SLOVENSKI STANDARD
SIST EN 12892:2001

01-november-2001

Livarstvo - Naprave za izdelavo izparljivih modelov za ulivanje z izparljivimi modeli

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

Gießereiwesen - Einrichtungen zur Herstellung von verlorenen Modellen für das Vollformgießverfahren

Fonderie - Outillages pour la production de modèles perdus pour le procédé de moulage "lost foam"

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ICS:

25.120.30	Livarska oprema	Moulding equipment
77.180	Oprema za metalurško industrijo	Equipment for the metallurgical industry

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EUROPEAN STANDARD

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English version

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

Fonderie - Outillages pour la production de modèles perdus pour le procédé de moulage "lost foam"

Gießereiwesen – Einrichtungen zur Herstellung von verlorenen Modellen für das Vollformgießverfahren

This European Standard was approved by CEN on 25 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.

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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of an identical text or by endorsement, at the latest by August 2000, and conflicting national standards shall be withdrawn at the latest by August 2000.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:

EN 12892
Founding – Equipment for the production of lost patterns for the lost foam casting process

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

prEN 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

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 foam process.

This standard describes the specification for tooling to produce patterns or cores for the lost foam 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 urea or dense polystyrene or expanded material 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.

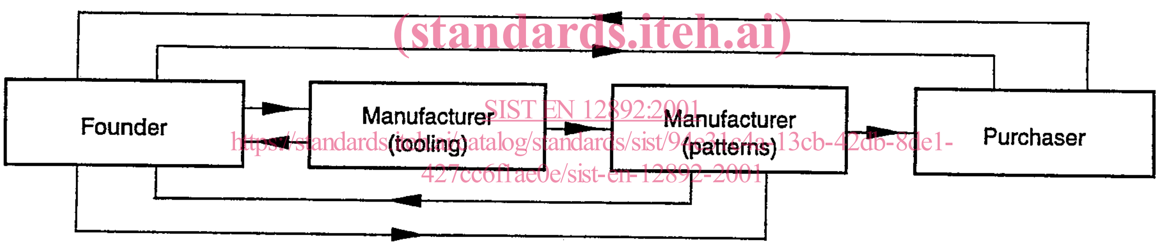

Figure 1 – Model inter-relationships between the contracting parties

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 by the lost foam process.

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

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

3.1 collapsible insert

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

3.2 contraction

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

3.3 dowel register

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

3.4 taper

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

3.5 fixing

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

3.6 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.

3.7 lost foam process

Pattern casting process in which a destructible pattern material is used.

NOTE: The pattern is surrounded by a heat resistant material prior to pouring.

3.8 manufacturer (patterns)

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

3.9 manufacturer (tooling)

Person or body responsible for the manufacture of the tooling and/or ancillary equipment required to produce a lost foam pattern.

3.10 master pattern

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

3.11 mismatch

Offset conditions at parting line caused by misalignment.

3.12 pattern

Foam based shaped material.

3.13 pattern injection

Process of filling the tooling cavity with expandable material.

3.14 stripping

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

3.15 tooling

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

3.16 tooling cavity

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

3.17 tooling filling system

Openings used to introduce the pattern material into the tooling.

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;

– number of sub-elements for each pattern;

– pattern and/or core materials;

– drawings and/or numerical data;

– number of tooling cavities required;

– contractions;

– joint lines;

– pattern joints;

– 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;

– pattern stripping and cooling support systems;

– tooling inspection requirements and inspection fixtures;

– runner/feeder positions and, if necessary, the system;

– tooling accessories;

– assembly accessories;

– any other important parameters such as surface protection and packaging for transport, storage, venting and assembling arrangements.