



THE CORROSIVE ENVIRONMENT

Span-Tech began as a supplier of fabric buildings for two applications with very harsh indoor environments—hog production and salt storage. Our nearly two decades of experience in manufacturing buildings allow us to provide solutions which are cost effective and which will withstand corrosive environments.

HOT DIPPED GALVANIZATION

Hot Dipped Galvanization (HDG) is an actual metallurgical bond between steel and zinc. It is the most common type of corrosion protection for steel and is generally considered the best. There are two main types of HDG--batch dip and in-line (also referred to as continuous).

BATCH DIP - is done after the part has been fabricated. The part is cleaned in an alkaline and acid bath. It is then rinsed several times to remove all contaminants. A clean part is required to get the best bond between zinc and steel. The part is then immersed in a molten zinc bath heated up to 850°F needed to assure adequate bonding. Excessive zinc is not removed. Steel strength and trace elements must be controlled to get the best bond. If this option is chosen by the customer, all Span-Tech welded assemblies are batch dipped meeting ASTM A123 and ASTM A385 standards.

PROS

- The dipped parts will have up to 300% the amount of zinc compared with in-line.
- Batch dip provides equal coverage for all surfaces of the parts. This means that the welds, the outside of part, the inside of the part (inside of the tubing) and heavy walled structural components are very similarly coated.
- Compared with other commonly available coatings -- in-line, electroplating, power coating -- batch dip provides unmatched corrosion resistance.

CONS

- The requirements to fabricate parts can be more difficult to meet than with in-line. Also, it is very difficult to fabricate or modify parts after they have been batch dipped.
- Trusses along top edge where cover rubs needs to be checked for rough spots.

IN-LINE - is done at a mill before fabrication. The steel is cleaned in an alkaline and acid bath. It is then rinsed several times to remove all contaminants. The steel is heated and the zinc is applied in a continuous line. Excess zinc is removed to the coating thickness specified by the customer. Top coats such as chromate or other organic coatings are sometimes applied to prevent white rusting. The now galvanized steel is then shipped to a fabricator for production. Span-Tech uses in-line material (where possible) in all non-welded assemblies meeting ASTM A653 and ASTM A787 standards. Span-Tech does provide a limited number of buildings with welded assemblies using in-line. Buildings using in-line galvanization are recommended for non-corrosive environments only.

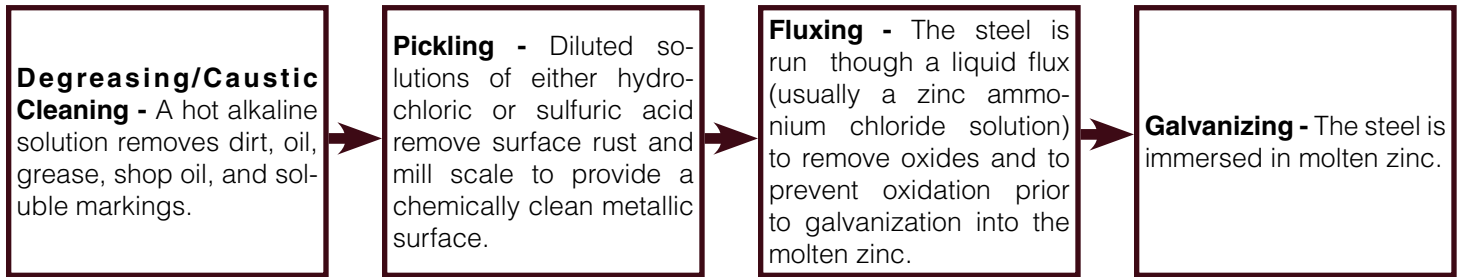
PROS

- The process is cost effective.
- The combination of organic coatings (or other alloys such as galvalum) provides very good corrosion protection.
- Ideal coating protection is provided for assemblies that do not have to be welded.

CONS

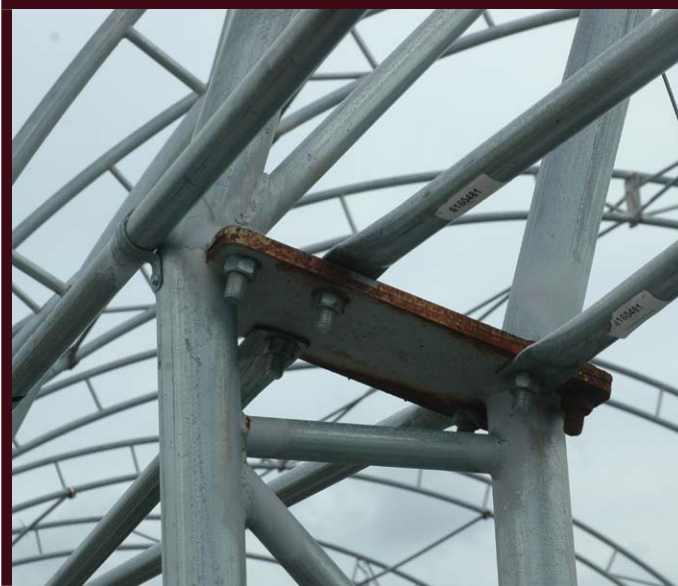
- It is not a good coating for assemblies that need to be welded. During welding, zinc is burned off so that additional coatings are required around the weld areas after fabrication. These welded areas are more susceptible to corrosion. Most times, these welded areas occur at the same points where the buildings' stresses are transferred.
 - In-line coated materials are typically only available in light gauge steel sheets and tubes. Other components such as connector plates, base plates and all other structural steel have to be coated by another process. Options may include electroplating, cold galvanization or simply left uncoated. These options do not provide the corrosion resistance of hot dipped galvanization.
 - Without proper preparation, the welds can become contaminated with zinc. An inferior weld can result. You can see this as there will be tiny holes in the weld.
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GENERAL PROCESS FOR HOT DIP GALVANIZATION - BATCH DIP AND IN-LINE



IN-LINE/CONTINUOUS VERSUS BATCH DIPPED----KNOW THE DIFFERENCES

Whether steel is batch dip or in-line is easily identifiable. Batch dip steel frames require vent holes throughout the weldment. The surfaces of the steel and the welds look consistent and will tend to become a more subdued gray over time. In-line typically has more sheen (a shinier appearance) especially over time. With in-line, vent holes are not required and the steel finish around the welded areas has a different appearance than the non-welded steel. The American Galvanizers Association (AGA) web site, galvanizeit.org, has extensive information regarding to all forms of corrosion protection.



In-Line/Continuous - Weld areas and steel plate thicker than 1/4" are not covered with same corrosion protection as the rest of the structure. Note zinc paint by welds.



Batch Dip - Coverage is equal both inside and out of the tubes, on the welds, and steel plates.

Steel weldments, trusses and the like built from in-line galvanized steel will result in a lower price point for the same size of building—compared with batch dip. Given the difference in corrosion protection, it might appear that the price differences should be greater between the two options. However, there are multiple factors which establish the price. Examples are the cost and availability of black steel tubing used for batch dipped compared with in-line galvanized tubing, the cost of zinc and the cost of zinc surcharges. These and other cost factors are continuously changing.

