

ATI Allegheny Ludlum AL Altemp® 625 Nickel-Base Superalloy, UNS N06625

Category : Metal , Nonferrous Metal , Nickel Alloy , Superalloy

Material Notes:

Allegheny Ludlum Altemp 625 alloy is an austenitic nickel-base superalloy possessing excellent resistance to oxidation and corrosion over a broad range of corrosive conditions, including jet engine environments and in many other aerospace and chemical process applications. Specific uses include jet engine nacelles, engine plumbing, aircraft ducting, recuperators, and thrust reversers. The alloy has outstanding strength and toughness at temperatures ranging from cryogenic temperature to 1093°C. This alloy also has exceptional fatigue resistance. The Altemp 625 alloy derives its strength from the solid solution strengthening effects of molybdenum and columbium on the nickel-chromium matrix. These elements also contribute to the alloy's outstanding corrosion resistance. Although the alloy was developed for high temperature strength, its highly alloyed composition provides a high level of general corrosion resistance to a wide range of oxidizing and non-molybdenum provide excellent resistance to chloride ion pitting and the high level of nickel provides resistance to chloride stress corrosion cracking. The material possesses a high degree of formability and shows better weldability than many high alloyed nickel-base alloys. The alloy is resistant to intergranular corrosion even in the welded condition. Information provided by Allegheny Ludlum.

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http://www.lookpolymers.com/polymer_ATI-Allegheny-Ludlum-AL-Altemp-625-Nickel-Base-Superalloy-UNS-N06625.php

Physical Properties	Metric	English	Comments
Density	8.44 g/cc	0.305 lb/in ³	

Mechanical Properties	Metric	English	Comments
Hardness, Rockwell B	95	95	Typical Annealed
Tensile Strength, Ultimate	>= 827 MPa	>= 120000 psi	For flat products (<4" thickness) and seamless tube and pipe
Tensile Strength, Yield	>= 414 MPa	>= 60000 psi	For flat products (<4" thickness) and seamless tube and pipe
Elongation at Break	45 %	45 %	Typical Annealed

Thermal Properties	Metric	English	Comments
Specific Heat Capacity	0.410 J/g-°C	0.0980 BTU/lb-°F	
Melting Point	1280 - 1350 °C	2340 - 2460 °F	
Solidus	1280 °C	2340 °F	
Liquidus	1350 °C	2460 °F	
Maximum Service Temperature, Air	1093 °C	1999 °F	Excellent oxidation and scale resistance to this temp.

Component Elements Properties	Metric	English	Comments
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Aluminum, Al Component Elements Properties	0.30 % Metric	0.30 % English	Comments
Carbon, C	0.050 %	0.050 %	
Chromium, Cr	22 %	22 %	
Iron, Fe	4.0 %	4.0 %	
Manganese, Mn	0.30 %	0.30 %	
Molybdenum, Mo	9.0 %	9.0 %	
Nickel, Ni	60 %	60 %	as balance; includes Co
Niobium, Nb (Columbium, Cb)	3.5 %	3.5 %	
Phosphorous, P	0.010 %	0.010 %	
Silicon, Si	0.25 %	0.25 %	
Sulfur, S	0.0030 %	0.0030 %	
Titanium, Ti	0.30 %	0.30 %	

Electrical Properties	Metric	English	Comments
Magnetic Permeability	1.0006	1.0006	75F; 200 Oe

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