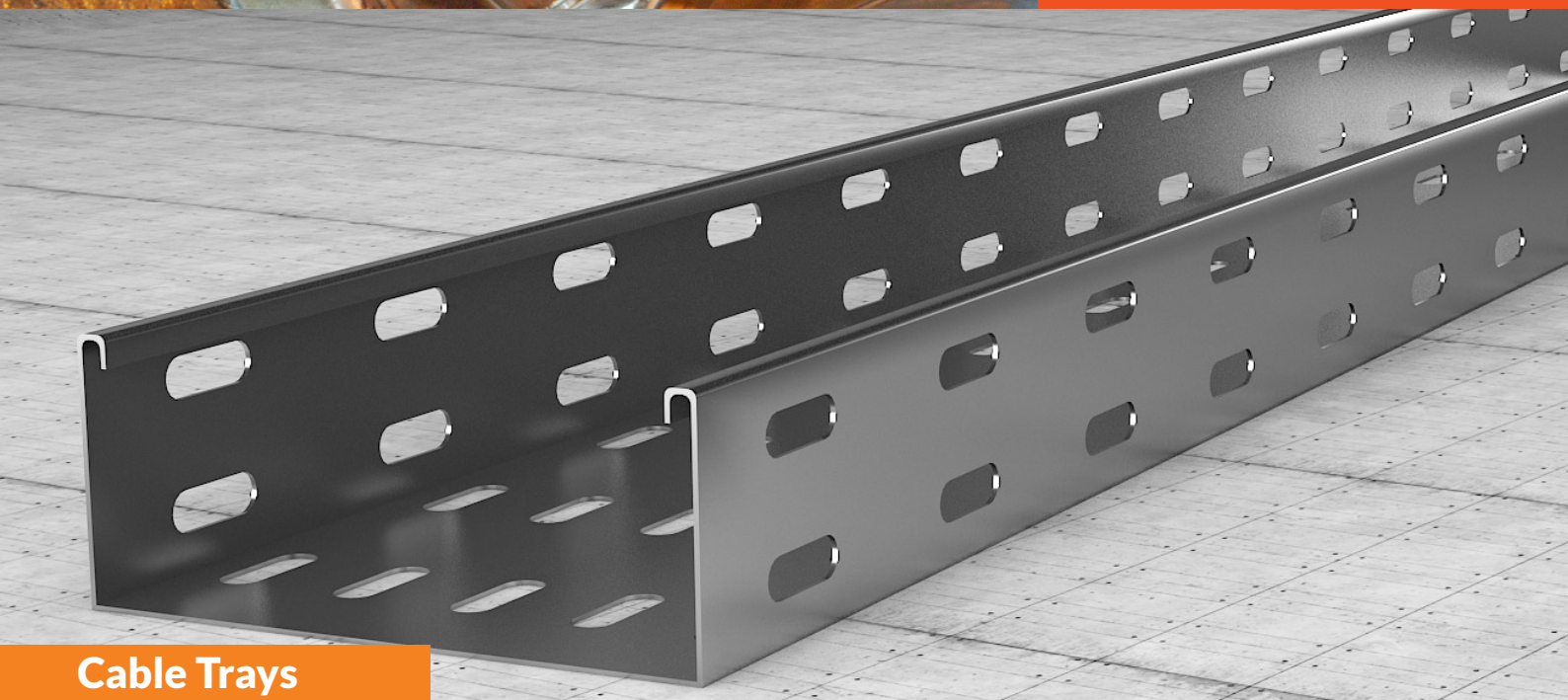




Hot Dip Galvanizing



Cable Trays



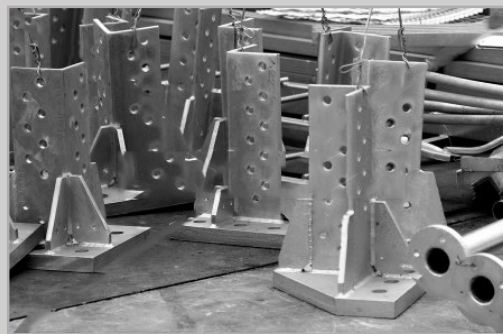
Crash Barrier

INTRODUCTION

At Coastal Qatar, we have always been about constantly taking on Engineering Challenges, and pushing the boundaries of engineering innovation. What began in the '70s, soon established itself as a brand that is synonymous with successful integration capabilities - both forward and backward, and an expertise that allows for holistic delivery and partnership. With a string of prestigious projects under our belt, it seemed the natural thing to happen. A bold and clear transition to what we are today - the Integrated Engineering specialists.

We believe in "Doing it right, the first time; every time". It's simply, our commitment to delivering excellence and incorporating passion into all that we do.

Taking pride in having a free and open structure that inspires trust, ours is a diverse, multi-cultural group of professionals who are driven toward accelerated growth, while being completely ethical, looking forward to building enduring relationships and tackling newer challenges, because, that is who we are. The Challenginers.





Brand Purpose Statement

As integrated engineering specialists, our strength lies in embracing engineering challenges, in simplifying the complex, and incorporating passion into all that we do. The Coastal way has always been about constantly challenging the boundaries of engineering innovation, commitment to safety, schedule and quality, thereby delivering excellence to the construction and engineering landscape of Qatar .

The Coastal Culture.

- We have a free and an open structure that inspires trust
- We are a diverse, multi-cultural group of professionals
- We don't overpromise or under deliver
- We aim to exceed expectations
- We believe in 'Doing it Right, the First Time, Every Time'
- We are driven by and towards accelerated growth, doing it the most ethical way

The Coastal Values

- Ongoing Innovation & Professionalism
- High levels of Domain Knowledge & Expertise
- Meticulous Planning & Driven By Process.
- Acute Transparency & Valuing Relationships

Our Factory





Galvanizing Segments



Stadiums



Rail-Metro



Airport



Public Works



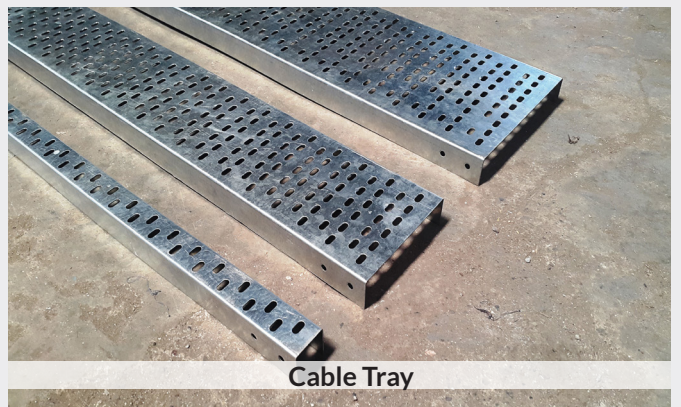
Sign Boards



Port



Oil & Gas



Cable Tray

About Coastal Steel & Galvanizing W.L.L

The new hot dip Galvanizing facility is situated in New Industrial Area, Building No.: 287, Zone.: 81, Street No.: 4. New Industrial Area, Doha, Qatar, and is equipped with fully automated state of the art Galvanizing equipment from Italy. The production capacity of the plant is 89000Mt/Year. The facility consists of Pre Treatment Area, Dryer, Hot Dip Galvanizing Furnace and Post Treatment Area.



Pre Treatment Area

Acid Degreasing Tank	13.5m Length	1.8m Width	3.0m Depth
Pickling Tank	13.5m Length	1.8m Width	3.0m Depth
Rinsing Tank	13.5m Length	1.8m Width	3.0m Depth
Fluxing Tank	13.5m Length	1.8m Width	3.0m Depth

Dryer

Pre-Heating Dryer	13.5m Length	4.0m Width	3.0m Depth
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Hot Dip Galvanizing Furnace

Zinc Kettle	13.5m Length	1.6m Width	3.0m Depth
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Post Treatment Area:

Cooling Tank	13.5m Length	1.8m Width	3.0m Depth
Passivation Tank	13.5m Length	1.8m Width	3.0m Depth

Standards and Codes for Hot Dip Galvanizing

British Standard (BSI): BS EN ISO 2009 : 1461 (Formerly BS 729 & BS EN ISO 1999 : 1461)
 American Standards: ASTM A 123/ A 123M, ASTM A 143/ A 143M, ASTM A153/ A 153M, ASTM A 384/ A384M, ASTM A 385/A 385M, ASTM A 767/ A 767 M, ASTM A 780/ A780M, ASTM B6, ASTM D 6386, ASTM E 376
 Qatar Standards: Qatar Construction Specification 2014 (QCS 2014)



What is Hot Dip Galvanizing?

Hot dip galvanizing is the process of coating iron or steel with a layer of zinc by immersing the metal in a bath of molten zinc at a temperature of around 860 °F (460 °C). During the process, a metallurgically bonded coating is formed which protects the steel from harsh environments, whether they be external or internal. Galvanized steel is widely used in applications where corrosion resistance is needed without the cost of stainless steel and can be identified by the crystallised pattern on the surface (often called a 'spangle'). Galvanizing is probably the most environmentally friendly process available to prevent corrosion.

WHY GALVANIZE?

The Benefits

When it comes to choosing a corrosion protection system what makes galvanizing unique?

It's an honest coating

Due to the unique alloy growth that occurs when clean steel is immersed into molten zinc – the coating effectively becomes part of the steel – if it looks good on day one it will remain so for many many years to come.

It's proven

With a history that stretches back over 200 years, there are innumerable examples in many environments proving its performance.

In Dorset, a bridge at Lydlinch was constructed in 1944 to assist the flow of supplies during the D-Day landings. The Callender-Hamilton design was originally intended only to be a temporary bridge but is still in use 70 years after construction. An inspection of the bridge was conducted by Galvanizers Association in 1999 after 55 years service. This indicated that the galvanized coating was in excellent condition with no signs of rust on any steel members. It is anticipated that the coating will achieve a maintenance-free life of more than 100 years.

It's sustainable

The long-term durability provided by galvanizing is achieved at relatively low environmental burden in terms of energy and other globally relevant impacts.

Several studies have demonstrated the high economic and environmental costs associated with the repeated maintenance painting of steel structures. These burdens can be significantly reduced by an initial investment in long-term protection. Lack of attention to optimal corrosion protection can leave a damaging economic legacy of repeated maintenance costs.

In social housing projects, future maintenance costs will be borne by the local authorities. In public infrastructure projects, use of galvanized steel leads to lower maintenance budgets, releasing public funds for other purposes.

Unique Characteristics of Hot Dip Galvanizing

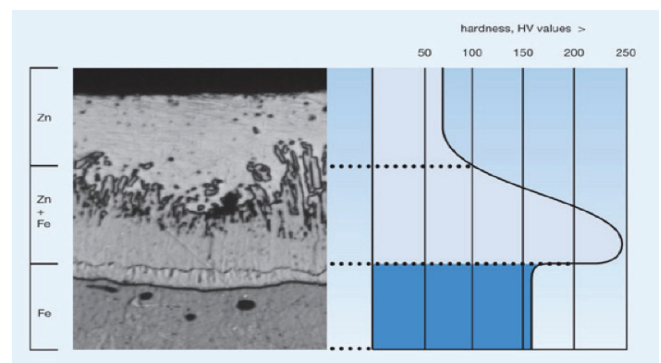
The unique nature of the galvanizing process provides a tough and abrasion resistant coating which means less site damage and speedy erection of structures.

Cohesion

Unlike most coatings, which rely solely on preparation of the steel to obtain adhesion, hot dip galvanizing produces a coating bonded metallurgically to the steel. In other words, the iron and zinc react together to form a series of alloys which make the coating an integral part of the steel surface with excellent cohesion.

Toughness

Resistance to mechanical damage of protective coatings during handling, storage, transport and erection is very important if the cost of 'touching up' on site is to be avoided. The outer layer of pure zinc is relatively soft and absorbs much of the shock of an initial impact during handling. The alloy layers beneath are much harder, sometimes even harder than the base steel itself. This combination provides a tough and abrasion resistant coating.



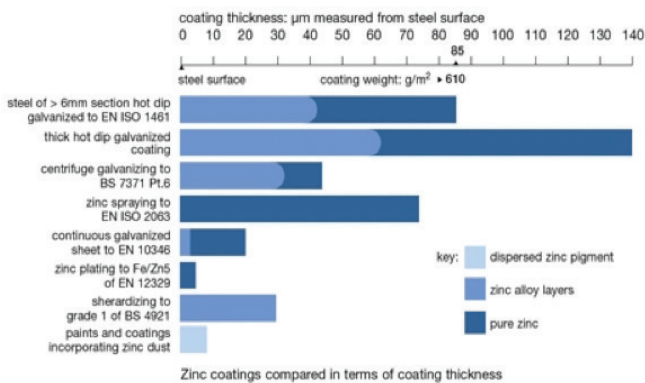
Micro section of hot dip galvanized coating showing variations in hardness through the coating

How Galvanizing Protects

Galvanizing is unique – tough, long-lasting, self-healing and covers internal and external surfaces. Here we highlight the benefits of barrier and sacrificial protection:

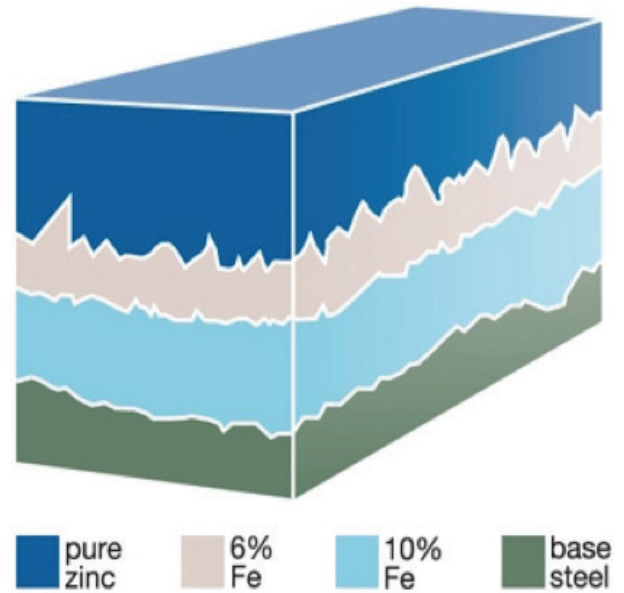
Barrier protection

Galvanizing provides a barrier between all internal and external steel surfaces and their environment. Galvanizing is a term often wrongly used to describe zinc coatings in general. The diagram below illustrates how the different types of zinc coatings vary in terms of coating thickness. The life expectancy of a zinc coating is largely determined by its thickness. Thicker coatings give longer life. Hot dip galvanizing provides fabricated iron or steel products with maximum protection through a continuous, tough, metallurgically bonded coating of much greater thickness.

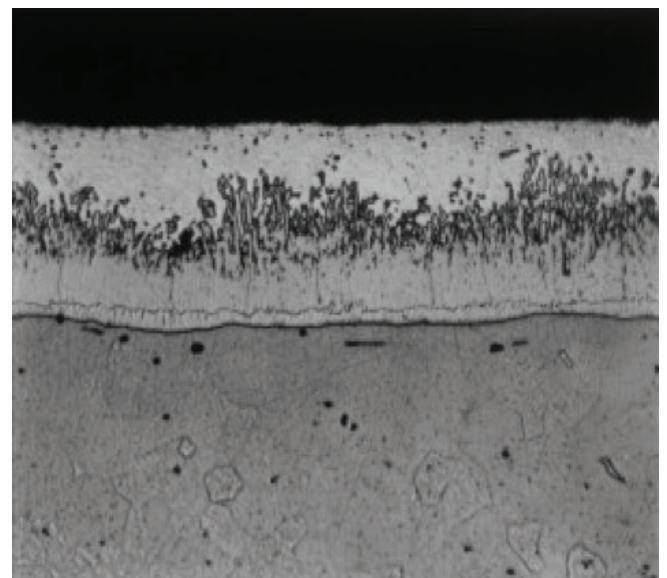


is no demarcation between steel and zinc but a gradual transition through the series of alloy layers which provide the metallurgical bond.

Schematic section through a typical hot dip galvanized coating



Microstructure of a typical hot dip galvanized coating



Protection by sacrificial action

Zinc corrodes in preference to steel and sacrifices itself to protect the steel, hence hot dip galvanizing will provide this sacrificial action. The corrosion products from the zinc are deposited on the steel resealing it from the atmosphere and therefore stopping corrosion. With paint coatings, additional protection would have to be applied immediately after the damage occurred or the steel would rust with eventual breakdown of the whole coating as rust crept underneath the paint film.

The Coating

When the reaction between iron and zinc has virtually ceased and the article is taken out of the galvanizing bath complete with its outer coating of free zinc, the process is complete. In reality there



Costs and Economics

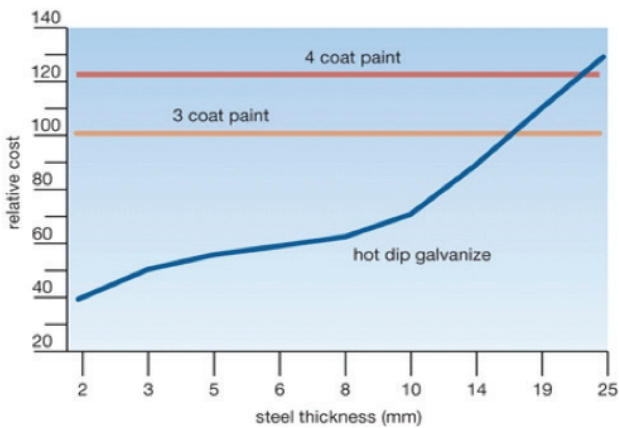
The true cost of protecting steelwork from corrosion has to take into consideration two important elements:

1. The initial cost of protection
2. The lifetime cost, which includes the cost of maintenance. This is the cost of ensuring that steelwork is protected from corrosion throughout its service life.

Initial Cost

Hot dip galvanizing is often perceived to be more expensive than it is. There are two reasons for this: Firstly, that such a high performance coating is automatically assumed to be expensive. Secondly, the initial cost of galvanizing relative to paint has changed significantly over recent years. Painting costs have steadily increased whilst galvanizing costs have remained stable.

The graph illustrates that for many applications the cost of hot dip galvanizing is lower than that of applying alternative coatings. The reason for this is simple: alternatives such as painting are very labour intensive compared with galvanizing, which is a highly mechanised, closely controlled, factory process.



Comparison between initial costs

Whole-Life Cost

The whole-life cost of a building can be defined as:

“The cost of acquiring, operating and maintaining a building over its whole life through to disposal”

Whole-life costing can be characterised as a system that quantifies financial values for buildings from

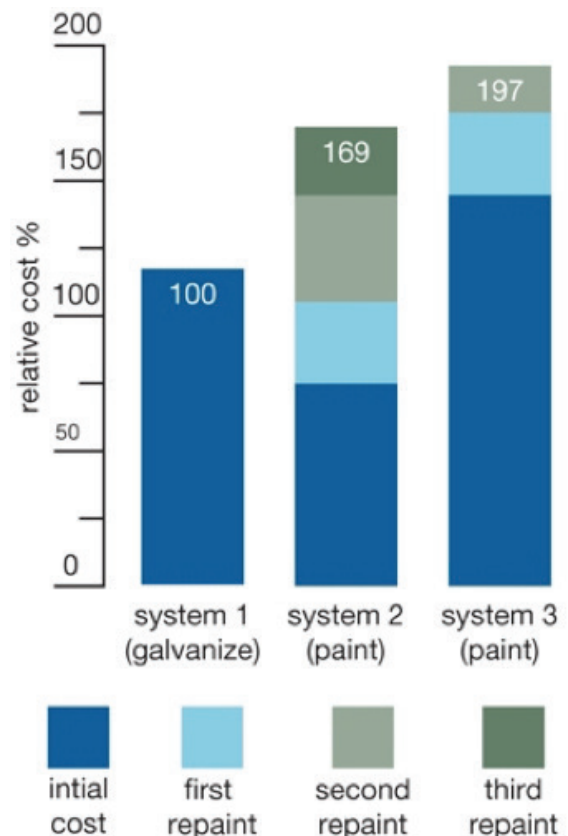
inception and throughout the building’s life. It is an approach that balances capital with revenue costs to achieve an optimum solution over a building’s whole life.

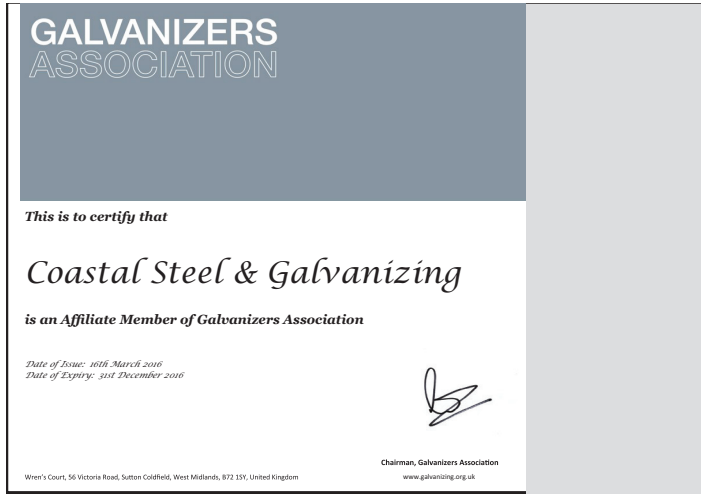
This technique, whilst not in itself new, has over recent years become accepted best practice in construction procurement. Whole-life costing can be used at any stage of the procurement process and can be used at the levels of facility, function, system and component. This includes everything from initial design to end-of-life.

Conclusion

It can be seen that over a -25year project life the cost of a “cheaper” paint system is almost 70% more than the cost of galvanizing. Likewise the cost of a more “expensive” paint system is almost double that of galvanizing. In initial, or first cost terms, hot dip galvanizing is comparative with a good quality paint system. However, when looking at lifetime costs, hot dip galvanizing works out to be considerably cheaper than most other systems.

Net Present Value compared





COASTAL GROUP OF COMPANIES



CERTIFICATIONS



AWARDS



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