

Green Data Issue

**Gray Coating for Green Building
Hot-Dip Galvanized Steel in
Life-Cycle Assessment (LCA)**

The US Green Building Council's Leadership in Energy and Environmental Design (LEED®) has been the most recognized benchmark in the green building market for 15 years. The LEED® system laid the groundwork for creating more sustainable buildings and the need for such a movement. And though LEED® still has a place in the development of a more sustainable built environment, many specifiers have shifted focus to a more objective and measurable indicator of a product or material's greenness, life-cycle assessment (LCA).

LCA is a standardized scientific method for the systematic analysis of all mass and energy flows as well as environmental impacts attributed to a product system, from raw material acquisition to end-of-life management. LCA accounts for not only the energy and material input and emission outputs of producing a product or material, but also the impacts while in use and at the end-of-life. Because many products can contribute as much or more environmental impact after production, an LCA provides a more complete measurement of a product's sustainability. Furthermore, conducting an LCA on a product not only benchmarks the current impact, but can also highlight areas for improvement to reduce the impact of that product in the future.

With all of these things in mind, the American Galvanizers Association (AGA), in conjunction with the International Zinc Association (IZA), conducted an LCA on hot-dip galvanized steel. Two renowned international environmental firms, Five Winds International and PE International were hired to perform the study using worldwide data collected from hot-dip galvanizers, zinc producers, and the GaBi database of published environmental statistics.

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Hot-Dip Galvanizing for
Sustainable Design

CLICK TO ORDER this cornerstone publication examining life-cycle assessment (LCA), life-cycle inventory, and LEED data, and learn how hot-dip galvanizing is the corrosion protection of choice for sustainable design.

ASK DR. GALV

I'm working on a steel project that requires corrosion protection and I would like to specify a sustainable protection system. How does hot-dip galvanizing compare to paint from an environmental standpoint?



A: As the necessity and popularity for sustainable development, or green building, continues to rise, questions about the differences between building materials and/or coatings are becoming more prevalent. Many sustainable benefits of hot-dip galvanized steel, such as its 100% recyclability, maintenance-free durability, and low life-cycle costs have been documented and promoted for years. However, with the increased interest and scrutiny in the marketplace to find true environmentally friendly materials, and avoid greenwashing, the demand for more objective and measurable data has grown.

The American Galvanizers Association (AGA) took the demand seriously and recently completed a life-cycle assessment (LCA) study on the environmental impact of hot-dip galvanized steel (see article). During the development of the Sustainable Development & Hot-Dip Galvanizing continuing education seminar and in preparation for this Dr Galv article, the AGA researched a number of resources to find measurable data on paint systems. While there are many variations of paint formulations, multiple paint manufacturers, and numerous paint systems used to coat steel, the research returned no similar studies conducted on paint systems.

Many of the paint manufactures make claims about being leading producers of green coatings, manufacturing low volatile organic chemical (VOC) paints, long-lasting formulations, and even recycled paints, but none have released any data on the impact or reduction of impact these materials have on the environment. Some manufactureres do release the levels of VOCs found in their products, but beyond that, no hard data is offered to support their claims of greenness.

The lack of information provided by the paint industry does make the comparison more difficult. The AGA has conducted a study and released its results to share with specifiers the environmental impact of hot-dip galvanizing, and also has committed to improving the process to lower the impact in the future (see article). Additionally, to help answer your question, here are two case study summaries that directly compare hot-dip galvanized steel to painted steel from an environmental standpoint.


- Case Study #1: [Balcony Structure](#)
- Case Study #2: [Parking Garage](#)

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