



**International
Standard**

ISO 10477

**Dentistry — Polymer-based crown
and veneering materials**

*Médecine bucco-dentaire — Produits à base de polymères pour
couronnes et facettes*

**Fifth edition
2026-09**

Sample Document

get full document from standards.iteh.ai

Sample Document

get full document from standards.iteh.ai



COPYRIGHT PROTECTED DOCUMENT

© ISO 2026

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

Foreword	v
Introduction	vi
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Classification	3
5 Requirements	3
5.1 General	3
5.2 Depth of cure	4
5.2.1 General	4
5.2.2 Depth of cure (only type 2 class 2 materials)	4
5.3 Surface finish	4
5.4 Flexural strength	4
5.5 Bond strength	5
5.5.1 Special bonding system without macromechanical retention	5
5.5.2 Values higher than 5 MPa	5
5.6 Water sorption	5
5.7 Solubility	5
5.8 Shade consistency	5
5.9 Colour stability	6
6 Sampling	6
6.1 For all tests	6
6.2 For test of shade consistency	6
6.3 For test of colour stability	6
7 Measurement and test methods	6
7.1 General	6
7.1.1 Ambient test conditions	6
7.1.2 Water	6
7.1.3 Preparation of test specimens	6
7.2 Visual inspection	7
7.3 Depth of cure (only for type 2, class 2 if not opaque resin)	7
7.3.1 Apparatus	7
7.3.2 Materials	8
7.3.3 Procedure and specimen preparation	9
7.3.4 Expression of results	9
7.4 Surface finish	9
7.4.1 Apparatus (for type 2 class 3 and type 4 materials)	9
7.4.2 Materials	9
7.4.3 Specimen preparation	9
7.4.4 Surface polishing	10
7.5 Flexural strength	10
7.5.1 Apparatus	10
7.5.2 Materials	11
7.5.3 Preparation of test specimens	11
7.5.4 Procedure	12
7.5.5 Expression of results	13
7.6 Bond strength (only type 1, type 2 classes 1 and 2 and type 3 materials)	13
7.6.1 Apparatus	13
7.6.2 Materials	14
7.6.3 Preparation of test specimens	15
7.6.4 Procedure	15
7.6.5 Expression of results	15

7.7	Water sorption and solubility	16
7.7.1	Apparatus	16
7.7.2	Materials	16
7.7.3	Preparation of test specimen	17
7.7.4	Procedure	17
7.7.5	Expression of results	18
7.8	Shade consistency and colour stability	19
7.8.1	General	19
7.8.2	Apparatus	19
7.8.3	Materials	19
7.8.4	Preparation of test specimens	20
7.8.5	Procedure	20
7.8.6	Colour comparison	21
7.8.7	Expression of results for shade consistency	21
7.8.8	Expression of results for colour stability	21
8	Packaging and labelling	21
8.1	Packaging	21
8.2	Labelling and instructions for use	21
	Bibliography	25

Sample Document

get full document from standards.iteh.ai

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).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO [had/had not] received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents. ISO shall not be held responsible for identifying any or all such patent rights.

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 2, *Prosthetic materials*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 55, *Dentistry*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This fifth edition cancels and replaces the fourth edition (ISO 10477:2020), which has been technically revised.

The main changes are as follows:

- materials for additive manufacturing have been added to [Clause 4](#) as type 2 class 3;
- materials for subtractive manufacturing have been added to [Clause 4](#) as type 4;
- editorial updates have been made.

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.

Introduction

Specific qualitative and quantitative test methods for demonstrating freedom from unacceptable biological hazards are not included in this document, but, for the assessment of possible biological hazards, reference should be made to ISO 10993-1 [\[1\]](#) and ISO 7405 [\[2\]](#).

Sample Document

get full document from standards.iteh.ai

Dentistry — Polymer-based crown and veneering materials

1 Scope

This document classifies polymer-based crown and veneering materials used in dentistry and specifies their requirements. It also specifies the test methods to be used to determine conformity to these requirements.

This document is applicable to polymer-based crown and veneering materials for laboratory fabricated permanent veneers or crowns. It also applies to polymer-based dental crown and veneering materials for which the manufacturer claims adhesion to the substructure without macro-mechanical retention such as beads or wires.

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 3696:1987, *Water for analytical laboratory use — Specification and test methods*

ISO 5139, *Dentistry — Polymer-based composite machinable blanks*

ISO 6344-2, *Coated abrasives — Determination and designation of grain size distribution — Part 2: Macrogrit sizes P12 to P220*

ISO 6344-3, *Coated abrasives — Determination and designation of grain size distribution — Part 3: Microgrit sizes P240 to P5000*

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

ISO 7491, *Dental materials — Determination of colour stability*

ISO 7500-1, *Metallic materials — Calibration and verification of static uniaxial testing machines — Part 1: Tension/compression testing machines — Calibration and verification of the force-measuring system*

ISO 8601-1, *Date and time — Representations for information interchange — Part 1: Basic rules*

ISO 18739, *Dentistry — Vocabulary of process chain for CAD/CAM systems*

ISO 22674, *Dentistry — Metallic materials for fixed and removable restorations and appliances*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 1942, ISO 18739 as well as the following apply.

ISO and IEC maintain terminology 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

polymer-based crown and veneering material

dental material supplied as a composite of powders and liquids or pastes that can contain monomers, either inorganic fillers or polymeric fillers, or both, or pre-polymerized blocks or discs that can contain polymers and inorganic fillers, and that, when polymerized or processed, is suitable for use as permanent dental veneers or crowns

Note 1 to entry: Polymerization is effected either by mixing initiator(s) and activator(s) ("self-curing" materials) or by external energy activation [by heat ("heat-curing" materials), photoactivated materials, either by visible light radiation ("light-curing" materials) or by UV radiation ("UV-curing" materials), or both], or both ("dual-cure" materials).

Note 2 to entry: The polymer-based crown and veneering materials for laboratory-fabricated permanent veneers or crowns can be used without substructure or can be attached to a substructure.

3.2

dentine resin

pigmented and slightly translucent *polymer-based crown and veneering material* (3.1) used to simulate the natural appearance of the dentine in a resin-based restoration or dental prosthesis

3.3

enamel resin

translucent, lightly pigmented *polymer-based crown and veneering material* (3.1) used to simulate the natural appearance of enamel, including the incisal portion of a resin-based restoration or dental prosthesis

3.4

cervical resin

intensely pigmented slightly translucent *polymer-based crown and veneering material* (3.1) having colours simulating those of cervical parts of natural teeth

3.5

opaque resin

polymer-based crown and veneering material (3.1) which, when applied to a substructure in accordance with the manufacturer's instructions, bonds to the surface and forms a layer that masks the underlying colour

Note 1 to entry: Opaque resins are only required to fulfil the requirement of 5.5.

3.6

subtractive manufacturing

milling

process of machining, grinding or reducing a larger bulk object to create a smaller detailed three-dimensional object using computer-aided design software and computer-aided manufacturing methods

Note 1 to entry: The term *milling* (3.6) is used in this document as it is a common term in dental technology and clinical dentistry for the processing of these materials.

3.7

additive manufacturing

AM

printing

process of joining materials to make parts from 3D model data, usually layer upon layer, as opposed to *subtractive manufacturing* (3.6) and formative manufacturing methodologies

Note 1 to entry: The term *printing* (3.7) is used in this document as it is a common term in dental technology and clinical dentistry for the processing of these materials.

3.8

vat photopolymerization

VPP

additive manufacturing (3.7) process in which liquid photopolymer in a *vat* (3.9) is selectively cured by photo-activated polymerization

Note 1 to entry: The liquid photopolymer can consist of monomers and photo-polymerization initiators and contain fillers.

Note 2 to entry: The term *printing* (3.7) can be used instead of the term *vat photopolymerization* (3.8) in dental technology and clinical dentistry for the processing of these materials.

3.9

vat

small tub, part of the polymerization device that contains the liquid photopolymer

3.10

computer-aided milling machine

computer-aided machining device designed for *subtractive manufacturing* (3.6) of dental restorations and dental prostheses using rotary instruments for cutting and grinding

4 Classification

The polymer-based crown and veneering materials described in this document shall be classified according to their activation system for polymerization:

- Type 1: polymer-based crown and veneering materials whose setting is effected by mixing initiator(s) and activator(s) (“self-curing” materials);
- Type 2: polymer-based crown and veneering materials whose setting is effected by the application of energy from an external source (“external-energy-activated” materials), e.g. heat or radiation (visible or UV range) or both;
 - Class 1: polymer-based crown and veneering materials that do not contain a photo-polymerization initiator;
 - Class 2: polymer-based crown and veneering materials that contain a photopolymerization initiator and are not intended for additive manufacturing (printing);
 - Class 3: polymer-based crown and veneering materials that are intended for additive manufacturing, e.g. vat photopolymerization (printing);
- Type 3: polymer-based crown and veneering materials whose setting is affected by mixing initiator(s) and activator(s) and also by the application of energy from an external source (“dual-cure” materials);
- Type 4: polymer-based crown and veneering materials that are intended for subtractive manufacturing (e.g. milling).

5 Requirements

5.1 General

The tests required for a crown and veneering material depend on the classification according to type and class.

See [Table 1](#) for the necessity of the specific tests described in [5.2](#) to [5.9](#).