SLOVENSKI STANDARD
SIST EN 50497:2008

01-junij-2008

Priporoļ ena preskusna metoda za ocenjevanje tveganja izloļ anja mehļ al pri kablih, oplaģļ enih in izoliranih s PVC

Recommended test method for assessment of the risk of plasticizer exudation from PVC insulated and sheathed cables

Empfohlenes Prüfverfahren zur Einschätzung des Risikos von Weichmacherausschwitzungen bei PVC-isolierten und -ummantelten Kabeln und Leitungen

Méthode d'essai recommandée pour l'évaluation du risque d'exsudation de plastifiant des gaines des câbles et des isolants en PVC

Ta slovenski standard je istoveten z: **EN 50497:2007**

ICS:

29.035.20	Plastiļ ni in gumeni izolacijski materiali	Plastics and rubber insulating materials
29.060.20	Kabli	Cables

SIST EN 50497:2008 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 50497

November 2007

ICS 29.035.20

English version

Recommended test method for assessment of the risk of plasticizer exudation from PVC insulated and sheathed cables

Méthode d'essai recommandée pour l'évaluation du risque d'exsudation de plastifiant des gaines des câbles et des isolants en PVC

Empfohlenes Prüfverfahren zur Einschätzung des Risikos von Weichmacherausschwitzungen bei PVC-isolierten und -ummantelten Kabeln und Leitungen

This European Standard was approved by CENELEC on 2007-11-01. 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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

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

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

Ref. No. EN 50497:2007 E

Foreword

This European Standard was prepared by the Technical Committee CENELEC TC 20, Electric cables, in response to CLC/TC 20 (AT) 42.

The text of the draft was submitted to the formal vote and was approved by CENELEC as EN 50497 on 2007-11-01.

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)	2008-11-01
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2009-11-01

Contents

Introduction

PVC, by its nature, requires the addition of chemical agents (plasticizers, extenders) in order to generate useful and effective electrical grade materials for cable insulation and sheathing having suitable flexibility. Use over many decades has shown that exceptional and unexpected circumstances, coupled with particular installation conditions, may generate unfavourable conditions in which the plasticizer or extender dissociates from the body of the cable material and exudes from it. This is undesirable as it progressively alters the characteristics of the PVC and, in extreme cases, may lead to cracking, or it could damage surrounding components. It is also aesthetically unpleasing and, if it drips or drains in discrete amounts, may become a serious nuisance and may cause concern.

In practice the phenomenon is rare, because material suppliers and cable manufacturers have developed controls for cable grade PVC compounds. These controls begin with material selection tests to screen out unsuitable additives. Such tests are described, for example, in ASTM D3291-97:2003.

Furthermore, PVC insulated and sheathed cables made to recognised standards are required to conform to the compatibility test in EN 60811-1-2, 8.1.4. In the vast majority of cases these actions are sufficient to prevent exudation in service.

It is not possible to determine every type of assembly into which a cable may be placed, nor every installation condition, including thermal condition, that may be experienced. However, where additional assurances and tests are deemed necessary, it is recommended that the method in this European Standard should be used.

1 Scope

The test method described in this European Standard shows, by the use of accelerated testing, discrete exudation of plasticizer from PVC insulated and sheathed cables. It is for use in circumstances where the manufacturer determines that there may be a specific risk that cannot be assessed only by use of the compatibility test in EN 60811-1-2, 8.1.4.

This method is intended as a qualitative test on the completed product and not an individual material test.

NOTE 1 Information on the background to use of the test is given in the Introduction.

NOTE 2 Although any exudation is most likely to be of plasticizer, other components may also exude and, for the purposes of this standard, are treated equally in this test.

NOTE 3 The method has been developed with special reference to PVC/PVC cables. No recommendation is given as to its use with cables based on other insulation and sheathing materials.

2 Normative references

The following referenced documents are indispensable for the application 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 60811-1-2 1995 Insulating and sheathing materials of electric cables – Common test methods – Part 1-2: General application – Thermal ageing methods (IEC 60811-1-2:1985 + A1:1989 + corr. May 1986)

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
compatibility
ability of the plasticizer to be retained by the bulk compound or base resin

NOTE High compatibility indicates good retention by the bulk compound.

3.2
plasticizer
substance incorporated into a material to increase its flexibility, softness, distensibility, or workability

NOTE Plasticizers typically consist of high boiling point , oily, organic liquids.

3.3
exudation
visible presence of plasticizer on the surface of the cable, or dripping from the cable

3.4
operating temperature
maximum permitted conductor temperature of the completed product

4 Test method

4.1 Apparatus

The apparatus includes the ordinary laboratory apparatus, and

a) air circulating oven in accordance with EN 60811-1-2,

b) filter or cigarette paper,

c) chamber capable of sub-zero temperatures.

4.2 Sampling

Take two representative samples of the completed cable.

Cut the two cables so that each of them forms a test sample (200 ± 10) mm long.

If a manufacturer produces the full range of the relevant product to a specific standard, testing is only necessary on one representative size if identical materials are used.

4.3 Conditioning of samples

The test samples shall be conditioned at (23 ± 2) °C for a period of 24 h prior to testing.

4.4 Test method

The two conditioned test samples shall be suspended vertically, with filter paper positioned underneath, in an air oven. The bottom edge of each sample shall be (15 ± 5) mm above the filter paper. The test samples shall be suspended in the air oven for a duration of 7 days, at a temperature of 10 °C above the maximum permitted conductor temperature of the cable, but at a minimum temperature of (80 ± 2) °C.

Immediately after this period of 7 days in the air oven, the test samples shall be separated as follows:

– one test sample shall be kept at an ambient temperature of (23 ± 2) °C;

– one test sample shall be kept at -(5 ± 2) °C.

In both cases the test sample, suspended vertically with the filter paper positioned underneath at the distance previously described, shall be kept at the respective condition for 21 days.

The test samples shall be checked at regular periods for symptoms of plasticizer exudation for the duration of 28 days (7 days + 21 days).

5 Evaluation of results

The examination shall be done with normal or corrected vision, without magnification, for plasticizer exudation. There shall be no

– greasy film on the surface of the cable,

– drops at the cable ends,

– marks on the filter paper.

The findings shall be recorded.

6 Test report

The test report shall contain the following minimum information:

a) the type and identification of the tested cable;

b) the reference to this document;

c) the date of the test;

d) the result of the test.