

Specification for

**Wrought magnesium  
alloys for general  
engineering  
purposes —  
Plate, sheet and strip**

# Co-operating organizations

The Non-ferrous Metals 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                                         | Institution of Mechanical Engineers<br>(Automobile Division) |
| Association of Bronze and Brass Founders                     | Institution of Mining and Metallurgy                         |
| Association of Consulting Engineers,<br>Incorporated         | Institution of Production Engineers                          |
| Board of Trade                                               | Institution of Structural Engineers                          |
| British Bronze and Brass Ingot Manufacturers'<br>Association | Lead Development Association                                 |
| British Electrical and Allied Manufacturers'<br>Association  | Light Metal Founders' Association                            |
| British Lead Manufacturers' Association                      | London Metal Exchange                                        |
| British Non-ferrous Metals Federation                        | Magnesium Industry Council*                                  |
| British Non-ferrous Metals Research<br>Association*          | Ministry of Defence (Army Dept)                              |
| Copper Development Association                               | Ministry of Defence (Navy Dept)                              |
| Crown Agents for Oversea Governments and<br>Administrations  | National Brassfoundry Association                            |
| Electric Cable Makers' Confederation                         | Non-ferrous Metal Stockists*                                 |
| Institute of British Foundrymen                              | Post Office                                                  |
| Institute of Metals                                          | Royal Institute of British Architects                        |
|                                                              | Society of Motor Manufacturers and Traders<br>Limited*       |
|                                                              | Tin Research Institute                                       |
|                                                              | Zinc Development Association                                 |
|                                                              | Individual manufacturers                                     |

The 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:

|                                      |                        |
|--------------------------------------|------------------------|
| Institute of Sheet Metal Engineering | Ministry of Technology |
|--------------------------------------|------------------------|

This British Standard, having been approved by the Non-ferrous Metals Industry Standards Committee, was published under the authority of the Executive Board on 30 October 1970

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

This standard makes reference to the following British Standards:

BS 18, *Methods for tensile testing of metals. Part 1, Non-ferrous metals.*

BS 1499, *Sampling non-ferrous metals.*

BS 1957, *Presentation of numerical values (finesness of expression; rounding of numbers).*

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

BS 4391, *Recommendations for metric basic sizes for metal wire, sheet and strip.*

This British Standard is one of a series for magnesium alloys in various wrought forms, first issued in 1947 (as BS 1350-57) and revised in 1961 (as BS 3370-74).

The edition is the first revision of the standard in metric terms, the preparation of which was authorized by the Non-Ferrous Metals Industry Standards Committee.

Others in the series are:

BS 3372, *Forgings and cast forging stock.*

BS 3373, *Extruded bars, sections and tubes (including extruded forging stock).*

With the introduction of this revision the series has been reduced to three separate standards:

BS 3370 has been combined with BS 3374 which formerly covered plate.

BS 3372 covering forgings now includes provision for cast forging stock.

BS 3373 has been combined with BS 3371 which formerly covered extruded tube and now additionally includes provision for extruded forging stock.

In preparing this metric specification regard has been paid to the recommendations of the International Organization for Standardization. Alloy compositions and properties have been brought into line with ISO Recommendations where this has been practicable. In the case of compositions, since ISO Recommendations have not yet been published for the whole range of alloys included, compositional designations which use chemical symbols and are internationally recognized have been listed following the British Standard designation for the alloy.

In the compositional designation system the basis metal symbol is first shown, followed by those for the essential alloying elements in order of diminishing content. Such elements where essential but less than 1 % have no following number; others are followed by a number indicating the percentage of the element to the nearest 0.5 %.

e.g. British Standard Alloy Designation MAG-111 (Compositional Designation Mg-Al3Zn1Mn)

Magnesium base alloy containing nominally:

Aluminium 3 %

Zinc 1 %

Manganese less than 1 % and within the specified limits

The condition or temper symbols now cited are also those proposed by ISO.

The former procedure of allocating alloy numbers to each material, prefixed by the letters MAG, the same alloy numbers being used throughout the series, has been retained. Between the letters MAG and the alloy number and separated by hyphens the following symbols are now adopted to indicate form.

S = plate, sheet and strip (BS 3370).

F = forgings (BS 3372).

E = extruded bars, sections and tubes (BS 3373).

Cast forging stock is to be referred to only by the British Standard reference BS 3372 and the relevant alloy designation.

The ISO Recommendations require that proof stress values should now be specified as 0.2 % values in place of 0.1 % values in earlier editions.

Elongation requirements are now specified for all thicknesses of rolled product above 0.5 mm and replace the bend test for certain thicknesses included in the previous edition.

Elongations are now required to be measured on 50 mm or  $5.65 \sqrt{S_0}$  as specified in Table 1 (where  $S_0$  is the cross-sectional area of the test piece).

Full details of chemical composition and mechanical properties, listed in relation to alloy, form and condition or temper, are now given in a single table instead of on separate specification sheets as in the previous edition.

In this series a new alloy MAG-131 (Mg-Zn2Mn1) has been introduced.

The following changes relating to composition have been introduced in this edition.

- 1) Deletion of the note relating to “available” zirconium.
- 2) Deletion of the reference to “determination” or “verification” analytically of the constituents or impurities in the chemical composition of the alloys.
- 3) Deletion of the appendix relating to the method of analysis for zirconium.
- 4) Restriction of the upper limit for manganese in MAG-111 material (Mg-Al3Zn1Mn) to bring it into line with ISO requirements.

All tables of tolerances have been reviewed and metric values in accordance with latest production practices are now cited.

Preferred standard sizes for plate and sheet are shown in Appendix B.

Appendix A shows available forms for all materials in the complete series.

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 to iv, pages 1 to 12, an inside back cover and a 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.

