

Aerospace Material Specification  
**BARS AND EXTRUDED SECTIONS**  
**OF ALUMINIUM-ZINC-MAGNESIUM-COPPER-CHROMIUM ALLOY**  
(Solution treated and precipitation treated)  
(Zn 5.7, Mg 2.5, Cu 0.5, Cr 0.15)

*NOTE. This specification is one of a series issued by the Procurement Executive, Ministry of Defence to meet a requirement not covered by an existing British Standard for aerospace material.*

**1. INSPECTION AND TESTING PROCEDURE**

This specification shall be used in conjunction with the relevant sections of British Standard L.100 as follows:

Bars for machining and extruded sections	Sections 1 and 5
Bars for machining and extruded sections for high stressed structures	Sections 1 and 6

**2. QUALITY OF MATERIAL**

The material shall be made from aluminium and alloying constituents, with or without approved scrap, at the discretion of the manufacturer.

**3. CHEMICAL COMPOSITION**

The chemical composition of the material shall be:

Element	Per cent	
	min	max
Copper	0.3	0.7
Magnesium	2.2	3.2
Silicon	—	0.5
Iron	—	0.5
Manganese	—	0.3
*Nickel	—	0.1
Zinc	5.2	6.2
*Lead	—	0.05
*Tin	—	0.05
Titanium plus Zirconium	—	0.2
Chromium	0.08	0.25
Chromium plus Manganese	0.18	0.50
Aluminium	The remainder	

\*Subject to the discretion of the Inspecting Authority, determination of these elements need be made on a small proportion only of the samples analysed.

**4. CONDITION**

**4.1 Bars and extruded sections.** Unless otherwise agreed and stated on the order in accordance with British Standard L.100, Section 5, bars for machining and extruded sections shall be supplied solution treated, straightened and subsequently precipitation treated, but not controlled stretched.

**4.2 Bars and extruded sections for highly stressed structures.** Unless otherwise agreed and stated on the order in accordance with British Standard L.100, Section 6, bars for machining and extruded sections for highly stressed structures shall be supplied solution treated, controlled stretched and subsequently precipitation treated.

## 5. HEAT TREATMENT

The material shall be heat treated as follows:

- (1) Solution treat by heating at a temperature of  $460 \pm 10^\circ\text{C}$  and quenching in water or oil.

*NOTE.* Material that has not to be subsequently stretched shall be quenched in water at a temperature of not less than  $85^\circ\text{C}$  or in oil.

- (2) Precipitation treat by heating at a temperature of  $135 \pm 5^\circ\text{C}$  for not less than 12 hours.

## 6. MECHANICAL PROPERTIES

### 6.1 Tensile test

**6.1.1 Controlled-stretched material.** Unless they are required by British Standard L.100 to be fixed by agreement between the manufacturer and the purchaser, the mechanical properties obtained from test pieces selected and prepared in accordance with the relevant requirements of British Standard L.100 shall be not less than the following values:

Diameter or minor sectional dimension of the bar or extruded section		0.2% proof stress	Tensile strength	Elongation on gauge length of	
				50 mm	$5.65 \sqrt{S_0}$
mm		N/mm <sup>2</sup>	N/mm <sup>2</sup>	%	%
Over	Up to and including				
	10	450	490	6	—
10	100	480	540	6	6
100	150	450	510	—	6

*NOTE.*  $1 \text{ N/mm}^2 = 0.102 \text{ kgf/mm}^2 = 0.1 \text{ hbar} = 0.065 \text{ tonf/in}^2$ . Information on SI units is given in BS 350, 'Conversion factors and tables', and in PD 5686, 'The use of SI units'.

**6.1.2 Non-controlled stretched material.** The mechanical properties shall be agreed between the manufacturer and the purchaser.

### 6.2 Hardness test. Table showing value of X:

Tensile strength of test piece*	Value of X
N/mm <sup>2</sup>	%
$f_t$ to less than $f_t + 15$	5
$f_t + 15$ to less than $f_t + 30$	7.5
$f_t + 30$ to less than $f_t + 45$	10
$f_t + 45$ and over	12.5

\* $f_t$  = minimum value for the particular size of material as specified in 6.1.1, or agreed in accordance with 6.1.2.

Approved for issue,

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