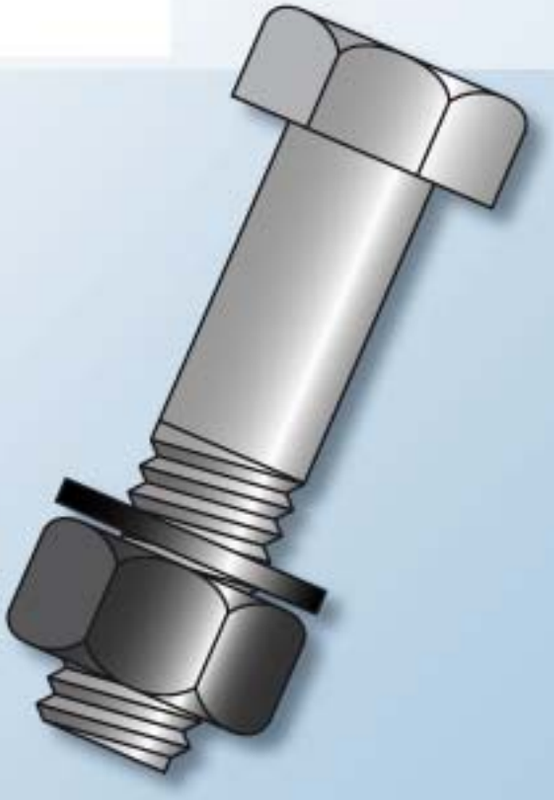


STRUCTURAL

BS EN 14399-3

High Strength Structural Bolting Assemblies for Preloading

BS EN 14399-3
High Strength Structural Bolting Assemblies for Preloading

BOLT - Property Class 8.8

BS EN 14399-3 Bolt Dimensions

Thread size ***d***		**M12**	**M16**	**M20**	**M22**	**M24**	**M27**	**M30**	**M36**
P pitch of thread		1.75	2	2.5	2.5	3	3	3.5	4
b	Bolt ≤ 125	30	38	46	50	54	60	66	78
	Bolt > 125 ≤ 200	-	44	52	56	60	66	72	84
	Bolt > 200	-	-	65	69	73	79	85	97
c	max.	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
	min.	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
da	max.	15.2	19.2	24.4	26.4	28.4	32.4	35.4	42.4
ds	max.	12.70	16.70	20.84	22.84	24.84	27.84	30.84	37.00
	min.	11.30	15.30	19.16	21.16	23.16	26.16	29.16	35.00
dw[1])	min.	20.1	24.9	29.5	33.3	38.0	42.8	46.6	55.9
e	min.	23.91	29.56	35.03	39.55	45.20	50.85	55.37	66.44
k	max.	7.95	10.75	13.40	14.90	15.90	17.90	19.75	23.55
	min.	7.05	9.25	11.60	13.10	14.10	16.10	17.65	21.45
r	min.	1.2	1.2	1.5	1.5	1.5	2.0	2.0	2.0
s	max.	22	27	32	36	41	46	50	60
	min.	21.16	26.16	31	35	40	45	49	58.8

[1]) The maximum value of ***dw*** shall not exceed the actual width across flats

Dimensions apply prior to coating

All dimensions are in millimetres

Characteristic		Standard
General Requirements		BS EN 14399-1
Materials & Manufacture		BS EN ISO 898-1 Property Class 8.8
Finish / Coatings	Self Colour / Black	BS EN 14399-3 - as processed
	Zinc Electroplated	BS 7371-3 or BS EN ISO 4042
	Hot Dip Galvanized	BS EN ISO 10684
Mechanical Properties		BS EN 14399-3, BS EN ISO 898-1 8.8
Dimensions & Tolerances		BS EN 14399-3
Threads		ISO 261, ISO 965-2 tolerance class 6g
Product Marking		BS EN 14399-3

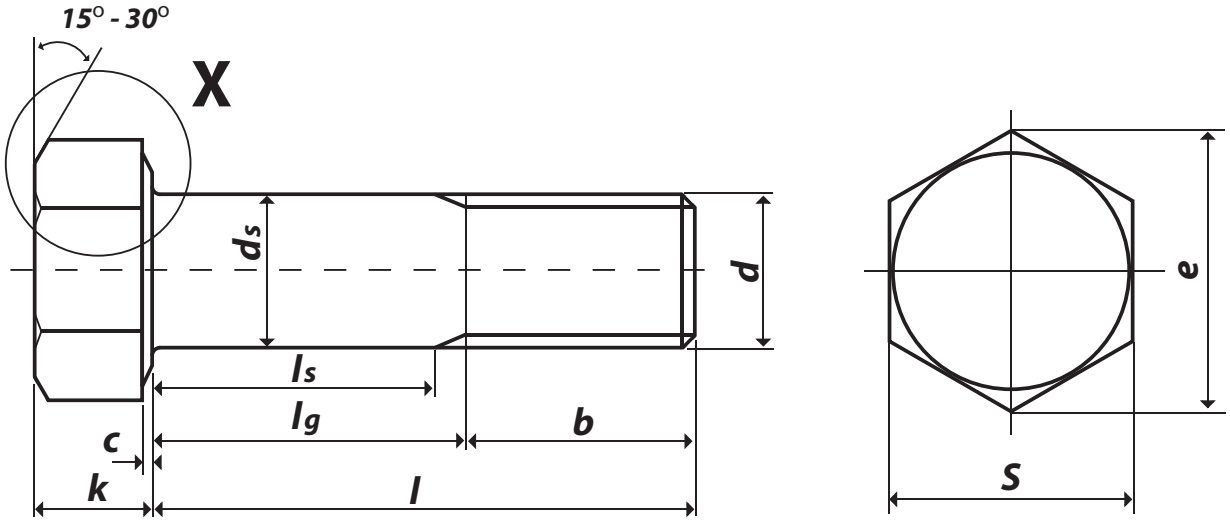
Important Note

It is a requirement of BS EN 14399 that

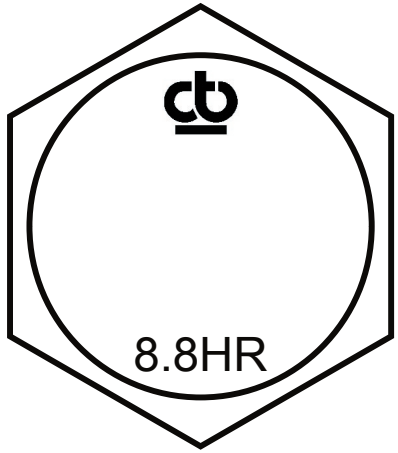
The bolt, nut and washer assembly is supplied by one manufacturer who is responsible for the function of the assembly.

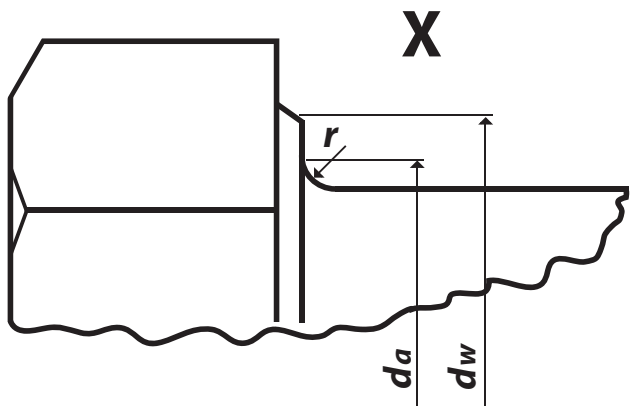
All the components are identified with the manufacturer's mark.

The coating of the assembly is under the control of the manufacturer.



BS EN 14399-3 Head Marking





BS EN 14399-3 Mechanical properties of property class 8.8 bolts

Bolt thread Dia.	Stress Area	Proof Load min	Ultimate Load min	Hardness Rockwell HRC	
	mm²	kN	kN	min	max
M12	84.3	50.7	70	23	34
M16	157	94.5	130	23	34
M20	245	147	203	23	34
M22	303	182	252	23	34
M24	353	212	293	23	34
M27	459	275	381	23	34
M30	561	337	466	23	34
M36	817	490	678	23	34

BS EN 14399-3 Bolt length and thread tolerances

Thread d			M12		M16		M20		M22		M24		M27		M30		M36	
l			*ls* min	*lg* max	*ls* min	*lg* max	*ls* min	*lg* max	*ls* min	*lg* max	*ls* min	*lg* max	*ls* min	*lg* max	*ls* min	*lg* max	ls min	lg max
nom	min	max																
35	33.75	36.25	6	11.25														
40	38.75	41.25	6	11.25	8	14												
45	43.75	46.25	6.25	15	8	14	10	17.5										
50	48.75	51.25	11.25	20	8	14	10	17.5	11	18.5								
55	53.5	56.5	16.25	25	8	14	10	17.5	11	18.5	12	21						
60	58.5	61.5	21.25	30	12	22	10	17.5	11	18.5	12	21	13.5	22.5				
65	63.5	66.5	26.25	35	17	27	10	17.5	11	18.5	12	21	13.5	22.5				
70	68.5	71.5	31.25	40	22	32	11.5	24	11	18.5	12	21	13.5	22.5	15	25.5		
75	73.5	76.5	36.25	45	27	37	16.5	29	12.5	25	12	21	13.5	22.5	15	25.5		
80	78.5	81.5	41.25	50	32	42	21.5	34	17.5	30	12	21	13.5	22.5	15	25.5		
85	83.25	86.75	46.25	55	37	47	26.5	39	22.5	35	16	31	13.5	22.5	15	25.5	18	30
90	88.25	91.75	51.25	60	42	52	31.5	44	27.5	40	21	36	15	30	15	25.5	18	30
95	93.25	96.75	56.25	65	47	57	36.5	49	32.5	45	26	41	20	35	15	25.5	18	30
100	98.25	101.75	61.25	70	52	62	41.5	54	37.5	50	31	46	25	40	16.5	34	18	30
110	108.25	111.75			62	72	51.5	64	47.5	60	41	56	35	50	26.5	44	18	30
120	118.25	121.75			72	82	61.5	74	57.5	70	51	66	45	60	36.5	54	22	42
130	128	132			76	86	65.5	78	61.5	74	55	70	49	64	40.5	58	26	46
140	138	142			86	96	75.5	88	71.5	84	65	80	59	74	50.5	68	36	56
150	148	152			96	106	85.5	98	81.5	94	75	90	69	84	60.5	78	46	66
160	156	164									85	100	79	94	70.5	88	56	76
170	166	174									95	110	89	104	80.5	98	66	86
180	176	184									105	120	99	114	90.5	108	76	96
190	186	194									115	130	109	124	100.5	118	86	106
200	196	204									125	140	119	134	110.5	128	96	116

All dimensions are in millimetres

BS EN 14399-3 Nut Dimensions

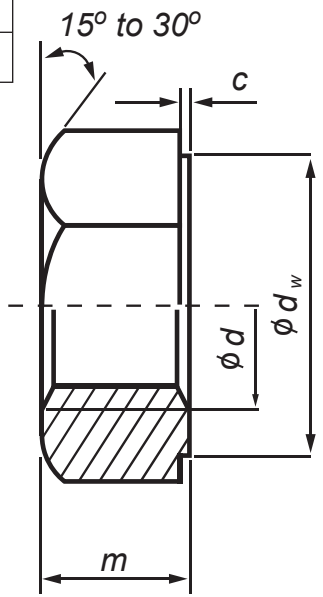
Thread size ***d***		**M12**	**M16**	**M20**	**M22**	**M24**	**M27**	**M30**	**M36**
P pitch of thread		1.75	2	2.5	2.5	3	3	3.5	4
c	max.	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
	min.	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
dw[1])	min.	20.1	24.9	29.5	33.3	38.0	42.8	46.6	55.9
e	min.	23.91	29.56	35.03	39.55	45.20	50.85	55.37	66.44
m	max.	10.8	14.8	18	19.4	21.5	23.8	25.6	31
	min.	10.37	14.1	16.9	18.1	20.2	22.5	24.3	29.4
s	max.	22	27	32	36	41	46	50	60
	min.	21.16	26.16	31	35	40	45	49	58.8

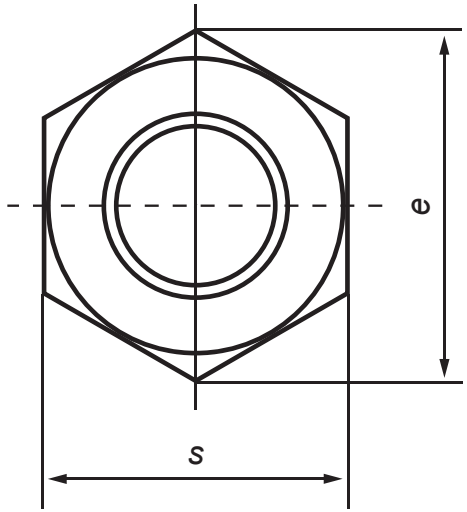
[1]) The maximum value of ***dw*** shall not exceed the actual width across flats

Dimensions apply prior to coating

Characteristic | Standard

Characteristic		Standard
General Requirements		BS EN 14399-1
Materials & Manufacture		BS EN 20898-2 Property Classes 8 & 10
Finish / Coatings	Self Colour / Black	BS EN 14399-3 - as processed
	Zinc Electroplated	BS 7371-3 or BS EN ISO 4042
	Hot Dip Galvanized	BS EN ISO 10684
Mechanical Properties		BS EN 14399-3 BS EN 20898-2 Classes 8 & 10
Dimensions & Tolerances		BS EN 14399-3
Threads		ISO 261 ISO 965-2 tolerance Class 6H or 6AZ
Product Marking		BS EN 14399-3





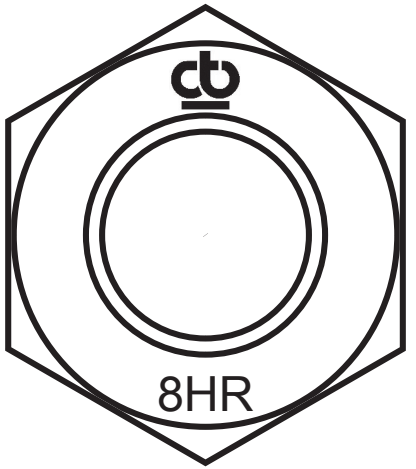
All dimensions are in millimetres

BS EN 14399-3 Proof load values of property classes 8 & 10 nuts

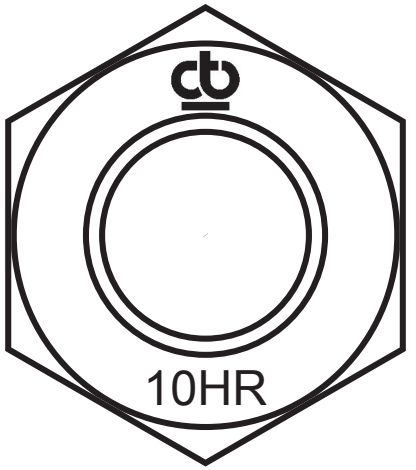
Nut thread Dia.	Stress Area Test Mandrel	Property Class	
		8	10
		Tolerance class 6H[1]) or 6AZ[1])	Tolerance class 6H[1]) or 6AZ[1])
	mm²	Proof Load kN	Proof Load kN
M12	84.3	84.3	97.8
M16	157	157	182.1
M20	245	245	284.2
M22	303	303	351.2
M24	353	353	409.5
M27	459	459	532.4
M30	561	561	650.8
M36	817	817	947.7

[1]) 6H is the tolerance class for self colour nuts and 6AZ is the tolerance class for hot dip galvanized nuts

BS EN 14399-3 Nut Marking



Property Class 8



Property Class 10

All dimensions are in millimetres

BS EN 14399-3
High Strength Structural Bolting Assemblies for Preloading

WASHER - Chamfered

BS EN 14399-6 Chamfered Washer Dimensions

Nominal size *d* [a])		M12	M16	M20	M22	M24	M27	M30	M36
d_1	min	13	17	21	23	25	28	31	37
	max	13.27	17.27	21.33	23.33	25.33	28.52	31.62	37.62
d_2	min	23.48	29.48	36.38	38.38	43.38	49	54.80	64.80
	max	24	30	37	39	44	50	56	66
h	nom	3	4	4	4	4	5	5	6
	min	2.7	3.7	3.7	3.7	3.7	4.4	4.4	5.4
	max	3.3	4.3	4.3	4.3	4.3	5.6	5.6	6.6
e	nom = min	0.5	0.75	0.75	0.75	0.75	1	1	1.25
	max	1.0	1.50	1.50	1.50	1.50	2	2	2.50
c	min	1.6	1.6	2.0	2.0	2.0	2.5	2.5	2.5
	max	1.9	1.9	2.5	2.5	2.5	3.0	3.0	3.0

[a]) Nominal thread diameter of associated bolts

Dimensions apply prior to coating

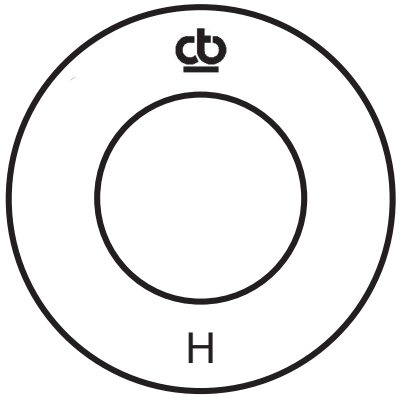
Characteristic / Standard

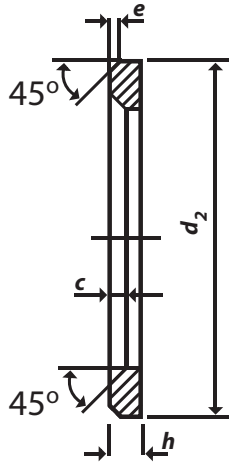
Characteristic		Standard
General Requirements		BS EN 14399-1
Finish / Coatings	Self Colour / Black	BS EN 14399-6 - as processed
	Zinc Electroplated	BS 7371-3 or BS EN ISO 4042
	Hot Dip Galvanized	BS EN ISO 10684
Mechanical Properties		BS EN 14399-6
Dimensions & Tolerances		BS EN 14399-6
Product Marking		BS EN 14399-6

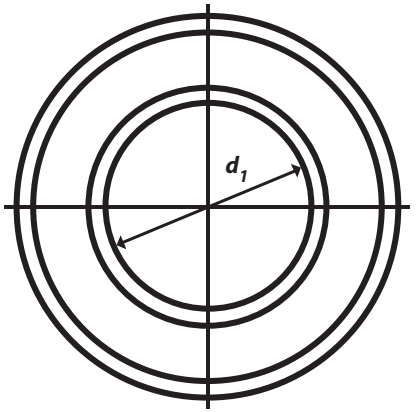
BS EN 14399-6 Mechanical properties of chamfered washer

Nominal Size	Vickers Hardness (HV)	
	min	max
M16 to M36 inclusive	300	370

BS EN 14399-6 Washer Marking







All dimensions are in millimetres