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**Plastics — Determination of Charpy  
impact properties —**

Part 2:  
**Instrumented impact test**

AMENDMENT 1: Precision data

*Plastiques — Détermination des caractéristiques au choc Charpy —*

*Partie 2: Essai de choc instrumenté*

*AMENDEMENT 1: Données de fidélité*

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Tel. + 41 22 749 01 11  
Fax + 41 22 749 09 47  
E-mail [copyright@iso.org](mailto:copyright@iso.org)  
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Published in Switzerland

## Foreword

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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.

Amendment 1 to ISO 179-2:1997 was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 2, *Mechanical properties*.

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# Plastics — Determination of Charpy impact properties —

## Part 2: Instrumented impact test

### AMENDMENT 1: Precision data

Page 11, Clause 9

Replace “See ISO 179-1, clause 9” by “See Annex D”.

End of text

Add the following annex:

#### Annex D (informative)

##### Precision data

**D.1** Tables D.1 and D.2 are based on a round-robin test involving four laboratories and one material. All of the test samples were produced and distributed by one source. Each “test result” was the average of 10 individual determinations. Each laboratory obtained and reported 10 test results for each material.

**D.2** Tables D.3 and D.4 are based on a round-robin test involving three laboratories and one material. All of the test samples were produced and distributed by one source. Each “test result” was the average of 10 individual determinations. Each laboratory obtained and reported 10 test results for each material.

**D.3** Due to the limited number of laboratories and materials, the explanations of  $r$  and  $R$  given in Clause D.4 are only intended to present a meaningful way of considering the *approximate* precision of this test method. The data in Tables D.1 to D.4 should not be rigorously applied to acceptance or rejection of material, as those data are specific to the round robin and might not be representative of other lots, conditions, materials or laboratories.

**D.4** Concept of “ $r$ ” and “ $R$ ” in Tables D.1 to D.4: If  $s_r$  and  $s_R$  have been calculated from a large enough body of data, and for test results that were averages from testing 10 specimens for each test result, then the following applies:

- a) **Repeatability** — Two test results obtained within one laboratory should be judged not equivalent if they differ by more than the  $r$  value for that material,  $r$  being the interval representing the critical difference between two test results for the same material, obtained by the same operator using the same equipment in the same laboratory.
- b) **Reproducibility** — Two test results obtained by different laboratories should be judged not equivalent if they differ by more than the  $R$  value for that material,  $R$  being the interval representing the critical difference between two test results for the same material, obtained by different operators using different equipment in different laboratories.

The judgements in a) and b) will have an approximately 95 % (0,95) probability of being correct.

**Table D.1 — Precision for Charpy (notched) impact strength**

Values in kilojoules per square metre

Material	Average	$s_r$	$s_R$	$r$	$R$
PS-HI	13,03	0,099	1,56	0,28	4,36
$s_r$ within-laboratory standard deviation; $s_R$ between-laboratory standard deviation; $r$ 95 % repeatability limit (= $2,8s_r$ ); $R$ 95 % reproducibility limit (= $2,8s_R$ ).					

**Table D.2 — Precision for impact energy at break**

Values in joules

Material	Average	$s_r$	$s_R$	$r$	$R$
PS-HI	0,40	0,004	0,04	0,01	0,11
$s_r$ within-laboratory standard deviation; $s_R$ between-laboratory standard deviation; $r$ 95 % repeatability limit (= $2,8s_r$ ); $R$ 95 % reproducibility limit (= $2,8s_R$ ).					

**Table D.3 — Precision for maximum impact force**

Values in newtons

Material	Average	$s_r$	$s_R$	$r$	$R$
PS-HI	193,7	3,62	9,72	10,14	27,23
$s_r$ within-laboratory standard deviation; $s_R$ between-laboratory standard deviation; $r$ 95 % repeatability limit (= $2,8s_r$ ); $R$ 95 % reproducibility limit (= $2,8s_R$ ).					

**Table D.4 — Precision for deflection at maximum impact force**

Values in millimetres

Material	Average	$s_r$	$s_R$	$r$	$R$
PS-HI	1,89	0,049	0,06	0,14	0,17
$s_r$ within-laboratory standard deviation; $s_R$ between-laboratory standard deviation; $r$ 95 % repeatability limit (= $2,8s_r$ ); $R$ 95 % reproducibility limit (= $2,8s_R$ ).					