

**SLOVENSKI STANDARD  
SIST EN 50290-2-30:2002****01-september-2002**

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**Communication cables - Part 2-30: Common design rules and construction - Poly (tetrafluoroethylene-hexafluoropropylene) (FEP) insulation and sheathing (Note: Applies only in conjunction with EN 50290-2-20)**

Communication cables -- Part 2-30: Common design rules and construction - Poly (tetrafluoroethylene-hexafluoropropylene) (FEP) insulation and sheathing

Kommunikationskabel -- Teil 2-30: Gemeinsame Regeln für Entwicklung und Konstruktion - Poly(tetrafluoroethylen-Hexafluoropropylen) (FEP) Isolierung- und Mantelmischungen

Câbles de communication -- Partie 2-30: Règles de conception communes et construction - Poly(tetrafluoroéthylène-hexafluoropropylène) (FEP) pour enveloppes isolantes et gainage

**Ta slovenski standard je istoveten z: EN 50290-2-30:2002**

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**ICS:**

29.035.20	Plastics and rubber insulating materials
33.120.10	Koaksialni kabli. Valovodi Coaxial cables. Waveguides

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EUROPEAN STANDARD

**EN 50290-2-30**

NORME EUROPÉENNE

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January 2002

ICS 29.035.20; 33.120.10

English version

**Communication cables**  
**Part 2-30: Common design rules and construction -**  
**Poly(tetrafluoroethylene-hexafluoropropylene) (FEP)**  
**insulation and sheathing**

Câbles de communication  
Partie 2-30: Règles de conception  
communes et construction -  
Poly(tétrafluoroéthylène-  
hexafluoropropylène) (FEP) pour  
enveloppes isolantes et gainage

Kommunikationskabel  
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# CENELEC

European Committee for Electrotechnical Standardization  
Comité Européen de Normalisation Electrotechnique  
Europäisches Komitee für Elektrotechnische Normung

**Central Secretariat: rue de Stassart 35, B - 1050 Brussels**

### Foreword

This European Standard was prepared by a joint working group of the Technical Committees CENELEC TC 46X, Communication cables, and CENELEC TC 86A, Optical fibres and optical fibre cables.

The text of the draft was submitted to the Unique Acceptance Procedure and was approved by CENELEC as EN 50290-2-30 on 2001-11-01.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2002-08-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2004-08-01

Annexes designated "normative" are part of the body of the standard. In this standard, annex A is normative.

This European Standard has been prepared under the European Mandate M/212 given to CENELEC by the European Commission and the European Free Trade Association.

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## 1 Scope

This Part 2-30 of EN 50290 gives specific requirements for poly(tetrafluoroethylene-hexafluoropropylene) (FEP) insulation and sheathing used in communication cables.

It is to be read in conjunction with Part 2-20 of EN 50290.

## 2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

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|-------------------|--|
| EN 60811-1-1:1995 | Insulating and sheathing materials of electric cables - Common test methods Part 1: General application -- Section 1: Measurement of thickness and overall dimensions - Tests for determining the mechanical properties (IEC 60811-1-1:1993) |
| EN 60811-1-2:1995 | Insulating and sheathing materials of electric cables - Common test methods Part 1: General application -- Section 2: Thermal ageing methods (IEC 60811-1-2:1985 + corr. May 1986 + A1:1989)   |
| EN 60811-1-3:1995 | Insulating and sheathing materials of electric cables - Common test methods Part 1-3: General application - Methods for determining the density - Water absorption tests - Shrinkage test (IEC 60811-1-3:1993)                               |
| EN 60811-1-4:1995 | Insulating and sheathing materials of electric cables - Common test methods Part 1-4: General application - Tests at low temperature (IEC 60811-1-4:1985 + corr. May 1986 + A1:1993)   |
| EN 60811-3-1:1995 | Insulating and sheathing materials of electric cables - Common test methods Part 3-1: Methods specific to PVC compounds - Pressure test at high temperature - Tests for resistance to cracking (IEC 60811-3-1:1985 + corr. May 1986)         |
| IEC 60093:1980    | Methods of test for volume resistivity and surface resistivity of solid electrical insulating materials  |
| IEC 60250:1969    | Recommended methods for the determination of the permittivity and dielectric dissipation factor of electrical insulating materials at power, audio and radio frequencies including metre wavelengths   |
| ISO 11357-3:1999  | Plastics -- Differential scanning calorimetry (DSC) -- Part 3: Determination of temperature and enthalpy of melting and crystallization  |

## 3 Requirements

In case of specific applications, additional performances could be needed. Relevant test methods and requirements shall be included in the detail specifications of the cables.

Table 1 – FEP insulation and sheathing compounds

Characteristics		Test method	Unit	Requirements
1	Maximum rated temperature at cable for which the compound can be used	ISO 11357-3	°C	200
2	Density	EN 60811-1-3	g/cm <sup>3</sup>	2,15 ± 0,03
3	Melting point		°C	265 ± 20
4	Mechanical characteristics			
4.1	In state of delivery			
4.11	Tensile strength - median, min.	EN 60811-1-1	MPa	10
4.12	Elongation at break - median, min.	EN 60811-1-1	%	200
4.2	After ageing			
	Ageing conditions - temperature - duration	EN 60811-1-2	°C h	240 ± 5 14*24
4.21	Tensile strength - median, min. - variation, max.	EN 60811-1-1	Mpa %	10 25
4.22	Elongation at break - median, min.	EN 60811-1-1	%	200
5	Heat shock  Test conditions - temperature - duration  Result to be obtained	EN 60811-1-3-102 <a href="https://standards.itech.ai/catalog/standards/sist/e5539fb7-39c8-4a9c-a065-b63cbb430c06/sist-en-50290-2-30-2002">https://standards.itech.ai/catalog/standards/sist/e5539fb7-39c8-4a9c-a065-b63cbb430c06/sist-en-50290-2-30-2002</a>	°C h	250 ± 5 6  No crack
6	Behaviour at low temperature  Bending at low temperature Test conditions - temperature  Result to be obtained	EN 60811-1-4	°C	- 15 ± 2  No crack
7	Volume resistivity, min.  - at max. rated temperature at cable - at 20 °C	IEC 60093	Ω.m Ω.m	10 <sup>16</sup> 10 <sup>17</sup>
8	Dielectric constant, max.  - at 50 kHz, 23 °C - at 100 kHz, 23 °C	IEC 60250		2,1 2,1
9	Dissipation factor, max.  - at 50 kHz, 23 °C - at 100 kHz, 23 °C	IEC 60250		4 x 10 <sup>-4</sup> 6 x 10 <sup>-4</sup>

**Annex A**  
(normative)**Volume resistivity**

This test shall be made on insulated conductor sample.

The sample shall be immersed in water previously heated to the specified temperature, a length of about 0,25 m at each end of the sample being kept above the water.

A DC voltage of between 80 V and 500 V shall be then applied between the conductor and the water.

The insulation resistance shall be measured 1 min after application of the voltage.

The volume resistivity shall be calculated from the measured insulation resistance by the following formula :

$$\rho = \frac{2\pi\ell R}{\log_e \frac{D}{d}}$$

where

- $\rho$  = volume resistivity, in  $\Omega$  meters  
 $R$  = measured insulation resistance, in  $\Omega$   
 $\ell$  = length of the sample, in meters  
 $D$  = outer diameter of the insulation, in mm  
 $d$  = inner diameter of the insulation, in mm

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