

# CASE STUDY

## Tube & Pipe : Low Energy Cure Flexible UV Coating QUAKERCOAT® 031 LE UV

### The Challenge

A welded steel tube producer encountered multiple UV (ultraviolet) coating challenges that have impacted their mechanical tubular products. This challenge was hindering their growth and it was raising a concern with their customer base. Poor adhesion properties caused the coating to peel off their tubes while in storage. They knew if they could reduce this concern they could potentially receive more orders from their customers. In addition to eliminating this issue, the manufacturer wanted to:

- Reduce costs and increase profits
- Utilize current low energy curing equipment
- Increase coating flexibility for use in shaping tubes since many typical UV coatings crack due to their intrinsic rigidity
- Improve coating flowability on galvanized surfaces



Tubes with competitive coating: Coating was seen peeling off during storage.

### The Solution

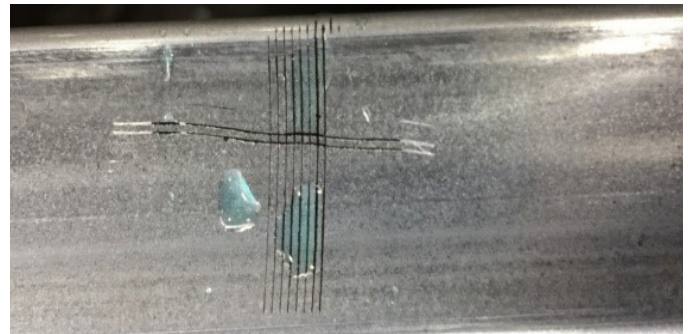
To meet the specific needs of the tube manufacturer, Quaker Houghton developed QUAKERCOAT® 031 LE UV, a high gloss, UV cured protective coating. The formulation was targeted to work with the limitation of the company's low energy curing lamps as well as having high flexibility for subsequent bending operations. In addition, a proprietary additive enhanced how the coating flowed on a galvanized substrate while maintaining the desired flexibility and low cure attributes.

### The Benefits

The implementation of the QUAKERCOAT® 031 LE UV coating:

- Resolved the adhesion problem as indicated by cross hatch tests which consequently lowered the defect rate and prevented any surface gaps
- Enhanced the tube bending ability without coating flaking by the end use customers
- Reduced the cost per part
- Achieved a rapid cure rate using the existing line speed thus increasing production and increased low energy curing lamps
- Offered increased flexibility thus increasing the performance characteristics of the tube

As a result, the tube company was able to capture more business opportunities with a higher performing tube product.



Tube with QUAKERCOAT® 031 LE UV coating: Tube was tested for coating adhesion with copper sulfate solution as an indicator that would turn black in the presence of bare, unprotected metal. As seen here, the solution did not change color demonstrating excellent coating performance.





Flexibility with QUAKERCOAT® 031 LE UV coating: Tube was bent in an extreme fashion through a swedging process. Under these conditions, the previous coating would show coating flake off and black marks. When copper sulfate solution is applied, no reaction is observed thus demonstrating the performance of the coating's level of flexibility.

## The Product

QUAKERCOAT® 031 LE UV is a high gloss 100% UV curing, permanent protective coating intended for use as a corrosion inhibiting coating on metal tube and pipe surfaces. Its features include excellent adhesion, excellent hardness, instant curing, and high resistance to impact. The product is a zero-VOC coating that complies with current environmental regulations on volatile solvent contents for paints and varnishes.

## Process And Equipment

Part	Smooth Galvanized ERW Square Tubing
Coating Equipment	Vacuum
Conveyor System	Standard V-Rolls

