SLOVENSKI STANDARD
SIST EN IEC 60773:2021

01-oktober-2021

Električni rotacijski stroji - Preskusne metode in aparati za merjenje obratovalnih lastnosti ščetk (IEC 60773:2021)

Rotating electrical machines - Test methods and apparatus for the measurement of the operational characteristics of brushes (IEC 60773:2021)

Drehende elektrische Maschinen - Prüfverfahren und -einrichtungen für die Messung der Betriebseigenschaften von Kohlebürsten (IEC 60773:2021)

Machines électriques tournantes - Méthodes d'essai et appareils pour le mesurage des caractéristiques opérationnelles des balais (IEC 60773:2021)

Ta slovenski standard je istoveten z: **EN IEC 60773:2021**

ICS:

29.160.01	Rotacijski stroji na splošno	Rotating machinery in general

SIST EN IEC 60773:2021 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN IEC 60773

May 2021

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English Version

Rotating electrical machines - Test methods and apparatus for the measurement of the operational characteristics of brushes (IEC 60773:2021)

Machines électriques tournantes - Méthodes d'essai et appareils pour le mesurage des caractéristiques opérationnelles des balais (IEC 60773:2021)

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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

Ref. No. EN IEC 60773:2021 E

European foreword

The text of document 2/2045/FDIS, future edition 2 of IEC 60773, prepared by IEC/TC 2 "Rotating machinery" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 60773:2021.

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) 2022-02-12
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2024-05-12

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.

Endorsement notice

The text of the International Standard IEC 60773:2021 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60027-4:2006	NOTE	Harmonized as EN 60027-4:2007 (not modified)
IEC 60034-1:2017	NOTE	Harmonized as EN 60034-1:—[1] (modified)
ISO 4287:1997	NOTE	Harmonized as EN ISO 4287:1998 (not modified)
ISO 4287:1997/A1:2009	NOTE	Harmonized as EN ISO 4287:1998/A1:2009 (not modified)

[1] To be published. Stage at the time of publication: FprEN 60034-1:2017/prAA.

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

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.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

Publication	Year	Title	EN/HD	Year
IEC 60034-19	2014	Rotating electrical machines - Part 19: Specific test methods for d.c. machines on conventional and rectifier-fed supplies	EN 60034-19	2014
IEC 60136	-	Dimensions of brushes and brush-holders for electrical machinery	-	-
IEC 60276	2018	Carbon brushes, brush holders, commutators and slip-rings - Definitions and nomenclature	EN IEC 60276	2019
IEC 60356	-	Dimensions for commutators and slip-rings	-	-
IEC 60584-1	2013	Thermocouples - Part 1: EMF specifications and tolerances	EN 60584-1	2013
IEC 60751	2008	Industrial platinum resistance thermometers and platinum temperature sensors	EN 60751	2008
IEC/TR 61015	-	Brush-holders for electrical machines. Guide to the measurement of the static thrust applied to brushes	-	-
ISO 1190-1	1982	Copper and copper alloys; Code of designation; Part 1: Designation of materials	-	-
ISO 3274	1996	Geometrical Product Specifications (GPS) - Surface texture: Profile method - Nominal characteristics of contact (stylus) instruments	EN ISO 3274	1997
ISO 15510	2014	Stainless steels - Chemical composition	-	-

IEC 60773

Edition 2.0 2021-04

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Rotating electrical machines – Test methods and apparatus for the measurement of the operational characteristics of brushes

Machines électriques tournantes – Méthodes d'essai et appareils pour le mesurage des caractéristiques opérationnelles des balais

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ROTATING ELECTRICAL MACHINES – TEST METHODS AND APPARATUS FOR THE MEASUREMENT OF THE OPERATIONAL CHARACTERISTICS OF BRUSHES

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.
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International standard IEC 60773 has been prepared by IEC technical committee 2: Rotating machinery.

This second edition cancels and replaces the first edition published in 1983. It constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

– The clause structure has been modified on the view point of a laboratory testing procedure. The new sequence is as follows: test rig specification (Clause 4), general testing procedure (Clause 5), and specific procedure for each operational characteristic (Clauses 6 to 8).
– A new Clause 9 has been added to introduce the black-band test for the characterisation of the brush grades for DC machines.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
2/2045/FDIS	2/2050/RVD

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

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

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

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

ROTATING ELECTRICAL MACHINES – TEST METHODS AND APPARATUS FOR THE MEASUREMENT OF THE OPERATIONAL CHARACTERISTICS OF BRUSHES

1 Scope

This document applies to test methods for the measurement of the operational characteristics of brushes designed to operate on commutating and slip ring machines under specified test conditions.

By extension some tests may be relevant for other kinds of sliding electrical contacts for electrical appliances.

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.

IEC 60034-19:2014, *Rotating electrical machines – Part 19: Specific test methods for d.c. machines on conventional and rectifier-fed supplies*

IEC 60136, *Dimensions of brushes and brush-holders for electrical machinery*

IEC 60276:2018, *Carbon brushes, brush holders, commutators and slip-rings – Definitions and nomenclature*

IEC 60356, *Dimensions for commutators and slip-rings*

IEC 60584-1:2013, *Thermocouples – Part 1: EMF specifications and tolerances*

IEC 60751:2008, *Industrial platinum resistance thermometers and platinum temperature sensors*

IEC TR 61015, *Brush-holders for electrical machines. Guide to the measurement of the static thrust applied to brushes*

ISO 1190-1:1982, *Copper and copper alloys – code of designation – Part 1: Designation of materials*

ISO 3274:1996, *Geometrical Product Specifications (GPS) – Surface texture: Profile method – Nominal characteristics of contact (stylus) instruments*

ISO 15510:2014, *Stainless steels – Chemical composition*

3 Terms, definitions, symbols and abbreviated terms

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

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

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

3.1 Terms and definitions

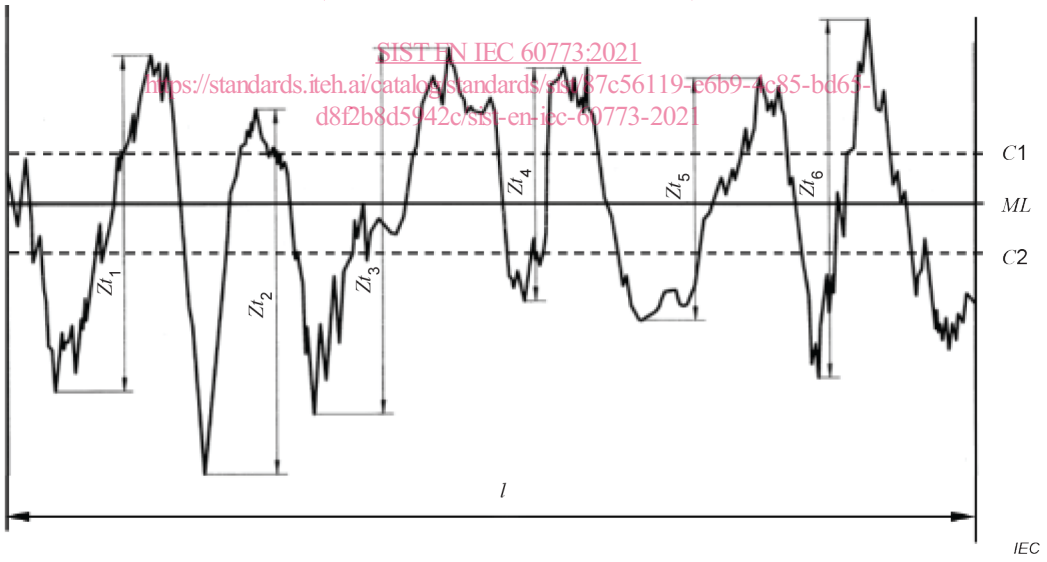
3.1.1
run-out
runout
inaccuracy of the rotating system, measured on the surface of the ring while turning

Note 1 to entry: This includes out-of-round (that is, lacking sufficient roundness); eccentricity (that is, lacking sufficient concentricity); or axial bending (regardless of whether the surfaces are perfectly round and concentric at every cross-sectional point).

3.1.2
roughness
Ra
arithmetic mean of the absolute ordinate value *Z(x)* of a profile within a sampling length *l*

$$Ra = \frac{1}{l} \times \int_0^l |Z(x)| \, .dx$$

Example: Figure 1 shows an example of profile.



Key

Zt_i	height of profile element *i*
l	sampling length
ML	mean line
C1 and *C2*	upper and lower intersection lines (respectively)

Figure 1 – Profile and determination of height of profile elements

[SOURCE: ISO 4287:1997, Figure 9]