

Specification for

# Tube of 99 % aluminium —

**(Cold drawn: seamless: tested  
hydraulically)  
(Not exceeding 12 mm wall thickness)**

UDC 629.7:669.71-462

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
5994	August 1988	Indicated by a sideline in the margin

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NOTE 1 Heating material to this specification (e.g. to facilitate bending or forming) may reduce its strength to that of the annealed condition.

NOTE 2 Other forms of material of similar composition are covered by the following British Standards:

BS L 16, *Sheet and strip (Temper designation H14 or H24)*.

BS L 17, *Sheet and strip (Temper designation—0)*.

BS L 34, *Forging stock, bars, extruded sections and forgings*.

BS L 116, *Tube (Cold drawn: seamless: not tested hydraulically)*.

NOTE 3 The chemical composition of this material complies with that registered as International Designation 1200.

NOTE 4 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.

**Compliance with a British Standard does not of itself confer immunity from legal obligations.**

### **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 plus iron	—	1.00
Copper	—	0.05
Manganese	—	0.05
Zinc	—	0.10
Titanium	—	0.05
Others: each	—	0.05
Others: total	—	0.15
<sup>a</sup> Aluminium	99.00	—

<sup>a</sup>The aluminium content is the difference between 100.00 % and the sum of all the other metallic elements present in amounts of 0.01 % or more each, expressed to the second decimal place before determining the sum.

## 4 Condition

The tube shall be supplied cold drawn.

## 5 Heat treatment

None.

## 6 Mechanical properties

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

Nominal outside diameter	Tensile strength
mm	MPa
Up to and including 75	125
Over 75	110

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

NOTE The test pieces may be annealed before being tested.

**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 2.1 MPa:

$$\text{Pressure (Mpa)} = 170 \times \frac{\text{Nominal wall thickness}}{\text{Nominal outside diameter}}$$

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	15.9	21.3	26.6	27.6	27.6	27.6	27.6	
4	12.8	17.0	21.3	25.5	27.6	27.6	27.6	27.6
5	10.2	13.6	17.0	20.4	27.2	27.6	27.6	27.6
10	5.1	6.8	8.5	10.2	13.6	17.0	20.4	27.2
14	3.6	4.9	6.1	7.3	9.7	12.1	14.6	19.4
20	2.6	3.4	4.3	5.1	6.8	8.5	10.2	13.6
25	2.1	2.7	3.4	4.1	5.4	6.8	8.2	10.9
30	2.1	2.3	2.8	3.4	4.5	5.7	6.8	9.1
50	2.1	2.1	2.1	2.1	2.7	3.4	4.1	5.4
100	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.7

**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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