SLOVENSKI STANDARD
SIST EN 60851-4:2001/A1:2002

01-april-2002

Amendment to clause 6 of EN

Winding wires - Test methods -- Part 4: Chemical properties

Wickeldrähte - Prüfverfahren -- Teil 4: Chemische Eigenschaften

Fils de bobinage - Méthodes d'essai -- Partie 4: Propriétés chimiques

Ta slovenski standard je istoveten z: **EN 60851-4:1996/A1:1997**

ICS:

29.060.10 Žice Wires

SIST EN 60851-4:2001/A1:2002 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 60851-4/A1

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ICS 29.060.10

Descriptors: Electrical wire, winding wire, insulated wire, chemical property

English version

Winding wires - Test methods
Part 4: Chemical properties
(IEC 60851-4:1996/A1:1997)

Fils de bobinage - Méthodes d'essai
Partie 4: Propriétés chimiques
(CEI 60851-4:1996/A1:1997)

Wickeldrähte - Prüfverfahren
Teil 4: Chemische Eigenschaften
(IEC 60851-4:1996/A1:1997)

This amendment A1 modifies the European Standard EN 60851-4:1996; it was approved by CENELEC on 1997-10-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment 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 amendment 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, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

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

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Foreword

The text of document 55/597/FDIS, future amendment 1 to IEC 60851-4:1996, prepared by IEC TC 55, Winding wires, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as amendment A1 to EN 60851-4:1996 on 1997-10-01.

The following dates were fixed:

- latest date by which the amendment has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 1998-07-01
- latest date by which the national standards conflicting with the amendment have to be withdrawn (dow) 1998-07-01

Endorsement notice

The text of amendment 1:1997 to the International Standard IEC 60851-4:1996 was approved by CENELEC as an amendment to the European Standard without any modification.

NORME INTERNATIONALE

INTERNATIONAL STANDARD

CEI
IEC
60851-4

1996

AMENDEMENT 1
AMENDMENT 1

1997-09

Amendement 1

Fils de bobinage – Méthodes d'essai –

Partie 4: Propriétés chimiques

Amendment 1

Winding wires – Test methods –

Part 4: Chemical properties

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FOREWORD

This amendment has been prepared by IEC technical committee 55: Winding wires.

The text of this amendment is based on the following documents:

FDIS	Report on voting
55/597/FDIS	55/614/RVD

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

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Replace the existing title of clause 6 by the following new title:

6 Test 20: Resistance to hydrolysis and to transformer oil
(applicable to enamelled wire)

Page 17

Replace the title and text of clause 6 by the following:

6 Test 20: Resistance to hydrolysis and to transformer oil (applicable to enamelled wire)

Resistance to hydrolysis is expressed by appearance and adherence after exposure of the specimens to transformer oil in the presence of water under pressure and at elevated temperature.

Resistance to transformer oil is expressed by breakdown voltage and flexibility after exposure of the specimens to transformer oil under pressure and at elevated temperature.

NOTE – The water may affect the coating by hydrolytic degradation and/or by absorption. If only absorption has occurred, drying the specimen at 125 °C ± 3 °C for 30 min prior to the breakdown voltage test will produce a recovery of the specimen. Wire with a nominal conductor diameter between 0,800 mm and 1,500 mm has been generally found convenient to handle and to test.

6.1 *Round wire*

6.1.1 *Equipment*

The following equipment shall be used:

- two glass tubes of 25 mm diameter and 300 mm length capable of being sealed;
- stainless steel pressure vessel of 400 ml to 500 ml volume with a pressure capacity of 6×10^6 Pa, preferably of unwelded construction and provided with a controlled heating system;
- transformer oil according to IEC 60296;
- paper according to IEC 60554-1, type 1.

6.1.2 *Specimens*

The following specimens shall be prepared:

– 12 straight pieces of wire about 200 mm in length;
– 10 twisted pair specimens prepared in accordance with 4.4.1 of IEC 60851-5;
– three mandrel wound specimens prepared in accordance with 5.1.1 of IEC 60851-3.

6.1.3 *Procedure*

6.1.3.1 *Resistance to hydrolysis*

Each of the tubes shall be charged with six straight pieces of wire according to 6.1.2 and 80 ml de-aerated dry transformer oil. To one of the tubes, 0,24 ml ± 0,01 ml of distilled water shall be added. The two tubes shall be sealed and placed in an oven for 24 h at 150 °C ± 3 °C. The tubes shall then be removed from the oven, allowed to cool down to room temperature and opened. The specimens shall be examined with normal vision.

One test shall be made. Any changes in appearance and adherence shall be reported.

6.1.3.2 *Resistance to transformer oil*

The pressure vessel shall be charged with components according to table 1 unless otherwise agreed between purchaser and supplier.

Table 1 – Volume of components

Component	Volume %
Transformer oil	65 ± 1
Paper	4 ± 0,01
Coating	0,26 ± 0,002
Steel	*
* By agreement between purchaser and supplier.	

The pressure vessel shall contain 10 twisted pair specimens, three mandrel wound specimens and extra pieces of wire to arrive at the volume of coating [1] specified in table 1. The paper shall be dried at a pressure of maximum 20 Pa at 90 °C ± 3 °C for 16 h or at 105 °C ± 3 °C for 4 h. After this preconditioning treatment the pressure vessel shall be charged with de-aerated dry oil according to table 1.

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[1] The total mass of wire in grams (M) to provide the required volume of enamel can be calculated approximately by:

$$M = \frac{Y \times V}{600 \times \delta \times D}$$

where

V is the volume of the pressure vessel in millilitres;

Y is the mass of 1 m of wire in grams;

δ is the increase in diameter due to the coating in millimetres;

D is the overall diameter of the wire in millimetres.

The sealed pressure vessel shall be heated at 150 °C ± 3 °C for 1 000 h ± 10 h. The pressure vessel shall then be allowed to cool to room temperature, discharged and opened. Five of the twisted pair specimens shall be tested at 105 °C ± 3 °C for breakdown voltage in accordance with 4.4.2 of IEC 60851-5 with the specimens under oil. The remaining five of the twisted pair specimens shall be dried at 125 °C ± 3 °C for about 30 min, allowed to cool to room temperature and then tested at 105 °C ± 3 °C for breakdown voltage in accordance with 4.4.2 of IEC 60851-5 with the specimens under oil.

The mandrel wound specimens shall be examined for cracks according to 5.1.1.1 of IEC 60851-3.

One test shall be made. The single values of breakdown voltage and any cracks shall be reported.

6.2 *Rectangular wire*

6.2.1 *Equipment*

Equipment according to 6.1.1 shall be used.

6.2.2 *Specimens*

The following specimens shall be prepared:

– 10 straight pieces of wire about 200 mm in length;
– four U-shaped specimens prepared in accordance with 4.6.1 of IEC 60851-5;
– two mandrel bent specimens prepared in accordance with 5.1.2 of IEC 60851-3.

6.2.3 *Procedure*

6.2.3.1 *Resistance to hydrolysis*

Each of the tubes shall be charged with five straight pieces of wire according to 6.2.2 and 80 ml de-aerated dry transformer oil. To one of the tubes, 0,24 ml ± 0,01 ml of distilled water shall be added. The two tubes shall be sealed and placed in an oven for 24 h at 150 °C ± 3 °C. The tubes shall then be removed from the oven, and then allowed to cool down to room temperature and opened. The specimens shall be examined with normal vision.

One test shall be made. Any changes in appearance and adherence shall be reported.