Sustainable Development & Hot-Dip Galvanizing

committed to a better

environmental

social

economic

future

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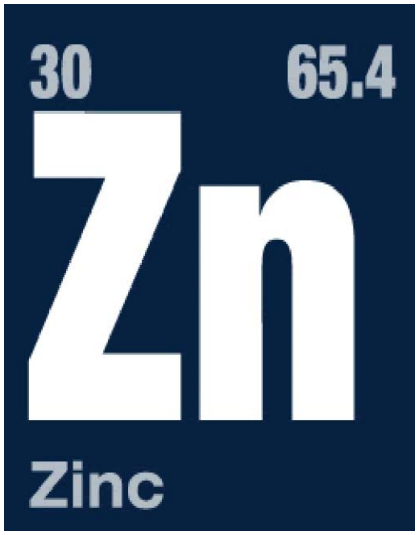
Fundamental Facts About Hot-Dip Galvanizing

Zinc Metal is a Sustainable Resource

Zinc metal used in the hot-dip galvanizing process is the 27th most abundant element in the Earth's crust and is fully-recyclable.



Steel is a Sustainable Resource

Zinc metal used in the hot-dip galvanizing process fully protects recyclable steel from corrosion. Protecting steel from corrosion makes our bridges, buildings, highways, and world safer, aesthetically pleasing, and longer-lasting.

Zinc is Essential for Man and the Environment

In contrast to man-made chemicals, zinc is a natural element that plays an essential role in the biological processes of all living organisms, including humans, animals, and plants. For this reason, the environmental impact of zinc cannot be assessed in the same manner as man-made chemical compounds. The hot-dip galvanizing industry is committed to scientific research that will properly establish zinc's role in the environment.

Hot-dip Galvanizing Contributes to Economic Growth

With the annual cost of corrosion estimated to be 4% of the gross national product, the economic savings potential hot-dip galvanizing can deliver is in the hundreds of billions of dollars. In addition, zinc and hot-dip galvanizing are essential to modern society and contribute an estimated $20 billion to the global economy.

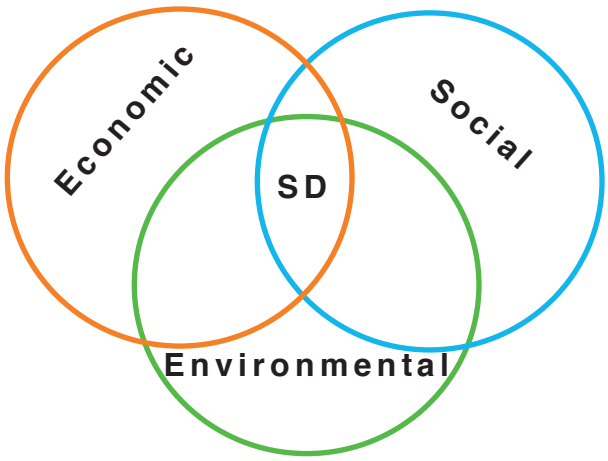
What is Sustainable Development?

Definition

Sustainable Development (SD) is the social, economic, and environmental commitment to build a future that is more prosperous, more just, and more secure. It involves business growth and development that balances near-term interests with the protection of the interests of future generations

Background

SD is the right approach for a responsible industry. It is also measurable in terms of the improvement in the quality of life (social), the number of jobs created (economic), and the level of care given to the water, air, and Earth (environmental). Now, whole industries and companies are regularly graded for their commitment to SD. Investment decisions in the industry and companies are made as a result of these grades.



AGA Sustainable Development Charter

Members of the American Galvanizers Association (AGA) utilize zinc in the process of providing durable steel products that are protected from corrosion for generations. These galvanized products are used for shelter, transportation, infrastructure, and consumer products. The AGA works to enhance galvanizing's contribution to society and to ensure that the process is in harmony with the natural environment and the needs of communities, now and in the future. In order to contribute to the betterment of society and build value for our shareholders, our business decisions and activities are guided by the following principles:

- *We recognize society's desire for economic prosperity, environmental protection, and social progress. We will balance and align our activities with society's goals.*
- *We believe that our activities can create opportunities to raise our society's standard of living and improve the quality of life, enabling communities to prevent or reduce environmental degradation and alleviate poverty.*
- *We adhere to ethical business practices and conduct our affairs in ways which demonstrate respect for human rights.*
- *We acknowledge that neither our services nor our operations should present unacceptable risks to people or the environment. We advocate the safe use and responsible management of chemicals, zinc, and the galvanized products we provide.*
- *We obey all applicable laws and regulations and when local standards do not exist or are inadequate, we will establish and meet standards that protect human and environmental health.*
- *We believe that decision-making should be based on scientific information and we therefore support research and monitoring to advance understanding of the impact of the production, use and recycling, or disposal of our products.*
- *We encourage waste minimization through recycling of process chemicals and zinc compounds that result from the galvanizing process.*
- *We value public consultation and citizen participation, and promote transparency and openness in our relationships. We treat our workers, business partners, and communities in a fair and respectful manner.*

Commitment to Sustainable Development

Represented by the American Galvanizers Association (AGA), the North American hot-dip galvanizing industry is in the business of metallurgically combining naturally-occurring zinc metal and steel to protect our transportation and utilities infrastructure, our buildings and factories, and all things made of steel from corrosion. Integral to the business of corrosion prevention is the industry's commitment to the principles of sustainable development.

In 2002, members of the AGA adopted its sustainability charter as part of a long-term action plan to bring the industry's activities more into harmony with the principles of sustainability. A set of measurable criteria have been identified to assist AGA member companies with the implementation of the charter.

Key elements of the AGA's sustainability strategy include:

- Make known to AGA members the financial, political, and operational benefits of embracing sustainable development.
- Identify measurable criteria within the hot-dip galvanizing operation where improvements can be made from year to year.
- Develop a ranking system to calculate overall commitment to sustainable development.
- Identify action items specific to the improvement of sustainability and encourage member companies to implement them.
- Develop and communicate the positive impact that hot-dip galvanizing has on the environment (based on scientific evidence) and the economy (based on life-cycle cost data) via the maintenance-free preservation of man-made structures for decades.
- Ensure efficient use of resources to produce hot-dip galvanized products.
- Reduce the energy intensity within the process.
- Continue to control emissions from point sources.
- Produce according to appropriate social and environmental standards.
- Reward those companies that are exemplary in operating within sustainable development principles.

Strategy

Action Plan

Partnerships

- Develop a network with stakeholders representing the local community, environmental groups, consumer groups, government, and process material suppliers.
- Develop and promote voluntary agreements to bolster or complement regulations.
- Strive for joint studies and exchange of information as a means of developing trust.
- Integrate or adapt into the local culture's intentions.
- Develop a company commitment and culture that promotes volunteerism with civic involvement and donation of time and money.
- Develop strategic alliances between employees and management looking to increase operating efficiencies and safety in addition to earning environmental improvements.

Responsible Management

- Embrace sustainable development as a guiding principle to conducting business.
- Track and measure improvements in recycling and waste minimization.
- Operate in an open manner, and communicate to the surrounding community the improvements in environmental management systems.
- Reduce emissions.
- Reduce the energy intensity involved in all areas of the galvanizing process.
- Support research and development and training directed toward process improvement.

Governance

- Encourage government to seek more objective and scientific rationale toward the regulation of metals.
- Support a regulatory framework affecting wastes that are complementary to recycling.
- Involve regulatory agencies in dialog to improve process efficiency with respect to air and water quality.

Communications

- Develop a long-term and regular strategy that recognizes the important contribution of galvanizing to the preservation of society's infrastructure—saving tax dollars, preventing lost productivity—all with recyclable zinc and steel.
- Promote to government and non-governmental groups the contribution that zinc and galvanizing make toward sustainable development.
- Increase public awareness of the contribution that galvanizing and its recyclability make toward sustainable development.

Measurement of Progress Toward Sustainability

Having made the commitment to balance business objectives with sustainable development priorities—and identifying specific action items that move our industry toward a sustainable future—it is fundamental to assess progress from year to year. Within each area (social, economic, environmental), there are key indicators to measure our progress. While not all indicators are quantifiable, it is important to sustainable development concepts that they all be monitored.

key indicators

ENVIRONMENT

Land Management
storm water runoff
zinc emissions

Waste Management
cleaning solutions

Secondary Product Management
dross and skimmings

Products in-use

Recyclability of 100%

SOCIAL

Corporate Responsibility
volunteer hours
charitable contributions

Health and Safety
employees
local community

HDG in Use to Protect....
electrical, cellular, wind towers and distribution networks
transportation systems and infrastructure (rail, bridges, signposts)
housing and commercial buildings (framing studs, roof sheeting)
agriculture (grain storage facilities, pens, feed troughs, gates, fence)

ECONOMIC

Stakeholder Relations
open-house/town meetings
involvement in decision-making

Industry Employment
minority participation
overall growth

Industry Growth vs. Overall Growth

Tax Dollar Savings

Price Stability for the Last Five Decades

New Uses of Hot-Dip Galvanized Steel

Sustainable HDG Steel Project Applications

Hot-dip galvanized steel is used in several different types of project applications. From bridges and buildings to power and recreational applications, hot-dip galvanized steel is used to fight corrosion. The following applications identify the numerous ways that hot-dip galvanized steel can be used to provide a sustainable future.

1997

Muskingum County Bridge — Zanesville, OH

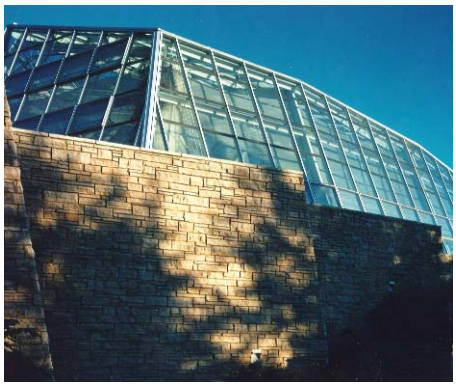
Muskingum County engineers needed to replace a dilapidated 50-year-old bridge. Rather than repair the structure, the decision was made to replace it with a hot-dip galvanized steel bridge. Following a life-cycle analysis, it was determined that hot-dip galvanizing was more cost-effective than other corrosion prevention systems. County engineers kept the original bridge in place until the new bridges' construction were complete, after which time, the old bridge was dismantled, piece by piece. Each section was then sandblasted, repaired, hot-dip galvanized, and attached to one of the new frames. Because of the old bridge's large size, Muskingum County was able to recycle the bridge and design four like-new, smaller bridges from its components.

1997

Wind-Powered Generators — San Francisco, CA

These wind turbine electrical generators were entirely constructed using hot-dip galvanized steel. The tower structures are fabricated of three components measuring from three to four feet in diameter, with heights as tall as 72 feet. The hot-dip galvanized coating covers the turbine nacelle, access platform, and miscellaneous steel. There are more than 7,000 turbines located in the Altamont Pass area, and a recent inspection of the project revealed the galvanized coating still exhibited the traditional coating appearance. The majority of the 7,000 turbines in this area were hot-dip galvanized and all were found to be performing to design.

1997



Butterfly Conservatory — Ontario, Canada

The galvanizer worked with 70 tons of precisely fabricated support structure steel; the galvanized steel was then uniquely coated with primer and painted with a moisture-cured urethane coating. Holding 2,000 butterflies of over 200 species, the $15 million butterfly conservatory in Ontario is the focal point of a facility dedicated to the rearing of butterflies and the education and entertainment of the public. Over half a million people have enjoyed the tropical butterfly haven since its opening in mid-1997. Thanks to hot-dip galvanizing's low maintenance and long-lasting corrosion prevention, the conservatory will be preserved for generations to come.

1998

Federal Reserve Bank — Minneapolis, MN

The pergola and bus shelter, railings, and miscellaneous steel were painted-over hot-dip galvanized steel, giving the Federal Reserve Bank in Minnesota a demure decor, while complementing the surrounding buildings and stonework. The Federal Reserve Bank is saving money; it was determined that, over the life of the outside structures, it was economical to use a duplex system. This system blends nicely with the outside environment and will continue to do so for decades to come.

Sustainable HDG Steel Project Applications

1998

Texas Motor Speedway — Forth Worth, TX

Texas Motor Speedway is the second-largest sports facility in the country and the third largest in the world. Hot-dip galvanizing was chosen for several reasons, including low maintenance costs, increased safety, cost effectiveness, and aesthetic appeal. In addition to the structural steel, the bracings, handrails and fixtures were also galvanized. Galvanizing all the structural steel for the speedway was a multi-million-pound project. Seating over 120,000 people—in a straightaway grandstand stretching almost 3,500 feet (1,067 meters)—required an massive amount of structural framework, all of which was galvanized.

2002

Pier 1 & Pier 21 Replacement — Norfolk, VA

This 90 by 1,500-foot structure heralds a new generation of piers at the Norfolk Naval Base, serving as a model for the rehabilitation or replacement of all the base's piers within the next 25 years. Its innovative design incorporates precast concrete pile caps, slabs, and edge beams protected by aesthetically pleasing hot-dip galvanized fenders and corner bolsters. Galvanizing was chosen to protect the 500 tons (per pier) of fenders and bolsters due to its proven ability to protect steel from corrosion in a seawater environment.

2003

Sox 35th Station — Chicago, Illinois

The canopy structure is part of the 35th Street bridge that crosses over a major expressway in Chicago and connects the Chicago White Sox baseball park with the internationally renowned Illinois Institute of Technology. Eighty-six tons of hot-dip galvanized steel were used to support the fiberglass roof panels of the canopy. The selection of hot-dip galvanized coating was made easy by the desire to have a simplistic uniform coating that could withstand the substantial level of road salts used during snowy winters. The Chicago Transit Authority has become a huge proponent of galvanizing for both the aesthetic, consistent appearance of the coating and for the substantial cost savings delivered because of its maintenance-free nature.

For more information contact the American Galvanizers Association at aga@galvanizeit.org or 720-554-0900