IEC 60794-1-21 â€“ Optical Fibre Cables â€“Part 1-21: Generic Specification â€“ Basic Optical Cable Test Procedures â€“Mechanical Test Methods- Method E4: Impact â€“ Testing Equipment

Description

6 Method E4: Impact
6.1 Object
The purpose of this test is to determine the ability of an optical fibre cable to withstand impact.
6.2 Sample
6.2.1 Sample length
The sample length shall be sufficient to carry out the specified test. When only physical damage is to be evaluated, the length may range from 1 m (for example for small diameter jumper cords or duplex cables) to 5 m (for larger diameter cables). Longer lengths may be necessary to permit optical measurements.
6.2.2 Termination
The sample shall be terminated at each end in a connector, or in a manner such that the fibres, sheathings and any strain members are clamped together in a representative manner. Clamps on the impact apparatus may be used, or the sample may be long enough so that no restraint is needed.
6.3 Apparatus
The apparatus shall allow an impact to be imparted to the cable sample which is fixed to a flat substantial steel base. When a single or only a few impacts are required, a suitable apparatus, as shown in Figure 7a, is used. This allows a weight to drop vertically onto a piece of steel which transmits the impact to the cable sample. When repeated impacts are required (say, more than five), a more practical apparatus, as shown in Figure 7b, is used, which

allows multiple impacts by a drop hammer. The apparatus shall be arranged to impart minimal friction to the moving weight/hammer.
NOTE This issue of friction has been found to be a particular problem when the apparatus is used at temperature
extremes.
In both cases, other equivalent apparatus may also be used.
The striking surface shall either be flat or have a curved surface with curvature radius of no less than 300 mm. If using a flat striking surface, the edges of the face shall be radiused to avoid a stress concentration riser, Figure 7c, detail B. If using a 300 mm curvature radius striking surface, then the surface may also be a spherical segment, as shown in Figure 7c, detail A, since for such a large curvature radius this gives an equivalent test method to that when using a rounded cylinder,.
The radius on the edge on the flat striking surface and on the 300 mm curvature radius striking surface shall be approximately 0,5 mm.
The apparatus shall include any optical test equipment needed to measure the changes in

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optical performance as required in the detail specification, and specified in Method A (Transmitted power) of IEC 60793-1-46:2001.

6.4 Procedure

Unless otherwise specified, the conditions for testing shall be in accordance with standard atmospheric conditions.

The mass of the weight or drop hammer and the height from which it falls shall be adjusted to give the value of impact energy shown in the detail specification. The number and rate of impacts, and their location on the sample shall be as specified in the detail specification.

6.5 Requirements

The acceptance criteria for the test shall be as stated in the detail specification. Typical failure modes include loss of optical continuity, degradation of optical transmittance or physical damage to the cable.

6.6 Details to be specified

The detail specification shall include the following:

a) number of impacts;
b) impact energy;
c) test temperature;
d) radius of the striking surface if other than specified herein;
e) frequency of multiple impacts (if any);
f) location of impacts on the sample;
g) if optical continuity or change in transmittance is to be measured.

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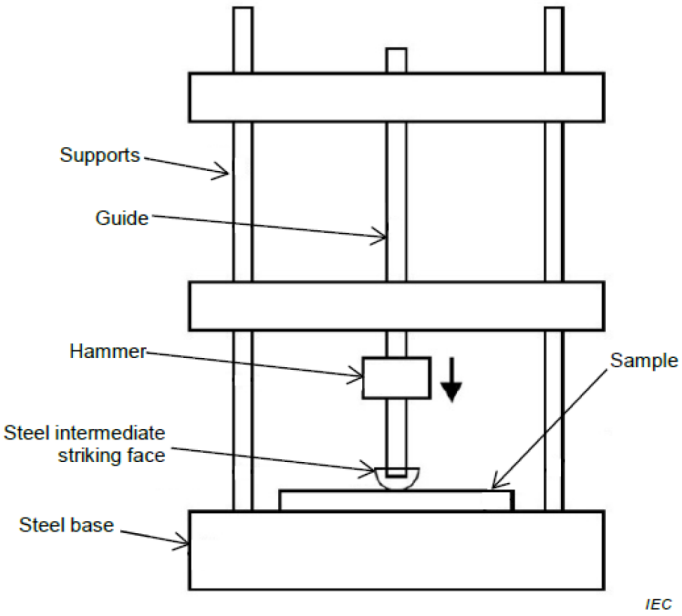


Figure 7a – Impact test – Apparatus for a few impacts

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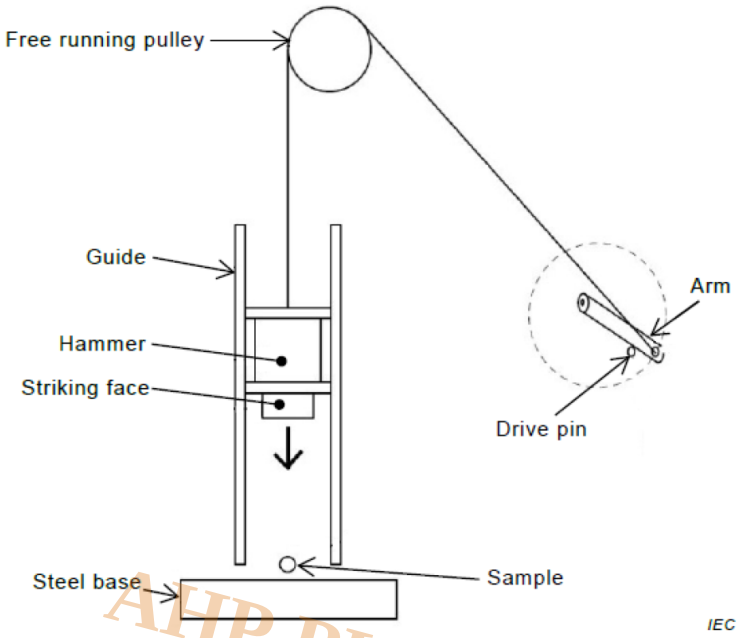


Figure 7b – Impact test – Apparatus for multiple impacts

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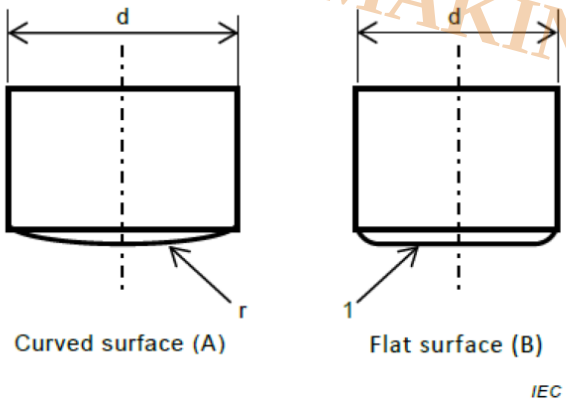


Figure 7c – Impact test – Details of the striking surface

Key

d hammer diameter, 20 mm ± 1 mm
r striking surface curvature radius, 300 mm, minimum
1 flat striking surface, with radiused edges

Figure 7 – Impact test

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Impact Tester for Optical Cables According to IEC 60794-1-21 Method E4

- Hard chrome guide shafts
- Manual release of weight
- geometry of striker as standard
- 4 weights are included

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Category

1. Equipment for Standards
2. Standards