

## DuPont is Discontinuing Hypalon

Dupont Performance Elastomers recently notified wire and cable manufacturers that the insulating compound Hypalon® will be discontinued in 2009.<sup>i</sup> Environmental pressures, high manufacturing costs, the hazardous manufacturing process, as well as commercial pressures have driven DuPont to this decision.<sup>ii</sup>

### What is Hypalon?

Hypalon is the DuPont trademark for a rugged, thermoset polymer. It has been a popular high-performance material used for the insulation and jacketing of wire and cable. Its thermal, mechanical and electrical characteristics offer many benefits for specialized and unique applications.

Polymer chemistry efforts to produce a material superior to natural rubber (polyisoprene) and butyl rubber resulted in the development of a high-performance CSPE (chlorosulfonated polyethylene) synthetic rubber. In 1951, DuPont began to market CSPE using the familiar Hypalon name. This name is given to a group of sulfur and peroxide cured elastomers based on chlorinated polyethylene and chlorosulfonated polyethylene (CSPE)<sup>iii</sup>. Figure 1 shows the basic structure of the polyethylene chain that the chlorine and sulfur atoms modify to form cross-linked CSPE molecules.

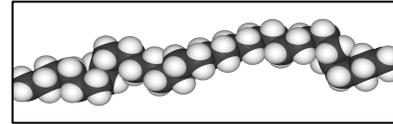


Figure 1. Structure of base Polyethylene chain

### It's a Tough Synthetic Rubber

CSPE has many advantages over commonly used polymers such as polyvinyl chloride (PVC) and polyethylene (PE). It is manufactured as a thermoset material capable of surviving abrasive, thermally stressful and chemically abusive environments that many common polymers would fail in. Unique among wire and cable polymers, it also results in flexible, inherently UV (sunlight) stable and highly formable and colorable material.

One of the most desired characteristics in the wire and cable industry is the thermal properties of Hypalon. Like most thermoset materials, it will not melt when exposed to high temperatures. This makes it an excellent material in applications where overloaded circuits might damage other insulation or jacketing materials or when the environment exposes the wire or cable to temperature extremes. Another often desired inherent strength of Hypalon is its UV stability. When properly manufactured, it can withstand extended exposure to direct sunlight with limited degradation of its electrical and mechanical strengths. It is so UV stable that it is often used in rooftops as a single-layer covering to protect flat roofs from the elements.

Even though many thermoplastic materials can be rugged, Hypalon combines the flexibility of rubber with extreme ruggedness. This makes it an ideal material for severe environments, such as extra-heavy-duty cord and mining applications. Some formulations of Hypalon are so tough, they are used for gaskets and seals placed under extreme pressures. Finally, as a stable thermoset polymer, CSPE-based materials are far more chemically inert than many other materials used in wire and cable. Because of this, they can be expected to survive in applications where caustic chemical exposure is probable, while many other common materials would fail in a matter of years, days or even minutes.

### Hypalon is Under Pressure

Like many other polymers used in the wire and cable industry, Hypalon has specific formulation requirements that are now either restricted legally or avoided as a part of good design practice. Even though all thermoset CSPE materials will not melt in high-temperature environments, they will eventually ignite and burn as the temperature rises. The gases produced during combustion of CSPE have varying levels of

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toxicity. Such toxic gases have been the subject of scrutiny in some segments of the industry. In addition, Hypalon often contains additives made from lead or lead compounds, a material well known for its dangers and restrictions.

### **So What are the Alternatives?**

If you are concerned about your products being obsolete, there is no need to worry. Even though DuPont is discontinuing Hypalon, CSPE is still available from several reputable sources. There are also compounds that perform similarly to CSPE without some of the drawbacks. Time has allowed other materials to catch up with the original innovations brought about by Hypalon. In fact, users that specify Hypalon in their products will realize little impact from the substitute. This is because manufacturers are generally taking one of two paths to resolution: 1) They are switching to other suppliers of CSPE materials and not missing a beat; or 2) they are switching to other materials such as thermoset CPE, which offers benefits similar to those offered by CSPE without some of the drawbacks. While manufacturers and distributors work out the logistics of the transition, consumers of CSPE products will generally not be able to identify any difference in performance, feel or product ratings regardless of the resolution path chosen by the manufacturer.

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<sup>i</sup> Dupontelastomers.com Press Release, May 7, 2009

<sup>ii</sup> Dupontelastomers.com Press Release, May 7, 2009

<sup>iii</sup> DuPont Hypalon® 40S Data Sheet, Rev. 3, Nov. 2002