

Flat Washers / Spring Washers / Metal Washers

Flat Washers

PWF
SPWF

Type	Material	Surface Treatment
PWF	Low Carbon Steel Equivalent	Trivalent Chromate JIS B 1256
SPWF	304 Stainless Steel	—

Spring Washers

SLW
SSLW

Type	Material	Surface Treatment
SLW	SWRH	Trivalent Chromate JIS B 1251
SSLW	304 Stainless Steel N1	—

Washers for Slotted Holes

PACK-PWFN
PACK-SPWFN

Type	Material	Surface Treatment
PACK-PWFN	Low Carbon Steel	Trivalent Chromate
PACK-SPWFN	304 Stainless Steel	—

Features
Thicker flat washers than the standard type. Usable to prevent washers for Slotted Holes from falling.

Metal Washers

LOWA

Type	d	d _{H7}
3	3.4	+0.010 0
4	4.5	+0.012 0
5	5.5	+0.015 0
6	6.5	+0.018 0
8	8.5	+0.015 0
10	10.5	+0.018 0
12	12.5	+0.018 0
16	16.5	+0.018 0

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

Type	Nominal	d	D		t
			PWF	SPWF	
PWF	2	2.2	4.3	5	0.3
	2.5	2.7	5	6.5	0.5
	2.6	2.8	—	—	—
	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
SPWF	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	—

Type	Nominal	d	D		t
			SLW	SSLW	
SLW	2	2.1	4.4	—	0.5
	2.5	2.6	5.2	—	0.6
	2.6	2.7	5.3	—	—
	3	3.1	5.9	—	0.7
	4	4.1	7.6	—	1.0
	5	5.1	9.2	—	1.3
SSLW	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

Lock Washers (Nord-Lock) / Tab Washers / Serrated Conical Disc Spring Washers / Disc Spring Washers

Lock Washers – Nord-Lock

NLDF

Material: 316 Stainless Steel or Equivalent
Hardness: 51 HRC min.

① This product is to be used in pairs.

Part Number 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 attempts 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 separate by more than one thread pitch.

Proper Installation

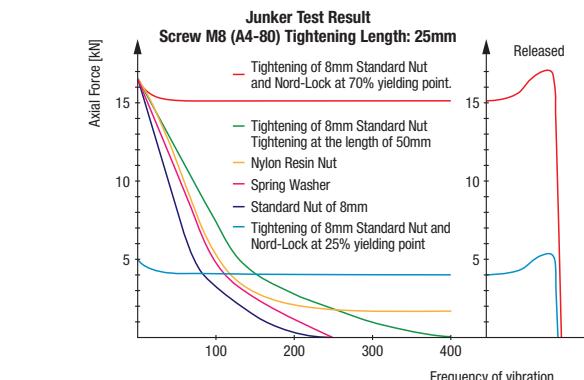
The washers come pre-assembled in pairs (glued). Upon reusing, please confirm the cams are not worn or cracked, and follow the installation instruction on the right. Do not use together with other washers.

Cautions on Repeated Use

NLDF can be used repeatedly with a lubricant.

Allowable Temperature

Temperature limit for NLDF is 500°C. Do not use in an environment when it exceeds the temperature limit.



Tab Washers One-Tabbed Two-Tabbed
① 10/Pkg

PACK-ZAST

PACK-ZATT

Serrated Conical Disc Spring Washers

GTS

RoHS10

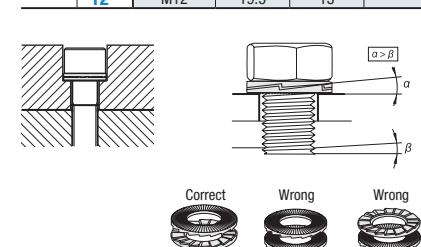
Material: From 1049 Carbon Steel to S70C
Hardness: 40~48 HRC min.
Surface Treatment: Tempered Collar JIS B 1251

Part Number	Type	d	D	D ₁	t	ℓ	ℓ ₁	b
3	3.2	12	7	0.29	13	5	4	
4	4.3	14	9	0.29	14	7	5	
5	5.3	17	10	0.5	15	8	6	
6	6.5	18	13	0.5	16	9	7	
8	8.5	22	16	0.5	20	13	7	
10	10.5	26	20	0.8	22	14	9	
12	12.5	30	24	0.8	27	19	10	
16	17	38	30	1.2	32	24	12	
20	21	45	38	1.2	36	28	15	
24	25	52	44	1.2	44	35	17	

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

① No.3 to 5, Light Load; No.6 to 24, Heavy Load

Type	No.	Applicable Screw	D	d	t
			3	M3	7
NLDF	4	M4	7.6	4.4	—
NLDF	5	M5	9	5.4	—
NLDF	6	M6	10.8	6.5	—
NLDF	8	M8	13.5	8.7	—
NLDF	10	M10	16.6	10.7	—
NLDF	12	M12	19.5	13	—



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 Screws M x P	Screw Strength Class A2-70, A4-70		Screw Strength Class A2-80, A4-80	
		G _f =0.65	μ _f =0.14, μ _w =0.14	G _f =0.65	μ _f =0.14, μ _w =0.14
3	3 x 0.5	0.9	1.5	1.2	2
4	4 x 0.7	2	2.6	2.7	3.4
5	5 x 0.8	3.9	4.1	5.3	5.5
6	6 x 1.0	6.9	5.9	9.2	7.8
8	8 x 1.				