INTERNATIONAL STANDARD

ISO 7787-3

Second edition
2017-05

Dentistry — Laboratory cutters —

Part 3: Carbide cutters for milling machines

Médecine bucco-dentaire — Fraises de laboratoire —

Partie 3: Fraises de laboratoire en carbure pour machines à fraiser

Reference number
ISO 7787-3:2017(E)

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

Contents

Page

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 on 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 the following URL: www.iso.org/iso/foreword.html.

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

This second edition cancels and replaces the first edition (ISO 7787-3:1991), which has been technically revised with the following changes:

a) normative references have been updated;

b) definitions were added;

c) clauses have been renumbered;

d) bibliography was added.

A list of all parts in the ISO 7787 series can be found on the ISO website.

Introduction

This document is one of a series of International Standards relating to dental rotary instruments.

The various dimensional and other requirements specified for carbide laboratory cutters are those considered important to ensure the interchangeability of these instruments.

Dentistry — Laboratory cutters —

Part 3:
Carbide cutters for milling machines

1 Scope

This document specifies dimensional and other requirements for the three most commonly used carbide cutters for milling machines which are predominantly used in the dental laboratory.

Other characteristics of laboratory cutters (for example, spiralled blades or cross-cut) are not covered by this document.

Cutters intended for use with CAD/CAM systems are excluded from the scope of this document.

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 8325, *Dentistry — Test methods for rotary instruments*

3 Terms, definitions and symbols

3.1 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:

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

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

3.1.1
laboratory cutter
cutting instrument designed for use with dental materials in the *dental laboratory* (3.1.2)

3.1.2
dental laboratory
facility where dental technician procedures complementing dental clinical treatment are carried out

[SOURCE: ISO 1942:2009, 2.77]

3.1.3
milling machine
device used in the *dental laboratory* (3.1.2) for milling of dental prosthetic parts

3.2 Symbols

d_1 diameter of the working part, head diameter

d_2 diameter at the end of the working part

l_1 length of the working part, head length

l_2 total length of laboratory cutter

4 Requirements

4.1 Material

The shank of the laboratory cutter shall be made of steel or other suitable material.

The working part shall be made of tungsten carbide.

The selection of the type of material and the treatment given to it shall be left to the discretion of the manufacturer.

4.2 Dimensions, shank and head shape

All dimensions are in millimetres.

The dimensions shall be as specified in Table 1, Table 2 and Table 3 and as shown in Figure 1, Figure 2 and Figure 3.

The shank of the laboratory cutter shall be Type 2 or Type 4 in accordance with ISO 1797.

In this document, the laboratory cutters are differentiated according to the shape of the head of the laboratory cutters.

Test in accordance with 6.1.

4.3 Cylindrical, side cutting only

A cylindrical cutter for side cutting only shall be as specified in Figure 1 and Table 1.

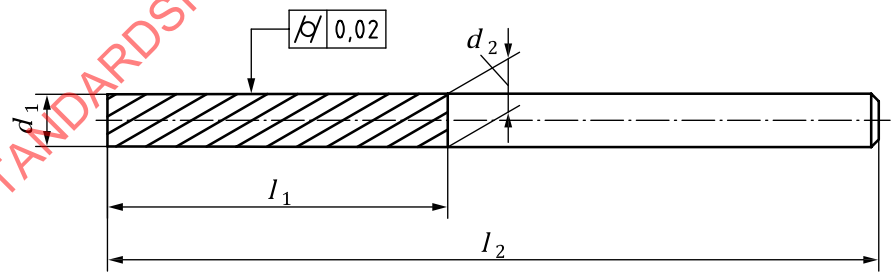

Figure 1 — Cylindrical, side cutting only

Table 1 — Cylindrical, side cutting only — Dimensions and number of blades

Dimensions in millimetres

Nominal size	d_1 ± 0,08	l_1 ± 0,5	l_2[a] ± 0,5	d_2 max.	Number of blades min.
010	1,0	8	30	1,08	12
015	1,5	10	30	1,58	16
023	2,3	15	34	2,35	22

[a] The limitations of ISO 1797:2017, Table 1 do not apply because these cutters are used in milling machines in the dental laboratory.

Test in accordance with 6.1.

4.4 Cylindrical, hemispherical

A cylindrical cutter, hemispherical, shall be as specified in Figure 2 and Table 2.

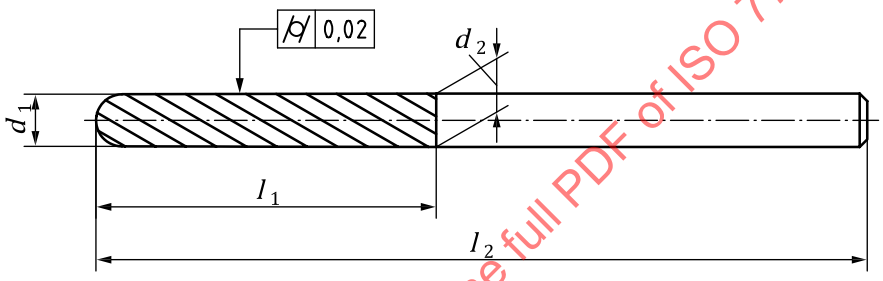

Figure 2 — Cylindrical, hemispherical

Table 2 — Cylindrical, hemispherical — Dimensions and number of blades

Dimensions in millimetres

Nominal size	d_1 ± 0,08	l_1 ± 0,5	l_2[a] ± 0,5	d_2 max.	Number of blades min.
010	1,0	8	30	1,08	12
015	1,5	10	30	1,58	16
023	2,3	15	34	2,35	22

[a] The limitations of ISO 1797:2017, Table 1 do not apply because these cutters are used in milling machines in the dental laboratory.

Test in accordance with 6.1.

4.5 Conical, truncated, side cutting only

A conical cutter, truncated, for side cutting only shall be as specified in Figure 3 and Table 3.

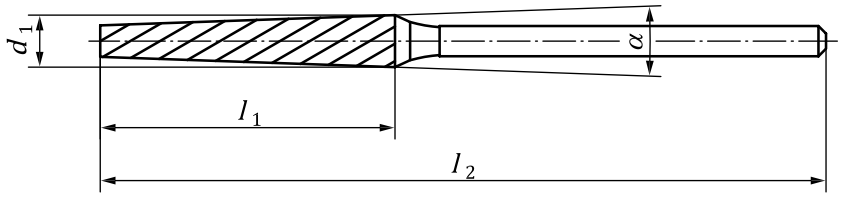

Figure 3 — Conical, truncated, side cutting only

Table 3 — Conical, truncated, side cutting only — Dimensions and number of blades

Dimensions in millimetres
Angles in degree

Nominal size	d_1 ± 0,08	l_1 ± 0,5	l_2[a] ± 0,5	α ± 0,5°	Number of blades min.
023	2,3	13	32	4	12
025	2,5	13	32	6	12
031	3,1	13	32	8	14
035	3,5	13	32	10	16
040	4,0	13	32	12	18

[a] The limitations of ISO 1797:2017, Table 1, do not apply because these cutters are used in milling machines in the dental laboratory.

Test in accordance with 6.1.

4.6 Run-out

The total indicated run-out determined as described in ISO 8325 shall not exceed 0,08 mm.

Test in accordance with 6.2.

5 Sampling

Take 10 instruments at random from the validation batch and test them according to the methods described in Clause 6.

This test is intended as type test and not as a routine test, e.g. for production batch control.

6 Measurement and test methods

6.1 Dimensions

Measurement of dimensions shall be made in accordance with ISO 8325 with suitable measuring devices.

The manufacturer shall validate that the accuracy of the measuring device is suitable.

6.2 Run-out

Record the readings for each cutting edge and sort the highest and the lowest for further analysis.

6.3 Pass/fail evaluation

If eight or fewer laboratory cutters pass, the product fails.

If nine laboratory cutters pass, test 10 additional laboratory cutters. When 10 additional laboratory cutters are tested, all 10 additional laboratory cutters shall pass for the product to comply.

7 Designation code number

The designation code numbers for laboratory cutters shall be in accordance with ISO 2157.

8 Marking

Laboratory cutters shall be marked with the following information:

a) trade name and/or trade mark of the manufacturer;

b) nominal size designation.