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Metallic materials — Charpy V-notch pendulum impact test — Instrumented test method

Matériaux métalliques — Essai de flexion par choc sur éprouvette Charpy à entaille en V — Méthode d'essai instrumenté

Reference number
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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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This document was prepared by Technical Committee ISO/TC 164, *Mechanical testing of metals*, Subcommittee SC 4, *Fatigue, fracture and toughness testing,* in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 459/SC 1, *Test methods for steel (other than chemical analysis)*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This third edition cancels and replaces the second edition (ISO 14556:2015), which has been technically revised.

The main changes are as follows:

— in Clause 1, a sentence was added to state that results shall not be directly used in design calculations;

— in Clause 4, the symbol K_p (potential energy of the pendulum hammer) was added; the symbol *KV* (absorbed energy) was changed to K_V;

— in 6.1 and D.2.1, the application of the “dynamic force adjustment” was added;

— in 6.2.3, a generic statement about the stiffness of the support block was removed;

— in 6.2.5, the possibility of directly determining characteristic values from printed graphs was removed;

— in Clauses 7 and 8, statements referring to Annex D when testing miniature test pieces were added;

— in 9.2, the characteristic values of force that can be evaluated from curves of Type A and B were changed;

— in 9.3, it is now specified that F_m is determined after general yield;

— in Figure 2, force-displacement curves in columns 3 (actual recording) were replaced with better-quality ones;

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— in Clause 10, a requirement to report the type of test piece (standard, subsize, or miniature) was added;

— in Annex A, it was clarified that those shown are examples of instrumented strikers;

— in Annex D, alternative miniature test pieces were removed;

— in D.2.1, the deviation range between W_t and K_V was changed from ±0,5 J to ±10 % of K_V;

— in D.3.1, dimensions for the standard miniature test piece were added; test temperature requirements were removed; the test report section was removed;

— in the Bibliography, a new reference, [8], was added.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Metallic materials — Charpy V-notch pendulum impact test — Instrumented test method

1 Scope

This document specifies a method of instrumented Charpy V-notch pendulum impact testing on metallic materials and the requirements concerning the measurement and recording equipment.

With respect to the Charpy pendulum impact test described in ISO 148-1, this test provides further information on the fracture behaviour of the product under impact testing conditions.

The results of instrumented Charpy test analyses are not directly transferable to structures or components and shall not be directly used in design calculations or safety assessments.

NOTE General information about instrumented impact testing can be found in References [1] to [5].

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 148-2, *Metallic materials — Charpy pendulum impact test — Part 2: Verification of testing machines*

3 Terms and definitions

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

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1 Characteristic values of force (see Figure 2)

3.1.1
general yield force
F_{gy}
force at the transition point from the linearly increasing part, discarding inertia peak(s), to the curved increasing part of the force-displacement curve

Note 1 to entry: It represents an approximation of the force at which yielding occurs across the entire test piece ligament (see 9.3).

3.1.2
maximum force
F_m
maximum force in the course of the force-displacement curve

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