



# FINAL DRAFT International Standard

## ISO/FDIS 13802

### Plastics — Verification of pendulum impact-testing machines — Charpy, Izod and tensile impact-testing

*Plastiques — Vérification des machines d'essai de choc pendulaire  
— Essais de choc Charpy, Izod et de choc-traction*

ISO/TC 61/SC 2

Secretariat: **KATS**

Voting begins on:  
**2025-05-27**

Voting terminates on:  
**2025-07-22**

Document Preview

ISO/FDIS 13802

<https://standards.iteh.ai/catalog/standards/iso/8d12d51d-b785-4cf2-a984-bbcba3c297c4/iso-fdis-13802>

**ISO/CEN PARALLEL PROCESSING**

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.

IN ADDITION TO THEIR EVALUATION AS BEING ACCEPTABLE FOR INDUSTRIAL, TECHNOLOGICAL, COMMERCIAL AND USER PURPOSES, DRAFT INTERNATIONAL STANDARDS MAY ON OCCASION HAVE TO BE CONSIDERED IN THE LIGHT OF THEIR POTENTIAL TO BECOME STANDARDS TO WHICH REFERENCE MAY BE MADE IN NATIONAL REGULATIONS.

iTeh Standards  
(<https://standards.iteh.ai>)  
Document Preview

ISO/FDIS 13802

<https://standards.iteh.ai/catalog/standards/iso/8d12d51d-b785-4cf2-a984-bbcba3c297c4/iso-fdis-13802>



**COPYRIGHT PROTECTED DOCUMENT**

© ISO 2025

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office  
CP 401 • Ch. de Blandonnet 8  
CH-1214 Vernier, Geneva  
Phone: +41 22 749 01 11  
Email: [copyright@iso.org](mailto:copyright@iso.org)  
Website: [www.iso.org](http://www.iso.org)

Published in Switzerland

## Contents

Page

Foreword.....	iv
Introduction.....	v
<b>1 Scope.....</b>	<b>1</b>
<b>2 Normative references.....</b>	<b>1</b>
<b>3 Terms and definitions.....</b>	<b>1</b>
<b>4 Measurement instruments.....</b>	<b>3</b>
<b>5 Description of a pendulum impact-testing machine.....</b>	<b>4</b>
5.1 Types of pendulum impact-testing machines.....	4
5.2 Pendulum impact testing machine components.....	4
<b>6 Procedure for verification and inspection of a pendulum impact-testing machine.....</b>	<b>5</b>
6.1 Machine design and manufacturer.....	5
6.2 Machine frame field verification.....	5
6.2.1 General.....	5
6.2.2 Installation.....	5
6.2.3 Levelness.....	6
6.2.4 Axial play of the pendulum bearings.....	6
6.2.5 Radial play of the pendulum bearings.....	6
6.2.6 Mechanism for holding and releasing the pendulum.....	6
6.2.7 Free hanging position.....	6
6.2.8 Contact between specimen and striking edge (Izod/Charpy).....	6
6.2.9 Potential energy, $E$ .....	6
6.2.10 Pendulum length, $L_p$ .....	7
6.2.11 Impact length, $L_i$ .....	8
6.2.12 Velocity of the pendulum at instant of impact, $v_i$ .....	8
6.3 Charpy testing machines.....	10
6.4 Izod testing machines.....	11
6.5 Tensile impact testing machines.....	12
6.6 Energy indicating system.....	13
6.6.1 Types of scale.....	13
6.6.2 Verification of analogue indicating equipment.....	13
6.6.3 Error in the indicated absorbed energy, $W_i$ , on analogue indicating systems.....	14
6.6.4 Verification of digital indicating equipment.....	14
6.7 Losses due to friction.....	14
6.7.1 Types of loss.....	14
6.7.2 Determination of the loss due to friction in the pointer.....	14
6.7.3 Determination of losses due to air resistance and friction in the pendulum bearings.....	15
6.7.4 Calculation of the total energy lost due to friction.....	15
6.7.5 Maximum permissible losses due to friction.....	15
<b>7 Frequency of verification.....</b>	<b>17</b>
<b>8 Verification report.....</b>	<b>17</b>
<b>Annex A (normative) Design requirements for Charpy machines.....</b>	<b>19</b>
<b>Annex B (normative) Design requirements for Izod machines.....</b>	<b>22</b>
<b>Annex C (normative) Design requirements for tensile impact machines.....</b>	<b>25</b>
<b>Annex D (informative) Ratio of frame mass to pendulum mass.....</b>	<b>30</b>
<b>Annex E (informative) Deceleration of pendulum during impact.....</b>	<b>33</b>
<b>Annex F (informative) Gauge plate for verification of Charpy impact pendulums.....</b>	<b>35</b>

## 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 document 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](http://www.iso.org/directives)).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at [www.iso.org/patents](http://www.iso.org/patents). ISO shall not be held responsible for identifying any or all such patent rights.

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 2, *Mechanical properties*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 249, *Plastics*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This third edition cancels and replaces the second edition (ISO 13802:2015), which has been technically revised.

The main changes are as follows:

- removed term entries 3.6 (gravity length), 3.7 (gyration length), and 3.19 (half-height Charpy impact reference specimen) and renumbered [Clause 3](#) accordingly;
- corrected the measurement unit and the requirement in [6.2.4](#);
- updated acceptance criteria in [6.6.3](#);
- updated the references in Note 2 of the [Clause 7](#);
- corrected value  $D_1$  in [Table A.1](#) to align with the value indicated in [Table 4](#);
- corrected value  $p_1$  in [Table B.1](#) to align with the value indicated in [Table 4](#);
- corrected the [Formulae \(D.4\)](#) and [\(D.5\)](#) in [Annex D](#).

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](http://www.iso.org/members.html).

## Introduction

A pendulum impact-testing machine verified in accordance with this document, and assessed as satisfactory, is considered suitable for impact testing with unnotched and notched test specimens of different types.

The verification of some geometrical properties is difficult to perform on the assembled instrument. It is, therefore, assumed that the manufacturer is responsible for the verification of such properties and for providing reference planes on the instrument that enable proper verification in accordance with this document.

iTeh Standards  
(<https://standards.iteh.ai>)  
Document Preview

ISO/FDIS 13802

<https://standards.iteh.ai/catalog/standards/iso/8d12d51d-b785-4cf2-a984-bbcba3c297c4/iso-fdis-13802>

