

## Galvanizing threaded sections.

### WHY GALVANIZE?

Hot dip galvanized coatings are applied to steel to improve the anti-corrosion performance of the steel to ensure that it lasts as long as possible with a minimum of maintenance

### COATINGS DIFFER

Only hot-dip galvanizing gives a coating that can reach the 50 year life required of structural building products.

### THICKNESS COUNTS

Compared to other zinc-rich coatings, hot-dipped galvanizing is:-

- THICKER
- HARDER
- FULLER

HOT-DIP GALVANIZED  
PRODUCTS LAST  
LONGER...



**Galvanized bolts.** Galvanizing of threaded fasteners is well-established, but care is required with some threaded components to ensure they remain serviceable.

The galvanizing of threaded fasteners is well established, and is done in specialised galvanizing facilities that centrifuge the fasteners to remove excess zinc from the threads. Australian Standards (AS1214) nominates the required clearances on nuts for use with galvanized bolts to accommodate the additional coating applied to the threads.

The problems associated with the galvanizing of internal threads on nuts are solved by galvanizing the nut blanks and tapping them afterwards. The intimate contact between the galvanized thread on the bolt and the uncoated steel on the thread on the nut provides an acceptable level of protection from corrosion.

The galvanizing of other threaded components such as bolt cages and threaded assemblies, tapped holes and socket attachments, is an issue of concern to both galvanizers and their clients.

These items are frequently included in fabricated assemblies and may be rendered unserviceable unless provision is made to deal with the cleaning of threaded item is dealt with.

### Methods of dealing with threaded components for galvanizing.

**External threads:** When items are withdrawn from the galvanizing bath, the excess molten zinc drains off the work. On threaded items, much of this zinc is trapped in the threads and forms a thick buildup on the bottom side of the thread.

There are a number of options available to the galvanizer for dealing with the cleaning of these threads. These are:

- Fettle the threaded sections while the zinc is still molten to bump or brush the threaded section to shake the free zinc of the threads.
- Heating the threaded section with a gas torch to re-melt the free zinc and wire brush the thread clean. This does not affect coating durability as most of the coating is a zinc-iron alloy with a higher melting point (650oC versus 420oC) and provided the area is not overheated, only the free zinc will be removed.
- Re-tapping the threads. This will remove the coating and is time consuming and access issues may make it impractical.

# Galvanizing threaded sections.

## TRIED & PROVEN

Over 40 years of field testing shows that galvanized coatings perform well even in harsh environments.

## DEALING WITH THREADED SECTIONS

Industrial Galvanizers has three specialised galvanizing facilities that centrifuge threaded fasteners. The galvanizing of threaded components such as bolt cages and threaded assemblies, tapped holes and socket attachments is an issue of concern to both galvanizers and their clients. Special provisions are needed to deal with the cleaning of the threaded item to ensure it is serviceable.

## WHY GALVANIZE WITH INDUSTRIAL GALVANIZERS?

For steel users requiring fast, proven corrosion protection for local or national projects Industrial Galvanizers is the established hot dip galvanizer with nationwide coverage.

- Protecting the threads prior to galvanizing to prevent them being galvanized. This can be done with proprietary stop-off materials. High temperature tapes from specialist suppliers like 3M can be used to mask threads. These procedures will leave the threaded elements ungalvanized.

**Internal threads:** Internal threads on sockets, nipples and tapped holes will always fill up with zinc on the down-side of the hole as it exits the galvanizing bath. The options for cleaning internal threads are limited to tapping out the threads after galvanizing.

The best methods of preventing zinc build-up in internal threads, is by preventing the zinc coming in contact with the threads. This can be done in a number of ways. These include:

- Inserting a stud or bolt in the hole prior to galvanizing. This can be removed after galvanizing and may require heating with a gas torch to free the fastener and allow it to be screwed out.
- Using a suitable high temperature sealant in small threaded holes that can be used to block off the hole. This can be mechanically removed after galvanizing.
- Using a proprietary stop-off product.

**Special threaded items:** Galvanizing of larger manufactured threaded items such as roof bolts, threaded rod, foundation

bolts and post-tensioning rods can be done successfully if the volume justifies the set-up cost for specialised thread cleaning operations. Some of Industrial Galvanizers' plants in Australia, Asia (and at Valmont in the USA) have the capability to efficiently galvanize long, threaded items to a high standard.

This is done by either installing special progressive galvanizing equipment that removes the excess zinc from the threads as part of the galvanizing process, efficient post cleaning systems that remove the excess zinc by heating the threaded sections and brushing, or vibrating the items.

Hot dip galvanizing remains the best way to provide a heavy duty anti-corrosion coating to threaded items, with the additional advantage that the zinc has self-lubrication properties along with a hardness that equals or exceeds that of the base steel.

**Cautionary note:** Some common pipe fittings such as threaded nipples and sockets are sometimes manufactured from free-machining steel and not from the parent steel from which the pipes or tubes to which they are attached are made. Free machining steel contains high levels of sulfur to deliberately weaken the steel so that it machines easily and forms small chips during the machining process. This type of steel is not suitable for hot dip galvanizing as it may be attacked by both the acids in the pickling pre-treatment operations, or by the molten zinc. In some cases, all the threads may be eroded off the fitting in the galvanizing process.

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