

Powertrusion Creates Composite Utility Poles with Help from Reichhold

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Much of the landscape of North America is adorned with wooden utility poles, supporting lines for electricity, phones, cable television and more. However, there are certain regions where wooden poles are scarce and others where using wood is not the best or most economical solution.

Enter **Powertrusion**, a Reichhold customer that designs, develops and manufactures high-tech lightweight fiber reinforced composites (FRC) through the pultrusion process with resins from Reichhold.

Powertrusion has designed a pultruded FRC utility pole for use as a power distribution pole. The pole's design and an innovative structure enable it to continuously distribute stress evenly over its entire structure providing greater strength, consistency and safety compared to wood distribution poles. Its composite construction overcomes problems presented in wood, steel and concrete poles such as decomposition, weight, conductivity, breakage and environmental problems.

Composite poles are lightweight, easily transportable and can be installed using minimal labor. Heavy wood poles require extensive labor to install and often require special handling equipment.

Powertrusion also manufactures and markets pultruded FRC utility cross arms and lighting poles.

The poles Powertrusion produces are engineered products. The company has worked closely over the years with electrical engineers and experienced linemen to design pultruded poles superior to wooden products. Wooden poles typically exhibit a test performance coefficient of variation (COV) of 20% whereas pultruded composite poles have a historical COV of less than five percent (5%).

FRC poles, at one-third the weight of wooden poles, have a tremendous advantage during both installation and throughout their service life. A 35' - 40' Class 4 pultruded pole can be carried by four people where a similar wooden pole might weigh over 1,000 pounds.

In a recent Rocky Mountain operation, a Powertrusion pole eliminated the need for a helicopter, which would have been necessary to install a similar wooden pole.

Powertrusion has designed its composite utility poles to be interchangeable with similarly-sized wooden poles so there are virtually no hardware issues involved in "change-outs."

One challenge for Powertrusion was to design poles with sufficient strength to support attachments in excess of 1,000 pounds. A series of Powertrusion tests proved it is possible.

Flame Resistance

Powertrusion has done some work with Reichhold to prove the inherent flame resistance of these pultruded FRC poles, working with the University of Delaware. Those tests proved Powertrusion's superiority to both treated and untreated timber poles.

The San Diego fires of 2003 proved the flame resistance of composite utility poles in the field. A Powertrusion pole which San Diego Gas & Electric was testing survived a fire that consumed 500,000 acres and claimed 23 lives, 2,400 homes, 800 miles of lines and 3,000 utility poles.

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Working with Reichhold

Powertrusion originally contacted Reichhold's **Nelson Douglass** with the idea of producing utility poles through the pultrusion process back in 1997. Reichhold and other suppliers assisted Powertrusion in getting off the ground. Reichhold customer, **Creative Pultrusions, Inc.**, produced the composite poles for Powertrusion for about two years. In 2001, Powertrusion moved operations to Las Vegas, Nevada (USA) and began producing poles of their own.

Working with Reichhold, Powertrusion looked for the right resins to fit the utility pole application. The first resin used was a flexible isophthalic pultrusion resin. The pole design was changed and Powertrusion switched to a low-profile, isophthalic-based resin. Today, Powertrusion employs Reichhold's **DION® XTREME 31040** urethane hybrid resin for its composite utility poles.

No More Paint

One of Powertrusion's goals was to eliminate the need to paint the poles. The company wanted to convert to a non-painted, pigmentable pole with better weathering and water absorption properties. When exposed to freeze-thaw cycles, composites run a risk of de-lamination. The company tried several combinations of materials, from both Reichhold and other suppliers.

The sticking point was strength. The pigmentable composite poles had to meet or beat their previous performance without re-tooling. If they could do that, the poles could be re-classified and Powertrusion could use the same tooling for a larger number of pole sizes. Reichhold helped Powertrusion eliminate the need for paint. By removing this step of the manufacturing process, Powertrusion was able to justify using a higher-end, higher performance resin, DION XTREME 31040.

With Reichhold as a technology partner, Powertrusion has been able to span a range of three pole classes with a single pole design. Design changes and the higher performance DION XTREME resin have allowed Powertrusion to expand its product classifications by building longer poles with required strength and stiffness.

Powertrusion's automated manufacturing process allows each pole to be serialized with tracking numbers. This allows the company and its customers to track each pole to a particular batch and date.

