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Dentistry — Dental tweezers

Médecine bucco-dentaire — Précelles dentaires

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Contents

	Page
Foreword	iv
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Classification	2
5 Requirements	2
5.1 Design and dimensions	2
5.1.1 Length	3
5.1.2 Working end	7
5.1.3 Handle	7
5.1.4 Guide pin	7
5.2 Material	7
5.3 Hardness (of working end)	7
5.4 Surface finish	7
5.4.1 All surfaces	7
5.4.2 Satin finish	8
5.5 Closing and opening forces	8
5.6 Resistance to reprocessing	8
6 Measurement and test methods	8
6.1 Visual inspection	8
6.2 Dimensions	8
6.3 Closing and opening forces	8
6.4 Resistance to reprocessing	9
7 Marking, labelling and instructions for use	9
7.1 Marking on the dental tweezers	9
7.2 Labelling on the package	10
7.3 Instructions for use	10
Bibliography	11

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.

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 documents 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).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 106, *Dentistry*, Subcommittee SC 4, *Dental instruments*.

This first edition of ISO 15098 cancels and replaces ISO 15098-1:1999, ISO 15098-2:2000 and ISO 15098-3:2000.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Dentistry — Dental tweezers

1 Scope

This document specifies general requirements and test methods for metallic dental tweezers of the Meriam type and for College type.

This document is not applicable to anatomical tweezers and surgical tweezers.

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 1101, *Geometrical product specifications (GPS) — Geometrical tolerancing — Tolerances of form, orientation, location and run-out*

ISO 1942, *Dentistry — Vocabulary*

ISO 2768-1, *General tolerances — Part 1: Tolerances for linear and angular dimensions without individual tolerance indications*

ISO 6508-1, *Metallic materials — Rockwell hardness test — Part 1: Test method*

ISO 7153-1, *Surgical instruments — Materials — Part 1: Metals*

ISO 15223-1:2016, *Medical devices — Symbols to be used with medical device labels, labelling and information to be supplied — Part 1: General requirements*

ISO 17664, *Processing of health care products — Information to be provided by the medical device manufacturer for the processing of medical devices*

ISO 21850-1, *Dentistry — Materials for dental instruments — Part 1: Stainless steel*

3 Terms and definitions

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

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

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

3.1

dental tweezers

hand-guided dental instrument designed to grasp, hold or transfer items and/or material into and out of the oral cavity

Note 1 to entry: Dental tweezers are also known as cotton forceps and pliers and are different from anatomical tweezers.

3.2

College type dental tweezers

special design of dental tweezers with straight shank and angled or curved working end

3.3

Meriam type dental tweezers

special design of dental tweezers with angulated shank and contra-angulated working end

3.4

guide pin

pin for guiding the tweezers' halves when the tweezers are pressed together

4 Classification

Dental tweezers are classified into the following types according to the shape of the shank and working end:

- Meriam type dental tweezers, i.e. with an angulated shank and a contra-angulated working end (see [Figure 1](#)).
- College type dental tweezers, i.e. with a straight shank, subdivided according to the shape of the working end:
 - angled: see [Figure 2](#).
 - curved: see [Figure 3](#).

5 Requirements

5.1 Design and dimensions

Meriam type dental tweezers shall have the designs shown in [Figure 1](#) and the dimensions given in [Table 1](#).

College type dental tweezers shall have the designs shown in [Figure 2](#) and [Figure 3](#) and the dimensions given in [Table 1](#).

Table 1 — Dimensions for dental tweezers

Tweezer type	b_1 mm	b_2 mm	b_3 mm	h_1 mm	h_2 mm	l mm	r mm	α °
Tolerance								
	±0,2	±0,2	±1	±1	±1	±5	reference	±5
Meriam type 1	1,3	1,1	12	6	6	160	—	40
Meriam type 2	1,6	1,3	13	6,2	6,2	162	—	43,4
College type 1, angled	1,3	1,1	10	8	—	150	—	40
College type 2, angled	1,5	1,2	?	10	—	152	—	45,7
College type 3, curved	1,3	1,1	10	8	—	150	15	—
See Table 2 for the description of each variable in this table.								

Dimensions without tolerances shall be in accordance with ISO 2768-1. Tolerances of form, orientation and location shall be in accordance with ISO 1101, if not specified otherwise in this document.

The points of measurement associated with the dimensions are listed in [Table 2](#).

Test in accordance with [6.1](#) and [6.2](#).

5.1.1 Length

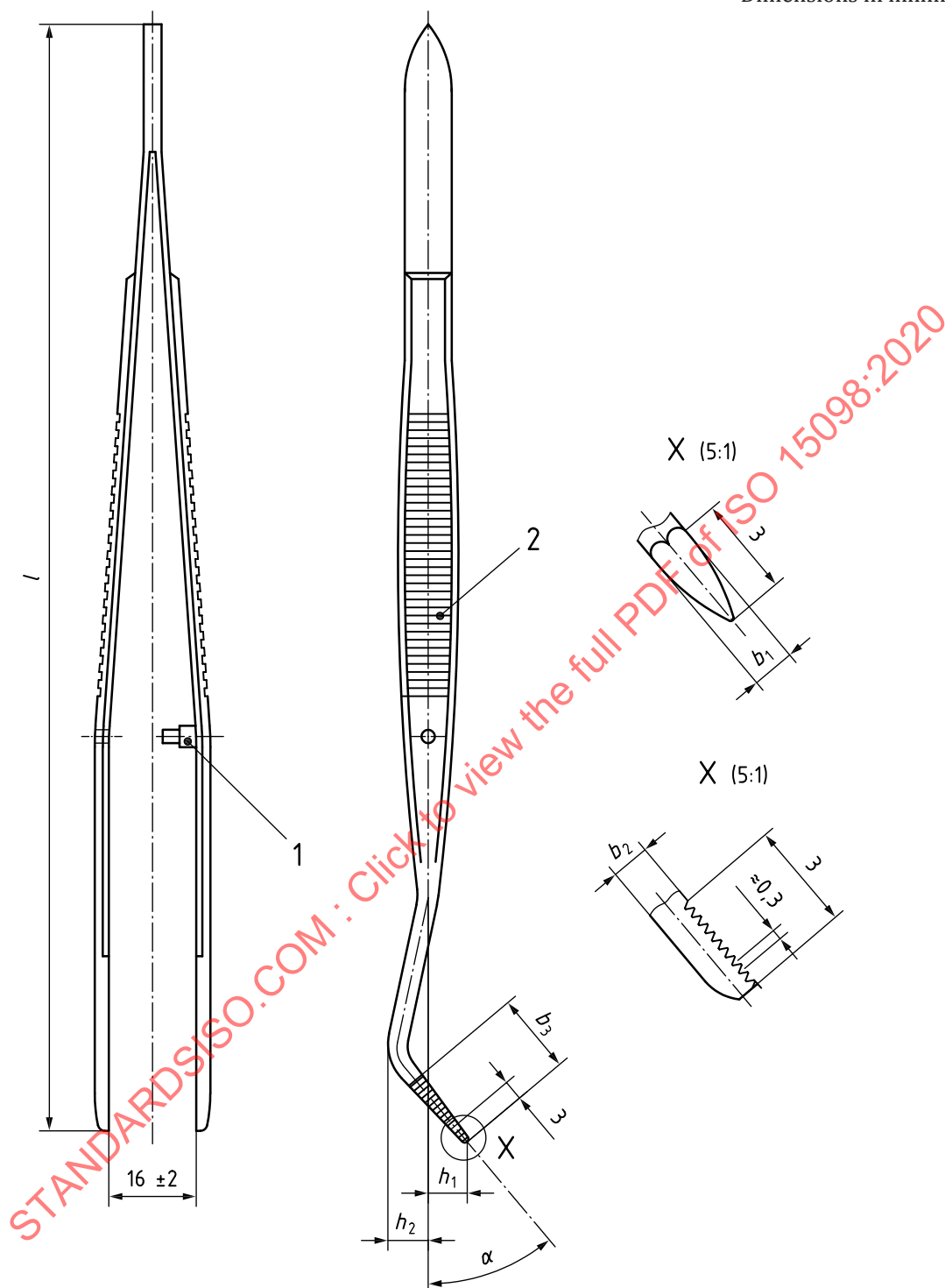
5.1.1.1 Location of measurement points

The location of measurement points for dental tweezers shall be as shown in [Table 2](#) and in [Figure 1](#) to [Figure 3](#).

Table 2 — Measurement points for dental tweezers

	Dimension	Measurement point
b_1	Blade width	Measured at a distance of 3 mm from the tip of the working end.
b_2	Blade thickness	Measured at a distance of 3 mm from the tip of the working end.
b_3	Blade length	Distance measured from the extreme tip of the blade, parallel to the centreline of the blade, to the blade/shank interface.
h_1	Blade height	Distance measured from the centreline of the instrument, at right angle to the centreline of the instrument, to the farthest extremity of the blade.
h_2	Shank height	Distance measured from the centreline of the instrument, at right angle to the centreline of the instrument, to the farthest external surface of the first bend of the shank.
l	Length	Distance measured with closed tweezers from the farthest extremity of the blade, parallel to the centreline of the instrument, to the end of the instrument.
r	Radius of blade	Radius of curvature of the inside of the blade.
α	Blade angle	Angle from the centreline of the blade to the centreline of the instrument.

Dimensions in millimetres



Key

- 1 guide pin
- 2 handle serrations

Figure 1 — Meriam type dental tweezers

Dimensions in millimetres

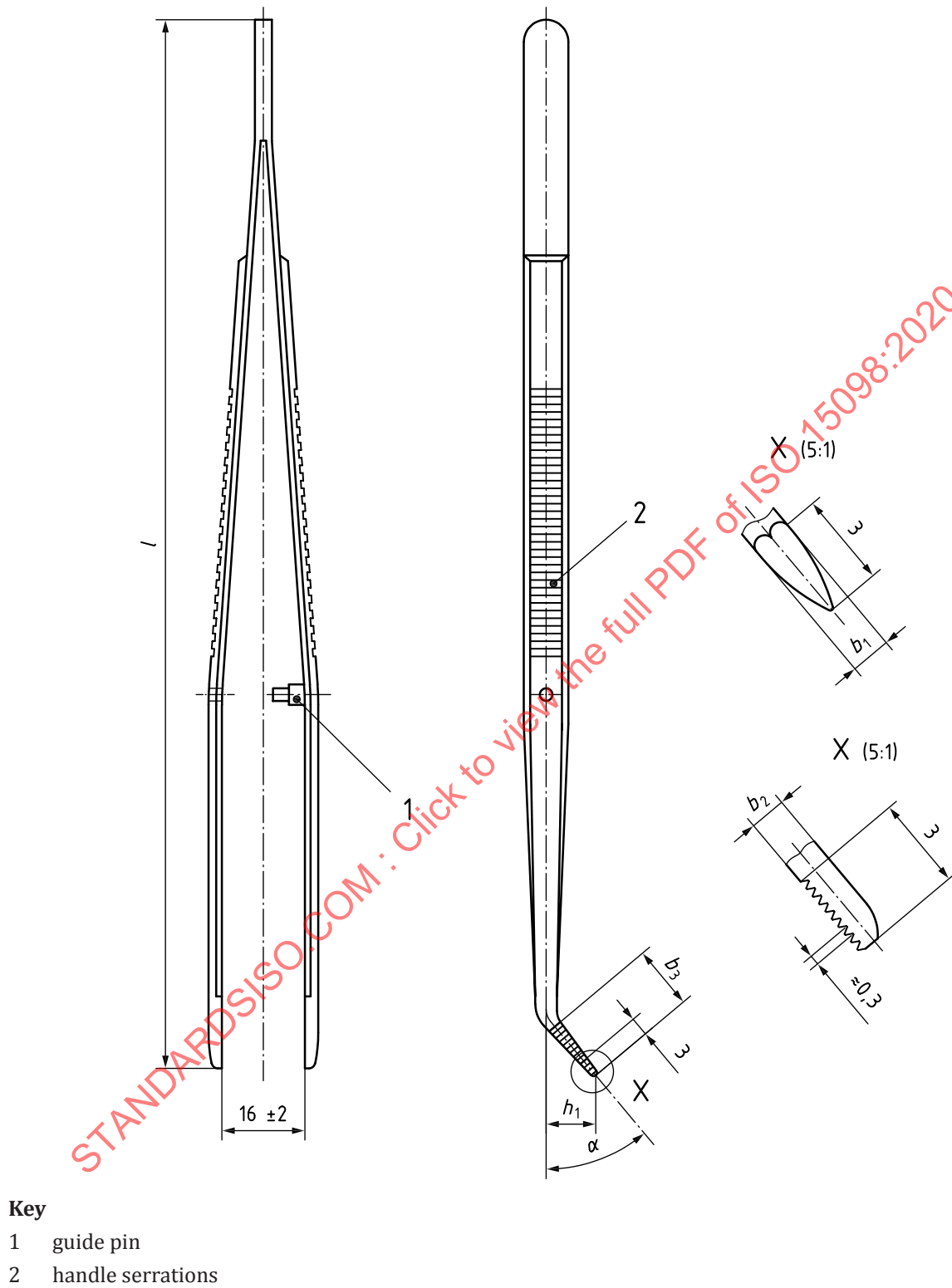
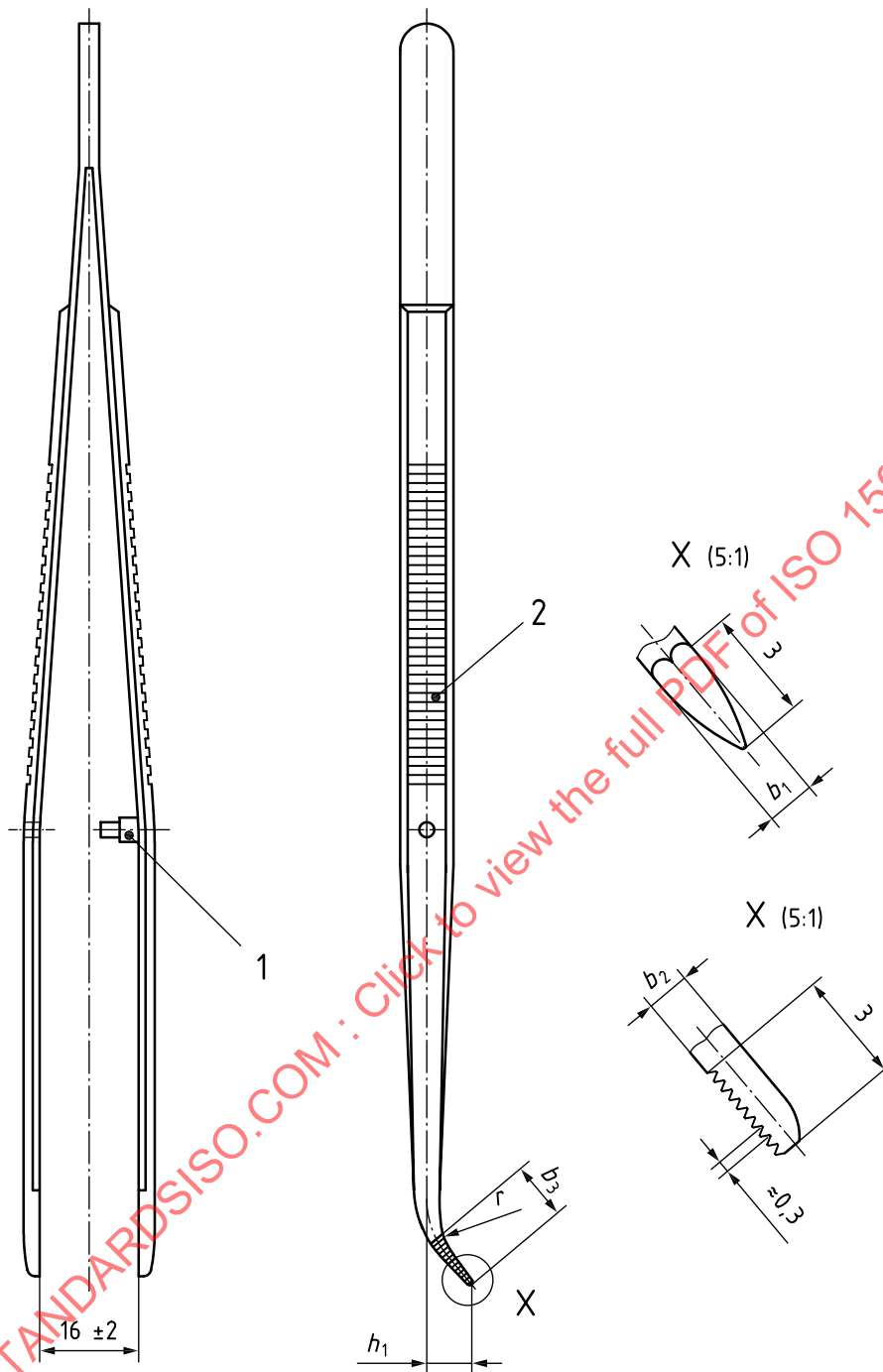


Figure 2 — College type dental tweezers — Angled



Key

- 1 guide pin
- 2 handle serrations

Figure 3 — College type dental tweezers — Curved

5.1.1.2 Length of Meriam type

Meriam type dental tweezers shall have a length of (160 ± 5) mm.

Test in accordance with [6.2](#).

5.1.1.3 Length of College type

College type dental tweezers shall have a length of (150 ± 5) mm.

Test in accordance with [6.2](#).

5.1.2 Working end

The working end of dental tweezers shall be serrated or smooth.

If it is serrated it shall be for:

- a) Meriam type: in accordance with [Figure 1](#), enlarged view X.
- b) College type: in accordance with [Figure 2](#) or [Figure 3](#), enlarged view X.

Test in accordance with [6.1](#).

5.1.3 Handle

The general design of the handle for dental tweezers is left to the manufacturer.

The handles of Meriam type and College type tweezers shall be serrated.

Test in accordance with [6.1](#).

5.1.4 Guide pin

Dental tweezers shall have a guide pin. In addition, it may have a stopper for the guide pin.

Test in accordance with [6.1](#).

5.2 Material

The material used for dental tweezers is at the discretion of the manufacturer provided the requirements of this document are satisfied. If stainless steel is used, it shall be in accordance with ISO 7153-1 or ISO 21850-1.

5.3 Hardness (of working end)

Dental tweezers shall have a Rockwell hardness of 40 HRC to 52 HRC.

Test in accordance with ISO 6508-1.

Alternatively, a Vickers hardness test in accordance with ISO 6507-1 can be performed. The measured values thus determined shall be converted into Rockwell values.

NOTE ISO 18265:2013, Table 1 contains practical conversion values. 1 HRC is added to the value thus calculated (empirical values with stainless steel).

5.4 Surface finish

5.4.1 All surfaces

The surfaces of dental tweezers shall be free from defects and residues.

Test in accordance with [6.1](#).

5.4.2 Satin finish

Any satin finish shall be both uniform and smooth.

Test in accordance with [6.1](#).

5.5 Closing and opening forces

The closing and opening forces for dental tweezers shall be within 20 % of the value stated by manufacturer when tested in accordance to [6.3](#).

The opening of the tweezer tips shall be between 14 mm to 18 mm.

Test in accordance with [6.3](#).

5.6 Resistance to reprocessing

The dental tweezers shall withstand 100 reprocessing cycles, as defined by the instructions for use in accordance with ISO 17664, without deterioration in performance or signs of corrosion.

The reprocessing cycle shall include the recommended methods for cleaning, disinfection and sterilization.

The manufacturer may state a maximum number of reprocessing cycles if less than 100 and this figure shall be used for testing.

Test in accordance with [6.4](#).

6 Measurement and test methods

6.1 Visual inspection

Carry out visual inspection with normal visual acuity and without magnification.

6.2 Dimensions

Measure the dimensions using a measuring device that is accurate to 1/10 of the tolerance to be measured.

6.3 Closing and opening forces

An example of the test apparatus is shown in [Figure 4](#).

Place the dental tweezers on a flat test supply.

Fix the one arm of the dental tweezers while the dental tweezers is open.

Apply compressive force on another arm that is not fixed, using a device (e.g. universal testing machine) that is capable of measuring the force with an accuracy of 0,1 N.

The force shall be applied at the midpoint of the length of the opening until the dental tweezers is fully closed (the tip of the working end on one arm has touched another arm).

Record the maximum force just before the closure of the dental tweezers.

The test shall be repeated on at least three samples.

Record the median of the test samples as the force value of the dental tweezers.