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**HEAT EXCHANGER**

## Corrosion Resistant Alloys

Heat exchangers have a broad range of industrial applications and are one of the most important and widely used pieces of process equipment. There is a lot to consider when designing a heat exchanger - common concerns include fouling, heat transfer efficiency and the ability of the equipment to handle the high temperatures, pressures and corrosive environments found particularly in the chemical and petrochemical industries. Whether it is a shell-and-tube or plate heat exchanger alloy selection is critical and titanium and nickel-based alloys offer the solutions.

### Alloys Properties

	Composition (%)	Key attributes
<b>Ti Grade 1</b> R50250/3.7025	Ti – max 0.18O	Commercially pure titanium has excellent resistance to sea water and aqueous salt solutions. It has good corrosion resistance in alkali media and nitric acid. Grade 1 offers optimum ductility and cold formability and is suitable for deep drawing. Grade 2 has an excellent balance of strength and ductility and is highly formable.
<b>Ti Grade 2</b> R50400 3.7035	Ti – max 0.25O	
<b>Nickel 200/201</b> N02200/2.4060	99.6 Ni	Commercially pure nickel which has outstanding resistance to caustic environments. 201 (with maximum 0.02%C) is used at temperatures above 315 °C.
<b>Alloy 400</b> N04400/2.4360	65Ni – 32Cu – 1.6Fe	Moderate strength with excellent corrosion resistance in a range of media including alkalis/caustic solutions, sulphuric, hydrochloric and hydrofluoric acids. It also has excellent sea water resistance.
<b>Alloy 600</b> N06600/2.4816	76Ni – 15Cr – 8Fe	Good high temperature strength, resistant to sulphuric acid under oxidising conditions. Suitable for high temperature caustic applications and in oxidising acid salts.
<b>Alloy 625</b> N06625/2.4856	61Ni – 21Cr – 2Fe – 9Mo – 3Nb	Largely resistant to attack in sea water and alkaline media. Resistant to pitting and crevice corrosion in severe environments with high strength up to 815 °C.
<b>Alloy 800</b> N08800/1.4876	32Ni – 21Cr – 46Fe – Al+Ti	Often used to replace austenitic stainless steels in chloride-containing waters owing to its low rates of attack in fresh and distilled water and resistance to stress-corrosion cracking. Excellent resistance to nitric acid.
<b>Alloy 825</b> N08825/2.4858	42Ni – 21Cr – 28 – 3Mo – 0.6Ti	Excellent resistance in sulphuric and phosphoric acids, good resistance in hydrochloric acid, caustic alkalis and sea water. Virtually immune to stress corrosion cracking.
<b>Alloy 22</b> N06022/2.4602	57Ni – 21Cr – 13Mo – 4Fe – 3.5W	Excellent resistance to both oxidising and reducing environments and has good resistance to mixed acids. Highly resistant to general corrosion, pitting, crevice corrosion and stress corrosion cracking.
<b>Alloy C-276</b> N10276/2.4819	57Ni – 16Cr – 5Fe – 16Mo – 4W	Exceptional resistance to sulphuric, phosphoric, nitric and hydrochloric acid at elevated temperatures. Excellent resistance to sea water under crevice conditions.

Alloy selection is dependent on the specific operating conditions, please contact us for more information.

