

Specification for

Filler metals for brazing

UDC 621.791.36.042/.046

NO COPYING WITHOUT BSI PERMISSION EXCEPT AS PERMITTED BY COPYRIGHT LAW

BSI
Documents

AVA

Document Sharing Hub

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Welding Standards Committee (WEE/-) to Technical Committee WEE/19 upon which the following bodies were represented:

- BNF Metals Technology Centre
- British Association for Brazing and Soldering
- British Non-ferrous Metals Federation
- Electricity Supply Industry in England and Wales
- Heating and Ventliating Contractors' Association
- Joint Industry Board for Services in England and Wales
- Plumbing Trades Union
- Welding Institute
- Coopted members

This British Standard, having been prepared under the direction of the Welding Standards Committee, was published under the authority of the Board of BSI and comes into effect on 30 April 1984

© BSI 03-1999

First published February 1952
First revision December 1966
Second revision April 1977
Third revision April 1984

The following BSI references relate to the work on this standard:
Committee reference WEE/19
Draft for comment 82/78741 DC

ISBN 0 580 13588 8

Amendments issued since publication

Amd. No.	Date of issue	Comments

Contents

	Page
Committees responsible	Inside front cover
Foreword	ii
1 Scope	1
2 Composition of material	1
3 Vacuum applications	1
4 Quality control	1
5 Marking	1
6 Manufacturer's certificate	2
Appendix A Filler metals for vacuum brazing and/or high vacuum applications	11
Appendix B References to health and safety publications	11
Table 1 — Group AL: aluminium brazing filler metals	3
Table 2 — Group AG: silver brazing filler metals	4
Table 3 — Group CP: copper-phosphorus brazing filler metals	5
Table 4 — Group CU: copper brazing filler metals	6
Table 5 — Group CZ: copper-zinc brazing filler metals	7
Table 6 — Group HTN: nickel and cobalt brazing filler metals	8
Table 7 — Group PD: palladium bearing brazing filler metals	9
Table 8 — Group AU: gold bearing brazing filler metals	10
Table 9 — Filler metals for vacuum brazing and/or high vacuum applications	11
Publications referred to	Inside back cover

Foreword

This revision of this British Standard, which has been prepared under the direction of the Welding Standards Committee, supersedes BS 1845:1977, which is withdrawn, and reflects the developments that have taken place since that earlier edition was published. This has resulted in more types being included particularly for aluminium and copper-phosphorus brazing filler metals although some silver brazing filler metals have also been changed.

Some minor changes in composition have been made and these have largely concerned impurity limits. Beryllium and cadmium limits in particular have been adjusted as part of a wider look at the safety aspects of brazing.

In this revision the material designations for aluminium alloys have been changed to those used in the International Alloy Designation System for Wrought Aluminium and Wrought Aluminium Alloys, which has been adopted in the United Kingdom and is now used in other British Standards. This system is administered by the Aluminium Association Inc., who issued the "Registration Record of International Alloy Designations and Chemical Composition Limits for Wrought Aluminum and Wrought Aluminum Alloys".

Similarly the type designations for nickel and cobalt base brazing filler metals have been changed so that the numbers generally correspond with the American Welding Society Standard ANSI/AWS A5 8-81.

Reference should be made to BS 1723 for details regarding the use of the various filler metals specified in this standard; but if in doubt, advice should be sought from the supplier as to the suitability of a particular filler metal for the material being brazed and the service conditions involved.

It has been assumed in the drafting of this British Standard that the execution of its provisions is entrusted to appropriately qualified and experienced people.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 12, an inside back cover and back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

1 Scope

This British Standard specifies a range of filler metals used for brazing and lays down requirements regarding the quality control system at the manufacturer's works. The filler metals are grouped under the following headings:

AL	aluminium brazing filler metals
AG	silver brazing filler metals
CP	copper-phosphorus brazing filler metals
CU	copper brazing filler metals
CZ	copper-zinc brazing filler metals
HTN	nickel and cobalt base brazing filler metals
PD	palladium bearing brazing filler metals
AU	gold bearing brazing filler metals

Filler metals for vacuum applications are given separately in Appendix A.

NOTE The titles of the publications referred to in this standard are listed on the inside back cover.

2 Composition of material

The filler metal shall be in accordance with one of the compositions shown in Table 1 to Table 8.

Filler metal, including any brazing consumable in which it may be supplied, shall be free from any inclusions and contaminants likely to impair the flow of the filler metal.

NOTE 1 The melting and, where given, application ranges of the filler metals given in the last columns of the tables are for general information only.

NOTE 2 Brazing filler metals are available as rod, wire, foil (or preforms made from them) or powder or as a constituent of a flux or binder paste, etc. The form of the material should be the subject of agreement between the purchaser and the supplier.

3 Vacuum applications

Filler metals of the silver, gold, or palladium type to be used for brazing parts for service under high vacuum conditions shall comply with the special impurity limits given in Table 9 in Appendix A. Where there is a preference for high purity filler metals for vacuum brazing applications the filler metals given in Appendix A shall be used. Filler metal complying with the requirements of Appendix A shall have the letter V added to the designation of the filler metal type.

NOTE Nickel and cobalt filler metals although used for vacuum brazing do not require special impurity limits.

4 Quality control¹⁾

The manufacturer shall have a quality control system to ensure that all filler metals (and brazing consumables containing them) supplied satisfy the requirements of this standard. The system shall be documented and provide for the ready detection of discrepancies and for timely and positive corrective action. The system shall provide records such that the identification number of each batch of consumables shall provide references to the manufacturer's own documented records.

Tests and inspections shall be performed during manufacture so that continuous quality control of production is maintained and any departure from the accepted quality will be detected before despatch. From each batch a sufficient quantity shall be taken to allow execution of the quality control tests defined in the manufacturer's system.

Compositions are determined by recognized analytical test methods. When any test specimen fails to satisfy the test requirements, two further test specimens shall be prepared, using material from the same batch and submitted to the test in which failure occurred. Provided that the tests on both of the additional specimens are satisfactory, the filler metal shall be deemed to have passed that test.

5 Marking

Each package of brazing filler metal shall be clearly marked with the following information:

- a) the number and date of this British Standard i.e. BS 1845:1984²⁾ and the particular type designation;
- b) the name of the supplier;
- c) the size and quantity of material;
- d) the batch number;
- e) the presence of cadmium where this is a constituent (i.e. above 0.025 %) of the filler metal;
- f) a health warning (see Appendix B) and the general warning sign (given below) accompanied by the appropriate cautionary wording indicating:
 - 1) the hazards associated with the use of the filler metal;
 - 2) a reference to the manufacturer's safety instructions.

¹⁾ Further guidance on general principles may be obtained from BS 4891.

²⁾ Marking BS 1845:1984 on or in relation to a product is a claim by the manufacturer that the product has been manufactured to the requirements of the standard. The accuracy of such a claim is therefore solely the manufacturer's responsibility. Enquiries as to the availability of third party certification to support such claims should be addressed to the Director, Quality Assurance Division, BSI, Maylands Avenue, Hemel Hempstead, Herts HP2 4SQ for certification marks administered by BSI or to the appropriate authority for other certification marks.



6 Manufacturer's certificate

The manufacturer shall provide for the issue of a certificate, which shall certify that the filler metals comply with the requirements of this British Standard.

NOTE This certificate will only be provided when specifically requested by the purchaser at the time of placing the order.