



Eltron's Ceramic, Refractory Coating

Refractory Paint Shows Excellent Adhesion, Mechanical Properties

Organic coatings are valuable for many applications; however they provide poor refractory protection and often produce dangerous VOCs. Ceramic insulators offer many benefits, however they are typically heavy, difficult to manufacture, and easily crack.

Benefits

- Simple application
- Excellent adhesion
- Material versatility
- No volatile organic compounds (VOCs)
- No organic binders or plasticizers
- Mechanically flexible
- Competitive pricing at only \$8.00/gallon

The Solution

Eltron has developed refractory paint that has excellent electrical, thermal and mechanical properties. Eltron's flexible ceramic paint creates a tough refractory layer. It cures at room temperature, is water-based, and contains no volatile organic compounds (VOCs), organic binders or plasticizers. As seen in Figure 1, the paint shows excellent adhesion and flexibility even when applied to a flexible substrate.

The paint can be applied by spraying, dipping, or brushing on. Eltron has developed surface preparation methods for Teflon[®], chloropel, Kapton[®], Mylar[®], butyl-coated Nomex[®], high-density polyethylene and other materials such as glass, quartz, fiberglass and alumina as well as various metals. Originally developed for high voltage plastic insulators used by the U.S. Air Force in pulsed power applications, Eltron's refractory paint coatings can be applied to plastic insulators of complex shape and large size with excellent adhesion (see Figure 2).

Features and Benefits

Tests for surface flashover and electrical discharge resistance show that plastic insulators coated with Eltron's refractory paint possess superior insulating and breakdown properties, compared to solid ceramic insulators, while retaining the weight advantages and mechanical resilience of plastic insulators.



Figure 1. Photographs of ceramic coated polyethylene terephthalate (Mylar[®]) flexible substrate showing no cracking or delamination during 180° bending.

Due to its inorganic nature and the lack of organic binders or plasticizers, Eltron's refractory paint displays excellent thermal properties in high temperature and plasma conditions. It can withstand thermal cycling between -196°C and 200°C on a variety of substrates.

Test results also illustrate the paint's low flammability. Insulation coated with Eltron's refractory paint resists ignition, shrinkage and melting (see Figure 3). A refractory paint coated square and uncoated square of high density polyethylene were exposed to direct flames of a propane torch for 20 seconds at a distance of 1".

In addition to considerable structural damage and shrinkage, the uncoated plastic sample ignited and continued to burn for 1 minute after the torch was removed. The coated plastic self-extinguished in only 3 seconds.

Stage of Development

Eltron has paint and process available for sale and commercialization.

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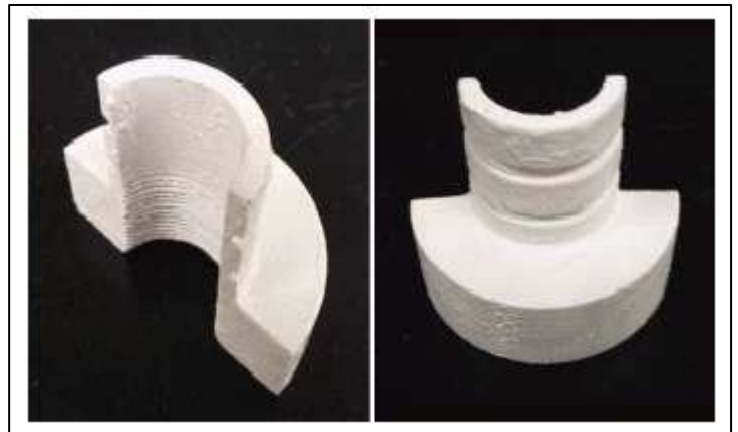


Figure 2. Complex plastic shape coated with refractory paint.



Figure 3. Refractory paint coated square (left) and uncoated square (right) of high density polyethylene after exposure to direct flame of a propane torch for 20 seconds, at a distance of 1 inch.

Contact Us

To discuss the possibility of entering into a business relationship with Eltron, contact the Business Development Group at business@eltronresearch.com.

To learn more about Eltron Research & Development and the many other technologies that the company is researching and commercializing, visit www.eltronresearch.com.



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