

Specification for

**Plate of aluminium-  
copper-magnesium-  
silicon-manganese  
alloy —**

**(Solution treated, controlled stretched  
and precipitation treated)  
(Cu 4.4, Mg 0.5, Si 0.7, Mn 0.8)**

UDC 629.7:669.715'3'721'782'74-41

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### Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 3 and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

This British Standard, having been approved by the Aerospace Industry Standards Committee, was published under the authority of the Executive Board of the Institution on 31 August 1971

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The following BSI references relate to the work on this standard:  
Committee reference ACE/24  
Draft for comment 69/23023

ISBN 0 580 06984 2

### Amendments issued since publication

Amd. No.	Date of issue	Comments
6841	November 1991	Indicated by a sideline in the margin

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NOTE 1 This British Standard covers plate, including that which has been forged as an intermediate operation, which is finished by hot or cold rolling. It does not cover forged plate which should be ordered to BS L 77.

NOTE 2 If material to this British Standard is re-solution treated but not again controlled stretched, it must be regarded as being in the solution treated and precipitation treated, but not controlled stretched, condition, even though the specified mechanical properties are obtained. Plate of this composition in that condition is covered by BS L 94.

NOTE 3 The specified chemical composition and mechanical properties meet the requirements of A.I.C.M.A. Recommendation AL.P12.

NOTE 4 Other forms of material of similar composition are covered by British Standards as listed in Appendix A.

## 1 Inspection and testing procedure

This British Standard shall be used in conjunction with Sections 1 and 14 of BS L 100.

## 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	%	
	min.	max.
<b>Copper</b>	<b>3.9</b>	<b>5.0</b>
<b>Magnesium</b>	<b>0.20</b>	<b>0.8</b>
<b>Silicon</b>	<b>0.50</b>	<b>0.90</b>
Iron	—	0.5
<b>Manganese</b>	<b>0.40</b>	<b>1.2</b>
Nickel <sup>a</sup>	—	0.2
Zinc <sup>a</sup>	—	0.2
Lead <sup>a</sup>	—	0.05
Tin <sup>a</sup>	—	0.05
Titanium plus Zirconium <sup>a</sup>	—	0.2
Chromium <sup>a</sup>	—	0.10
<b>Aluminium</b>	—	<b>The remainder</b>

<sup>a</sup> 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 Except as provided in 4.2, the material shall be supplied solution treated, controlled stretched, to a permanent extension of not less than 1½ % nor more than 3 %, and precipitation treated.

4.2 If agreed between the manufacturer and the purchaser and stated on the order, the material shall be supplied solution treated and controlled stretched to a permanent extension of not less than 1½ % nor more than 3 %. No other alternative condition of supply is permissible.

## 5 Heat treatment

The material shall be heat treated as follows:

- 1) Solution treat by heating at a temperature of  $505 \pm 5$  °C and quenching in water at a temperature not exceeding 40 °C.
- 2) Precipitation treat by heating uniformly for the requisite period at a temperature between 160 °C and 190 °C.

NOTE The following temperatures and times at temperature have been found appropriate:

Temperature	Time at temperature
°C	hours
165	12 to 18
175	9 to 12
185	3 to 6

## 6 Mechanical properties

**6.1 Tensile test.** The mechanical properties obtained from test pieces selected and prepared in accordance with the relevant requirements of BS L 100 shall be not less than the following values:

Nominal thickness	Direction	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 6	Up to and including 12.5	410	460	7	—	
12.5	25					
25	40	Longitudinal	410	450	—	6
		Long transverse	400	450	—	5
		Short transverse	360	420	—	2.5
40	63	Longitudinal	400	430	—	6
		Long transverse	390	430	—	5
		Short transverse	360	420	—	2.5
63	90	Longitudinal	400	430	—	6
		Long transverse	390	430	—	4
		Short transverse	360	420	—	2.5
90	115	Longitudinal	380	430	—	6
		Long transverse	370	420	—	4
		Short transverse	340	410	—	2.5
115	140	Longitudinal	360	420	—	6
		Long transverse	350	410	—	4
		Short transverse	340	400	—	2.5

NOTE 1 N/mm<sup>2</sup> = 1 MN/m<sup>2</sup> = 0.102 kgf/mm<sup>2</sup> = 0.1 hbar = 0.065 tonf/in<sup>2</sup>. Information on SI units is given in BS 3763 "The International System of units (SI)", and in PD 5686, "The use of SI units". See also BS 350, "Conversion factors and tables".

## Appendix A British Standards covering other forms of material of similar composition

Form	Solution treated and aged at room temperature	Solution treated and precipitation treated	Supplied for solution treatment by the user
Bars and extruded sections (not exceeding 200 mm diameter or minor sectional dimension)	BS L 102	BS L 65	—
Forging stock and forgings	BS L 103	BS L 77	—
Hexagonal bars for nuts, couplings and hollow machined parts (free from peripheral and asymmetric coarse grain)	—	BS L 87	—
Sheet and strip	BS L 70	BS L 104	BS L 106 <sup>a</sup>
Aluminium-coated sheet and strip	BS L 72	BS L 73	BS L 107 <sup>a</sup>
Close toleranced sheet and strip (aluminium-coated)	BS L 89	BS L 90	BS L 108 <sup>a</sup>
Tube (not exceeding 10 mm wall thickness)	BS L 105	BS L 63	—
Wire for solid, cold-forged rivets (not exceeding 10 mm diameter)	—	—	BS L 37
Plate: not controlled stretched	—	BS L 94	—

<sup>a</sup> In course of preparation.

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