

BS 2TA 52:2009



BSI British Standards

AEROSPACE SERIES

Specification for sheet and strip of titanium-copper alloy (Tensile strength 690–920 MPa)

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

Committee reference ACE/61

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Amendments issued since publication

Date	Text affected
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Contents

Foreword *ii*

1 Scope *1*

2 Normative references *1*

3 Technical requirements *1*

Bibliography *4*

List of tables

Table 1 – Technical requirements for titanium–copper sheet and strip *2*

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/-/49, *Titanium and its 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This British Standard supersedes BS TA 52:1973, which is withdrawn.

Information about this document

This is a full revision of BS TA 52, and introduces the following principal changes:

- a) requirements stated in tabular format in accordance with EN 4500-1 and EN 4500-4;
- b) chemical composition amended to add requirements for “other” elements;
- c) melting method details deleted and replaced by reference to Section 1 of BS TA 100.

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 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 standard specifies requirements for titanium-copper alloy sheet and strip with a tensile strength of 690 to 920 MPa.

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 TA 100, *Procedure for inspection, testing and acceptance of wrought titanium and titanium alloys*

3 Technical requirements

Material to this standard shall conform to Table 1.

NOTE The format and symbols used in Table 1 are derived from EN 4500-1 and EN 4500-4.

Table 1 Technical requirements for titanium–copper sheet and strip

1	Material designation			BS TA 52							
2	Chemical composition %	Element	Cu	Fe	O ₂	C	N ₂	H ₂	Others		Ti
		Min.	2.0	—	—	—	—	—	—	—	Base
		Max.	3.0	0.20	0.20	0.08	0.030	0.010	0.10	0.40	
3	Method of melting			See Section 1 of BS TA 100							
4.1	Form			Sheet and strip ¹⁾							
4.2	Method of production			Rolled							
4.3	Limit dimension(s)	mm	—								
5	Technical specification			Sections 1 and 5 of BS TA 100							
6.1	Delivery condition			Solution treated + descaled							
	Heat treatment			805 °C ≤ θ ≤ 820 °C / t ≤ 30 mins / AC							
6.2	Delivery condition code			W							
7	Use condition			Solution treated + precipitation treated							
	Heat treatment			Delivery condition + θ = 400 °C ± 5 °C / 8 h ≤ t ≤ 24 h + (with or without intermediate AC) θ = 475 °C ± 5 °C / t = 8 h / AC							
Characteristics											
8.1	Test sample(s)			See Section 5 of BS TA 100							
8.2	Test piece(s)			See Section 5 of BS TA 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 or LT				L or LT ²⁾			
12	Temperature	θ	°C	Ambient				Ambient			
13	Proof stress	R _{p0.2}	MPa	—				≥ 550			
14	Strength	R _m	MPa	—				690 ≤ R _m ≤ 920			
15	Elongation	A	%	—				≥ 10			
16	Reduction of area	Z	%	—							
17	Hardness			—							
18	Shear strength	R _c	MPa	—							
19	Bending	κ	—	2.0; α = 180°				—			
20	Impact strength			—							
21	Temperature	θ	°C	—							
22	Time		h	—							
23	Stress	σ _a	MPa	—							
24	Elongation	a	%	—							
25	Rupture stress	σ _R	MPa	—							
26	Elongation at rupture	A	%	—							
27	Notes (see line 98)			1), 2)							

Table 1 Technical requirements for titanium–copper sheet and strip (*continued*)

44	External defects	—	See Section 5 of BS TA 100											
74	Surface contamination	—	See Section 5 of BS TA 100											
95	Marking	—	See Section 5 of BS TA 100											
96	Dimensional inspection	—	See Section 5 of BS TA 100											
		7	The tolerances applicable to material finished by cold rolling shall apply.											
98	Notes	—	¹⁾ British Standards covering other forms of material of similar composition are:											
			<table border="1"> <tr> <td rowspan="2">R_m (MPa)</td> <td>min.</td> <td>540</td> </tr> <tr> <td>max.</td> <td>770</td> </tr> <tr> <td colspan="2">Form</td> <td>British Standard</td> </tr> <tr> <td colspan="2">Sheet and strip</td> <td>BS TA 21</td> </tr> </table>	R _m (MPa)	min.	540	max.	770	Form		British Standard	Sheet and strip		BS TA 21
		R _m (MPa)	min.		540									
			max.	770										
Form		British Standard												
Sheet and strip		BS TA 21												
	²⁾ In material greater than 200 mm wide the properties might not be achieved if the material is tested in other than the transverse direction.													

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.

BS TA 21, *Specification for sheet and strip of titanium-copper alloy (Tensile strength 540–700 MPa)*

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

EN 4500-4, *Metallic materials – Rules for the drafting and presentation of material standards – Part 4: Specific rules for titanium and titanium alloys*¹⁾

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

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