INTERNATIONAL STANDARD

ISO 702-1

Third edition
2009-07-15

Machine tools — Connecting dimensions of spindle noses and work holding chucks —

Part 1: Conical connection

Machines-outils — Dimensions d'assemblage des nez de broche et des mandrins porte-pièces —

Partie 1: Assemblage conique

Reference number
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Foreword

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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.

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ISO 702-1 was prepared by Technical Committee ISO/TC 39, *Machine tools*, Subcommittee SC 8, *Work holding spindles and chucks*.

This third edition cancels and replaces the second edition (ISO 702-1:2001), Tables 1 and 2 and Figures 1 and 2 of which have been technically revised.

ISO 702 consists of the following parts, under the general title *Machine tools — Connecting dimensions of spindle noses and work holding chucks*:

— *Part 1: Conical connection*

— *Part 2: Camlock type*

— *Part 3: Bayonet type*

— *Part 4: Cylindrical connection*

Machine tools — Connecting dimensions of spindle noses and work holding chucks —

Part 1: Conical connection

1 Scope

This part of ISO 702 specifies the sizes for interchangeability of conical spindle noses and corresponding connecting faces of face plates or work holding chucks.

NOTE The “camlock type”, “bayonet type” and “cylindrical connection” are specified in ISO 702-2, ISO 702-3 and ISO 702-4, respectively.

2 Interchangeability

In this part of ISO 702, all dimensions and tolerances are expressed in millimetres.

Although there are differences in the values of dimensions and assembly screws in metric and inch series, the connecting dimensions in Tables 1 and 2 allow for interchangeability between metric- and inch-based chucks (see also footnote “a” in Table 2).

3 Sizes for interchangeability

3.1 Spindle noses

See Figure 1 and Table 1.

— Type A1: Two bolt circles of diameter d_2 and d_3;

— Type A2: One outer bolt circle of diameter d_3 (Type A2 for Nos. 3 and 4; types A1 and A2 for Nos. 5 to 28).

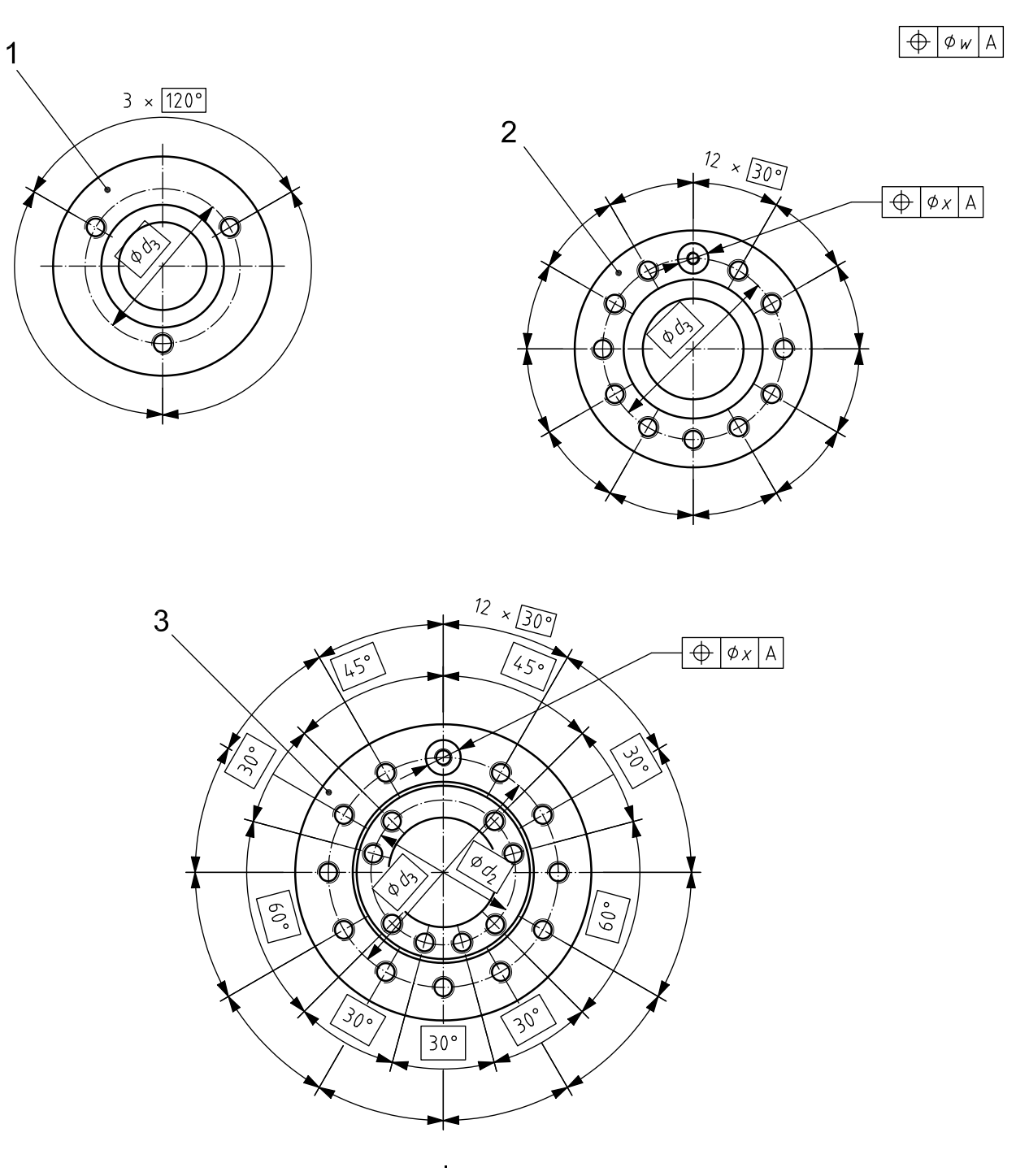
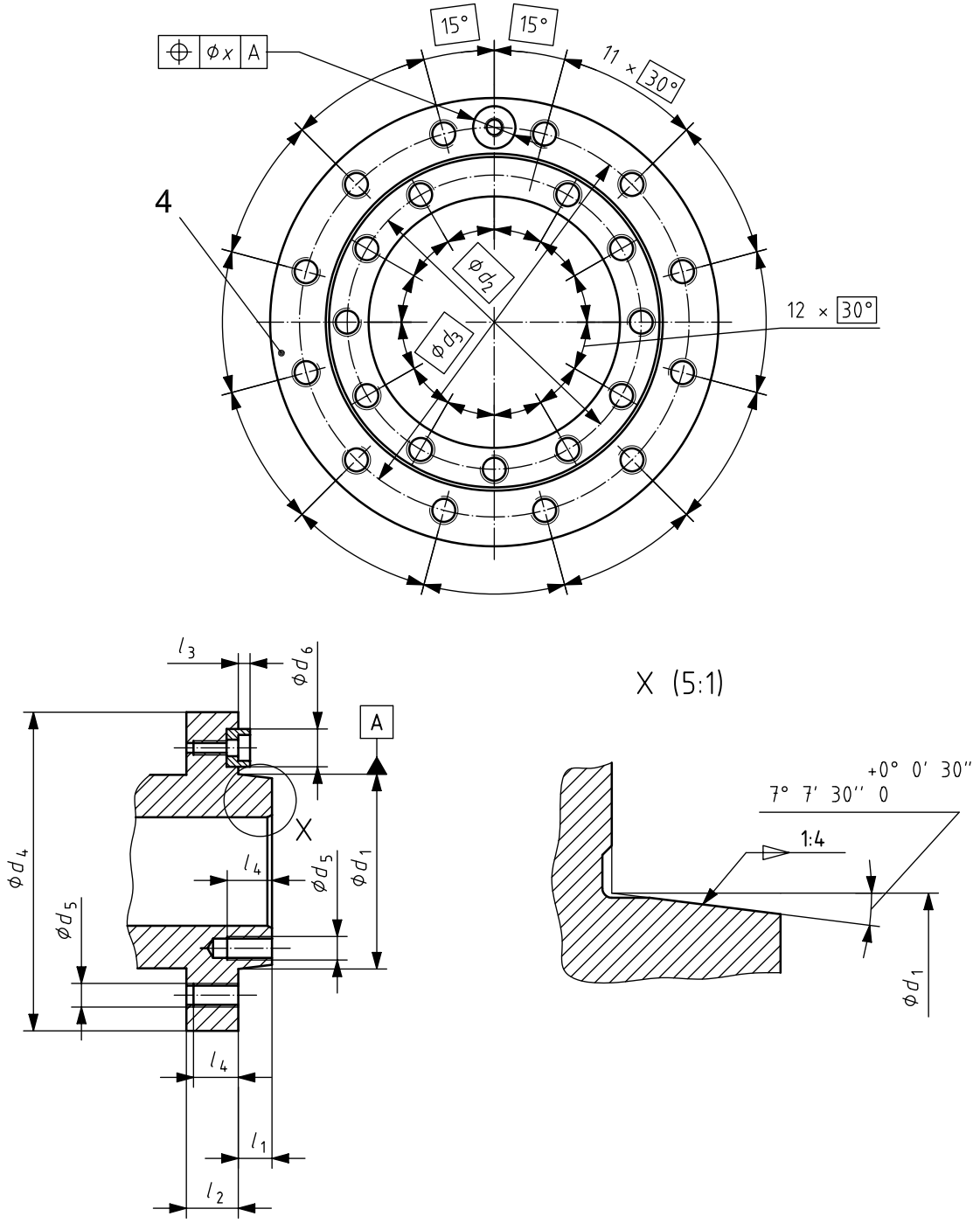


Figure 1 (*continued*)



Key

1 size No. 3
2 size No. 4
3 size Nos. 5 to 11
4 size Nos. 15 to 28

a All fixing holes.

Figure 1 — Spindle noses

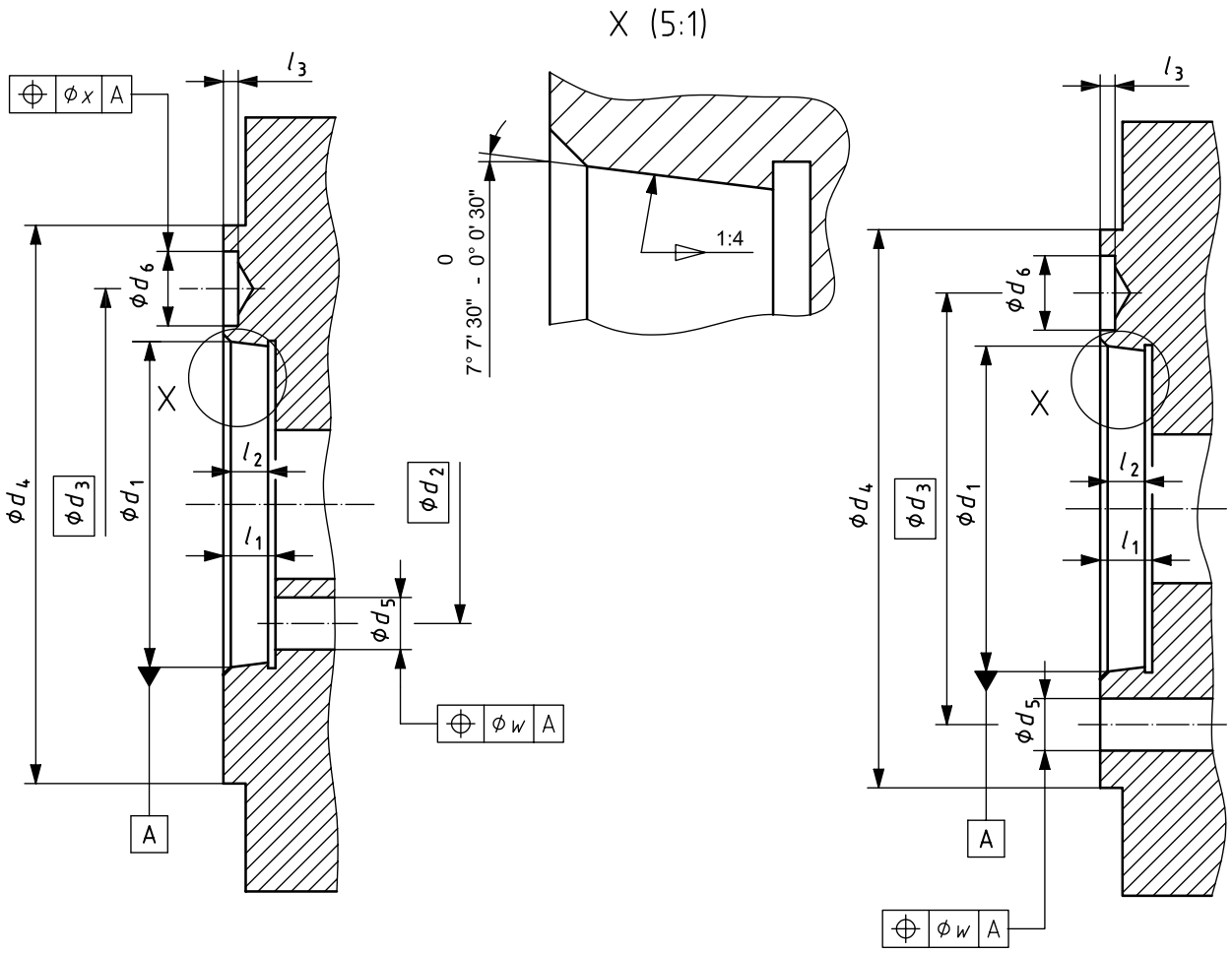
Table 1 — Dimensions of spindle noses

Dimension		No.								
		3	4	5	6	8	11	15	20	28
d_1	nom.	53,975	63,513	82,563	106,375	139,719	196,869	285,775	412,775	584,225
	tol.	$^{+0,008}_{-0}$	$^{+0,008}_{-0}$	$^{+0,010}_{-0}$	$^{+0,010}_{-0}$	$^{+0,012}_{-0}$	$^{+0,014}_{-0}$	$^{+0,016}_{-0}$	$^{+0,020}_{-0}$	$^{+0,023}_{-0}$
d_2		—	—	61,9	82,6	111,1	165,1	247,6	368,3	530,2
d_3		70,6	82,6	104,8	133,4	171,4	235	330,2	463,6	647,6
d_4		92	108	133	165	210	280	380	520	725
d_5		M10	M10	M10	M12	M16	M20	M24	M24	M30
d_6 H8/h8		—	14,25	15,9	19,05	23,8	28,6	34,9	41,3	50,8
l_1 (Type A1)	$^{0}_{-0,025}$	—	—	14,288	15,875	17,462	19,050	20,638	22,225	25,400
l_1 (Type A2)		11	11	13	14	16	18	19	21	24
l_2		16	20	22	25	28	35	42	48	56
l_3		—	5	5	5	6	8	8	8	8
l_4		14	17	19	22	25	32	37	42	50
w and x		0,2	0,2	0,2	0,2	0,2	0,2	0,3	0,3	0,3

NOTE The general tolerance for untoleranced dimensions is ± 0,4 mm.

3.2 Connecting face dimensions

See Figure 2 and Table 2.



a) With inner bolt circle (for mounting on spindle nose A1 by means of its inner bolt circle)

b) With outer bolt circle (for mounting on spindle nose A1, or spindle nose A2 by means of its outer bolt circle)

Figure 2 — Connecting face dimensions

Table 2 — Connecting face dimensions

Dimension	No. 3	4	5	6	8	11	15	20	28
d_1	53,975	63,513	82,563	106,375	139,719	196,869	285,775	412,775	584,225
tol. Type 1 [a]	$^{+0,003}_{-0,005}$	$^{+0,003}_{-0,005}$	$^{+0,004}_{-0,006}$	$^{+0,004}_{-0,006}$	$^{+0,004}_{-0,008}$	$^{+0,004}_{-0,010}$	$^{+0,004}_{-0,012}$	$^{+0,005}_{-0,015}$	$^{+0,006}_{-0,017}$
tol. Type 2 [a]	$^{+0,008}_{0}$	$^{+0,008}_{0}$	$^{+0,010}_{0}$	$^{+0,010}_{0}$	$^{+0,012}_{0}$	$^{+0,014}_{0}$	$^{+0,016}_{0}$	$^{+0,020}_{0}$	$^{+0,030}_{0}$
d_2	—	—	61,9	82,6	111,1	165,1	247,6	368,3	530,2
d_3	70,6	82,6	104,8	133,4	171,4	235	330,2	463,6	647,6
d_4	92	108	133	165	210	280	380	520	725
d_5	12	12	12	14	18	22	25,5 [b]	27 [b]	33
d_6 $^{+0,1}_{0}$	—	14,7	16,3	19,45	24,2	29,4	35,7	42,1	51,6
l_1 (Type A1) $^{+0,025}_{0}$	—	—	14,288	15,875	17,462	19,050	20,638	22,225	25,400
l_1 min. (Type A2) [c]	—	—	15	16	18	20	21	23	26
l_2	10	10	12	13	14	16	17	19	22
l_3	—	6,5	6,5	6,5	8	10	10	10	10
w and x	0,2	0,2	0,2	0,2	0,2	0,2	0,3	0,3	0,3

NOTE The general tolerance for untoleranced dimensions is ± 0,4 mm.

[a] Type identification shall be marked.

[b] These are compromise dimensions to allow for interchangeability between inch and metric chucks.

[c] l_1 of Type 1 may be used in place of l_1 of Type 2 only if the face plate is rigid enough not to cause bending when the screws are tightened on the inner bolt circle.

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