



SLOVENSKI STANDARD
SIST EN 61858-2:2014

01-julij-2014

Sistemi električne izolacije - Toplotno vrednotenje sprememb preverjenega sistema električne izolacije z EIS - 2. del: Predhodno oblikovana navitja EIS (IEC 61858-2:2014)

Electrical insulation systems - Thermal evaluation of modifications to an established EIS-Part-2: Form-wound EIS

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 61858-2:2014](https://standards.iteh.ai/catalog/standards/sist/85d52551-711c-447b-9025-58146b9b1267/sist-en-61858-2-2014)

Ta slovenski standard je istoveten z: EN 61858-2:2014

ICS:

29.080.30 Izolacijski sistemi Insulation systems

SIST EN 61858-2:2014

en

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 61858-2:2014](#)

<https://standards.iteh.ai/catalog/standards/sist/85d52551-711c-447b-9625-5814bb9b1269/sist-en-61858-2-2014>

EUROPEAN STANDARD

EN 61858-2

NORME EUROPÉENNE

EUROPÄISCHE NORM

May 2014

ICS 29.080.30

English Version

Electrical insulation systems - Thermal evaluation of
modifications to an established electrical insulation system (EIS)
- Part 2: Form-wound EIS
(IEC 61858-2:2014)

Systèmes d'isolation électrique - Évaluation thermique des
modifications apportées à un système d'isolation électrique
(SIE) éprouvé - Partie 2: Système d'isolation électrique à
enroulements préformés
(CEI 61858-2:2014)

Elektrische Isoliersysteme - Thermische Bewertung von
Veränderungen an einem erprobten elektrischen
Isoliersystem (EIS) - Teil 2: EIS mit Flachdraht-Wicklungen
(IEC 61858-2:2014)

This European Standard was approved by CENELEC on 2014-03-19. 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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, 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: Avenue Marnix 17, B-1000 Brussels

Foreword

The text of document 112/253/CDV, future edition 1 of IEC 61858-2, prepared by IEC/TC 112 "Evaluation and qualification of electrical insulating materials and systems" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61858-2:2014.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2014-12-19
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2017-03-19

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

Endorsement notice

The text of the International Standard IEC 61858-2:2014 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following note has to be added for the standard indicated:

IEC 60172

NOTE Harmonized as EN 60172.

SIST EN 61858-2:2014

<https://standards.iteh.ai/catalog/standards/sist/85d52551-711c-447b-9625-5814bb9b1269/sist-en-61858-2-2014>

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60034-18-31	2012	Rotating electrical machines - Part 18-31: Functional evaluation of insulation systems - Test procedures for form-wound windings - Thermal evaluation and classification of insulation systems used in rotating machines	EN 60034-18-31	2012
IEC 60085	2007	Electrical insulation - Thermal evaluation and designation	EN 60085	2008
IEC 60216-5	-	Electrical insulating materials - Thermal endurance properties - Part 5: Determination of relative thermal endurance index (RTE) of an insulating material	EN 60216-5	-
IEC 60216-6	-	Electrical insulating materials - Thermal endurance properties - Part 6: Determination of thermal endurance indices (Th and RTE) of an insulating material using the fixed time frame method	EN 60216-6	-
IEC 60317	Series	Specifications for particular types of winding wires	EN 60317	Series
IEC 60317-16 ¹⁾	-	Specifications for particular types of winding wires - Part 16: Polyester enamelled rectangular copper wire, class 155	EN 60317-16 ¹⁾	-
IEC 60317-17	-	Specifications for particular types of winding wires - Part 17: Polyvinyl acetal enamelled rectangular copper wire, class 105	EN 60317-17	-
IEC 60317-18	-	Specifications for particular types of winding wires - Part 18 : Polyvinyl acetal enamelled rectangular copper wire, class 120	EN 60317-18	-
IEC 60317-27	-	Specifications for particular types of winding wires - Part 27: Paper tape covered rectangular copper wire	EN 60317-27	-

¹⁾ Withdrawn publication.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60317-28	-	Specifications for particular types of winding wires - Part 28: Polyesterimide enamelled rectangular copper wire, class 180	EN 60317-28	-
IEC 60317-29	-	Specifications for particular types of winding wires - Part 29: Polyester or polyesterimide overcoated with polyamide-imide enamelled rectangular copper wire, class 200	EN 60317-29	-
IEC 60317-30 ¹⁾	-	Specifications for particular types of winding wires - Part 30: Polyimide enamelled rectangular copper wire, class 220	EN 60317-30	-
IEC 60317-31	-	Specifications for particular types of winding wires - Part 31: Glass-fibre wound resin or varnish impregnated, bare or enamelled rectangular copper wire, temperature index 180	EN 60317-31	-
IEC 60317-32	-	Specifications for particular types of winding wires - Part 32: Glass-fibre wound, resin or varnish impregnated, bare or enamelled rectangular copper wire, temperature index 155	EN 60317-32	-
IEC 60317-33	-	Specifications for particular types of winding wires - Part 33: Glass-fibre wound resin or varnish impregnated, bare or enamelled rectangular copper wire, temperature index 200	EN 60317-33	-
IEC 60317-39	-	Specifications for particular types of winding wires - Part 39: Glass-fibre braided resin or varnish impregnated, bare or enamelled rectangular copper wire, temperature index 180	EN 60317-39	-
IEC 60317-40	-	Specifications for particular types of winding wires - Part 40: Glass-fibre braided resin or varnish impregnated, bare or enamelled rectangular copper wire, temperature index 200	EN 60317-40	-
IEC 60317-44	-	Specifications for particular types of winding wires - Part 44: Aromatic polyimide tape wrapped rectangular copper wire, class 240	EN 60317-44	-
IEC 60317-47	-	Specifications for particular types of winding wires - Part 47: Aromatic polyimide enamelled rectangular copper wire, class 240	EN 60317-47	-
IEC 60317-53	-	Specifications for particular types of winding wires - Part 53: Aromatic polyamide (aramid) tape wrapped rectangular copper wire, temperature index 220	EN 60317-53	-

¹⁾ Withdrawn publication.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60317-58	-	Specifications for particular types of winding wires - Part 58: Polyamide-imide enamelled rectangular copper wire, class 220	EN 60317-58	-
IEC 60505	-	Evaluation and qualification of electrical insulation systems	EN 60505	-

iTeh STANDARD PREVIEW (standards.iteh.ai)

SIST EN 61858-2:2014

<https://standards.iteh.ai/catalog/standards/sist/85d52551-711c-447b-9625-5814bb9b1269/sist-en-61858-2-2014>

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 61858-2:2014](#)

<https://standards.iteh.ai/catalog/standards/sist/85d52551-711c-447b-9625-5814bb9b1269/sist-en-61858-2-2014>



IEC 61858-2

Edition 1.0 2014-02

INTERNATIONAL STANDARD

NORME INTERNATIONALE



**Electrical insulation systems – Thermal evaluation of modifications to an established electrical insulation system (EIS) –
Part 2: Form-wound EIS**

**Systèmes d'isolation électrique – Évaluation thermique des modifications apportées à un système d'isolation électrique (SIE) éprouvé –
Partie 2: Système d'isolation électrique à enroulements préformés**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

PRICE CODE
CODE PRIX

T

ICS 29.080.30

ISBN 978-2-8322-1394-0

**Warning! Make sure that you obtained this publication from an authorized distributor.
Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.**

CONTENTS

FOREWORD.....	3
INTRODUCTION.....	5
1 Scope.....	6
2 Normative references	6
3 Terms and definitions	7
4 General considerations.....	9
5 Substitution of phase insulation and/or ground insulation.....	11
5.1 Generically identical	11
5.2 Substitution or addition of selected components and additives.....	11
5.3 Reduction of thickness.....	11
6 Substitution of winding wire	12
6.1 Winding wire	12
6.2 Substitution of conductor material.....	13
6.3 Alternate winding wire.....	13
7 Substitution of impregnating resin/varnish	13
8 Evaluation of additions	13
9 Procedure C – Single-point thermal ageing test.....	13
9.1 Test objects.....	13
9.2 Establishing the EIS relative thermal endurance index (EIS RTE)	13
9.3 Interpretation of results.....	14
10 Full thermal aging test (procedure D).....	14
Annex A (normative) Classes of winding wire.....	15
Annex B (informative) Visual representation of form-wound coil manufacturing process.....	16
Bibliography.....	22
Figure 1 – Overview of evaluation methods.....	10
Figure 2 – Substitution of phase and ground insulation	11
Figure 3 – Substitution of winding wire.....	12
Figure 4 – Substitution of conductor material	12
Figure B.1 – Rectangular winding wire shaped into un-formed coil on coil forming machine.....	16
Figure B.2 – Un-formed coil being wrapped with a protective fabric	17
Figure B.3 – Un-formed coil completely wrapped with protective fabric	17
Figure B.4 – Coil forming machine stretches and bends oval coil to formed shape coil in the shaping apparatus.....	18
Figure B.5 – Formed coil with protective layer removed	18
Figure B.6 – Close-up of formed coil's knuckle insulation.....	19
Figure B.7 – Formed coil with multiple layers of insulation	19
Figure B.8 – Formed coils placed into the form-wound test specimen or Formette	20
Figure B.9 – Insulation details.....	21
Table A.1 – Winding wire type – Rectangular conductor.....	15

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**ELECTRICAL INSULATION SYSTEMS –
THERMAL EVALUATION OF MODIFICATIONS TO
AN ESTABLISHED ELECTRICAL INSULATION SYSTEM (EIS) –**

Part-2: Form-wound EIS

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 61858-2 has been prepared by IEC technical committee 112: Evaluation and qualification of electrical insulating materials and systems.

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

CDV	Report on voting
112/253/CDV	112/274/RVC

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

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 61858 series, published under the general title *Electrical insulation systems – Thermal evaluation of modifications to an established insulation system (EIS)*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN 61858-2:2014](#)

<https://standards.iteh.ai/catalog/standards/sist/85d52551-711c-447b-9625-5814bb9b1269/sist-en-61858-2-2014>