

Flowserve Corporation has devoted more than 85 years to the development of alloys and the production of equipment to provide long, trouble-free life when handling severe corrosives. Pumps, valves, pipe, fittings, anodes, towers and various accessory castings are among the equipment engineered and produced by Flowserve Corporation in various nickel-base alloys, iron-base alloys, and reactive alloys.

The ratings listed in this bulletin represent the concentration and temperature at which each alloy experiences 20 mpy corrosion or less in an uncontaminated environment, unless otherwise indicated. Where applicable, localized forms of corrosion, such as pitting and stress corrosion cracking, have been considered. However, many other factors must be considered when selecting a material for a corrosive service. These include: primary corrosive; secondary corrosive; contaminants; concentration; pH; maximum, minimum and normal operating temperature; viscosity; velocity; solids in suspension; continuous or intermittent operation; degree of aeration; type or design of equipment; and any other peculiarities of the solution.

These ratings may be used as a guide in selecting materials for many Flowserve product components, including pipe, casings, covers, impellers, and valve bodies. Critical components such as plugs, shafts, and mag drive containment shells require lower rates of corrosion. In these cases, we recommend consulting with the Flowserve Materials Engineering Department.

The corrosion chart in this bulletin is intended to be a guide to the selection of the proper corrosion resistant material for a given application. The ratings are not a blanket recommendation or warranty, expressed or implied, for any of the materials for any media. These ratings are the compilation of extensive laboratory and field tests, operating experience and best judgement.

Corrosion Resistance

	Ductile Iron/ Carbon Steel	Type 400 Series	17-4PH	CF-8M	CD-4MCuN (Durconet 100)	CN-7M (Durimet 20)	Inconel CY-40	Monel M-35-1	Nickel C2-100	N-7M (Chlorimet 2)	CW-6M (Chlorimet 3)	Duriron	Durichlor 51/ Superchlor 77	Stellite 6	Durco DC-8 (10 mpy or less)	Titanium	Titanium-Pd	Zirconium 702 Zirconium 705
Acetaldehyde CH ₃ CHO	10 ^C	10 ^B	—	All ^D	All ^D	All ^D	—	10 ^D	10 ^E	All ^D	All ^D	All ^D	All ^D	10 ^A	—	All ^D	All ^D	All ^D
Acetic Acid CH ₃ COOH	NR	NR	0-6*	All ^C	All ^D	All ^D	All ^A	—	—	All ^D	All ^E	All ^D	All ^D	1-9*	All ^D	All ^E	All ^E	All ^E
Acetic Anhydride (CH ₃ CO) ₂ O	NR	NR	All ^A	All ^E	All ^E	All ^E	All ^D	9-10 ^E	All ^E	All ^E	All ^D	All ^D	All ^D	—	All ^D	All ^D	All ^D	All ^D
Acetone CH ₃ COCH ₃	All ^E	All ^E	All ^E	All ^E	All ^E	All ^E	All ^E	All ^E	All ^E	All ^E	All ^E	All ^E	All ^E	All ^E	All [*]	All ^E	All ^E	All ^E
Aluminum Chloride AlCl ₃	NR	NR	NR	NR	NR	1 ^A	NR	0-5 ^A	10 ^D	All ^D	All ^D	0-7 ^D	All ^D	NR	All ^D	NR	0-4 ^D	All ^D
Aluminum Nitrate Al(NO ₃) ₃	NR	1 ^D 10 ^D	10 ^B	All ^D	1 ^D 10 [*]	All ^D	1 ^A	1 ^A	1 ^A	1 ^A	1 ^A	All ^D	All ^D	—	All ^D	1 ^D	All ^D	1 ^D
Aluminum Sulfate Al ₂ (SO ₄) ₃	NR	NR	NR	0-5 ^D	All ^D	All ^E	0-2 ^A	0-5 ^A	0-3 ^A	All ^E	All ^E	All ^D	All ^D	—	All ^D	All ^D	All ^D	All ^A
Ammonia-Anhydrous NH ₃	10 ^D	10 ^E	10 ^E	10 ^E	10 ^E	10 ^E	10 ^E	NR	10 ^E	10 ^E	10 ^E	10 ^A	10 ^A	—	—	10 ^E	10 ^E	10 ^E
Ammonium Bifluoride NH ₄ HF ₂	NR	NR	NR	1 ^B	All ^C	All ^D	1 ^A 10 ^A	1 ^D	1 ^A 10 ^A	1 ^D	5-10 ^E	NR	NR	—	—	NR	NR	NR
Ammonium Carbonate (NH ₄)HCO ₃ • (NH ₄)CO ₂ NH ₂	All ^C	All ^D	10 ^B	All ^D	0-7 ^D	All ^D	1 ^D	1 ^D	10 ^A	All ^D	All ^D	All ^D	All ^D	—	All ^D	5*	5*	—
Ammonium Chloride NH ₄ Cl	10 ^A	NR	NR	NR	NR	NR	0-4 ^B	1 ^D	1 ^D	0-3 ^D	0-4 ^D	0-4 ^D	All ^D	NR	All ^D	All ^D	All ^D	All ^D

0 = 0% weight percent
1 = 10% weight percent
2 = 20% weight percent
3 = 30% weight percent

4 = 40% weight percent
5 = 50% weight percent
6 = 60% weight percent
7 = 70% weight percent

8 = 80% weight percent
9 = 90% weight percent
10 = 100% weight percent
All = All Concentrations

NR = Not Recommended
A = 68°F max. (20°C)
B = 122°F max (50°C)
C = 167°F max (75°C)

D = 212°F max. (100°C)
E = 257°F max. (125°C)
* = To boiling
+ = Continuous service

Examples: 0-4^B From 0 to 40% (weight percent) the material listed is acceptable to 122°F (50°C).
8^C At 80% the material listed is acceptable to 167°F (75°C).
All^D All concentrations to 212°F (100°C) are acceptable.
1^D 10^D Material is acceptable at 10% to 212°F (100°C) and 100% to 212°F (100°C).

Corrosion Resistance

continued

	Ductile Iron/ Carbon Steel	Type 400 Series	17-4PH	CF-8M	CD-4MCuN (Durconet 100)	CN-7M (Durimet 20)	Inconel CY-40	Monel M-35-1	Nickel C2-100	N-7M (Chlorimet 2)	CW-6M (Chlorimet 3)	Duriron	Durichlor 51/ Superchlor 77	Stellite 6	Durco DC-8 (10 mpy or less)	Titanium	Titanium-Pd	Zirconium 702 Zirconium 705
Ammonium Fluoride NH ₄ F	NR	1 ^A	—	1 ^A 10 ^A	1 ^A	1 ^A	0-2 ^A	0-2 ^C	1 ^D 10 ^A	0-2 ^D	0-5 ^D	NR	NR	—	All ^D	NR	NR	NR
Ammonium Hydroxide NH ₄ OH	0-3 ^D	0-3 ^D	1*	All ^D	All ^D	All ^D	All ^A	NR	NR	All ^D	All ^D	0-3 ^D	0-3 ^D	—	All ^D	0-4 ^D	0-4 ^D	All ^D
Ammonium Nitrate NH ₄ NO ₃	0-5 ^D	All ^B	10 ^B	All ^D	All ^D	All ^D	10 ^A	NR	1 ^A	NR	All ^D	All ^D	All ^D	NR	All ^D	All*	All ^D	All ^D
Ammonium Phosphate (NH ₄) ₂ HPO ₄ or NH ₄ H ₂ PO ₄	10 ^A	1 ^A	—	0-4 ^D	0-4 ^D	0-4 ^D	1 ^D	0-3 ^D	1 ^D	10 ^A	0-4 ^D	All ^D	All ^D	—	All ^D	1 ^D	1 ^D	1 ^D
Ammonium Sulfate (NH ₄) ₂ SO ₄	0-3 ^A	NR	0-4 ^A	0-5 ^D	0-5 ^D	0-5 ^D	0-5 ^D	0-4 ^D	0-9 ^D	0-5 ^D	All ^D	All ^D	All ^D	NR	All ^D	All ^D	All ^D	All ^D
Ammonium Sulfide (NH ₄) ₂ S	1 ^D 10 ^A	1 ^D	—	1 ^D 10 ^D	1 ^D 10 ^D	1 ^D 10 ^D	0-2 ^D	1 ^D	1 ^D	1 ^D	1 ^D 10 ^D	—	—	—	—	—	—	—
Ammonium Sulfite (NH ₄) ₂ SO ₃	NR	NR	—	0-5 ^E	0-5 ^E	0-5 ^E	NR	NR	NR	0-3 ^D	0-6 ^D	0-5 ^D	0-5 ^D	—	—	6 ^D	6 ^D	—
Amyl Acetate CH ₃ COOC ₅ H ₁₁	1 ^A 10 ^E	10 ^E	10 ^B	All ^E	All ^E	All ^E	All ^B	All ^D	All ^E	All ^E	All ^E	All ^D	All ^D	10 ^B	10 ^C	All ^B	8-10 ^B	All ^D
Amyl Alcohol C ₅ H ₁₁ OH	10 ^D	10 ^D	10 ^B	All ^B	All ^B	All ^B	10 ^D	10 ^D	10 ^D	10 ^D	10 ^D	All ^D	All ^D	—	All ^B	10 ^D	10 ^D	10 ^D
Amyl Chloride CH ₃ (CH ₂) ₃ CH ₂ Cl	10 ^A	NR	10 ^A	NR	10 ^C	10 ^C	10 ^D	9-10 ^D	8-10 ^D	All ^A	All ^A	1 ^D 10 ^D	All ^D	10 ^B	10 ^D	10 ^D	10 ^D	10 ^D
Aniline Hydrochloride C ₆ H ₅ NH ₂ • HCl	NR	NR	NR	NR	NR	NR	NR	NR	NR	0-2 ^D	NR	All ^D	All ^D	NR	—	0-2 ^D	0-2 ^D	0-2 ^D
Barium Chloride BaCl ₂	10 ^A	—	—	—	—	—	0-6 ^D	0-6 ^D	All ^D	0-6 ^D	All ^D	0-6 ^D	All ^D	NR	All ^D	All ^D	All ^D	All ^D
Barium Nitrate Ba(NO ₃) ₂	1 ^A 10 ^A	0-3 ^D	—	NR	0-3 ^D	All ^D	1 ^D	NR	0-3 ^D	1 ^D 10 ^E	All ^D	All ^D	All ^D	—	All ^D	All ^B	All ^B	All ^A
Barium Sulfate BaSO ₄	10 ^D	10 ^D	10 ^B	1 ^D 10 ^D	1 ^D 10 ^D	1 ^D 10 ^D	10 ^D	All ^D	10 ^D	10 ^D	All ^D	All ^D	All ^D	—	All ^D	All ^D	All ^D	All ^D
Benzaldehyde C ₆ H ₅ CHO	10 ^D	10 ^D	10 ^D	10 ^E	10 ^E	10 ^E	10 ^E	10 ^E	10 ^E	10 ^D	10 ^D	All ^D	All ^D	NR	All ^D	10 ^A	10 ^A	10 ^D
Benzene C ₆ H ₆	10 ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	0-7 ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^C	All ^D	All ^D	All ^D
Benzoic Acid C ₆ H ₅ COOH	NR	All ^D	All ^D	All ^D	All ^D	All ^D	0-4 ^C	All ^D	All ^D	0-7 ^D	All ^D	All ^D	All ^D	—	All ^D	All ^D	All ^D	All ^E
Black Liquor	NR	—	—	All ^C	All ^D	All ^D	—	—	NR	—	—	—	—	—	All ^D	—	—	All ^D
Boric Acid H ₃ BO ₃	NR	1 ^D 10 ^B	10 ^B	0-4 ^D	0-5 ^E	0-5 ^E	0-2 ^D	0-2 ^D	0-2 ^D	All ^E	All ^E	All ^D	All ^D	—	All ^D	All ^D	All ^D	All ^D
Brine, Neutral Typically NaCl	All ^B	—	—	All ^D	All ^D	All ^E	All ^D	All ^D	All ^D	All ^E	All ^E	All ^D	All ^D	NR	All ^D	All ^C	All ^C	All ^D
Bromine, dry Br	NR	NR	NR	NR	10 ^A	10 ^A	10 ^D	10 ^B	10 ^D	10 ^E	10 ^E	NR	NR	NR	—	NR	NR	NR
Bromine, wet Br	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	10 ^D	NR	NR	NR	—	All ^A	All ^A	NR
Butane CH ₃ CH ₂ CH ₂ CH ₃	All ^D	10 ^D	10 ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	10 ^A	—	All ^D	All ^D	All ^D
Butyric Acid CH ₃ CH ₂ CH ₂ COOH	NR	NR	10 ^B	All ^D	All ^D	All ^D	NR	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	—	—	All ^C	All ^C	All ^D
Calcium Bisulfite Ca (HSO ₃) ₂	NR	NR	—	All ^E	All ^E	All ^E	NR	NR	NR	10 ^A	All ^E	NR	NR	—	All ^D	10 ^D	10 ^D	All ^D

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Corrosion Resistance

continued

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Sodium Peroxide Na ₂ O ₂	All ^A	1 ^A	1 ^A	All ^D	1 ^D	All ^D	1 ^D	1 ^D	1 ^D	1 ^D	1 ^D	1 ^D	—	—	All ^D	—	All ^D	
Sodium Phosphate Na ₂ HPO ₄ (dibasic) NaH ₂ PO ₄ (mono)	0-6 ^B	NR	—	0-6 ^D	0-6 ^D	0-6 ^D	0-6 ^D	0-6 ^D	0-6 ^D	0-6 ^D	All ^D	All ^D	—	All ^D	0-6 ^D	0-6 ^D	All ^D	
Sodium Silicate 2Na ₂ O • SiO ₂	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^E	1 ^D	All ^D	All ^D	All ^D	—	—	All ^D	All ^D	All ^D	
Sodium Sulfate Na ₂ SO ₄	All ^B	—	0-2 ^C	All ^D	All ^D	All ^D	0-3 ^D	0-3 ^D	All ^D	All ^D	All ^D	All ^D	1 ^A	All ^D	All ^D	All ^D	All ^D	
Sodium Sulfide Na ₂ S	NR	NR	NR	0-4 ^D	0-5 ^D	0-5 ^D	All ^D	0-5 ^E	All ^D	2 ^A	0-5 ^D	0-4 ^C	0-4 ^C	—	—	0-5 ^D	0-5 ^D	NR
Sodium Sulfite Na ₂ SO ₃	NR	1 ^D	—	0-5 ^D	All ^D	All ^D	0-3 ^D	0-2 ^D	0-3 ^D	NR	All ^D	NR	NR	—	All ^D	All ^D	All ^D	All ^D
Stannic Chloride SnCl ₄	NR	NR	NR	NR	NR	NR	10 ^D	10 ^A	10 ^D	NR	NR	0-2 ^B	All ^D	NR	All ^D	0-3 ^D	0-3 ^D	0-3 ^D
Stannous Chloride SnCl ₂	NR	NR	—	NR	NR	1 ^D	10 ^E	10 ^E	10 ^E	NR	All ^C	All ^D	All ^D	NR	—	10 ^A	10 ^A	All ^D
Stearic Acid CH ₃ (CH ₂) ₁₆ COOH	NR	10 ^D	10 ^B	10 ^E	All ^D	All ^D	10 ^E	10 ^E	10 ^E	All ^D	All ^D	All ^D	All ^D	—	All ^D	All ^D	All ^D	All ^D
Styrene C ₆ H ₅ CH:CH ₂	All ^B	All ^A	All ^A	All ^B	All ^D	All ^C	All ^A	All ^A	All ^A	All ^A	All ^A	All ^D	All ^D	—	—	All ^D	All ^D	All ^D
Sulfur S	10 ^E	10 ^E	—	10 ^E	10 ^D	10 ^D	10 ^E	10 ^E	10 ^E	10 ^E	9-10 ^E	10 ^E	10 ^E	—	10 ^E	10 ^E	10 ^E	All ^E
Sulfur Chloride S ₂ Cl ₂	10 ^D	10 ^A	NR	NR	10 ^E	10 ^E	10 ^E	NR	10 ^E	All ^D	9-10 ^E	NR	All ^D	NR	—	NR	NR	All ^D
Sulfuric Acid <70% H ₂ SO ₄	NR	NR	NR	NR	1 ^D	0-7 ^C	NR	0-6 ^D	0-2 ^A	0-7 [*]	0-7 ^C	0-7 ^C	0-7 ^D	0-7 ^A	0-7 ^C	NR	1 ^C	0-7 ^D
Sulfuric Acid >70% H ₂ SO ₄	NR	NR	NR	10 ^A	8-10 ^B	7-10 ^C	NR	NR	NR	7-10 [*]	7-10 ^C	7-10 ^E	7-10 ^E	7-10 ^A	7-9 ^C	NR	NR	NR
Sulfurous Acid H ₂ SO ₃	NR	NR	0-2 ^A	0-2 ^A	0-2 ^A	0-2 ^D	10 ^A	NR	NR	NR	All ^D	NR	NR	NR	—	All ^B	All ^B	All ^D
Tartaric Acid HOOC(CHOH) ₂ COOH	NR	0-5 ^D	—	0-5 ^D	All ^D	All ^D	All ^C	All ^D	0-6 ^B	All ^D	All ^D	All ^D	All ^D	All ^D	—	All ^D	All ^D	All ^D
Thionyl Chloride SOCl ₂	NR	NR	NR	10 ^A	10 ^B	10 ^B	NR	NR	NR	9-10 ^C	1 ^C	10 ^D	10 ^D	—	—	NR	NR	—
Titanium Tetrachloride TiCl ₄	10 ^A	10 ^A	10 ^A	10 ^A	10 ^A	10 ^A	10 ^E	10 ^A	—	NR	10 ^A	10 ^A	10 ^A	—	—	10 ^E	10 ^E	10 ^A
Toluene C ₆ H ₅ CH ₃	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^C	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D
Tributyl Phosphate (C ₄ H ₉) ₃ PO ₄	10 ^A	—	—	10 ^A	10 ^A	1 ^C 10 ^A	—	10 ^E	10 ^A	—	10 ^E	10 ^D	10 ^D	—	—	—	—	—
Trichloroethylene CHCl: CCl ₂	9-10 ^D	5 ^D	—	9-10 ^D	All ^D	All ^D	9-10 ^D	9-10 ^D	9-10 ^D	9-10 ^D	9-10 ^D	All ^D	All ^D	10 ^A	—	All ^D	All ^D	5-10 ^D
Triethanolamine (HOCH ₂ CH ₂) ₃ N	All ^D	All ^D	All ^E	All ^E	All ^E	All ^E	10 ^B	10 ^A	10 ^A	All ^A	All ^A	All ^E	All ^E	All ^A	All ^D	10 ^B	10 ^B	All ^E
Vegetable Oil	10 ^E	10 ^E	10 ^E	9-10 ^E	9-10 ^E	9-10 ^E	10 ^E	10 ^E	9-10 ^E	10 ^E	10 ^E	10 ^E	10 ^E	—	—	10 ^D	—	10 ^D
Vinyl Acetate CH ₃ COOCH : CH ₂	10 ^B	—	—	10 ^B	10 ^B	1 ^C 10 ^B	10 ^B	10 ^E	10 ^B	—	8 ^E 10 ^B	10 ^D	10 ^D	—	—	—	—	—
Xylene C ₆ H ₄ (CH ₃) ₂	All ^D	All ^D	All ^D	All ^E	All ^E	All ^E	All ^D	All ^D	All ^E	All ^E	All ^D	All ^D	All ^D	All ^A	All ^D	All ^D	All ^D	All ^D
Zinc Chloride ZnCl ₂	NR	NR	NR	NR	0-8 ^B	0-8 ^B	All ^B	0-7 ^C	0-5 ^B	All ^D	All ^D	0-4 ^C	All ^D	NR	All ^D	All ^D	0-7 ^E	All ^D
Zinc Sulfate ZnSO ₄	NR	0-5 ^A	0-5 ^A	All ^C	All ^D	All ^B	All ^C	All ^D	All ^B	All ^D	All ^D	All ^D	All ^D	—	All ^D	All ^D	0-4 ^D	All ^D

Corrosion Resistance

continued

	Ductile Iron/ Carbon Steel	Type 400 Series	17-4PH	CF-8M	CD-4MCuN (Durimet 100)	CN-7M (Durimet 20)	Inconel CY-40	Monel M-35-1	Nickel C2-100	N-7M (Chlorimet 2)	CW-5M (Chlorimet 3)	Duriron	Durichlor 51/ Superchlor 77	Stellite 6	Durco DC-8 (10 mpy or less)	Titanium	Titanium-Pd	Zirconium 702 Zirconium 705
Potassium Bisulfate KHSO ₄	NR	NR	NR	1 ^D	All ^D	All ^D	NR	All ^D	All ^A	All ^D	All ^D	All ^D	—	All ^D	1 ^A 10 ^A	1 ^A 10 ^A	All ^D	
Potassium Chloride KCl	NR	0-3 ^A	0-3 ^A	NR	0-3 ^D	0-3 ^C	0-3 ^D	0-3 ^D	0-3 ^D	All ^D	0-3 ^D	All ^D	NR	All ^D	All ^D	All ^D	All ^D	
Potassium Hydroxide KOH	0-5 ^B	0-5 ^D	0-3 ^B	0-5 ^D	All ^E	0-8 ^E	All ^D	0-6 ^D	All ^E	All ^D	All ^D	0-3 ^B	0-3 ^B	—	All ^D	0-3 ^C	0-3 ^C	All ^D
Potassium Nitrate KNO ₃	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	NR	All ^D	All ^D	All ^D	8 ^A	All ^D	All ^D	All ^D	All ^D
Potassium Sulfate K ₂ SO ₄	0-2 ^C	1 ^A	1 ^A	0-2 ^D	All ^D	All ^D	0-2 ^D	0-2 ^D	0-2 ^D	All ^D	All ^D	All ^D	All ^D	1 ^A	All ^D	All ^D	All ^D	All ^D
Propane C ₃ H ₈	All ^D	All ^D	All ^B	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^A	All ^D	All ^D	All ^D	All ^D
Sea Water	NR	NR	NR	10 ^A +	10 ^B +	10 ^A +	10 ^A	10 ^B	10 ^A	10 ^C	10 ^E	10 ^C	10 ^C	10 ^A	All ^D	10 ^D	All ^D	10 ^D
Silver Nitrate AgNO ₃	NR	1-9 ^D	—	0-7 ^D	0-7 ^D	0-6 ^D	10 ^A	NR	NR	0-6 ^D	0-6 ^A	0-9 ^D	0-9 ^D	—	—	0-2 ^B	0-2 ^B	1 ^A
Sodium Acetate NaC ₂ H ₃ O ₂	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	—	—	All ^D	All ^D	All ^D
Sodium Aluminate Na ₂ Al ₂ O ₃ or NaAlO ₂	0-4 ^D	—	—	0-4 ^D	0-4 ^D	0-4 ^D	0-5 ^D	0-5 ^D	0-5 ^D	1 ^A	1 ^A	NR	NR	—	—	0-3 [*]	0-3 [*]	—
Sodium Bicarbonate NaHCO ₃	0-2 ^D	0-2 ^D	0-2 ^B	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	0-2 ^D	All ^D	All ^D	All ^D	—	All ^C	All ^D	All ^D	All ^D
Sodium Bichromate Na ₂ Cr ₂ O ₇	All ^D	All ^D	All ^B	All ^D	All ^D	All ^C	—	—	—	All ^C	All ^D	All ^D	All ^D	—	All ^D	All ^C	All ^C	All ^C
Sodium Bisulfate NaHSO ₄	NR	10 ^C	NR	0-5 ^A	All ^D	All ^D	1 ^D	0-4 ^D	0-5 ^D	All ^D	All ^D	All ^D	All ^D	—	All ^D	0-3 ^A	0-3 ^A	All ^D
Sodium Bisulfite NaHSO ₃	NR	NR	NR	0-4 ^A	All ^D	All ^D	0-4 ^A	0-2 ^B	0-4 ^D	0-4 ^D	All ^D	NR	NR	—	All ^D	All ^D	All ^D	All ^D
Sodium Bromide NaBr	NR	NR	NR	—	0-5 ^D	0-5 ^D	0-6 ^D	0-5 ^D	0-6 ^D	0-6 ^D	0-6 ^D	NR	NR	—	—	10 ^A	10 ^A	10 ^A
Sodium Carbonate Na ₂ CO ₃	0-4 ^D	0-3 ^D	0-4 ^B	0-4 ^D	0-4 ^D	0-4 ^D	0-4 ^D	0-4 ^D	0-4 ^D	0-4 ^D	0-4 ^D	0-4 ^C	0-4 ^C	—	—	0-4 ^D	0-4 ^D	10 ^D
Sodium Chlorate NaClO ₃	NR	—	0-7 ^D	0-7 ^D	0-7 ^D	0-7 ^D	0-6 ^D	0-6 ^D	0-6 ^D	0-7 ^D	0-7 ^D	0-7 ^D	All ^D	—	All ^D	0-4 ^A	0-4 ^A	All ^D
Sodium Chloride NaCl	0-3 ^B	NR	0-3 ^D	0-3 ^D	0-3 ^D	0-3 ^D	0-3 ^D	All ^D	0-3 ^D	0-3 ^D	All ^D	0-4 ^D	All ^D	NR	All ^D	All ^D	All ^D	All ^D
Sodium Chlorite NaClO ₂	NR	NR	NR	0-4 ^A	0-4 ^B	1 ^D	NR	NR	NR	NR	1 ^A	0-5 ^A	0-5 ^B	—	—	0-3 ^D	0-3 ^D	—
Sodium Citrate C ₆ H ₅ O ₇ Na ₃	10 ^A	10 ^A	—	0-4 ^D	0-4 ^D	0-4 ^D	—	10 ^A	10 ^A	0-5 ^A	0-5 ^A	10 ^D	10 ^D	—	—	6 ^B 10 ^A	5 ^B 10 ^A	—
Sodium Cyanide NaCN	All ^D	0-2 ^D	All ^A	All ^B	All ^D	All ^D	All ^A	NR	1 ^A	10 ^B	10 ^B	—	—	—	—	All ^D	All ^D	All ^D
Sodium Fluoride NaF	NR	NR	NR	1 ^E	1 ^D	1 ^D 10 ^C	10 ^A	1 ^D 10 ^C	1 ^D	1 ^A 10 ^D	1 ^A 10 ^D	NR	NR	—	—	1 ^A 10 ^A	1 ^A 10 ^A	0-2 ^B
Sodium Hydroxide NaOH	0-5 ^B	0-3 ^D	0-7 ^B	0-5 ^D	All ^E	0-7 ^E	All ^D	All [*]	All ^E	All ^D	All ^D	0-5 ^C	0-5 ^C	1 ^A	All ^E	0-7 ^D	0-7 ^D	All ^D
Sodium Hypochlorite NaOCl	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0-2 ^B	1 ^B	All ^C	NR	0-2 ^A	All ^C	All ^D	1 ^D
Sodium Nitrate NaNO ₃	All ^B	10 ^A	0-9 ^D	0-9 ^E	All ^D	All ^D	All ^D	All ^D	All ^D	NR	All ^D	All ^D	All ^D	All ^B	All ^D	All ^D	All ^D	All ^D
Sodium Nitrite NaNO ₂	0-6 ^D	0-6 ^D	0-6 ^D	0-6 ^D	0-6 ^D	0-6 ^D	0-6 ^D	0-6 ^D	0-6 ^D	0-6 ^D	0-6 ^D	0-6 ^D	0-6 ^D	—	—	10 ^D	10 ^D	0-6 ^D
Sodium Perchlorate NaClO ₄	10 ^A	—	—	0-9 ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	—	All ^D	All ^D	All ^D	—

Corrosion Resistance

continued

	Ductile Iron/ Carbon Steel	Type 400 Series	17-4PH	CF-8M	CD-4MCuN (Durimet 100)	CN-7M (Durimet 20)	Inconel C7140	Monel M-35-1	Nickel C2-100	N-7M (Chlorimet 2)	CW-5M (Chlorimet 3)	Duriron	Durichlor 51/ Superchlor 77	Stellite 6	Durco DC-8 (10 mpy or less)	Titanium	Titanium-Pd	Zirconium 702 Zirconium 705
Calcium Carbonate CaCO ₃	All ^A	1 ^D 10 ^A	10 ^B	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	—	—	All ^D	All ^D	All ^D
Calcium Chlorate Ca(ClO ₃) ₂	All ^A	0-3 ^D	—	0-3 ^D	0-3 ^D	0-3 ^D	0-3 ^D	0-3 ^D	0-3 ^D	0-3 ^D	0-7 ^D	NR	—	—	All ^D	10 ^B	10 ^B	—
Calcium Chloride CaCl ₂	NR	NR	NR	NR	All ^B	All ^B	0-6 ^D	0-6 ^D	0-5 ^E	All ^E	All ^E	All ^D	All ^D	—	All ^D	All ^D	All ^D	All ^C
Calcium Hydroxide Ca(OH) ₂	All ^B	1 ^D	—	All ^D	All ^D	All ^D	All ^E	All ^D	All ^D	All ^D	All ^D	All ^B	All ^B	—	—	All [*]	—	0-2 ^D
Calcium Hypochlorite Ca(OCl) ₂	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0-2 ^B	0-7 ^D	All ^D	NR	All ^D	All ^D	All ^D	0-2 ^D
Calcium Nitrate Ca(NO ₃) ₂	0-3 ^B	NR	—	0-4 ^D	0-4 ^D	0-4 ^D	0-4 ^D	0-4 ^D	0-5 ^D	0-4 ^D	0-4 ^D	1 ^D	All ^D	—	—	1 ^D	1 ^D	—
Calcium Phosphate Ca ₃ (PO ₄) ₂ , CaH ₄ (PO ₄) ₂	10 ^D	—	—	1 ^D	1 ^D	1 ^D	1 ^D	1 ^D	1 ^D	1 ^D	All ^D	All ^D	All ^D	—	All ^D	1 ^D	1 ^D	1 ^D
Calcium Sulfate CaSO ₄	1 ^D	1 ^D 10 ^D	10 ^B	1 ^D 10 ^D	1 ^D 10 ^D	1 ^D 10 ^D	1 ^D 10 ^D	1 ^D 10 ^A	1 ^D 10 ^D	1 ^E	1 ^E	1 ^D 10 ^A	All ^D	—	—	1 ^D 10 ^D	1 ^D 10 ^D	1 ^D 10 ^D
Calcium Sulfite CaSO ₃	1 ^D	1 ^D	—	1 ^D	1 ^D	1 ^D	—	10 ^D	NR	1 ^D	1 ^D	1 ^D	1 ^D	—	—	1 ^D	1 ^D	—
Carbon Disulfide CS ₂	NR	10 ^D	10 ^D	9 ^A 10 ^D	9 ^A 10 ^D	9 ^A 10 ^D	All ^B	10 ^D	10 ^D	10 ^C	All ^D	9 ^A 10 ^D	9 ^A 10 ^D	—	—	10 ^D	10 ^D	All ^D
Carbon Tetrachloride, dry CCl ₄	10 ^B	NR	10 ^B	10 ^B	10 ^D	10 ^D	10 ^D	All ^D	10 [*]	All ^B	All ^C	10 ^D	All ^D	—	All ^D	All ^D	All ^D	All ^C
Carbon Tetrachloride, wet CCl ₄	NR	NR	NR	NR	NR	NR	10 ^A	All ^B	9-10 [*]	All ^A	All ^B	All ^B	All ^D	NR	All ^D	All ^D	All ^D	All ^C
Chlorinated Water	—	NR	NR	NR	—	—	NR	NR	NR	NR	All ^A	10 ^A	All ^D	NR	—	10 ^D	All ^A	10 ^C
Chlorine, dry (<50 ppm H ₂ O) Cl ₂	10 ^A	NR	NR	10 ^A	10 ^E	10 ^D	10 ^E	10 ^E	10 ^A	10 ^E	10 ^E	10 ^B	10 ^C	—	—	NR	NR	10 ^D
Chlorine, wet (>50 ppm H ₂ O) Cl ₂	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	9-10 ^B	All ^B	All ^D	NR	—	—	—	NR
Chlorine Dioxide ClO ₂	NR	—	—	NR	NR	NR	NR	NR	NR	NR	10 ^B	All ^A	All ^D	NR	All ^C	All ^D	All ^D	NR
Chloroacetic Acid CH ₂ ClCOOH	NR	NR	—	NR	NR	NR	NR	0-9 ^C	1 ^D 10 ^E	All ^D	All ^D	All ^D	All ^D	NR	All ^B	All ^D	All ^D	All ^D
Chlorobenzene C ₆ H ₅ Cl	10 ^D	10 ^D	10 ^A	10 ^D	10 ^D	10 ^D	10 ^D	9-10 ^C	10 ^E	All ^E	All ^D	9-10 ^C	All ^D	NR	All ^D	10 ^D	10 ^D	10 ^D
Chloroform CHCl ₃	10 ^D	10 ^D	10 ^A	10 ^D	7-10 ^B	7-10 ^B	9-10 ^D	8-10 ^C	8-10 ^D	9-10 ^D	9-10 ^D	10 ^D	All ^D	10 ^A	—	8-10 ^C	8-10 ^C	10 ^D
Chlorosulfonic Acid ClSO ₂ OH	10 ^D	NR	NR	10 ^A	10 ^A	10 ^A	NR	NR	NR	9-10 ^E	All ^A	10 ^C	All ^D	—	1 ^D	10 ^D	10 ^D	NR
Chromic Acid CrO ₃	NR	NR	NR	NR	0-2 ^B	0-2 ^B	NR	NR	NR	NR	All ^C	All ^D	All ^D	0-2 ^B	1 ^A	All ^D	All [*]	0-5 ^D
Copper Nitrate Cu(NO ₃) ₂	NR	0-9 ^D	—	All ^D	All ^D	All ^D	NR	NR	NR	NR	All ^A	All ^D	All ^D	—	All ^D	All ^B	All ^D	All ^B
Copper Sulfate CuSO ₄	NR	0-2 ^A	10 ^B	All ^B	All ^D	All ^D	0-3 ^D	0-3 ^A	0-3 ^A	10 ^D	All ^D	All ^D	All ^D	—	All ^D	All ^D	All ^D	All ^D
Cupric Chloride CuCl ₂	NR	NR	—	NR	NR	NR	NR	NR	NR	NR	All ^B	NR	All ^D	0-2 ^A	All ^B	0-5 [*]	0-5 [*]	NR
Cuprous Chloride CuCl or Cu ₂ Cl ₂	NR	NR	NR	NR	0-5 ^D	0-5 ^D	NR	NR	NR	NR	All ^B	All ^D	All ^D	NR	All ^D	0-5 ^D	0-5 ^D	NR
Cyclohexane C ₆ H ₁₂	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^A	All ^D	All ^D	All ^D	All ^D
Diethanolamine (HOCH ₂ CH ₂) ₂ NH	10 ^E	10 ^D	—	10 ^E	10 ^E	10 ^E	10 ^B	10 ^B	NR	10 ^B	10 ^B	10 ^E	All ^D	—	—	10 ^D	10 ^D	—

Corrosion Resistance

continued

Corrosion Resistance <i>continued</i>	Ductile Iron/ Carbon Steel	Type 400 Series	17-4PH	CF-8M	CD-4MCuN (Duramet 100)	CN-7M (Durimet 20)	Inconel C740	Monel M-35-1	Nickel C2-100	N-7M (Chlorimet 2)	CW-5M (Chlorimet 3)	Duriron	Durichlor 51/ Superchlor 77	Stellite 6	Durco DC-8 (10 mpy or less)	Titanium	Titanium-Pd	Zirconium 702 Zirconium 705
Diethyl Ether C ₂ H ₅) ₂ O	10 ^D	10 ^D	—	9-10 ^D	9-10 ^D	9-10 ^D	10 ^D	10 ^D	10 ^D	10 ^D	10 ^D	10 ^D	—	—	10 ^D	10 ^D	10 ^D	
Dimethyl Amine (CH ₃) ₂ NH	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	—	All ^D	All ^D	All ^D	All ^D	—	—	All ^D	All ^D	All ^D	
Ethyl Acetate CH ₃ COOC ₂ H ₅	10 ^D	10 ^A	10 ^A	All ^E	All ^E	All ^E	8-10 ^C	8-10 ^B	10 ^E	All ^E	All ^E	All ^D	All ^D	10 ^A	All ^D	All ^D	All ^D	
Ethyl Alcohol C ₂ H ₅ OH	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^A	All ^C	All ^D	All ^D	All ^D	
Ethyl Benzene C ₆ H ₅ C ₂ H ₅	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^A	All ^D	All ^D	All ^D	All ^D	
Ethyl Chloride C ₂ H ₅ Cl	10 ^E	10 ^E	10 ^D	10 ^D	10 ^E	10 ^E	10 ^E	10 ^E	All ^A	All ^A	10 ^D	All ^D	NR	All ^D	10 ^E	10 ^D	10 ^E	
Ethylene H ₂ C : CH ₂	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	
Ethylene Dichloride ClCH ₂ CH ₂ Cl	10 ^D	10 ^A	10 ^A	10 ^D	10 ^D	10 ^D	10 ^D	9-10 ^D	All ^D	9-10 ^D	9-10 ^D	9-10 ^D	All ^D	10 ^A	All [*]	10 [*]	10 [*]	All ^D
Ethylene Glycol CH ₂ OHCH ₂ OH	All ^C	10 ^D	10 ^B	All ^D	All ^D	All ^D	10 ^D	8-10 ^D	10 ^D	All ^D	All ^D	All ^D	All ^D	10 ^A	All ^D	All ^D	All ^D	All ^D
Ferric Chloride FeCl ₃	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0-3 ^B	NR	All ^D	1 ^A 10 ^C	All ^D	All ^D	All ^D	NR
Ferric Nitrate Fe(NO ₃) ₃	NR	0-6 ^A	0-5 ^A	0-5 ^D	All ^D	All ^D	NR	NR	NR	NR	All ^B	All ^D	All ^D	1-5 ^A	All ^D	All ^D	All ^D	—
Ferric Sulfate Fe ₂ (SO ₄) ₃	NR	0-2 ^A	10 ^A	All ^B	All ^D	All ^B	NR	NR	NR	All ^C	All ^B	All ^D	All ^D	—	All ^D	All ^D	All ^D	All ^D
Ferrous Chloride FeCl ₂	NR	NR	NR	NR	NR	NR	NR	NR	NR	0-5 ^D	0-5 ^D	0-5 ^D	All ^D	NR	All ^D	All ^D	0-5 ^D	All ^D
Ferrous Sulfate FeSO ₄	NR	0-4 ^A	10 ^A	All ^D	All ^D	All ^D	0-2 ^D	10 ^C	10 ^A	All ^D	All ^D	All ^D	All ^D	—	—	All ^D	All ^D	All ^D
Fluosilicic Acid H ₂ SiF ₆	NR	NR	—	NR	—	0-2 ^B	NR	0-3 ^A	NR	All ^A	All ^E	NR	NR	—	All ^C	NR	NR	NR
Formaldehyde HCHO	NR	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^B	All ^D	All ^D	All ^D	All ^D	—	All ^D	All ^D	All ^D	All ^D
Formic Acid HCOOH	NR	NR	1 ^C	All ^D	All ^D	All ^D	All ^A	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	0-9 [*]	All ^D	All ^B	0-5 [*]	All ^D
Furfural C ₄ H ₃ OCHO	1 ^D 10 ^C	NR	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D
Furfuryl Alcohol C ₄ H ₃ OCH ₂ OH	All ^D	10 ^D	10 ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	10 ^D	10 ^D	All ^D	10 ^D	All ^D
Gasoline	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^A	All ^D	All ^D	All ^D	All ^D
Glycerol C ₃ H ₅ (OH) ₃	10 ^B	All ^D	All ^B	All ^D	All ^D	All ^D	All ^D	All ^D	All ^E	All ^D	All ^D	All ^D	All ^D	All ^A	All ^D	All ^D	All ^D	All ^D
Heptane CH ₃ (CH ₂) ₅ CH ₃	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^A	All ^D	All ^D	All ^D	All ^D
Hydrobromic Acid HBr	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	10 ^B	0-4 ^A	0-4 ^B	NR	—	0-4 ^B	0-4 ^C	NR
Hydrochloric Acid HCl - aerated	NR	NR	NR	NR	NR	NR	NR	NR	NR	0-4 ^B	0-4 ^B	0-4 ^A	0-4 ^B	NR	1 ^C	1 ^A	1 ^C	0-4 ^C
Hydrochloric Acid HCl - non-aerated	NR	NR	NR	NR	NR	NR	1 ^A	0-3 ^A	0-2 ^A	0-4 ^D	0-4 ^B	0-4 ^B	0-4 ^B	NR	1 ^C	1 ^A	1 ^C	0-4 ^D
HCL Waste Pickel Liquor	NR	NR	NR	NR	NR	NR	NR	NR	NR	All ^B	All ^B	All ^C	NR	NR	1 ^C	0-2 ^C	NR	
Hydrofluoric Acid HF - aerated	NR	NR	NR	NR	NR	0-2 ^B	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR

Corrosion Resistance

continued

	Ductile Iron/ Carbon Steel	Type 400 Series	17-4PH	CF-8M	CD-4MCu/N (Duramet 100)	CN-7M (Durimet 20)	Inconel CY-40	Monel M-35-1	Nickel C2-100	N-7M (Chlorimet 2)	CW-5M (Chlorimet 3)	Duriron	Durichlor 51/ Superchlor 77	Stellite 6	Durco DC-8 (10 mpy or less)	Titanium	Titanium-Pd	Zirconium 702 Zirconium 705
Hydrofluoric Acid HF - non-aerated	NR	NR	NR	NR	NR	NR	NR	All ^E	NR	All ^B	All ^B	NR	NR	NR	NR	NR	NR	NR
Hydrogen Chloride HCl	10 ^E	NR	—	10 ^E	10 ^E	10 ^E	10 ^E	10 ^E	10 ^E	10 ^E	10 ^C	10 ^A	10 ^C	—	—	10 ^E	10 ^E	10 ^D
Hydrogen Fluoride HF	10 ^E	NR	—	10 ^E	10 ^E	10 ^E	10 ^E	10 ^E	10 ^E	10 ^E	10 ^E	NR	NR	—	—	NR	NR	NR
Hydrogen Peroxide H ₂ O ₂	NR	NR	5-9 ^A	0-5 ^D	0-5 ^D	0-5 ^D	0-2 ^C	NR	NR	NR	NR	10 ^D	10 ^D	—	—	0-5 ^D	0-5 ^D	All ^D
Hydrogen Sulfide H ₂ S	10 ^A	NR	NR	1 ^A 10 ^E	10 ^E	1 ^A 10 ^E	1 ^B	NR	NR	10 ^C	10 ^C	NR	NR	—	—	10 ^D	10 ^D	0-5 ^D
Isopropyl Alcohol (CH ₃) ₂ CHOH	9-10 ^B	10 ^D	10 ^A	9-10 ^B	9-10 ^B	9-10 ^B	9-10 ^C	9-10 ^B	9-10 ^C	10 ^D	10 ^D	10 ^D	10 ^D	10 ^A	All ^D	10 ^D	10 ^D	10 ^D
Kerosene	10 ^D	10 ^A	10 ^A	10 ^D	10 ^D	10 ^D	10 ^D	10 ^D	10 ^D	10 ^D	10 ^D	10 ^D	10 ^D	All ^D	All ^D	10 ^D	10 ^D	—
Lead Acetate Pb(C ₂ H ₃ O ₂) ₂	NR	10 ^D	—	All ^D	All ^D	All ^D	1 ^D 10 ^D	All ^D	1 ^D	All ^D	All ^D	All ^D	All ^D	—	All ^D	All ^D	All ^D	All ^D
Magnesium Chloride MgCl ₂	10 ^A	—	NR	NR	0-4 ^A	0-4 ^A	5 ^D	0-3 ^D	0-5 ^A	5-10 ^D	All ^D	5-10 ^D	All ^D	NR	All ^D	All ^C	All ^C	All ^D
Magnesium Sulfate MgSO ₄	0-3 ^C	10 ^D	10 ^B	All ^D	All ^E	All ^E	All ^C	All ^C	0-6 ^D	All ^B	All ^B	All ^D	All ^D	10 ^A	All ^D	All ^D	All ^D	All ^D
Maleic Acid COOH (CH) ₂ COOH	NR	10 ^A	—	All ^D	All ^D	All ^D	0-5 ^D	0-5 ^D	10 ^A	All ^D	All ^D	All ^D	All ^D	—	All ^D	All ^D	All ^D	All ^D
Manganese Chloride MnCl ₂	10 ^A	—	—	NR	0-5 ^D	0-5 ^D	NR	0-4 ^A	0-4 ^A	0-4 ^D	All ^D	0-4 ^D	All ^D	NR	All ^D	All ^D	All ^D	All ^D
Mercuric Chloride HgCl ₂	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0-3 ^C	NR	All ^D	NR	All ^D	0-6 ^D	0-6 ^D	0-4 ^D
Methyl Alcohol CH ₃ OH	All ^D	All ^C	All ^A	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^A	All ^C	All ^D	All ^D	All ^D
Methyl Ethyl Ketone CH ₃ COCH ₂ CH ₃	All ^D	All ^A	All ^A	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^A	All ^D	All ^D	All ^D	All ^D
Methyl Formate HCOOCH ₃	All ^D	—	—	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	All ^D	0-3 ^D	0-3 ^D	—	—	10 ^A	10 ^A	10 ^A
Nickel Chloride NiCl ₂	NR	NR	NR	NR	0-3 ^B	0-3 ^B	NR	NR	NR	All ^D	All ^D	All ^D	All ^D	NR	All ^D	All ^D	All ^D	All ^D
Nickel Nitrate Ni(NO ₃) ₂	NR	10 ^B	10 ^A	All ^D	All ^D	All ^D	10 ^E	10 ^E	10 ^E	NR	10 ^A	All ^D	All ^D	—	—	All ^A	10 ^A	—
Nickel Sulfate NiSO ₄	NR	10 ^D	—	All ^D	All ^D	All ^D	0-3 ^D	0-2 ^D	0-3 ^D	—	0-6 ^D	All ^D	All ^D	—	All ^D	—	10 ^D	0-3 ^C
Nitric Acid <70% HNO ₃	NR	0-7 ^B	0-2 ^B	0-6 [*]	0-7 ^E	0-7 [*]	0-5 ^A	NR	NR	NR	0-6 ^A	0-7 ^B	0-7 ^B	0-5 ^A	0-7 [*]	0-7 ^E	0-3 [*]	0-7 ^E
Nitric Acid >70% HNO ₃	NR	NR	NR	7-9 ^D	7-9 ^D	8 ^C 9 ^B	NR	NR	NR	NR	NR	10 ^C	10 ^C	NR	NR	—	7 [*]	10 ^D
Nitrobenzene C ₆ H ₅ NO ₂	10 ^E	10 ^D	—	All ^E	All ^E	All ^E	10 ^D	NR	NR	NR	All ^E	All ^E	All ^E	—	All ^E	All ^E	All ^E	All ^E
Oxalic Acid (HOOC) ₂ • 2H ₂ O	NR	NR	—	All ^A	All ^C	All ^C	0-5 ^D	NR	NR	All ^D	All ^D	All ^D	All ^D	—	All ^D	NR	NR	All ^D
Phenol C ₆ H ₅ OH	All ^B	10 ^D	10 ^B	All ^D	All ^D	All ^D	All ^D	All ^B	All ^E	All ^E	All ^E	All ^D	All ^D	—	All ^D	All ^A	All ^D	All ^D
Phosphoric Acid H ₃ PO ₄	NR	NR	0-5 ^C	All ^D	All ^D	All ^D	All ^D	NR	NR	All ^D	0-8 ^D	All ^A	All ^A	1-9 ^B	8-9 ^D	NR	1 [*]	0-5 ^D
Phthalic Acid C ₆ H ₄ (COOH) ₂	10 ^D	10 ^E	10 ^D	1 ^E 10 ^E	1 ^E 10 ^D	1 ^E 10 ^D	10 ^D	10 ^E	10 ^E	10 ^E	10 ^E	All ^D	All ^D	—	—	1 ^A 10 ^A	1 ^A 10 ^A	All ^D
Picric Acid C ₆ H ₂ (NO ₂) ₃ OH	NR	10 ^A	—	All ^A	All ^A	All ^A	NR	NR	10 ^A	All ^D	All ^D	All ^C	All ^C	—	All ^D	All ^D	All ^D	All ^D

Composition

Durco Designation	Composition								
	Cr	Ni	Mo	Cu	Si	Mn	C	Fe	Co
Ductile Iron					2.75 max		3.0 min	Bal	
Carbon Steel	0.50 max	0.5 max	0.20 max	0.30 max	0.60 max	1.00 max	0.30 max	Bal	
17-4PH	15.5-17.5	3.0-5.0		3.0-5.0	1.0 max	1.0 max	0.07 max	Bal	
Durco CF-8M	18.0-21.0	9.0-12.0	2.0-3.0		2.00 max	1.50 max	0.08 max	Bal	
Durcomet 100	24.5-26.5	4.75-6.00	1.75-2.25	2.75-3.25	1.00 max	1.00 max	0.04 max	Bal	
Durimet 20	19.0-22.0	27.5-30.5	2.0-3.0	3.0-4.0	1.50 max	1.50 max	0.07 max	Bal	
Durcomet 5	20.0-22.0	15.0-17.0			4.0-6.0	1.50 max	.025 max	Bal	
Durco CK-3M	19.5-20.5	17.5-19.5	6.0-7.0	0.5-1.0	1.00 max	1.2 max	.025 max	Bal	
Durco CY-40	14.0-17.0	Bal			3.00 max	1.50 max	0.40 max	11.00 max	
Durco M-35				26.0-33.0	1.25 max	1.50 max	0.35 max	3.50 max	
Nickel CZ-100		95.0 min			1.25 max	2.00 max	1.00 max	3.00 max	
Chlorimet 2	1.00 max	Bal	30.0-33.0		1.00 max	1.00 max	0.07 max	3.00 max	
Chlorimet 3	17.0-20.0	Bal	17.0-20.0		1.00 max	1.00 max	0.07 max	3.00 max	
Duriron	0.50 max		0.50 max	0.50 max	14.20-14.75	1.50 max	0.70-1.10	Bal	
Durichlor 51M	3.25-5.00		0.40-0.60	0.50 max	14.20-14.75	1.50 max	0.75-1.15	Bal	
Superchlor 77	4.00-4.50		3.00-3.30	0.12 max	15.50-16.00	1.00 max	0.80-0.95	Bal	
Stellite 6	27.0-31.0	3.0 max	1.5 max		1.5 max	1.0 max	0.9-1.4	3.0 max	Bal
Durco DC-8	Proprietary Cobalt Base Alloy								
Titanium	N, 0.05 max; H, 0.015 max; O, 0.40 max						0.10 max	0.25 max	
Titanium-Pd	N, 0.05 max; H, 0.015 max; O, 0.40 max; Pd, 0.12 min						0.10 max	0.25 max	
Zirconium	N, 0.03 max; H, 0.005 max; O, 0.25 max; Hf, 4.5 max						0.10 max	0.30 max	
Zirconium 5	N, 0.03 max; H, 0.005 max; O, 0.30 max; Hf, 4.5 max; Co, 2.0-3.0						0.10 max	0.30 max	

Specifications and Properties

Durco Designation	Durco Symbol	ACI Designation	Equivalent Wrought Designation	ASTM Specifications*	DIN (WN)	Mechanical Properties			Typical Brinell Hardness
						Tensile Strength, min, psi	Yield Point min, psi	Elongation min, % in 2"	
Ductile Iron	DCI	None	None	A395	1693 (0.7043)	60,000	40,000	18	160
Carbon Steel	DS	None	Carbon Steel	A216, Gr. WCB	17245 (1.0619)	70,000	36,000	22	150
17-4PH	17-4	None	17-4PH	A564, Type 630	—	145,000	125,000	13	330
Durco CF-8M	D4	CF-8M	316	A744, Gr. CF-8M	17445(1.4408)	70,000	30,000	30	154
Durcomet 100	CD4M	CD-4MCu	Ferrallium 255	A995, Gr. 1B	SEW410 (1.4463)	100,000	70,000	16	224
Durimet 20	D20	CN-7M	Alloy 20	A744, Gr. CN-7M	(1.4500)	62,000	25,000	35	133
Durcomet 5	DV	None	None	None	—	90,000	40,000	30	175
Durco CK-3M	CK-3M	CK-3MCuN	254SMO	A744, Gr. CK-3MCuN	(1.4529)	80,000	38,000	35	195
Durco CY-40	DINC	CY-40	Inconel 600	A494, Gr. CY-40	17742 (2.4816)	70,000	28,000	30	147
Durco M-35	DMM	M-35-1	Monel 400	A494, Gr. M-35-1	17130 (2.4365)	65,000	25,000	25	130
Nickel CZ-100	DNI	CZ-100	Nickel 200	A494, Gr. CZ-100	17730 (2.4170)	50,000	18,000	10	118
Chlorimet 2	DC2	N-7M	Hastelloy B-2	A494, Gr. N-7M	(2.4882)	76,000	40,000	20	200
Chlorimet 3	DC3	CW-6M	Hastelloy C-276	A494, Gr. CW-6M	(2.4883)	72,000	40,000	25	200
Duriron	D	None	None	A518, Gr. 1	—	930# (A)	—	—	520
Durichlor 51	D51M	None	None	A518, Gr. 2	—	930# (A)	—	—	520
Superchlor 77	SD77	None	None	None	—	1600# (A)	—	—	520
Stellite 6	F6	None	Stellite 6	None	—	115,000	96,000	3	400
Durco DC-8	DC8	None	None	None	—	—	—	—	300
Titanium	Ti	None	Titanium	B367, Gr. C-3	17850 (3.7031)	65,000	55,000	12(B)	200
Titanium-Pd	Ti-Pd	None	Titanium-Pd	B367, Gr. C-8A	17850 (3.7032)	65,000	55,000	12(B)	200
Zirconium	Zr	None	Zirconium 702	B752, Gr. 702C	—	55,000	40,000	12(B)	190
Zirconium 5	Zr5	None	Zirconium 705	B752, Gr. 705C	—	70,000	40,000	12(B)	190

* Whenever an ASTM specification is cited, the Durco alloy will conform to the chemical and mechanical requirements of the latest edition of the specification. (A) Minimum transverse strength. (B) Minimum percent elongation in 1".

For further assistance with materials recommendations, call the Materials Engineering Department at [REDACTED] or fax your request to [REDACTED]. You may also e-mail us at [REDACTED]@flowserve.com.



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