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MECHANICAL PROPERTY LIMITS
FOR ALUMINIUM ALLOY FORGINGS

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MECHANICAL PROPERTY LIMITS FOR ALUMINIUM ALLOY FORGINGS

1. SCOPE

The grades or alloys listed in this ISO Recommendation are those the designation and chemical composition of which are specified in ISO Recommendation R 209-1968, *Composition of wrought products of aluminium and aluminium alloys.*

The property limits given in section 3 apply to test pieces of not more than 30 mm ($1\frac{1}{4}$ in) diameter or thickness, adequately forged from the forging stock which may be cast, extruded or rolled. Alternatively, the test pieces may be cut from forgings of not more than 75 mm (3 in) thickness, except that the elongation values should be reduced to 70 % of the listed values.

The test of the separately forged test pieces or of test pieces cut from forgings should be made in the direction of major metal flow.

Before comparing them with the limiting values listed in section 3, the measured or calculated values of 0.2 % proof stress or yield strength [$R_c(0.2)$], or of tensile strength (R_m), should be rounded off to the nearest 0.1 kgf/mm^2 (or 100 lbf/in^2) and those of the percentage elongation (A) to the nearest 1 % (see Annexes A and B of ISO Recommendation R 826, *Mechanical property limits for rolled products of aluminium and aluminium alloys*).

2. SYMBOLS AND ABBREVIATIONS

The symbols and abbreviations used in section 3 have the following meanings :

R_c (0.2)	:	0.2 % proof stress or yield strength
R_m	:	Tensile strength
A	:	Percentage elongation after fracture
S_o	:	Original cross-sectional area of the gauge length of the test piece
1 kgf/mm^2	:	1 kilogramme-force per square millimetre = about 9.8 N/mm^2 (newton per square millimetre)
1000 lbf/in^2	:	1000 pounds-force per square inch = about 6.9 N/mm^2

3. MECHANICAL PROPERTY LIMITS

Alloy	Condition	R_c (0.2) min.		R_m min.		A min. on	
						$5.65\sqrt{S_o}$	50 mm (2 in)
		kgf/mm^2	1000 lbf/in^2	kgf/mm^2	1000 lbf/in^2	%	%
Al-Si1 Mg	solution treated and naturally aged	12.0	17.0	19.0	27.0	15	15
	solution treated and precipitation treated	25.0	35.5	30.0	43.0	8	8
Al-Mg1 Si Cu	solution treated and precipitation treated	24.0	34.0	27.0	38.0	8	8
Al-Cu4 Mg Si	solution treated and naturally aged	21.0	30.0	36.0	51.0	11	11
Al-Cu4 Mg1	solution treated and naturally aged	27.0	38.0	40.0	57.0	11	11
Al-Cu4 Si Mg	solution treated and naturally aged	21.0	30.0	36.0	51.0	11	11
	solution treated and precipitation treated	37.0	53.0	42.0	60.0	6	6