BRITISH STANDARD

BS EN
12060 : 1998

Zinc and zinc alloys — Method of sampling — Specifications

The European Standard EN 12060 : 1997 has the status of a British Standard

ICS 77.120.60

National foreword

This British Standard is the English language version of EN 12060 : 1997. It supersedes BS 3630 : Part 4 : 1963 which is withdrawn.

The UK participation in its preparation was entrusted by Technical Committee NFE/8, Zinc and zinc alloys, to Subcommittee NFE/8/4, Analysis of zinc and zinc alloys, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this subcommittee can be obtained on request to its secretary.

Cross-references

The British Standards which implement international or European publications referred to in this document may be found in the BSI Standards Catalogue under the section entitled 'International Standards Correspondence Index', or by using the 'Find' facility of the BSI Standards Electronic Catalogue.

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, the EN title page, pages 2 to 6, an inside back cover and a back cover.

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Descriptors: Zinc, zinc alloys, sampling, specifications, specimen preparation, procedures

English version

Zinc and zinc alloys — Method of sampling — Specifications

Zinc et alliages de zinc — Méthode d'échantillonnage — Spécifications

Zink und Zinklegierungen — Probenahme — Spezifikationen

This European Standard was approved by CEN on 26 September 1997.

CEN

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

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

Ref. No. EN 12060 : 1997 E

Foreword

This European Standard has been prepared by Technical Committee CEN/TC 209, Zinc and zinc alloys, the secretariat of which is held by AFNOR.

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of an identical text or by endorsement, at the latest by April 1998, and conflicting national standards shall be withdrawn at the latest by April 1998.

Within its programme of work, Technical Committee CEN/TC 209 entrusted CEN/TC 209/SC 3 Methods of analysis and testing to prepare the following document:

EN 12060 Zinc and zinc alloys — Method of sampling — Specification

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.

Contents

1 Scope

This European Standard specifies the requirements for sampling of zinc and zinc alloys, as specified in EN 1179 and EN 1774, for analysis.

2 Normative references

This European Standard incorporates by dated or undated references 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 European Standard only when incorporated in it by amendment or revision. For undated references, the latest edition of the publication referred to applies.

EN 1774 *Zinc and zinc alloys — Alloys for foundry purposes — Ingot and liquid*

EN 1179 *Zinc and zinc alloys — Primary zinc*

3 Definitions

For the purposes of this standard, the following definitions apply:

3.1 ingot

Cast product intended for remelting [EN 1179:1995].

3.2 batch

Number of ingots taken from a single cast [EN 1179:1995].

3.3 cast

3.3.1 cast, for non-continuous casting

Product of one furnace or crucible melt [EN 1179:1995].

3.3.2 cast, for continuous casting

Identified volume of liquid metal [EN 1179:1995].

3.4 sample

Portion of the product, representative of its chemical composition.

3.5 test piece

Final form of the material submitted for analysis.

3.6 consignment of cast product

Unless otherwise agreed between the purchaser and the supplier for the purpose of sampling, a consignment of cast product shall be defined as material received as a load.

3.7 sampling unit

Individual cast product selected from a consignment.

3.8 gross sample

Total amount of sampling units selected from a consignment.

3.9 test sample

Sample prepared from the gross sample and from which test portions shall be taken.

3.10 test portions

Quantity of material taken from the test sample and on which the analysis is actually carried out.

4 Principle

Since zinc and zinc alloy ingots can have very different shapes and weights, the chemical composition of samples can differ depending on the specific location of the test piece in the given ingot due to segregation processes during solidification. It is recommended that samples are taken during the casting process at the time of manufacture.

5 Apparatus

5.1 *Ladle*

Designed to hold sufficient molten metal to completely fill the sample mould, with a handle or other equipment suitable to reach into a furnace, trough, pot or crucible. It shall be made of a material not affecting the molten metal (i.e. chemically inert).

5.2 *Sample moulds*

Designed to produce homogeneous samples representative of the product metal. The form and the size of the mould are very important. Moulds shall have a sufficient cooling rate, to cause the rapid solidification of the metal and avoid the segregation of the components. Moulds shall be chemically inert, not affecting the molten metal.

6 Identification of samples and preparation of test piece

6.1 Identification

Samples shall be identified with a unique identity.

6.2 Preparation

Shape and size of test piece are dependent upon the device and operations used. The test piece shall be prepared according to the requirements of the analytical method used.

7 Procedure

7.1 Frequency of sampling

Sampling during continuous or non-continuous casting processes shall be performed at a frequency that represents the product and production facilities.

7.2 Personnel

Samples shall only be taken by trained and experienced personnel.

7.3 Cast products

If sampling of ingots and castings is required, the method of sampling shall be agreed between the purchaser and the supplier. The sampling of ingots shall be in accordance with annex A.

Annex A (normative)

Sampling of ingots with a weight less than 25 kg

A.1 General

This annex specifies the methods for the selection and preparation of samples for chemical analysis of zinc and zinc alloys in the form of ingots less than 25 kg when sampling from molten metal is not possible.

A.2 Selection of sampling units

A.2.1 *General*

The sampling units shall be selected from batches, each batch being composed of ingots of the same composition.

Following an agreement between the purchaser and the supplier, each consignment shall be divided into a series of batches provided that they contain:

a) not less than 25 t for zinc ingots; or

b) not less than 5 t for the zinc alloy ingots.

Any consignment of less than stated in a) and b) shall be regarded as a single batch.

A.2.2 *Frequency of sampling*

For zinc ingots from each batch of ingots, select, at random, one ingot from every 100 for zinc grade Z1, Z2 and Z3 and one ingot from every 50 for zinc grade Z4 and Z5, specified in EN 1179.

For zinc alloy ingots from each batch of ingots select, at random, one ingot from every 50. In each case the number of ingots selected shall be not less than five.

When the consignment is made up of less than five ingots, all shall be used in making the selection.

A.3 Sample preparation

A.3.1 *General procedure*

A.3.1.1 Sampling units taken from cast products not subject to significant segregation shall be sampled by drilling completely through each ingot. The location and number of holes shall be such as to ensure that the sample taken is representative. Cast products subject to significant segregation shall have the whole cross-section of each sampling unit sampled by milling. Sampling may also be carried out by sawing or clipping.

A.3.1.2 Before sampling, the sampling unit shall be clean and free from scale, dirt, oil, grease and other contaminants.

A.3.1.3 The saw, drill bit, cutter or other tool used for sampling shall be thoroughly cleaned prior to use. The speed of sampling shall be so regulated that excessive heating and consequent oxidization of the sample is avoided. Lubricants shall not be used. Carbide-tipped tools are recommended.

A.3.1.4 The gross sample shall be prepared by thoroughly mixing equal masses of drillings, millings, sawings or clippings taken from each sampling unit. The chips obtained by milling, drilling etc., shall be uniformly small in size.

A.3.1.5 The gross sample shall weigh at least four times the amount required for the total analysis, and shall be divided into four test samples of equal mass, each of which shall be placed in a container and sealed; one for the supplier, one for the purchaser, one for reference purposes, if necessary, and one as reserve.

A.3.2 *Cast zinc ingot, in accordance with EN 1179*

A.3.2.1 *General*

The selection of samples for chemical analysis shall normally be carried out by drilling in accordance with the following procedure:

A.3.2.2 Arrange the selected ingots flat, side by side, upside down with reference to the position occupied in the ingot mould, in groups of a maximum of ten ingots. Ensure that the casting marks are arranged in the same way for each of the ingots.

A.3.2.3 In each group, draw a diagonal across the rectangle thus formed.

A.3.2.4 With the aid of a tungsten carbide drill of approximately 15 mm diameter and without the use of a lubricant, drill each ingot right through at two points on the diagonal at distances from the long side of the ingot of one-third and two-thirds of the length of the short side. (See figure A.1.)

A.3.2.5 Carry out the drilling without heating the metal to the point of oxidation, in such a way as to obtain drillings of a thickness between 0,2 mm and 0,5 mm.

A.3.3 *Cast zinc alloy ingot in accordance with EN 1774*

A.3.3.1 *General*

The selection of samples for chemical analysis shall be carried out by drilling in accordance with the following procedure:

A.3.3.2 Arrange the selected ingots flat, side by side, upside down with reference to the position occupied in the ingot mould, in groups of a maximum of five ingots. Ensure that the casting marks are arranged in the same way for each of the ingots.

A.3.3.3 In each group, draw a diagonal across the rectangle thus formed.

A.3.3.4 With the aid of a tungsten carbide drill of approximately 15 mm diameter and without the use of a lubricant, drill each ingot right through at three points on the diagonal at distances from the long side of the ingot of one-fourth, two-fourths and three-fourths of the length of the short side. (See figure A.2.)

In the case where the exact position of the point to be drilled coincides with a notch in the ingot, choose another point as close as possible.

A.3.3.5 Carry out the drilling without heating the metal to the point of oxidation, in such a way as to obtain drillings of a thickness between 0,2 mm and 0,5 mm.

A.3.4 ***Sampling units of mass greater than 25 kg***

Sampling of individual sampling units of mass greater than 25 kg shall be by agreement between the purchaser and the supplier.

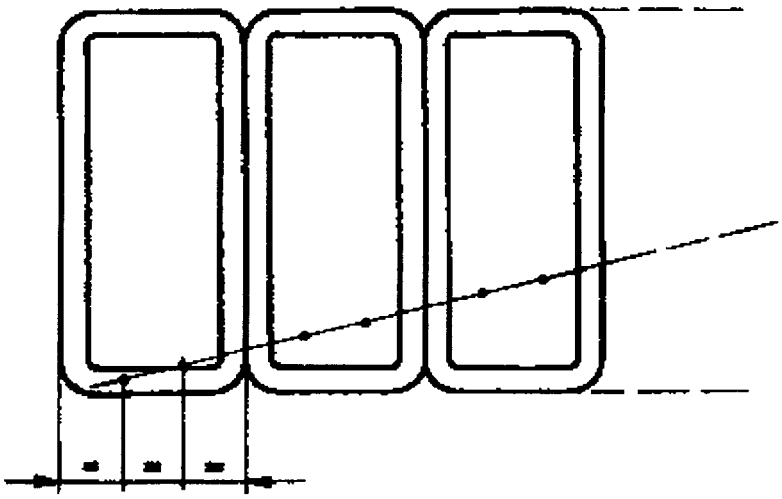

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Figure A.1 Cast zinc ingots

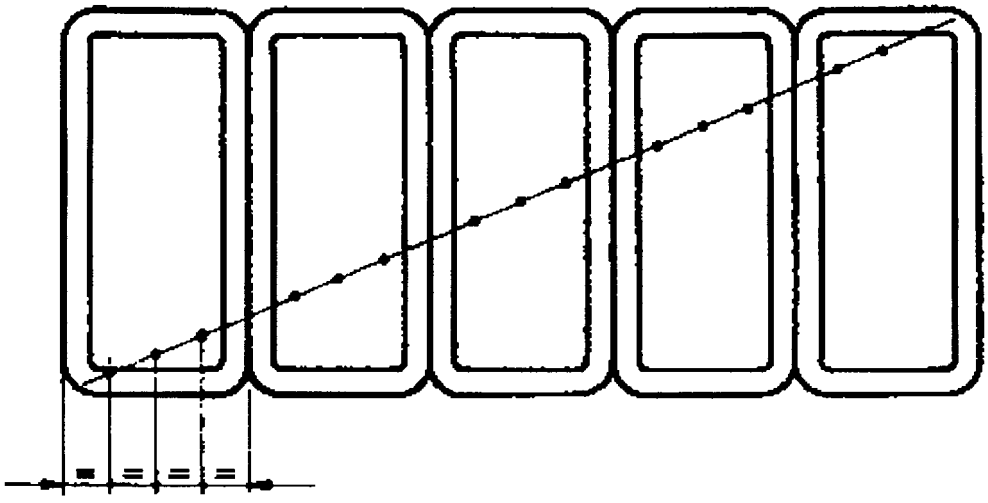

Figure A.2 Cast zinc alloy ingots

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