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B.S.F.

BRITISH ENGINEERING STANDARDS ASSOCIATION.
BRITISH STANDARD FINE (B.S.F.) BRIGHT HEXAGON BOLTS, NUTS, SET-SCREWS,
SPLIT PINS, WASHERS AND STUDS.

B.S.F.

SIZES $\frac{7}{32}$ IN. TO 2 IN. DIA.

(All dimensions are given in inches.)

NOTES.

CHAMFERING OF HEADS OF BOLTS AND SET-SCREWS, NUTS, WASHERS AND STUDS.

All B.S.F. Bright Hexagon Bolt-heads, Set-screw Heads, Nuts and Slotted Nuts shall have a chamfer of approximately 30° on their upper faces and all B.S.F. Lock Nuts shall be similarly chamfered on both faces, also the hexagonal portion of B.S.F. Castle Nuts where it joins the castellated portion.

B.S.F. Bright Washers when chamfered shall have a chamfer of approximately 30° .

The short ends of B.S.F. Bright Studs shall have a chamfer of approximately 45° .

SCREW THREADS.

All Bolts, Set-screws, Nuts and Studs supplied as B.S.F. Bright Bolts, Set-screws, etc., in addition to conforming with the dimensions given on this sheet (B.E.S.A. Publication No. 191 C-1924) shall have their screw threads in accordance with Tables 2 and 3 of B.S. Publication No. 84-1918, B.S. Fine Screw Threads and their Tolerances, so far as they apply.

DIAMETER OF BOLT OR STUD (DIMENSION "A").

The maximum diameter of the unthreaded portion of the bolt or stud is equal to the nominal size.

The figures given in brackets are the tolerances permitted on this dimension, e.g., the diameter of a 1" B.S.F. Bright Bolt must lie between 1" and 0.9992".

MINIMUM LENGTH OF THREAD (DIMENSION "E").

The lengths given are the minimum lengths, measured from the first full thread, to which, under reasonable pressure, a B.S.F. Bright Nut can be screwed down.

These lengths apply only to B.S.F. bolts.

BOLT LENGTHS (DIMENSIONS "F," "G," "H," "J" AND "K").

To ascertain dimension J (the length of a bolt from head to the centre of the split pin hole) dimension H (the thickness of the piece or pieces to be clamped) must be added to dimension F when using a slotted nut and to dimension G when using a castle nut, i.e.,

For a slotted nut $J = H + F$.

For a castle nut $J = H + G$.

To ascertain dimension K (the full length of a bolt) the thickness of the Nut (or Nuts) and Washer to be used must be added to dimension H, e.g.,

When using an ordinary nut and washer $K = H + M + X$.

Nominal Size (See Note 9)	A	$\frac{7}{32}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{11}{16}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{3}{4}$	2
Number of Threads per Inch	B	28	20	18	16	14	12	11	10	9	8	7	6	5	4	3	2	1	1	1
Width across Flats	C	0.410	0.440	0.520	0.685	0.705	0.815	0.915	1.002	1.092	1.200	1.300	1.400	1.670	1.860	2.010	2.200	2.390	2.565	2.735
Approximate Width across Corners	D	0.413	0.445	0.525	0.690	0.710	0.820	0.920	1.010	1.100	1.200	1.300	1.400	1.670	1.860	2.010	2.200	2.390	2.565	2.735
Approximate Width across Corners	E	0.48	0.51	0.61	0.69	0.83	0.95	1.06	1.17	1.27	1.39	1.50	1.71	1.93	2.15	2.37	2.56	2.78	2.98	3.19
Thickness of Min. Bolt Head	F	0.15	0.18	0.21	0.26	0.32	0.37	0.43	0.48	0.54	0.59	0.65	0.76	0.87	0.98	1.07	1.18	1.28	1.40	1.51
Minimum Length of Thread (See Note 1)	G	0.437	0.500	0.625	0.750	0.875	1.000	1.125	1.250	1.375	1.500	1.750	2.000	2.250	2.500	2.750	3.000	3.250	3.500	4.000
When using Slotted Nut (See Note 2)	H	0.14	0.17	0.20	0.27	0.31	0.37	0.41	0.47	0.53	0.57	0.64	0.74	0.86	0.96	1.06	1.21	1.31	1.44	1.52
When using Castle Nut (See Note 2)	I	0.21	0.24	0.30	0.36	0.45	0.51	0.59	0.66	0.72	0.80	0.87	1.02	1.14	1.29	1.41	1.54	1.69	1.81	1.98
Drill for Split Pin Hole	L	0.652	0.652	0.670	0.670	0.684	0.684	0.684	0.684	0.684	0.684	0.684	0.684	0.684	0.684	0.684	0.684	0.684	0.684	0.684
H, J and K (See Note 3)																				
Thickness of Nut	M	0.161	0.180	0.240	0.302	0.365	0.427	0.480	0.552	0.615	0.677	0.740	0.805	0.900	1.005	1.105	1.200	1.355	1.490	1.730
Thickness of Lock Nut	N	0.104	0.123	0.156	0.198	0.240	0.281	0.323	0.365	0.406	0.448	0.480	0.573	0.658	0.730	0.813	0.896	0.980	1.063	1.149
Thickness of Slotted Nut	O	0.171	0.200	0.250	0.312	0.375	0.437	0.500	0.562	0.625	0.687	0.750	0.815	0.900	1.000	1.105	1.200	1.355	1.490	1.730
Face of Nut to Min. Bottom of Slot	P	0.091	0.120	0.148	0.208	0.225	0.287	0.303	0.365	0.428	0.443	0.506	0.585	0.710	0.777	0.812	0.947	1.105	1.230	1.262
Approximate Width of Slot	S	0.062	0.062	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064
Approximate Depth of Slot	T	0.070	0.070	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064
Radius on Castellated Portion	R	0.04	0.04	0.05	0.05	0.06	0.06	0.06	0.06	0.07	0.07	0.08	0.08	0.09	0.09	0.10	0.11	0.12	0.13	0.14
Thickness of Hexagon and First Face of Nut to Bottom of Slot	Q	0.161	0.180	0.240	0.302	0.365	0.427	0.480	0.552	0.615	0.677	0.740	0.805	0.900	1.005	1.105	1.200	1.355	1.490	1.730
Thickness of Castle Nut	P	0.231	0.260	0.334	0.396	0.505	0.567	0.677	0.739	0.802	0.911	0.974	1.145	1.270	1.433	1.588	1.703	1.875	2.000	2.188
Diameter of Castellated Portion	Q	0.241	0.270	0.344	0.408	0.515	0.577	0.687	0.749	0.812	0.921	0.984	1.155	1.280	1.443	1.598	1.713	1.885	2.010	2.218
Approximate Width of Slot	S	0.062	0.062	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064
Approximate Depth of Slot	T	0.070	0.070	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064
Radius on Castellated Portion	R	0.04	0.04	0.05	0.05	0.06	0.06	0.06	0.06	0.07	0.07	0.08	0.08	0.09	0.09	0.10	0.11	0.12	0.13	0.14
Diameter and Overall Length of Split Pin	U	$\frac{3}{16} \times \frac{3}{16}$	$\frac{1}{2} \times \frac{1}{2}$	$\frac{5}{16} \times \frac{5}{16}$	$\frac{3}{4} \times \frac{3}{4}$	$\frac{7}{8} \times \frac{7}{8}$	1×1	$1\frac{1}{8} \times 1\frac{1}{8}$	$1\frac{1}{4} \times 1\frac{1}{4}$	$1\frac{3}{8} \times 1\frac{3}{8}$	$1\frac{1}{2} \times 1\frac{1}{2}$	$1\frac{5}{8} \times 1\frac{5}{8}$	2×2	$2\frac{1}{8} \times 2\frac{1}{8}$	$2\frac{1}{4} \times 2\frac{1}{4}$	$2\frac{3}{8} \times 2\frac{3}{8}$	$2\frac{1}{2} \times 2\frac{1}{2}$	3×3	$3\frac{1}{2} \times 3\frac{1}{2}$	4×4
Diameter of Hole	V	0.233	0.265	0.328	0.390	0.453	0.515	0.578	0.641	0.704	0.767	0.830	0.893	1.000	1.031	1.166	1.281	1.405	1.531	1.778
Outside Diameter	W	0.495	0.560	0.620	0.745	0.870	0.995	1.120	1.240	1.365	1.490	1.615	1.740	1.865	1.990	2.115	2.240	2.365	2.490	2.615
Thickness	X	0.054	0.054	0.070	0.070	0.090	0.090	0.100	0.112	0.124	0.140	0.140	0.156	0.172	0.188	0.192	0.212	0.212	0.212	0.212
Over All Length of Stud	Z	Measured from first thread of long end to flat face of short end. For Standard Lengths, see Table on right.																		
Long End of Stud	AA	Screwed for a length equal to overall length less twice the diameter. Measured from the first to the last full thread.																		
Plain Part of Stud	BB	Equal to the diameter of stud.																		
Short End of Stud	CC	Screwed for a length equal to the diameter of stud. Measured from the flat end of the stud to the end of the lead of the thread, i.e., to the point where the thread disappears.																		
Length of Set-screw	Y	The form and dimensions of the heads and the rounding at the ends of B.S.F. Set-screws shall be the same as for B.S.F. Bolts.																		

BRITISH STANDARD STOCK LENGTHS

FOR

B.S.F. BRIGHT HEXAGON BOLTS, SET-SCREWS & STUDS.

NOMINAL SIZE	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	3	$3\frac{1}{4}$	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	$5\frac{1}{2}$	6
$\frac{1}{4}$																				
$\frac{5}{16}$																				
$\frac{3}{8}$																				
$\frac{7}{16}$																				
$\frac{1}{2}$																				
$\frac{9}{16}$																				
$\frac{5}{8}$																				
$\frac{3}{4}$																				
$\frac{7}{8}$																				
1																				

Bolt Lengths (See K, Fig. 1) are indicated by a solid line, thus—
Set-screw Lengths (See Y, Fig. 9) „ „ dot and dash line, thus—
Stud Lengths (See Z, Fig. 8) „ „ broken line, thus—

NOTE:—Intermediate lengths and larger diameters are regarded as special.

MATERIAL.

Unless they are otherwise ordered, all B.S.F. Bright Steel Bolts, Nuts, Set-screws and Studs shall comply with the following mechanical tests:—

Tensile Strength ... not less than 32 tons per sq. in.
Elongation per cent. (on a gauge length equal to 4 $\sqrt{\text{area}}$) ... not less than 14.5
Reduction of Area per cent. ... not less than 40
Brinell Hardness Number ... not less than 150

NOTE:—Attention is drawn to the fact that the parts may have been made of free cutting steel.

The Association recommends that for general use these sizes be dispensed with.

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British Engineering Standards Association

FORMED IN 1901 AS THE ENGINEERING STANDARDS COMMITTEE

DIMENSIONS

FOR

BRITISH STANDARD FINE (B.S.F.)

BRIGHT HEXAGON BOLTS, SET-SCREWS AND NUTS,

SPLIT-PINS, WASHERS AND STUDS.

(Superseding portions of Publication No. 54-1911, Threads, Nuts and Bolt Heads for use in Automobile Construction.)

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The following Government Departments and Scientific and Industrial Organisations were officially represented upon the Sectional Committee, Sub-Committee and Panel entrusted with the preparation of this Specification:—

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NOTE.

In order to keep abreast of progress in the Industries concerned, the British Standard Specifications are subject to periodical review.

Suggestions for improvements, addressed to the Director, British Engineering Standards Association, 28, Victoria Street, London, S.W.1, will be welcomed at all times. They will be recorded, and in due course brought to the notice of the Committees charged with the revision of the Specifications to which they refer.

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