EC800/EC800H/EC800AT NICKEL-IRON-CHROMIUM ALLOY

(UNS N08800, N08810, N08811)

Electralloy's austenitic nickel-iron-chromium alloy EC800/EC800H/EC800AT offers excellent strength along with good corrosion and oxidation resistance at elevated temperatures. Electralloy's single chemistry has been designed to meet requirements for alloys UNS N08800, UNS N08810, and UNS N08811.

CHEMICAL COMPOSITION (Nominal Analysis, weight percent)

Carbon *(max)*	**0.06 / 0.10**	**Nickel**	**30.00 / 35.00**
Manganese *(max)*	**1.50**	**Copper** *(max)*	**0.75**
Phosphorus *(max)*	**0.035**	**Aluminum**	**0.15 / 0.60**
Sulfur *(max)*	**0.015**	**Titanium**	**0.15 / 0.60**
Silicon *(max)*	**1.00**	**Al + Ti**	**0.85 / 1.20**
Chromium	**19.00 / 23.00**	**Iron**	**Balance**

TYPICAL APPLICATIONS

EC800/EC800H/EC800AT is used in environments where resistance to oxidation and carburization is required while maintaining strength. Applications include heat treating equipment, annealing fixtures, furnace parts, and chemical and petrochemical processing operations.

EC800/EC800H/EC800AT specifications include the following:

ASTM B408
ASTM B564
AMS 5766
NACE MR0175

EC800/EC800H/EC800AT is available in a variety of sizes and forms, including ingot, billet, bar, and coil rod.

The information and data contained in this Product Data sheet are intended for general information and do not constitute any warranty, expressed or implied, of suitability for any applications or design.

EC800/EC800H/EC800AT (UNS N08800, N08810, N08811) NICKEL-IRON-CHROMIUM ALLOY

PHYSICAL PROPERTIES

Melting Temperature:	2475°F to 2525°F (1357°C to 1385°C)
Density:	0.287 lb./in.^{3} (7.95 gm/cm^3)
Magnetic Permeability:	(H=200 Oersteds) Annealed 1.014 @ 70°F
Specific Heat:	(32°F - 212°F) 0.11 Btu/lb./°F
Electrical Resistivity:	(@ 70°F) 38.9 microhm-in.
Curie Temperature:	-117°F (-83°C)

Coefficient of Thermal Expansion

Temperature		
°F	°C	In./in./°F
70 to 400	21 to 204	8.8×10^{-6}
70 to 1200	21 to 649	9.6×10^{-6}
70 to 1600	21 to 871	10.2×10^{-6}

Thermal Conductivity

Temperature		
°F	°C	Btu/ft/hr./°F
70	21	6.7
800	427	10.6
1600	871	15.0

Modulus of Elasticity :

Temperature	10^6 psi
75	28.5
800	24.6
1800	19.2

MECHANICAL PROPERTIES

Tensile Data: *Annealed*

	UTS	.2 % YS	%El in 2" (50.8 mm) or 4D
	ksi (min)	ksi (min)	(min)
ASTM B408	65 (448 MPa)	25 (172 MPa)	30
AMS 5766	65 (448 MPa)	25 (172 MPa)	30

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HEAT TREATMENT

EC800/EC800H/EC800AT does not harden by heat treatment. Anneal by heating to 2100°F and water quenching.

WORKABILITY

The recommended hot working temperature range is between 1850°F - 2200°F. Hot working between 1000°F - 1600°F should be avoided due to possibility of cracking. EC800/EC800H is readily cold worked. No special precautions are needed, however this alloy work hardens and may require in-process annealing.

CORROSION & OXIDATION RESISTANCE

EC800/EC800H/EC800AT has excellent resistance to scaling and oxidation at high temperatures. It also has good corrosion resistance to carburizing atmospheres. The alloy can be sensitized and is susceptible to intergranular attack if held between 1000°F - 1600°F.

WELDING

EC800/EC800H/EC800AT can be welded using conventional methods such as gas tungsten arc (GTAW), gas metal arc (GMAW), and shielded metal arc (SMAW).

MACHINING

EC800/EC800H/EC800AT can be machined using conventional techniques and equipment however considerably more power is required when compared to mild steel. This alloy is machined most readily in the annealed condition. To avoid excessive work hardening, the setup should be as rigid as possible and high speed steel or carbide-tipped cutting tools used. Cutting tools should be kept sharp at all times to assure clean burr free cutting. Heavy feeds and a good supply of coolant are recommended.

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