

INTERNATIONAL STANDARD

ISO
7492

Fourth edition
2019-03

Dentistry — Dental explorer

Médecine bucco-dentaire — Sondes exploratrices dentaires

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Reference number
ISO 7492:2019(E)

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Published in Switzerland

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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 fourth edition cancels and replaces the third edition (ISO 7492:2018), of which it constitutes a minor revision.

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

- recommendation for maximum length of a dental explorer was reduced from 178 mm to 173 mm in [4.3](#);
- 4.6.2 of the previous edition was removed, because it did not apply to explorers, and handle surface finish was already defined in paragraphs 1 and 2 of 4.6.1 of the previous edition;
- sentence 1 of paragraph 2 of [4.7](#) was removed because reflective coatings are not an applicable property of explorers;
- requirement for UDI code was added in [Clause 6](#).

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 — Dental explorer

1 Scope

This document specifies the dimensions and performance requirements for dental explorers.

This document is not applicable to endodontic explorers.

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 1942, *Dentistry — Vocabulary*

ISO 6507-1, *Metallic materials — Vickers hardness test — Part 1: Test method*

ISO 6508-1, *Metallic materials — Rockwell hardness test — Part 1: Test method*

ISO 7153-1, *Surgical instruments — Materials — Part 1: Metals*

ISO 17664, *Processing of health care products — Information to be provided by the medical device manufacturer for the processing of medical devices*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 1942 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/>

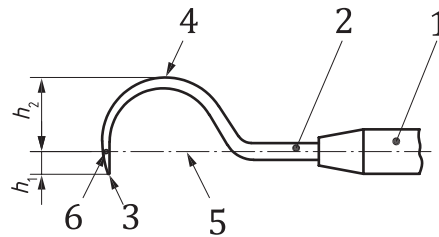
3.1.1

dental explorer

handheld dental instrument with a pointed tip designed for tactile examination of tooth surfaces

Note 1 to entry: See [Figure 1](#).

Note 2 to entry: Dental explorer is used to examine teeth for decay (caries), calculus, furcations, or other abnormalities.



Key

- 1 handle
- 2 shank
- 3 working tip
- 4 first bending point
- 5 centreline
- 6 datum point
- h_1 working end height
- h_2 shank height

Figure 1 — Designation of parts and dimensions for dental explorers

3.1.2

datum point

section point between the centreline of the handle, at right angle to the centreline, and the working tip

Note 1 to entry: The datum point is where h_1 and h_2 meet.

3.1.3

handle

area used for holding the *dental explorer* (3.1.1) during tactile exploration

3.1.4

shank

part of the *dental explorer* (3.1.1) that connects the working end to the handle

3.1.5

working end

part of the *dental explorer* (3.1.1) after the first bend of the shank including the working tip

Note 1 to entry: The working end is the combination of h_1 and h_2 directly on the explorer.

3.1.6

working tip

active part of the working end which will be first to contact the tooth surface

3.2 Symbols and abbreviated terms

For the purposes of this document, the following symbols and abbreviated terms apply, and are shown in [Figure 1](#) to [Figure 9](#).

- b length of working tip (only used in [Figure 5](#))
- h_1 working end height
- h_2 shank height

- r working end radius
- α working end angle
- β secondary angle of working tip (only used in [Figure 5](#))

4 Requirements

4.1 Materials

4.1.1 Material of the working end

The working end of a dental explorer shall be made of metallic materials in accordance with ISO 7153-1.

4.1.2 Material of the handle

The material of the handle, selected at the discretion of the manufacturer, shall meet the requirements of [4.5](#), [4.6](#), and [4.7](#).

4.2 Location of measurement points

The location of the points of measurement for dental explorers shall be as shown in [Figure 1](#) and in [Table 1](#).

Table 1 — Measurement of dimensions for dental explorers

Symbol	Meaning	Points of measurement
b	Length of working tip (only used in Figure 5)	distance from the extreme tip of the working end, parallel to the centreline of the working tip, to the first bend of the working end
h_1	Working end height	distance from the datum point, at right angles to the centreline of the shank, to the farthest extremity of the working tip
h_2	Shank height	distance from the datum point, at right angles to the centreline of the shank, to the furthest point on the external surface of the first bend of the working end
r	Working end radius	radius of curvature of the inside of the first bend of the working end
α	Working end angle	angle between the centreline of the shank and the working end
β	Secondary angle of working tip (only used in Figure 5)	angle between the centreline of the working end and the working tip

4.3 Shape and dimensions

The dental explorer shall have one of the forms shown in [Figure 2](#) to [Figure 9](#).

Commonly used dimensions are shown in [Table 2](#). The column is arranged according to the increase in the dimension h_1 .

The dimensions shall be measured in accordance with [Table 1](#) and [Figure 1](#).

The working tip shall be pointed but the exact shape and design of the working end is left to the discretion of the manufacturer.

The maximum length of a dental explorer shall be at the manufacturer's discretion, but it should be noted that overall lengths in excess of 173 mm can cause difficulty in containment within a sterilization cassette.

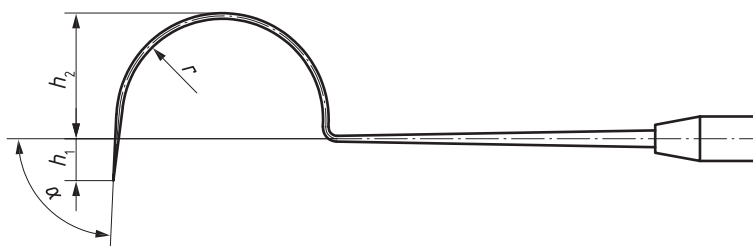


Figure 2 — Dental explorer, arc shape

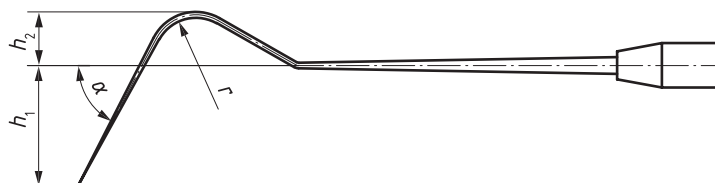


Figure 3 — Dental explorer, standard (double angled)



Figure 4 — Dental explorer, elbowed

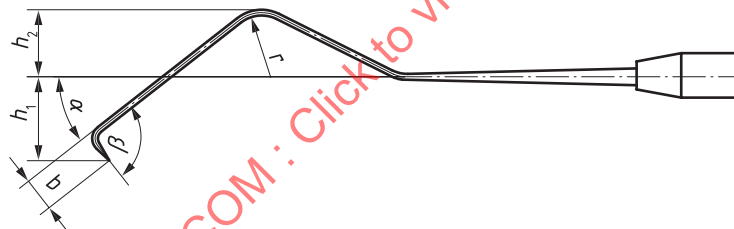


Figure 5 — Dental explorer, double elbowed

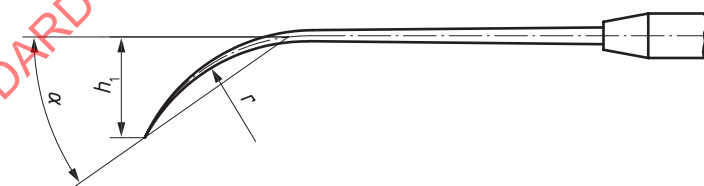


Figure 6 — Dental explorer, curved

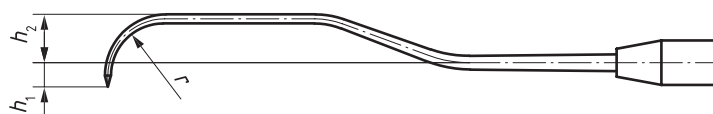


Figure 7 — Dental explorer, hooked

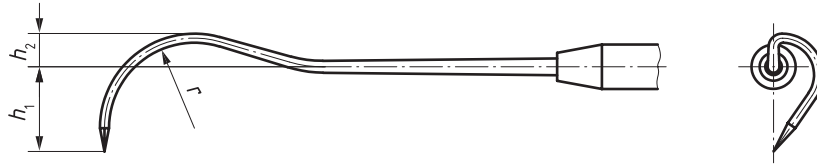


Figure 8 — Dental explorer, 3D shaped

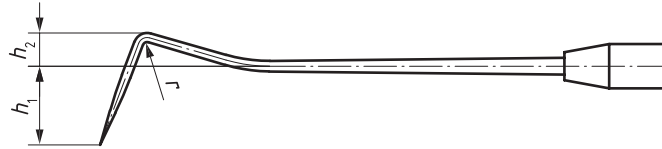


Figure 9 — Dental explorer, right angle

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Table 2 — Dimensions of dental explorer

Linear dimensions in millimetres

Angular dimensions in degrees

Shape	b $\pm 0,5$	h_1 $\pm 0,5$	h_2 $\pm 0,5$	r $\pm 0,5$	α $\pm 10^\circ$	β $\pm 10^\circ$
Figure 2	—	1,5	9,0	6	90°	—
	—	2,0	9,0	6	70°	—
	—	2,5	7,5	6	85°	—
	—	3,0	8,5	6	90°	—
	—	4,2	3,8	4	85°	—
	—	4,2	3,8	4	85°	—
Figure 3	—	6,3	4,0	1,5	40°	—
	—	7,2	3,2	2,5	62°	—
	—	8,2	4,1	2,5	85°	—
	—	9,0	3,0	2	90°	—
	—	9,0	3,0	2	60°	—
	—	10,0	3,0	2	85°	—
Figure 4	—	4,5	—	—	80°	—
	—	6,0	—	—	67°	—
	—	11,5	—	—	67°	—
	—	12,0	—	—	80°	—
	—	13,0	—	—	40°	—
	—	14,3	—	—	70°	—
Figure 5	1,6	5,2	5,8	5	50°	260°
	1,6	6,5	5,8	5	50°	100°
	2,0	5,0	4,0	2	38°	125°
Figure 6	—	4	—	11	25°	—
	—	5	—	4	55°	—
	—	5	—	12	25°	—
	—	6	—	11	35°	—
	—	7	—	8	40°	—
	—	11	—	11	45°	—
	—	11,5	—	8	55°	—
Figure 7	—	1,6	3,2	4	—	—
Figure 8	—	5,6	2,2	5	—	—
Figure 9	—	5,2	2,2	0,2	—	—

4.4 Hardness of working tip

The hardness of the working tip of the finished instrument shall be for:

- martensitic stainless steel: 500 HV1 to 650 HV1;
- austenitic stainless steel: greater than 500 HV1;
- cobalt-based alloys: greater than 500 HV1.

Test the hardness in accordance with [5.3](#).

4.5 Connection between working end and handle

The connection between working end and handle of the dental explorer shall not loosen under tensile load or torque.

The connection between working end and handle shall meet at least a tensile force of 600 N and a torque of 0,45 Nm.

Test the tensile strength in accordance with [5.4.1](#).

Test the torque in accordance with [5.4.2](#).

4.6 Surface finish

The surface finish is at the discretion of the manufacturer, but shall be visibly free from surface defects, e.g. pores, crevices, grinding marks, and from production residues, e.g. residual scale, acids, grease, remaining grinding and polishing material.

Handle surface finishes should be able to be easily cleaned.

Test in accordance with [5.1](#).

4.7 Resistance to reprocessing

Dental explorers shall withstand 100 reprocessing cycles, as defined by the manufacturer's instructions, without deformation or showing signs of corrosion.

For hollow components there shall be no ingress of water within the hollow portion of the instrument.

Test in accordance with [5.5](#).

5 Test methods

5.1 Visual inspection

Conduct visual inspection at normal visual acuity without magnification.

5.2 Dimensions

Measure the dimensions using a measuring device that is accurate to 1/10 of the tolerance to be measured.

5.3 Hardness testing

Carry out hardness testing in accordance with ISO 6508-1, scale C or ISO 6507-1.

5.4 Connection between working end and handle

5.4.1 Tensile load

Connect the handle and the working end to a tensile strength machine. Pull at 0,5 mm per minute until both parts loosen. Record the tensile force data.