

PROJECT AT A GLANCE

The strength of steel: redefining anti-corrosion coatings for long-lasting commercial infrastructure

Next-generation silicone-based solutions reduce maintenance costs of steel through lower-carbon industrial coatings



Project Name: PSX anti-corrosion coatings for infrastructure

Project Description: Redefine low-carbon, anti-corrosion coatings for stronger, more sustainable steel infrastructure

Project Start: 2018

Crediting Period: Project Lifetime, 5 years

Collaborator: PPG

Location: North America

Why Beyond Business as Usual? Improves durability and cost-efficiency of anti-corrosion coatings while offering the building industry with alternative low-carbon solutions



Uncovering a clear path forward for a high-energy industry

The production of steel is energy-intensive, making the material the fifth largest consumer of fuels among U.S. manufacturing sectors.¹ From regulatory bodies to city governments, organizations are recognizing the need to tighten standards for lower greenhouse gas (GHG) emissions in the building industry, which includes steel production. In fact, since 1990, the industry has reduced steel energy intensity by 31 percent and CO₂ emissions by 36 percent per ton of steel shipped.²

While significant progress has been made, there is more work to be done to curb environmental impact.

Dow and PPG's collaboration began with this in mind—to offer reduced GHG emissions industrial coatings by introducing a next-generation alternative to the traditional options available. The incumbent coating technology is a three-coat system with a zinc primer, an intermediate epoxy layer, and a polyurethane topcoat. PSX, on the other hand, is a revolutionary two-coat system with a zinc primer and polysiloxane topcoat. This system, which requires fewer coats to achieve the same level of protection as a competitive three-coat system, results in less energy-intensive production and application, and therefore, a potential reduction of GHG emissions.

Once applied to a structure, polysiloxane-based solutions are more durable than polyurethane-based industrial coatings. Requiring fewer re-coats over time, this means lower maintenance costs for the building owner and lower carbon emissions impact.

In addition, PSX solutions are designed to help businesses across the value chain stay ahead of the curve by accelerating adoption of innovative technologies. Specifically, by investing in research and development for low-carbon technologies, Dow and PPG are at the forefront of driving code changes such as updates to ISO 129444, which specifies performance characteristics for anti-corrosion steel coatings.

A fresh face for iconic infrastructure

Steel is the heartbeat of North American infrastructure. Many of the most iconic buildings and bridges in the United States and Canada were built with steel and designed to last decades, if not centuries. But as with any building material, degradation is inevitable over time. PPG – a global supplier of paints and coatings – is going beyond business as usual to not only help lessen high costs of steel corrosion in the built environment, but also reduce the life cycle carbon impact of industrial coatings.

As a contributor under the Official Carbon Partnership between Dow and the International Olympic Committee (IOC), PPG is redefining anti-corrosion coatings for a wide range of steel commercial infrastructure – from power plants and skyscrapers, to ships and trains, to roller coasters. PPG's two-coat PSX solutions, powered by Dow polysiloxane technologies, enable paint and coating formulators to offer architects and property developers a next-generation option. Compared to existing three-layer systems, PPG PSX technologies help improve the building owner's bottom line long-term, while leaving a lasting, positive legacy for the environment.

¹https://www.energy.gov/sites/prod/files/2013/11/f4/energy_use_and_loss_and_emissions_iron.pdf

²<https://www.steel.org/-/media/doc/steel/reports/2018-aisi-profile-book.ashx?la=en&hash=17FC8A36231996DAE1B8CBFADEF58CBAA0363E33>

Building lasting infrastructure for a stronger urban future

As cities continue to expand and evolve, paving the path for a sustainable future in the built environment is paramount.

Through next-generation engineered polysiloxane with enhanced flexibility, PSX solutions offer better long-term adhesion, toughness, corrosion and chemical resistance in even highly insistent exposure conditions using less materials. This translates to reduced application time, improved cost-efficiency and ultimately, a smaller carbon footprint.

As city skylines continue to grow and change through steel infrastructure, the future of urban environments depends in part on how effectively we build, maintain and protect them. By adopting advanced innovations in low-carbon technology, the building industry can work together to strive toward a positive climate legacy.

Dow silicone-based technologies for industrial paints & coatings

Dow silicone resins are a key ingredient for protective paints and industrial coatings. The versatility of silicone resins, which offer adhesion over substrates and superior film resistance, allows formulators to tailor performance attributes to the distinct needs of infrastructure coatings—from hardness and flexibility to dielectric properties. With outstanding heat resistance and weatherability, silicone resins are excellent for protecting exterior structures in highly demanding conditions, while enabling the production of low-VOC paints and coatings for a more sustainable future.

Learn more about Dow's solutions for Industrial Paints & Coatings: <https://www.dow.com/en-us/product-technology/pt-resins-binders-film-formers/pg-resinsbinders-silicone-resins-binders.html>

Dow-IOC official carbon partnership: combining the power of sport and science for a more sustainable future

Dow is a Worldwide Partner and the Official Chemistry Company of the Olympic Movement. In 2017, Dow was appointed the Official Carbon Partner of the International Olympic Committee (IOC) to develop carbon mitigation programs using science to create carbon savings that are applied to balance the operational carbon footprint of the IOC. Dow is collaborating with customers, value chain partners and industry leaders to work together to introduce innovative low-carbon technologies in the sectors of Buildings & Infrastructure, Food & Packaging and Manufacturing & Energy. These mitigation projects are tailored to the technology needs of the various geographic regions and help to accelerate the adoption of more sustainable technologies across different sectors and value chains. The program and carbon reductions are verified by a third party, Environmental Resources Management.

Be part of the program

As part of the Dow-IOC Carbon Partnership, we seek to deploy better technologies that reduce costs and promote resource-efficient processes. We invite industry leaders who would like to gain competitive differentiation, enhance sustainability expertise and be climate leaders to work with Dow and other technical experts to improve the economic and environmental profile of their operations and solutions.

Learn more at <https://www.dow.com/en-us/sports/sustainability/ioc-carbon-partner>.



OFFICIAL CARBON PARTNER

About Dow

Dow (NYSE: DOW) combines one of the broadest technology sets in the industry with asset integration, focused innovation and global scale to achieve profitable growth and become the most innovative, customer-centric, inclusive and sustainable materials science company. Dow's portfolio of performance materials, industrial intermediates and plastics businesses delivers a broad range of differentiated science-based products and solutions for our customers in high-growth segments, such as packaging, infrastructure and consumer care. Dow operates 113 manufacturing sites in 31 countries and employs approximately 37,000 people. Dow delivered pro forma sales of approximately \$50 billion in 2018. References to Dow or the Company mean Dow Inc. and its subsidiaries. For more information, please visit www.dow.com or follow @DowNewsroom on Twitter.

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