INTERNATIONAL STANDARD

ISO 15488

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Collets with 8° setting angle for tool shanks — Collets, nuts and fitting dimensions

Pinces de serrage avec angle de réglage de 8° pour queues d'outil — Pinces, écrous de serrage et dimensions d'assemblage

Reference number
ISO 15488:2003(E)

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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 15488 was prepared by Technical Committee ISO/TC 29, *Small tools*.

This second edition cancels and replaces the first edition (ISO 15488:1996), which has been technically revised. In particular, in Table 3, the values of d_{10} for nominal dimensions 25 mm and 32 mm as well, as the values of l_{10} for nominal values 25 mm, 32 mm and 40 mm, have been modified. Figure 5 has been modified for the sake of clarity.

Collets with 8° setting angle for tool shanks — Collets, nuts and fitting dimensions

1 Scope

This International Standard specifies the dimensions, materials and manufacturing requirements, and designation of collets (of form A or of form B) for tools with cylindrical shanks and their corresponding holders and nuts. For non-standardized clamping devices, such as clamping devices specified in drawings, these holders can be agreed upon between customer and supplier.

Form A applies to milling and any other application where a hard collet bore is required, provided that the clamping range of h10 be sufficient.

Form B applies for general purposes where an extended clamping range is required.

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 2768-1:1989, *General tolerances — Part 1: Tolerances for linear and angular dimensions without individual tolerance indications*

3 Dimensions

3.1 General

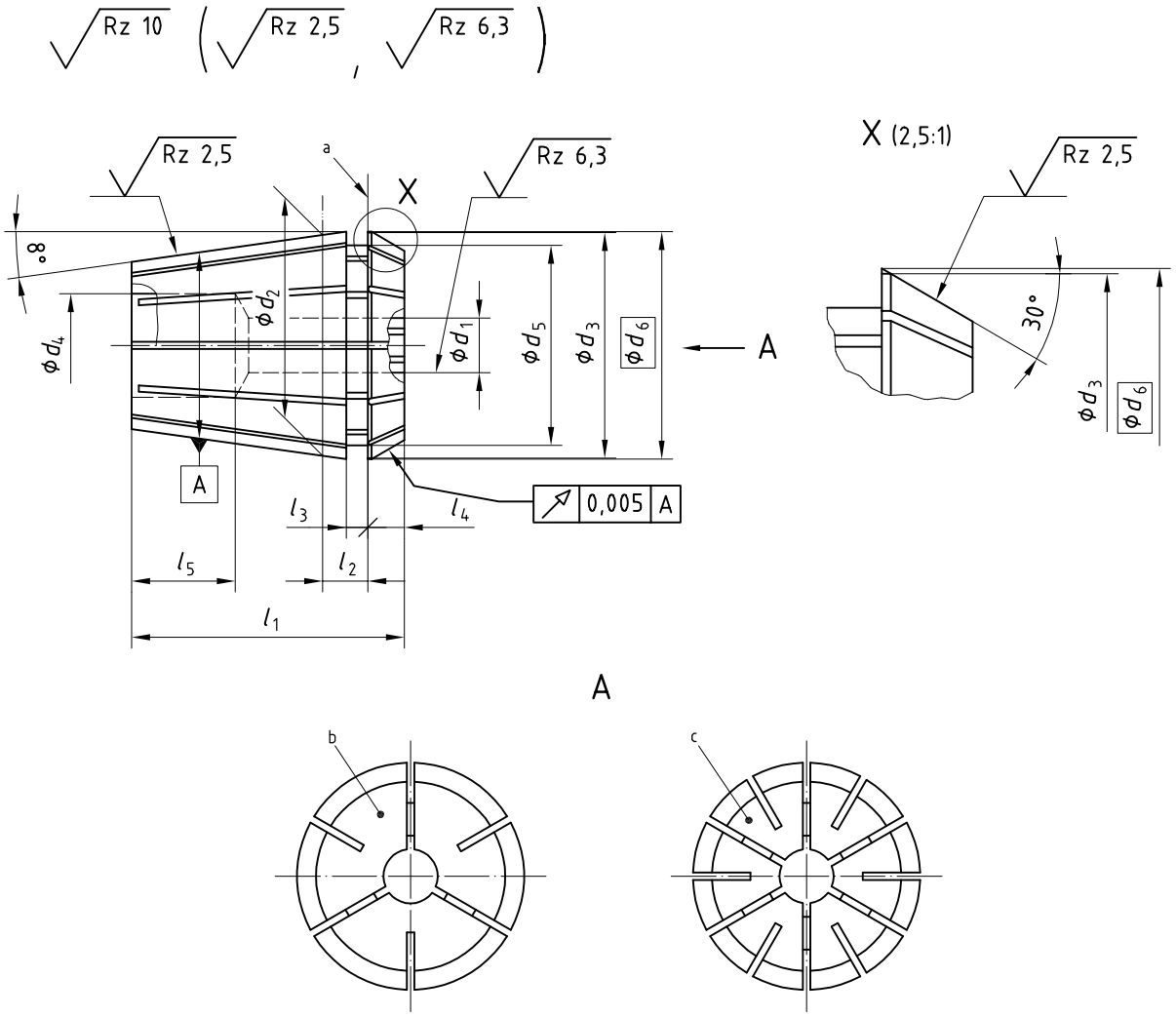
Collets, holders and nuts need not correspond to Figures 1 to 3; only the given dimensions shall be complied with.

General tolerances: ISO 2768-m

3.2 Collets

See Figure 1 and Table 1.

Tolerances in millimetres,
surface roughness in micrometres



a Reference area.

b Form A, 6 to 8 slots.

c Form B, 12 to 16 slots.

Figure 1 — Collets form A and form B

Table 1 — Collet dimensions

Dimensions in millimetres

Nominal size	d_1 H7 Form A[a] Nominal diameter from (incl.)	d_1 H7 Form A[a] Nominal diameter up to (incl.)	d_1 H7 Form B[b] Nominal diameter from (incl.)	d_1 H7 Form B[b] Nominal diameter up to (incl.)	d_2	d_3 $^{0}_{-0,2}$ Form A	d_3 $^{0}_{-0,2}$ Form B	d_4 Form A	d_4 Form B	d_5	d_6 Form A	d_6 Form B	l_1 max.	l_2 Form A	l_2 Form B	l_3 Form A	l_3 Form B	l_4 ± 0,2	l_5 min.
11	1	< 3	1	2,5	11	11,3	11,5	5	5	9,5	11,6	11,7	18	2	3,8	2	2	2,5	9
	3	6	3	7				—	—										—
16	1	< 5	1	4	16	16,74	17	7	7,5	13,8	17,1	17,25	27,5	2,3	6,26	2,3	2,7	4	9
	5	10	5	10				—	—										—
20	1	< 7	1	6	20	20,74	21	9	10	17,4	21,1	21,3	31,5	2,4	6,36	2,4	2,8	4,8	12
	7	13	7	13				—	—										—
25	1	< 8	2	7	25	25,74	26	10	12	22	26,1	26,3	34	2,5	6,66	2,5	3,1	5	13
	8	16	8	16				—	—										—
32	2	< 8	3	7	32	32,74	33	12	15	29,2	33,1	33,35	40	2,7	7,16	2,7	3,6	5,5	15
	8	20	8	20				—	—										—
40	3	< 9	4	8	40	40,74	41	14	20	36,2	41,1	41,4	46	3,5	7,66	3,5	4,1	7	18
	9	26	9	26				—	—										—

[a] Form clamping range h10.

[b] Clamping range $^{0}_{-0,5}$.

Nominal size 16 to 40, clamping range $^{0}_{-1}$ or, upon agreement, $^{0}_{-0,5}$.

3.3 Holder

See Figure 2 and Table 2.

Tolerances in millimetres,
surface roughness in micrometers

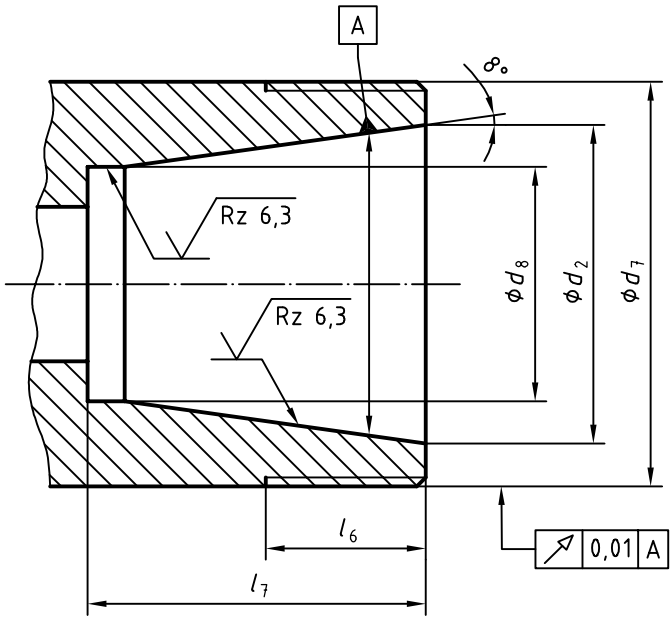


Figure 2 — Holder form C

Table 2 — Holder dimensions

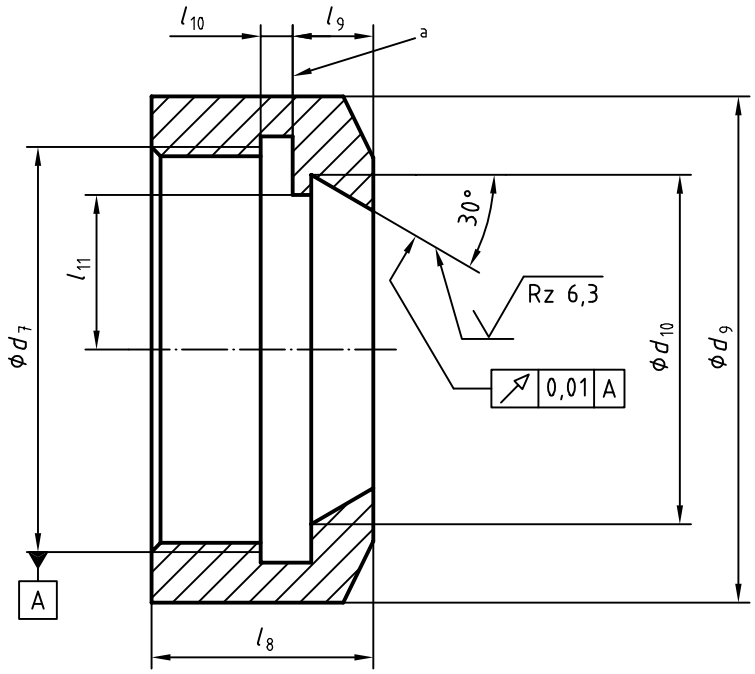
Dimensions in millimetres

Nominal size		11	16	20	25	32	40
d_2	± 0,05	11	16	20	25	32	40
d_7	6g	M14 × 0,75	M22 × 1,5	M25 × 1,5	M32 × 1,5	M40 × 1,5	M50 × 1,5
d_8	$^{+0,5}_{0}$	7,5	10,5	13,5	18	23,5	30,5
l_6	min.	10	13	13,5	14	16	17
l_7 (Form A or B)	min.	17	22	26,5	29	34	38

3.4 Nut

See Figure 3 and Table 3.

Tolerances in millimetres,
surface roughness in micrometres



a Reference area.

Figure 3 — Nut form D

Table 3 — Nut dimensions

Dimensions in millimetres

Nominal size	d_7 6H	d_9	d_{10}	l_8	l_9	l_{10} $^{0}_{-0,2}$	l_{11} max.
11	M14 × 0,75	19	12,1	11,3	3,1	1	5
16	M22 × 1,5	32	17,71	17,5	4,7	1,1	7,2
20	M25 × 1,5	35	21,76	19	5,5	1,2	9,2
25	M32 × 1,5	42	26,64	20	5,7	1,3	11,5
32	M40 × 1,5	50	33,57	22,5	6,2	1,6	14,9
40	M50 × 1,5	63	41,86	25,5	7,7	2,1	18,5

3.5 Collet run-out tolerances

Table 4 specifies collet run-out tolerances. These tolerances are checked as is shown in Figure 4 by the introduction of a test mandrel into the collet.

The diameter of the test mandrel is the nominal diameter of the collet.

For the test mandrel, the following specifications apply:

a) diameter tolerance: h6;

b) cylindricity: 0,002 mm;

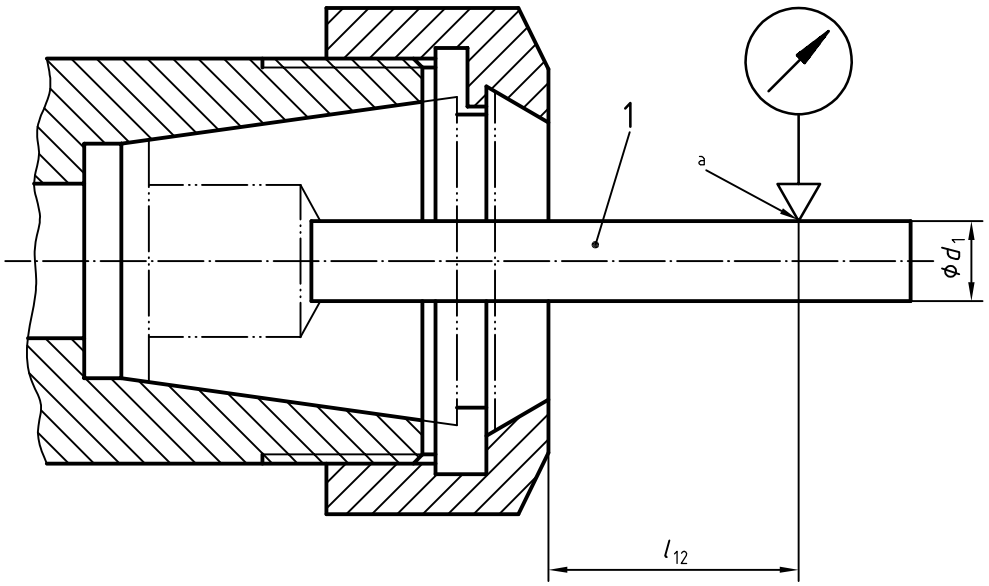
c) parallelism: 0,002 mm;

d) roundness: 0,002 mm;

e) surface without longitudinal marks;

f) maximum surface roughness $Rz = 4$ µm;

g) surface hardness: $(58\ ^{+3}_{0})$ HRC.



Key

1 test mandrel

a Test point.

Figure 4 — Testing of run-out tolerance

Table 4 — Collet run-out tolerance values

Dimensions in millimetres

d_1 H7 Nominal diameter		l_{12}	Run-out tolerance[a]	
above	up to (included)		Class 1[b]	Class 2
1 (included)	1,6	6	0,01	0,015
1,6	3	10		
3	6	16		
6	10	25		
10	18	40	0,015	0,020
18	26	50		

[a] Normal style collets are designed with run-out tolerance class 2. If class 1 is required, it shall be given separately, see 5.1.

[b] In the case of applications where run-out tolerances class 1 are required, the accuracy of the whole system (machine tool spindle, holder, collet and tool) shall be observed.

4 Material

4.1 Collet

Steel, at manufacturer's discretion, with a tensile strength of at least 700 N/mm^2.

4.2 Nut

Steel, at manufacturer's discretion.

5 Manufacturing requirements

5.1 Collet

Collets form A and form B: bore and taper hardened, hardness ($44\ ^{+4}_{0}$) HRC.

Tolerances of taper: AT3 in accordance with Table A.1.

Run-out tolerance: class 2, for normal styles.

5.2 Holder

Taper bore hardened, hardness ($56\ ^{+4}_{0}$) HRC.

Tolerances of taper: AT4 in accordance with Table A.2.

5.3 Nut

Design at manufacturer's discretion.

6 Designation

6.1 Collet

A collet in accordance with this International Standard shall be designated by

a) "Collet";

b) reference to this International Standard, i.e. ISO 15488;

c) form (A or B);

d) nominal size;

e) nominal diameter, d_1, in millimetres;

f) run-out tolerance in the case of class 1.

EXAMPLE 1 A collet of form B, nominal size 32 and nominal diameter $d_1 = 10$ mm is designated as follows:

Collet ISO 15488 - B 32 × 10

EXAMPLE 2 A collet of form B, nominal size 32, nominal diameter $d_1 = 10$ mm and of run-out tolerance class 1 is designated as follows:

Collet ISO 15488 - B 32 × 10 Cl1

6.2 Holder

A holder in accordance with this International Standard shall be designated by

a) "Holder";

b) reference to this International Standard, i.e. ISO 15488;

c) form C;

d) nominal size.

EXAMPLE A holder of form C and nominal size 32 is designated as follows:

Holder ISO 15488 - C 32

6.3 Nut

A nut in accordance with this International Standard shall be designated by

a) "Nut";

b) reference to this International Standard, i.e. ISO 15488;

c) form D;

d) nominal size.

EXAMPLE A nut of form D and nominal size 32 is designated as follows:

Nut ISO 15488 - D 32

6.4 Test mandrel

A test mandrel in accordance with this International Standard shall be designated by

a) "Test mandrel";

b) reference to this International Standard, i.e. ISO 15488;

c) diameter, d_1, in millimetres.

EXAMPLE A test mandrel of diameter $d_1 = 10$ mm is designated as follows:

Test mandrel ISO 15488 - 10

7 Marking

Collets in accordance with this International Standard are marked with:

— relevant nominal diameter;

— name or trademark of the manufacturer.

8 Operational set-up

See Figure 5 and Table 5.

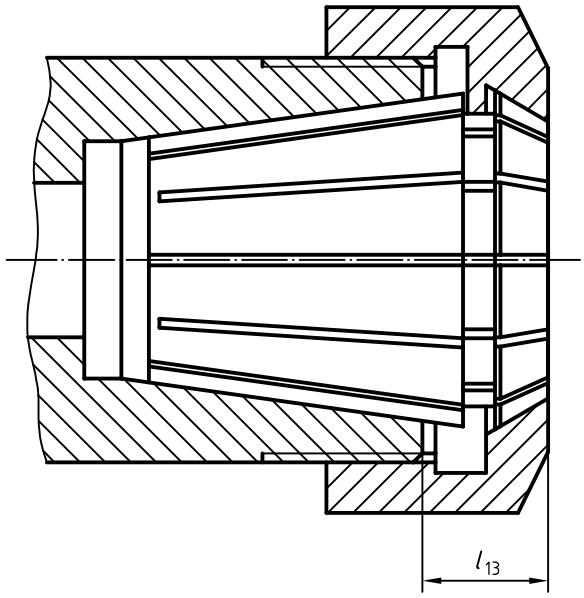


Figure 5 — Operational set-up for collets form A and form B

Table 5 — Dimensions

Dimensions in millimetres

Nominal size	l_{13} max.
11	6,6
16	10,6
20	11,5
25	12
32	13
40	15

Annex A
(normative)

Cone angle tolerances AT3 and AT4

This annex specifies the values for AT3 tolerance (see Table A.1) and AT4 tolerance (see Table A.2) from ISO 1947:1973, *System of cone tolerances for conical workpieces form C = 1:3 to 1:500 and lengths from 6 to 630 mm*, which has been withdrawn.

Table A.1 — Cone angle tolerance AT3

Range of cone lengths L		AT_α		AT_D[a]
mm		μrad	seconds	μm
over	up to			
10	16	100	21	1 ... 1,6
16	25	80	16	1,3 ... 2
25	40	63	13	1,6 ... 2,5

[a] AT_D is calculated from the constant AT_α value within a range of cone lengths.

Table A.2 — Cone angle tolerance AT4

Range of cone lengths L		AT_α		AT_D[a]
mm		μrad	seconds	μm
over	up to			
10	16	160	33	1,6 ... 2,5
16	25	125	26	2 ... 3,2
25	40	100	21	2,5 ... 4

[a] AT_D is calculated from the constant AT_α value within a range of cone lengths.

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Price based on 11 pages