



BSI Standards Publication

Guideline for the measurement of high power damage sensitivity of single-mode fibre to bends — Guidance for interpretation of result

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National foreword

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A list of organizations represented on this committee can be obtained on request to its secretary.

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TECHNICAL REPORT



Guidelines for the measurement of high-power damage sensitivity of single-mode fibre to bends – Guidance for the interpretation of results

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

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CONTENTS

FOREWORD.....	4
1 Scope.....	6
2 Normative references	6
3 Background	7
4 Test procedures	9
4.1 Safety.....	9
4.1.1 Safety issues	9
4.1.2 Eye safe working	9
4.1.3 Risk of fire/flame	9
4.1.4 Risk of atmospheric pollution from coating by-products.....	9
4.1.5 Risk of fibre fuse initiation	9
4.1.6 Risk of damage to downstream components	10
4.1.7 Risk avoidance	10
4.2 General.....	10
4.3 Apparatus.....	10
4.3.1 Light source.....	10
4.3.2 Isolator	10
4.3.3 Bend jig	11
4.3.4 Receiver	11
4.3.5 Attenuator	11
4.3.6 Computer	11
4.3.7 Camera	11
4.3.8 Thermal imaging camera	11
4.3.9 Oven	11
4.3.10 Sample.....	12
4.4 Test method 1 – Failure time characterization as a function of the launch power and bend conditions (bend angle and diameter)	12
4.4.1 Description and procedure.....	12
4.4.2 General comments and conclusions on test method 1.....	13
4.4.3 Reported items for test method 1	14
4.5 Test method 2 – Equilibrium temperature measurement	14
4.5.1 General	14
4.5.2 Coating heating measurements and power lost at bend	16
4.5.3 Analysis – test method 2: equilibrium temperature	17
4.5.4 Test conditions for test method 2	18
4.5.5 Conclusions on test method 2	19
4.5.6 Reported items for test method 2	19
5 Conclusions.....	20
Annex A (informative) Robustness of fibres against damage from exposure to high power at bends	21
Bibliography.....	39
Figure 1 – Example of experimental layout.....	11
Figure 2 – Damage results for fibre ‘G’.....	13
Figure 3 –Example of time evolution of catastrophic high-power loss and related maximum temperature reached by the coating near to the top of the bent fibre (apex)	15

Figure 4 – Sample FLIR camera output of the fibre bent under high power	16
Figure 5 – Dependence of the coating equilibrium temperature as a function of launched power and bend diameter for an IEC B1.2/ITU-T G.654 single-mode fibre (see reference [10])	16
Figure 6a – Calculated from experimental test data at 1 360 nm	18
Figure 6b – Extrapolated for 1 550 nm	18
Figure 6c – Extrapolated for 1 625 nm	18
Figure 6 – Maximum safe powers for 25 year life time as a function of bend radius enabling a safe coating temperature of ~80 °C for four single-mode fibre (sub-) categories.....	18
Figure A.1 – Clamping arrangements for high-power damage testing in 180° bends.....	23
Figure A.2 – Clamping arrangement for high-power damage testing in 90° bends	23
Figure A.3 – Typical R1 failure characteristics with a loss of greater than 10 dB	24
Figure A.4 – Typical R2 failure characteristics	24
Figure A.5 – A schematic illustration of the three regimes	24
Figure A.6 – Monitor signal changes – Typical for an R1 failure	25
Figure A.7 – Monitor signal changes – Typical for an R2 failure	25
Figure A.8 – Damage results for fibre sample ‘D’	26
Figure A.9 – High-power damage results at 90° and 180° for fibre ‘D’	26
Figure A.10 – Time to failure versus bend diameter at different launched powers	27
Figure A.11 – Bend loss performance at 180° (and 90° for comparison) for fibre ‘D’.....	28
Figure A.12 – Power limitation for primary coated fibre	28
Figure A.13 – Comparison of power limitation for primary and secondary coated fibre ‘D’	29
Figure A.14 – Maximum optical power ensuring a 25 year lifetime and 180° bend loss versus bend diameter (from reference [12])	30
Figure A.15 – Maximum optical power ensuring a 25 year lifetime versus 180° bend loss.....	30
Figure A.16 – 180° 2-point OS ¹ bend loss for fibre ‘D’	32
Figure A.17 – 180° 2-point bend loss at 1 480 nm for fibre ‘D’	32
Figure A.18 – 2-point bend loss for fibre ‘D’ at various angles.....	33
Figure A.19 – 180° 2-point bend loss at 1 480 nm for a range of fibres	34
Figure A.20 – Time to failure versus inverse of equilibrium temperature using an IEC B1.2/ITU-T G.654 single-mode fibre for bend diameters varying from 4 mm to 10 mm and launched power in the range 0,8 W to 3,2 W.....	35
Figure A.21 – Effect of baking primary coated fibre ‘C’ (reference [15]) in an oven at constant temperature	35
Figure A.22 – Time to failure for different coatings as a function of bend radius.....	37
Table A.1 – Dependence of high-power damage on power entering coating	37

INTERNATIONAL ELECTROTECHNICAL COMMISSION

GUIDELINES FOR THE MEASUREMENT OF HIGH-POWER DAMAGE SENSITIVITY OF SINGLE-MODE FIBRE TO BENDS – GUIDANCE FOR THE INTERPRETATION OF RESULTS

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IEC 62547, which is a technical report, has been prepared by subcommittee 86A: Fibres and cables, of IEC technical committee 86: Fibre optics.

This second edition cancels and replaces the first edition published in 2009, and constitutes a technical revision.

The main changes with respect to the previous edition are listed below:

- updates related to B6 (bend-insensitive) category single-mode fibres);
- update to analysis for test method 2: Maximum temperature specification.

The text of this technical report is based on the following documents:

Enquiry draft	Report on voting
86A/1494/DTR	86A/1508/RVC

Full information on the voting for the approval of this technical report 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.

The committee has decided that the contents of this publication will remain unchanged until the stability 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.

A bilingual version of this publication may be issued at a later date.

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GUIDELINES FOR THE MEASUREMENT OF HIGH-POWER DAMAGE SENSITIVITY OF SINGLE-MODE FIBRE TO BENDS – GUIDANCE FOR THE INTERPRETATION OF RESULTS

1 Scope

This technical report describes two methods for the measurement of the sensitivity of single mode optical fibres to high-power damage at bends:

- test method 1 – Failure time characterisation as a function of the launch power and bend conditions (bend angle and bend diameter);
- test method 2 – Equilibrium temperature measurement.

Results from the two methods can only be compared qualitatively.

The results in this report are predominantly on un-cabled and un-buffered fibres. Cabled and buffered fibres are expected to respond differently, because the protective layers can affect the ageing process. Note also that test method 2 testing cannot be applied to buffered or cabled fibres.

These methods do not constitute a routine test to be used in the evaluation of optical fibre.

The parameters derived from the two methods are not intended to be specified within a detailed fibre specification.

The catastrophic failure modes arising and which are described in this document in general occur at bending radii much smaller than specified in the single-mode fibre specification IEC 60793-2-50 or than would be recommended based on mechanical reliability considerations alone.

This report includes several annexes, including a discussion on the rationale for the approaches adopted, metrics for assessment, guidance, examples and some conclusions from initial studies.

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 60793-1-47, *Optical fibres – Part 1-47: Measurement methods and test procedures – Microbending loss*

IEC 60793-2-50, *Optical fibres – Part 2-50: Product specifications – Sectional specification for class B single-mode fibres*

IEC 60825-1, *Safety of laser products – Part 1: Equipment classification and requirements*

IEC 60825-2, *Safety of laser products – Part 2: Safety of optical fibre communication systems (OFCS)*