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Self-centring chucks for machine tools with two-piece jaws (tongue and groove type) — Sizes for interchangeability and acceptance test specifications

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*Mandrins pour machines-outils, à serrage concentrique et à mors
rapportés (assemblage cruciforme par tenon et languette) — Dimensions
d'interchangeabilité et conditions de réception*

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Reference number
ISO 3442:1991(E)

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.

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 3442 was prepared by Technical Committee ISO/TC 39, *Machine tools*, Sub-Committee SC 8, *Chucks*.

This second edition cancels and replaces the first edition (ISO 3442:1975), which has been technically revised.

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Introduction

This International Standard is one of a series relating to self-centring chucks with two-piece jaws; however, only types in common use are covered.

Because of its wide usage, the type called “tongue and groove” has been made the subject of this International Standard.

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Self-centring chucks for machine tools with two-piece jaws (tongue and groove type) — Sizes for interchangeability and acceptance test specifications

1 Scope

This International Standard specifies the sizes for interchangeability, and describes, with reference to ISO 230-1, the geometrical tests on self-centring chucks with two-piece jaws and the corresponding permissible deviations which apply.

It deals only with the inspection of rotational accuracy of the chuck and the positioning of the assembling elements of top jaws. It does not apply to other dynamic qualities, such as measurement of lack of balance during rotation, balancing or measurement of gripping power.

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the edition indicated was 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 edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 230-1:1986, *Acceptance code for machine tools — Part 1: Geometric accuracy of machines operating under no-load or finishing conditions.*

3 Preliminary remarks

3.1 Sizes for interchangeability

Although the internal mounting parts and the fixing screws are not mutually interchangeable, depending on whether they are manufactured in conformity with the metric sizes or the inch sizes, there is direct interchangeability for the same type between the base or master jaws in metric sizes and top jaws in inches, or vice versa.

3.2 Acceptance test specifications

According to the type of chuck under consideration, i.e. hand- or power-operated, the main purpose of these tests is to allow either top jaw mounting compatible with the machining accuracy of the chuck or a precise setting for top jaws on the chuck after carrying out preliminary centring, straightening or locking operations on a jig separate from the machine.

4 Precision classes

Two precision classes are specified, namely

- class I, corresponding to precision chucks;
- class II, corresponding to normal accuracy chucks.

For purposes of information, and particularly concerning class I power-operated chucks, it should be noted that these can be provided, if necessary, with specially adjusted base or master jaws which are not interchangeable with other base or master jaws. In this case, chucks shall be marked.

5 Sizes for interchangeability

The sizes for interchangeability are shown in figure 1 and are given in 5.1 and 5.2, respectively, for hand-operated chucks and power-operated chucks.

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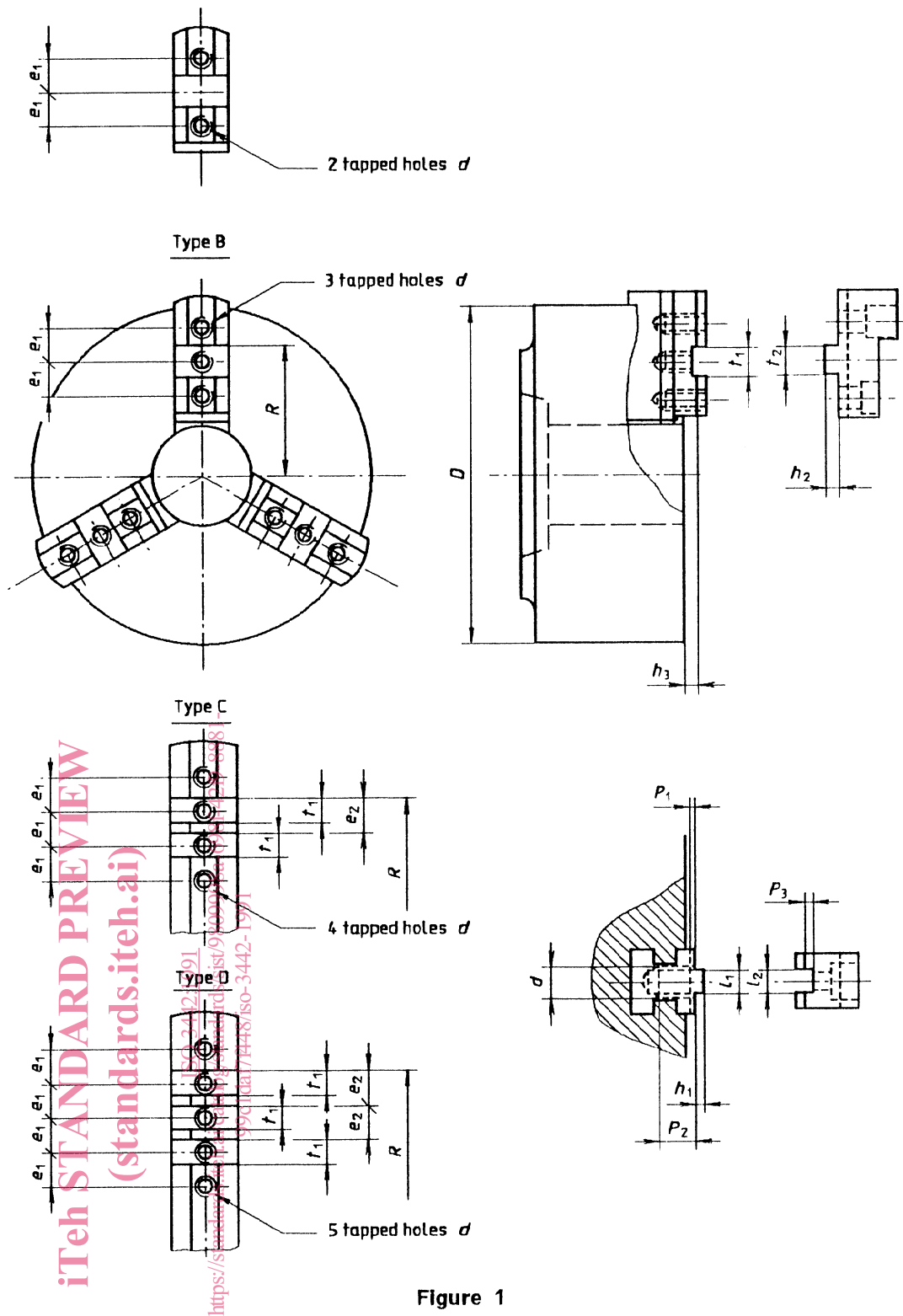


Figure 1

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5.1 Hand-operated chucks

The sizes for interchangeability for hand-operated chucks are given in table 1 (metric) and in table 2 (inches).

Table 1

Dimensions in millimetres

Nominal diameter of chuck, D_{nom}	100	125	160	200	250	315	400	500	630	800	1 000
Type	A	A	A	A	A	B	B	C	D	D	D
$D \pm 5 \%$	100	125	160	200	250	315	400	500	630	800	1 000
Base or master jaw											
d	M6	M8	M10	M10	M12	M12	M16	M20	M20	M20	M20
$e_1 \pm 0,15$	9,5	11,1	19	22,2	27	31,75	38,1	38,1	38,1	38,1	38,1
e_2	—	—	—	—	—	—	—	38,1	38,1	38,1	38,1
h_1	2,2	2,2	3	3	3	3	3	3	3	3	3
h_3 min.	4	4	5	5	5	5	8	8	8	8	8
l_1 h9	6,35	6,35	7,94	7,94	12,7	12,7	12,7	12,7	12,7	12,7	12,7
P_1	3,2	3,2	4	4	4	4	7	7	7	7	7
P_2	9	13	18	18	20	20	28	33	33	33	33
t_1 H8	9,525	9,525	12,675	12,675	19,025	19,025	19,025	19,025	19,025	19,025	19,025
Top jaw											
h_2	2,2	2,2	3	3	3	3	6	6	6	6	6
l_2 E9	6,35	6,35	7,94	7,94	12,7	12,7	12,7	12,7	12,7	12,7	12,7
P_3	3,2	3,2	4	4	4	4	4	4	4	4	4
t_2 h8	9,525	9,525	12,675	12,675	19,025	19,025	19,025	19,025	19,025	19,025	19,025

Table 2

Dimensions in Inches

Nominal diameter of chuck, D_{nom}	4	5	6	8	10	12	15	18	21	24	28	32	36
Type			A	A	A	B	B	C	D	D	D	D	D
$D \pm 5\%$	4	5	6	8	10	12	15	18	21	24	28	32	36
Base or master jaw													
d	0,250	0,312	0,375	0,375	0,500	0,500	0,625	0,750	0,750	0,750	0,750	0,750	0,750
UNC-3B	-20	-18	-16	-16	-13	-13	-11	-10	-10	-10	-10	-10	-10
$e_1 \pm 0,006$	0,375	0,437	0,750	0,875	1,062	1,250	1,500	1,500	1,500	1,500	1,500	1,500	1,500
e_2	--	--	--	--	--	--	--	1,500	1,500	1,500	1,500	1,500	1,500
h_1	max. 0,10 min. 0,08	max. 0,10 min. 0,08	max. 0,14 min. 0,12	max. 0,14 min. 0,12	max. 0,14 min. 0,12	max. 0,14 min. 0,12	max. 0,14 min. 0,12	max. 0,14 min. 0,12	max. 0,14 min. 0,12	max. 0,14 min. 0,12	max. 0,14 min. 0,12	max. 0,14 min. 0,12	max. 0,14 min. 0,12
h_3	0,16	0,16	0,20	0,20	0,20	0,20	0,32	0,32	0,32	0,32	0,32	0,32	0,32
l_1	max. 0,250 min. 0,248	max. 0,250 min. 0,248	max. 0,312 min. 0,310	max. 0,312 min. 0,310	max. 0,500 min. 0,498	max. 0,500 min. 0,498	max. 0,500 min. 0,498	max. 0,500 min. 0,498	max. 0,500 min. 0,498	max. 0,500 min. 0,498	max. 0,500 min. 0,498	max. 0,500 min. 0,498	max. 0,500 min. 0,498
P_1	max. 0,13 min. 0,11	max. 0,13 min. 0,11	max. 0,18 min. 0,16	max. 0,18 min. 0,16	max. 0,18 min. 0,16	max. 0,18 min. 0,16	max. 0,30 min. 0,28	max. 0,30 min. 0,28	max. 0,30 min. 0,28	max. 0,30 min. 0,28	max. 0,30 min. 0,28	max. 0,30 min. 0,28	max. 0,30 min. 0,28
P_2	0,35	0,51	0,65	0,65	0,80	0,80	1,10	1,30	1,30	1,30	1,30	1,30	1,30
t_1	max. 0,375 min. 0,374	max. 0,375 min. 0,374	max. 0,500 min. 0,499	max. 0,500 min. 0,499	max. 0,750 min. 0,749	max. 0,750 min. 0,749	max. 0,750 min. 0,749	max. 0,750 min. 0,749	max. 0,750 min. 0,749	max. 0,750 min. 0,749	max. 0,750 min. 0,749	max. 0,750 min. 0,749	max. 0,750 min. 0,749
Top jaw													
h_2	max. 0,10 min. 0,08	max. 0,10 min. 0,08	max. 0,12 min. 0,10	max. 0,12 min. 0,10	max. 0,12 min. 0,10	max. 0,12 min. 0,10	max. 0,25 min. 0,23	max. 0,25 min. 0,23	max. 0,25 min. 0,23	max. 0,25 min. 0,23	max. 0,25 min. 0,23	max. 0,25 min. 0,23	max. 0,25 min. 0,23
l_2	max. 0,253 min. 0,251	max. 0,253 min. 0,251	max. 0,315 min. 0,313	max. 0,315 min. 0,313	max. 0,503 min. 0,501	max. 0,503 min. 0,501	max. 0,503 min. 0,501	max. 0,503 min. 0,501	max. 0,503 min. 0,501	max. 0,503 min. 0,501	max. 0,503 min. 0,501	max. 0,503 min. 0,501	max. 0,503 min. 0,501
P_3	max. 0,13 min. 0,11	max. 0,13 min. 0,11	max. 0,17 min. 0,15	max. 0,17 min. 0,15	max. 0,17 min. 0,15	max. 0,17 min. 0,15	max. 0,17 min. 0,15	max. 0,17 min. 0,15	max. 0,17 min. 0,15	max. 0,17 min. 0,15	max. 0,17 min. 0,15	max. 0,17 min. 0,15	max. 0,17 min. 0,15
t_2	max. 0,374 min. 0,373	max. 0,374 min. 0,373	max. 0,499 min. 0,498	max. 0,499 min. 0,498	max. 0,749 min. 0,748	max. 0,749 min. 0,748	max. 0,749 min. 0,748	max. 0,749 min. 0,748	max. 0,749 min. 0,748	max. 0,749 min. 0,748	max. 0,749 min. 0,748	max. 0,749 min. 0,748	max. 0,749 min. 0,748