

Specification for

# Wire for solid cold-forged rivets of aluminium-copper- magnesium-silicon- manganese alloy —

(for use in the solution treated and  
naturally aged condition) (not  
exceeding 10 mm diameter) (Cu 4.4,  
Mg 0.5, Si 0.7, Mn 0.8) (2014A)

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January 2011

# Committees responsible for this British Standard

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

Aluminium Federation  
 Aluminium Stockholders' Association  
 Association of Light Alloy Refiners Ltd.  
 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 Ltd.

This British Standard, having been prepared under the direction of the Aerospace Standards Policy Committee, was published under the authority of the Board of BSI and comes into effect on 31 January 1990

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The following BSI references relate to the work on this standard:  
 Committee reference ACE/24  
 Draft for comment 87/75975 DC

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## Amendments issued since publication

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6625	December 1990	Indicated by a sideline in the margin

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## Foreword

This British Standard, having been prepared under the direction of the Aerospace Standards Policy Committee, is a revision of BS 6L 37:1971 which is withdrawn. This revision updates the specification and is presented in tabular format. The composition of this material corresponds with International Designation 2014A. 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 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 Scope

This British Standard specifies the chemical composition, heat treatment, mechanical properties and the inspection and testing procedures applicable to cold drawn wire of aluminium-copper-magnesium-silicon-manganese alloy supplied in the cold drawn condition for the manufacture of cold-forged solid rivets.

NOTE Rivets manufactured from wire to this standard require solution treatment immediately before installation.

## 2 References

This standard makes reference to the following publications.

BS 5555, *Specification for SI units and recommendations for the use of their multiples and certain other units.*

BS 5775, *Specification for quantities, units, and symbols.*

BS EN 2500, *Guidelines for the preparation and use of standards for metallic materials*<sup>1)</sup>.

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

ASTM E112-81, *Estimating the average grain size of metals*<sup>2)</sup>.

## 3 Technical requirements

The technical requirements for material to this standard shall comply with those specified in the table. All material supplied shall comply with the requirements appropriate to its dimensions and condition as specified in the standard given in line 5.1 of the table.

Symbols and units in the tables shall be interpreted in accordance with BS 5555, BS 5775 or BS EN 2500.

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<sup>1)</sup> In preparation.

<sup>2)</sup> Published by The American Society for the Testing of Materials and available from BSI Sales, Linford Wood, Milton Keynes MK14 6LE.

1	Chemical composition %		Element	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ti + Zr	Others		Al	
			Min.	0.50	—	3.9	0.40	0.20	—	—	—	—	—	—	—	—	—
	Max.	0.9	0.50	5.0	1.2	0.8	0.10	0.10	0.25	0.15	0.20	0.05	0.15				
2	1			2				3					4				
4	Form Method of production Limit dimensions			Wire Cold drawn $0 < D \leq 10$ mm													
5	5.1 Technical specification			BS L 100, sections 1 and 12													
6	6.1 Condition and heat treatment for delivery			Annealed and cold drawn to a cross-sectional reduction of 30 – 40 % (H13)													
7	Condition and heat treatment for use			H13 (1) As delivered													
8	Test piece heat treatment sampling			H13				0 (see line 29)				T42 (see line 29)					
9	Dimensions concerned		<i>D</i>	mm		$0 < D \leq 6$				$6 < D \leq 10$				$0 < D \leq 10$			
11	Direction of sample			L													
12	Tensile	Temperature	$\theta$	°C		Room temperature											
14		Strength	$R_m$	MPa									$\geq 400$				
27	Notes			(1) see line 98													
29	Condition and heat treatment reference							0 Annealed $350 \pm 15$ °C				T42 Solution treated $495 \pm 5$ °C/ Water quenched $\theta \leq 40$ °C Naturally aged Room temperature $t \geq 48$ h.					
34	Grain size (2)			Heat treatment T42, see line 29 column 4 ASTM E112-81 3.5 or finer													
42	Torsion test			No visible defects when tested to BS L 100, section 12									—				
98	Notes			(1) The condition of use indicated is for rivet manufacture. (2) Capability requirement.													
99	Typical uses			Cold forged solid rivets													



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