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## TIP Project Brief – 090121/10H020

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### Civil Infrastructure Advanced Coating Technology for Infrastructure

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*Develop a novel coating technology using a high-intensity infrared light source to fuse and bond nanocomposite metal coatings and claddings to large steel structures such as bridges, oil rigs and pipelines.*

#### **Sponsor: MesoCoat, Inc.**

*Euclid, OH*

- Project Performance Period: 2/1/2010 - 1/31/2013
- Total project (est.): \$3,956 K
- Requested TIP funds: \$1,792 K

This joint research venture led by MesoCoat, together with The Edison Materials Technology Center (EMTEC) and Polythermics, LLC, is developing a novel coating technology to change the way large steel and steel alloy structures are protected from corrosion. Steel structures, including bridges, pipelines, and support structures, are subject to corrosion and attack from the atmosphere, acid rain, salt, and chloride ions, among others. Current protection systems rely on often hazardous primer materials such as heavy metals coated with an organic polymer paint as a moisture barrier. The organic coatings are subject to ultra violet degradation over time and must be repaired or replaced regularly, a process that involves stripping with volatile organic compounds (VOCs). Many of the materials, such as lead, cadmium and chromium as well as the VOCs have been phased out or are subject to increasingly strict environmental regulations. This project is developing large area nanocomposite, corrosion-resistant coating materials and a high-rate, low-cost application technology. Novel, high-intensity infrared light sources will be used to fuse nanocomposite metal-ceramic and polymer coatings onto steel surfaces of large structures, replacing electroplating, chromate primers, hot-dip galvanizing and fusion-bonded epoxy coatings. If successful, the application system, which relies on a scalable high intensity white light optical source, will be able to rapidly heat a surface to remove old paint or polymer coatings with minimal hazardous waste or volatile organic emissions. The same application system can also be used for removal of damaged concrete as well as for repair and reinforcement of metallic pipe at rates ten to hundred times that of weld cladding. The metal finishing industry, according to MesoCoat, is currently a \$16 billion market (inorganics only) and one of the largest users of hazardous and carcinogenic chemicals in industry. This project's technology would provide a complete, portable system to strip coatings, apply high-performance metal primers and zero VOC polymer topcoats with improved performance at lower cost.

#### **For project information:**

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#### **Active Project Members**

- EMTEC (Dayton, OH)  
*[Original, Active JV Member]*
- MesoCoat, Inc. (Euclid, OH)  
*[Original, Active JV Member]*
- Polythermics (Kirkland, WA)  
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