
INTERNATIONAL STANDARD



3408

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

Ball screws — Nominal diameters and basic leads — Metric and inch series

Vis à billes — Diamètres nominaux et pas hélicoïdaux — Séries métrique et en inches

First edition — 1975-07-15

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[ISO 3408:1975](#)

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Descriptors : screws, ball screws, diameter, basic leads, metric system, imperial system.

Price based on 3 pages

FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO Member Bodies). The work of developing International Standards is carried out through ISO Technical Committees. Every Member Body interested in a subject for which a Technical Committee has been set up 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.

Draft International Standards adopted by the Technical Committees are circulated to the Member Bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 3408 was drawn up by Technical Committee ISO/TC 39, *Machine tools*, and circulated to the Member Bodies in April 1974.

It has been approved by the Member Bodies of the following countries :

Australia	Germany	Switzerland
Austria	Hungary	Thailand
Belgium	India	Turkey
Brazil	Romania	United Kingdom
Chile	South Africa, Rep. of	Yugoslavia
Czechoslovakia	Spain	
France	Sweden	

The Member Body of the following country expressed disapproval of the document on technical grounds :

Japan

Ball screws — Nominal diameters and basic leads — Metric and inch series

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1 SCOPE AND FIELD OF APPLICATION

This International Standard lays down nominal diameters and basic leads for ball screws. It also gives preferred combinations of nominal diameter and basic lead and a general plan which includes additional combinations to be used when it becomes necessary to deviate from the preferred combinations.

Inch dimensions : 0.250 — 0.3125 — 0.375 — 0.500 —
0.625 — 0.750 — 0.875 — 1.000 — 1.250 — 1.500 —
1.750 — 2.000 — 2.250 — 2.500 — 3.000 — 3.500 —
4.000 — 4.500 — 5.000 — 6.000 and 8.000 in.

2 DEFINITIONS

2.1 nominal diameter : The diameter of the cylinder containing the centres of the balls being in contact with the screw shaft and the nut body at the theoretical contact points.

2.2 basic lead : The prescribed axial displacement of the nut reference point relative to the screw shaft for a rotation of 2π radians of the screw shaft in relation to the nut.

3 NOMINAL DIAMETERS

The following series of nominal diameters shall be used :

Metric dimensions : 6 — 8 — 10 — 12 — 16 — 20 —
25 — 32 — 40 — 50 — 63 — 80 — 100 — 125 — 160
and 200 mm.

4 BASIC LEADS

The following series of basic leads shall be used :

Metric dimensions : 2 — 2,5 — 3 — 4 — 5 — 6 — 8 —
10 — 12 — 16 and 20 mm.

Inch dimensions : 0.0833 — 0.1 — 0.125 — 0.1666 —
0.2 — 0.25 — 0.3333 — 0.375 — 0.4 — 0.5 — 0.75 and
1.0 in.

Where possible, preference shall be given to the following basic leads :

Metric dimensions : 2,5 — 5 — 10 and 20 mm.

Inch dimensions : 0.125 — 0.25 — 0.5 and 1.0 in.

5 COMBINATIONS OF NOMINAL DIAMETER AND BASIC LEAD – METRIC SERIES

5.1 Preferred combinations

Dimensions in millimetres

Nominal diameter	Basic lead			
6	2,5			
8	2,5			
10	2,5			
12	2,5			
16	2,5	5		
20		5		
25		5	10	
32		5	10	
40		5	10	
50		5	10	20
63		5	10	20
80			10	20
100			10	20
125			10	20
160				20
200				20

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5.2 General plan

For preferred combinations the lead value is underlined. The combinations for which the lead value is not underlined shall be used when it becomes necessary to deviate from the preferred combinations.

Dimensions in millimetres

Nominal diameter	Basic lead									
6	2	<u>2,5</u>								
8		<u>2,5</u>	3							
10		<u>2,5</u>	3	4						
12		<u>2,5</u>	3	4	<u>5</u>					
16		<u>2,5</u>	3	4	<u>5</u>	6				
20			3	4	<u>5</u>	6	8			
25				4	<u>5</u>	6	8	<u>10</u>		
32				4	<u>5</u>	6	8	<u>10</u>	12	
40					<u>5</u>	6	8	<u>10</u>	12	
50					<u>5</u>	6	8	<u>10</u>	12	16
63					<u>5</u>	6	8	<u>10</u>	12	16
80						6	8	<u>10</u>	12	16
100						8		<u>10</u>	12	16
125								<u>10</u>	12	16
160								<u>10</u>	12	16
200								<u>10</u>	12	16

6 COMBINATIONS OF NOMINAL DIAMETER AND BASIC LEAD – INCH SERIES

6.1 Preferred combinations

Dimensions in inches

Nominal diameter	Basic lead			
	0.312 5 0.375	0.125 0.125		
0.500 0.625 0.750 0.875	0.125 0.125 0.125 0.125	0.25 0.25 0.25		
1.000 1.250 1.500 1.750		0.25 0.25 0.25 0.25	0.5 0.5	
2.000 2.250 2.500 3.000 3.500		0.25 0.25 0.25 0.25 0.25	0.5 0.5 0.5 0.5 0.5	1.0 1.0 1.0
4.000 4.500 5.000 6.000 8.000			0.5 0.5 0.5 0.5 0.5	1.0 1.0 1.0 1.0 1.0

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6.2 General plan

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For preferred combinations the lead value is underlined. The combinations for which the lead value is not underlined shall be used when it becomes necessary to deviate from the preferred combinations.

Dimensions in inches

Nominal diameter	Basic lead										
	0.250 0.312 5 0.375	0.083 3	0.1 0.1 0.1	<u>0.125</u> <u>0.125</u>	0.166 6						
0.500 0.625 0.750 0.875		0.1 0.1	<u>0.125</u> <u>0.125</u> <u>0.125</u> <u>0.125</u>	0.166 6 0.166 6 0.166 6 0.166 6	0.2 0.2 0.2 0.2	<u>0.25</u> <u>0.25</u> <u>0.25</u>	0.333 3 0.333 3	0.375 0.375			
1.000 1.250 1.500 1.750				0.166 6 0.166 6 0.166 6	0.2 0.2 0.2	<u>0.25</u> <u>0.25</u> <u>0.25</u>	0.333 3 0.333 3 0.333 3	0.375 0.375 0.375	0.4 0.4 0.4	<u>0.5</u> <u>0.5</u> <u>0.5</u>	
2.000 2.250 2.500 3.000 3.500					0.2 0.2 0.2	<u>0.25</u> <u>0.25</u> <u>0.25</u> <u>0.25</u>	0.333 3 0.333 3 0.333 3	0.375 0.375 0.375	0.4 0.4 0.4	<u>0.5</u> <u>0.5</u> <u>0.5</u> <u>0.5</u>	0.75 0.75 0.75 0.75 0.75
4.000 4.500 5.000 6.000 8.000							0.333 3	0.375 0.375	0.4 0.4	<u>0.5</u> <u>0.5</u> <u>0.5</u> <u>0.5</u>	0.75 0.75 0.75 0.75 0.75

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MODIFICATION TO FOREWORD (*inside front cover*)

The ISO member body for Italy has now approved this International Standard. Italy should therefore be included in the list of countries whose member bodies have approved the document.

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