



HOT-DIP GALVANIZED TRUCKS AND TRAILERS

DURABLE
SUSTAINABLE
COST-EFFECTIVE
MAINTENANCE-FREE

Hot-Dip Galvanized Trucks and Trailers

A variety of original equipment manufacturing (OEM) products have utilized hot-dip galvanized steel for more than a century because of its outstanding durability and maintenance-free qualities. The trucking and trailer industry is one of these sectors that has utilized such coating because of the harsh and ever-changing environment they are subjected to. Aggressive road salts and constant exposure are extremely corrosive and having a durable coating is a must to extend use and reduce maintenance.

Weather varies from below freezing to extreme heat radiating from the blacktop. Whether wet or dry, the coating has to protect against impact from stones, road deicing salts and debris. The long lasting corrosion resistance provided by hot-dip galvanized steel reduces operating costs and keeps trucks and trailers on the road longer. Hot-dip galvanizing is a cost effective, maintenance-free coating that repels rust and leaves a desirable finish.

The potential growth of this market is incredible based on the number of trucks and trailers on the road today. The potential for these parts is on the rise in the transportation industry. Hot-dip galvanizing is the preferred corrosion protection system for steel, as demonstrated on many truck and trailer related products, including the following:

Booms
Frames
Hitches
I-beams

Latches
Poles
Safety Bars
Strip Doors

Tanks
Towmasters
Trailers
Truck Beds

Truck Ramps
Plows
Undercarriage Beams

SUSTAINABILITY

Sustainable development is an increasingly important consideration especially in the transportation industry. Preserving the environment is a huge priority, and hot-dip galvanizing has the ability to positively contribute to this goal. The zinc of the hot-dip galvanized coating, as well as the steel itself, is 100% recyclable. Furthermore, the longevity of the coating eliminates the need for expending additional energy in the future on maintenance and upkeep. Additional energy is saved by eliminating the need to replace hot-dip galvanized products, which would require more energy and natural resources to create and transport new steel.

The zinc in hot-dip galvanized coatings is a natural element, the 27th most abundant in the Earth's crust, and is essential to all life. Zinc is necessary in many biological processes, and is used in many common products such as diaper rash cream, sun block, and common cold remedies. It does not add to landfills like paints and other materials do, and in fact, a large percentage of the original product is produced from recycled material (zinc and steel).

DURABILITY

Weather deteriorates trailers, and durability is extremely important in the truck and trailer industry. The harsh roads salts can be detrimental to the trucks. Trucks and trailers need special attention because of the number of compartments that can be exposed to the environment and hot-dip galvanizing has the ability to coat the entire surface; including small corners with an even corrosion-free coating.



Galvanized trailers are able to remain maintenance and corrosion-free

Protection of the frame is the determining factor to continued life on trucks and trailers. By specifying hot-dip galvanizing, the life of the truck is extended and costs are reduced by not having to replace the frame after just a few years in service. A unique characteristic of hot-dip galvanizing is the development of tightly-bonded abrasion resistant intermetallic layers. This abrasion resistance provides unmatched protection against damage caused by harsh road and weather conditions.

This complete coverage ensures even the inside of the trucks and trailers are protected against rough handling. Hot-dip galvanized steel has been specified extensively for truck and trailers because of its unmatched abrasion resistance. This unique characteristic of hot-dip galvanized coating is the development of tightly-bonded (~3,600 psi) abrasion resistance intermetallic layers. These layers create a complete uniform protection system that provides unmatched protection against damage by rough handling of road salts, sand and material being hauled on the interior of the truck. Hot-dip galvanizing is a total immersion process, creating complete coverage of all interior and exterior surfaces.



Truck trailer beams are exposed to a variety of harsh conditions.

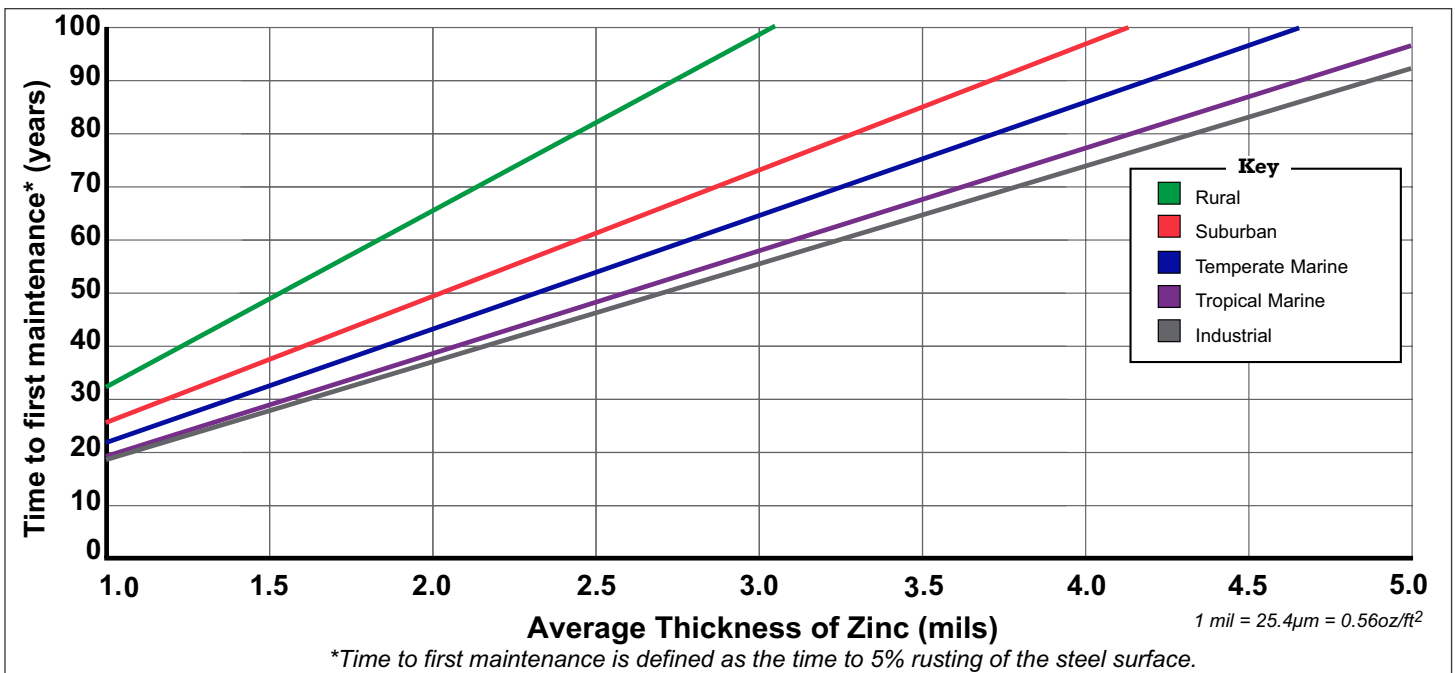


Figure 1: Time to First Maintenance Chart

MAINTENANCE-FREE

Trucks and trailers are used on a daily basis for many years at a time. So, it is extremely important to have a corrosion resistant coating that will constantly protect the steel. Maintenance is time-consuming and expensive and can create major hold ups in the trucking industry. By utilizing HDG steel, maintenance can be virtually eliminated. Hot-dip galvanized coatings exposed to the environment last at least 75 years, and interior or enclosed galvanized coatings have been shown to last well over 100 years. For most truck and trailer products, this maintenance-free period lasts as long as or longer than the project design life. For most truck and trailer products, this maintenance-free period lasts as long as or longer than the vehicle design life. The *Time to First Maintenance Chart* (Figure 1) shows the durability of hot-dip galvanized coatings in five environments representing atmospheric conditions. As you can see, in the harshest environment (Industrial) first maintenance will not be required for approximately 73 years.

LIFE-CYCLE COST

Hot-dip galvanized steel truck and trailer products are economically superior on a life-cycle basis. Because of the durability and maintenance-free nature of the zinc coating, your initial investment will be the total cost of the product throughout its life. In addition to being competitive with other corrosion protection systems in terms of initial investment, when you take into account the long-term advantages of the galvanized coating, you will discover it is well worth the investment. Hot-dip galvanizing is has more durability and is less expensive when compared to high-performance paint systems. Maintenance is costly, time consuming and labor intensive. Throughout the life of these trucking projects, maintenance is eliminated and money is saved by utilizing HDG steel.

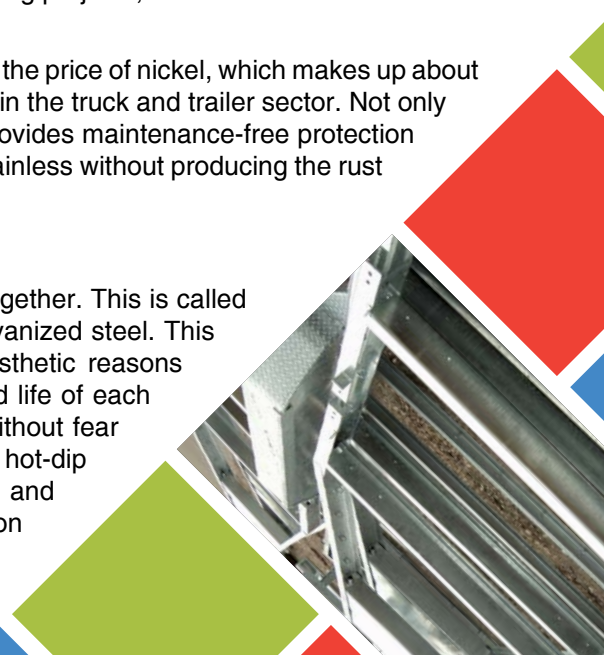
Calculate the value of utilizing HDG in your next project.
Visit lccc.galvanizeit.org

In recent years, the cost of stainless steel has skyrocketed due to the increase in the price of nickel, which makes up about 10% of Grade 304 stainless steel.¹ This has opened up an opportunity for HDG in the truck and trailer sector. Not only is hot-dip galvanizing more cost effective than stainless steel, but it can also provides maintenance-free protection for the life of the truck or trailer. "Galvanizing provides the aging properties of stainless without producing the rust or requiring any maintenance as fa as painting or touch-ups."¹

AESTHETICS

Few specifiers realize the value of utilizing two corrosion protection systems together. This is called a duple system, and is formed by painting or powder coating over hot-dip galvanized steel. This system has been used for decades and is most commonly specified for aesthetic reasons with the combined benefit of receiving 1.5 - 2.3 times the sum of the expected life of each system alone. The maintenance cycle of the paint system can be extended without fear of rust. Safety is the number one concern in the truck and trailer sector, and hot-dip galvanizing can be painted to increase visibility and for safety signs. Trucks and trailers can be duplexed to add branding, logos, company or safety information without comprising the durability of the coating.

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CONCLUSION

With a growing population and an increased focus on sustainability for transport of goods and people the truck and trailer industry is a critical element of our nation's transportation system. Hot-dip galvanizing is a natural choice for the trucking industry with robust corrosion and impact resistance combined with low initial and life-cycle cost.

Hot-dip galvanized steel is a great solution for truck and trailer manufacturing. Providing a corrosion protection system that requires no touch-up or maintenance for years to come, hot-dip galvanizing's durable barrier and cathodic protection against nicks and scratches is also beneficial. Furthermore, hot-dip galvanizing is often a more economic solution than other materials and provides design freedom with the option of duplex systems. Hot-dip galvanized trucks will continue to transport materials safely and corrosion-free for decades.



¹Trailer/Body Builders. "More Painless than Stainless." Rick Weber. May 2007.



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Case Studies

CAPACITY TRUCKS - LONGVIEW, TX

Capacity Trucks, located in Longview, TX, is a premier manufacturer of quality yard trucks. Their product can be seen in ports, shipping hubs, warehouses, distribution centers and terminals throughout the world. Capacity was looking for a way to make their product more competitive for their business and more sustainable for their customers.

In many cases these trucks travel through extreme and very harsh working environments, many times operating 24 hours a day. This was the leading cause of an increasing demand for refurbishing leased trucks. Capacity captured this demand, but needed a way to reduce cost. Knowing that the frame was one of the determining factors of continued life, their engineers specified a Hot Dip Galvanized (HDG) frame and boom assembly to not only extend the life of the truck, but reduce cost by not having to replace the frames and booms while refurbishing.



The design team understood that the material must be designed for HDG rather than paint. They had several meetings with the galvanizer to ensure the truck frame and boom assembly were properly designed for hot dip galvanizing.



As of now Capacity Trucks have very reliable and well known customers with galvanized truck frames such as FedEx, UPS, BASF and more. Sustainability and life-cycle costs, both of which can be increased and decreased respectively by galvanizing, is what made galvanizing the most attractive choice for increased quality of this product.

MYCO TRAILERS - CUSTOM BUILT BOAT TRAILERS - BRADENTON, FL

Saltwater, humidity, and Florida's tropical environment are all enemies of the steel construction boat trailer. The submersion of the trailer when launching a boat can wreak havoc on the steel members. The last thing an individual wants is a breakdown due to corrosion while trailering their boat. In this industry corrosion protection is an absolute necessity. Myco Trailers is a world leader, and has set themselves apart in the trailer industry. Myco trailers are custom built, all-welded boat trailers for a perfect fit for the hull shape of your boat. Many of these trailers are hot-dip galvanized for corrosion resistance to withstand the various, harsh environments that they may be subjected to. The cathodic protection of hot-dip galvanizing will ensure that the steel trailer holds strong against corrosion of fresh water and salt water alike. Also, the hardness and durability of the galvanized coating will not easily scratch making it susceptible to corrosion. This is an important quality for military use when transporting through heavy brush, rugged terrain, and various environments around the globe. The durability and long life of hot-dip galvanizing provides a cost-effective product allowing Myco's customers to further invest in improving their boat rather than making repairs to their trailer.



KOKOSING WATER TRUCK - FREDERICKTOWN, OH

Kokosing Construction has long believed in the benefits of hot-dip galvanizing through their general contracting companies, bridge and highways divisions, and their aggregate processing subsidiaries. This time hot-dip galvanizing was called to perform for the company's over-the-road water trucks. The company consulted with the galvanizer and their fabricator to seek a solution to their ongoing corrosion problems with the water trucks they use in their bridge and highway division. Through careful design and fabrication techniques the entire tank was able to be dipped in the bath of molten zinc with little to no clean up required before installation on the truck. The overall success of this tank has helped solve the corrosion problems for Kokosing and helped to build a niche market for the steel fabricator.



ROSENBAUER VIPER AERIAL LADDERS - FREMONT, NE

Hot-dip galvanized (HDG) steel is the most cost efficient coating solution for maintenance free ladders in the industry. HDG is specified for its complete coverage during the immersion process and for the outstanding corrosion protection. The entire interior and exterior areas are protected and the intermetallic bond of the zinc is approximately ten times greater than the adhesion of paint to the underlying steel. These ladders will outlast any aerial in the industry.

These ladder sections are internally vented to provide a uniform finish of superior quality to the end user. The unique design allows the coating to reach the inside of each side rail, hand rail, diagonal, k-brace, and rung. Using hot-dip galvanizing minimizes costs, improves the quality, and ultimately exceed the end users' expectations.



U-HAUL TRAILER - TEMPE, AZ

With a household name like U-Haul, maintaining the lead in the trailer rental business means having a willingness to change for the better. Hot-dip galvanizing is rugged enough to handle road hazards such as rocks and road salt. The zinc coating is harder than the steel itself, and is aesthetically appealing. Driven by short-term cost reduction and long-term maintenance savings, U-Haul began to specify hot-dip galvanizing for some its trailer parts in 1995. After regular consultation with the galvanizer, a unique protocol was developed to dip the entire assembled trailer into the molten zinc bath-including moving parts such as the tailgate. Design suggestions from the galvanizer were met with enthusiasm by U-Haul. A residual benefit was discovered when U-Haul was able to eliminate all paint specifications and the inventory required to paint and repaint the trailers. Not only is the profile of hot-dip galvanizing elevated because of the many thousands of trailers now on the road, but U-Haul has an industry partner in hot-dip galvanizing. Commented U-Haul representatives, "We now have a coating with the durability and lifetime that matches the intended expectancy of our product."



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