INTERNATIONAL STANDARD

ISO 9173-1

Second edition
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Dentistry — Extraction forceps —

Part 1: General requirements and test methods

Art dentaire — Daviers —

Partie 1: Exigences générales et méthodes d'essai

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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

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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 9173-1 was prepared by Technical Committee ISO/TC 106, *Dentistry*, Subcommittee SC 4, *Dental instruments*.

This second edition cancels and replaces the first edition (ISO 9173-1:1991), which has been technically revised. The following changes have been made:

a) the scope has been expanded to cover all extraction forceps;

b) the descriptions of the test procedures have been improved;

c) the requirements for specific forceps have been removed and will be included in a future part of ISO 9173.

ISO 9173 consists of the following parts, under the general title *Dentistry — Extraction forceps*:

— *Part 1: General requirements and test methods*

Further parts are planned.

Introduction

This revision of ISO 9173-1 is intended to cover all extraction forceps used in dentistry.

Dentistry — Extraction forceps —

Part 1:
General requirements and test methods

1 Scope

This part of ISO 9173 specifies the general performance requirements for extraction forceps used in dentistry.

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 6508-1, *Metallic materials — Rockwell hardness test — Part 1: Test method (scales A, B, C, D, E, F, G, H, K, N, T)*

ISO 7153-1, *Surgical instruments — Metallic materials — Part 1: Stainless steel*

ISO 13402, *Surgical and dental hand instruments — Determination of resistance against autoclaving, corrosion and thermal exposure*

3 Terms and definitions

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

3.1
extraction forceps
type of pincers used for the extraction of teeth

3.2
beak separation
minimum gap between beak tips with the extraction forceps closed

3.3
overall beak length
distance from beak tip to pivot centre

3.4
fastening components
components of the extraction forceps used for fastening the pincers, e.g. pins, rivets and screws

4 Requirements

4.1 Materials

4.1.1 Component parts

With the exception of the fastening components, the component parts shall be made of stainless steel conforming to grade A, B or C in accordance with ISO 7153-1, or other stainless steels providing extraction forceps made of these other steels meet the requirements of 4.2 to 4.7.

4.1.2 Fastening components

The fastening components shall be made of stainless steel conforming to any of the grades specified in ISO 7153-1, or other stainless steels providing instruments made of these other steels meet the requirements of 4.2 to 4.7.

4.2 Maximum overall length

Unless otherwise specified in the manufacturer's literature, the maximum overall length of extraction forceps shall not exceed 178 mm.

4.3 Rockwell hardness

The component parts of the extraction forceps, with the exception of the fastening components, shall be heat treated to attain a Rockwell hardness value of 42 HRC to 52 HRC determined in accordance with ISO 6508-1.

Mating surfaces on the same extraction forceps, such as those on opposite beaks, shall not vary in hardness by more than 3 units on Rockwell hardness scale C.

4.4 Surface finish

4.4.1 All surfaces

All surfaces shall be free from surface defects (e.g. pores, cracks, grinding marks, residual scale, inclusions) and shall also be free from any non-functional sharp edges.

Test in accordance with 5.1.

4.4.2 Beaks

When the inner or crown space of the extraction forceps is serrated or textured, the serration or texture shall be consistent within any one pattern of extraction forceps.

Test in accordance with 5.1.

4.5 Resistance to autoclaving

The extraction forceps shall show no evidence of corrosion.

The extraction forceps shall show no change in hardness or mechanical strength in any part, nor shall they acquire a permanent distortion set greater than 0,2 mm.

Test in accordance with 5.2.

NOTE Discolouration due to water marking does not constitute evidence of corrosion.

4.6 Resistance to corrosion and thermal exposure

The extraction forceps shall show no evidence of corrosion.

The extraction forceps shall show no change in hardness or mechanical strength in any part, nor shall they acquire a permanent distortion set greater than 0,2 mm.

Test in accordance with 5.2.

NOTE Discolouration due to water marking does not constitute evidence of corrosion.

4.7 Joint opening/closing force

The joint of the extraction forceps shall be so constructed that the extraction forceps opens and closes smoothly.

The moment of force required shall be between 0,20 N·m and 0,68 N·m.

Test in accordance with 5.3.

When each handle end is gripped between the index finger and thumb of each hand, there shall be no perceptible sideways movement in any position of the joint between fully closed and a handle opening of at the most 50 mm.

5 Test methods

5.1 Visual inspection

Visual inspection shall be carried out under normal vision, without magnification.

5.2 Resistance test

5.2.1 Test sequence and cycles

Carry out one of the following alternative tests in one continuous sequence of operations for five cycles:

a) autoclave test (5.2.2) or

b) boiling water and thermal exposure test (5.2.3).

5.2.2 Autoclave test

Carry out the autoclave test as specified in ISO 13402.

5.2.3 Boiling water test and thermal exposure test

Carry out the boiling water test and the thermal exposure test as specified in ISO 13402.

5.2.4 Removal of blemishes

After completing the resistance test (5.2.2 or 5.2.3), rub the extraction forceps vigorously with a soft cloth to remove blemishes.