

ALLOY DESCRIPTION

4032 is a high strength alloy used for pistons.

TYPICAL MECHANICAL PROPERTIES

Temper	Gage Length		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	
	mm.	in.	KSI	MPa	KSI	MPa			KSI	MPa	KSI	MPa	KSI x 10 ³	Gpa
T6	50	2	55	380	46	315	9	120			16	110	11.4	79

COMPARATIVE CHARACTERISTICS

Temper	Corrosion Resistance		Cold Workability ³	Machinability ³	Anodize Response ³	Brazeability ⁴	Weldability ⁴		
	General ¹	Stress ²					Gas	Arc	Spot
T6	C	B	...	B	...	D	D	B	C

- 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.

* DATA NOT AVAILABLE

CHEMICAL COMPOSITION LIMITS

										Others	
Weight %	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Each	Total
Nominal	11.0 - 13.5	1	0.50 - 1.3	...	0.8 - 1.3	0.10	0.50 - 1.3	0.25	...	0.05	0.15

TYPICAL PHYSICAL PROPERTIES

Characteristic			English	Metric
Nominal Density (68 °F/20 °C)			0.97 lbs./in. ³	2.68 g/cm ³
Melting Range			1180 °F - 1215 °F	638 °C - 657 °C
Specific Heat (212 °F/100 °C)			.206 BTU/lb. - °F	864 J/kg - °K
Coefficient of Thermal Expansion	Linear 68 °F-212 °F 20 °C-100 °C		10.0 micro in./in.-°F	18.0 micro m/m -°K
	Volumetric 68 °F/20 °C		3.11 x 10 ⁻⁵ in. ³ /in. ³ -°F	56 x 10 ⁻⁶ m ³ /m ³ -°K
Thermal Conductivity (68 °F/20 °C)	T6		81.5 BTU/ft. - hr. - °F	141 W/m - °K
Electrical Conductivity (68 °F/20 °C)	Equal Volume	T6	36 % IACS	36 % IACS

* DATA NOT AVAILABLE