



## **MADISON CHEMICAL INDUSTRIES INC.**

**NEWS RELEASE**  
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### **COATING GALVANIZED STRUCTURES: A NEW WAY FORWARD**

MILTON, ON – Madison Chemical Industries Inc. has announced the launch of a new generation of high performance polymer coatings that enables, for the first time, the protecting of galvanized structures without the necessity for capital-intensive surface preparation such as blasting or elaborate multi-step chemical pretreatments.

Madison has been creating and marketing heavy duty industrial coatings since 1973 and has been active in the coating of galvanized structures – primarily electrical transmission and cellular towers – since 1981.

Galvanizing is the name used to describe the application of a layer of zinc to a ferrous structure, typically in molten form. The zinc forms a sacrificial protective film and, until exhausted, will prevent corrosion of the parent steel. Although galvanizing works well on its own in many applications, there are some circumstances where the galvanizing itself needs protection. For example, when a galvanized structure is embedded in the ground or is exposed to wet or salty service, zinc does not form the tightly bonded patina that we see in atmospheric service. The zinc therefore is depleted quickly unless protected with a suitable barrier coating. The application of a monolithic coating over zinc is known as duplex painting, a reference to the fact that the structure now has two kinds of protection.

Preparation of the zinc surface is a complex matter. For service conditions that are somewhat benign or where the design life is measured in years rather than decades, various dipping processes or light abrading of the zinc surface will provide adequate adhesion for the specified topcoat. However, for longer term heavy duty or severe service, the accepted form of surface preparation in duplex painting is blasting the zinc layer with sand, steel grit, quartz or some other angular medium.

Properly done, blasting the zinc gives an excellent result. This requires expertise, constant monitoring, a significant capital investment and well-maintained equipment. The process must be rigidly controlled, inspected and documented in order to achieve consistent results. The blast medium is particularly important: particle size, angularity, freshness and cleanliness are all important. Equipment design and settings must be considered, as well as the possibility of dust or other contaminants on the surface being coated.

For years, Madison has been at the forefront of establishing training programs, quality control programs and best practices in order to ensure long-lasting results. In the 1980's, Madison started a program of initial training and annual refresher training of spray technicians and to this day is the only coating manufacturer who does so. In 1998, the company developed quality control documentation specifically for galvanized structures; this consists of Recommended Practices, a Daily Start-Up Check List and a Coating Log. In 2002, Madison created and published a manual specifically for this application, a book providing detailed guidelines on everything from surface preparation to safety.

Madison has also made an ongoing commitment to research, allocating over \$100,000 since the turn of the century to this market.

One industry has been at the forefront of dramatic improvements in this area, namely the power pole manufacturers. Virtually all pole producers and their outside coatings contractors have purchased new coating equipment and some have made significant capital investments in blasting facilities as well. There has been an emphasis on quality control procedures. The strengths and weaknesses of various blast media have been studied and tested. As a result of all these activities, the protective coating system on power poles has improved significantly in recent years.

What about other galvanized structures manufactured from steel plate? What about zinc-coated steel panels or galvanized piping? For someone who hasn't already made a significant capital investment in state-of-the-art blasting equipment, there is a real dilemma because there simply was no viable alternative – until now.

While doing its share in making the current technology work well, Madison conducted research for years into the possibility of an alternative to blasting or, at the very least, a way of cutting back on the severity and intensity of the blasting operation. This quest for the “holy grail” has been littered with disappointment and many people – sometimes including Madison's own researchers – felt at times that the goal might be illusory.

Then, a breakthrough occurred. In 2007, Madison research staff discovered a way of increasing the adhesion of one its pipeline coating products. This involved several simple formulation adjustments which did not adversely affect any other coating properties. Also enhanced was resistance to Cathodic Disbondment, a test designed to predict long term performance. The technology has now been incorporated into several pipeline and storage tank coating systems. One such system is CorroPipe II Century Pipe Coating, a product which has a design life of 100 years.

The attention of Madison's researchers then turned to galvanized steel. When the team members blasted and coated galvanized steel using its usual product for that application but with the same formulation adjustment that worked so well on pipe, they found that adhesion increased by up to 50%. The improvement was, as it turns out, even more dramatic on galvanizing than on a straight steel substrate. Moreover, the difference was most obvious where the surface preparation was less than ideal, i.e. where the adhesion might otherwise be marginal. The new technology held out the promise of better long term results for industries that

were blasting their products but had not yet made same level of capital and quality commitment as the power pole producers.

But the greatest surprise was yet to come when the researchers developed an easy to use, non hazardous and environmentally "green", surface conditioner/adhesion promoter called GalvaGrip. They were amazed to find that the adhesion properties achieved by simply conditioning the metal surface with GalvaGrip equaled the results achieved with a white metal blast using steel grit under ideal conditions, hitherto the best known surface preparation methodology from a performance viewpoint. The Cathodic Disbondment testing also provided results equal to steel grit.

Besides being cost effective, the new process is simple and much easier to control because there are few variables compared to blasting. Capital costs for building a blast facility are eliminated.

In the end result, a simple application of an easy to use and environmentally "green" surface conditioner/adhesion-enhancer has led to the most significant breakthrough in duplex coatings since Madison first began to coat galvanized structures over twenty years ago: - coatings that not only reduce the cost and invasiveness of abrasive blasting, but even eliminate the need for blasting altogether. The zinc layer remains intact and unfractured and the coating has optimum adhesion to it.

This new technology greatly broadens the types of applications where high performance coatings can be applied economically and effectively to galvanized steel structures of all kinds, as well as vehicles, implements and equipment in industries as diverse as mining, agricultural, pulp and paper, petrochemical and the infrastructure.

Four new products have been released that incorporate this new generation of coating technology. These products are GalvaGrip, GalvaClad II Aromatic, GalvaClad II Aliphatic, and GalvaClad Liquid Zinc.

GalvaGrip is a proprietary aqueous dispersion that is environmentally "green" and easy to use. It contains Madison's AP-50 Adhesion Promoter as well as a rust-dissolving agent, a powerful degreaser and an industrial-grade surface penetrating compound, all of which work synergistically to create adhesion comparable to that achieved with a commercial-grade sandblasting on weathering steel and with near-white abrasive blast on galvanized structures.

GalvaClad II Aromatic is supplied in a solvent free, 1:1 format, instant setting polyurethane coating. It is a self-priming, high build, non-flammable one coat system targeted at rapid-throughput production situations. The product is very robust and can be used indoors or out, below ground or above. Being based on aromatic resins, this product will fade, become dull and chalk when exposed to direct sunlight.

GalvaClad II Aliphatic shares the same format but contains mostly aliphatic resins and, as such, will have significantly better gloss and colour retention. Either of the above products can be pigmented to any desired colour.

The final product in the group, GalvaClad Liquid Zinc, is paint-like. This “surface tolerant” primer can be used in the shop on new structures but is primarily intended for field rehabilitation, where meticulous surface preparation may not be practical. For normal atmospheric service, simple scraping and sanding will suffice; because of its superior adhesion compared to other paints and coatings, this will provide satisfactory long term results. GalvaClad Liquid Zinc cures over time to a silver metallic finish similar to the patina which appears on galvanizing itself after several months of exposure.

The new technology is available now. Commencing immediately, Madison will be working with interested parties to set up and commission suitable facilities for acid etching and coating galvanized structures of various kinds and sizes. For more information, contact Richard Schertzer or Ross Mitchell at Madison head office. For contact details, visit [www.madisonchemical.com](http://www.madisonchemical.com).

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