

Table 7.2: Mechanical Property Limits – Extruded Products (continued)

Alloy and Temper	Thickness ¹ (mm) Over Up to	Tensile Strength (MPa)				Elongation ^{2,3} (% min in 50 mm or 5.65 √A)
		Ultimate min	Ultimate max	Yield min	Yield max	
6262 – T6	All thicknesses	280	240		8	
6060 – O ⁵	All thicknesses	130			16	
6060 – T1	– 12.0	115	60		12	
	– 25.0	110	55		10	
6060 – T5	– 12.0	150	110		8	
	– 25.0	145	105		8	
6060 – T52 ⁷	– 12.0	150	110		8	
6063 – O ⁵	All thicknesses	130			16	
6063 – T1	– 12.0	115	60		12	
	– 25.0	110	55		10	
6063 – T4 & T42 ⁶	– 150.0	130	70		12	
6063 – T5	– 12.0	150	110		8	
	– 25.0	145	105		6	
6063 – T52 ⁷	– 12.0	150	110		8	
6063 – T6 & T62 ⁶	– 25.0	205	170		8	
	– 185	150.0	160		10	
6063 – H112	All thicknesses	110			13	
6106 – T4 & T42 ⁶	– 150.0	130	70		12	
6106 – T6 & T62 ⁶	– 10.0	235	210		8	
	– 20.0	205	170		8	
	– 25.0	185	160		10	
6463A – T1	– 12.0	115	80		12	
6463A – T5	– 12.0	150	110		8	
6463A – T6	– 3.0	205	170		8	
	– 12.0	205	170		10	
6005A – T4	– 12.0	180	110		14	
6005A – T6	All thicknesses	260	240		8	
6261 – T1	All thicknesses	190	115		14	
6261 – T5	– 5.0	295	255		7	
	– 10.0	280	240		7	
6261 – T6 & T62 ⁶	All thicknesses	295	255		7	
7005 – T53	– 20.0	350	300		10	

Footnotes

- ¹ The thickness of the cross-section or wall thickness from which the tensile specimen is taken determines the applicable mechanical properties. See 'Sampling and Testing', Section 4, pages 4.4 to 4.6 for number, types and location of tensile test specimens.
- ² For material of such dimensions that a standard test specimen cannot be taken, or for material thinner than 1.6 mm, the test for elongation is not required.
- ³ A = cross-sectional area of specimen.
- ⁴ These yield strengths are not determined or guaranteed unless specifically requested.
- ⁵ Annealed (O temper) material shall, upon heat treatment or heat treatment and ageing, be capable of developing the mechanical properties applicable to T42 or T62 temper material respectively.
- ⁶ Material heat-treated from any temper by the user should attain the mechanical properties applicable to this temper.
- ⁷ A temper satisfying T5 requirements with improved formability.

Table 4.1: Chemical Composition Limits of Registered Alloys^{1,2} (continued)

International Registered Designation	Silicon	Iron	Copper	Manganese	Magnesium	Chromium	Zinc	Titanium	Aluminum
5154A	0.50	0.50	0.10	0.10-0.50	3.1-3.9	0.25	0.20	0.20	0.15
5454	0.25	0.40	0.10	0.50-1.0	2.4-3.0	0.05-0.20	0.25	0.20	0.15
5056	0.30	0.40	0.10	0.05-0.20	4.5-5.5	0.05-0.20	0.10	0.05-0.20	0.15
5356	0.25	0.40	0.10	0.05-0.20	4.5-5.5	0.05-0.20	0.10	0.05	0.15
5457	0.08	0.10	0.20	0.15-0.45	0.8-1.2	0.05	0.05	0.05 V	0.10
5557	0.10	0.12	0.15	0.10-0.40	0.40-0.8	0.15	0.25	0.10	0.10
5082	0.20	0.35	0.15	0.15	4.0-5.0	0.15	0.25	0.10	0.15
5083	0.40	0.40	0.10	0.40-1.0	4.0-4.9	0.05-0.25	0.25	0.15	0.15
5086	0.40	0.50	0.10	0.20-0.7	3.5-4.5	0.05-0.25	0.25	0.15	0.15
5182	0.20	0.35	0.15	0.20-0.50	4.0-5.0	0.10	0.25	0.10	0.15
6060	0.30-0.6	0.10-0.30	0.10	0.10	0.35-0.6	0.05	0.15	0.10	0.15
6103	0.35-1.1	0.6	0.8	0.2-0.3	0.8-1.5	0.35	0.20	0.10	0.15
6261	0.4-0.7	0.40	0.15-0.40	0.20-0.35	0.7-1.0	0.10	0.20	0.10	0.15
6106	0.30-0.6	0.35	0.25	0.05-0.20	0.40-0.8	0.20	0.10	0.05	0.10
6005A	0.50-0.9	0.35	0.3	0.50	0.40-0.7	0.30	0.20	0.10	0.15
6082	0.70-1.3	0.50	0.10	0.40-1.0	0.6-1.2	0.25	0.20	0.10	0.15
6061A	0.40-0.8	0.7	0.15-0.70	0.15	0.8-1.2	0.04-0.35	0.25	0.15	0.15
6003	0.35-1.0	0.6	0.8	0.8	0.8-1.5	0.35	0.20	0.10	0.15
6101	0.30-0.7	0.50	0.10	0.35-0.8	0.35-0.8	0.03	0.10	0.03	0.10
6201A	0.50-0.7	0.50	0.04	0.5	0.5-0.9	0.06 B	0.06 B	0.03	0.10
6351	0.7-1.3	0.50	0.10	0.40-0.8	0.40-0.8	0.20	0.20	0.20	0.15
6523	0.7-1.3	0.50	0.10	1.0-1.5	0.4-0.35	0.04-0.35	1.6-2.4	0.05	0.15
6561	0.40-0.8	0.7	0.15-0.40	0.15	0.8-1.2	0.04-0.35	0.25	0.15	0.15
6262	0.40-0.8	0.7	0.15-0.40	0.15	0.8-1.2	0.04-0.14	0.25	0.15	0.15
6063	0.20-0.6	0.35	0.10	0.45-0.9	0.45-0.9	0.10	0.10	0.10	0.15
6463A	0.20-0.6	0.15	0.25	0.05	0.30-0.9	0.05	0.05	0.05	0.15
7005	0.35	0.40	0.10	0.20-0.7	1.0-1.8	0.06-0.20	4.0-5.0	0.01-0.06	0.15
7072	0.7 Si + Fe	0.10	0.10	0.10	1.0-1.8	0.06-0.20	4.0-5.0	0.01-0.06	0.15
8006	0.40	1.2-2.0	0.30	0.30-1.0	0.10	0.05	0.10	0.10	0.15
8008	0.6	0.9-1.6	0.20	0.50-1.0	0.10	0.05	0.10	0.10	0.15
8011	0.50-0.9	0.6-1.0	0.10	0.10	0.05	0.05	0.10	0.08	0.15

For footnotes, see Page 4.9

Table 2.1: Typical Mechanical Properties¹ (continued)

Alloy and Temper	Tensile Strength (MPa)		Elongation (% min in 50 mm, 1.5 mm thick specimen)	Hardness ²		Shear Strength, Ultimate (MPa)	Fatigue Strength Endurance Limit ³ (MPa)	Modulus of Elasticity ⁴ (MPa x 10 ³)
	Ultimate	Yield		Vickers	Brinell (500 kg load 10 mm ball)			
6063 - O	90	50	30	30	25	69	55	69
- T1	150	90	20	45	42	97	62	69
- T31	180		12					69
- T32	205	8	8					69
- T33	260	240	20					69
- T34	340	325	15					69
- T4	170	90	22		48	110	69	69
- T5	220	180	12		73	117	69	69
- T6	240	215	12			152	69	69
- T81	250	230	11	85				69
- T82	250	255	9					69
- T83	280	270	8	90	82	152	69	69
- T84	315	305						69
- H112	150	90	20	45		97	62	69
- H14	160	95	18					69
- H18	200	150	8					69
6005A - T5	285	265	12					
6060 - O	90	50	30					
- T1	150	70	20					
- T5	220	180	12	70	68			
- T52	190	130	15					
- T81	250	230	11					
6106 - T4	180	90	22					
- T6	250	230	13					
- T83	300	270	12					
6463A - T1	150	90	20		42	97	69	69
- T5	185	145	12		60	117	69	69
- T6	240	215	12		74	152	69	69
8011 - O	90	35	30					69
- H12	115	105	10					69
- H14	130	120	8					69
- H16	150	140	5					69
- H18	175	160	4					69

Footnotes

- ¹ These typical properties are averages for various forms, sizes and methods of manufacture and may not exactly describe any one particular product. **Typical tensile strength and elongation properties should not be used for design purposes.**
- ² Hardness is commonly reported in either of the two units quoted. A complete listing in both units is not given because of difficulties of exact correlation between the two systems.
- ³ Based on 500,000 cycles of completely reversed stress using the R. R. Moore type of machine and specimen.
- ⁴ Average of tension and compression moduli. Compression modulus is about 2% greater than tension modulus.
- ⁵ Round test specimens used.