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Zinc and zinc alloys — Method of sampling — Specifications

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

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 20081 was prepared by Technical Committee ISO/TC 18, *Zinc and zinc alloys*, Subcommittee SC 1, *Methods of sampling and analysis of zinc and zinc alloys*.

This first edition cancels and replaces ISO 3751:1976, ISO 3752:1976, ISO 3816:1976 and ISO 3817:1976, which have been technically revised.

Zinc and zinc alloys — Method of sampling — Specifications

1 Scope

This International Standard specifies the requirements for sampling of zinc and zinc alloys, as specified in ISO 752 and ISO 301, for analysis.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 301, *Zinc alloy ingots intended for casting*

ISO 752, *Zinc ingots*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 301 and ISO 752 and the following apply.

3.1
sample
portion of the product, representative of its chemical composition

3.2
test piece
final form of the material submitted for analysis

3.3
consignment of cast product
material received as load

NOTE This definition is used unless otherwise agreed between the purchaser and the supplier for the purpose of sampling.

3.4
sampling unit
individual cast product selected from a consignment

3.5
gross sample
total amount of sampling units selected from a consignment

3.6
test sample
sample prepared from the gross sample and from which test portions are taken

3.7
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 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 be 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 mold, 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

The shape and size of the 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 during casting

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

Samples shall only be taken by trained and experienced personnel.

7.2 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.

Samples shall only be taken by trained and experienced personnel.

Annex A
(normative)

Sampling of ingots with a weight equal to or less than 30 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 30 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 that 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 2,5 t of materials for zinc grades ZN-1, ZN-2 and ZN-3 and one ingot from every 1 t for zinc grades ZN-4 and ZN-5, specified in ISO 752.

For zinc alloy ingots from each batch of ingots select, at random, one ingot from every one 1 t of material.

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, they shall all be used in making the selection.

A.3 Sample preparation

A.3.1 General procedure

Sampling units taken from cast products not subject to significant segregation (ingot thickness above 50 mm) 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.

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

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

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.

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 a reserve.

A.3.2 Cast zinc ingot, in accordance with ISO 752

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

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.

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

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.)

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 ISO 301

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

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.

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

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-quarter and three-quarters 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.

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 30 kg

Sampling of individual sampling units of mass greater than 30 kg shall be by agreement between the purchaser and the supplier.

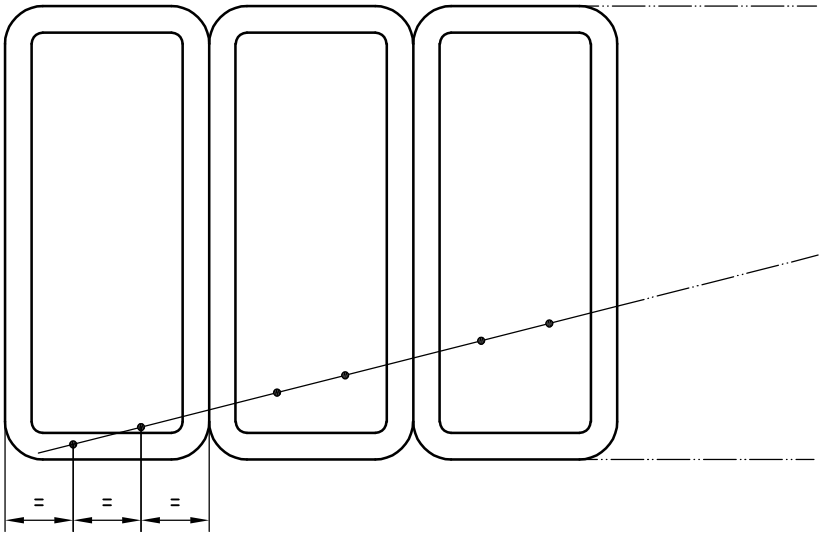

Figure A.1 — Cast zinc ingots

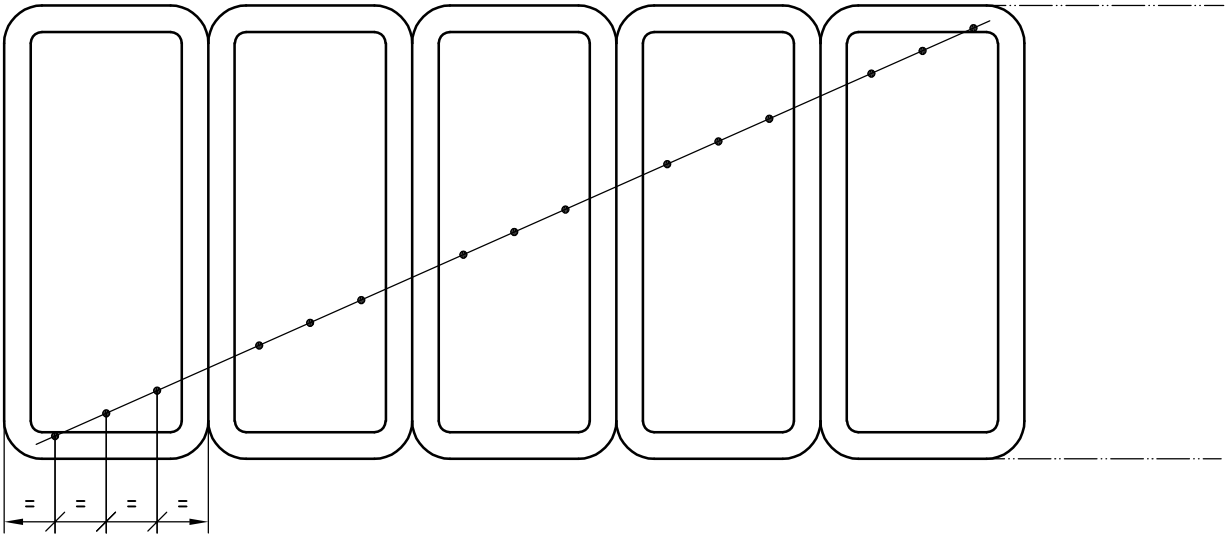

Figure A.2 — Cast zinc alloy ingots

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