

Press Release

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Loctite Ablestik ICP 4000 Series Materials Withstand High Temperature, High Vibrational Energy Environments

New Silicone-Based Electrically Conductive Adhesives Ideal for Automotive Applications

Recognizing the emerging requirements of higher temperature, higher vibrational energy automotive sensor applications, Henkel has developed a new portfolio of silicone-based electrically conductive adhesives (ECAs) with unique properties to address harsh environmental conditions. The *Loctite Ablestik* ICP 4000 series of ECAs withstand operating temperatures as high as 200 degrees Celsius and deliver the flexibility required to cope with significant vibration.

Traditionally, older-generation epoxy-based ECAs have been utilized for certain automotive sensor applications. As technology has progressed, however, and sensor proximity to the heat and vibration source – the engine block – has become closer, epoxy systems are challenged to maintain long-term flexibility and conductivity. The *Loctite Ablestik* ICP 4000 materials overcome these challenges.

“Automotive electronics specialists increasingly require very rugged adhesives that can survive harsh environments,” explains Henkel’s Tom Adcock, Global Product Manager for Electronics Assembly adhesives. “We developed this portfolio of silicone ECAs specifically to meet these requirements and went beyond conventional testing regimens to ensure their performance in the field.”

Typical temperature, humidity, shock and storage testing evaluates ECA performance for a period of 1,000 to 1,500 cycles/hours. When validating the properties of the *Loctite Ablestik* ICP 4000 series materials, however, testing time periods were doubled. The new silicone-based ECAs showed good performance even after 3,000 hours of 85°C/85% RH temperature and humidity testing, 3,000



cycles of thermal shock analysis from -40 up to 175 degrees Celsius, and 3,000 hours of heat storage at 175 degrees Celsius. These results clearly illustrate the ECAs' capability not only during cycling, but throughout long-term operation in the field as well.

High temperature and high vibration compatibility

Understanding that automotive electronics manufacturers have varying application and production requirements, the *Loctite Ablestik* ICP 4000 materials have been formulated to provide a range of capability focusing on electrical resistance, adhesion, thermal conductivity and flexibility while delivering high temperature and high vibration compatibility. The materials are single component, silver-filled, heat-curable, silicone-based electrically conductive adhesives. The new silicone ECAs deliver improved flexibility over traditional epoxy-based materials, allowing for compensation of common CTE mismatches and, therefore, the ability to survive extreme vibration over extended periods of time. *Loctite Ablestik* ICP 4000 series materials also exhibit very low outgassing and bleed during cure, which adds to their high reliability. "The trend toward increasing electronics content in automobiles with sensor location moving ever-closer to heat- and vibration-producing sources will only accelerate," concludes Adcock. "In order to progress emerging technology requirements, new materials such as these latest silicone ECAs from Henkel will be critical."

For more information about Henkel's *Loctite Ablestik* ICP 4000 series or any of Henkel's advanced adhesive materials, visit our website www.henkel.com/electronics.

Henkel operates worldwide with leading brands and technologies in three business areas: Laundry & Home Care, Beauty Care and Adhesive Technologies. Founded in 1876, Henkel holds globally leading market positions both in the consumer and industrial businesses with well-known brands such as Persil, Schwarzkopf and Loctite. Henkel employs about 47,000 people and reported sales of 16,510 million euros and adjusted operating profit of 2,335 million euros in fiscal 2012. Henkel's preferred shares are listed in the German stock index DAX.

Photo material is available at <http://www.henkel.com/press>

Contact

Henkel Electronic Materials LLC
Doug Dixon
Phone: 714-368-8000
Fax: 714-368-2265

doug.dixon@us.henkel.com
www.henkel.com/electronics

The following material is available:



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