

ALLOY DESCRIPTION

This alloy is used in aerospace applications such as space booster and fuel tanks. The alloy is readily weldable. It is useful over a temperature range of -452° to 600 °F. The alloy also has good fracture toughness. The T8 temper is resistant to stress corrosion cracking.

TYPICAL MECHANICAL PROPERTIES (LONGITUDINAL)

Temper	Tensile (.500" Dia. Specimen)					Hardness Brinell 500kg 10 mm	Shear		Fatigue*		Modulus	
	Ultimate		Yield		Elongation/4D %		Ultimate Shearing Strength		Endurance Limit - R.R. Moore Type		Modulus of Elasticity	
	KSI	MPa	KSI	MPa			KSI	MPa	KSI	MPa	KSI x 10 ³	Gpa
0	25	172	11	76	18	45	-	-	-	-	10.6	73.1
T3, T3511	52	359	36	248	17	95	-	-	-	-	10.6	73.1
T8, T851, T8511	66	455	51	352	10	125	-	-	15	103	10.6	73.1

*5 x 10E8 cycles of reversed stress

COMPARATIVE CHARACTERISTICS

Temper	Corrosion Resistance		Cold Workability ³	Machinability ³	Anodize Response ³	Brazeability ⁴	Weldability ⁴		
	General ¹	Stress ²					Gas	Arc	Spot
0	-	-	-	-	-	D	D	A	B
T3, T3511	D	C	C	B	B	D	A	A	A
T8, T851, T8511	D	B	D	B	B	D	A	A	A

- Ratings A through E are relative ratings in decreasing order of merit, based on exposures to sodium chloride solution by intermittent spraying or immersion. Alloys with A and B ratings can be used in industrial and seacoast atmospheres without protection. Alloys with C, D and E ratings generally should be protected at least on faying surfaces.
- Stress-corrosion cracking ratings are based on service experience and laboratory tests of specimens exposed to the 3.5% sodium chloride alternate immersion test.
 - A= No known instance of failure in service or in laboratory tests.
 - B= No known instance of failure in service; limited failures in laboratory tests of short transverse specimens.
 - C= Service failures with sustained tension stress acting in short transverse direction relative to grain structure; limited failures in laboratory tests of long transverse specimens.
 - D= Limited service failures with sustained longitudinal or long transverse
- Ratings A through D for Workability (cold), A through E for Machinability and A through C for Anodize Response, are relative ratings in decreasing order of merit.
- Ratings A through D for Weldability and Brazeability are relative ratings defined as follows:
 - A= Generally weldable by all commercial procedures and methods.
 - B= Weldable with special techniques or for specific applications that justify preliminary trials or testing to develop welding procedure and weld performance.
 - C= Limited weldability because of crack sensitivity or loss in resistance to corrosion and mechanical properties.
 - D= No commonly used welding methods have been developed.

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APPLICABLE SPECIFICATIONS

Cold Finished	Extruded
ASTM B211	ASTM B221
	AMS 4162
	AMS 4163

CHEMICAL COMPOSITION LIMITS

										Others	
Weight %	Si	Fe	Cu	Mn	Mg	Zn	Ti	V	Zr	Each	Total
Minimum	-	-	5.8	0.20	-	-	0.02	0.05	0.10	-	-
Maximum	0.20	0.30	6.8	0.40	0.02	0.10	0.10	0.15	0.25	0.05	0.15

TYPICAL PHYSICAL PROPERTIES

Characteristic		English	Metric
Nominal Density (68 °F/20 °C)		0.103 lbs./in. ³	2.84 Mg/m ³
Melting Range		1010 °F - 1190 °F	543 °C - 643 °C
Specific Heat (212 °F/100 °C)		0.206 BTU/lb. - °F	864 J/kg - °K
Coefficient of Thermal Expansion	Linear 68 °F-212 °F 20 °C-100 °C	12.5 micro in./in.-°F	22.5 micro m/m -°K
	Volumetric 68 °F/20 °C	3.62 x 10 ⁻⁵ in. ³ /in. ³ -°F	65 x 10 ⁻⁶ m ³ /m ³ -°K
Thermal Conductivity (68 °F/20 °C)	T3, T3551	67 BTU/ft. - hr. - °F	116 W/m - °K
	T8, T851, T8511	75 BTU/ft. - hr. - °F	130 W/m - °K
Electrical Conductivity (68 °F/20 °C)	Equal Volume	T3, T3551	28% IACS
		T8, T851, T8511	30% IACS