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Dentistry - Compatibility testing for metal-ceramic and ceramic-ceramic systems (ISO 9693:2019)

Táto norma obsahuje anglickú verziu európskej normy.  
This standard includes the English version of the European Standard.

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**Dentistry - Compatibility testing for metal-ceramic and ceramic-ceramic systems (ISO 9693:2019)**

Médecine bucco-dentaire - Essais de compatibilité pour systèmes métallo-céramiques et céramo-céramiques (ISO 9693:2019)

Zahnheilkunde - Kompatibilitätsprüfungen für metallkeramische und keramisch-keramische Systeme (ISO 9693:2019)

This European Standard was approved by CEN on 6 October 2019.

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**EN ISO 9693:2019 (E)**

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## **European foreword**

This document (EN ISO 9693:2019) has been prepared by Technical Committee ISO/TC 106 "Dentistry" in collaboration with Technical Committee CEN/TC 55 "Dentistry" the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by May 2020, and conflicting national standards shall be withdrawn at the latest by May 2020.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

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According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

## **Endorsement notice**

The text of ISO 9693:2019 has been approved by CEN as EN ISO 9693:2019 without any modification.

# INTERNATIONAL STANDARD

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## Dentistry — Compatibility testing for metal-ceramic and ceramic-ceramic systems

*Médecine bucco-dentaire — Essais de compatibilité pour systèmes  
métallo-céramiques et céramo-céramiques*



Reference number  
ISO 9693:2019(E)

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# ISO 9693:2019(E)

## 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](http://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](http://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 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](http://www.iso.org/iso/foreword.html).

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

This third edition cancels and replaces ISO 9693-1:2012 and ISO 9693-2:2016, which have been technically revised.

The main changes compared to the previous editions are as follows:

- this document focuses only on the compatibility of veneering ceramics fired on to metallic or ceramic substrate materials. Tests of dental veneering ceramics themselves, whether for either metal or ceramic substructures, are now contained in ceramics standard ISO 6872;
- some clauses are relevant for all materials (e.g. measurement of thermal expansion coefficients);
- the de-bonding test (formerly denoted the Schwickerath bond characterization test) for veneering ceramic fired to a substrate is retained for metallic substrates and for ceramic substrates with an elastic modulus less than 250 GPa;
- a new requirement has been added for metal-ceramic systems to undergo thermal shock testing according to either of two protocols.

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](http://www.iso.org/members.html).



## **Introduction**

Dental veneering ceramics and metal alloys or substructure ceramics are suitable materials for the fabrication of dental restorations. Compatibility between the veneering ceramic and the substructure material under mechanical and thermal loading is essential if they are to function in a prosthetic construction.

This document specifies requirements and test methods for assessing the risk of failure associated with masticatory forces and the oral environment.

# Dentistry — Compatibility testing for metal-ceramic and ceramic-ceramic systems

## 1 Scope

This document specifies requirements and test methods to assess the thermomechanical compatibility between a veneering ceramic and a metallic or ceramic substructure material used for dental restorations.

This document applies only to the materials used in combination. Conformity cannot be claimed for a single material.

For requirements for ceramic materials, see ISO 6872. For requirements for metallic materials see ISO 22674.

## 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 6872:2015, *Dentistry — Ceramic materials*

ISO 22674:2016, *Dentistry — Metallic materials for fixed and removable restorations and appliances*

**koniec náhľadu – text ďalej pokračuje v platenej verzii STN**