INTERNATIONAL STANDARD

ISO
2568
Second edition
1988-12-01

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

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

Filières rondes de filetage, à main et à machine, et porte-filière à main

Reference number
ISO 2568 : 1988 (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.

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. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 2568 was prepared by Technical Committee ISO/TC 29, *Small tools.*

This second edition cancels and replaces the first edition (ISO 2568 : 1973), of which it constitutes a minor revision. It incorporates amendments 1 and 2, published in 1977 and 1983 respectively, and a new clause 5 "Marking" has been added.

Users should note that all International Standards undergo revision from time to time and that any reference made herein to any other International Standard implies its latest edition, unless otherwise stated.

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 M1 to M68;
  - fine thread, from M1 to M56.
- ISO inch threads:
  - "Unified coarse" series (UNC), from No. 1 — 64 to 2 3/4 — 4;
  - "Unified fine" series (UNF), from No. 0 — 80 to 1 1/2 — 12.

The dimensional characteristics of circular screwing dies, as a function of thread diameters and pitches, are given in annex A.

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 annex B. Annex B is applicable to screwing dies for inch threads of the following types:

B.1 — "British Standard Whitworth" (BSW).

B.2 — "British Standard Fine" (BSF).

B.3 — "British Association" (BA).

All screwing dies are available in two classes, namely

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

2 ISO metric threads

Screwing dies with:

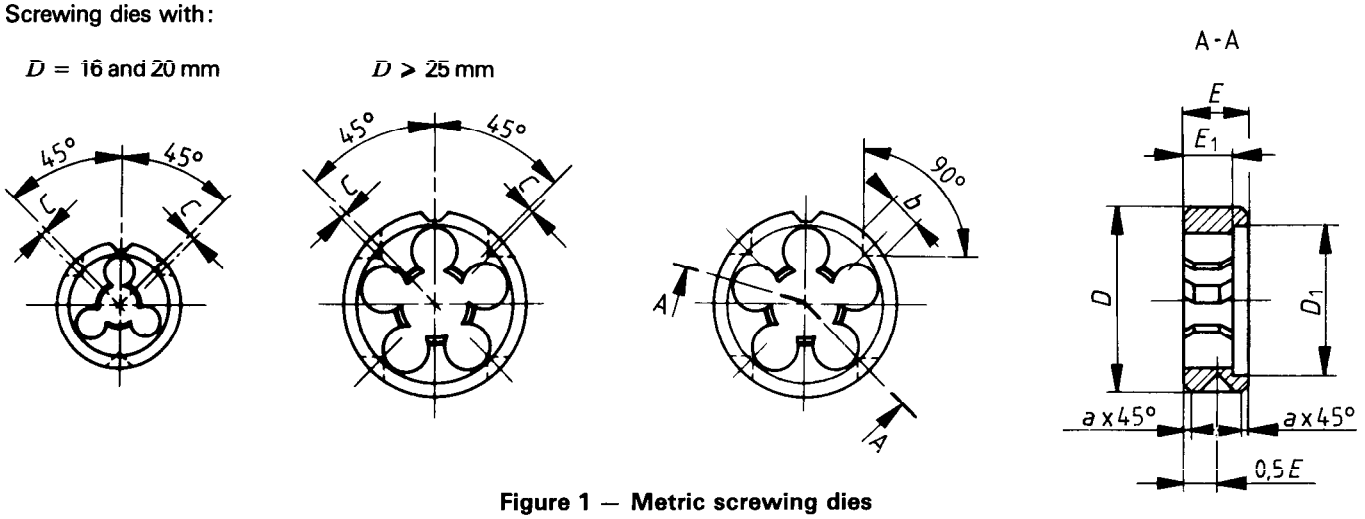

Figure 1 — Metric screwing dies

2.1 Coarse thread

Table 1

Dimensions in millimetres

Designation	d nom.	Pitch	D	D_1	E	E_1	C	b	a
M1	1	0,25	16	11	5	2	0,5	3	0,2
M1,1	1,1								
M1,2	1,2								
M1,4	1,4	0,3				2,5			
M1,6	1,6	0,35							
M1,8	1,8								
M2	2	0,4				3			
M2,2	2,2	0,45							
M2,5	2,5								
M3	3	0,5	20		5			4	0,5
M3,5	3,5	0,6							
M4	4	0,7							
M4,5	4,5	0,75			7		0,6		
M5	5	0,8							
M6	6	1							
M7	7		25		9		0,8	5	
M8	8	1,25							
M9	9								
M10	10	1,5	30		11		1		1
M11	11								

Designation	d nom.	Pitch	D	E	C	b	a
M12	12	1,75	38	14	1,2	6	1
M14	14	2					
M16	16		45	18*			
M18	18	2,5					
M20	20						
M22	22		55	22	1,5	8	2
M24	24	3					
M27	27		65	25	1,8		
M30	30	3,5					
M33	33						
M36	36	4					
M39	39		75	30			
M42	42	4,5					
M45	45		90	36	2		
M48	48	5					
M52	52						
M56	56	5,5	105	36	2,5	10	
M60	60						
M64	64	6	120	36			
M68	68						

* For an M16 die, this dimension is an exception to the general table (table 6) given in annex A.

NOTES

1 The shape of the V-groove 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 Tolerances:

- for precision screwing dies:
  - on D: f10
  - on E: js12
- for non-precision screwing dies:
  - on D and E: the tolerances are left to the discretion of the manufacturer.

2.2 Fine thread

Table 2

Dimensions in millimetres

Designation	d nom.	Pitch	D	D_1	E	E_1	C	b	a
M1 × 0,2	1	0,2	16	11	5	2	0,5	3	0,2
M1,1 × 0,2	1,1								
M1,2 × 0,2	1,2								
M1,4 × 0,2	1,4								
M1,6 × 0,2	1,6								
M1,8 × 0,2	1,8								
M2 × 0,25	2	0,25							
M2,2 × 0,25	2,2								
M2,5 × 0,35	2,5	0,35				2,5			
M3 × 0,35	3		20	15	5	3		4	
M3,5 × 0,35	3,5								
M4 × 0,5	4	0,5							
M4,5 × 0,5	4,5								
M5 × 0,5	5								
M5,5 × 0,5	5,5								
M6 × 0,75	6	0,75			7		0,6		0,5
M7 × 0,75	7		25		9		0,8	5	
M8 × 1	8	1							
M9 × 1	9								
M10 × 1	10		30		11		1		1
M10 × 1,25		1,25							
M12 × 1,25	12	1,25	38		10		1,2	6	
M12 × 1,5		1,5							
M14 × 1,25	14	1,25							
M14 × 1,5		1,5							
M15 × 1,5	15	1,5							
M16 × 1,5	16		45		14				
M17 × 1,5	17								
M18 × 1,5	18	1,5							
M18 × 2		2							
M20 × 1,5	20	1,5							
M20 × 2		2							
M22 × 1,5	22	1,5	55		16		1,5	8	
M22 × 2		2							
M24 × 1,5	24	1,5							
M24 × 2		2							
M25 × 1,5	25	1,5							
M25 × 2		2							
M27 × 1,5	27	1,5	65		18		1,8		
M27 × 2		2							
M28 × 1,5	28	1,5							
M28 × 2		2							

For the shape of the V-groove and the tolerances, see notes 1 and 2 in 2.1.

Designation	d nom.	Pitch	D	E	C	b	a
M30 × 1,5	30	1,5	65	18	1,8	8	1
M30 × 2		2					
M30 × 3		3		25			2
M32 × 1,5	32	1,5		18			
M32 × 2		2					
M33 × 1,5	33	1,5					
M33 × 2		2					
M33 × 3		3		25			
M35 × 1,5	35	1,5		18			
M36 × 1,5	36	1,5					
M36 × 2		2					
M36 × 3		3		25			
M39 × 1,5	39	1,5	75	20			
M39 × 2		2					
M39 × 3		3		30			
M40 × 1,5	40	1,5		20			
M40 × 2		2					
M40 × 3		3		30			
M42 × 1,5	42	1,5		20			
M42 × 2		2					
M42 × 3		3		30			
M42 × 4		4					
M45 × 1,5	45	1,5	90	22	2		
M45 × 2		2					
M45 × 3		3		36			
M45 × 4		4					
M48 × 1,5	48	1,5		22			
M48 × 2		2					
M48 × 3		3		36			
M48 × 4		4					
M50 × 1,5	50	1,5		22			
M50 × 2		2					
M50 × 3		3		36			
M52 × 1,5	52	1,5		22			
M52 × 2		2					
M52 × 3		3		36			
M52 × 4		4					
M55 × 1,5	55	1,5	105	22	2,5	10	
M55 × 2		2					
M55 × 3		3		36			
M55 × 4		4					
M56 × 1,5	56	1,5		22			
M56 × 2		2					
M56 × 3		3		36			
M56 × 4		4					

3 ISO inch threads

Screwing dies with:

D — 16 and 20 mm

D > 25 mm

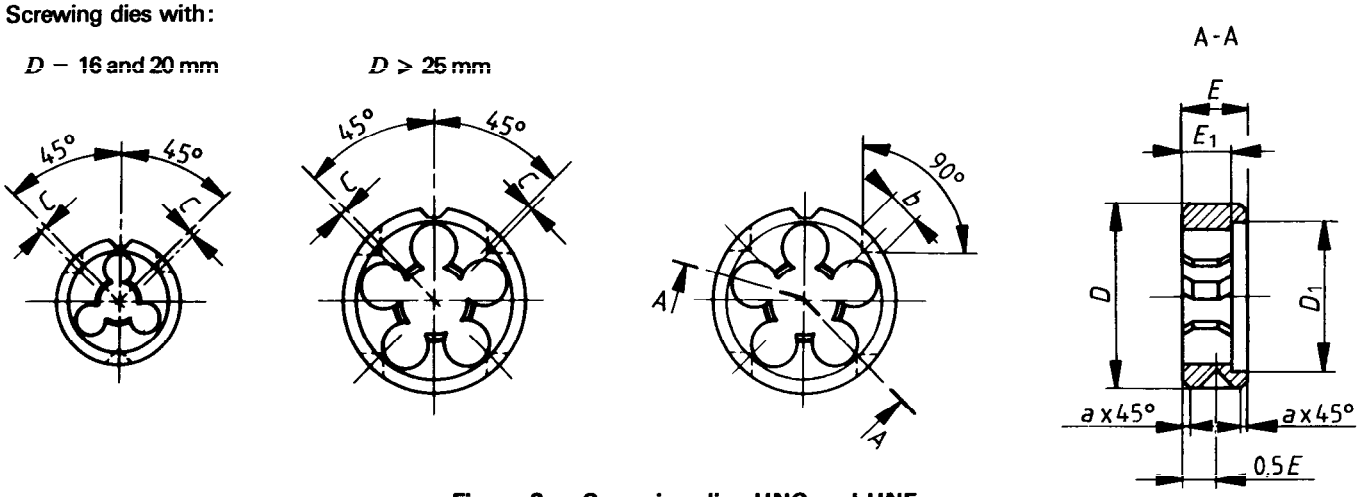

Figure 2 — Screwing dies UNC and UNF

3.1 "Unified coarse" series (UNC)

Table 3

Dimensions in millimetres

Designation	d nom.	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	6,35	1,27							
5/16 — 18 — UNC	7,938	1,411	25		9		0,8	5	1
3/8 — 16 — UNC	9,525	1,588	30		11		1		
7/16 — 14 — UNC	11,112	1,814							
1/2 — 13 — UNC	12,7	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	19,05	2,54							
7/8 — 9 — UNC	22,225	2,822	55		22		1,5	8	2
1 — 8 — UNC	25,4	3,175							
1 1/8 — 7 — UNC	28,575	3,629	65		25		1,8		
1 1/4 — 7 — UNC	31,75								
1 3/8 — 6 — UNC	34,925	4,233							
1 1/2 — 6 — UNC	38,1		75		30				
1 3/4 — 5 — UNC	44,45	5,08	90		36		2		
2 — 4 1/2 — UNC	50,8	5,644							
2 1/4 — 4 1/2 — UNC	57,15		105		36		2,5	10	
2 1/2 — 4 — UNC	63,5	6,35	120		36				
2 3/4 — 4 — UNC	69,85								

3.2 "Unified fine" series (UNF)

Table 4

Dimensions in millimetres

Designation	d nom.	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							
No. 8 — 36 — UNF	4,166	0,706			7		0,6		0,5
No. 10 — 32 — UNF	4,826	0,794							
No. 12 — 28 — UNF	5,486	0,907							
1/4 — 28 — UNF	6,35							5	
5/16 — 24 — UNF	7,938	1,058	25		9		0,8		1
3/8 — 24 — UNF	9,525		30		11		1		
7/16 — 20 — UNF	11,112	1,27							
1/2 — 20 — UNF	12,7		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	19,05	1,588							
7/8 — 14 — UNF	22,225	1,814	55		16		1,5	8	
1 — 12 — UNF	25,4	2,117							
1 1/8 — 12 — UNF	28,575		65		18		1,8		
1 1/4 — 12 — UNF	31,75								
1 3/8 — 12 — UNF	34,925								
1 1/2 — 12 — UNF	38,1		75		20				2

NOTES

1 The shape of the V-groove 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 Tolerances:

- for precision screwing dies:
  - on D: f10
  - on E: js12
- for non-precision screwing dies:
  - on D and E: the tolerances are left to 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 > 25 mm

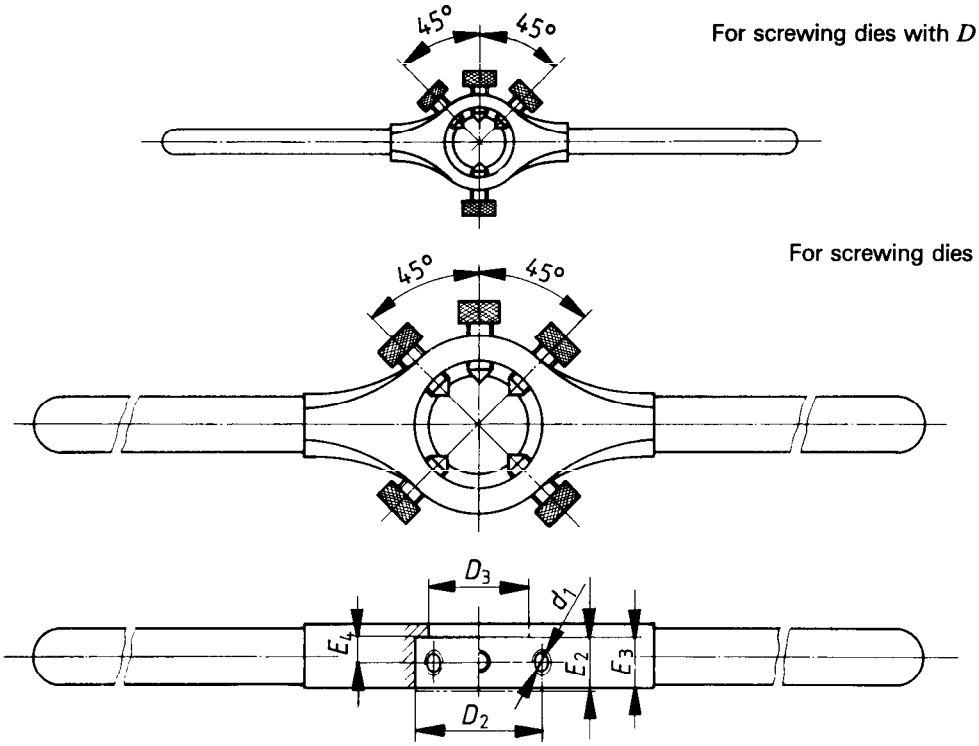

Figure 3 — Die stocks

Table 5

Dimensions in millimetres

D D10	E_2	E_3	E_4 $^{0}_{-0,2}$	D_3	d_1
16	5	4,8	2,4	11	M3
20	5	4,8	2,4	15	M4
	7	6,5	3,4		
25	9	8,5	4,4	20	M5
30	11	10	5,3	25	
38	10	9	4,8	32	M6
	14	13	6,8		
45	14	13	6,8	38	M6
	18	17	8,8		
55	16	15	7,8	48	M8
	22	20	10,7		
65	18	17	8,8	58	M8
	25	23	12,2		
75	20	18	9,7	68	M8
	30	28	14,7		
90	22	20	10,7	82	M8
	36	34	17,7		
105	22	20	10,7	95	M10
	36	34	17,7		
120	22	20	10,7	107	M10
	36	34	17,7		

5 Marking

5.1 Screwing dies for ISO metric threads, the dimensions of which conform with those given in tables 1 and 2, shall be marked with the thread designation.

Examples:

A circular screwing die for coarse ISO metric threads (for example M1) shall be marked as follows:

M1

A circular screwing die for fine ISO metric threads (for example M12 × 1,25) shall be marked as follows:

M12 × 1,25

5.2 Screwing dies for ISO inch threads, UNC and UNF series and types BSW, BSF and BA, the dimensions of which conform with those given in tables 3, 4, 7, 8 and 9, shall be marked with the thread designation.

Examples:

A screwing die for ISO inch threads, UNC series (for example 1/4 — 20), shall be marked as follows:

1/4 — 20 — UNC

A screwing die for ISO inch threads, UNF series (for example No. 12 — 28), shall be marked as follows:

No. 12 — 28 — UNF

A screwing die for ISO inch threads, type BSW (for example 1/2 — 12), shall be marked as follows:

1/2 — 12 — BSW

A screwing die for ISO inch threads, type BSF (for example 1/4 — 26), shall be marked as follows:

1/4 — 26 — BSF

A screwing die for ISO inch threads, type BA (for example No. 4), shall be marked as follows:

BA No. 4

5.3 Where tools comply in all respects with the relevant International Standards, the symbol ISO may be appended to the mark at the discretion of the manufacturer.

Annex A

General table of dimensional characteristics of circular screwing dies for metric and inch threads

(This annex forms an integral part of the standard.)

Table 6

Ranges of threaded diameters d			D	D_1	E																				Pitch range in millimetres	
in millimetres		in inches																							from (over)	to (incl.)
from (over)	to (incl.)	from (over)	to (incl.)																						Standard metric pitches	
					—	0,25	0,36	0,46	0,7	0,85	1,12	1,45	1,6	1,9	2,12	2,65	3,35	3,75	4,5	5,7	—				Number of threads per inch	
						0,25	0,36	0,46	0,7	0,85	1,12	1,45	1,6	1,9	2,12	2,65	3,35	3,75	4,5	5,7	—				Pitch in inches converted to millimetres (approximately)	
						0,2 0,25	0,3 0,35	0,4	0,5 0,6 0,7	0,75 0,8	1	1,25	1,5	1,75	2	2,5	3	3,5	4 4,5	5 5,5	6					
					—	80 72	64 56		48 44 40	36 32	28 26 24	22 20 19 18	16	14	13 12	11 10	9 8	7	6	5 4,5	4 3,5						
					—	0,318 0,353	0,397 0,454		0,529 0,577 0,635	0,705 0,794	0,907 0,977 1,058	1,154 1,27 1,337 1,411	1,588	1,814	1,954 2,117	2,309 2,54	2,822 3,175	3,629	4,233	5,08 5,644	6,35 7,257						
																									Cut lengths E_1 [1]	
																									C	b	a
0,9	2,65	0,035 4	0,104 3	11	5	2	2,5	3		5															0,5	3	0,2
2,65	6,35	0,104 3	0,25	15	5	3			5	—	—	—															
					7	—			—	7	7	7													0,6	4	0,5
6,35[2]	9	0,25	0,354 3	25	9					9	9	9													0,8	5	
9	11,2	0,354 3	0,440 9	30	11						11	11	11	11											1		
11,2	15	0,440 9	0,590 6	38	10						10	10	—	—											1,2	6	1
					14						14[3]	—	14	14													
15[4]	21,2	0,590 6	0,834 6	45	14						14	14	14	14													
					18						15[3]	—	—	—	18												
21,2	26,5	0,834 6	1,043 3	55	16							16	16	16	—	—									1,5	8	2
					22							—	20[3]	—	22	22											
26,5	37,5	1,043 3	0,476 4	65	18							18	18	18	18	—	—	—							1,8		1
					25							—	—	—	24[3]	25	25	25									
37,5	42,5	1,476 4	1,673 2	75	20							20	—	20	20	—		—									2
					30							—	—	—	26[3]	30		30									
42,5	53	1,673 2	2,086 6	90	22							22	—	22	22	—	—	—	—						2		
					36							—	—	—	26[3]	36	36	36	36								
53	63	2,086 6	2,480 3	105	22							22	—	22	22	—									2,5	10	
					36							—	—	—	31[3]	36		36	36								
63	71	2,480 3	2,795 3	120	22										22	—	—	—	—	—	—						
					36										—	—	—	36	—	36							

1) For diameter/pitch combinations not shown in the table, the value of E_1 is left to the manufacturer's discretion.

2) The specified values of D, E and E_1 are not applicable to a die for an R 1/16 thread (see ISO 4230, *Hand- and machine-operated circular screwing dies for taper pipe threads — R Series*).

3) These values of E_1 are only applicable to dies for "R" series threads.

4) The specified values of D and E are not applicable to a die for an R 1/2 thread (see ISO 4230).

Annex B

Circular screwing dies for non-ISO inch threads

(This annex does not form an integral part of the standard.)

Screwing dies with:

D = 16 and 20 mm

D > 25 mm

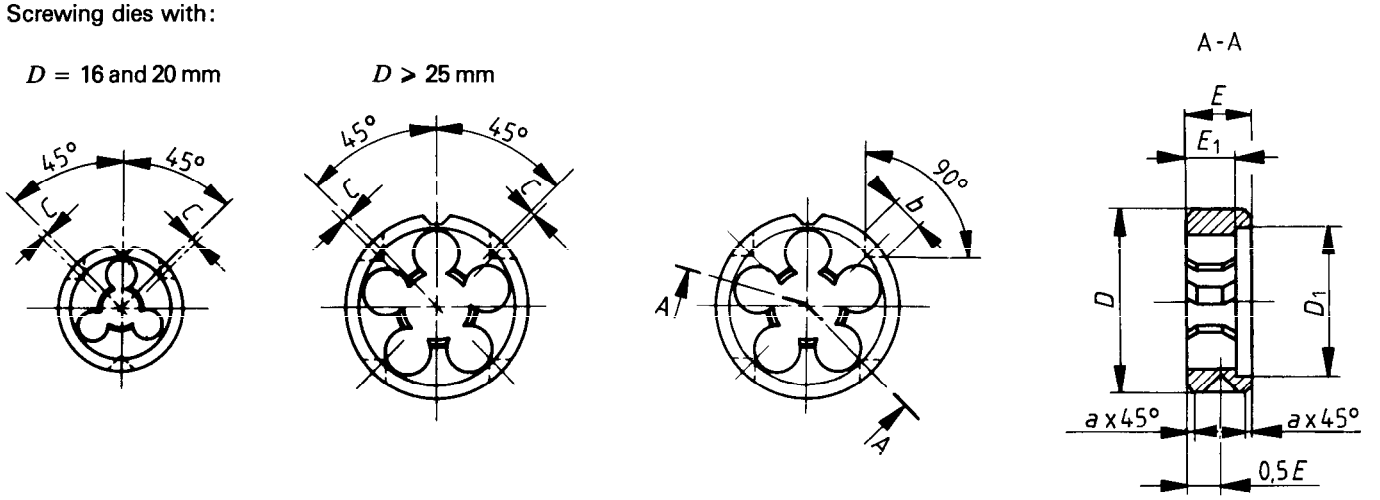

Figure 4 — Screwing dies BSW, BSF and BA

B.1 For "British Standard Whitworth" threads (BSW)

Table 7

Dimensions in millimetres

Designation	d nom.	Pitch ≈	D	E	C	b	a
1/8 — 40 — BSW	3,175	0,635	20	5	0,5	4	0,2
3/16 — 24 — BSW	4,762	1,058		7	0,6		0,5
1/4 — 20 — BSW	6,35	1,27	25	9	0,8	5	
5/16 — 18 — BSW	7,938	1,411					
3/8 — 16 — BSW	9,525	1,588	30	11	1		1
7/16 — 14 — BSW	11,112	1,814					
1/2 — 12 — BSW	12,7	2,117	38	14	1,2	6	
9/16 — 12 — BSW	14,288						
5/8 — 11 — BSW	15,875	2,309	45	18			
11/16 — 11 — BSW	17,462						
3/4 — 10 — BSW	19,05	2,54					
7/8 — 9 — BSW	22,225	2,822	55	22	1,5	8	2
1 — 8 — BSW	25,4	3,175					
1 1/8 — 7 — BSW	28,575	3,629	65	25	1,8		
1 1/4 — 7 — BSW	31,75						
1 1/2 — 6 — BSW	38,1	4,233	75	30			
1 3/4 — 5 — BSW	44,45	5,08	90	36	2		
2 — 4 1/2 — BSW	50,8	5,644					
2 1/4 — 4 — BSW	57,15	6,35	105	36	2,5	10	
2 1/2 — 4 — BSW	63,5		120	36			
2 3/4 — 3 1/2 — BSW	69,85	7,257					

B.2 For "British Standard Fine" threads (BSF)

Table 8

Dimensions in millimetres

Designation	d nom.	Pitch ≈	D	E	C	b	a
3/16 — 32 — BSF	4,762	0,794	20	7	0,6	4	0,5
7/32 — 28 — BSF	5,556	0,907					
1/4 — 26 — BSF	6,35	0,977	25	9	0,8	5	
9/32 — 26 — BSF	7,144						
5/16 — 22 — BSF	7,938	1,154					
3/8 — 20 — BSF	9,525	1,27	30	11	1		1
7/16 — 18 — BSF	11,112	1,411					
1/2 — 16 — BSF	12,7	1,588	38	10	1,2	6	
9/16 — 16 — BSF	14,288						
5/8 — 14 — BSF	15,875	1,814	45	14			
11/16 — 14 — BSF	17,462						
3/4 — 12 — BSF	19,05	2,117					
7/8 — 11 — BSF	22,225	2,309	55	22	1,5	8	2
1 — 10 — BSF	25,4	2,54					
1 1/8 — 9 — BSF	28,575	2,822	65	25	1,8		
1 1/4 — 9 — BSF	31,75						
1 3/8 — 8 — BSF	34,925	3,175					
1 1/2 — 8 — BSF	38,1		75	30			
1 5/8 — 8 — BSF	41,275						
1 3/4 — 7 — BSF	44,45	3,629	90	36	2		
2 — 7 — BSF	50,8						
2 1/4 — 6 — BSF	57,15	4,233	105	36	2,5	10	
2 1/2 — 6 — BSF	63,5		120	36			
2 3/4 — 6 — BSF	69,85						

NOTES

1 The shape of the V-groove 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 Tolerances:

- for precision screwing dies:
  - on D: f10
  - on E: js12
- for non-precision screwing dies:
  - on D and E: the tolerances are left to the discretion of the manufacturer.

B.3 For "British Association" threads (BA)

Table 9

Dimensions in millimetres

Designation	d nom.	Pitch	D	D_1	E	E_1	C	b	a
BA No. 14	1	0,23	16	11	5	2	0,5	3	0,2
BA No. 13	1,2	0,25							
BA No. 12	1,3	0,28				2,5			
BA No. 11	1,5	0,31							
BA No. 10	1,7	0,35							
BA No. 9	1,9	0,39				3			
BA No. 8	2,2	0,43							
BA No. 7	2,5	0,48							
BA No. 6	2,8	0,53	20		5			4	
BA No. 5	3,2	0,59							
BA No. 4	3,6	0,66							
BA No. 3	4,1	0,73			7		0,6		0,5
BA No. 2	4,7	0,81							
BA No. 1	5,3	0,9							
BA No. 0	6	1							

NOTES

1 The shape of the V-groove 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 Tolerances:

- for precision screwing dies:
  - on D: f10
  - on E: js12
- for non-precision screwing dies:
  - on D and E: the tolerances are left to the discretion of the manufacturer.

UDC 621.992

Descriptors : tools, cutting tools, threading dies, marking.

Price based on 11 pages