

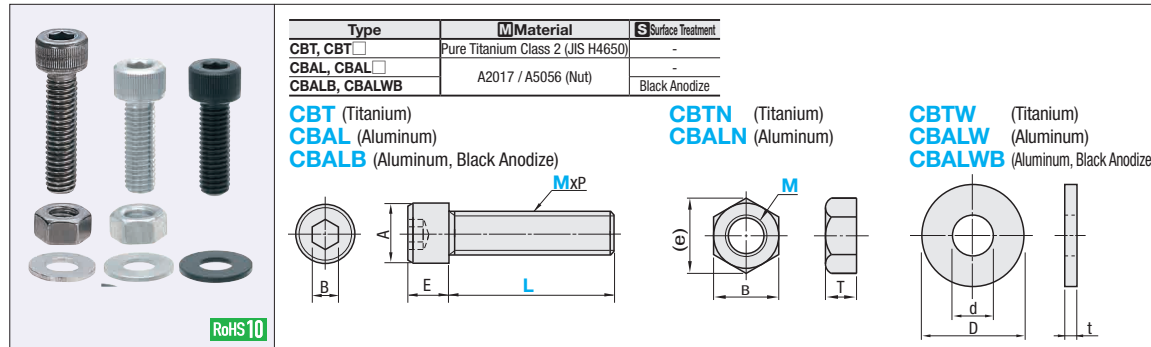
Hex Socket Head Cap Screws / Nuts / Washers

Titanium, Aluminum

Note that, for some of the types shown here, order might be unable to be received by the MISUMI Thailand, Malaysia, Indonesia, and/or India offices.

Hex Socket Button Head Cap Screws

Box



Hex Socket Head Cap Screws

Part Number	M x P	A	E	B	CBT		CBAL		CBALB		Quantity
					Unit Price	Volume Discount Rate	Unit Price	Volume Discount Rate	Unit Price	Volume Discount Rate	
Type	M-L				* Less than*	or More*	* Less than*	or More*	* Less than*	or More*	
CBT CBAL CBALB	3-6	3 x 0.5	5.5	3	2.5						100
	8										
	10										
	12										
	15										
	4-6	4 x 0.7	7	4	3						
	8										
	10										
	12										
	15										
	5-8	5 x 0.8	8.5	5	4						
	10										
	12										
	15										
	20										
6-8	6 x 1.0	10	6	5							
10											
12											
15											
20											
8-15	8 x 1.25	13	8	6							
20											
25											
30											
35											
10-20	10 x 1.5	16	10	8							
25											
30											
35											

Nuts

Part Number	M	B	(e)	T	CBTN		CBALN		* Quantity
					Unit Price	Volume Discount Rate	Unit Price	Volume Discount Rate	
Type	M				* Less than*	or More*	* Less than*	or More*	
CBTN CBALN	3	5.5	6.4	2.4					100
	4								
	5								
	6								
	8								
	10								

Washers

Part Number	No.	D	d	t	CBTW		CBALW		CBALWB		Quantity
					Unit Price	Volume Discount Rate	Unit Price	Volume Discount Rate	Unit Price	Volume Discount Rate	
Type	No.				* Less than*	or More*	* Less than*	or More*	* Less than*	or More*	
CBTW CBALW CBALWB	3	7	3.2	0.5							100
	4										
	5										
	6										
	8										
	10										

Ordering Example

Part Number
CBT5-12
CBTN8
CBTW10

⊙ Sizes with no price listings are not available.

Characteristics of Titanium (JIS H4650 Pure Titanium Class 2)

- Strength of titanium is comparable to low-carbon steel, yet the specific gravity is 60% of steel.
- It can be used in low to high temperatures.
- It has better chemical resistance than that of stainless steel.

Typical Physical Properties of Titanium

Item	Unit	Data
Purity	%	99.5 or More
Tensile Strength	N/mm ²	340~510
Yield Stress	N/mm ²	215 or More
Operating Temp.	°C	-200~350

Chemical Resistance of Titanium

Chemical Solution	Concentration (%)	Temperature (°C)	Titanium	SUS316
Hydrochloric Acid	10	30	⊙	×
Sulfuric Acid	20	30	⊙	×
Sodium Hydroxide	50	120	⊙	○

⊙: Corrosion resistant enough for use.

○: Corrosive but usable depending on conditions.

×: Unusable due to insufficient corrosion resistance.

Changes in Mechanical Characteristics of Titanium by Temperature

Item	Unit	Data		
		-200°C	Ambient Temperature	350°C
Tensile Strength	N/mm ²	994	421	167
Elongation	%	25.7	46	54

Comparison by Metals

Item	Unit	Titanium	Aluminum	Steel
Specific Gravity	g/cm ³	4.5	2.7	7.9
Tensile Strength	N/mm ²	377	78	315
Thermal Conductivity	cal/cm · sec · °C	0.041	0.487	0.145
Young's Modulus	kN/mm ²	106	69	205

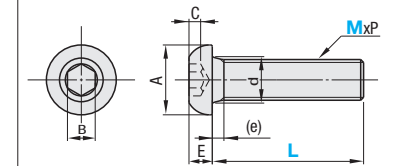
Mechanical Characteristics of Hex Socket Cap Screws (Reference)

	Tensile Breaking Load N		Torsional Breaking Torque N·m	
	Titanium	Aluminum	Titanium	Aluminum
	M3	3210	1650	2.4
M4	5610	2890	4.7	2.5
M5	9080	4680	9.8	6.7
M6	12800	6630	11.3	11.0
M8	23400	12000	22.8	30.0
M10	37100	23560	61.5	48.0

- Shown above are reference values and not guaranteed.
- Recommended tightening torque is torsional shear torque x50%.
- Use torque driver or torque wrench for tightening.
- Values of black anodized products are approx. 80% of values above.



Type	Material	Hardness	Surface Treatment
BOX-BCB	SCM435	34~44HRC	Black Oxide
BOX-SBCB	SUS304 Equivalent	-	-



MxP (Coarse)	A	E	B	C (Min.)	d	(e)
3x0.5	5.7	1.65	2	1.04	3.6	1
4x0.7	7.6	2.2	2.5	1.3	4.7	1.4
5x0.8	9.5	2.75	3	1.56	5.7	1.6
6x1.0	10.5	3.3	4	2.08	6.8	2

⊙ Can be ordered as a separate item P185

⊙ Please specify in box quantity when ordering. One box is shipped for an order of 1.

Ordering Example

Part Number
BOX-BCB5-10
BOX-SBCB5-10

Box package is cost-saving for in-house stock or when large quantities are needed.

Type	M-L	Unit Price 1 to 10 boxes		Pcs./Box		
		Price per pkg.	1 Box			
BOX-BCB	3-5			1,000 pcs./box		
	6					
	8					
	10					
	12					
	15					
	20					
	25					
	4-6				500 pcs./box	
	8					
	10					
	12					
	15					
	20					
	25					
30						
5-8			200 pcs./box			
10						
12						
15						
20						
25						
30						
6-10				500 pcs./box		
12						
15						
20						
25						
30						
BOX-SBCB (Stainless Steel)	3-5					1,000 pcs./box
	6					
	8					
	10					
	12					
	15					
	20					
	25					
	4-6				500 pcs./box	
	8					
	10					
	12					
	15					
	20					
	25					
30						
5-8			200 pcs./box			
10						
12						
15						
20						
25						
30						
6-10				500 pcs./box		
12						
15						
20						
25						
30						

Type	M-L	Unit Price 1 to 10 boxes		Pcs./Box	
		Price per pkg.	1 Box		
BOX-BCB	3-5			1,000 pcs./box	
	6				
	8				
	10				
	12				
	15				
	20				
	25				
	4-6				500 pcs./box
	8				
	10				
	12				
	15				
	20				
	25				
30					
5-8			200 pcs./box		
10					
12					
15					
20					
25					
30					
6-10				500 pcs./box	
12					
15					
20					
25					
30					