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Specification for copper-tin-phosphorous alloy rods and sections

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Summary of pages

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Foreword

Publishing information

This British Standard was 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This British Standard supersedes BS B 24:1991, which is withdrawn.

Information about this document

This is a full revision of BS B 24 and introduces the following principal changes:

- a) requirements are stated in tabular format in accordance with EN 4500-1;
- b) for dimensional inspection of alloy rods and sections (Table 1, line 96), withdrawn BS 2874 has been replaced by BS EN 12163.

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-tin-phosphorous alloy supplied in the form of rods, including hollow rods, and sections.

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 12163, *Copper and copper alloys – Rod for general purposes*

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.

Table 1 Technical requirements for Cu-Sn-P alloy rods and sections

| 1 | Material designation | | BS B 24 | | | | | | | |
|-----|-------------------------|---------|------------------------------|-----|------|------|-----|------|--------------------|------|
| 2 | Chemical composition % | Element | Sn | P | Pb | Fe | Ni | Zn | Total impurities | Cu |
| | | Min. | 7.5 | 0.1 | — | — | — | — | — | Base |
| | | Max. | 9.0 | 0.4 | 0.05 | 0.10 | 0.3 | 0.30 | 0.30 ¹⁾ | |
| 3 | Method of melting | | — | | | | | | | |
| 4.1 | Form | | Rods and sections | | | | | | | |
| 4.2 | Method of production | | Rolled, extruded or drawn | | | | | | | |
| 4.3 | Limit dimension(s) | mm | 6 ≤ a or D ≤ 80 | | | | | | | |
| 5 | Technical specification | | Sections 1 and 2 of BS B 100 | | | | | | | |

| | | | | | | | | | | |
|-----|-------------------------|--|--------------------|--|--|--|--|--|--|--|
| 6.1 | Delivery condition | | As manufactured | | | | | | | |
| | Heat treatment | | — | | | | | | | |
| 6.2 | Delivery condition code | | — | | | | | | | |
| 7 | Use condition | | Delivery condition | | | | | | | |
| | Heat treatment | | — | | | | | | | |

Characteristics

| | | | | | | | | | | | |
|-----|------------------------------------|-----------------------|---------------------------|---------|-------|------------------|---------|------------------|---------|--|--|
| 8.1 | Test sample(s) | | See Section 2 of BS B 100 | | | | | | | | |
| 8.2 | Test piece(s) | | See Section 2 of BS B 100 | | | | | | | | |
| 8.3 | Heat treatment | | Use condition | | | | | | | | |
| 9 | Dimensions concerned | mm | 6 ≤ a or D ≤ 18 | | | 18 < a or D ≤ 40 | | 40 < a or D ≤ 80 | | | |
| 10 | Thickness of cladding on each face | % | — | | | | | | | | |
| 11 | Direction of test piece | | L | | | L | | L | | | |
| 12 | Temperature | θ | °C | Ambient | | | Ambient | | Ambient | | |
| 13 | T | Proof stress | R _{p0.2} | MPa | ≥ 400 | | ≥ 360 | | ≥ 300 | | |
| 14 | | Strength | R _m | MPa | ≥ 550 | | ≥ 500 | | ≥ 450 | | |
| 15 | | Elongation | A | % | ≥ 15 | | ≥ 18 | | ≥ 20 | | |
| 16 | | Reduction of area | Z | % | — | | | | | | |
| 17 | Hardness | | HV ≥ 127 or HBW ≥ 120 | | | | | | | | |
| 18 | Shear strength | R _c | MPa | — | | | | | | | |
| 19 | Bending | κ | — | — | | | | | | | |
| 20 | Impact strength | | — | | | | | | | | |
| 21 | C | 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) | | | | | | | | |

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 2874, *Specification for copper and copper alloy rods and sections (other than forging stock)*¹⁾

EN 4500-1, *Metallic materials – Rules for the drafting and presentation of material standards – Part 1: General rules*²⁾

1) Referred to in the foreword only.

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

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