

Dimensions of Fully Threaded Bolts / Setscrews

Thread <i>d</i>		M12	M16	M20	M24	M30	M36
<i>p</i> (pitch)		1.75	2	2.5	3	3.5	4
<i>a</i>	max.	5.3	6	7.5	9	10.5	12
	min.	0.6	0.8	0.8	0.8	0.8	0.8
<i>c</i>	max.	0.15	0.2	0.2	0.2	0.2	0.2
	min.	13.7	17.7	22.4	26.4	33.4	39.4
<i>da</i>	max.	16.63	22.49	28.19	33.61	42.75	51.11
<i>dw</i>	min.	20.03	26.75	33.53	39.98	50.85	60.79
<i>k</i>	nom.	7.5	10	12.5	15	18.7	22.5
	max.	7.68	10.18	12.715	15.215	19.12	22.92
	min.	7.32	9.82	12.285	14.785	18.28	22.08
<i>r</i>	min.	0.6	0.6	0.8	0.8	1	1
<i>s</i>	max.	18	24	30	36	46	55
	min.	17.73	23.67	29.67	35.38	45	53.8

Dimensions are in millimetres and apply prior to coating.

The table shows the popular dimensions, other diameters can be supplied provided the quantity required is sufficient to warrant manufacture.

In addition, standard thread bolts in accordance with BS EN ISO 4014 can be supplied provided the quantity required is sufficient to warrant manufacture.

Important Note

BS EN 15048 requires that:

- The bolt and nut assembly is supplied by one manufacturer who is responsible for the function of the assembly.
- The bolt and nut are identified with the manufacturer's mark.
- The coating of the assembly is under the control of the manufacturer.

Characteristic

Standard

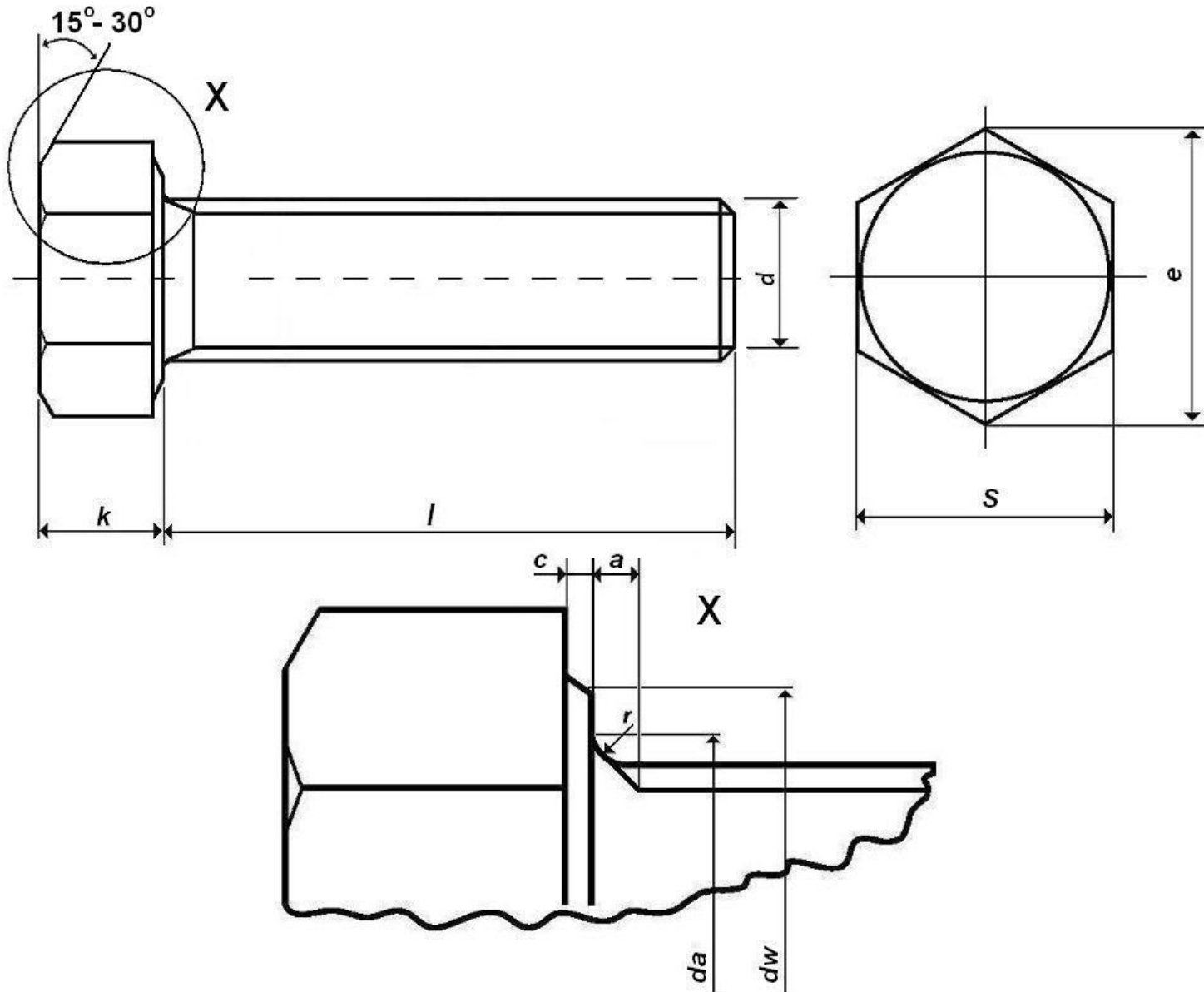
Fully Threaded Bolts / Setscrews		
General Requirements		BS EN 15048 - 1 & 2
Threads		ISO 965 / BS3643 tolerance class 6g
Materials & Manufacture		BS EN ISO 898-1 Property Class 8.8
Mechanical Properties - Setscrews		BS EN ISO 898-1 Property Class 8.8
Mechanical Properties - Assemblies		BS EN 15048 - 2
Dimensions & Tolerances		BS EN ISO 4017
Finish / Coatings	Self Colour/Black	BS EN ISO 4017 - as processed
	Zinc Electroplated	BS EN ISO 4042
	Hot Dip Galvanized	BS EN ISO 10684
Product Marking		BS EN ISO 898-1 & BS EN 15048 - 1

Tolerance on nominal length for Fully Threaded Bolts / Setscrews

Nominal length (mm)		Tolerance (mm)
Over	Up to and including	
30	50	±1.25
50	80	±1.5
80	120	±1.75
120	180	±2
180	250	±2.3

Certification

Property Class 8.8 Fully Threaded Bolts / Setscrews are supplied with a Test Certificate.



Head Marking



Fully Threaded Bolts / Setscrews
 The actual arrangement and sizes of the markings may vary from that shown

BS EN 15048 Non-preloaded Structural Bolting Assemblies Property Class 8.8

Proof Load, Ultimate Tensile Load & Hardness of Bolts

Nominal Diameter & Thread Pitch	Stress Area	Property Class 8.8			
		Proof Load min	Tensile Load min	Hardness Rockwell HRC	
				min	max
mm ²	kN	kN	min	max	
M12 x 1.75	84.3	50.7	70	23	34
M16 x 2	157	94.5	130	23	34
M20 x 2.5	245	147	203	23	34
M24 x 3	353	212	293	23	34
M30 x 3.5	561	337	466	23	34
M36 x 4	817	490	678	23	34

Bolt and Nut Combinations Supplied

Bolt Property Class & Finish	supplied with	Nut Property Class & Finish
8.8 - Self Colour		8 - Self Colour
8.8 - Zinc Electroplated		8 - Zinc Electroplated
8.8 - Hot Dip Galvanized		10 - Hot Dip Galvanized

BS EN 15048 Non-preloaded Structural Bolting Assemblies

Property Class 8.8

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Dimensions of Nuts

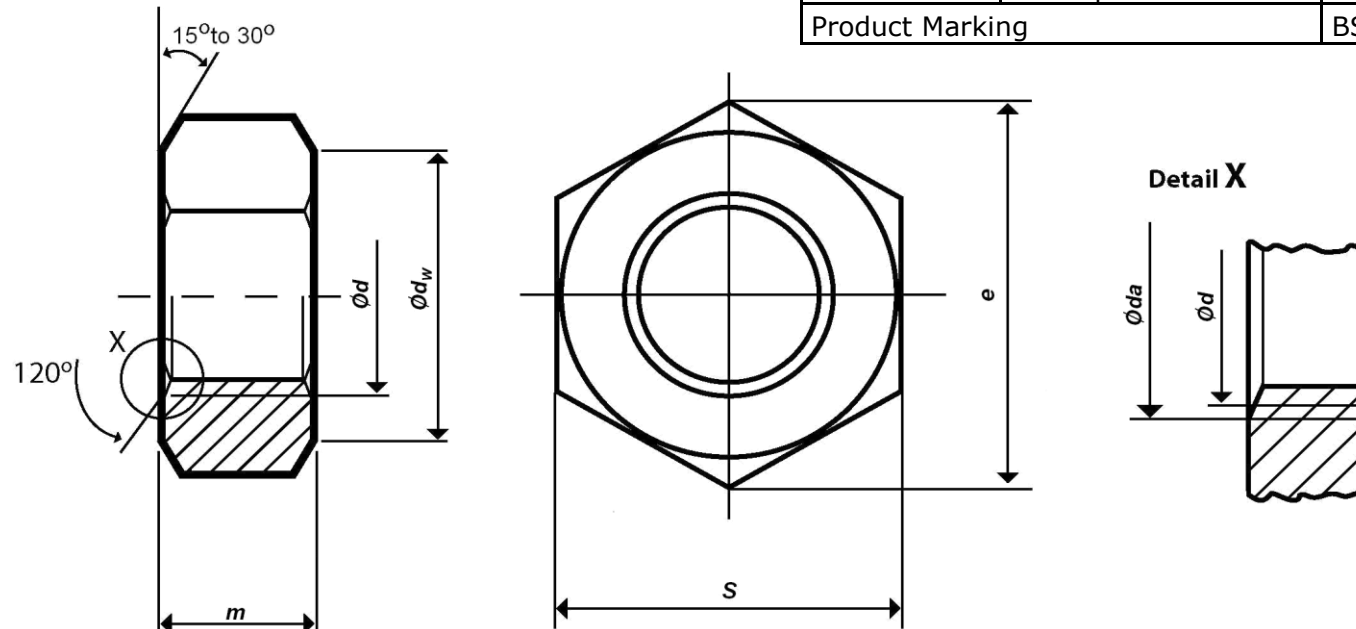
Thread <i>d</i>	M12	M16	M20	M24	M30	M36	
<i>P</i> (pitch)	1.75	2	2.5	3	3.5	4	
<i>da</i>	max.	13	17.3	21.6	25.9	32.4	38.9
	min.	12	16	20	24	30	36
<i>dw</i>	min.	16.6	22.5	27.7	33.3	42.8	51.1
<i>e</i>	min.	20.03	26.75	32.95	39.55	50.85	60.79
<i>m</i>	max.	10.80	14.8	18.0	21.5	25.6	31
	min.	10.37	14.1	16.9	20.2	24.3	29.4
<i>s</i>	max.=nom	18	24	30	36	46	55
	min.	17.73	23.67	29.16	35	45	53.8

Dimensions are in millimetres and apply prior to coating

Characteristic

Standard

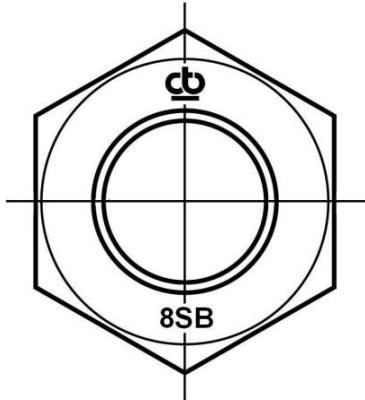
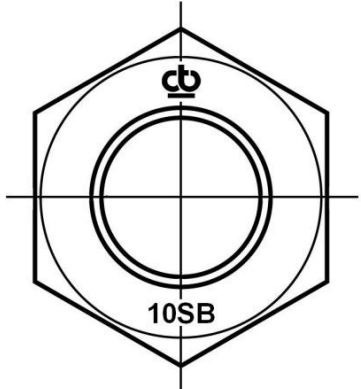
General Requirements	BS EN ISO 4032	
Threads	Self Colour / Zinc Electroplated	ISO 965 / BS 3643 tolerance class 6H
	Hot Dip Galvanized	ISO 965-5 tolerance class 6AZ
Materials & Manufacture	BS EN 20898-2 Property Classes 8 & 10	
Mechanical Properties	Self Colour / Zinc Electroplated	BS EN 20898-2 Property Class 8
	Hot Dip Galvanized	BS EN 20898-2 Property Class 10
Dimensions & Tolerances	BS EN ISO 4032	
Finish / Coatings	Self Colour / Black	BS EN ISO 4032 - as processed
	Zinc Electroplated	BS EN ISO 4042
	Hot Dip Galvanized	BS EN ISO 10684
Product Marking	BS EN 20898-2 & BS EN 15048 - 1	



BS EN 15048 Non-preloaded Structural Bolting Assemblies Property Class 8.8

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BS EN 15048 NUT MARKING

PROPERTY CLASS 8	PROPERTY CLASS 10
	

PROOF LOAD OF NUTS

Nominal Diameter & Thread Pitch	Stress Area	Proof Load min	
		Property Class 8 Standard 6H fit ¹	Property Class 10 over tapped 6AZ fit ²
	mm ²	kN	kN
M12 x 1.75	84.3	74.2	88.5
M16 x 2	157	138.2	164.9
M20 x 2.5	245	225.4	259.7
M24 x 3	353	324.8	374.2
M30 x 3.5	561	516.1	594.7
M36 x 4	817	751.6	866
¹ Nut finish self colour or zinc electroplated			
² Nut finish hot dip galvanized			

DIMENSIONS OF BS EN 7091 WASHERS

Nominal size of bolt or screw	Inside diameter $d1$		Outside diameter $d2$		Thickness s	
	max	min	max	min	max	min
M12	13.93	13.50	24	22.7	2.8	2.2
M16	17.93	17.50	30	28.7	3.6	2.4
M20	22.52	22	37	35.4	3.6	2.4
M24	26.52	26	44	42.4	4.6	3.4
M30	33.62	33	56	54.1	4.6	3.4
M36	40	39	66	64.1	6	4

Dimensions are in millimetres and apply prior to coating

CHARACTERISTIC

STANDARD

General Requirements	BS EN ISO 7091	
Materials & Manufacture	BS EN ISO 7091	
Dimensions & Tolerances	BS EN ISO 7091	
Finish / Coatings	Self Colour / Black	BS EN ISO 7091 – as processed
	Zinc Electroplated	BS EN ISO 4042
	Hot Dip Galvanized	BS EN ISO 10684

