



DESCRIPTION

Alcoa introduced alloy 7055 in the -T7751 temper for plate and the -T77511 for extrusions in 1991. This new 7XXX alloy was specifically developed for use in compression-dominated structures and provides advantages over alloy 7150 in compressive and tensile strengths while maintaining other important properties such as fracture toughness and corrosion resistance.

Alloy 7055-T7751 plate is available in thicknesses from 0.375 in. (9.53mm) to 1.25 in. (31.75mm) in widths up to 110 in. (2.79m). Alloy 7055-T77511 extrusions are available with wall thicknesses from 0.5 in. (12.7mm) to 2.5 in. (63.5mm) with a maximum circle size of 10 in. (254mm).

APPLICATIONS

Alloy 7055 in the -T77 temper is best suited for applications where compressive strength is the critical design criteria such as upper wing structures, horizontal stabilizer, and keel beams. Other potential applications include seat and cargo tracks. When compared to 7150-T651 or -T7751, 7055-T77 typically provides a 7 to 10% increase in specific minimum compressive and tensile yield strength. The advantage of increased compressive strength of alloy 7055 permits significant weight savings when compared to alloy 7150.

CHEMICAL COMPOSITION LIMITS (WT.%)

	Alloy 7150	Alloy 7055		Alloy 7150	Alloy 7055
Si	0.12	0.10	Zr	0.08-0.15	0.08-0.25
Fe	0.15	0.15	Ti	0.15	0.06
Cu	1.9-2.5	2.0-2.6	Others, each	0.05	0.05
Mn	0.10	0.05	Others, total	0.15	0.15
Mg	2.0-2.7	1.8-2.3	Balance	Aluminum	Aluminum
Cr	0.04	0.04	Note: Value maximum if range not shown		
Zn	5.9-6.9	7.6-8.4			

**MECHANICAL PROPERTIES (ROOM TEMPERATURE)
TYPICAL PROPERTIES (DESIGN ALLOWABLE DATA EXISTS)**

	1 in. (25.4mm) Plate		1 in. (25.4mm) Extrusion	
	7150-T7751	7055-T7751	7150-T77511	7055-T77511
F _{tu} , ksi (MPa)				
L	88 (607)	92 (634)	94 (648)	97 (669)
LT	88 (607)	93 (641)	86 (593)	91 (627)
F _{ty} , ksi (MPa)				
L	83 (572)	89 (614)	89 (614)	95 (655)
LT	82 (565)	89 (614)	82 (565)	89 (614)
F _{cy} , ksi (MPa)				
L	82 (565)	90 (621)	92 (634)	97 (669)
LT	87 (600)	94 (648)		
e, percent				
L	12	11	12	11
LT	11	10	9	10

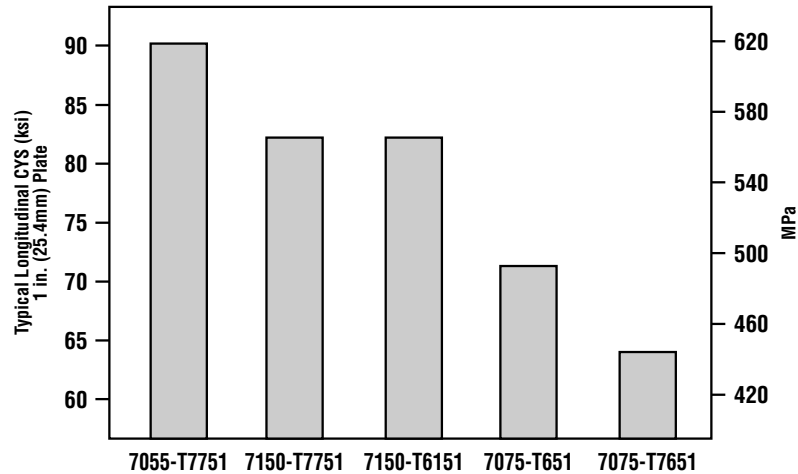
SUPPLYING THE WORLD'S BEST



ALCOA MILL PRODUCTS, INC.

P.O. BOX 8025 • BETTENDORF, IOWA 52722 • (800) 523-9596 • www.millproducts-alcoa.com

TYPICAL COMPRESSIVE YIELD STRENGTH OF 7055-T7751 1 IN. (25.4 MM) PLATE VS. CONVENTIONAL 7XXX SERIES ALLOYS



CORROSION RESISTANCE

Exfoliation Corrosion Resistance

Alloy 7055-T7751 plate has shown no exfoliation after 2 years exposure in a seacoast environment at Point Judith, Rhode Island. This performance is significantly better than 7075-T651. The current ASTM G34 (EXCO) accelerated exfoliation test does not consistently rate 7055-T7751 plate in a manner that correlates with the Point Judith, Rhode Island, seacoast exposure performance. Alcoa is developing a 4 day, accelerated ANCIT (Aluminum-Nitrate-Chloride-Immersion Test) exfoliation test that should provide good correlation of outdoor exposure with the laboratory accelerated test.

Stress Corrosion Cracking (SCC) Resistance

The SCC capability has not been fully defined in the short transverse direction for alloy 7055-T77. Based on data currently available, a 15 ksi (103 MPa) capability is expected for both -T7751 plate and -T77511 extrusions when tested according to ASTM G47. The 7055-T77 SCC capability is between 7150-T61 and 7150-T77 plate and extrusions.

FATIGUE AND FATIGUE CRACK GROWTH

The fatigue and fatigue crack growth performance of alloy 7055 products are comparable to those of 7150-T77 and 7150-T6 products.

FRACTURE TOUGHNESS (ROOM TEMPERATURE) TYPICAL PROPERTIES

K _{IC} :ksi√in. (MPa√m)	1 in. (25.4mm) Plate		1 in. (25.4mm) Extrusion	
	7150-T7751	7055-T7751	7150-T77511	7055-T7751
L-T	27 (29.7)	26 (28.6)	27 (29.7)	30 (33.0)
T-L	24 (26.4)	24 (26.4)	22 (24.2)	25 (27.5)



PRODUCT SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE

ALCOA MILL PRODUCTS, INC.

P.O. BOX 8025 • BETTENDORF, IOWA 52722 • (800) 523-9596 • www.millproducts-alcoa.com

ACRP-069-B