

Communication cables - Part 2-24: Common design rules and construction - Polyethylene sheathing compounds

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 50290-2-24:2021 sisaldab Euroopa standardi EN 50290-2-24:2021 ingliskeelset teksti.	This Estonian standard EVS-EN 50290-2-24:2021 consists of the English text of the European standard EN 50290-2-24:2021.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation and Accreditation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 30.04.2021.	Date of Availability of the European standard is 30.04.2021.
Standard on kättesaadav Eesti Standardimis- ja Akrediteerimiskeskusest.	The standard is available from the Estonian Centre for Standardisation and Accreditation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 29.035.20, 33.120.10

Standardite reprodutseerimise ja levitamise õigus kuulub Eesti Standardimis- ja Akrediteerimiskeskusele. Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonsesse süsteemi või edastamine ükskõik millises vormis või millisel teel ilma Eesti Standardimis- ja Akrediteerimiskeskuse kirjaliku loata on keelatud.

Kui Teil on küsimusi standardite autorikaitse kohta, võtke palun ühendust Eesti Standardimis- ja Akrediteerimiskeskusega: Koduleht www.evs.ee; telefon 605 5050; e-post info@evs.ee

The right to reproduce and distribute standards belongs to the Estonian Centre for Standardisation and Accreditation. No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without a written permission from the Estonian Centre for Standardisation and Accreditation.

If you have any questions about copyright, please contact Estonian Centre for Standardisation and Accreditation:

Homepage www.evs.ee; phone +372 605 5050; e-mail info@evs.ee

English Version

**Communication cables - Part 2-24: Common design rules and
construction - Polyethylene sheathing compounds**

Câbles de communication - Partie 2-24: Règles de
conception communes et construction - Mélanges pour
gaines en polyéthylène

Kommunikationskabel - Teil 2-24: Gemeinsame Regeln für
Entwicklung und Konstruktion - PE-Mantelmischungen

This European Standard was approved by CENELEC on 2021-01-19. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.



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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Contents	Page
European foreword	4
1 Scope	5
2 Normative references	5
3 Terms and definitions	6
4 Compound test requirements	6
5 Cable test requirements	6
6 Ageing considerations	7
7 Health, safety and environmental (HSE) requirements	7
Bibliography.....	10

European foreword

This document (EN 50290-2-24:2021) has been prepared by CLC/TC 46X "Communication cables".

The following dates are fixed:

- latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2022-01-19
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2024-01-19

This document supersedes EN 50290-2-24:2002 and all of its amendments and corrigenda (if any).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

1 Scope

This document gives specific requirements for polyethylene sheathing compounds, as given in Table 1, for use in inner and outer sheathing of communication cables including fibre optic cables.

It is expected to be read in conjunction with EN 50290-2-20, the product standards EN 50407 series, EN 50117 series, EN 60794 series and other applicable product standards.

Using raw material and type test data as outlined in this document, the raw material supplier will have sufficient data to demonstrate compliance and warrant that the material is suitable for the specified application.

There are several routes used for manufacture of polyethylene and as a consequence a number of different types of polyethylene are defined as given in Table 1.

Table 1 — Polyethylene materials (informative)

Abbreviation	Material type	Reactor process	Polymer structure	Maximum operating temperature ^a °C
LDPE ^b	Low density polyethylene	High pressure/ temperature radical reaction	Long chain branched	+70
LLDPE	Linear low density polyethylene	Low pressure/ temperature catalytic reaction	Significant short chain branching	+80
MDPE	Medium density polyethylene	Low pressure/ temperature catalytic reaction	Short chain branched	+80
HDPE	High density polyethylene	Low pressure/ temperature catalytic reaction	Limited short chain branching	+80
^a Further guidance on operating temperature is contained in EN 50290-2-20				
^b Upper process capability for density 0,930 g/ml. Normally density range 0,917–0,925 g/ml				

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

EN 50289-4-17, *Communication cables - Specifications for test methods - Part 4-17: Test methods for UV resistance evaluation of the sheath of electrical and optical fibre cable*

EN 50290-2-20, *Communication cables - Part 2-20: Common design rules and construction - General*

EN 60811-406, *Electric and optical fibre cables - Test methods for non-metallic materials - Part 406: Miscellaneous tests - Resistance to stress cracking of polyethylene and polypropylene compounds (IEC 60811-406)*

EN 60811-407, *Electric and optical fibre cables - Test methods for non-metallic materials - Part 407: Miscellaneous tests - Measurement of mass increase of polyethylene and polypropylene compounds (IEC 60811-407)*

EN 60811-501, *Electric and optical fibre cables - Test methods for non-metallic materials - Part 501: Mechanical tests - Tests for determining the mechanical properties of insulating and sheathing compounds (IEC 60811-501)*

EN 60811-511, *Electric and optical fibre cables - Test methods for non-metallic materials - Part 511: Mechanical tests - Measurement of the melt flow index of polyethylene compounds (IEC 60811-511)*

EN 60811-605, *Electric and optical fibre cables - Test methods for non-metallic materials - Part 605: Physical tests - Measurement of carbon black and/or mineral filler in polyethylene compounds* (IEC 60811-605)

EN 60811-606, *Electric and optical fibre cables - Test methods for non-metallic materials - Part 606: Physical tests - Methods for determining the density* (IEC 60811-606)

EN 60811-607, *Electric and optical fibre cables - Test methods for non-metallic materials - Part 607: Physical tests - Test for the assessment of carbon black dispersion in polyethylene and polypropylene* (IEC 60811-607)

EN ISO 868, *Plastics and ebonite - Determination of indentation hardness by means of a durometer (Shore hardness)* (ISO 868)

EN ISO 11357-6, *Plastics - Differential scanning calorimetry (DSC) - Part 6: Determination of oxidation induction time (isothermal OIT) and oxidation induction temperature (dynamic OIT)* (ISO 11357-6)

ISO 974, *Plastics — Determination of the brittleness temperature by impact*

ISO 11359-2, *Plastics — Thermomechanical analysis (TMA) — Part 2: Determination of coefficient of linear thermal expansion and glass transition temperature*

DIN 51900-1, *Testing of solid and liquid fuels - Determination of gross calorific value by the bomb calorimeter and calculation of net calorific value - Part 1: Principles, apparatus, methods*

3 Terms and definitions

No terms and definitions are listed in this document.

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

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

4 Compound test requirements

The tests are to be carried out on granules or moulded plaques produced from granules of compound. Specific requirements are shown in Table 2. This data shall be provided by the compound supplier. Relevant test methods, requirements and limits shall be included in any supply specification of the compound.

In the case of special applications, additional requirements could be specified.

5 Cable test requirements

The anticipated performance assumes standard cable design and conventional process technology and is specified in Table 3. Using type test data, the compound supplier is expected to demonstrate compliance and warrant that the material is suitable for the specified application.

In the case of special applications, additional requirements could be specified.