IEC 60794-1-2 Optical Fibre Cables â€“Part 1-2: Generic Specification â€“ Basic Optical Cable Test Procedures â€“ Method E7: Torsion â€“ Testing Equipment

Description

11.1 Object
This test method is intended to establish the ability of a fibre optic cable to withstand mechanical twisting. The primary purpose of this procedure is to measure any variation in the optical power transmittance of a fibre when the cable is subjected to torsional forces external to the cable jacket. A secondary purpose is to evaluate the possibility of physical damage that may occur as a result of such stresses.
11.2 Sample
The specimen shall be a sample of fibre optic cable having a total length sufficient to permit the appropriate clamping and twisting, and long enough to permit optical transmittance measurements as required by the detail specification.
11.3 Apparatus
The twisting apparatus consists essentially of two cable gripping devices or clamps, one fixed and one that can rotate, supported as appropriate, the distance between them being adjustable. The rotating clamp is connected to suitable turning equipment (e.g. a torquing lever). Any clamp supports, gripping devices or torquing equipment used shall all be such as to permit access to both ends of the cable specimen for optical testing as may be required. Suitable apparatus is illustrated in Figures 10, 11, and 12.
The cable gripping devices shall be such that

- they may be tightened around the cable sufficiently to prevent movement within the grip,
- the clamps hold the cable firmly in a straight line,
- the clamps induce neither localized twisting damage on the cable caused by the inside edge of the clamp nor undue localized concentration of pressure on the cable,
- the process of clamping does not induce any significant or accurately measurable attenuation increase (or no more than a negligible increase) in the specimen.
  If required by the detail specification and/or to minimize specimen bending from a straight configuration, use weights or an appropriate loading mechanism to apply a tensile load to the cable gripping fixture (see Figures 11 and 12).
  The apparatus shall include optical transmittance equipment to measure the change in optical throughput as required in the detail specification, and specified in method A (Transmitted power) of IEC 60793-1-46.

11.4 Procedure
Install the specimen in the test apparatus such that the test length L (see Figures 10, 11 and 12) is as required by the detail specification. Take care to insure that no initial stress is applied to the specimen. Except for the necessary twisting operation, take care not to move or disturb the specimen ends throughout the test.
Minimize specimen sag (Figure 10 or 11) or vertical deviation from a straight line (Figure 12) as

AHP PLASTIK MAKINA

much as possible.

If change of optical measurement is required by the detail specification, measure the unstressed specimen. Compare results with those after clamping to ensure that the clamping has not significantly degraded the cable performance.
If not prohibited by the detail specification, specimen sag or bend may be minimized by supporting the test length or by applying tension to the specimen cable between clamps. If required, apply tension as specified in the detail specification to keep the specimen straight. If tension is required by the detail specification, but specific tension loads are not stated, apply tension as shown in Table 1.

Table 1 – Tension to be applied

Nominal cable diameter range mm	Minimum load N
≤ 2,5	15
2,6 to 4,0	25
4,1 to 6,0	40
6,1 to 9,0	45
9,1 to 13,0	50
13,1 to 18,0	55
18,1 to 24,0	65
24,1 to 30,0	70
≥ 30,1	75

AHP PLASTIK MAKINA

If a determination of optical transmittance changes is required by the detail specification, measure optical output power for the specimen after clamping and application of tensile load. Rotate the movable cable clamp as follows:
a) 180Â° clockwise;
b) return to the starting position;
c) 180Â° counter-clockwise;
d) return to the starting position.

This total four-part movement constitutes one cycle. Unless otherwise specified in the detail specification, complete each cycle within 1 min maximum, for a total of 10 cycles.
During the final tenth cycle, determine the number of transmitting fibres with the cable

a) with the cable rotated 180Â° clockwise;
b) with the cable rotated 180Â° counter-clockwise;
c) with no rotation, after completion of the final cycle.

Carry out the acceptance criteria parameters measurements. Allow the specimen to rest for a minimum period of 5 min. If necessary, the sample may be removed from the apparatus for visual examination using normal corrected vision.

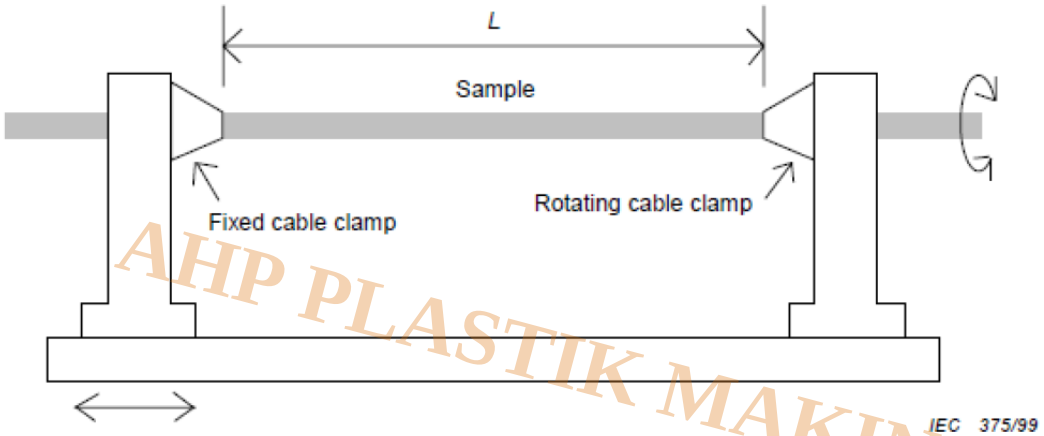
11.5 Requirements
The acceptance criteria for the sample under test shall be as stated in the detail specification. Typical

failure modes include loss of optical continuity, increase in fibre loss and damage to the cable jacket or core components.

11.6 Details to be specified

The detail specification shall include the following:

a) test length L;
b) any tension which is to be applied;
c) number of fibres to be monitored for optical transmittance;
d) maximum allowable change in optical transmittance.



AHP PLASTIK MAKINA

Figure 10 – Cable torsion apparatus

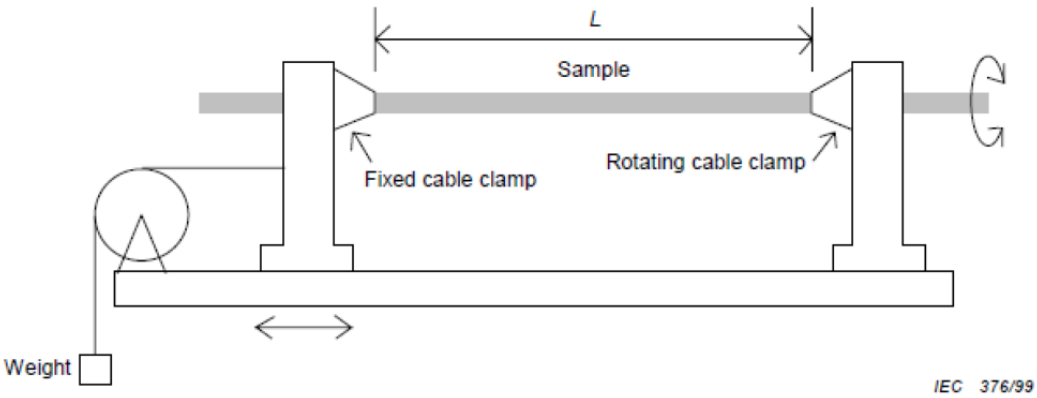


Figure 11 – Cable torsion apparatus with tension applied

Direct Sales by Manufacturer

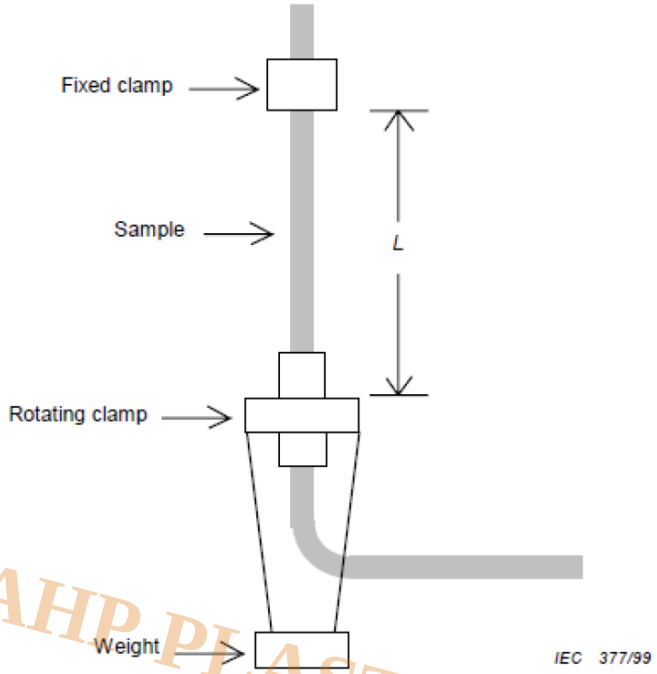


Figure 12 – Alternative cable torsion apparatus with tension applied

AHP PLASTIK MAKINA



Torsion Tester According to IEC-60794-1-21 Method E7

The Optical Fiber Cable Torsion Testing Machine is used to determine the ability of optical fiber cable to withstand mechanical twisting.

- Â· Touch screen 7â€•
- Â· Max distance between grips: 1000mm
- Â· Torsion angle: 90, 180, 360 degrees
- Â· Twisting cycles: up to 9999
- Â· Frequency of loading: 50-30 cycles per minute
- Â· Mass of weights: 1-10kg

Category

1. Equipment for Standards
2. Standards