INTERNATIONAL STANDARD

ISO 16408

First edition
2004-04-15

Dentistry — Oral hygiene products — Oral rinses

Art dentaire — Produits d'hygiène buccale — Bains de bouche

Reference number
ISO 16408:2004(E)

PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

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 16408 was prepared by Technical Committee ISO/TC 106, *Dentistry*, Subcommittee SC 7, *Oral hygiene products*.

Introduction

Oral rinses are used for oral hygiene purposes intended to provide health and/or cosmetic benefits.

This International Standard specifies the chemical and physical properties of oral rinses. Common labelling aspects are also specified in order to enhance international understanding and trade.

Dentistry — Oral hygiene products — Oral rinses

1 Scope

This International Standard specifies physical and chemical requirements and test methods for oral rinses. It also specifies the accompanying information such as manufacturer's instructions for use, marking and/or labelling requirements.

This International Standard is not applicable to other delivery systems (e.g. mouthsprays, foams, powders). It is not intended to describe regulatory aspects, e.g. methods of prescription.

This International Standard is not applicable to oral rinses available by prescription only.

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 1942, *Dentistry — Vocabulary*

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

ISO 8601, *Data elements and interchange formats — Information interchange — Representation of dates and times*

INCI, *International Nomenclature of Cosmetic Ingredients*

3 Terms and definitions

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

3.1
oral rinse
mouthrinse
mouthwash
liquid formulation used by the public for oral care purposes

3.2
mouthspray
liquid formulation in spray form for oral care purposes, not requiring dilution with water

4 Classification

Oral rinses shall be classified according to their application by the user as follows:

— **Type 1:** ready-for-use solutions;

— **Type 2:** concentrated solutions for use after dilution with water;

— **Type 3:** solutions for use after mixing.

5 Requirements

5.1 pH value

Oral rinses shall have a pH value between 3,0 and 10,5. If the pH value of an oral rinse is below 5,5, it shall pass a demineralization test or erosion test, or shall demonstrate safety by other appropriate methods.

Test the pH value in accordance with 7.1 and 7.3

NOTE 1 At the time of development of this International Standard, there was no evidence that oral rinses with pH values between 5,5 and 10,5 promoted enamel erosion.

NOTE 2 At the time of development of this International Standard, several scientific test methods were available. It is intended to include one internationally- accepted test method in the next revision of this International Standard.

5.2 Total fluoride concentration and maximum amount of fluoride

The total fluoride concentration of one container of oral rinse of Type 1 shall not exceed a mass fraction of 0,15 %.

The maximum amount of ionic fluoride per single container shall not exceed 125 mg.

Fluoride-containing oral rinses shall be tested in accordance with Annex A or one of the procedures given in ISO 11609:1995, Annex B [3], or other validated method of similar sensitivity and accuracy, for example reference [4], [11] or [12].

5.3 Heavy metals

The maximum total concentration of heavy metals in oral rinses shall not exceed 20 mg/kg.

Test in accordance with a validated method, for example reference [5], [9] or [13], or other method of similar sensitivity and accuracy.

5.4 Compatibility with oral tissues

Oral rinses shall not cause irritation or damage to the oral hard and/or soft tissue, when used in accordance with the manufacturer's recommendation for frequency and duration of use and experience with known side effects.

Specific qualitative and quantitative requirements for freedom from biological hazards are not included in this International Standard, but it is recommended that reference be made to ISO 7405 and ISO 10993-1 when assessing possible biological or toxicological hazards.

5.5 Microbial contamination

The microbial contamination of oral rinses shall not exceed 100 colony-forming units per gram. Oral rinses shall be free of pathogens.

Testing for microbial contamination shall be carried out according to a validated method, for example reference [6], [7], [8] or [10].

5.6 Stability to ageing

Oral rinses shall show no signs of deterioration, such as agglomeration or change in clarity, after being subjected to the determination of stability to ageing procedure specified in 7.4

NOTE Oral rinses that demonstrate stability through 30 months do not require an expiry date (expiration date) on the product label [see 9.2 m)].

5.7 Container and/or dispensing system

The container and/or dispensing system shall neither contaminate nor permit contamination of the oral rinse inside such that it will affect its compliance with the requirements of Clause 5 after being subjected to the determination of stability to ageing described in 7.4.

5.8 Readily fermentable carbohydrates

Oral rinses shall not contain readily fermentable carbohydrates.

Compliance shall be established by the absence of such compounds in the complete formula, or by performing tests in accordance with commonly used analytical methods.

6 Sampling

The oral rinses used for testing shall be representative of actual manufactured oral rinse and shall not be altered in any way.

Eight containers of oral rinses from the same manufacturing tracking code (e.g. batch code, lot number) shall be tested before the determination of stability to ageing (see 7.4).

Eight containers of oral rinses from the same manufacturing tracking code (e.g. batch code, lot number) shall be tested after the determination of stability to ageing (see 7.4).

7 Test methods

7.1 General

All tests shall be performed before and after the test for stability to ageing (see 7.4).

7.2 Visual inspection

Before and after agitation, examine the oral rinse under a bright light with normal visual acuity without magnification.

7.3 Determination of pH value

Test the pH value of the oral rinse in its intended use concentration.

Determine the pH value of the solution using a calibrated pH-meter with a sensitivity of ± 0,1 mV.

7.4 Determination of stability to ageing

7.4.1 Test

One of the following two tests shall be performed.

a) **Accelerated test:** store the oral rinse at (40 ± 2) °C for 3 months at (75 ± 5) % relative humidity or under such conditions of time and temperature as will simulate storage at room temperature for 30 months.

b) **Real time test:** store the oral rinse at (24 ± 3) °C at (55 ± 10) % relative humidity for 30 months or for the period indicated by the expiry date listed on the product label [see 9.2 m)].

7.4.2 Compliance

Examine, by visual inspection (see 7.2) of the oral rinse, whether requirement 5.6 is fulfilled.

7.5 Pass/fail criteria

Unless otherwise noted, if none of the samples fails, the oral rinse passes.

If one sample does not meet the minimum requirement, another eight samples shall be tested. If no more samples fail, the oral rinse passes. If a total of two or more samples of the 16 samples fail, the oral rinse fails.

8 Test report

The test report shall include at least the following information:

a) reference to this International Standard (i.e. ISO 16408);

b) the manufacturer's tracking code (e.g. batch code, lot number);

c) the test results and the method of determination used;

d) any unusual features noted during the determination;

e) whether the oral rinse passed or failed the test.

9 Accompanying information

9.1 Manufacturer's instructions for use

The manufacturer's or supplier's instructions for use accompanying the oral rinse shall contain at least the information specified in 9.2, with the exception of d), f) and m), and if necessary, also the following:

a) information on common side effects;

b) recommended storage conditions (e.g. need for refrigeration).

9.2 Information on primary and secondary containers

The following information, where appropriate, shall be given on the primary container, and also on the secondary container, if it exists:

a) manufacturer's name and address and/or agent responsible in the country of sale;

b) trade name;

c) the wording “oral rinse” or equivalent, as defined in Clause 3;

d) the manufacturer's tracking code (e.g. batch code, lot number);

e) a list of ingredients: a complete declaration according to the INCI list for cosmetic ingredients, if applicable, or a declaration according to the regional or national laws and/or national Pharmacopoeia or with descriptive names of ingredients. The identification of the ingredients shall be consistent with the guidelines, which state how the declaration should be made and the ingredients identified.

   This requirement is applicable to the secondary container. It is only applicable to the primary container if there is no secondary container;

f) net volume, in millilitres;

g) if the oral rinse contains alcohol, the declaration of alcohol content, as volume fraction, and the following warning: “Not to be given to children under 6 years of age”;

h) if the oral rinse contains fluoride, the concentration of fluoride, in milligrams per kilogram (mg/kg) or parts per million (10^{-6}) by mass of fluoride ion, and the following warning: “Not to be given to children under 6 years of age”;

i) instructions and warning for proper use with children;

j) for oral rinses of Type 2, the statement: “Dilute according to the manufacturer’s instructions for use”;

k) for oral rinses of Type 3, the statement: “Mix according to the manufacturer's instructions for use”;

l) the warning: “Do not swallow”;

m) if the period of stability is less than 30 months when stored under the manufacturer's recommended conditions [see 9.1 b)], the expiry date, expressed in accordance with ISO 8601.

10 Packaging

Packaging should ensure the integrity of the contents of the container during storage and transportation. The packaging system for oral rinses is left to the discretion of the manufacturer.

Annex A
(informative)

Determination of fluoride in oral rinses containing ionic fluoride compounds

A.1 Principle

This test method may be used for the determination of fluoride in oral rinses containing ionic fluoride compounds. If this method is used, the procedure given shall be followed.

This test is a type test.

A.2 Reagents and/or materials

During the analysis, unless otherwise stated, use only reagents of recognized analytical grade.

A.2.1 Deionized water, in accordance with ISO 3696:1987, grade 2.

A.2.2 Fluoride standard solution, commercially available or prepared with sodium fluoride (NaF).

A.2.3 Buffer solution, Total Ionic Strength Adjustment Buffer (TISAB) with cyclohexanediamine tetraacetate (CDTA).

Other buffer solutions such as ammonium acetate buffer, applicable to fluoride analysis, can also be used.

Ammonium acetate buffer (pH 5,3) is prepared by dispersing 16 g of ammonium chloride, 23 g of ammonium acetate and 0,4 g of *trans*-1,2-cyclohexanediamine-*N,N,N′,N′*-tetraacetate monohydrate in about 80 ml of water and by dissolving this solution after mixing and heating. The pH value of this buffer is adjusted to 5,3 with acetic acid, and the buffer is diluted with deionized water to 100 ml.

A.3 Apparatus

The following apparatus shall be used.

A.3.1 Laboratory balance, with a reading accuracy of 0,01 g.

A.3.2 Flask, of capacity 20 ml.

A.3.3 Fluoride ion selective electrode.

A.3.4 Graduated cylinder, of capacity 15 ml to 50 ml.

A.3.5 Stirrer.

A.3.6 pH-meter with a sensitivity of ± 0,1 mV.

A.3.7 Pipette, of capacity 1,0 ml.

A.3.8 Plastic vial, or any small beaker or container.

A.3.9 Washing bottle.

A.4 Preparation of solutions and calibration curve

A.4.1 Preparation of standard solution for calibration

Make successive dilutions of the stock fluoride standard solution (A.2.2) to obtain a set of working standard solutions which includes 5 mg/kg, 10 mg/kg, 50 mg/kg, 100 mg/kg and 150 mg/kg of fluoride.

A.4.2 Preparation of calibration curve

Use the following procedure to prepare the calibration curve.

a) Pipette 1,0 ml of each standard solution (A.4.1) into a plastic vial (A.3.8). Add 1,0 ml of buffer solution (A.2.3) and mix thoroughly.

b) Insert the fluoride ion-selective electrode (A.3.3) into the plastic vial. Make sure no air bubbles have been trapped under the electrode.

c) Record the millivolt reading to 0,1 mV at the steady potential difference.

d) Measure every standard solution at least twice, until the difference between the millivolt readings of two measurements of the same standard solution is less than 0,2 mV.

e) Construct a calibration curve of millivolts versus the log of the fluoride ion concentration, expressed in milligrams per kilogram.

A.4.3 Preparation of sample solution

In duplicate, pipette 1,0 ml of each sample into a 20 ml flask (A.3.2).

Add 9,0 ml of deionized water (A.2.1) to the flask and mix thoroughly. This is the sample solution.

A.5 Procedure

Determine the fluoride ion concentration in the sample solution as follows.

a) Transfer accurately an equal amount of sample solution (A.4.3) and buffer solution (A.2.3) into a plastic vial (A.3.8) and mix thoroughly.

b) Insert the fluoride ion-selective electrode (A.3.3) into the plastic vial (A.3.8) that contains the sample and buffer solution. Make sure no air bubbles are trapped under the electrode.

c) Record the millivolt reading to the nearest 0,1 mV at the steady potential difference.

d) Use the calibration curve of standard solutions to determine the fluoride ion concentration in the sample solution, in milligrams per kilogram.

A.6 Expression of results

A.6.1 Expression

The fluoride ion concentration shall be expressed in milligrams per kilogram of the oral rinse solution, unless otherwise required.

NOTE Regulatory requirements in some regions require the expression of fluoride ion concentration in ppm = parts per million (10^{-6}).

A.6.2 Calculation of fluoride ion concentration

Calculate the fluoride ion concentration of one container of oral rinse using the following equation (units see A.6.1):

$$c_{OR} = c_S \times 10 \quad (1)$$

where

c_{OR} is the fluoride ion concentration of oral rinse, in milligrams per kilogram (10^{-6});

c_S is the fluoride ion concentration of sample solution, in milligrams per kilogram (10^{-6}).

A.6.3 Calculation of mass of ionic fluoride

Calculate the mass of ionic fluoride per single container of oral rinse using the following equation (units see A.6.1):

$$m_{OR} = c_{OR} \times m \quad (2)$$

where

m_{OR} is the mass of ionic fluoride of oral rinse, in milligrams;

c_{OR} is the fluoride ion concentration of oral rinse, in milligrams per kilogram (10^{-6});

m is the mass of the solution in one container of oral rinse, in kilograms.

Bibliography

[1] ISO 7405, *Dentistry — Preclinical evaluation of biocompatibility of medical devices used in dentistry — Test methods for dental materials*

[2] ISO 10993-1, *Biological evaluation of medical devices — Part 1: Evaluation and testing*

[3] ISO 11609:1995, *Dentistry — Toothpastes — Requirements, test methods and marking*

[4] AS 2827:1985, *Method for determining soluble fluorine derivatives and total fluorine derivatives in toothpaste*

[5] British Pharmacopeia, *Heavy metal analysis in toothpastes,* 1990, pp. 87–88

[6] CTFA, *Determination of adequacy of preservation of cosmetic and toiletry formulations*, 1973

[7] CTFA, *Microbiological limit guidelines for cosmetic and toiletries*, 1973

[8] CTFA, *Microbial quality management*, 1990

[9] Japanese Pharmacopeia, *Heavy metal limit test*, (10th ed.), 1981, pp. 742–744

[10] *Notes of guidance for testing of cosmetic ingredients for their safety evaluation.* The Scientific Committee on Cosmetic Products and Non-Food Products intended for Consumers, Annex 8, SCCNFP/0321/24 October 2000

[11] Official Journal of European Commission No. L 291/37–40, *Determination of total fluorine in dental creams*,1983

[12] US FDA *Standards for fluoride dentifrices*, Federal register, 45, 1980, p. 62

[13] US Pharmacopeia, *Heavy metal analysis in toothpastes,* 1990, pp. 1523–1524

ICS 11.060.10

Price based on 9 pages