BRITISH STANDARD AEROSPACE SERIES

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Incorporating
Corrigendum No. 1

Copper-beryllium alloy strip, foil and parts (solution treated, cold rolled: half hard and precipitation treated)

ICS 49.025.15; 49.035

British Standards

Committees responsible for this British Standard

The preparation of this British Standard was entrusted to Technical Committee ACE/16, Wrought and cast copper alloys and miscellaneous metallic materials for aerospace, upon which the following bodies were represented:

British Non-Ferrous Metals Federation

Copper Development Association

Ministry of Defence

Society of British Aerospace Companies Ltd.

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Amendments issued since publication

Amd. No.	Date	Comment
13903 Corrigendum No. 1	1 October 2002	Change to “Use condition” in Table 1, line 13

Contents

Foreword

This British Standard has been prepared by Technical Committee ACE/16. It supersedes BS B 30:1991, which is withdrawn.

This new edition incorporates technical changes only. It does not represent a full review or revision of the standard, which will be undertaken in due course.

The following changes have been included in this edition of the standard. A new subclause **3.4** has been added, specifying the requirements for parts; in Table 1, line 6.1, the quenching details have been modified and in Table 1, line 19, "*k*" has been specified.

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Summary of pages

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

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1 Scope

This British Standard specifies the inspection and testing procedures, chemical composition, heat treatment and mechanical properties for a precipitation hardening copper-beryllium alloy supplied in the form of strip and foil. The material is supplied in the solution treated and cold rolled condition for precipitation treatment after conversion into parts.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this British Standard. For dated references, any subsequent amendments to, or revisions of, any of these publications do not apply. For undated references, the latest edition of the publication referred to applies.

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

BS 5775-0*, Specification for quantities, units and symbols — Part 0: General principles.*

BS B 100*, Procedure for inspection, testing and acceptance of wrought copper alloys.*

BS EN 1654*, Copper and copper alloys — Strip for springs and connectors.*

3 Technical requirements

3.1 Material to this standard shall conform to the technical requirements specified in Table 1. All material supplied shall conform to the requirements appropriate to its dimensions and condition as specified in the standards given in lines 5 and 96 of Table 1.

3.2 Symbols and units used in Table 1 shall be interpreted in accordance with BS 5555 and BS 5775-0.

NOTE The format of Table 1 and the symbols used in this table are derived from prEN 4500-1:1996.

3.3 For the purposes of this standard, a batch is defined as material of the same nominal cross-sectional dimensions, from the same cast, manufactured by the same route and heat treated together.

3.4 Parts shall be supplied in the solution treated, cold rolled and precipitation treated condition.

Table 1 — Technical requirements for Cu-Be alloy strip, foil and parts (solution treated, cold rolled: half hard and precipitation treated)

1	**Material designation**				CuBe1.9					
2	**Chemical**		Element		Be	Co + Ni	Ni + Co + Fe	Al	Si	Others	Cu
	composition		min.		1.80	0.20					Base
	%		max.		2.00		0.6	0.20	0.20	0.50	
3	**Methods of melting**				—						
4.1	**Form**				Strip, foil and parts						
4.2	**Method of production**				Rolling						
4.3	**Limit dimensions**		mm		$0.10 \leqslant a \leqslant 3.0$						
5	**Technical specification**				BS B 100						
6.1	**Delivery condition**				Solution treated and cold rolled (½ H)						
	Heat treatment				$760\,^{\circ}C \leqslant \theta \leqslant 835\,^{\circ}C$/Quench + cold rolled (1)						
6.2	**Delivery condition code**				—						
7	**Use condition**				Solution treated, cold rolled and precipitation treated						
	Heat treatment				Delivery condition $+ 315\,^{\circ}C \leqslant \theta \leqslant 330\,^{\circ}C/t$ = 2h/AC						
Characteristics											
8.1	**Test sample(s)**				See BS B 100						
8.2	**Test piece(s)**				See BS B 100						
8.3	**Heat treatment**				Delivery condition				Use condition		
9	**Dimensions concerned**			mm	—						
10	**Thickness of cladding on each face**			%	—						
11	**Direction of test piece**				L		T		L		
12		**Temperature**	θ	°C	Ambient temperature						
13		**Proof stress**	$R_{p0.2}$	MPa	—		—		$\geqslant 1130$		
14	**Tensile**	**Strength**	R_m	MPa	$590 \leqslant R_m \leqslant 690$				$1270 \leqslant R_m \leqslant 1480$		
15		**Elongation**	A	%	$\geqslant 5$				$\geqslant 1$		
16		**Reduction of area**	Z	%	—						
17	**Hardness**				$180 \leqslant HV \leqslant 225$				$370 \leqslant HV \leqslant 430$		
18	**Shear strength**		R_c	MPa	—						
19	**Bending**		k	—	0.5 ($a = 90^{\circ}$) (2)		1.0 ($a = 90^{\circ}$) (2)		—		
20	**Impact strength**				—						
21		**Temperature**	θ	°C	—						
22		**Time**		h	—						
23		**Stress**	σ_a	MPa	—						
24	**Creep**	**Elongation**	a	%	—						
25		**Rupture stress**	σ_R	MPa	—						
26		**Elongation at rupture**	A	%	—						
96	**Dimensional standard**				BS EN 1654, class A						
98	**Notes**				(1) Quenching shall be effected by forced air, sprayed water or immersion in oil or water. (2) "k"is calculated from: $k = \frac{r}{a}$ where r = bending radius and a = thickness.						

Bibliography

Standards publications

prEN 4500-1:1996, *Rules for drafting and presentation of material standards — Part 1: General rules.*

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