



ALLOY 7150-T7751 PLATE AND 7150-T77511 EXTRUSIONS

**SUPERIOR COMBINATION OF HIGH STRENGTH-
GOOD CORROSION RESISTANCE**

SUPPLYING THE WORLD'S BEST



ALLOY 7150-T7751 PLATE & 7150-T77511 EXTRUSIONS

MAJOR BREAKTHROUGH

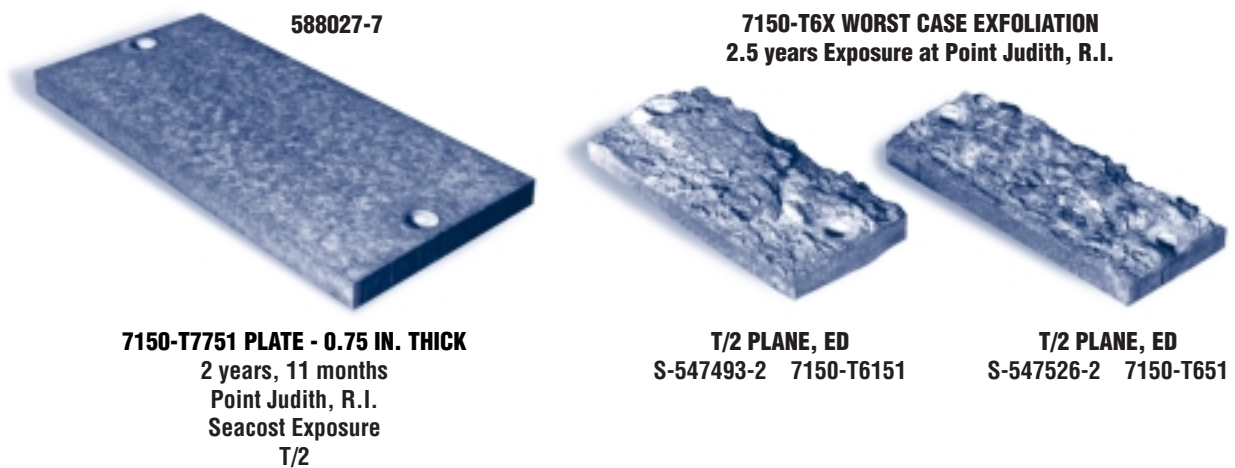
Alloy 7150-T77 provides an unsurpassed combination of high strength and corrosion resistance compared to other 7XXX series aerospace alloys of similar strength. Alloy 7150-T77 provides peak strength through the Alcoa-patented-T77 aging process.

CORROSION RESISTANCE

Alcoa guarantees an accelerated test exfoliation rating of EB or better for 7150-T7751 plate and 7150-T77511 extrusions, based on the 48-hour ASTM G34 EXCO test. This performance level is equivalent to other 7XXX-series alloys in an "exfoliation resistant" -T76 condition.

The accompanying photographs display the results of long-term, aggressive seacoast atmospheric exposure. T/2 plane specimens of 7150-T7751 plate display a typical behavior of "P" (pitting and no exfoliation) after a 2 year, 11 month exposure. For comparison, T/2 plane specimens of similar-strength 7150-T6 plates are rated ED (severe exfoliation) after exposure of 2 years and 6 months. This severe corrosion condition is not considered unusual for 7XXX-T6 alloys exposed at seacoast for this duration.

Alloy 7150-T77 also provides good stress corrosion cracking resistance. When specified, Alcoa will certify that 7150-T7751 plate and 7150-T77511 extrusions pass the 20-day alternate immersion test per ASTM-G47 at 25 ksi (172 MPa) short transverse applied stress. Other guarantees are subject to inquiry.



APPLICATIONS IN SERVICE

Stiffened upper wing panels and lower horizontal stabilizer panels of Alloy 7150-T7751 plate and 7150-T77511 extrusions are now in service on numerous civil and military transport aircraft. The alloy and temper are effective in compression-loaded stiffened panels requiring a combination of high compressive yield strength, moderately high toughness, good fatigue and corrosion resistance vs. stiffened panels made from earlier products such as 7150-T6 or 7075-T6.

Other successful applications of 7150-T77 include: extruded fuselage stringers, fuselage keel beams, and airline passenger seal tracks.

Alloy 7150-T77 provides weight savings opportunities in structure governed by static strength requirements but where “overaged” condition corrosion resistance is required.

PROCUREMENT SPECIFICATIONS

Plate

Temper 7150-T7751
 Specification . . . AMS 4252
 MIL-HDBK-5
 Coverage Approved

Extrusion

Temper 7150-T77511
 Specification . . . AMS-4345
 MIL-HDBK-5
 Coverage Approved

“S”-BASIS MINIMUM LONGITUDINAL PROPERTY COMPARISONS OF 1.001 INCH (25.2 MM) PLATE. UNITS: ksi (MPa)

Alloy/Temper	Ultimate Tensile Strength	Tensile Yield Strength	Compressive Yield Strength	Elongation %	EXCO Rating
7150-T7751	84 (579)	78 (538)	77 (531)	8	EB
7150-T6151	84 (579)	78 (538)	75 (517)	9	EC (Typ.)
7075-T651	76 (524)	69 (476)	66 (455)	6	ED (Typ.)
7050-T7651	77 (531)	67 (462)	64 (441)	8	EB
7075-T7651	70 (483)	59 (407)	59 (407)	6	EB

“S”-BASIS MINIMUM 7150-T7751 PLATE PROPERTIES

	in.	0.250-0.499	0.500-0.749	0.750-1.000	1.001-1.500	1.501-3.000
	mm	(6.35-12.69)	(12.70-19.04)	(19.05-25.40)	(25.41-38.10)	(38.11-76.20)
Ultimate Tensile Strength	L	80 (552)	83 (572)	84 (579)	84 (579)	82 (565)
	LT	80 (552)	83 (572)	84 (579)	84 (579)	82 (565)
	ST	-	-	-	-	77 (531)
Tensile Yield Strength	L	74 (510)	77 (531)	78 (538)	78 (538)	76 (524)
	LT	74 (510)	76 (524)	76 (531)	77 (531)	75 (517)
	ST	-	-	-	-	67 (462)
Compressive Yield Strength	L	73 (503)	76 (524)	77 (531)	77 (531)	75 (517)
	LT	77 (531)	79 (545)	81 (558)	81 (558)	79 (545)
Elongation %	L	8	8	8	8	7
	LT	8	8	8	8	6
	ST	-	-	-	-	1
K _{IC} , ksi√in. (MPa√m)	L-T	-	-	20 (22.0)	22 (24.2)	inquire
	T-L	-	-	18 (19.8)	20 (22.0)	inquire

ALLOY 7150-T7751 PLATE & 7150-T77511 EXTRUSIONS

“S”-BASIS MINIMUM 7150-T77511 EXTRUSION PROPERTIES

	in. mm	0.040-0.249 (1.00-6.34)	0.250-0.499 (6.35-12.69)	0.500-0.749 (12.70-19.04)	0.750-2.000 (19.05-50.80)
Ultimate Tensile Strength	L	85 (594)	87 (608)	88 (615)	89 (622)
	LT	81 (566)	82 (573)	83 (580)	83 (580)
Tensile Yield Strength	L	78 (545)	82 (573)	83 (580)	84 (587)
	LT	74 (510)	76 (531)	79 (552)	78 (545)
Compressive Yield Strength	L	78 (545)	82 (573)	83 (580)	85 (594)
	LT	76 (531)	80 (559)	81 (566)	82 (573)
Elongation %	L	7	8	9	8
K _{IC} , ksi√in. (MPa√m)	T-L	-	-	-	21 (23.1)
	T-L	-	-	-	17 (18.7)

(Max. area, 20 sq. in., Max. circle diameter, 10 in.)

7 1 5 0 - T 7 7 S T A T U S

Statistically based “A” and “B” design mechanical and physical properties are available in specific thickness ranges upon inquiry.

Alcoa does not provide guidelines for user solution heat treatment and artificial aging to -T77 condition at the present time. For artificial age forming in an autoclave, “TAF-temper” condition is available subject to inquiry.

Extruded stepped shapes are not available in 7150-T77511.

H I S T O R Y

Alcoa has pioneered the development of the -T77 temper, a high strength corrosion resistant temper for Alloy 7150 plate and extrusions.

Before development of the -T77 temper, corrosion resistance could be improved by artificially aging beyond the point of peak strength to a -T76 condition, which significantly reduced static strength.



PRODUCT SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE

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