



LOCTITE®

CASE STUDY

**Loctite Potting Material Meets
Demanding Switch Gear Sensor
Reliability Requirements**





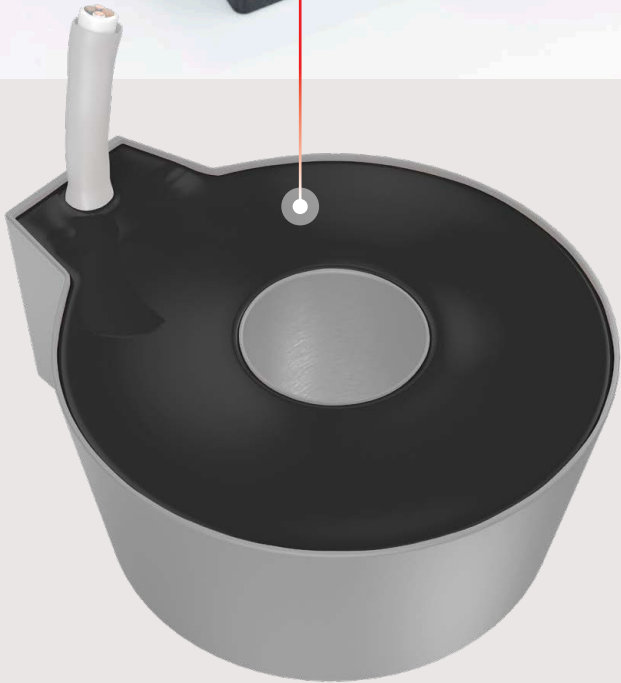
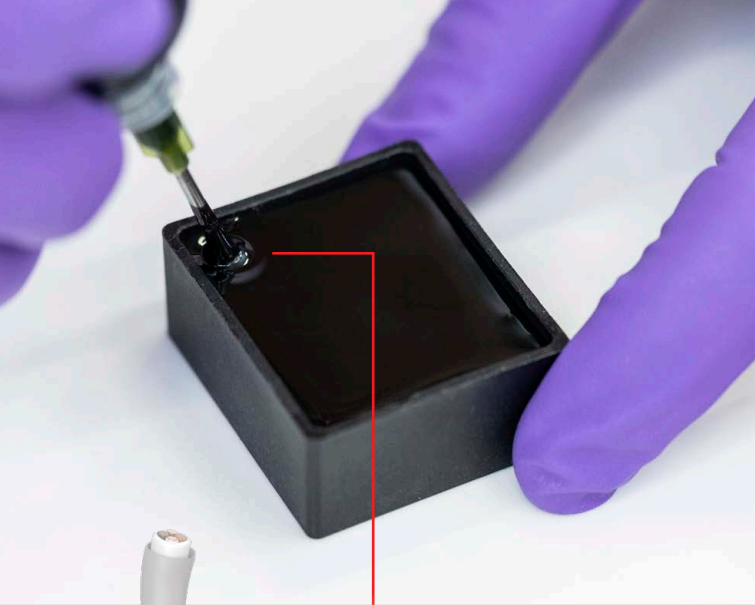
Market Situation and Challenge

- Current sensors are a critical component of switch gears used in electrical distribution systems. The primary role of these sensors is to measure current and voltage. Reliable performance is crucial, as any malfunction can render the entire switch gear inoperable.
- A new current sensor design required a protective potting material to fortify the sensor against harsh environmental conditions and contaminants, including water and oil.
- While there are industry standard tests, including flammability, curing, adhesion, hardness, and chemical resistance, this customer dictated additional challenging material quality evaluation criteria such as rigorous immersion analyses.
- The initial potting material selected could not pass the customer's stringent evaluation standards and degraded during some of the testing and did not deliver the protection required for proper function. An alternative potting solution was needed to avoid further delays in product deployment.

Customer Requirements

- In addition to traditional prerequisites for specific cure mechanisms, temperature resistance, adherence to UL 94 standards, impact and vibration resistance, low shrinkage, and hardness, the customer's quality metrics dictated that the material show no signs of degradation after prolonged immersion in oil and water.
- Reductions in labor, inventory, and production costs were also objectives of the potting evaluation project.
- Long-term reliability is critical, and the potted voltage meters had to pass all performance and quality tests and provide compatibility with manual and automated production processes.

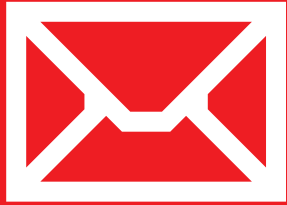




Henkel Solution

- Henkel's technical team worked with the customer to evaluate the performance of various potting formulations. Based on the stringent requirements, two-part **Loctite PE 3140/PE 3163** was selected. This material and several other suppliers' potting compounds were subjected to customer testing. Loctite PE 3140/PE 3163 was the only material that passed all metrics, including the immersion testing.
- In addition to material performance, the customer wanted to improve cost efficiency in its process. Henkel was able to supply the material in large-quantity packaging (5x larger than the previously sourced material), which enabled higher UPH, less inventory management, reduced labor costs, less waste, and higher productivity.
- By using Loctite PE 3140/PE 3163, the customer was able to immediately eliminate the 5% device failures experienced with the previous potting material. The improvements in inventory, labor, and production efficiency resulted in an estimated cost savings of between 10% and 15% annually. Most critically, the customer was able to proceed with product deployment without delay and with the assurance of reliability in critical high-wattage electrical distribution systems.
- The current sensor, protected with Loctite PE 3140/PE 3163, has been produced in high volume and used in the field for over four years without issue. Based on the results, the customer is expanding this material solution to other projects.

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