Specification for

Unified machine screws and machine screw nuts

BSI STANDARDS

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the General Mechanical Engineering Standards Policy Committee (GME/-) to Technical Committee GME/9, upon which the following bodies were represented:

BEAMA Ltd.
British Constructional Steelwork Association Ltd.
British Industrial Fasteners Federation
British Railways Board
British Steel Industry
British Steel Industry (Wire Section)
Gauge and Tool Makers' Association
Ministry of Defence
Society of Motor Manufacturers and Traders Limited
Washer Manufacturers' Association of Great Britain

The following bodies were also represented in the drafting of the standard, through subcommittees and panels:

British Furniture Manufacturers' Federation
British Independent Steel Producers' Association
National Association of Fastener Stockholders

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Foreword

This British Standard has been prepared under the direction of the General Mechanical Engineering Standards Policy Committee. This revision of the standard supersedes BS 1981 : 1972 which is withdrawn.

The principal changes that have been made in this edition are as follows.

(a) The single recess type in the previous edition is now nominated as type Z and recess depth data have been deleted. Penetration values for cross recesses are now required to comply with BS 6605 : 1990.

(b) New requirements for recess type V have been added. Penetration values for this type are also required to comply with BS 6605.

Product certification. Users of this British Standard are advised to consider the desirability of third party certification of product conformity with this British Standard based on testing and continuing surveillance, which may be coupled with assessment of a supplier's quality systems against the appropriate Part of BS 5750.

Enquiries as to the availability of third party certification schemes will be forwarded by BSI to the Association of Certification Bodies. If a third party certification scheme does not already exist, users should consider approaching an appropriate body from the list of Association members.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Specification

1 Scope

This British Standard specifies requirements for the dimensions, tolerances and mechanical properties of machine screws and machine screw nuts having ISO inch (Unified) screw threads.

Dimensions and tolerances are given for machine screws and nuts in the following diameter ranges:

(a) hexagon head machine screws from No. 2 to No. 12;

(b) slotted countersunk and pan head machine screws from No. 0 to $\frac{3}{4}$ in;

(c) slotted raised cheese head machine screws (non-preferred) from No. 0 to $\frac{1}{2}$ in;

(d) slotted raised countersunk machine screws from No. 0 to $\frac{3}{8}$ in;

(e) slotted hexagon head machine screws (non-preferred) No. 4 to 12;

(f) recessed (types Z and V) pan and countersunk head machine screws from No. 2 to $\frac{1}{2}$ in;

(g) recessed (types Z and V) raised cheese head machine screws (non-preferred) from No. 2 to $\frac{1}{2}$ in;

(h) recessed (types Z and V) raised countersunk head machine screws from No. 2 to $\frac{3}{8}$ in;

(i) square and hexagon machine screw nuts, pressed type, from No. 0 to $\frac{3}{8}$ in;

(j) hexagon machine screw nuts, precision type, from No. 0 to No. 12.

Mechanical properties are specified for steel, brass and aluminium alloy machine screws and machine screw nuts.

Appendices are included that relate to the dimensioning of 80° countersunk heads, slot widths and standard sizes (not to be confused with stock sizes, see note 1 to table 27).

NOTE 1. Attention is drawn to the fact that it is claimed that the type V recess is the subject of British patent no. 1 521 141 copies of which can be obtained from the Patent Office, 25 Southampton Buildings, London WC2A 1AY. BSI takes no position as to the validity of the patent or whether it is still in force. The patent is irrevocably endorsed 'licences of right' under Section 46 of the Patents Act 1977, which states:

'(3) Where such an entry is made in respect of a patent —

(a) any person shall, at any time after the entry is made, be entitled as of right to a licence under the patent on such terms as may be settled by agreement or, in default of agreement, by the Comptroller on the application of the proprietor of the patent or the person requiring the licence'.

Licence details may be obtained from the registered proprietor of the patent.

NOTE 2. Details of precision hexagon screws and nuts $\frac{1}{4}$ in diameter and above are given in BS 1768.

NOTE 3. The titles of the British Standards referred to in this standard are listed on the inside back cover.

2 Terminology

2.1 For the purposes of this British Standard the generic term 'screws' has been adopted as applying to the products whether threaded up to the head or having an unthreaded portion of shank.

2.2 The designations of the various types of screw and nut are in accordance with those commonly used in the United Kingdom.

3 Material

The material from which the screws and nuts are manufactured shall have a tensile strength not less than the following:

steel	25 tonf/in^2	(386 MPa)
brass	20 tonf/in^2	(309 MPa)
aluminium alloy	20 tonf/in^2	(309 MPa)

NOTE 1. These minimum tensile strengths may be taken as applicable to the finished products.

NOTE 2. Screws and nuts that comply with the requirements of this standard are not normally subjected to test, but where this is required the purchaser is to state so in his enquiry and order.

NOTE 3. If the purchaser requires screws and nuts to be manufactured from steel of a higher tensile strength, or from another material, this is to be subject to agreement between the purchaser and the supplier.

4 General dimensions

4.1 Screws

The general dimensions and tolerances for screws shall be as given in tables 1 to 18 inclusive, clauses **6** to **12** inclusive and tables 21 to 26 inclusive.

4.2 Precision nuts (normal applications)

The general dimensions and tolerances for nuts shall be as given in table 19 and in **6.3.**

4.3 Pressed nuts (light duty applications)

The general dimensions and tolerances for pressed nuts shall be as given in table 20 and in **6.4.**

5 Heads of screws

5.1 The screw heads shall be concentric with the shank within the tolerances given in table 17, using the head diameter or across flats dimension as datum.

5.2 The slots and recesses shall be clean and free from burrs and shall be symmetrical with the shank within the tolerances given in table 17, using the shank diameter as datum.

5.3 The depth of slot (t) shall be measured from the top of the head to the point at which the slot breaks through the side.

5.4 The depth of the recess shall be such that, when measured in accordance with BS 6605, the penetration of the gauge into the recess complies with the penetration values given in tables 5, 7, 9, 11, 13, 15 and 21 to 26 inclusive.

5.5 The bearing surface of perpendicular bearing surface screw heads shall be at right angles to the axis of the body within 2°.

5.6 The taper of sides of hexagon head screws (see table 16), i.e. the angle between one side and the axis, shall not exceed 2° or 0.004 in, whichever is the greater. The specified limits across flats shall relate to the larger end of taper.

Where edges and corners of hexagon surface or upset type hexagon heads are slightly rounded, the diameter of the bearing surface shall be not less than 90 % of the minimum across flats dimensions.

NOTE. The head height indicated in the dimensional tables represents a metal to metal measurement, i.e. on heads having rounded top surfaces the truncation of the rounded surface due to slot or recess is not considered part of the head height.

6 Screw threads

6.1 General

The screw threads shall be ISO inch (Unified) series threads complying with BS 1580 : Parts 1 & 2 and BS 1580 : Part 3.

6.2 Screws

The external threads shall comply with tolerance class 2A limits of BS 1580.

6.3 Precision nuts (normal applications)

The internal threads shall comply with tolerance class 2B limits of BS 1580 and be subject to gauging made to tolerances specified in BS 919.

6.4 Pressed nuts (light duty applications)

The internal threads shall comply with tolerance class 2B limits of BS 1580 and be subject to gauging made to tolerances specified in BS 919. Checking shall be by means of a GO screw plug gauge and a NOT GO plain plug gauge for the minor diameter.

7 Nominal length of screws

7.1 Countersunk head

The nominal length shall be the distance from the upper surface of the head to the extreme end of the shank, including any chamfer, radius or cone point.

7.2 Raised countersunk head

The nominal length shall be the distance from the upper surface of the head (excluding the raised portion) to the extreme end of the shank, including any chamfer, radius or cone point.

7.3 Pan, raised cheese head and hexagon head

The nominal length shall be the distance from the underside of the head to the extreme end of the shank, including any chamfer, radius or cone point.

7.4 Nominal lengths and tolerances on length

The tolerances on the standard nominal lengths shall be as given in table 18.

NOTE. For preferred sizes of diameters and associated standard lengths see tables 27 to 31 in appendix B.

8 Length of thread on screws

8.1 The length of thread shall be the distance from the end of the screw (including any chamfer, radius or cone point) to the leading face of a nut without counter sink, which has been screwed as far as possible onto the screw by hand.

8.2 The minimum thread length shall be 1.75 in on screws over 2 in long.

8.3 Screws that are too short for the above thread length shall be threaded as far as possible to the head. The length of unthreaded shank under the head shall not exceed $1\frac{1}{2}$ pitches for truncated countersunk and truncated raised countersunk heads and two pitches for all other head styles.

NOTE. The length of unthreaded shank is defined as the distance from the leading face of a nut that has been screwed as far as possible onto the screw by hand up to:

(a) the junction of the basic major diameter and the countersunk portion of the head on countersunk and raised countersunk heads; or

(b) the underside of the head on all other types of head.

9 Diameter of unthreaded shank on screws

The diameter of the unthreaded portion of the shank on screws shall be not greater than the basic major diameter of the screw thread and shall be not less than the minimum effective diameter of the screw thread.

NOTE 1. Where it is essential that the diameter of the unthreaded portion of the shank shall be not less than the minimum major diameter of the thread this should be stated by the purchaser.

NOTE 2. The diameter of the unthreaded portion of shank is closely associated with the method of manufacture. It will generally be nearer the major diameter of the thread for turned screws and nearer the effective diameter for those produced by cold heading.

10 Radius under the head of screws

10.1 Screws having heads with perpendicular bearing surface, e.g. pan, hexagon, raised cheese, truncated countersunk and truncated raised countersunk shall have a radius or fillet radius running smoothly into the face of the head and shank without any step or discontinuity.

The minimum and maximum radii shall be in accordance with those given in table 1.

NOTE. The maximum values of radius are based upon 15 % of the basic screw diameter.

10.2 Countersunk and raised countersunk head screws shall have a radius running smoothly into the conical bearing surface of the head and the shank without any step or discontinuity.

The minimum and maximum radii shall be in accordance with those given in table 1.

NOTE. The maximum values of radius are based upon 40 % of the basic screw diameter.

10.3 All radii for flat and conical bearing shall be measured from the screw blank before thread rolling.

11 Ends of screws

NOTE. For convenience, one type of end of screw only is shown in figures 6 to 18 inclusive.

11.1 Rolled thread ends

When screws are made with rolled threads the 'lead' formed by the thread rolling operation shall be regarded as providing the necessary chamfer and no other machining shall be necessary.

NOTE. The approximate form of the end as rolled is shown in figure 1.

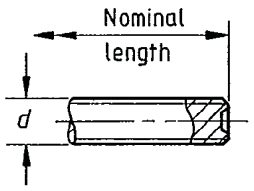


Figure 1. Rolled thread end

11.2 Cut thread ends

The end of screws with cut threads, and with diameters greater than or equal to $\frac{1}{4}$ in, shall be finished with a chamfer complying with the dimensions shown in figure 2.

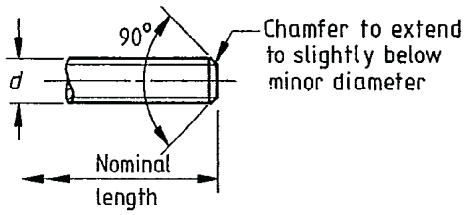


Figure 2. Cut thread chamfered end

NOTE. At the option of the manufacturer, the ends of screws smaller than $\frac{1}{4}$ in diameter may be finished either with a radius approximately equal to $1\frac{1}{4}$ times the nominal diameter of the shank, as shown in figure 3, or with a chamfer complying with the dimensions shown in figure 2.

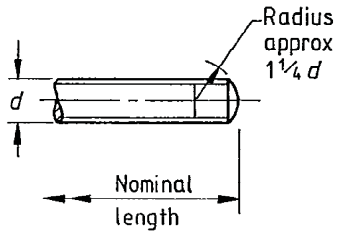


Figure 3. Cut thread radiused end

11.3 Cone points

The dimensions of cone points shall comply with those given in figure 4.

NOTE. Cone points are permissible on cut or rolled thread screws, but should be avoided whenever possible.

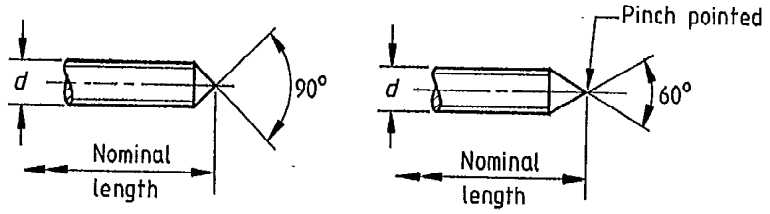


Figure 4. Cone pointed ends

11.4 Header points

Header points shall comply with the dimensions shown in figure 5 and given in tables 2 and 3.

NOTE. After thread rolling, the end produced approximates to the chamfered end shown in figure 2 for cut thread screws.

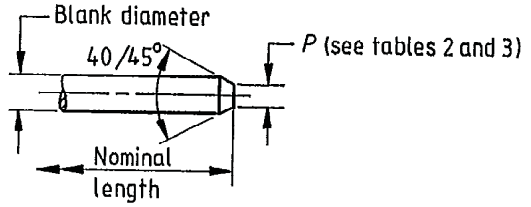


Figure 5. Header point

12 Designation

When designating standard machine screws or machine screw nuts in an enquiry or order the following information shall be given:

(a) details of the material;

(b) whether screw or nut;

(c) the style of head and whether slotted or recess type;

(d) the diameter and thread series (UNC or UNF), and, in the case of screws, the length;

(e) the type of end (if a special point is required);

(f) the number of this British Standard, i.e. BS 1981;

(g) details of the plating required, if any, in accordance with the appropriate British Standard, e.g. BS 3382 : Parts 1 & 2.

Examples

(1) Steel slotted countersunk head screws No. 10 UNC × $\frac{1}{2}$ in to BS 1981, zinc plated to BS 3382 : Part 2.

(2) Brass square nut No. 6 UNC to BS 1981.

Table 1. Under head radii

Nominal screw size	*r* min.	*r* max.	
	All heads	Heads complying with 10.1	Heads complying with 10.2
	in	in	in
0	0.004	0.009	0.024
1	0.004	0.010	0.029
2	0.004	0.012	0.034
3	0.004	0.015	0.040
4	0.004	0.016	0.045
5	0.004	0.019	0.050
6	0.004	0.021	0.055
8	0.008	0.024	0.065
10	0.008	0.028	0.076
12	0.008	0.032	0.086
$\frac{1}{4}$	0.010	0.037	0.100
$\frac{5}{16}$	0.016	0.047	0.125
$\frac{3}{8}$	0.016	0.055	0.150
$\frac{7}{16}$	0.024	0.065	0.175
$\frac{1}{2}$	0.024	0.075	0.200
$\frac{5}{8}$	0.024	0.093	0.250
$\frac{3}{4}$	0.024	0.112	0.300

Table 2. Header point dimensions for UNC screws

Nominal diameter	Number of threads per inch	Diameter of header point *P*	
		Max.	Min.
		in	in
4	40	0.074	0.065
5	40	0.086	0.076
6	32	0.090	0.080
8	32	0.114	0.102
10	24	0.125	0.112
12	24	0.149	0.134
$\frac{1}{4}$	20	0.171	0.157
$\frac{5}{16}$	18	0.222	0.206
$\frac{3}{8}$	16	0.271	0.253
$\frac{7}{16}$	14	0.318	0.298
$\frac{1}{2}$	13	0.369	0.347
$\frac{5}{8}$	11	0.468	0.452
$\frac{3}{4}$	10	0.545	0.515

Table 3. Header point dimensions for UNF screws

Nominal diameter	Number of threads per inch	Diameter of header point *P*	
		Max.	Min.
		in	in
4	48	0.079	0.070
5	44	0.088	0.079
6	40	0.098	0.087
8	36	0.118	0.106
10	32	0.138	0.124
12	28	0.156	0.141
$\frac{1}{4}$	28	0.187	0.173
$\frac{5}{16}$	24	0.237	0.221
$\frac{3}{8}$	24	0.294	0.276
$\frac{7}{16}$	20	0.342	0.322
$\frac{1}{2}$	20	0.400	0.378
$\frac{5}{8}$	18	0.507	0.481
$\frac{3}{4}$	16	0.614	0.584

Table 4. Slotted countersunk head machine screws

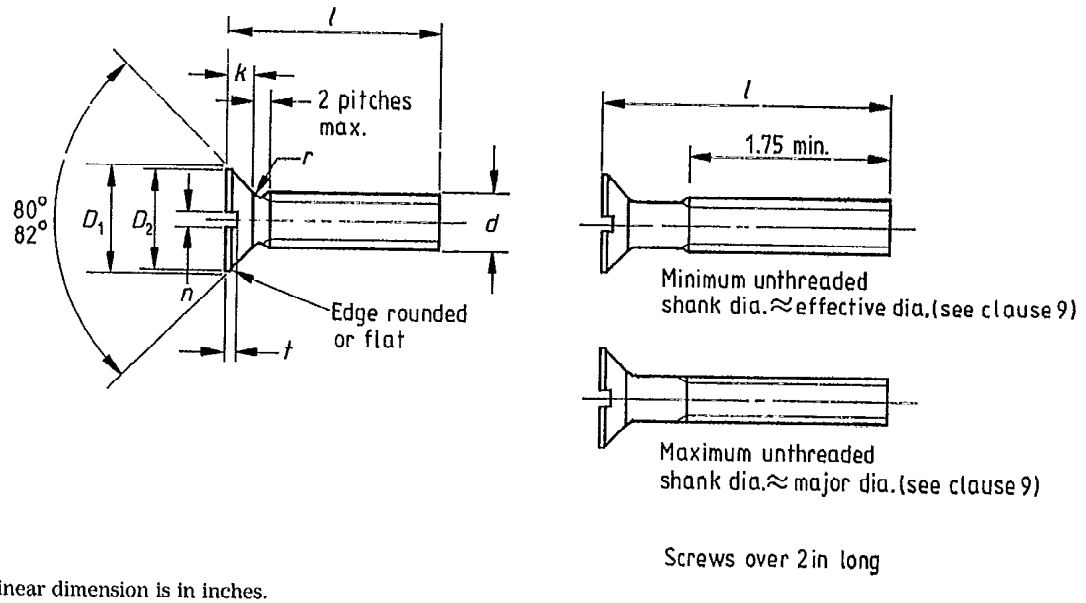
Nominal size	Diameter of screw $d^{1)}$	Head diameter		Head reference height $k^{1)}$	Flushness tolerance[2]	Screws with lengths as below or shorter have truncated heads (see table 6)	Width of slot $n^{1)}$		Depth of slot $t^{1)}$	
	Basic	Max. sharp $D_1^{1)}$	Min. $D_2^{1)}$		Max.		Max.	Min.	Max.	Min.
	in	in	in	in	in	in	in	in	in	in
0	0.0600	0.119	0.099	0.035	0.008	$\frac{1}{8}$	0.23	0.016	0.015	0.010
(1)	0.0730	0.146	0.123	0.043	0.008	$\frac{1}{8}$	0.26	0.019	0.019	0.012
2	0.0860	0.172	0.147	0.051	0.008	$\frac{1}{8}$	0.031	0.023	0.023	0.015
(3)	0.0990	0.199	0.171	0.059	0.008	$\frac{1}{8}$	0.035	0.027	0.027	0.017
4	0.1120	0.225	0.195	0.067	0.008	$\frac{3}{16}$	0.039	0.031	0.030	0.020
5	0.1250	0.252	0.220	0.075	0.008	$\frac{3}{16}$	0.043	0.035	0.034	0.022
6	0.1380	0.279	0.244	0.083	0.008	$\frac{3}{16}$	0.048	0.039	0.038	0.024
8	0.1640	0.332	0.292	0.100	0.008	$\frac{1}{4}$	0.054	0.045	0.045	0.029
10	0.1900	0.385	0.340	0.116	0.008	$\frac{5}{16}$	0.060	0.050	0.053	0.034
(12)	0.2160	0.438	0.389	0.132	0.009	$\frac{3}{8}$	0.067	0.056	0.060	0.039
$\frac{1}{4}$	0.2500	0.507	0.452	0.153	0.011	$\frac{7}{16}$	0.075	0.064	0.070	0.046
$\frac{5}{16}$	0.3125	0.635	0.568	0.191	0.014	$\frac{1}{2}$	0.084	0.072	0.088	0.058
$\frac{3}{8}$	0.3750	0.762	0.685	0.230	0.015	$\frac{9}{16}$	0.094	0.081	0.106	0.070
$\frac{7}{16}$	0.4375	0.812	0.723	0.223	0.016	$\frac{5}{8}$	0.094	0.081	0.103	0.066
$\frac{1}{2}$	0.5000	0.875	0.775	0.223	0.018	$\frac{3}{4}$	0.106	0.091	0.103	0.065
$\frac{5}{8}$	0.6250	1.125	1.002	0.298	0.022	$\frac{15}{16}$	0.133	0.116	0.137	0.088
$\frac{3}{4}$	0.7500	1.375	1.230	0.372	0.028	$1\frac{1}{8}$	0.149	0.131	0.171	0.111

[1)] See figure 6.

[2)] See appendix A.

NOTE 1. Nominal thread diameters shown in brackets are non-preferred.

NOTE 2. For values of the radius between head and shank, r, see table 1 and clause 10.



Linear dimension is in inches.

Figure 6. Slotted countersunk head machine screws

Table 5. Recessed countersunk head machine screws: details of recess type Z

Nominal size	Penetration[1]		Recess diameter S[2]	Recess and driver point number
	Max.	Min.	Nominal	
	in	in	in	
2	0.053	0.043	0.094	1
(3)	0.058	0.048	0.099	1
4	0.079	0.069	0.120	1
5	0.071	0.053	0.146	2
6	0.091	0.073	0.166	2
8	0.107	0.089	0.181	2
10	0.122	0.104	0.196	2
(12)	0.125	0.107	0.250	3
$\frac{1}{4}$	0.151	0.133	0.275	3
$\frac{5}{16}$	0.193	0.175	0.357	4
$\frac{3}{8}$	0.222	0.204	0.385	4
$\frac{7}{16}$	0.238	0.220	0.401	4
$\frac{1}{2}$	0.253	0.235	0.416	4

[1] See BS 6605.

[2] See figure 7.

NOTE. Nominal thread diameters shown in brackets are non-preferred.

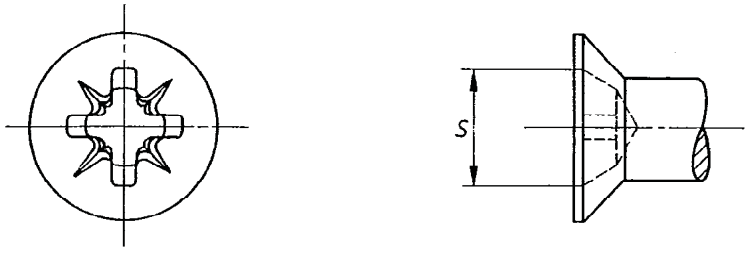


Figure 7. Recessed countersunk head machine screws: enlarged views of recess type Z

Table 6. Slotted truncated countersunk head machine screws: short length[1)]

Nominal size	Diameter of screw d[2)]	Head diameter		Head height k[2)]		Flushness tolerance[3)]	Width of slot n[2)]		Depth of slot t[2)]	
	Basic	Max. sharp D_1[2)]	Min. D_2[2)]	Max.	Min.	Max.	Max.	Min.	Max.	Min.
	in	in	in	in	in	in	in	in	in	in
0	0.0600	0.119	0.099	0.025	0.018	0.008	0.023	0.016	0.011	0.007
(1)	0.0730	0.146	0.123	0.031	0.023	0.008	0.026	0.019	0.014	0.009
2	0.0860	0.172	0.147	0.036	0.028	0.008	0.031	0.023	0.016	0.011
(3)	0.0990	0.199	0.171	0.042	0.033	0.008	0.035	0.027	0.019	0.012
4	0.1120	0.225	0.195	0.047	0.038	0.008	0.039	0.031	0.022	0.014
5	0.1250	0.252	0.220	0.053	0.043	0.008	0.043	0.035	0.024	0.016
6	0.1380	0.279	0.244	0.059	0.048	0.008	0.048	0.039	0.027	0.017
8	0.1640	0.332	0.292	0.070	0.058	0.008	0.054	0.045	0.032	0.021
10	0.1900	0.385	0.340	0.081	0.068	0.008	0.060	0.050	0.037	0.024
(12)	0.2160	0.438	0.389	0.092	0.078	0.009	0.067	0.056	0.043	0.028
$\frac{1}{4}$	0.2500	0.507	0.452	0.107	0.092	0.011	0.075	0.064	0.050	0.032
$\frac{5}{16}$	0.3125	0.635	0.568	0.134	0.116	0.014	0.084	0.072	0.062	0.041
$\frac{3}{8}$	0.3750	0.762	0.685	0.161	0.140	0.015	0.094	0.081	0.075	0.049
$\frac{7}{16}$	0.4375	0.812	0.723	0.156	0.133	0.016	0.094	0.081	0.072	0.045
$\frac{1}{2}$	0.5000	0.875	0.775	0.156	0.130	0.018	0.106	0.091	0.072	0.046
$\frac{5}{8}$	0.6250	1.125	1.002	0.208	0.176	0.022	0.133	0.116	0.096	0.062
$\frac{3}{4}$	0.7500	1.375	1.230	0.260	0.223	0.028	0.149	0.131	0.120	0.078

[1)]See appendix A.

[2)]See figure 8.

[3)]For normal length screws, see table 4.

NOTE 1. Nominal thread diameters shown in brackets are non-preferred.

NOTE 2. For values of the radius between head and shank, r, see table 1 and clause 10.

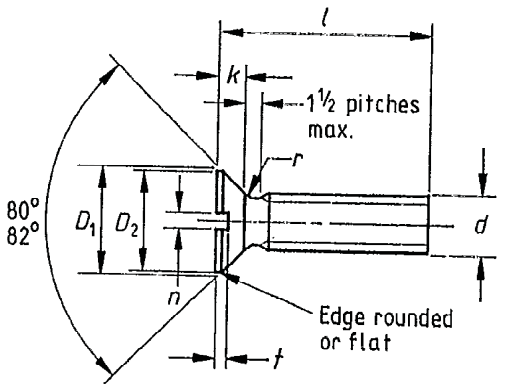


Figure 8. Slotted truncated countersunk head machine screws

Table 7. Recessed truncated countersunk head machine screws: details of recess type Z

Nominal size	Penetration[1]		Recess diameter S[2]	Recess and driver point number
	Max.	Min.	Nominal	
	in	in	in	
2	0.046	0.036	0.087	1
(3)	0.053	0.043	0.094	1
4	0.068	0.058	0.109	1
5	0.079	0.069	0.120	1
6	0.063	0.045	0.138	2
8	0.091	0.073	0.166	2
10	0.107	0.089	0.181	2
(12)	0.100	0.082	0.225	3
$\frac{1}{4}$	0.115	0.097	0.240	3
$\frac{5}{16}$	0.145	0.127	0.309	4
$\frac{3}{8}$	0.193	0.175	0.357	4
$\frac{7}{16}$	0.222	0.204	0.385	4
$\frac{1}{2}$	0.238	0.220	0.401	4

[1]See BS 6605.

[2]See figure 9.

NOTE. Nominal thread diameters shown in brackets are non-preferred.

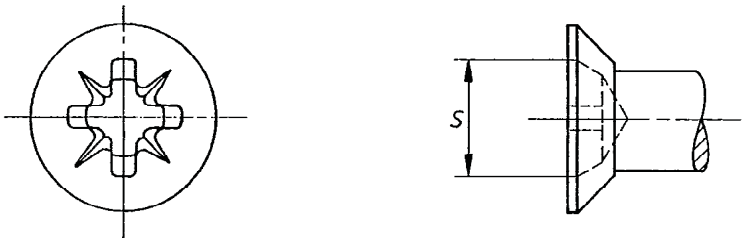


Figure 9. Recessed truncated countersunk head machine screws: enlarged views of recess type Z

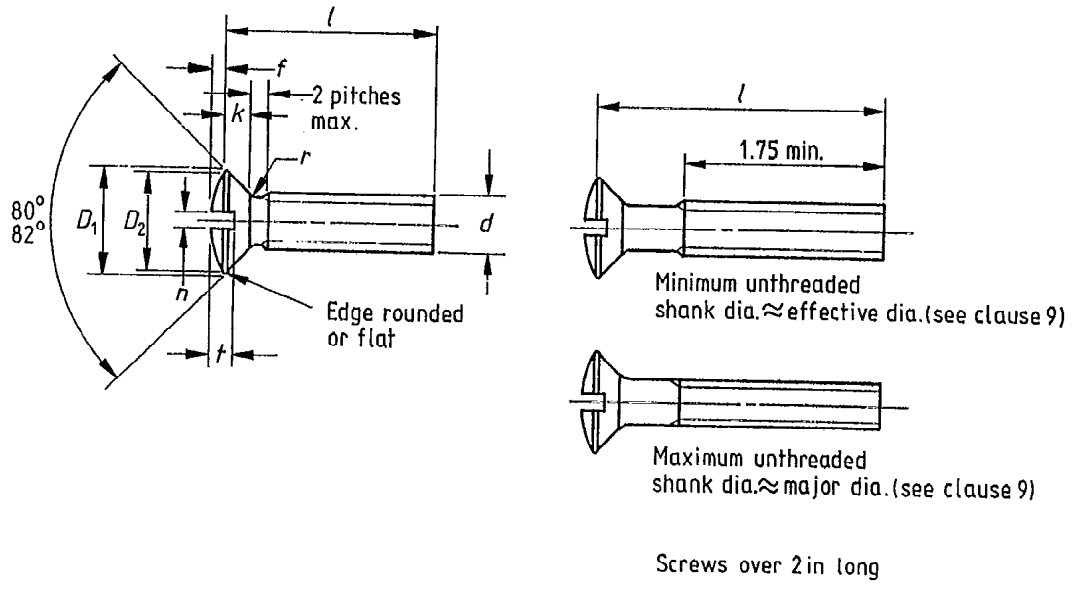
Table 8. Slotted raised countersunk head machine screws

Nominal size	Diameter of screw $d^{1)}$	Head diameter		Height of raised portion $f^{1)}$	Head reference height $k^{1)}$	Screws with lengths as below or shorter have truncated heads	Width of slot $n^{1)}$		Depth of slot $t^{1)}$	
	Basic	Max. sharp $D_1{}^{1)}$	Min. $D_2{}^{1)}$	Nominal			Max.	Min.	Max.	Min.
	in	in	in	in	in	in	in	in	in	in
0	0.0600	0.119	0.099	0.021	0.035	$\frac{1}{8}$	0.023	0.016	0.030	0.025
(1)	0.0730	0.146	0.123	0.025	0.043	$\frac{1}{8}$	0.026	0.019	0.038	0.031
2	0.0860	0.172	0.147	0.029	0.051	$\frac{1}{8}$	0.031	0.023	0.045	0.037
(3)	0.0990	0.199	0.171	0.033	0.059	$\frac{1}{8}$	0.035	0.027	0.052	0.043
4	0.1120	0.225	0.195	0.037	0.067	$\frac{3}{16}$	0.039	0.031	0.059	0.049
5	0.1250	0.252	0.220	0.041	0.075	$\frac{3}{16}$	0.043	0.035	0.067	0.055
6	0.1380	0.279	0.244	0.045	0.083	$\frac{3}{16}$	0.048	0.039	0.074	0.060
8	0.1640	0.332	0.292	0.052	0.100	$\frac{1}{4}$	0.054	0.045	0.088	0.072
10	0.1900	0.385	0.340	0.060	0.116	$\frac{5}{16}$	0.060	0.050	0.103	0.084
(12)	0.2160	0.438	0.389	0.068	0.132	$\frac{3}{8}$	0.067	0.056	0.117	0.096
$\frac{1}{4}$	0.2500	0.507	0.452	0.079	0.153	$\frac{7}{16}$	0.075	0.064	0.136	0.112
$\frac{5}{16}$	0.3125	0.635	0.568	0.099	0.191	$\frac{1}{2}$	0.084	0.072	0.171	0.141
$\frac{3}{8}$	0.3750	0.762	0.685	0.117	0.230	$\frac{9}{16}$	0.094	0.081	0.206	0.170

1) See figure 10.

NOTE 1. Nominal thread diameters shown in brackets are non-preferred.

NOTE 2. For values of the radius between head and shank, r, see table 1 and clause 10.



Linear dimension is in inches.

Figure 10. Slotted raised countersunk head machine screws

Table 9. Recessed raised countersunk head machine screws: details of recess type Z

Nominal size	Penetration[1]		Recess diameter S[2]	Recess and driver point number
	Max.	Min.	Nominal	
	in	in	in	
2	0.053	0.043	0.095	1
(3)	0.067	0.057	0.109	1
4	0.082	0.072	0.123	1
5	0.073	0.055	0.150	2
6	0.092	0.074	0.169	2
8	0.107	0.089	0.183	2
10	0.124	0.106	0.200	2
(12)	0.133	0.115	0.261	3
$\frac{1}{4}$	0.152	0.134	0.280	3
$\frac{5}{16}$	0.205	0.187	0.373	4
$\frac{3}{8}$	0.231	0.213	0.398	4

[1] See BS 6605.

[2] See figure 11.

NOTE. Nominal thread diameters shown in brackets are non-preferred.

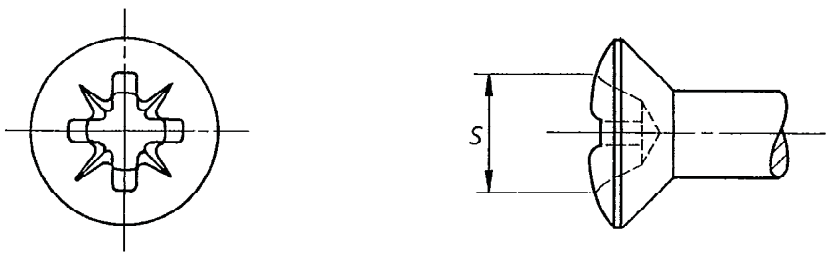


Figure 11. Recessed raised countersunk head machine screws: enlarged views of recess type Z

Table 10. Slotted truncated raised countersunk head machine screws: short length[1)]

Nominal size	Diameter of screw $d^{2)}$	Head diameter		Head reference height $k^{2)}$	Height of raised portion $f^{2)}$	Width of slot $n^{2)}$		Depth of slot $t^{2)}$	
	Basic	Max. sharp $D_1{}^{2)}$	Min. $D_2{}^{2)}$		Nominal	Max.	Min.	Max.	Min.
	in	in	in	in	in	in	in	in	in
0	0.0600	0.119	0.099	0.025	0.021	0.023	0.016	0.028	0.022
(1)	0.0730	0.146	0.123	0.031	0.025	0.026	0.019	0.034	0.027
2	0.0860	0.172	0.147	0.036	0.029	0.031	0.023	0.040	0.033
(3)	0.0990	0.199	0.171	0.042	0.033	0.035	0.027	0.047	0.038
4	0.1120	0.225	0.195	0.047	0.037	0.039	0.031	0.053	0.043
5	0.1250	0.252	0.220	0.053	0.041	0.043	0.035	0.059	0.048
6	0.1380	0.279	0.244	0.059	0.045	0.048	0.039	0.065	0.053
8	0.1640	0.332	0.292	0.070	0.052	0.054	0.045	0.078	0.064
10	0.1900	0.385	0.340	0.081	0.060	0.060	0.050	0.090	0.074
(12)	0.2160	0.438	0.389	0.092	0.068	0.067	0.056	0.103	0.085
$\frac{1}{4}$	0.2500	0.507	0.452	0.107	0.079	0.075	0.064	0.119	0.098
$\frac{5}{16}$	0.3125	0.635	0.568	0.134	0.099	0.084	0.072	0.149	0.124
$\frac{3}{8}$	0.3750	0.762	0.685	0.161	0.117	0.094	0.081	0.179	0.149

[1)]For normal length screws, see table 8

[2)]See figure 12.

NOTE 1. Nominal thread diameters shown in brackets are non-preferred.

NOTE 2. For values of the radius between head and shank, r, see table 1 and clause **10**.

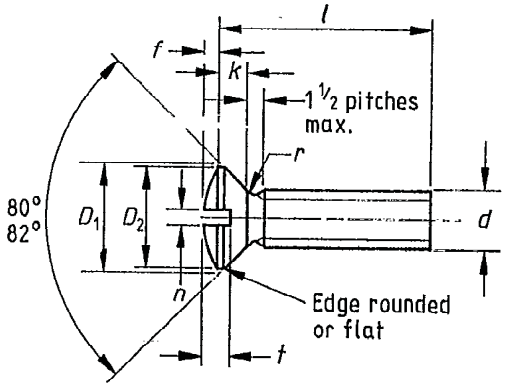


Figure 12. Slotted truncated raised countersunk head machine screws

Table 11. Recessed truncated raised countersunk head machine screws: details of recess type Z

Nominal size	Penetration[1]		Recess diameter S[2]	Recess and driver point number
	Max.	Min.	Nominal	
	in	in	in	
2	0.053	0.043	0.095	1
(3)	0.067	0.057	0.109	1
4	0.082	0.072	0.123	1
5	0.073	0.055	0.150	2
6	0.092	0.074	0.169	2
8	0.107	0.089	0.183	2
10	0.124	0.106	0.200	2
(12)	0.133	0.115	0.261	3
$\frac{1}{4}$	0.152	0.134	0.280	3
$\frac{5}{16}$	0.205	0.187	0.373	4
$\frac{3}{8}$	0.231	0.213	0.398	4

[1] See BS 6605.

[2] See figure 13.

NOTE. Nominal thread diameters shown in brackets are non-preferred.

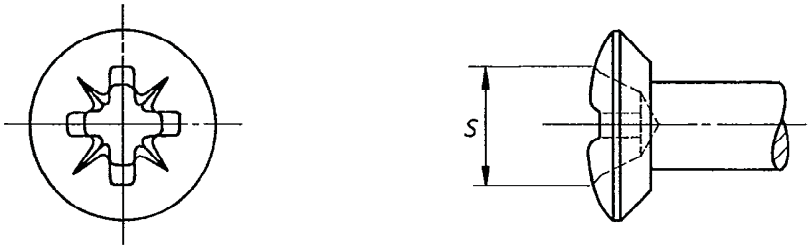


Figure 13. Recessed truncated raised countersunk head machine screws: enlarged views of recess type Z

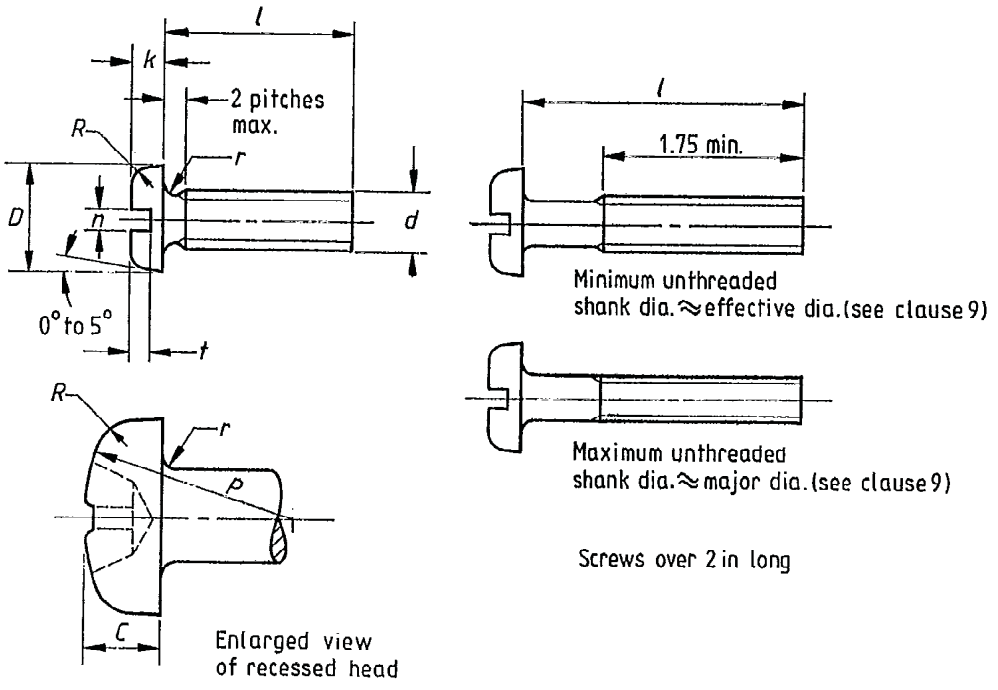
Table 12. Slotted and recessed pan head machine screws

Nominal size	Diameter of screw $d^{1)}$	Head diameter $D^{1)}$		Head height (slotted) $k^{1)}$		Head height (recessed) $C^{1)}$		Head radius (slotted) $R^{1)}$	Head radius (recessed) $P^{1)}$	Width of slot $n^{1)}$		Depth of slot $t^{1)}$	
	Basic	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Nominal	Max.	Min.	Max.	Min.
	in	in	in	in	in	in	in	in	in	in	in	in	in
0	0.0600	0.116	0.104	0.039	0.031	0.044	0.036	0.020	—	0.023	0.016	0.022	0.014
(1)	0.0730	0.142	0.130	0.046	0.038	0.053	0.044	0.025	—	0.026	0.019	0.027	0.018
2	0.0860	0.167	0.155	0.053	0.045	0.062	0.053	0.035	0.132	0.031	0.023	0.031	0.022
(3)	0.0990	0.193	0.180	0.060	0.051	0.071	0.062	0.037	0.150	0.035	0.027	0.036	0.026
4	0.1120	0.219	0.205	0.068	0.058	0.080	0.070	0.042	0.173	0.039	0.031	0.040	0.030
5	0.1250	0.245	0.231	0.075	0.065	0.089	0.079	0.044	0.191	0.043	0.035	0.045	0.034
6	0.1380	0.270	0.256	0.082	0.072	0.097	0.087	0.046	0.207	0.048	0.039	0.050	0.037
8	0.1640	0.322	0.306	0.096	0.085	0.115	0.105	0.052	0.244	0.054	0.045	0.058	0.045
10	0.1900	0.373	0.357	0.110	0.099	0.133	0.122	0.061	0.284	0.060	0.050	0.068	0.053
(12)	0.2160	0.425	0.407	0.125	0.112	0.151	0.139	0.078	0.323	0.067	0.056	0.077	0.061
$\frac{1}{4}$	0.2500	0.492	0.473	0.144	0.130	0.175	0.162	0.087	0.373	0.075	0.064	0.087	0.070
$\frac{5}{16}$	0.3125	0.615	0.594	0.178	0.162	0.218	0.203	0.099	0.527	0.084	0.072	0.106	0.085
$\frac{3}{8}$	0.3750	0.740	0.716	0.212	0.195	0.261	0.244	0.143	0.652	0.094	0.081	0.124	0.100
$\frac{7}{16}$	0.4375	0.863	0.038	0.247	0.227	0.304	0.286	0.148	0.782	0.094	0.081	0.149	0.119
$\frac{1}{2}$	0.5000	0.987	0.958	0.281	0.260	0.348	0.327	0.169	0.917	0.106	0.091	0.169	0.137
$\frac{5}{8}$	0.6250	1.125	1.090	0.350	0.325	—	—	0.210	—	0.133	0.116	0.211	0.171
$\frac{3}{4}$	0.7500	1.250	1.209	0.419	0.390	—	—	0.251	—	0.149	0.131	0.252	0.205

[1)]See figure 14.

NOTE 1. Nominal thread diameters shown in brackets are non-preferred.

NOTE 2. For values of the radius between head and shank, r, see table 1 and clause 10.



Linear dimension is in inches.

Figure 14. Slotted and recessed pan head machine screws

Table 13. Recessed pan head machine screws: details of recess type Z

Nominal size	Penetration[1]		Recess diameter S[2]	Recess and driver point number
	Max.	Min.	Nominal	
	in	in	in	
2	0.053	0.043	0.096	1
(3)	0.062	0.052	0.104	1
4	0.072	0.062	0.114	1
5	0.068	0.050	0.146	2
6	0.076	0.058	0.154	2
8	0.092	0.074	0.169	2
10	0.108	0.090	0.185	2
(12)	0.117	0.099	0.246	3
$\frac{1}{4}$	0.137	0.119	0.265	3
$\frac{5}{16}$	0.164	0.146	0.333	4
$\frac{3}{8}$	0.201	0.183	0.369	4
$\frac{7}{16}$	0.224	0.206	0.392	4
$\frac{1}{2}$	0.246	0.228	0.412	4

[1] See BS 6605.

[2] See figure 15.

NOTE. Nominal thread diameters shown in brackets are non-preferred.

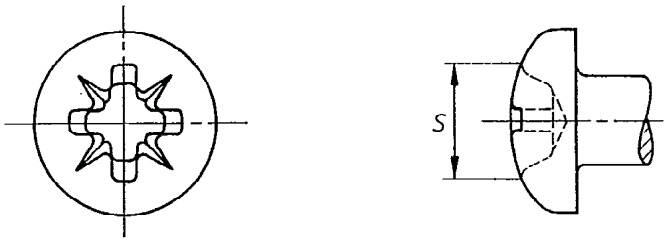


Figure 15. Recessed pan head machine screws: enlarged views of recess type Z

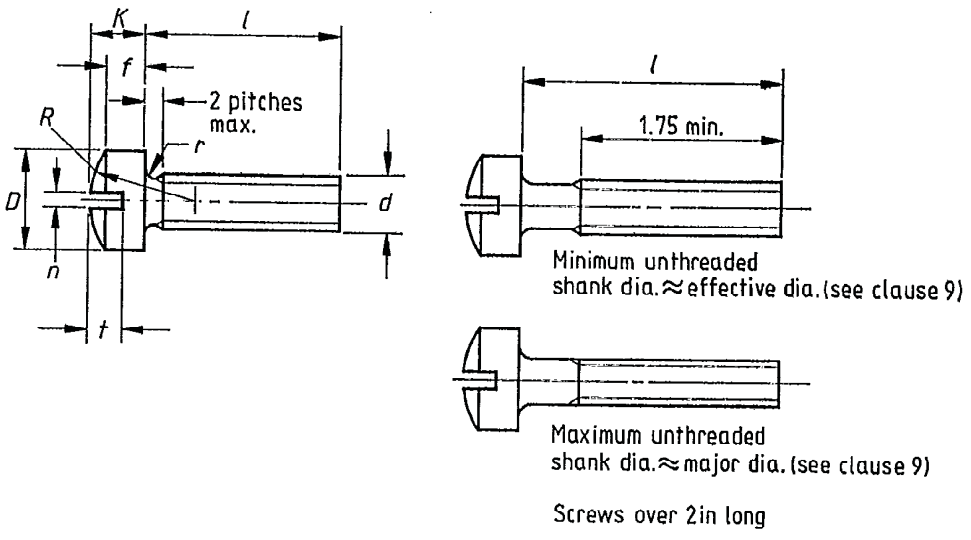
Table 14. Slotted raised cheese head machine screws

Nominal size	Diameter of screw $d^{1)}$	Head diameter $D^{1)}$		Total head height $k^{1)}$		Head side height $f^{1)}$	Head radius $R^{1)}$	Width of slot $n^{1)}$		Depth of slot $t^{1)}$	
	Basic	Max.	Min.	Max.	Min.	Nominal	Nominal	Max.	Min.	Max.	Min.
	in	in	in	in	in	in	in	in	in	in	in
0	0.0600	0.096	0.083	0.059	0.043	0.041	0.091	0.023	0.016	0.025	0.015
(1)	0.0730	0.118	0.104	0.071	0.055	0.049	0.111	0.026	0.019	0.031	0.020
2	0.0860	0.140	0.124	0.083	0.066	0.058	0.132	0.031	0.023	0.037	0.025
(3)	0.0990	0.161	0.145	0.095	0.077	0.066	0.150	0.035	0.027	0.043	0.030
4	0.1120	0.183	0.166	0.107	0.088	0.074	0.173	0.039	0.031	0.048	0.035
5	0.1250	0.205	0.187	0.120	0.100	0.083	0.191	0.043	0.035	0.054	0.040
6	0.1380	0.226	0.208	0.132	0.111	0.091	0.207	0.048	0.039	0.060	0.045
8	0.1640	0.270	0.250	0.156	0.133	0.108	0.244	0.054	0.045	0.071	0.054
10	0.1900	0.313	0.292	0.180	0.156	0.124	0.284	0.060	0.050	0.083	0.064
(12)	0.2160	0.357	0.334	0.205	0.178	0.141	0.323	0.067	0.056	0.094	0.074
$\frac{1}{4}$	0.2500	0.414	0.389	0.237	0.207	0.163	0.373	0.075	0.064	0.109	0.087
$\frac{5}{16}$	0.3125	0.518	0.490	0.295	0.262	0.203	0.468	0.084	0.072	0.137	0.110
$\frac{3}{8}$	0.3750	0.622	0.590	0.355	0.315	0.243	0.652	0.094	0.081	0.164	0.133
$\frac{7}{16}$	0.4375	0.625	0.589	0.368	0.321	0.254	0.782	0.094	0.081	0.170	0.135
$\frac{1}{2}$	0.5000	0.750	0.710	0.412	0.362	0.285	0.917	0.106	0.091	0.190	0.151

[1)] See figure 16.

NOTE 1. Nominal thread diameters shown in brackets are non-preferred.

NOTE 2. For values of the radius between head and shank, r, see table 1 and clause **10.**



Dimension is in inches.

Figure 16. Slotted raised cheese head machine screws

Table 15. Recessed raised cheese head machine screws: details of recess type Z

Nominal size	Penetration[1]		Recess diameter S[2]	Recess and driver point number
	Max.	Min.	Nominal	
	in	in	in	
2	0.053	0.043	0.096	1
(3)	0.062	0.052	0.104	1
4	0.072	0.052	0.114	1
5	0.054	0.036	0.132	2
6	0.076	0.058	0.154	2
8	0.092	0.074	0.169	2
10	0.108	0.090	0.185	2
(12)	0.117	0.099	0.246	3
$\frac{1}{4}$	0.137	0.119	0.265	3
$\frac{5}{16}$	0.183	0.165	0.314	3
$\frac{3}{8}$	0.201	0.183	0.369	4
$\frac{7}{16}$	0.224	0.206	0.391	4
$\frac{1}{2}$	0.246	0.228	0.412	4

[1] See BS 6605.

[2] See figure 17.

NOTE. Nominal thread diameters shown in brackets are non-preferred.

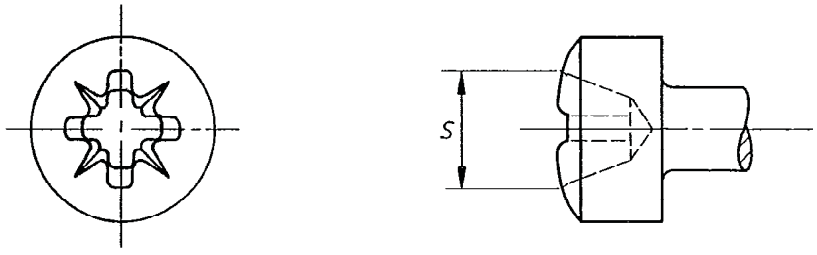


Figure 17. Recessed raised cheese head machine screws: enlarged views of recess type Z

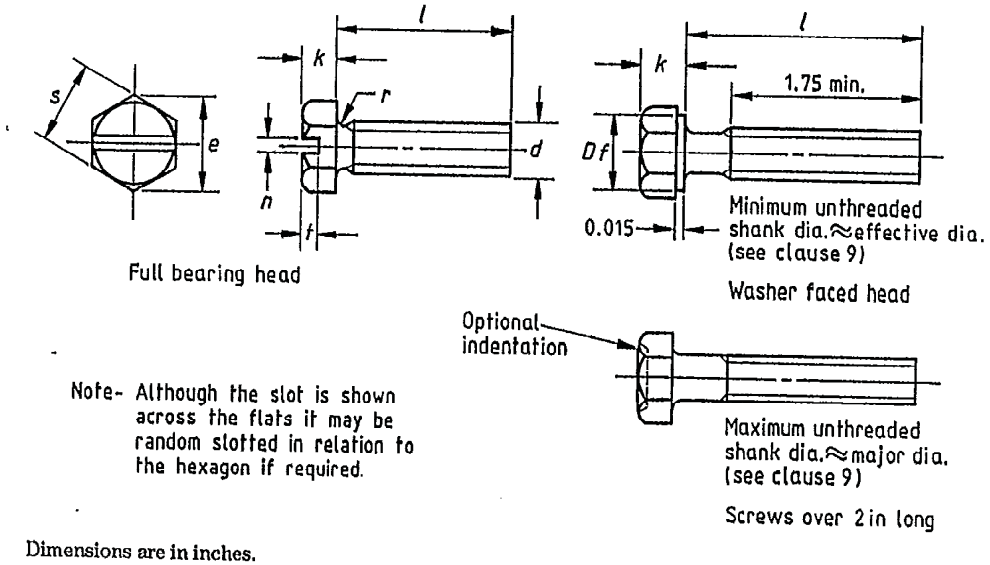
Table 16. Plain and slotted hexagon head machine screws

Nominal size	Diameter of screw $d^{1)}$	Width across flats $s^{1)}$		Across corners $e^{1)}$	Head height $k^{1)}$		Diameter of washer face $Df^{1)}$		Width of slot $n^{1)}$		Depth of slot $t^{1)}$	
	Basic	Max.	Min.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
	in	in	in	in	in	in	in	in	in	in	in	in
2	0.0860	0.125	0.120	0.134	0.050	0.040	0.110	0.100	0.031	0.023	—	—
(3)	0.0990	0.187	0.181	0.202	0.055	0.044	0.171	0.161	0.035	0.027	—	—
4	0.1120	0.187	0.181	0.202	0.060	0.049	0.171	0.161	0.039	0.031	0.036	0.025
5	0.1250	0.187	0.181	0.202	0.070	0.058	0.171	0.161	0.043	0.035	0.042	0.030
6	0.1380	0.250	0.244	0.272	0.093	0.080	0.234	0.224	0.048	0.039	0.046	0.033
8	0.1640	0.250	0.244	0.272	0.110	0.096	0.234	0.224	0.054	0.045	0.066	0.052
10	0.1900	0.312	0.305	0.340	0.120	0.105	0.295	0.285	0.060	0.050	0.072	0.057
(12)	0.2160	0.312	0.305	0.340	0.155	0.139	0.295	0.285	0.067	0.056	0.093	0.077

[1)]See figure 18.

NOTE 1. Nominal sizes shown in brackets are non-preferred.

NOTE 2. For values of the radius between head and shank, r, see table 1 and clause **10.**



Dimensions are in inches.

Figure 18. Plain and slotted hexagon head machine screws

Table 17. Symmetry and concentricity tolerances

Nominal size	Slot or recess to shank Z		Head to shank Z_1	
	Countersunk head, raised countersunk head and pan head	Raised cheese heads	Countersunk head, raised countersunk head and pan head	Raised cheese heads
0	IT 13[1)]	IT 13[1)]	0.006	0.006
(1)			0.007	0.006
2			0.007	0.007
(3)			0.007	0.007
4			0.007	0.007
5			0.009	0.007
6			0.009	0.007
8			0.009	0.009
10			0.009	0.009
(12)			0.010	0.009
$\frac{1}{4}$			0.010	0.010
$\frac{5}{15}$			0.010	0.010
$\frac{3}{8}$			0.012	0.010
$\frac{7}{16}$			0.012	0.010
$\frac{1}{2}$	IT 14[1)]	IT 14[1)]	0.012	0.012
$\frac{5}{8}$			0.025	—
$\frac{3}{4}$	IT 15[1)]	—	0.025	—

[1)] See BS 6322 : Part 1.

NOTE. The above tolerances are half the total indicator reading.

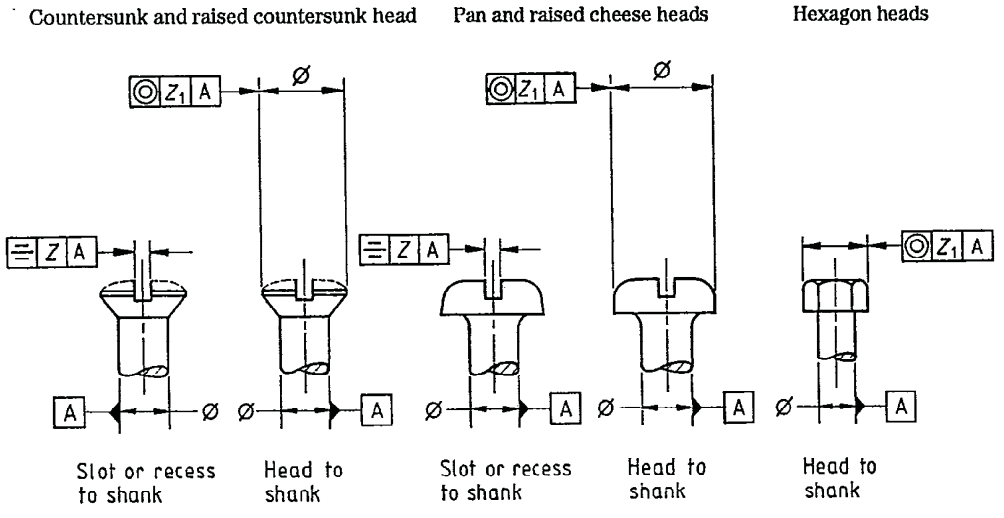


Figure 19. Symmetry and concentricity tolerances

Table 18. Nominal lengths and tolerances for machine screws

Nominal length	Tolerance	Nominal length	Tolerance[1)]
$\frac{1}{16}$	+0.000	$(1\frac{1}{8})$	+0.000
$(\frac{3}{32})$	−0.010	$1\frac{1}{4}$	−0.060
$\frac{1}{8}$		$(1\frac{3}{8})$	
$(\frac{5}{32})$		$1\frac{1}{2}$	
		$1\frac{3}{4}$	
$\frac{3}{16}$	+0.000	2	
$\frac{1}{4}$	−0.020	$(2\frac{1}{4})$	
$(\frac{5}{16})$		$2\frac{1}{2}$	
$\frac{3}{8}$		$(2\frac{3}{4})$	
$(\frac{7}{16})$		3	
$\frac{1}{2}$		$(3\frac{1}{4})$	
		$3\frac{1}{2}$	
$\frac{5}{8}$	+0.000	$(3\frac{3}{4})$	
$\frac{3}{4}$	−0.030	4	
$\frac{7}{8}$			
1			

[1)]For screws with pinched cone points the above tolerances on length shall be doubled.

NOTE. Lengths quoted in brackets should be avoided if possible (non-preferred).

Table 19. Dimensions of machine screw nuts: precision type, sizes No. 0 to No. 12

Nominal size	Basic major diameter of thread $d^{1)}$	Width across flats $s^{1)}$		Width across corners $e^{1)}$		Thickness $m^{1)}$		
		Max. (basic)	Min.	Hexagon		Nominal	Max.	Min.
				Max.	Min.			
	in	in	in	in	in		in	in
0	0.0600	$\frac{5}{32}$ 0.1562	0.150	0.180	0.171	$\frac{3}{64}$	0.050	0.043
(1)	0.0730	$\frac{5}{32}$ 0.1562	0.150	0.180	0.171	$\frac{3}{64}$	0.050	0.043
2	0.0860	$\frac{3}{16}$ 0.1875	0.180	0.217	0.205	$\frac{1}{16}$	0.066	0.057
(3)	0.0990	$\frac{3}{16}$ 0.1875	0.180	0.217	0.205	$\frac{1}{16}$	0.066	0.057
4	0.1120	$\frac{1}{4}$ 0.2500	0.241	0.289	0.275	$\frac{3}{32}$	0.098	0.087
5	0.1250	$\frac{5}{16}$ 0.3125	0.302	0.361	0.344	$\frac{7}{64}$	0.114	0.102
6	0.1380	$\frac{5}{16}$ 0.3125	0.302	0.361	0.344	$\frac{7}{64}$	0.114	0.102
8	0.1640	$\frac{11}{32}$ 0.3438	0.332	0.397	0.378	$\frac{1}{8}$	0.130	0.117
10	0.1900	$\frac{3}{8}$ 0.3750	0.362	0.433	0.413	$\frac{1}{8}$	0.130	0.117
(12)	0.2160	$\frac{7}{16}$ 0.4375	0.423	0.505	0.482	$\frac{5}{32}$	0.161	0.148

[1)]See figure 20.

NOTE 1. For dimensions of nuts $\frac{1}{4}$ in and larger, see BS 1768.

NOTE 2. Nominal sizes shown in brackets are non-preferred.

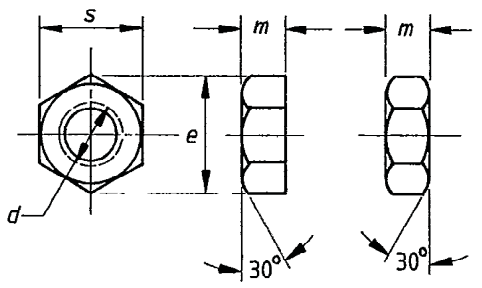


Figure 20. Machine screw nuts: precision type, sizes No. 0 to No. 12

Table 20. Dimensions of machine screw nuts: pressed type, square and hexagon

Nominal size	Basic major diameter of thread $d^{1)}$	Width across flats $s^{1)}$		Width across corners $e^{1)}$				Thickness $m^{1)}$	
				Square		Hexagon			
		Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
	in	in	in	in	in	in	in	in	in
0	0.0600	0.156	0.150	0.221	0.206	0.180	0.171	0.050	0.043
(1)	0.0730	0.156	0.150	0.221	0.206	0.180	0.171	0.050	0.043
2	0.0860	0.187	0.180	0.265	0.247	0.217	0.205	0.066	0.057
(3)	0.090	0.187	0.180	0.265	0.247	0.217	0.205	0.066	0.057
4	0.1120	0.250	0.241	0.354	0.331	0.289	0.275	0.098	0.087
5	0.1250	0.312	0.302	0.442	0.415	0.361	0.344	0.114	0.102
6	0.1380	0.312	0.302	0.442	0.415	0.361	0.344	0.114	0.102
8	0.1640	0.344	0.332	0.486	0.456	0.397	0.378	0.130	0.117
10	0.1900	0.375	0.362	0.530	0.497	0.433	0.413	0.130	0.117
(12)	0.2160	0.437	0.423	0.619	0.581	0.505	0.482	0.161	0.148
$\frac{1}{4}$	0.2500	0.437	0.423	0.619	0.581	0.505	0.482	0.193	0.178
$\frac{5}{16}$	0.3125	0.562	0.545	0.796	0.748	0.649	0.621	0.225	0.208
$\frac{3}{8}$	0.3750	0.625	0.607	0.884	0.833	0.722	0.692	0.257	0.239

[1)]See figure 21.

NOTE. Nominal sizes shown in brackets are non-preferred.

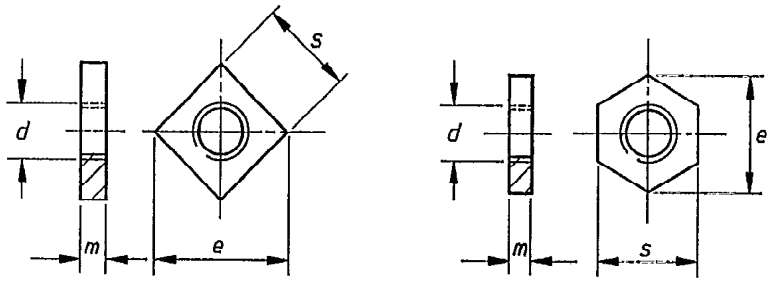


Figure 21. Machine screw nuts: pressed type

Table 21. Recessed countersunk head machine screws: details of recess type V

Nominal size	Penetration[1]		Recess diameter S[2]	Recess and driver point number
	Max.	Min.	Max.	
	in	in	in	
2	0.038	0.032	0.096	1
(3)	0.047	0.041	0.104	1
4	0.066	0.54	0.120	1
5	0.057	0.047	0.152	2
6	0.073	0.059	0.165	2
8	0.087	0.069	0.177	2
10	0.106	0.083	0.193	2
(12)	0.107	0.093	0.244	3
$\frac{1}{4}$	0.140	0.113	0.272	3
$\frac{5}{16}$	0.179	0.160	0.362	4
$\frac{3}{8}$	0.210	0.186	0.388	4
$\frac{7}{16}$	0.227	0.201	0.404	4
$\frac{1}{2}$	0.246	0.216	0.417	4

[1] See BS 6605.

[2] See figure 22.

NOTE. Nominal thread diameters shown in brackets are non-preferred.

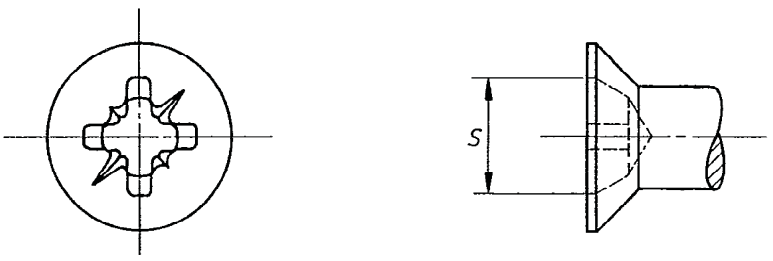


Figure 22. Recessed countersunk head machine screws: enlarged views of recess type V

Table 22. Recessed truncated countersunk head machine screws: details of recess type V

Nominal size	Penetration[1]		Recess diameter S[2]	Recess and driver point number
	Max.	Min.	Max.	
	in	in	in	
2	0.031	0.025	0.091	1
(3)				1
4	0.052	0.044	0.108	1
5	0.066	0.057	0.120	1
6	0.057	0.048	0.152	2
8	0.073	0.064	0.165	2
10	0.087	0.077	0.177	2
(12)	0.090	0.079	0.230	3
$\frac{1}{4}$	0.100	0.088	0.238	3
$\frac{5}{16}$	0.131	0.118	0.323	4
$\frac{3}{8}$	0.179	0.162	0.362	4
$\frac{7}{16}$	0.210	0.190	0.388	4
$\frac{1}{2}$	0.227	0.207	0.404	4

[1] See BS 6605.

[2] See figure 23.

NOTE. Nominal thread diameters shown in brackets are non-preferred.

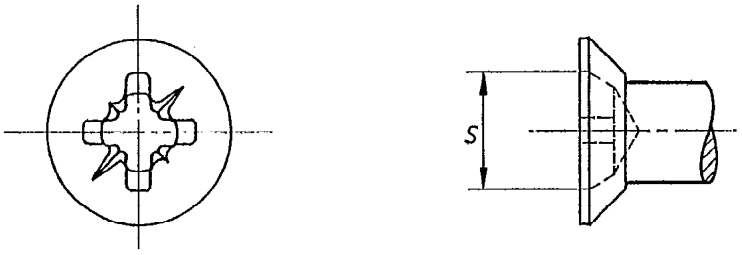


Figure 23. Recessed truncated countersunk head machine screws: enlarged views of recess type V

Table 23. Recessed raised countersunk head machine screws: details of recess type V

Nominal size	Penetration[1]		Recess diameter S[2]	Recess and driver point number
	Max.	Min.	Max.	
	in	in	in	
2	0.040	0.034	0.098	1
(3)	0.052	0.044	0.108	1
4	0.068	0.056	0.122	1
5	0.060	0.050	0.156	2
6	0.079	0.063	0.171	2
8	0.096	0.075	0.185	2
10	0.115	0.091	0.201	2
(12)	0.124	0.104	0.260	3
$\frac{1}{4}$	0.143	0.117	0.276	3
$\frac{5}{16}$	0.198	0.176	0.380	4
$\frac{3}{8}$	0.222	0.196	0.400	4

[1] See BS 6605.

[2] See figure 24.

NOTE. Nominal thread diameters shown in brackets are non-preferred.

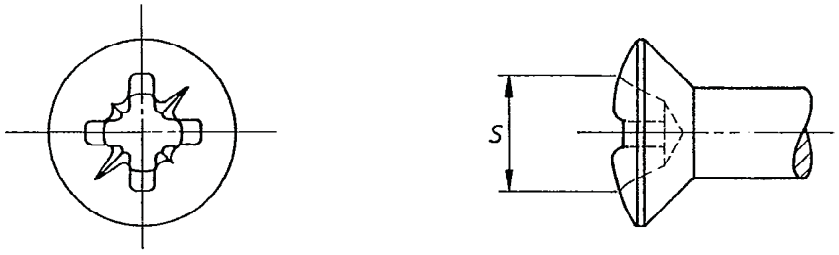


Figure 24. Recessed raised countersunk head machine screws: enlarged views of recess type V

Table 24. Recessed truncated raised countersunk head machine screws: details of recess type V

Nominal size	Penetration[1]		Recess diameter S[2]	Recess and driver point number
	Max.	Min.	Max.	
	in	in	in	
2	0.040	0.034	0.098	1
(3)	0.052	0.044	0.108	1
4	0.068	0.056	0.122	1
5	0.060	0.050	0.156	2
6	0.079	0.063	0.171	2
8	0.096	0.075	0.185	2
10	0.115	0.091	0.201	2
(12)	0.124	0.104	0.260	3
$\frac{1}{4}$	0.143	0.117	0.276	3
$\frac{5}{16}$	0.198	0.176	0.380	4
$\frac{3}{8}$	0.222	0.196	0.400	4

[1]See BS 6605.

[2]See figure 25.

NOTE. Nominal thread diameters shown in brackets are non-preferred.

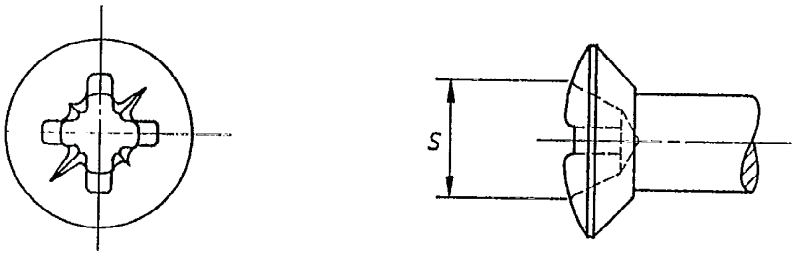


Figure 25. Recessed truncated raised countersunk head machine screws: enlarged views of recess type V

Table 25. Recessed pan head machine screws: details of recess type V

Nominal size	Penetration[1]		Recess diameter S[2]	Recess and driver point number
	Max.	Min.	Max.	
	in	in	in	
2	0.042	0.036	0.100	1
(3)	0.047	0.041	0.104	1
4	0.063	0.055	0.118	1
5	0.058	0.049	0.154	2
6	0.065	0.056	0.159	2
8	0.079	0.067	0.171	2
10	0.110	0.091	0.197	2
(12)	0.110	0.098	0.248	3
$\frac{1}{4}$	0.127	0.111	0.262	3
$\frac{5}{16}$	0.158	0.142	0.346	4
$\frac{3}{8}$	0.191	0.170	0.374	4
$\frac{7}{16}$	0.215	0.190	0.393	4
$\frac{1}{2}$	0.229	0.202	0.406	4

[1] See BS 6605.

[2] See figure 26.

NOTE. Nominal thread diameters shown in brackets are non-preferred.

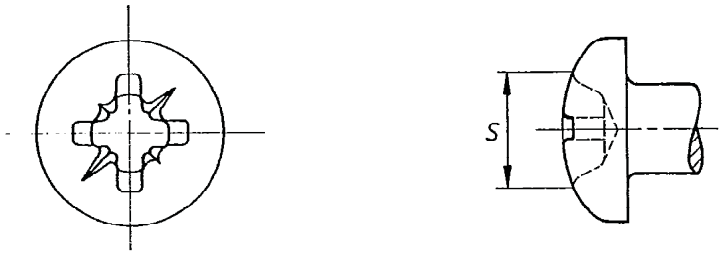


Figure 26. Recessed pan head machine screws: enlarged views of recess type V

Table 26. Recessed raised cheese head machine screws: details of recess type V

Nominal size	Penetration[1]		Recess diameter S[2]	Recess and driver point number
	Max.	Min.	Max.	
	in	in	in	
2	0.047	0.036	0.100	1
(3)	0.047	0.041	0.104	1
4	0.059	0.051	0.114	1
5				2
6	0.065	0.056	0.159	2
8	0.079	0.067	0.171	2
10	0.110	0.091	0.197	2
(12)	0.110	0.098	0.248	3
$\frac{1}{4}$	0.127	0.111	0.262	3
$\frac{5}{16}$	0.172	0.150	0.299	3
$\frac{3}{8}$	0.191	0.170	0.374	4
$\frac{7}{16}$	0.215	0.190	0.394	4
$\frac{1}{2}$	0.229	0.202	0.406	4

[1] See BS 6605.

[2] See figure 27.

NOTE. Nominal thread diameters shown in brackets are non-preferred.

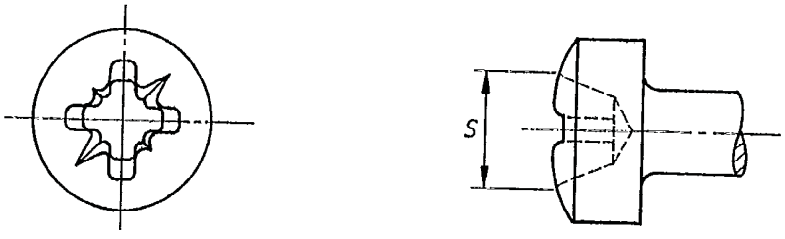


Figure 27. Recessed raised cheese head machine screws: enlarged views of recess type V

Appendices

Appendix A. Dimensions of 80° countersunk head screws

A.1 Countersunk head screws

The basic requirement for countersunk head screws is that the head should fit into the countersunk hole with as great a degree of flushness as possible. To achieve this it is necessary for the dimensions of both the head of the screw and the countersunk hole to be controlled within prescribed limits.

A.2 Size of head

In this standard the maximum or design size of head is controlled by a theoretical diameter to a sharp corner and the minimum head angle of 80°. The minimum head size is controlled by a minimum head diameter, the maximum head angle of 82° and a flushness tolerance (see figure 28).

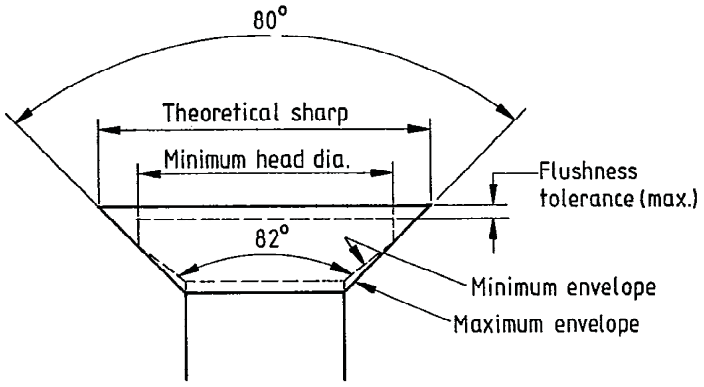


Figure 28. Size of countersunk screw head

A.3 Edge of head

The edge of the head may be flat or rounded, as shown in figure 29, but not sharp-edged.

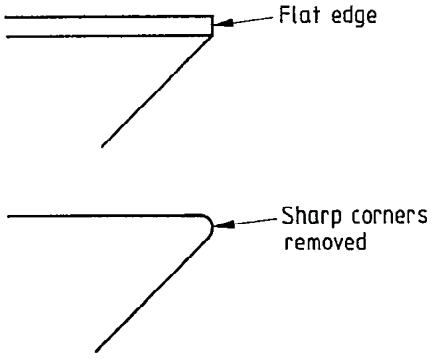


Figure 29. Edge of head of countersunk screw

Appendix B. Standard sizes of machine screws

Standard sizes of machine screws are given in tables 27 to 31.

Table 27. Standard sizes for countersunk head machine screws: ISO inch (Unified) threads

Thread size	0	(1)	2	(3)	4	5	6	8	10	(12)	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$
Nominal length																	
$\frac{1}{16}$																	
($\frac{3}{32}$)																	
$\frac{1}{8}$																	
($\frac{5}{32}$)																	
$\frac{3}{16}$																	
$\frac{1}{4}$	Standard				×		×										
($\frac{5}{16}$)	lengths																
$\frac{3}{8}$					×	×	×	×	×								
($\frac{7}{16}$)																	
$\frac{1}{2}$					×	×	×	×	×		×						
$\frac{9}{16}$					×	×	×	×	×		×	×					
$\frac{5}{8}$							×	×	×		×	×	×				
$\frac{11}{16}$							×		×		×	×	×				
1						×	×	×	×		×	×	×		×		
($1\frac{1}{8}$)									×		×	×	×		×		
$1\frac{1}{4}$								×	×		×	×	×		×		
($1\frac{3}{8}$)									×		×	×	×				
$1\frac{1}{2}$									×		×	×					
$1\frac{3}{4}$												×					
2																	
($2\frac{1}{4}$)																	
$2\frac{1}{2}$																	
($2\frac{3}{4}$)																	
3																	
($3\frac{1}{4}$)																	
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4																	
($4\frac{1}{4}$)																	
$4\frac{1}{2}$																	
($4\frac{3}{4}$)																	
5																	
$5\frac{1}{2}$																	
6																	
$6\frac{1}{2}$																	
7																	
$7\frac{1}{2}$																	
8																	

NOTE 1. The standard sizes are those between the stepped lines. Those marked with a cross should be regarded as first choice. Manufacturers' catalogues and suppliers' lists should be consulted in order to determine availability from stock.

NOTE 2. Sizes in brackets should be avoided if possible.

NOTE 3. Lengths above the dotted line are threaded to head, those below the dotted line have a minimum thread length of $1\frac{3}{4}$ in.

Table 28. Standard sizes for raised countersunk head machine screws: ISO inch (Unified) threads

Thread size	0	(1)	2	(3)	4	5	6	8	10	(12)	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$
Nominal length													
$\frac{1}{16}$													
($\frac{3}{32}$)													
$\frac{1}{8}$													
($\frac{5}{32}$)													
$\frac{3}{16}$					×								
$\frac{1}{4}$	Standard						×						
($\frac{5}{16}$)	lengths												
$\frac{3}{8}$							×	×	×				
($\frac{7}{16}$)													
$\frac{1}{2}$							×	×	×		×		
$\frac{5}{8}$								×	×		×	×	
$\frac{3}{4}$							×	×	×		×	×	
$\frac{7}{8}$							×		×			×	
1							×	×	×		×	×	
($1\frac{1}{8}$)													
$1\frac{1}{4}$									×		×		
($1\frac{3}{8}$)													
$1\frac{1}{2}$								×	×		×		
$1\frac{3}{4}$												×	
2									×				
($2\frac{1}{4}$)													
$2\frac{1}{2}$													
($2\frac{3}{4}$)													
3													
($3\frac{1}{4}$)													
$3\frac{1}{2}$													
($3\frac{3}{4}$)													
4													
($4\frac{1}{4}$)													
$4\frac{1}{2}$													
($4\frac{3}{4}$)													
5													
$5\frac{1}{2}$													
6													
$6\frac{1}{2}$													
7													
$7\frac{1}{2}$													
8													

NOTE 1. The standard sizes are those between the stepped lines. Those marked with a cross should be regarded as first choice. Manufacturers' catalogues and suppliers' lists should be consulted in order to determine availability from stock.

NOTE 2. Sizes in brackets should be avoided if possible.

NOTE 3. Lengths above the dotted line are threaded to head, those below the dotted line have a minimum thread length of $1\frac{3}{4}$ in.

Table 29. Standard sizes for pan head machine screws: ISO inch (Unified) threads

Thread size	0	(1)	2	(3)	4	5	6	8	10	(12)	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$
Nominal length																	
$\frac{1}{16}$																	
($\frac{3}{32}$)																	
$\frac{1}{8}$																	
($\frac{5}{32}$)																	
$\frac{3}{16}$					×		×										
$\frac{1}{4}$					×		×	×	×								
($\frac{5}{16}$)																	
$\frac{3}{8}$					×		×	×	×		×						
($\frac{7}{16}$)																	
$\frac{1}{2}$					×		×	×	×		×	×	×				
$\frac{9}{16}$					×		×	×	×		×	×	×				
$\frac{5}{8}$					×		×	×	×		×	×	×				
$\frac{11}{16}$								×	×		×	×	×				
$\frac{3}{4}$							×	×	×								
$\frac{13}{16}$																	
$\frac{7}{8}$								×	×		×	×	×				
1							×	×	×		×	×	×				
($1\frac{1}{8}$)																	
$1\frac{1}{4}$							×	×	×		×	×	×				
($1\frac{3}{8}$)																	
$1\frac{1}{2}$									×		×	×	×				
$1\frac{3}{4}$								×	×		×						
2									×		×	×	×				
($2\frac{1}{4}$)																	
$2\frac{1}{2}$											×						
($2\frac{3}{4}$)																	
3																	
($3\frac{1}{4}$)																	
$3\frac{1}{2}$																	
($3\frac{3}{4}$)																	
4																	
($4\frac{1}{4}$)																	
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($4\frac{3}{4}$)																	
5																	
$5\frac{1}{2}$																	
6																	
$6\frac{1}{2}$																	
7																	
$7\frac{1}{2}$																	
8																	

Standard lengths

NOTE 1. The standard sizes are those between the stepped lines. Those marked with a cross should be regarded as first choice. Manufacturers' catalogues and suppliers' lists should be consulted in order to determine availability from stock.

NOTE 2. Sizes in brackets should be avoided if possible.

NOTE 3. Lengths above the dotted line are threaded to head, those below the dotted line have a minimum thread length of $1\frac{3}{4}$ in.

Table 30. Standard sizes for raised cheese head machine screws: ISO inch (Unified) threads

Thread size	0	(1)	2	(3)	4	5	6	8	10	(12)	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$
Nominal length															
$\frac{1}{16}$															
$(\frac{3}{32})$															
$\frac{1}{8}$															
$(\frac{5}{32})$															
$\frac{3}{16}$															
$\frac{1}{4}$		Standard													
$(\frac{5}{16})$		lengths													
$\frac{3}{8}$															
$(\frac{7}{16})$															
$\frac{1}{2}$															
$\frac{5}{8}$															
$\frac{3}{4}$															
$\frac{7}{8}$															
1															
$(1\frac{1}{8})$															
$1\frac{1}{4}$															
$(1\frac{3}{8})$															
$1\frac{1}{2}$															
$1\frac{3}{4}$															
2															
$(2\frac{1}{4})$															
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3															
$(3\frac{1}{4})$															
$3\frac{1}{2}$															
$(3\frac{3}{4})$															
4															
$(4\frac{1}{4})$															
$4\frac{1}{2}$															
$(4\frac{3}{4})$															
5															
$5\frac{1}{2}$															
6															
$6\frac{1}{2}$															
7															
$7\frac{1}{2}$															
8															

NOTE 1. The standard sizes are those between the stepped lines. Manufacturers' catalogues and suppliers' lists should be consulted in order to determine availability from stock.

NOTE 2. Sizes in brackets should be avoided if possible.

NOTE 3. Lengths above the dotted line are threaded to head, those below the dotted line have a minimum thread length of $1\frac{1}{4}$ in.

Table 31. Standard sizes for hexagon head machine screws: ISO inch (Unified) threads

Thread size	2	(3)	4	5	6	8	10	(12)
Nominal length								
$\frac{1}{16}$								
($\frac{3}{32}$)								
$\frac{1}{8}$								
($\frac{5}{32}$)								
$\frac{3}{16}$								
$\frac{1}{4}$								
($\frac{5}{16}$)	Standard							
$\frac{3}{8}$							×	
($\frac{7}{16}$)	lengths							
$\frac{1}{2}$							×	
$\frac{5}{8}$							×	
$\frac{3}{4}$							×	
$\frac{7}{8}$								
1							×	
($1\frac{1}{8}$)								
$1\frac{1}{4}$							×	
($1\frac{3}{8}$)								
$1\frac{1}{2}$								
$1\frac{3}{4}$								
2								
($2\frac{1}{4}$)								
$2\frac{1}{2}$								
($2\frac{3}{4}$)								
3								
($3\frac{1}{4}$)								
$3\frac{1}{2}$								
($3\frac{3}{4}$)								
4								
($4\frac{1}{4}$)								
$4\frac{1}{2}$								
($4\frac{3}{4}$)								
5								
$5\frac{1}{2}$								
6								
$6\frac{1}{2}$								
7								
$7\frac{1}{2}$								
8								

NOTE 1. The standard sizes are those between the stepped lines. Those marked with a cross should be regarded as first choice. Manufacturers' catalogues and suppliers' lists should be consulted in order to determine availability from stock.

NOTE 2. Sizes in brackets should be avoided if possible.

Appendix C. Metric slot widths

In order to achieve rationalization of slotting saws, it has been agreed that metric slot widths as specified in BS 4183, and as given in table 32, should be applied to all types of slotted screws. The old slot widths have been retained in tables 4, 6, 8, 10, 12, 14 and 16 of this standard. These new slot widths will be gradually introduced by the manufacturers, but screws having slot widths complying either with tables 4, 6, 8, 10, 12 and 16 or table 32 are acceptable to this British Standard.

Table 32. Metric slot widths

Screw size	Metric slot widths			
	Max.	Min.	Max.	Min.
	mm	mm	in	in
0	0.60	0.46	0.024	0.018
1	0.60	0.46	0.024	0.018
2	0.70	0.56	0.028	0.022
3	0.80	0.66	0.032	0.026
4	1.00	0.86	0.040	0.034
5	1.00	0.86	0.040	0.034
6	1.20	1.06	0.048	0.042
8	1.51	1.26	0.060	0.050
10	1.51	1.26	0.060	0.050
12	1.91	1.66	0.075	0.065
$\frac{1}{4}$	1.91	1.66	0.075	0.065
$\frac{5}{16}$	2.31	2.06	0.091	0.081
$\frac{3}{8}$	2.31	2.06	0.091	0.081
$\frac{7}{16}$	2.31	2.06	0.091	0.081
$\frac{1}{2}$	2.81	2.56	0.111	0.101
$\frac{5}{8}$	3.31	3.06	0.130	0.120
$\frac{3}{4}$	3.31	3.06	0.130	0.120

Publication(s) referred to

BS 919	Specification for screw gauge limits and tolerances
BS 1474	Specification for wrought aluminium and aluminium alloys for general engineering purposes: bars, extruded round tubes and sections
BS 1475	Specification for wrought aluminium and aluminium alloys for general engineering purposes — wire
BS 1580	Specification for Unified screw threads Parts 1 & 2 Diameters $\frac{1}{4}$ in and larger Part 3 Diameters below $\frac{1}{4}$ in
BS 1768	Specification for Unified precision hexagon bolts, screws, & nuts (UNC & UNF threads). Normal series
BS 3382	Specification for electroplated coatings on threaded components Parts 1 & 2 Cadmium on steel components. Zinc on steel components
BS 3643	ISO metric screw threads Part 1 Principles and basic data Part 2 Specification for selected limits of size
BS 4183	Specification for machine screws and machine screw nuts. Metric series
BS 6322	Tolerances for fasteners Part 1 Specification for tolerances of bolts, screws and nuts with thread diameters $\geq$ 1.6 mm and $\leq$ 150 mm and product grades A, B and C
BS 6605	Specification for cross recesses for screws

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AMD 7485

Revised figures

AMD 7485
January 1993

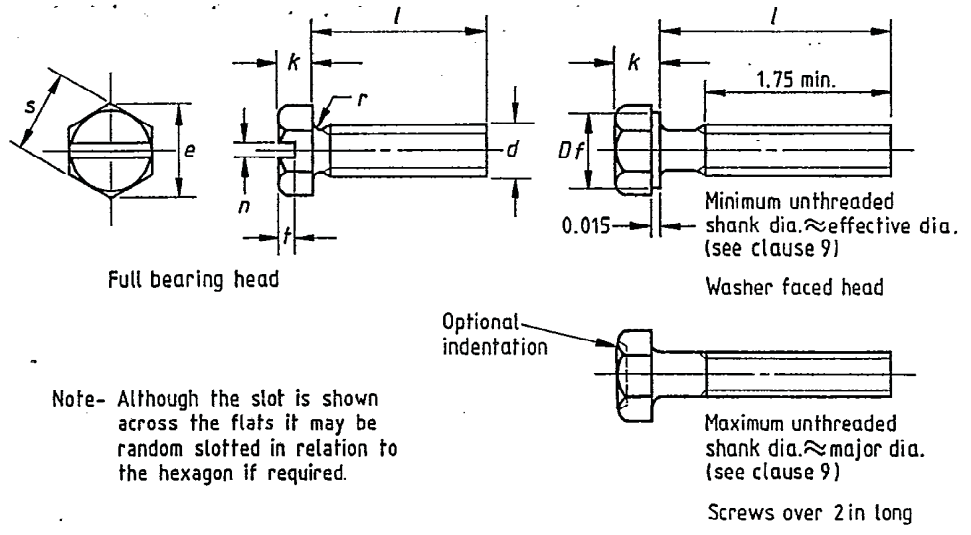
Figure 18. Plain and slotted hexagon head machine screws

Delete the existing figure 18 and substitute the attached figure 18.

AMD 7485
January 1993

Figure 19. Symmetry and concentricity tolerances

Delete the existing figure 19 and substitute the attached figure 19.



Dimensions are in inches.

Figure 18. Plain and slotted hexagon head machine screws

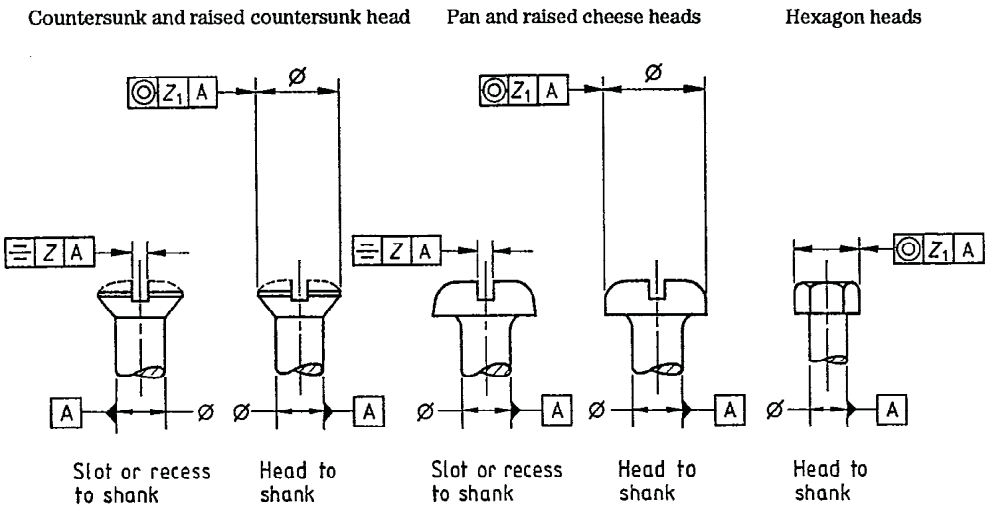


Figure 19. Symmetry and concentricity tolerances