

INTERNATIONAL STANDARD

ISO
3630-1

First edition
1992-12-15

Dental root-canal instruments —

Part 1:

Files, reamers, barbed broaches, rasps, paste carriers, explorers and cotton broaches

Instruments pour canaux radiculaires utilisés en art dentaire —

Partie 1: Limes, alésoirs, broches barbelées, râpes, bourre-pâtes, sondes exploratrices et broches porte-coton



Reference number
ISO 3630-1:1992(E)

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Annex

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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.

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.

International Standard ISO 3630-1 was prepared by Technical Committee ISO/TC 106, *Dentistry*, Sub-Committee SC 4, *Dental instruments*.

This first edition of ISO 3630-1 cancels and replaces ISO 3630:1984, of which it constitutes a technical revision.

ISO 3630 consists of the following parts, under the general title *Dental root-canal instruments*:

- *Part 1: Files, reamers, barbed broaches, rasps, paste carriers, explorers and cotton broaches*
- *Part 2: Enlargers*
- *Part 3: Condensers, pluggers and spreaders*

It is anticipated that additional types of instruments will form the subject of additional future parts.

Annex A of this part of ISO 3630 is for information only.

Introduction

This International Standard covers significant features of hand- and power-operated dental root canal instruments which are used by the dentist for the mechanical preparation of root canals for treatment. In dentistry these instruments are also referred to as endodontic instruments.

Part 1, in addition to the specific instruments indicated, includes general specifications, requirements and test methods which are applicable to all types of root-canal instruments.

Attention is drawn to the International Standard on a number coding system, ISO 6360, which specifies a 15-digit number for the identification of dental rotary instruments of all types.

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Dental root-canal instruments —

Part 1:

Files, reamers, barbed broaches, rasps, paste carriers, explorers and cotton broaches

1 Scope

This part of ISO 3630 specifies requirements and test methods for files, reamers, barbed broaches, rasps, paste carriers, explorers and cotton broaches. In addition it covers general specifications, test methods, information on the designation code and identification symbols for root-canal instruments independent of specific types.

The requirements of this part of ISO 3630 shall become effective two years from the date of publication.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 3630. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 3630 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 1797-1:1992, *Dental rotary instruments — Shanks — Part 1: Shanks made of metals.*

ISO 1797-2:1992, *Dental rotary instruments — Shanks — Part 2: Shanks made of plastics.*

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

ISO 6360-1:1985, *Dental rotary instruments — Number coding system — Part 1: General characteristics.*

ISO 6360-2:1986, *Dental rotary instruments — Number coding system — Part 2: Shape and specific characteristics.*

ISO 8601:1988, *Data elements and interchange formats — Information interchange — Representation of dates and times.*

3 Nominal sizes, designation (code number) and corresponding diameters

Table 1 gives the nominal sizes for the working parts to be used for all dental root-canal instruments regardless of the type of instrument.

The nominal sizes usually correspond to the values of the extended diameters at the tip or the working part in hundredths of a millimetre.

The designation (code number) with three digits is part of the 15-digit identification number laid down in ISO 6360-1.

Table 1 — Nominal sizes, designation (code number) and corresponding diameters

Nominal size: designation (code number)	Corresponding diameter mm
008	0,08
010	0,10
012	0,12
015	0,15
017	0,17
020	0,20
025	0,25
030	0,30
035	0,35
040	0,40
045	0,45
050	0,50
055	0,55
060	0,60
070	0,70
075	0,75
080	0,80
090	0,90
100	1,00
105	1,05
110	1,10
120	1,20
130	1,30
140	1,40
150	1,50
160	1,60
170	1,70
190	1,90

4 Requirements

4.1 Material

4.1.1 Working part

The working part and the shaft, if one part, shall be made of stainless steel or carbon steel. The type of steel and the treatment shall be at the discretion of the manufacturer.

4.1.2 Handle, shank

The handle, or shank, when affixed to the shaft, shall be made of metal or plastics material (see ISO 1797-1 and ISO 1797-2 respectively) of a quality suitable to withstand normal operative procedures. The type of material and the treatment shall be at the discretion of the manufacturer.

If the requirements of 4.2 to 4.4 are fulfilled, the instruments are considered also to comply with the requirements of 4.1.2.

4.2 Dimensional requirements

The dimensions are given in millimetres.

The dimensional requirements of the instruments shall comply with the respective tables and figures; within the dimensional requirements, variations in shape and design are permitted.

Testing shall be carried out in accordance with 6.1 and 6.2.

4.2.1 Shanks

Shanks shall be type 1 or 2 as specified in ISO 1797-1. Instruments used with type 1 or 2 shanks shall be operated with handpieces that are restricted to operate at slow speed. Except for paste carriers the handpieces shall have only an action of pulling motion and/or reciprocating motion (90° maximum) unless otherwise specified.

4.2.2 Files and reamers

This clause covers the following types of instruments:

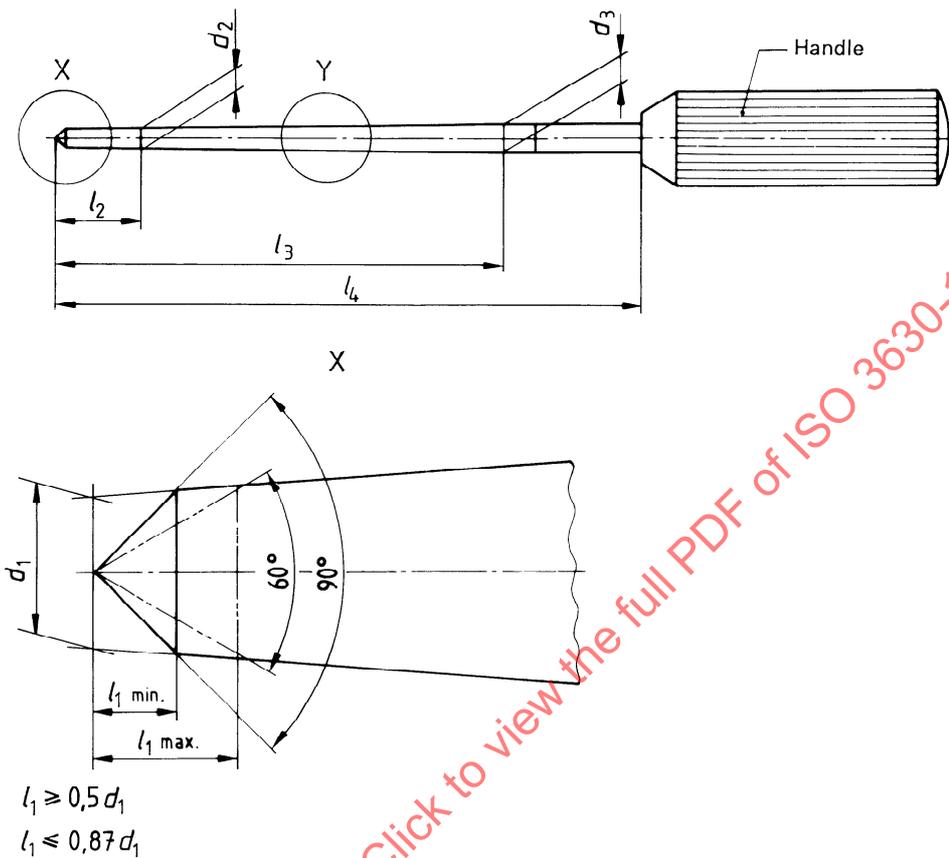
Files, type H

Files, type K

Reamers, type K

These files and reamers shall be in accordance with figure 1 and tables 2 to 4.

NOTE 1 The dimensions are aligned with those of the dental obturating points (see ISO 6877) and dental absorbent points (see note 6).



The tip length shall be within the limits specified by the minimal and maximal angle (l_1 min. to l_1 max.).

Shape and tip at the manufacturer's discretion.

Handle or shank (type 1 or 2 of ISO 1797-1) at the manufacturer's discretion.

Taper along working part 0,02:1

Detail Y: see table 2

- d_1 diameter of the projection of the working part at the tip end (nominal size)
- d_2 diameter at length l_2
- d_3 diameter at the end of minimum length of working part, length l_3
- l_1 tip length
- l_2 length for measuring point d_2
- l_3 length for measuring point d_3 and minimum length of working part
- l_4 length of operative end

Figure 1 — Files, type H; files, type K; reamers, type K

Table 2 — Typical flute form, detail Y

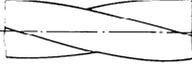
Instrument	Detail Y (see figure 1)
Files, type H	
Files, type K	
Reamers, type K	

Table 3 — Dimensions and designation

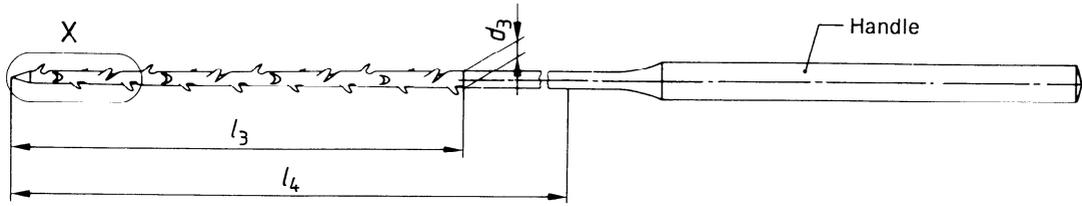
Nominal size	d_1 ref.	d_2 tol.	d_3 tol.	l_2	l_3 min.	Colour designation	
008	0,08	0,14	0,40	3	16	grey purple white yellow red blue green black	
010	0,10	0,16	0,42				
015	0,15	0,21	0,47				
020	0,20	0,26	0,52				
025	0,25	0,31	0,57				
030	0,30	0,36	0,62				
035	0,35	0,41	0,67				
040	0,40	0,46	0,72				
045	0,45	0,51	0,77			± 0,02	white yellow red blue green black
050	0,50	0,56	0,82				
055	0,55	0,61	0,87				
060	0,60	0,66	0,92				
070	0,70	0,76	1,02			± 0,04	white yellow red blue green black
080	0,80	0,86	1,12				
090	0,90	0,96	1,22			± 0,04	white yellow red blue green black
100	1,00	1,06	1,32				
110	1,10	1,16	1,42				
120	1,20	1,26	1,52				
130	1,30	1,36	1,62				
140	1,40	1,46	1,72				

Table 4 — Length l_4

l_4 ± 0,5
21 25 28 31
NOTE — Lengths of instruments not listed shall be within ± 0,5 mm of the stated length.

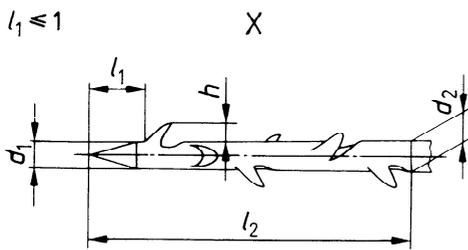
4.2.3 Barbed broaches

Barbed broaches shall be in accordance with figure 2 and table 5.



Shape of tip at the manufacturer's discretion

Hand use: design of handle at the manufacturer's discretion



- d_1 diameter of the projection of the core at the tip end
- d_2 diameter of core at length l_2
- d_3 diameter of core at length l_3
- h height of barb
- l_1 length measured from tip point to base of first barb
- l_2 length for measuring point d_2
- l_3 length for measuring point d_3 and length of working part
- l_4 length of operative end

Figure 2 — Barbed broaches

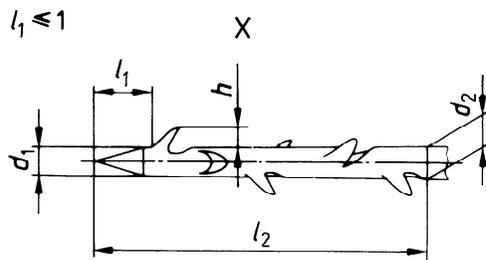
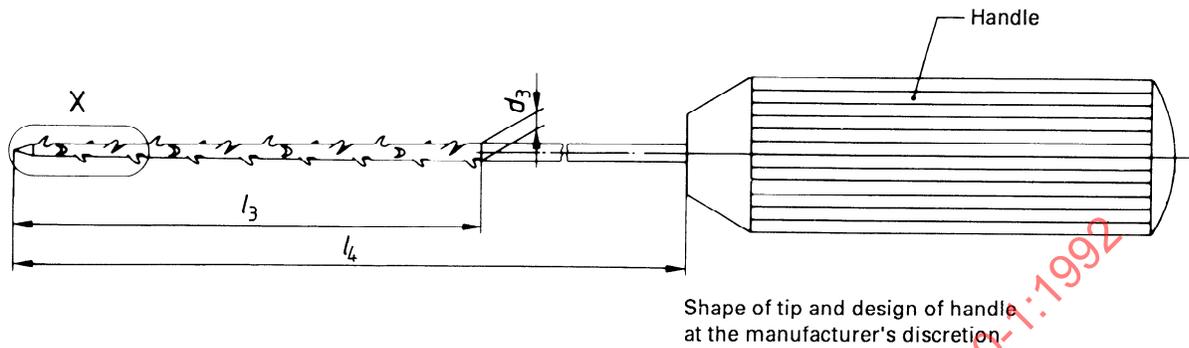
Table 5 — Dimensions and designation

Nominal size ¹⁾	d_1		d_2		d_3		l_2	l_3 $\pm 1,5$	l_4 min.	h \approx	Number of barbs min.	Designation	
		tol.		tol.		tol.						Colour	Number
020 025 030	0,12 0,14 0,16	$\pm 0,02$	0,15 0,17 0,19	$\pm 0,02$	0,22 0,24 0,26	$\pm 0,02$	3	10,5	20	0,075 0,085 0,095	36	purple white yellow	0 1 2
035 040	0,18 0,21	$\pm 0,03$	0,21 0,24	$\pm 0,03$	0,28 0,31	$\pm 0,03$				0,105 0,120		red blue	3 4
050 060	0,25 0,29	$\pm 0,04$	0,28 0,32	$\pm 0,04$	0,35 0,39	$\pm 0,04$				0,140 0,160		green black	5 6

1) The nominal size designation is calculated by the core diameter d_1 plus approximately twice the height of the barbs.

4.2.4 Rasps

Rasps shall be in accordance with figure 3 and table 6.



- d_1 diameter of the projection of the core at the tip end
- d_2 diameter of core at length l_2
- d_3 diameter of core at length l_3
- h height of barb
- l_1 length measured from tip point to base of first barb
- l_2 length for measuring point d_2
- l_3 length for measuring point d_3 and length of working part
- l_4 length of operative end

Figure 3 — Rasps

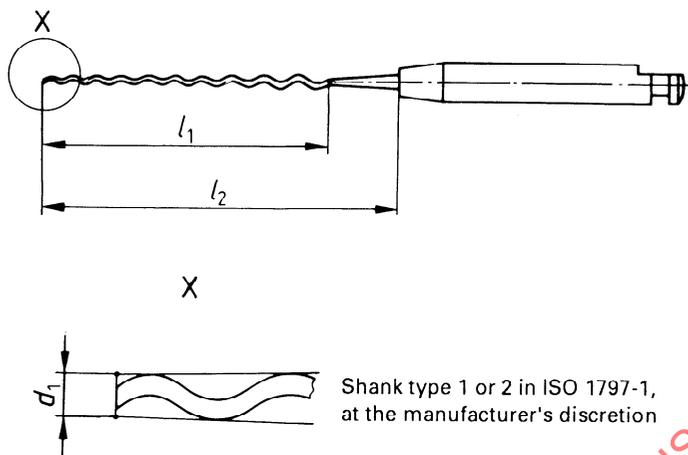
Table 6 — Dimensions and designation

Nominal size ¹⁾	d_1	d_2	d_3	l_2	l_3	l_4	h	Number of barbs min.	Designation	
	+0,03 0	+0,03 0	+0,03 0						Colour	Number
025	0,15	0,20	0,31	3	10,5	25,5	0,05	50	white	1
030	0,18	0,23	0,34				0,06		yellow	2
035	0,21	0,26	0,37				0,07		red	3
040	0,24	0,29	0,40				0,08		blue	4
045	0,27	0,32	0,43				0,09		green	5
050	0,30	0,35	0,46				0,10		black	6

1) The nominal size designation is calculated by the core diameter d_1 plus approximately twice the height of the barbs.

4.2.5 Paste carriers

Paste carriers shall be in accordance with figure 4 and tables 7 and 8.



Winding of spiral at the manufacturer's discretion. The winding of the spiral shall be such as to convey the material to the tip of the instrument when rotated clockwise.

Taper along working part 0,00 to 0,02:1

- d_1 diameter of the projection of working part at the tip end (nominal size)
- l_1 length of working part
- l_2 length of operative end

Figure 4 — Paste carriers

Table 7 — Dimensions and designation

Nominal size	d_1 $\pm 0,05$	l_1 min.	Colour	Designation	
				Ring marking on shank	
025	0,25	16	red	I	
030	0,30		blue	II	
035	0,35		green	III	
040	0,40		black	IIII	

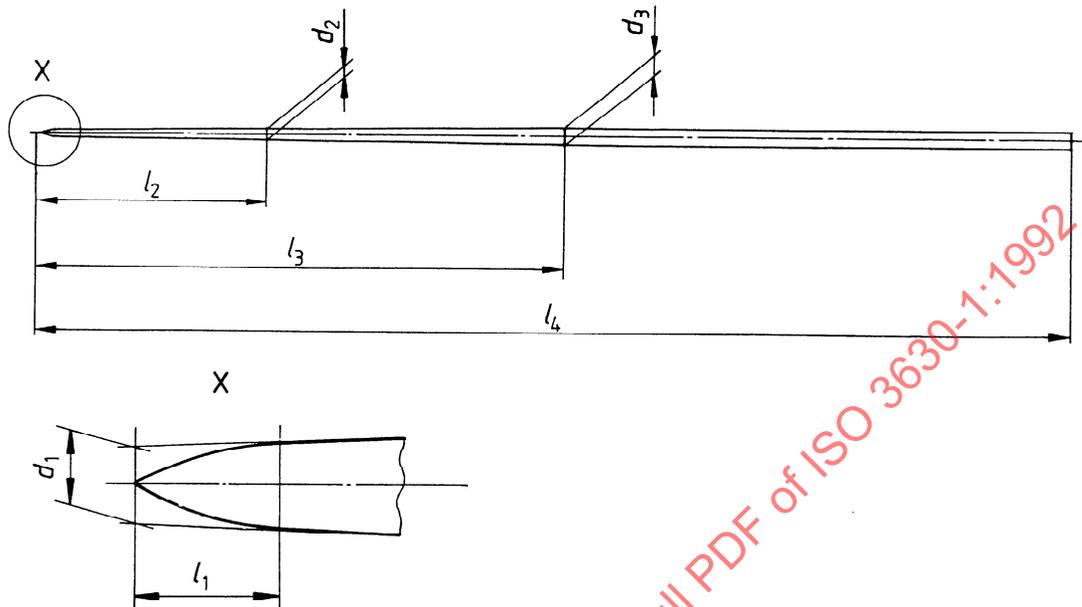
Table 8 — Length l_2

l_2 $\pm 0,5$	
for shank type 1	for shank type 2
21	21
25	25
29	—

NOTE — Lengths of instruments not listed shall be within $\pm 0,5$ mm of the stated length.

4.2.6 Explorers and cotton boaches

Explorers and cotton boaches shall be in accordance with figure 5 and table 9.



Cross-section along operative end: round or polygonal at the manufacturer's discretion

Taper along operative end 0,007:1, with tolerance of $^{+0,003}_0$

- d_1 diameter of the projection of the working part at the tip end (nominal size)
- d_2 diameter at the end of the working part
- d_3 diameter at the end of the operative part
- l_1 tip length
- l_2 length of working part (length for measuring point d_2)
- l_3 length of operative end (length for measuring point d_3)
- l_4 overall length

Figure 5 — Explorers and cotton boaches

Table 9 — Dimensions and designation

Nominal size	d_1 $\pm 0,02$	d_2 $\pm 0,02$	d_3 max.	l_1	l_2 $\pm 1,5$	l_3 $\pm 0,5$	l_4 $\pm 1,5$	Designation	
								Colour	Number
012	0,12	0,20						white	1
015	0,15	0,23						yellow	2
017	0,17	0,25						red	3
020	0,20	0,28	0,8	$2 \times d_1$	10,5	25	50	blue	4
025	0,25	0,33						green	5
030	0,30	0,38						black	6

4.3 Mechanical requirements

4.3.1 Resistance to fracture in torque and angular deflection

4.3.1.1 Files, reamers, barbed broaches and rasps

The test piece shall not fracture and the minimum value for the resistance to fracture in torque and the minimum value for the angular deflection given in table 10 shall be reached.

Testing shall be carried out in accordance with 6.3.

4.3.1.2 Other instruments

NOTE 2 For other root-canal instruments, requirements will be added as soon as data are available.

Table 10 — Resistance to fracture in torque and angular deflection

Nominal size	Resistance to fracture (torque) g·cm min.					Angular deflection degrees min.							
	Files type K	Files type H	Reamers type K	Barbed broaches	Rasps	Files and reamers type K	Files type H	Barbed broaches	Rasps				
008	5	5	5	—	—	360	180	—	—				
010	6	5	6	—	—			90	—	—			
015	8	8	8	—	—				120	—	—		
020	18	12	12	5	—		90	90		—			
025	30	20	20	6	8					90	90	90	
030	45	35	35	8	10		120	90					90
035	65	50	50	10	12								
040	100	65	70	12	20		120	90		90			
045	120	90	95	—	26						120	90	90
050	170	120	120	20	35		120	90	90				
055	1)	160	1)	—	—	120				90	90		
060	1)	250	1)	35	—							120	90
070	1)	350	1)	—	—		120	90	90				

1) The minimum values for sizes greater than those listed above are not specified: all instruments of greater size can be assumed to have adequate resistance to fracture and angular deflection.

4.3.2 Resistance to bending

4.3.2.1 Files, reamers, barbed broaches and rasps

The values for the resistance to bending given in table 11 shall not be exceeded.

Testing shall be carried out in accordance with 6.4.

4.3.2.2 Other instruments

NOTE 3 For other root-canal instruments, requirements will be added as soon as data are available.

4.3.3 Resistance to pull and twist, handle or shank security

This requirement does not apply to safety spiral paste carriers.

Handles or shanks, when affixed to the operative end, shall be securely and permanently affixed. The instrument shall have no axial movement from the handle or shank and shall not twist within the handle or shank when torqued.

Testing shall be carried out in accordance with 6.5.

4.4 Chemical requirements

4.4.1 Resistance to corrosion

Instruments made out of stainless steel shall show no evidence of corrosion. Instruments made out of metal not specifically treated against corrosion are not included.

Testing shall be carried out in accordance with 6.6.

4.4.2 Heat effects of sterilization

The working part of instruments shall show no signs of deterioration.

The handles, upon visual inspection, shall show no deformation or colour change.

Testing shall be carried out in accordance with 6.7.

Table 11 — Resistance to bending

Nominal size	Bending moment g·cm max.				
	Files type K	Files type H	Reamers type K	Barbed broaches	Rasps
008	20	20	20	—	—
010	25	20	25	—	—
015	50	35	50	—	—
020	80	65	80	25	—
025	120	100	120	30	50
030	150	135	150	40	70
035	190	170	220	50	90
040	250	220	320	80	140
045	360	320	375	—	170
050	450	520	410	120	210
055	1)	720	1)	—	—
060		920		170	—
070		1 120		—	—

1) The maximum values for sizes greater than those listed above are not specified: all instruments of greater size are such that flexibility is not a consideration.

5 Sampling

A sample of 10 instruments shall be used of each type and size for validating the following requirements:

- dimensions (see 4.2);
- resistance to fracture in torque and angular deflection (see 4.3.1);
- resistance to bending (see 4.3.2).

The method of procurement should be recorded in the test report.

If all 10 samples pass, the product passes. If eight or fewer samples pass, the product fails. If nine samples pass, test five additional samples. When five additional samples are to be tested, all five shall pass for the product to be accepted.

For other requirements sampling is specified in the respective test clauses.

6 Testing

6.1 Visual inspection

For compliance with the requirements, visually inspect at normal visual acuity (unless otherwise specified).

6.2 Measurement of dimensions

The lengths, diameters and tapers are measured or calculated with a shadowgraph or other equipment of equivalent accuracy, for example dial gauges.

The taper is determined by calculation using actual measured diameters d_2 and d_3 . Taper is the difference between d_2 and d_3 divided by the length of the taper. Taper tolerance is controlled solely by the tolerance of the specified diameters.

The tip dimension is calculated from the projection of the taper of the working part onto a plane at the tip of the instrument (datum line) which is perpendicular to the long axis (centre-line) of that instrument. When determining the tip length, the instrument is turned until the edges on the tip show approximately the same length.

6.3 Resistance to fracture in torque and angular deflection

6.3.1 Test apparatus (see figure 6).

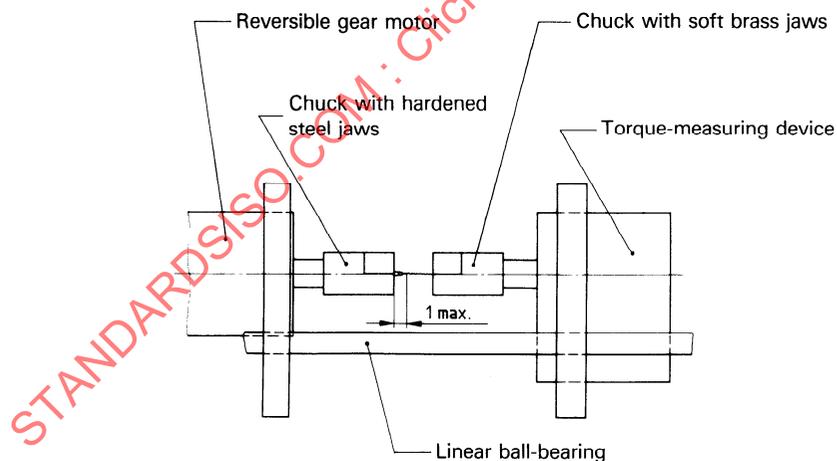


Figure 6 — Apparatus for torque test

6.3.1.1 **Low-speed reversible geared motor** capable of revolving the test piece at 2 min^{-1} .

6.3.1.2 **Torque-measuring device** fixed on two linear ball-bearings mounted on the shaft of the device.

6.3.1.3 Chuck, with jaws made from soft brass for clamping the test piece at the tip along a length of 3 mm and coaxially with the torque axis (see figure 7).

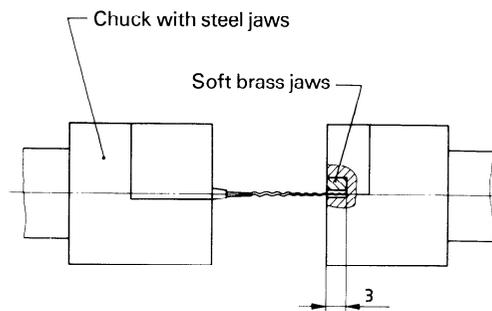


Figure 7 — Test chuck detail

6.3.1.4 Separate amplifier and digital display for controlling the operation of the motor and recording the torque and angular deflection.

6.3.1.5 Chuck with jaws made from hardened steel for clamping the test piece at the shank.

6.3.2 Procedure

Remove the handles with a suitable wire cutter at the point at which the handle is attached to the instrument shaft. Calibrate the torque-measuring device for the torque range of the sample to be tested. Set the test piece into the chuck of the geared motor leaving a maximum of 1 mm of the unground portion of the shank out of the chuck. Tighten the chuck.

Slowly slide the torque-measuring device along the linear bearing until the tip of the test piece enters 3 mm into the brass jaws. Check to ensure that the test piece is straight and centred into the jaws (see figure 6). Tighten the chuck. Since clamping will probably induce a prestress of the test piece, activate the geared motor in steps until the torque digital display or the strip chart recorder shows a zero reading. After ensuring that the geared motor is set for clockwise rotation as viewed from the test piece shank end, activate the device. The test device will cease operation when the test piece fails. Record the maximum torque and angular deflection for each piece tested.

6.4 Resistance to bending

6.4.1 Test apparatus

The equipment as described in 6.3.1 is used with the modification of the clamping jaws and the bending device or catch pin as shown in figure 8. The amplifier shall be capable of being set to a pre-selected angular deflection of 45° at which point the test stops.

6.4.2 Procedure

Remove the handles with a suitable wire cutter at the point at which the handle is attached to the instrument shaft.

Set the apparatus to stop the angular deflection at 45°. Set the chuck onto the shaft of the torque-measuring device. Set the tip of the test piece into the jaws of the chuck perpendicular to the axis of the motor to a depth of 3 mm. Tighten the chuck. Mount the catch pin onto the motor shaft. Slide the torque-measuring device along the linear ball-bearing until the test piece is located above the rotating pin. Rotate the motor in the correct direction in stages until the catch pin is lightly touching the test piece. Ensure that the display shows zero. Activate the torque-measuring device. When the angular deflection has reached 45° the test will stop. Record the applied force at the display for each piece tested.

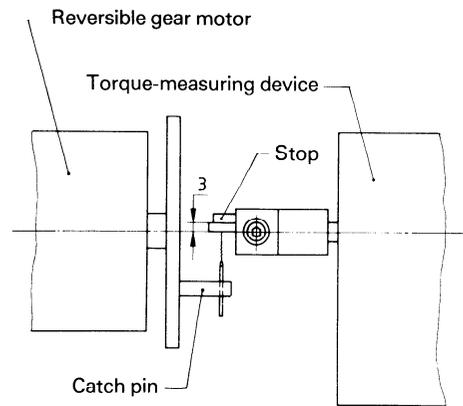


Figure 8 — Apparatus for bending test

6.5 Resistance to pull and twist: handle or shank

Take as a sample five instruments of each type and size, and test for pull strength: take another five instruments of each type and size for twist strength.

6.5.1 Pull strength

Grasp the operative end leaving 3 mm of the shaft exposed. Support the handle or shank to prevent axial movement without restriction to the embedded operative end. Apply a mass of 2,25 kg axially. Measure and record the length of the operative end to determine any evidence of axial movement.

Excluded are paste carriers with a spiral between the working part and the shank which are designed to fracture at this point if over-torqued.

6.5.2 Twist strength

Mount the handle or shank into the chucking device of a torque meter. The handle or shank shall be gripped along a portion behind the end of the embedded wire of the operative end. Insert the operative portion of the instrument leaving 3 mm of the shank exposed. Twist the instrument with a torque of 360 g·cm.

Rotate the torque meter until the instrument wire slips within the handle or shank or until the minimum torque is obtained. It should be noted that for wire diameters up to 0,60 mm, the shaft may twist before slippage within the handle or shank.

6.6 Resistance to corrosion

6.6.1 Sampling and preparation of sample

Take as the sample and for each test five instruments of each size. Scrub the test pieces with soap and water, rinse in hot water, dip in 95 % (V/V) ethanol or isopropyl alcohol (isopropanol; 2-propanol) and dry.

6.6.2 Procedure

Test pieces are subjected to one of the tests described in 6.6.2.1 and 6.6.2.2.

6.6.2.1 Copper sulfate test

Prepare copper sulfate solution as follows:

copper(II) sulfate pentahydrate ($\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$): 4,0 g;

sulfuric acid (H_2SO_4 , ρ 1,84 g/ml): 10,0 g;

water (H₂O): 90 ml.

Immerse the test pieces in the copper sulfate solution at (20 ± 2) °C, for 6 min, then wipe off with a cloth saturated with fresh water. Examine the test pieces under a magnification of at least $\times 5$ for the presence of brown stains indicating corrosion.

6.6.2.2 Agar ion test

Prepare an agar ion gel as follows:

potassium hexacyanoferrate(III) [K₃Fe(CN)₆]: 0,2 g;

sodium chloride (NaCl): 1,0 g;

water (H₂O): 100 ml;

agar-agar: 1,5 g.

Pour the agar gel into a transparent container. Insert the test pieces into the gel at (37 ± 2) °C, at distances of not less than 10 mm and a distance of 10 mm from the periphery of the container. Insert the test pieces to a depth of about 20 mm for 6 min. Examine the test pieces while in the gel for the presence of blue precipitates on the surface indicating corrosion.

6.7 Heat effects of sterilization

6.7.1 Apparatus

Steam autoclave and dry-heat sterilizers.

6.7.2 Procedure

Using distilled or de-ionized water, subject 10 unwrapped instruments of each size to a pressure of 220 kPa (2,2 bar) for 20 min at a temperature of (136 ± 2) °C, and then dry-heat sterilize them at (180 ± 5) °C for 120 min.

Excluded are instruments identified as for single use.

Water for testing shall be in accordance with ISO 3696.

7 Designation, marking and identification

7.1 Code for colour designation

The handles or shanks of root canal instruments shall be designated with colours according to table 12 or the respective abbreviation specified in table 13.

NOTES

4 The colour designation is based on six colours from white to black, i.e. from light to dark. This sequence is repeated for instruments with more than six sizes, except when up to two additional sizes are specified. For these cases, purple and grey are used in descending order.

Due to the different series and types of instruments, it is not possible to apply one specific colour generally to a certain diameter of a root-canal instrument.

5 In addition to the root-canal instruments given in table 12, enlargers are covered by ISO 3630-2 and condensers, pluggers and spreaders by ISO 3630-3 (see the Foreword).

For the colours, the abbreviations given in table 13 may be used.

Table 12 — Colour designation

Nominal size	Colour designation for				
	files and reamers types H and K	paste carriers	barbed broaches	rasps	explorers and cotton broaches
008	grey	—	—	—	—
010	purple	—	—	—	—
012	—	—	—	—	white
015	white	—	—	—	yellow
017	—	—	—	—	red
020	yellow	—	purple	—	blue
025	red	red	white	white	green
030	blue	blue	yellow	yellow	black
035	green	green	red	red	—
040	black	black	blue	blue	—
045	white	—	—	green	—
050	yellow	—	green	black	—
055	red	—	—	—	—
060	blue	—	black	—	—
070	green	—	—	—	—
080	black	—	—	—	—
090	white	—	—	—	—
100	yellow	—	—	—	—
110	red	—	—	—	—
120	blue	—	—	—	—
130	green	—	—	—	—
140	black	—	—	—	—

Table 13 — Colour abbreviations

Colour	Abbreviation
grey	gry
purple	pur
white	wht
yellow	yel
red	red
blue	blu
green	grn
black	blk

7.2 Additional designation

Additional designations in accordance with table 14 may be used.

Root-canal instruments may be marked in addition at the handle with the size designation according to table 1 (column 1) and the type identification symbol according to figure 6.

7.3 Identification symbols

Identification symbols, if used on the handle, on the packaging or in manufacturer's catalogues or dental literature, shall be in accordance with figure 9.