BUMAX®

www.zhenkunhang.com

Contents

Photo: Thierry Martinez

www.zhenkunhang.com

Photo: Thierry Martinez

YOUR SUPPLIER OF HIGH-STRENGTH STAINLESS STEEL FASTENERS

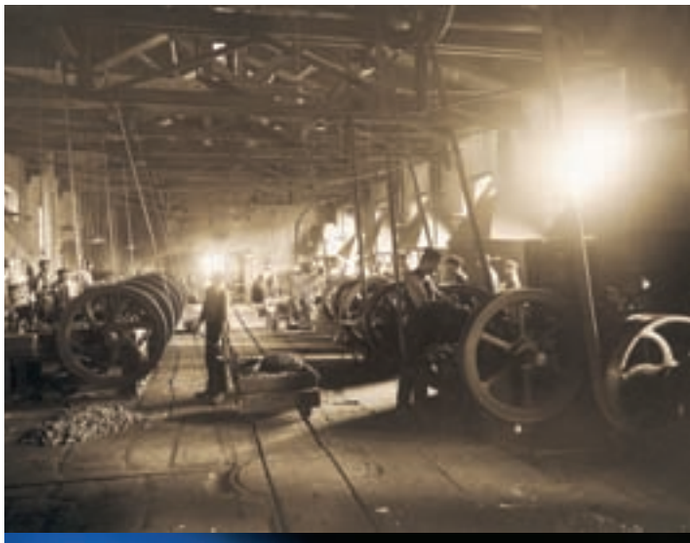
Bulten Stainless has its own production facility in Sweden and holds a very wide range in stock for rapid delivery. If you are in need of unique solutions, talk to our technical customer services. We accept all challenges.

ROOTED IN QUALITY

The company's roots go as far back as the 17th century – a time when exactitude and a sense of responsibility were the most characteristic qualities of forges and foundries. The manufacture and sale of stainless steel fasteners started in 1926. We are carrying on that tradition in our high levels of quality and by working closely with our customers.

COMPLETE RANGE

As market leader, Bulten Stainless always has a complete range of high-strength stainless steel fasteners in stock.



OWN PRODUCTION FACILITIES

At its own production facilities in Sweden, Bulten Stainless manufactures both standard and engineered special products. If you have a requirement, we have the resources and skill to offer customised solutions. For many years, Bulten Stainless has been manufacturing fasteners "that don't exist" – in other words, products with properties far beyond normal standards. The earlier we get involved in the process, the better we are able to fulfil the customer's requirements.

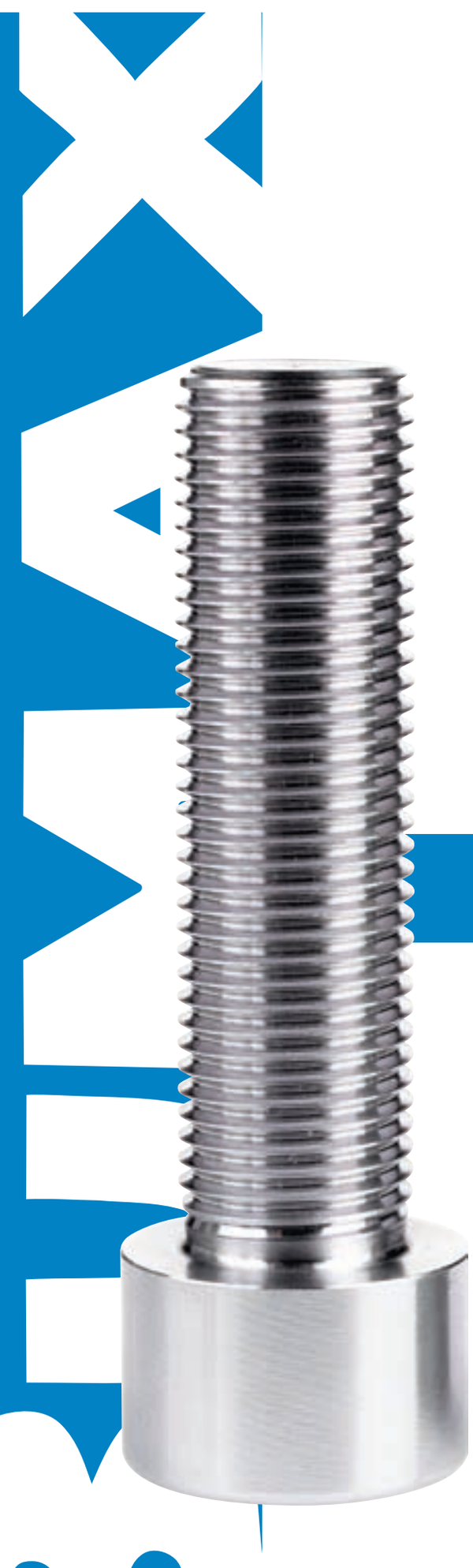
RESEARCH AND DEVELOPMENT

Continuous product development is a central feature of operations at Bulten Stainless. In addition, we work very closely with Swedish manufacturers of high-alloy steel. This has resulted in several products that are globally unique in various ways, and means that we are always ready to face any challenges that come along.

LOGISTICS

Distribution is an important part of our business today. Speed, safety and precision are three key words in our deliveries.

www.zhenkunhang.com



World-class performance!

Many of our customers work in highly demanding environments on a day-to-day basis. This is why Bulten Stainless has developed Bumax.

Bumax involves:

- **Unmatched corrosion resistance.**
- **Safer and smaller joints thanks to their uniquely high strength.**
- **New solutions thanks to extreme hardness.**
- **Peace of mind in guaranteed traceability.**
- **Better overall economy.**

BUMAX®

For a long time, Bulten Stainless has dominated the development of high-strength fasteners made of high-alloy steel. Bumax is, so far, the best we have ever made.

Bumax 88/109 displays peak performance long after other fasteners have reached their limits. This is thanks to its uniquely high strength. The difference in extreme environments is particularly noticeable.

Bumax Hard has been developed for thread forming in steel and in stainless steel. This is made possible by its exceptional surface hardness.

All of our Bumax products are made from the best A4 steel on the market – a new variant of the acid-proof Swedish steel SS14.2343. The special characteristic of the composition of this steel is its low carbon content and enhanced chromium, nickel and molybdenum content.

Bumax is a complete range of high-strength fasteners that we always hold in stock.

Bulten Stainless is constantly striving to force the pace of development. This – in combination with our in-depth knowledge of production processes – means that we are able to offer support and technical solutions that contribute to the development of the customer's business as well.

www.zhenkunhang.com

In most technical structures there are strict safety requirements – and within certain industries these requirements are extreme. Oil drilling rigs are facilities where there is no room for compromise in the choice of fasteners. The highest levels of quality are required for working life, strength and corrosion resistance – requirements that match the properties of Bumax.

For obvious reasons, corrosion resistance is the key consideration when building ships and other marine products. Today, the industry is also trying to achieve increasingly low weight in the designs. As regards resistance to corrosion and the combination of low weight/high strength, the unique performance of Bumax products has therefore stirred up justifiable attention within the marine industry – worldwide.

www.zhenkunhang.com

▲ Volvo Ocean Race

The Volvo Ocean Race, formerly called the Whitbread Round the World Race, is the toughest sailing contest in the world, with crews and equipment constantly exposed to extreme stresses. The first competition took place in 1973 and has since then been arranged every four years. The 2001 event was the first under the auspices of Volvo – in previous years British company Whitbread had responsibility for arranging the round-the-world race.

Photo: Thierry Martinez

◀ Assa Abloy

"Ocean racing has become a materials sport and, naturally, it is extremely important to have a good supplier of fasteners. I have to say that Bulten Stainless not only met my greatest expectations but exceeded them. I have rarely encountered such a professional, helpful and enthusiastic business partner.

Not once did I hear the word "impossible" – they were always highly motivated in their search for the best solution. The engineered special products manufactured, such as keel bolts, were extremely successful."

Magnus Olsson, helmsman on the Assa Abloy boat and technical supervisor for the project.

www.zhenkunhang.com

PED-approved pressure vessel screw for Metso Paper

Bumax 88 is the first acid-proof, high-strength fastener on the market to be approved in accordance with the new pressure equipment directive, PED 97/23/EC.

TÜV's PMA approval (Particular Material Appraisal) of the screw means that manufacturers of pressure vessels obtain a number of advantages.

- *Existing designs do not need to be redimensioned and changed. Bumax 88 can be used with the same dimensions as previous screws.*
- *In the case of new designs, bolted joints can even be scaled down, thanks to the uniquely high strength of Bumax.*

There is currently no other high-strength screw on the market that fulfils the new requirements without a comprehensive and very expensive testing and certification process.

Bumax 88, with pressure vessel approval, therefore comes as a great relief to many industries – including Metso Paper, a world leader in the manufacture of production equipment for the paper and pulp industries. When the company discovered Bumax 88, it was able to avoid paying out huge sums for special certification – getting a screw with higher strength instead.

Asko Cylinda

Bulten Stainless is a flexible, expert partner in product development and problem-solving. Collaboration with white-goods manufacturer Asko Cylinda resulted in a brand new screw with unique characteristics – Bumax Hard. It was developed to cope with thread-forming in stainless steel, in order to simplify an element of the assembly process in dishwasher production.

Bumax Hard resolved Asko Cylinda's problem. And it is now a standard product for many other manufacturers requiring stainless steel, thread-forming screws with high-strength properties.

www.zhenkunhang.com

www.zhenkunhang.com

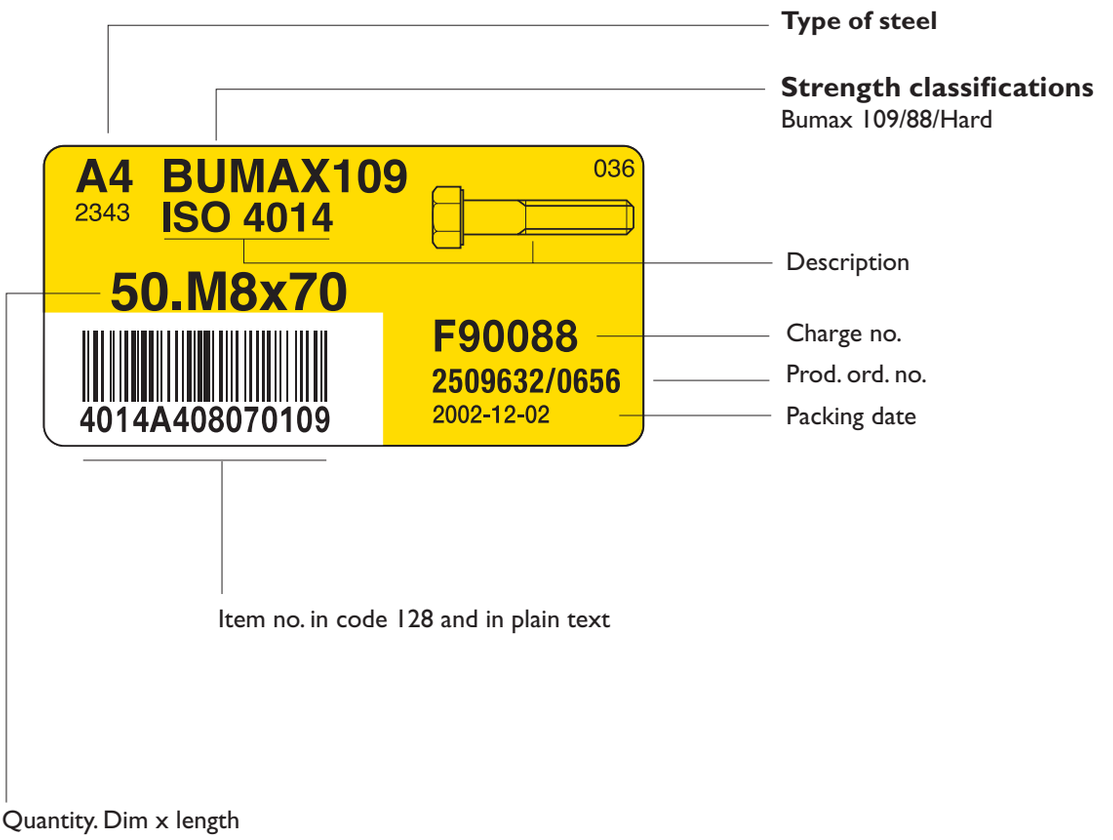
The label and traceability

Yellow label/Bumax 109 and Bumax Hard
Bumax 109 products. Min. tensile strength (Rm) 1000 N/mm^2 (145ksi) and min. stress at 0.2% permanent strain (Rp 0.2) 900 N/mm^2 (130ksi). Bumax 109 products are made from acid-proof steel, SS 14.2343/EN1.4436, with a low carbon content of max. 0.03% (AISI 316L high Mo) and, as regards Rm and Rp 0.2, they are equivalent to Class 10.9 steel bolts.

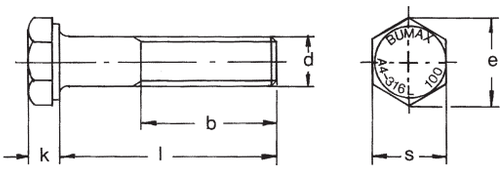
Orange label /Bumax 88
Bumax 88 products. Min. tensile strength (Rm) 800 N/mm^2 (116ksi) and min. stress at 0.2% permanent strain (Rp0.2) 640 N/mm^2 (93ksi). Bumax 88 products are made from acid-proof steel, SS 14.2343/EN1.4436, with a low carbon content of max. 0.03% (AISI 316L high Mo) and, as regards Rm and Rp 0.2, they are equivalent to Class 8.8 steel bolts.

Yellow label
Bumax 109, Bumax Hard
2343/1.4436/316L HiMo

Orange label
Bumax 88
2343/1.4436/316L HiMo



www.zhenkunhang.com



HEXAGON HEAD BOLT 100 M

Bumax 109-M6S
A4-SS 2343-316L HiMo
EN1.4436
EN 24014, ISO 4014

Thread d	M6	M8	M10	M12	M16
Pitch of thread	1	1.25	1.5	1.75	2
s	10	13	16	18	24
k	4	5.3	6.4	7.5	10
e (min.)	11.05	14.38	17.77	20.03	26.75
Length of thread engagement b					
for l to 125 inclusive	18	22	26	30	38
over 125					

Bolt length	Approximate weight per 100				
l	kg	kg	kg	kg	kg
35	0.92				
40	1.0	2.0			
45	1.2	2.2	3.8	5.4	
50	1.3	2.4	4.0	5.8	
55	1.4	2.6	4.4	6.3	
60	1.5	2.8	4.7	6.7	
65			5.0		
70	1.7	3.2	5.3	7.5	14
80	1.9	3.6	5.9	8.4	16
90			6.6	9.2	17
100			7.2	10	19
120				12	22
Nut type					
Bumax 109-M6M	0.22	0.48	1.1	1.5	2.9

Sample order: Bumax 109-M6S M6x35

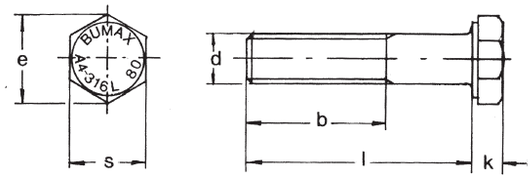
Supplied anti-friction conditioned.

Packaging

Diameter	M6	M8	M10	M12	M16
No. per pack	100	50	50	25	25

www.zhenkunhang.com

HEXAGON HEAD BOLT 80 M



Bumax 88-M6S
A4-SS 2343-316L HiMo
EN1.4436
EN 24014, ISO 4014

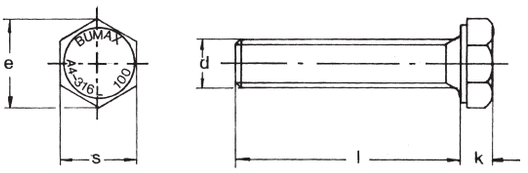
Thread d	M6	M8	M10	M12	M14	M16	M18	M20	M24	M27	M30	M36
Pitch of thread	1	1.25	1.5	1.75	2	2	2.5	2.5	3	3	3.5	4
s	10	13	16	18	21	24	27	30	36	41	46	55
k	4	5.3	6.4	7.5	8.8	10	11.5	12.5	15	17	18.7	22.5
e (min.)	11.05	14.38	17.77	20.03	23.35	26.75	30.14	33.53	39.98	45.2	50.85	60.79
Length of thread engagement b												
for l to 125 inclusive	18	22	26	30	34	38	42	46	54	60	66	
over 125	24	28	32	36	40	44	48	52	60	66	72	84
Bolt length						**Approximate weight per 100**						
l	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg
30	0.83											
35	0.92	1.8										
40	1.0	2.0	3.4									
45	1.2	2.2	3.8	5.4								
50	1.3	2.4	4.0	5.8		10						
55	1.4	2.6	4.4	6.3		11						
60	1.5	2.8	4.7	6.7		12						
65	1.6	3.0	5.0	7.1		13						
70	1.7	3.2	5.3	7.5		14		23				
75		3.4	5.5	7.9		15		24	37		64	
80	1.9	3.6	5.9	8.4	12	16		25	39		69	
85			6.2									
90	2.1	3.9	6.6	9.2	13	17	22	28	43		71	
100	2.3	4.3	7.2	10	14	19	24	30	46	60	77	117
110	2.5	4.7	7.5	11		20		33	50	65	82	
120	2.7	4.8	8.3	12	16	22	28	35	54	70	88	132
130	2.9	5.3	9.6	13		23		38	56	72	92	
140		5.8	10	14	19	25	32	40	60	77	98	147
150		6.2	11	15		26	34	42	63	81	103	
160			12	16		28		45	67	86	109	163
180			13	17		31		49	74	95	120	
200			14			34		54	81	103	131	195
Nut type												
Bumax 88-M6M	0.22	0.48	1.1	1.5	2.3	2.9	4.9	5.7	11	16	22	40

Sample order: Bumax 88-M6S M6x30

Packaging

Diameter	M6	M8	M10	M12	M14	M16	M18	M20	M24	M27	M30	M36
No. per pack	100	50	50	25	25	25	10	10	10	10	10	10

www.zhenkunhang.com



HEXAGON HEAD SCREW 100 M

Bumax 109-M6S-H
A4-SS 2343-316L HiMo
EN1.4436
EN 24017, ISO 4017

Thread d	M6	M8	M10	M12	M16
Pitch of thread	1	1.25	1.5	1.75	2
s	10	13	16	18	24
k	4	5.3	6.4	7.5	10
e (min.)	11.05	14.38	17.77	20.03	26.75
Screw length	**Approximate weight per 100**				
l	kg	kg	kg	kg	kg
20	0.6	1.2	2.1		
25	0.7				
30	0.8	1.6	2.6	3.8	7.7
35					
40			3.1	4.5	9.0
45					9.7
50					10
55					11
60					12
Nut type					
Bumax 109-M6M	0.22	0.48	1.1	1.5	2.9

Sampel order: Bumax 109-M6S-H M6x20

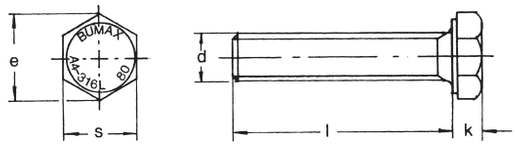
Supplied anti-friction conditioned.

Packaging

Diameter	M6	M8	M10	M12	M16
No. per pack	100	50	50	25	25

www.zhenkunhang.com

HEXAGON HEAD SCREW 80 M



Bumax 88-M6S-H
A4-SS 2343-316L HiMo
EN1.4436
EN 24017, ISO 4017

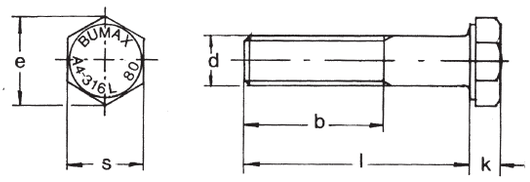
Thread d	M4	M5	M6	M8	M10	M12	M14	M16	M18	M20	M24	M27	M30	M36
Pitch of thread	0.7	0.8	1	1.25	1.5	1.75	2	2	2.5	2.5	3	3	3.5	4
s	7	8	10	13	16	18	21	24	27	30	36	41	46	55
k	2.8	3.5	4	5.3	6.4	7.5	8.8	10	11.5	12.5	15	17	18.7	22.5
e (min.)	7.66	8.79	11.05	14.38	17.77	20.03	23.36	26.75	30.14	33.53	39.98	45.2	50.85	60.79
Screw length						**Approximate weight per 100**								
l	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg
6	0.14													
8	0.15													
10	0.16	0.27	0.41	0.91										
12	0.18	0.29	0.44	0.98	1.7									
14		0.32	0.48	1.0										
16	0.21	0.35	0.51	1.1	1.9									
20	0.24	0.39	0.58	1.2	2.1	3.1								
22			0.62	1.3										
25	0.28	0.46	0.67	1.4	2.4	3.4		7.0						
30	0.31	0.55	0.75	1.6	2.6	3.8	5.8	7.7						
35		0.63	0.84	1.7	2.9	4.1		8.3		15				
40		0.65	0.92	1.9	3.1	4.5	6.8	9.0	12	16	24			
45		0.70	1.0	2.0	3.4	4.9		9.7		17	26			
50		0.76	1.1	2.2	3.6	5.2	7.8	10	14	18	27	38		
55										19				
60			1.3	2.5	4.1	5.8	8.8	12	15	20	30	42	54	
65										21	32			
70			1.4	2.8	4.6	6.7	9.8	13	17	22	33	45	59	
75										23	35			
80			1.6	3.1	5.1	7.4		14	19	24	36	49	64	99
90					5.7	8.1					39	53	69	106
100					6.1	8.8				28	42	57	73	114
110					6.6									
120					7.1			20			48	65		127
130					7.6							69		134
140												73		141
150										38		77		148
160												81		
Nut type														
Bumax 88-M6M	0.07	0.11	0.22	0.48	1.1	1.5	2.3	2.9	4.9	5.7	11	16	22	40

Sample order: Bumax 88-M6S-H M4x6

Packaging

Diameter	M4	M5	M6	M8	M10	M12	M14	M16	M18	M20	M24	M27	M30	M36
No. per pack	200	100	100	50	50	25	25	25	10	10	10	10	10	10

www.zhenkunhang.com



HEXAGON HEAD BOLT 80 UNC

Bumax 88-U6S
A4-SS 2343-316L HiMo
EN1.4436
SS 1943 (ANSI B18.2)

Thread d	UNC	1/4	5/16	3/8	1/2	5/8	3/4	7/8	1
No. of threads per inch		20	18	16	13	11	10	9	8
s inch		7/16	1/2	9/16	3/4	15/16	1.1/8	1.5/16	1.1/2
s mm		11.1	12.7	14.3	19	23.8	28.6	33.3	38.1
k		4	5.2	6	7.9	9.9	11.9	13.9	15.5
e (min.)		12.39	14.15	15.95	21.34	26.69	31.85	37.21	42.55
Length of thread engagement b for 1 to 152 inclusive		19	22	25	32	38	44	51	57
over 152							51		

Bolt length l		Approximate weight per 100							
inch	mm	kg	kg	kg	kg	kg	kg	kg	kg
1/2	13	0.56	0.95						
5/8	16	0.62	1.1	1.5					
3/4	19	0.66	1.1	1.6					
7/8	22			1.7					
1	25	0.79	1.3	1.9	3.8	6.8			
1.1/4	32	0.97	1.5	2.2	4.4	7.7	12		
1.1/2	38	1.1	1.8	2.5	4.8	8.5	13	20	
1.3/4	45	1.3	2.0	2.9	5.6	9.4	15		
2	51	1.4	2.3	3.3	6.2	10	16	24	33
2.1/4	57			3.6	6.7	11	17		35
2.1/2	64	1.7	2.8	3.9	7.5	12	19	27	37
2.3/4	70			4.3	8.1	13	20	29	
3	76	2.0	3.2	4.7	8.7	14	21	31	42
3.1/4	83			5.0	9.2	15	23	33	
3.1/2	89		3.7	5.3	10	16	24	35	47
4	102		4.3	6.1	11	18	27	39	52
4.1/2	114			6.7	12	20	30	42	57
5	127			7.4	14	23	33	46	61
5.1/2	140			8.2	15	24	36	50	67
6	152			8.7	16	26	38	54	71
6.1/2	165						41		
7	178						44		
Nut type Bumax 88-U6M		0.32	0.47	0.69	1.6	3.2	5.3	9.2	14

Sample order: A4-U6S 1/4x13

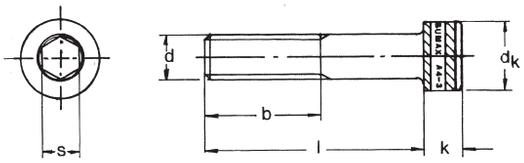
Screws above the stepped line are fully-threaded.

Can be manufactured to order as Bumax 109.

Packaging

Diameter	1/4	5/16	3/8	1/2	5/8	3/4	7/8	1
No. per pack	100	50	50	25	25	10	10	10

www.zhenkunhang.com



HEXAGON SOCKET 100 M

Hexagon socket head cap screw

Bumax 109-MC6S
A4-SS 2343-316L HiMo
EN1.4436
EN/ISO 4762 (DIN 912)

Thread d	M6	M8	M10	M12
Pitch of thread	1	1.25	1.5	1.75
dk	10	13	16	18
k	6	8	10	12
s	5	6	8	10
Length of thread engagement b	24	28	32	36

Screw length	Approximate weight per 100			
l	kg	kg	kg	kg
20	0.65	1.3	2.3	
30	0.83	1.7	2.8	3.9
40	1.1	2.1	3.3	4.7
50	1.3	2.5	3.9	5.5
60	1.5	2.9	4.6	6.3
70	1.9	3.3	5.2	7.1
80	2.1	3.7	5.9	8.0
90		4.0	6.5	8.9
100			7.1	9.8
120				12
Nut type				
Bumax 109-M6M	0.22	0.48	1.1	1.5

Sample order: Bumax 109-MC6S M6x20

Screws above the stepped line are fully-threaded.

Supplied anti-friction conditioned.

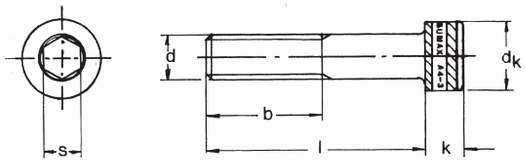
Packaging

Diameter	M6	M8	M10	M12
No. per pack	100	50	50	25

www.zhenkunhang.com

HEXAGON SOCKET 80 M

Hexagon socket head cap screw



Bumax 88-MC6S
A4-SS 2343-316L HiMo
EN1.4436
EN/ ISO 4762 (DIN 912)

Thread										
d	**M3**	**M4**	**M5**	**M6**	**M8**	**M10**	**M12**	**M16**	**M20**	**M24**
Pitch of thread	0.5	0.7	0.8	1	1.25	1.5	1.75	2	2.5	3
dk	5.5	7	8.5	10	13	16	18	24	30	36
k	3	4	5	6	8	10	12	16	20	24
s	2.5	3	4	5	6	8	10	14	17	19
Length of thread engagement b	18	20	22	24	28	32	36	44	52	60
Screw length						**Approximate weight per 100**				
l	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg
6	0.071	0.15								
8	0.080	0.17								
10	0.088	0.18	0.27							
12	0.096	0.20	0.30	0.51						
14				0.52						
16	0.12	0.23	0.35	0.58	1.2	2.1				
20	0.14	0.27	0.40	0.65	1.3	2.3	3.2			
22										
25	0.16	0.32	0.48	0.76	1.5	2.5	3.6			
30	0.19	0.37	0.56	0.83	1.7	2.8	3.9	7.8	13	
35		0.42	0.63	0.99	1.9	3.0	4.3	8.4		
40		0.47	0.71	1.1	2.1	3.3	4.7	9.1	15	
45			0.79	1.1	2.2	3.6	5.0	9.8	16	
50		0.56	0.86	1.3	2.5	3.9	5.5	11	17	30
55						4.2		12		
60			1.0	1.5	2.9	4.6	6.3	12	19	32
65						4.8				
70			1.2	1.9	3.3	5.2	7.1	14	22	36
75						5.4				
80				2.1	3.7	5.9	8.0	15	24	40
90				2.2		6.5	8.9	17	27	43
100						7.1	9.8	19	29	47
110								20		
120						8.4	12	22		55
130										
140									39	62
150										66
Nut type Bumax 88-M6M	0.03	0.07	0.11	0.22	0.48	1.1	1.5	2.9	5.7	11

Sample order: Bumax 88-MC6S M3x6

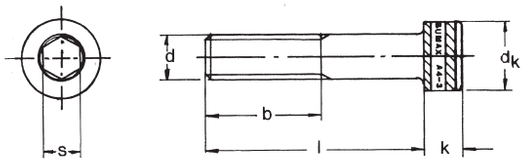
Screws above the stepped line are fully-threaded.

Due to space restrictions, M3 and M4 can be supplied without marking and knurling.

Packaging

Diameter	**M3**	**M4**	**M5**	**M6**	**M8**	**M10**	**M12**	**M16**	**M20**	**M24**
No. per pack	500	200	100	100	50	50	25	25	10	10

www.zhenkunhang.com



HEXAGON SOCKET 80 UNC

Hexagon socket head cap screw

Bumax 88-UC6S
A4-SS 2343-316L HiMo
EN1.4436
SS 1960 (ANSI B18.3)

Thread									
d	**UNC**	**1/4**	**5/16**	**3/8**	**1/2**	**5/8**	**3/4**	**7/8**	**1**
No. of threads per inch		20	18	16	13	11	10	9	8
dk		9.5	11.9	14.3	19	23.8	28.6	33.3	38.1
k		6.3	7.9	9.5	12.7	15.9	19	22.2	25.4
s inch		3/16	1/4	5/16	3/8	1/2	5/8	3/4	3/4
s mm		4.8	6.4	7.9	9.5	12.7	15.9	19	19
b		25	28	38	38	51	57	76	76
Screw length l						**Approximate weight per 100**			
inch	mm	kg	kg	kg	kg	kg	kg	kg	kg
1/2	13	0.50	0.9						
5/8	16	0.58	1.0						
3/4	19	0.62	1.1	1.7					
7/8	22		1.1	1.9					
1	25	0.73	1.2	2.0	4.1				
1.1/4	32	0.86	1.3	2.1	4.8	8.2			
1.1/2	38	1.0	1.6	2.5	5.2	9.0			
1.3/4	45								
2	51		2.1	3.2	6.2	11	17	26	37
2.1/4	57					12			
2.1/2	64			4.0			20		
2.3/4	70								
3	76				8.2		23	32	46
3.1/4	83								
3.1/2	89								
4	102							40	56
Nut type Bumax 88		0.32	0.47	0.69	1.6	3.2	5.3	9.2	14

Sample order: Bumax 88-UC6S 1/4UNCx13

Screws above the stepped line are fully-threaded, while screws below the line are usually supplied partially-threaded with a thread engagement length as above.

However we reserve the right, at our discretion, to supply all lengths in a fully-threaded design.

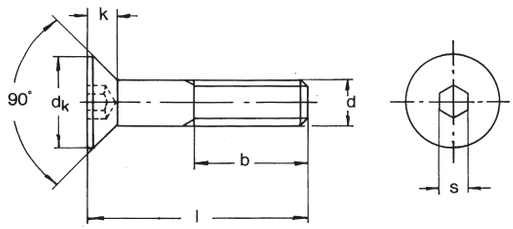
Packaging

Diameter	**1/4**	**5/16**	**3/8**	**1/2**	**5/8**	**3/4**	**7/8**	**1**
No. per pack	100	50	50	25	25	10	10	10

www.zhenkunhang.com

HEXAGON SOCKET 80 M

Hexagon socket countersunk head screw



Bumax 88-MF6S
A4-SS 2343-316L HiMo
EN1.4436
EN/ ISO 10642 (DIN 7991)

Thread								
d	**M3**	**M4**	**M5**	**M6**	**M8**	**M10**	**M12**	**M16**
Pitch of thread	0.5	0.7	0.8	1	1.25	1.5	1.75	2
dk max.	6.72	8.96	11.20	13.44	17.92	22.4	26.88	33.6
k max.	1.86	2.48	3.1	3.72	4.96	6.2	7.44	8.8
s	2	2.5	3	4	5	6	8	10
Length of thread engagement b	18	20	22	24	28	32	36	44
Screw length				**Approximate weight per 100**				
l	kg	kg	kg	kg	kg	kg	kg	kg
6	0.04							
8	0.05							
10	0.06	0.11	0.19	0.26				
12	0.07	0.12	0.20	0.32				
16	0.08	0.15	0.26	0.36	0.74			
20	0.10	0.18	0.31	0.44	0.87	1.4		
25		0.22	0.36	0.53	1.0	1.7		
30		0.29	0.45	0.64	1.2	1.9	2.9	
35					1.3	2.2		
40				0.88	1.6	2.4	3.6	6.5
45							4.1	
50			0.77	1.1	2.0	3.0		7.8
60				1.3	2.5		5.5	9.2
70					3.0		6.3	11
80								13
90								
100								16
Nut type								
Bumax 88-M6M	0.03	0.07	0.11	0.22	0.48	1.1	1.5	2.9

Sample order: Bumax 88-MF6S M3x6

Screws above the stepped line are fully-threaded.

However we reserve the right, at our discretion, to supply all lengths in a fully-threaded design.

Packaging

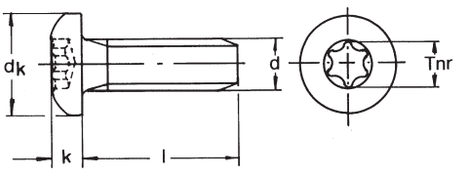
Diameter	**M3**	**M4**	**M5**	**M6**	**M8**	**M10**	**M12**	**M16**
No. per pack	500	200	100	100	50	50	25	25

www.zhenkunhang.com

Bulten Stainless supplies high-strength acid-proof fasteners to the defence industry throughout Europe.

www.zhenkunhang.com

www.zhenkunhang.com



HEXALOBULAR SOCKET SCREW M

Thread-forming Taptite pan head screw, Torx grip

Bumax Hard-MRT-TT
A4-SS 2343-316L HiMo
EN1.4436

Thread d	M3	M4	M5	M6	M8
Pitch of thread	0.5	0.7	0.8	1	1.25
dk	5.6	8	9.5	12	16
k (max)	2.4	3.1	3.7	4.6	6
Torx nr	T10	T20	T25	T30	T45

Screw length	Approximate weight per 100				
l	kg	kg	kg	kg	kg
6	0.06				
8	0.07	0.15			
10	0.08	0.17	0.28		
12	0.09	0.18	0.31	0.51	
16		0.22	0.35	0.58	1.2
20		0.25	0.41	0.65	1.4
25			0.47	0.74	1.5
30				0.82	1.7
40					2.0

Sample order: Bumax Hard-MRT-TT Torx M3x6

All lengths are supplied in a fully-threaded design.

Guide values for hole diameter – refer to technical information.

For assembly in structural steel type ST37 and stainless steel <200 HV.

Supplied surface coated. Dim. ≥M8 also anti-friction conditioned.

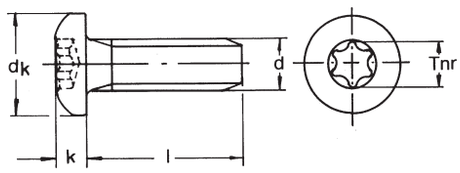
Packaging

Diameter	M3	M4	M5	M6	M8
No. per pack	500	200	100	100	50

www.zhenkunhang.com

HEXALOBULAR SOCKET SCREW M

Thread forming Taptite pan head screw, Torx grip



Bumax MRT-TT
A4-SS 2343-316L HiMo
EN1.4436

Thread d	M3	M4	M5	M6	M8
Pitch of thread	0.5	0.7	0.8	1	1.25
dk	5.6	8	9.5	12	16
k (max.)	2.4	3.1	3.7	4.6	6
Torx no.	T10	T20	T25	T30	T45

Screw length	Approximate weight per 100				
l	kg	kg	kg	kg	kg
6	0.06				
8	0.07	0.15			
10	0.08	0.17	0.28		
12	0.09	0.18	0.31	0.51	
16		0.22	0.35	0.58	1.2
20		0.25	0.41	0.65	1.4
25			0.47	0.74	1.5
30				0.82	1.7
40					2.0

Sample order: Bumax -MRT-TT Torx M3x6

All lengths are supplied in a fully-threaded design.

For assembly in material with hardness not exceeding HV 115.

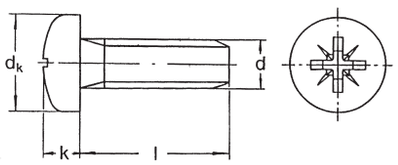
Guide values for hole diameter – refer to technical information.

Bumax HARD or hardened, bright galvanised screws in SS 2302/2303, which are made to order, are recommended for assembly in material with a hardness exceeding HV 115.

Packaging

Diameter	M3	M4	M5	M6	M8
No. per pack	500	200	100	100	50

www.zhenkunhang.com



CROSS RECESSED SCREW M

Thread-forming Taptite pan head screw, cross-recess Z

Bumax MRX-TT
A4-SS 2343-316L HiMo
EN1.4436

Thread d	M3	M4	M5	M6
Pitch of thread	0.5	0.7	0.8	1
dk	5.6	8	9.5	12
k (max.)	2.4	3.1	3.7	4.6
Driver no.	1	2	2	3

Screw length	Approximate weight per 100			
l	kg	kg	kg	kg
6	0.06			
8	0.07	0.15		
10	0.08	0.17	0.28	
12	0.09	0.18	0.31	0.51
16		0.22	0.35	0.58
20			0.41	0.65
25				0.74

Sample order: Bumax-MRX-TT Z M3x6

All lengths are supplied in a fully-threaded design.

For assembly in material with hardness not exceeding HV 115.

Guide values for hole diameter – refer to technical information.

For assembly in material with hardness not exceeding HV 115.

Bumax Hard or hardened, bright galvanised screws in SS 2302/2303, which are made to order, are recommended for assembly in material with a hardness exceeding HV 115.

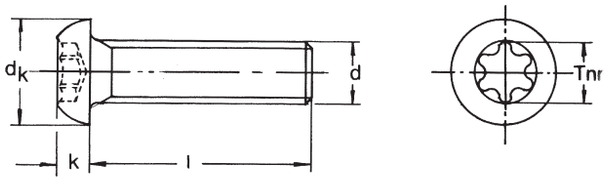
Packaging

Diameter	M3	M4	M5	M6
No. per pack	500	200	100	100

www.zhenkunhang.com

HEXALOBULAR SOCKET SCREW 80 M

Button head, Torx grip
Bumax 88-MKT
A4-SS 2343-316L HiMo
EN1.4436
DIN/EN/ISO 7380



Thread d	M5	M6	M8
Pitch of thread	0.8	1	1.25
dk	9.5	10.5	14
k (max.)	2.75	3.3	4.4
Grip no.	T25	T30	T40

Screw length	Approximate weight per 100		
l	kg	kg	kg
8	0.19		
10	0.26	0.29	
12	0.35	0.38	
14		0.43	
16	0.47	0.49	1.1
20	0.54	0.67	1.2
25	0.63	0.76	1.3
30	0.71	0.85	1.3
35		0.98	
40	0.87	1.10	1.6
50	0.95	1.30	1.9
70		1.80	

Sample order: Bumax 88-MKT M5x8

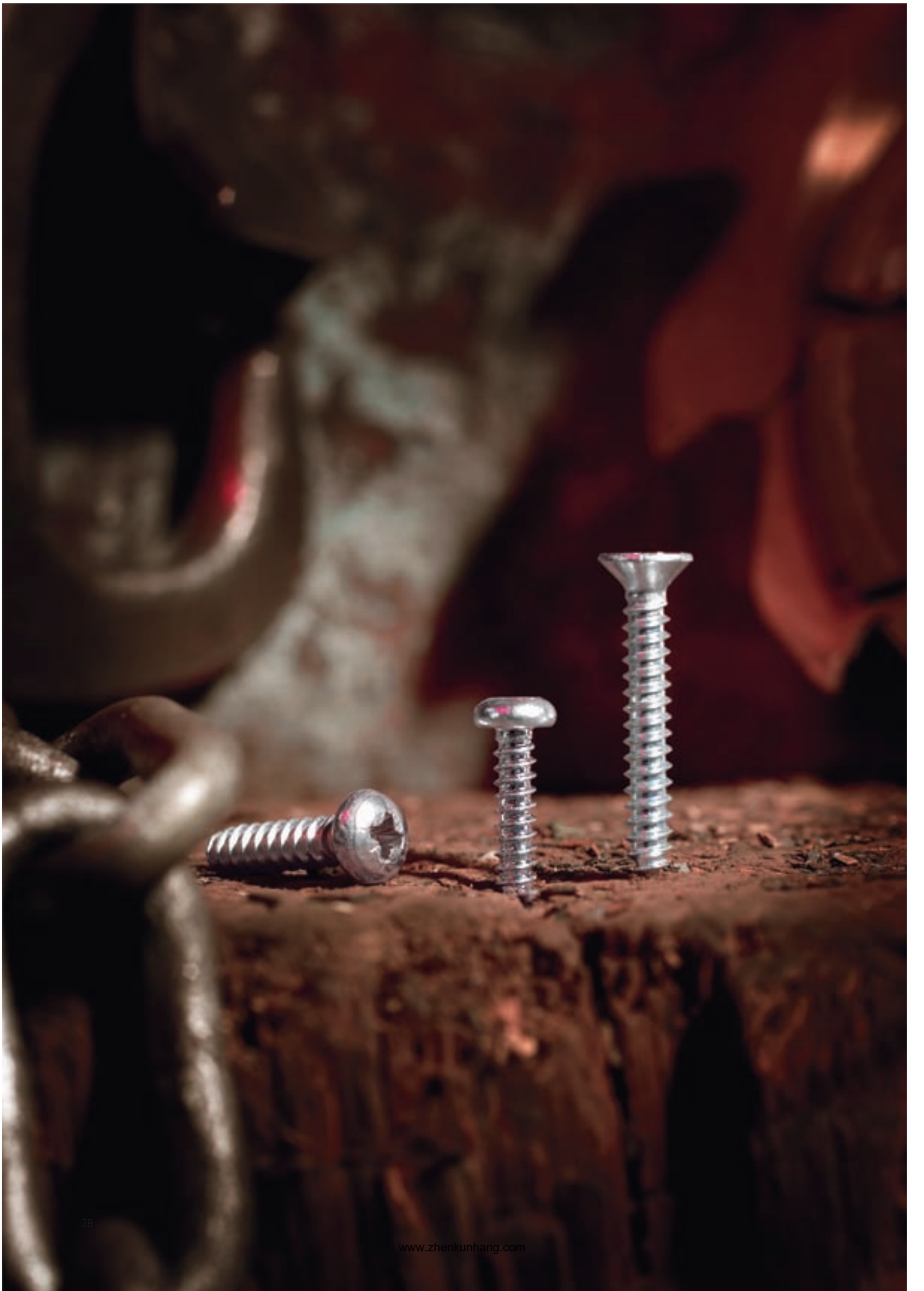
All lengths are supplied in a fully-threaded design.

Packaging

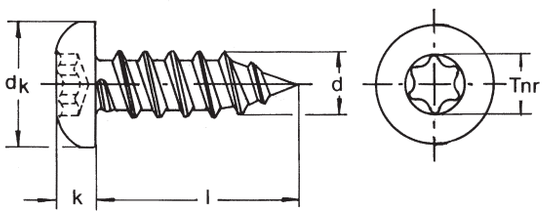
Diameter	M5	M6	M8
No. per pack	100	100	50

www.zhenkunhang.com


www.zhenkunhang.com



www.zhenkunhang.com



HEXALOBULAR SOCKET SCREW ST

Self tapping pan head screw, Torx grip

Bumax Hard-RTS
A4-SS 2343-316L HiMo
EN1.4436
EN/ISO 7049 SS-EN-ISO 14585 (DIN 7981)

Thread d	**ST2,9 (B4)**	**ST3,5 (B6)**	**ST4,2 (B8)**	**ST4,8 (B10)**	**ST5,5 (B12)**	**ST6,3 (B14)**
dk	5.6	7	8	9.5	11	12
k (max.)	2.4	2.6	3.1	3.7	4	4.6
TORX no.	T10	T15	T20	T25	T25	T30
Screw length			**Approximate weight per 100**			
l	kg	kg	kg	kg	kg	kg
9.5	0.050	0.08	0.12			
13	0.063	0.10	0.15	0.22		
16	0.074	0.11	0.17	0.25	0.36	
19	0.085	0.13	0.19	0.28	0.40	
25		0.16	0.23	0.34	0.48	0.61
32		0.20	0.28	0.41	0.57	0.73
38			0.32	0.47	0.65	0.84
50				0.52	0.81	1.1

Sample order: Bumax Hard-RTS Torx 2.9x9.5

Guide values for hole diameter – refer to technical information.

For assembly in structural steel type ST37 with HV<200.

Supplied surface-coated.

During a transitional period, we reserve the right to supply in accordance with the withdrawn DIN standard.

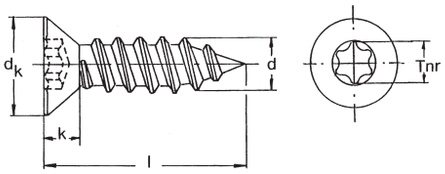
Packaging

Diameter	**ST2.9**	**ST3.5**	**ST4.2**	**ST4.8**	**ST5.5**	**ST6.3**
No. per pack	500	500	500	200	200	200

www.zhenkunhang.com

HEXALOBULAR SOCKET SCREW ST

Self tapping countersunk head screw, Torx grip



Bumax Hard-FTS
A4-SS 2343-316L HiMo
EN1.4436
EN/ISO 7050 SS-EN-ISO 14586 (DIN 7982)

Thread d	**ST2.9** (B4)	**ST3.5** (B6)	**ST4.2** (B8)	**ST4.8** (B10)	**ST5.5** (B12)	**ST6.3** (B14)
dk	5.5	7.3	8.4	9.3	10.3	11.3
k (max.)	1.7	2.35	2.6	2.8	3	3.15
TORX no.	T10	T15	T20	T25	T25	T30
Screw length	**Approximate weight per 100**					
l	kg	kg	kg	kg	kg	kg
6.5	0.028					
9.5	0.035	0.054	0.078			
13	0.048	0.072	0.10	0.15		
16	0.058	0.087	0.12	0.18		
19	0.069	0.10	0.14	0.21	0.29	0.36
25	0.070	0.13	0.19	0.27	0.37	0.47
32		0.15	0.24	0.34	0.46	0.60
38		0.17	0.28	0.40	0.54	0.70
50			0.37	0.52	0.70	0.90

Sample order: Bumax Hard-FTS Torx 2.9x6.5

Guide values for hole diameter – refer to technical information.

For assembly in structural steel type ST37 with HV<200.

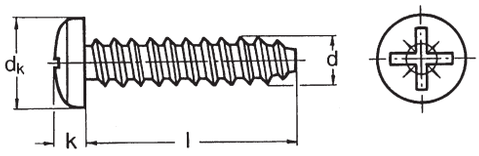
During a transitional period, we reserve the right to supply in accordance with the withdrawn DIN standard.

Supplied surface coated.

Packaging

Diameter	**ST2.9**	**ST3.5**	**ST4.2**	**ST4.8**	**ST5.5**	**ST6.3**
No. per pack	500	500	500	200	200	200

www.zhenkunhang.com



CROSS RECESSED SCREW PLASTITE

Self tapping pan head screw for plastics, cross-recess Z

Bumax RX-Plastite
A4-SS 2343-316L HiMo
EN1.4436

Thread no. threads/inch	**4-20**	**6-19**	**8-16**	**10-14**
d	3.1	3.6	4.6	5.3
dk	5.6	7,0	8.0	9.5
k	2	2.5	2.9	3.5
Driver no.	1	2	2	2
Hole diameter	2.5-2.7	3.0-3.2	3.8-4.0	4.4-4.7

Screw length	**Approximate weight per 100**			
l	kg	kg	kg	kg
8	0.04			
10	0.05	0.09		
12	0.06	0.10	0.17	
16	0.08	0.12	0.20	0.26
20		0.14	0.23	0.30
25			0.26	0.34

Sample order: Bumax 316L-RX-Plastite 4-20x8

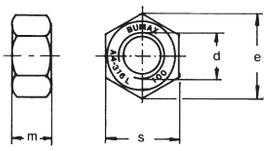
Packaging

Diameter	**4-20**	**6-19**	**8-16**	**10-14**
No. per pack	500	500	500	500

www.zhenkunhang.com

www.zhenkunhang.com

HEXAGON NUT 100 M



Bumax 109-M6M
A4-SS 2343-316L HiMo
EN1.4436
EN 24032, ISO 4032

Thread d	Pitch of thread	s max.	m max.	Strength classification	Approx. Weight kg/100
M6	1	10	5.2	100	0.25
M8	1.25	13	6.8	100	0.52
M10	1.5	16	8.4	100	1.2
M12	1.75	18	10.8	100	1.7
M16	2	24	14.8	100	3.3

Sample order: Bumax 109-M6M M6

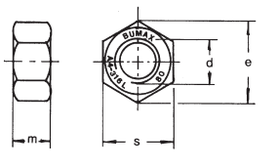
Supplied anti-friction conditioned.

Packaging

Diameter	M6	M8	M10	M12	M16
No. per pack	100	100	50	25	25

www.zhenkunhang.com

HEXAGON NUT 80 M



Bumax 88-M6M
A4-SS 2343-316L HiMo
EN1.4436
EN 24032, ISO 4032

Thread d	Pitch of thread	s max.	m max.	Strength classification	Approx. Weight kg/100
M6	1	10	5.2	80	0.25
M8	1.25	13	6.8	80	0.52
M10	1.5	16	8.4	80	1.2
M12	1.75	18	10.8	80	1.7
M14	2	21	12.8	80	2.5
M16	2	24	14.8	80	3.3
M18	3	27	15.8	80	4.9
M20	2.5	30	18	80	6.4
M24	3	36	21.5	80	11

Sample order: Bumax 88-M6M M6

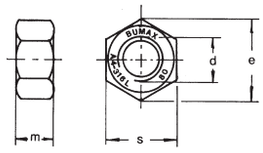
Supplied anti-friction conditioned.

Packaging

Diameter	M6	M8	M10	M12	M14	M16	M18	M20	M24
No. per pack	100	100	50	50	50	25	25	25	10

www.zhenkunhang.com

HEXAGON NUT 80 UNC



Bumax 88-U6M
A4-SS 2343-316L HiMo
EN1.4436
SS 1989, (ANSI B18.2)

Thread d	No. of threads per inch	s inch	s mm	m mm	e (min) mm	Strength classification	Approx. Weight kg/100
1/4 UNC	20	7/16	11.1	5.6	12.39	80	0.32
5/16 UNC	18	1/2	12.7	6.7	14.15	80	0.47
3/8 UNC	16	9/16	14.3	8.3	15.95	80	0.69
7/16 UNC	14	11/16	17.5	9.5	19.5	80	1.3
1/2 UNC	13	3/4	19.1	11.1	21.34	80	1.6
5/8 UNC	11	15/16	23.8	13.9	26.69	80	3.2
3/4 UNC	10	1.1/8	28.6	16.3	31.85	80	5.3
7/8 UNC	9	1.5/16	33.3	19.1	37.21	80	9.2
1 UNC	8	1.1/2	38.1	21.8	42.55	80	14

Sample order: Bumax 88-U6M 1/4 UNC

Since no particular requirement has been specified regarding the shape of the nut, the designation U6M has been given.
U6M means that any design of U6FM, U6AM or U6PM is approved by the purchaser.
Bulten Stainless normally supplies 1 design in accordance with U6FM unless otherwise specified.

Supplied anti-friction conditioned.

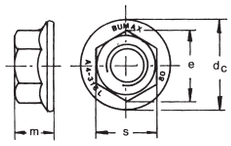
Packaging

Diameter	1/4	5/16	3/8	7/16	1/2	5/8	3/4	7/8	1"
No. per pack	100	100	50	50	50	25	25	10	10

www.zhenkunhang.com

HEXAGON NUT 80 M

With flange



Bumax 88-MF6M
A4-SS 2343-316L HiMo
EN1.4436
DIN 6923, ISO 4161

Thread d	Pitch of thread	s max.	m max.	e min	dc-max.	Strength classification	Approx. Weight kg/100
M6	1	10	6	11.05	14.2	80	0.35
M8	1.25	13	8	14.38	17.9	80	0.70
M10	1.5	15	10	16.64	21.8	80	1.2
M12	1.75	18	12	20.03	26	80	2.1
M16	2	24	16	26.75	34.5	80	4.1
M20	2.5	30	20	32.95	42.8	80	7.3

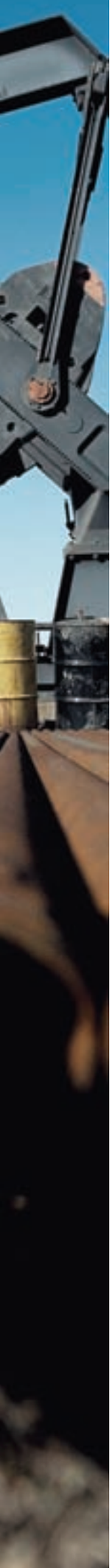
Sample order: Bumax 88-MF6M M6

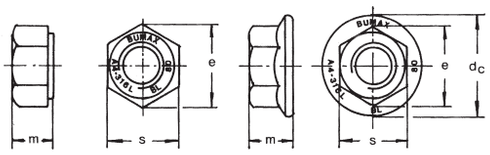
Supplied anti-friction conditioned.

Packaging

Diameter	M6	M8	M10	M12	M16
No. per pack	100	100	50	25	25

www.zhenkunhang.com





PRELOAD LOOKING HEXAGON NUT 80 M

All-metal
Bumax Lock 88
A4-SS 2343-316L HiMo
EN1.4436

	Thread d	Pitch of thread	s max.	m max.	e min	dc-max.	Strength classification	Approx. Weight kg/100
Fläns	M6	1	10	6	11.05	14.2	80	0.35
	M8	1.25	13	8	14.38	17.9	80	0.7
	M10	1.5	(16). 15	10	16.64	21.8	80	1.2
	M12	1.75	18	12	20.03	26	80	2.1
Ansats	M12	1.75	18	12	20.03		80	1.9
	M16	2	24	16	26.75		80	3.8
	M20	2.5	30	20	32.95		80	7.2

Sample order: Bumax Lock 88 M6

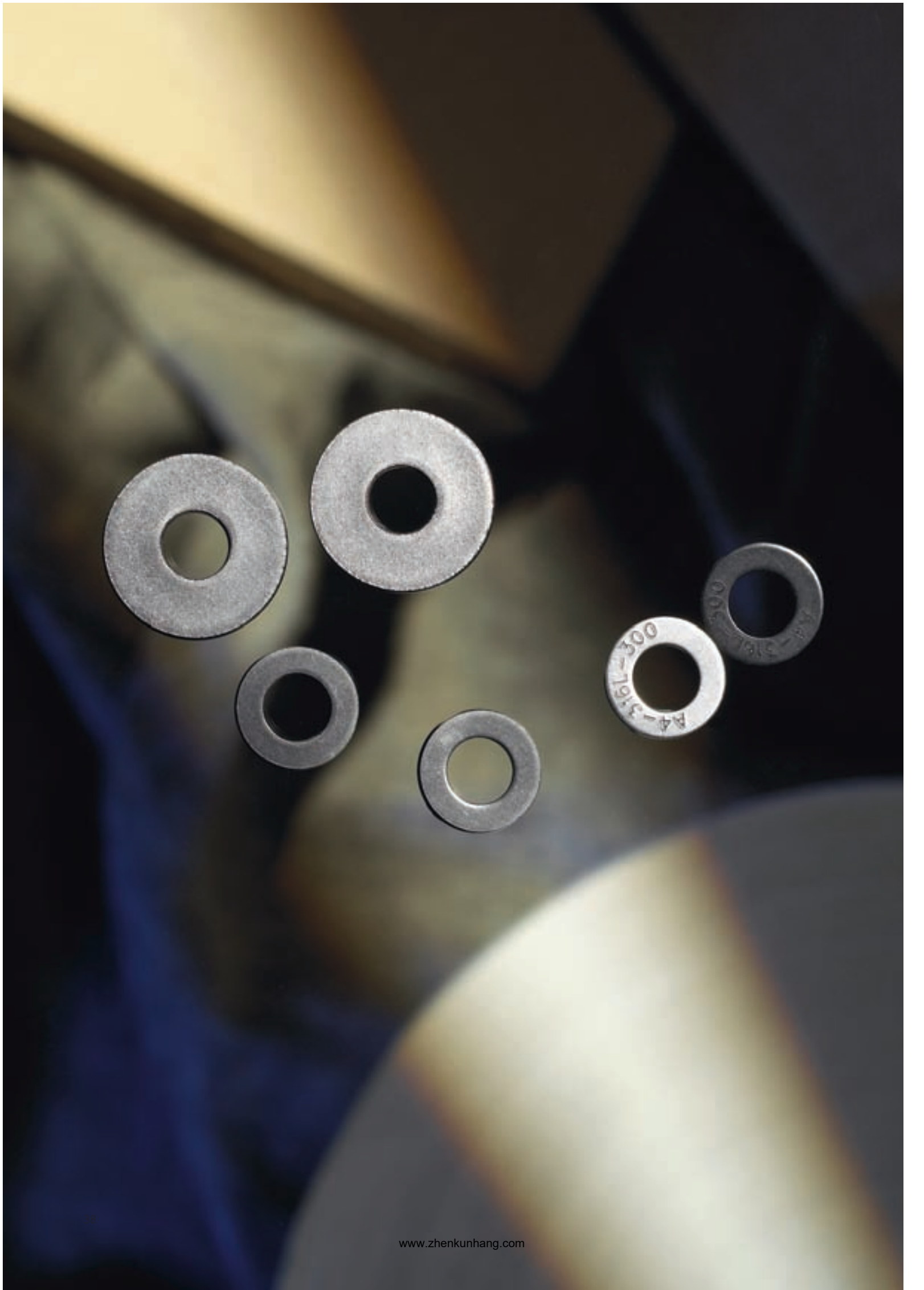
M6-M12: with flange
M12-M20: with collar. To be fitted with the collar downward against the base.

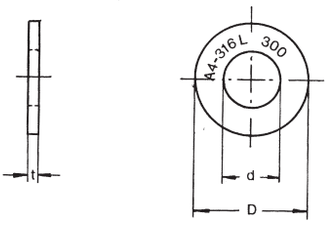
Supplied anti-friction conditioned.

Packaging

Diameter	M6	M8	M10	M12	M16
No. per pack	100	100	50	50	25

www.zhenkunhang.com


A4-316L-300



PLAIN WASHER

Hardness HV 300

Bumax 109-HRB
A4-SS 2343-316L HiMo
EN1.4436
DIN 125, ISO 7089

Hole diameter d	D	t	For screw and nut with M thread	Imperial thread	Approx. Weight kg/100
6.4	12	1.6	6		0.10
8.4	16	1.6	8	5/16	0.18
10.5	20	2	10		0.36
13	24	2.5	12		0.63

Sample order: Bumax 109-HRB 6.4

The washers are marked: A4-316L-300.
Recommended for Bumax 109.

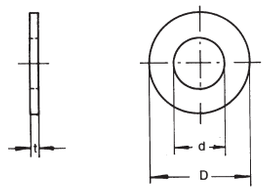
Packaging

Diameter	6.4	8.4–13
No. per pack	200	100

www.zhenkunhang.com

PLAIN WASHER

Hardness HV 200



Bumax 88-RB
A4-SS 2343-316L HiMo
EN1.4436
DIN 125, ISO 7089, SS 70

Hole diameter d	D	t	For screw and nut with M thread	Imperial thread	Approx. Weight kg/100
5.3	10	1	5	Nr 10	0.044
6.4	12	1.6	6		0.10
6.7	14	1.5		1/4	0.13
8.4	16	1.6	8	5/16	0.18
10	18	2		3/8	0.26
10.5	20	2	10		0.36
13	24	2.5	12		0.63
13.5	24	2		1/2	0.47
15	28	2.5	14		0.86
17	30	3	16	5/8	1.1
19	34	3	18		1.5
21	37	3	20	3/4	1.7
23	39	3	22	7/8	1.8
25	44	4	24		3.2
26	45	4		1	3.2

Sample order: Bumax 88-RB 5.3

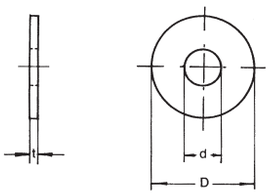
Recommended for Bumax 88.

Washers for Imperial threaded screws usually comply with SS 70.

Packaging

Diameter	5.3-6.7	8.4-23	25-26
No. per pack	200	100	50

www.zhenkunhang.com



PLAIN WASHER

Large series

Bumax RBS
A4-SS 2343-316L HiMo
EN1.4436
EN/ISO 7093, DIN 9021

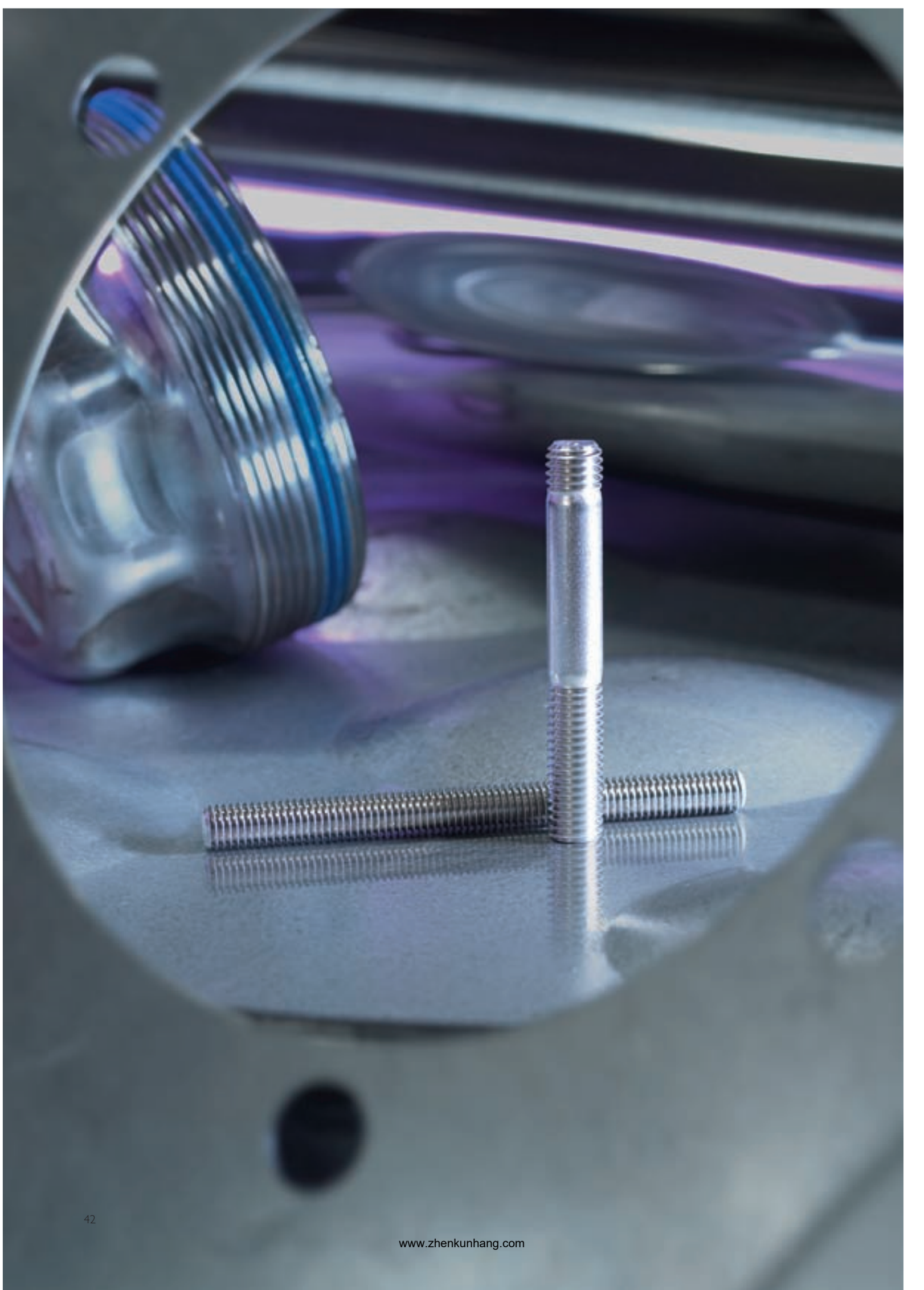
Hole diameter d1	d2	h	For screw and nut with M thread	Imperial thread	Approx. Weight kg/100
6.4	18	1.6	6		0.28
8.4	24	2	8	5/16	0.62
10.5	30	2.5	10		1.2
13	37	3	12		2.2

Sample order: Bumax A4-SS2343-RBS 6.4

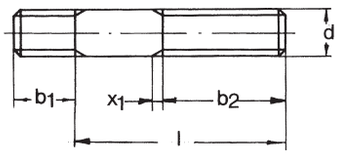
Packaging

Diameter	6.4	8.4-13
No. per pack	200	100

www.zhenkunhang.com



STUD 80 M



Bumax 88-PS
A4-SS 2343-316L HiMo
EN1.4436
DIN 938

Thread d	M6	M8	M10	M12	M16	M20
Pitch of thread	1	1.25	1.5	1.75	2	2.5
Length of thread engagement						
x1	2.5	3.2	3.8	4.3	5	6.3
b2 för l < 125	18	22	26	30	38	46
b2 för l > 125					44	52
b1	6	8	10	12	16	20

Length	Approximate weight per 100					
l	kg	kg	kg	kg	kg	kg
20		0.93	1.5			
25	0.57		1.8	2.7		
30	0.68	1.3	2.0	2.9		
35	0.79	1.5		3.4	6.7	
40		1.6	2.6	3.9	7.2	13
45			2.9	4.3	8.1	
50		2.0	3.2	4.8	8.9	14
55					9.8	
60			3.9	5.7	11	17
65			4.2		11	
70					12	
80						22
135					23	
160					26	

Sample order: Bumax 88-PS M6x25

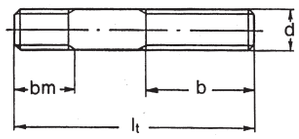
Lengths above the stepped line have length of thread engagement b2 = l-(X1+3).

Packaging

Diameter	M6	M8	M10	M12	M16	M20
No. per pack	100	50	50	25	25	10

www.zhenkunhang.com

STUD 80 M



Bumax 88-MPS
A4-SS 2343-316L HiMo
EN1.4436
SS 1460

Thread d	M6	M8	M10	M12	M16	M20
Pitch of thread	1	1.25	1.5	1.75	2	2.5
Length of thread engagement						
b	[1]	[1]	[1]	[1]	[1]	[1]
threaded end bm	10	12	15	17	22	27

Screw length	Approximate weight per 100					
lt	kg	kg	kg	kg	kg	kg
30	0.53					
35		1.1				
40	0.73	1.3	2.0	2.9		
50	0.95	1.7	2.6	3.6	6.6	
60		2.1	3.2	4.4	8.0	
70			3.8	5.3	9.2	15
80					11	17
100						21

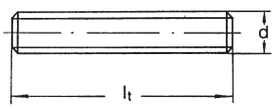
Sample order: Bumax 88-MPS M6x30

[1] Length of thread engagement b varies with screw lengths. Refer to the current screw standard.

Packaging

Diameter	M6	M8	M10	M12	M16	M20
No. per pack	100	50	50	25	25	10

www.zhenkunhang.com



STUD BOLT 80 M

Bumax 88-MHGS
A4-SS 2343-316L HiMo
EN1.4436
DIN 976

Thread d	Pitch of thread	lt mm	Approx. Weight kg/100	Strength classification
M5	0.8	1000	12	80
M6	1	1000	18	80
M8	1.25	1000	32	80
M10	1.5	1000	50	80
M12	1.75	1000	73	80
M14	2	1000	99	80
M16	2	1000	133	80
M18	2.5	1000	165	80
M20	2.5	1000	208	80
M22	2.5	1000	256	80
M24	3	1000	300	80
M27	3	1000	388	80
M30	3.5	1000	474	80
M33	3.5	1000	581	80
M36	4	1000	689	80

Sample order: Bumax 88-MHGS M5x1000

Packaging

1 pcs in plastic sleeve

www.zhenkunhang.com

Photo:Thierry Martinez

www.zhenkunhang.com

Engineered special products

For Bulten Stainless, the development of engineered special products is considered a responsible task of confidence – working in close collaboration with the customer. We therefore offer our own range of specially designed products.

Our high levels of skill, many years of experience and flexibility mean that we are able to satisfy most requests as regards non-standard fasteners.

Engineered special products are developed in accordance with the specifications requested by our customers:

1. Manufacture according to finished drawing from the customer.
2. Modification of standard product.
3. Manufacture of fasteners in specialist alloys.
4. Joint development projects – we produce completely new products in collaboration with the customer.

EF Language M 39
Scale 1:2

Assa Abloy M 30
Scale 1:2

Assa Abloy's keel bolts are made from an exceptionally strong super-martensitic stainless steel.

The 12 keel bolts in the Assa Abloy tolerated the same high loads as the 18 bolts in the EF Language – but replaced 36 kg of keel bolts with 11 kg. That's what you call development!

Also the swedish Volvo Ocean Race boat of 2005–2006 is equiped with keel bolts as well as all other stainless steel fasteners from Bulten Stainless.

Bulten Stainless "by appointment" to the Formula 1 team of ocean racing

First it was the EF Language boat in the Whitbread Round the World Race. Then Assa Abloy in the Volvo Ocean Race. Bulten Stainless has become a trusted supplier to one of the toughest challenges in sailing.

The keel bolt challenge

For the EF Language boat, 18 x M 39 2-kilo keel bolts were supplied in ferrite austenitic steel SAF 2205.
Ahead of the Assa Abloy project, it was essential – without compromising on safety – to reduce the weight of the fasteners by 30 per cent.
After extensive consideration, testing and discussion with designers, the result was as follows:

	Dimension	Quantity	Weight
EF Language	M 39	18 pcs	35.6 kg
Assa Abloy	M 30	12 pcs	10.9 kg

Photo: Thierry Martinez

www.zhenkunhang.com

Technical information

Bumax is a collective product name for Bulten Stainless high-strength, extra corrosion-resistant fasteners.

Material designations

The designations adhere to the standards established by SIS and ISO
A4 = SS14.2347 = EN 1.4401
A4-2343 = SS14.2343 = EN 1.4436
Bumax A4 = SS14.2343L = EN1.4436L = EN 1.4432

Dimensions and weight details

Dimensions for all products are given in millimetres. For products with Imperial threads, essential dimensions are also given in inches. The weight details are weighted average figures.

Strength classifications (in compliance with SS-ISO 3506)

In this catalogue the strength values stated apply exclusively to dimensions held in stock, unless otherwise agreed. Mechanical properties are reported in the following tables.

Bumax level:

The difference between standard A4 and Bumax fasteners consists primarily in that the Bumax products' properties start out at the level where "normal" fasteners end or ended long ago.

This means that a Bumax fastener is always better, stronger and more corrosion-resistant than a "normal" fastener. Here are a few examples:

Bumax 88:
Fasteners in the Bumax 88 class have properties that correspond, as far as possible, to 8.8 carbon steel screws. Since 8.8 also indicates the type of steel, they obviously do not correspond in that respect.

Bumax 109:
Fasteners in the Bumax 109 class have properties that correspond, as far as possible, to 10.9 carbon steel screws. As for 8.8, 10.9 also indicates the type of steel – here, too, the Bumax products naturally differ from those made of carbon steel.

Table 1

Property Class	Rm Tensile strength MPa min	ksi min	Rp 0.2 Stress at 0.2% permanent strain MPa min	ksi min	Elongation at fracture
8.8 steel	800	116	640	93	12 %
Bumax 88	800	116	640	93	0.3 d
Bumax 88 (for pressure vessels)	800	116	640	93	0.4 d
10.9 steel	1000	145	900	130	9 %
Bumax 109 ≤M12	1000	145	900	130	0.2 d
Bumax 109 >M12	1000	145	800	116	0.2 d

As the table above shows, it is only the method of measuring and stating the elongation that differs. The difference consists primarily in that all testing of stainless steel fasteners must take place on the finished product in lengths ranging from 2.5xd upwards, while testing of carbon steel products is usually carried out on test pieces with the elongation then being measured on a test length of 5xd. Obviously, with such differing methods of measuring the elongation, the measured values obtained cannot be compared, but in practice it has been demonstrated that the stainless steel screws are usually considerably tougher than the carbon steel screws.

Mechanical properties at low temperature:

The properties of the steel are affected by temperature and the ISO gives the following informative instructions for its use at low temperature.

Table 2

Type of steel	Min temperature
Bumax 88	-200°C, -328°F

Mechanical properties at elevated temperature:

When the temperature rises, strength is reduced – the following table indicates, in percentage terms, the residual strength at different temperatures.

Table 3

Type of steel	100 °C	200 °C	300 °C	400 °C	500 °C
Bumax 88	ca 90 %	ca 90 %	ca 85 %	ca 80 %	ca 75 %
Bumax 109	ca 95 %	ca 95 %	ca 90 %	ca 90 %	ca 80 %

Tabell 4

Mechanical properties for fasteners in austenitic steel									
Group	Type	Strength class [5]	Diameter range [4]	Screws and stud bolts [3]					Nuts [3]
				Tensile strength Rm min N/mm²	ksi	Stress at 0.2% strain Rp 0.2 [1] N/mm² min.	ksi	Elongation AL [2] min.	Stress under proof load S_p N/mm² min.
Austenite	A1.A2	50	< M 39	500	72	210	30	0.6 d	500
	A3.A4	70	< M 24	700	101	450	65	0.4 d	700
	and A5	80	< M 24	800	116	600	87	0.3 d	800
Bumax 88		Bumax 88	< M 36	800	116	640	93	0.3 d[6]	800
	Pres. vessel	Bumax 88	M 6 – M 24	800	116	640	93	0.4 d	800
	Pres. vessel	Bumax 88	¼ -1" UNC	800	116	640	93	0.4 d	800
Bumax 109		Bumax 109	< M 14	1000	145	900	130	0.2 d	1000
		Bumax 109	≥ M 14	1000	145	800	116	0.2 d	1000

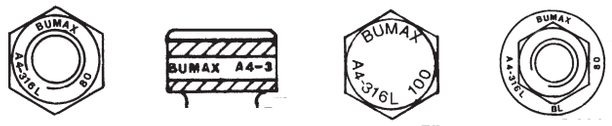
1) All mechanical strength values are calculated with regard to the nominal stress area and applies to screw lengths ≥ 2.5xd.
2) Elongation is indicated in mm x nominal screw diameter (d) and applies to screw lengths ≥ 2.5xd.
3) Testing of mechanical properties must be carried out on finished products (not on prepared test pieces).
4) For fasteners with nominal thread diameter >M24 the mechanical properties shall be agreed upon. Bumax do meet specification independent of size.
5) ISO 3506 states classes 50, 70 and 80. Bumax 88 and 109 are the internal standards of Bulten Stainless and are not included in ISO 3506.
6) For dimensions >M30 the elongation is 0,2 d min.

www.zhenkunhang.com

Marking

The Bumax range held in stock consisting of hexagon head screw, hexagon socket screw, hexagon nut and Bumax Lock are normally marked in accordance with the figure below.

Example



Exceptions
Dimensions < M5 do not contain some of the marking due to space restrictions.

Manufacturer designation (Bumax), type of steel (A4 -316L), property class (80 or 100). The marking of 80 and 100 adheres to the ISO instructions, which state that strength should be indicated by 0.1x the tensile strength in N/mm2.

UNC-threaded products are not covered by ISO standards, but we do adhere to ISO-3506 for these products as well, as far as possible.

Finish

Our Bumax products are supplied bright or passivated, in order to achieve the best corrosion resistance. All products in the Bumax 109 family, and all Bumax nuts and washers, are supplied anti-friction conditioned with wax.

Choice of material

Great care has been taken in choosing the material for our Bumax products. The low carbon content combined with higher levels of the alloying elements Chromium, Nickel and Molybdenum provide the steel with excellent resistans to corrosion and put them at the top of the A4 group. For very severe corrosion conditions, we recommend that materials should be chosen in consultation with our engineers or those at the steelworks. Examples of Stainless steels often used are EN 1.4462 (SAF 2205), EN 1.4410 (SAF 2507) and EN 1.4563 (254 SMO). We also undertake manufacture in other stainless and acid-proof types of steel, assuming sufficient volumes and that the type of steel is available in a suitable form.

Bumax Hard Taptite Thread-forming screw

Bumax Hard Taptite is a thread-forming screw which forms its own thread during assembly, because of its trilobular shape, its conical entry thread and its great surface hardness. Bumax Hard is suitable both for assembly in structural steel and cold-rolled stainless/acid-proof steel with a max. hardness of 200 HV.

Table 5. Hole diameters and material thickness (T) for Bumax Hard Taptite thread-forming screws.

Product	**Screw dimensions**					
T mm	M3	M4	M5	M6	M8	M10
	Hole diameter mm					
0 1–1.5	2.7	3.65				
1.51–2.5	2.8	3.65	4.6	5.5		
2.51–4	2.8	3.7	4.7	5.6		
4.1–6.5	2.85	3.75	4.7	5.6	7.5	9.3
6.6–10		3.8	4.75	5.65	7.6	9.4
10.1–15				5.7	7.7	9.5

All dimensions refer to drilled holes.

Table 6. Stages and forces in assembly.
Approximate values, applying to T=0.6–1xd

	Screw dimensions					
Nm/ibf.in	M3	M4	M5	M6	M8	M10
Thread-forming torque **Gm**	0.7/6.2	1.8/15.9	3.5/31	8/71	15/133	28/248
Tightening torque **Mv**	1.3/11.5	3/26.6	6/53	12/106	25/221	49/434
Breakdown torque **Bm**	4.5/39.8	7.9/70	13/115	20/177	30/266	52/460

All dimensions refer to drilled holes.

Bumax Hard ST Self-tapping screw (sheet metal screw)

Bumax Hard self-tapping screw with ST thread is designed for use in structural steel with a maximum hardness of approx. 200 HV. It also works exceptionally well in stainless steel sheets assuming that the thickness of the metal (T) is < the pitch of the thread (P) and that the hardness does not exceed 200 HV.

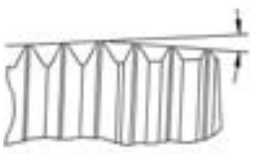
Table 7. Hole diameters and material thickness (T) for Bumax Hard ST self-tapping screws.

Material thickness	**Screw diameter**					
T mm	ST2.9	ST3.5	ST4.2	ST4.8	ST5.5	ST6.3
	Hole diameter mm					
<0.56	2.2	2.6				
0.56–0.63	2.3	2.7	3.2	3.7		
0.64–0.75	2.3	2.8	3.2	3.7	4.3	
0.76–0.88	2.4	2.8	3.2	3.8	4.3	4.9
0.89–1.25	2.4	2.8	3.3	3.8	4.4	4.9
1.26–1.38	2.5	2.8	3.5	3.9	4.5	4.9
1.39–1.75	2.6	2.9	3.8	3.9	4.6	5.0
1.76–2.25		3.0	3.8	4.0	4.7	5.2
2.26–3.0		3.2	3.9	4.1	5.0	5.3
3.1–4.0				4.4	5.1	5.8

All dimensions refer to drilled holes.
In the case of stamped and collared holes in austenitic steel, the deformation hardening might mean that the hardness will exceed 200 HV and assembly problems could therefore arise. Should any assembly problems arise, please contact us for advice and instructions.

www.zhenkunhang.com

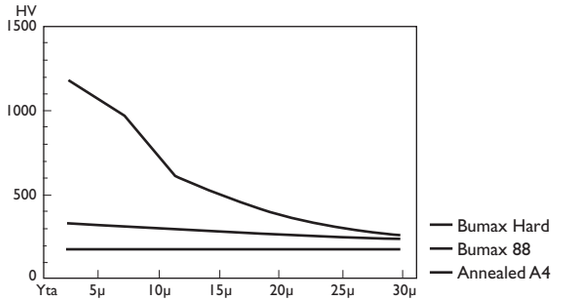
Bumax Hard Taptite – a stainless/acid-proof thread-forming screw for assembly in stainless/acid-proof steel



Thread form and entry thread

Taptite Trilobular geometry

Table 8. Surface hardness for Bumax Hard fasteners

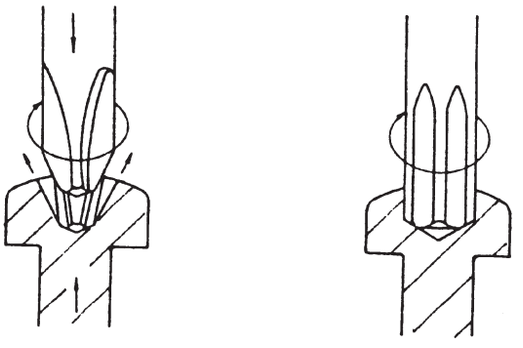


Hardness in HV on the surface as well as at hardness penetrations of 5, 10, 15, 20, 25 and 30µ.

Torx – The superior grip

Bumax Taptite, MKT and the Bumax Hard programme are supplied with a Torx grip, quite simply because it is superior to all other normal recess and grip types.

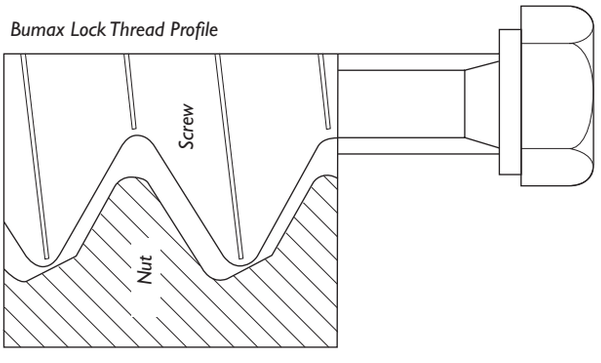
Since the driver surfaces of the Torx grip are parallel to the screw axis, there is no ratcheting effect, and a considerable reduction in the strain on fitters and tools alike. The immediate significance of this is less risk of strain injury for fitters, and a lower risk of damage to surrounding surfaces.



Bumax Lock – a stainless/acid-proof all-metal lock nut that works

Bumax Lock is an all-metal lock nut. It is equipped with a specially designed thread profile that locks when it is tightened, distributing the tensile stress along the entire nut thread. This allows better load distribution, which in turn produces greater gripping strength. NB: Bumax Lock needs a higher tightening torque. Refer to Table 9.

Bumax Lock Thread Profile



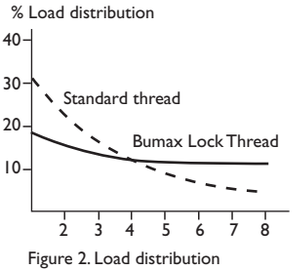


Figure 2. Load distribution

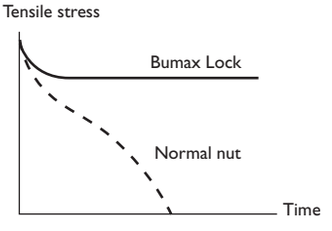


Figure 3. Residual stress

www.zhenkunhang.com

Tightening torques and forces for Bumax unions

Table 9

	Tightening torque M_v, Nm / lbf.ft [1),3)]						Preload applied KN / lbf ± 23% [2)]						Failure load KN			Yield load KN			Nominal stress area mm²	Pitch of thread
dim/class, Bumax	109 Nm	lbf.ft	88 Nm	lbf.ft	Lock 88 Nm	lbf.ft	109 KN	lbf	88 KN	lbf	Lock 88 KN	lbf	109	88	Lock 88	109	88	Lock 88		
M3	1.7	1.25	1.3	0.96	-	-	2.9	652	2.1	472	2.1	472	5	4	4	4.5	3.2	3.2	5.03	0.5
M4	4.2	3	2.9	2.1	-	-	5.2	3.6	3.6	809	3.6	809	8.8	7	7	8	6	6	8.78	0.7
M5	8.1	6	5.7	4.2	6.6	4.9	8.6	1933	5.9	1326	5.9	1326	14	11	11	13	9	9	14.2	0.8
M6	14	10.3	10	7.4	12	8.9	12	2698	8.4	1888	8.4	1888	20	16	16	18	13	13	20.1	1.0
M8	34	25	25	18.4	29	21.4	21	4721	15	3372	15	3372	37	29	29	33	23	23	36.6	1.25
M10	66	48.7	47	34.7	54	39.8	34	7644	24	5395	24	5395	58	46	46	52	37	37	58.0	1.5
M12	115	84.8	82	60.5	94	69.3	49	11016	35	7668	35	7868	84	67	67	76	54	54	84.3	1.75
M14	162	62	129	95	-	-	60	13489	48	10791	48	10791	115	92	92	92	74	74	115	2.0
M16	248	183	198	146	228	168	81	18210	65	14613	65	14613	157	126	126	125	100	100	157	2.0
M18	344	254	275	203	-	-	100	22481	80	17985	80	17985	192	154	154	154	123	123	192	2.0
M20	481	355	385	284	442	326	128	28776	102	22931	102	22931	245	196	196	196	157	157	245	2.5
M24	-		665	490	765	564	-	-	181	40690	181	40690	-	282	282	-	226	226	353	3.0
M27	-		961	709	-	-	-	-	235	52830	235	52830	-	367	367	-	294	294	459	3.0
M30	-		1310	966	-	-	-	-	287	64520	287	64520	-	449	449	-	359	359	561	3.5
M36	-		2280	1682	-	-	-	-	418	93970	418	93970	-	654	654	-	523	523	817	4.0
1/4-20 UNC	-	-	11	8.1	-	-	-	-	8.0	1798	8.0	-	-	17.0	-	-	13.1	-	20.5	20 th/inch
5/16-18 UNC	-	-	22	16.2	-	-	-	-	13.2	2967	13.2	-	-	28.0	-	-	22.4	-	33.8	18 th/inch
3/8-16 UNC	-	-	39	28.8	-	-	-	-	19.5	4384	19.5	-	-	41.5	-	-	33.2	-	50.0	16 th/inch
1/2-13 UNC	-	-	95	70	-	-	-	-	35.7	8026	35.7	-	-	75.9	-	-	60.8	-	91.5	13 th/inch
5/8-11 UNC	-	-	188	139	-	-	-	-	56.9	12792	56.9	-	-	121.0	-	-	96.9	-	146.0	11 th/inch
3/4-10 UNC	-	-	329	243	-	-	-	-	84.2	18929	84.2	-	-	179.0	-	-	143.4	-	216.0	10 th/inch
7/8-9 UNC	-	-	527	389	-	-	-	-	116.2	26123	116.2	-	-	247.0	-	-	197.9	-	298.0	9 th/inch
1"-8 UNC	-	-	789	582	-	-	-	-	152.5	34283	152.5	-	-	325.0	-	-	259.6	-	391.0	8 th/inch

[1)] The tightening torque recommendations refer to flat burr-free surfaces, lubricated with a high quality lubricant.

[2)] Preload applied is calculated as 65% of Rp 0.2, but in practice the value could be expected to vary between around 50% and 80% of this.

[3)] The tightening torque recommendations are calculated according to a co-efficient of friction of 0.16, which is equivalent to wax BSAB 1952V.

The stress is calculated as around 70% of the yield load but could in practice be expected to vary between around 60% – 80%.

www.zhenkunhang.com

Bumax 88 for pressure vessels
The new pressure equipment directive, PED, 97/23/EC, came into force within the EU on 29 May 2002, concerning pressure-bearing equipment with a working pressure > 0.5 Bar.

Bumax 88 is currently the only high-strength fasteners with approval for pressure vessels in Europe. Bumax 88 has been approved by TÜV in a special Particular Material Appraisal in compliance with PED 97/23/EC and TÜV documents Nos. 011P01421H and 0121P003310-1 and in accordance with AD 2000 W2 issued December 2002.

Product types
Hexagon head bolts and screws in compliance with ISO 4014 and 4017 and SS 1943. Socket head cap screws in accordance with ISO 4762, DIN 912 and SS 1960.
Studs and stud bolts in accordance with DIN 938, 939, 976, SS 1948 and SS 1947.
Nuts in accordance with ISO 4032 and SS 1989.

Dimensions range
M6 – M30 and 1/4 - 1 1/4" with min. length 3 x nominal thread diameter.

Temperature range
Bumax 88 may be used in pressure vessel equipment within a temperature range of -200 to +400 °C.

Mechanical properties at room temperature:
At room temperature, the following values apply to dimensioning.

Tensile strength (Rm) min 800 N/mm^2
Yield strength Rp 0.2 min 640 N/mm^2
Elongation after fracture A min 0.4 xd
d = nominal thread diameter

Mechanical properties at elevated temperature:
At elevated temperatures, the following values apply to dimensioning.

Temperature °C/F	100/212	200/392	300/572	400/752
Rp 0.2 N/mm^2 / ibf/in^2	510/73969	480/69618	450/65267	420/60916
Rm N/mm^2 / ibf/in^2	553/80206	501/72664	474/68748	461/66862

Certification
Bumax 88 for pressure vessels is supplied with a special certificate in accordance with EN/ISO 10204 3.1.B, stating that the products are approved in accordance with PED 97/23/EC.

www.zhenkunhang.com

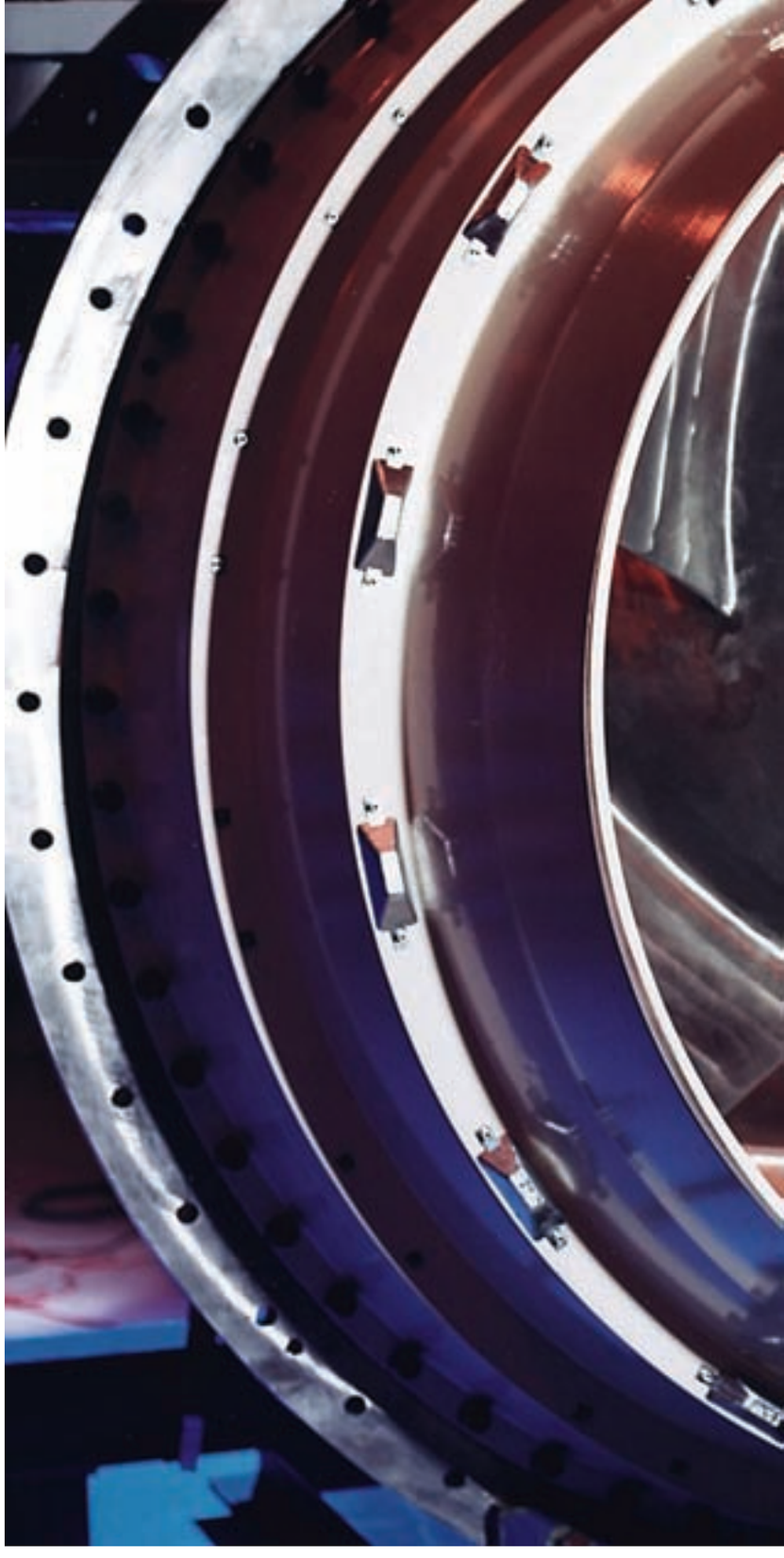
Material data for stainless and acid-proof steel

Table 10

Steel type	Stainless	Acid-proof	Acid-proof	Acid-proof Bumax
Designation:				
ISO group	A2	A4	A4	A4
ISO no.	(11)	20a	20	-
Bulten Stainless	A2	A4-2343	A4	Bumax
SS 14[1)]	2333	2343	2347	2353
Avesta	832MV	832 SK	832SF	-
Fagersta	P350	P440	P425	R44010
Sandvik	5P10	5R60	-	-
EN Name[1)]	X5CrNi18-10	X3CrNiMo17-13-3	X5CrNiMo17-12-2	X2CrNiMo17-12-3
EN 10027-2	1.4301	1.4436	1.4401	1.4432
USA(AISI)[1)]	304	316L	316	-
UK (BS)[1)]	304S15	-	316S16	316S13
France (AFNOR)[1)]	Z6CN18-09	Z6CND 17-12	Z6CND 17-11	Z3CND17-13-03
Italy (UNI)[1)]	X5Cr 1810	X5CrNiMo 1713	X5CrNiMo 1712	X2CrNiMo18-14-3
Japan (JIS)[1)]	304	-	316	-
Analysis:				
Carbon C %	max.0.07	max. 0.05	max. 0.07	max- 0.03
Chromium Cr %	17-19,5	16-18.5	16,5-18.5	16.5-18.5
Nickel Ni %	8-10,5	10.5-14	10-13	11.0-14.5
Molybdenum Mo %	-	2.5-3.0	2-2.5	2.5-3.0
Copper Cu %	≤ 4	-	< 1	-
Stabiliser Ti/Nb %	-	-	-	-
Structure	Austenitic	Austenitic	Austenitic	Austenitic
Physical data				
Magnetic	No[2)]	No	No	No
Scaling temp.				
In air approx. °C	850	850	850	850
Conditioning properties				
Temperable	No	No	No	No
Weldability	Very good [3)]	Very good [4)]	Very good	Very good [4)]
Remarks	At an Ni content of ≤9% and high degree of cold working, there is a risk of the material becoming magnetised. For normal corrosion stresses, usable within the food and chemicals industries.	Used within the cellulose and paper industries, for example. Good corrosion resistance.	Similar to SS 2343, but there is a slightly higher risk of crevice corrosion and pitting in environments where chlorides are present.	Similar to 2343 but because of its low carbon content, the steel has very good resistance to inter-granular corrosion. Refer to SS14.2353. The increased Cr and Ni contents make the steel more resistant to pitting and crevice corrosion. The increased Ni content also has a positive effect as regards the risk of stress corrosion cracking.

[1)] Given as a reference. EN standards apply. For Bumax is Bumax-composition given.
[2)] With Ni contents of ≤9% and with higher strengths, magnetisation may occur.
[3)] With annealed weld joint insensitive to inter-granular corrosion.
[4)] Not sensitive to inter-granular corrosion up to 500 °C.

www.zhenkunhang.com



Kamewa waterjets from Rolls-Royce

ISO 9001, ISO 14001 Certification

Bulten Stainless strives constantly to improve the quality of its end products as well as its business operation. We therefore work according to carefully structured management systems that have been granted certification in compliance with the latest standards.

The Quality Management System has been awarded

www.zhenkunhang.com

certification in compliance with ISO 9001:2000, in which customer satisfaction is among the central components. The Environmental Management System has been granted certification in compliance with ISO 14001, and ensures that we continuously develop our environmental efforts to promote ecological sustainability.

Approved pressure vessel screw

In compliance with a PMA (Particular Material Appraisal) approval from TÜV, Bumax 88 fulfils the requirements contained in the new pressure equipment directive, PED 97/23/EC. Bumax 88 is the first fastener on the market to have been approved in compliance with the PED requirements.

www.zhenkunhang.com

青岛震坤行贸易有限公司
Tel 0532-85081293. Fax 0532-83027892. E-mail: thinkingtrading@126.com
www.zhenkunhang.com