

Specification for

# Filler materials for gas welding

ICS 25.160.20

NO COPYING WITHOUT BSI PERMISSION EXCEPT AS PERMITTED BY COPYRIGHT LAW



Document Sharing Hub

# Co-operating organizations

The Welding Industry Standards Committee, under whose supervision this British Standard was prepared, consists of representatives from the following Government departments and scientific and industrial organizations:

- Aluminium Federation\*
- Associated Offices Technical Committee\*
- Association of Consulting Engineers
- British Constructional Steelwork Association
- British Electrical and Allied Manufacturers' Association\*
- British Railways Board\*
- British Steel Industry\*
- Crown Agents for Oversea Governments and Administrations
- Department of Employment and Productivity
- Department of Trade and Industry
- Department of Trade and Industry, National Engineering Laboratory
- Institution of Civil Engineers
- Institution of Electrical Engineers
- Institution of Mechanical Engineers\*
- Institution of Production Engineers\*
- Institution of Structural Engineers
- Lloyd's Register of Shipping\*
- London Transport Executive
- Ministry of Defence, Army Department\*
- Ministry of Defence, Navy Department
- Ministry of Defence (combined)
- Shipbuilders' and Repairers' National Association
- Society of British Aerospace Companies Limited
- Welding Institute\*

The Government department and scientific and industrial organizations marked with an asterisk in the above list, together with the following were directly represented on the committee entrusted with the preparation of this British Standard:

- British Association for Brazing and Soldering
- British Compressed Gases Association
- British Non-ferrous Metals Federation
- Copper Development Association
- Electricity Council, the Central Electricity Generating Board and the Area Boards in England and Wales
- Institute of Iron and Steel Wire Manufacturers
- Magnesium Industry Council
- Oil Companies' Materials Association
- Society of Motor Manufacturers and Traders Ltd.
- Stainless Steel Development Association
- Individual firms

This British Standard, having been approved by the Welding Industry Standards Committee, was published under the authority of the Executive Board on 30 March 1972

© BSI 03-2001

First published July 1950  
First revision December 1952  
Second revision September 1957  
Third revision March 1972

The following BSI references relate to the work on this standard:  
Committee reference WEE/39  
Draft for comment 70/32328

ISBN 0 580 07470 6

## Amendments issued since publication

| Amd. No.                   | Date       | Comments                                   |
|----------------------------|------------|--------------------------------------------|
| 5363                       | May 1987   |                                            |
| 10840                      | June 2000  |                                            |
| 13107<br>Corrigendum No. 1 | March 2001 | Correction to Table 4, heading of column 2 |
|                            |            |                                            |

# Contents

|                                                                 | Page               |
|-----------------------------------------------------------------|--------------------|
| Co-operating organizations                                      | Inside front cover |
| Foreword                                                        | ii                 |
| 1 Scope                                                         | 1                  |
| 2 Chemical compositions                                         | 1                  |
| 3 Sizes                                                         | 1                  |
| 4 Condition                                                     | 1                  |
| 5 Lengths of rods                                               | 1                  |
| 6 Packing                                                       | 1                  |
| 7 Marking                                                       | 2                  |
| 8 Supplier's certificate                                        | 2                  |
| Appendix A Safety references                                    | 7                  |
| Table 1 <i>Deleted</i>                                          | 3                  |
| Table 2 — Chemical compositions: cast iron                      | 3                  |
| Table 3 — Chemical compositions: austenitic stainless steels    | 4                  |
| Table 4 — Chemical compositions: copper and copper alloys       | 5                  |
| Table 5 — Chemical compositions: aluminium and aluminium alloys | 6                  |
| Table 6 <i>Deleted</i>                                          |                    |

## Foreword

This standard makes reference to the following British Standards:

BS 1728, *Methods for the analysis of aluminium and aluminium alloys.*

BS 1748, *Methods for the analysis of copper alloys.*

BS 2901, *Specification for filler rods and wires for gas-shielded arc welding.*

BS 3907, *Methods for the analysis of magnesium and magnesium alloys.*

BS 6200, *Sampling and analysis of iron, steel and other ferrous metals.*

BS EN 12536, *Welding consumables — Rods for gas welding of non alloy and creep resisting steels — Classification.*

This standard has been revised to take account of the technical developments that have occurred since the previous edition, in respect of both usage of gas welding and chemical compositions of filler materials. As a result most groups of materials have been altered by way of additions, deletions or composition changes. The austenitic stainless steel filler materials have undergone the greatest revision with regard to composition, coupled with a new method of designation. Throughout the standard relevant chemical compositions have been aligned with those specified in BS 2901, “*Filler rods and wires for gas-shielded arc welding*”. For guidance on filler materials to be used for gas welding when not specified in this standard, reference may be made to BS 2901.

Sizes of filler materials are now only given in terms of nominal values as tolerances depend on the particular material and size, but this is not a factor that affects the welding process.

In accordance with current practice, this standard uses metric units and in deciding on the dimensions of the filler materials account has been taken of appropriate ISO Standards.

The material designations for aluminium and 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 UK 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 Aluminium and Wrought Aluminium Alloys”. Some consequential minor amendments to composition limits have resulted.

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 8, an inside back cover and a back cover.

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

## 1 Scope

This British Standard specifies requirements and chemical compositions, for filler materials for gas welding of cast iron, austenitic stainless steels, copper and copper alloys and aluminium and aluminium alloys. Filler materials for gas welding of ferritic steels are specified in BS EN 12536.

NOTE The titles of the British Standards referred to in this standard are listed on page ii.

## 2 Chemical compositions

The materials shall have a chemical composition in accordance with the requirements specified in Table 2, Table 3, Table 4 or Table 5 for the particular type ordered.

In cases of dispute regarding the chemical composition of the materials, sampling and check analysis shall be carried out in accordance with BS 1748, BS 1728, BS 3907 or BS 6200, or by a mutually agreed alternative method of comparable accuracy.

## 3 Sizes

For materials supplied as rods or wires, the sizes shall be selected from the following nominal diameters:

0.8<sup>1)</sup>, 1.2, 1.6, 2.4, 3.2, 4.0, 5.0 and 6.0 mm.

For cast iron materials, which are supplied in square section, the sizes shall be selected from the following nominal values of the side of the square:

3.2, 5, 6, 8, 10 and 12 mm.

## 4 Condition

**4.1 Finish.** The filler material shall have a smooth finish, free from surface imperfections, corrosion products, grease or other foreign matter that would adversely affect the quality of the weld.

**4.2 Copper coating on ferritic steels.** Unless otherwise agreed, ferritic steel filler materials shall be supplied with a protective copper coating, it being a uniform, well-bonded, smooth coating applied over a clean surface. The copper content of the coated filler material expressed as a percentage of the filler material plus the coating shall not exceed 0.4 % by weight.

**4.3 Condition of aluminium, aluminium alloy and magnesium alloy filler materials.**

Aluminium, aluminium alloy and magnesium alloy filler materials shall be supplied in the as manufactured (M) condition.

## 5 Lengths of rods<sup>2)</sup>

Rods less than 2.5 mm in diameter should preferably be supplied in lengths of 500 mm or 1 000 mm. Rods 2.5 mm in diameter and larger should preferably be supplied in lengths of 1 000 mm. Lengths other than the above preferred lengths may be supplied by agreement between the purchaser and the supplier.

The tolerance on each length shall be  $\pm 5$  mm.

## 6 Packing

The filler material shall be suitably packed to guard against damage, contamination or deterioration during storage and transportation.

NOTE If special conditions apply (e.g. transportation to a tropical region), the purchaser should state them at the time of ordering.

<sup>1)</sup> Because of wire-drawing problems, not all of the wire compositions can be supplied in this size.

<sup>2)</sup> Deleted.