
Materiali za izoliranje, oplaščenje in prevleke nizkonapetostnih energetskih kablov - 10-2. del: Razne mase za oplaščenje - Plastomerni poliuretan

Insulating, sheathing and covering materials for low voltage energy cables - Part 10-2: Miscellaneous sheathing compounds - Thermoplastic polyurethane

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**Insulating, sheathing and covering materials
for low voltage energy cables
Part 10-2: Miscellaneous sheathing compounds –
Thermoplastic polyurethane**

Matériaux pour enveloppe isolante,
gainage et revêtement pour les câbles
d'énergie basse tension
Partie 10-2: Mélanges divers pour gaine -
Polyuréthane thermoplastique

Isolier-, Mantel- und
Umhüllungswerkstoffe für
Niederspannungskabel und -leitungen
Teil 10-2: Diverse Mantelmischungen -
Thermoplastisches Polyurethan

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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 the Technical Committee CENELEC TC 20, Electric cables.

The text of the draft was submitted to the formal vote and was approved by CENELEC as EN 50363-10-2 on 2005-11-01.

EN 50363 (in all its parts) supersedes the equivalent information at present in HD 21.1 S4, HD 21.14 S1, HD 22.1 S4, HD 22.10 S1, HD 22.14 S2 and prHD 21.15 S1. The existing information in these HDs will be deleted at the next maintenance review.

EN 50363-10-2 should be read in conjunction with EN 50363-0.

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) 2006-11-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2007-11-01

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1 Scope

This part of EN 50363 specifies the test requirements for the physical properties of the harmonised thermoplastic polyurethane sheathing compound given in Table 1.

The relevant test methods are given in EN 60811 series and EN 50396.

NOTE This part of EN 50363 is to be read in conjunction with EN 50363-0.

Table 1 - Types of thermoplastic polyurethane sheathing compound

Type	Maximum cable operating temperature °C	General application
TMPU	90	Tough flexibles for outdoor use at low temperatures

2 Normative references

For the purposes of this part of EN 50363, the requirements of EN 50363-0, Clause 2, apply with regard to normative references.

3 Definitions

[SIST EN 50363-10-2:2006](https://standards.iteh.ai/catalog/standards/sist/346f49b4-b1ab-46e3-9123-c61b4-9f4115/sist-en-50363-10-2-2006)

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For the purposes of this part of EN 50363, the definitions given in EN 50363-0, Clause 3, apply.

4 Properties

Each compound shall meet the particular requirements listed in Table 2, when using the test methods referenced in columns 4 and 5.

NOTE For cross-references to the latest editions of the test method standards see Table 2 of EN 50363-0.

Table 2 – Requirements for the tests for thermoplastic polyurethane (TPU) sheathing compound

1	2	3	4	5	6
Ref No	Test ^a	Unit	Test method described in EN 60811 ^b		Type of compound
			Section	Clause	TPU
1	Mechanical properties				
1.1	Properties before ageing		1-1	9.2	
1.1.1	Values to be obtained for the tensile strength:				
	- median, min.	N/mm ²			25,0
1.1.2	Values to be obtained for the elongation at break:				
	- median, min.	%			300
1.2	Properties after ageing in air oven		1-2	8.1.3.1	
1.2.1	Ageing conditions:				
	- temperature	°C			110 ± 2
	- duration of treatment	h			7 x 24
1.2.2	Value to be obtained for the tensile strength:				
	- median, min.	N/mm ²			-
	- variation, max.	%			± 30
1.2.3	Values to be obtained for the elongation at break:				
	- median, min.	%			300
	- variation, max.	%			± 30
1.3	Properties after immersion in mineral oil		2-1	10	
1.3.1	Test conditions:				
	- oil temperature	°C			100 ± 2
	- duration of immersion in oil	h			7 x 24
1.3.2	Values to be obtained for the tensile strength:				
	- variation, max.	%			± 40
1.3.3	Value to be obtained for the elongation at break:				
	- median, min.	%			300
	- variation, max.	%			± 30
1.4	Properties after immersion in water (resistance to hydrolysis)		EN 50396	10.3	
1.4.1	Test conditions:				
	- temperature of water	°C			80 ± 2
	- duration	h			7 x 24
1.4.2	Values to be obtained for the tensile strength:				
	- variation, max.	%			± 30

**Table 2 – Requirements for the tests for thermoplastic polyurethane (TPU)
sheathing compound (continued)**

1	2	3	4	5	6
Ref No	Test ^a	Unit	Test method described in EN 60811 ^b		Type of compound
			Section	Clause	TPU
1.4.3	Value to be obtained for the elongation at break: - median, min. - variation, max.	% %			300 ± 30
2	Heat shock test		3-1	9.2	
2.1	Test conditions: - temperature - duration of treatment	°C h			150 ± 2 1,0 ^c
2.2	Result to be obtained				
3	Pressure test at high temperature		3-1	8.2	
3.1	Test conditions: - force exerted by the blade (k value) ^d - duration of heating under load - temperature	h °C	3-1 3-1	8.2.4 8.2.5	^e ^e 100 ± 2
3.2	Result to be obtained: - median of the depth of indentation, max.	%			50
4	Bending test at low temperature		1-4	8.2	
4.1	Test conditions: - temperature - period of application of low temperature	°C h	1-4 1-4	8.2 8.2.3	- 50 ± 3 ^e
4.2	Result to be obtained				^c
5	Elongation test at low temperature		1-4	8.4	
5.1	Test conditions: - temperature - period of application of low temperature	°C h	1-4	8.4.4 & 8.4.5	- 50 ± 3 ^e
5.2	Result to be obtained: - elongation without break, min.	%			30
6	Tear strength Mean value to be obtained, min.	N/mm	EN 50396	10.2	40,0
7	Resistance against saponification Mean value to be obtained, max.	mg of KOH/g	EN 50396	10.1	200
^a Information on other tests is given in EN 50363-0, Clause 5. ^b Unless stated otherwise. ^c No cracks. ^d The standard shows how to convert the given k value into a force in Newtons. ^e See test method referred to in columns 4 and 5.					