



Technical Data Sheet

ATI 42™**Nickel Alloy: Low Expansion Alloy**

(UNS K94100)

GENERAL PROPERTIES

ATI 42 alloy is used extensively in the manufacture of sealed beam automobile head lamps, in grommet and pin type glass-metal seals, and in integrated circuit lead frames. It is also the core metal used in the manufacture of Dumet wire. ATI 42 alloy has a low expansion coefficient used to match the expansion characteristics of 98% alumina and hard borosilicate glasses. In its various annealed or tempered conditions ATI 42 alloy has excellent formability, good stampability, good photoetching characteristics and is solderable. The alloy is fully austenitic at all application temperatures. Where glass-metal sealing is involved, the alloy is usually stabilized with titanium additions to prevent evolution of CO₂ bubbles in the glass-metal interface. A titanium stabilized version is available for glass-to-metal seal applications where formation of CO₂ bubbles is to be avoided during fabrication.

TYPICAL COMPOSITION

Element	Weight %
C	0.010
Mn	0.50
P	0.010
S	0.007
Si	0.20
Cr	0.15
Ni	40.75
Al	0.001
Co	0.004
Fe	Balance

SPECIFICATIONS

ASTM F-30 (42)

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PRODUCT FORMS

Strip - Width: Up to 24" (609 mm)

Thickness: 0.004" - 0.062" (0.10 mm - 1.57 mm).

APPLICATIONS

Lead frames, color TV electron guns, glass-metal and ceramic-metal seals, transistors

MECHANICAL AND PHYSICAL PROPERTIES

Typical Annealed Properties			
0.2% Yield Strength	40 ksi (275 MPa)	Density	0.294 lb/in ³ (8.15 g/cm ³)
Tensile Strength	70 ksi (482 MPa)	Electrical Resistivity	86 microhm cm
Elongation	28% in 2" (51mm)	Grain Size	7 or finer
Hardness	55 Rb		

Thermal Expansion Coefficient	
30 to 300°C	4.0 - 4.7 μ m/m°C
30 to 450°C	6.7 - 7.4 μ m/m°C

Lead Frame Quality Strip Tensile Data	
Tensile Strength	95 - 105 Ksi
	(655 - 724 MPa)