INTERNATIONAL STANDARD

ISO 7787-4

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Dental rotary instruments — Cutters —

Part 4: Miniature carbide laboratory cutters

Instruments rotatifs dentaires — Fraises techniques —

Partie 4: Fraises techniques miniatures en carbure pour laboratoire

Reference number
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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 3.

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 part of ISO 7787 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 7787-4 was prepared by Technical Committee ISO/TC 106, *Dentistry*, Subcommittee SC 4, *Dental instruments*.

ISO 7787 consists of the following parts, under the general title *Dental rotary instruments — Cutters*:

— *Part 1: Steel laboratory cutters*

— *Part 2: Carbide laboratory cutters*

— *Part 3: Carbide laboratory cutters for milling machines*

— *Part 4: Miniature carbide laboratory cutters*

Introduction

This part of ISO 7787 is one of a series of standards relating to dental rotary instruments.

The various dimensional and other requirements specified for miniature carbide laboratory cutters are those considered important to ensure the interchangeability and safe usage of these instruments in the dental laboratory.

The nominal diameters of the working part listed in Tables 1 to 16 comply with the diameters specified in ISO 2157, *Dental rotary instruments — Nominal diameters and designation code number*.

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

Dental rotary instruments — Cutters —

Part 4: Miniature carbide laboratory cutters

1 Scope

This part of ISO 7787 specifies the shape and dimensional characteristics, number of blades, type of toothing and run-out for the ten most common miniature carbide laboratory cutters, which are predominantly used in the dental laboratory.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of ISO 7787. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of ISO 7787 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 1797-1, *Dental rotary instruments — Shanks — Part 1: Shanks made of metals*

ISO 2859-1, *Sampling procedures for inspection by attributes — Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection*

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

ISO 8325, *Dental rotary instruments — Test methods*

3 Symbols

For the purposes of this part of ISO 7787, the following symbols apply.

d_1 diameter of working part, head diameter;

d_2 neck diameter;

l length of working part, head length;

α angle of working part.

4 Requirements

4.1 Materials

4.1.1 Working part

The working part shall be made of tungsten carbide. The selection of the type of tungsten carbide and its treatment are at the discretion of the manufacturer.

4.1.2 Shank

The material of the shank shall comply with ISO 1797-1.

4.2 Shapes

The shapes of the working part shall be as specified in Figures 1 to 15.

Variations of the shapes are permitted within the limited dimensions and the descriptions used in the subclause titles.

Testing shall be carried out in accordance with 5.1.

4.3 Dimensions and number of blades

4.3.1 Working part

4.3.1.1 General

Dimensions are given in millimetres and angles are given in degrees.

The dimensions of the working part shall be as specified in Figures 1 to 15 as appropriate and Tables 1 to 15 as appropriate.

The number of blades shall be as specified in Table 16.

Testing shall be carried out in accordance with 5.2.

4.3.1.2 Spherical, round

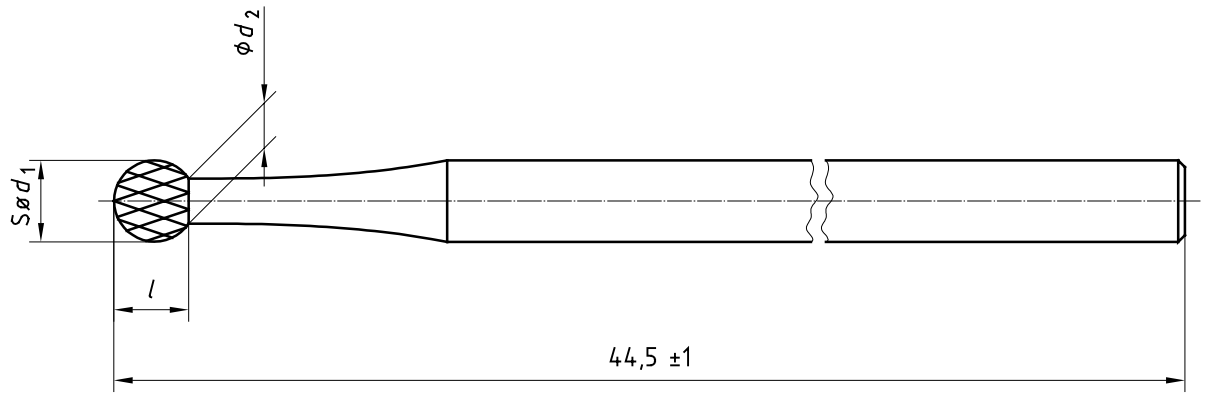

Figure 1

Table 1 — Dimensions

Designation of nominal diameter (Nominal size)	d_1 ± 0,1	d_2 max.	l ± 0,5
010	1,0	0,75	0,85
012	1,2	0,85	1,05
014	1,4	0,95	1,25
016	1,6	1,05	1,4
018	1,8	1,20	1,6
021	2,1	1,35	1,9
023	2,3	1,45	2,1
025	2,5	1,50	2,3
027	2,7	1,60	2,5
031	3,1	1,80	2,6

4.3.1.3 Inverted conical

4.3.1.3.1 Inverted conical, regular

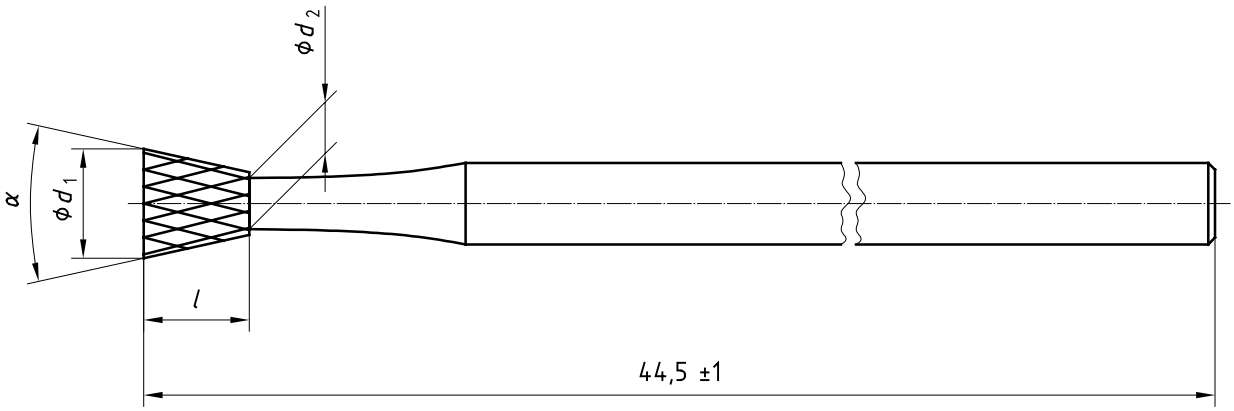

Figure 2

Table 2 — Dimensions

Designation of nominal diameter (Nominal size)	d_1 ± 0,1	d_2 max.	l ± 0,5	α
014	1,4	0,95	1,2	10° to 16°
018	1,8	1,25	1,55	
031	3,1	2,35	3,0	

4.3.1.3.2 Inverted conical, long

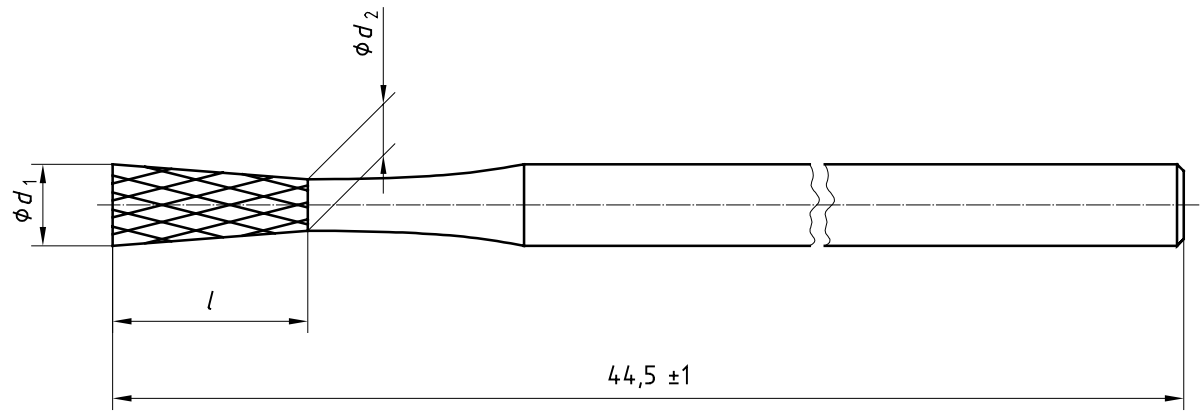

Figure 3

Table 3 — Dimensions

Designation of nominal diameter (Nominal size)	d_1 ± 0,1	d_2 max.	l ± 0,5
014	1,4	0,95	4,75
016	1,6	1,10	4,75
023	2,3	1,45	5,5

4.3.1.4 Cylindrical

4.3.1.4.1 Cylindrical, regular

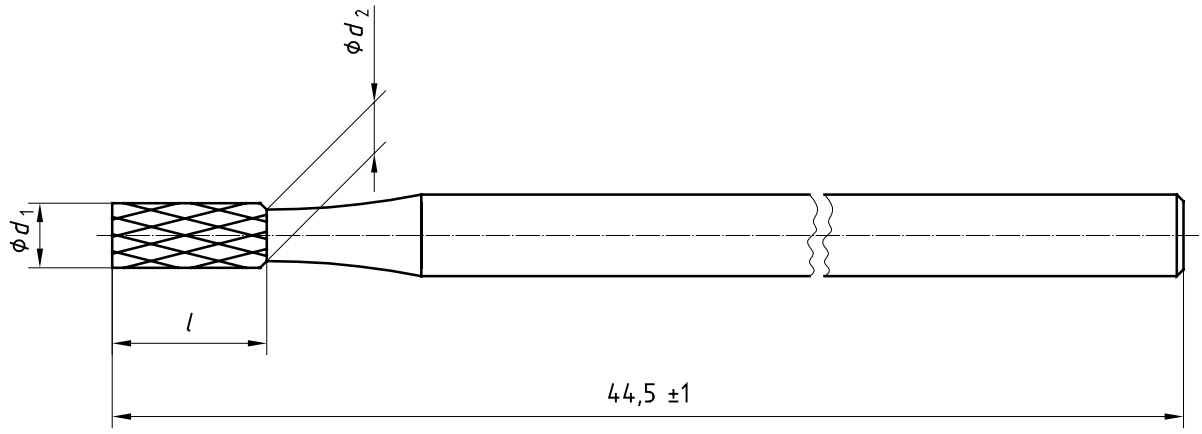

Figure 4

Table 4 — Dimensions

Designation of nominal diameter (Nominal size)	d_1 ± 0,1	d_2 max.	l ± 0,5
014	1,4	1,30	4,75
023	2,3	1,85	5,5
025	2,5	2,35	5,5

4.3.1.4.2 Cylindrical, long

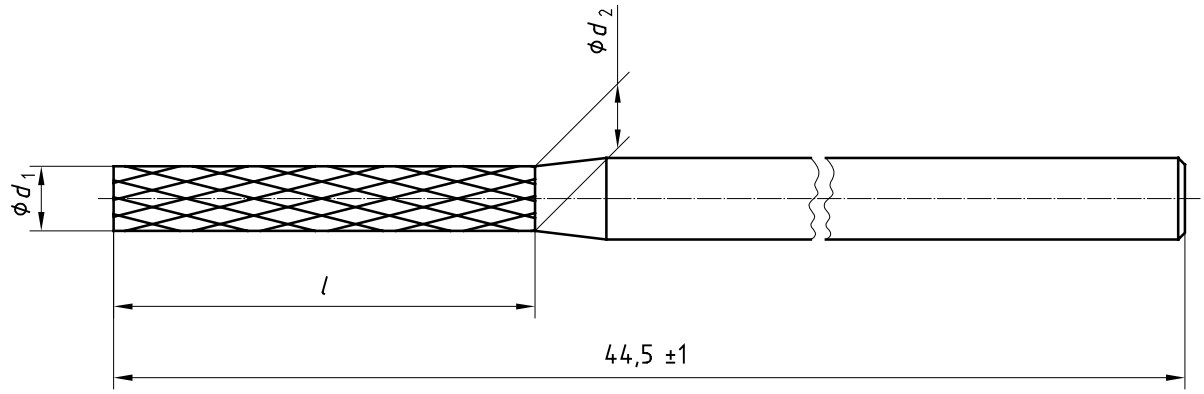

Figure 5

Table 5 — Dimensions

Designation of nominal diameter (Nominal size)	d_1 ± 0,1	d_2 max.	l ± 0,5
023	2,3	2,35	15,0

4.3.1.5 Hemispherical, cylindrical

4.3.1.5.1 Hemispherical, cylindrical, regular

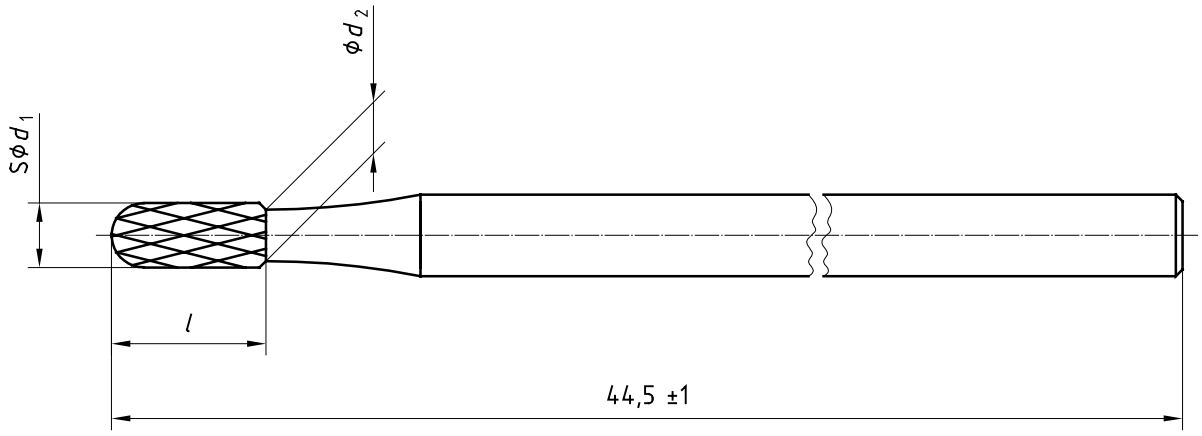

Figure 6

Table 6 — Dimensions

Designation of nominal diameter (Nominal size)	d_1 ± 0,1	d_2 max.	l ± 0,5
014	1,4	1,30	4,75
023	2,3	1,85	5,5

4.3.1.5.2 Hemispherical, cylindrical, long

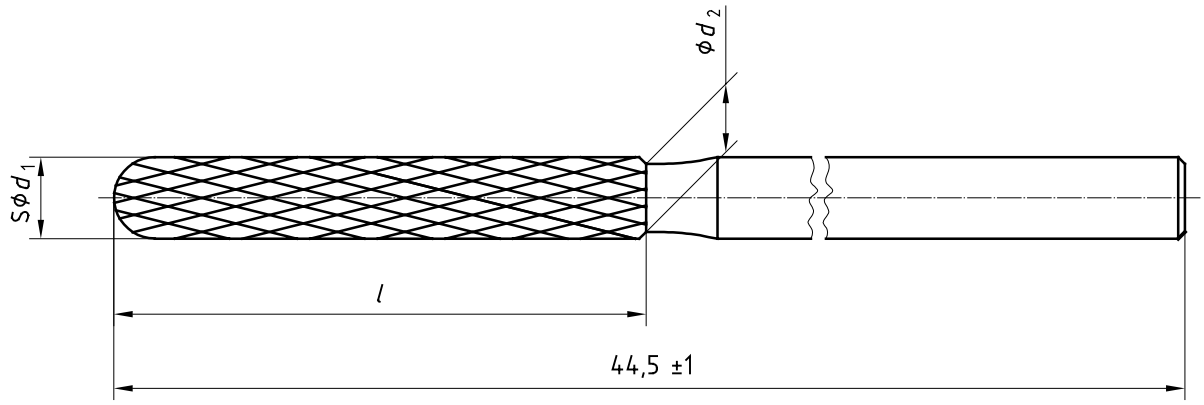

Figure 7

Table 7 — Dimensions

Designation of nominal diameter (Nominal size)	d_1 ± 0,1	d_2 max.	l ± 0,5
016	1,6	1,6	9,5
023	2,3	2,35	15,0

4.3.1.6 Truncated conical, domed

4.3.1.6.1 Truncated conical, domed, regular

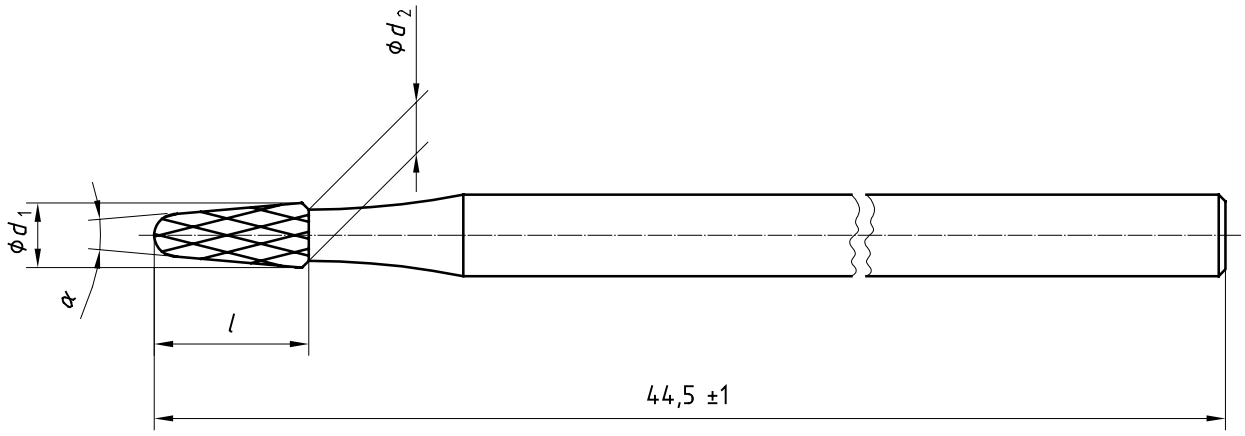

Figure 8

Table 8 — Dimensions

Designation of nominal diameter (Nominal size)	d_1 ± 0,1	d_2 max.	l ± 0,5	α
014	1,4	1,25	4,75	10° to 14°
016	1,6	1,50	5,0	
018	1,8	1,60	5,5	
023	2,3	1,95	5,5	

4.3.1.6.2 Truncated conical, domed, long

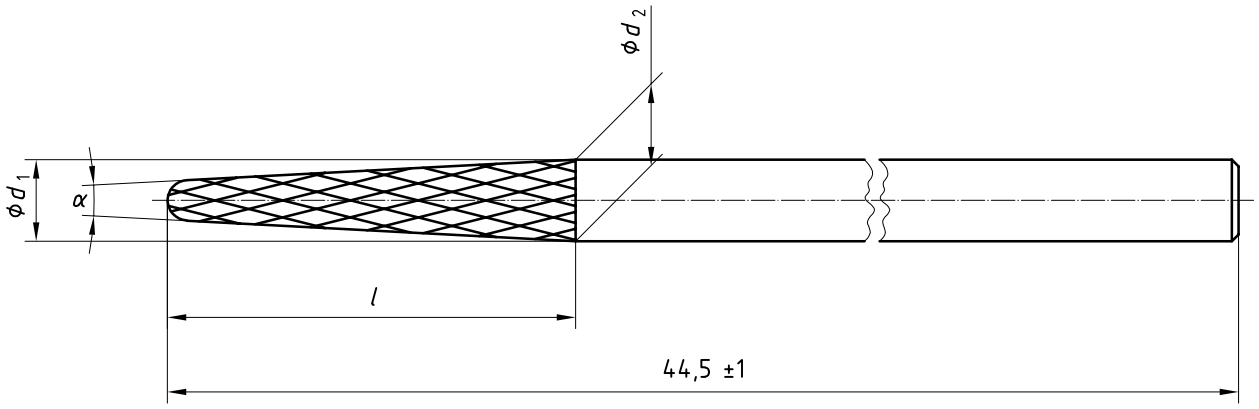

Figure 9

Table 9 — Dimensions

Designation of nominal diameter (Nominal size)	d_1 ± 0,1	d_2 max.	l ± 0,5	α
016	1,6	1,6	9,5	6° to 10°
023	2,3	2,35	11,5	

4.3.1.7 Truncated conical, sharp end

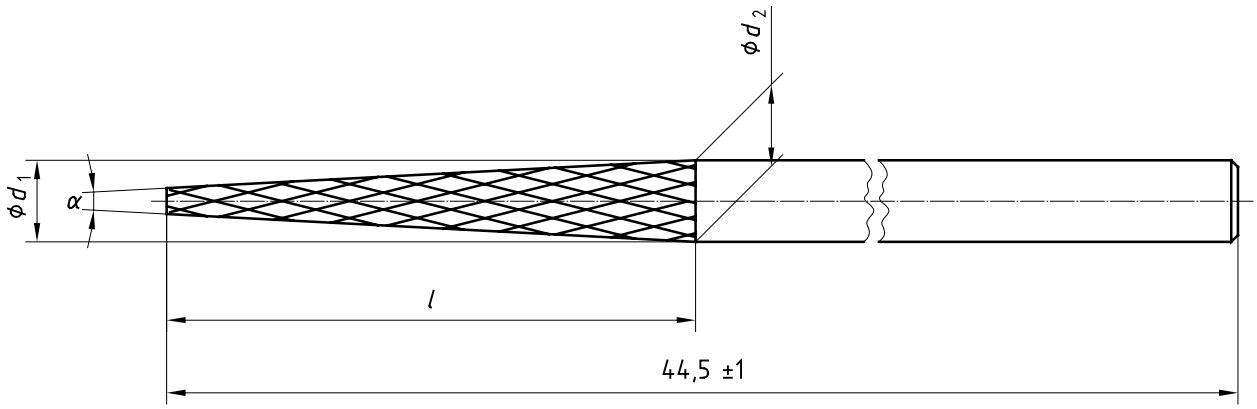

Figure 10

Table 10 — Dimensions

Designation of nominal diameter (Nominal size)	d_1 ± 0,1	d_2 max.	l ± 0,5	α
023	2,3	2,35	15,0	6° to 10°

4.3.1.8 Egg (longitudinal ellipsoidal)

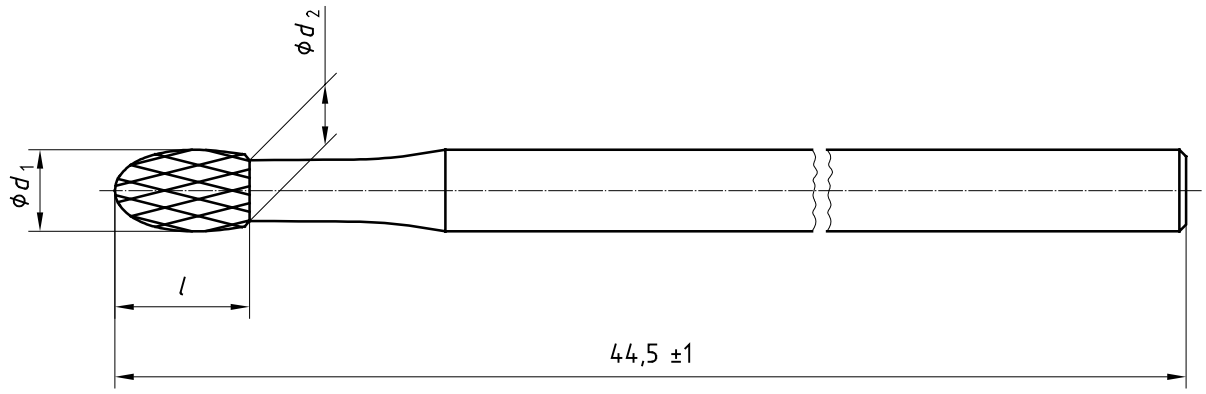

Figure 11

Table 11 — Dimensions

Designation of nominal diameter (Nominal size)	d_1 ± 0,1	d_2 max.	l ± 0,5
014	1,4	1,0	2,9
023	2,3	1,7	3,8

4.3.1.9 Torpedo (ogivo/cylindrical)

4.3.1.9.1 Torpedo, regular

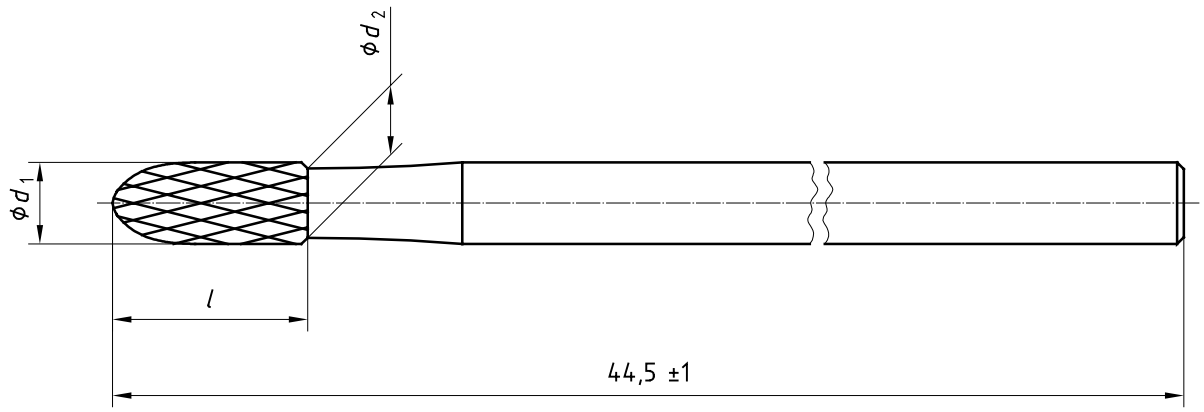

Figure 12

Table 12 — Dimensions

Designation of nominal diameter (Nominal size)	d_1 ± 0,1	d_2 max.	l ± 0,5
012	1,2	1,15	4,5
023	2,3	1,85	5,5

4.3.1.9.2 Torpedo, long

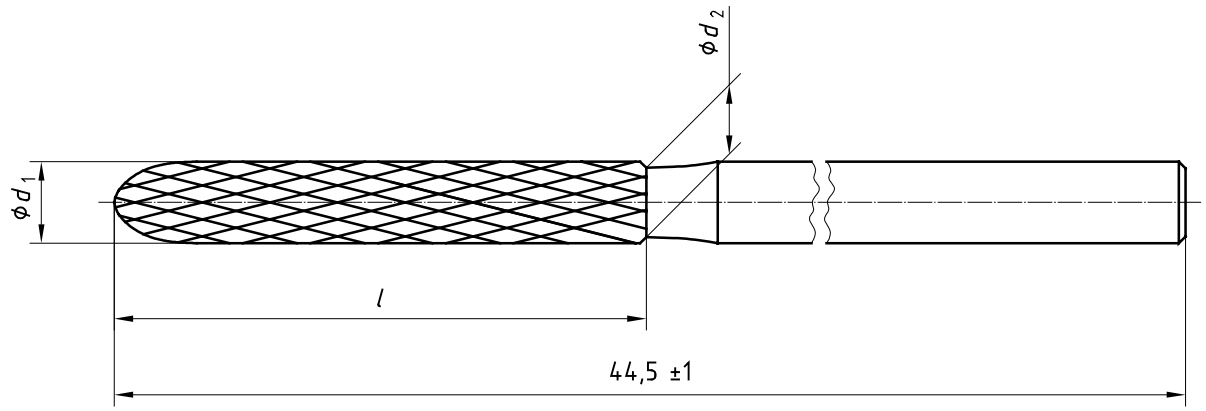

Figure 13

Table 13 — Dimensions

Designation of nominal diameter (Nominal size)	d_1 ± 0,1	d_2 max.	l ± 0,5
016	1,6	1,6	9,5
023	2,3	2,35	15,0

4.3.1.10 Pear (hemispherical/inverted conical)

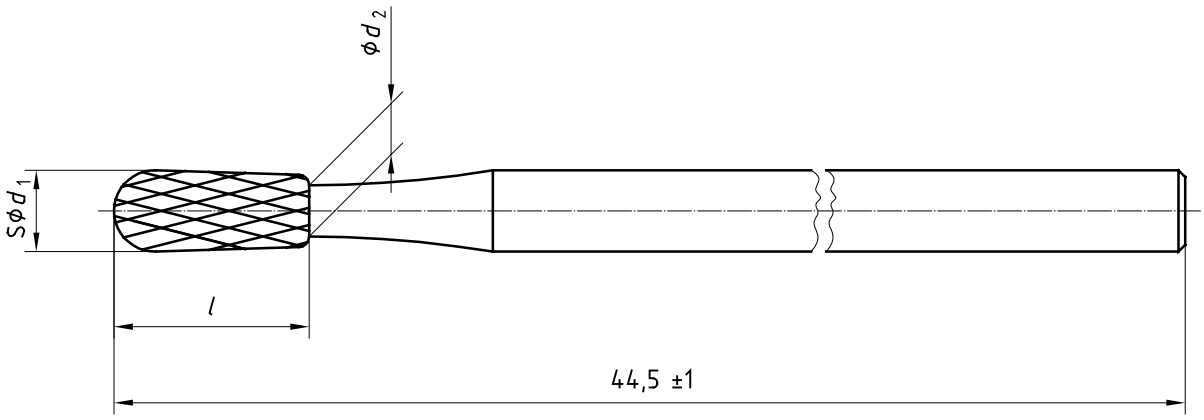

Figure 14

Table 14 — Dimensions

Designation of nominal diameter (Nominal size)	d_1 ± 0,1	d_2 max.	l ± 0,5
023	2,3	1,45	5,5
029	2,9	2,00	5,5

4.3.1.11 Bud (hemispherical)

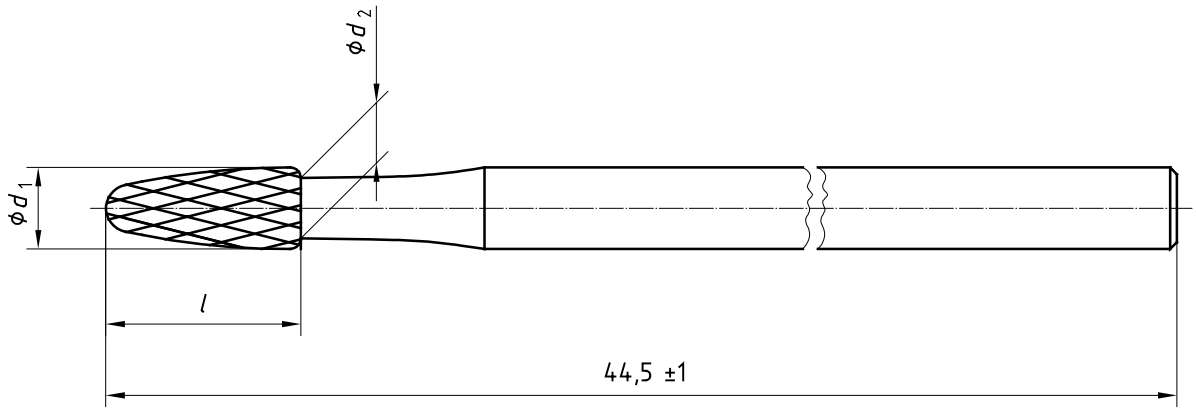

Figure 15

Table 15 — Dimensions

Designation of nominal diameter (Nominal size)	d_1 ± 0,1	d_2 max.	l ± 0,5
012	1,2	0,9	3,5
023	2,3	1,7	5,5

Table 16 — Designation of toothing and number of blades

Designation of toothing			Number of blades																					
			010[a]		012[a]		014[a]		016[a]		018[a]		021[a]		023[a]		025[a]		027[a]		029[a]		031[a]	
Term	Abbre-viation[b]	Colour	right[c]	left[c]	right[c]	left[c]	right[c]	left[c]	right[c]	left[c]	right[c]	left[c]	right[c]	left[c]	right[c]	left[c]	right[c]	left[c]	right[c]	left[c]	right[c]	left[c]	right[c]	left[c]
Very fine	VF	Yellow					12 to 16		14 to 16		16 to 20													
	VFX							8 to 12	14 to 16	8 to 12	16 to 20	12 to 16			20 to 24	12 to 18	20 to 24	12 to 18	20 to 24	12 to 18				
Fine	F	Red			10 to 12		10 to 12		12 to 14		12 to 14													
	FX				10 to 12	6 to 8	10 to 12	6 to 8	12 to 14	8 to 12	12 to 14	8 to 12			14 to 22	8 to 18	14 to 22	8 to 18	14 to 22	8 to 18	18 to 22	12 to 18	18 to 22	12 to 18
Medium	M	Blue	6 to 8		6 to 8		8 to 10	8 to 10	10 to 12						8 to 16		8 to 16		8 to 16		12 to 16		12 to 16	
	MX		6 to 8	4 to 6	6 to 8	4 to 6	8 to 10	5 to 8	8 to 10	6 to 8	10 to 12	6 to 9			10 to 16	6 to 14	10 to 16	6 to 14	10 to 16	6 to 14	12 to 16	8 to 14	12 to 16	8 to 14

NOTE Empty cells indicate miniature carbide laboratory cutters which do not exist at present.

[a] Nominal diameter refers to the diameters in Tables 1 to 15.

[b] X refers to miniature carbide laboratory cutters with crosscut toothing.

[c] “Right” or “left” refers to the helicoidal toothing on the working part, when viewed from along the shaft of the miniature carbide laboratory cutter.

4.3.2 Shank

The shank shall be Type 2 as specified in ISO 1797-1.

4.4 Toothing

The toothing of the cutters in Figures 1 to 15 is shown as examples only. The selection of the toothing is at the discretion of the manufacturer. For the designation of toothing, see clause 7 and Table 16.

Testing shall be carried out in accordance with 5.3.

4.5 Run-out

The total indicated run-out shall not exceed 0,08 mm.

Testing shall be carried out in accordance with 5.4.

5 Test procedure

5.1 Shapes

Determine the shapes by using a shadowgraph or measuring the relevant dimensions in accordance with ISO 8325.

5.2 Dimensions and number of blades

Measure the dimensions in accordance with ISO 8325.

Determine the number of blades by visual inspection.

5.3 Toothing

Determine the type of toothing by visual inspection.

5.4 Run-out

Determine the run-out in accordance with ISO 8325.

The measurement point shall be the largest diameter, or, for cylindrical cutters, the middle of the working part.

6 Acceptance quality limit (AQL)

The acceptance quality limit (AQL) in accordance with ISO 2859-1 shall be 6,5.

7 Designation of toothing and number of blades

The toothing shall be designated by any of the following information, or any combination thereof:

a) a descriptive term (fine, medium, etc.) as specified in Table 16;

b) its abbreviation (F, M, etc.) as specified in Table 16;

c) a colour as specified in Table 16;

d) the code number as specified in ISO 6360.

The number of blades shall be as specified in Table 16.

8 Marking

Marking on miniature carbide laboratory cutters may contain information concerning the toothing of the instrument.

If a marking is applied, it shall follow the specification of clause 7.

Marking by colour shall be applied behind the working part, outside of the fitting length.

9 Labelling on the package

The labelling on the package shall contain at least the following information:

a) name and/or trade mark of manufacturer or distributor;

b) material of working part;

c) type of shank, in accordance with ISO 1797-1;

d) shape number, in accordance with ISO 6360;

e) nominal diameter (nominal size);

f) identification of toothing;

g) lot number.

The information should preferably be given in accordance with the relevant parts of ISO 6360.

10 Packaging

The packaging used for miniature carbide laboratory cutters is at the discretion of the manufacturer.

ICS 11.060.20

Price based on 20 pages