SLOVENSKI PREDSTANDARD

oSIST prEN ISO 148-2:2006

julij 2006

Kovinski materiali – Nihajni udarni preskus po Charpyju – 2. del: Preverjanje preskusnih naprav (ISO/DIS 148-2:2006)

Metallic materials - Charpy pendulum impact test - Part 2: Verification of testing machines (ISO/DIS 148-2:2006)

ICS 77.040.10

Referenčna številka
oSIST prEN ISO 148-2:2006(en)

EUROPEAN STANDARD

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English Version

Metallic materials - Charpy pendulum impact test - Part 2: Verification of testing machines (ISO/DIS 148-2:2006)

Matériaux métalliques - Essai de flexion par choc sur éprouvette Charpy - Partie 2: Vérification des machines d'essai (mouton-pendule) (ISO/DIS 148-2:2006)

This draft European Standard is submitted to CEN members for parallel enquiry. It has been drawn up by the Technical Committee ECISS/TC 1.

If this draft becomes a European Standard, 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.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

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Ref. No. prEN ISO 148-2:2006: E

Foreword

This document (prEN ISO 148-2:2006) has been prepared by Technical Committee ISO/TC 164 "Mechanical testing of metals" in collaboration with Technical Committee ECISS/TC 1 "Steel - Mechanical testing", the secretariat of which is held by AFNOR.

This document is currently submitted to the parallel Enquiry.

Endorsement notice

The text of ISO 148-2:2006 has been approved by CEN as prEN ISO 148-2:2006 without any modifications.

DRAFT INTERNATIONAL STANDARD ISO/DIS 148-2

ISO/TC **164**/SC **4** Secretariat: **ANSI**

Voting begins on:
2006-05-11

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2006-10-11

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Metallic materials — Charpy pendulum impact test —

Part 2:
Verification of testing machines

Matériaux métalliques — Essai de flexion par choc sur éprouvette Charpy —

Partie 2: Vérification des machines d'essai (mouton-pendule)

[Revision of first edition (ISO 148-2:1998)]

ICS 77.040.10

ISO/CEN PARALLEL ENQUIRY

The CEN Secretary-General has advised the ISO Secretary-General that this ISO/DIS covers a subject of interest to European standardization. **In accordance with the ISO-lead mode of collaboration as defined in the Vienna Agreement, consultation on this ISO/DIS has the same effect for CEN members as would a CEN enquiry on a draft European Standard.** Should this draft be accepted, a final draft, established on the basis of comments received, will be submitted to a parallel two-month FDIS vote in ISO and formal vote in CEN.

To expedite distribution, this document is circulated as received from the committee secretariat. ISO Central Secretariat work of editing and text composition will be undertaken at publication stage.

Pour accélérer la distribution, le présent document est distribué tel qu'il est parvenu du secrétariat du comité. Le travail de rédaction et de composition de texte sera effectué au Secrétariat central de l'ISO au stade de publication.

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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 148-2 was prepared by Technical Committee ISO/TC 164, *Mechanical Testing of Metals*, Subcommittee SC 4, *Toughness Testing*.

This second edition cancels and replaces the first edition (1998), which has been technically revised.

ISO 148 consists of the following parts, under the general title *Metallic materials — Charpy pendulum impact test*:

— *Part 1: Test Method*

— *Part 2: Verification of testing machines*

— *Part 3: Preparation and characterization of Charpy V-notch test pieces for indirect verification of pendulum impact machines*

Metallic materials — Charpy pendulum impact test —

Part 2:
Verification of testing machines

1 Scope

This part of ISO 148 covers the verification of the constructional elements of pendulum-type impact testing machines. It is applicable to machines with 2 mm or with 8 mm strikers used for pendulum impact tests carried out, for instance, in accordance with ISO 148-1.

It can analogously be applied to pendulum impact testing machines of other capacities and of different design.

Impact machines used for industrial, general or research laboratory testing of metallic materials in accordance with this part of ISO 148 are referred to as industrial machines. Those with more stringent requirements are referred to as reference machines. Specifications for the verification of reference machines are found in ISO 148-3.

This part of ISO 148 describes two methods of verification.

a) The direct method, which is static in nature and involves measurement of the critical parts of the machine to ensure that it meets the requirements of this part of ISO 148. Instruments used for the verification and calibration shall be traceable to national standards. The direct method shall be used when a machine is being installed or repaired, or if the indirect method gives a non-conforming result.

b) The indirect method, which is dynamic in nature, and which uses reference test pieces to verify points on the measuring scale.

A pendulum impact testing machine is not in compliance with this part of ISO 148 until it has been verified by both the direct and indirect methods (see Clause 7).

The requirements for the reference test pieces are found in ISO 148-3.

NOTE This part of ISO 148 takes into account the total energy absorbed in fracturing the test piece using an indirect method. This total absorbed energy consists of 1) the energy needed to break the test piece itself and 2) the internal energy losses of the pendulum impact testing machine performing the first half-cycle swing from the initial position. Internal energy losses are due to:

a) Air resistance, friction of the bearings of the rotation axis and the indicating pointer of the pendulum which can be determined by the direct method (see 6.3.4).

b) Shock of the foundation, vibration of the frame and pendulum for which no suitable measuring methods and apparatus have been developed.

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 148-1: *Metallic materials — Charpy pendulum impact test — Part 1: Test method.*

ISO 148-3: *Metallic materials — Charpy pendulum impact test — Part 3: Preparation and characterization of Charpy V-notch test pieces for indirect verification of pendulum impact machines.*

3 Terms and definitions

For the purposes of this part of ISO 148, the following definitions apply.

3.1 Definitions pertaining to the machine

3.1.1
anvil
the portion of the machine that serves to properly position the test piece for impact with respect to the striker and the test piece supports, and supports the test piece under the force of the strike

3.1.2
base
that part of the framework of the machine located below the horizontal plane of the supports

3.1.3
centre of percussion
that point in a body at which, on striking a blow, the percussive action is the same as if the whole mass of the body was concentrated at the point (see Figure 4)

NOTE When a simple pendulum delivers a blow along a horizontal line passing through the centre of percussion, there is no resulting horizontal reaction at the axis of rotation.

3.1.4
centre of strike
that point on the striking edge of the pendulum at which, in the free hanging position of the pendulum, the vertical edge of the striker meets the upper horizontal plane of a test piece of half standard height (i.e. 5 mm) or equivalent gauge bar resting on the test piece supports (see Figure 2)

3.1.5
industrial machine
impact machine used for industrial, general, or most research-laboratory testing of metallic materials

NOTE 1 These machines are not used to establish reference values.

NOTE 2 Industrial machines are verified using the procedures described in this part of ISO 148.

3.1.6
reference machine
pendulum impact testing machines used to determine the reference energy of a reference test piece

3.1.7
striker
the portion of the pendulum that contacts the test piece

NOTE The edge that actually contacts the test piece may have a radius of 2 mm (the 2 mm striker) or a radius of 8 mm (the 8 mm striker). (See Figure 2.)

3.1.8
test piece supports
the portion of the machine that serves to properly position the test piece for impact, with respect to the centre of percussion of the pendulum, the striker and the anvils. (see Figures 2 and 3)

3.2 Definitions pertaining to energy

3.2.1
total absorbed energy (absorbed energy)
K_T
the total energy required to break a test piece when tested by a pendulum impact testing machine

NOTE It is equal to the difference in the potential energy from the starting position of the pendulum to the end of the first half swing during which the test piece is broken (see Clause 6.3)

3.2.2
initial potential energy (potential energy)
K_P
Difference between the potential energy of the pendulum hammer prior to its release for the impact test, and the potential energy of the pendulum hammer at the position of impact, as determined by direct verification (see Clause 6.3.1)

3.2.3
absorbed energy)
K
Energy required to break a test piece with a pendulum impact testing machine, as indicated by the pointer of other readout device, which is corrected for friction

NOTE The letter V or U is used to indicate the notch geometry, that is: KV or KU. The number 2 or 8 is used as a subscript to indicate striker radius, that is KV_2 for example.

3.2.4
nominal initial potential energy (nominal energy)
K_N
the energy assigned by the manufacturer of the pendulum impact testing machine

3.2.5
reference energy
K_R
the average absorbed energy associated with test pieces used to verify the performance of pendulum impact machines

3.2.6
reference test piece:
Impact test pieces used to verify the suitability of pendulum impact testing machines by comparing the indicated energy measured by that machine to the reference energy associated with the test pieces

NOTE Reference test pieces are prepared in accordance with ISO 148-3.

3.3 Definitions pertaining to test pieces

(placed in the test position on the supports of the machine) (See Figures 2 and 3)

3.4.1
height
distance between the notched face and the opposite face

3.4.2
width
dimension perpendicular to the height that is parallel to the notch

3.4.3
length
largest dimension at right angles to the notch