



**SLOVENSKI STANDARD**  
**oSIST prEN IEC 61300-2-22:2023**  
**01-februar-2023**

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**Optični spojni elementi in pasivne komponente - Osnovni preskusni in merilni postopki - 2-22. del: Preskusi - Sprememba temperature**

Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 2-22: Tests - Change of temperature

Lichtwellenleiter - Verbindungselemente und passive Bauteile - Grundlegende Prüf- und Messverfahren - Teil 2-22: Prüfungen - Temperaturwechsel

Dispositifs d'interconnexion et composants passifs à fibres optiques - Méthodes fondamentales d'essais et de mesures - Partie 2-22: Essais - Variations de température

**Ta slovenski standard je istoveten z: prEN IEC 61300-2-22:2022**

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**ICS:**

33.180.20	Povezovalne naprave za optična vlakna	Fibre optic interconnecting devices
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# 86B/4674/CDV

## COMMITTEE DRAFT FOR VOTE (CDV)

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IEC SC 86B : FIBRE OPTIC INTERCONNECTING DEVICES AND PASSIVE COMPONENTS	
SECRETARIAT: Japan	SECRETARY: Mr Shigeru Tomita
OF INTEREST TO THE FOLLOWING COMMITTEES:	PROPOSED HORIZONTAL STANDARD: <input type="checkbox"/> Other TC/SCs are requested to indicate their interest, if any, in this CDV to the secretary.
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TITLE:

**Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 2-22: Tests - Change of temperature**

PROPOSED STABILITY DATE: 2032

NOTE FROM TC/SC OFFICERS:

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## 29 INTERNATIONAL ELECTROTECHNICAL COMMISSION

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**FIBRE OPTIC INTERCONNECTING DEVICES AND  
PASSIVE COMPONENTS –  
BASIC TEST AND MEASUREMENT PROCEDURES –****Part 2-22: Tests – Change of temperature****FOREWORD**

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- International Standard IEC 61300-2-22 has been prepared by subcommittee 86B: Fibre optic interconnecting devices and passive components, of IEC technical committee 86: Fibre optics:
- This third edition cancels and replaces the second edition published in 2007. It constitutes a technical revision. The changes with respect to the previous edition are:
- a) Include a passive component, patch cord, splices, fibre management system or protective housing to withstand the effects of a change of temperature or a succession of changes of temperature into the project scope;
  - b) Update the severity categories description, number of cycles, and duration of the extremes, Table 1; in line with the IEC 61753-1;
  - c) Add the Annex (normative) for different test sample types with cable length information.

81 The text of this standard is based on the following documents:

FDIS	Report on voting
86B/XXXXFDIS	86B/XXXXRVD

82

83 Full information on the voting for the approval of this standard can be found in the report on  
84 voting indicated in the above table.

85 This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

86 A list of all parts of the IEC 61300 series, published under the general title *Fibre optic*  
87 *interconnecting devices and passive components – Basic test and measurement procedures*,  
88 can be found on the IEC website.

89 The committee has decided that the contents of this publication will remain unchanged until the  
90 maintenance result date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data  
91 related to the specific publication. At this date, the publication will be

- 92 • reconfirmed;
- 93 • withdrawn;
- 94 • replaced by a revised edition, or
- 95 • amended.

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98 **FIBRE OPTIC INTERCONNECTING DEVICES AND**  
99 **PASSIVE COMPONENTS –**  
100 **BASIC TEST AND MEASUREMENT PROCEDURES –**

101 **Part 2-22: Tests – Change of temperature**  
102  
103

104 **1 Scope**

105 This part of IEC 61300 describes a procedure to determine the suitability of a fibre optic  
106 interconnecting device and a passive component to withstand the effects of a change of  
107 temperature or a succession of changes of temperature.

108 **2 Normative references**

109 The following documents are referred to in the text in such a way that some or all of their content  
110 constitutes requirements of this document. For dated references, only the edition cited applies.  
111 For undated references, the latest edition of the referenced document (including any  
112 amendments) applies.

113 IEC 60068-2-14, *Basic environmental testing procedures – Part 2-14: Tests – Test N: Change*  
114 *of temperature*

115 IEC 60529, *Degrees of protection provided by enclosures (IP Code)*

116 IEC 61300-1, *Fibre optic interconnecting devices and passive components – Basic test and*  
117 *measurement procedures – Part 1: General and guidance*

118 IEC 61300-2-38, *Fibre optic interconnecting devices and passive components - Basic test and*  
119 *measurement procedures - Part 2-38: Tests - Sealing for pressurized fibre optic closures*

120 IEC 61300-3-1, *Fibre optic interconnecting devices and passive components - Basic test and*  
121 *measurement procedures - Part 3-1: Examinations and measurements - Visual examination*

122 IEC 61300-3-3, *Fibre optic interconnecting devices and passive components - Basic test and*  
123 *measurement procedures - Part 3-3: Examinations and measurements - Active monitoring of*  
124 *changes in attenuation and return loss*

125 IEC 61300-3-4, *Fibre optic interconnecting devices and passive components - Basic test and*  
126 *measurement procedures - Part 3-4: Examinations and measurements – Attenuation*

127 IEC 61300-3-6, *Fibre optic interconnecting devices and passive components - Basic test and*  
128 *measurement procedures - Part 3-6: Examinations and measurements - Return loss*

129 IEC 61753-1, *Fibre optic interconnecting devices and passive components – Performance*  
130 *standard – Part 1: General and guidance*

131 **3 Terms and definitions**

132 For the purposes of this document, the terms and definitions given in IEC 61300-1 apply.

133 ISO and IEC maintain terminological databases for use in standardization at the following  
134 addresses:

- 135 • IEC Electropedia: available at <http://www.electropedia.org/>
- 136 • ISO Online browsing platform: available at <http://www.iso.org/obp>

137 **4 General description**

138 This procedure is conducted in accordance with IEC 60068-2-14, test Nb, change of  
139 temperature with specified rate of change.

140 The device under test (DUT) is first subjected to one extreme of temperature for a given period  
141 of time. It is then subjected to the other extreme of temperature for an equal period of time. It  
142 can be subjected to one or more changes of temperatures defined by the temperature profile  
143 and the number of cycles.

## 144 5 Apparatus

### 145 5.1 Environmental test chamber

146 A suitable environmental test chamber shall be used in accordance with IEC 60068-2-14, Test  
147 Nb.

### 148 5.2 Examination and measurement equipment

149 As specified by the relevant specification, the examination and optical measurement  
150 equipment shall be available as required by IEC 60529, IEC 61300-2-38, IEC 61300-3-1, IEC  
151 61300-3-3, IEC 61300-3-4, or IEC 61300-3-6.

## 152 6 Procedure

### 153 6.1 General

154 The procedure is in accordance with IEC 60068-2-14, Test Nb.

### 155 6.2 Preconditioning

156 Unless otherwise stated in the relevant specification, maintain the DUT under standard  
157 atmospheric conditions as defined in IEC 61300-1 for at least 2 hours. For devices such as  
158 protective housings and fibre management systems, the duration shall be at least 4 hours.  
159 Clean the mechanical and optical alignment parts of the DUT according to the manufacturer's  
160 instructions.

161 NOTE Cleaning method for optical connector and optical transceiver are described in IEC TR 62627-01 and IEC TR  
162 62572-4, respectively.

### 163 6.3 Initial examination and measurement

164 Take initial examinations and measurements as required by the relevant specification.

### 165 6.4 Setting DUT

166 Place the DUT in the environmental test chamber in its normal operating position and make  
167 connections to the monitoring equipment. Test sample configuration in the chamber: See IEC  
168 61300-1.

169 Unless otherwise stated in the relevant specification:

- 170 – If optical measurements are requested during the test by the relevant specification, these  
171 measurements shall be performed (at a minimum) at the end of each dwell at each  
172 temperature extreme before starting the temperature change. Use a maximum measurement  
173 period of 10 minutes between optical measurements during the performance test.
- 174 – allow dependence on wavelength scan time for components that require wavelength  
175 scanning.

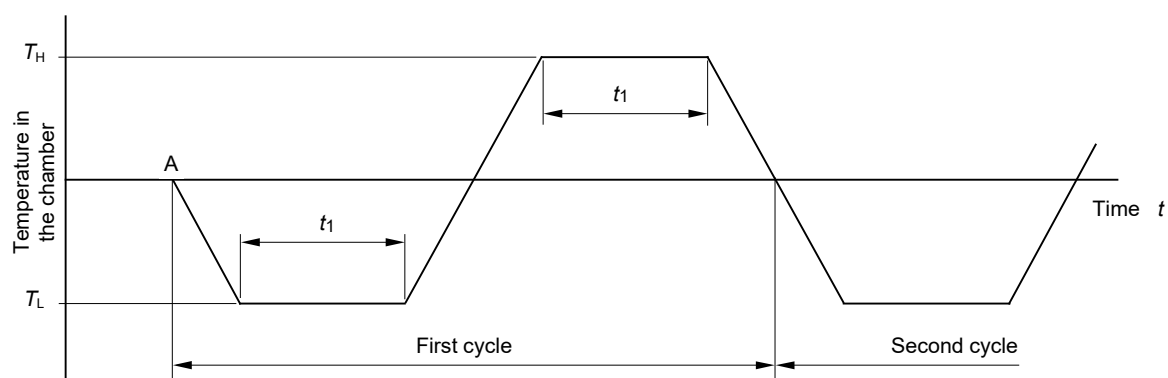
### 176 6.5 Test conditions

177 Unless otherwise specified, the temperature profile in Figure 1 shall be applied. Start at  
178 standard atmospheric conditions and ramp down to the low temperature  $T_L$ . Maintain the low  
179 temperature during  $t_1$  for a minimum of 60 min or as specified in the relevant specification.  
180 Ramp up to the high temperature  $T_H$ . Maintain the temperature during  $t_1$  for a minimum of 60  
181 min or as specified in the relevant specification. Ramp down to the low temperature and repeat  
182 this profile for the required number of cycles. The rate of change of temperature shall be:  $(1 \pm$   
183  $0,2) \text{ }^\circ\text{C}/\text{min}$ .

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186

187

**Key**

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A start of the first cycle

189

 $T_L$  low chamber temperature

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 $T_H$  high chamber temperature

191

 $t_1$  dwell time

192

**Figure 1 – Temperature profile**

193

NOTE It is permissible to increase the dwell time at each extreme to allow sufficient time to perform a complete set of measurements.

194

195

**6.6 Recovery**

196

Allow the test sample to remain under standard atmospheric conditions for a period of at least 2 h and for protective housings at least 4 h.

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198

**6.7 Examinations and measurements during the test and recovery**

199

Perform all examinations and measurements during the test and recovery as required by the relevant specification.

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201

**6.8 Final examinations and measurements**

202

Carry out the final examinations and measurements as required by the relevant specification.

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**7 Severity**

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The table 1 shows the specified test severities in relation to the performance categories. It is recommended to verify the test severities with the relevant IEC 61753 performance standards and IEC 62005 reliability documents for the normative values.

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Each of the following severities consists of a combination of a low temperature with the corresponding high temperature and the corresponding number of cycles.

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**Table 1 – Severities (1 of 2)**

Category	Category Description	Low temperature °C	High temperature °C	Number of cycles	Duration at extremes h
C	Indoor controlled environment	-10 ( $\pm 2$ )	+60 ( $\pm 2$ )	5	1 or 4 <sup>a)</sup>
OP	Outdoor protected environment	-25 ( $\pm 2$ )	+70 ( $\pm 2$ )	12	1
E	Extreme environment	-40 ( $\pm 2$ )	+85 ( $\pm 2$ )	12	1
I	Industrial environment	-40 ( $\pm 2$ )	+70 ( $\pm 2$ )	12	4

210

**Table 1 – Severities (2 of 2)**

211

Category	Category Description	Low temperature °C	High temperature °C	Number of cycles	Duration at extremes h
OP+	Extended outdoor protected environment	−40 (±2)	+75 (±2)	12	1
A	Outdoor aerial environment	−40 (±2)	+65 (±2)	12	4
G	Outdoor ground level environment	−40 (±2)	+65 (±2)	12	4
S	Outdoor subterranean or sub-surface environment	−30 (±2)	+60 (±2)	12	4
C <sup>HD</sup>	Indoor controlled environment with additional heat dissipation	−10 (±2)	+70 (±2)	5	1
OP <sup>HD</sup>	Outdoor controlled environment with additional heat dissipation	−25 (±2)	+85 (±2)	12	1
OP+ <sup>HD</sup>	Extended outdoor controlled environment with additional heat dissipation	−40 (±2)	+85 (±2)	12	1
I <sup>HD</sup>	Industrial environment with additional heat dissipation	−40 (±2)	+85 (±2)	12	4
<p>NOTE A suitable operating service environment (performance category) is selected according to the application.</p> <p><sup>a</sup>1 h 1h for connectors, field mountable connectors (FMC), passive components, splices and fibre management systems (FMS). 4 h for wall outlets, boxes, optical distribution frame modules (ODFM) and closures.</p>					

## 212 8 Details to be specified and reported

213 The following details, as applicable, shall be specified in the relevant specification and reported  
214 in the test report:

- 215 – severity;
- 216 – initial examinations and measurements and performance requirements;
- 217 – examinations and measurements during test and performance requirements;