



SLOVENSKI STANDARD
SIST EN 12883:2001
01-november-2001

Livarstvo - Naprave za izdelavo staljivih modelov za ulivanje z voščenimi staljivimi modeli

Founding - Equipment for the production of lost patterns for the lost wax casting process

Gießereiwesen - Einrichtungen zur Herstellung von verlorenen Modellen für das Wachsauerschmelzverfahren

Fonderie - Outillages pour la production de modèles perdus pour le procédé de moulage à la cire perdue

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ICS:

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77.180	Oprema za metalurško industrijo	Equipment for the metallurgical industry

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en

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 12883

June 2000

ICS 77.180

English version

Founding - Equipment for the production of lost patterns for the lost wax casting process

Fonderie - Outillages pour la production de modèles perdus
pour le procédé de moulage à la cire perdue

Gießereiwesen - Einrichtungen zur Herstellung von
verlorenen Modellen für das Wachsausschmelzverfahren

This European Standard was approved by CEN on 24 December 1999.

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.

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 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.

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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 2000, and conflicting national standards shall be withdrawn at the latest by December 2000.

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.

Within its programme of work, Technical Committee CEN/TC 190 requested CEN/TC 190/WG 1.30 "Production equipment, tools, foundry auxiliaries (e.g. patterns, permanent moulds, moulding materials)" to prepare the following standard:

prEN 12883

Founding – Equipment for the production of lost patterns for the lost wax casting process

This is one of three of European Standards for foundry patterns and tools. The other standards are:

prEN 12890

Founding – Patterns, pattern equipment and coreboxes for the production of sand moulds and sand cores

prEN 12892

Founding – Equipment for the production of lost patterns for the lost foam casting process

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Introduction

Lost pattern production processes involve the moulding of a pattern. The pattern is then destroyed either prior to or during the casting process.

At present two processes are commonly used:

- investment casting (lost wax process);
- lost foam process.

This standard concerns the lost wax process.

This standard describes the specification for tooling to produce patterns or cores for the lost wax process.

This standard is intended for purchasers, manufacturers and founders. It is also intended to ensure correct interpretation of part and tool drawings/numerical data, and to ensure pattern equipment will produce lost moulds and lost cores, suitable for use and to assist in determining the usually undefined limits of good workmanship. It stresses the need for consultation between the founder, manufacturer (patterns), manufacturer (tooling) and purchaser before work commences.

This standard is intended to assist interested parties in producing tooling for lost wax patterns suitable for use to produce castings by the lost pattern process.

There is a complex relationship between the parties who might be involved in specifying, manufacturing, ordering and designing the equipment within the scope of this standard.

NOTE: Figure 1 gives an indication of the relationships that could exist between the four parties concerned.

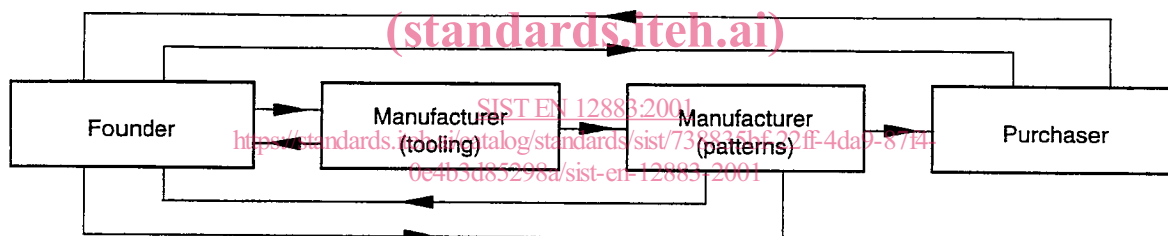


Figure 1 - Model inter-relationship between contracting parties

This standard not only specifies the usual features of design, manufacture, materials, tolerances, contractions and required machining allowances but also specifies other features such as usage, classification, quality control, marking, packaging and storage.

1 Scope

This standard specifies the requirements for tooling for the production of lost patterns for the lost wax process including soluble wax cores, and the production of ceramic cores.

This standard does not specify equipment used to produce castings by the Shaw process.

This standard does not specify the processes which directly generate the lost pattern(s) by means of numerical data such as stereolithography or sintered wax process or laminated object manufacturing (LOM).

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.

EN 10204

Metallic products – Types of inspection documents

EN 20286-1

ISO system of limits and fits – Part 1: Bases of tolerances, deviations and fits (ISO 286-1:1988)

ISO 8062 : 1994

Castings – System of dimensional tolerances and machining allowances

3 Terms and definitions

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

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3.1 ceramic core

Pre-formed refractory aggregate inserted into a wax or plastic pattern to shape the interior of that part of a casting which cannot be shaped by the pattern.

NOTE: Sometimes wax is injected around the pre-formed core.

3.2 collapsible insert

Part made in two or more pieces to permit withdrawal from an undercut pattern surface.

3.3 contraction

Provision applied to the tooling for shrinkage occurring during the production of castings.

3.4 cast tooling process

Method whereby tooling is made either from a low melting point metal alloy, normally cast under pressure, or from a resin, cast around a master pattern.

3.5 dowel register

Component which ensures accuracy of fit or alignment between mating portions of the tooling.

3.6 fixing

One or more components which ensure that the parts of the tooling are held together securely and accurately.

3.7 insert or loose piece

Part which is removed by hand or by mechanical means from the pattern before or during stripping and is then repositioned in the tooling.

3.8 lost wax process

Pattern casting process in which wax or fusible resin is used.

NOTE: The pattern is surrounded by a refractory slurry. After the mould is dry, the pattern is melted or burned out of the mould cavity and molten metal is poured into the resulting cavity.

3.9 manufacturer (patterns)

Person or body responsible for the manufacture of lost wax patterns.

3.10 manufacturer (tooling)

Person or body responsible for making the tooling and/or ancillary equipment required to produce a lost wax pattern.

3.11 master pattern

Model used to produce a pattern which includes the appropriate contractions.

3.12 mismatch

Offset conditions at parting line caused by misalignment.

3.13 pattern

Wax or plastic-based shaped material.

3.14 pattern injection

Process of filling the tooling cavity with wax or fusible resin material.

3.15 soluble wax core

Dissolvable wax component used to produce the internal geometry of the pattern.

3.16 stripping

Action of removing the pattern from the tooling by hand or by mechanical means.

3.17 taper

Draft angles on surfaces of tooling parts which enable the tooling parts or the lost patterns to be withdrawn.

3.18 tooling cavity

Intended space in the tooling into which pattern material is introduced.

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3.19 tooling

All the equipment required for the production of a lost pattern (except for the machine used to inject the wax).

3.20 tooling filling system

Openings used to introduce the pattern material into the tooling.

3.21 wax chill

Pre-formed solid wax piece introduced into the tooling cavity to prevent excessive shrinkage at the wax injection stage.

4 Order information and delivery conditions

4.1 General

There shall have been an agreement made and an exchange of information carried out between the purchaser, the manufacturer (patterns), the manufacturer (tooling) and the founder by the time of acceptance of the order, to ensure a full understanding of the respective requirements of the parties concerned.

4.2 Points to be discussed

As applicable, the following essential points shall be considered during the negotiation stage:

- casting material(s) and its (their) identification;
- number of patterns to be produced; [SIST EN 12883:2001](https://standards.iteh.ai/catalog/standards/sist/738835bf-22ff-4da9-87f4-0e4b3d85298a/sist-en-12883-2001)
- pattern and /or core materials; <https://standards.iteh.ai/catalog/standards/sist/738835bf-22ff-4da9-87f4-0e4b3d85298a/sist-en-12883-2001>
- drawings and/or numerical data;
- number of tooling cavities required;
- contractions;
- joint lines;
- tapers;
- components and identification of tooling;
- required machining allowances;
- machining provisions and tooling finishing requirements;
- tooling materials;
- tooling quality class;
- surface condition of the tooling cavity;
- dimensional tolerances;
- wax pattern stripping and cooling support systems;
- tooling inspection requirements and inspection fixtures;

- runner/feeder positions and, if necessary, the running system;
- tooling accessories, such as cores, runners and wax chills;
- any other important parameters, such as surface protection and packaging for transport, storage, venting and assembling arrangements.

4.3 Mandatory information

The enquiry and order shall include information on:

- a) number of toolings to be supplied and delivery requirements;
- b) specification(s) of the material(s) to be used in the manufacture of the tooling;
- c) relevant drawings and/or relevant numerical data;
- d) contraction(s) to be used;
- e) sizes and positions of any runners and feeders required;
- f) position(s) and size(s) of wax injection hole(s);
- g) information on tooling mounting, connection and alignment;
- h) surface condition required for the tooling cavity;
- i) inspection(s) and documentation required;
- j) relevant quality class;
- k) any functional tests required;

and, as applicable:

- l) additional properties not specified in the material standards;
- m) special measures to be taken or specifications to be observed, particularly with regard to the testing of welds;
- n) repairs of tooling;
- o) type of protection and packaging;

NOTE: Transport arrangements can be included.

- p) approval procedures;
- q) storage arrangements;
- r) any other requirements.

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5 Classification

Tooling shall be classified in accordance with the quality classes given in table 1 or table 2.

There shall be an agreement made between the parties concerned on the quality class to be adopted (see table 1 and table 2).

Table 1 - Metal pattern equipment

Features	Quality class	
	M3	M4
Use	Long run manufacture using wax injection machines and involving high standards	Batchwise manufacture using wax injection machines and involving high standards
Manufacture	Worked from solid material (machined) or cast to size and suitably finished	As for M3, but finishing not as critical, alternatively made up from several parts
Material	Aluminium alloys, steels, and other alloys	As for M3, but also including hard lead and pattern metal. Low melting point metal alloy or non-metallic fillers, only used with prior permission
Wearing parts	See relevant material	See relevant material
Loose pieces	See relevant material	See relevant material
Dimensional tolerances	In accordance with EN 20286-1 and ISO 8062 : 1994	As for M3

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Table 2 - Plastic pattern equipment

Features	Quality class	
	K3	K4
Use	Batchwise manufacture using wax injection machines and involving high standards	Short runs using wax injection machines
Manufacture	Cast, or back-filled, or as a shell with suitably reinforced ribbing	As for K3, but preferably reinforced
Material	Plastics with high stability and abrasion resistance	Plastics
Wearing parts	See relevant material	As for K3
Loose pieces	See relevant material	No special instructions
Dimensional tolerances	In accordance with EN 20286-1 and ISO 8062 : 1994	As for K3