

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: EN 1.0330 Equiv. EN 1.4301 Equiv.
Surface Treatment: Trivalent Chromate

RoHS 10 JIS B 1256

Part Number	d	D		t	PWF		SPWF	
		Normal	PWF		SPWF	Unit Price	Volume Discount Rate	Unit Price
2	2.2	4.3	5	0.3	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					
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					
24	25.0	39.0	44.0	4.0				

Spring Washer

SLW SSLW

Material: JIS-SWRHEN 1.4311 Equiv.
Surface Treatment: Trivalent Chromate

RoHS 10 JIS B 1251

Part Number	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
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: EN 1.0330 Equiv. EN 1.4301 Equiv.
Surface Treatment: Trivalent Chromate

RoHS 10

Features
*Thicker flat washers than the standard type. Usable to prevent washers for slotted holes from falling.

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

Metal Washers

LOWA

Material: EN 1.0038 Equiv.
Surface Treatment: Trivalent Chromate

RoHS 10

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

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

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

NLDF

Material: EN 1.4404 Equiv.
Hardness: 51HRC

RoHS 10

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

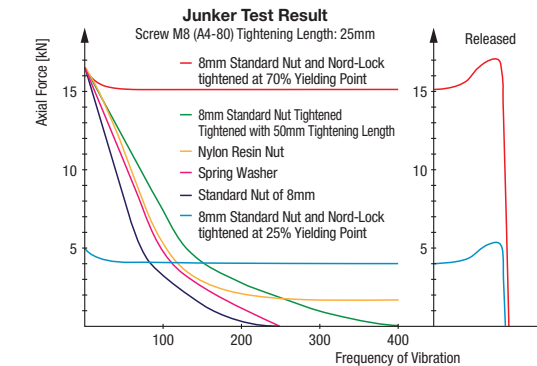
The washers come pre-assembled in pairs (glued). Upon reusing, please confirm the cams are not worn or cracked, and follow the installation instruction on the right. Do not use together with other washers.

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.



Part Number	Type	Applicable Screw No.	D	d	t	Unit Price		Volume Discount Rate
						1 ~ 9 pc(s)	10 ~ 200 pc(s)	
3	M3	7	3.4		2.2			
4	M4	7.6	4.4					
5	M5	9	5.4					
6	M6	10.8	6.5					
8	M8	13.5	8.7					
10	M10	16.6	10.7		2.0			
12	M12	19.5	13					

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

EX Example

Counterbore dia. does not need to be increased.

Correct Incorrect Incorrect

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 $\mu g=0.14$		Screw Strength Class: A2-80 / A4-80 Gf=0.65 $\mu g=0.14$	
		Torque N·m	Tightening Force kN	Torque N·m	Tightening Force kN
		3	3x0.5	0.9	1.5
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

Ⓞ Gf: Coefficient at the Yield Point μg : Coefficient of Friction at Screw Thread μw : Coefficient of Friction in Washer

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

PACK-ZAST PACK-ZATT

Material: EN 1.4301 Equiv.

RoHS 10

10 pcs. per pkg.

Serrated Conical Disc Spring Washers

GTS

Material: From EN 1.1206 Equiv. to S70C
Hardness: 40 to 48HRC
Surface Treatment: Tempered Collar

RoHS 10 JIS B 1251

Disc Spring Washers

SSRBW

Material: EN 1.4301 (CSP) Equiv.
Hardness: 37 to 46HRC

RoHS 10 JIS B 1251 Class 2 Equiv.

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	15	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	t	Unit Price		Quantity
						Less than *	or More	
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.

No.3 to 5, Light Load; No.6 to 24, Heavy Load

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

Part Number	Type	No.	D	d	t	Unit Price		Volume Discount Rate	
						1 - 49 pc(s)	50 - 99	100 - 500	100 - 500
4	4	7.5	4.3	0.7	0.45				
5	5	9.0	5.3	0.85	0.55				
6	6	10.5	6.4	0.95	0.60				
8	8	13.5	8.4	1.3	0.90				
10	10	16.5	10.5	1.6	1.10				
12	12	19.0	13.0	1.75	1.20				

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