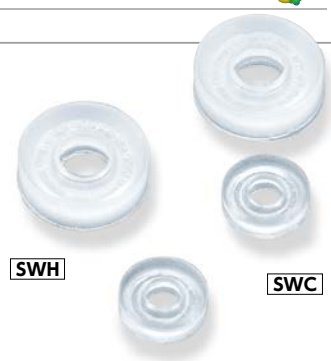
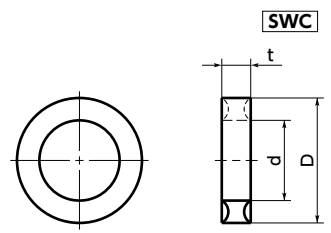
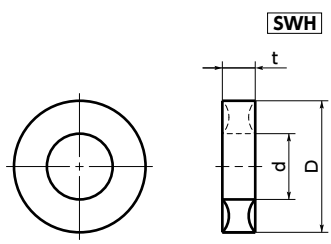




SWH/SWC Locking and Sealing Rings

WEB Selection Tool WEB CAD Download



SWH For Hex head screws and hex Nuts

Part Number	Nominal	d	D	t	Mass (g)	Qty*1 per pack
SWH-3	3	3.2	8	2.2	0.1	10
SWH-4	4	4.15	9.5	2.6	0.1	10
SWH-5	5	5.15	10.6	3	0.2	10
SWH-6	6	6.5	12.7	3.5	0.3	10
SWH-8	8	8.1	16.2	4	0.6	5
SWH-10	10	10.2	19.6	4.5	1	5
SWH-12	12	12.2	23.6	5	1.5	5

*1 The minimum order quantity is 1 piece. → P.794

SWC For Socket Head Cap Screws

Part Number	Nominal	d	D	t	Mass (g)	Qty*1 per pack
SWC-4	4	4.1	7.7	2	0.1	10
SWC-5	5	5.15	9.8	3	0.2	10
SWC-6	6	6.5	10.5	2.5	0.2	10
SWC-8	8	8.1	14	3.3	0.3	10
SWC-10	10	10.2	17	3.8	0.5	10
SWC-12	12	12.2	19	4.4	0.7	5

*1 The minimum order quantity is 1 piece. → P.794

- For sealing of the bolt tightening section.
- **SWH** — For hex head screws and hex nuts
- **SWC** — For socket head cap screws
- Max. Operating Temperature : -60 to 80 deg C
- Also, **SWT** Toothed Washer for locking and sealing rings is available.



Application

Thread Locking and Thread Sealing

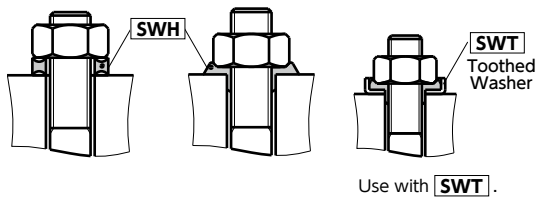
Material/Finish

RoHS Compliant

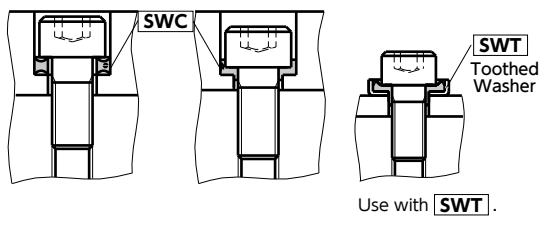
	SWH	SWC
Main Body	Polyamide (White)	Polyamide (White)

Installation Method

- Before Tightening
- After Tightening



- Before Tightening
- After Tightening



Part number specification

SWC-10



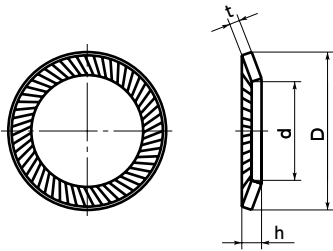
Order in number of packs.
The minimum order quantity is 1 piece. → P.794

Individual Sales → P.794	Cleanroom Wash & Packaging → P.792	Screw Length Adjustment → P.796	Vibration Resistant → P.795	Modification process for captive use → P.791
Available / Add'l charge	Not Available	Not Available	Not Available	Not Available



SWR/SWRS Ribbed Lock Washers

WEB Selection Tool
 WEB CAD Download
 Vibration resistant treatment
 SUS Stainless steel



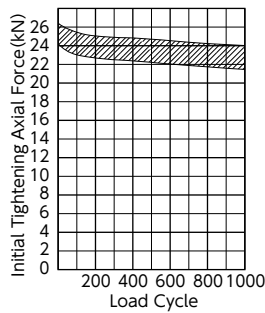
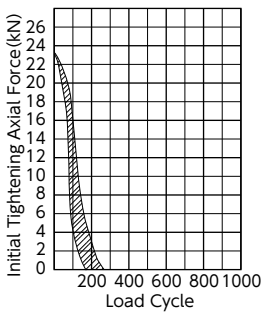
● Material/Finish RoHS Compliant

	SWR	SWRS
Main Body	SCM435 (Hardness 425 - 495 HV) Ferrosoferric Oxide Coating (Black)	SUS304

● Vibration test comparison

Test Hexagon Screws : DIN933 - 8.8-M10 - 35, Vibration : 15Hz, Amplitude : 0.5mm

■ Spring Washer (DIN127) ■ Ribbed Lock Washer (SWR)



- Ribs on both sides of the washer hook onto the bolt bearing surface and intended attachment section to prevent looseness due to vibration.
- Washers for loosing prevention. For connecting locations that cannot use other means such as adhesives.
- More effective for loosing prevention than standard spring washers.

● Application

Vibration Resistant

● Part number specification

SWR-10



Order in number of packs.

The minimum order quantity is 1 piece. ➔ P.794

SWR Steel · Ferrosoferric Oxide Coating

Unit : mm

Part Number	Nominal	d	D	t	h	Mass (g)	Qty per pack*1
SWR-3	3	3.2 ^{+0.3} ₀	5.5 ⁰ _{-0.3}	0.45	0.9	0.05	20
SWR-4	4	4.3 ^{+0.3} ₀	7 ⁰ _{-0.36}	0.5	1	0.08	20
SWR-5	5	5.3 ^{+0.3} ₀	9 ⁰ _{-0.36}	0.6	1.1	0.14	20
SWR-6	6	6.4 ^{+0.36} ₀	10 ⁰ _{-0.36}	0.7	1.2	0.23	20
SWR-8	8	8.4 ^{+0.36} ₀	13 ⁰ _{-0.43}	0.8	1.4	0.43	10
SWR-10	10	10.5 ^{+0.43} ₀	16 ⁰ _{-0.43}	1	1.6	0.82	10
SWR-12	12	13 ^{+0.43} ₀	18 ⁰ _{-0.43}	1.1	1.7	0.89	10
SWR-16	16	17 ^{+0.43} ₀	24 ⁰ _{-0.52}	1.3	2.1	2	10
SWR-20	20	21 ^{+0.52} ₀	30 ⁰ _{-0.62}	1.5	2.4	3.4	5

*1 The minimum order quantity is 1 piece. ➔ P.794

SWRS Stainless Steel

Unit : mm

Part Number	Nominal	d	D	t	h	Mass (g)	Qty per pack*1
SWRS-3	3	3.2 ^{+0.3} ₀	5.5 ⁰ _{-0.3}	0.5	0.95	0.05	20
SWRS-4	4	4.3 ^{+0.3} ₀	7 ⁰ _{-0.36}	0.7	1.2	0.08	20
SWRS-5	5	5.3 ^{+0.3} ₀	9 ⁰ _{-0.36}	0.7	1.2	0.14	10
SWRS-6	6	6.4 ^{+0.36} ₀	10 ⁰ _{-0.36}	0.7	1.2	0.23	10
SWRS-8	8	8.4 ^{+0.36} ₀	13 ⁰ _{-0.43}	1	1.6	0.43	10
SWRS-10	10	10.5 ^{+0.43} ₀	16 ⁰ _{-0.43}	1	1.6	0.82	5
SWRS-12	12	13 ^{+0.43} ₀	18 ⁰ _{-0.43}	1.25	1.85	0.89	5
SWRS-16	16	17 ^{+0.43} ₀	24 ⁰ _{-0.52}	1.5	2.3	2	5
SWRS-20	20	21 ^{+0.52} ₀	30 ⁰ _{-0.62}	1.8	2.8	3.4	5

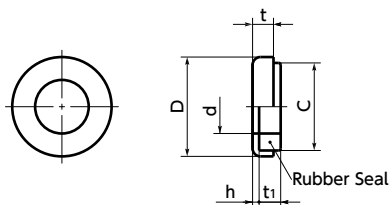
*1 The minimum order quantity is 1 piece. ➔ P.794

Individual Sales ➔ P.794	Cleanroom Wash & Packaging ➔ P.792	Screw Length Adjustment ➔ P.796	Vibration Resistant ➔ P.795	Modification process for captive use ➔ P.791
Available / Add'l charge	Available / Add'l charge	Not Available	Not Available	Not Available



SWS Sealing Washers

WEB Selection Tool WEB CAD Download **SUS** Stainless steel

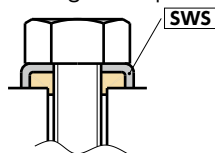


Material/Finish

RoHS Compliant

	SWS	SWS-F
Main Body	SUS304	SUS304
Rubber Seal	NBR	Fluororubber

Usage example



Part number specification

SWS-10-F



Order in number of packs.

The minimum order quantity is 1 piece. → P.794

- Stainless steel sealing washers with a built-in rubber seal.
- Washers prevent the leakage of gas and liquid from the bearing surface of the screw head.
- The rubber does not escape even when the screw is tightened, and the rubber contacts tightly with the thread peak section to form a seal.
- Fluororubber is used for rubber seal of **SWS-F**. Excellent chemical resistance, heat resistance, and ozone resistance.
- Max. Operating Temperature
120°C — **SWS**
200°C — **SWS-F**
- Also, sealing washers with silicone rubber and EPDM rubber seals is available.

Application

Sealing
Hydraulic Equipment, Pneumatic Machinery and Equipment

SWS Rubber Seal : NBR

Unit : mm

Part Number	Nominal	d	D	h	t	t ₁	C	Mass (g)	Qty*1 per pack
SWS-3	3	3.2	7	0.5	2.2	2.2	6.3	0.2	10
SWS-4	4	4.2	8	0.5	2.1	2.3	7.2	0.2	10
SWS-5	5	5.2	9.5	0.8	2.7	2.8	8.2	0.6	10
SWS-6	6	6.2	11.5	1	3	3	9.8	1	10
SWS-8	8	8.2	15.2	1	3.2	3.3	13.4	1.8	5
SWS-10	10	10.2	18	1.5	4	3.8	15.1	3.2	5
SWS-12	12	14.2	24	1.5	4.8	4.6	21.1	6.6	5
SWS-16	16	18.8	30	2	5.3	4.8	26.2	11	5

*1 The minimum order quantity is 1 piece. → P.794

SWS-F Rubber Seal : Fluororubber

Unit : mm

Part Number	Nominal	d	D	h	t	t ₁	C	Mass (g)	Qty*1 per pack
SWS-3-F	3	3.2	7	0.5	2.2	2.2	6.3	0.2	10
SWS-4-F	4	4.2	8	0.5	2.1	2.3	7.2	0.2	10
SWS-5-F	5	5.2	9.5	0.8	2.7	2.8	8.2	0.6	10
SWS-6-F	6	6.2	11.5	1	3	3	9.8	1	10
SWS-8-F	8	8.2	15.2	1	3.2	3.3	13.4	1.8	5
SWS-10-F	10	10.2	18	1.5	4	3.8	15.1	3.2	5
SWS-12-F	12	14.2	24	1.5	4.8	4.6	21.1	6.6	5
SWS-16-F	16	18.8	30	2	5.3	4.8	26.2	11	5

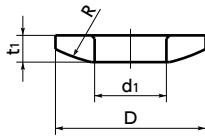
*1 The minimum order quantity is 1 piece. → P.794

Individual Sales → P.794	Cleanroom Wash & Packaging → P.792	Screw Length Adjustment → P.796	Vibration Resistant → P.795	Modification process for captive use → P.791
Available / Add'l charge	Not Available	Not Available	Not Available	Not Available



SQW/SQWS Spherical Washers

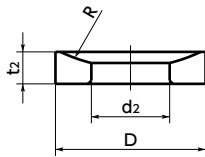
WEB Selection Tool WEB CAD Download SUS Stainless steel



Convex Side



Concave and Convex Set



Concave Side



- Part number specification

SQWS-10



- Use a concave and convex set.
- Washers can absorb a tilt of the bolt and bearing surface to a maximum of 2°.

● Application

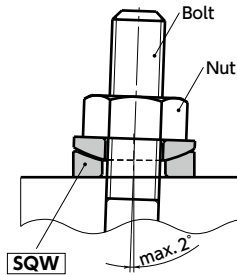
Absorption of misalignment of bolt and bearing surface

● Material/Finish

RoHS Compliant

	SQW	SQWS
Main Body	S45C (Hardness 25 - 30 HRC) Ferroferrous Oxide Coating (Black)	SUS304

● Usage example



SQW Steel • Ferroferrous Oxide Coating

Unit : mm

Part Number	Nominal	D	d1	d2	t1	t2	t	R	Mass (g)	Qty per pack
SQW-3	3	7.3	3.5	3.8	1.3	1.6	2.3	8	0.2	1
SQW-4	4	9.4	4.5	4.9	1.7	2	3	10.2	0.3	1
SQW-5	5	11.5	5.5	6	2.1	2.5	3.7	12.5	0.5	1
SQW-6	6	13	6.6	7.2	2.3	2.8	4.2	15	3	1
SQW-8	8	17	9	9.6	3.1	3.7	5.6	20	7	1
SQW-10	10	22	10.5	12	4	3.5	6	25	13	1
SQW-12	12	26	13.5	15	5	4	7.5	30	22	1

SQWS Stainless Steel

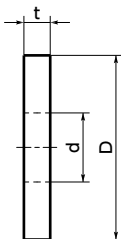
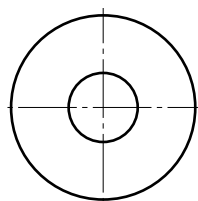
Unit : mm

Part Number	Nominal	D	d1	d2	t1	t2	t	R	Mass (g)	Qty per pack
SQWS-3	3	7.3	3.5	3.8	1.3	1.6	2.3	8	0.2	1
SQWS-4	4	9.4	4.5	4.9	1.7	2	3	10.2	0.3	1
SQWS-5	5	11.5	5.5	6	2.1	2.5	3.7	12.5	0.5	1
SQWS-6	6	13	6.6	7.2	2.3	2.8	4.2	15	3	1
SQWS-8	8	17	9	9.6	3.1	3.7	5.6	20	7	1
SQWS-10	10	23	11	12	4.1	4.9	7	25	17	1
SQWS-12	12	25	14	15	4.5	5.6	8.4	30	21	1

Individual Sales → P.794	Cleanroom Wash & Packaging → P.792	Screw Length Adjustment → P.796	Vibration Resistant → P.795	Modification process for captive use → P.791
1 pc. in 1 bag	Available / Add'l charge	Not Available	Not Available	Not Available

**SWF** High Intensity Flat WashersWEB Selection
ToolWEB CAD
Download

Vibration resistant treatment



- Flat washers for high intensity screws.
- The surface area is twice or more of that of standard washers. Washers eliminate bolt looseness by preventing the sinking of the bearing surface.
- For the connection of materials with low limits for bearing surface pressure such as aluminum and plastic.

● Application

Prevention of bearing surface sinking and loosening

● Material/Finish

RoHS Compliant

	SWF
Main Body	SCM435 (Hardness 350 - 430 HV) Ferrosoferric Oxide Coating (Black)

Unit : mm

Part Number	Nominal	d	D	t	Mass (g)	Qty per pack
SWF-6	6	6.4 ^{+0.3} ₀	17 ⁰ _{-0.43}	3	5	1
SWF-8	8	8.4 ^{+0.3} ₀	23 ⁰ _{-0.52}	4	11	1
SWF-10	10	10.5 ^{+0.3} ₀	28 ⁰ _{-0.52}	4	17	1
SWF-12	12	13 ^{+0.4} ₀	35 ⁰ _{-0.52}	5	33	1
SWF-16	16	17 ^{+0.4} ₀	45 ⁰ _{-0.62}	6	64	1

- Part number specification

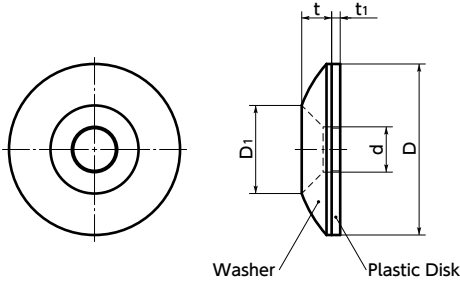
SWF-8

Individual Sales → P.794	Cleanroom Wash & Packaging → P.792	Screw Length Adjustment → P.796	Vibration Resistant → P.795	Modification process for captive use → P.791
1 pc. in 1 bag	Not Available	Not Available	Not Available	Not Available



SWBS Bezel Washers

WEB Selection Tool WEB CAD Download SUS Stainless steel



- Washers are for flat screws. They decorate attachment surfaces beautifully.
- Their smooth slanted shape prevents catching of screw heads.
- The plastic disk prevents damage to the attachment surface.

● Application

Decoration, prevention of catching the screw head, prevention of damage to the intended fastening material

● Material/Finish

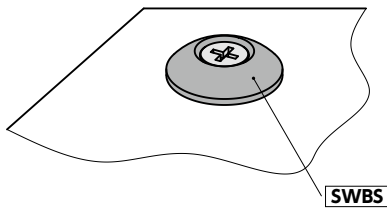
RoHS Compliant

SWBS	
Main Body	SUS303
Plastic Disk	Nylon 6 (White)

Unit : mm

Part Number	Nominal	D	d	D1	t	t1	Mass (g)	Qty per pack
SWBS-4	4	18	4.3	8.5	3	0.8	3.6	1
SWBS-5	5	20	5.3	10.3	3.5	1	5	1
SWBS-6	6	22	6.4	12.3	4	1	7.2	1
SWBS-8	8	26	8.4	16.4	5	1	11	1

- Usage example
For Decoration



- Part number specification

SWBS-6



1 Individual Sales → P.794	Cleanroom Wash & Packaging → P.792	Screw Length Adjustment → P.796	Vibration Resistant → P.795	Modification process for captive use → P.791
1 pc. in 1 bag	Available / Add'l charge	Not Available	Not Available	Not Available

Special Screws
Vacuum Application
Low Profile, Small Head
High Performance S.S.
Titanium
Special Material
Chemical Resistance
Special Surface Treatment
Miniature
Captive/ Full Thread
Functional
Inch
Tamper Resistance
Hexabular Socket Head
Plugs
Plastic
Washers/ Lock Nuts

Hex Socket Head Cap Screws

Full Thread / High Strength Stainless Steel / Configurable Length

SUS316L Hex Socket Head Cap Screws / Hex Screws / Nuts / Washers

Hex Socket Head Cap Screws Full Thread

Type	Material	Surface Treatment	Hardness	Strength Class
ACB	SCM435	Black Oxide Coating	32~44HRC	12.9(M3-M20)10.9(M24)
ASCB	SUS304 Equivalent	-	-	A2-70

RoHS

Hex Socket Head Cap Screws High Strength Stainless Steel

Material: SUS316L
JIS B 1176
* Strength Class: A4-100 (10.9 Equivalent)

RoHS

Part Number	ACB		Part Number	ACB	
	Unit Price	Volume Discount Rate		Unit Price	Volume Discount Rate
Type	M-L	1 ~ 99 pcs.	Type	M-L	1 ~ 99 pcs.
3-25			12-50		
30			55		
35			60		
40			65		
45			70		
50			75		
4-30			80		
35			85		
40			90		
45			100		
50			110		
55			120		
60			16-60		
5-30			65		
35			70		
40			75		
45			80		
50			85		
55			90		
60			100		
65			110		
70			120		
75			20-70		
80			75		
85			80		
90			85		
95			90		
100			100		
10-45			110		
50			120		
55			24-100		
60			110		
65			110		
70			120		
75					
80					
85					
90					
95					
100					
110					
120					

RoHS

Part Number	Unit Price	Volume Discount Rate		
		1 ~ 4 pc(s).	5 ~ 49 pcs.	50 ~ 99 pcs. 100 ~ 500 pcs.
Type	M-L			
3-5				
6				
8				
10				
12				
15				
20				
4-6				
8				
10				
12				
15				
20				
5-8				
8				
10				
12				
15				
20				
6-10				
8				
10				
12				
15				
20				
25				
30				

Mechanical Properties (Reference)

Type	Material	Strength Class	Tensile Strength (N/mm ²)	0.2% Proof Stress (N/mm ²)	Corrosion Resistance	Nonmagnetic
SCB	SUSXM7	A2-70	700	450	○	○
SSCB	SUS316L	A4-70	700	450	○	○
SCBF	SUS316L	A4-100 (10.9 Equivalent)	1000	900	○	○

SCB P.174 SSCB P.180 ○: Excellent / ○: Good

MxP	A	E	B
3x0.5	5.5	3	2.5
4x0.7	7	4	3
5x0.8	8.5	5	4
6x1.0	10	6	5
8x1.25	13	8	6
10x1.5	16	10	8
12x1.75	18	12	10
16x2.0	24	16	14
20x2.5	30	20	17
24x3.0	36	24	19

Material: SUS316L
Strength Class: SSCB A4-70
RSSCB A4-50 Equivalent

RoHS

SUS316L Hex Socket Head Cap Screws

Part Number	Type	M-L	MxP	A	E	B	Unit Price	Volume Discount Rate
							1 ~ 49 pc(s).	50 ~ 200 pcs.
SSCB	3-6							
			3x0.5	5.5	3	2.5		
			4x0.7	7	4	3		
			5x0.8	8.5	5	4		
			6x1.0	10	6	5		
			8x1.25	13	8	6		
			10x1.5	16	10	8		
			12x1.75	18	12	10		

SUS316L Nuts

Part Number	Type	M	B	(e)	T	Unit Price	Volume Discount Rate
						1 ~ 49 pc(s).	50 ~ 200 pcs.
SSLBNR		3	5.5	6.4	2.4		
		4	7	8.1	3.2		
		5	8	9.2	4		
		6	10	11.5	5		
		8	13	15	6.5		
		10	17	19.6	8		
		12	19	21.9	10		

SUS316L Spring Washers

Part Number	Type	No.	d	D	t	Unit Price	Volume Discount Rate
						1 ~ 49 pc(s).	50 ~ 200 pcs.
SSSLW		3	3.1	5.9	0.7		
		4	4.1	7.6	1.0		
		5	5.1	9.2	1.3		
		6	6.1	12.2	1.5		
		8	8.2	15.4	2.0		
		10	10.2	18.4	2.5		
		12	12.2	21.5	3.0		

SUS316L Washers

Part Number	Type	No.	D	d	t	Unit Price	Volume Discount Rate
						1 ~ 49 pc(s).	50 ~ 200 pcs.
SSPW		3	7	3.2	0.5		
		4	9	4.3	0.8		
		5	10	5.3	1.0		
		6	12.5	6.4	1.5		
		8	17	8.4	1.5		
		10	21	10.5	2.0		
		12	24	13.0	2.5		

Ordering Example

Part Number: SSCB5-12 SSSLW8

SUS316L Hex Screws

Part Number	Type	M-L	MxP	A	E	Unit Price	Volume Discount Rate
						1 ~ 49 pc(s).	50 ~ 200 pcs.
RSSCB	4-10						
			4x0.7	7	2.8		
			5x0.8	8	3.5		
			6x1.0	10	4.0		
			8x1.25	13	5.5		
			10x1.5	17	7.0		

Properties of SUS316L

SUS316L is composed of SUS304 with Molybdenum added, having high corrosion resistance.

<Reference: Corrosion Resistance of Stainless Steel>

Before Test	SUS440C	SUS304	SUS316L
48hr			
168hr			

Testing Method: Conforms to the cycle test method in JIS H 8502 for a complex corrosion test.

Test Conditions:

- ① (1) Salt Water Spray Test (5%NaCl, 35°C) 2hr
- ② Dry (60°C) 4hr
- ③ Wet (95%RH, 35°C) 2hr

One cycle takes 8 hrs.

Hex Socket Head Cap Screws Configurable Length

Type	Material	Surface Treatment	Hardness	Strength Class
FBAB	SCM435	Black Oxide	38~43HRC	12.9
FBAM	SUS304 Equivalent	Electroless Nickel Plating	-	A2-70
FBAS	SUS304 Equivalent	-	-	A2-70

RoHS

Part Number	Type	M (Coarse)	L 1mm Increment	l 1mm Increment	Unit Price			
					FBAB	FBAM	FBAS	FBAS
		4	30~100	10~40				
		5	30~100					
		6	35~150					
		8	40~150					
		10	45~210					

For l=L, there will be incomplete threads (2 pitches Max.) below the screw head

Ordering Example

Part Number: FBAS6 - L - l

Example: FBAS6 - 100 - 22

Phillips Round Flat Head Screws / Ornamental Screws / Washers for Ornamental Screw

Phillips Binding Head Screws

Phillips Round Flat Head Screws

Type	Material	Surface Treatment
MSARA	SWCH Equivalent	Trivalent Chromate
MSARAS	SUS304 Equivalent	-

MxP (Coarse)	A	(f)	E	Phillips No.
3x0.5	6	0.7	1.75	2
4x0.7	8	0.9	2.3	2
5x0.8	10	1.2	2.8	2
6x1.0	12	1.4	3.4	3

RoHS

MSARA (Trivalent Chromate)					MSARAS (Stainless Steel)							
Part Number	Unit Price	Volume Discount Rate			Part Number	Unit Price	Volume Discount Rate					
Type	M - L	1 ~ 29 pc(s)	30 ~ 99 pcs	100 ~ 299 pcs	300 ~ 500 pcs	Type	M - L	1 ~ 29 pc(s)	30 ~ 99 pcs	100 ~ 299 pcs	300 ~ 500 pcs	
MSARA	3 - 5					MSARAS	3 - 5					
	6						6					
	8						8					
	10						10					
	12						12					
	4 - 6						4 - 6					
	8						8					
	10						10					
	12						12					
	15						15					
	20						20					
	5 - 8						5 - 8					
10					10							
12					12							
15					15							
20					20							
6 - 10					6 - 10							
12					12							
15					15							
20					20							

Ordering Example **Part Number**
MSARAS4-8

Ornamental Screws / Washers for Ornamental Screw

Type	Material	Surface Treatment
VIS	C2700W	Nickel Plating
VISS	SUS304 Equivalent	-
VIZS	C2700W	Nickel Plating
VIZZ	SUS303	-

M (Coarse)	P (Pitch)	D
3	0.5	6
4	0.7	8
5	0.8	10
6	1.0	12

RoHS

Ornamental Screws				Washers for Ornamental Screw			
Part Number	Unit Price	Volume Discount Rate		Part Number	Unit Price	Volume Discount Rate	
Type	M-L	1 - 99 pc(s)	100 - 500 pcs	Type	d	D	t
VIS (Brass)	3-10			VIZS (Brass)	3	10	2
	15				4	12	2.5
	20				5	14	3
	25				6	16	3.5
	30				3	10	2
	35				4	12	2.5
	40				5	14	3
	45				6	16	3.5
	50				3	10	2
	4-10				4	12	2.5
	15				5	14	3
	20				6	16	3.5
30			3	10	2		
35			4	12	2.5		
40			5	14	3		
45			6	16	3.5		
50			3	10	2		

Ordering Example **Part Number**
VISS-30
VIZS4

Phillips Binding Head Screws

Type	Material	Surface Treatment
BDJ	SWCH Equivalent	Trivalent Chromate
BDJS	SUS304 Equivalent	-

MxP (Coarse)	A	E	Phillips No.
3x0.5	6.3	1.9	2
4x0.7	8.3	2.5	2
5x0.8	10.3	3.1	2
6x1.0	12.4	3.7	3

RoHS

BDJ (Trivalent Chromate)					BDJS (Stainless Steel)							
Part Number	Unit Price	Volume Discount Rate			Part Number	Unit Price	Volume Discount Rate					
Type	M - L	1 ~ 9 pc(s)	10 ~ 29 pcs	30 ~ 49 pcs	50 ~ 500 pcs	Type	M - L	1 ~ 9 pc(s)	10 ~ 29 pcs	30 ~ 49 pcs	50 ~ 500 pcs	
BDJ	3 - 5					BDJS	3 - 5					
	6						6					
	8						8					
	10						10					
	12						12					
	15	-	-	-	-		15					
	20						20					
	25						25					
	30						30					
	5 - 8						5 - 8					
	10						10					
	12						12					
	15						15					
	20						20					
	25						25					
	30						30					
	6 - 10						6 - 10					
	12						12					
15					15							
20					20							
25					25							
30					30							

Ordering Example **Part Number**
BDJ5-10

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

Washers / Washers for Slotted Holes / Metal Washers

Single Item Sale- -Pkg. Sale

Flat washers and spring washers can be ordered by cost saving boxes. P236

Flat Washer

PWF SPWF

Material: SPCC Equivalent (PWF), SUS304 (SPWF)
Surface Treatment: Trivalent Chromate

RoHS

Part Number	Type	d	D		t	PWF			SPWF			
			Normal	PWF		SPWF	Unit Price	Volume Discount Rate	Unit Price	Volume Discount Rate		
2	2.2	4.3	5	0.3	1-24 pc(s)	25-199 pcs	200-499 pcs	500-1000 pcs	1-24 pc(s)	25-199 pcs	200-499 pcs	500-1000 pcs
2.5	2.7	5	6.5	0.5								
2.6	2.8	5	6.5	0.5								
3	3.2	6.0	7.0	0.5								
4	4.3	8.0	9.0	0.8								
5	5.3	10.0	10.0	1.0								
6	6.4	12.5	12.5	1.6								
8	8.4	15.5	17.0	3.0								
10	10.5	18.0	21.0	2.0								
12	13.0	21.0	24.0	2.5								
16	17.0	28.0	30.0	3.0								
20	21.0	34.0	37.0	4.0								
24	25.0	39.0	44.0	4.0								

Spring Washer

SLW SSLW

Material: SWRH (SLW), SUS304N1 (SSLW)
Surface Treatment: Trivalent Chromate

RoHS

Part Number	Type	d	D	t	SLW			SSLW			
					Unit Price	Volume Discount Rate	Unit Price	Volume Discount Rate			
2	2.1	4.4	0.5	1-24 pc(s)	25-199 pcs	200-499 pcs	500-1000 pcs	1-24 pc(s)	25-199 pcs	200-499 pcs	500-1000 pcs
2.5	2.6	5.2	0.6								
2.6	2.7	5.3	0.6								
3	3.1	5.9	0.7								
4	4.1	7.6	1.0								
5	5.1	9.2	1.3								
6	6.1	12.2	1.5								
8	8.2	15.4	2.0								
10	10.2	18.4	2.5								
12	12.2	21.5	3.0								
16	16.2	28.0	4.0								
20	20.2	33.8	5.1								
24	24.5	40.3	5.9								

Ordering Example **Part Number PWF3**

Washers for Slotted Holes

PACK-PWFN PACK-SPWFN

Material: SPCC (PACK-PWFN), SUS304 (PACK-SPWFN)
Surface Treatment: Trivalent Chromate

RoHS

Part Number	Type	d	D	T	d	D	T	PACK-PWFN		PACK-SPWFN	
								Unit Price	Volume Discount Rate	Unit Price	Volume Discount Rate
3	3.4	8	1	3.3	8	1	50	1-2 pkg(s)	3 pkg(s) or More	1-2 pkg(s)	3-500 pkg(s)
4	4.5	10	1.6	4.5	10	1.5	50				
5	5.5	16	2	5.5	12	2	20				
6	6.5	16	3.2	6.5	13	3	20				
8	8.5	20	3	8.5	22	3	20				

Metal Washers

LOWA

Material: Steel for General Structure

RoHS

Part Number	Type	d	D	t	Unit Price		Volume Discount Rate	
					1-49 pc(s)	50-99 pcs	100-200 pcs	201-300 pcs
3	3	6						
4	4	10						
5	5	10						
6	6	14						
8	8	18						
10	10	22						
12	12	25						
16	16	32						

Ordering Example **Part Number PACK-PWFN3 LOWA5**

Lock Washers (Nord-Lock®) / Tab Washers / Disc Spring Washers

NLDF

Material: SUS316L Equivalent
Hardness: 51HRC

RoHS

Part Number	Type	Applicable Screw	D	d	t	Unit Price		Volume Discount Rate
						1-9 pc(s)	10-200 pcs	
3	M3	7	3.4	2.2				
4	M4	7.6	4.4	2.2				
5	M5	9	5.4	2.2				
6	M6	10.8	6.5	2.2				
8	M8	13.5	8.7	2.2				
10	M10	16.6	10.7	2.0				
12	M12	19.5	13	2.0				

This product is to be used in pairs.

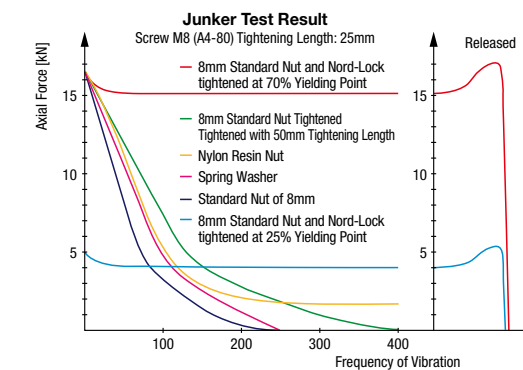
Ordering Example **Part Number NLDF3**

Principle of Lock Washers
A pair of washers with wedge cams on one side and radial ribs on the other side each to compose a self-locking arrangement. Cam angle (α) is set to be larger than the thread lead angle (β). When the screw begins to rotate loose, a force is generated by a cam member to push up and separate from the opposite cam member. The rotation is blocked by the wedge effect and the cams will not be separated by more than one thread pitch.

Proper Installation
The washers come pre-assembled in pairs (glued). Upon reusing, please confirm the cams are not worn or cracked, and follow the installation instruction on the right. Do not use together with other washers.

Cautions on Repeated Use
NLDF can be used repeatedly with a lubricant. Use lubricant for repeated use.

Allowable Temperature
Temperature limit for NLDF is 500°C. Do not use in an environment where the temperature limit is exceeded.



For orders larger than indicated quantity, please check with WOS.

Example

Counterbore dia. does not need to be increased.

About Mating Materials
On the surface of mating materials, there will be impression marks made by the radial teeth of the washers. The hardness of the mating surfaces should not exceed the hardness of the Nord-Lock Washers.

Recommended Tightening Torque and Tightening Force
Please refer to the values listed below as guidelines when securing a screw with a lock washer. There is no self-locking effect when the values are far below recommended values. If the tightened torque exceeds the recommended values, loosening the screws may become impossible or Nord-Lock may be broken.

Screw Tightening Torque and Recommended Tightening Force when Lock Washer is Used. (Lubricant GTP600)

NLDF	Applicable Screw MxP	Screw Strength Class: A2-70 / A4-70 Gf=0.65 μg=0.14 μw=0.14		Screw Strength Class: A2-80 / A4-80 Gf=0.65 μg=0.14 μw=0.14	
		Torque N·m	Tightening Force kN	Torque N·m	Tightening Force kN
3	3x0.5	0.9	1.5	1.2	2
4	4x0.7	2	2.6	2.7	3.4
5	5x0.8	3.9	4.1	5.3	5.5
6	6x1.0	6.9	5.9	9.2	7.8
8	8x1.25	17	11	22	14
10	10x1.5	33	17	43	23
12	12x1.75	56	25	75	33

Tab Washers-One-Tabbed Tab Washers-Two-Tabbed

PACK-ZAST PACK-ZATT

Material: SUS304

RoHS

Serrated Conical Disc Spring Washers

GTS

Material: From S50C to S70C
Hardness: 40 to 48HRC
Surface Treatment: Tempered Collar

RoHS

Part Number	Type	No.	d	D	D1	t	l	l1	b	Unit Price		Volume Discount Rate	
										1-9 pc(s)	10-30 pc(s)	1-9 pc(s)	10-30 pc(s)
3	3	12	7	0.25	13	5	4						
4	4	14	9	0.25	14	7	5						
5	5	17	10		15	8	6						
6	6	18	13	0.5	18	9	6						
8	8	22	16		20	13	7						
10	10	26	20	0.8	22	14	9						
12	12	30	24		27	19	10						
16	16	38	30		32	24	12						
20	20	45	38	1.2	36	28	15						
24	24	52	44		44	35	17						

Part Number	Type	No.	D	d	H	t	Unit Price		Volume Discount Rate		Quantity
							Less than *	* or More	1-49 pc(s)	50-99 70-99 100-500	
3	3	5.5	3.2	0.6	0.45					15000	
4	4	7	4.25	0.7	0.5					10000	
5	5	8.5	5.25	0.85	0.6					5000	
6	6	10	6.4	1.25	1.0					6000	
8	8	13	8.4	1.55	1.2					3000	
10	10	16	10.6	1.90	1.5					2000	
12	12	18	12.6	2.20	1.8					1000	
16	16	24	16.9	2.80	2.3					500	
20	20	30	20.9	3.55	2.8					250	
24	24	36	25.4	4.25	3.5					150	

For orders larger than indicated quantity, please check with WOS.

Ordering Example **Part Number PACK-ZAST3 GTS10 SSRBW8**

For orders larger than indicated quantity, please check with WOS.

Disc Spring Washers

SSRBW

Material: SUS304-CSP
Hardness: 37 to 46HRC
Surface Treatment: Tempered Collar

RoHS

Tapered Washers / Tapered Nuts / Square Nuts / Square Washers

Tapered Washers

Type	Material	Surface Treatment
ZTQ	SS400	Trivalent Bright Chromate Plating
ZTQM	S45C	Trivalent Chromate

RoHS

Tapered Nuts

ZTN

Material: SS400
Surface Treatment: Trivalent Bright Chromate Plating

RoHS

Part Number	Type	Angle α	d	D	Angle 3°		Angle 5°		Angle 8°		ZTQ		ZTQM	
					t1	t2	t1	t2	t1	t2	Unit Price	Volume Discount Rate	Unit Price	Volume Discount Rate
6	ZTQ	3	7	16	1.2	2	1.6	3	1.7	4	1 - 49 pcs(s)	50 - 200 pcs.	1 - 49 pcs(s)	50 - 100 pcs.
8	ZTQ	3	9	18	1.1	2	1.4	3	1.5	4				
10	ZTQ	5	11	22	1.8	3	2	1.9	5					
12	ZTQ	5	14	26	1.6	3	1.7	4	2.3	6				
16	ZTQ	8	18	32	3.3	5	3.2	6	3.5	8				
20	ZTQ	8	21	40	2.9	5	2.5	6	3.4	9				
24	ZTQ	8	27	52	3.3	6	3.5	8	3.7	11				

Part Number	Type	M (Coarse)	Angle α	D	Angle 3°		Angle 5°		Angle 8°		d	Unit Price	Volume Discount Rate
					t1	t2	t1	t2	t1	t2			
6	ZTN	6	3	16	5	5.8	5	6.4	5	7.2	7		
8	ZTN	8	3	18	6.5	7.4	6.5	8.1	6.5	9	9		
10	ZTN	10	5	22	8	9.2	8	9.9	8	11.1	11		
12	ZTN	12	8	26	10	11.3	10	12.2	10	13.5	13		
16	ZTN	16	8	32	13	14.7	13	15.8	13	17.5	17		

Ordering Example: Part Number - **ZTQ6** - **5**

Square Nuts

NSQ

Material: SS400
Surface Treatment: Trivalent Bright Chromate Plating

RoHS

Part Number	Type	M (Coarse)	L	B	T	Unit Price		Volume Discount Rate
						1 - 49 pcs(s)	50 - 500 pcs.	
4	NSQ	4	7	7	3.2			
5	NSQ	5	8	8	4			
6	NSQ	6	16	10	4.5			
8	NSQ	8	42	15.5	6			

Ordering Example: Part Number - **NSQ8**

*For orders larger than indicated quantity, please check with WDS.

Square Nuts, Square Washers - Dim. Configurable 1-Hole

Type	Material	Surface Treatment	
Nuts: FKT, FKTB, FKTS	Washers: FKW, FKWB, FKWS	S45CD	-
		S45CD	Black Oxide
		SUS304	-

RoHS

Part Number	Type	B	1mm Increment	0.5mm Increment	M (Coarse)	T	Unit Price		
							FKT	FKTB	FKTS
16	Nuts	16	16-50	M/2+2P≤A-M/2-2	6	6			
22	Nuts	22			8	6			
25	Nuts	25			10	9			
38	Nuts	38			12	10			

Part Number	Type	B	1mm Increment	0.5mm Increment	D Selection	Unit Price		
						FKW	FKWB	FKWS
16	Washers	16	16-50	D/2+2P≤A-D/2-2	7	9		
22	Washers	22			7	9		
25	Washers	25			7	9	11	14
38	Washers	38			7	9	11	14

Ordering Example: Part Number - **FKW16** - **A20** - **P10** - **D7**

Square Nuts, Square Washers 2-Hole

Type	Material	Surface Treatment	
Nuts: FK2T, FK2TB, FK2TS	Washers: FK2W, FK2WB, FK2WS	S45CD	-
		S45CD	Black Oxide
		SUS304	-

RoHS

Part Number	Type	B	A	P	M	T	Unit Price				Volume Discount Rate			
							1 - 4 pc(s)	5 - 9 pcs.	10 - 49 pcs.	50 - 200 pcs.				
Nuts FK2TS	10	10	25	15	2	3								
							30	20	3	3				
							35	25	3	3				
							50	40	3	3				
							30	15	6	6				
							40	20	6	6				
	16	16	50	30	6	6								
							60	40	6	6				
							120	100	6	6				

Ordering Example: Part Number - **FK2TS10** - **A25** - **P15**

Part Number	Type	B	1mm Increment			M (Coarse)	T
			A	P			
6	Nuts	6	30-200	2M≤P≤A-2M	3	2	
10	Nuts	10			3	3	
16	Nuts	16			6	6	
22	Nuts	22			8	6	
25	Nuts	25			10	9	
38	Nuts	38			12	10	

Part Number	Type	B	1mm Increment			D Selection	T	
			A	P				
6	Washers	6	30-200	2D≤P≤A-2D	4	2		
10	Washers	10			4	6	3	
16	Washers	16			7	9	6	
22	Washers	22			7	9	6	
25	Washers	25			7	9	11	14
38	Washers	38			7	9	11	14

B	Type	Unit Price			
		A30-50	A51-100	A101-150	A151-200
6	FK2TS				
10	FK2TS				
16	FK2TB				
	FK2TS				
	FK2TS				
22	FK2TB				
	FK2TS				
	FK2TS				
25	FK2TB				
	FK2TS				
	FK2TS				
38	FK2TB				
	FK2TS				
	FK2TS				

B	Type	Unit Price			
		A30-50	A51-100	A101-150	A151-200
6	FK2WS				
10	FK2WS				
16	FK2W				
	FK2WB				
	FK2WS				
22	FK2W				
	FK2WB				
	FK2WS				
25	FK2W				
	FK2WB				
	FK2WS				
38	FK2W				
	FK2WB				
	FK2WS				

Ordering Example: Part Number - **FK2T16** - **A40** - **P25**
FK2WS25 - **A50** - **P20** - **D7**