

BS 3B 31:2009



BSI British Standards

AEROSPACE SERIES

Specification for copper-beryllium alloy strip and foil (solution treated, cold rolled: full hard and precipitation treated)

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The following BSI references relate to the work on this standard:

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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This British Standard supersedes BS 2B 31:2001, which is withdrawn.

Information about this document

This is a full revision of BS 2B 31 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, cold rolled: fully hard and precipitation treated)

1	Material designation		BS B 31							
	2	Chemical composition %	Element	Be	Co + Ni	Co + Fe + Ni	Al	Si	Others	Cu
Min.			1.80	0.20	—	—	—	—	0.50	Base
Max.			2.00	—	0.6	0.20	0.20			
3	Method of melting		—							
4.1	Form		Strip and foil							
4.2	Method of production		Rolled							
4.3	Limit dimension(s)	mm	0.10 ≤ a ≤ 3.0							
5	Technical specification		Sections 1 and 6 of BS B 100							

6.1	Delivery condition		Solution treated + cold rolled (H)						
	Heat treatment		760 °C ≤ θ ≤ 835 °C / Quench ¹⁾						
6.2	Delivery condition code		—						
7	Use condition		Solution treated + cold rolled (H) + precipitation treated						
	Heat treatment		Delivery condition + 315 °C ≤ θ ≤ 330 °C / t = 2 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 ≤ a ≤ 3.0				0.10 ≤ a ≤ 3.0		
10	Thickness of cladding on each face	%	—						
11	Direction of test piece		L		T		L		
12	Temperature	θ	°C	Ambient		Ambient		Ambient	
13	Proof stress	R _{p0.2}	MPa	—		—		≥ 1 140	
14	T	Strength	R _m	MPa	690 ≤ R _m ≤ 830		—		1 310 ≤ R _m ≤ 1 500
15		Elongation	A	%	≥ 2		—		≥ 1
16		Reduction of area	Z	%	—				
17	Hardness		215 ≤ HV ≤ 290				380 ≤ HV ≤ 450		
18	Shear strength	R _c	MPa	—					
19	Bending	κ	—	1.0 (α = 90°)		3.0 (α = 90°)		—	
20	Impact strength		—						
21	Temperature	θ	°C	—					
22	Time		h	—					
23	Stress	σ _a	MPa	—					
24	C	Elongation	a	%	—				
25		Rupture stress	σ _R	MPa	—				
26		Elongation at rupture	A	%	—				
27	Notes (see line 98)		1)						

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.

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