

Steel underground tanks store safe, clean, reliable propane for a wide range of residential needs. Mastic or thermoplastic outer coatings help tanks perform reliably over the long term by protecting tanks from the potentially damaging effects of exposure to moisture, bacteria, and minerals in the soil.

These environmental factors, combined with tank coating application issues, can reduce the long-term corrosion protection offered by underground propane tank coatings. A recent research study evaluates the performance of several tank coating types to help marketers better understand and compare the performance of various tank coatings.



Failure to provide proper [tank] protection can cause hidden corrosion and potential leaks as well as weakening of the tank wall over a period of time.

— National Propane Gas Association, No. 412 — Installation of Underground LP-Gas Systems



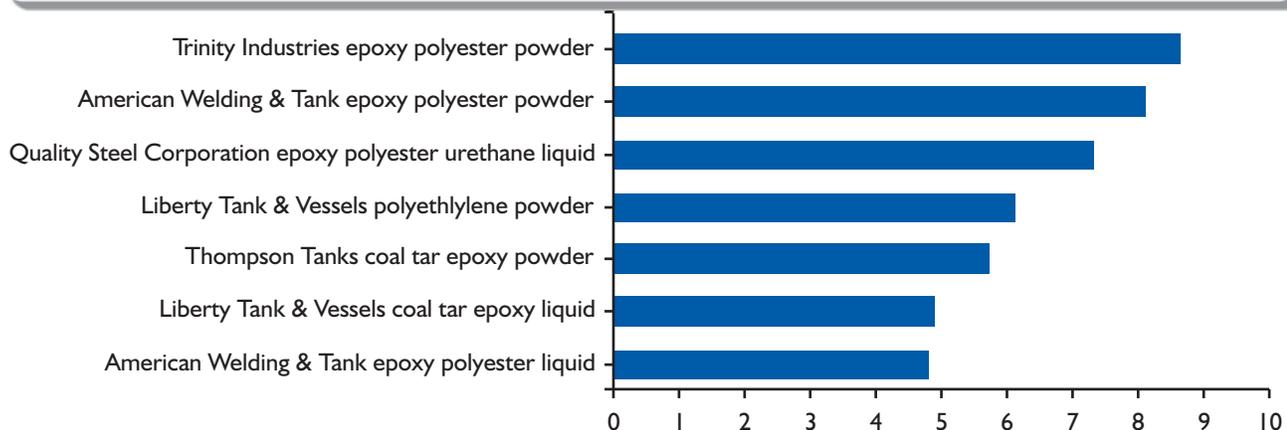
### Research Status: Results Available

- The study was completed in 2009.
- The comparative tank coating performance data collected during the study is presented in a visual summary piece and a detailed project report. Both are available at [www.propaneresearch.com](http://www.propaneresearch.com).
- The study's results will help propane marketers and retailers select the best tank and coating for a specific customer or application.

### Supporting Facts

- Coatings protect underground propane tanks from moisture, bacteria, and minerals.
- Pinholes, gaps in the coating, disbondments (loss of adhesion), and incomplete or uneven application can affect the tank's susceptibility to corrosion.
- The effectiveness of different coating types can vary under different environmental conditions.
- The detailed data in this report can identify how variations in tank surface preparation, coating application, and environmental issues impact tank coating performance.

### Result Highlights: Overall Performance Rating



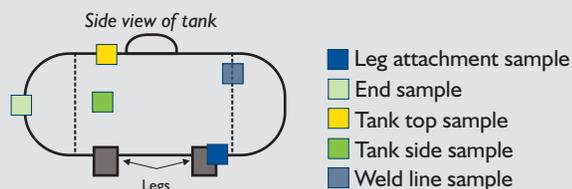
For more information on this and other research projects, go to [www.propaneresearch.com](http://www.propaneresearch.com).

# A Closer Look

## Testing Underground Propane Tank Coatings: Collection of Test Samples

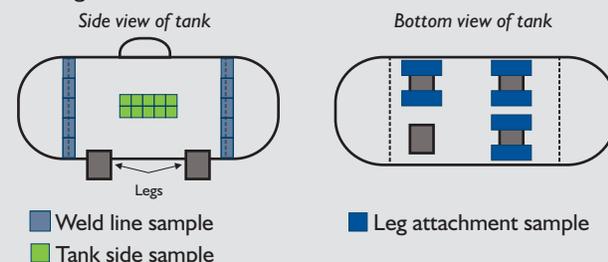
### Group 1: Mechanical Testing

Five 6-inch-by-6-inch samples were taken from the following places on each tank: a leg attachment, the end, the top, the side, and a weld point. Oversized samples were removed and were then carefully cut to size using a band saw to ensure that the tank coatings were not damaged.



### Group 2: Environmental and Mechanical Testing

From each tank, 25 4-inch-by-6-inch samples were taken, as follows: 10 samples from the weld line, 10 samples from the side of the tank, and five samples from the areas where the tank legs are attached to the tank.



### Project:

Testing and Evaluation of Underground Propane Tank Coatings (**Docket 12469**)

### Partner:

KTA-TATOR Inc.

## Research Process

### Sample Selection

- Tested the coatings applied to seven 500-pound tanks from five U.S. propane tank manufacturers. Three of the tanks had liquid-applied coatings, and four had powder coatings.

### Testing and Evaluation

- Evaluated the initial condition of the tank coatings and collected coating test samples.
- Performed mechanical testing (including adhesion, hardness, and impact resistance testing) on Group 1 samples.
- Performed environmental exposure testing (including accelerated weathering, chemical immersion, and thermal cycling) on Group 2 samples.
- Performed mechanical tests on the Group 2 samples that had completed environmental exposure testing.

## Results

- **Powder coatings outperform liquid coatings.** Overall, powder coatings consistently outperformed liquid coatings; three of the four top-performing coatings were powders.
- **Coatings on welded seam areas perform worse than coatings on side and leg areas.** Chemical immersion caused the most damage on the welded seam areas of five of the seven tanks. Overall, the welded seam areas often performed worse than the side and leg attachment samples for the same tank.
- **Local, careful tank delivery is essential.** Six of seven tanks arrived with handling damage from common carrier delivery. The one tank delivered by the supplier arrived with only minor abrasions.

## What's Next?

For more information, visit [www.propaneresearch.com](http://www.propaneresearch.com) to view the *Evaluation of Underground Propane Tank Coatings: Docket 12469 Final Report* and the visual summary results of the testing for each tank coating.

### FOR MORE INFORMATION:

#### Propane Education & Research Council

Gregory Kerr, Director of Research and Development  
1140 Connecticut Ave. NW, Suite 1075  
Washington, DC 20036  
202-452-8975

[www.propaneresearch.com](http://www.propaneresearch.com)

[www.usepropane.com](http://www.usepropane.com)

### PROJECT PARTNER:

#### KTA-TATOR Inc.

William D. Corbett, Technical Services Manager  
115 Technology Drive  
Pittsburgh, PA 15213  
412-788-1300

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