



# SLOVENSKI STANDARD SIST EN ISO 148-1:2010

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**Kovinski materiali - Udarni preskus žilavosti po Charpyju - 1. del: Preskusna metoda (ISO 148-1:2009)**

Metallic materials - Charpy pendulum impact test - Part 1: Test method (ISO 148-1:2009)

Metallische Werkstoffe - Kerbschlagbiegeversuch nach Charpy - Teil 1: Prüfverfahren (ISO 148-1:2009)

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Matériaux métalliques - Essai de flexion par choc sur éprouvette Charpy - Partie 1: Méthode d'essai (ISO 148-1:2009) [SIST EN ISO 148-1:2010](#)

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77.040.10 Mehansko preskušanje kovin Mechanical testing of metals

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English Version

## Metallic materials - Charpy pendulum impact test - Part 1: Test method (ISO 148-1:2009)

Matériaux métalliques - Essai de flexion par choc sur éprouvette Charpy - Partie 1: Méthode d'essai (ISO 148-1:2009)

Metallische Werkstoffe - Kerbschlagbiegeversuch nach Charpy - Teil 1: Prüfverfahren (ISO 148-1:2009)

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## Foreword

The text of ISO 148-1:2009 has been prepared by Technical Committee ISO/TC 164 "Mechanical testing of metals" of the International Organization for Standardization (ISO) and has been taken over as EN ISO 148-1:2010 by Technical Committee ECISS/TC "Test methods for steel (other than chemical analysis)" the secretariat of which is held by AFNOR.

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of an identical text or by endorsement, at the latest by April 2011, and conflicting national standards shall be withdrawn at the latest by April 2011.

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# INTERNATIONAL STANDARD

**ISO**  
**148-1**

Second edition  
2009-11-15

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## **Metallic materials — Charpy pendulum impact test —**

### **Part 1: Test method**

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

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*Partie 1: Méthode d'essai*

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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 148-1 was prepared by Technical Committee ISO/TC 164, *Mechanical testing of metals*, Subcommittee SC 4, *Toughness testing — Fracture (F), Pendulum (P), Tear (T)*.

This second edition cancels and replaces the first edition (ISO 148-1:2006), 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*

Annexes B and C are based on ASTM E23 (*Standard Test Methods for Notched Bar Impact Testing of Metallic Materials*), copyright ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, USA.

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# Metallic materials — Charpy pendulum impact test —

## Part 1: Test method

### 1 Scope

This part of ISO 148 specifies the Charpy pendulum impact (V-notch and U-notch) test method for determining the energy absorbed in an impact test of metallic materials.

This part of ISO 148 does not apply to instrumented impact testing, which is specified in ISO 14556.

### 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 148-2:2008, *Metallic materials — Charpy pendulum impact test — Part 2: Verification of testing machines*

ISO 286-1, *Geometrical product specifications (GPS) — ISO code system for tolerances of linear sizes — Part 1: Basis of tolerances, deviations and fits*

### 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

#### 3.1 Energy

##### 3.1.1

##### **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

[ISO 148-2:2008, definition 3.2.2]

##### 3.1.2

##### **absorbed energy**

$K$

energy required to break a test piece with a pendulum impact testing machine, after correction 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, for example  $KV_2$ .

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## 3.2 Test piece

With the test piece placed in the test position on the supports of the machine, the following nomenclature shall apply (see Figure 1).

## 3.2.1 height

 $h$ 

distance between the notched face and the opposite face

## 3.2.2 width

 $w$ 

dimension perpendicular to the height that is parallel to the notch

## 3.2.3 length

 $l$ 

the largest dimension at right angles to the notch

## 4 Symbols and abbreviated terms

The symbols and designations applicable to this part of ISO 148 are indicated in Tables 1 and 2, and are illustrated in Figure 2.

Table 1 — Symbols and their unit and designation

Symbol	Unit	Designation
$K_p$	J	Initial potential energy (potential energy)
$FA$	%	Shear-fracture appearance
$h$	mm	Height of test piece
$KU_2$	J	Absorbed energy for a U-notch test piece using a 2 mm striker
$KU_8$	J	Absorbed energy for a U-notch test piece using an 8 mm striker
$KV_2$	J	Absorbed energy for a V-notch test piece using a 2 mm striker
$KV_8$	J	Absorbed energy for a V-notch test piece using a 8 mm striker
$LE$	mm	Lateral expansion
$l$	mm	Length of test piece
$T_t$	°C	Transition temperature
$w$	mm	Width of test piece

## 5 Principle

This test consists of breaking a notched test piece with a single blow from a swinging pendulum, under the conditions defined in Clauses 6, 7 and 8. The notch in the test piece has specified geometry and is located in the middle between two supports, opposite to the location which is struck in the test. The energy absorbed in the impact test is determined.

Because the impact values of many metallic materials vary with temperature, tests shall be carried out at a specified temperature. When this temperature is other than ambient, the test piece shall be heated or cooled to that temperature, under controlled conditions.