BS 3B 28:2009

BSI Standards Publication

AEROSPACE SERIES

Specification for copper-beryllium alloy strip and foil (solution treated and precipitation treated)

Publishing and copyright information
The BSI copyright notice displayed in this document indicates when the document was last issued.

ISBN 978 0 580 62843 6

ICS 49.025.15

The following BSI references relate to the work on this standard:
Committee reference ACE/61
Draft for comment 09/30181201 DC

Publication history
First published December 2001
Second (present) edition, November 2009

Amendments issued since publication

Date	Text affected

Contents

List of tables

Summary of pages

This document comprises a front cover, an inside front cover, pages i to ii, pages 1 to 4, an inside back cover and a back cover.

Foreword

Publishing information

This British Standard is published by BSI and came into effect on 30 November 2009. It was prepared by Panel ACE/61/-/16, *Copper and miscellaneous alloys*, under the authority of Technical Committee ACE/61, *Metallic materials for aerospace purposes*. A list of organizations represented on this committee can be obtained on request to its secretary.

Supersession

This British Standard supersedes BS 2B 28:2001, which is withdrawn.

Information about this document

This is a full revision of BS 2B 28 and introduces the following principal changes:

a) requirements are stated in tabular format in accordance with EN 4500-1;

b) references to parts have been deleted.

Hazard warnings

WARNING. This British Standard calls for the use of substances and/or procedures that can be injurious to health if adequate precautions are not taken. It refers only to technical suitability and does not absolve the user from legal obligations relating to health and safety at any stage.

Use of this document

It has been assumed in the preparation of this British Standard that the execution of its provisions will be entrusted to appropriately qualified and experienced people, for whose use it has been produced.

Presentational conventions

The provisions of this standard are presented in roman (i.e. upright) type. Its requirements are expressed either as a set of instructions or in sentences in which the principal auxiliary verb is "shall".

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.

Contractual and legal considerations

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

1 Scope

This British Standard specifies requirements for copper-beryllium alloy supplied in the form of strip and foil.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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 Table 1.

NOTE The format and symbols used in Table 1 are derived from EN 4500-1.

3.2 For the purposes of this standard, a batch shall be material of the same nominal cross-sectional dimensions, from the same cast, manufactured by the same route and heat treated together.

Table 1 **Technical requirements for Cu-Be alloy strip and foil (solution treated and precipitation treated)**

1	**Material designation**			**BS B 28**						
2	**Chemical composition %**	Element		Be	Co + Ni	Co + Fe + Ni	Al	Si	Others	Cu
		Min.		1.80	0.20	—	—	—	—	Base
		Max.		2.00	—	0.6	0.20	0.20	0.50	
3	**Method of melting**			—						
4.1	**Form**			Strip and foil						
4.2	**Method of production**			Rolled						
4.3	**Limit dimension(s)**		mm	$0.10 \leqslant a \leqslant 3.0$						
5	**Technical specification**			Sections 1 and 6 of BS B 100						

6.1	**Delivery condition**		Solution treated	
	Heat treatment		$760\ °C \leqslant \theta \leqslant 835\ °C$ / Quench [1)]	
6.2	**Delivery condition code**		—	
7	**Use condition**		Solution treated and precipitation treated	
	Heat treatment		Delivery condition + $315\ °C \leqslant \theta \leqslant 330\ °C$ / t = 3 h / AC	
			Characteristics	
8.1	**Test sample(s)**		See Section 6 of BS B 100	
8.2	**Test piece(s)**		See Section 6 of BS B 100	
8.3	**Heat treatment**		Delivery condition	Use condition
9	**Dimensions concerned**	mm	$0.10 \leqslant a \leqslant 3.0$	$0.10 \leqslant a \leqslant 3.0$
10	**Thickness of cladding on each face**	%	—	
11	**Direction of test piece**		L	T	L
12	T **Temperature**	θ	°C	Ambient	Ambient	Ambient
13	T **Proof stress**	$R_{p0.2}$	MPa	—	—	$\geqslant 960$
14	T **Strength**	R_m	MPa	$410 \leqslant R_m \leqslant 540$	—	$1\ 140 \leqslant R_m \leqslant 1\ 340$
15	T **Elongation**	A	%	$\geqslant 35$	—	$\geqslant 3$
16	T **Reduction of area**	Z	%	—		
17	**Hardness**			$90 \leqslant HV \leqslant 140$		$350 \leqslant HV \leqslant 400$
18	**Shear strength**	R_c	MPa	—		
19	**Bending**	κ	—	0 ($\alpha = 90°$) [2)]	0 ($\alpha = 90°$) [2)]	—-
20	**Impact strength**			—		
21	C **Temperature**	θ	°C	—		
22	C **Time**		h	—		
23	C **Stress**	σ_a	MPa	—		
24	C **Elongation**	a	%	—		
25	C **Rupture stress**	σ_R	MPa	—		
26	C **Elongation at rupture**	A	%	—		
27	**Notes** (see line 98)			[1), 2)]		

Table 1 **Technical requirements for Cu-Be alloy strip and foil (solution treated and precipitation treated)** *(continued)*

44	**External defects**	—	See Section 6 of BS B 100
95	**Marking**	—	See Section 6 of BS B 100
96	**Dimensional inspection**	—	BS EN 1654 class A
98	**Notes**	—	1) Quenching shall be effected by forced air, sprayed water or immersion in oil or water. 2) A "k" value of 0 indicates a bending radius less than or equal to 0.1 mm.

Bibliography

Standards publications

For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 4500-1, *Metallic materials – Rules for the drafting and presentation of material standards – Part 1: General rules* [1)]

[1)] Published as ASD-STAN Prestandard at the date of publication of this standard.

This page deliberately left blank

British Standards Institution (BSI)

BSI is the national body responsible for preparing British Standards and other standards-related publications, information and services.

BSI is incorporated by Royal Charter. British Standards and other standardization products are published by BSI Standards Limited.

About us

We bring together business, industry, government, consumers, innovators and others to shape their combined experience and expertise into standards -based solutions.

The knowledge embodied in our standards has been carefully assembled in a dependable format and refined through our open consultation process. Organizations of all sizes and across all sectors choose standards to help them achieve their goals.

Information on standards

We can provide you with the knowledge that your organization needs to succeed. Find out more about British Standards by visiting our website at bsigroup.com/standards or contacting our Customer Services team or Knowledge Centre.

Buying standards

You can buy and download PDF versions of BSI publications, including British and adopted European and international standards, through our website at bsigroup.com/shop, where hard copies can also be purchased.

If you need international and foreign standards from other Standards Development Organizations, hard copies can be ordered from our Customer Services team.

Subscriptions

Our range of subscription services are designed to make using standards easier for you. For further information on our subscription products go to bsigroup.com/subscriptions.

With **British Standards Online (BSOL)** you'll have instant access to over 55,000 British and adopted European and international standards from your desktop. It's available 24/7 and is refreshed daily so you'll always be up to date.

You can keep in touch with standards developments and receive substantial discounts on the purchase price of standards, both in single copy and subscription format, by becoming a **BSI Subscribing Member**.

PLUS is an updating service exclusive to BSI Subscribing Members. You will automatically receive the latest hard copy of your standards when they're revised or replaced.

To find out more about becoming a BSI Subscribing Member and the benefits of membership, please visit bsigroup.com/shop.

With a **Multi-User Network Licence (MUNL)** you are able to host standards publications on your intranet. Licences can cover as few or as many users as you wish. With updates supplied as soon as they're available, you can be sure your documentation is current. For further information, email bsmusales@bsigroup.com.

BSI Group Headquarters

389 Chiswick High Road London W4 4AL UK

Revisions

Our British Standards and other publications are updated by amendment or revision.

We continually improve the quality of our products and services to benefit your business. If you find an inaccuracy or ambiguity within a British Standard or other BSI publication please inform the Knowledge Centre.

Copyright

Useful Contacts:

Customer Services
Tel: +44 845 086 9001
Email (orders): orders@bsigroup.com
Email (enquiries): cservices@bsigroup.com

Subscriptions
Tel: +44 845 086 9001
Email: subscriptions@bsigroup.com

Knowledge Centre
Tel: +44 20 8996 7004
Email: knowledgecentre@bsigroup.com

Copyright & Licensing
Tel: +44 20 8996 7070
Email: copyright@bsigroup.com

bsi.

...making excellence a habit.™