SLOVENSKI STANDARD
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Founding - Technical conditions of delivery - Part 1: General

Gießereiwesen - Technische Lieferbedingungen - Teil 1: Allgemeines

Fonderie - Conditions techniques de fourniture - Partie 1: Généralités

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Descriptors: foundry engineering, alloys, definitions, user supplier relations, designation, manufacturing, specifications, tests, inspection, packing, marking, general conditions

English version

Founding - Technical conditions of delivery - Part 1 : General

Fonderie - Conditions techniques de fourniture - Partie 1 : Généralité

Gießereiwesen - Technische Lieferbedingungen - Teil 1 : Allgemeines

This European Standard was approved by CEN on 1997-05-02. 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

Contents

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of an identical text or by endorsement, at the latest by December 1997, and conflicting national standards shall be withdrawn at the latest by December 1997.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 1.10 "Technical conditions of delivery" to prepare the following standard:

EN 1559-1
Founding – Technical conditions of delivery – Part 1: General

This standard is one of a series of European Standards for technical delivery conditions for castings. The other standards in this series are:

prEN 1559-2
Founding – Technical conditions of delivery – Part 2: Additional requirements for steel castings

EN 1559-3
Founding – Technical conditions of delivery – Part 3: Additional requirements for iron castings

prEN 1559-4
Founding – Technical conditions of delivery – Part 4: Additional requirements for aluminium alloy castings

EN 1559-5
Founding – Technical conditions of delivery – Part 5: Additional requirements for magnesium alloy castings

prEN 1559-6
Founding - Technical conditions of delivery - Part 6: Additional requirements for zinc alloy 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.

Introduction

This European Standard uses a system of identification for delivery conditions with the following structure:

– subclauses marked with a single dot (•) indicate that conditions shall be agreed at the time of enquiry and order;

– subclauses marked with two dots (••) indicate that conditions can be agreed at the time of enquiry and order (optional);

– subclauses without dot marking are mandatory.

The purchaser specifies the requirements of the casting(s) to fulfill the intended use.

The manufacturer produces the casting(s) to the requirements stated.

It is recommended that full consultations between the manufacturer and the purchaser are made.

1 Scope

This part of EN 1559 specifies the general technical delivery conditions for castings made from cast metallic materials except copper alloy castings.

Additional technical delivery condition requirements which are specific to particular materials are specified in the following parts of this standard series:

prEN 1559-2 for cast steel;

EN 1559-3 for cast iron;

prEN 1559-4 for cast aluminium;

EN 1559-5 for cast magnesium;

prEN 1559-6 for cast zinc.

This part of EN 1559 is not applicable to metallic castings for further reprocessing such as forging ingots and continuously cast billets and blooms.

2 Normative references

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

prEN 1559-2
Founding – Technical conditions of delivery – Part 2: Additional requirements for steel castings

EN 1559-3
Founding – Technical conditions of delivery – Part 3: Additional requirements for iron castings

prEN 1559-4
Founding – Technical conditions of delivery – Part 4: Additional requirements for aluminium alloy castings

EN 1559-5
Founding – Technical conditions of delivery – Part 5: Additional requirements for magnesium alloy castings

prEN 1559-6
Founding - Technical conditions of delivery - Part 6: Additional requirements for zinc alloy castings

EN 1560
Founding – Designation system for cast iron – Material symbols and material numbers

EN 1754
Magnesium and magnesium alloys – Magnesium and magnesium alloy anodes, ingots and castings – Designation system

EN 1780-1
Aluminium and aluminium alloys – Designation of unalloyed and alloyed aluminium ingots for remelting, master alloys and castings – Part 1: Numerical designation system

EN 1780-2
Aluminium and aluminium alloys – Designation of unalloyed and alloyed aluminium ingots for remelting, master alloys and castings – Part 2: Chemical symbol based designation system

EN 10027-1
Designation systems for steels – Part 1: Steel names, principal symbols

EN 10027-2
Designation systems for steels – Part 2: Numerical system

EN 10204
Metallic products – Types of inspection documents

prEN 12844
Zinc and zinc alloys – Castings - Specifications

EN ISO 9001
Quality systems – Model for quality assurance in design/development, production, installation and servicing (ISO 9001 : 1994)

EN ISO 9002
Quality systems – Model for quality assurance in production, installation and servicing (ISO 9002 : 1994)

EN ISO 9003
Quality systems – Model for quality assurance in final inspection and test (ISO 9003 : 1994)

ISO 5459
Technical drawings – Geometrical tolerancing – Datums and datum-systems for geometrical tolerances

ISO 8062
Castings – System of dimensional tolerances and machining allowances

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 Definitions

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

3.1 purchaser

Person or body who places an order.

3.2 manufacturer

Person or body who produces castings.

3.3 casting

Workpiece that has been shaped by solidification of a liquid metal or alloy in a mould.

3.4 as-cast casting

Casting that has not received any kind of finishing treatment after casting (beyond removal of casting appendages, such as gates, risers and flash and removal of residues of the moulding material where necessary).

3.5 as-delivered casting

Casting manufactured to the delivery requirements of the order.

3.6 initial sample

Casting, completely manufactured by means of the equipment and processes used for series production under the appropriate control conditions.

NOTE: The initial sample is to furnish the proof that the manufacturer is in the position to comply with the quality requirements (dimensions, material, function, etc.) requested by the purchaser.

3.7 preliminary sample

Casting which corresponds to a large degree to the "initial sample", but has either not or only partially been manufactured by means of the equipment and processes used for series production.

3.8 relevant wall thickness

Wall thickness for which the mechanical properties apply.

NOTE: Not always appropriate to all materials.

3.9 inspection

Activities such as measuring, examining, testing, gauging one or more characteristics of a product or service and comparing these with specified requirements to determine conformity.

3.10 continuous inspection

Any regular inspection of the characteristics and/or manufacturing parameters of a casting manufactured over a period of time, normally in large quantities and always to the same specification. This inspection is carried out according to an agreed procedure and may include agreed statistical methods.

3.11 inspection representative

One or more individuals who is/are either

a) the inspector designated in the official regulations;

b) the manufacturer's authorized representative, who is functionally independent of the production process, acting on behalf of the purchaser;

c) the purchaser's authorized representative.

3.12 test unit

Number of pieces or the tonnage of castings to be accepted or rejected together, on the basis of the tests carried out on test pieces in accordance with the requirements of the relevant specification, material standard or order.

NOTE: This term is sometimes referred to as "inspection lot" or "test batch".

3.13 sample casting

Casting selected from a test unit for the purpose of obtaining test pieces.

3.14 sample

Sufficient quantity of material for the purpose of producing one or more test pieces. It can be separately cast, cast on or cut from the casting itself.

NOTE: In certain cases, the sample can be the sample casting itself.

3.15 test piece

Part of the sample, with specified dimensions, machined or unmachined, brought to a required condition for submission to a given test.

NOTE: In certain cases the test piece can be the sample itself.

3.16 sequential testing

Group or series of tests from which the average and individual results are used to demonstrate that the requirements of the order and/or product standard or material standard have been satisfied.

4 Information to be supplied by the purchaser

4.1 • Mandatory information (see also checklist in annex B)

The purchaser shall give clear information in the enquiry and order, in particular on

a) the number of castings to be supplied, the permissible deviations from this number, and the schedule of delivery;

b) the specification of the cast material;

In the case of castings made of standardized cast material, the following shall be specified:

- the number of the relevant material standard;
- the designation of the cast material either by symbol or by number;

c) the relevant drawings, standards and technical specifications;

d) the supply of pattern equipment, core boxes, permanent moulds;

e) requirements regarding the outer and inner conditions of the castings.

4.2 •• Optional information (see also checklist in annex B)

When applicable, the enquiry and order shall include other requirements, such as

a) the relevant wall thickness of the castings;

b) the as-delivered condition, e.g. heat treatment, surface treatment;

c) additional properties not specified in the material standard;

d) the mass of the castings;

e) the delivery of preliminary samples;

f) the delivery of initial samples;

g) the method and the extent (area and/or frequency) of non-destructive testing;

h) the method and the extent (area and/or frequency) of machining to be carried out by the manufacturer;

i) surface areas for further operations by the purchaser, such as local surface treatments, welding operations etc.;

j) the type and the extent (area and/or frequency) of special tests to be carried out by the manufacturer and the conditions applicable to such tests;

k) criteria for statistical sampling;

l) special measures to be taken or specifications to be observed for manufacture or testing of castings, particularly with regard to the testing of production welds, in cases where castings are partly or completely subject to special stress conditions;

m) whether traceability is required;

n) the type of documents covering the tests performed;

o) the type of surface protection and packing for storage and transport arrangement;

p) repairs and storage arrangements for patterns and tools;

q) the formation of a test unit unless already defined by material specification;

r) the agreement of production welding;

s) any other special requirements, e.g. metallographic structure, corrosion resistance, machinability;

t) the application of a quality assurance system given in EN ISO 9001, EN ISO 9002 or EN ISO 9003.

4.3 Drawings, patterns and tools

4.3.1 ● The purchaser shall make available to the manufacturer the necessary drawing(s), e.g. drawing(s) of the as-cast casting and/or the finished machined casting. The identification of the relevant drawing(s) shall be specified in the enquiry and order.

Unless otherwise agreed, the drawing(s) shall conform to international or national drawing standards. If modifications to the purchaser's drawing(s) are necessary, they shall be agreed between the manufacturer and the purchaser.

Unless otherwise agreed the patterns and tools shall conform, where applicable, to the relevant European Standards.

NOTE: European Standards for patterns and tools are in course of preparation. It should be stated whether a tapered feature (see ISO 8062) is to be added, subtracted or averaged.

When applicable, the surfaces to be machined, the required machining allowances and datums (for datums see ISO 5459) for machining and for the dimensional check shall be specified on the drawing(s).

4.3.2 ●● If the purchaser is making available to the manufacturer pattern equipment, tooling or permanent moulds, their identification shall be specified in the order. The surfaces of the casting to be machined shall be clearly identified and, when necessary, indicated on the drawing(s).

Unless otherwise required, the purchaser decides the shape, sizes and suitability for the purpose of the pattern equipment, tooling or permanent moulds, expendable patterns and inserts supplied.

The manufacturer of the casting shall check on the basis of physical examination that the pattern etc. are useable and complete.

The purchaser may require the manufacturer to either fully inspect the equipment supplied or to satisfy himself that the sufficient machining allowances for his manufacturing work and any subsequent machining are available.

4.3.3 ● For general tolerances and machining allowances for castings, ISO 8062 shall apply unless otherwise specified by the purchaser.

The casting tolerance grade and, where applicable, the required machining allowance grade shall be specified on the drawing or in the order.

4.4 ●● Information on the mass

If there is a tolerance on the mass for castings, agreement shall be made by the time of ordering as to whether the mass of a casting shall be the same as the mass calculated from the drawing or the mass of an initial sample with sizes within the size tolerances. When the mass is calculated from the drawing, then any modifications to the mould and/or the casting process and all machining allowances shall be taken into account.