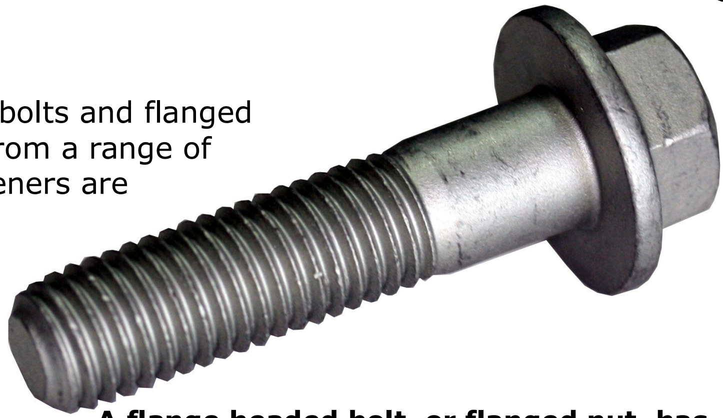
Flanged Bolts and Nuts

Product Range

Why use flanged fasteners?

There is a trend towards using flange headed bolts and flanged nuts. Some of the reasons as to why OEM's, from a range of industries, are increasingly using flanged fasteners are

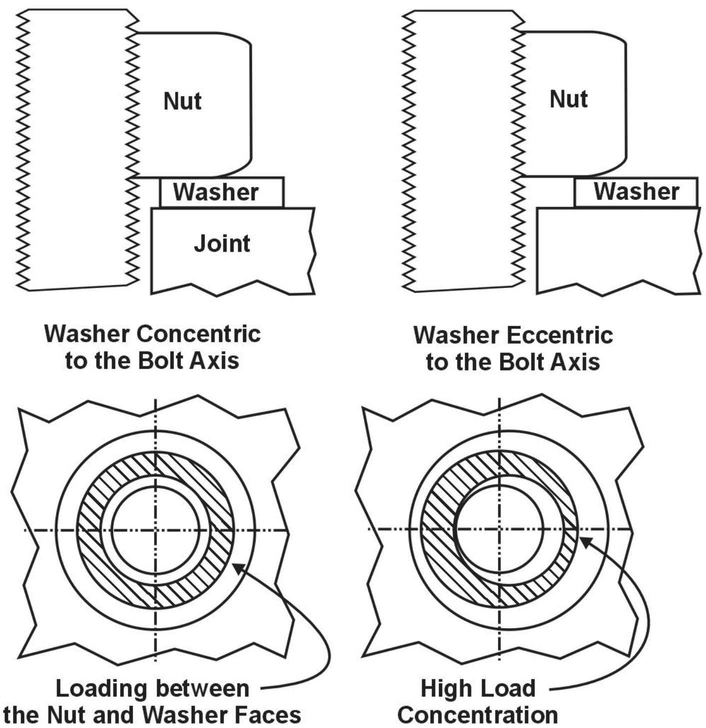


A flange headed bolt, or flanged nut, has a greater bearing area. This is of crucial importance in many applications.

Washers have traditionally been used to protect the joint surface from damage during the tightening process and to distribute the load under the bolt head and nut. The stress under the face of a standard hexagon headed nut can result in indentation into standard strength steel surfaces. In recent years washers have started to be replaced by flanged headed fasteners for several reasons.

Standard washers are typically softer than the nuts and bolts that they are used with and can often plastically deform under the high compressive stress that they must sustain. For higher strength fasteners, this can lead to the washer dishing and indenting resulting in the clamp force being reduced significantly. An example of such a washer is shown at the side. Flange headed nuts and bolts do not suffer from this effect since the washer face is as strong as the bolt/nut itself.

Indented washer as a result of use with a high strength hex head bolt/nut.



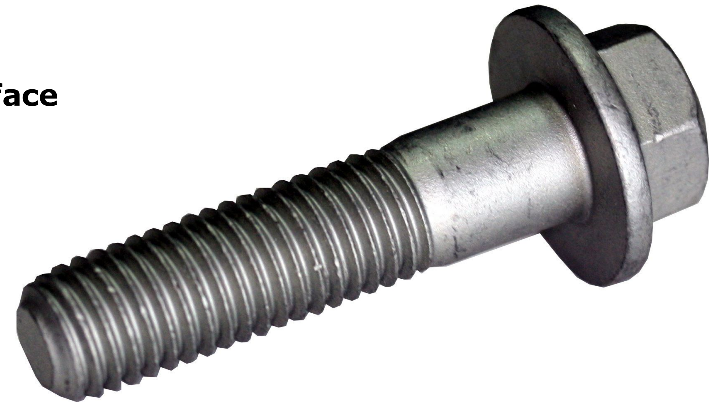
To overcome the indentation problem, special hardened washers can be used however such washers are not available usually off the shelf. Research conducted in the 1980's in the U.K. showed that because of the clearance hole in the washer, an eccentric loading could occur that can lead to very high localised stresses.

A reasonably large clearance hole in the washer is needed to ensure that the radius that is present under the bolt head does not contact the hole edge. Such clearance on the nut can lead to the washer being tightened eccentrically to the bolt axis. This leads to a high localised load concentration increasing the risk of indentation and joint damage.

One further effect that was noted in the research was movement of the bearing face during tightening. Normally when the nut is tightened, the nut moves on a stationary washer. However it has been found that sometimes as the nut is being tightened, the washer begins to rotate on the joint surface. That is, the nut and the washer rotate as one. This changes the relationship between the applied torque and the load in the bolt with potential adverse consequences.

For these, as well as some other reasons, flange headed bolts and flanged nuts are the preferred type of fastener in many applications.

Types of Flange Headed Fasteners



Flange Headed Bolt with Plain Bearing Surface

These bolts are as a standard hex headed product but with a flanged surface allowing the bolts to be tightened fully whilst in direct contact with a low strength joint material, such as aluminium. Available in both property class 8.8 and 10.9 as well as, depending upon the size requested, stainless steel.

Flange Headed Bolt with a Serrated Bearing Surface

The purpose of the serrated face is to prevent the bolt from self-loosening. For the serrations to function as intended the joint material hardness must be less than that of the bolt. This is to allow the serrations to bite into the surface. They are not suitable for applications that require the joint surface to be kept smooth. The removal torque can be higher than the tightening torque due to the effect of the serrations.

Free Spinning Flanged Nut with a Serrated Bearing Surface

This nut has a serrated face to match the serrated face flanged bolt. Available in property class 8 or 10 to match a property class 8.8 or 10.9 bolt.

Free Spinning Flanged Nut with a Plain Bearing Surface

A free spinning flanged nut to match a flanged bolt. Available in property class 8 or 10 to match a property class 8.8 or 10.9 bolt.

Coneloc Flanged Nut

The Coneloc Flanged Nut is an all-metal prevailing torque type self-locking nut. The locking action is achieved by localised precision deformation of the thread in the cone section on top of the nut. When the Coneloc nut is tightened onto the bolt, the thread is gripped on the flanks providing the locking action. The nut has a plain bearing surface.

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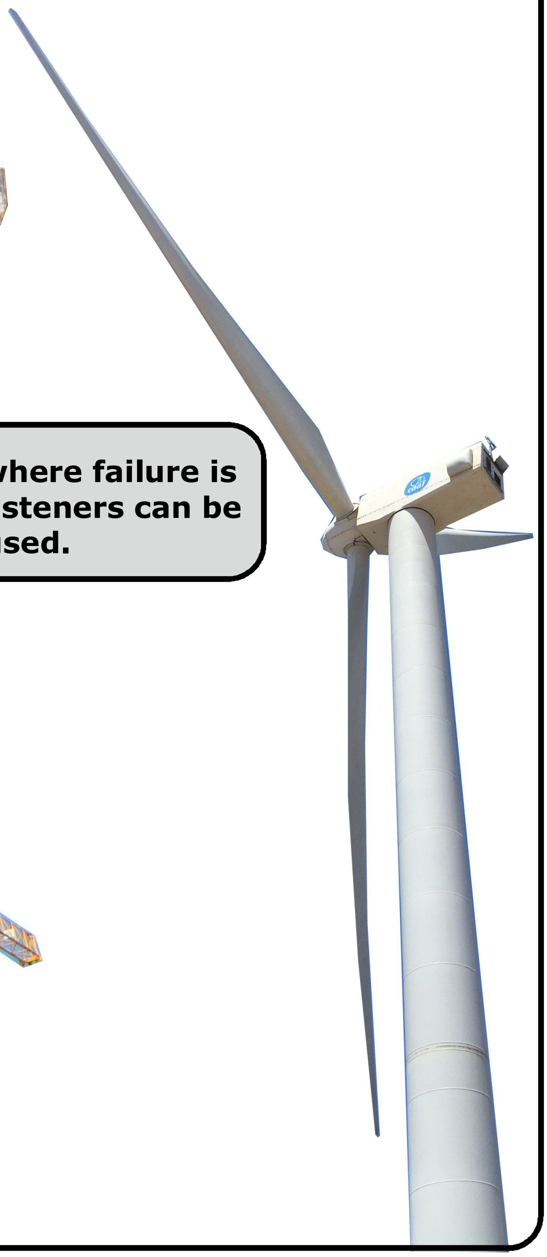
Applications

In critical applications where failure is not an option, flanged fasteners can be productively used.



Finishes Available

Bolts and nuts are available in an electro-zinc plated (EZP) finish and, alternatively, a zinc flake coating.

The EZP finish is an electrolytically applied process in which a coating of zinc is deposited on the fastener surface. It is common on smaller sized fasteners. Typically, the colour of the coating has a silver appearance.

The zinc flake coating has typically a silver grey appearance. The coating is applied by a dip process followed by a heat treatment that bonds the zinc flakes together. This type of coating typically provides a greater resistance to corrosion than EZP. This coating is preferable for higher strength (10.9) bolts since, being a non-electrolytically applied process, the risk from hydrogen embrittlement is reduced.

Please call or email us for further information.

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