

KaiserSelect®

PLATE ALLOY **7099-T7451**

HIGH STRENGTH FOR LIGHTWEIGHT STRUCTURES

PRODUCT DESCRIPTION

- Engineered to provide an optimum combination of high strength, corrosion performance, and high toughness
- Creates airframe lightweighting opportunities in applications requiring high strength balanced with high fracture toughness and good resistance to stress corrosion cracking including wing structures such as ribs, spars and skins, as well as fuselage applications such as frames and floor beams
- Available in thicknesses from 1" to 6" (25 mm to 152 mm)
- **AA7099** is a less quench sensitive Al-Mg-Zn-Cu-Zr alloy engineered for high strength properties in thicker sections

PERFORMANCE CHARACTERISTICS

- Up to 10% higher ultimate strength and up to 15% higher yield strength over 7050-T7451 while maintaining similar fracture toughness performance
- Good stress corrosion cracking (SCC) resistance and excellent exfoliation resistance
- As a **KaiserSelect®** product, **7099-T7451** has exceptional lot to lot consistency, flatness and low repeatable reduced distortion both during and after machining. These enhanced characteristics facilitate complex machining with high metal removal rates and less part repositioning while maintaining final part dimensional tolerances

PROCESSING CHARACTERISTICS

- The over-aged **T7451** temper is obtained through a two stage aging treatment
- Optimized thermal cycle delivers the best combination of properties throughout the thickness range to achieve both high strength and corrosion performance



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please visit KaiserAluminum.com or call (866) 499-7690.

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CHEMICAL COMPOSITION LIMITS (WT%)

Weight %	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti	Zr	OTHERS	
										Each	Total
Minimum	-	-	1.4	-	1.6	-	7.4	-	0.05	-	-
Maximum	0.12	0.15	2.1	0.04	2.3	0.04	8.4	0.06	0.15	0.05	0.15

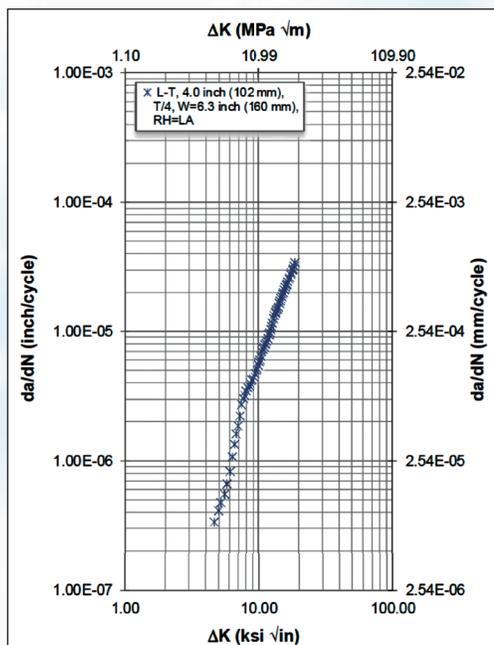
PROPERTIES

Property (English / Metric)	Orientation	THICKNESS		
		1 in / 25 mm	4 in / 102 mm	6 in / 152 mm
Tensile strength ⁽¹⁾ : ksi / MPa	L	78 / 538	75 / 517	74 / 510
Yield strength ⁽¹⁾ : ksi / MPa	L	73 / 503	71 / 490	69 / 476
Elongation ⁽¹⁾ : % (4D)	L	11	10	9
Toughness K_{Ic} per ASTM E399 ⁽²⁾ : ksi√in / MPa√m	L-T	35 / 39	30 / 33	27 / 30
SCC min per ASTM G47: ksi / MPa	ST	-	35 / 240	
EXCO rating per ASTM G34	-	Better or equal to EA		
Density: lbs/in ³ / g/cm ³	-	0.103 / 2.85		
Young's Modulus, E: ksi x 10 ³ / GPa	L	10.2 / 70.0		
Young's Modulus Compression, E_c : ksi x 10 ³ / GPa	L	10.7 / 73.5		

(1) Aluminum Association Temper Registration Property Minimums (T99 Basis) (2) Fracture toughness properties are typical.

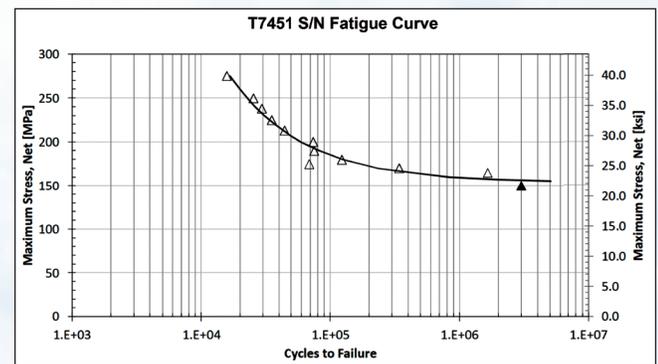
T7451 FATIGUE CRACK GROWTH CHART

Fatigue crack growth rate was tested using a compact tension (CT) specimen according to ASTM E647. A typical L-T orientation fatigue crack growth (FCG) curve is shown for a 4" (102 mm) gauge specimen. The specimen was tested at T/4, W/3 position.



T7451 S/N FATIGUE CURVE

S/N fatigue was tested using an open hole test specimen according to ASTM E466. A typical L-T orientation curve is shown for a 4" (102 mm) gauge specimen.



Open Hole
 $K_t = 2.3$
 $R = 0.1$
 L-T direction
 T/4, W/3 position
 $f = 30$ Hz

Δ L-T $K_t = 2.3$
 — L-T $K_t = 2.3$ Curve Fit
 ▲ L-T $K_t = 2.3$ Runout

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