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# TECHNICAL REPORT



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## Guideline for combining different single-mode fibres types

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

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### **GUIDELINE FOR COMBINING DIFFERENT SINGLE-MODE FIBRES TYPES**

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IEC 62000, 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 (2005) and constitutes a technical revision.

The major technical changes with respect to the previous edition are considerations concerning B6 fibres.

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

Enquiry draft	Report on voting
86A/1276/DTR	86A/1283/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- withdrawn,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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## GUIDELINE FOR COMBINING DIFFERENT SINGLE-MODE FIBRES TYPES

### 1 Scope

This technical report provides guidelines concerning single-mode fibre compatibility.

A given type of single-mode fibre, for example B4, may have different implementations by suitably optimising several of the following parameters: mode field diameter (hence effective area), chromatic dispersion coefficient, slope of the chromatic dispersion curve, cable cut-off wavelength.

This guideline indicates the items that should be taken into account when planning to connect: (1) different implementations of single-mode fibres of the same type, e.g. different implementations of type B single-mode fibres, and (2) single-mode fibres of different types, e.g. B1.1 with B4. See IEC 60793-2-50 for the attributes and definitions of single-mode fibre. The attributes and definitions of fibres covered in this technical report are given in Table 1.

**Table 1 – Correspondence table of various single-mode fibres**

<b>Common name</b>	<b>Use (IEC 6079-2-50)</b>	<b>IEC Class</b>	<b>ITU-T Recommendation</b>
<b>Dispersion unshifted single-mode fibre</b>	Optimised for use in the 1 310 nm region but can be used in the 1 550 nm region	B1.1	G.652 A, B
<b>Cut-off shifted single-mode fibre</b>	Optimised for low loss in the 1 550 nm region, with cut off wavelength shifted above the 1 310 nm region	B1.2	G.654
<b>Extended band dispersion unshifted single-mode fibre</b>	Optimised for use in the 1 310 nm region but can be used in the O, E, S, C and L-band (i.e. throughout the 1 260 nm to 1 625 nm range).	B1.3	G.652 C, D
<b>Dispersion shifted single-mode fibre</b>	Optimised for single channel transmission in the 1 550 nm region. Multiple channels can only be transmitted if care is taken to avoid the effects of four wave mixing by, for example, moderating the power levels or appropriate spacing or placement of the channels	B.2	G.653
<b>Non-zero dispersion-shifted single-mode fibre</b>	Optimised for multiple channel transmission in the 1 550 nm region with a cut off wavelength that may be shifted above the 1 310 nm region	B4	G.655
<b>Wideband non-zero dispersion-shifted single-mode fibre</b>	Optimised for multiple channel transmission in the wavelength range of 1 460 to 1 625 nm with the positive value of the chromatic dispersion coefficient that is greater than some non-zero value over the same wavelength range.	B5	G.656
<b>Bend loss optimised</b>	Bending loss insensitive single-mode fibre suitable for use in the access networks, including inside buildings at the end of these networks.  B6_a fibres are suitable to be used in the O, E, S, C and L-band (i.e. throughout the 1 260 nm to 1 625 nm range) and meet the requirements of B1.3 fibres.	B6_a	G.657.A
	Bending loss insensitive single-mode fibre suitable for use in the access networks, including inside buildings at the end of these networks.	B6_b	G.657.B

<b><i>Common name</i></b>	<b><i>Use (IEC 6079-2-50)</i></b>	<b><i>IEC Class</i></b>	<b><i>ITU-T Recommendation</i></b>
	B6_b fibres are suitable for transmission at 1 310 nm, 1 550 nm, and 1 625 nm for restricted distances that are associated with in-building transport of signals.		

This guide does not consider the connection of fibres with the same implementation from different manufacturers, which is already considered by the standardisation procedure.