HOT-DIP GALVANIZED FOOD AND BEVERAGE FACILITIES

SAFE
DURABLE
ATTRACTIVE
SUSTAINABLE
COST-EFFECTIVE
MAINTENANCE-FREE

AMERICAN GALVANIZERS ASSOCIATION

Hot-Dip Galvanized Food & Beverage Products

With a daily grind riddled with forklifts, pallets, chemicals, wash-downs, and moisture, food and beverage processing facilities are some of the toughest, most corrosive environments imaginable. The food processing industry is very cost competitive. Any opportunity to decrease operating costs can lead to an advantage in the market place and higher profit margins. Galvanized steel's maintenance-free longevity translates to huge savings in both industries.

The Food and Drug Administration (FDA) has approved the use of galvanized steel for food preparation and conveyance for all applications with the exception of foods that have a high acid content, such as tomatoes, oranges, limes, and other fruits. Since many food products are stored on racks or in coolers with shelving, the acid content in these foods can accelerate corrosion, so having a protection system able to withstand the acidity is critical.

The hot-dip galvanized coating protects iron from interacting with food products while also protecting the steel from corrosion from the environment. This double protection lasts for many years and needs little to no maintenance. Some of the applications for galvanized steel are food storage racks, bar counter tops, coolers and meat storage hooks, as well as many products at the site of food production. At the farm you can find many galvanized products such as dairy stalls, milk cans, chicken coops and many others. The following is a list of common applications where HDG is used in food and beverage facilities:

Equipment Hooks	Grain Hoppers	Slotted Floors	Trailers
Farm Building	Growing Racks	Stanchions	Veterinary Equipment
Feeding Equipment	Refrigeration Shelves	Storage Racks	Waste Handling
Grain Elevators	Silo Extraction Equip.	Substation Structures	Watering Troughs

AESTHETICS

Recently, aesthetics in the food and beverage industry has become an important consideration in the selection of a coating. Food processing facilities are now becoming more welcoming to the public and need to provide a clean, durable, and positive image. Hot-dip galvanizing provides this aesthetic appeal while allowing the facility to be corrosion-free and aesthetically pleasing to the public.

DURABILITY

Whether rough, physical abrasion or slow, insidious deterioration over the years of exposure to moisture and chemicals, hot-dip galvanized steel provides the most comprehensive protection against corrosion inside and out. The zinc coating developed during the galvanizing process creates a barrier which protects steel against the corroding effects of moisture and chemical abrasion. With rigid regulations for cleanliness, food processing plants are exposed to more than the average share of harsh chemical cleaners and water.

Moisture is everywhere in a food processing facility and having a corrosion protection system that will protect against this harsh environment is crucial. These facilities have to constantly be aware of the moisture level as well as chemical exposure. Hot-dip galvanized steel has stood strong against the harshest moisture environments imaginable and can easily protect pipes, storage racks, and other structures from moisture and condensation.

The temperature of the air can also have a significant impact on the corrosion rate of some materials. Galvanized steel protects against corrosion at very low temperatures (below -40F) or very high temperatures (above 150F and below 390F). This makes galvanized steel a good choice for food processing facilities in frigid climates or well heated facilities.

The *Time to First Maintenance (Figure 1)* shows the durability of hot-dip galvanized coatings in five different environments. According to ASTM A123, a minimum coating of 3.9 mils is required for steel 1/4" thick, meaning even in the harshest environment (industrial), maintenance is not required for approximately 70 years.

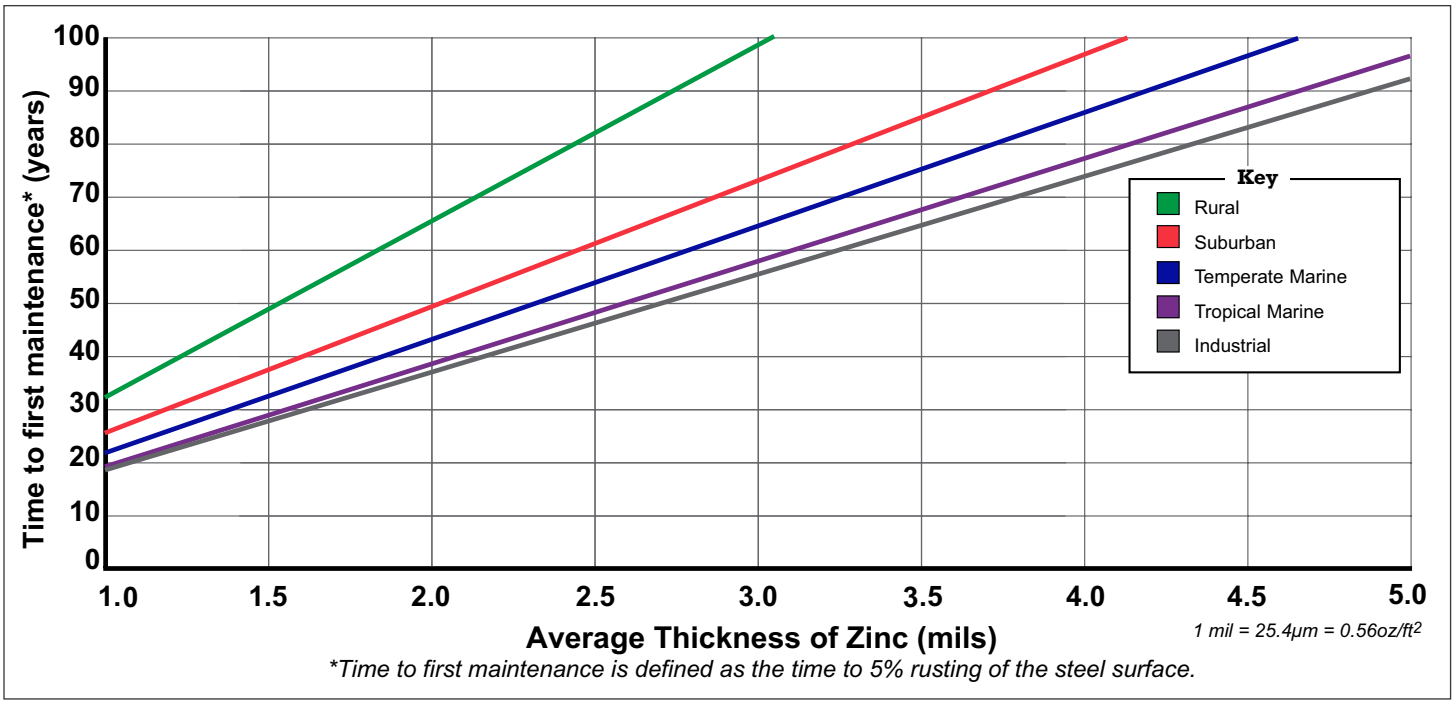

Figure 1: Time to First Maintenance Chart

SAFETY

Food processing is one of the largest manufacturing industries in the United States, "Keeping corrosion at bay is critical since it can lead to unacceptable contaminates in a food manufacturing environment that threated sanitation and product safety, as well as reduce the reliability of machinery, leading to costly downtime. Corrosion is a threat to the overall success and profitability of any food manufacturing facility."[1] Hot-dip galvanized steel offers a safe, reliable, durable coating to protect structures within a facility, while the natural zinc poses no threat to the products transported through the facility.

MAINTENANCE FREE

"Food manufacturing facilities are highly corrosive environments due to the continual exposure to chemicals, water and other corrosive elements used during processing and daily sanitation. It is critical to prevent corrosion in order to avoid the high costs of repair, replacement, and downtime that is often the result of corrosion damage.[1]" By taking preventative measures; such as designing the facility to utilize hot-dip galvanized steel, can help to reduce the threat of corrosion. Facility owners do not have time or money to waste on these downtimes, and with the use of hot-dip galvanized steel there will be nothing slowing down the flow of product through the facility.

Hot-dip galvanizing is a coating of naturally occurring zinc metallurgically bonded to steel to protect it from environmental corrosion for years with little to no maintenance. The zinc coating of hot-dip galvanized steel corrodes at a very slow rate, protecting food and beverage plants with an aesthetically pleasing, consistent appearance, and is 100% recyclable at the end of life.

SUSTAINABILITY

Sustainable development is the social, economic, and environmental commitment to growth and development that meet the needs of the present without compromising the ability of future generations to meet their own needs. The food and beverage sector faces an enormous amount of pressure to be sustainability conscious. Specifying hot-dip galvanizing allows the industry to use facilities that are corrosion and maintenance-free while using 100% recyclable steel and zinc. Hot-dip galvanized projects add huge benefits to a company's sustainability programs and help to lead the way in this new green industry.

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LIFE-CYCLE COST

Food and beverage projects are often in service for many years before they are changed out. It is important to consider the initial cost, but also what the cost will be over the life of the project. Galvanized steel is durable and maintenance-free, so the only cost incurred is during the initial construction. Motivated by increasing demands of food and beverage projects to be environmentally sound, life-cycle cost is extremely important to protect and prepare projects for little to no maintenance for years to come. The life-cycle cost calculator (lcc.galvanizeit.org) allows you to compare the initial-cost of hot-dip galvanizing to various paint systems. In most instances, the initial cost of galvanizing is comparable with those of paint systems, but over time, hot-dip galvanizing will deliver substantial savings, through deferred maintenance costs, repairs, and touch-ups.

Calculate the value of utilizing
HDG in your next project.
Visit lccc.galvanizeit.org

[1]Food Manufacturing. "*Knowledge About Corrosion Prevention Crucial for Success in Food Manufacturing Industry.*" Stephanie Ellis. May 2015

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Food & Beverage Case Studies

LAZY MAGNOLIA BREWERY - KILN, MS

The Lazy Magnolia Brewery is Mississippi's oldest packaging brewery, and the first one since prohibition was enacted in 1907. The first batches were produced in 2005 but progress was interrupted by hurricane Katrina, chich rsulted in a loss of 80% of the business. The brewery received a grant from the US Department of Agriculture and began an expansion occurring over a four year period.

The owners specified hot-dip galvanized (HDG) steel for the building expansion because of its cost-effectiveness and durability in the harsh conditions of the brewery. Steam and changing pH levels required a degree of protection only HDG could provide. The owners are engineers, so they used ingenuity in design by making the building tall enough for the brew house and large enough for additional equipment when needed for any future expansion. The little to no mainenance of HDG was a major benefit in choosing to hot-dip galvanize the project becasue of the inaccessibilie of the process equipment placement.The brewery was in operation while the construction was in progress so on time delivery was critical to avoid delays. The fabricator and the galvanizer worked together to expedite the job and provide progressive dipping on the trusses where required.

Craft beer is catching on in Mississippi. The Magnolia State has recently changed beer laws allowing alcohol by volume at 10.2 percent. This will mean more expansion of craft breweries where hot-dip galvanized steel will be needed for corrosion protection.

Lazy Magnolia is dedicated to providing the best possible products through tireless efforts, superior motivation, and Southern Heritage. With solid and sound business decisions the company has expanded into 14 states with more to come in the near future. HDG steel played a major role in the recent expansion of the brewery required to meet the increase in demand. This kind of ingenuity helped the owners realized it was the right time, right place and right product for a growing business in the south. Learn more about the Lazy Magnolia Brewery at galvanizeit.org/lazy-magnolia.

OCEAN SPRAY RECEIVING STATION - RICHMOND, BC

Ocean Spray's $26 million state-of-the-art receiving station offers more convenient access to local growers and more capacity providing a 50 percent increase to the current capability. Cranberries are Richmond's largest agricultural crop, and the new facility will process approximately 100 million pounds of the fruit each year. The facility also includes equipment to sort and screen cranberries as well as the means to bin all outbound fruit.

In a news release, Peter Dhillion, a longtime local cranberry grower and Vice Chairman of the Ocean Spray Board said "as Ocean Spray continues to expand business across the globe, the Richmond community has been an important partner. Almost 20% of Ocean Spray's total acreage in North America is in British Columbia, and so the new state-of-the-art receiving station will help us maximize the efficiency of handling our crop."

As cranberries are typically wet-picked (harvested by flooding the beds), when they come to the receiving station to be cleaned, sorted, and stored, there is some moisture present. To combat the moisture throughout the processing of the tart fruit, hot-dip galvanizing was used on the steel structures within the new facility. Hot-dip galvanizing uses natural zinc to provide maintenance-free corrosion protection. With the help of sustainable hot-dip galvanized steel, Ocean Spray will be able to process cranberries safely and efficiently through this vital station well into the future. Learn more about the Ocean Spray Receiving Station at galvanizeit.org/ocean-spray.

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BUFFALO WILD WINGS - BRADLEY, IL

The Buffalo Wild Wings restaurant in Bradley, Illinois recently requested to have its cooler system manufactured by Cooler Concepts who galvanizes its shelving systems. Cooler Concepts has grown by nearly 200 percent due to the massive popularity of its galvanized shelf product. The company, citing success with hot-dip galvanizing for the past seven years, likes to use the product for its visual appearance and its durability.

Often times, the shelving holds beverages and food, and is subject to potential rust and corrosion building situations. HDG not only keeps the shelving in excellent shape, but also protects perishable materials from being subject to corrosion. At the Buffalo Wild Wings restaurant, 1200 pounds of shelving was coated with HDG. Other large jobs for Cooler Concepts include galvanizing shelving for the Miami Dolphins football Stadium, the new Washington Nationals Baseball Park, and many Buffalo Wild Wings restaurants across the US. By using HDG, the shelving will remain maintenance free for decades of corrosion protection. Learn more about Buffalo Wild Wings at galvanizeit.org/buffalo-wild-wings.

ANDERSON GRAIN STORAGE - COMO, TX

For decades, the classic, tall sheet metal silo dotted the landscape of the US grain belt The newest design for storage of massive amounts of grain is the “Hoop Building.” This design combines a concrete base and galvanized superstructure with galvanized conveyors and walkways. The galvanized structure and equipment provide maintenance-free usage, and eliminates flaking paint and rust which can contaminate the food grain, as well as a structure that is much less susceptible to wind damage. In addition, the Hoop Building provides a larger surface area for grain storage, aeration, moisture elimination, and inspection. Traditional silos are prone to explosion whereas the Hoop design provides open air circulation thus eliminating the accumulation of gasses.

A single Hoop Building replaces many silos at a more economical initial cost as well as a considerably better life-cycle cost. The initial size options and expandability of the Hoop Building over the traditional silo makes it the grain storage facility of the future. Delivery vehicles can enter the Hoop Structure for safe, clean offloading and the conveyor systems can be easily accessed for mechanical maintenance.

The tough, abrasion resistant galvanized coating can withstand the constant attack by grains of all kinds.The economic advantages, the safety aspects, the convenience of operation and long life-cycle provided by hot-dip galvanizing are being recognized by grain companies and farmers alike when choosing a new structure for grain handling. The Hoop Building is the new choice for future grain handling structures. Learn more about the Anderson Grain Storage at galvanizeit.org/anderson-grain.

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