | | mercuric chloride | | | | | F | | E |
| glue | E | G | G | G | G | G | | naphtha | G | G | E | E | E | E | E |
| glycerin | F | G | E | E | E | E | E | naphthalene | E | G | G | G | G | G | E |
| heptane | O | O | O | O | E | G | E | nickel chloride | O | | G | G | G | G | E |
| hydrochloric acid(air free) | O | O | O | O | O | F | G | nickel nitrate | | | G | G | G | | G |
| hydrogen chloride | | | | | | | | nickel sulfate | O | | G | G | G | G | G |
| hydrochloric acid | O | O | O | O | O | O | E | nitric acid(10%) | O | O | E | E | E | O | G |
| hydrofluoric acid | O | O | O | O | O | G | G | nitric acid(30%) | O | O | E | E | E | O | G |
| hydrogen fluoride | O | O | O | F | F | E | | nitric acid(100%) | O | O | E | E | E | O | G |
| hydrogen | | | E | E | E | | E | nitrobenzene | G | | G | G | E | G | |
| hydroxide | O | O | E | E | E | G | | nitrous acid(10%) | O | O | G | G | G | O | |
| hydrogen peroxide | O | | G | G | E | G | E | nitrous oxide | G | | G | G | G | O | |
| hydrogen sulfite(dry) | G | F | E | E | E | | G | oleic acid | F | G | G | E | E | G | G |
| hydrogen sulfide(wet) | F | | E | E | E | | E | oleum | G | | G | G | G | G | G |
| hypo(sodium thiosulfate) | O | F | E | E | E | G | | olive oil | | | E | E | | | |
| hypochlorites - sodium | | O | F | E | E | G | E | oxalate | O | O | | | E | G | E |
| ink | | | G | E | E | G | G | oxalic acid | O | G | E | E | E | G | G |
| iodine(wet) | | O | O | O | O | F | E | palmitic acid | | G | G | G | G | G | |
| iodoform | G | | O | | | F | E | palm oil | | | G | G | | | |
| isopropyl alcohol | | | G | G | G | G | | paraffin | G | E | E | E | E | E | E |
| JP-4 | | | E | E | E | E | | paraformaldehyde | G | G | G | G | G | G | |
| JP-5 fuel | | | E | E | E | E | | penicilin | O | O | O | G | O | E | |
| kerosene | G | E | E | E | E | G | E | pentane | G | E | E | E | G | G | G |
| ketchup | O | O | E | E | E | G | E | petrolatum | | | G | G | G | | |
| lacquers(and solvents) | F | E | | E | | E | | phenol | O | E | E | E | E | E | E |

CODE

E - Excellent

F - Fair

G - Good

O - Not recommended

Blank - No data

CORROSION TABLES

CARBON STEEL AND BRONZE ARE SHOWN FOR COMPARISON PURPOSES

| MEDIA | CARBON STEEL | BRONZE | AISI 304 | AISI 316, 347, 321 | ALLOY 20 | HASTELLOY | MONEL-INCONEL | MEDIA | CARBON STEEL | BRONZE | AISI 304 | AISI 316, 347, 321 | ALLOY 20 | HASTELLOY | MONEL-INCONEL |
|------------------------|--------------|--------|----------|--------------------|----------|-----------|---------------|-----------------------------|--------------|--------|----------|--------------------|----------|-----------|---------------|
| phosphoric acid(10%) | O | | G | G | E | G | E | sodium phosphate | F | F | G | G | G | | G |
| phosphoric acid(25%) | O | | G | G | E | G | E | sodium silicate | G | G | G | G | G | G | |
| phthalic acid | | | G | G | G | | | sodium sulfate | G | G | G | E | E | E | E |
| picric acid | O | | E | E | E | G | E | sodium sulfide | G | O | G | G | G | | E |
| pine oil | G | | E | E | | | | sodium thiosulfate | | | E | E | E | | |
| pineapple juice | | | | E | | | | soybean oil | F | | E | E | E | E | |
| potassium bisulfite | O | | G | G | G | O | | stannic chloride | O | O | O | E | E | F | G |
| potassium bromide | O | | E | E | | G | | stannous chloride | O | O | O | E | E | F | G |
| potassium carbonate | G | G | G | G | G | G | | starch | | | | G | | | |
| potassium chlorate | G | | G | G | G | | | steam(212°F) | E | E | E | E | E | E | |
| potassium chloride | F | G | F | F | F | G | G | stearic acid | | F | E | E | E | G | E |
| potassium cyanide | G | O | G | G | G | G | G | sugar liquids | O | O | E | E | E | E | E |
| potassium dichromate | F | O | G | G | G | | E | sulfate - black liquor | | F | G | G | G | G | E |
| potassium diphosphate | | | | E | | | | sulfate - green liquor | | | G | G | G | G | E |
| potassium ferricyanide | F | O | G | G | G | G | G | sulfate - white liquor | | | G | G | G | F | E |
| potassium ferrocyanide | F | G | G | G | G | G | G | sulfur dioxide(dry) | G | F | G | G | G | G | E |
| potassium hydroxide | F | G | G | G | G | E | E | sulfur trioxide(dry) | G | G | G | G | G | G | E |
| potassium iodide | F | | G | G | G | G | | sulfuric acid(20%) | O | G | O | O | E | E | E |
| potassium nitrate | E | | G | G | G | G | G | sulfuric acid(50%) | O | G | O | O | E | E | E |
| potassium permanganate | G | | G | G | G | E | E | sulfuric acid(100%) | F | E | O | G | E | O | G |
| potassium sulfate | G | G | G | G | G | G | G | sulfurous acid | O | F | F | O | E | O | |
| propane | G | E | G | G | G | G | | tall oil | | | | G | | | G |
| pyrogalllic acid | G | | E | E | E | G | E | tannic acid | F | G | E | E | E | G | E |
| rosin emulsion | F | G | G | G | G | E | | tartaric acid | O | E | E | E | E | G | |
| salad oil | F | G | G | G | G | G | | tetraethyl lead | | | | G | G | | |
| salicylic acid | O | G | G | G | G | G | G | toluene | E | E | E | E | E | E | |
| sea water | O | F | E | E | E | E | G | tomato juice | | | F | E | E | G | E |
| silver nitrate | O | O | G | G | G | O | G | trichloroethylene | G | G | G | G | G | E | E |
| sodium acetate | F | | G | G | G | F | G | tung oil | | | | G | | | |
| sodium aluminate | | | G | G | G | G | G | turpentine | G | G | G | G | G | G | |
| sodium bicarbonate | F | G | G | G | E | G | G | titanium "E" | | | | | | | |
| sodium bisulfate(10%) | O | G | E | E | E | G | G | urea | | | G | G | | | |
| sodium bisulfite | O | G | E | E | E | G | G | varnish | O | O | E | E | | G | E |
| sodium borate | | | G | G | G | G | G | vegetable oil, edible | | | E | E | E | G | E |
| sodium bromide(10%) | G | | F | G | G | G | G | vegetable oil, non - edible | | | E | E | E | G | E |
| sodium carbonate | G | G | G | G | G | | G | vinegar | O | E | E | E | | | |
| sodium chlorate | | G | G | G | G | | G | vitamins | O | O | O | G | O | E | |
| sodium chloride | F | G | G | G | G | G | G | water - distilled(aerated) | O | E | E | E | E | E | E |
| sodium chromate | G | F | | | | G | | water - fresh | | F | E | E | E | E | E |
| sodium cyanide | G | O | G | G | G | G | | water - sea | O | F | E | E | E | E | |
| sodium fluoride | O | | F | G | | E | F | whiskey | O | | E | E | | E | |
| sodium hydroxide | F | G | G | G | G | E | E | wine | O | | E | E | | | |
| sodium hypochlorite | O | O | O | G | E | O | E | xylene(dry) | G | | E | E | | | |
| sodium nitrate | G | G | G | G | G | G | G | zinc chloride | O | O | O | O | G | G | G |
| sodium perborate | G | | G | G | G | G | G | zinc hydrosulfite | E | | E | E | E | G | G |
| sodium peroxide | F | O | G | G | G | G | G | zinc sulfate | O | G | G | G | G | G | G |

CODE

E - Excellent F - Fair G - Good O - Not recommended Blank - No data