INTERNATIONAL STANDARD

ISO 14233

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Dentistry — Polymer-based die materials

Art dentaire — Produits à base de polymère pour matrices

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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 14233 was prepared by Technical Committee ISO/TC 106, *Dentistry*, Subcommittee SC 2, *Prosthodontic materials*.

Introduction

Polymer-based die materials are not covered by ISO 6873[1], which describes only gypsum-based die materials. Hence the need for this International Standard, whose requirements have been designed to delineate satisfactory polymer-based die materials and exclude unsatisfactory ones. It is anticipated that both manufacturer and user can apply this International Standard as a basis for producing or obtaining satisfactory products and results.

Dentistry — Polymer-based die materials

1 Scope

This International Standard gives compositional, performance, user-information, packaging and marking, and testing requirements for polymer-based die materials used in dentistry. It is applicable to die materials having a polymeric matrix as their principal constituent. Polymer-based die materials are used in the dental laboratory mainly to produce casts from dental impressions for the manufacture of fixed or removable restorations.

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 4823, *Dentistry — Elastomeric impression materials*

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

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 following terms and definitions apply.

3.1
polymer-based die material
material which is primarily an epoxy resin, polyurethane or an acrylate resin and (especially epoxy resins and polyurethane) which contains metallic, metaloxides and/or inorganic fillers

4 Requirements

4.1 Components

The components of the polymer-based die material shall be free of extraneous matter and shall show no sign of deterioration. When treated according to the manufacturer's instructions, the material shall form a solid suitable for the intended purpose.

Testing shall be carried out in accordance with 6.2.

4.2 Working time

The working time in minutes of the polymer-based die material shall be not less than that stated by the manufacturer. At the manufacturer's stated working time, the requirement of 4.4 shall be met.

Testing shall be carried out in accordance with 6.3.

4.3 Setting time

At the manufacturer's stated setting time the Vickers hardness of the polymer-based die material shall be not less than 6 HV 0,2.

Testing shall be carried out in accordance with 6.4.

4.4 Detail reproduction

The polymer-based die material shall reproduce a line 20 µm wide.

Testing shall be carried out in accordance with 6.3.

4.5 Linear dimensional change

The linear dimensional change of the polymer-based die material after 24 h shall be less than 1,0 %.

Testing shall be carried out in accordance with 6.3.

4.6 Vickers hardness

The Vickers hardness of the polymer-based die material determined 24 h after the preparation of the specimens shall be not less than that stated by the manufacturer.

Testing shall be carried out in accordance with 6.5.

5 Sampling

The test sample shall consist of one or more retail packages from the same batch and contain sufficient (approximately 50 ml) material to carry out the specified tests plus any necessary repetition of the tests.

6 Test methods

6.1 General

6.1.1 Test conditions

Prepare and test the specimens at (23 ± 2) °C and at a relative humidity of not less than 30 %.

6.1.2 Preparation of test specimens

Mix and process the polymer-based die material in accordance with the manufacturer's instructions.

6.2 Visual inspection

Use visual inspection to determine compliance with 4.1 and Clauses 7 and 8.

6.3 Working time, detail reproduction and linear dimensional change

6.3.1 Reagents and/or materials

6.3.1.1 Elastomeric impression material, compatible with the die material and conforming to ISO 4823.

6.3.2 Apparatus

6.3.2.1 **Ruled test block**, as shown in Figure 1.

6.3.2.2 **Ring mould**, as shown in Figure 2.

6.3.2.3 **Split mould**, as shown in Figure 3.

6.3.2.4 **Glass plate,** (50 ± 5) mm × (50 ± 5) mm × (4 ± 1) mm, dusted with talcum powder for storage of the impression.

6.3.2.5 **Lens**, for (6 ± 1) × magnification with light at low-angle illumination.

6.3.2.6 **Measuring microscope**, accurate to 0,01 mm.