SLOVENSKI STANDARD
SIST EN IEC 60276:2020

01-februar-2020

Nadomešča:
SIST EN 60276:1999

Ogljikove ščetke, držalo ščetk, komutatorji in drsni obroči - Definicije in nomenklatura (IEC 60276:2018)

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

Definitionen und Benennungen für Kohlebürsten, Bürstenhalter, Kommutatoren und Schleifringe (IEC 60276:2018)

Balais de charbon, porte-balais, collecteurs et bagues - Définitions et nomenclature (IEC 60276:2018)

Ta slovenski standard je istoveten z: **EN IEC 60276:2019**

ICS:

01.040.29	Elektrotehnika (Slovarji)	Electrical engineering (Vocabularies)
29.100.20	Električni in elektromehanski sestavni deli	Electrical and electromechanical components
29.160.10	Sestavni deli rotacijskih strojev	Components for rotating machines

SIST EN IEC 60276:2020 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN IEC 60276

September 2019

ICS 01.040.29; 29.100.20

Supersedes EN 60276:1996 and all of its amendments and corrigenda (if any)

English Version

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

Balais de charbon, porte-balais, collecteurs et bagues - Définitions et nomenclature (IEC 60276:2018)

Definitionen und Benennungen für Kohlebürsten, Bürstenhalter, Kommutatoren und Schleifringe (IEC 60276:2018)

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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 60276:2019 E

European foreword

The text of document 2/1898/FDIS, future edition 2 of IEC 60276, prepared by IEC/TC 2 "Rotating machinery" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 60276:2019.

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) 2020-03-20
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2022-09-20

This document supersedes EN 60276:1996 and all of its amendments and corrigenda (if any).

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 60276:2018 was approved by CENELEC as a European Standard without any modification.

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 60136	-	Dimensions of brushes and brush-holders for electrical machinery	-	-
IEC 60773	-	Test methods and apparatus for measurement of the operational characteristics of brushes	-	-

IEC 60276

Edition 2.0 2018-05

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Carbon brushes, brush holders, commutators and slip-rings – Definitions and nomenclature

Balais de charbon, porte-balais, collecteurs et bagues – Définitions et nomenclature

INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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CARBON BRUSHES, BRUSH HOLDERS, COMMUTATORS AND SLIP-RINGS – DEFINITIONS AND NOMENCLATURE

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 60276 has been prepared by IEC technical committee 2: Rotating machinery.

This second edition cancels and replaces the first edition, issued in 1968 and its Amendment 1, issued in 1987. It constitutes a technical revision.

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

– Some nomenclature has been deleted or added, whereas remaining definitions have been detailed and clarified, to reflect the technical evolution since 1987.
– Additional definitions have been included to address the request for reviewing this standard, in particular nomenclature of commutator/slip-rings markings, brush markings and commutation sparks codes.

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

FDIS	Report on voting
2/1898/FDIS	2/1901/RVD

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.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website 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.

CARBON BRUSHES, BRUSH HOLDERS, COMMUTATORS AND SLIP-RINGS – DEFINITIONS AND NOMENCLATURE

1 Scope

This document applies to carbon brushes for electrical machinery. For the present, it applies only to carbon brushes for commutators and slip-rings in rotating machines.

Terms and definitions are relative to the brush construction (references 100's to 500's and parts of 900's) and to the markings when operating on a rotating machine (references 600's to 800's).

By extension, terms and definitions may be relevant for any kind of sliding electrical contacts for electrical machinery.

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

IEC 60773, *Test methods and apparatus for measurement of the operational characteristics of brushes*

3 Terms and definitions

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

NOTE Brushes are classified according to the class of grade used, as follows.

3.1
grade
brush material used for the brush body, defined by its composition and its physical properties

3.2
carbon
consists of various forms of amorphous carbon, generally made of a mixture of carbonaceous powders agglomerated with a binder, moulded and baked at suitable temperature to carbonize the binder

Note 1 to entry: Also named hard carbon (or plain carbon).

Note 2 to entry: The material can contain additives and can be impregnated with oils, wax or resin. This material contains principally carbon, because it is not graphitized during baking operation.

3.3
carbon-graphite
carbographitic
CG
consists of a mixture of powdered amorphous carbon and graphite, agglomerated with a binder (pitch or resin), moulded and baked at suitable temperature to carbonize the binder

3.4
electrographite
electrographitic
EG
consists of various forms of amorphous carbon (hard carbon or carbon-graphite) converted during manufacture into artificial / synthetic graphite

3.5
natural-graphite
NG
carbon-graphite grade consisting principally of natural graphite

Note 1 to entry: Sometimes also called soft graphite.

3.6
resin-bonded
bakelite-graphite
BG
consists of powdered carbon and/or graphite bonded with a resin (artificial, synthetic or natural) and polymerized at suitable temperature

3.7
metal-graphite
metallographitic
MG
consists of a mixture of powdered metals and graphite pressed and baked at suitable temperature

Note 1 to entry: Baking is named sintering when a reducing atmosphere is used during baking.

3.8
metal-impregnated
M
consists of carbon, carbon-graphite or electrographite which contains a metal which has been added by an impregnation process.

Metal can be added by:

– melting the metal and impregnating under pressure, or

– impregnating with a metal precursor and decomposition of this precursor during a further baking operation, or

– deposition in vapour phase.

Note 1 to entry: The second and third processes are also called metallization.

4 Symbols and abbreviated terms

4.1 Symbols

a axial dimension of brush (mm)

c chamfer dimension (mm)

I current per brush (A)

r radial dimension of brush (mm)

R radius (mm)

t tangential dimension of brush (mm)

U voltage (V)

α contact bevel angle (°)

β top bevel angle (°)

4.2 Subscripts

A anodic

C cathodic

B brush

T top of the brush

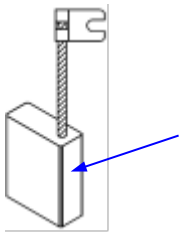
c contact

5 Nomenclature

NOTE The definition corresponds to the part highlighted in blue / grey colour or pointed out by an arrow on the corresponding figure (when applicable).

5.1 Brushes

5.1.1 101: Body / block

101		Brush body / block

5.1.2 102 to 104: Definitions of t, a and r

References a) and b) below correspond respectively to commutator (DC Motor) and slip-ring (synchronous or asynchronous machine).