

Specification for

Dental water-based cements

The European Standard EN 29917:1994 has the status of a British Standard

UDC 615.464:613.314

Cooperating organizations

The European Committee for Standardization (CEN), under whose supervision this European Standard was prepared, comprises the national standards organizations of the following countries:

Austria	Oesterreichisches Normungsinstitut
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United Kingdom	British Standards Institution

This British Standard, having been prepared under the direction of the Health Care Standards Policy Committee, was published under the authority of the Standards Board and comes into effect on 15 June 1994

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National foreword

This British Standard has been prepared under the direction of the Health Care Standards Policy Committee and is the English language version of EN 29917:1994, *Dental water-based cements*, published by the European Committee for Standardization (CEN). It is identical with ISO 9917:1991, *Dental water-based cements* and Technical Corrigendum 1 to ISO 9917:1991 published in 1993. The Technical Corrigendum reads as follows.

“In Table 1, at both chemical type entries for zinc phosphate (application: luting and bases/liners) change the acid erosion limit from 0,1 to 1,0”.

In preparing this British Standard these corrections have been made in the text.

This British Standard supersedes the following British Standards which are withdrawn.

BS 3364:1980, *Specification for dental zinc phosphate cement*.

BS 3365, *Dental silicate cement and dental silico-phosphate cement*.

BS 3365-1:1980, *Specification for dental silicate cement (hand mixed)*.

BS 3365-2:1987, *Specification for dental silico-phosphate cement (hand mixed)*.

BS 3365-3:1981, *Specification for capsulated cements*.

BS 6039:1981, *Specification for glass ionomer cements*.

BS 6814:1987, *Specification for dental zinc polycarboxylate cements*.

Cross-references

The British Standards which implement international or European publications referred to in this document may be found in the BSI Standards Catalogue under the section entitled “International Standards Correspondence Index”, or by using the “Find” facility of the BSI Standards Electronic Catalogue.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the EN title page, pages 2 to 19 and a back cover.

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English version

Dental water-based cements

(ISO 9917:1991 + Technical Corrigendum 1)

Ciments dentaires à base d'eau
(ISO 9917:1991 + Rectificatif Technique 1)

Zahnärztliche wasserhärtende Zemente
(ISO 9917:1991 + Technische Korrektur 1)

This European Standard was approved by CEN on 1994-01-14. CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

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Foreword

This European Standard has been taken over by the Technical Committee CEN/TC 55, *Dentistry*, from the work of ISO/TC 106, *Dentistry*, of the International Organization for Standardization (ISO).

CEN/TC 55 decided to submit this document to the CEN members for voting by Unique Acceptance Procedure (UAP).

The result of the Unique Acceptance Procedure (UAP) was positive.

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 July 1994, and conflicting national standards shall be withdrawn at the latest by July 1994.

In accordance with the CEN/CENELEC Internal Regulations, the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

NOTE Normative references to international publications are listed in Annex ZA (normative).

Introduction

This International Standard has been prepared in order to present the requirements and test methods for all types of water-based dental cements in one document. It supersedes the previously published standards for individual cements, shown below, which will therefore be withdrawn:

ISO 1565:1978, *Dental silicate cement (hand-mixed)*.

ISO 1566:1978, *Dental zinc phosphate cement*.

ISO 3824:1984, *Dental silico-phosphate cement (hand-mixed)*.

ISO 3851:1977, *Capsulated dental silicate and silico-phosphate filling materials*.

ISO 4104:1984, *Dental zinc polycarboxylate cements*.

ISO 7489:1986, *Dental glass polyalkenoate cements*.

Specific qualitative and quantitative requirements for freedom from biological hazard are not included in this International Standard but it is recommended that, in assessing possible biological or toxicological hazards, reference should be made to ISO/TR 7405:1984, *Biological evaluation of dental materials*, or any more recent edition.

1 Scope

This International Standard specifies requirements for the following types of dental cements, including both hand-mixed and capsulated cements for mechanical mixing, which are intended for permanent cementation, lining and restoration, and effect setting only by an aqueous acid-base reaction.

Silicate cements based on the reaction between an alumino-silicate glass powder and an aqueous solution of phosphoric acid which may contain metal ions. They are used for the aesthetic restoration of anterior teeth.

Zinc phosphate cements based on the reaction between an oxide powder (the principal constituent of which is zinc oxide) and an aqueous solution of phosphoric acid which may contain metal ions. They are used as luting agents to seal dental appliances to hard oral structures or to other appliances. They can also be used as a base for restorative materials and as a temporary restorative material by increasing the ratio of powder to liquid relative to that used for luting.

Silicophosphate cements based on the reaction between a powder of acid-soluble aluminosilicate glass and metal oxides (principally zinc oxide) and an aqueous solution of phosphoric acid which may contain metal ions. They are used as temporary restorative materials or as luting agents to seal dental appliances to hard oral structures by varying the ratio of powder to liquid.

Zinc polycarboxylate cements based on the reaction between zinc oxide and aqueous solutions of polyacrylic acid or similar polycarboxylic compounds, or zinc oxide/polycarboxylic acid powders which are mixed with water. They are used as luting agents to seal appliances to hard oral structures or to other appliances, or as a base for restorative materials or as temporary restorative materials.

Glass polyalkenoate cements based on the reaction between an aluminosilicate glass powder and an aqueous solution of an alkenoic acid, or between an aluminosilicate glass/polyacid powder blend and water, or an aqueous solution of tartaric acid. These translucent cements are for use for the aesthetic restoration of teeth, as luting agents, as bases or liners and for restoring pits and fissures.

Glass polyalkenoate cements in which the glass and a metal have been fused together and which are intended for the restoration of teeth are also included.

This International Standard specifies limits for each of the properties according to whether the cement is intended for as a luting agent, a restorative material, a base or a liner.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 2590:1973, *General method for the determination of arsenic — Silver diethyldithiocarbamate photometric method.*

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

ISO 7491:1985, *Dental materials — Determination of colour stability of dental polymeric materials.*

3 Definitions

For the purposes of this International Standard, the following definitions apply.

3.1

mixing time

that part of the working time required in order to obtain a satisfactory mix of the components

3.2

working time

period of time, measured from the start of mixing, during which it is possible to manipulate a dental material without an adverse effect on its properties

3.3

net setting time

period of time measured from the end of mixing until the material has set according to the criteria and conditions described in 7.3. For the purposes of this International Standard, in view of the wide variation in mixing times of the cements, the net setting time is determined from the end of mixing

4 Classification

4.1 Chemical type

For the purposes of this International Standard, dental cements are classified on the basis of their chemical composition, as follows.

4.1.1 Silicate cement.

4.1.2 Zinc phosphate cement.

4.1.3 Silicophosphate cement.

4.1.4 Zinc polycarboxylate cement.

4.1.5 Glass polyalkenoate cement.

4.2 Application

For the purposes of this International Standard, materials are classified on the basis of their usage, as follows.

4.2.1 Luting cements.

4.2.2 Bases and liners.

4.2.3 Restorative cements.

5 Requirements

5.1 Material

The cement shall consist of a powder and liquid which, when mixed according to the manufacturer's instructions, will comply with the requirements of this International Standard.

5.2 Components

5.2.1 *Liquid*

When tested according to 7.1.2, the liquid shall be free from deposits or filaments on the inside of its container. There shall be no visible signs of gelation.