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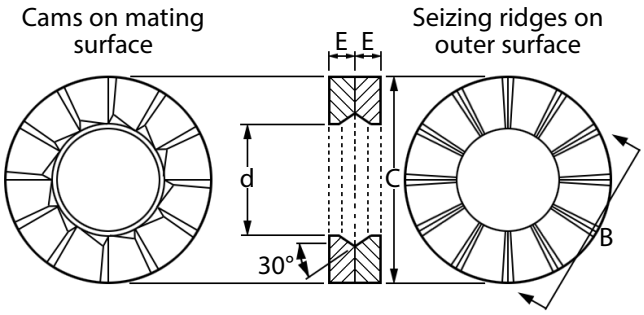
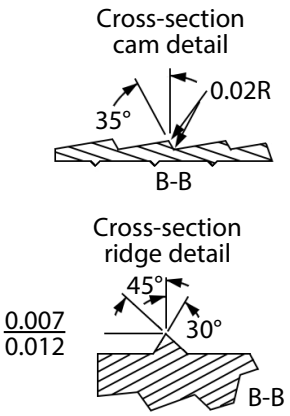
# FASTENERS

**DIS**

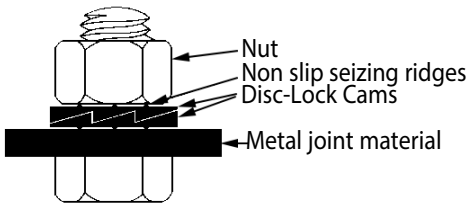
## Disc-Lock® Washers

Stainless Steel : To Suit M5 - M12

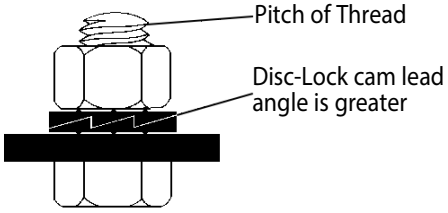


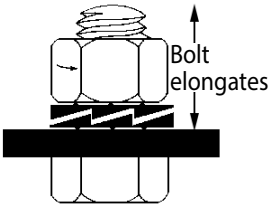

To install the Disc-Lock washer, simply mate the cams of the two pieces together and place between the nut and the joint material.



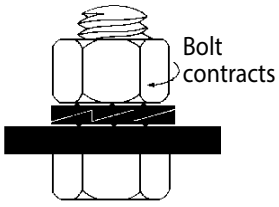

As the nut is tightened, one half of the Disc-Lock Washer is seated to the joint material and the other to the nut.




When the bolt elongates due to vibration and shock, the nut will attempt to rotate loose. As one half of the Disc-Lock Washer tries to rotate with the nut, the interlocking cams work against each other. This will increase/maintain the preload and further lock the assembly.




As the bolt contracts, the inclined planes of the cams cause the nut to rotate back to its original position.




| Part Number | To Suit Thread | No. of Cams | d | C | E |
|---|---|---|---|---|---|
| DIS-M5 | M5 | 6 | 5.15 | 10.18 | 2.03 |
| DIS-M6 | M6 | 6 | 6.66 | 12.57 | 3.22 |
| DIS-M8 | M8 | 8 | 8.28 | 15.95 | 3.60 |
| DIS-M10 | M10 | 8 | 10.38 | 17.90 | 4.06 |
| DIS-M12 | M12 | 10 | 12.95 | 23.82 | 4.22 |
| DIS-M14 | M14 | 10 | 14.53 | 28.65 | 3.23 |
| DIS-M16 | M16 | 12 | 16.53 | 31.67 | 4.79 |

## Material

316 Stainless Steel.

Also available in 1010 Carbon Steel (case hardened to 40/55 on the Rockwell C scale to a depth of 0.13mm), Zinc plated to suit M5 to M38 threads, P.O.A.

## Proven Applications

Disc-Lock® has outperformed all other types of loose, washered, threaded or pinned systems in a wide range of high stress, corrosive, and vibration sensitive applications, e.g: Heavy Equipment (Road and Construction), Bus and Truck Fleets, Pipelines, Military, Public Utilities, Railroads, Oil Drilling Rigs (On and OffShore), Mining, Equipment, Scaffolding Equipment, Engine Mounting, Refineries, Rapid Transport Equipment, Logging Equipment, Steel Erectors, and many more.

## Features

In common with most fastening devices, Disc-Lock Washers should only be used against flat, relatively smooth metal surfaces.

If the joint material is not metal, the Disc-Lock Washer may be used by securing a metal plate to the joint material in such a manner that the metal plate will not rotate.

As with all fasteners, Disc-Lock Washers should be re-examined before re-using. An air-gun can be used when installing and removing Disc-Lock Washers.

The Disc-Lock system underpins a range of vibration proof and heavy-duty structural locking devices recommended for the most stressful applications, consisting of two washer shaped pieces (preassembled as glued pairs ) with rising, interlocking cams, whose angle is greater than the pitch angle of the thread on the bolt on one side and a series of ridges on the other. To install, place a pair under the nut or bolt head in blind hole applications and vibration loosening problems are solved.

As the fastener attempts to rotate loose – whether it is a washer or nut - the interlocking cams rise against each other to create a wedging effect, which locks the assembly, thereby maintaining the tension in the fastener and maintaining joint integrity. The result is a fastening system that is vibration proof according to Military Standards. (United States Military MIL-STD-1321, Vibration Test 7. Test Results data available upon request.) Once applied and installed correctly the Disc-Lock fastener will remain secure and will ensure that nuts and bolts do not require retightening.

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+44 (0)1246 455522
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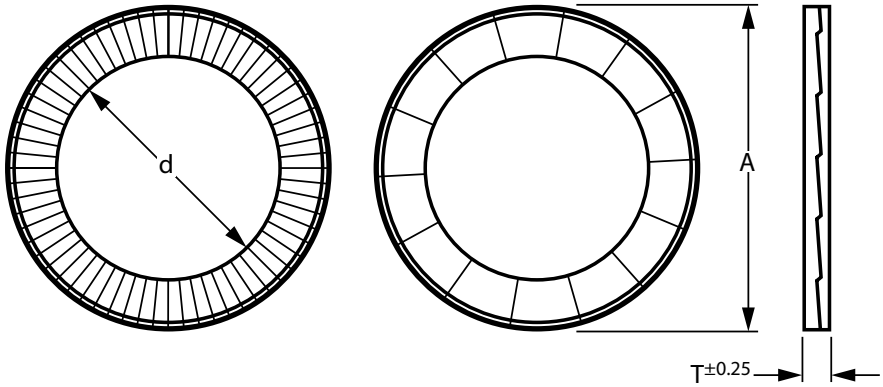
# FASTENERS

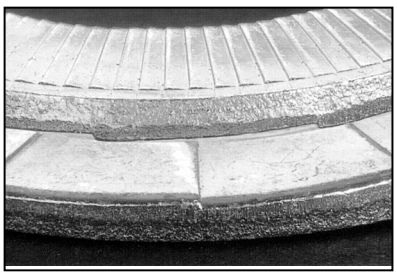
**NL**

## Nord-Lock Washers

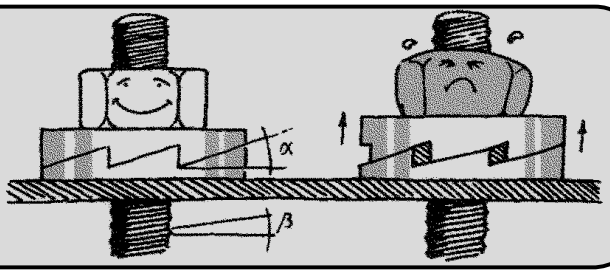
Steel : To Suit M3 - M42




| Part Number | To Suit Thread d | Inner Dia. d | Outer Dia. A | Thickness T±0.25 | Approx. Mass Kg / 100 pairs |
|---|---|---|---|---|---|
| NL3 | M3 | 3.4 ±0.1 | 7.0 ±0.2 | 1.8 | 0.03 |
| NL4* | M4 | 4.4 ±0.1 | 7.6 ±0.2 | 1.8 | 0.04 |
| NL5* | M5 | 5.4 ±0.1 | 9.0 ±0.2 | 1.8 | 0.05 |
| NL6 | M6 | 6.5 ±0.1 | 10.8 ±0.2 | 1.8 | 0.07 |
| NL6SP | M6 | 6.5 ±0.1 | 13.5 ±0.2 | 2.5 | 0.20 |
| NL8 | M8 | 8.7 ±0.1 | 13.5 ±0.2 | 2.5 | 0.15 |
| NL8SP | M8 | 8.7 ±0.1 | 16.6 ±0.2 | 2.5 | 0.28 |
| NL10 | M10 | 10.7 ±0.2 | 16.6 ±0.2 | 2.5 | 0.22 |
| NL10SP | M10 | 10.7 ±0.2 | 21.0 ±0.2 | 2.5 | 0.47 |
| NL11 | M11 | 11.4 ±0.2 | 18.5 ±0.2 | 2.5 | 0.29 |
| NL12 | M12 | 13.0 ±0.2 | 19.5 ±0.2 | 2.5 | 0.29 |
| NL12SP | M12 | 13.0 ±0.2 | 25.4 ±0.2 | 3.4 | 0.93 |
| NL14* | M14 | 15.2 ±0.2 | 23.0 ±0.2 | 3.4 | 0.56 |
| NL16 | M16 | 17.0 ±0.2 | 25.4 ±0.2 | 3.4 | 0.67 |
| NL16SP | M16 | 17.0 ±0.2 | 30.7 ±0.2 | 3.4 | 1.28 |
| NL18* | M18 | 19.5 ±0.2 | 29.0 ±0.2 | 3.4 | 0.85 |
| NL20* | M20 | 21.4 ±0.2 | 30.7 ±0.2 | 3.4 | 0.93 |
| NL22* | M22 | 23.4 ±0.2 | 34.5 ±0.2 | 3.4 | 1.29 |
| NL24* | M24 | 25.3 ±0.2 | 39.0 ±0.2 | 3.4 | 1.68 |
| NL1* | 1″ | 27.9 ±0.2 | 39.0 ±0.2 | 3.4 | 1.53 |
| NL27* | M27 | 28.4 ±0.2 | 42.0 ±0.3 | 5.8 | 3.29 |
| NL30* | M30 | 31.4 ±0.2 | 47.0 ±0.3 | 5.8 | 4.20 |
| NL33* | M33 | 34.4 ±0.2 | 48.5 ±0.3 | 5.8 | 3.97 |
| NL36* | M36 | 37.4 ±0.2 | 55.0 ±0.3 | 5.8 | 5.59 |
| NL39 | M39 | 40.4 ±0.2 | 58.5 ±0.3 | 5.8 | 6.28 |
| NL42 | M42 | 43.2 ±0.2 | 63.0 ±0.3 | 5.8 | 7.47 |



The key is the difference in angles. Here you see what happens when a nut attempts to loosen. The height of the pair of washers expand more than the corresponding pitch of the thread. Nord-Lock washers positively lock the fastener in a joint which is subjected to extreme vibration.




## Material

**Washers:** Steel EN 1.7182 (or equivalent), through hardened.
**Coating:** Zinc flake Delta Protekt® with a matt grey finish.
**Hardness:** ≥ 465 HV1.

Achieves maximum safety when locking fasteners.
Not susceptible to temperature. Reusable. Easy to assemble and disassemble.
Locking function is not affected by lubrication.

**Always lubricate fasteners before reusing -** when reusing fasteners the friction is always higher.

In order to assure the unique mechanical locking function of the Nord-Lock washers, the hardness of the mating surfaces must be lower than the hardness of the Nord-Lock washers.

## Other Info.

**Note:** Sold in glued pairs as standard.
NL-SP= Special outer diameter. Further NL-SP sizes available, P.O.A.
Non-metric sizes available, P.O.A.
Other sizes to suit M3 to M130 threads available, P.O.A.
* NL-SP with wider Outer Dias. available, P.O.A.

The Nord-Lock washer has cams on one side with a greater angle than the pitch of the thread. The washers have radial teeth on the other side. They are installed in pairs, cam face to cam face. When the bolt and/or nut are tightened, the teeth grip, seat the mating surfaces and lock, preventing the washers from slipping. The interacting cams create a wedge option, thereby increasing bolt tension and not allowing the fastener to rotate loose.

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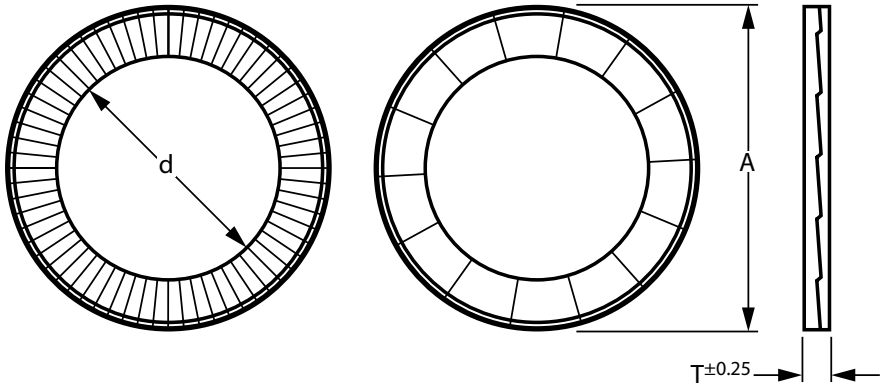
# FASTENERS

## NL-SS

## Nord-Lock Washers

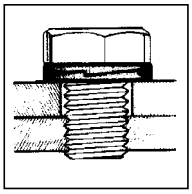
Stainless Steel : To Suit M3 - M30



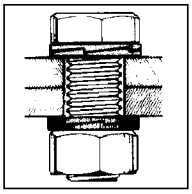

| Part Number | To Suit Thread d | Inner Dia. d | Outer Dia. A | Thickness T±0.25 | Approx. Mass Kg / 100 pairs |
|---|---|---|---|---|---|
| NL3SS | M3 | 3.4 ±0.1 | 7.0 ±0.2 | 2.2 | 0.04 |
| NL4SS* | M4 | 4.4 ±0.1 | 7.6 ±0.2 | 2.2 | 0.04 |
| NL5SS* | M5 | 5.4 ±0.1 | 9.0 ±0.2 | 2.2 | 0.06 |
| NL6SS | M6 | 6.5 ±0.1 | 10.8 ±0.2 | 2.2 | 0.09 |
| NL6SSSP | M6 | 6.5 ±0.1 | 13.5 ±0.2 | 2.0 | 0.16 |
| NL8SS | M8 | 8.7 ±0.1 | 13.5 ±0.2 | 2.0 | 0.12 |
| NL8SSSP | M8 | 8.7 ±0.1 | 16.6 ±0.2 | 2.0 | 0.22 |
| NL10SS | M10 | 10.7 ±0.2 | 16.6 ±0.2 | 2.0 | 0.18 |
| NL10SSSP | M10 | 10.7 ±0.2 | 21.0 ±0.2 | 2.2 | 0.37 |
| NL11SS | M11 | 11.4 ±0.2 | 18.5 ±0.2 | 2.2 | 0.26 |
| NL12SS | M12 | 13.0 ±0.2 | 19.5 ±0.2 | 2.0 | 0.23 |
| NL12SSSP | M12 | 13.0 ±0.2 | 25.4 ±0.2 | 3.0 | 0.82 |
| NL14SS* | M14 | 15.2 ±0.2 | 23.0 ±0.2 | 3.0 | 0.49 |
| NL16SS | M16 | 17.0 ±0.2 | 25.4 ±0.2 | 3.0 | 0.59 |
| NL16SSSP | M16 | 17.0 ±0.2 | 30.7 ±0.2 | 3.2 | 1.13 |
| NL18SS* | M18 | 19.5 ±0.2 | 29.0 ±0.2 | 3.2 | 0.80 |
| NL20SS* | M20 | 21.4 ±0.2 | 30.7 ±0.2 | 3.0 | 0.82 |
| NL22SS* | M22 | 23.4 ±0.2 | 34.5 ±0.2 | 3.2 | 1.23 |
| NL24SS* | M24 | 25.3 ±0.2 | 39.0 ±0.2 | 3.2 | 1.52 |
| NL1SS* | 1" | 27.9 ±0.2 | 39.0 ±0.2 | 3.2 | 1.42 |
| NL27SS* | M27 | 28.4 ±0.2 | 42.0 ±0.3 | 6.8 | 3.45 |
| NL30SS* | M30 | 31.4 ±0.2 | 47.0 ±0.3 | 6.8 | 4.43 |

## Assembly Instructions

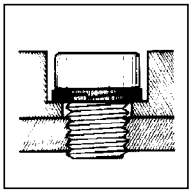
***When tightening, a 20% higher torque should be applied than if tightening against a flat washer.***



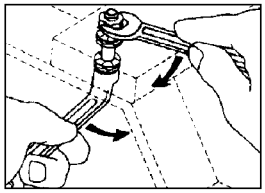
Nord-Lock washers can be used on standard grade as well as high grade bolts.



They can be used with screws in tapped holes as well as bolts and nuts in through holes.



Bolts in a counterbored hole.



**Note:** Keep the bolt secure when tightening the nut.

## Material

316L Stainless Steel, surface hardened.
**Hardness:** ≥ 520 HV0.05.

Achieves maximum safety when locking fasteners.
Not susceptible to temperature.
Reusable. Easy to assemble and disassemble.
Locking function is not affected by lubrication.

**Always lubricate fasteners before reusing -** when reusing fasteners the friction is always higher.

In order to assure the unique mechanical locking function of the Nord-Lock washers, the hardness of the mating surfaces must be lower than the hardness of the Nord-Lock washers.

## Other Info.

**Note:** Sold in glued pairs as standard.
NL-SSSP= Special outer diameter.
Further NL-SP sizes available, P.O.A.
Non-metric sizes available, P.O.A.
Other sizes to suit M3 to M80 threads available, P.O.A.

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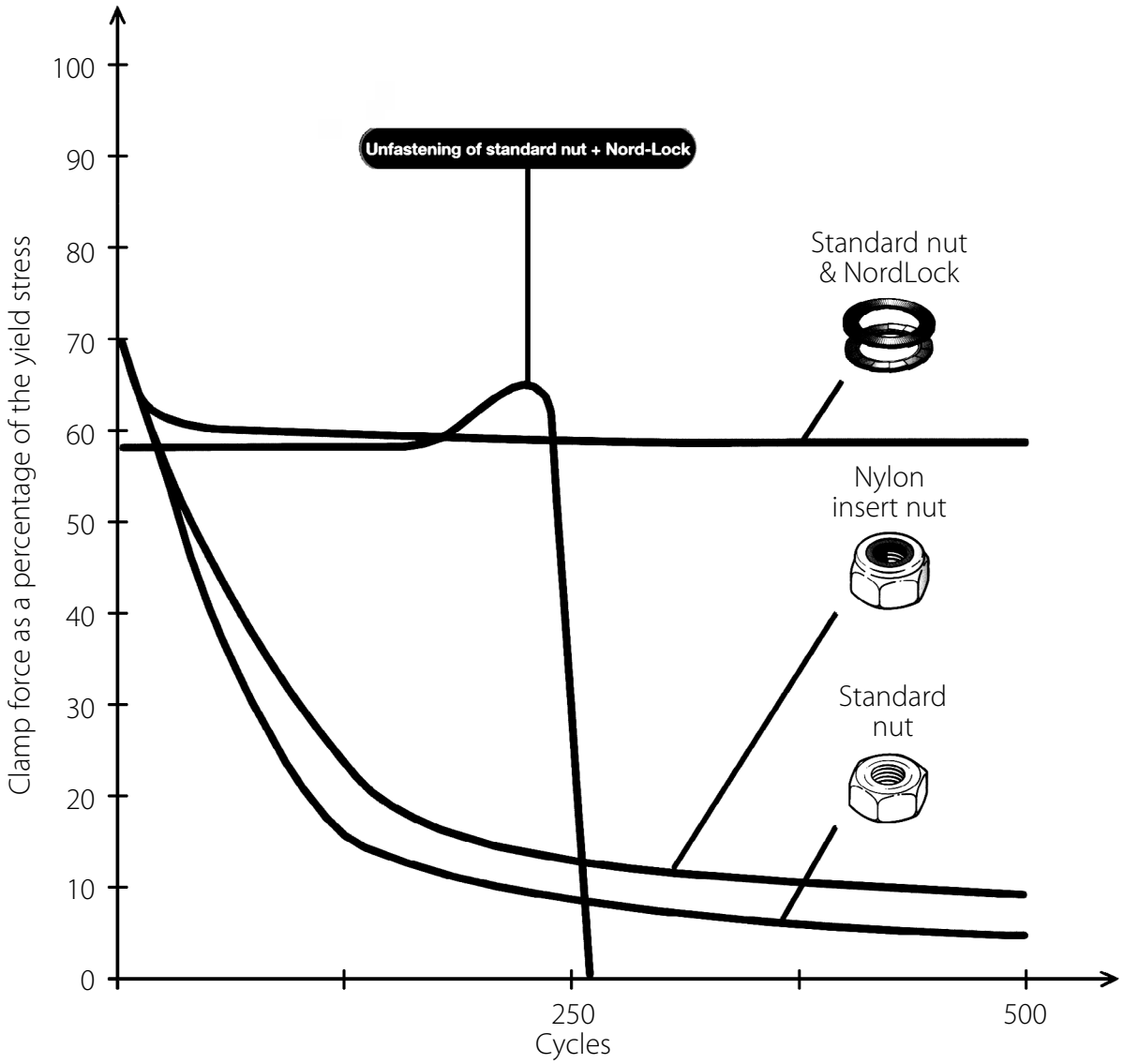
# FASTENERS

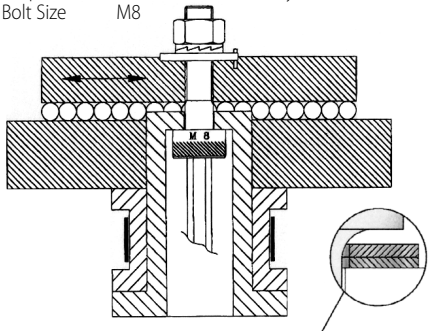
## Nord-Lock Washers

TECHNICAL




***When tightening a 20% higher torque should be applied than if tightening against a flat washer.***

Frequency 40 Hz Clamp Length 20mm
Amplitude ±0.5mm Bolt Quality 8.8
Bolt Size M8

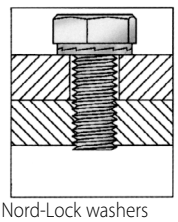


One method for testing the security of a bolted joint during vibration is the Junker-vibration test. The preload (bolt tension) is measured by a load cell and vibrating motions are generated radially through the bolt.

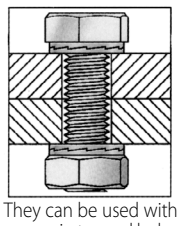
Nord-Lock together with a standard nut present a locking security that is superior to locking nuts (nylon inserts). Bolts that are locked by friction in the thread lose most of their pre-load by vibrations while those locked with Nord-Lock only present a minor loss of pre-load which is mainly caused by settlement in the thread.

Even after moderate tightening the bolt is safely locked when using Nord-Lock.

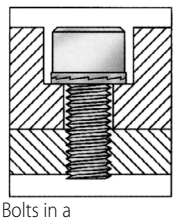
One proof of the security is that the pre-load increases when turning the bolt loose with a wrench rather than an instant drop. This is a unique Nord-Lock characteristic.



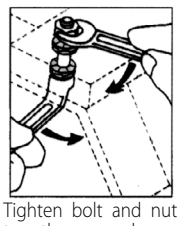
Nord-Lock washers can be used on standard grade as well as high grade bolts.



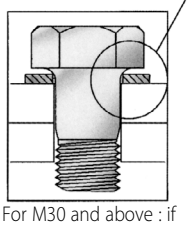
They can be used with screws in tapped holes as well as bolts and nuts in through holes.



Bolts in a counterbored hole.



Tighten bolt and nut together as shown above.



For M30 and above : if bolt head radius is too large use next metric size.

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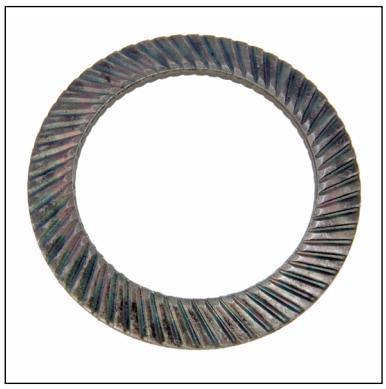
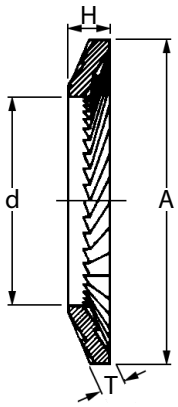
# FASTENERS

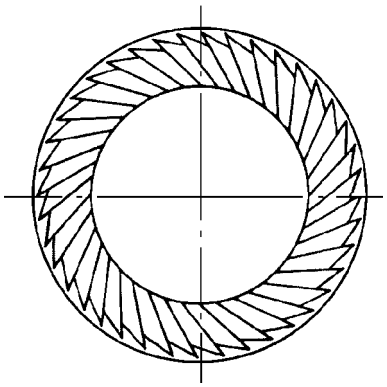
## WMS

## Safety Washers

Steel : To Suit M1.6 - M36





| Part Number | To Suit Thread | Inner Dia. d | Outer Dia. A | Thickness T | Min. Height H | Max. Height H | Mass Kg/1000 |
|---|---|---|---|---|---|---|---|
| WMS1.6 | M1.6 | 1.7 | 3.2 | 0.35 | 0.40 | 0.6 | 0.013 |
| WMS2 | M2 | 2.2 | 4.0 | 0.35 | 0.40 | 0.6 | 0.021 |
| WMS2.5 | M2.5 | 2.7 | 4.8 | 0.45 | 0.50 | 0.9 | 0.039 |
| WMS3 | M3 (⅛") | 3.2 | 5.5 | 0.45 | 0.50 | 0.9 | 0.049 |
| WMS3.5 | M3.5 | 3.7 | 6.0 | 0.45 | 0.55 | 0.9 | 0.055 |
| WMS4 | M4 (5⁄32") | 4.3 | 7.0 | 0.50 | 0.55 | 1.0 | 0.085 |
| WMS5 | M5 (3⁄16") | 5.3 | 9.0 | 0.60 | 0.60 | 1.1 | 0.167 |
| WMS6 | M6 | 6.4 | 10.0 | 0.60 | 0.70 | 1.2 | 0.200 |
| WMS6.35 | - (¼") | 6.7 | 9.5 | 0.60 | 0.65 | 1.2 | 0.150 |
| WMS7 | M7 | 7.4 | 12.0 | 0.70 | 0.80 | 1.3 | 0.355 |
| WMS8 | M8 (5⁄16") | 8.4 | 13.0 | 0.70 | 0.90 | 1.4 | 0.392 |
| WMS10 | M10 (⅜") | 10.5 | 16.0 | 0.90 | 1.10 | 1.6 | 0.750 |
| WMS11.1 | - (7⁄16") | 11.6 | 15.9 | 0.90 | 1.05 | 1.6 | 0.595 |
| WMS12 | M12 | 13.0 | 18.0 | 1.00 | 1.15 | 1.7 | 0.879 |
| WMS12.7 | - (½") | 13.7 | 19.0 | 1.00 | 1.25 | 1.8 | 0.976 |
| WMS14 | M14 | 15.0 | 22.0 | 1.10 | 1.35 | 2.0 | 1.641 |
| WMS16 | M16 (⅝") | 17.0 | 24.0 | 1.30 | 1.55 | 2.1 | 1.984 |
| WMS18 | M18 | 19.0 | 27.0 | 1.40 | 1.75 | 2.3 | 2.970 |
| WMS19 | M19 (¾") | 20.0 | 30.0 | 1.40 | 1.90 | 2.5 | 4.100 |
| WMS20 | M20 | 21.0 | 30.0 | 1.40 | 1.85 | 2.5 | 3.742 |
| WMS22 | M22 (⅞") | 23.0 | 33.0 | 1.40 | 1.95 | 2.7 | 4.507 |
| WMS24 | M24 | 25.6 | 36.0 | 1.60 | 2.15 | 2.9 | 5.910 |
| WMS25.4 | - (1") | 27.0 | 38.0 | 1.80 | 2.35 | 3.1 | 7.449 |
| WMS27 | M27 | 28.6 | 39.0 | 1.80 | 2.35 | 3.1 | 7.369 |
| WMS30 | M30 (1. ⅛") | 31.6 | 45.0 | 1.80 | 2.60 | 3.6 | 10.780 |
| WMS36 | M36 (1. ⅜") | 38.0 | 54.0 | 2.50 | 3.20 | 4.2 | 21.280 |

## Material

Spring Steel to DIN EN 10132-4, hardened and chemically blackened, suitable for Grades upto 8.8.

## Options

Other dimensions available on request, P.O.A.
Also available in corrosion resistant Steel (1.4301), Phosphorous Bronze (CuSn8), Nickel Cobolt alloy, creep resistant Steel (1.4122) and Inconel, P.O.A.
Surface treatments sucha as Bronzed, Phosphated, Galvanized and Zinc Lamellar coatings available, P.O.A.
Reinforced safety washers for bolts or screws in Grades 8.8 and 10.9 available, P.O.A.

## Other Info.

Safety washers are in the form of a disc spring which is serrated on both sides and of trapezoidal cross section. Their diameters are matched to screw dimensions. The outer diameter of the washer is matched to the head diameter of pan-head and hexagon socket head cap screws. As a result, the serrated safety washer can be used with practically any screw and bolt type, including those with rescessed heads. The only exception are countersunk screws.

Their ingenious form of the serrated safety washer combines the advantages of security through friction and mechanical locking offering the following advantages:

- The serrations lock the washers positively resisting vibration
- Concentric force transmission and uniform axial load eliminate bending torques and deformation of the bolt stem
- The design of the serrations prevent friction and damage to components when tightening
- High safety factor against loss of preload and loosening
- Wide variety of materials and different finishes
- The closed ring form results in a high degree of pre-tensioning, whilst avoiding burst-open effect.

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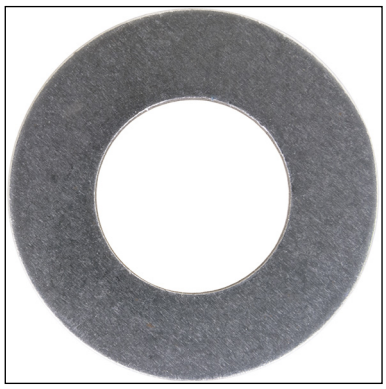
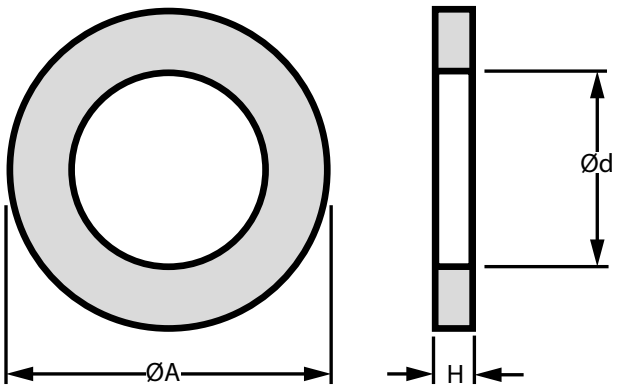
**WM**
**SHW**

# FASTENERS

## Plain Flat Washers

DIN 125 : Form A (M1.6 - M5), Form B (M6 - M48)






| Part Number | Form | To Suit Thread d | ØA | H |
|---|---|---|---|---|
| **STEEL** | | | | |
| WM3 | A | M3 | 7.0 | 0.50 |
| WM4 | A | M4 | 9.0 | 0.80 |
| WM5 | A | M5 | 10.0 | 1.00 |
| WM6 | B | M6 | 12.5 | 0.90 |
| WM8 | B | M8 | 17.0 | 1.10 |
| WM10 | B | M10 | 21.0 | 1.45 |
| WM12 | B | M12 | 24.0 | 1.80 |
| WM16 | B | M16 | 30.0 | 2.20 |
| **STAINLESS** | | | | |
| SHW-1.6 | A | M1.6 | 4.0 | 0.30 |
| SHW-2 | A | M2 | 5.0 | 0.30 |
| SHW-2.5 | A | M2.5 | 6.0 | 0.50 |
| SHW-3 | A | M3 | 7.0 | 0.50 |
| SHW-3.5 | A | M3.5 | 8.0 | 0.50 |
| SHW-4 | A | M4 | 9.0 | 0.80 |
| SHW-5 | A | M5 | 10.0 | 1.00 |
| SHW-6 | B | M6 | 12.5 | 0.90 |
| SHW-8 | B | M8 | 17.0 | 1.10 |
| SHW-10 | B | M10 | 21.0 | 1.45 |
| SHW-12 | B | M12 | 24.0 | 1.80 |
| SHW-14 | B | M14 | 28.0 | 2.20 |
| SHW-16 | B | M16 | 30.0 | 2.20 |
| SHW-18 | B | M18 | 34.0 | 2.20 |
| SHW-20 | B | M20 | 37.0 | 2.20 |
| SHW-22 | B | M22 | 39.0 | 2.70 |
| SHW-24 | B | M24 | 44.0 | 2.70 |
| SHW-27 | B | M27 | 50.0 | 2.70 |
| SHW-30 | B | M30 | 56.0 | 2.70 |
| SHW-33 | B | M33 | 60.0 | 3.30 |
| SHW-36 | B | M36 | 66.0 | 3.30 |
| SHW-39 | B | M39 | 72.0 | 3.30 |
| SHW-42 | B | M42 | 78.0 | 3.00 |
| SHW-45 | B | M45 | 85.0 | 3.00 |
| SHW-48 | B | M48 | 92.0 | 3.30 |

## Material

**WM:** Steel.
**SHW:** A2 Stainless Steel to DIN 125. Available in A4 material, P.O.A.
**Maximum Operating Temperature (WM):** +430°C.

## Other Info.

Form B is manufactured from thinner material than Form A.
Form A is available on sizes M6 and greater P.O.A.

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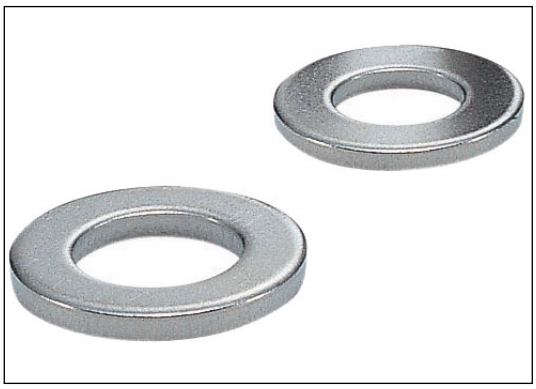
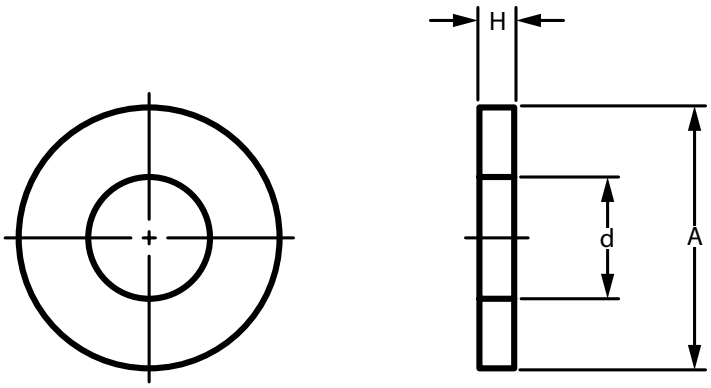
# FASTENERS

**SWAT**

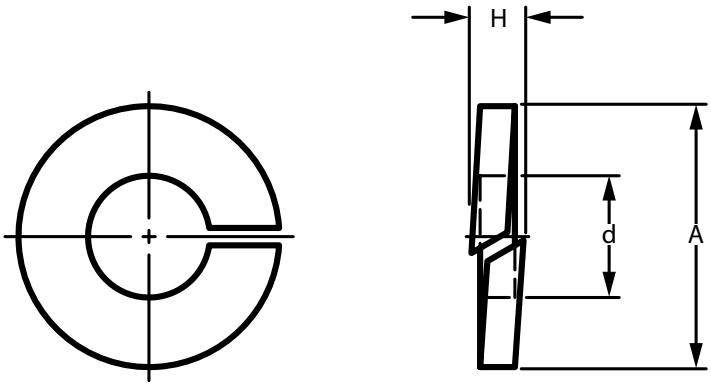
## Washers

Titanium : M3 - M10






| Part Number Plain Washer | To Suit Thread Size | d | A | H | Mass g |
|---|---|---|---|---|---|
| SWAT-3-F | M3 | 3.2 | 7.0 | 0.5 | 0.068 |
| SWAT-4-F | M4 | 4.3 | 9.0 | 0.8 | 0.180 |
| SWAT-5-F | M5 | 5.3 | 10.0 | 1.0 | 0.250 |
| SWAT-6-F | M6 | 6.4 | 12.5 | 1.6 | 0.650 |
| SWAT-8-F | M8 | 8.4 | 17.0 | 1.6 | 1.200 |
| SWAT-10-F | M10 | 10.5 | 21.0 | 2.0 | 2.300 |




| Part Number Spring Lock | To Suit Thread Size | d | A | H | Mass g |
|---|---|---|---|---|---|
| SWAT-3-S | M3 | 3.1 | 5.9 | 0.7 | 0.062 |
| SWAT-4-S | M4 | 4.1 | 7.6 | 1.0 | 0.150 |
| SWAT-5-S | M5 | 5.1 | 9.2 | 1.3 | 0.270 |
| SWAT-6-S | M6 | 6.1 | 12.2 | 1.5 | 0.590 |
| SWAT-8-S | M8 | 8.2 | 15.4 | 2.0 | 1.200 |
| SWAT-10-S | M10 | 10.2 | 18.4 | 2.5 | 2.100 |

## Material

TB340C (Grade 2 Titanium).
Excellent chemical and seawater resistance.

**Specific Gravity:** 4.51.
**Melting Point:** 1668°C.
**Longitudinal Elastic Modulus:** 106 GPa.
**Thermal Conductivity:** 17.16 W/(m•K).
**Linear Expansion Coefficient:** 8.4 x $10^{-6}$ °$K^{-1}$.
**Electrical Resistance:** 0.55 μΩ•m.
**Amplitude Permeability:** 1.0001μ (Nonmagnetic).
**Tensile Strength:** 270-410 N/$mm^2$.
**0.2% Proof Stress:** 165 (or higher) N/$mm^2$.
**Elongation:** 27% (or higher).

*The Tensile Breaking Force values listed are for reference only and are not guaranteed under performance conditions.

## Features

- The specific gravity of titanium is approximately 60% that of stainless steel. For use in lightweight applications, e.g. automotive, aerospace, medical and robotics.
- Completely Nonmagnetic (0 Magnetic Flux Density). Nonmagnetic characteristics may be used with FPD (Flat Panel Display) and semiconductor production equipment and devices, and electronic equipment.
- Excellent chemical and seawater resistance for electrochemical plating and aquatic applications.
- Chemical polishing and brightening processing improve the screw surface. Furthermore, the screws are cleanroom washed, cleanroom packed, and comply with clean specifications that require no oil or foreign matter deposits.
- For information on chemical resistance test details please contact Sales.

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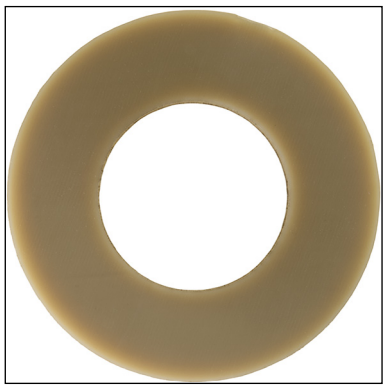
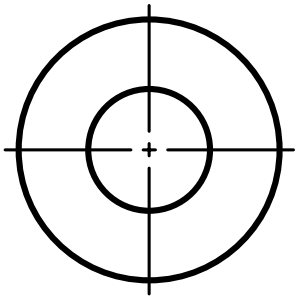
# FASTENERS

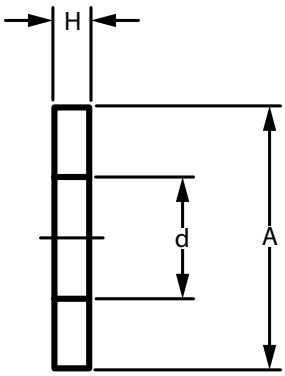
## SPE-W

## Washers

PEEK† : M2 - M10








| Part Number | To Suit Thread d | d | A | H | Mass g | Quantity per Pack |
|---|---|---|---|---|---|---|
| SPE-2-W | M2 | 2.1 | 4.0 | 0.5 | 0.006 | 20 |
| SPE-2.6-W | M2.6 | 2.7 | 6.0 | 0.5 | 0.015 | 20 |
| SPE-3-W | M3 | 3.2 | 7.0 | 0.5 | 0.020 | 20 |
| SPE-4-W | M4 | 4.3 | 9.0 | 0.8 | 0.051 | 20 |
| SPE-5-W | M5 | 5.3 | 10.0 | 1.0 | 0.073 | 20 |
| SPE-6-W | M6 | 6.4 | 12.5 | 1.6 | 0.190 | 10 |
| SPE-8-W | M8 | 8.4 | 17.0 | 1.6 | 0.360 | 5 |
| SPE-10-W | M10 | 10.5 | 21.0 | 2.0 | 0.680 | 5 |

## Material

PEEK (Polyetheretherketone), light brown. †PEEK is a registered trademark of Vitre™.

Heat Resistance Temperature: 180°C. This is the value for the plastic material. The maximum operating temperature of the product changes with performance conditions such as tightening torque.

*Numerical values listed above are for reference only; they are not guaranteed under performance conditions. The recommended torque is 50% of the numerical values.

## Precautions for Use

Because a cumulative pitch difference is created when PEEK screws are manufactured, use these screws with nuts. If a nut is not used, use a 20 mm or less fit with female thread.

## Features

- PEEK is a thermoplastic super-engineering plastic with excellent physical and chemical properties.
- These screws have excellent chemical resistance. They are mostly unaffected by chemicals excluding concentrated sulfuric, nitric and hydrofluoric acid.
- These screws have excellent heat resistance, water resistance, and high heat resistance strength.
- These screws have excellent abrasion, shock, and fatigue resistance.
- They have high incombustibility that meets V-0 of UL 94.

## Applications

FPD production equipment, semiconductor devices, PCB etching devices, metallic surface treatment equipment and facilities, chemical plants, transformers, electrical and electronic equipment, hot water pumps, and chemical pumps.

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