



ALLOY DESCRIPTION

Alloy 2124 is a high purity version of 2024 typically supplied in 1.5”–6.0” plate. The alloy has good fracture toughness and is used primarily for structural aircraft parts. Corrosion resistance and anodizeability are only fair. It is also the basic alloy for cold finished square and rectangular bar. Again, this is because of its high strength and good machinability, which are essential for precision fittings and parts.

TYPICAL MECHANICAL PROPERTIES

| 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 |
| T851 | 70 | 485 | 64 | 450 | 8 | | | | | | 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 |
| T851 | D | B | D | B | C | D | D | C | B |

- 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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CHEMICAL COMPOSITION LIMITS

| | | | | | | | | | Others | |
|----------|------|------|-----|------|-----|------|------|------|--------|-------|
| Weight % | Si | Fe | Cu | Mn | Mg | Cr | Zn | Ti | Each | Total |
| Minimum | - | - | 3.8 | 0.30 | 1.2 | - | - | - | - | - |
| Maximum | 0.20 | 0.30 | 4.9 | 0.9 | 1.8 | 0.10 | 0.25 | 0.15 | 0.05 | 0.15 |

TYPICAL PHYSICAL PROPERTIES

| Characteristic | | English | Metric |
|---------------------------------------|--|--|--|
| Nominal Density (68 °F/20 °C) | | 0.100 lbs./in. ³ | 2.77 Mg/m ³ |
| Melting Range | | 935 °F - 1180 °F | 502 °C - 638 °C |
| Specific Heat (212 °F/100 °C) | | 0.209 BTU/lb. - °F | 875 J/kg - °K |
| Coefficient of Thermal Expansion | Linear 68 °F-212 °F 20 °C-100 °C | 12.7 micro in./in.-°F | 22.9 micro m/m -°K |
| | Volumetric 68 °F/20 °C | 3.67 x 10 ⁻⁵ in. ³ /in. ³ -°F | 66 x 10 ⁻⁶ m ³ /m ³ -°K |
| Thermal Conductivity (68 °F/20 °C) | T851 | 88 BTU/ft. - hr. - °F | 151 W/m - °K |
| Electrical Conductivity (68 °F/20 °C) | Equal Volume | T851 | 39% IACS |
| | Equal Weight | | |