INTERNATIONAL STANDARD ISO 2568

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

Hand- and machine-operated circular screwing dies and hand-operated die stocks

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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 2568 was drawn up by Technical Committee ISO/TC 29, *Small tools*.

It was approved in July 1972 by the Member Bodies of the following countries :

Austria	Israel	Spain
Belgium	Italy	Sweden
Czechoslovakia	Korea, Rep. of	Thailand
Egypt, Arab Rep. of	Netherlands	Turkey
France	New Zealand	United Kingdom
Hungary	Poland	U.S.A.
India	Romania	U.S.S.R.
Ireland	South Africa, Rep. of	

The Member Bodies of the following countries expressed disapproval of the document on technical grounds :

Australia
Japan
Switzerland

Printed in Switzerland

Hand- and machine-operated circular screwing dies and hand-operated die stocks

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies the general dimensions of hand-operated and machine-operated screwing dies. These dimensions, established as a function of the thread diameter and pitch, are the following :

- outside diameter;
- thickness;
- cutting portion length :
- general dimensions of attachment.

It also gives the interchangeability dimensions of hand-operated die stocks.

This International Standard is applicable to screwing dies intended for the manufacture of the following threads :

- ISO metric threads :
  - coarse thread, from M 1 to M 68;
  - fine thread, from M 1 to M 56.
- ISO inch threads :
  - "Unified coarse" series (UNC), from No. 1–64 to 2 3/4;
  - "Unified fine" series (UNF), from No. 0–80 to 1 1/2.

It also includes an Annex giving the dimensional characteristics of circular screwing dies as a function of thread diameters and pitches.

The general dimensions of screwing dies for threads which are not dealt with in this International Standard, and therefore are not recommended, are given for guidance only in an Appendix. This Appendix is applicable to screwing dies for inch threads of the following types :

Z.1 – "British Standard Whitworth" (BSW).

Z.2 – "British Standard Fine" (BSF).

Z.3 – "British Association" (BA).

All screwing dies are available in two classes namely

- non-precision screwing dies;
- precision screwing dies.

2 ISO METRIC THREADS

2.1 Coarse thread

Screwing dies with :

D = 16 and 20 mm

$D \geqslant 25$ mm

Section A-A

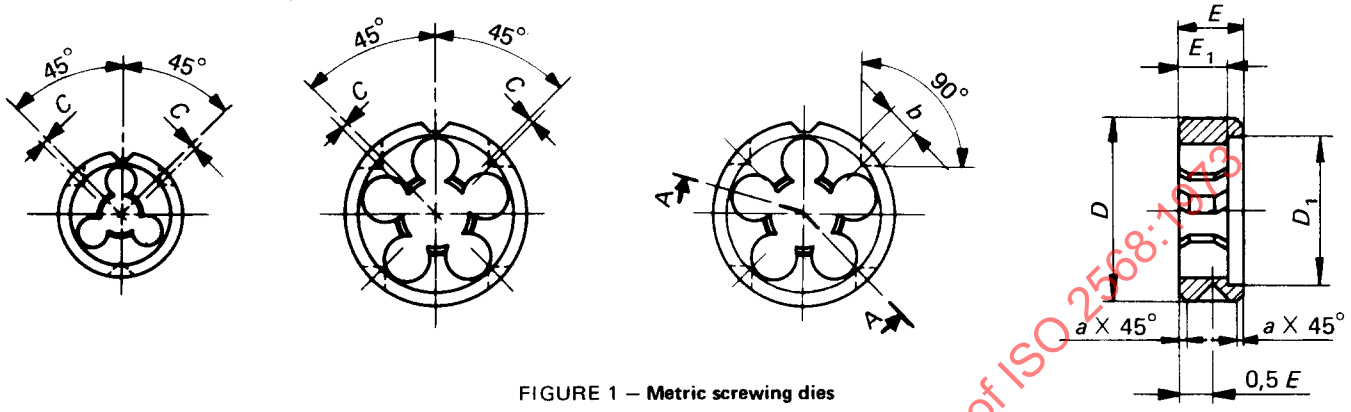


FIGURE 1 — **Metric screwing dies**

TABLE 1

Dimensions in millimetres

Designation	d nominal	Pitch	D	D_1	E	E_1	C	b	a
M 1	1	0,25	16	11	5	2	0,5	3	0,2
M 1,1	1,1								
M 1,2	1,2								
M 1,4	1,4	0,3				2,5			
M 1,6	1,6	0,35							
M 1,8	1,8								
M 2	2	0,4				3			
M 2,2	2,2	0,45							
M 2,5	2,5								
M 3	3	0,5	20		5			4	0,5
M 3,5	3,5	0,6							
M 4	4	0,7							
M 4,5	4,5	0,75			7		0,6		
M 5	5	0,8							
M 6	6	1							
M 7	7		25		9		0,8	5	
M 8	8	1,25							
M 9	9								
M 10	10	1,5	30		11		1,0		1,0
M 11	11								

Designation	d nominal	Pitch	D	E	C	b	a
M 12	12	1,75	38	14	1,2	6	1
M 14	14	2					
M 16	16			14			
M 18	18	2,5	45	18			
M 20	20						
M 22	22		55	22	1,5	8	2
M 24	24	3					
M 27	27		65	25	1,8		
M 30	30	3,5					
M 33	33						
M 36	36	4					
M 39	39		75	30			
M 42	42	4,5					
M 45	45		90	36	2,0		
M 48	48	5					
M 52	52						
M 56	56	5,5	105	36	2,5	10	
M 60	60						
M 64	64	6	120	36			
M 68	68						

Tolerances :

- for precision screwing dies :
  - on D : f10
  - on E : j_s12
- for non-precision screwing dies :
  - on D and E : the tolerances are left to the discretion of the manufacturer.

The shape of the adjusting vee is left to the discretion of the manufacturer. Screwing dies are generally supplied with two chamfers at the thread entrance according to the material to be threaded and at the discretion of the manufacturer.

2.2 Fine thread

TABLE 2

Dimensions in millimetres

Designation	d nominal	Pitch	D	D_1	E	E_1	C	b	a
M 1 × 0,2	1	0,2	16	11	5	2	0,5	3	0,2
M 1,1 × 0,2	1,1								
M 1,2 × 0,2	1,2								
M 1,4 × 0,2	1,4								
M 1,6 × 0,2	1,6								
M 1,8 × 0,2	1,8								
M 2 × 0,25	2	0,25							
M 2,2 × 0,25	2,2								
M 2,5 × 0,35	2,5	0,35				2,5			
M 3 × 0,35	3		20	15	5	3		4	
M 3,5 × 0,35	3,5								
M 4 × 0,5	4	0,5							
M 4,5 × 0,5	4,5								
M 5 × 0,5	5								
M 5,5 × 0,5	5,5								
M 6 × 0,75	6	0,75			7		0,6		
M 7 × 0,75	7		25		9		0,8	5	0,5
M 8 × 1	8	1							
M 9 × 1	9								
M 10 × 1	10		30		11		1,0		
M 10 × 1,25		1,25							
M 12 × 1,25	12	1,25	38		10		1,2	6	1,0
M 12 × 1,5		1,5							
M 14 × 1,25	14	1,25							
M 14 × 1,5		1,5							
M 15 × 1,5	15	1,5							
M 16 × 1,5	16								
M 17 × 1,5	17								
M 18 × 1,5	18	1,5	45		14				
M 18 × 2		2							
M 20 × 1,5	20	1,5							
M 20 × 2		2							
M 22 × 1,5	22	1,5	55		16		1,5	8	
M 22 × 2		2							
M 24 × 1,5	24	1,5							
M 24 × 2		2							
M 25 × 1,5	25	1,5							
M 25 × 2		2							
M 27 × 1,5	27	1,5	65		18		1,8		
M 27 × 2		2							
M 28 × 1,5	28	1,5							
M 28 × 2		2							

Designation	d nominal	Pitch	D	E	C	b	a
M 30 × 1,5	30	1,5	65	18	1,8	8	2,0
M 30 × 2		2					
M 30 × 3		3		25			
M 32 × 1,5	32	1,5		18			
M 32 × 2		2					
M 33 × 1,5	33	1,5					
M 33 × 2		2					
M 33 × 3		3		25			
M 35 × 1,5	35	1,5		18			
M 36 × 1,5	36	1,5					
M 36 × 2		2					
M 36 × 3		3		25			
M 39 × 1,5	39	1,5	75	20			
M 39 × 2		2					
M 39 × 3		3		30			
M 40 × 1,5	40	1,5		20			
M 40 × 2		2					
M 40 × 3		3		30			
M 42 × 1,5	42	1,5		20			
M 42 × 2		2					
M 42 × 3		3		30			
M 42 × 4		4					
M 45 × 1,5	45	1,5	90	22	2,0		
M 45 × 2		2					
M 45 × 3		3		36			
M 45 × 4		4					
M 48 × 1,5	48	1,5		22			
M 48 × 2		2					
M 48 × 3		3		36			
M 48 × 4		4					
M 50 × 1,5	50	1,5		22			
M 50 × 2		2					
M 50 × 3		3		36			
M 52 × 1,5	52	1,5		22			
M 52 × 2		2					
M 52 × 3		3		36			
M 52 × 4		4					
M 55 × 1,5	55	1,5	105	22	2,5	10	
M 55 × 2		2					
M 55 × 3		3		36			
M 55 × 4		4					
M 56 × 1,5	56	1,5		22			
M 56 × 2		2					
M 56 × 3		3		36			
M 56 × 4		4					

For tolerances and note, see 2.1.

3 ISO INCH THREADS

3.1 "Unified coarse" series (UNC)

Screwing dies with :

D = 16 and 20 mm

$D \geqslant 25$ mm

Section A-A

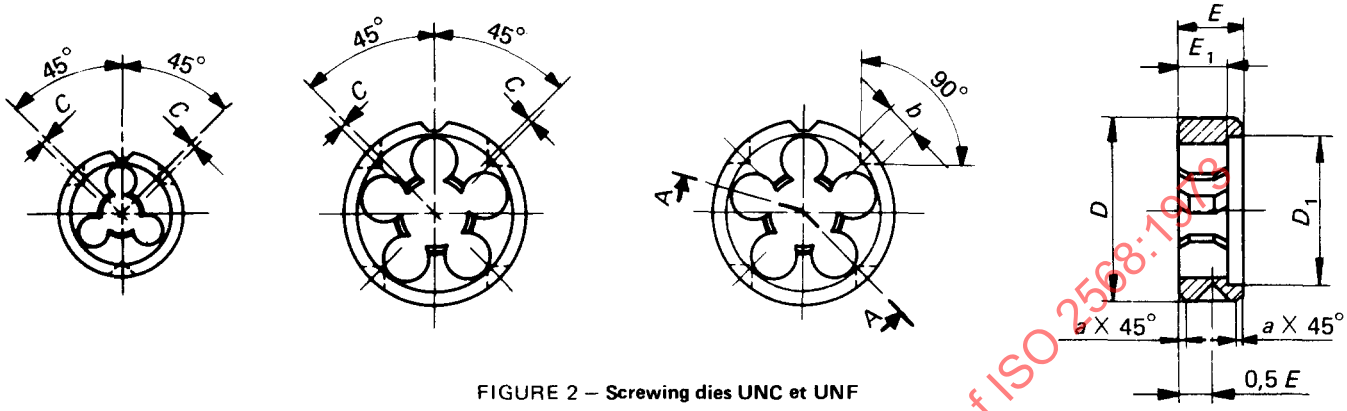


FIGURE 2 – **Screwing dies UNC et UNF**

TABLE 3

Dimensions in millimetres

Designation	d nominal	Approximate pitch	D	D_1	E	E_1	C	b	a
No. 1 – 64 – UNC	1,854	0,397	16	11	5	3	0,5	3	0,2
No. 2 – 56 – UNC	2,184	0,454							
No. 3 – 48 – UNC	2,515	0,529							
No. 4 – 40 – UNC	2,845	0,635	20		5			4	0,5
No. 5 – 40 – UNC	3,175								
No. 6 – 32 – UNC	3,505	0,794			7		0,6		
No. 8 – 32 – UNC	4,166								
No.10 – 24 – UNC	4,826	1,058							
No.12 – 24 – UNC	5,486								
1/4 – 20 – UNC	6,350	1,270	25		9		0,8	5	
5/16 – 18 – UNC	7,938	1,411							
3/8 – 16 – UNC	9,525	1,588	30		11		1,0		1,0
7/16 – 14 – UNC	11,112	1,814							
1/2 – 13 – UNC	12,700	1,954	38		14		1,2	6	
9/16 – 12 – UNC	14,288	2,117							
5/8 – 11 – UNC	15,875	2,309	45		18				
3/4 – 10 – UNC	19,050	2,540							
7/8 – 9 – UNC	22,225	2,822	55		22		1,5	8	2,0
1 – 8 – UNC	25,400	3,175							
1 1/8 – 7 – UNC	28,575	3,629	65		25		1,8		
1 1/4 – 7 – UNC	31,750								
1 3/8 – 6 – UNC	34,925	4,233	75		30				
1 1/2 – 6 – UNC	38,100								
1 3/4 – 5 – UNC	44,450	5,080	90		36		2,0		
2 – 4 1/2 – UNC	50,800	5,644	105		36		2,5	10	
2 1/4 – 4 1/2 – UNC	57,150								
2 1/2 – 4 – UNC	63,500	6,350	120		36				
2 3/4 – 4 – UNC	69,850								

3.2 "Unified fine" series (UNF)

TABLE 4

Dimensions in millimetres

Designation	*d* nominal	Approximate pitch	*D*	D_1	*E*	E_1	*C*	*b*	*a*
No. 0 – 80 – UNF	1,524	0,318	16	11	5	2,5	0,5	3	0,2
No. 1 – 72 – UNF	1,854	0,353							
No. 2 – 64 – UNF	2,184	0,397				3			
No. 3 – 56 – UNF	2,515	0,454							
No. 4 – 48 – UNF	2,845	0,529	20		5			4	
No. 5 – 44 – UNF	3,175	0,577							
No. 6 – 40 – UNF	3,505	0,635			7		0,6		0,5
No. 8 – 36 – UNF	4,166	0,706							
No.10 – 32 – UNF	4,826	0,794							
No.12 – 28 – UNF	5,486	0,907							
$^1/_4$ – 28 – UNF	6,350		25		9		0,8	5	
$^5/_{16}$ – 24 – UNF	7,938	1,058							
$^3/_8$ – 24 – UNF	9,525		30		11		1,0		1,0
$^7/_{16}$ – 20 – UNF	11,112	1,270							
$^1/_2$ – 20 – UNF	12,700		38		10		1,2	6	
$^9/_{16}$ – 18 – UNF	14,288	1,411							
$^5/_8$ – 18 – UNF	15,875		45		14				
$^3/_4$ – 16 – UNF	19,050	1,588							
$^7/_8$ – 14 – UNF	22,225	1,814	55		16		1,5	8	
1 – 12 – UNF	25,400	2,117							
$1\,^1/_8$ – 12 – UNF	28,575		65		18		1,8		
$1\,^1/_4$ – 12 – UNF	31,750								
$1\,^3/_8$ – 12 – UNF	34,925								
$1\,^1/_2$ – 12 – UNF	38,100		75		20				2,0

Tolerances :

– for precision screwing dies :
  – on *D* : f10
  – on *E* : j_s12

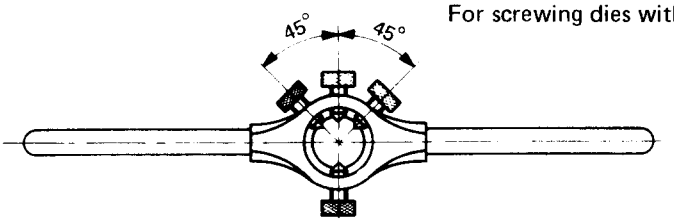
– for non-precision screwing dies :
  – on *D* and *E* : the tolerances are left to the discretion of the manufacturer.

The shape of the adjusting vee is left to the discretion of the manufacturer. Screwing dies are generally supplied with two chamfers at the thread entrance according to the material to be threaded and at the discretion of the manufacturer.

4 DIE STOCKS – INTERCHANGEABILITY DIMENSIONS

(For metric and inch threads)

For screwing dies with $D = 16$ and 20 mm



For screwing dies with $D \geqslant 25$ mm

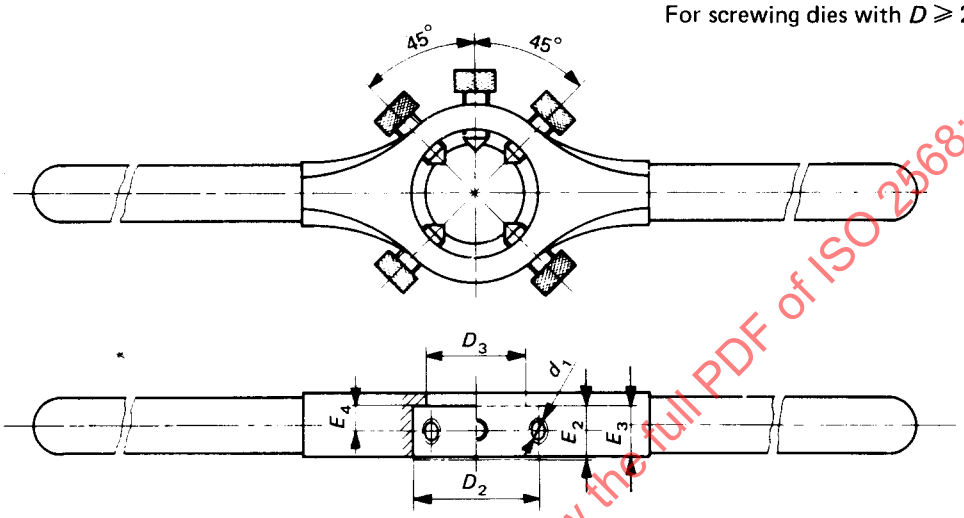


FIGURE 3 – **Die stocks**

TABLE 5

Dimensions in millimetres

D_2 D 10	E_2	E_3	E_4 $^{0}_{-0,2}$	D_3	d_1
16	5	4,8	2,4	11	M 3
20	5	4,8	2,4	15	M 4
	7	6,5	3,4		
25	9	8,5	4,4	20	M 5
30	11	10	5,3	25	
38	10	9	4,8	32	M 6
	14	13	6,8		
45	14	13	6,8	38	M 6
	18	17	8,8		
55	16	15	7,8	48	M 8
	22	20	10,7		
65	18	17	8,8	58	M 8
	25	23	12,2		
75	20	18	9,7	68	M 8
	30	28	14,7		
90	22	20	10,7	82	M 8
	36	34	17,7		
105	22	20	10,7	95	M 10
	36	34	17,7		
120	22	20	10,7	107	M 10
	36	34	17,7		

ANNEX

GENERAL TABLE OF DIMENSIONAL CHARACTERISTICS OF CIRCULAR SCREWING DIES FOR METRIC AND INCH THREADS

TABLE 6

Dimensions in millimetres

Ranges of threaded diameters d				D	D_1	E	0,20 0,25	0,28 0,35	0,39 0,45	0,48 0,70	0,73 0,81	0,90 1,00	1,25	1,50	1,75	2,00	2,50	3,00	3,50	4,00 4,50	5,00 5,50	6,00	Metric pitches		
in millimetres		in inches					–	80 72	64 56	48 40	36 32	28 24	22 18	16	14	13 12	11 10	9 8	7	6	5 4 1/2	4 3 1/2	Number of threads per inch		
from (over)	to (incl.)	from (over)	to (incl.)				–	0,318 0,353	0,397 0,454	0,529 0,635	0,705 0,794	0,907 1,058	1,154 1,411	1,588	1,814	1,954 2,117	2,309 2,540	2,822 3,175	3,629	4,233	5,080 5,644	6,350 7,257	Pitch in inches converted to millimetres (approximately)		
							Cut lengths E_1																C	b	a
0,90	2,65	0.0354	0.1043	16	11	5	2	2,5	3	5													0,5	3	0,2
2,65	6,30	0.1043	0.2480	20	15	5		3		5	–	–											0,5	4	0,2
						7		–		–	7	7											0,6		0,5
6,30	9,00	0.2480	0.3543	25		9					9	9	9										0,8	5	
9,00	11,20	0.3543	0.4409	30		11						11	11	11									1,0		1,0
11,20	15,00	0.4409	0.5906	38		10							10	10	–								1,2	6	
						14							–	–	14	14									
15,00	20,00	0.5906	0.7874	45		14							14	14	14	14									
						18							–	–	–	–	18								
20,00	26,50	0.7874	1.0433	55		16								16	16	16	–	–					1,5	8	
						22								–	–	–	22	22							2,0
26,50	37,50	1,0433	1,4764	65		18								18		18		–	–	–			1,8		1,0
						25								–		–		25	25	25					2,0
37,50	42,50	1.4764	1.6732	75		20								20		20		–							
						30								–		–		30		30					
42,50	53,00	1.6732	2.0866	90		22								22		22		–	–	–			2,0		
						36								–		–		36	36	36	36				
53,00	63,00	2.0866	2.4803	105		22								22		22		–		–	–		2,5	10	
						36								–		–		36		36	36				
63,00	71,00	2.4803	2.7953	120		36														36	–	36			