IEC 61300-2-12

Edition 3.0 2009-07

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Fibre optic interconnecting devices and passive components – Basic test and measurement procedures –
Part 2-12: Tests – Impact

Dispositifs d'interconnexion et composants passifs à fibres optiques – Méthodes fondamentales d'essais et de mesures –
Partie 2-12: Essais – Impact

IEC 61300-2-12:2009

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INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

PRICE CODE
CODE PRIX L

ICS 33.180.20 ISBN 978-2-88910-490-1

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

FIBRE OPTIC INTERCONNECTING DEVICES AND PASSIVE COMPONENTS – BASIC TEST AND MEASUREMENT PROCEDURES –

Part 2-12: Tests – Impact

FOREWORD

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International Standard IEC 61300-2-12 has been prepared by subcommittee 86B: Fibre optic interconnecting devices and passive components, of IEC technical committee 86: Fibre optics.

This third edition of IEC 61300-2-12 cancels and replaces the second edition published in 2005. In this third edition, the impact test with a steel ball has been added.

The text of this standard is based on the following documents:

CDV	Report on voting
86B/2784/CDV	86B/2848/RVC

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts of IEC 61300 series, published under the general title *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures* can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

The contents of the corrigendum of June 2011 have been included in this copy.

FIBRE OPTIC INTERCONNECTING DEVICES AND PASSIVE COMPONENTS – BASIC TEST AND MEASUREMENT PROCEDURES –

Part 2-12: Tests – Impact

1 Scope

This part of IEC 61300 is to evaluate the ability of a passive fibre optic device or a closure to withstand impacts likely to be encountered during usage. The impact may be a localized impact, a series of impacts with hard objects, or an impact normally associated with dropping the device.

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.

IEC 61300-1, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 1: General and guidance*

IEC 61300-3-1, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-1: Examinations and measurements – Visual examination*

IEC 61753-1, *Fibre optic interconnecting devices and passive components performance standard – Part 1: General and guidance for performance standards*

3 General description

Three methods are described:

– Method A: a specimen with an attached length of cable is freely swung in a pendular motion and allowed to strike an impact surface.

– Method B: a steel ball is dropped on the specimen which is placed on a smooth hard rigid surface of concrete or steel.

– Method C: the specimen is released such as to allow free fall drops from the position of suspension.

Impairment of function to the extent that the device fails to meet the requirements of the relevant specification constitutes failure.

4 Apparatus

4.1 Method A – Pendulum drop

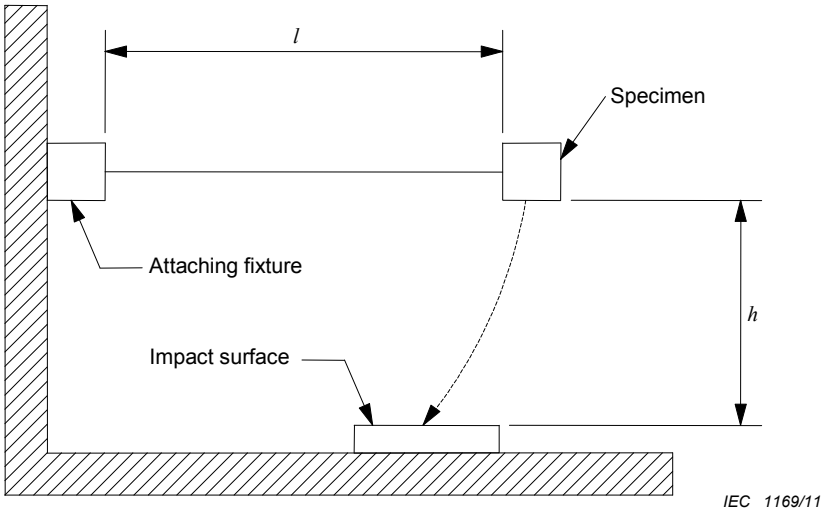
4.1.1 Attaching fixture

The attaching fixture shall be capable of being mounted on any convenient, rigid, vertical structure. If the device has an attached cable, the cable shall be mounted to the fixture in such a manner as to allow it to swing freely from a horizontal to a vertical position. An

example of a suitable set-up is shown in Figure 1. For devices which have no cable attached, one of two options shall be used:

a) a connector assembly adaptor or other fixture of equivalent or less weight shall be mounted such that a patchcord cable can be attached, or

b) method C shall be used.



Values for the cable length *l* and the drop height *h* are given in 5.4.2.

Figure 1 – Method A – Apparatus

4.1.2 Surface plate

The impact surface shall be a steel plate with a minimum thickness of 12,5 mm. The surface area of the plate shall be commensurate with the specimen dimensions.

4.2 Method B – Impact with steel ball

4.2.1 Impact tool

A steel ball of 1 kg shall be dropped from a hand-held position, or by a release device. Where necessary, other masses and shapes of the impact tool may be defined in the relevant specification.

4.2.2 Surface

Unless otherwise specified, all test specimens shall be positioned on a smooth hard rigid surface of concrete or steel. Where necessary, other surfaces may be defined in the relevant specification.

4.2.3 Drop apparatus

An example of an apparatus to drop the impact tool is given in Figure 2. It consists of a hollow tube (guide) with a release system. The inner diameter of the tube shall be wide and smooth enough to minimise interaction between the tube and impact tool during the free fall.

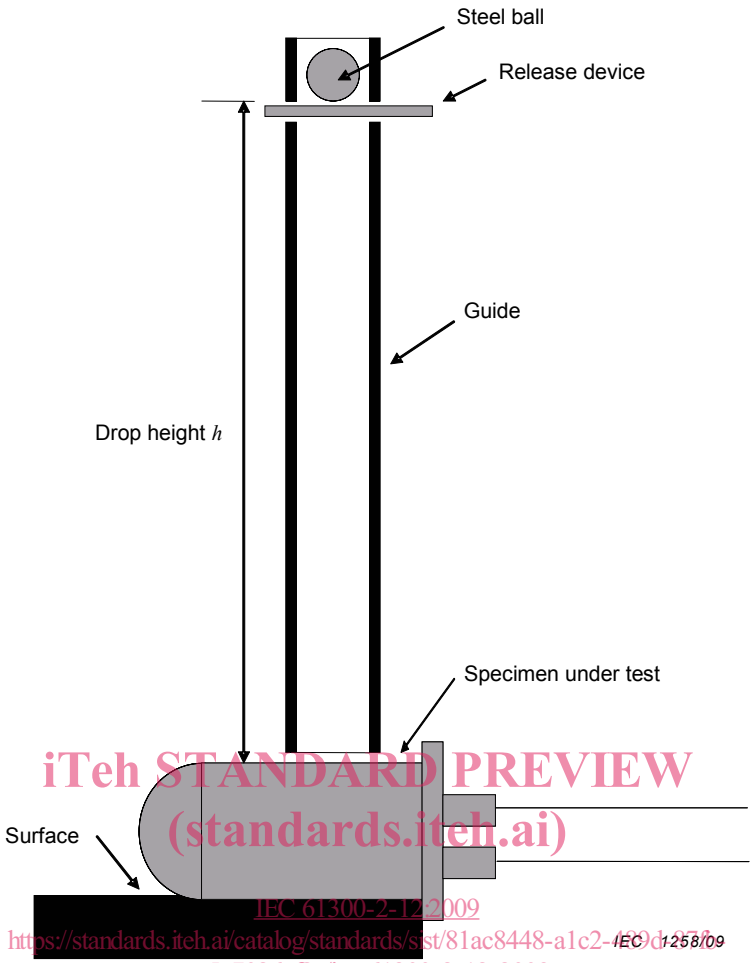


Figure 2 – Method B – Apparatus

4.3 Method C – Free drop of specimen

4.3.1 Attaching fixture

Specimens may be dropped from a hand-held position if small enough, or by a lifting-release device. Where a lifting–release device is used for the test, it shall not impart a rotational or sideways force to the specimen.

4.3.2 Impact surface

Unless otherwise specified, all drops shall be on to a smooth hard rigid surface of concrete or steel. Where necessary, other surfaces may be defined in the relevant specification.

5 Procedure

5.1 Preparation of specimen

Prepare and clean the specimen in accordance with the manufacturer's instructions.

5.2 Preconditioning

Pre-condition the specimen for 4 h at the standard test conditions as defined in IEC 61300-1, unless otherwise specified in the relevant specification.

5.3 Initial examinations and measurements

Complete initial examinations and measurements on the specimen shall be made as required by the relevant specification. Visual examination shall be done according to IEC 61300-3-1.

5.4 Test method

5.4.1 General

One of the following three methods shall be used in this test. They require examinations and measurements before and after the test only. If examinations and measurements are required during the test by the relevant specification, details will be specified in the relevant specification.

5.4.2 Method A

5.4.2.1 Drop height

Attach the cable clamping fixture at a drop height h from the impact surface as shown. The height, h, shall be 1,5 m.

5.4.2.2 Cable lenght

The cable length, l, shall be 2 m.

5.4.2.3 Fixation

Hold the specimen in a horizontal position with the cable fully extended as shown and allow it to drop on to the impact surface.

5.4.2.4 Cycle

Repeat the cycle 5 times.

5.4.3 Method B

5.4.3.1 Impact tool

A steel ball with mass 1 kg shall be positioned above the centre of the specimen, using the equipment as described in 4.2.3 at an appropriate drop height, h, which shall be measured from the part of the specimen nearest the impact surface, shall be selected from Table 1.

Table 1 – Drop height

IEC 61753-1 performance category	Drop height h m
Category A (Aerial) and G (Ground)	1
Category S (Subterranean)	2

5.4.3.2 Position

Specimen shall be positioned in an orientation such that it will be subjected to impact in the centre of the specimen. The specimen shall be subjected to one impact in this position.

5.4.3.3 Cycle

Repeat the cycle for other impact locations by rotating the specimen along its longitudinal axis by 90°. In total 4 positions shall be tested (at 0°, 90°, 180° and 270°).

5.4.4 Method C

5.4.4.1 Fixation

Hold the specimen by hand or by a lifting-release device as described in 4.3.1 at the appropriate drop height, h, given in Table 2 in 5.4.3.2 and in an orientation such that it will be subjected to impact on its resting surface, a corner or an edge as described in 5.4.4.2.

5.4.4.2 Drop height

The drop height h, which shall be measured from the part of the specimen nearest the test surface, shall be determined from Table 2.

Table 2 – Drop height and specimen mass

Specimen mass kg	**Drop height *h*** mm
0 to <10	100
10 to <25	75
25 to <50	50
>50	25

5.4.4.3 Corner and edge drop

For corner or edge drops, the specimen shall be positioned such that a straight line drawn through the corner or edge to be tested and the specimen's geometric centre is approximately perpendicular to the impact surface as shown in Figure 3.

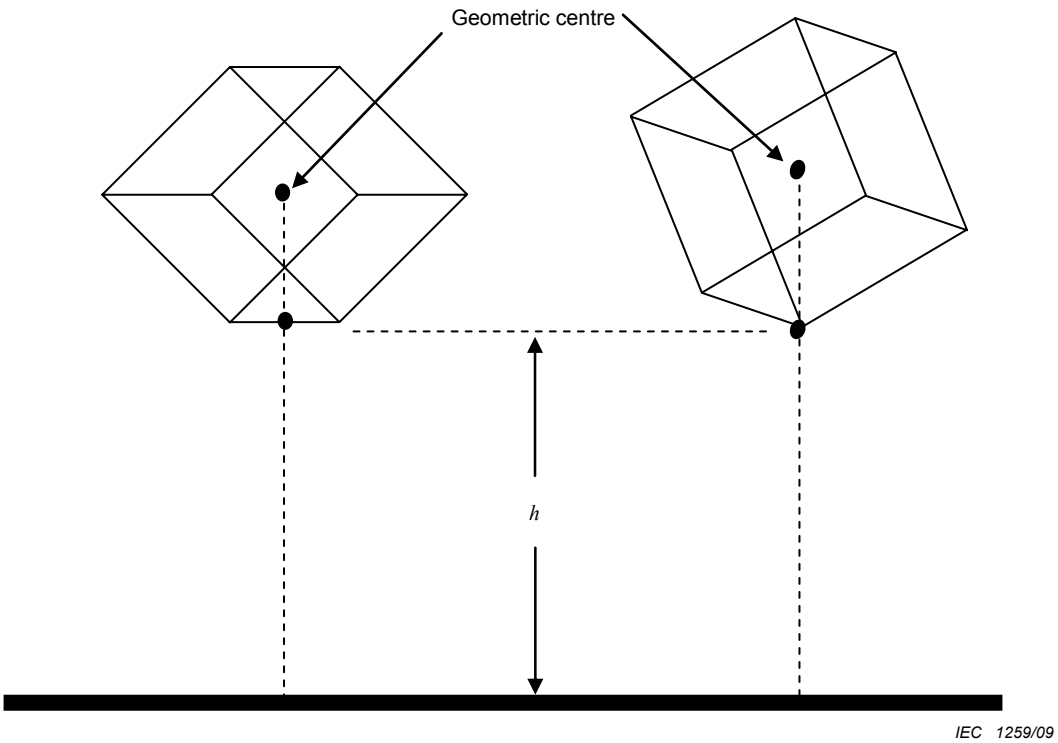


Figure 3 – Orientations for edge and corner drops