



SLOVENSKI STANDARD

SIST EN 1753:1998

01-avgust-1998

Magnezij in magnezijeve zlitine - Ingoti in ulitki iz magnezijevih zlitin

Magnesium and magnesium alloys - Magnesium alloy ingots and castings

Magnesium und Magnesiumlegierungen - Blockmetalle und Gußstücke aus Magnesiumlegierungen

Magnésium et alliages de magnésium - Lingots et pièces moulées en alliages de magnésium

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ICS:

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EUROPEAN STANDARD

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Descriptors: magnesium, magnesium alloys, ingots, castings, designation, chemical composition, mechanical properties, test specimen, tests, correspondence of designations

English version

Magnesium and magnesium alloys - Magnesium alloy ingots and castings

Magnésium et alliages de magnésium - Lingots et pièces moulées en alliages de magnésium
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This European Standard was approved by CEN on 1997-05-01. CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

The European Standards exist in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 190 "Foundry technology", the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by December 1997, and conflicting national standards shall be withdrawn at the latest by December 1997.

Within its programme of work, Technical Committee CEN/TC 190 requested CEN/TC 190/WG 3.10 "Cast magnesium" to prepare the following standard:

EN 1753

Magnesium and magnesium alloys – Magnesium alloy ingots and castings

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

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Introduction

This European Standard classifies the commercially available magnesium alloys into a number of grades suitable for the applications to which they might be put.

Some of the alloys referenced in this standard can be the subject of a patent or of patent applications and their listing herein is not to be construed in any way as the granting of a licence under such patent rights.

1 Scope

This European Standard specifies the chemical composition of magnesium alloy ingots. It also specifies the chemical composition of magnesium alloy castings. It also specifies the mechanical properties of separately cast samples of these alloys (see clause 6). By agreement, it also specifies the mechanical properties of magnesium alloy castings determined from samples cut from a casting.

2 Normative references

This standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 1559-5

Founding – Technical conditions of delivery – Part 5: Additional requirements for magnesium alloy castings

EN 10002-1

Metallic materials – Tensile testing – Part 1: Method of test (at ambient temperature)

EN 10003-1

Metallic materials – Brinell hardness test – Part 1: Test method

ISO 31-0:1992

Quantities and units – Part 0: General principles

NOTE: Informative references to documents used in the preparation of this standard, and cited at the appropriate places in the text, are listed in a bibliography, see annex A.

3 Designation

3.1 Material

The material shall be designated either by symbol or by number as given in tables 1 to 5.

NOTE 1: The material number designation and the material symbol designation are in accordance with EN 1754.

NOTE 2: A list of international, national and former national European designations corresponding to the European designations is given in annex B.

NOTE 3: The materials for aerospace applications referred to in European Standards prepared by AECMA (Association Européenne des Constructeurs de Matériel Aérospatial) have different designations.

3.2 Temper designation

The following symbols for temper designation shall be used:

- F as cast;
- T4 solution heat-treated and naturally aged;
- T5 as cast and artificially aged;
- T6 solution heat-treated and artificially aged.

NOTE: Examples of the use of these designations are given in EN 1559-5.

3.3 Casting process designation

The following symbols shall be used for the designation of the different casting processes:

- S sand casting;
- K permanent mould casting;
- D pressure die casting;
- L investment casting.

NOTE: Examples of the use of these designations are given in EN 1559-5.

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4 Requirements

4.1 Chemical composition

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The chemical composition of magnesium alloy ingots shall conform to the requirements for the appropriate material given in table 1.

The chemical composition of magnesium alloy castings shall conform to the requirements for the appropriate material given in table 2.

NOTE: For additional information regarding the manganese and iron contents see annex C.

4.2 Mechanical properties of castings

The mechanical properties obtained from test pieces prepared from separately cast samples for sand castings and permanent mould castings shall meet the requirements given in tables 3 and 4. As appropriate, the tests shall be carried out in accordance with clause 7.

NOTE 1: Mechanical properties obtained from test pieces prepared from separately cast samples for investment castings are not specified as experience is limited. As a general rule they are similar to those for permanent mould castings.

NOTE 2: The values obtained from test pieces cut from castings can differ from the minimum values specified in the tables because of variation in structure arising from differences in section thickness and soundness.

NOTE 3: The mechanical properties obtained from test pieces prepared from separately cast samples for pressure die castings are very dependent upon injection parameters. Therefore, the properties given in table 5 are for guidance only.

The Brinell hardness test shall be carried out on porosity free areas of castings or on a test piece which has not been stressed.

4.3 Frequency of testing

The frequency of testing shall be in accordance with EN 1559-5.

5 Sampling

Conditions for sampling, formation of batches and frequency of verification shall be as specified in EN 1559-5.

6 Test pieces

6.1 Design

The design of test pieces shall be subject to an agreement between the manufacturer and the purchaser.

6.2 Test pieces obtained from separately cast samples

6.2.1 Sand cast samples

Test pieces may be in the machined or unmachined condition.

The following conditions shall apply:

- samples shall be cast in sand moulds and without artificial chilling;
- the minimum diameter of the test piece shall be 12 mm;
- the gauge length and the parallel length shall conform to EN 10002-1.

6.2.2 Permanent mould cast samples

Test pieces may be in the machined or unmachined condition.

The following conditions shall apply:

- the minimum diameter of the test piece shall be 12 mm;
- the gauge length and parallel length shall conform to EN 10002-1.

6.2.3 Pressure die cast samples

The following condition shall apply:

- the surface of the test pieces shall be as cast.

6.2.4 Investment cast samples

Test pieces may be in the machined or unmachined condition.

The following conditions shall apply:

- the minimum diameter of the test piece shall be 5 mm;
- the gauge length and parallel length shall conform to EN 10002-1.

6.3 Test pieces cut from castings

The geometry and location of test pieces cut from castings shall be specified by agreement between the manufacturer and the purchaser.

When it is agreed between the manufacturer and the purchaser to use circular cross-section test pieces, the minimum diameter shall be 4 mm.

7 Test methods

7.1 Tensile test

Tensile tests shall be carried out in accordance with EN 10002-1.

7.2 Brinell hardness test

Brinell hardness tests shall be carried out in accordance with EN 10003-1.

NOTE: A 5 mm ball diameter is recommended. By agreement between the manufacturer and the purchaser a smaller ball diameter may be used for thin wall castings.

8 Retests

Retests shall be carried out in accordance with EN 1559-5.

9 Rounding of numbers

The number representing the result for any value specified in this standard shall be expressed to the same number of decimal places as the corresponding number in this standard. The rounding of numbers shall meet the requirements of ISO 31-0:1992, annex B, clause B.3, rule A or B. The choice shall be left to the discretion of the manufacturer, unless the use of one of the rules is agreed by the time of acceptance of the order.

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