INTERNATIONAL STANDARD

ISO 9854-2

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Thermoplastics pipes for the transport of fluids — Determination of pendulum impact strength by the Charpy method —

Part 2:
Test conditions for pipes of various materials

Tubes thermoplastiques pour le transport des fluides — Détermination de la résistance aux chocs pendulaires par la méthode Charpy —

Partie 2: Conditions d'essai pour différentes matières constitutives de tubes

Reference number
ISO 9854-2:1994(E)

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.

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.

International Standard ISO 9854-2 was prepared by Technical Committee ISO/TC 138, *Plastics pipes, fittings and valves for the transport of fluids*, Subcommittee SC 5, *General properties of pipes, fittings and valves of plastic materials and their accessories — Test methods and basic specifications*.

ISO 9854 consists of the following parts, under the general title *Thermoplastics pipes for the transport of fluids — Determination of pendulum impact strength by the Charpy method*:

— *Part 1: General test method*

— *Part 2: Test conditions for pipes of various materials*

Annex A of this part of ISO 9854 is for information only.

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Thermoplastics pipes for the transport of fluids — Determination of pendulum impact strength by the Charpy method —

Part 2:
Test conditions for pipes of various materials

1 Scope

This part of ISO 9854 specifies the values or options chosen for the test parameters, i.e. the impact energy, test piece dimensions, shape and spacing of the test piece supports, and type of test piece, for testing the impact resistance (pendulum method) of thermoplastics pipes of the following materials, when tested in accordance with ISO 9854-1.

It applies to pipes made of unplasticized poly(vinyl chloride) (PVC-U), unplasticized poly(vinyl chloride), for extrusion, impact modified (PVC-U,EP), chlorinated poly(vinyl chloride) (PVC-C), acrylonitrile/butadiene/styrene (ABS), acrylonitrile/styrene/acrylate (ASA) and polypropylene (PP) and propylene-copolymer.

This test is not intended to be a reference test method for determining the impact strength of pipes.

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this part of ISO 9854. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this part of ISO 9854 are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 9854-1:1994, *Thermoplastics pipes for the transport of fluids — Determination of pendulum impact strength by the Charpy method — Part 1: General test method.*

3 Specific test conditions

3.1 General

For testing in accordance with ISO 9854-1, the values or options for the test parameters shall comply with those specified in table 1, 2, 3 or 4 of this part of ISO 9854, and with 3.2, 3.3, 3.4 or 3.5, as appropriate, depending on the material of which the pipe is made, and its size.

3.2 PVC-U and PVC-U,EP pipes

See table 1.

3.3 PVC-C pipes

See table 2.

3.4 ABS and ASA pipes

See table 3.

3.5 Polypropylene (PP) and propylene-copolymer pipes

See table 4.

Table 1 — PVC-U and PVC-U,EP pipes

Pipe dimensions		Test piece shape[1]	Test piece supports[2]	Impact energy	Test temperature °C	
External diameter mm	Wall thickness e mm			J	PVC-U	PVC-U,EP
< 25	All	1	Figure 1	15	23 ± 2	0 ± 2
⩾ 25 but < 75	All	2	Figure 2	15	23 ± 2	0 ± 2
⩾ 75	$e \leqslant 9,5$	2	Figure 2 or 3	15	23 ± 2	0 ± 2
⩾ 75	$e > 9,5$	3	Figure 1 or 3	50	23 ± 2	0 ± 2

1) See ISO 9854-1:1994, clause 5, table 1.

2) See ISO 9854-1:1994, clause 4.

Table 2 — PVC-C pipes

Pipe dimensions		Test piece shape[1]	Test piece supports[2]	Impact energy	Test temperature
External diameter mm	Wall thickness e mm			J	°C
< 25	All	1	Figure 1	15	23 ± 2
⩾ 25 but < 75	$e \leqslant 4,2$	2	Figure 2	15	23 ± 2
⩾ 25 but < 75	$4,2 < e \leqslant 9,5$	3	Figure 1	15	23 ± 2
⩾ 75	$e \leqslant 9,5$	2	Figure 2 or 3	15	23 ± 2
⩾ 75	$e > 9,5$	2	Figure 2 or 3	15	23 ± 2

1) See ISO 9854-1:1994, clause 5, table 1.

2) See ISO 9854-1:1994, clause 4.

Table 3 — ABS and ASA pipes

Pipe dimensions		Test piece shape[1]	Test piece supports[2]	Impact energy	Test temperature
External diameter mm	Wall thickness e mm			J	°C
< 75	$e < 3$	2	Figure 2	15	23 ± 2
< 75	$e \geqslant 3$	3	Figure 1	15	23 ± 2
⩾ 75	$e < 3$	2	Figure 2 or 3	15	23 ± 2
⩾ 75	$e \geqslant 3$	3	Figure 1 or 3	15	23 ± 2

1) See ISO 9854-1:1994, clause 5, table 1.

2) See ISO 9854-1:1994, clause 4.

Table 4 — Polypropylene (PP) and propylene-copolymer pipes

Pipe dimensions		Test piece shape[1]	Test piece supports[2]	Impact energy	Test temperature °C	
External diameter mm	Wall thickness e mm			J	Homopolymer	Copolymer
< 25	All	1	Figure 1	15	23 ± 2	0 ± 2
⩾ 25 but < 75	$e \leqslant 4{,}2$	2	Figure 2	15	23 ± 2	0 ± 2
⩾ 25 but < 75	$4{,}2 < e \leqslant 10{,}5$	3	Figure 1	15	23 ± 2	0 ± 2
⩾ 75	$e \leqslant 4{,}2$	2	Figure 2 or 3	15	23 ± 2	0 ± 2
⩾ 75	$4{,}2 < e \leqslant 10{,}5$	3	Figure 1 or 3	15	23 ± 2	0 ± 2

1) See ISO 9854-1:1994, clause 5, table 1.

2) See ISO 9854-1:1994, clause 4.

Annex A
(informative)

Basic specification

Initially ten test pieces should be tested. A single failure is permitted.

If two or three failures occur, it is recommended that a further 20 test pieces be tested. The total number of failures, expressed as a percentage, should not exceed 10 %.

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Descriptors: plastics products, pipes (tubes), fluid circuits, thermoplastic resins, plastic tubes, tests, determination, strength, Charpy impact tests, testing conditions.

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