

## Railway Safety Reaches A Pinnacle Underground

New cable compounds meet the challenge posed by the railway industry for low smoke and toxicity, even in a system that has the most stringent requirements in the world.

### Situation

London's Underground, a thriving railway system that carries about a billion passengers per year, also lays claim to being the oldest subterranean train system in the world. The first underground railway to operate electric trains, it is usually referred to as the "Tube," thanks to the shape of the system's tunnels far below street level. Built mainly in the mid to late 1800s, the long tunnels were not designed for optimum fire safety by today's standards. In fact, long sections of the tunnels were designed without exits, and it has become cost-prohibitive to renovate them. As a result, if a fire began in one of the deep tunnels, smoke and fumes could overwhelm passengers, who would have no ready means of escape. Because so many people use the London Underground on a daily basis, extreme precautions are taken to prevent the occurrence of fire, smoke, and toxic vapors, which is one reason the system's standards for low smoke and toxicity are the most stringent of any rail system on Earth.

The railway industry has exacting requirements for cables that are used in both infrastructure (tunnels) as well as rolling stock (trains). These requirements cover underground trains, railways, subways, trams, and mass rapid-transit propulsion equipment. Safety is the critical issue. In fact, smoke and fume levels deemed safe are specified by the railway industry in a variety of regulations: BS6853 (UK), NF 16 101 (France), DIN 5510 (Germany) and TS 45545-2 (Europe).

### The PolyOne Difference

PolyOne became aware of a market demand among cable producers for a flame-retardant, low-smoke and fume, zero halogen (LSFOH) compound for railway cables that would both meet London Underground BS6853 requirements for low smoke and low toxicity while also providing excellent resistance to mineral oil.

In response to this market demand, PolyOne developed two new compounds—ECCOH™ 5803 and ECCOH™ 5806. These are the first LSFOH compounds on the market meeting strict low smoke and toxicity requirements while also offering exceptional mineral oil resistance, withstanding IRM 903 for 7 days at 100°C.



## Delivering a Value-Added Solution

By replacing traditional cable materials with ECCOH 5803 and 5806, suppliers are able to introduce railway cable products with an unmatched level of performance in the market. These compounds can be applied to railway cables for both infrastructure and rolling stock for simplified inventory requirements. Further, because the materials do not require any pre-drying prior to processing, suppliers can trim manufacturing costs significantly.

In addition to low smoke and low toxicity in the event of fire, advantages of ECCOH™ 5803 and 5806 include:

- Highly flame retardant
- No acid gas emissions during a fire due to halogen-free chemistry
- Mineral oil resistance at high temperature (IRM 903 7d at 100°C)
- Wide operating temperature from -40°C up to 120°C
- Weatherability testing indicates 20-year UV resistance
- Can be crosslinked via dry silane or e-beam technology to achieve higher temperature resistance

**Product choices often vary by region due to differences in regulatory and agency requirements, availability and other key factors. Please contact your nearest sales office for assistance in choosing the right solution for your locale.**

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