

Cost-effective Fire Protection while meeting UL and ASTM Standards

A \$10 billion construction project to build a heavy crude refinery in the Middle East began in 2006. The refinery has the capacity to refine 900,000 barrels of crude oil a day, 120 million cubic feet of associated sour gas and 50,000 barrels of condensate a day. The project is both an offshore and onshore development.

The refinery complex has three electrical substations containing 175 gland boxes ranging in size from 0.5 m to 5 m long, 0.5 m to 1 m wide, and 0.35 m deep. The refinery owner wanted to use the best possible fire protection products to protect these vital assets, and specified that any solution must comply with Underwriters Laboratories (UL) and American Society for Testing and Materials (ASTM) standards.

A competitor's proposed solutions were rejected for a variety of reasons, including high cost; inability to ensure the gland boxes would be adequately sealed; a lack of documentation for this application; and the proposed materials didn't meet ASTM or UL standards. While meeting all of the above requirements, 3M engineers and other fire protection specialists performed an engineering analysis that identified 3M™ Interam™ Endothermic Mat (3M E-mat) as the best technical solution and lowest total cost.



Helps Mitigate Fire Spread

To ensure the customer had the necessary information and skills to successfully perform the installation, three technical discussions on worldwide UL and ASTM standards and three installation trainings and inspections were conducted on the job site.

3M Fire Protection Products are designed to help mitigate fire spread, providing additional time to control the fire and allow a safer evacuation. With more than 30 years experience, 3M has developed, tested and listed systems to protect critical electrical and structural components.

"3M E-mat meets global UL and ASTM standards, so the customer was confident the product would perform as advertised," said Ernie Schmidt, Advanced Technical Service Specialist, 3M Building and Commercial Services Division. "They were also confident it would perform to the requirements they established for their facility."



However, the 3M team faced several challenges as extremely high temperatures up to 118 F (48 C) caused adhesive problems in attaching the 3M™ Interam™ Endothermic Mat to the gland boxes. The problem was resolved by using 3M™ High-Strength 90 Adhesive. Supply issues also threatened the tight installation schedule, but due to the customer's confidence in the 3M solution, air shipment of 3M E-mat was authorized to keep the project on schedule.

Lowest Total Cost of Ownership

“Because 3M E-mat is easy to install, and particularly for this application, we trained lower-wage workers who were able to install the product,” said Schmidt. “Competitive products would have required a sprayer and higher-wage workers, and taken longer to install than the 3M solution.”

“3M provided the most time-competitive solution, and because 3M E-mat is less labor-intensive to install compared to other fire protection products, it has the lowest total cost of ownership,” said Schmidt. “3M E-mat goes on quickly with adhesive and banding, and the ease of application saved at least a week in the construction schedule. It's a great solution. We provided great training and support – everything the customer could ask for.”

3M™ Interam™ Endothermic Mat

Easy-to-install, 3M E-mat provides full-envelope fire protection for a broad range of critical components including structural steel, electrical raceways and vessel skirts. The flexibility and space saving design of 3M E-mat meets installation requirements in nearly all areas of refineries.

This flexible mat provides a uniform covering that, when exposed to high temperatures, releases chemically-bound water to cool the outer surfaces of the wrap material and significantly retard heat transfer. 3M's advanced fire protection technology offers outstanding performance in many fire scenarios including large hydrocarbon pool fires in accordance with UL 1709 (ASTM E 1529).

Visit www.3M.com/firestop for technical information, listed systems, training information and more or call 1.800.328.1687.



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