

LOW HEAD AND ULTRA-LOW HEAD HEXAGON SOCKET HEAD CAP SCREWS

RoHS CBS (Low head hexagon socket head cap screw)
CBSST (Stainless steel low head hexagon socket head cap screw)

Type	M	H	S	Strength class
CBS	SCM435	32~39HRC	Black oxide (Fe ₃ O ₄)	10.9
CBSST	SUSXM7	—	—	A2-50

RoHS CBSS (Ultra-low head hexagon socket head cap screws)

M SCM435
H 32~39HRC
S Black oxide (Fe₃O₄)

(Strength class 10.9
Head strength class M3~M8 5.8
M10 4.8)

M×P	A	E	B	t max.	l	l max.	Catalog No.		Base unit price	
							CBS	CBSST	CBS	CBSST
3×0.5	5.5	2	2	1.5	Full thread	Full thread	CBS 3-6	CBSST 3-6	1~99 pcs. 100~300	100~300
							8	8		
							10	10		
							12	12		
							16	16		
4×0.7	7	2.8	2.5	2.3	Full thread	Full thread	CBS 4-6	CBSST 4-6	1~99 pcs. 100~300	100~300
							8	8		
							10	10		
							12	12		
							16	16		
5×0.8	8.5	3.5	3	2.7	Full thread	Full thread	CBS 5-8	CBSST 5-8	1~99 pcs. 100~300	100~300
							10	10		
							12	12		
							16	16		
							20	20		
6×1.0	10	4	4	3	Full thread	Full thread	CBS 6-8	CBSST 6-8	1~99 pcs. 100~300	100~300
							10	10		
							12	12		
							16	16		
							20	20		
8×1.25	13	5	5	3.8	Full thread	Full thread	CBS 8-10	CBSST 8-10	1~99 pcs. 100~300	100~300
							12	12		
							16	16		
							20	20		
							25	25		
10×1.5	16	6	6	4.5	Full thread	Full thread	CBS 10-16	CBSST 10-16	1~99 pcs. 100~300	100~300
							20	20		
							25	25		
							30	30		
							35	35		
12×1.75	18	7	8	5	Full thread	Full thread	CBS 12-20	CBSST 12-20	1~99 pcs. 100~300	100~300
							25	25		
							30	30		
							35	35		
							40	40		

M×P	A	E	B	t max.	l1 max.	Catalog No.		Base unit price	
						CBSS	CBSS	1~49 pcs.	50~300
3×0.5	6	1.3	1.5	2	1.6	CBSS 3-6	CBSS 3-6		
						8	8		
						10	10		
						12	12		
						16	16		
4×0.7	8	1.5	2	2.5	1.6	CBSS 4-6	CBSS 4-6		
						8	8		
						10	10		
						12	12		
						16	16		
5×0.8	9	1.5	3	3	1.6	CBSS 5-8	CBSS 5-8		
						10	10		
						12	12		
						16	16		
						20	20		
6×1.0	10	1.5	3	4	2.0	CBSS 6-8	CBSS 6-8		
						10	10		
						12	12		
						16	16		
						25	25		
8×1.25	13	1.5	4	5	2.5	CBSS 8-8	CBSS 8-8		
						10	10		
						12	12		
						16	16		
						20	20		
10×1.5	16	1.5	5	5	3.0	CBSS10-10	CBSS10-10		
						12	12		
						16	16		
						20	20		
						25	25		

For larger orders, ask about prices/delivery.

Example: 8.8
Indicates that the minimum yield point or proof strength is 80% of the tensile strength.
Indicates that the minimum tensile strength is 800N/mm² (81.6kgf/mm²).

A2-50
Indicates that the minimum tensile strength is 500N/mm² (51kgf/mm²).
Steel class A2 (Austenitic stainless steel)

Order Catalog No. CBS 4-10 CBSST-12 Days to Ship Quotation

Price Quotation

- Features**
- Low head hexagon socket head cap screws
 - Can be used without modification in locations where the heads of conventional hexagon socket head cap screws would cause an obstruction.
 - Ultra-low head hexagon socket head cap screws
 - Developed in order to reduce the space required for the height of the screw head.
 - Unlike flat head screws, countersinking of the opposite material is not required.

NORD-LOCK LOOSENING PREVENTION WASHERS

RoHS NLDP

Equivalent to S20C
47HRC
Thin zinc coating (chrome-free)

2 of these products form a single pair for use.

Bolt	D	d	t	Catalog No.		Base unit price	Volume discount unit price
				Type	No.		
M 3	7.0	3.4	1.8	NLDP	3	1~19 pairs	20~199 pairs
M 4	7.6	4.4	1.8		4		
M 5	9.0	5.4	1.8		5		
M 6	10.8	6.5	1.8		6		
M 8	13.5	8.7	2.5		8		
M10	16.6	10.7	2.5		10		
M12	19.5	13.0	2.5		12		
M16	25.4	17.0	3.4		16		
M20	30.7	21.4	3.4		20		

2 of these products form a single pair for use. Prices marked with * apply to orders for 20~99 pairs.

Order Catalog No. NLDP 6 Days to Ship Quotation

Set sales

Catalog No.		Set price	Pairs/set
Type	No.		
NLDP-B	3	Quotation	200 pairs
	4		
	5		
	6		
	8		
	10		
	12	Quotation	100 pairs
	16		
	20		
	20		

Example

Can be used without enlarging the size of the bolt head counterbore.

Order Catalog No. NLDP-B6 Days to Ship Quotation

Be sure that the quantity is correct when ordering. Example: An order for one NLDP-B6, will result in the delivery of 200 pairs.

Principle of washers for loosening prevention

Washers for loosening prevention have wedge-shaped cams on the inside and radial ribs on the outside. 2 of these washers form a single pair. The cam angle (α) is set larger than the thread lead angle (β). When a force acts to loosen the bolt, the cams of one washer press the cams of the other washer up and away, however due to the wedge effect the washers do not separate by more than the thread pitch.

Installing correctly

2 washers are delivered as a single pair, with adhesive already applied. Before reusing these washers, check that the raised parts have not been crushed and that there is no cracking. Then use in accordance with the correct installation method shown in the figure at right. Remove any other washers or similar items before using these products.

Precautions for repeated use

NLDP can be used repeatedly. At this time, be sure to use lubricating oil.

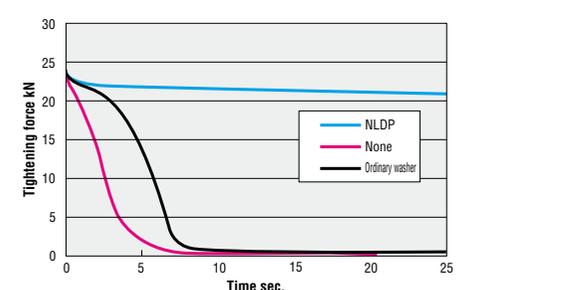
Allowable temperature limit

The maximum allowable temperature for NLDP is 200°C. Do not use these washers at temperatures above this limit.

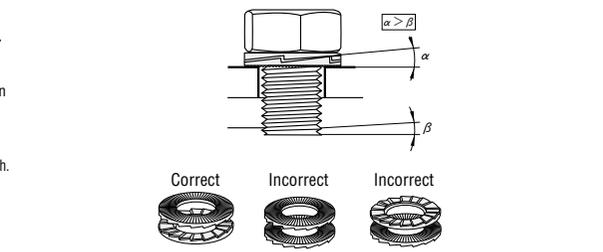
Graph of vibration test results (reference)

Tester: Yanker type vibration tester
Amplitude: ±0.5mm
Frequency: 40 Hz

Loosening prevention washer used: NLDP8
Bolt used: M8 (strength class 12.9)
Clamped material used: Equivalent to S20C (28HRC)



[Fig.] Results of vibration tests with and without NLDP washers



Concerning the clamped material

Marks in the shape of the ribs on the outside of the washers will be left on the clamped material. Use only clamped material with a hardness that is no greater than the hardness of the washers for loosening prevention.

Recommended tightening torque and tightening force

When tightening a bolt and using washers for loosening prevention, refer to the recommended values in the table below. At values that are significantly less than the recommended values, the loosening prevention effects will not be achieved. At values higher than the recommended values, removing the bolts will be difficult and the loosening prevention washers may crack. Use caution.

[Table:] Recommended bolt tightening torques and bolt tightening force when loosening prevention washers are used

NLDP	Bolt M×P	Bolt strength class 12.9 μ : 0.12 Gf=0.75		Bolt strength class 10.9 μ : 0.14 Gf=0.71		Bolt strength class 8.8 μ : 0.14 Gf=0.71	
		Torque Nm	Tightening force kN	Torque Nm	Tightening force kN	Torque Nm	Tightening force kN
3	3×0.5	2	3.9	1.7	3.2	1.3	2.4
4	4×0.7	4.6	6.7	3.8	5.6	3	4.2
5	5×0.8	9	10.9	7.5	9.1	5.9	6.8
6	6×1.0	15.7	15.4	13.1	12.9	10.3	9.7
8	8×1.3	37.6	28.1	31.3	23.4	24.8	17.6
10	10×1.5	74	44	62	37	49	28
12	12×1.8	127	65	106	54	84	40
16	16×2.0	310	120	258	100	203	75
20	20×2.5	607	188	506	156	398	118

μ : Thread coefficient of friction
Gf: Yield point ratio