

# INTERNATIONAL STANDARD

## NORME INTERNATIONALE



**Dimensions, marking and testing of carbon brushes and dimensions of brush-holders for electrical machinery**

**Dimensions, marquages et essais des balais et dimensions des porte-balais pour machines électriques**



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IEC Secretariat  
3, rue de Varembe  
CH-1211 Geneva 20  
Switzerland

Tel.: +41 22 919 02 11  
[info@iec.ch](mailto:info@iec.ch)  
[www.iec.ch](http://www.iec.ch)

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## CONTENTS

FOREWORD.....	7
1 Scope.....	10
2 Normative references.....	10
3 Terms, definitions and symbols.....	11
3.1 Terms and definitions.....	11
3.2 Symbols.....	19
4 Units and marking.....	21
4.1 Units.....	21
4.2 Marking.....	21
4.2.1 Units.....	21
4.2.2 Additional marks on the brush.....	21
4.2.3 Additional marks for brush-holders.....	22
5 Principal dimensions and tolerances of brushes.....	22
5.1 Sequence.....	22
5.2 Standard dimensions.....	24
5.3 Tolerances on principal dimensions.....	24
5.3.1 General tolerances.....	24
5.3.2 Split brushes.....	25
5.3.3 Metal-graphite brushes.....	26
5.4 Recommended combinations of principal dimensions.....	26
5.4.1 Combination for $t$ and $a$ .....	26
5.4.2 Square brush.....	29
6 Complementary dimensions of brushes.....	30
6.1 Chamfers.....	30
6.1.1 Angle.....	30
6.1.2 Dimension.....	30
6.1.3 Non-reversing chamfer.....	31
6.2 Angles for contact and top bevels.....	32
6.2.1 Angles for contact bevel.....	32
6.2.2 Angles for top bevel.....	33
6.2.3 Combination of angles.....	34
6.3 Pressure angle.....	34
6.4 Depth of insertion $q_i$ of the flexible (shunt) in the brush.....	35
6.5 Residual material width adjacent to the flexible.....	36
6.6 Safe length of a worn brush $r_m$ .....	37
7 Combinations of brushes: flexibles and terminals.....	38
7.1 Flexibles.....	38
7.1.1 General.....	38
7.1.2 Nominal area and maximum diameter of flexibles.....	39
7.1.3 Length of flexible.....	40
7.1.4 Flexible protection.....	40
7.2 Terminals.....	40
7.2.1 General.....	40
7.2.2 Axial spade terminals.....	41
7.2.3 Flag terminals.....	42
7.2.4 Double shoe terminals.....	43

7.2.5	Tubular terminals.....	44
7.2.6	Soldered terminals.....	45
7.2.7	Current capacity of terminals.....	46
8	Test procedures for determining physical properties of brushes.....	47
8.1	General.....	47
8.2	Measurement of electrical resistance of brush/flexible connection.....	47
8.2.1	General.....	47
8.2.2	Test equipment.....	48
8.2.3	Test procedure.....	50
8.2.4	Test procedure for method b) (mathematical).....	55
8.2.5	Calculation and report.....	56
8.3	Measurement of the pull strength of tamped or moulded connections.....	56
8.3.1	General.....	56
8.3.2	Principle.....	56
8.3.3	Test equipment.....	56
8.3.4	Test procedure.....	59
8.3.5	Calculation and report.....	59
9	Brush-holder dimensions and configuration.....	59
9.1	General.....	59
9.2	Dimensions of the inside of the brush-box.....	59
9.2.1	Main dimensions.....	59
9.2.2	Tolerances and clearances on brush-box chamfer.....	59
9.2.3	Dimensions and tolerances on brush-box chamfer.....	60
9.3	Check of brush-box dimensions.....	61
9.3.1	General.....	61
9.3.2	Gauging of dimensions $t$ and $r$ .....	61
9.3.3	Gauging of chamfers.....	61
9.4	Serrations on fixing face of the brush-holder.....	61
9.4.1	General.....	61
9.4.2	Profile and dimensions of serrations.....	61
9.4.3	Location of serrations.....	62
9.5	Brush-holder mounting position.....	62
Annex A (normative)	Equivalent dimensions in inches.....	63
Annex B (normative)	Values of the principal dimensions of metal-graphite brushes.....	66
Annex C (informative)	Considerations relative to brush stability.....	67
C.1	General.....	67
C.2	Radial brush without top bevel angle operating in bidirectional rotation.....	68
C.3	Radial brush with top bevel angle operating in the forward direction.....	70
C.4	Radial brush with top bevel angle operating in the reverse direction.....	71
C.5	Trailing type brushes.....	72
C.6	Reaction type brush with top bevel angle.....	74
Annex D (informative)	Flexibles configuration.....	77
Annex E (informative)	Flexible location.....	78
Annex F (informative)	Recommended values of thickness for spade, flag and double shoe terminals.....	79
Annex G (informative)	Technical questionnaire for the definition of a carbon brush.....	80
Bibliography	.....	82

Figure 1 – Examples of brush components.....	11
Figure 2 – Chamfer height .....	12
Figure 3 – Contact bevel angle $\alpha$ .....	12
Figure 4 – Top bevel angle $\beta$ .....	13
Figure 5 – Pressure area width for commutator and for slip-ring .....	13
Figure 6 – Depth of insertion.....	14
Figure 7 – Residual material width .....	14
Figure 8 – Safe length of a worn brush .....	15
Figure 9 – Flexible dimensions $l_S$ and $d_S$ for different examples of brushes .....	16
Figure 10 – Definition of distance $d_P$ for different types of brush connection .....	17
Figure 11 – Brush-holder box chamfer height.....	18
Figure 12 – Definition of serration location distance.....	19
Figure 13 – Safe remaining length mark for different brush designs .....	22
Figure 14 – Main dimensions for a wedge-edge brush.....	23
Figure 15 – Preferred orientation for anisotropic grades depending on the application .....	30
Figure 16 – Angle of chamfers .....	30
Figure 17 – Split brush.....	31
Figure 18 – Non-reversing chamfer height .....	31
Figure 19 – Sharp edge when a contact bevel angle $\alpha$ is applied .....	33
Figure 20 – Flat surface of edge when a top bevel angle $\beta$ is applied.....	33
Figure 21 – Flexible configuration illustration .....	38
Figure 22 – Definition of shape and dimensions of axial spades terminals .....	41
Figure 23 – Definition of shape and dimensions of flag terminals .....	42
Figure 24 – Definition of shape and dimensions of double shoe terminals .....	43
Figure 25 – Definition of shape and dimensions of tubular terminals .....	44
Figure 26 – Definition of shape (example) and dimensions of formed spade terminal .....	45
Figure 27 – Definition of shape (examples) and dimensions of two types of pin terminals.....	46
Figure 28 – Examples of testing device for the measurement of the connection electrical resistance .....	48
Figure 29 – Example of contact probe for flexible.....	49
Figure 30 – Example of contact probe for brush .....	49
Figure 31 – Measurement of connection resistance for a moulded or tamped connection .....	51
Figure 32 – Measurement of connection resistance for a riveted connection .....	52
Figure 33 – Alternative method for the measurement of connection resistance in case of 2 rivets.....	53
Figure 34 – Connection with a metal top soldered or riveted to the block .....	54
Figure 35 – Iterated determination of location P of Probe 2.....	55
Figure 36 – Test equipment for the measurement of the pull out force .....	57
Figure 37 – Example of support device for brushes with inclined connection hole .....	58
Figure 38 – Profile of serrations – cross-sectional view.....	62
Figure C.1 – Illustration of rotational moments for a radial brush.....	69

Figure C.2 – Illustration of forces applied on a radial brush with top bevel angle operating in the forward rotation .....	70
Figure C.3 – Illustration of forces applied on a radial brush with top bevel angle operating in the reverse direction .....	72
Figure C.4 – Illustration of forces applied on a trailing brush with a top bevel angle operating in the forward direction .....	73
Figure C.5 – Illustration of forces applied on a reaction brush .....	75
Figure E.1 – Flexible location .....	78
Figure G.1 – Main dimensions .....	80
Figure G.2 – Brush operation .....	81
Table 1 – Symbols for each unit system .....	21
Table 2 – Standard dimensions of brush block .....	24
Table 3 – Tolerances on $t$ , $a$ and $r$ .....	25
Table 4 – Recommended combination of $t$ , $a$ and $r$ .....	27
Table 5 – Dimension of chamfer height $c$ .....	31
Table 6 – Recommended values of non-reversing chamfer height .....	32
Table 7 – Preferred values for contact bevel angle $\alpha$ and top bevel angle $\beta$ .....	33
Table 8 – Typical combination values for contact bevel angle $\alpha$ and top bevel angle $\beta$ .....	34
Table 9 – Recommended minimum values of pressure area with $w_p$ .....	35
Table 10 – Maximum values of depth of insertion $q_i$ .....	35
Table 11 – Example of maximum values of $q_i$ for a EC grade .....	36
Table 12 – Minimum width of residual material .....	37
Table 13 – Recommended nominal area for flexibles and their corresponding maximum diameter .....	39
Table 14 – Standard lengths of flexibles $l_S$ and tolerances .....	40
Table 15 – Standard values of spade terminals dimensions .....	42
Table 16 – Standard values of flag terminals dimensions .....	43
Table 17 – Standard values of double shoe terminals dimensions .....	44
Table 18 – Standard values of tubular terminals dimensions .....	45
Table 19 – Standard values of formed spade terminals dimensions and tolerances .....	46
Table 20 – Minimum values of current capacity for terminals .....	47
Table 21 – Tolerances on brush box dimensions and clearances .....	60
Table 22 – Maximum value of the brush-box chamfer height $c_H$ .....	60
Table A.1 – Standard dimensions and tolerances on brush dimensions $t \times a \times r$ in inch system .....	63
Table A.2 – Nominal and maximum dimensions of chamfer height $c$ to be used in inch system .....	64
Table A.3 – Recommended minimum value of $w_p$ to be used in inch system .....	64
Table A.4 – Maximum values of depth of insertion $q_i$ .....	64
Table A.5 – Recommended nominal area for flexibles (shunts) and their corresponding maximum diameter .....	65
Table A.6 – Standard lengths of flexibles $l_S$ and tolerances .....	65
Table B.1 – $t \times a \times r$ tolerances and clearance for metal graphite grades .....	66

Table C.1 – Overview of the different mechanical configurations (bevel angles) in operation .....	67
Table D.1 – Configuration of flexibles .....	77
Table F.1 – Recommended thickness for spade, flag and double shoe terminals corresponding to screws diameter.....	79
Table G.1 – Elements to be included in a form.....	80

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**DIMENSIONS, MARKING AND TESTING OF CARBON BRUSHES AND  
DIMENSIONS OF BRUSH-HOLDERS FOR ELECTRICAL MACHINERY**

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IEC 60136 has been prepared by IEC technical committee TC 2: Rotating machinery. It is an International Standard.

This third edition cancels and replaces the second edition published in 1986 and Amendment 1:1995. This edition constitutes a technical revision.

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

Title: modified.

Clause or subclause	Previous clause	Change
1	I-1	Clarification and extension of the scope.
2	None	New clause introduced.
3	None	New clause introduced.
4	I-4 and II-7.5	Addition of units and extension of marking.
5.1	I-2	Addition of cylindrical and wedge-shape brushes.
5.2	I-3	Distinction of dimensions between $t$ , $a$ and $r$ .
6.1	II-7.1	Revision of the chamfer dimension table and addition of non-reversing chamfer.
6.2	II-7.2	Revision of angles dimensions and addition of typical combination of angles.
6.4	II-7.4	Clarification of the definition of the depth of insertion and modification of maximum values.
6.5	None	New subclause introducing the concept of residual material width.
7.1.2	II-8.7	Change of definition of flexibles area and diameter.
7.1.4	None	Addition of flexible protection.
7.2	II-8.1 to II-8.5	Clarification. Addition of other types of terminals.
8	Annex C	Clarification of the method of measurement of electrical resistance and addition of graphical method.
9.2 and 9.3	Clause A.3	Brush holder: Separation of Dimensions and Control of brush box in two different subclauses.
Annex A	None	Compilation of tables with inches dimensions from the previous edition.
Annex B	None	Addition of recommended dimensions for metal-graphite grades.
Annex C	None	Explanation of stability of brushes (linked to 6.2).
Annex D	II-8.7	Addition of examples of configuration of flexibles.
Annex E	None	Addition of recommended standardization of flexibles' location.
Annex F	Annex D and II-8.8	Link between the thickness of terminals and the screw diameter.
Annex G	Annex B	Simplification of the questionnaire, to include only elements defined in this document.

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

Draft	Report on voting
2/2180/FDIS	2/2189/RVD

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at [www.iec.ch/members\\_experts/refdocs](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/publications](http://www.iec.ch/publications).

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# DIMENSIONS, MARKING AND TESTING OF CARBON BRUSHES AND DIMENSIONS OF BRUSH-HOLDERS FOR ELECTRICAL MACHINERY

## 1 Scope

This document applies primarily to brushes and brush-holders for cylindrical commutators and slip rings for electrical rotating machines. Some clauses of this document may cover other configurations, such as flat commutators or plain disks.

It defines the dimensions of brushes and their components, together with their tolerances:

- dimensions of brush block ( $t$ ,  $a$ ,  $r$ ),
- angles  $\alpha$  and  $\beta$ ,
- chamfer,
- flexibles (shunts),
- standard terminals.

It also covers the conventional designation of principal dimensions, the marking of brushes and the testing methods for the qualification of brushes after their manufacturing (except the brush grade material, covered by IEC 60413).

And finally, it specifies dimensions of the brush-holders that are linked to brushes.

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

IEC 60560, *Definitions and terminology of brush-holders for electrical machines*

ISO 129-1, *Technical product documentation (TPD) – Presentation of dimensions and tolerances – Part 1: General principles*

ISO 197-1:1983, *Copper and copper alloys – Terms and definitions – Part 1: Materials*

ISO 286-2:2010, *Geometrical product specifications (GPS) – ISO code system for tolerances on linear sizes – Part 2: Tables of standard tolerance classes and limit deviations for holes and shafts*