

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 SUS304
Surface Treatment Trivalent Chromate

RoHS 10

JIS B 1256

| 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 | 2.0 | | | | | | | | |
| 10 | 10.5 | 18.0 | 21.0 | 2.5 | | | | | | | | |
| 12 | 13.0 | 21.0 | 24.0 | 3.0 | | | | | | | | |
| 16 | 17.0 | 28.0 | 30.0 | 4.0 | | | | | | | | |
| 20 | 21.0 | 34.0 | 37.0 | 5.0 | | | | | | | | |
| 24 | 25.0 | 39.0 | 44.0 | 6.0 | | | | | | | | |

Spring Washer

SLW SSLW

Material JIS-SWRH SUS304N
Surface Treatment Trivalent Chromate

RoHS 10

JIS B 1251

| 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 SUS304
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 | 3.4 | 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
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 | 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

RoHS 10

Material: SUS316L Equivalent
Hardness: 51HRC

| 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 | | | | | |
| 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 | | | | | |
| 12 | M12 | 19.5 | 13 | | | | | |

This product is to be used in pairs.

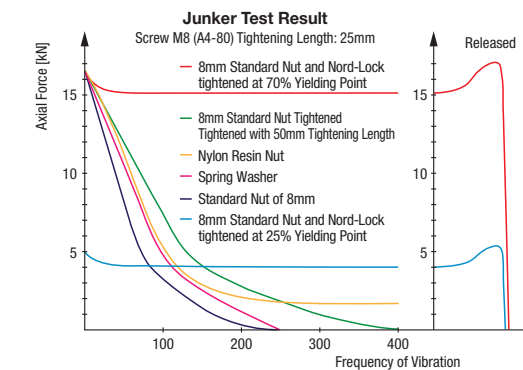
Ordering Example **Part Number** NLDF3

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
Set up correctly as shown in the image to 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.

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 $\mu g=0.14$ $\mu w=0.14$ | | Screw Strength Class: A2-80 / A4-80 Gf=0.65 $\mu g=0.14$ $\mu w=0.14$ | |
|------|----------------------|---|---------------------|---|---------------------|
| | | 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 **PACK-ZAST**

Tab Washers-Two-Tabbed **PACK-ZATT**

RoHS 10

Material: SUS304

Serrated Conical Disc Spring Washers **GTS**

RoHS 10

Material: From S50C to S70C
Hardness: 40 to 48HRC
Surface Treatment: Tempered Collar JIS B 1251

| Part Number | Type | No. | d | D | D1 | t | ℓ | ℓ_1 | 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 | 19 | 9 | 7 | | | | | | |
| 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 pc(s) | |
| 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 |

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

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