
**Dentistry — Test methods for rotary
instruments**

Art dentaire — Méthodes d'essai pour instruments rotatifs

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 8325 was prepared by Technical Committee ISO/TC 106, *Dentistry*, Subcommittee SC 4, *Dental instruments*.

This second edition cancels and replaces the first edition (ISO 8325:1985), which has been technically revised.

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Introduction

To check the conformity of dental rotary instruments against relevant product standards, it is indispensable to conduct tests on the basis of harmonised test methods in order to achieve comparable test results. In the respective product standards for dental rotary instruments, reference is made to the test methods specified in this International Standard.

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Dentistry — Test methods for rotary instruments

1 Scope

This International Standard specifies methods for measuring the dimensional characteristics, neck strength and surface roughness of dental rotary instruments, such as burs, cutters, polishers, diamond and abrasive instruments.

This International Standard does not provide test methods for the characteristics of materials used for dental rotary instruments.

NOTE For testing of these characteristics, see the respective product standards.

This International Standard is not applicable to dental root-canal instruments (see ISO 3630-1).

2 Normative references

The following referenced documents are indispensable for the application 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 1797-1, *Dental rotary instruments — Shanks — Part 1: Shanks made of metals*
ISO 1797-2, *Dental rotary instruments — Shanks — Part 2: Shanks made of plastics*

ISO 1942, *Dentistry — Vocabulary*

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

ISO 4288, *Geometrical Product Specification (GPS) — Surface texture: Profile method — Rules and procedures for the assessment of surface texture*

3 Terms and definitions

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

4 Test methods

4.1 General

The test methods specified in this International Standard refer to the main dimensional characteristics of dental rotary instruments. They are demonstrated by describing the measurement procedures for the single characteristics of instruments.

In addition to the test methods specified below, other equivalent methods and test devices exist and may be used, provided they render similar results. In case of dispute, however, the test methods specified in this International Standard become reference.

For evaluation of test results, see the relevant product standard.

4.2 Atmospheric conditions

Tests shall be conducted at room temperature (20 °C to 25 °C).

4.3 Measurement instruments

A list of measurement instruments is provided as follows:

- a) micrometer;
- b) vernier calliper;
- c) dial gauge;
- d) comparator;
- e) toolmaker's microscope, workshop microscope, measuring microscope;
- f) shadowgraph (e.g. profile projector);
- g) ring gauge;
- h) pneumatic gauge;
- i) goniometer;
- j) laser scanner.

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Other precision instruments may equally be applicable, and may be used at the discretion of the manufacturer. Measurement instruments with reasonable accuracy shall be chosen in respect to the characteristics of the instruments to be measured.

Lengths and diameters shall be measured and calculated in millimetres, angles in degrees.

5 Measuring of single characteristics of instruments

5.1 Shape of the working part

5.1.1 Measurement instrument

Any suitable instrument of those listed in 4.3 shall be used, having an accuracy of $\leq 0,01$ mm.

The applied measuring force shall not exceed 1,5 N.

5.1.2 Measurement location

The measurement location shall cover the whole representative integral shape of the test piece.

5.1.3 Procedure

Determine the shape of the working part visually or by using an instrument specified in 5.1.1.

Conduct one measurement.

5.2 Diameter of the working part

5.2.1 Measurement instrument

Any suitable instrument of those listed in 4.3 shall be used, having an accuracy of $\leq 0,01$ mm.

The applied measuring force shall not exceed 1,5 N.

In case of dispute, the reference method shall be that using a dial gauge.

5.2.2 Measurement location

The measurement point shall be as follows, unless specified otherwise in the respective product standard:

- a) for cylindrical instruments: the middle of the working part;
- b) for non-cylindrical instruments: the largest diameter of the working part.

5.2.3 Procedure

Measure the diameter of the working part using an instrument as specified in 5.2.1.

Conduct one measurement on the peripheral surface, i.e. on the top surface.

For diamond instruments, conduct three measurements at angles 120° apart on the circumference of the test piece. Lift the blade before rotating the test piece to the next measurement point. Record the three measuring results as d_1 , d_2 and d_3 .

5.2.4 Evaluation of test results for diamond instruments

For diamond instruments, calculate the average diameter by using the following formula:

$$d = \frac{d_1 + d_2 + d_3}{3} \quad (1)$$

where

d_1 is the diameter given by measurement 1;

d_2 is the diameter given by measurement 2;

d_3 is the diameter given by measurement 3.

5.3 Neck diameter

5.3.1 Measurement instrument

Any suitable instrument of those listed in 4.3 shall be used, having an accuracy of 0,01 mm.