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Zobozdravstvo - Dentalni diamantni instrumenti - 1. del: Splošne zahteve (ISO/DIS 7711-1:2020)

Dentistry - Dental diamond instruments - Part 1: General requirements (ISO/DIS 7711-1:2020)

Zahnheilkunde - Zahnärztliche Diamantinstrumente - Teil 1: Allgemeine Anforderungen (ISO/DIS 7711-1:2020)

Instruments rotatifs dentaires -- Instruments diamantés -- Partie 1: Dimensions, exigences, marquage et emballage (ISO/DIS 7711-1:2020)

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Dentistry — Diamond rotary instruments —

Part 1:
General requirements

Instruments rotatifs dentaires — Instruments diamantés —

Partie 1: Dimensions, exigences, marquage et emballage

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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 106, *Dentistry*, Subcommittee SC 4, *Dental instruments*.

This third edition of ISO 7711-1 cancels and replaces the second edition (ISO 7711:1997) and the second edition (ISO 7711-3:2004), which has been technically revised.

The main changes compared to the previous edition are as follows:

a) inclusion of ISO 7711-3 in 7711-1;

b) addition of definitions in clause 3;

b) addition of blank materials in 4.1;

d) Tables for force values were removed (43 pages).

A list of all parts in the ISO 7711 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Dentistry — Diamond rotary instruments —

Part 1: General requirements

1 Scope

This document specifies general requirements and test methods for diamond rotary instruments used in dentistry, including designation, colour code and grit sizes and a quality control for these instruments.

It applies to all types of diamond rotary instruments independent of type and shape with exception to diamond discs which are defined in ISO 7711-2.

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.

ISO 1797:2017, *Dentistry — Shanks for rotary and oscillating instruments*

ISO 1942, *Dentistry —Vocabulary*

ISO 2157, *Dentistry — Nominal diameters and designation code numbers for rotary instruments*

ISO 3696, *Water for analytical laboratory use — Specification and test methods*

ISO 8325:2004, *Dentistry — Test methods for rotary instruments*

ISO 6106, *Abrasive products — Checking the grain size of superabrasives*

ISO 14457, *Dentistry — Handpieces and motors*

ISO 21850-1, *Dentistry — Materials for dental instruments —Part 1: Stainless steel*

3 Terms, definitions and symbols

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions given in ISO 1942 and ISO 14457 and the following apply.

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

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1.1
blank
supporting material for a rotary instrument consisting of a shank, neck (optional) and an uncoated working part (see Figure 1)

Key

1 working part
2 neck
3 shank

Figure 1 — Blank

3.1.2
diamond rotary instrument
rotary instrument consisting of a blank (3.1.1) and a working part (3.1.6) coated with diamond grit (see Figure 2)

Key

1 working part
2 neck
3 shank

Figure 2 — Diamond rotary instrument

3.1.3
macrogrit
grit with grain size distribution which is determined by sieving

3.1.4
microgrit
grit with grain size distribution which is determined by sedimentation

3.1.5
shank
part of the diamond instrument to be connected to a dental handpiece

3.1.6
working part
part of the diamond instrument with an active grinding surface

3.2 Symbols and abbreviated terms

The following symbols and abbreviated terms are used in this document:

d_1, d_2, d_3 diameter of working part; head diameter;

L_1 length of the working part; head length;

L_2 overall length.

The overall length of the instrument, L_2, is the sum of the fitting length of the shank, the length of the neck and the length of the working part.

4 Requirements

4.1 Material

4.1.1 Blank

The stainless steel material for the blank of the diamond rotary instrument shall be in accordance with ISO 21850-1.

4.1.2 Shank hardness

The hardness of the shank shall comply with ISO 1797.

4.1.3 Working part

The working part shall be coated with diamond grit, bound in either metal or other suitable material at the discretion of the manufacturer.

The diamond grit may consist of natural or synthetic origin.

4.2 Designation, colour code, grit sizes

4.2.1 Designation

The fineness of the diamond grit used shall comply with the requirements in Table 1.

4.2.2 Colour code

The colour code complements the designation. Usage of the colour code for mean grain size is optional and at the discretion of the manufacturer. If colour coding is used, the colours shall be those specified in Table 1.

The location on the diamond instrument where the colour is applied may be on the shank or neck and is left at the discretion of the manufacturer.

4.2.3 Grain size distribution

4.2.3.1 Macrogrits

The method for determining or verifying the grain size distribution of macrogrits for diamonds used in the manufacture of industrial products (e.g. grinding wheels, saws) as specified in ISO 6106, for grain sizes between 1180 µm and 41 µm, shall be used.

The series of diamond grit sizes is designated as D series (D 1181 to D 46), where “D” denotes diamond.

NOTE Further information is given in references [13] and [15] (see Bibliography).

4.2.3.2 Microgrits

Currently no internationally accepted method for determining or verifying the grain size distribution of microgrits diamonds is available. Therefore, methods from regional standards or national standards are used.

The series of diamond grit sizes is designated as M series, where “M” denotes microgrit.

NOTE Further information is given in references [12] and [14] (see Bibliography).

4.2.4 Grit sizes

The grit sizes as specified in Table 1 shall be used for all types of diamond instruments.

The grit sizes and their classification in regard to their fineness are selected according to Table 1.

Because of the difficulty in separating grain sizes, overlapping areas are unavoidable and commonly accepted.

Columns 3 and 4 indicate colour codes and their equivalent grit size ranges, respectively.

Table 1 — Designation, colour code, grit sizes for diamond grits

Designation	Abbreviation	Colour code	Grit designation	Mean grain size[a] µm
ultra fine	UF	white	M 4 to M 14	8
extra fine	EF	yellow	M 10 to M 36	25
fine	F	red	M 27 to D 76	46
medium	M	blue	D 64 to D 126	107
coarse	C	green	D 107 to D 181	151
very coarse	VC	black	D 151 to D 213	181

[a] Mean grain size [µm] is used for information in the communication to the dentist or dental technician.

NOTE Grit sizes >D213 are acceptable in extraoral or laboratory use.

Overlapping of grit sizes may be allowed as dictated by the intended use of the instruments.

4.3 Dimensions

4.3.1 Designated dimensions of overall length

The overall length of the diamond rotary instrument, L_2, is the sum of the fitting length of the shank, the neck and the length of the working part."Standard" refers to instruments with standard fitting lengths of shank. For instruments with longer or shorter shank lengths, the overall length, L_2, will vary accordingly. See ISO 1797 for fitting lengths of shanks.

The dimensions for Type 1 shall be according to ISO 1797:2017, Table 1.

If the manufacturer deviates from the overall length specified in Tables 2 to 5, it shall be ensured that the minimum fitting length of ISO 1797 is observed.

Table 2 — Overall length L_2 for instruments with length of working part up to 5 mm

Dimensions in millimetres

Designation	Overall length L_2		
Shank type	Type 1	Type 2	Type 3
Tolerance	± 0,5	$L_2 \leq 50$: ± 0,5 $L_2 > 50$: ± 1	± 0,5
short	$L_2 \leq 18,5$	—	$L_2 \leq 16,5$
standard	$18,5 < L_2 \leq 22,0$	$L_2 \leq 44,5$	$16,5 < L_2 \leq 19,0$
long	$22,0 < L_2 \leq 26,0$	$44,5 < L_2 \leq 64,5$	$19,0 < L_2 \leq 21,0$
extra long	$26,0 < L_2 \leq 34,0$	$64,5 < L_2 \leq 70,0$	$21,0 < L_2 \leq 25,0$