



EC32750 (UNS S32750) SUPER DUPLEX STAINLESS STEEL ALLOY

Electralloy's EC32750 is a Duplex stainless steel alloy, UNS S32750, with a minimum 40 PREN. The duplex structure of approximately equal portions of austenite and ferrite provides higher strength than austenitic stainless steels with useful ductility and toughness. The ductile to brittle fracture transition temperature for EC32750 is below -50°F. The alloy delivers good combination of general corrosion, and stress corrosion cracking, resistance at moderate cost because it does not contain large amounts of Nickel.

CHEMICAL COMPOSITION (Nominal Analysis, weight percent)

Carbon (<i>max</i>)	0.030	Copper (<i>max</i>)	0.50
Manganese (<i>max</i>)	1.00	Nitrogen	0.24 / 0.32
Silicon (<i>max</i>)	0.80	Iron	Balance
Chromium.....	24.00 / 26.00	Sulfur (<i>max</i>)	0.020
Molybdenum	3.0 / 5.0	Phosphorus (<i>max</i>)	0.035
Nickel	6.0 / 8.0		

TYPICAL APPLICATIONS

Typical applications include pumps, shafts, valves, flanges, and fasteners for offshore oil & gas platforms, marine applications, chemical processing, pulp & paper, water desalination, and heat exchanger equipment. The higher nitrogen and molybdenum in **EC32750** provide minimum "pitting resistance equivalent number" (PREN) of 40, and as such is listed in NACE MR0175 for use in sour gas environments. EC32750 is limited to approximately 570°F maximum continuous operating temperature.

EC32750 can be supplied to meet all the requirements of the following specifications, and more...

ASTM A182 (F53), A479, A789, A790

NACE MR0175

EC32750 is available in a wide variety of sizes and forms, including ingot, billet, and bar.

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PHYSICAL PROPERTIES

Melting Temperature:		-2600°F to 2650°F (1425°C to 1455°C)	
Density:		0.28 lb./in. ³ (7.8 gm/cm ³)	
Magnetic Permeability:		Magnetic	
Specific Heat:		(68°F) 0.11 Btu/lb./°F	
Coefficient of Thermal Expansion			
Temperature			
°F	°C	In./in./°F	
68 to 212	20 to 100	7.2 x 10 ⁻⁶	
68 to 400	20 to 205	7.5 x 10 ⁻⁶	
Thermal Conductivity			
Temperature			
°F	°C	Btu/ft./hr./°F	
68	20	~9	
Electrical Resistivity			
°F	°C	Micro ohm in	
68	20	33.5	
Modulus of Elasticity (E)			
Temperature		Tension	
°F	°C	10 ³ ksi	10 ³ MPa
68	20	29	200

HEAT TREATMENT

EC32750, like austenitic and other duplex stainless steels, is not hardenable by heat treatment. EC32750 is typically solution annealed at between 1880°F and 2060°F, followed by rapid cooling to prevent precipitation of deleterious sigma phase and reduction in toughness.

HOT WORKING

Recommended hot working temperature range for EC32750 is 2200°F down to 1800°F (1205°C to 980°C).

CORROSION & OXIDATION RESISTANCE

Electralloy EC32750 with its high chromium content exhibits very good general corrosion resistance, and in combination with the molybdenum content achieves good chloride pitting and crevice corrosion resistance. Its excellent chloride stress corrosion cracking resistance makes it a good choice for various saltwater applications. Its resistance to phosphoric and organic acids makes it useful in oil & gas, pulp & paper, and pollution control equipment.

TYPICAL MINIMUM ROOM TEMPERATURE BAR TENSILE PROPERTIES

Tensile Data: 2010°F solution anneal						
	UTS		YS		EI	RA
Size	ksi	MPa	ksi	MPa	%	%
<2"Ø	116	800	80	551	25	50
>=2"Ø	110	758	75	517	25	50
Typical Hardness:					310 BHN maximum	
Charpy Impact Data: 2010°F solution anneal						
Test Temp		Force		Charpy impact values considerably with cross section.		
°F	°C	ft*lbs	Joules			
68	20	150	200			
-50	-46	50	68			

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.

WELDING

EC32750 is weldable using most fusion techniques, but is not amenable to electron beam or oxy-acetylene welding processes. Pre-heating or post weld heat treatment is not typically necessary. EC32750 may be welded to carbon steel, austenitic stainless steel, and other duplexes using appropriate consumable filler material.

MACHINING

The alloy can be machined using techniques & equipment similar to 300 series stainless, even though EC32750 is considerably harder. It requires slower speeds, sharp tools, and rigid set-ups. High speed tools can be utilized, but carbide tipped tooling is more prevalent and will increase machining speeds.

