

Specification for

**Tube of aluminium —
2¼ % magnesium
alloy —**

**(Temper designation—0)
(Seamless: tested hydraulically)
(Not exceeding 12 mm wall thickness)**

UDC 629.7:669.715'721-462

Confirmed
January 2011

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Aerospace Standards Committee (ACE/-) to Technical Committee ACE/24 upon which the following bodies were represented:

Aluminium Federation
Aluminium Stockholders' Association
Association of Light Alloy Refiners Limited
BNF Metals Technology Centre
British Forging Industry Association
British Industrial Fasteners Federation
British Investment Casting Trade Association
Institute of British Foundrymen
Light Metal Founders' Association
Magnesium Industry Council
Ministry of Defence
Society of British Aerospace Companies Limited

This British Standard, having been prepared under the direction of the Aerospace Standards Committee, was published under the authority of the Board of BSI and comes into effect on 28 February 1986

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The following BSI references relate to the work on this standard:
Committee reference ACE/24
Draft for comment 81/77624 DC

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Amendments issued since publication

Amd. No.	Date of issue	Comments
5993	August 1988	Indicated by a sideline in the margin

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NOTE 1 Other forms of material of similar composition are covered by the following British Standards:

BS L 44, *Forging stock, bars, extruded sections and forgings.*

BS L 80, *Sheet and strip (Temper designation—0).*

BS L 81, *Sheet and strip (Temper designation H16 or H26).*

NOTE 2 The chemical composition of this material complies with that registered as International Designation 5251.

NOTE 3 The title of the publication referred to in this standard is listed on the inside back cover.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 and 2, an inside back cover 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.

1 Inspection and testing procedure

This British Standard shall be used in conjunction with the relevant sections of the latest issue of BS L 100.

2 Quality of material

The material shall be made from aluminium of the chemical composition specified in clause 3, with or without approved scrap at the discretion of the manufacturer.

NOTE In the manufacture of this tube, the use of bridge or port dies is prohibited.

3 Chemical composition

The chemical composition of the material shall be:

Element	%	
	min.	max.
Silicon	—	0.40
Iron	—	0.50
Copper	—	0.15
Manganese	0.10	0.50
Magnesium	1.70	2.40
Chromium	—	0.15
Zinc ^a	—	0.15
Titanium ^a	—	0.15
Others: each	—	0.05
Others: total	—	0.15
Aluminium	—	Remainder

^a Subject to the discretion of the Quality Assurance Authority, determination of these elements need be made on a small proportion only of the samples analysed.

4 Condition

The tube shall be supplied softened and suitable for manipulation.

5 Heat treatment

None.

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:

0.2 % proof stress	Tensile strength		Elongation on gauge length of 50 mm
	min.	max.	
MPa	MPa	MPa	%
60	160	200	18

6.2 Single drifting test. The specified percentage of the tubes shall be subjected to the single drifting test.

6.3 Hydraulic distention test. One sample of the tube at least 500 mm long in each batch shall be tested to the appropriate pressure determined from the following formula, subject to a maximum of 27.6 MPa and a minimum of 1.4 MPa:

$$\text{Pressure (Mpa)} = 130 \times \frac{\text{Nominal wall thickness}}{\text{Nominal outside diameter}}$$

The sample tube shall not burst, nor show a permanent increase in mean diameter greater than 0.2 %.

Examples of the application of this formula are given in the following table:

Nominal outside diameter	Nominal wall thickness (mm)							
	0.3	0.4	0.5	0.6	0.8	1.0	1.2	1.6
	Test pressure (MPa)							
mm								
3.2	12.2	16.3	20.3	24.4	27.6	27.6	27.6	
4	9.8	13.0	16.3	19.5	26.0	27.6	27.6	27.6
5	7.8	10.4	13.0	15.6	20.8	26.0	27.6	27.6
10	3.9	5.2	6.5	7.8	10.4	13.0	15.6	20.8
14	2.8	3.7	4.6	5.6	7.4	9.3	11.2	14.9
20	2.0	2.6	3.3	3.9	5.2	6.5	7.8	10.4
25	1.6	2.1	2.6	3.1	4.2	5.2	6.2	8.3
30	1.4	1.7	2.2	2.6	3.5	4.3	5.2	7.0
50	1.4	1.4	1.4	1.6	2.1	2.6	3.1	4.2
100	1.4	1.4	1.4	1.4	1.4	1.4	1.6	2.1

6.4 Bore test. The tube shall be subjected to the bore test.

7 Non-destructive testing

Each length of tube shall be tested in accordance with the method specified in ASTM E215-67 along its length for internal and external surface defects. Defect indications shall be less than from a 2A hole.

Publication referred to

BS L 100, *Procedure for inspection and testing of wrought aluminium and aluminium alloys.*

ASTM E215-67, *Standardizing equipment for electromagnetic testing of seamless aluminium alloy tube.* |

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