INTERNATIONAL STANDARD

ISO 15854

First edition
2005-07-15

Dentistry — Casting and baseplate waxes

Art dentaire — Cires pour coulée et pour plaque de base

Reference number
ISO 15854:2005(E)

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

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.

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 15854 was prepared by Technical Committee ISO/TC 106, *Dentistry*, Subcommittee SC 2, *Prosthodontic materials*.

This first edition cancels and replaces ISO 1561:1995 and ISO 12163:1999, which have been technically revised.

Introduction

This International Standard does not include specific and quantitative requirements for freedom from biological hazards. It is recommended that, in assessing possible biological or toxicological hazards, reference be made to ISO 7405 and ISO 10993-1 (see Bibliography).

Dentistry — Casting and baseplate waxes

1 Scope

This International Standard is applicable to dental casting wax and to dental baseplate wax. It specifies the classification of, and requirements for, dental casting wax and baseplate wax together with the test methods to be employed to determine compliance with these requirements.

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 1942-2, *Dental vocabulary — Part 2: Dental materials*

ISO 3336, *Dentistry — Synthetic polymer teeth*[1)]

ISO 4824, *Dentistry — Ceramic denture teeth*[1)]

ISO 6873, *Dental gypsum products*

ISO 8601, *Data elements and interchange formats — Information interchange — Representation of dates and times*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 1942-2 and the following apply.

3.1
casting wax
mouldable material primarily for shaping patterns in the production of fixed cast restorations using the "lost-wax" procedure

3.2
baseplate wax
mouldable material primarily for shaping patterns that will be duplicated in denture base polymers, and for forming occlusion rims and other patterns

1) ISO 3336 and ISO 4824 are to be combined and revised as ISO 22112, *Dentistry — Artificial teeth for dental prostheses.*

4 Classification

Dental waxes covered by this International Standard are classified according to the flow characteristics that represent their hardness, as follows:

a) **Type 1** (casting wax):

1) **Class 1** Soft

2) **Class 2** Hard

b) **Type 2** (baseplate wax):

1) **Class 1** Soft

2) **Class 2** Hard

3) **Class 3** Extra hard

5 Requirements

5.1 Appearance

The wax shall be uniform in colour, supplied in pieces of uniform size, of smooth texture and free of foreign materials. Test in accordance with 8.1.

5.2 Flow

The samples of the wax when tested in accordance with 8.2 shall have flow properties complying with the requirements in Table 1.

Table 1 — Flow requirements

Temperature	Type 1 Casting wax				Type 2 Baseplate wax					
	Class 1		Class 2		Class 1		Class 2		Class 3	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
°C	%	%	%	%	%	%	%	%	%	%
23,0 ± 0,1	—	—	—	—	—	1,0	—	0,6	—	0,2
30,0 ± 0,1	—	1,0	—	—	—	—	—	—	—	—
37,0 ± 0,1	—	—	—	1,0	5,0	90,0	—	10,0	—	1,2
40,0 ± 0,1	50,0	—	—	20,0	—	—	—	—	—	—
45,0 ± 0,1	70,0	90,0	70,0	90,0	—	—	50,0	90,0	5,0	50,0
— Undefined.										

5.3 Behaviour on trimming

The wax shall be capable of being trimmed without chipping, flaking or tearing when tested in accordance with 8.3.

5.4 Behaviour on softening (Type 1)

The wax shall soften without flaking or crumbling and shall cohere readily when tested in accordance with 8.4.

5.5 Appearance after flaming (Type 2)

The wax shall present a smooth glossy surface when tested in accordance with 8.5.

5.6 Behaviour on softening (Type 2)

The wax shall soften without becoming sticky or crumbly and shall be mouldable without breaking or laminating when tested in accordance with 8.6.

5.7 Residue on artificial teeth (Type 2)

The wax shall not leave a residue on either ceramic or plastic teeth when tested in accordance with 8.7.

5.8 Behaviour of colouring material (Type 2)

The colouring material shall neither separate from the wax nor impregnate the gypsum mould when tested in accordance with 8.7.

5.9 Adhesion on storage (Type 2)

Self-adhesion during storage of the wax shall be such that when tested in accordance with 8.8, there shall be no evidence of damage to wax surfaces that have been in contact with either wax or paper. Where separating paper is used, the wax and paper surfaces shall separate cleanly and readily.

5.10 Residue on ignition (Type 1)

If the manufacturer does not state a value for the residue on ignition, the solid residue of the wax, as determined in accordance with 8.9, shall be no greater than 0,1 %.

If the manufacturer states a value for the residue on ignition, the solid residue of the wax, as determined in accordance with 8.9, shall not differ by more than 20 % from that value.

5.11 Biocompatibility

See ISO 7405 and ISO 10993-1 for guidance on compatibility.

6 Sampling

The amount of material procured for testing shall be at least 250 g for Type 1, or 500 g for Type 2, and from one batch.

7 Test methods — General

7.1 Ambient temperature

Unless otherwise specified in this International Standard, all specimen preparation and testing shall be conducted at an ambient temperature of (23 ± 2) °C.

7.2 Apparatus function verification

All accessories, instruments and equipment shall be examined before use to ensure that they are in acceptable working order, appropriately calibrated and complying with specifications stated for them in this International Standard.

8 Test methods — Specific

8.1 Visual inspection

Carry out visual inspection at nominally normal visual acuity and without magnification.

8.2 Flow

8.2.1 Apparatus

8.2.1.1 Micrometer screw gauge

For measuring specimen length, use a micrometer screw gauge with a range of at least 10 mm, being accurate to 0,005 mm or better.

8.2.1.2 Flow-testing instrument

Use a flow-testing instrument, such as the one shown in Figure 1, consisting of the following components:

— metallic cylindrical weight (item 1 in Figure 1);

— plastic or hard rubber shaft (item 2 in Figure 1);

— brass plate (item 3 in Figure 1);

— measuring dial gauge (item 4 in Figure 1), with a range of at least 10 mm, accurate to 0,005 mm or better, and rigidly supported (optional);

— locking screw (item 5 in Figure 1) (optional).

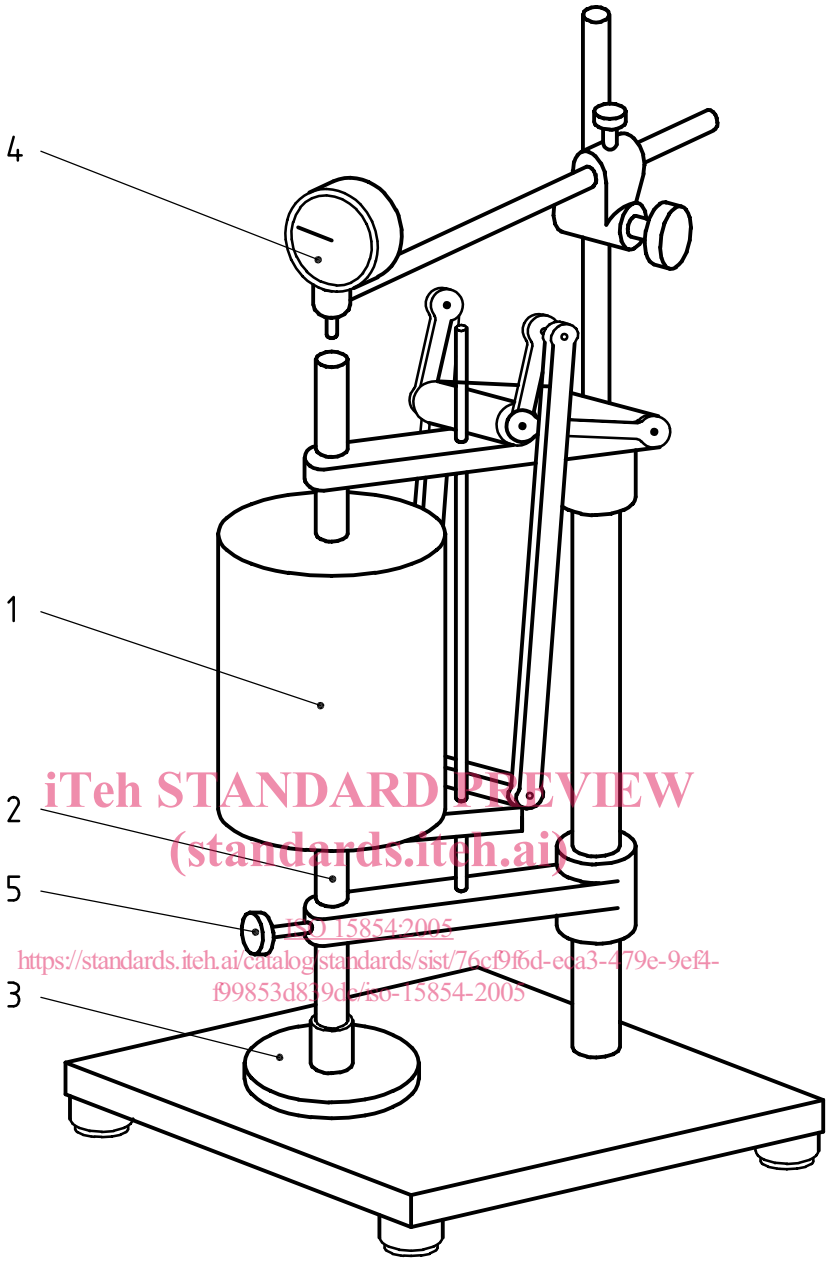
The total mass of the components of items 1, 2 and 3 shall be such as to provide an axial compressive force of (19,6 ± 0,1) N. The weight (1) shall be separated a minimum distance of 76 mm from the brass plate (3) by the shaft (2). The diameter of the brass plate (3) shall be no less than 50 mm and the thickness no greater than 6,5 mm. The optional dial gauge (4) and locking screw (5) may replace the micrometer screw gauge for direct measurement (8.2.3).

8.2.1.3 Pouring pan

For melting the wax, use a metal or porcelain pan with handle similar to the example shown in Figure 2.

8.2.1.4 Infrared lamp

For heating the wax, use an infrared lamp with nominal power of 250 W.



Key

1 weight
2 shaft
3 brass plate
4 gauge
5 locking screw

Figure 1 — Flow-testing instrument