INTERNATIONAL STANDARD

ISO 10552

Third edition
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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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Foreword

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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).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 114, *Horology*, Subcommittee SC 7, *Overall dimensions*.

This third edition cancels and replaces the second edition (ISO 10552:2012), which has been technically revised.

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 documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 286-1, *Geometrical product specifications (GPS) — ISO code system for tolerances on linear sizes — Part 1: Basis of tolerances, deviations and fits*

ISO 6426-2, *Horological vocabulary — Part 2: Technical and commercial definitions*

ISO 22810, *Horology — Water-resistant watches*

3 Terms and definitions

For the purposes of this document, the terms and 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 countersink reaming diameter for water-resistant tube into the crown (types 1, 2, and 3)

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 countersink depth of crown for water-resistant tube (types 1, 2, and 3)

P_2 the tapped part shall be at least three 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 customer's specifications.

Other dimensions and tolerances are specified in Tables 1 and 2. Tolerances are specified in accordance with ISO 286-1.

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 tubes 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 as:

— $D_3 = d_4 - 0{,}08$ mm, and

— $D_3 \geq D_2 + 0{,}27$ 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).

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 (tol. js12).

5.2 Sealed tubes

In order to maintain a flat surface at the external tube end for types 1, 2, and 3 (see Figure 2), for dimensions with d_1 = 1,50 mm and 1,60 mm, the tube edge curvature shall be shifted (towards the tube end) while remaining tangent to the outer surface indicated by the diameter d_1.

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

For tubes with wall thicknesses of 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. Values from 0,10 mm, in 0,10 mm graduations, are recommended.

The control of sealibility shall be carried out on watches completed in accordance with ISO 22810.

The use of two gaskets is permissible for 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;

— tubes of type 3: d_1 = 1,50 mm;

— tubes 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 × S 0,80 × 1,17 × 0,50 type 1 ISO 10552.

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

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

EXAMPLE

2,00 × 1,90 × 3,50 type 2 ISO 10552.

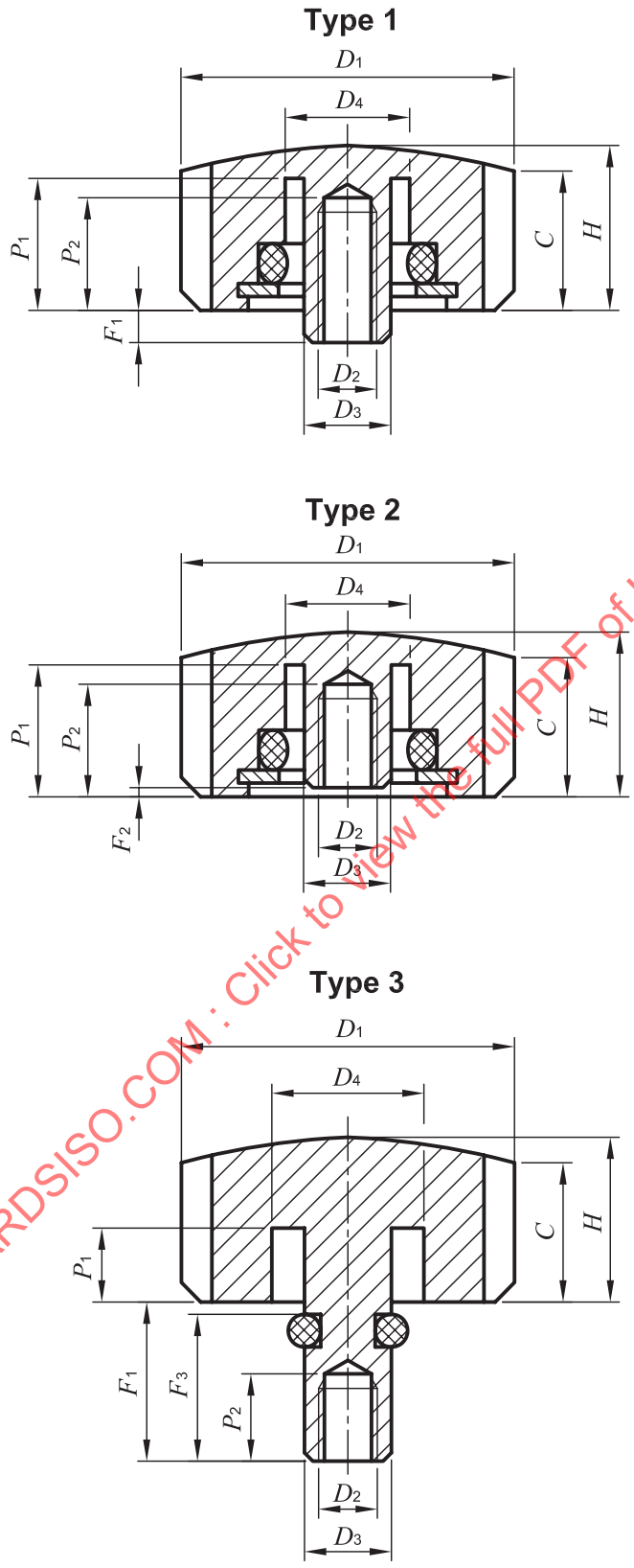

Figure 1 — Crowns

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	0,85	0,80
	S 0,70	0,95	1,00
			1,20
			1,40
3,00	S 0,60	0,85	0,80
	S 0,70	0,95	1,00
	S 0,80	1,05	1,20
			1,40
3,50	S 0,60	0,85	0,80
	S 0,70	0,95	1,00
	S 0,80	1,05	1,20
			1,40
4,00	S 0,70	0,95	0,80
	S 0,80	1,05	1,00
	S 0,90	1,20	1,20
	S 1,00	1,30	1,40
4,50	S 0,80	1,05	0,80
	S 0,90	1,20	1,00
	S 1,00	1,30	1,20
			1,40
5,00	S 0,80	1,05	0,80
	S 0,90	1,20	1,00
	S 1,00	1,30	1,20
			1,40
5,50	S 0,80	1,05	0,80
	S 0,90	1,20	1,00
	S 1,00	1,30	1,20
			1,40
6,00	S 0,90	1,20	0,80
	S 1,00	1,30	1,00
			1,20
			1,40

Dimensions in millimetres

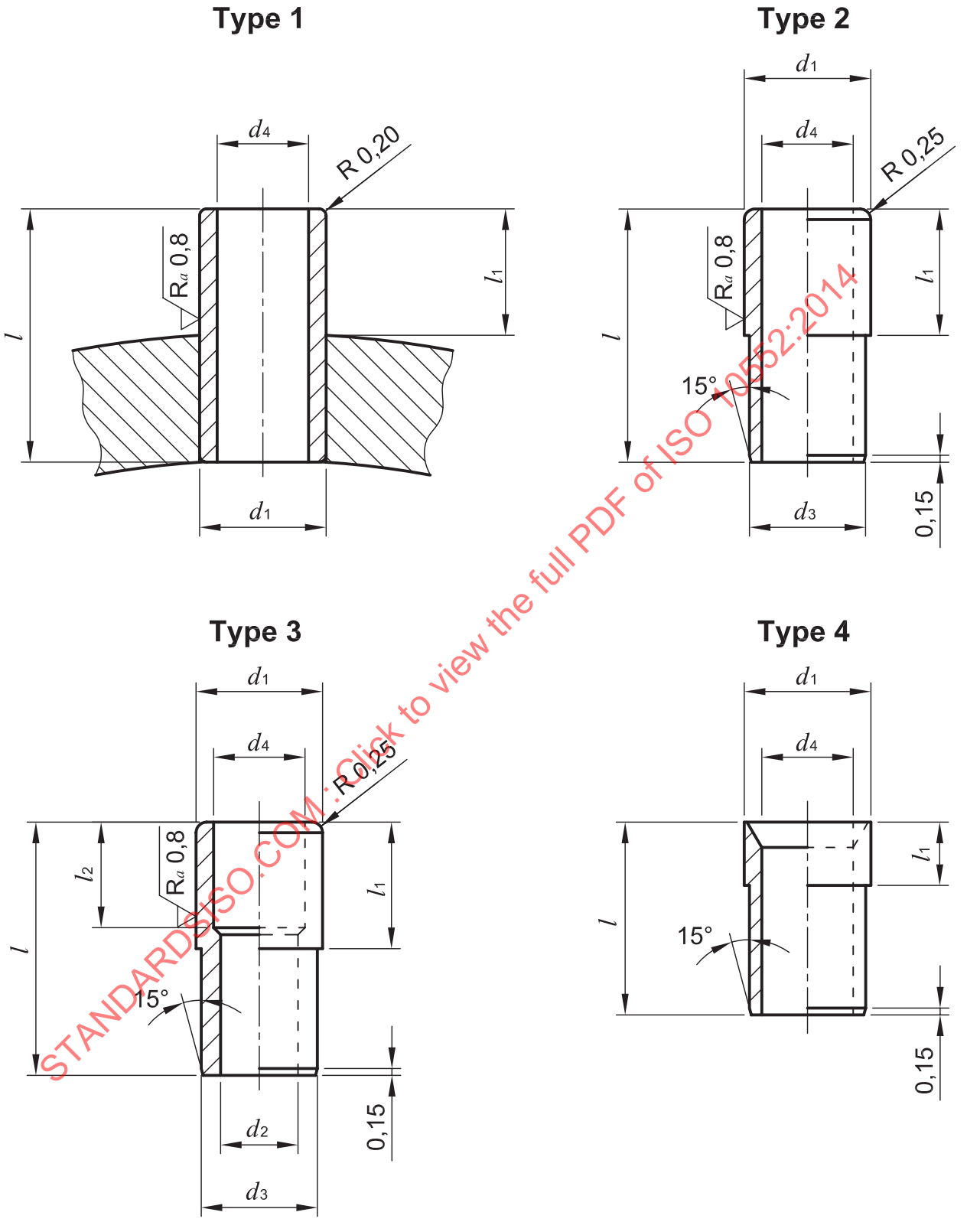

Figure 2 — Sealed tubes

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	