

# Understanding the Galvanizing Process



## What is Galvanizing?

Hot-dip galvanizing is the process during which fabricated steel is fully immersed in molten zinc. What happens is that the iron in the steel reacts with the molten zinc to create a tightly-bonded alloy coating, resulting in the best corrosion protection.

**Did you know?** Galvanizing is named after Luigi Galvani, who discovered the process during an experiment with frog legs.

## The Galvanizing Process

- **Surface Preparation:** This is a critical step in the galvanizing process. Any inadequacies in surface preparation will become apparent after the steel is removed from the molten zinc; areas that haven't been prepared properly will remain uncoated. Three steps make up the surface preparation step. During the
  - *Degreasing/Caustic Cleaning:* Organic contaminants such as dirt and oil are removed via a cleaning bath. Certain contaminants cannot be removed by degreasing and must be removed by mechanical means such as sandblasting.
  - *Pickling:* A solution removes mill scale and rust from the steel's surface, or, in conjunction with pickling, an abrasive cleaning or air blasting can be implemented.
  - *Fluxing:* The application of zinc ammonium chloride removes any remaining rust and creates a protective layer on the steel to prevent rust from forming during the process until the molten zinc bath.
- **Galvanizing:** The steel is galvanized by immersion in a molten zinc bath, where it reacts with the zinc and forms metallurgically bonded zinc-iron intermetallic alloy layers. Once removed from the bath, the excess zinc is removed. The material is cooled by immersion in a solution, water, or by being left to air out.
- **Inspection:** This step is very simple, coating thickness and appearance are examined carefully to ensure they are up to standards

Information adapted from [www.galvanizeit.org/hot-dip-galvanizing](http://www.galvanizeit.org/hot-dip-galvanizing). To learn more about the hot-dip galvanizing process please visit their website.

**Disclaimer:** Newly galvanized material can often look dirty and used, but as time passes it will weather, develop a patina, and be harder and more durable than ever. See below for examples of what is acceptable or not to send to the customer.

