
Advancements in Plastic Pipe System Technology

by Drew P. LaMarca

Emabond Solutions

dlaMarca@emabond.com



EXOWELD PlasticsTM
A Division of Emabond Solutions, LLC

2010 IAPMO / WPC Emerging Technology Symposium - May 11-12, 2010

A New Plastic Pipe Technology

- Emabond Solutions transformational breakthrough was to develop and commercialize a Field Portable Induction Welding Unit with safety and ease of use built in for plastic pipe system assembly.



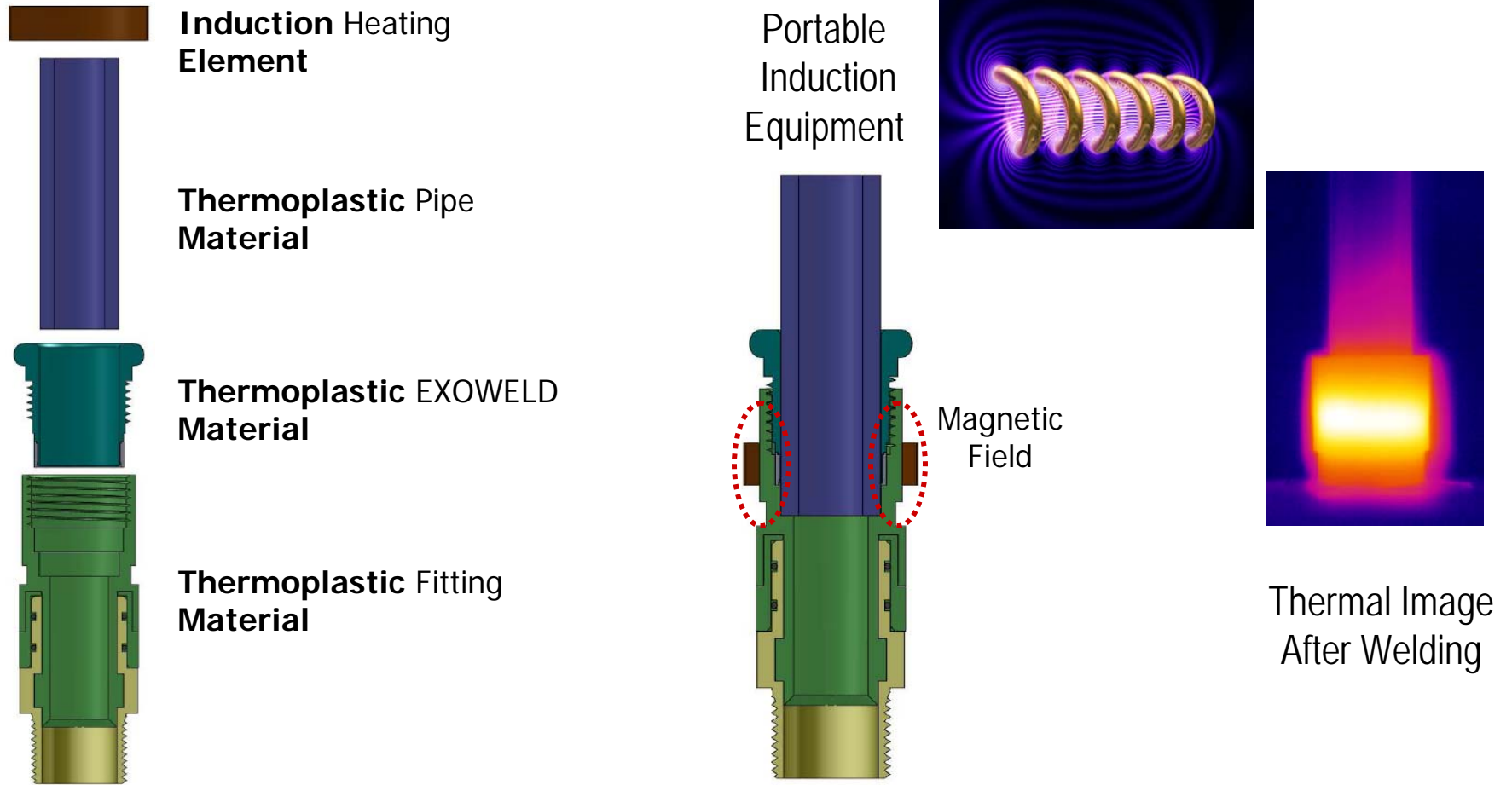
- Emabond Solutions has created a platform technology which can be expanded to include induction welding of other plastic pipe materials.

Innovation Momentum

- The EXOWELD Portable process consists of an Electromagnet Element, through which a Alternating Current (AC) is passed through which creates the Induced Field for Heating the EXOWELD Plastic Matrix delivering a Non-Contact and Non-Invasive Method for Reliable and Repeatable Welds.
- This Technology is a fusion joining process to achieve superior mechanical performance and ease installation in constrained locations with flexibility and adaptable to existing plumbing.

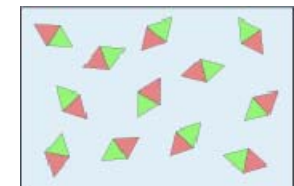
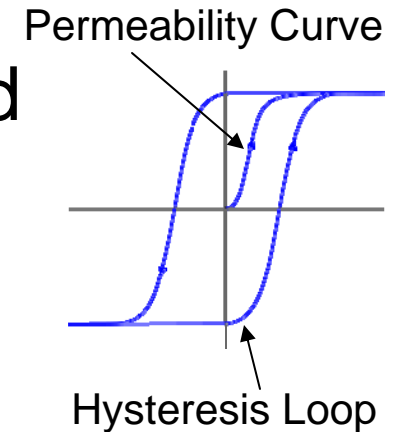


Differentiation is a Shear Joint



An Engineered Process

- The EXOWELD Plastic Matrix is welded by induction to the adjoining pipe connection surfaces. Heat is generated by magnetic hysteresis losses in our matrix compound that has magnetic permeability.
- An external magnetic field is applied to the ferromagnetic target, the atomic dipoles align themselves with the external field. When the external field is removed, the dipole alignment changes back to the original state which creates a loss.



Independent Testing and Validation

- Received NSF 14 and NSF 61 Approval based on NSF pw-rfh-SE 9164
- Completed IGC 266-10 to obtain an IAPMO Certification Mark.
- The pressure pipe system is for the Building and Construction Industry requiring hot and cold water distribution in Indoor and Outdoor Installations using an approved PE-RT Piping and Fitting System (250psi@73oF, 185psi@140oF and 115psi@180oF).



Technology Direction

- The value to the Plastic Piping Industry is to provide a Transformational Technology to Enhance the Consumer's Green Building Experience by installing a Sustainable and Safe Material and Process for Energy Efficiency and Fire Protection Service.
- This direction provides a **TOTAL PIPING SOLUTION** to Residential and Commercial Potable Water Distribution for Indoor and Outdoor Installations using a Piping and Fitting System which is welded inductively by a Temperature Controlled, Non-Contact Fusion Joining Process.

Professional Installation

- The advancement of a Polyethylene of Raised Temperature (PE-RT) pressure pipe system and induction welding process is to be listed in the Uniform Plumbing Code and have UL and FM approval for NFPA 13 fire service based on a single innovative plastic material and process. The welded pipe system installation offers ease of use, training, certification and safety for the professional trades.
- An installation standard will be used to ensure the professional trades are trained to properly install and inspect hot/cold water distribution and standalone/multipurpose residential fire sprinkler systems.

A Method for Design

- A Inductively welded shear joint has increased hot and cold water pressures ratings at 180°F and 73°F compared to mechanical and hot plate connections.
- The induction welding provides ASTM single and multilayer plastic pipe systems with unrestricted and unobstructed fluid flow compared to mechanical and hot plate joining connection methods.
- The inductive welded PE-RT pipe system meets ASTM D 3350 for continuous outdoor use with prolonged UV exposure and below grade installation.



Indoor and Outdoor Sustainability

- It has a long life: Non-Contact and Non-Invasive Induction Joining Process for Welded Pipe Connections.
- It saves energy: Offers a high temperature potable water solution for efficient solar and geothermal thermal systems.
- It adds durability: Used in Extreme Temperatures and UV. The color of the pipe products is black.
- It doesn't contribute to the waste stream: There are No Solvents, Adhesives, Thermoset Materials, or Solders.
- It is renewable and recyclable: The welded pipe system is a PE material product for the alternative energy market.

Thank you



EXOWELD PlasticsTM
A Division of Emabond Solutions, LLC

2010 IAPMO / WPC Emerging Technology Symposium - May 11-12, 2010