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Dentistry — Dental furnace —

Part 3: Test method for the evaluation of high temperature sintering furnace measurement with a separate thermocouple

Médecine bucco-dentaire — Fours dentaires —

Partie 3: Méthode d'essai pour l'évaluation du mesurage des hautes températures de frittage au moyen d'un thermocouple externe

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 document 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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A list of all parts in the ISO 13078 series can be found on the ISO website.

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Introduction

In dentistry, sintering furnaces are used for sintering restorations made from oxide ceramics and from sintered metal. Significantly higher temperatures than those for firing dental ceramic masses containing silicates are necessary, for example, zirconium oxide (ZrO_2) is typically sintered at a temperature of up to 1 700 °C.

The sintering temperature is of vital importance for the properties of the sintered material. Incorrect sintering temperatures can result in low strength, discrepant colouration or low ageing resistance. Furthermore, a poor accuracy of fit owing to excessively low or uneven shrinkage can occur. Too high a sintering temperature generally results in a larger grain size and can lead to a softening and consequently a deformation of the restoration. Too low a sintering temperature results in an inadequate sintering quality and possibly residual porosity.

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Dentistry — Dental furnace —

Part 3: Test method for the evaluation of high temperature sintering furnace measurement with a separate thermocouple

1 Scope

This document specifies a test method for the calibration of resistance-heated high temperature sintering furnaces that are suitable for the sintering of dental restorations in the temperature range up to 1 700 °C.

NOTE A test method for the calibration of dental furnaces that are suitable for the heat treatment of silica-based dental ceramic restorations in the temperature range between 600 °C and 1 050 °C is specified in ISO 13078:2013. ISO 13078:2013 does not include the calibration of sintering furnace used for sintering of oxide ceramics or sintered metal, in whose firing chamber restorations are sintered at temperatures of 1 000 °C to 1 700 °C.

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, *Dentistry — Ceramic materials*

IEC 60584-1:2013, *Thermocouples — Part 1: EMF specifications and tolerances*

IEC 60584-3, *Thermocouples — Part 3: Extension and compensating cables — Tolerances and identification system*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 1942, ISO 6872 and IEC 60584-1:2013 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

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

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

3.1
heating rate
rate of temperature increase

Note 1 to entry: The heating rate shall be expressed in degrees Celsius per minute (°C/min).

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