

TECHNICAL REPORT



Selection of optical fibre cable specifications relative to mechanical, ingress, climatic or electromagnetic characteristics – Guidance

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

PRICE CODE

R

ICS 33.180.10

ISBN 978-2-88910-941-8

CONTENTS

FOREWORD.....	3
INTRODUCTION.....	5
1 Scope.....	6
2 Normative references.....	6
3 Acronyms.....	6
4 MICE attributes and severities.....	6
4.1 General.....	6
4.2 Mechanical.....	7
4.2.1 Shock/bump.....	7
4.2.2 Vibration.....	7
4.2.3 Tensile force.....	7
4.2.4 Crush.....	7
4.2.5 Impact.....	7
4.2.6 Bending, flexing and torsion.....	7
4.3 Ingress.....	7
4.3.1 Basic consideration.....	7
4.3.2 Particulate ingress.....	7
4.3.3 Water immersion.....	8
4.4 Climatic.....	8
4.4.1 General.....	8
4.4.2 Ambient temperature.....	8
4.4.3 Rate of change of temperature.....	8
4.4.4 Humidity.....	8
4.4.5 Solar radiation.....	8
4.4.6 Liquid pollution.....	9
4.4.7 Gaseous pollution.....	9
4.5 Electromagnetic.....	10
Annex A (informative) Details of MICE classification.....	11
Annex B (informative) IEC cable standards.....	13
Annex C (informative) Fibre specifications and tests.....	15
Bibliography.....	18
Table 1 – Resistance to solar radiation.....	8
Table 2 – Liquid pollution.....	9
Table 3 – Gaseous pollution resistance.....	10
Table 4 – Gaseous pollution resistance.....	10
Table A.1 – Details of MICE classification (Mechanical).....	11
Table A.2 – Details of MICE classification (Ingress).....	11
Table A.3 – Details of MICE classification (Chemical).....	11
Table A.4 – Details of MICE classification (Gas).....	12
Table A.5 – Details of MICE classification (Electromagnetic).....	12

INTERNATIONAL ELECTROTECHNICAL COMMISSION

SELECTION OF OPTICAL FIBRE CABLE SPECIFICATIONS RELATIVE TO MECHANICAL, INGRESS, CLIMATIC OR ELECTROMAGNETIC CHARACTERISTICS – GUIDANCE

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

The main task of IEC technical committees is to prepare International Standards. However, a technical committee may propose the publication of a technical report when it has collected data of a different kind from that which is normally published as an International Standard, for example "state of the art".

IEC 62362 which is a technical report, has been prepared by subcommittee 86A: Fibres and cables, of IEC technical committee 86: Fibre optics.

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

Enquiry draft	Report on voting
86A/1297/DTR	86A/1302/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.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

Withdrawn

INTRODUCTION

Optical fibre cable specification standards are defined in the IEC 60794 series, which are listed in Annex B. They are organized in a hierarchy similar to the IECQ system. They differ from the IECQ system in that they are all performance standards. Optical fibre cable standards mainly cover the attributes and tests that protect the fibre from the environment, including installation, and the fibre attributes that may be affected by cabling. The attributes of the fibres within the cable are defined by reference to optical fibre specification standards of the IEC 60793 series, which are listed in Annex C. A complete and up-to-date listing of standards in the IEC 60793 and IEC 60794 series is available on website of the IEC: <http://www.iec.ch>.

The different levels of hierarchy are: general, sectional, family, and product. The primary distinction between these is the level of detail. Typically more options or wider ranges are present at the higher level. At a given level, the distinctions are with respect to application or cable construction. The references section of this document gives a more complete mapping. Parts of the family specification include blank detail specifications for various attributes that do not have normative requirements.

At the sectional specification level, two main categories are indoor and outdoor cables. Typically the outdoor cables have tougher tests than the indoor cables. At the product specification level, there are series of standards intended to support ISO/IEC 11801 for premises cabling, using both indoor and outdoor varieties.

This guidance will not attempt to reproduce the requirements of all the different specifications. For each of the MICE attributes, it will discuss the situation and mention the key options.

Withhold

SELECTION OF OPTICAL FIBRE CABLE SPECIFICATIONS RELATIVE TO MECHANICAL, INGRESS, CLIMATIC OR ELECTROMAGNETIC CHARACTERISTICS – GUIDANCE

1 Scope

The purpose of this guidance is to provide information on the specification of optical fibre cables with respect to the mechanical, ingress, climatic or electromagnetic characteristics (MICE) as classified within ISO/IEC 24702.

In this classification system each letter of the four initials of the acronym are subscripted with a value of from one to three to indicate different severities. The current attributes and severities are found in Annex A.

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 60794-1-2, *Optical fibre cables – Part 1-2: Generic specification – Basic optical cable test procedures*

IEC 60794-2 (all parts), *Optical fibre cables – Part 2: Indoor optical fibre cables*

IEC 60794-3 (all parts), *Optical fibre cables – Part 3: Outdoor cables*

ISO/IEC 24702, *Information technology – Generic cabling – Industrial premises*

ISO/IEC 11801, *Information technology – Generic cabling for customer premises*