Henkel Excellence is our Passion

Press Release

2016/June/28

Solutions for sealing and protecting automotive electronics

Encapsulation, impregnation and potting with high performance resins

The quantity of electronics found in all areas of modern road vehicles continues to increase, and electric drive systems are now entering the mainstream. So the need to ensure the reliable performance of electrical and electronic components and systems is taking on new importance. Polymer-based solutions from Henkel provide high levels of protection for different types of these components.

Countless safety systems in cars and trucks now depend on the continuous high-level functionality of interconnected electronic components, often positioned in areas that are exposed to wide temperature variations, to oils and greases, to moisture, dust, stone impacts, and vibrations. For these reasons, it is important that, wherever possible, electronic and electrical components are securely protected from the environment.

Solutions now available from Henkel include:

- Technomelt low-pressure moldable hot-melt polyamides for encapsulation of plugs, sockets, sensors;
- Loctite acrylic impregnation resins for sealing microscopic gaps in metal/plastics hybrid components;
- Thermally conductive potting resins for electric propulsion components.

Low-pressure hot-melt polyamide encapsulation

In the low-pressure hot-melt molding technique, resin is injected around components fixed in a closed mold. The hot-melt serves as an encapsulant and also as a housing, so there is no need for a separate shell to protect the components. Once the hot-melt material has cooled and solidified, the components are ready for further processing.

Resins for hot-melt molding are single-component polyamide systems that can be used in simple and clean production processes. These processes take up little floor space, they are fast and energy-efficient.

Henkel Technomelt hot-melt molding materials provide high humidity resistance, temperature resistance up to 150°C, and impact resistance down to -50°C. This makes them superior to many other polyamide hot-melts, which normally can be used in environments of up to only 120°C and are more prone to hydrolysis.

The new materials from Henkel are the result of experience in hot-melt molding for the automotive industry that dates back over 25 years. They provide new opportunities for higher temperature applications in humid environments, such as sensors in door handles, rear view cameras, batteries or tire pressure monitoring systems, or for sealing aluminium cables.

Sealing gaps with acrylic impregnation

Acrylic impregnation products such as Loctite IS 5100 provide a sealing solution for electrical and electronic components. Microscopic voids are inherent in many electronic assemblies that combine metal and plastics elements. Over time in the field, these voids can cause product failures, so it is important that they are filled before the parts are put into vehicles. Henkel offers an impregnation service, either on-site or at its own service centers, for permanently sealing parts such as sensors, connectors, coils and electronic housings. Once impregnated, these components are protected from moisture, solvents, fluxes and other corrosive agents.

The impregnation process involves putting parts into a vacuum chamber, which is then filled with the acrylic resin. Once this has filled all the gaps in the parts, excess resin is removed by a centrifuge and parts are then thoroughly washed and rinsed before the remaining resin is allowed to cure. All parts go through a leak test to guarantee that the process has sealed the parts.

Impregnation is a fast, high quality, cost-effective sealing solution that can be used on existing parts without any need for design changes. Once treated, parts have the same dimensions and surface aspect as untreated parts, but their durability and long-term reliability is considerably improved. The specially developed acrylic resin protects against moisture, chemicals and dust, and remains flexible, retaining its sealing properties, throughout multiple thermal cycles. The process is unique to Henkel. Since it is offered as a service, customers do not need to invest in any capital equipment.

Potting with thermally conductive resins

Henkel's thermally conductive potting materials are intended for electric automobile propulsion components that require support in dissipating generated heat.

Today's compact high-performance electric propulsion components have a high power density. This inevitably leads to the generation of heat, which must be discharged to the cooling system on the outside if reliability is not to suffer. Henkel offers a variety of thermally conductive and electrically insulating potting materials that meet the technical and processing requirements of this application.

Photo material is available at www.henkel.com/press.

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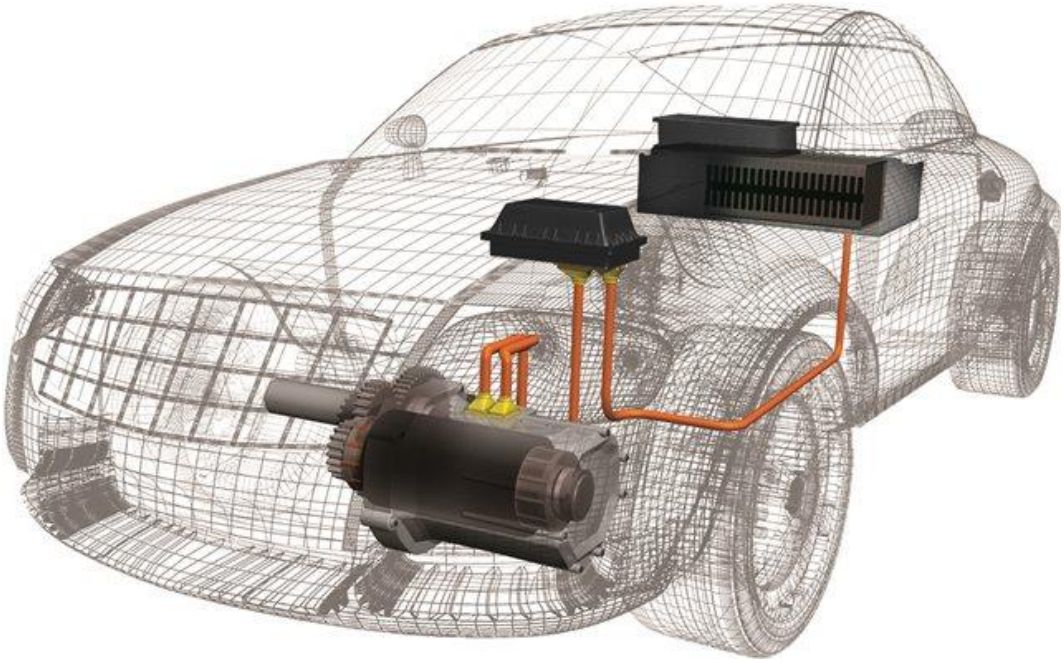
The following material is available:



Henkel offers solutions for sealing and protecting automotive electronics. (Photo: Henkel, PR013)

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