

Optical fibre cables - Part 1-21: Generic specification -
Basic optical cable test procedures - Mechanical tests
methods

EESTI STANDARDI EESSÕNA

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Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
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ICS 33.180.10

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English Version

Optical fibre cables - Part 1-21: Generic specification - Basic optical cable test procedures - Mechanical tests methods (IEC 60794-1-21:2015)

Câbles à fibres optiques - Partie 1-20: Spécification générale - Procédures fondamentales d'essais des câbles optiques - Méthodes d'essais mécaniques (IEC 60794-1-21:2015)

Lichtwellenleiter - Teil 1-21: Fachgrundspezifikation - Grundlegende - Prüfverfahren für Lichtwellenleiterkabel - Mechanische Prüfverfahren (IEC 60794-1-21:2015)

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Europäisches Komitee für Elektrotechnische Normung

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Foreword

The text of document 86A/1638/FDIS, future edition 1 of IEC 60794-1-21, prepared by SC 86A "Fibres and cables" of IEC/TC 86 "Fibre optics" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60794-1-21:2015.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2016-01-14
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2018-04-14

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CONTENTS

FOREWORD.....	9
1 Scope and object.....	11
2 Normative references	11
3 Method E1: Tensile performance	12
3.1 Object.....	12
3.2 Sample length.....	12
3.3 Apparatus	12
3.4 Procedure	12
3.4.1 General requirements	12
3.4.2 Procedure.....	13
3.5 Requirements	13
3.6 Details to be specified.....	13
3.7 Details to be reported	14
4 Method E2: Abrasion	15
4.1 Object.....	15
4.2 Sample	15
4.3 Method E2A: Abrasion resistance of optical fibre cable sheaths	15
4.3.1 Apparatus	15
4.3.2 Procedure.....	16
4.3.3 Requirements	16
4.3.4 Details to be specified	16
4.4 Method E2B: Abrasion resistance of optical fibre cable markings	16
4.4.1 Apparatus	16
4.4.2 Procedure.....	17
4.4.3 Requirements	17
4.4.4 Details to be specified	17
5 Method E3: Crush.....	18
5.1 Object.....	18
5.2 Sample	18
5.3 Method E3A: Plate/plate	18
5.3.1 Apparatus	18
5.3.2 Procedure.....	18
5.4 Method E3B: Mandrel/plate	19
5.4.1 Apparatus	19
5.4.2 Procedure.....	19
5.5 Requirements	19
5.6 Details to be specified.....	19
6 Method E4: Impact	21
6.1 Object.....	21
6.2 Sample	21
6.2.1 Sample length	21
6.2.2 Termination	21
6.3 Apparatus	21
6.4 Procedure	22
6.5 Requirements	22
6.6 Details to be specified.....	22

7	Method E5A: Stripping force stability of cabled optical fibres	24
7.1	Object	24
7.2	Sample	24
7.2.1	Sample length	24
7.2.2	Sample preparation	24
7.3	Apparatus	24
7.4	Procedure	25
7.5	Requirements	25
7.6	Details to be specified	25
8	Method E5B: Strippability of optical fibre ribbons	25
8.1	Object	25
8.2	Sample	25
8.3	Apparatus	25
8.3.1	General	25
8.3.2	Stripping tool	25
8.3.3	Motor and slide (if used)	26
8.3.4	Positioning and holding equipment	26
8.3.5	Alcohol wipe	26
8.4	Procedure	26
8.5	Requirements	27
8.6	Details to be specified	27
9	Method E5C: Strippability of buffered optical fibres	27
9.1	Object	27
9.2	Sample	27
9.3	Apparatus	27
9.4	Procedure	28
9.5	Requirements	28
9.6	Details to be specified	28
10	Method E6: Repeated bending	28
10.1	Object	28
10.2	Sample	28
10.2.1	Sample length	28
10.2.2	Termination	29
10.3	Apparatus	29
10.4	Procedure	29
10.5	Requirements	29
10.6	Details to be specified	30
11	Method E7: Torsion	30
11.1	Object	30
11.2	Sample	30
11.3	Apparatus	31
11.4	Procedure	31
11.5	Requirements	32
11.6	Details to be specified	32
11.7	Details to be reported	32
12	Method E8: Flexing	34
12.1	Object	34
12.2	Sample	34

12.3	Apparatus	34
12.4	Procedure	34
12.5	Requirements	34
12.6	Details to be specified.....	34
13	Method E9: Snatch (deleted)	35
14	Method E10: Kink	35
14.1	Object.....	35
14.2	Sample	35
14.3	Apparatus	35
14.4	Procedure.....	36
14.5	Requirements	36
14.6	Details to be specified.....	36
15	Method E11: Bend	37
15.1	Object.....	37
15.2	Sample	37
15.3	Apparatus	37
15.4	Procedure	37
15.4.1	Procedure 1 – Test method E11A (standard test procedure).....	37
15.4.2	Procedure 2 – Test method E11B (alternative test procedure)	37
15.5	Requirements	38
15.6	Details to be specified.....	38
16	Method E12: Cut-through resistance (deleted).....	39
17	Method E13: Shotgun damage.....	39
17.1	Object.....	39
17.2	General.....	39
17.3	Method E13A: Shotgun test.....	39
17.3.1	Sample	39
17.3.2	Apparatus	39
17.3.3	Procedure.....	39
17.3.4	Requirements	40
17.3.5	Details to be specified	40
17.4	Method E13B: Shotgun simulation	40
17.4.1	Sample	40
17.4.2	Apparatus.....	40
17.4.3	Procedure.....	41
17.4.4	Requirements	41
17.4.5	Details to be specified	41
17.4.6	Calculation of drop weight and height	41
18	Method E14: Compound flow (drip).....	45
18.1	Object.....	45
18.2	Sample	45
18.3	Apparatus	45
18.4	Procedure.....	46
18.5	Requirements	46
18.6	Details to be specified.....	46
19	Method E15: Bleeding and evaporation.....	47
19.1	Object.....	47
19.2	Sample	47

19.3	Apparatus	47
19.4	Procedure	47
19.5	Requirements	48
19.6	Details to be specified.....	48
20	Method E16: [Title unknown] (deleted).....	48
21	Method E17: Bending stiffness	48
21.1	Object.....	48
21.2	General.....	48
21.3	Method E17A: Three-point bend.....	49
21.3.1	Sample	49
21.3.2	Apparatus.....	49
21.3.3	Procedure.....	49
21.3.4	Requirements	50
21.3.5	Details to be specified	50
21.4	Method E17B: cantilever bend	50
21.4.1	Sample	50
21.4.2	Apparatus.....	50
21.4.3	Procedure.....	50
21.4.4	Requirements	51
21.4.5	Details to be specified	51
21.5	Method E17C: Buckling bend	51
21.5.1	Sample	51
21.5.2	Apparatus.....	51
21.5.3	Procedure.....	51
21.5.4	Requirements	51
21.5.5	Details to be specified	52
22	Method E18A: Bending under tension.....	53
22.1	Object.....	53
22.2	Sample	53
22.3	Apparatus	53
22.4	Procedure	54
22.5	Requirements	54
22.6	Details to be specified.....	54
23	Method E18B: Sheave test (primarily for OPGW and OPAC)	56
23.1	Object.....	56
23.2	Sample	56
23.3	Apparatus	57
23.4	Procedure	57
23.5	Requirements	58
23.6	Details to be specified.....	58
24	Method E19: Aeolian vibration	59
24.1	Object.....	59
24.2	Sample	59
24.3	Apparatus	59
24.4	Procedure	60
24.5	Requirements	61
24.6	Details to be specified.....	61
25	Method E20: Cable coiling performance	62

25.1	Object.....	62
25.2	Sample	62
25.3	Apparatus	62
25.4	Procedure	62
25.5	Requirements	63
25.6	Details to be specified.....	63
26	Method E21: Sheath pull-off force for optical fibre cable for use in patch cords.....	63
26.1	Object.....	63
26.2	General.....	63
26.3	Sample	63
26.4	Apparatus	63
26.4.1	General	63
26.4.2	Tensile test rig.....	63
26.4.3	Recording equipment.....	64
26.4.4	Stripping tools	64
26.4.5	Pulling	64
26.4.6	Cable anchor	64
26.5	Procedure	64
26.6	Requirements	64
26.7	Details to be specified.....	64
27	Method E22: Buffered fibre movement under compression in optical fibre cables for use in patch cords	66
27.1	Object.....	66
27.2	Sample	66
27.3	Apparatus	66
27.4	Procedure	67
27.5	Requirements	67
27.6	Details to be specified.....	67
28	Method E23: Microduct route verification test	68
28.1	Object.....	68
28.2	General.....	68
28.3	Sample	68
28.4	Apparatus	68
28.5	Procedure	69
28.6	Requirements	69
28.7	Details to be reported	69
29	Method E24: Installation test for microduct cabling	69
29.1	Object.....	69
29.2	General.....	69
29.3	Sample	69
29.4	Apparatus	69
29.5	Procedure	70
29.6	Requirements	70
29.7	Details to be specified.....	70
29.8	Details to be reported	71
30	Method E25: Rip cord functional test	71
30.1	Object.....	71
30.2	Sample	72

30.3	Apparatus	72
30.4	Procedure	72
30.5	Requirements	72
30.6	Details to be specified.....	72
30.7	Details to be reported	73
31	Method E26: Galloping	73
31.1	Object.....	73
31.2	Sample	73
31.3	Apparatus	73
31.4	Procedure	74
31.5	Requirements	74
31.6	Details to be specified.....	74
32	Method E27: Indoor simulated installation test.....	75
32.1	General.....	75
32.2	Object.....	75
32.3	Sample	75
32.4	Apparatus	76
32.5	Procedure	76
32.6	Requirements	76
32.7	Details to be specified.....	76
33	Method E28: Cable and fibre mechanical reliability test	76
33.1	Object.....	76
33.2	Sample	76
33.3	Apparatus	76
33.4	Procedure	76
33.5	Requirements	77
33.6	Detail to be specified	77
	Bibliography.....	78
	Figure 1 – Tensile performance measuring apparatus	14
	Figure 2 – Example of tensile performance measuring apparatus using transfer devices and chuck drums	15
	Figure 3 – Typical test set-up for tests E2A and E2B method 1	17
	Figure 4 – Typical test set-up for test E2B, apparatus 2	18
	Figure 5 – Apparatus for crush test, Method E3A, details of plate/plate option	20
	Figure 6 – Apparatus for crush test, Method E3B, details of plate/mandrel option	21
	Figure 7 – Impact test	24
	Figure 8 – Repeated bending test for cable/connector assembly	30
	Figure 9 – Cable torsion apparatus	33
	Figure 10 – Cable torsion apparatus with tension applied	33
	Figure 11 – Alternative cable torsion apparatus with tension applied.....	33
	Figure 12 – Flexing apparatus.....	35
	Figure 13 – Kink test.....	36
	Figure 14 – Bend test apparatus	38
	Figure 15 – Method E13B test set-up	43
	Figure 16 – Drop weight incorporating shot support pin.....	44

Figure 17 – Alternative drop weight and shot support pin	44
Figure 18 – Bleeding and evaporation test set-up	48
Figure 19 – Method E17A – Test set-up	52
Figure 20 – Example of results of applied force and displacement	52
Figure 21 – Method E17B – Test set-up	52
Figure 22 – Method E17C – Test set-up	53
Figure 23 – Single-bend	55
Figure 24 – S-bend	56
Figure 25 – Partial-bend	59
Figure 26 – Partial-bend, multiple pulley	59
Figure 27 – Aeolian vibration test	62
Figure 28 – Schematic of test arrangement	65
Figure 29 – Example of pulling jig	65
Figure 30 – Cable sample preparation	66
Figure 31 – Test set-up for fibre movement under compression	68
Figure 32 – Schematic representation of test route, with leg-length L	71
Figure 33 – Cable galloping test	75
Figure 34 – Indoor simulated installation test	76
Figure 35 – Mechanical reliability test apparatus	77
Table 1 – Condition of stripped samples	27
Table 2 – Typical test gauge length	31
Table 3 – Test values for cable galloping test schematic	75

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OPTICAL FIBRE CABLES –

Part 1-21: Generic specification – Basic optical cable test procedures – Mechanical test methods

1 Scope and object

This part of IEC 60794 applies to optical fibre cables for use with telecommunication equipment and devices employing similar techniques, and to cables having a combination of both optical fibres and electrical conductors.

The object of this standard is to define test procedures to be used in establishing uniform requirements for mechanical requirement performance.

Throughout this standard the wording “optical cable” may also include optical fibre units, microduct fibre units, etc.

General requirements and definitions are given in IEC 60794-1-20 and a complete reference guide to test method of all types in the IEC 60794-1-2.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60227-2, *Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V – Part 2: Test methods*

IEC 60793-1-22:2001, *Optical fibres – Part 1-22: Measurement methods and test procedures – Length measurement*

IEC 60793-1-32:2010, *Optical fibres – Part 1-32: Measurement methods and test procedures – Coating strippability*

IEC 60793-1-40, *Optical fibres – Part 1-40: Measurement methods and test procedures – Attenuation*

IEC 60793-1-46:2001, *Optical fibres – Part 1-46: Measurement methods and test procedures – Monitoring of changes in optical transmittance*

IEC 60794-1-1, *Optical fibres – Part 1-1: Generic specification – General*

IEC 60794-1-2:2013, *Optical fibre cables – Part 1-2: Generic specification – Cross reference table for optical cable test procedures*

IEC 60794-1-20:2014, *Optical fibre cables – Part 1-20: Generic specification – Basic optical cable test procedures – General and definitions*

IEC 60794-1-22:2012, *Optical fibre cables – Part 1-22: Generic specification – Basic optical cable test procedures – Environmental test methods*

IEC TR 62691, *Guide to the installation of optical fibre cables*

IEC 61300-2-44, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 2-44: Tests – Flexing of the strain relief of fibre optic devices*

3 Method E1: Tensile performance

3.1 Object

This test method applies to optical fibre cables which are tested at a particular tensile strength in order to examine the behaviour of the attenuation and/or the fibre elongation strain as a function of the load on a cable which may occur during installation and operation. This method is intended to be non-destructive.

3.2 Sample length

Length under tension ≥ 50 m unless otherwise defined in the relevant specification. For cables requiring specialized anchoring devices (e.g. OPGW, all-dielectric self-supporting (ADSS), heavy wire armored cables, etc.), the minimum length shall be 25 m.

Short lengths in the tensile test will adversely affect the accuracy of the measurement. The lengths shown above are the recommended minimum lengths for this test.

Total sample length is longer than the length under tension to allow for clamping and connection to test equipment.

3.3 Apparatus

The apparatus consists of

- a) an attenuation measuring apparatus for the determination of attenuation changes (see IEC 60793-1-40), and/or a fibre elongation strain measuring apparatus (see IEC 60793_1_22:2001, Method C: Fibre elongation);
- b) a tensile strength measuring apparatus which is able to accommodate the minimum length to be tested. Transfer devices may be used for testing longer samples under tension (see Figure 2). The diameters of sheaves in the transfer device shall be no smaller than the minimum bending diameter of the cable under test; typically 1 m diameter;
- c) a load cell with a maximum error of ± 3 % of its maximum range;
- d) a clamping device to secure all cable components at the ends of the length under test: care should be taken that the specific method of capturing the cable components does not affect the results. A mandrel is frequently an appropriate device, with a diameter typically 1 m, but not less than the minimum bending diameter specified for the cable;
- e) if required, mechanical or electrical means for measuring the cable load or elongation, per the detail specification shall be provided.

Examples of suitable apparatus are shown in Figure 1 and Figure 2.

3.4 Procedure

3.4.1 General requirements

- a) Unless otherwise specified, the conditions for testing shall be in accordance with the expanded test conditions as defined in IEC 60794-1-20.