



THE **OLANDER** COMPANY INC

Fastener Pictorial Guide:

Washers

THE OLANDER COMPANY INC

ELECTRONIC-COMMERCIAL-SPECIALTY FASTENERS
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Flat Washers

A flat washer, or a plain washer, is a flat annulus or ring, often of metal, used to spread the load of a screwed fastening. Additionally, a flat washer may be used when the hole is a larger diameter than the fixing nut.

***Available in many different sizes and materials**



Split Lock Washer

A split lock washer, or a spring lock washer, is a ring split at one point and bent into a helical shape. This causes the washer to exert a spring force between the fastener's head and the substrate, which maintains the washer hard against the substrate and the bolt thread hard against the nut or substrate thread, creating more friction and resistance to rotation.



High Collar Lock Washer

A high collar split lock washer has a smaller outside diameter and thicker section than a regular split lock washer. It is intended for use with socket head cap screws because of the screw's small head diameter.

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Ribbed Lock Washers

Ribbed lock washers are disc springs with trapezoidal cross section on both sides for gripping. Ribbed safety washers are ready to fit washers to sustain preload and avoid loosening. As the bolt is tightened the serrations crunch into the mating faces and prevents the screw from loosening up due to vibration. Also, the disc shape holds the necessary tension. They are available in various sizes to fit bolts or screws. The diameters for ribbed lock washers are matched to screw dimensions.



Toothed Washers

A toothed washer, also known as a serrated washer or star washer, is a lock washer which has serrations that extend radially inward and/or outward to bite into the bearing surface. This type of lock washer is especially effective when used with a soft material, such as aluminum or plastic, but can still resist rotation more than a plain washer on hard surfaces, as the tension between washer and the surface is applied over a much smaller area (the teeth). There are four types: internal, external, combination, and countersunk.



Tooling Washers

A tooling washer is thicker and made from a harder material than a flat washer and is used for tooling and spacing applications.

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Flush Finish Washers

Flush finish washers are countersunk into the work surface and feature internal contours suitable for countersunk or flat headed bolts and screws. This type of cup washer often has a lip or flange built into its outer rim to offer better support for the screw.



Spring Washers

There are three types of spring washers: Belleville, Curved, and Wave.

Belleville washers, also known as cupped spring washers or conical washers, have a slight conical shape, which provides an axial force when deformed.

Curved spring washers are similar to Belleville washers, except the washer is curved in only one direction. Therefore, there are only four points of contact. Unlike Belleville washers, they exert only light pressures.

Wave washers have a "wave" in the axial direction, which provides spring pressure when compressed. Wave washers, of comparable size, do not produce as much force as Belleville washers.

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Countersunk Finishing Washers

Countersunk finishing washers are round formed washers that are designed to be used with flat and oval head screws such as wood screws, sheet metal (tapping) screws, and machine screws. Being raised and convex, they accept standard 82° countersunk heads. Finishing washers are commonly available in three materials: brass, stainless steel, and steel. Common finishes include nickel plating for brass and steel, and zinc plating for steel.



Nylon 6/6 Retaining Washers

The white nylon 6/6 retaining washer has teeth that grip a fastener so the two stay attached when they are loosened. Nylon 6/6 provides resistance to abrasion, corrosion, and many chemicals and solvents. The material is a strong yet lightweight plastic and is nonconductive. Nylon 6/6 can either absorb or lose moisture, which may alter its dimensions and mechanical properties.



Shoulder Washers

A shoulder washer is a plain washer type with an integral cylindrical sleeve; they are used as electrically insulating grommets.

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