LION® alloy 300

LION® alloy 300 (UNS K93120) is an age-hardenable (maraging) iron-nickel steel combining ultra-high strength, toughness and resistance to crack propagation. The alloy is well suited to applications where heat treatment distortion and dimensional changes must be minimized and where high fracture toughness is required, such as rocket motor casings, light aircraft landing gear, power shafts and low temperature tooling.

The 18% nickel maraging steels offer a unique combination of properties not available from conventional low alloy ultra-high strength steels. They offer high strength, high ductility and toughness, and resistance to crack propagation. Hardening is accomplished by a simple aging cycle of 3 hours at 900°F (482°C) followed by air cooling. LION alloy 300 provides through hardening without quenching, freedom from decarburization, minimal distortion during aging, good formability, machinability, and weldability and a low coefficient of thermal expansion.

Available Products and Specifications

LION alloy 300 is designated UNS K93120 and is available as forging billet and bar.

Major specifications: AMS 6514

Table 1 - Limiting Chemical Composition, %

Carbon	0.03 max.
Silicon	0.10 max.
Manganese	0.10 max.
Sulfur	0.010 max.
Phosphorus	0.010 max.
Cobalt	8.0-9.5
Nickel	18.0-19.0
Molybdenum	4.6-5.2
Titanium	0.55-0.80
Aluminum	0.05-0.15
Iron	Balance*

*Reference to the 'balance' of a composition does not guarantee this is exclusively of the element mentioned but that it predominates and others are present only in minimal quantities.

Physical Constants

Table 2 - Physical Constants

Density, lb/in^3	0.290
g/cm^3	8.0
Melting Range, °F	2600-2650
°C	1427-1454
Specific Heat, Btu/lb•°F	0.08
J/kg•°K	335
Permeability at 200 Oersted (15.9 kA/m)	77.
5Coefficient of Expansion, 70-200°F, 10^{-6} in/in•°F	4.8
21-93°C, µm/m•°C	8.64
Thermal Conductivity, Btu•in/ft^2•h•°F	136
W/m•°C	19.6

Typical Mechanical Properties

Table 3 - Typical Mechanical Properties of LION alloy 300

	Solution Annealed 1500°F (816°C), 1 hr, AC	Solution Annealed Plus Aged 900°F (482°C), 3 hrs, AC
0.2% Yield Strength, ksi	120	280
Ultimate Tensile Strength, ksi	150	290
Elongation, %	16	8
Reduction of Area, %	70	40
Hardness, Rc	30	52