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# KIN LONG

*For Better Living*

## Fastening Products Catalogue



**Guangdong Kinlong Hardware Products Co., Ltd.**

**No.3, Jian Lang Rd., Daping, Tangxia Town, Dongguan City, china.**

T : 0086-769-82166666 82136666  
F : 0086-769-82955240 82955241  
E : mail@kinlong.com  
H : www.kinlong.com

[www.kinlong.com](http://www.kinlong.com)

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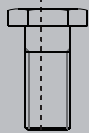
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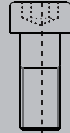


## Screw Models

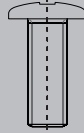
### Head Types



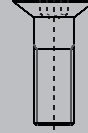
Hexagon Head



Cylindrical Head



Pan Head

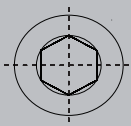


Countersunk Head

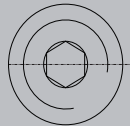


Flange Head

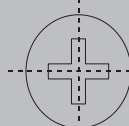
### Hole Types



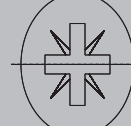
Inner Hexagon  
Socket Head



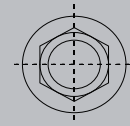
Inner Hexagon  
Socket Flat Head



Cross Recessed Head

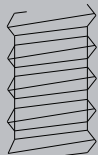


Star-shaped Head

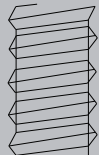


Hexagon Flange

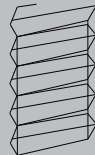
### Thread Form



TYPEA  
10#-12T 12#-11T  
14#-10T



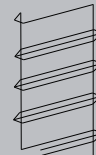
6#-20T 7#-19T  
8#-18T 10#-16T  
12#-14T 14#-14T



TYPEC  
8#-32T 10#-24T  
12#-24T 14#-20T



HI-LOW



DOUBLE THREAD

### Drill Tail



SPOON



WING TEKS



PT.1



PT.2



PT.3



PT.4



PT.5



PT.6



Name	Standard Code	
	GB (code)	German standard
Cross Recessed Countersunk Head Screws	GB 819	DIN965
Cross Recessed Pan Head Self-tapping Screws	GB/T 845	DIN7981
Cross Recessed Countersunk Head Self-tapping Screws	GB/T 846	DIN7982
Cross Recessed Pan Head Self-drilling & Tapping Screws	GB/T15856.1	DIN7504N
Cross Recessed Countersunk Head Self-drilling & Tapping Screws	GB/T15856.2	DIN7504P
Hexagon Flange Head Self-drilling & Tapping Screws	GB/T15856.4	DIN7504K

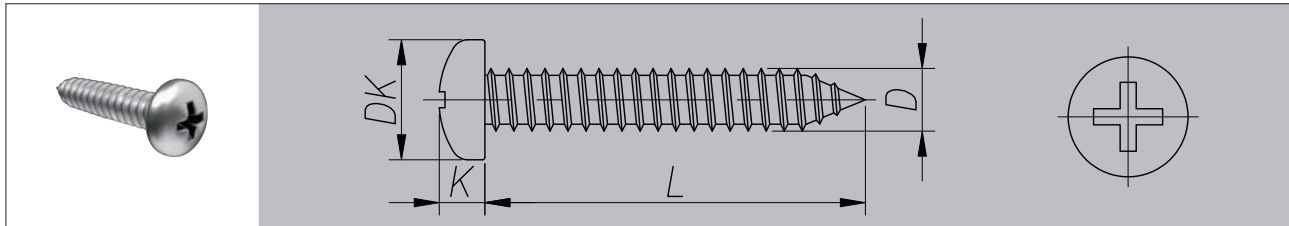


## Doors and Windows series





■ Cross Recessed Pan Head Self-tapping Screws

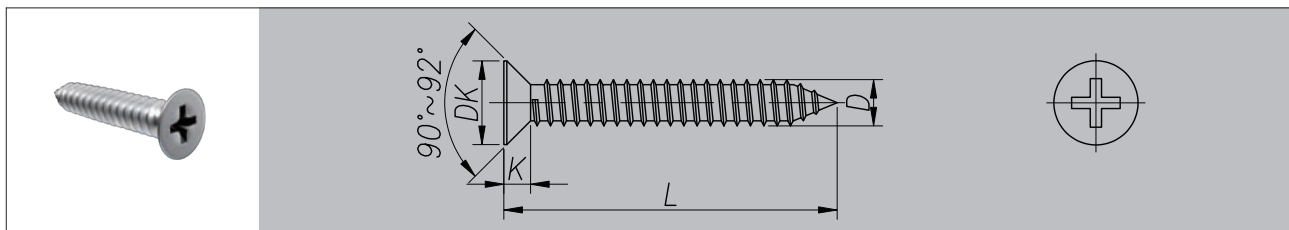


Description: Apply to the connection between thin sheet metal (aluminum, copper, low carbon steel) parts and thicker metal parts or woodwork (main body). Use cross screwdriver to screw, and will leave a thread after screwing in.

Material: 304、316、410

Nominal diameter D		ST3.5	ST4.2	ST4.8	ST5.5	ST6.3	
Pitch	P	1.3	1.4	1.6	1.8	1.8	
	DK	max	7	8	9.5	11	12
		min	6.64	7.64	9.18	10.57	11.57
K	max	2.6	3.1	3.8	4	5.6	
	min	2.35	2.8	3.7	3.8	4.3	
Groove No.		2			3		

■ Cross Recessed Countersunk Head Self-tapping Screws



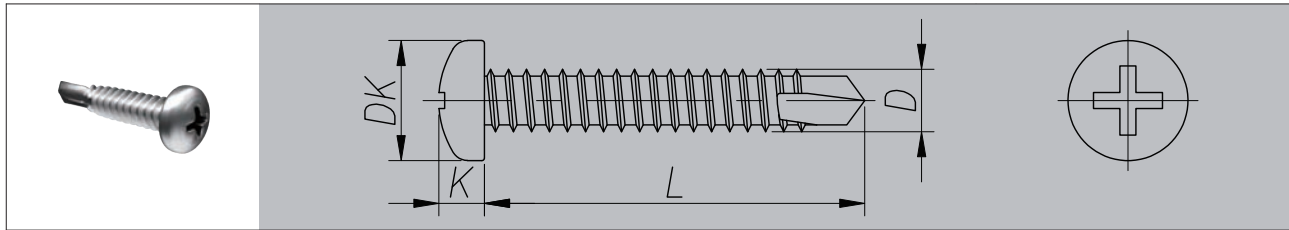
Description: Apply to thin sheet metal(aluminum,copper,low carbon steel) parts and thicker metal parts or the thread connection between woodwork(main body). Use cross screwdriver to screw, and will leave a thread after screwing in.Screw head is not allowed to be left outside.

Material: 304、316、410

Nominal diameter D		ST3.5	ST4.2	ST4.8	ST5.5	ST6.3	
Pitch	P	1.3	1.4	1.6	1.8	1.8	
	DK	max	7.3	8.4	9.3	10.3	11.3
		min	6.9	8	8.9	9.9	10.9
K	max	2.35	2.6	2.8	3	3.15	
Groove No.		2			3		



### ■ Cross Recessed Pan Head Self-drilling & Tapping Screws

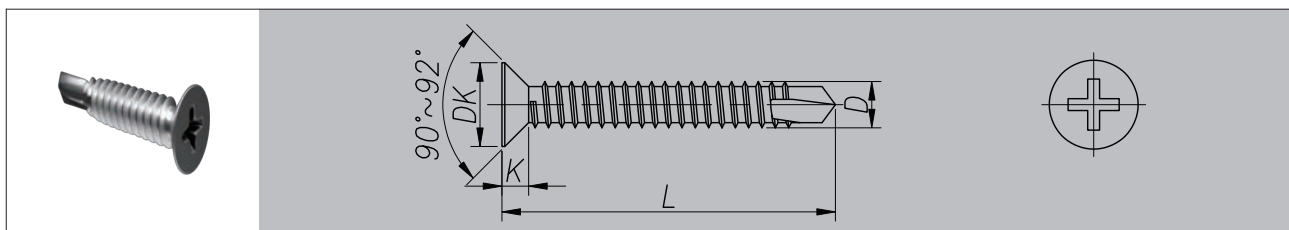


Description: Apply to the connection of cases like multi-layer plates or big-size panels (in lightweight buildings), and have a good comprehensive economic benefit in these industries like construction, automobile manufacturing etc. When selecting, please note that the thickness of the connected parts should be less than the length of the end of screw drill to make sure the drilling is completed before tapping. Use cross type screwdriver to screw.

Material: 304,316,410

Nominal diameter D		ST3.5	ST4.2	ST4.8	ST5.5	ST6.3
Pitch	P	1.3	1.4	1.6	1.8	1.8
DK	max	7	8	9.5	11	12
	min	6.64	7.64	9.14	10.57	11.57
k	max	2.6	3.1	3.7	4	4.6
	min	2.35	2.8	3.4	3.7	4.3
Groove No.		2			3	

### ■ Cross Recessed Countersunk Head Self-drilling & Tapping Screws



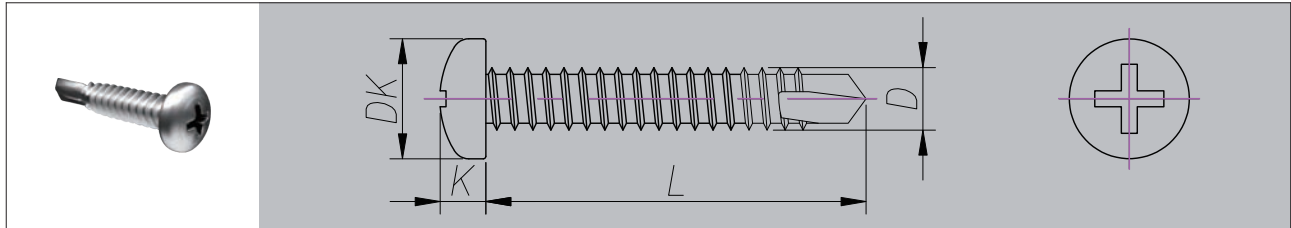
Description: Apply to the connection of cases like multi-layer plates or big-size panels (in lightweight buildings), and have a good comprehensive economic benefit in these industries like construction, automobile manufacturing etc. When selecting, please note that the thickness of the connected parts should be less than the length of the end of screw drill to make sure the drilling is completed before tapping. Use cross type screwdriver to screw.

Material:304,316,410

Nominal diameter D		ST3.5	ST4.2	ST4.8	ST5.5	ST6.3
Pitch	P	1.3	1.4	1.6	1.8	1.8
DK	max	7.3	8.4	9.3	10.3	11.3
	min	6.9	8	8.9	9.9	10.9
k	max	2.35	2.6	2.8	3	3.15
Groove No.		2			3	



■ Cross recessed pan head integrated self-drilling & tapping screws



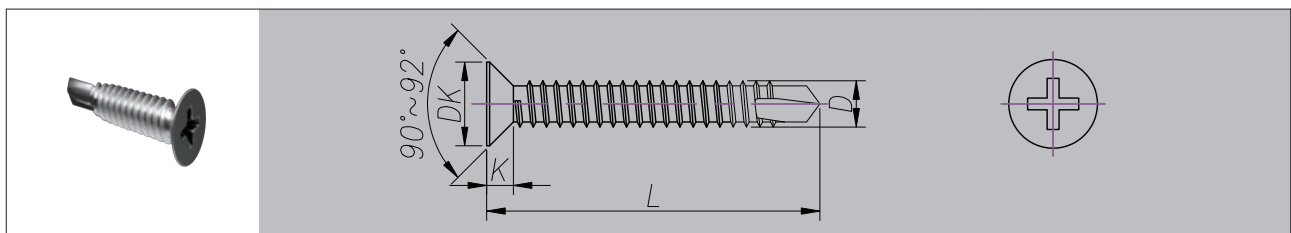
Description: The alloy steel tapping thread with special local heat treatment can make a new easy wedging alveolar inside the steel board or aluminum board at the moment of penetration.

Material: 316+1035 316+435

304+1035 304+435

Nominal diameter D		ST3.5	ST4.2	ST4.8	ST5.5	ST6.3
Pitch	P	1.3	1.4	1.6	1.8	1.8
DK	max	7	8	9.5	11	12
	min	6.64	7.64	9.14	10.57	11.57
K	max	2.6	3.1	3.7	4	4.6
	min	2.35	2.8	3.4	3.7	4.3
Groove No.		2			3	

■ Cross recessed countersunk head integrated self-drilling & tapping screws



Description: With tapping machine, screw can penetrate the 0-12mm steel plate directly. And it can design the length of alloy drill according to different usage requirements.

Material: 316+1035 316+435

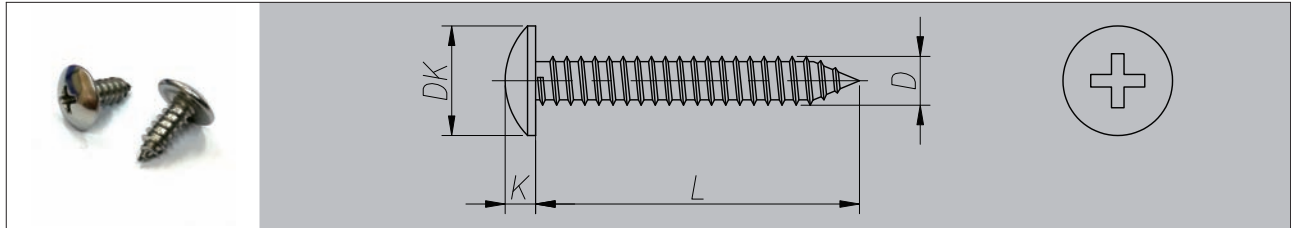
304+1035 304+435

Nominal diameter D		ST3.5	ST4.2	ST4.8	ST5.5	ST6.3
Pitch	P	1.3	1.4	1.6	1.8	2.1
DK	max	7.3	8.4	9.3	10.3	11.3
	min	6.9	8	8.9	9.9	10.9
K	max	2.35	2.6	2.8	3	3.15
Groove No.		2			3	





### ■ Cross Recessed Big Flat Head Self-tapping Screws

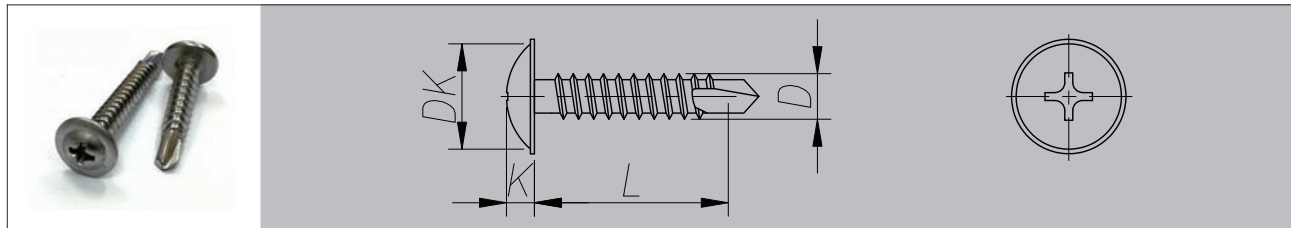


Description: Apply to the connection between thin sheet metal (aluminum, copper, low carbon steel) parts and thicker metal parts or the thread connection between woodwork (main body). Leave a thread after screwing in.

Material: 304,316,410

Nominal diameter D		ST3.5	ST3.9	ST4.2	ST4.8	ST5.5	ST6.3
Pitch	P	1.3	1.3	1.4	1.6	1.8	1.8
DK	max	8.1	9.4	9.4	11.8	11.8	14
	min	7.6	8.9	8.9	11.2	11.2	13.3
K	max	2.35	2.65	2.65	3.25	3.25	3.5
	min	2.05	2.35	2.35	2.95	2.95	3.5
Groove No.		2				3	

### ■ Cross Slotted Washer Head Self-drilling&tapping Screws



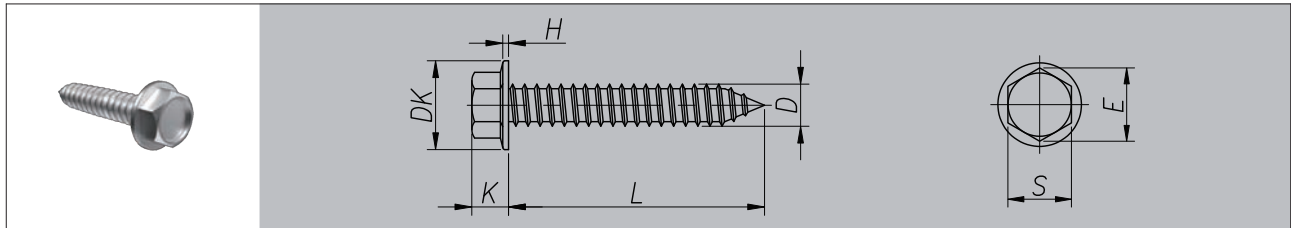
Description: Apply to the connection of cases like multi-layer plates and big-size panels (in lightweight buildings), having a good comprehensive economic benefit in these industries like construction, automobile manufacturing etc. When selecting, please note that the thickness of the connected parts should be less than the length of the end of screw drill to make sure the drilling is completed before tapping. Use cross type screwdriver to screw.

Material: 304,316,410

Nominal diameter D		ST3.5	ST3.9	ST4.2	ST4.8	ST5.5	ST6.3
Pitch	P	1.3	1.3	1.4	1.6	1.8	1.8
DK	max	8	9.2	11.2	11.5	12	12
	min	7.4	8.6	10.2	12	11.6	11.6
K	max	2.3	2.4	2.6	2.8	2.9	2.9
	min	2	2.1	2.2	2.5	2.6	2.6
Groove No.		2				3	



Hexagon Flange Head Self-tapping Bolts

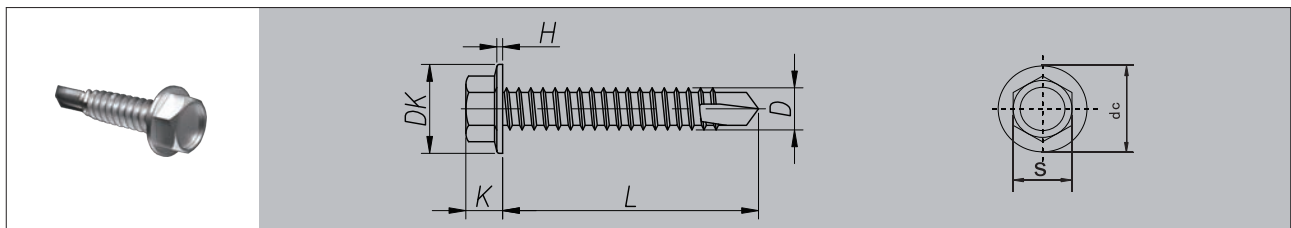


Description: Apply to the connection between thin sheet metal (aluminum, copper, low carbon steel) parts and thicker metal parts or the thread connection between woodwork (main body). Use flange type screwdriver to screw, and will leave a thread after screwing in.

Material: 304,316,410

Nominal diameter D		ST2.2	ST2.9	ST3.5	ST4.2	ST4.8	ST5.5	ST6.3	ST8	ST9.5
Pitch	P	0.8	1.1	1.3	1.4	1.6	1.8	1.8	2.1	2.1
DK	max	4.5	6.4	7.5	8.5	10	11.2	12.8	16.8	21
K	max	2.2	3.2	3.8	4.3	5.2	6	6.7	8.6	10.7

Hexagon Flange Head Self-drilling & Tapping Screws



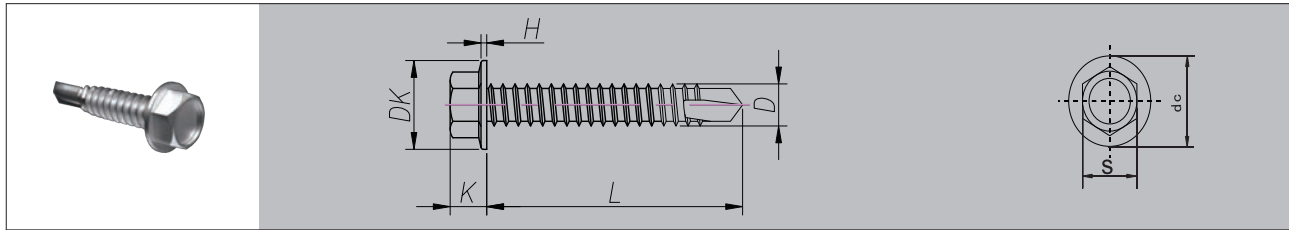
Description: Apply to the connection of cases like multi-layer plates and big-size panels (in lightweight buildings), having a good comprehensive economic benefit in these industries like construction, automobile manufacturing etc. When selecting, please note that the thickness of the connected parts should be less than the length of the end of screw drill to make sure the drilling is completed before tapping. Use flange type screwdriver to screw.

Material: 304,316,410

Nominal diameter D		ST3.5	ST3.9	ST4.2	ST4.8	ST5.5	ST6.3
Pitch	P	1.3	1.3	1.4	1.6	1.8	1.8
H	min	0.6	0.6	0.8	0.9	1	1
DK	max	8.3	8.3	8.8	10.5	11	13.5
	min	7.6	7.6	8.1	9.8	10	12.2
K	max	3.4	3.4	4.1	4.3	5.4	5.9
	min	3	3	3.6	3.8	4.8	5.3
S	max	5.5	5.5	7	8	8	10
	min	5.32	5.32	6.78	7.78	7.78	9.78



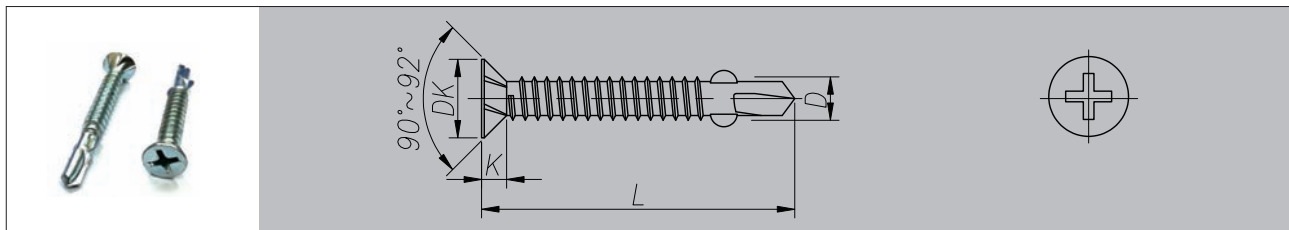
Hexagon flange head integrated self-drilling & tapping screws



Description: For A2 or A4 stainless steel screws, during the whole producing process, strengthen the thread by cold forging, and keep the unique corrosion resistance of all kinds of stainless steel without heat treatment. It screws smoothly in the alveolar by gentle and firm way, without breaking the screw thread to pass the aggregating part, Achieving excellent performance of polymer and solid resistance and wind resistance.  
Material: 316+1035 316+435 304+1035 304+435

Nominal diameter D		ST3.5	ST3.9	ST4.2	ST4.8	ST5.5	ST6.3
Pitch	P	1.3	1.3	1.4	1.6	1.8	1.8
H	min	0.6	0.6	0.8	0.9	1	1
DK	max	8.3	8.3	8.8	10.5	11	13.5
	min	7.6	7.6	8.1	9.8	10	12.2
K	max	3.4	3.4	4.1	4.3	5.4	5.9
	min	3	3	3.6	3.8	4.8	5.3
S	max	5.5	5.5	7	8	8	10
	min	5.32	5.32	6.78	7.78	7.78	9.78

Cross Recessed Countersunk Ear Head Self-drilling&tapping Screws

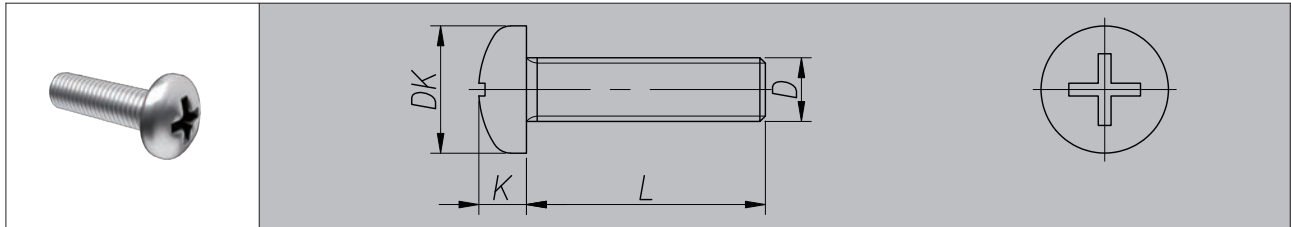


Description: Apply to the connection of cases like multi-layer plates and big-size panels (in lightweight buildings), having a good comprehensive economic benefit in these industries like construction, automobile manufacturing etc. When selecting, please note that the thickness of the connected parts should be less than the length of the end of screw drill to make sure the drilling is completed before tapping. Use cross type screwdriver to screw.  
Material:304,316,410

Nominal diameter D		ST3.5	ST3.9	ST4.2	ST4.8	ST5.5	ST6.3
Pitch	P	1.3	1.3	1.4	1.6	1.8	1.8
DK	max	7.3	7.45	8.4	9.3	10.3	11.3
	min	6.9	7.2	8	8.9	9.9	10.9
K	max	2.35	2.5	2.6	2.8	3	3.15
Groove No.		2				3	



■ ■ ■ Cross recessed pan head screws

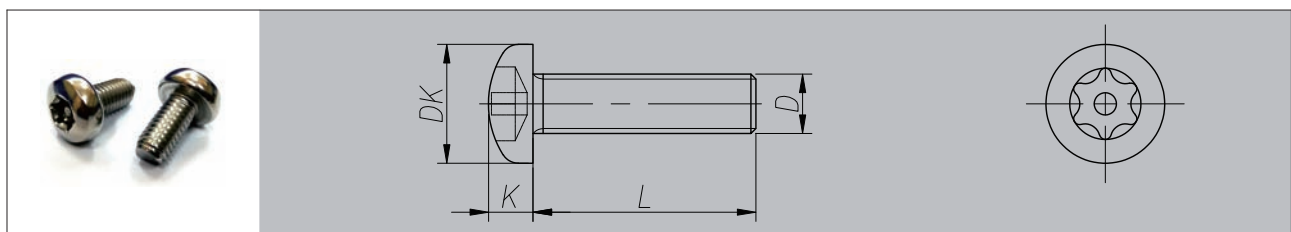


Description: Apply to the mechanical equipment which has high requirements on strength and accuracy, making two parts (structural components) joint together as a whole.

Material: 304、316

Nominal diameter D		M1.6	M2	M2.5	M3	M3.5	M4	M5	M6	M8	M10
Pitch	P	0.35	0.4	0.45	0.5	0.6	0.7	0.8	1	1.25	1.5
DK	MAX	3.2	4	5	5.6	7	8	9.5	12	16	20
K	MAX	1.3	1.6	2.1	2.4	2.6	3.1	3.7	4.6	6	7.5
Groove No.	NO.	0		1		2		3		4	

■ ■ ■ Plum Blossom Groove Pan Head Column Anti-theft Screws



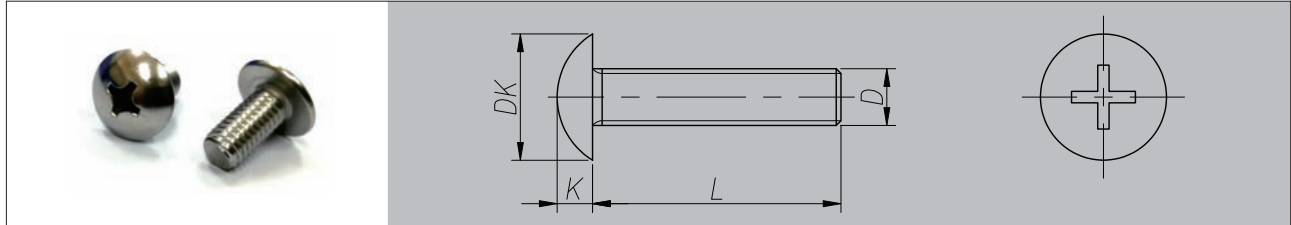
Description: Apply to the mechanical equipment which has high requirements on strength and accuracy, making two parts (structural components) joint together as a whole with certain anti-theft function.

Material: 304、316

Nominal diameter D		M3	M4	M5	M6	M8
Pitch	P	0.5	0.7	0.8	1	1.25
DK	max	5.6	8	9.5	12	16
	min	5.3	7.64	9.14	11.57	15.57
K	max	2.66	3.1	3.7	4.6	6
	min	2.4	2.92	3.52	4.3	5.7



### ■ Cross Recessed Large Flat Head Screws

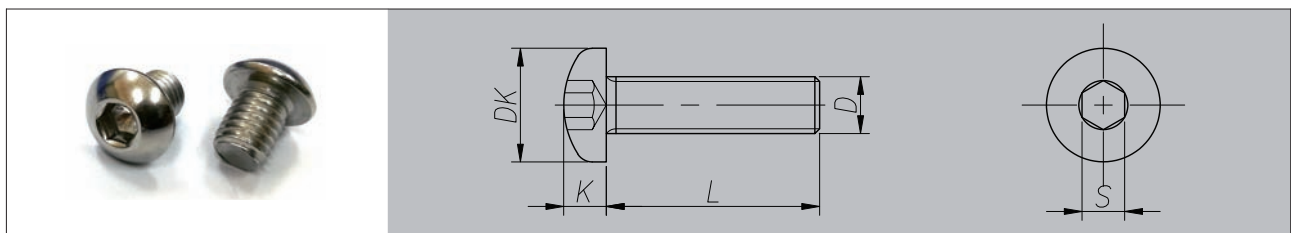


Description: Apply to the mechanical equipment which has high requirements on strength and accuracy, making two parts (structural components) joint together as a whole.

Material: 304、316

Nominal diameter D		M3	M4	M5	M6	M8
Pitch	P	0.5	0.7	0.8	1	1.25
DK	max	6.65	9.4	11.8	14	17.8
	min	6.35	8.9	11.2	13.3	17
K	max	2.05	2.65	3.25	3.9	5
	min	1.75	2.35	2.95	3.5	4.6

### ■ Hexagon Socket Flat Round Head Screws



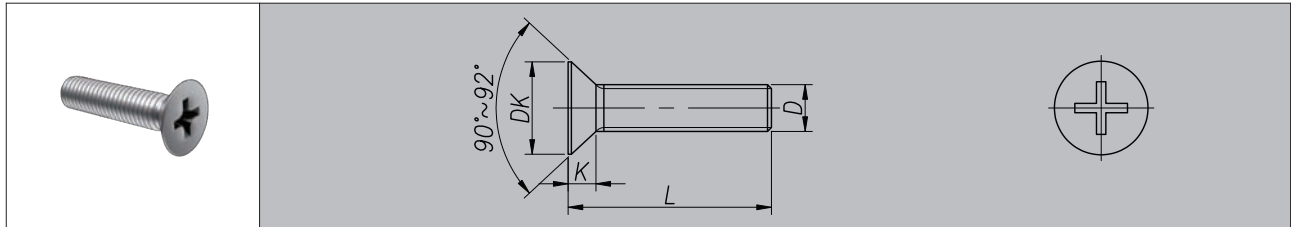
Description: Apply to the mechanical equipment which has high requirements on strength and accuracy, making two parts (structural components) joint together as a whole.

Material: 304、316

Nominal diameter D		M3	M4	M5	M6	M8
Pitch	P	0.5	0.7	0.8	1	1.25
DK	max	5.3	7.64	9.14	11.75	15.57
	min	5.6	8	9.5	16	17.8
K	max	2.4	2.92	3.52	4.3	5.7
	min	2.66	3.1	3.7	4.6	6



■ Cross Recessed Countersunk Head screws

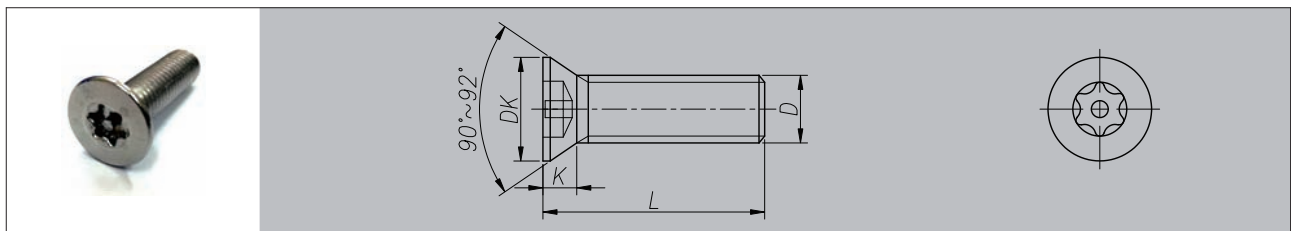


Description: Apply to the mechanical equipment which has high requirements on strength and accuracy, making two parts (structural components) joint together as a whole.

Material: 304、316

Nominal diameter D		M1.6	M2	M2.5	M3	M3.5	M4	M5	M6	M8	M10
Pitch	P	0.35	0.4	0.45	0.5	0.6	0.7	0.8	1	1.25	1.5
DK	MAX	3	3.8	4.7	5.5	7.3	8.4	9.3	11.3	15.8	18.3
K	MAX	1	1.2	1.5	1.65	2.35	2.7	2.7	3.3	4.65	5
Groove No.	NO.	0		1		2			3	4	

■ Plum Blossom Countersunk Head Column Anti-theft Screws



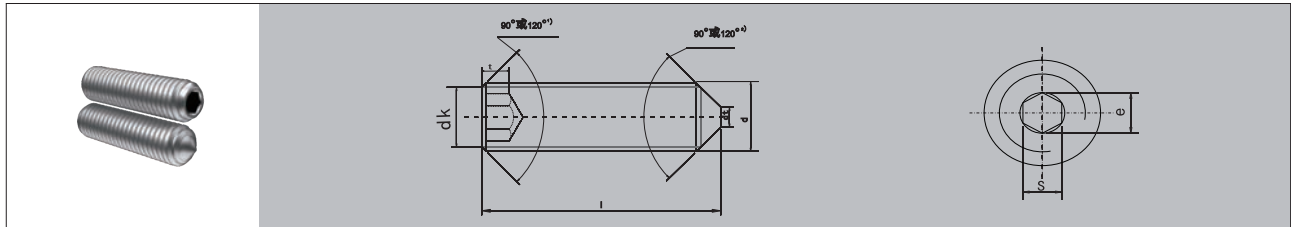
Description: Apply to the mechanical equipment which has high requirements on strength and accuracy, making two parts (structural components) joint together as a whole with certain anti-theft function.

Material: 304、316

Nominal diameter D		M3	M4	M5	M6	M8
Pitch	P	0.5	0.7	0.8	1	1.25
DK	max	5.5	8.4	9.3	11.3	15.8
	min	5.2	8.04	8.94	10.87	15.37
K	max	1.65	2.7	2.7	3.3	4.65



### Inner Hexagon Prototype Set Screws

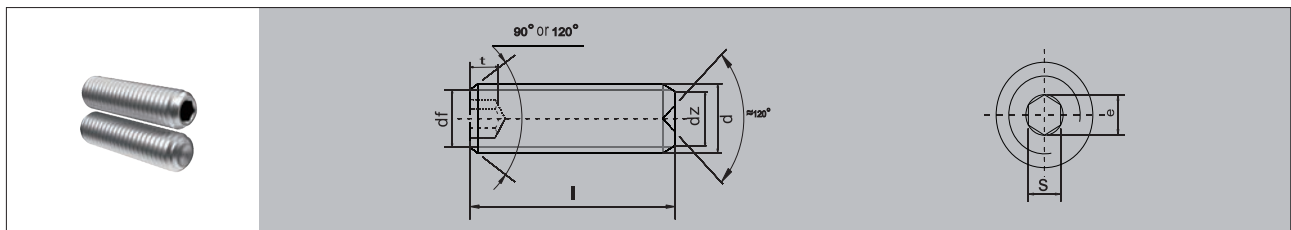


Description: The inner hexagon tapered end set screws with no head and inner hexagon groove need to be installed with a six-inch wrench that conforms to the size. The headless design makes the connected parts more beautiful and high-grade.

Material: 304、316

Nominal diameter D		M1.6	M2	M2.5	M3	M4	M5	M6	M8	M10	M12	M16	M20	M24
Pitch	P	0.35	0.4	0.45	0.5	0.7	0.8	1	1.25	1.5	1.75	2	2.5	3

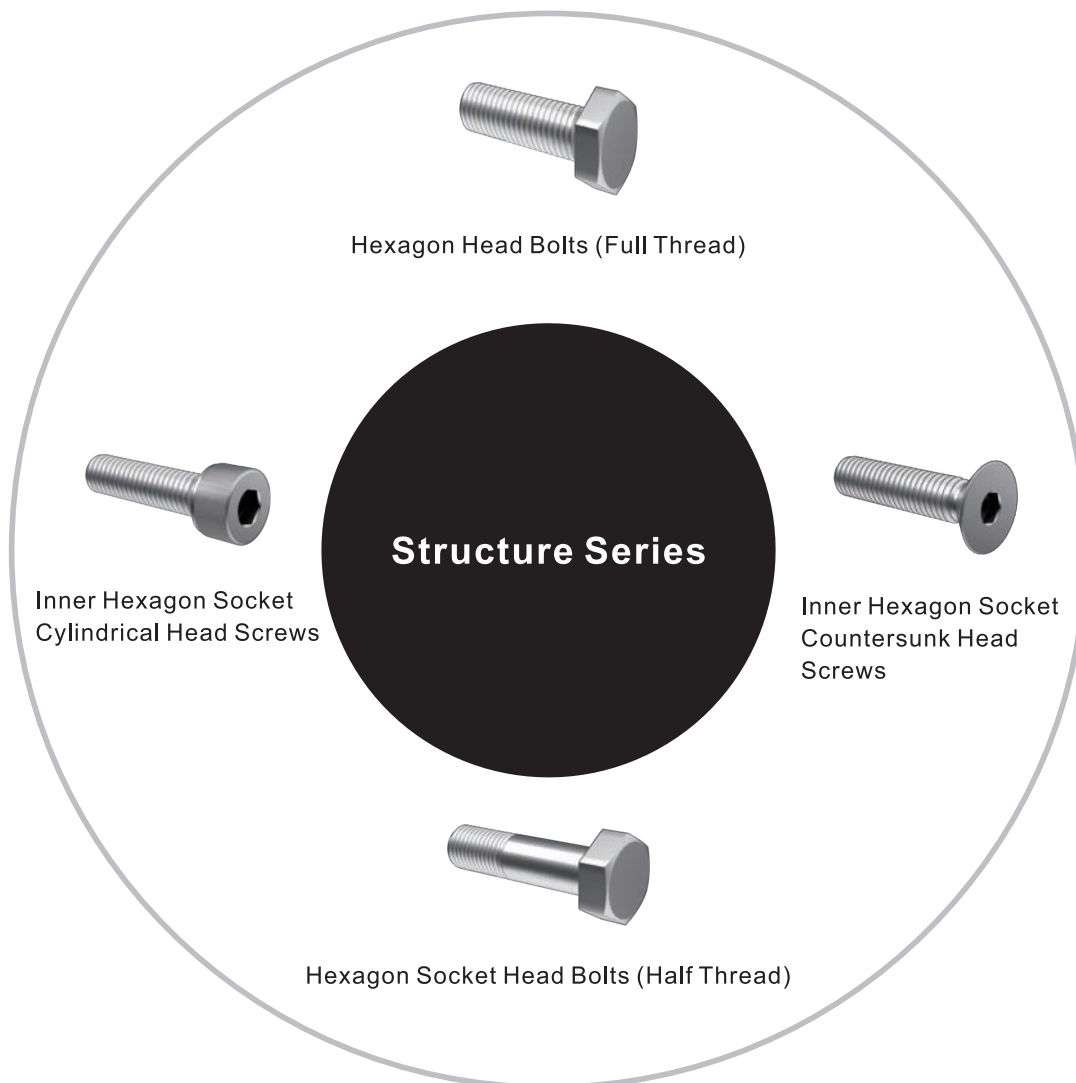
### Inner Hexagon Recessed Set Screws



Description: The inner hexagon concave end set screws with no head and inner hexagon groove, of which the screw tail is concave end, need to be installed with the six-inch wrench with the size, its unique headless design makes the connected piece more beautiful and high-end.

Material: 304、316

Nominal diameter D		M1.6	M2	M2.5	M3	M4	M5	M6	M8	M10	M12	M16	M20	M24
Pitch	P	0.35	0.4	0.45	0.5	0.7	0.8	1	1.25	1.5	1.75	2	2.5	3



Name	Standard Code	
	GB (code)	German standard
Inner Hexagon Socket Countersunk Head Screws	GB/T 70.3	DIN7991
Inner Hexagon Socket Cylindrical Head Screws	GB 70.1	DIN912
Hexagon Head Bolts (Full Thread)	GB/T 5783	DIN933
Hexagon Socket Head Bolts (Half Thread)	GB/T 5782	DIN931



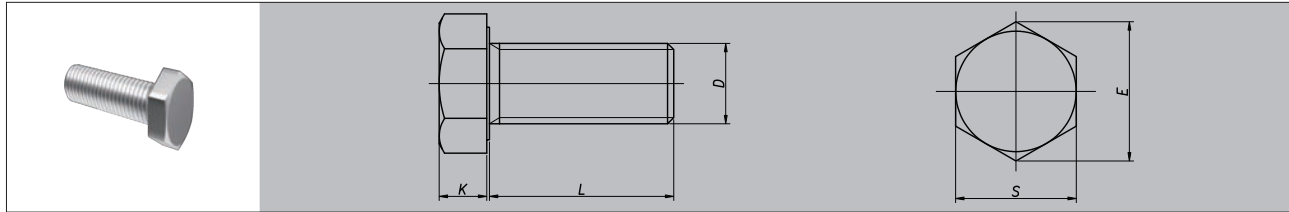


## Structure Series





Hexagon Head Bolts (Full Thread)

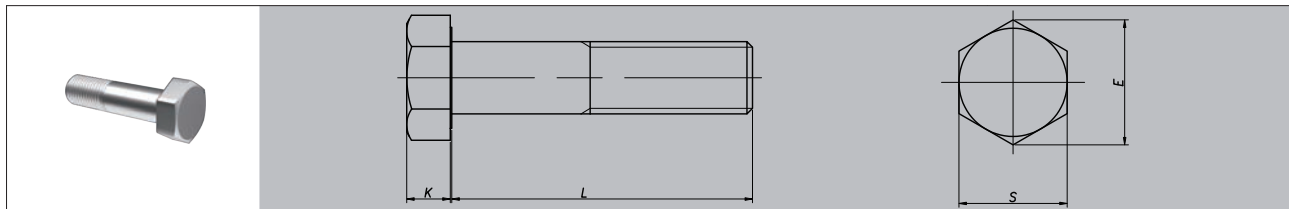


Description: Apply to the mechanical equipment which has high requirements on strength and accuracy, making two parts (structural component) joint together as a whole.

Material: 304、316

Nominal diameter D		M8	M10	M12	M14	M16	M18	M20	M22	M24	
Pitch	P	1.25	1.5	1.75	2	2	2.5	2.5	2.5	3	
K	A grade	max	5.45	6.56	7.68	8.98	10.18	11.72	12.72	14.22	15.22
		min	5.15	6.22	7.32	8.62	9.82	11.28	11.28	13.78	14.78
	B grade	max	5.54	6.69	7.79	9.09	10.29	11.85	12.85	14.35	15.35
		min	5.06	6.11	7.21	8.51	9.71	11.15	12.15	13.65	14.65
S	max		13	17	19	22	24	27	30	32	36
	min	A grade	12.73	16.73	18.67	21.67	23.67	26.67	29.67	31.61	35.38
		B grade	12.57	16.57	18.48	21.16	23.16	26.16	29.16	31	35

Hexagon Socket Head Bolts (Half Thread)



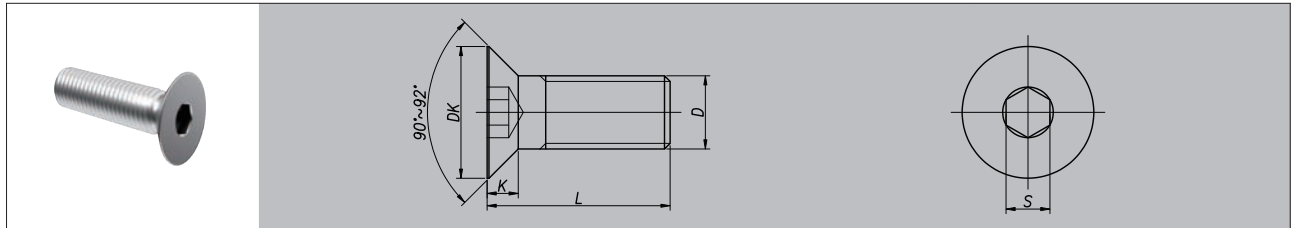
Description: Apply to the mechanical equipment which has high requirements on strength and accuracy, making two parts (structural component) joint together as a whole.

Material: 304、316

Nominal diameter D		M8	M10	M12	M14	M16	M18	M20	M22	M24	
Pitch	P	1.25	1.5	1.75	2	2	2.5	2.5	2.5	3	
K	A grade	max	5.45	6.58	7.68	8.98	10.18	11.72	12.72	14.22	15.22
		min	5.15	6.22	7.32	8.62	9.82	11.28	11.28	13.78	14.78
	B grade	max	/	/	/	10.29	11.85	12.85	14.35	15.35	17.35
		min	/	/	/	9.71	11.15	12.15	13.65	14.65	16.65
S	max		13	17	19	22	24	27	30	32	36
	min	A grade	12.73	16.73	18.67	21.67	23.67	26.67	29.67	31.61	35.38
		B grade	/	/	/	/	23.16	26.16	29.16	31	35
L1	min	L≤125 L1=2D+6 125≤L≤200 L1=2D+12 L>200 L1=2D+25									



### Inner Hexagon Socket Countersunk Head Screws

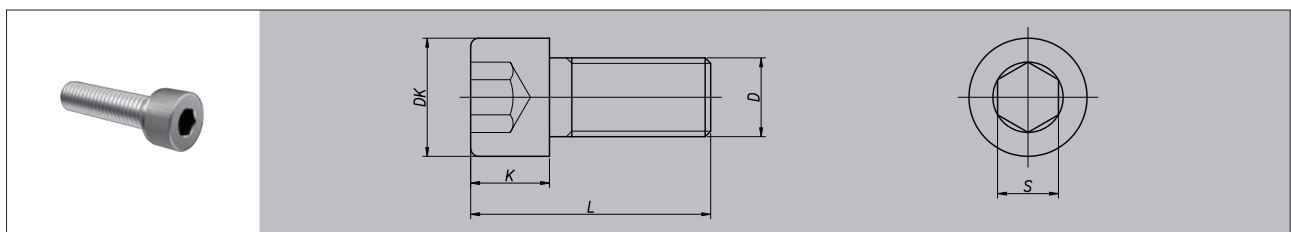


Description: Strong tightening force, need to drill a thread hole on the connected parts, and need special hexagon tools to work together.

Material: 304,316

Nominal diameter D		M3	M4	M5	M6	M8	M10	M12	M14	M16	M20
Pitch	P	0.5	0.7	0.8	1	1.25	1.5	1.75	2	2	2.5
DK	MAX	6.72	8.96	11.2	13.44	17.92	22.4	26.88	30.8	33.6	40.32
K	MAX	1.86	2.48	3.1	3.72	4.96	6.2	7.44	8.4	8.8	10.16

### Inner Hexagon Socket Cylindrical Head Screws



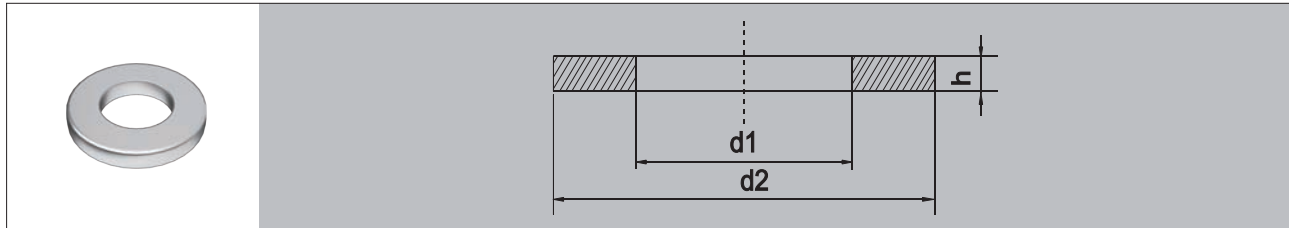
Description: Strong tightening force, need to drill a thread hole on the connected parts, and need special hexagon tools to work together.

Material: 304,316

Nominal diameter D		M4	M5	M6	M8	M10	M12	M14	M16	M20	M24
Pitch	P	0.7	0.8	1	1.25	1.5	1.75	2	2	2.5	3
Dk	Smooth head	7	8.5	10	13	16	18	21	24	30	36
MAX	Knurled head	7.22	8.72	10.22	13.27	16.27	18.27	21.33	24.33	30.33	36.39
K	MAX	4	5	6	8	10	12	14	16	20	24



Flat Washer

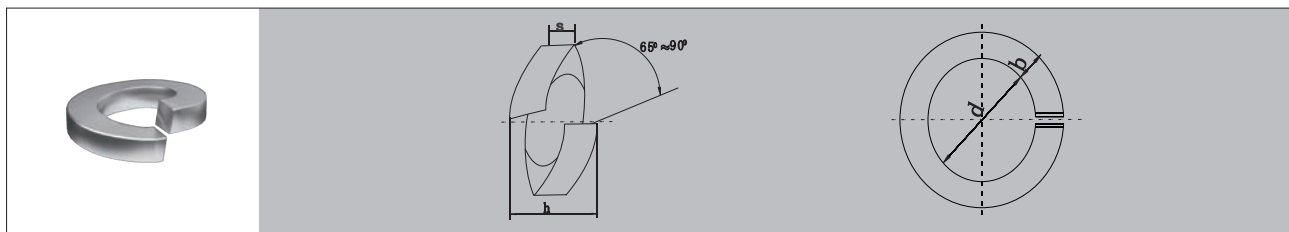


Description: Together with bolts, screws, and nuts, it protects the tightened surface to avoid scratch and increases the stressed area of the fastened parts.

Material: 304,316

Specification		φ2	φ2.5	φ3	φ4	φ5	φ6	φ8	φ10	φ12	φ14	φ16	φ20	φ24	φ30	φ36
Inner diameter	D1	2.2	2.7	3.2	4.3	5.3	6.4	8.4	10.5	13	15	17	21	25	31	37
Outer diameter	D2	5	6	7	9	10	12	16	20	24	28	30	37	44	56	66
Thickness	H	0.3	0.5	0.5	0.8	1	1.6	1.6	2	2.5	2.5	3	3	4	4	5

Spring washer



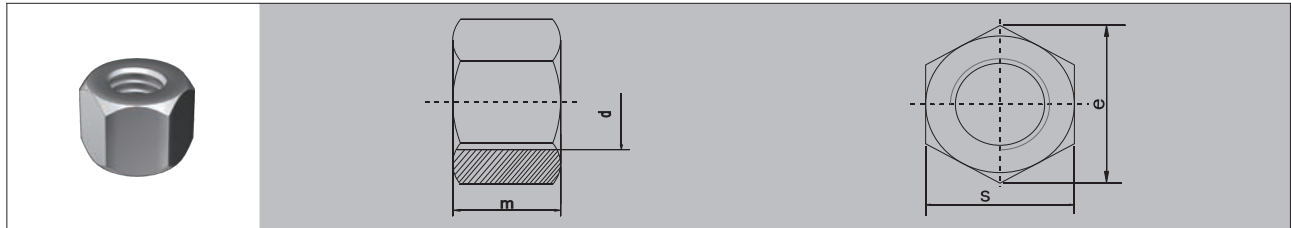
Description: Installed on the supporting surface of bolts, screws and nuts to prevent loosen and eliminate the gap after assembly.

Material: 304,316

Specification		φ3	φ4	φ5	φ6	φ8	φ10	φ12	φ14	φ16	φ18	φ20	φ22	φ24
Inner diameter	D	3.1	4.1	5.1	6.1	8.1	10.2	12.2	14.2	16.2	18.2	20.2	2.5	24.5
Nominal diameter	S(b)	0.8	1.1	1.3	1.6	2.1	2.6	3.1	3.6	4.1	4.5	5	5.5	6
Thickness	H	1.6	2.2	2.6	2.6	4.2	5.2	6.2	7.2	8.2	9	10	11	12



Hexagon nut

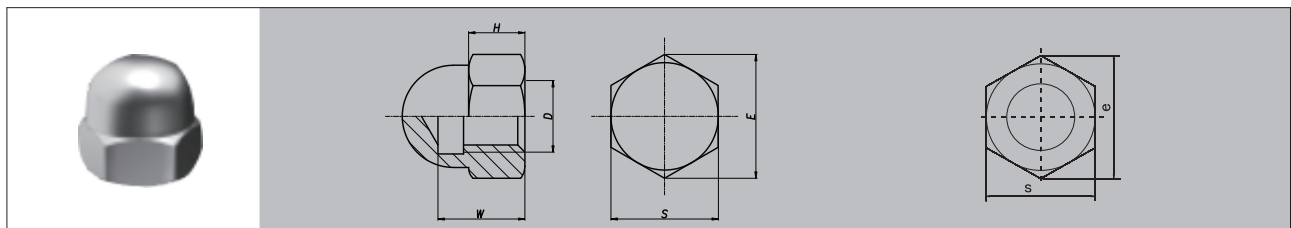


Description: Work together with bolts and screws, mostly used in these cases need to be disassembled frequently.

Material: 304,316

Thread specification		M3	M4	M5	M6	M8	M10	M12	M14	M16	M18	M20	M22	M24
Pitch	P	0.5	0.7	0.8	1	1.25	1.5	1.75	2	2	2.5	2.5	2.5	3
Thickness	M	2.4	3.2	4	5	6	8	10	11	13	14	16	18	19
Opposite side	Smax	5.5	7	8	10	14	17	19	22	24	27	30	32	36

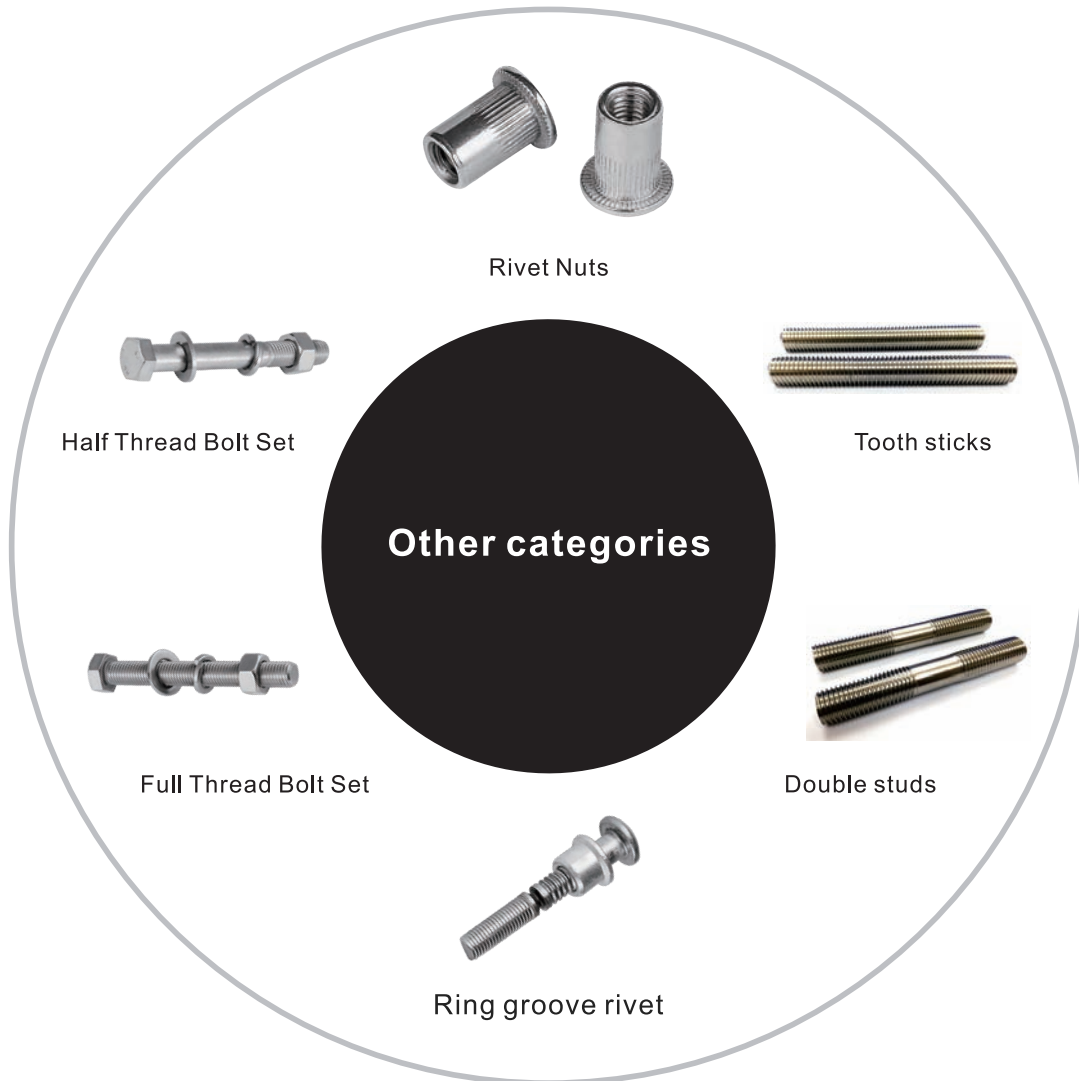
Dome nut



Description: Apply to the place where need to cover the end of screw thread, mostly used in the end of pipeline system with the effect of anti-dust and damp proof.


Material: 304,316

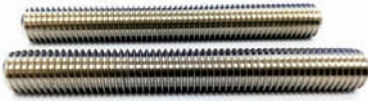
Thread specification		M3	M4	M5	M6	M8	M10	M12	M14	M16	M18	M20	M22	M24
Pitch	P	0.5	0.7	0.8	1	1.25	1.5	1.75	2	2	2.5	2.5	2.5	3
Thickness	H	2.4	3.2	4	5	6	8	10	11	13	14	16	18	19
Opposite side	Smax	5.5	7	8	10	14	17	19	22	24	27	30	32	36
Thickness	H	0.5	0.7	0.8	1	1.25	1.5	1.75	2	2	2.5	2.5	2.5	3
Opposite side	E	2.4	3.2	4	5	6	8	10	11	13	14	16	18	19
Opposite side	S	5.5	7	8	10	14	17	19	22	24	27	30	32	36









	<p>■ ■ Rivet Nuts</p> <p>Material: 304, 316, ML08AL(carbon steel)</p> <p>Surface Treatment: White Zinc, Color Zinc, Green Zinc, Blue -white Zinc, White Washing, ZnC Nickel Alloy Color</p> <p>Specification: M3, M4, M5, M6, M8, M10, M12</p>
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	<p>■ ■ Blind rivets</p> <p>Material: All-iron All-steel Semi-steel Aluminum iron</p> <p>Surface Treatment: nature finish, lue -white Zinc, White Washing</p> <p>Specification: Ø2.4, Ø3, Ø3.2, Ø4, Ø4.8, Ø5, Øφ6, Ø6.4</p>
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	<p>■ ■ Tooth sticks</p> <p>Material: 304, 316</p> <p>Surface Treatment: nature finish</p> <p>Specification: M6, M8, M10, M12, M14, M16, M20, M24</p>
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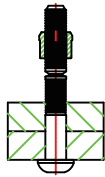
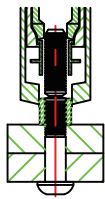
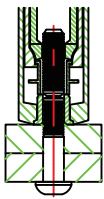
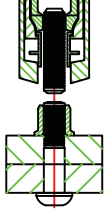
	<p>■ ■ Double studs</p> <p>Material: 304, 316</p> <p>Surface Treatment: nature finish</p> <p>Specification: M6, M8, M10, M12, M14, M16, M20, M24</p>
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<p>■ ■ Rod Bolt Set</p>	<p>■ ■ Half Thread Bolt Set</p>
	
<p>■ ■ Stud Set</p>	<p>■ ■ Full Thread Bolt Set</p>



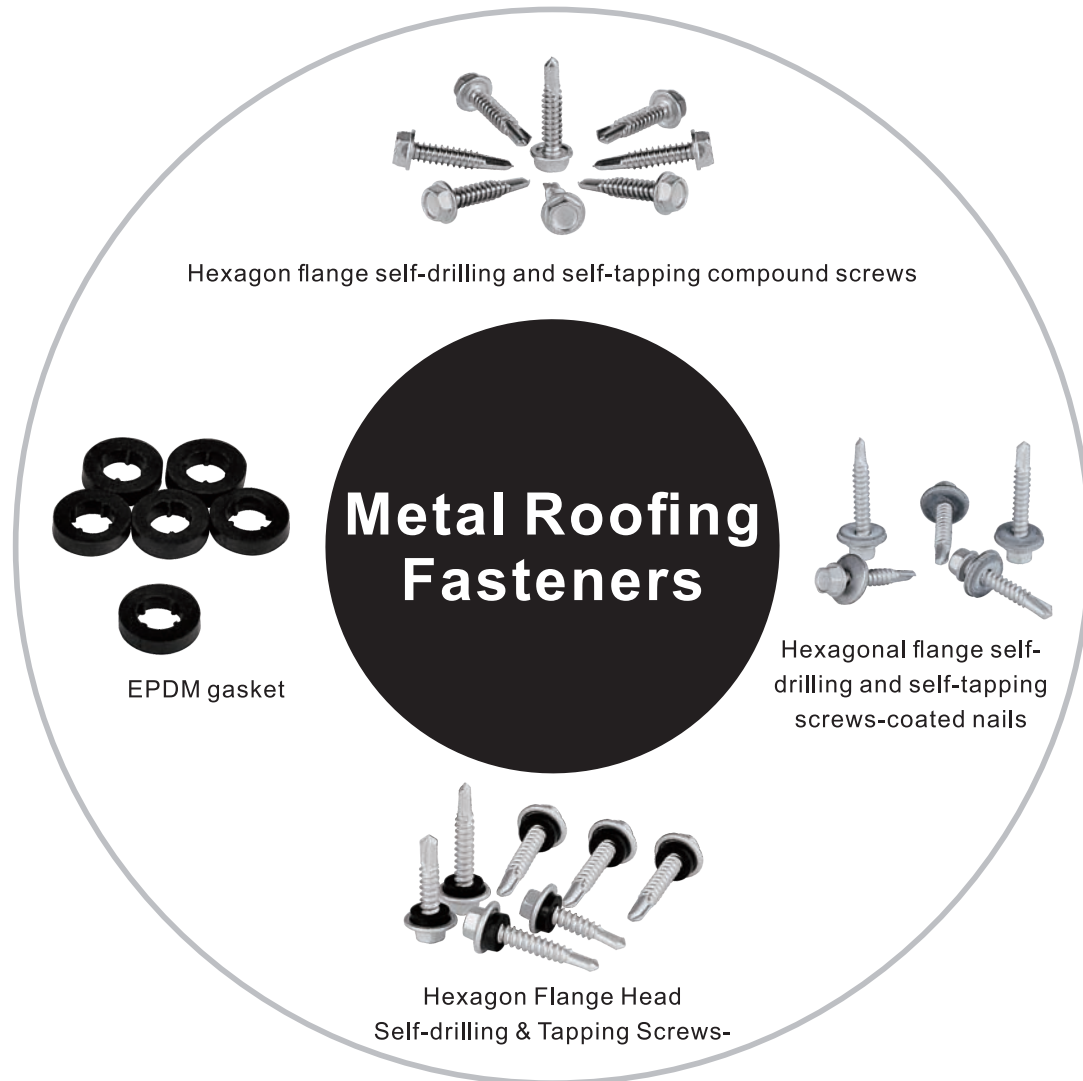
## Ring groove rivet

Ring groove rivet refers to a special rivet. Ring groove rivets are divided into large diameter ring groove rivets, small diameter ring groove rivets, continuous groove ring groove rivets, and short tail rivets (bobtail). Ring groove rivets are made of high-quality carbon steel, with high riveting strength and firmness and reliability. Its biggest feature is its good anti-vibration performance, wide application and convenient construction.

	<p style="text-align: center;">Ring groove rivet installation steps</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>①</p>  </div> <div style="text-align: center;"> <p>②</p>  </div> <div style="text-align: center;"> <p>③</p>  </div> <div style="text-align: center;"> <p>④</p>  </div> </div>
<p>Ring groove rivets are used for riveting two structural parts into a whole. It is composed of two parts: rivet and nail sleeve. The rivet consists of a nail rod and a nail sleeve. When riveting, first insert the rivet into the nail hole of the connected part, and then set the nail on the ring groove of the working section of the rivet from the other side of the connected part, and then use the special tool-the muzzle sleeve of the pneumatic ring groove rivet gun on the ring groove of the clamping section of the rivet, press the muzzle against the end face of the nail sleeve, and then pull the trigger of the gun. The rivet gun will tighten the ring groove nail rod of the clamping section of the rivet until it breaks. At this time, the inner wall of the nail sleeve is squeezed into the ring groove of the working section of the rivet to form a new rivet head, thereby riveting and fastening the connected piece.</p>	<p style="text-align: center;">Features</p> <p>Convenient operation, high efficiency, low noise, good shock resistance, so it is widely used in various vehicles, ships, aviation, mechanical equipment, building structures and other fields.</p>







Name	Standard Code			
	GB (code)	ISO National standard	German standard	Japanese standard
Hexagonal Compound Drilling Nails	GB15856.4	ISO15480-1999	DIN7504-K	JIS1124-2003
Plum blossom countersunk head drill nails	GB15856.2	ISO15482-1999	DIN7504-P	
Cross countersunk head drill nail	GB15856.2	ISO15482-1999	DIN7504-P	
Plum blossom pan head drill tail nails	GB15856.1	ISO15481-1999	DIN7504-N	
Cross pan head drill nail	GB15856.1	ISO15481-1999	DIN7504-N	



## Metal Roofing Fasteners

The application of metal roofing has a long history and outstanding advantages. It is an ideal building roof covering material. The fabricated metal roofing system has become the first choice for building roofing materials due to its excellent product characteristics.

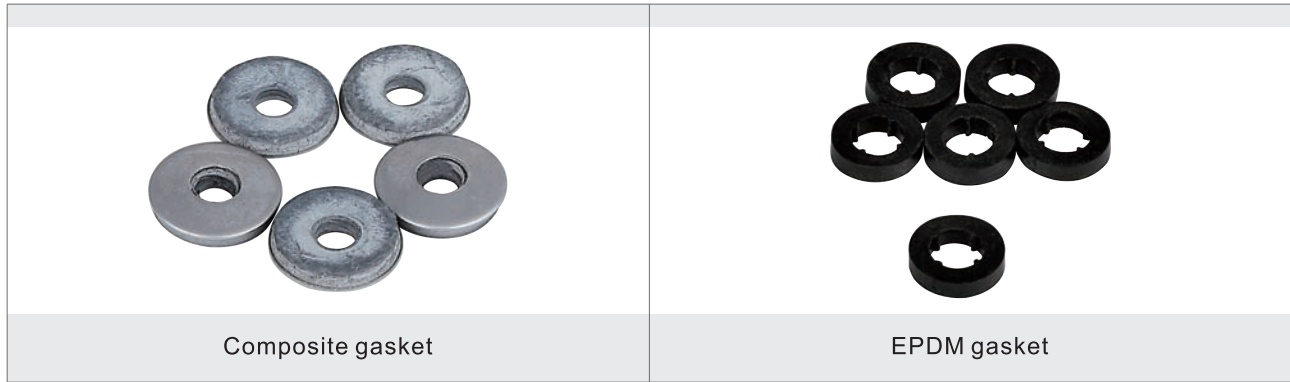
The single-layer roof structure is often open, with screws passing through the roof panel to connect with the purlin. Fasteners are important parts of the unit roof system. There are many types of fasteners. The commonly used fastener materials for metal roofing include carbon alloy screws, aluminum alloy screws, stainless steel composite screws, etc.

Composite screw material: SUS304+SCM435/SUS316+SCM435

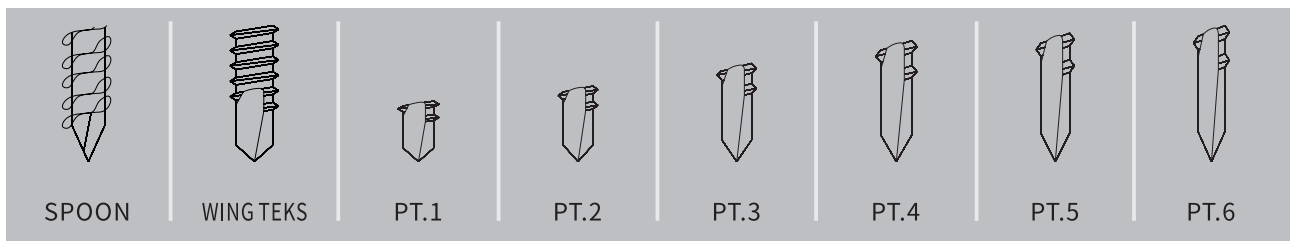
 <p>Hexagonal flange self-drilling and self-tapping screws-zinc tin alloy</p>	 <p>Hexagon flange self-drilling and self-tapping compound screws</p>	
 <p>Hexagonal flange self-drilling and self-tapping screws-coated nails</p>	 <p>Cross countersunk head compound self-drilling screw</p>	 <p>Torx countersunk head composite self-drilling screws</p>
 <p>Hexagon head double-thread compound self-drilling screw</p>	 <p>Torx pan head compound self-drilling screw</p>	 <p>Hexagon head compound self-drilling screw 5# tail</p>



gasket



Drill Tail



Finished product standard

According to the standard: factory standard

Dimensional tolerance: (length 13mm is No. 1 tail, length 16-19mm is No. 2 tail, length over 19mm is No. 3 tail)

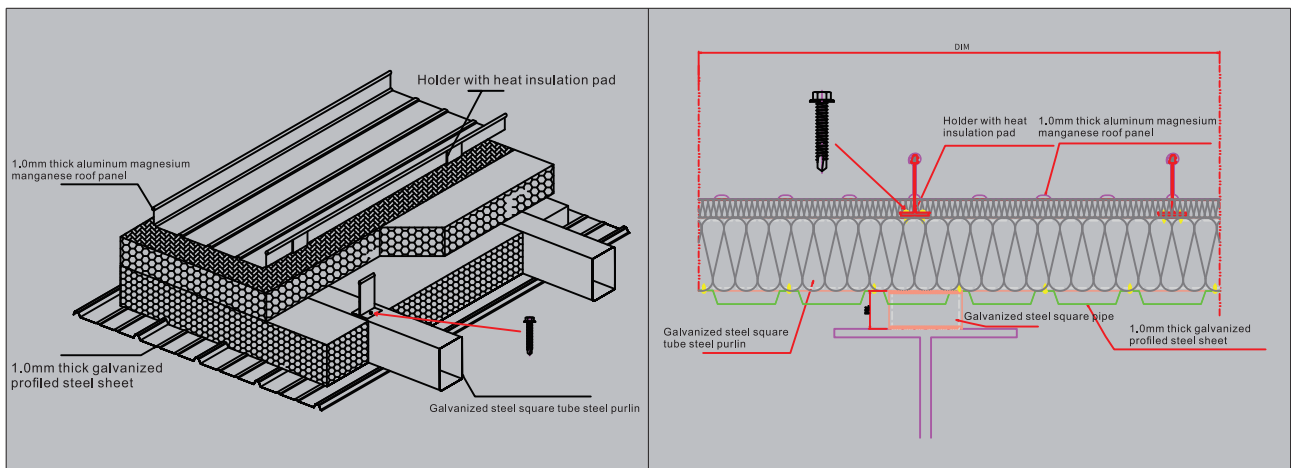
Screw specifications	ST2.9 4#-24	ST3.5 6#-20	ST3.9 7#-19	ST4.2 8#-18	ST4.8 10#-16	ST4.8 10#-24	ST5.5 12#-14	ST5.5 12#-24	ST6.3 14#-14	ST6.3 14#-20
Tail width	2.30 2.50	2.90 3.10	3.05 3.20	3.40 3.60	4.00 4.20	4.20 4.40	4.65 4.85	4.90 5.10	5.50 5.70	5.65 5.85
No. 1 tail length and width	2.30min	2.80min	2.80min	3.50min	4.50min		5.20min		6.00min	
No. 2 tail length and width	2.80min	3.50min	3.50min	4.00min	5.20min		6.00min		7.20min	
No. 3 tail length and width		4.20min	4.20min	5.00min	6.00min		7.20min		8.00min	
No. 4 tail length and width				6.00min	7.20min		10.50min		10.50min	
No. 5 tail length and width					8.70min		13.50min		13.50min	
No. 6 tail length and width							15.80min		15.80min	

No. 2-6 tail tapping thickness parameter (experimental value)

Blade model tapping panel thickness	No. 2 tail	No. 3 tail	No. 4 tail	No. 5 tail	No. 6 tail
tapping panel thickness(mm).max	4	6	8	12	14



Considering the metal roof from the material point of view, the factors that affect its design and selection include:	Operation process
<ul style="list-style-type: none"> <li>▶ The physical properties of the material, such as the strength, hardness, and brittleness of the material;</li> <li>▶ The chemical properties of the material, such as corrosion resistance, electrochemical corrosion performance, etc.</li> </ul>	<ul style="list-style-type: none"> <li>▶ The thickness of the overall roof panel material needs to be fixed.</li> <li>▶ Choose a stainless steel self-drilling screw of sufficient length to fix the system.</li> <li>▶ Choose suitable electric tools for the screws of the determined model.</li> <li>▶ The screws and power tools must be perpendicular to the surface of the profile plate during installation, and force a center point to be created.</li> <li>▶ Apply force on the power tool by hand to ensure that the force is on the same vertical line as the center point.</li> <li>▶ The force is constant and uniform, and the drilling stops immediately after the screw is in place.</li> </ul>





# Test report and certificate

**SGS** 中国认可 国际互认 检测 TESTING CNAS L0167

**测试报告**  
 编号 : QZIN2008041524MR\_CN  
 日期 : 2020-09-08  
 页码 : 1 of 4

客户名称: 广东聚朋五金制品有限公司  
 客户地址: 广东省东莞市谢岗镇大坪堤前路3号

样品名称: 六角法兰圆自钻自攻钉  
 产品规格: ST5.5X32

以上信息及样品由客户提供及确认, SGS 不承担证实客户提供信息的准确性、适当性和/或完整性的责任。

SGS 参考号: QZIN2008040983CM  
 收样日期: 2020-08-07  
 测试开始时间: 2020-08-07  
 测试结束时间: 2020-09-08  
 测试结果: 请见下页 (除非有特别说明外, 本报告结果仅对测试样品负责)

通标标准技术服务有限公司广州分公司  
 检测中心  
 授权签名  
  
 罗明 授权签字人

Member of the SGS Group (SGS SA)

**SGS**

**测试报告**  
 编号 : QZIN2008041524MR\_CN  
 日期 : 2020-09-08  
 页码 : 2 of 4

结果总结:

序号	测试项目	测试方法	结果	结论
1	SO <sub>2</sub> 气体腐蚀	DIN 50018:2013-05	可见变色和白色产物	/

备注: 合格: 达到要求  
 不合格: 未达到要求  
 /: 不下判定

取样照片:

Member of the SGS Group (SGS SA)

**SGS**

**测试报告**  
 编号 : QZIN2008041524MR\_CN  
 日期 : 2020-09-08  
 页码 : 3 of 4

测试项目: SO<sub>2</sub>气体腐蚀  
 样品描述: 金属件  
 测试方法: DIN 50018:2013-05  
 试验条件:  
 箱体容积: 300L  
 步骤 1:  
 注入 SO<sub>2</sub> 气体量: 0.67%(V/V)  
 SO<sub>2</sub> 气体暴露: (40±3)°C, 100%RH, 8h  
 步骤 2:  
 无 SO<sub>2</sub> 环境: (18~28)°C, 最大 75%RH, 16h  
 步骤 1-步骤 2 为 1 个循环, 共 25 个循环, 总 600 小时。

测试结果:

样品	外观
#1	可见变色和白色产物
#2	可见变色和白色产物
#3	可见变色和白色产物

测试照片:

Member of the SGS Group (SGS SA)

**SGS**

**测试报告**  
 编号 : QZIN2008041524MR\_CN  
 日期 : 2020-09-08  
 页码 : 4 of 4

测试样品 (4号)

设备信息:

设备	型号	设备编号	校准日期	下次校准日期
腐蚀试验箱	519-SA	QZMR-AG-E004	2020-03-09	2021-03-08

\*\*\*\*\* 报告结束 \*\*\*\*\*

Member of the SGS Group (SGS SA)



**SGS**

**测试报告**  
 编号 : GZIN2008041175MR\_CN  
 日期 : 2020-10-21  
 页码 : 1 of 4

客户名称: 广东冠航五金制品股份有限公司  
 客户地址: 广东省东莞市塘厦镇大坪堂银禧路3号

样品名称: 六角法兰面自钻自攻钉  
 产品规格: STS 5X32  
 以上信息由客户提供及确认, SGS 不承担证实客户提供信息的准确性、适当性和/或完整性的责任。

SGS 参考号: GZIN2008040990CM  
 收样日期: 2020-08-06  
 测试开始时间: 2020-08-06  
 测试结束时间: 2020-10-21  
 测试结果: 请见下页 (除另有特别说明外, 此报告结果仅对测试样品负责)

通标标准技术服务有限公司广州分公司  
 检测中心  
 授权签名  
  
 罗勇 授权签字人

Member of the SGS Group (SGS SA)

**SGS**


**测试报告**  
 编号 : GZIN2008041175MR\_CN  
 日期 : 2020-10-21  
 页码 : 2 of 4

结果总结:

序号	测试项目	测试方法	结果	结论
1	中性盐雾 (NSS) 试验	ASTM B117-19	可见白锈, 但无可见红锈	1

备注: 合格, 达到要求  
 不合格, 未达到要求  
 /: 不下判定

原样照片:



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**SGS**

**测试报告**  
 编号 : GZIN2008041175MR\_CN  
 日期 : 2020-10-21  
 页码 : 3 of 4

测试项目: 中性盐雾(NSS)试验  
 样品描述: 金属件  
 测试方法: ASTM B117-19  
 测试条件:  
 沉降盐液浓度: (5±1)% NaCl(m/m)  
 试验槽温度: (35±2)°C  
 盐雾沉降率: (1.0-2.0)ml/(80cm²·h)  
 沉降盐液 pH 值(23±3)°C: 6.5-7.2  
 暴露时间: 1500 小时

测试结果:

样品	外观
#1	可见白锈, 但无可见红锈
#2	可见白锈, 但无可见红锈
#3	可见白锈, 但无可见红锈

测试照片:



测试中 参照样品 测试样品

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**测试报告**  
 编号 : GZIN2008041175MR\_CN  
 日期 : 2020-10-21  
 页码 : 4 of 4



测试样品 (均漆)

设备信息:

设备	型号	设备编号	校准日期	下次校准日期
循环腐蚀试验箱	CCT1100	GZMR-AG-E092	2020-06-30	2021-06-29

\*\*\*\*\* 报告结束 \*\*\*\*\*

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测试报告

编号 : GZIN2008041174MR\_CN  
日期 : 2020-10-21  
页码 : 1 of 4



客户名称: 广东望南五金制品有限公司  
客户地址: 广东省东莞市塘厦镇大坪东环路3号

样品名称: 六角法兰面自动车床打  
产品规格: STS.5X25

以上信息及样品由客户提供及确认, SGS 不承担对客户所提供信息的准确性、适当性或完整性的责任。

SGS 参考号: GZIN2008040806CM  
收样日期: 2020-08-06  
测试开始时间: 2020-08-06  
测试结束时间: 2020-10-21  
测试结果: 请见下页 (除另有特别说明外, 此报告结果仅对测试样品负责)

通标标准技术服务有限公司广州分公司  
检测中心

授权签名

罗雄 授权签字人



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测试报告

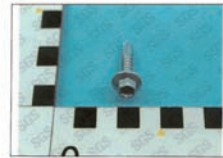
编号 : GZIN2008041174MR\_CN  
日期 : 2020-10-21  
页码 : 2 of 4

结果总结:

序号	测试项目	测试方法	结果	结论
1	中性盐雾 (NSS) 试验	ASTM B117-19	可见白锈, 但无可见红锈	I

备注: 合格, 达到要求  
不合格, 未达到要求  
I, 不予判定

照片附件:



Member of the SGS Group (SGS SA)



测试报告

编号 : GZIN2008041174MR\_CN  
日期 : 2020-10-21  
页码 : 3 of 4

测试项目: 中性盐雾(NSS)试验

样品描述: 金属件

测试方法: ASTM B117-19

测试条件:

沉降盐雾浓度: (5±1)% NaCl(m/m)

试验箱温度: (35±2)°C

盐雾沉降率: (1.0-2.0)ml(80cm²·h)

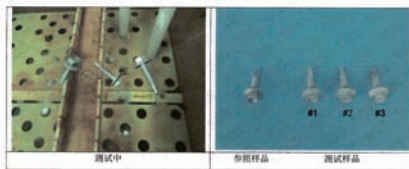
沉降盐液 pH 值(23±3)°C: 6.5-7.2

暴露时间: 1500 小时

测试结果:

样品	外观
#1	可见白锈, 但无可见红锈
#2	可见白锈, 但无可见红锈
#3	可见白锈, 但无可见红锈

测试照片:



Member of the SGS Group (SGS SA)



测试报告

编号 : GZIN2008041174MR\_CN  
日期 : 2020-10-21  
页码 : 4 of 4



设备信息:

设备	型号	设备编号	校准日期	下次校准日期
循环腐蚀试验箱	CCT1100	GZMR-AG-E082	2020-06-30	2021-06-29

\*\*\*\*\* 报告结束\*\*\*\*\*



Member of the SGS Group (SGS SA)



**SGS**

中国认可  
国家认证  
检测  
TESTING  
CNAS L6167

**测试报告**  
编号 : QZIN2008041517MR\_CN  
日期 : 2020-09-08  
页码 : 1 of 4

客户名称: 广东登鼎五金制品有限公司  
客户地址: 广东省东莞市塘厦镇大坪堂村路3号

样品名称: 六角法兰面自攻螺钉  
产品规格: ST5.5X25

SGS 参考号: QZIN2008040959CM  
收样日期: 2020-08-07  
测试开始时间: 2020-08-07  
测试结束时间: 2020-09-08  
测试结果: 请见下页 (绿另有特别说明, 此报告结果仅对测试样品负责)

通标标准技术服务有限公司广州分公司  
检测中心  
授权签名  
  
罗璐 授权签字人

Member of the SGS Group (SGS SA)

**SGS**

**测试报告**  
编号 : QZIN2008041517MR\_CN  
日期 : 2020-09-08  
页码 : 2 of 4

结果总结:

序号	测试项目	测试方法	结果	结论
1	SO <sub>2</sub> 气体腐蚀	DIN 50018:2013-05	可见变色和白色产物	/

备注: 合格: 达到要求  
不合格: 未达到要求  
/ 不予判定

原样照片:

Member of the SGS Group (SGS SA)

**SGS**

**测试报告**  
编号 : QZIN2008041517MR\_CN  
日期 : 2020-09-08  
页码 : 3 of 4

测试项目: SO<sub>2</sub>气体腐蚀  
样品描述: 金属材料  
测试方法: DIN 50018:2013-05

试验条件:  
箱体容积: 300L  
步骤 1:  
通入 SO<sub>2</sub> 气体量: 0.67%(V/V)  
SO<sub>2</sub> 气体流量: (40±3)°C, 100%RH, 6h  
步骤 2:  
无 SO<sub>2</sub> 环境: (18~28)°C, 最大 75%RH, 16h  
步骤 1-步骤 2 为 1 个循环, 共 25 个循环, 取 600 小时。

测试结果:

样品	外观
#1	可见变色和白色产物
#2	可见变色和白色产物
#3	可见变色和白色产物

测试照片:

Member of the SGS Group (SGS SA)

**SGS**

**测试报告**  
编号 : QZIN2008041517MR\_CN  
日期 : 2020-09-08  
页码 : 4 of 4

测试样品 (腐蚀)

设备信息:

设备	型号	设备编号	校准日期	下次校准日期
腐蚀试验箱	S19-SA	QZMR-AG-E004	2020-03-09	2021-03-08

\*\*\*\*\* 报告结束 \*\*\*\*\*

Member of the SGS Group (SGS SA)





Name	Standard Code	
	GB (code)	German standard
Big Hexagon High Strength Bolts for Steel Structure	GB/T 1228	/
Torsional Shear Type High Strength Bolts for Steel Structure	GB/T 3632	/
Cylindrical Head Welding Studs for Arc Stud Welding	GB/T 10433	/



## Prefabricated construction

High-strength bolted connections have developed into one of the main connection forms of steel structures with the same status as welding. It has the advantages of good mechanical properties, good fatigue and seismic performance, high connection stiffness, and simple construction. It is widely used in site connection of building steel structure and bridge steel structure.

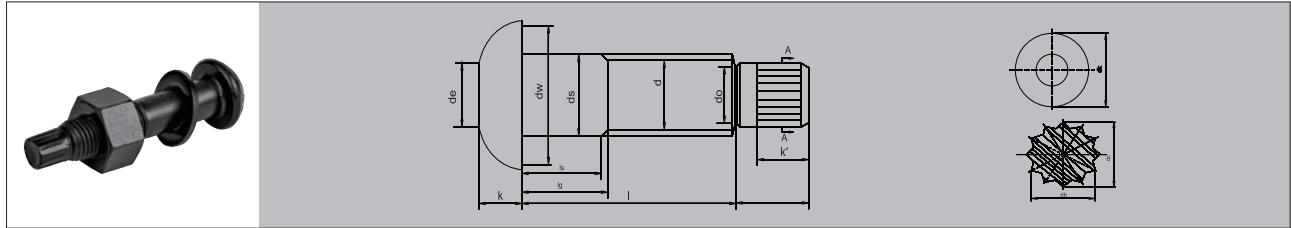
At present, there are two types of high-strength bolts with large hexagon head and torsional shear type in China. Civil engineering commonly used models are M16, M20, M22, M24, the maximum specifications can reach M30, the performance level is divided into 10.9S and 8.8S. The materials are mainly 20MnTiB steel, 40B steel, 35VB steel, 45 steel and 35 steel.

**High-strength bolts:** used in industrial and civil construction, highway and railway bridges, tower and mast structures, pipe supports, lifting machinery and other steel structural connections.





High strength bolts with torsional shear type for steel structure

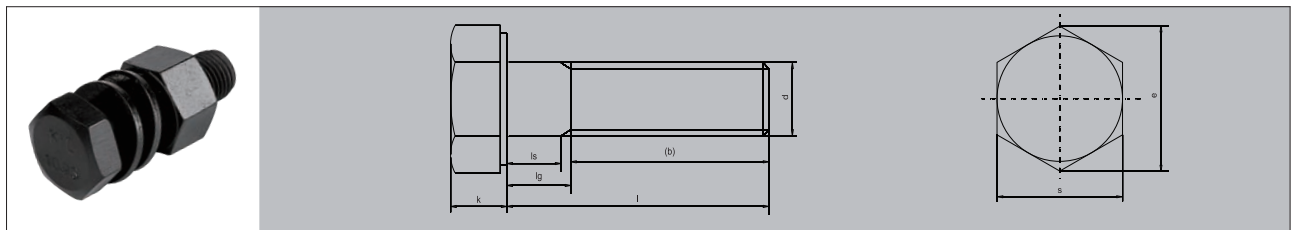


Note: After the surface blackening process, high strength bolts are formed, which are often used in steel structure engineering.

Material: 20MnTiB, 35VB

Nominal diameter D		M16	M20	M22	M24	M27	M30
Pitch	P	2	2.5	2.5	3	3	3.5
ds	max	16.43	20.52	22.52	24.52	27.84	30.84
	min	15.57	19.48	21.48	23.48	26.16	29.16
dK	Nominal	30	37	41	44	50	55

Large hexagon head high strength bolts for steel structure



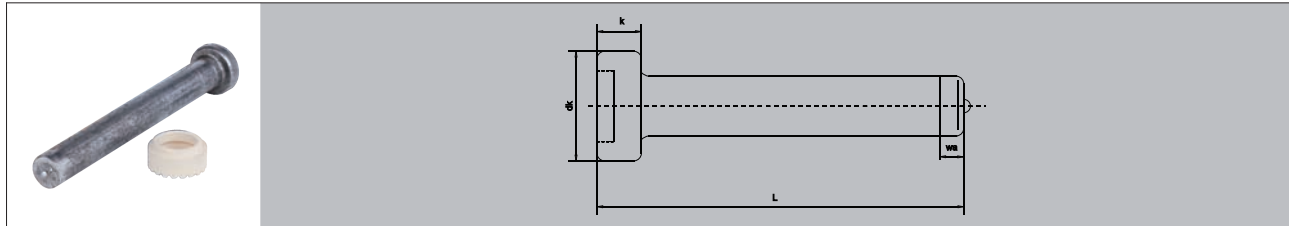
Note: After the surface blackening process, high strength bolts are formed, which are often used in steel structure engineering.

Material: 20MnTiB, 35VB

Nominal diameter D		M16	M20	M22	M24	M27	M30
Pitch	P	2	2.5	2.5	3	3	3.5
E	min	29.56	37.29	39.55	45.2	50.85	55.37
K	Nominal	10	12.5	14	15	17	18.7
S	max	27	34	36	41	46	50



■ Cylinder Head Welding Nail



Description: Usually applied to steel structure to go with magnetic ring, and connected by argon arc welding.  
Material: ML15, ML15AI

Nominal diameter D		10	13	16	19	22	25
DK	max	18.65	24.58	31.5	31.5	34.5	39.5
K	max	7.45	8.45	8.45	10.45	10.45	12.55

Welding nails, also known as shear nails, specifically refer to components that are designed to resist shear forces. When the beam and plate are bent under the vertical load, the shear force (horizontal direction) of the beam and plate is the largest. The superposed surface of the superposed beam and plate members is at this place (or close to it), and many shear nails are set to resist the shear force to ensure the normal bending capacity of the beam and plate.

The lower part of the composite floor is a steel beam and the upper part is a concrete slab. The two work together. However, on the interface between the two, that is, between the bottom of the concrete slab and the top of the steel beam, it is necessary to ensure that it can effectively transmit shear force to prevent relative slippage between the two. It is far from enough to rely on the adhesion between the concrete and the steel beam, so it is necessary to set shear nails on the top of the steel beam, weld it to the steel beam, and embed it in the concrete, so that the shear force can be effectively transmitted. Shear nails should transmit the shear force between the concrete and the steel beam and the "lifting force" separating them when they are effective, so that the concrete and steel can be combined to work together.

Welding nails are also widely used in industrial plant construction, highways, railways, bridges, towers, automobiles, energy, transportation facilities, airports, stations, power stations, pipe supports, lifting machinery and other types of steel structures.

Use method of welding nail porcelain ring	Use method of welding nail porcelain ring
First, the porcelain ring seat is placed on the stud position where the wire has been placed. Use a welding torch to align the nail with the porcelain ring seat. Turn on the power of the welding torch and draw the arc at the ignition point of the stud to generate a high temperature melting stud head and the base material to form a high temperature melting welding pool. After a short time, the peg is welded to the base material, then the porcelain ring is removed, inspect the peripheral weld.	First, the porcelain ring seat is placed on the stud position where the wire has been placed. Use a welding torch to align the nail with the porcelain ring seat. Turn on the power of the welding torch and draw the arc at the ignition point of the stud to generate a high temperature melting stud head and the base material to form a high temperature melting welding pool. After a short time, the peg is welded to the base material, then the porcelain ring is removed, inspect the peripheral weld.



## Highway and Bridge

High-strength bolted connections have developed into one of the main connection forms of steel structures with the same status as welding. It has the advantages of good mechanical properties, good fatigue and seismic performance, high connection stiffness, and simple construction. It is widely used in site connection of building steel structure and bridge steel structure.




Introduction to the installation method of steel bridge	Application area
<p>The steel structure bridge adopts the node connection form to connect the various components. The connection strength of the node device directly affects the safety and service life of the steel structure bridge. The straight webs, chords, horizontal links, and oblique webs at the joints of existing steel structure bridge nodes are connected by bolts. All relying on bolts for locking connections, instability factors such as nut locking force attenuation and screw fatigue will directly affect the safety of steel structure bridges.</p> <p>On the other hand, this installation form requires processing multiple bolt holes at the ends of the straight web bar, the Chord Bar, the transverse connecting bar and the Oblique Web bar, which will destroy the material integrity of the individual parts themselves, reducing the strength of the connection between the spare parts themselves.</p>	<b>Large hexagon high-strength screw</b>
	<p>Mostly used for bridges (the main forms of steel structure bridges are cable-stayed bridges, steel arch bridges, beam bridges, steel box girder bridges, steel truss girder bridges, and rigid frame bridges. Small steel rails, high-voltage and ultra-high-voltage equipment connections.</p>
	<b>Torsional shear type high strength screw</b>
	<p>Mostly used for steel frame structure beam, column connection, solid web beam connection, heavy crane beam connection in industrial plant, braking system and connection of important structures under dynamic load.</p>
	<b>Welding nails</b>
	<p>It is widely used in bridges, industrial plant buildings, highways, railways, towers, automobiles, energy, transportation facilities, airports, stations, power stations, pipe supports, lifting machinery and other various steel structures.</p>

		
Large hexagon high-strength bolts for steel structures	Cylindrical studs for arc stud welding	Torsion-shear high-strength bolts for steel structures





High-strength Big Hexagon Head Bolts Connection&Welding Nails

	Torsional shear type high-strength bolts connection for steel structure GB/T 3632-2008 Torsional shear type high-strength bolts consist of one bolt, one nut and one washer.
	High-strength big hexagon head bolts connection for steel structure GB/T 1228-2006 Big hexagon ream bolts consist of one bolt, one nut and two washers.
	Cylindrical head welding studs for arc stud welding Ordinary flat welding porcelain ring B1 type      GB/T 10433-2002 Penetration welding porcelain ring B2 type

Outline of High-strength Bolts

Name	Material	Surface Treatment	Grade	Standard	Remark
Torsional shear type high strength bolt	20MnTiB/35VB	blacken	10.9S	GB/T3632	screw/ one flat washer/nut
Welding nail(stud)	ML15/ML15Al	nature finish	—	GB/T10433	screw/magnetic ring
Big hexagon head bolt	20MnTiB/35VB	blacken	10.9S	GB/T1228~1231	screw/ two flat washers/nut

High strength bolted joints for steel structures

Category	Performance level	Recommended materials	Trial Specifications	Standard number	
High strength large hexagon bolt	Bolt	8.8S	45 steel, 35 steel	≤M30, ≤M16	GB/T 699
		10.9S	20MnTiB, 35VB	≤M24, M27-M30	GB/T 3077
	Nut	8H	35GrMo, 40Gr	≤M30	/
		10H	45 steel, 35 steel		GB/T 699
Washer	Hardness HRC35-45	45 steel, 35 steel	≤M30	GB/T 699	
High strength twist shear bolt	Bolt	10.9S	20MnTiB, 35VB	≤M24, M27-M30	GB/T 3077
	Nut	10H	35 steel	≤M30	GB/T 699
	Washer	Hardness HRB98-32	45steel	≤M30	GB/T 699

# Test report and certificate

Cb-094/C

**国检检测**  
CHINA COMPONENTS TEST

**检测报告**  
Test Report

2015171208L

防伪码/Anti-fake: 3A29089C 报告编号: WL2019023670

委托单位/Client: 广东坚朗五金制品股份有限公司

地址/Address: 湖北省武汉市东西湖区金银潭大道130号

名称规格/Name and Specification: 高强度六角头螺栓连接副 M24×110 10.9S

来样编号/Sample No.: 来样批号: JL20190530339

工程名称/Project Name: 鹿公大桥

委托人提供以上信息, 实验室不负责其真实性。

管理编号/Manage No.: WL201902367

委托日期/Commission Date: 2019-07-02

检测日期/Test Date: 2019/7/3~2019/7/4

结果评价依据/Standard & Requirement GB/T1231-2006《钢结构用高强度六角头螺栓、六角螺母、垫圈技术条件》

检测结果/Test Result: 参见下页 See next page

武汉国检检测技术有限公司  
授权签字人/Approved by: **汪超**

报告日期/Report Date: 2019/07/04 页码/Page: 1/2

审核/Reviewed by: **李朝**

声明: 1. 报告经授权签字人审核; 2. 报告由委托人盖章和盖章生效; 3. 报告由委托人; 4. 未经本公司同意不得复制或擅自修改报告(不含中文摘要); 5. 委托单位应保留检测报告原件并妥善保管; 6. 报告解释权归本公司所有。

中国·湖北·武汉 东湖新技术开发区光谷大道111号光谷·芯中心1-09-101, 201号 TEL: 027-87272252 FAX: 027-87466888

Cb-094/C

**国检检测**  
CHINA COMPONENTS TEST

**检测报告**

报告编号: WL2019023670

检测项目 /Test Item	检测方法 /Test Method	技术要求 /Requirement	检测结果 /Result	结论 /Conclusion
高强度螺栓连接副扭矩系数平均值	GB/T 1231-2006	0.110~0.150	0.134	符合
高强度螺栓连接副扭矩系数标准偏差	GB/T 1231-2006	≤0.0100	0.0082	符合
高强度螺栓轴力/N	GB/T 1231-2006	367~438	412.0/417.6/418.1/418.3/412.9/418.9/419.4/417.3	符合
螺母保证载荷	GB/T 1231-2006	对螺母施加367N的保证载荷, 持续15s, 螺母不应脱扣或断裂, 当去除载荷后, 应可用手将螺母旋出, 或者借助徒手松开螺母(但不超过半拍)后用手旋出	件均可用手旋出, 试验后螺母均完好	符合
螺母洛氏硬度/HRC	GB/T 1231-2006	989B~529B	28.0/30.5/28.0/27.0/27.0/27.0/27.0/27.0/27.0/27.0	符合
垫片洛氏硬度/HRC	GB/T 1231-2006	35BRC~45BRC	43.0/42.5/42.5/42.0/43.0/42.5/43.0/42.5	符合

检测/Inspected by: **蒋小经** 以下空白

武汉国检检测技术有限公司  
授权签字人/Approved by: **汪超**

报告日期/Report Date: 2019/07/04 页码/Page: 2/2

Cb-094/C

**国检检测**  
CHINA COMPONENTS TEST

**检测报告**  
Test Report

2015171208L

防伪码/Anti-fake: C1469029 报告编号: WL2019023680

委托单位/Client: 广东坚朗五金制品股份有限公司

地址/Address: 湖北省武汉市东西湖区金银潭大道130号

名称规格/Name and Specification: 高强度六角头螺栓连接副 M24×110 10.9S

来样编号/Sample No.: 来样批号: JL20190530337

工程名称/Project Name: 鹿公大桥

委托人提供以上信息, 实验室不负责其真实性。

管理编号/Manage No.: WL201902368

委托日期/Commission Date: 2019-07-02

检测日期/Test Date: 2019/7/3~2019/7/4

结果评价依据/Standard & Requirement GB/T1231-2006《钢结构用高强度六角头螺栓、六角螺母、垫圈技术条件》

检测结果/Test Result: 参见下页 See next page

武汉国检检测技术有限公司  
授权签字人/Approved by: **汪超**

报告日期/Report Date: 2019/07/04 页码/Page: 1/2

审核/Reviewed by: **李朝**

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Cb-094/C

**国检检测**  
CHINA COMPONENTS TEST

**检测报告**

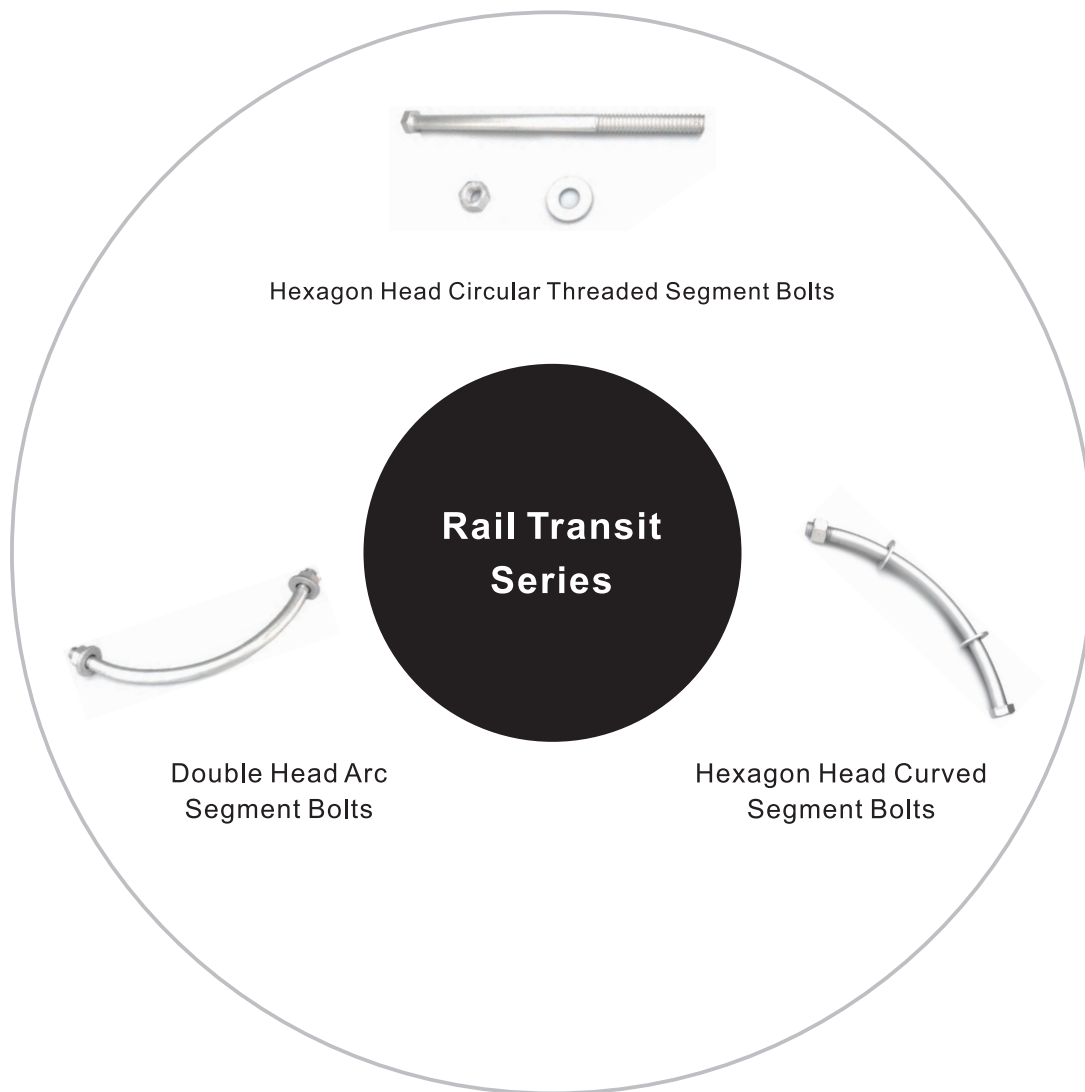
报告编号: WL2019023680

检测项目 /Test Item	检测方法 /Test Method	技术要求 /Requirement	检测结果 /Result	结论 /Conclusion
高强度螺栓连接副扭矩系数平均值	GB/T 1231-2006	0.110~0.150	0.134	符合
高强度螺栓连接副扭矩系数标准偏差	GB/T 1231-2006	≤0.0100	0.0055	符合
高强度螺栓轴力/N	GB/T 1231-2006	367~438	425.4/422.7/421.4/416.5/419.6/423.3/423.9/416.1	符合
螺母保证载荷	GB/T 1231-2006	对螺母施加367N的保证载荷, 持续15s, 螺母不应脱扣或断裂, 当去除载荷后, 应可用手将螺母旋出, 或者借助徒手松开螺母(但不超过半拍)后用手旋出	件均可用手旋出, 试验后螺母均完好	符合
螺母洛氏硬度/HRC	GB/T 1231-2006	989B~529B	27.5/28.0/27.0/28.5/28.5/27.5/28.0/27.0/27.0/27.0	符合
垫片洛氏硬度/HRC	GB/T 1231-2006	35BRC~45BRC	42.5/43.0/42.5/43.0/43.0/43.0/43.0/43.5	符合

检测/Inspected by: **蒋小经** 以下空白

武汉国检检测技术有限公司  
授权签字人/Approved by: **汪超**

报告日期/Report Date: 2019/07/04 页码/Page: 2/2



category	Name	Standard Code	remarks
		GB (code)	
Rail Transit Series	bolt	GB/T 5782 GB/T 901	reference
	nut	GB/T 6170	reference
		GB/T 41	reference





# Rail Transit Series














## Segment bolt series

Segment bolts are a special type of fastener used by shield tunneling machines to connect and fasten their segments during tunneling. Through this bolt connection, several arched segments can be connected into a circle. Therefore, the surface that supports the entire tunnel is also called a segment bolt, and even becomes a segment connector, or because it is used for shield tunnels, it is called a shield tunnel segment bolt or connector.

Application Industry	Installation method
It is specially used for segment connection of various shield tunneling tunnels, such as highway crossing river tunnels, railway shield tunnels, power cable shield tunnels, power plant suction shield tunnels, gas pipeline engineering shield tunnels, and highway mountain shield construction tunnel, ocean shield tunnel, municipal engineering, civil defense engineering, military special engineering, etc.	The shield tunnel section is connected by bolts one by one by circular segments, and each segment has reserved segment bolt holes. Each ring has horizontal and vertical segment bolts connected together, and each ring has six to eight tape-shaped segments that are joined together to form a cylindrical pipe.

Hexagon Head Circular Threaded Segment Bolts	Double Head Arc Segment Bolts	Hexagon Head Curved Segment Bolts	Stainless Steel Straight Segment Bolt	Stainless Steel Curved Segment Bolt
				
Bolts material: 45#, 40Cr, 316      Performance level: 5.8, 6.8, 8.8 Surface treatment: hot-dip galvanizing, dacromet, nanocomposite Powder galvanizing, natural surface finish Application areas: subway shield, tunnel segment connection				

			
Sherardizing-anti-alkali surface treatment	Dacromet + anti-alkali surface treatment	Sherardizing surface treatment	Dacromet surface treatment

Specification	M16	M24	M27	M30
Straight thread	39, 42	39, 42, 45	42, 45, 50	42, 45, 50
radian	R200, R310	R350, R360, R380	R350, R360, R380	R350, R360, R380
Opposite side	23.16	35.0	40.0	45.0
Diagonal distance	26.17	39.55	45.2	50.85
Head thickness	10.0	15.0	17.0	18.7



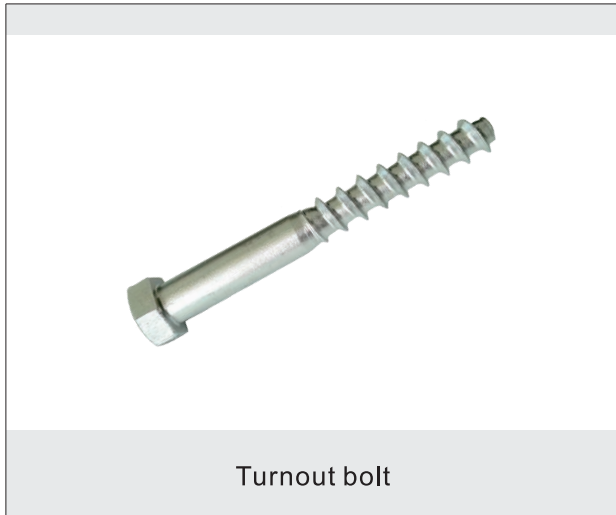
6.8 grade segment bolt technical parameter list							
Name of the part	Material	Hardness value HV	Tensile strength MPa	Surface treatment	Coating thickness $\mu\text{m}$	Salt spray time h	
Segment Bolts	Bolts	45#/40Cr	190-250	$\geq 600$	Dacromet	$\geq 6.8.6$	480, 1000
	nut	45#	170-302	/			
	washer	/	140-300	/			

8.8 grade bolt technical parameter table							
Name of the part	Material	Hardness value HV	Tensile strength MPa	Surface treatment	Coating thickness $\mu\text{m}$	Salt spray time h	
Segment Bolts	Bolts	45#/40Cr	255-335	$\geq 800$	Dacromet	$\geq 6.8.6$	480, 1000
	nut	45#	233-353	/			
	washer	/	140-300	/			

Major Project Cases		
No.	Name	Implementation year
1	XBZH-1 Standard Six Work Area of the Pearl River Delta Intercity New Baiguang Project	2018
2	Section 02 of Xiamen Metro Line 4	2018
3	Xiamen Rail Transit Line 6	2018
4	Taiyuan Metro	2018
5	Xi'an Metro Line 6	2018
6	Section 13 of Shijiazhuang Metro Line 3 Phase I	2019
7	Shijiazhuang Metro Line 2	2019
8	Xi'an Metro Line 14	2019
9	Xi'an Metro Line 14	2019
10	Shijiazhuang Metro Line 3 Phase II	2019
11	Kunming Metro Line 5	2019
12	Changsha Rail Transit Line 6 Central City Section	2020
13	Shijiazhuang Metro Line 1	2020
14	Nantong Rail Transit Line 2	2020
15	Xi'an Metro Line 6	2020
16	Section 3 of Shenyang Metro Line 2	2020
17	Shenyang Metro Line 2 Tender Section 4	2020
18	Suzhou Rail Transit Line S1-15	2020
19	Suzhou Rail Transit Line S1-09	2020
20	Section 02 of Suzhou Rail Transit S1 Line	2020



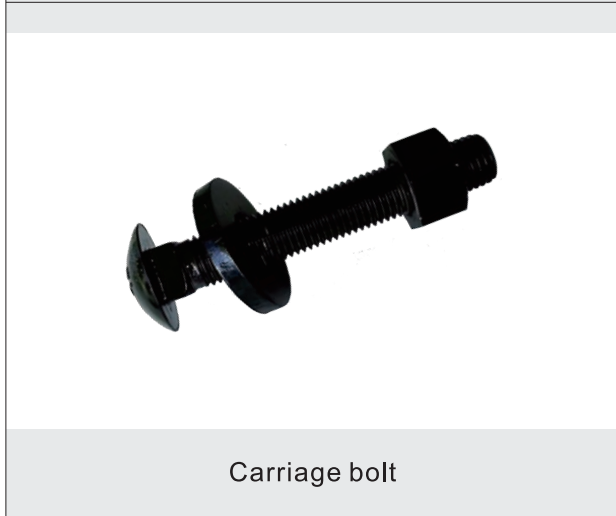
Track matching bolts



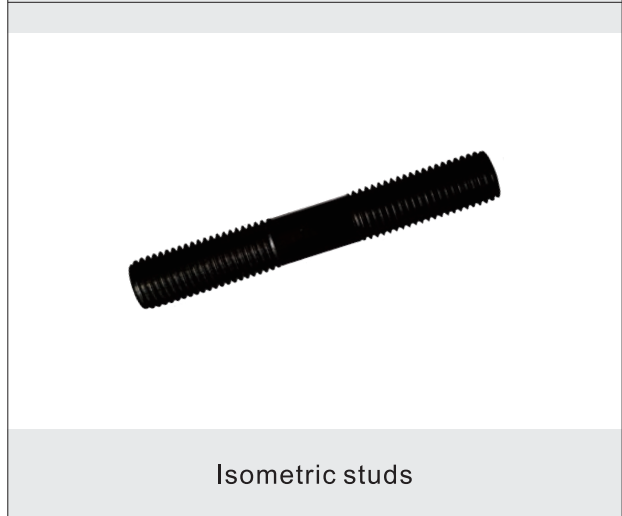
Turnout bolt



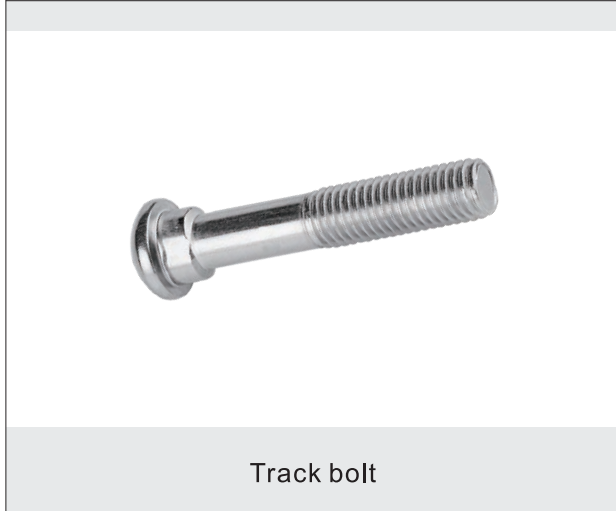
Hexagon head bolts



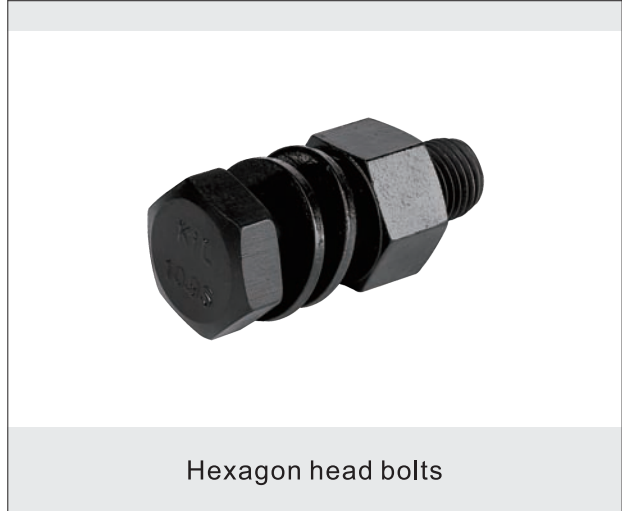
Carriage bolt



Isometric studs



Track bolt



Hexagon head bolts



# Test report and certificate



广东省东莞市质量监督检测中心  
Guangdong Dongguan Quality Supervision & Testing Center

检验报告  
No: M20060038

共 2 页, 第 1 页

样品名称	垫片螺栓 8.8级	商标	KIL
型号/规格/颜色	M27×529.6	等级	8.8级
生产单位及地址	广东坚朗五金制品股份有限公司 东莞市塘厦镇大坪堂村3号	生产日期/批号	
委托单位及地址	广东坚朗五金制品股份有限公司 东莞市塘厦镇大坪堂村3号	检验类别	型式试验
样品数量	3个	单号	M1072273
样品状况	正常	接样日期	2020-06-05
		检验日期	2020-06-28
检验依据	GB/T 2098.1-2010 紧固件机械性能 螺栓、螺钉和螺柱 GB/T 2098.2-2015 紧固件机械性能 螺母 GB/T 4956-2003 磁性基体上非磁性覆层 覆层厚度测量 磁性法 受检方提供的垫片螺栓图纸及技术要求		
判定依据	GB/T 2098.1-2010 紧固件机械性能 螺栓、螺钉和螺柱 GB/T 2098.2-2015 紧固件机械性能 螺母 GB/T 4956-2003 磁性基体上非磁性覆层 覆层厚度测量 磁性法 受检方提供的垫片螺栓图纸及技术要求		
检验结论	所检项目符合GB/T 2098.1-2010、GB/T 2098.2-2015、GB/T 4956-2003标准要求及受检方提供的垫片螺栓图纸及技术要求的。		
备注			

批准: 黄伟 审核: 郭海峰 编制: 何平

日期: 2020年06月28日

广东省东莞市质量监督检测中心  
Guangdong Dongguan Quality Supervision & Testing Center

检验报告  
No: M20060038

共 2 页, 第 2 页

序号	检验项目	单位/符号	标准要求	检测结果	单项评价	
1	螺栓实物抗拉强度Re	MPa	≥830	864, 断裂发生在未旋合螺纹长度内	合格	
2	螺栓洛氏硬度 (H <sub>R</sub> , r/2内)	—	23-34HRC	23.1HRC 23.2HRC 23.0HRC	合格	
3	螺栓镀层厚度	头部	um	≥70	77.3	合格
		杆部	um	≥70	80.0	
4	垫圈邵氏硬度	—	≥1400N/30	172HF30 166HF30 174HF30	合格	
5	垫圈镀层厚度	um	≥70	72.3	合格	
6	六角螺母支承面氏硬度	—	233-353H/30	293HF30	合格	
7	六角螺母侧边厚度	um	≥70	71.6	合格	

检验结果说明: 1. 检验地点: 长安分地点

实验室地址: 松山湖本部: 广东省东莞市松山湖科技产业园区工业南路2号  
长安分地点: 广东省东莞市长安镇富源路10号  
石碣分地点: 广东省东莞市石碣镇洪中南路185号石碣华创创新科技园四楼  
东城分地点: 广东省东莞市东城区沙河科技园广汇工业2号楼

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**广东省东莞市质量监督检测中心**  
Guangdong Dongguan Quality Supervision & Testing Center

**检验报告**

册证号: 524K3580  
No: M20060037

共 2 页, 第 1 页

样品名称	管片螺栓 6.8级	商标	KIL
型号/规格/颜色	M27×529, 6	等级	6.8级
生产单位及地址	广东翠明五金制品有限公司 东莞市塘厦镇大坪堂路3号	生产日期/批号	
委托单位及地址	广东翠明五金制品有限公司 东莞市塘厦镇大坪堂路3号	检验类别	型式试验
样品数量	2个	单号	M1072273
样品状况	正常	接样日期	2020-06-05
		报告日期	2020-07-01
检验依据	GB/T 3098.1-2010 紧固件机械性能 螺栓、螺钉和螺柱 GB/T 3098.2-2015 紧固件机械性能 螺母 GB/T 4956-2003 磁性基体上非磁性覆层 覆层厚度测量 磁性法 受检方提供的管片螺栓图纸及技术要求		
判定依据	GB/T 3098.1-2010 紧固件机械性能 螺栓、螺钉和螺柱 GB/T 3098.2-2015 紧固件机械性能 螺母 GB/T 4956-2003 磁性基体上非磁性覆层 覆层厚度测量 磁性法 受检方提供的管片螺栓图纸及技术要求		
检验结论	所检项目符合GB/T 3098.1-2010、GB/T 3098.2-2015、GB/T 4956-2003标准要求及受检方提供的管片螺栓图纸及技术要求。		
备注			

批准: 黄小科 审核: 郭清辉 编制: 何平

检验检测专用章  
签发日期: 2020年07月01日

**广东省东莞市质量监督检测中心**  
Guangdong Dongguan Quality Supervision & Testing Center

**检验报告**

共 2 页, 第 2 页

册证号: M20060037

序号	检验项目	单位符号	标准要求	检测结果	单项评价
1	螺栓实物抗拉强度 $R_m$	MPa	$\geq 600$	606, 断裂发生在未装合螺纹长度内	合格
2	螺栓清洗精度 (1.6, r/2 内)	—	89-99.999B	92.399B 94.118B 94.999B	合格
3	螺栓镀层厚度	头部	$\geq 70$	83.0	合格
		杆部	$\geq 70$	75.8	
4	垫圈镀层厚度	—	$\geq 140000$	153000 162000 171000	合格
5	垫圈镀层厚度	$\mu m$	$\geq 70$	75.1	合格
6	六角螺母镀层厚度	—	170-302000	300000	合格
7	六角螺母镀层厚度	$\mu m$	$\geq 70$	73.2	合格

检验结果说明: 1. 检验地点: 长安分地点

实验室地址: 松山湖本部: 广东省东莞市松山湖科技产业园区工业南路2号  
长安分地点: 广东省东莞市长安镇莲湖路10号  
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WWW.DDQDT.COM

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Add: No.2, Dongguo South Road, Dongguan Life Sci-Tech Industrial Park, Dongguan, Guangdong, China.  
邮编: P.C. 523808  
电话: Tel: 0769-23071111  
传真: Fax: 0769-23077200  
网址: Web: WWW.DDQDT.COM



# Carbon Steel Bolts (I)

## Introduction of Carbon Steel Bolts

According to the performance grade, carbon steel bolts can be classified into 3.6, 4.6, 4.8, 5.6, 6.8, 8.8, 9.8, 10.9, 12.9 etc.

For example:

The material of the bolts is low carbon alloy steel or the medium carbon steel, meanwhile it has grade 8.8 and above, after heat treatment (quenching, temper), these bolts are called high-strength bolts, and the others are called ordinary bolts.

Performance grade consists of two figures which stand for the nominal tensile strength and yield ratio of bolt material.

For example the performance grade 4.6 means:

- Nominal tensile strength is 400MPa
- Yield ratio is 0.6
- Yield strength is 240MPa from the formula  $400 \times 0.6$

After the heat treatment of material, the high-strength bolt grade 10.9 can achieve the following performance:

- Nominal tensile strength 1000Mpa
- Yield ratio 0.9
- Yield strength  $1000 \times 0.9 = 900\text{MPa}$

The meaning of bolt performance grade is general international standard. The bolts with same performance grade, despite of the material and producing area, the performance are the same, just need to select the performance grade during designing.

- Strength grade 8.8 and 10.9 means the bolt's shear stress grade is 8.8GPa and 10.9GPa. The 's' in 10.9s means steel structure.

High-strength bolts are mainly applied to steel structure projects, to connect the steel plate.

- High-strength bolts can be classified into tor-shear types high-strength bolts and big hexagonal high strength bolts
- Big hexagonal head high strength bolts are the high strength grade in ordinary bolts, while the tor-shear type high strength bolts are the improved types of big hexagonal head high strength bolts.



## Carbon Steel Bolts (II)

### Outline of High-strength Bolts

Name	Material	Surface Treatment	Grade	Standard	Remark
Torsional shear type high strength bolts	20MnTiB/35VB	blacken	10.9S	GB/T3632	screw/ one flat washer/nut
Welding nails(studs)	ML15/ML15Al	nature finish	—	GB/T10433	screw/magnetic ring
Big hexagon head bolts	20MnTiB/35VB	blacken	10.9S	GB/T1228~1231	screw/ two flat washers/nut
Inner hexagon Cylindrical head screws	10B21/35/45	blacken/galvanized /dacromet	4.8/8.8/10.9/12.9	DIN912	configuration according to client's requirement
Hexagon flange bolts	10B21/35/45	galvanized	4.8/8.8/10.9	GB/T5787	
Double head screws	35/45	blacken/galvanized	4.8/8.8/12.9	GB/T953	

### Performance grade

Category	Bolt	Nut	Washer
Form size	according to GB/T1228	according to GB/T1229	according to GB/T1230
Performance grade	10.9S	10H	35-45HRC
	8.8S	8H	35-45HRC

### Mechanical properties

Thread specification M	Performance grade	Material	Tensile strength Mpa
M12-M24	10.9S	20MnTiB	1040-1240
M27-M30		35VB	
M12-M24	8.8S	20MnTiB	830-1030
M27-M30		35VB	





# Fastener FAQ

1. Self-tapping screws are not used directly on the profile without drilling the corresponding bottom hole, resulting in fractures and phillips screws slipped that cannot be used.

Specification	Reference torque (Nm)		Breaking torque (Nm)	Prefabricated hole diameter (mm)	Plate thickness (mm)
	Screw-in type	Cutting type			
ST2.2	0.24	0.3	0.45	1.95	1.2-1.3
ST2.6	0.48	0.6	0.9	2.2	1.2-1.3
ST2.9	0.8	1	1.5	2.4	1.2-1.3
ST3.3	1.07	1.33	2	2.7	1.2-1.3
ST3.5	1.45	1.8	2.7	2.95	1.8-2
ST3.9	1.82	2.27	3.4	3.25	1.8-2
ST4.2	2.36	2.93	4.4	3.45	1.8-2
ST4.8	3.37	4.2	6.3	4.05	3-3.2
ST5.5	5.35	6.67	10	4.75	3-3.2
ST6.3	7.29	9.08	13.6	5.5	4.5-5
ST8	16.5	20.5	30.8	6.9	5-6.85

Note: The red specifications in the table are common specifications

2. The rotating speed of the used tool is too fast, and the tool is used for a long time after the screw is tightened, causing the screw to break and phillips screws slipped to be unusable.

3. The bit is too long, and the bit and the screw shake greatly, which makes it impossible to drill or break the screw.

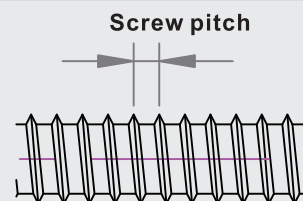
4. The bit does not match the phillips screws, and the cap head phillips screws slipped after being forcibly used, making the screws unusable.

5. Stainless steel (304/316) screws are used on steel linings, steel frames, screws cannot be drilled, heads are damaged, and cap screws cannot be used.

6. During the use of the screw, double-layer obstacles will cause the screw to break.

7. The thickness of the profile to be drilled is greater than 2/3 of the length of the self-drilling self-tapping drill bit, which causes fracture and phillips screws slipped.

8. The mismatch between the pitch of the screw and the thickness of the profile results in a tight screw lock.



9. Due to the different materials, different tooth pitches need to be selected. If the material is not selected correctly, problems such as screw breakage and phillips screws slipped due to cutting objects cannot be ruled out.

## 10. Common terms

Common terms		
	ST-Self-tapping nominal mark	M-Metric mechanical teeth nominal mark



11.The product material hardness is different, you need to choose the correct screw

Characteristics and application of the material 410	
<p>The material 410 (i.e. 1Cr13) is a kind of martensite stainless steel which has magnetism. Its main feature is that the core and surface hardness can be improved by heat treatment. It has a high comprehensive mechanical properties. But the corrosion resistance is not as good as 304,302. For the screw made of 410, no need to drill hole in advance, it can penetrate the steel plate directly,to realize drilling,tapping,locking at a time, saving time and labor. Though having a high comprehensive mechanical properties, its corrosion resistance is not good, need to pay attention to the application environment.</p>	<ul style="list-style-type: none"> <li>▶ no direct contact to rain water</li> <li>▶ not suitable for strong acid and alkali</li> <li>▶ not suitable for the environment with high humidity</li> <li>▶ not suitable for seaside</li> <li>▶ not suitable for the place near chemical factory</li> </ul>
<p>Notes:If need to use in above cases, then must enhance the corrosion resistance first, which can be achieved by doing the treatment Dacromet on the surface. Otherwise, it can not be used directly.</p>	

Material	Tensile strength N/mm <sup>2</sup>	Hardness HV	Application	Appearance	Corrosion resistance	Working environment	Thickness of the fixed plate
1022A Coating nail	1000	surface: HV450-650 core: HV280-400	plastic+steel keel wood+thick engineering plastic wood+steel keel fiberboard+steel keel	electroplate	No red rust after leaving the entire screw in the neutral salt fog for 72 hours	neutrality indoor	apply to the steel plate with thickness below 12mm, not apply to stainless steel plate
SUS304	500-700	surface: HV210-270 core: HV190-230	plastic+thin plastic aluminum wood board+ plastic plastic+thin steel wood+thin steel, aluminum board fiberboard+thin steel, aluminum board	nature finish	No red rust after leaving the screw head in the neutral salt fog for 120 hours	neutrality indoor exposed outdoor corrosive outdoor littoral area indoor	apply to the steel late with thickness below 1mm, and the aluminum plate thickness below 6mm
SUS316	500-700	surface: HV210-270 core: HV190-230	plastic+thin plastic wood+plastic plastic+thin steel wood+thin steel, aluminum board	nature finish	No red rust after leaving the screw head in the neutral salt fog for 120 hours	neutrality indoor exposed outdoor corrosive outdoor littoral area indoor littoral area outdoor	apply to the steel plate with thickness below 1mm, and the aluminum plate thickness below 6mm
SUS410	1400-1600	surface: HV580-680 core: HV350-450	plastic+steel, stainless steel keel wood+thick engineering plastic wood+steel, stainless steel keel fiberboard+steel, stainless steel keel	nature finish	No red rust after leaving the screw ead in the neutral salt fog for 72 hours	neutrality indoor exposed outdoor littoral area indoor	apply to the steel plate with thickness below 12mm, and the stainless steel plate thickness below 5mm

Notes:

- 1.Neutrality refers to the neutral climate in the inland. Corrosive environment is the environment with alkaline, sulfide, such as chemical, smelting, paper making, food and pharmaceutical factories, etc;
- 2.Littoral area: A region within 10KM from the coastline.



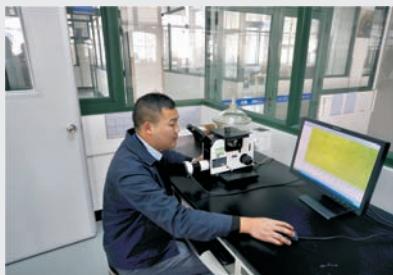
## National Accreditation Laboratory

Technology Innovated, Beauty Created

KIN LONG builds a provincial level technology center and owns a laboratory certified by China National Accreditation Service. KIN LONG establishes the research and development center and sets up the market orientated product development mechanism. Owing more than 600 patents in China and abroad, KIN LONG was awarded as one of national high-

end technology enterprises.

Relying on strong R&D and test capacity, KIN LONG is also actively involved in the edition of National standard, Industrial standard and local standard. Till now, KIN LONG has completed editions of more than a hundre standards.





## Commonly Used National Standard for Screws

National Standard No.	Name	National Standard No.	Name
GB/T5780	Hexagon head bolts/Grade C/Half thread	GB/T846	Cross recessed countersunk head tapping screws
GB/T5781	Hexagon head bolts/Grade C/Full thread	GB/T5283	Slotted countersunk head tapping screws
GB/T5782	Hexagon head bolts/Grade A&B	GB/T5284	Slotted oval head tapping screws
GB/T5783	Hexagon head bolts/Full thread/Grade A&B	GB/T865	Countersunk head rivets
GB/T41	I-Shape hexagon nuts /Grade C	GB/T867	Cup head rivets
GB/T6170	I-Shape hexagon nuts /Grade A&B	GB/T99	Slotted round head wood screws
GB/T93	Spring washer	GB/T100	Slotted countersunk head wood screws
GB/T97	Flat washer	GB/T101	Slotted oval head wood screws
GB/T859	Light-type spring washer	GB/E950	Cross recessed round head wood screws
GB/T95	Flat washer/Grade C	GB/T951	Cross recessed countersunk head wood screws
GB/T67	Recessed pan head screws	GB/T952	Cross recessed oval head wood screws
GB/T68	Recessed countersunk head screws	GB/T1014	Large oval head socket shank rivets
GB/T70	Hexagon socket head cap screws	GB/T12615	Enclosed mushroom flat self-plugging rivets
GB/T818	Cross recessed pan head screws	GB/T12616	Enclosed countersunk flat self-plugging rivets
GB/T819	Cross recessed countersunk head screws	GB/T12617	Slotted countersunk flat self-plugging rivets
GB/T820	Cross recessed oval head screws	GB/T12618	Open type mushroom flat self-plugging rivets
GB/T845	Cross recessed pan head tapping screws		

## Commonly Used Material Chemical Composition Table

Grade	chemical composition%										
TYPE	C	Si	Mn	P	S	Ni	Cr	Mo	Cu	Others	
302	0.15	1	2	0.045	0.03	8.0-1.0	17.0-19.0				Has a good anti-corrosion performance in these mediums like nitric acid, most organic acids and inorganic acids, water solution, phosphoric acid, alkali and gas etc, will obtain a higher strength after cold working.
302HQ/ XM7	0.08	1	2	0.045	0.03	8.5-10.5	17.0-19.0		3.0-4.0		Has good cold working performance, suitable for the parts like cold heading etc.
303	0.15	1	2	0.2	≥0.15	8.0-10	17.0-19.0	≤0.60			Easy to lathe and cut.
303Cu	0.15	1	3	0.2	≥0.15	8.0-10	17.0-19.0	≤0.60	1.5-3.5		Easy to lathe and cut, suitable for automatic lathe.
304	0.08	1	2	0.045	0.03	8.0-10	18.0-20.0				Has good anti-corrosion performance, widely used.
304H	0.08	1	2	0.045	0.03	8.0-10	18.0-20.0				Has good anti-corrosion performance, strength will be enhanced after cold working.
304HC	0.08	1	2	0.045	0.03	8.0-10	18.0-20.0		2.0-3.0		Good cold working performance and good corrosion resistance.
304HCM	0.08	1	2	0.045	0.03	8.0-10	17.0-19.0		2.5-4.0		Good cold working performance and good corrosion resistance.
304L	0.03	1	2	0.045	0.03	9.0-13.0	18.0-20.0				Excellent corrosion resistance of grain boundary, suitable for the parts without heat treatment after welding.
304M	0.06	1	2	0.045	0.03	8.9-10	18.0-20.0				Good corrosion resistance and good drawing performance.
305	0.12	1	2	0.045	0.03	10.5-13.0	17.0-19.0				Good cold working performance and corrosion resistance.
305J1	0.08	1	2	0.045	0.03	11.0-13.0	16.5-19.0				Good cold working performance and corrosion resistance.
309S	0.08	1	2	0.045	0.03	12.0-15.0	22.0-24.0				Good heat resistance and oxidation resistance.
310S	0.08	1.5	2	0.045	0.03	19.0-22.0	24.0-26.0				Good heat resistance and oxidation resistance.
314	0.25	1.5-3.0	2	0.04	0.03	19.0-22.0	24.0-26.0				Better corrosion resistance than SUS 304 in these mediums like sea water and all kinds of organic acid etc.
316	0.08	1	2	0.045	0.03	10.0-14.0	16.0-18.0	2.0-3.0			Better corrosion resistance than SUS 304 in these mediums like sea water and all kinds of organic acid etc.
316Cu	0.03	1	2	0.045	0.03	10.0-14.0	16.0-18.0	2.0-3.0	2.0-3.0		Good cold impacting, good corrosion resistance.
316L	0.03	1	2	0.045	0.03	12.0-15.0	16.0-18.0	2.0-3.0			Important corrosion resistance material, has lower carbon content than SUS316, making it has better corrosion resistance of grain boundary.
321	0.08	1	2	0.045	0.03	9.0-13.0	17.0-19.0			Ti≤5%C	Add Ti to SUS304, having a good corrosion resistance, suitable for fabricating welding core, diamagnetic instrument parts.
410	0.15		1		0.03		11.5-13.5				Having a certain degree of hardness, plasticity and toughness, and the ability to resist saltwater solution, nitric acid and some organic acid with low concentration.
416	0.15		1.25		≥0.15		12-14.0				Better cutting performance than SUS410, suitable or machining on automatic lathe.
420	0.26-0.4		1		0.03		12-14.0				Has better cutting performance.
410L	0.03	1	1	0.04	0.03		11.5-13.5				Has strong toughness.
430	0.12	0.75	1	0.04	0.03		16.0-18.0				The ability to resist corrosion in anti-oxidative media, but there is a tendency to intergranular attachment
430F	0.12	1	1.25	0.06	0.15		16.0-18.0				Has better cutting performance than SUS430, suitable for machining in automatic lathe.
631(J1)	0.09	1	1	0.04	0.03	6.5-8.5	16.0-18.0			Al0.75-1.5	Heat resistant spring action, aging treatment steel.