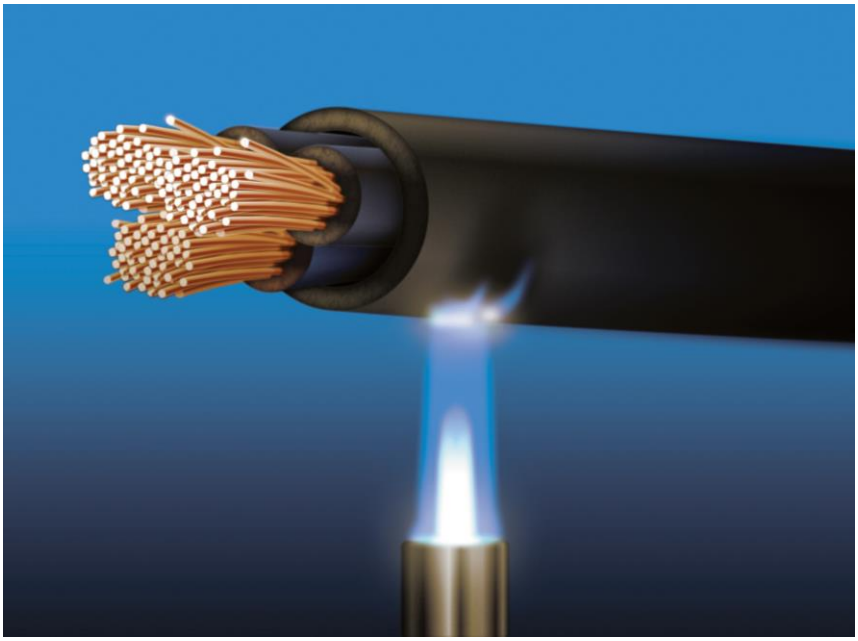
SOLUTION DATA SHEET

Game-changing ESTANE® NHFR compound for cable applications

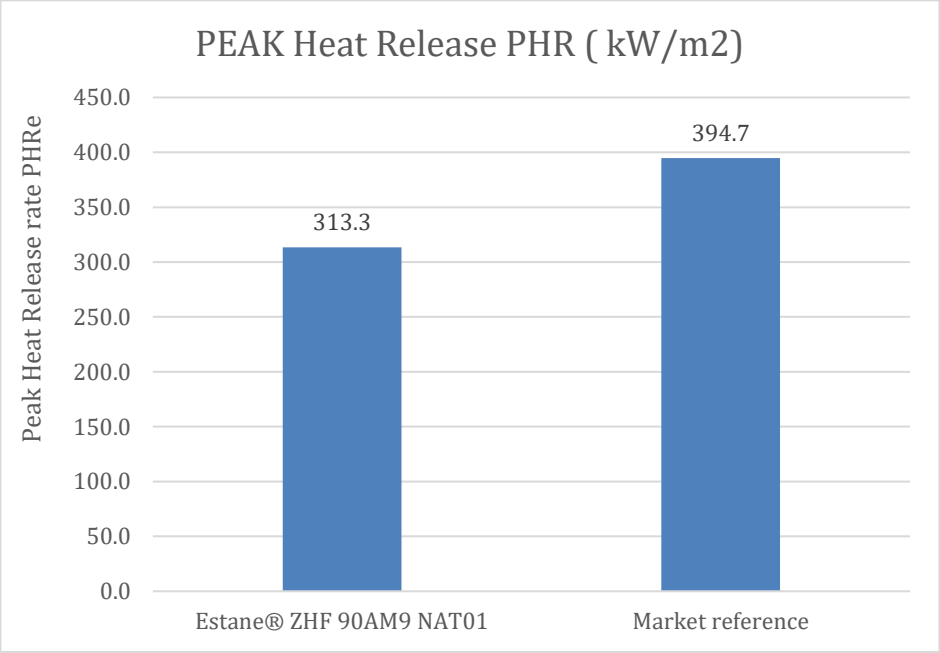


Markets	Robotic, automation and other demanding industrial cables; Data, energy, and communication cables; Construction, mining, and marine cables
Polymer	ESTANE thermoplastic polyurethane (TPU)
Key Benefits	• Non-Halogenated Flame retardancy (NHFR) • Outstanding mechanical properties • High UL temperature rating • Sustainable alternative • Global Regulatory Compliance • Easy processability • Matt / Silky aspect

Given the broad application scope in the wire and cable industry, an extensive product portfolio is required to support the current TPU flame retardant needs. For this reason, the ideal NHFR resin would need to combine various properties to meet the requirements of diverse cable end uses. Based on its extensive knowledge of flame-retardant additives and polymer chemistry, Lubrizol Engineered Polymers has developed a new NHFR TPU grade called ESTANE® ZHF 90AM9 NAT 01 combining the necessary key features.

Lubrizol Engineered Polymers uses a unique technology to offer wire and cable manufacturers a new, halogen-free resin which has very high mechanicals and excellent FR properties and good surface aesthetics. UV-stabilized ESTANE ZHF 90AM9 TPU is EN 50363-10-2 capable and has UL 94 V-0 and UL 105°C temperature ratings. It is a hydrolytic-stable grade with a tensile strength above 35 MPa and passes Cable Flame Test (according to UL-1581, Sec. 1061) on small diameter cables with a proven use case down to 8 mm. diameter.

ESTANE ZHF 90AM9 NAT 01 shows improved cone calorimetry properties contributing to its excellent cable flame test results and it has superior performance compared to the market reference, as can be seen below:



Sample thickness: 3 mm. & Irradiance level: 35 kW/m2

Graph 1: Peak Heat Release comparison of ESTANE ZHF 90AM9 NAT 01 with market reference

Summary of benefits obtained by using ESTANE ZHF 90AM9 NAT 01 TPU:

1. **Long-term performance**
    - heat and hydrolytic resistance,
    - high mechanicals,
    - high flame resistance
2. **Regulatory compliance**: UL105º C and EN 50363-10-2
3. **Easy to process**

All the above can be found in just one TPU grade, which contains no plasticizer, a real game changer.

Lubrizol Engineered Polymers has one of the most complete NHFR TPU portfolios that brings NHFR solutions for the wire and cable market in the field of automation, sensor, data and drag chain cables, among others. All ESTANE ZHF flame retardant TPUs have been developed considering processability and global regulatory compliance to serve wire and cable companies looking for FR solutions that are halogen-free while continuing to meet the stringent regulations applied in these sectors.

For more information, please visit our web site: www.lubrizol.com/engineered-polymers