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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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Equipment for the
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SIST EN 1559-1:2011

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English Version

Founding - Technical conditions of delivery - Part 1: General

Fonderie - Conditions techniques de fourniture - Partie 1:
GénéralitésGießereiwesen - Technische Lieferbedingungen - Teil 1:
Allgemeines

This European Standard was approved by CEN on 15 January 2011.

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 CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists 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 CEN-CENELEC Management Centre has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Contents	Page
Foreword.....	3
Introduction	4
1 Scope	5
2 Normative references	5
3 Terms and definitions	6
4 Information to be supplied by the purchaser	8
4.1 Mandatory information	8
4.2 ●● Optional information	8
4.3 Drawings, patterns and tools	9
4.4 ●● Information on the mass.....	10
4.5 ●● Preliminary sample.....	10
4.6 ●● Initial sample.....	10
5 Designations	10
6 Manufacture.....	11
6.1 ●● Manufacturing process	11
6.2 Welding operations.....	11
7 Requirements	12
7.1 General.....	12
7.2 Material	12
7.3 Casting.....	12
8 Inspection	14
8.1 General.....	14
8.2 Type of inspection documents and type of inspection.....	14
8.3 Test unit.....	15
8.4 Samples	16
8.5 Test procedures.....	16
8.6 Invalidation of test results	17
8.7 Retests	17
8.8 Sorting and reprocessing	18
9 Marking	18
10 Packaging and surface protection	18
11 Complaints	18
Annex A (normative) Mandatory and/or optional information checklist	19
Annex B (informative) Significant technical changes between this European Standard and the previous edition	22
Bibliography	23

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Foreword

This document (EN 1559-1:2011) 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 August 2011, and conflicting national standards shall be withdrawn at the latest by August 2011.

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

This document supersedes EN 1559-1:1997.

Annex B provides details of significant technical changes between this European Standard and the previous edition.

Within its programme of work, Technical Committee CEN/TC 190 requested CEN/TC 190/WG 1 “Technical conditions of delivery and cast iron designation” to revise EN 1559-1:1997.

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:

- EN 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*
- EN 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*
- EN 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, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, 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 may 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 fulfil 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.

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1 Scope

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

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

NOTE 1 Technical delivery conditions for copper alloy castings are specified in EN 1982.

NOTE 2 Additional technical delivery condition requirements which are specific to particular materials are specified in the following parts of this standard series: EN 1559-2 for cast steel; EN 1559-3 for cast iron; EN 1559-4 for cast aluminium; EN 1559-5 for cast magnesium; EN 1559-6 for cast zinc.

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.

EN 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*

EN 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*

EN 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 alloyed aluminium ingots for remelting, master alloys and castings — Part 1: Numerical designation system*

EN 1780-2, *Aluminium and aluminium alloys — Designation of 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*

EN 10027-2, *Designation systems for steels — Part 2: Numerical system*

EN 10204:2004, *Metallic products — Types of inspection documents*

EN 12844, *Zinc and zinc alloys — Castings — Specifications*

EN 12883, *Founding — Equipment for the production of lost patterns for the lost wax casting process*

EN 12890, *Founding — Patterns, pattern equipment and coreboxes for the production of sand moulds and sand cores*

EN 1559-1:2011 (E)

EN 12892, *Founding — Equipment for the production of lost patterns for the lost foam casting process*

EN ISO 10135, *Geometrical product specifications (GPS) — Drawing indications for moulded parts in technical product documentation (TPD) (ISO 10135:2007)*

ISO 80000-1:2009, *Quantities and units — Part 1: General*

ISO 5459, *Technical drawings — Geometrical tolerancing — Datums and datum-systems for geometrical tolerances*

3 Terms and definitions

For the purposes of this document, the following terms and 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 representative of the casting, defined for the determination of the size of the cast samples to 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**

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

NOTE 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 the inspector designated in the official regulations, the manufacturer's authorized representative, who is functionally independent of the production process, acting on behalf of the purchaser, or 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

NOTE 1 The sample can be separately cast, cast side-by-side, cast on or cut from the casting itself.

NOTE 2 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

3.17**acceptance criteria**

limits of test results, agreed between manufacturer and purchaser at the time of the order which show conformity to specified requirements of the casting(s)

3.18**drawing**

technical information, given on an information carrier, graphically presented in accordance with agreed rules and usually to scale

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EN 1559-1:2011 (E)**3.19****finishing welding**

production welding carried out in order to ensure the agreed quality of the casting

3.20**joint welding**

production welding used to assemble components together to obtain an integral unit

4 Information to be supplied by the purchaser**4.1 Mandatory information**

See also checklist in Annex A.

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

- a) number of castings to be supplied, the permissible deviations from this number, and the schedule of delivery;
- b) specification of the cast material.

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

- 1) the number of the relevant material standard;
- 2) the designation of the cast material (either by symbol or by number);
- c) relevant drawings, standards and technical specifications; in case of numerical data exchange, provision shall be made for integrity of data;
- d) supply of pattern equipment, core boxes, permanent moulds;
- e) requirements regarding the outer and inner conditions of the castings;
- f) relevant information for machining, such as location and clamping points.

4.2 •• Optional information

See also checklist in Annex A.

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

- a) 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) mass of the castings;
- e) delivery of preliminary samples;
- f) delivery of initial samples;
- g) method and the extent (area and/or frequency) of non-destructive testing;

- h) 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) type of documents covering the tests performed;
- o) type of surface protection and packing for storage and transport arrangement;
- p) repairs and storage arrangements for patterns and tools;
- q) formation of a test unit unless already defined by material specification;
- r) agreement of production welding;
- s) any other special requirements, e.g. metallographic structure, corrosion resistance, machinability;
- t) application of a quality assurance system, e.g. EN ISO 9001:2008;
- u) any requirement regarding confidentiality (including sub contracting).

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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. Any modification of the drawing should be uniquely identified. Unless otherwise agreed the patterns and tools shall conform, where applicable, to EN 12883, EN 12890 and EN 12892.

It shall be stated whether a taper is to be added, subtracted or averaged. The drawing indications shall be in accordance with EN ISO 10135.

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 that the patterns, etc. are useable and complete.