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Dentistry — Shanks for rotary and oscillating instruments

Médecine bucco-dentaire — Queues pour instruments rotatifs et oscillants

Reference number
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Foreword

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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).

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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 third edition cancels and replaces ISO 1797-1, ISO 1797-2, and ISO 1797-3, which have been technically revised with the following changes:

a) combination of three material parts into one International Standard;

b) reprocessing requirements for plastic shanks have been added;

c) AQL-values have been deleted;

d) quality control concept was moved to Annex A.

Dentistry — Shanks for rotary and oscillating instruments

1 Scope

This document specifies the requirements for dimensions and material properties of shanks used in dentistry for rotary or oscillating instruments. It describes the measurement methods for the verification of the requirements.

This document is not applicable to tips fixed to the handpiece with a screw, e.g. scaler tips.

Information about the location of marking is also given. Annex A on quality control is included in order to ensure a high quality level.

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 527-2, *Plastics — Determination of tensile properties — Part 2: Test conditions for moulding and extrusion plastics*

ISO 1101, *Geometrical product specifications (GPS) — Geometrical tolerancing —Tolerances of form, orientation, location and run-out*

ISO 1942, *Dentistry — Vocabulary*

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

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

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

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

ISO 14457, *Dentistry — Handpieces and motors*

3 Terms, definitions and symbols

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 1942, ISO 14457 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
handpiece
powered handheld device used to operate a rotary or *oscillating instrument* (3.1.3)

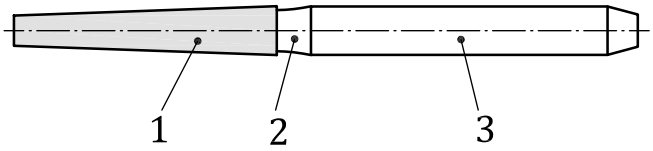
Note 1 to entry: This definition includes reciprocating instruments.

[SOURCE: ISO 14457:2012, 3.10, modified]

3.1.2
instrument
tool used for rotary or oscillating movements, consisting of working part, neck (if applicable) and *shank* (3.1.5), which is constructed to fit into a *handpiece* (3.1.1)

Note 1 to entry: This includes continuous rotation or *oscillating instruments* (3.1.3).

Note 2 to entry: See Figure 1.



Key

1 working part
2 neck
3 shank

Figure 1 — Designation of instrument parts

3.1.3
oscillating instrument
instrument (3.1.2) used with an alternate (cyclic) movement, including vibrating, consisting of a *shank* (3.1.5) and a working part used in a *handpiece* (3.1.1) for dental procedures

Note 1 to entry: All movements can be combined with axial movements.

3.1.4
rotary instrument
instrument (3.1.2) used with a continuous rotation in a *handpiece* (3.1.1) consisting of a *shank* (3.1.5) and a working part used for dental procedures

3.1.5
shank
part of the shaft of a rotary or *oscillating instrument* (3.1.3) used in dentistry which is designed to fit into the chuck of a *handpiece* (3.1.1) or a handpiece for laboratory use

3.1.6
fitting length
length of the *shank* (3.1.5) that is contained within the chuck of a *handpiece* (3.1.1) or a handpiece for laboratory use

3.2 Symbols

d_1 shank diameter

d_2 diameter in the groove

d_3 second distance for plastic shanks

l_1 fitting length

l_2 shoulder to end length

l_3 shoulder to groove length

l_4 width of groove

l_5 length of conical or rounded end

*R*a surface roughness

s maximum distance from the circumference to the flat area

δ shank cylindricity

4 Classification

Shanks for rotary or oscillating instruments are classified into the following types, according to their diameters and designs:

— Type 1: RA (right angle), CA (contra angle): diameter 2,35 mm, with groove and flat area (see Figure 2);

— Type 2: HP (handpiece): diameter 2,35 mm, cylindrical (see Figure 3);

— Type 3: FG (friction grip): diameter 1,6 mm, cylindrical with conical or rounded end (see Figure 4);

— Type 4: HP (handpiece): diameter 3 mm cylindrical (see Figure 3).

NOTE All movements can be combined with axial movements.

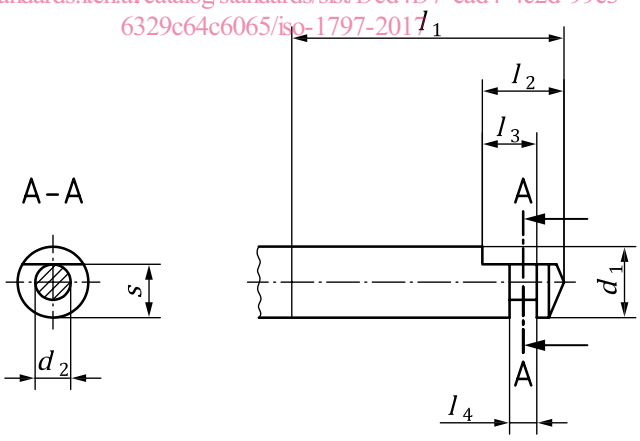


Figure 2 — Type 1 shank

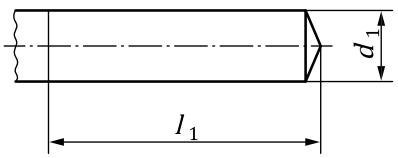


Figure 3 — Type 2 and Type 4 shank

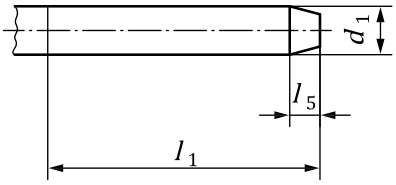


Figure 4 — Type 3 shank

5 Requirements

5.1 Dimensions

5.1.1 Dimensions of shanks made of metal, tungsten carbide or ceramic material

The dimensions and tolerances for shanks made of metal, tungsten carbide or ceramic material shall be as shown in Figure 5, Figure 6, Figure 7 and Figure 8 and as given in Table 1.

Dimensions are given in millimetres and surface roughness in micrometres.

The end of the shank for Type 1, Type 2 and Type 4 shall be flat, conical or rounded. The end of the shank for Type 3 shall be conical or rounded.

Test in accordance with 7.1 to 7.4.

Table 1 — Fitting length of shank

Dimensions in millimetres

Shank	Diameter	Fitting length, l_1 min.		
		Miniature, short	Standard, long	Extra long
Type 1[a]	2,35	9	11	12
Type 2	2,35	15	30	30
Type 3	1,6	9	11	12
Type 4	3	—	30	30

[a] The start of any enlargement on a Type 1 shank (e.g. by marking or the working head) shall be outside the fitting length.

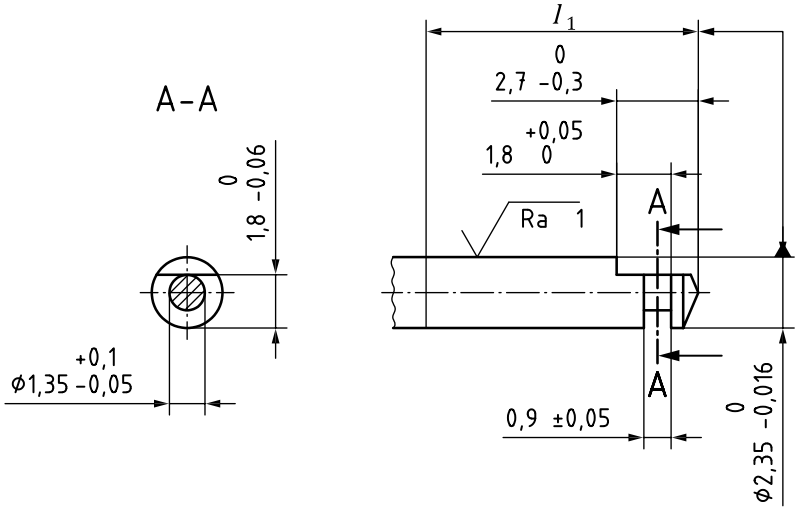


Figure 5 — Dimensions, tolerances and surface roughness for Type 1 shank

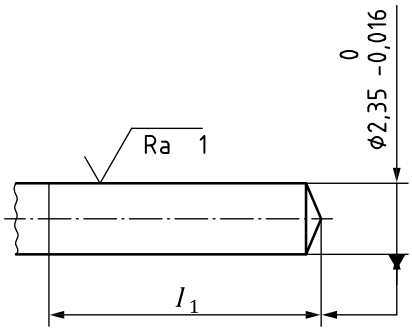


Figure 6 — Dimensions, tolerances and surface roughness for Type 2 shank

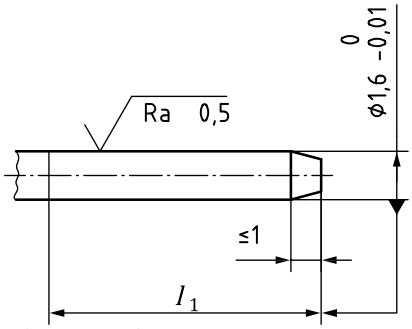


Figure 7 — Dimensions, tolerances and surface roughness for Type 3 shank

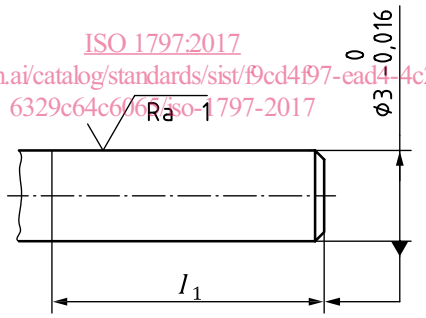


Figure 8 — Dimensions, tolerances and surface roughness for Type 4 shank

5.1.2 Dimensions of Type 1 plastic shanks

5.1.2.1 General

The dimensions and tolerances for Type 1 plastic shanks shall be as shown in Figure 9 and Figure 10.

Dimensions are given in millimetres and surface roughness in micrometres.

The fitting lengths shall be in accordance with Table 1.

The end of the shank for Type 1 shall be flat, conical or rounded.

Test in accordance with 7.1 to 7.4, if applicable.