Atkore™

WHITE PAPER

New Coatings for Steel: Longer Life, Lower Cost

For decades, engineers have had limited choices when it came to protecting steel from corrosion in outdoor environments. Hot dip galvanized (HDG) has long been the standard and provides a good level of protection, but most often will not protect the steel for the entire service life of the facility. Stainless steel has been another option to provide superior protection, but at a much higher installation cost.

This paper examines a cost competitive, new alternative that offers 3 times the service life of HDG, extending the useful life of many projects without the need for much more expensive stainless alternatives.

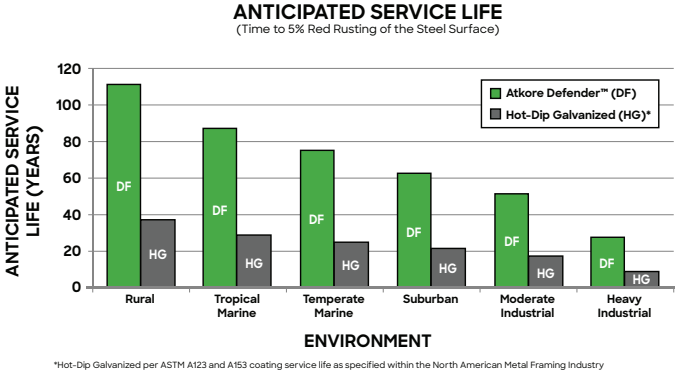
Steel vs. The Elements

Although the battle between man and the elements has raged for millennia, it has been less than 200 years since metallurgists began developing strategies for protecting steel from corrosion. Galvanized steel was first created in 1840, and stainless steel only emerged in 1913, just over a century ago. Still many different types of steel – including carbon steel – are still widely in use for a broad variety of applications.

When it comes to construction applications, contractors and engineers have traditionally segmented the steel corrosion protection requirements into three broad categories. These are:

- Indoor applications that are relatively free from corrosion issues and most commonly satisfied with pre-galvanized or electrogalvanized zinc coatings, or other powder coated or painted coatings
- Outdoor applications that present some corrosion issues and are most commonly serviced with a hot-dipped galvanized coating paired with stainless steel threaded fasteners
- High corrosion or chemical exposure applications, typically served with type 304 or 316 stainless steel, or other corrosion resistant materials such as fiberglass or aluminum

Although Hot-Dip Galvanized is the most common finish, there are some serious drawbacks when using HDG for outdoor applications. First, Hot-Dip Galvanized steel typically reaches 5% red rust after just around 1000 hours of continuous salt spray exposure based on industry standard testing. As a result, the anticipated service life for galvanized steel in outdoor applications is often less than that of the facility in which it is installed, requiring a complete teardown and reinstallation at some point throughout the life of the building. Over the long term, particular attention must be given to exposed struts and fittings fabricated from galvanized steel, since these components are especially vulnerable to the elements.



*Hot-Dip Galvanized per ASTM A123 and A153 coating service life as specified within the North American Metal Framing Industry

Outdoor Applications: Stainless or What?

For these reasons many engineers and builders instead utilize stainless rather than rely on galvanized. Stainless offers great performance in comparison, but at what price differential? Stainless steel is often two to five times more expensive than hot-dip galvanized steel for a given application.

So, the tradeoff has been whether to have the superior protection of stainless at a higher cost, or lesser protection at a significantly lower cost. Until now, no effective alternatives have been available. Engineers and contractors still want improved protection from corrosion, while maintaining a lower price point than stainless steel. Fortunately, new coatings that have come on the market are making a huge impact on the construction industry and are providing better coating options for strut, fittings, and other members.

Why New Coatings Matter

Today, new non-stainless steel solutions can offer 3 times the useful life of hot-dip galvanized steel for nearly any application. New coatings can help better ensure that products and projects will last well beyond the period of any liabilities, and thus offer peace of mind to engineers and contractors alike. Coatings that can eliminate the need for repainting or recoating can also translate into bottom-line profits, yielding bigger savings in the long term as well as up-front savings during construction.

The Perfect Steel for Outdoors

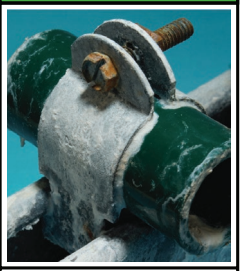
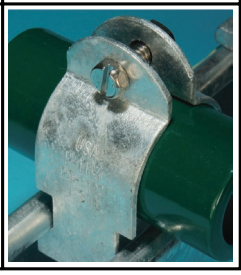
What are the desired properties for the ‘perfect’ steel for outdoor and corrosion-prone locations? Ideally, this steel would:

- Offer a direct substitution and replacement for hot-dip galvanized and stainless steel
- Offer superior performance to eliminate or reduce any future need to repair or replace the system
- Be available at a similar or lower price than current options
- Offer a thin, consistent coating layer to make it easier to coat threaded fasteners
- Eliminate the binding of threads that is typically found in hot dip galvanized steel
- Have a proven track record that can allay the fears of change industry-wide

Introducing Atkore Defender™

Atkore now offers a new line of coated steel products under its Defender™ brand. With this introduction engineers and contractors now have an alternative to stainless steel for high corrosion, outdoor applications. Atkore Defender steel enables delivery of systems that last, by offering 3 times better protection than hot-dip galvanized against outdoor corrosion. Atkore Defender steel keeps its rust-free appearance for years, and its coating has self-healing properties that enables the steel to re-protect itself when cut or scratched.

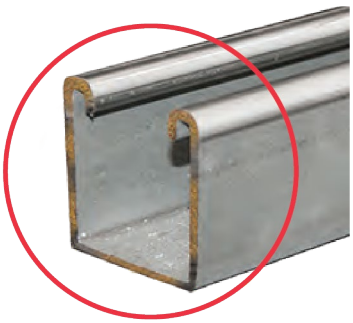
PHOTOS FROM ASTM B117 SALT SPRAY TEST

	0 hours	100 hours	1,000 hours	2,000 hours	3,000 hours
Atkore Defender™ (DF)					
Hot-Dip Galvanized (HG) per ASTM A123 and A153					

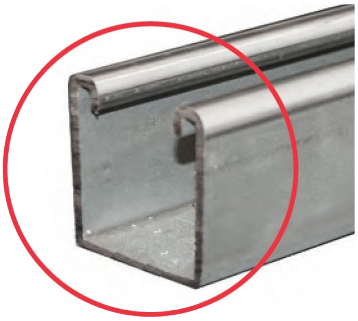
Building with Atkore Defender can offer significant lifetime savings for a project, enabling teams to avoid replacement and costly maintenance that would otherwise be required with lesser types of steel coatings. By using Atkore Defender engineers and contractors can

- Save up to 40 percent in material costs by avoiding stainless steel fasteners
- Greatly reduce labor costs by avoiding or eliminating cut end touch-ups

And longer life for steel can also translate to less waste and less scrap in landfills, improving the environment for all of us.



Red rust may form on the cut end



Will heal over time*

* Duration of healing can vary depending on weather, location, type and size of application.

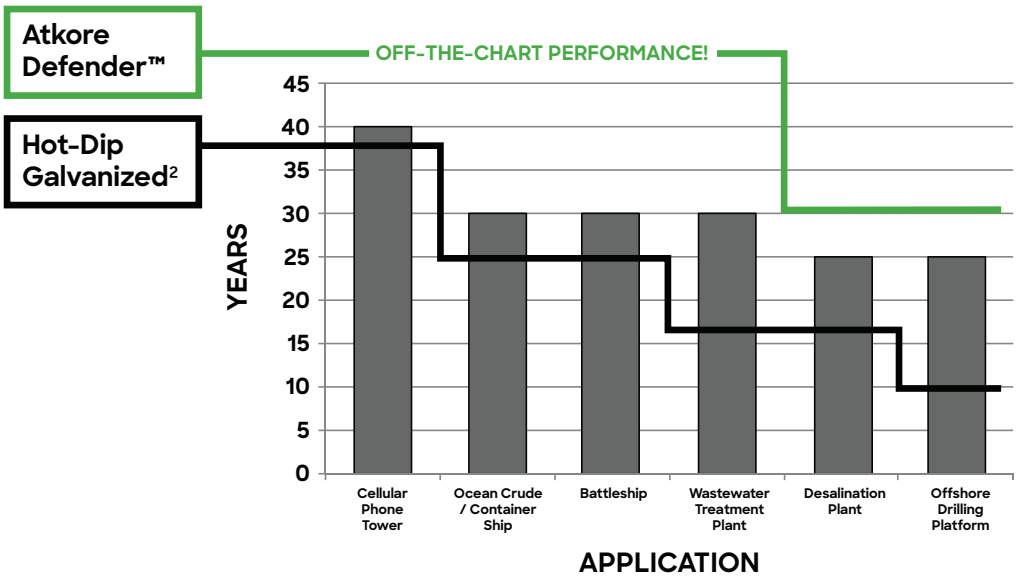
Why Atkore Defender™?

Atkore has a rock-solid history with nearly a century of experience in steel strut, conduit, tubing and other products. More importantly, the new Defender™ coatings are available exclusively from Atkore.

To help engineers and contractors gain confidence in Atkore Defender coatings Atkore also provides a comprehensive set of tools for their evaluation including:

- 3rd party, accredited laboratory tests and ASTM standards to back up performance claims
- Case studies that demonstrate the use of Atkore Defender in a variety of applications
- Real-world use cases that demonstrate the advantages of Atkore Defender under various conditions

TYPICAL APPLICATION DESIGN LIFE[1] VS. ANTICIPATED SERVICE LIFE



1) Typical application design life is sourced from a number of different publications and is not true for all applications. Reference your project-specific requirements and environment for a true performance estimate.
2) Hot-Dip Galvanized per ASTM A123 and A153 coating service life as specified within the North American Metal Framing Industry

The coating technologies used in Atkore Defender have been in widespread use in outdoor applications across the globe for years, and now Atkore brings that tried-and-true expertise to steel framing for construction professionals to take advantage of.

The bottom-line benefits are clear: Higher performance, and lower project costs with Atkore Defender.

For more information on Atkore's Corrosion Resistant Product Line

CLICK HERE

About Atkore

Atkore is forging a future where our employees, customers, suppliers, shareholders and communities are building better together – a future focused on serving the customer and powering and protecting the world. With approximately 5,000 employees and 47 manufacturing facilities worldwide, Atkore is a leading provider of electrical, safety, and infrastructure solutions.

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