



Understanding, and Preventing Galling

What is Galling and what causes it to happen?

Galling is one of the most common problems when tightening fasteners. Also known as cold welding, galling results in damaged threads, broken fasteners, weakened joints and seized bolts. Essentially, to define galling - it's a form of severe adhesive wear.

Galling happens during installation of fasteners made of alloys such as stainless steel, aluminium and titanium. While the fastener is being tightened, pressure builds between the thread surfaces and breaks down the protective oxide coatings. Without the oxide coating, the thread's metal high points are exposed to each other. This, in turn, creates friction, which causes heat that seizes the metal. These can be the reasons of galling on stainless steel bolts and other materials.

What to do when galling happens and how to avoid it:

If the galling is minor, slight damage may occur to the thread surface. In that case, the installer may be able to remove the fastener. On the other end, severe cases of galling can weld the nut and bolt together and there is no way to remove the fastener. If the fastener is tightened once galling begins, the fastener may even be twisted off or see its threads stripped.

How do you minimise the risks of galling?

• Think about your material

Highly ductile materials, or materials which possess low work-hardening rates, are often prone to galling. For instance, austenitic stainless steels have a tendency to gall under certain conditions, though you can minimise this risk by using a hard nut of duplex stainless steel. Brass and bronze are frequently used for bearings, bushings and other sliding applications due to their tendency to resist galling.

• Keep it clean

Surfaces should be smooth and clean from dirt and dust that can settle between mating surfaces.

• Smooth rough edges

It's worth noting that highly polished or rough surfaces tend to gall more. Wipe a rag over the thread surface. If it snags, it will most likely gall when assembled. Electropolishing will smooth any rough edges on your surface finish and reduce the possibility of galling.

• Use lubricant

To reduce friction, choose an appropriate lubricant. Lubrication is required even if the joint is intended to be permanent. However, if your application involves food, you'll have to avoid many lubricants, so beware.