

INTERNATIONAL
STANDARD

ISO
10552

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**Timekeeping instruments — Crowns and
sealed tubes — Designs and dimensions**

*Instruments horaires — Couronnes et tubes étanches — Constructions et
dimensions*

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Reference number
ISO 10552:1999(E)

Foreword

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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 10552 was prepared by Technical Committee ISO/TC 114, *Horology*, Subcommittee SC 7, *Overall dimensions*.

Annex A of this International Standard is for information only.

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Timekeeping instruments — Crowns and sealed tubes — Designs and dimensions

1 Scope

This International Standard specifies designs and dimensions of crowns and sealed tubes and their tolerances.

This International Standard is applicable to crowns and sealed tubes of mechanical, electromechanical and electronic wristwatches of water-resistant designs.

2 Normative references

The following standards contain provisions which, through references in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard 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 2281:1990, *Horology — Water-resistant watches*.

ISO 6426-2:1984, *Horological vocabulary — Part 2: Technico-commercial definitions*.

3 Definitions

For the purposes of this International Standard, the definitions given in ISO 6426-2 apply.

4 Symbols

4.1 Crowns

- D_1 outer diameter of the crown (types 1, 2 and 3)
- D_2 diameter of the thread (types 1, 2 and 3)
- D_3 diameter of the crown hub (types 1, 2 and 3)
- D_4 diameter of reaming bore for type 4 tube
- C height of the knurled surface (types 1, 2 and 3)
- F_1 protrusion of the crown hub (types 1 and 3)
- F_2 sinking of the crown hub (type 2)

- F_3 positional dimension of the groove (type 3)
- H height of the crown (types 1, 2 and 3)
- P_1 depth of the crown bore for the sealed tube (types 1, 2 and 3)
- P_2 the tapped part shall be at least 3 threads long (types 1, 2 and 3)

4.2 Sealed tubes

- d_1 fitting diameter (type 1) or head diameter (types 2, 3 and 4)
- d_2 diameter of the hole for the winding stem (type 3)
- d_3 fitting diameter (types 2 and 3)
- d_4 diameter of the hole (types 1, 2 and 4) or of the bore (type 3) for the crown hub
- l total length (types 1, 2, 3 and 4)
- l_1 length of protrusion of the sealed tube (type 1) or height of the head (types 2, 3 and 4)
- l_2 depth of the hollow for the crown hub (type 3)

5 Crowns and sealed tubes — Designs and dimensions

5.1 Crowns with one gasket

Dimensions C and H (see figure 1) are variable depending on the customers' specifications.

Other dimensions and tolerances are specified in tables 1 and 2.

The minimum depth P_1 of the crowns (see figure 1) shall be greater than the length l_1 of the sealing tubes (see figure 2).

The inside diameter of the gaskets of the crowns of types 1 and 2 (see figure 1) shall be 0,20 mm to 0,25 mm less than the diameter d_1 of the sealing tubes of types 1, 2 and 3 (see figure 2).

For crowns of types 1 and 2 (see figure 1) the finished thickness after drilling (H minus P_2) shall be not less than 0,60 mm.

For crowns of type 1 (see figure 1) the protrusion F_1 of the crown hubs shall be 0,50 mm (tol. js12).

For crowns of type 2 (see figure 1) the end of the crown hubs F_2 shall be recessed 0,10 mm (tol. js12) into the crown with tubes of types 1 and 2, and 0,20 mm (tol. js12) with tube of type 3.

For crowns of types 1 and 2 (see figure 1 and table 1), the diameter of the crown hub D_3 shall be defined by:

$$D_3 = d_4 - 0,08 \text{ mm} \text{ and } D_3 \geq D_2 + 0,27 \text{ mm}.$$

For crowns of type 3 (see figure 1 and table 2), the protrusion F_1 of the crown hubs shall be between 1,60 mm and 2,60 mm (tol. js12) ($\pm 50 \mu\text{m}$).

For crowns of type 3 (see figure 1 and table 3) the positional dimension F_3 of the groove shall be between 1,40 mm and 2,00 mm.

5.2 Sealed tubes

In order to conserve the internal case surface undamaged with the wall of the tubes of types 1, 2 and 3 (see figure 2), in the dimensions $d_1 = 1,50$ mm and 1,60 mm, the tube edge curvature shall be tangential to the tube outer surface with d_1 diameter.

Dimensions and tolerances for tubes of types 1, 2, 3 and 4 are specified in tables 3 to 5.

For tubes with wall thickness less than 0,125 mm, the tube shall be soldered.

For stepped tubes, the minimum length of step shall be not less than the stepped diameter.

The total length, l , of the tube shall be specified in each case. Recommended values are from 0,10 mm in 0,10 mm graduations.

The control of sealability shall be carried out on watches completed in accordance with ISO 2281.

The use of two gaskets is permissible for the crowns of types 1,2 and 3.

The following dimensions are not recommended for gold tubes:

- tubes of types 1 and 2 $d_1 = 1,50$ mm; $d_1 = 1,60$ mm
- tube of type 3 $d_1 = 1,50$ mm
- tube of type 4 $d_1 = 1,40$ mm.

6 Designations

The abbreviated designation of a sealed crown is $D_1 \times D_2 \times D_3 \times P_1 \times F_1$ type ... ISO 10552.

EXAMPLES:

4,00 x S 0,80 x 1,17 x 0,50 type 1 ISO 10552

4,00 x S 0,80 x 1,05 x 1,80 type 3 ISO 10552

The abbreviated designation of a sealed tube is $d_1 \times l_1 \times l$ type ... ISO 10552.

EXAMPLE:

2,00 x 1,90 x 3,50 type 2 ISO 10552.

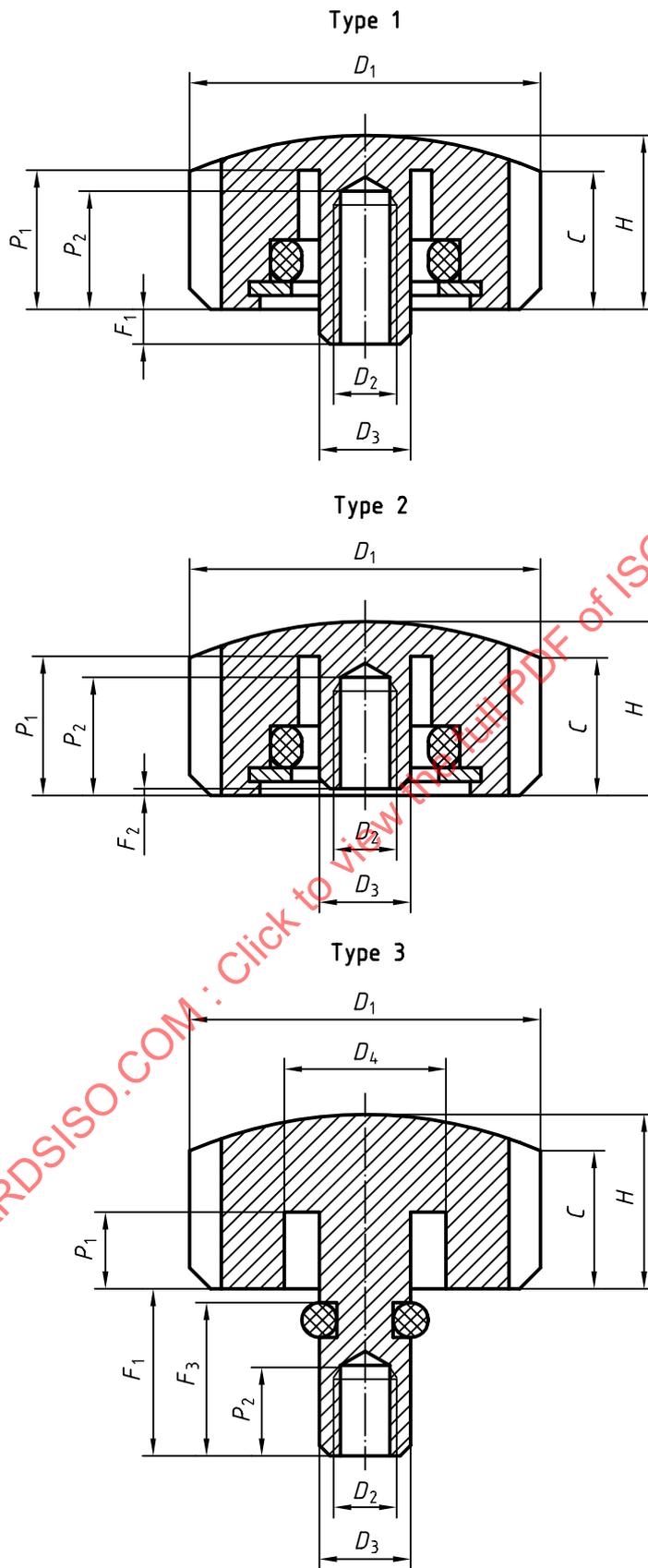


Figure 1 — Crowns

Table 1 — Crowns of types 1 and 2

Dimensions in millimetres

D_1	D_2	P_1
js13		js12
3,00	S 0,80 S 0,90	1,50 2,00 2,20 2,40
3,50	S 0,80 S 0,90	1,50 2,00 2,20 2,40
4,00	S 0,80 S 0,90 S 1,00	1,60 2,00 2,20 2,40
4,50	S 0,90 S 1,00	1,60 2,00 2,20 2,40
5,00	S 0,90 S 1,00	1,60 2,00 2,20 2,40
5,50	S 0,90 S 1,00	1,60 2,00 2,20 2,40
6,00	S 0,90 S 1,00	1,60 2,00 2,20 2,40
6,50	S 0,90 S 1,00	1,60 2,00 2,20 2,40
7,00	S 0,90 S 1,00	1,60 2,00 2,20 2,40

Table 2 — Crowns of type 3

Dimensions in millimetres

D_1	D_2	D_3	P_1
js13		js11	js12
2,50	S 0,60 S 0,70	0,85 0,95	0,80 1,00 1,20 1,40
3,00	S 0,60 S 0,70 S 0,80	0,85 0,95 1,05	0,80 1,00 1,20 1,40
3,50	S 0,60 S 0,70 S 0,80	0,85 0,95 1,05	0,80 1,00 1,20 1,40
4,00	S 0,70 S 0,80 S 0,90 S 1,00	0,95 1,05 1,20 1,30	0,80 1,00 1,20 1,40
4,50	S 0,80 S 0,90 S 1,00	1,05 1,20 1,30	0,80 1,00 1,20 1,40
5,00	S 0,80 S 0,90 S 1,00	1,05 1,20 1,30	0,80 1,00 1,20 1,40
5,50	S 0,80 S 0,90 S 1,00	1,05 1,20 1,30	0,80 1,00 1,20 1,40
6,00	S 0,90 S 1,00	1,20 1,30	0,80 1,00 1,20 1,40

Dimensions in millimetres

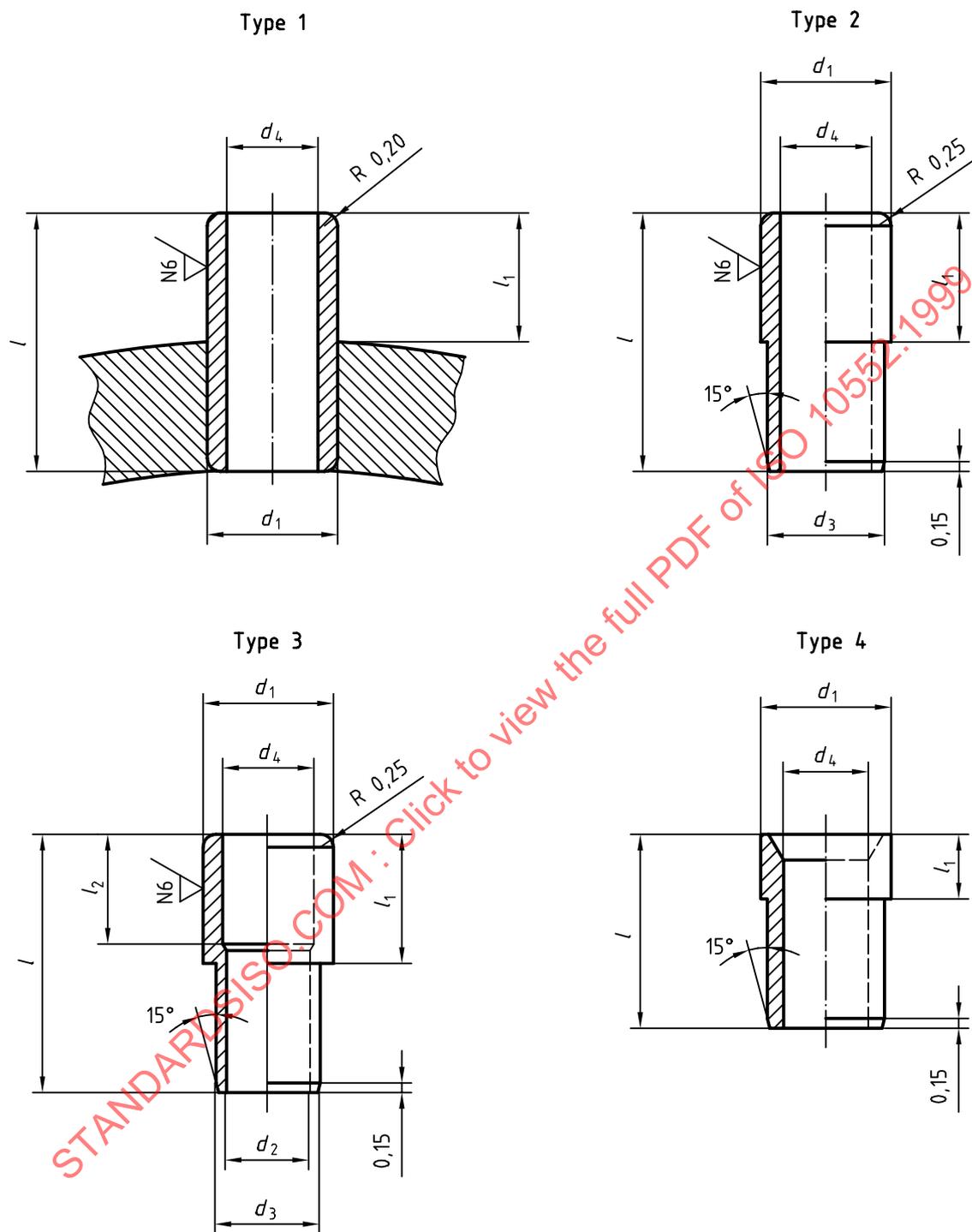


Figure 2 — Sealed tubes

Table 3 — Tubes of types 1 and 2

Dimensions in millimetres

d_1	d_4	Winding stem stroke	l_1	d_3
k7	H10		h10	k7
1,50	1,25	0,40	1,40	1,40
		0,80	1,90	
		1,00	2,10	
		1,20	2,30	
1,60	1,25	0,40	1,40	1,50
		0,80	1,90	
		1,00	2,10	
		1,20	2,30	
2,00	1,40	0,40	1,50	1,80
		0,80	1,90	
		1,00	2,10	
		1,20	2,30	
2,00	1,50	0,40	1,50	1,80
		0,80	1,90	
		1,00	2,10	
		1,20	2,30	
2,50	1,40	0,40	1,50	2,00
		0,80	1,90	
		1,00	2,10	
		1,20	2,30	
2,50	1,50	0,40	1,50	2,00
		0,80	1,90	
		1,00	2,10	
		1,20	2,30	

Table 4 — Tubes of type 3

Dimensions in millimetres

d_1	d_2	d_3	d_4	Winding stem stroke	l_1	l_2
k7	H10	k7	H10		h10	js10
1,50	1,05	1,30	1,25	0,40	1,40	1,25
				0,80	1,90	1,75
				1,00	2,10	1,95
				1,20	2,30	2,15
1,60	1,10	1,40	1,25	0,40	1,40	1,25
				0,80	1,90	1,75
				1,00	2,10	1,95
				1,20	2,30	2,15
2,00	1,30	1,60	1,40	0,40	1,50	1,35
				0,80	1,90	1,75
				1,00	2,10	1,95
				1,20	2,30	2,15
2,00	1,30	1,60	1,50	0,40	1,50	1,35
				0,80	1,90	1,75
				1,00	2,10	1,95
				1,20	2,30	2,15
2,50	1,30	1,80	1,40	0,40	1,50	1,35
				0,80	1,90	1,75
				1,00	2,10	1,95
				1,20	2,30	2,15
2,50	1,30	1,80	1,50	0,40	1,50	1,35
				0,80	1,90	1,75
				1,00	2,10	1,95
				1,20	2,30	2,15