Adhesive/Sealant

Weekly Intelligence Report

2026-05-18 | 20 articles | 5 countries

troy-technical.jp

This Week's Keyword

Advanced Adhesives

For EV, Semiconductor & Sustainable Pkg

20	5	>200	10-20
articles	countries	W/mK	%
Total Articles Analyzed	Source Countries	Max Thermal Cond.	EMC Price Increase

All 20 Articles This Week — 5-Axis Evaluation Matrix

How to read columns — Tech Novelty: degree of breakthrough Market Proximity: closeness to commercialization Market Impact: industry-wide effect Data Reliability: quantitative data & peer review US/EU Relevance: direct impact on US/European companies & supply chains

#	Article Title	Type	Tech Novelty	Market Proximity	Market Impact	Data Reliability	US/EU Relevance	Summary
#01	Plexus Thermomechanical	New Product	●●●●○	●●●●○	●●●●○	●●●○○	●●●●●	New PU adhesives integrate high thermal conductivity with structural bonding for EVs and power electronics, simplifying assembly.
#02	Henkel Silicone-Free TIM	New Product	●●●○○	●●●●○	●●●●○	●●●●○	●●●●●	Henkel launches silicone-free thermal gap filler (1.7 W/mK) and PU adhesive (2 W/mK) for EV battery thermal management.
#03	Sumitomo Bakelite Price	Market Overview	●○○○○	●●●●●	●●●○○	●●●○○	●●●●○	Sumitomo Bakelite raises prices for semiconductor epoxy molding compounds by 10-20% due to raw material and logistics costs.
#04	Sumitomo Chem Alumina	New Material	●●●●○	●●●○○	●●●●○	●●●○○	●●●●○	Sumitomo Chemical develops new ultra-low alpha, high-thermal-conductivity alumina filler for advanced AI/HPC semiconductors.
#05	JSR Taiwan Expansion	Corporate Strategy	●●○○○	●●●●○	●●●●○	●●●○○	●●●●○	JSR expands Taiwan production and R&D; for 2nm and advanced packaging materials, driven by AI demand and TSMC.
#06	Henkel Teroson EP 52	New Product	●●●●○	●●●●○	●●●●○	●●○○○	●●●●●	Henkel launches Teroson EP 52 series, high-damping structural adhesives for automotive lightweighting and NVH reduction.
#07	SiC Microchannel Cool	Research	●●●●●	●●○○○	●●●●●	●●●●●	●●●●○	Direct die-attach microchannel cooling with sintered silver reduces SiC inverter thermal resistance to <0.15 K/W, boosting performance.
#08	UV-Curable Adhesives	Market Overview	●●○○○	●●●●●	●●●○○	●○○○○	●●●○○	UV-curable adhesives are indispensable for invisible, rapid, and durable bonding of transparent materials like glass and acrylic.
#09	PU-Acrylic Solder Resis	Research	●●●●○	●●○○○	●●●●○	●●●●●	●●●●○	Research unveils polyurethane-modified acrylic resins for solder resists with high adhesion and low dielectric properties for 5G/AI packaging.
#10	TANAKA Die-Attach	New Material	●●●●○	●●●●○	●●●●○	●●●●○	●●●●○	TANAKA to unveil silver sintering pastes (>200 W/mK) and AgSn TLP sheets for next-gen SiC/GaN power semiconductors.
#11	Optical Bonding LCD	Market Overview	●●○○○	●●●●●	●●●○○	●○○○○	●●●○○	Optical bonding enhances TFT LCD display readability, durability, and moisture resistance for industrial and outdoor applications.
#12	Ziitek Liquid Cooling	New Product	●●●○○	●●●●○	●●●●○	●●○○○	●●●○○	Ziitek to showcase full-stack liquid cooling systems and advanced TIMs for high-power-density data centers.

#	Article Title	Type	Tech Novelty	Market Proximity	Market Impact	Data Reliability	US/EU Relevance	Summary
#13	CTE-Gradient Interconn	Research	●●●●●	●●○○○	●●●●●	●●●●●	●●●●○	CTE-gradient interconnects with Ga-In eutectic in nanosilver paste reduce shear stress by >50% in SiC inverters, boosting reliability.
#14	Henkel Packaging Ctr	Corporate Strategy	●●○○○	●●●●○	●●●○○	●●○○○	●●●●●	Henkel upgrades Packaging Competence Center in Germany to accelerate sustainable, recyclable mono-material packaging innovation.
#15	Dexerials Auto/EV Mat	Corporate Strategy	●●○○○	●●●●○	●●●○○	●●○○○	●●●●●	Dexerials to showcase ACFs, SVRs, and industrial adhesives for automotive sensing and EV batteries at US/EU trade shows.
#16	Henkel Japan EV Recycle	New Product	●●●●○	●●●●○	●●●●○	●●○○○	●●●●○	Henkel Japan unveils electrically disassemblable adhesive and UV-curing insulating coating to boost EV battery repair and recycling.
#17	Heraeus Die-Attach	New Product	●●●●○	●●●●○	●●●●○	●●●●○	●●●●●	Heraeus unveils mAgic® PE340 silver sintering paste and Microbond® solder preforms for high-reliability power electronics.
#18	Henkel Sustain Sealant	New Product	●●●○○	●●●●○	●●●○○	●●○○○	●●●●●	Henkel introduces next-gen water-based, phthalate-free, and allergen-free sealants for sustainable food and beverage cans.
#19	ASMC 2026 Conference	Market Overview	●○○○○	●○○○○	●●○○○	●○○○○	●●●●●	ASMC 2026 convened global semiconductor leaders to discuss advanced manufacturing challenges, materials, and packaging innovations.
#20	Resonac Profit Outlook	Corporate Strategy	●○○○○	●●●●●	●●●●○	●●●●○	●●●●○	Resonac raises H1 2026 profit outlook by 93% due to robust demand for AI semiconductor materials.

●●●●○ High ●●●○○ Med-High ●●○○○ Med ●○○○○ Low | Yellow highlight = featured article

Three Questions That Demand Your Decision This Week

❶ Is your SiC power module design ready for next-gen thermal and reliability demands?

Breakthroughs in direct die-attach microchannel cooling and CTE-gradient interconnects (articles #07, #13) promise >50% performance gains and drastically reduced thermal cycling damage for SiC inverters. Does your current roadmap incorporate these radical approaches, or will competitors gain a critical advantage in EV and industrial power electronics?

❷ Are your advanced packaging material suppliers keeping pace with AI/HPC demands?

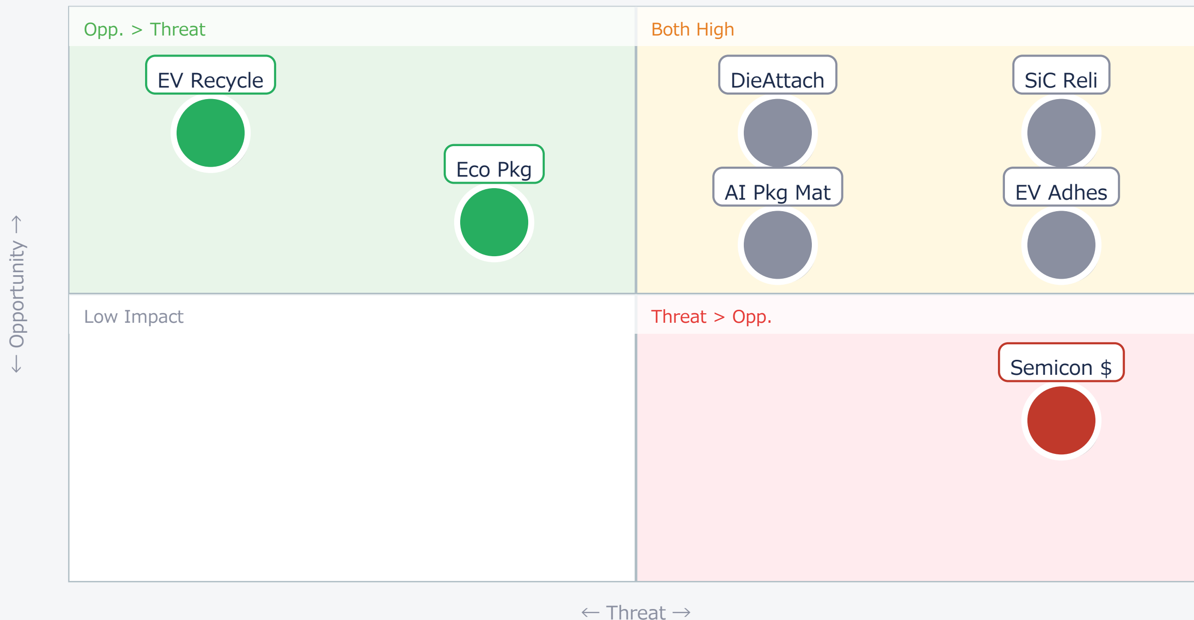
New ultra-low alpha alumina fillers (Sumitomo Chemical #04) and polyurethane-modified acrylic solder resists with dual high adhesion/low dielectric (ACS #09) are critical for next-gen AI/HPC chips. With Asian suppliers like JSR (#05) and Resonac (#20) aggressively expanding, are your US/EU material supply chains diversified and innovative enough to avoid bottlenecks and maintain competitive edge?

❸ How will you capitalize on the circular economy for EV batteries and sustainable packaging?

Henkel is leading with an electrically disassemblable adhesive for EV batteries (#16) and upgrading its competence center for recyclable mono-material packaging (#14, #18). Is your company developing similar solutions to meet tightening regulations and consumer demand for sustainability, or are you risking obsolescence in these critical markets?

Opportunities vs. Threats for US/European Companies

Opportunity vs. Threat Matrix for US/European Companies



Item	Quadrant	↑ Opportunity	↓ Threat
● SiC Reli	Critical	Boost SiC perf	Lagging tech
● EV Adhes	Critical	New EV designs	Competitor lead
● DieAttach	Critical	High-power pkg	Asian rivals
● AI Pkg Mat	Critical	Next-gen chips	Material gap

● EV Recycle	Opp.	Circular economy	—
● Eco Pkg	Opp.	Green branding	—
● Semicon $	Threat	—	Cost pressure

Deep Dive ① — SiC Inverter Thermal Management Breakthrough

#07 | 2026/05/14 | PatSnap Eureka | Tech Novelty●●●●● Proximity●●○○○ Market Impact●●●●● Data Reliability●●●●● US/EU Relevance●●●●○

An innovative thermal management solution for high-power-density SiC inverters combines direct die-attach microchannel cooling with sintered silver bonding. This approach directly joins SiC dies to polycrystalline CVD SiC microchannel coolers.

A sintered silver paste layer under 20μm drastically reduces thermal resistance to below 0.15 K/W, achieving over 50% performance improvement compared to conventional DBC modules by minimizing CTE mismatch.

> ▶ Strategic Analyst's Perspective
>
> Strategic Analyst's Perspective: The reported thermal resistance reduction and performance improvement are highly significant and appear realistic for lab conditions, though mass production challenges remain. Technical barriers include scaling CVD SiC microchannel fabrication and ensuring uniform, ultra-thin sintered silver layers. [Opportunity] for US/EU power module manufacturers to lead in next-gen EV and industrial inverter designs. [Threat] for those reliant on conventional packaging, risking obsolescence. Next actions: [R&D;] Initiate feasibility studies on SiC-on-SiC direct bonding and microchannel integration by Q3 2026. [Procurement] Identify potential suppliers for advanced SiC substrates and sintering materials.

Deep Dive ② — CTE-Gradient Interconnect for SiC Reliability

#13 | 2026/05/14 | PatSnap Eureka | Tech Novelty●●●●● Proximity●●○○○ Market Impact●●●●● Data Reliability●●●●● US/EU Relevance●●●●○

An innovative CTE-gradient interconnect technology drastically reduces thermal cycling damage in SiC power inverter modules. It uses Ga-In eutectic microdroplets in sintered nanosilver paste via Transient Liquid Phase Sintering (TLPS).

This biomimetic approach creates a continuous CTE gradient, reducing shear stress at the SiC-die interface by over 50% compared to conventional sintering, significantly enhancing thermomechanical fatigue resistance.

> ▶ Strategic Analyst's Perspective
>
> Strategic Analyst's Perspective: The >50% shear stress reduction is a game-changer for SiC reliability and appears credible from a research standpoint. Key technical barriers include precise control of Ga-In eutectic dispersion and TLPS process parameters for consistent gradient formation in mass production. [Opportunity] for US/EU power module OEMs to differentiate products with superior long-term reliability and extended warranties. [Threat] for existing die-attach material suppliers if they cannot rapidly integrate similar stress-mitigation features. Next actions: [R&D;] Establish internal projects or external partnerships to explore biomimetic CTE-gradient materials for SiC packaging by Q3 2026. [Strategy] Assess competitive landscape for advanced die-attach solutions.

Deep Dive ③ — Advanced Die-Attach for Power Electronics

#17 | 2026/05/12 | Heraeus Electronics | Tech Novelty●●●●○ Proximity●●●●○ Market Impact●●●●○ Data Reliability●●●●○ US/EU Relevance●●●●●

Heraeus Electronics unveiled mAgic® PE340 silver pressure sintering paste for high-density packaging with precision printability, and Microbond® solder preforms using low-melt Innolot® technology for IGBTs.

The award-winning mAgic® PE360 sintering paste, boasting over 200 W/mK thermal conductivity, is already qualified in automotive projects for SiC modules operating above 150°C, enhancing reliability and performance.

> ▶ Strategic Analyst's Perspective
>
> Strategic Analyst's Perspective: Heraeus's new products and existing qualified solutions are highly realistic and directly address market needs for high-reliability power electronics. The automotive qualification of PE360 is a strong indicator of market readiness. Technical barriers are primarily related to process integration and cost optimization for new sintering pastes and preforms. [Opportunity] for US/EU power module manufacturers to adopt these advanced materials for immediate performance and reliability gains in EV and industrial applications. [Threat] for material suppliers lagging in high-performance, high-reliability die-attach solutions, especially for SiC/GaN. Next actions: [Procurement] Evaluate mAgic® PE340 and Microbond® samples for next-gen designs by end of Q2 2026. [R&D;] Benchmark current die-attach solutions against Heraeus's offerings.

Other Notable Articles

#01 Plexus Introduces Thermomechanical Polyurethane Adhesives for Integrated Thermal Management and Structural Bonding in EVs and Power Electronics (ITW Performance Polymers (Plexus))
Tech Novelty●●●●○ Proximity●●●●○ Market Impact●●●●○

New US-made PU adhesives combine high thermal conductivity and structural bonding, simplifying EV battery and power electronics assembly.

#02 Henkel Unveils Silicone-Free Thermal Gap Filler and High-Strength Conductive Adhesive for Advanced EV Battery Thermal Management (Henkel)
Tech Novelty●●●○○ Proximity●●●●○ Market Impact●●●●○

Henkel's new silicone-free gap filler (1.7 W/mK) and PU adhesive (2 W/mK) improve EV battery thermal management and manufacturing efficiency.

#04 Sumitomo Chemical Develops New Ultra-Low Alpha, High-Thermal-Conductivity Alumina Filler for Advanced Semiconductors (住友化学)
Tech Novelty●●●●○ Proximity●●●○○ Market Impact●●●●○

New alumina filler from Sumitomo Chemical offers ultra-low alpha emissions and high thermal conductivity for AI/HPC semiconductors.

#06 Henkel Unveils Next-Gen Teroson EP 52 Series: High-Damping Structural Adhesives for Automotive Lightweighting and NVH Reduction (Henkel)
Tech Novelty●●●●○ Proximity●●●●○ Market Impact●●●●○

Henkel's Teroson EP 52 series offers high-damping structural adhesives for automotive lightweighting and enhanced NVH performance, especially for EVs.

Recommended Actions This Week

Action recommendations based on article evaluation matrix and opportunity/threat analysis.

Immediate (this week)

- [Procurement] Review existing contracts for semiconductor encapsulation materials (EMCs) in light of Sumitomo Bakelite's 10-20% price increase (#03). Identify alternative suppliers or negotiate terms.
- [Executive] Assess the strategic implications of Asian material suppliers (JSR, Resonac) strengthening their advanced semiconductor material capabilities in Taiwan (#05, #20). Evaluate potential supply chain risks.

Short-term (1 month)

- [R&D;] Obtain samples and technical data for new thermomechanical polyurethane adhesives (Plexus #01, Henkel #02) and high-damping structural adhesives (Henkel #06) for EV and power electronics applications. Begin preliminary testing.
- [Business Dev] Investigate Henkel Japan's electrically disassemblable adhesive (#16) and UV-curing insulating coating for EV batteries. Explore partnership or licensing opportunities to enhance battery repair/recycling capabilities.
- [Procurement] Engage with Heraeus Electronics to evaluate their new mAgic® PE340 silver sintering paste and Microbond® solder preforms (#17) for integration into next-generation power module designs.

Medium-long term (quarter+)

- [R&D;] Launch internal research programs or seek academic collaborations to explore direct die-attach microchannel cooling (#07) and CTE-gradient interconnect technologies (#13) for SiC power modules. Target proof-of-concept by Q4 2027.
- [Strategy] Develop a comprehensive roadmap for sustainable packaging, incorporating mono-material solutions and advanced adhesives, leveraging insights from Henkel's competence center upgrade (#14, #18).
- [R&D;] Initiate development of ultra-low alpha, high-thermal-conductivity fillers (e.g., alumina) and advanced low-dielectric solder resists (#04, #09) to meet future AI/HPC semiconductor packaging requirements.

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Adhesives_Sealants — Selected Articles

Date: 2026-05-18

Articles: 20

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#14 Henkel Upgrades Packaging Competence Center to Accelerate Sustainable Packaging Innovation and Circular Economy Transition

#15 Dexerials to Showcase Advanced Functional Materials at AutoSens USA and The Battery Show Europe, Targeting Automotive and EV Markets

#16 Henkel Japan Unveils Electrically Disassemblable Adhesive and UV-Curing Insulating Coating to Boost EV Battery Repair and Recycling

#17 Heraeus Electronics Unveils Advanced Die-Attach Materials for High-Reliability Power Electronics at PCIM Europe 2026

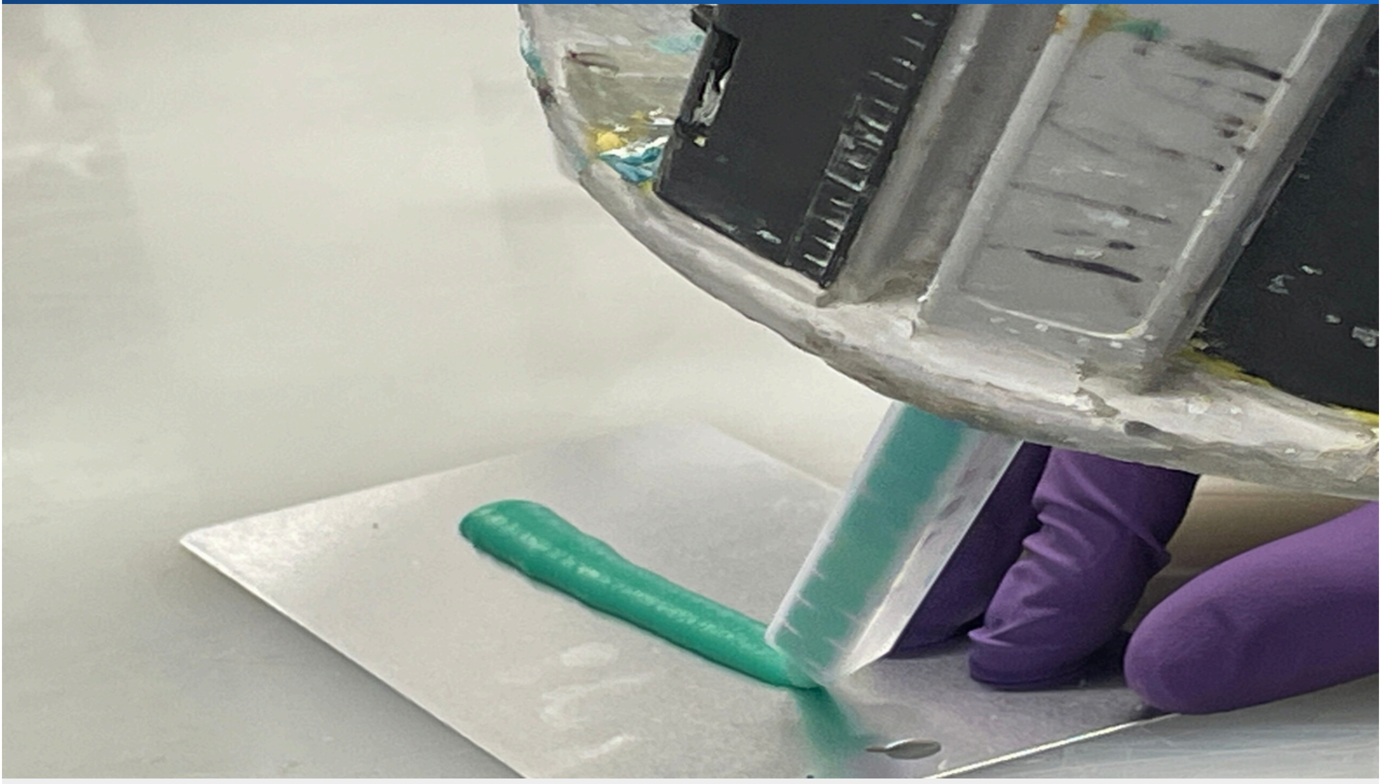
#18 Henkel Unveils Sustainable Sealants for Beverage and Food Cans at METPACK 2026, Meeting Evolving Safety and Efficiency Demands

#19 ASMC 2026 Convenes Global Semiconductor Leaders to Tackle Advanced Manufacturing Challenges and Accelerate Innovation

#20 Resonac Raises Mid-Year Profit Outlook, Driven by Robust Demand for AI Semiconductor Materials

Plexus Introduces Thermomechanical Polyurethane Adhesives for Integrated Thermal Management and Structural Bonding in EVs and Power Electronics

Published May 08, 2026 ITW Performance Polymers (Plexus) USA



OVERVIEW

Plexus has launched a new series of thermomechanical polyurethane structural adhesives, including the DT2630LD, designed to concurrently manage heat and provide robust structural bonding in demanding applications. These innovative adhesives offer both high thermal conductivity and low modulus, enabling them to act as an active thermal pathway while maintaining structural integrity. This solution significantly simplifies assembly processes and enhances long-term reliability in high-heat-density environments like EV battery systems and data center power distribution units.

IN DEPTH

Background and Industry Challenges

The intensifying demands for miniaturization and increased power density in modern electronics and the automotive industry present significant challenges in thermal management and mechanical reliability. Specifically, Electric Vehicle (EV) battery systems and data center power electronics require both highly efficient heat dissipation and robust structural resilience against vibrations and impacts. Conventional approaches often rely on separate thermal interface materials (TIMs) and structural adhesives, which invariably complicate manufacturing, extend assembly times, and introduce potential failure points due to coefficient of thermal expansion (CTE) mismatches that can lead to delamination or cracking under thermal cycling.

Key Findings and Technical Features

In response to these critical engineering needs, Plexus has unveiled three new thermomechanical polyurethane structural adhesives: Plexus DT2325, DT2430, and DT2630LD. This product family is distinguished by its ability to provide both high-performance structural bonding and functional thermal management within a single material system.

- **Plexus DT2630LD** is a non-sag formulation engineered with a high thermal conductivity (specific values available upon request, but it functions as part of the thermal path) and a low modulus. This unique combination allows the adhesive layer to actively contribute to heat dissipation, mitigating the common issues where traditional adhesives either insulate components or become brittle under thermal stress. It is particularly effective for bonding cells or modules to cooling plates within EV battery systems, where thermal transfer and mechanical stability are crucial for safety and performance.
- **Plexus DT2430** offers a well-balanced solution, providing robust structural strength, UL94 V-0 flame retardancy, and enhanced heat flow. This versatility makes it suitable for a wide range of power electronics and industrial system applications.

- **Common Attributes** across the series include low volatile organic compounds (VOCs), high dielectric strength, and exceptional resistance to vibration and impact. Furthermore, these adhesives demonstrate strong adhesion across diverse substrates, enhancing environmental compliance, operational safety, and overall long-term product durability.

Technical Significance and Outlook

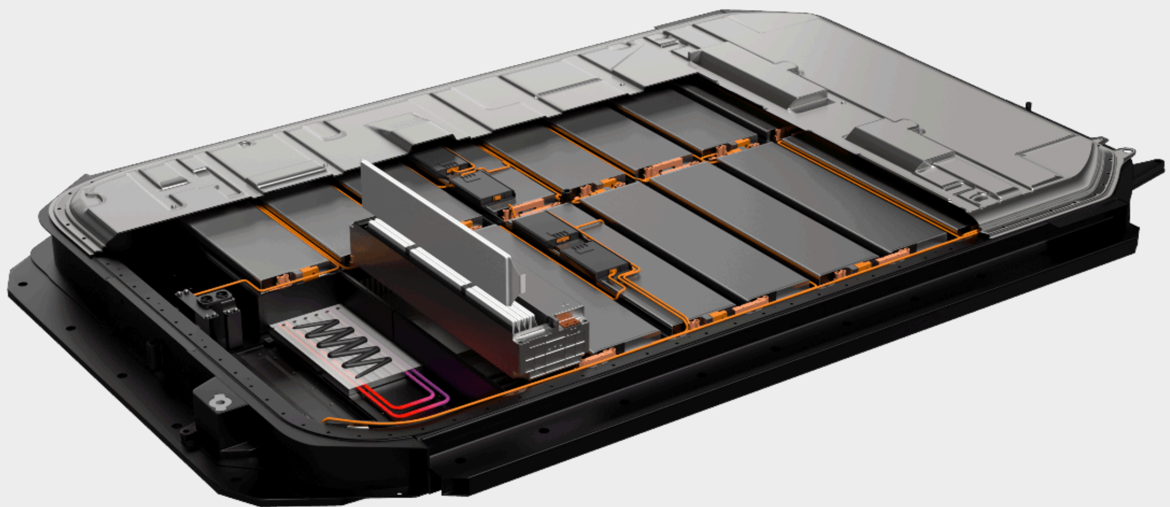
The introduction of this advanced polyurethane adhesive platform represents a pivotal development for sectors requiring high performance and reliability, such including EV batteries, data centers, and power electronics. These materials are expected to significantly contribute to simplified designs, streamlined assembly processes, and extended product lifespans. By integrating bonding and thermal management, engineers can achieve reduced component counts and shorter manufacturing cycles, leading to substantial cost reductions. The adhesives' ability to alleviate thermal cycling stresses will also reduce system failure rates, a critical factor for the safety and reliability of EV batteries. Looking ahead, as next-generation electronic and automotive systems continue to push for higher power densities and smaller form factors, the demand for such integrated material solutions is projected to expand dramatically, enabling more compact, robust, and thermally efficient designs globally.

Source: https://itwperformancepolymers.com/news-article/plexus-launches-new-thermomechanical-polyurethane-structural-adhesives-to-address-heat-stress-and-durability-challenges

Collected: May 15, 2026 | Automated Research System (Gemini API)

Henkel Unveils Silicone-Free Thermal Gap Filler and High-Strength Conductive Adhesive for Advanced EV Battery Thermal Management

Published May 12, 2026 Henkel Germany



OVERVIEW

Henkel has introduced two new thermal interface materials designed to enhance EV battery thermal management: the Bergquist TGF 2030APS gap filler, which is silicone-free with a thermal conductivity of 1.7 W/m·K, and the Loctite TLB 9270APS, a polyurethane-based adhesive offering 2 W/m·K thermal conductivity with superior bonding strength and electrical insulation. These innovations address the critical need for efficient heat dissipation and robust structural integrity in high-energy-density EV batteries, supporting rapid charging and advanced cell-to-pack architectures.

IN DEPTH

Background and EV Battery Thermal Management Challenges

The rapid expansion and performance enhancement of electric vehicles (EVs) have spurred significant advancements in battery energy density and fast-charging technologies. This trend leads to a substantial increase in heat generation within battery packs, making efficient and reliable thermal management a paramount factor dictating battery safety, lifespan, and overall performance. Key challenges for battery manufacturers and OEMs include mitigating thermal runaway risks, alleviating stress from thermal expansion, and optimizing manufacturing efficiency. Furthermore, novel cell-to-pack and cell-to-chassis architectures necessitate superior thermal conduction pathways between battery cells and the cooling systems.

Key Findings and Technical Features

Henkel has responded to these critical requirements by launching two new products to bolster its EV battery thermal management solutions:

- **Bergquist TGF 2030APS Gap Filler**: This two-component gap filler features a thermal conductivity of 1.7 W/m·K and is notably silicone-free. The silicone-free formulation eliminates potential risks associated with silicone migration, ensuring cleaner manufacturing environments and enhanced long-term reliability. It is designed for high-speed dispensing and cures at room temperature, contributing to improved manufacturing efficiency and reduced energy consumption. Its low compressive stress ensures minimal mechanical impact on delicate battery cells while creating an effective thermal pathway.
- **Loctite TLB 9270APS Adhesive**: This two-component, polyurethane-based adhesive boasts a thermal conductivity of 2 W/m·K, coupled with exceptional bonding strength and electrical insulation properties. Specifically developed for 'cell-to-pack' designs, where individual cells are directly bonded to the battery pack structure, it provides robust structural support while simultaneously enabling efficient heat diffusion. Being a solvent-free formulation, it also contributes to a lower environmental footprint.

Technical Significance and Outlook

Henkel's new product offerings represent a crucial step forward in supporting the evolution of EV battery technology. The Bergquist TGF 2030APS enhances assembly reliability in environments sensitive to silicone, while the Loctite TLB 9270APS integrates high thermal conductivity with structural adhesion, increasing design flexibility for battery packs. Both products are engineered to manage the heat generated during rapid charging, thereby reducing the risk of thermal runaway and consequently improving EV safety and longevity. Furthermore, features like room-temperature curing and solvent-free formulations contribute to greener manufacturing processes and potential cost savings. As the EV battery market continues its rapid expansion and demands for energy density and charging speed intensify, these advanced thermal management materials are anticipated to play an indispensable role in the development of next-generation EV platforms globally, setting new benchmarks for performance and sustainability.

Source: https://www.autotrade.ie/index.php/henkel-launches-improvements-for-ev-battery-thermal-management/79259

Collected: May 15, 2026 | Automated Research System (Gemini API)

Sumitomo Bakelite Announces Price Increase for Semiconductor Encapsulation Epoxy Molding Compounds

Published May 14, 2026　住友ベークライト株式会社　Japan

OVERVIEW

Sumitomo Bakelite has announced a price revision for its SUMIKON™ EME series of epoxy resin molding compounds for semiconductor encapsulation, effective June 1, 2026, with increases ranging from 10% to 20%. This adjustment is driven by a significant rise in raw material procurement costs, exacerbated by Middle East tensions, alongside broad increases in packaging materials, energy, and logistics expenses. The move reflects growing global cost pressures impacting the semiconductor materials supply chain.

IN DEPTH

Background and Market Dynamics

The semiconductor industry continues to experience robust demand driven by advancements in high-performance computing and the expansion of diverse applications. Semiconductor encapsulation materials, crucial for protecting devices from environmental factors and ensuring electrical and mechanical reliability, are integral to the quality of final products. Sumitomo Bakelite, a leading supplier in this sector, sees its SUMIKON™ EME series of epoxy molding compounds widely adopted across various semiconductor devices. However, recent geopolitical tensions, particularly in the Middle East, have profoundly impacted petrochemical markets, exerting upward pressure on the entire supply chain's cost structure.

Key Announcement and Driving Factors for Price Revision

On May 14, 2026, Sumitomo Bakelite officially announced its decision to revise the selling prices for its SUMIKON™ EME series of epoxy resin molding compounds for semiconductor encapsulation. The new pricing will apply to shipments made on or after June 1, 2026, with an anticipated increase of approximately 10% to 20% over current prices.

The primary factors necessitating this price adjustment are:

- **Surging Raw Material Costs**: The escalating tensions in the Middle East have led to a substantial increase in the price of petrochemicals, which are key raw materials for epoxy resins. Concurrently, costs for auxiliary materials such as curing agents and fillers have also trended upwards.
- **Increased Manufacturing and Logistics Costs**: Significant increases have been observed across energy expenses (electricity, fuel) essential for production, packaging material costs, and domestic and international transportation fees. These cumulative cost increases have severely impacted the product's overall cost base.

Despite continuous efforts to implement cost reduction measures through corporate initiatives, the company determined that these efforts alone could no longer absorb the rising expenses. The price revision is deemed necessary to maintain a stable supply system and ensure the long-term viability of their operations.

Impact and Future Outlook

This price revision is expected to directly influence the manufacturing costs for semiconductor device manufacturers. While encapsulation materials typically represent a smaller percentage of the final product cost, any increase contributes to the overall cost base. It is likely that other suppliers in the semiconductor materials sector are facing similar cost pressures, potentially leading to a broader trend of price adjustments across the entire semiconductor supply chain. This situation underscores the critical importance of profitability maintenance for material suppliers and stringent cost management for semiconductor manufacturers. Moving forward, enhanced collaboration between suppliers and customers to ensure stable raw material supply and cost optimization, or the exploration of more cost-efficient alternative materials in R&D, is anticipated to intensify across the industry.

Source: https://www.sumibe.co.jp/english/topics/2026/it-materials/0509_01/index.html

Collected: May 15, 2026 | Automated Research System (Gemini API)

Sumitomo Chemical Develops New Ultra-Low Alpha, High-Thermal-Conductivity Alumina Filler for Advanced Semiconductors

Published May 08, 2026 住友化学 Japan

OVERVIEW

Sumitomo Chemical has developed a new 'ELA series' of high-purity alumina, boasting extremely low alpha-particle emissions and enhanced thermal conductivity, specifically for advanced semiconductors. This innovation utilizes unique particle shapes and dense packing technology to minimize soft errors and efficiently dissipate heat when integrated into encapsulation materials. The ELA series is critical for next-generation AI and HPC semiconductors, where high reliability and superior thermal management are paramount for device performance and longevity.

IN DEPTH

Background and Challenges in Advanced Semiconductors

The relentless advancement in Artificial Intelligence (AI) and High-Performance Computing (HPC) has led to an exponential increase in semiconductor integration and operating speeds. Consequently, the heat generated per unit area has escalated dramatically, making efficient thermal dissipation critical for maintaining device performance and reliability. Simultaneously, as circuit geometries shrink and operating voltages decrease, even trace amounts of radioactive elements (particularly alpha particles) within encapsulation materials pose a growing risk of soft errors, which can compromise overall system reliability. Therefore, next-generation semiconductors urgently require encapsulation fillers that combine ultra-low alpha emissions with exceptional thermal conductivity.

Key Findings and Technical Features

To address these multifaceted demands, Sumitomo Chemical, primarily through its Korean subsidiary Dongwoo Fine-Chem Co. Ltd., has successfully developed the new 'ELA series' of high-purity, fine spherical alumina, featuring both ultra-low alpha emissions and high thermal conductivity.

- **Ultra-Low Alpha-Particle Emissions**: The ELA series achieves significantly reduced alpha-particle emission levels, which are a known cause of soft errors in semiconductor devices. This breakthrough substantially lowers the risk of transient malfunctions, particularly in high-reliability applications such as data centers and automotive electronics where fault tolerance is critical.
- **Enhanced Thermal Dissipation**: By leveraging unique particle morphologies and proprietary fine-particle-size control technology, Sumitomo Chemical has enabled a high-density loading of alumina within resin matrices. This innovation ensures that material flowability is maintained while maximizing thermal conduction paths, dramatically improving the overall heat dissipation performance of semiconductor encapsulation materials. The spherical shape of the particles facilitates uniform dispersion and high packing density, further contributing to reduced thermal resistance.

- **Exceptional Purity**: Advanced purification techniques are employed to thoroughly eliminate impurities, ensuring the ultra-high purity levels required for state-of-the-art semiconductor materials.

Technical Significance and Outlook

The ELA series from Sumitomo Chemical offers a groundbreaking solution for both thermal management and reliability enhancement in AI semiconductors and next-generation HPC devices. This enables device manufacturers to design and produce more stable and higher-performing semiconductors. The material is particularly beneficial for automotive electronics, where stable operation in high-temperature environments is crucial, and for 24/7 data centers, as it prevents performance degradation and soft errors due to heat, thereby extending product lifespan. As semiconductors continue their trajectory of higher performance and further miniaturization, the demand for advanced materials with such integrated functionalities will only grow. Sumitomo Chemical is positioned to establish a strong competitive advantage in this evolving market. Beyond encapsulation, this technology holds promise for other thermal management applications, including thermal interface sheets and components for semiconductor manufacturing equipment.

Source: https://lushbooklife.com/news-of-sumitomo-chemicals-new-high-purity-alumina-product/

JSR Fortifies Advanced Semiconductor Material Production and R&D in Taiwan to Meet Surging AI Demand

Published May 08, 2026 JSR株式会社 Japan

OVERVIEW

JSR, a leading semiconductor materials manufacturer, announced a significant expansion of its production and R&D capabilities in Taiwan, effective April 2026. This strategic move, driven by key customer requests like TSMC and supply chain resilience initiatives, targets advanced materials for 2nm process nodes and next-generation packaging. JSR will focus on crucial materials such as thick-film photoresists, photosensitive dielectric materials, and underfills essential for AI semiconductors and cutting-edge packaging technologies like chiplets and CoWoS.

IN DEPTH

Background and Transformation of the Advanced Semiconductor Market

The global semiconductor industry is undergoing an unprecedented transformation, largely fueled by the rapid advancements in Artificial Intelligence (AI) and the surging demand for High-Performance Computing (HPC). As the physical limits of traditional silicon scaling (Moore's Law) become increasingly apparent, advanced packaging (back-end processing) has emerged as a pivotal enabler for achieving higher device performance. Technologies such as chiplets, CoWoS (Chip-on-Wafer-on-Substrate), 3D integration, and High Bandwidth Memory (HBM) demand increasingly complex structures and sophisticated thermal management solutions, making innovative materials indispensable. Taiwan, as the world's largest semiconductor foundry hub, stands at the epicenter of these advanced technology developments.

Key Developments and JSR's Strategic Focus

JSR, a global leader in semiconductor materials, announced in April 2026 its comprehensive plan to significantly strengthen its semiconductor materials production and R&D infrastructure in Taiwan. This strategic imperative is driven by strong local supply demands from leading foundries, including TSMC, and a broader industry push to fortify supply chain resilience against geopolitical uncertainties. JSR's enhanced focus will be on the following critical areas:

- **Advanced Chemical Mechanical Planarization (CMP) Materials**: CMP processes are vital for achieving the ultra-flat surfaces required for advanced interconnect layers in highly miniaturized circuits. JSR will intensify its development of new slurries and pads tailored for process nodes beyond 2nm, ensuring the precision necessary for next-generation devices.
- **Next-Generation Packaging Materials**: The company will accelerate local production and R&D for materials critical to advanced packaging technologies like chiplets, CoWoS, and 3D integration. This includes thick-film photoresists, photosensitive dielectric materials, and underfill encapsulants. These materials play essential roles in electrical interconnection, mechanical protection, and thermal management within these complex multi-chip assemblies.

- **EUV Lithography Related Materials**: JSR will also enhance its development of photoresist materials for extreme ultraviolet (EUV) lithography, the cutting-edge patterning technology, to support high-resolution and high-throughput manufacturing processes.

This strategic expansion will be realized through investments in local factories and R&D centers in Taiwan, fostering closer collaboration with customers and establishing rapid feedback loops to accelerate the pace of technological innovation.

Impact and Future Outlook

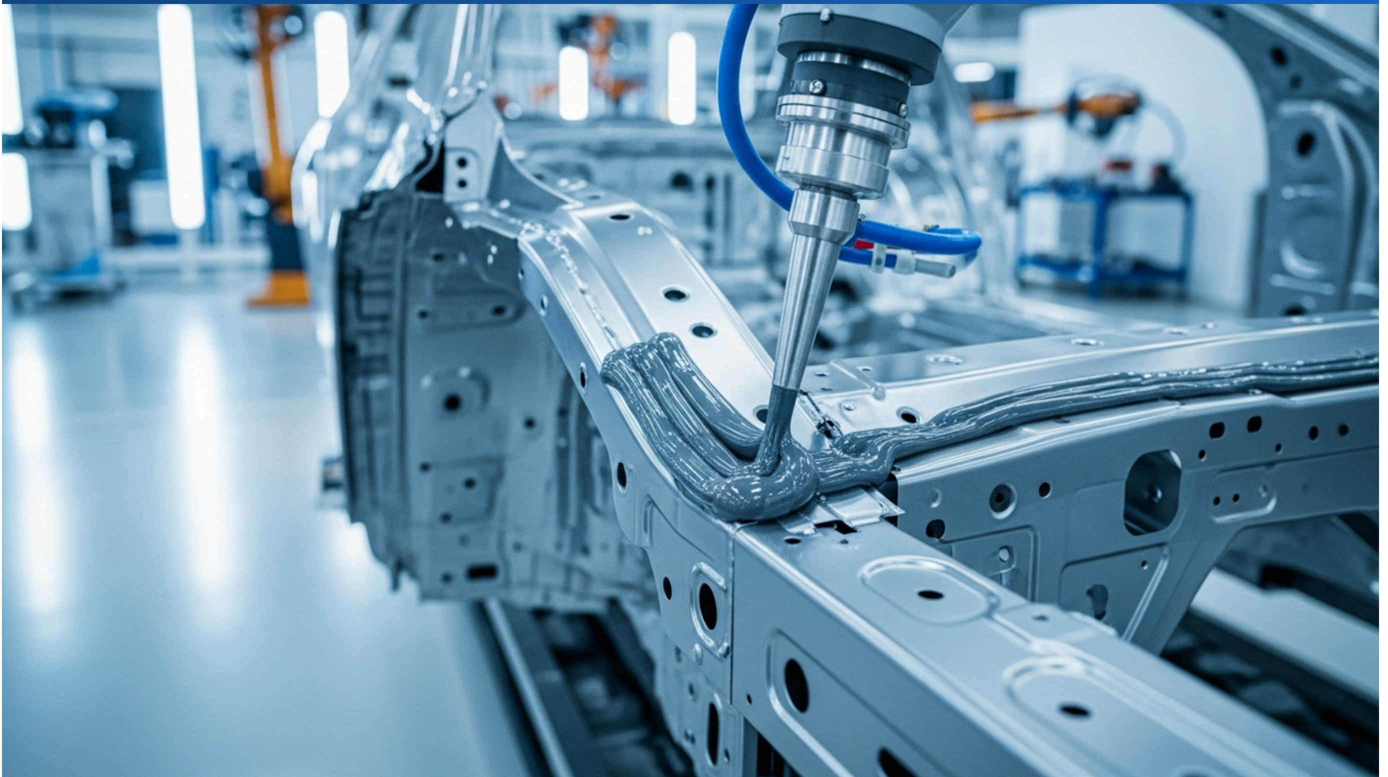
JSR's strengthened production and R&D presence in Taiwan directly supports the burgeoning growth of the advanced semiconductor market, particularly in AI. The increased local material supply capacity will enhance supply chain stability, contributing to the overall robustness of Taiwan's semiconductor ecosystem. The specific emphasis on advanced packaging materials is poised to catalyze further advancements in HBM and chiplet technologies, accelerating the mass production of high-performance devices such as AI accelerators. This move is expected to significantly bolster JSR's competitiveness in the global semiconductor materials market and solidify its position as a key enabler of future technological innovation. Furthermore, diversifying manufacturing bases beyond Japan holds crucial implications for enhancing resilience against potential future geopolitical risks.

Source: https://lushbooklife.com/news-of-jsr-semiconductor-materials-production-and-development-in-taiwan/

Collected: May 15, 2026 | Automated Research System (Gemini API)

Henkel Unveils Next-Gen Teroson EP 52 Series: High-Damping Structural Adhesives for Automotive Lightweighting and NVH Reduction

Published May 13, 2026 Henkel Germany



OVERVIEW

Henkel has launched the Teroson EP 52 Series, a new high-performance structural adhesive engineered for automotive manufacturing, combining superior bonding strength with advanced vibration damping capabilities. Utilizing proprietary High Damping Structural Adhesive (HDSA) technology, this heat-curing, solvent-free adhesive simultaneously facilitates vehicle lightweighting and enhances Noise, Vibration, and Harshness (NVH) performance. The series integrates seamlessly into automated Body-in-White (BIW) production lines, promising improved structural integrity, durability, and passenger comfort for next-generation vehicles.

IN DEPTH

Background and Automotive Industry Challenges

The automotive industry is under immense pressure to reduce vehicle weight, driven by demands for improved fuel efficiency, electrification initiatives, and stringent safety regulations. This imperative necessitates the joining of dissimilar materials, such as aluminum and high-strength steel, which inherently introduces new challenges related to joint strength, fatigue durability, and vibrational characteristics. Crucially, Noise, Vibration, and Harshness (NVH) performance directly impacts ride comfort and brand perception, making the simultaneous achievement of lightweighting and NVH mitigation a key development objective for automakers. Traditional structural adhesives, while strong, have offered limited vibration damping capabilities.

Key Findings and Technical Features

To address these complex demands, Henkel has introduced the Teroson EP 52 Series, its next-generation high-performance structural adhesive. This product line leverages Henkel's proprietary "High Damping Structural Adhesive (HDSA) technology" and incorporates the following key features:

- **Superior Structural Bonding Strength**: The adhesive reinforces welded joints, particularly in the Body-in-White (BIW) structure, enhancing crash safety and overall vehicle rigidity. It achieves robust adhesion between dissimilar materials, thereby supporting advanced lightweighting designs.
- **Advanced Vibration Damping Capability**: The Teroson EP 52 Series possesses exceptional vibration absorption and damping properties, a significant improvement over conventional structural adhesives. This capability effectively reduces road-induced vibrations and powertrain noise transmitted into the cabin, leading to a substantial improvement in interior acoustics and ride comfort. The HDSA technology enables the adhesive to serve as both a structural component and an NVH countermeasure.
- **Manufacturing Process Compatibility**: As a heat-curing, one-component epoxy adhesive with a solvent-free formulation, it integrates seamlessly into existing automated BIW production lines. This ensures that its adoption does not compromise production efficiency. The adhesive also maintains excellent bonding performance and durability even under high-temperature conditions.

Technical Significance and Outlook

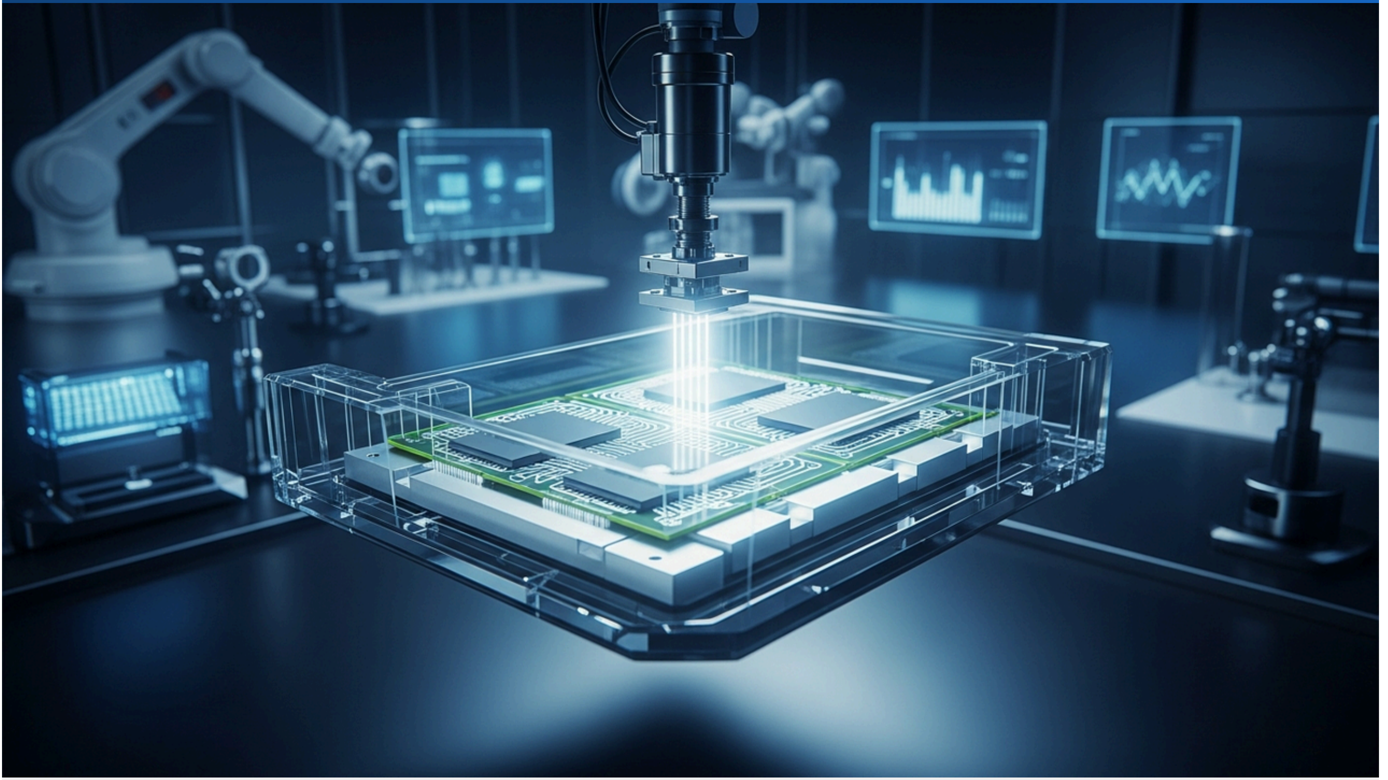
The Teroson EP 52 Series represents an innovative solution that simultaneously addresses the critical automotive trends of lightweighting and enhanced comfort. Its implementation offers automakers the potential for greater design flexibility in vehicle body structures, reduced part counts, and simplified assembly processes. The superior NVH performance is particularly impactful for electric vehicles (EVs), where the absence of internal combustion engine noise accentuates other sources of vibration, making interior quietness a crucial differentiator and a premium feature. Long-term benefits include improved vehicle durability and, from a sustainability perspective, an extended product lifespan. Henkel's innovation highlights the expanding role of adhesives not merely as joining materials but as functional components that elevate overall vehicle performance in next-generation automotive development.

Source: https://chemicaltoday.in/news/Posts/6a0598b9efe9ca40d6bb590c

Collected: May 15, 2026 | Automated Research System (Gemini API)

Direct Die-Attach Microchannel Cooling with Sintered Silver Boosts SiC Inverter Thermal Performance

Published May 14, 2026 PatSnap Eureka USA



OVERVIEW

An innovative thermal management solution combining direct die-attach microchannel cooling with sintered silver bonding is proposed to combat overheating in high-power-density SiC inverters. By directly joining SiC dies to polycrystalline CVD SiC microchannel coolers with a sintered silver paste layer under 20μm, thermal resistance is drastically reduced to below 0.15 K/W. This approach achieves over 50% performance improvement compared to conventional DBC modules, minimizing CTE mismatch and unlocking higher power output and reliability for SiC modules.

IN DEPTH

Background and Thermal Challenges in SiC Power Inverters

Silicon Carbide (SiC) power semiconductors are rapidly gaining traction in high-power-density applications, including electric vehicle (EV) inverters, renewable energy systems, and industrial power supplies, due to their superior high-speed switching capabilities, high voltage endurance, and low on-resistance. However, the operation of SiC devices at high power densities inevitably generates substantial heat. This excessive thermal load can degrade device performance, shorten lifespan, and significantly increase the risk of thermal runaway failures. Conventional cooling systems, which often involve multiple material layers (e.g., die-attach materials, ceramic substrates, baseplates), inherently introduce high thermal resistance, thereby limiting the full potential of SiC devices.

Key Findings and Technical Solution

Analysis by PatSnap Eureka highlights an advanced approach to effectively prevent overheating in high-power-density SiC inverters. This solution centers on the synergistic combination of "direct die-attach microchannel cooling" and "sintered silver bonding technology."

- **Direct Die-Attach Microchannel Cooling**: This innovative technique eliminates conventional thermal interface materials (TIMs) and ceramic substrates by directly bonding the SiC power die to a microchannel cooler fabricated from polycrystalline CVD SiC. The microchannel cooler, designed to efficiently circulate liquid coolants, directly and rapidly extracts heat generated from the die. This direct structural integration dramatically shortens the thermal conduction path, minimizing thermal resistance.
- **High-Thermal-Conductivity Sintered Silver Bonding**: Sintered silver paste, known for its high thermal conductivity and excellent high-temperature reliability, is employed for the critical bond between the SiC die and the SiC microchannel cooler. Precise control of the die-attach thickness to below 20μm is targeted to further reduce thermal resistance to below 0.15 K/W. Sintered silver offers superior thermal performance and reliability compared to traditional lead-free solders.

- **Minimized CTE Mismatch**: A key advantage of this approach is the near-perfect match in the Coefficient of Thermal Expansion (CTE) between the SiC die and the SiC microchannel cooler, as both components are SiC-based. This significantly reduces thermomechanical stresses generated during thermal cycling, thereby enhancing the long-term reliability and operational lifespan of the device.

Technical Significance and Outlook

The combination of direct die-attach microchannel cooling and sintered silver bonding technology promises to revolutionize the thermal management of SiC inverters. This technology is projected to achieve over 50% performance improvement compared to conventional Direct Bonded Copper (DBC)-based modules, enabling smaller, more powerful inverter designs. This advancement will significantly contribute to extending EV driving ranges, reducing charging times, improving the efficiency of renewable energy systems, and enhancing the robustness of industrial infrastructure. Furthermore, the dramatic reduction in thermal resistance and mitigation of thermomechanical stresses will substantially boost the reliability and longevity of SiC power devices, leading to lower long-term operational costs. Moving forward, this technology is poised to broaden the application scope of SiC devices and potentially establish a new standard in the power electronics industry, pushing the boundaries of what is thermally feasible.

Source: https://eureka.patsnap.com/blog/tech-solutions/prevent-silicon-carbide-inverter-overheating/

Collected: May 15, 2026 | Automated Research System (Gemini API)

UV-Curable Adhesives Emerge as Indispensable Solution for Invisible Bonding of Transparent Materials

Published May 08, 2026   Craft Resin Blog   UK

OVERVIEW

UV-curable adhesives are gaining prominence as the optimal solution for invisibly repairing and bonding transparent materials like glass and acrylic. Unlike cyanoacrylates that cause frosting or epoxies that yellow over time, UV adhesives cure optically clear within 5-10 seconds upon UV light exposure. This rapid, on-demand curing and high transparency make them invaluable for diverse applications requiring precise, aesthetic bonding, including displays, optical components, and medical devices.

IN DEPTH

Background and Challenges in Transparent Material Bonding

Bonding and repairing transparent materials such as glass and acrylic pose significant challenges due to the dual requirements of aesthetic integrity and functional performance. Traditional adhesives often fall short: cyanoacrylates (super glues) can generate a white powdery residue (blooming) that fogs the bond line and trap air bubbles, while many epoxy adhesives tend to yellow over time, compromising transparency. These issues directly lead to quality degradation and aesthetic loss in products demanding high clarity and precise finishes, such as displays, optical lenses, decorative items, and medical devices. Consequently, there has been a pressing need for innovative solutions capable of achieving virtually "invisible" bonds in transparent materials.

Key Findings and Technical Advantages of UV Adhesives

UV-curable adhesives are highlighted as a fundamental solution to these challenges, emphasizing their superior technical advantages in transparent bonding and repair applications. The primary features and benefits of these adhesives include:

- **Optical Clarity**: UV adhesives maintain exceptional transparency after curing, rendering the adhesive layer virtually invisible. This characteristic is particularly critical for optical components and multi-layered display assemblies.
- **Rapid, On-Demand Curing**: Curing is initiated and completed within a mere 5 to 10 seconds upon exposure to ultraviolet (UV) light. This significantly boosts productivity and allows for immediate component fixation after precise positioning, enhancing operational efficiency by eliminating the long waiting times associated with conventional adhesives.
- **Low Shrinkage**: Minimal shrinkage during curing reduces internal stress within the bond line, mitigating the risk of material distortion or delamination. This is crucial for maintaining precision and stability in large transparent panels and delicate optical components.
- **Excellent Weatherability and Durability**: Many UV adhesives offer superior resistance to moisture, chemicals, and weathering after curing, often exhibiting non-yellowing properties, which ensures long-term reliability and performance.

The article also differentiates between UV resins and UV adhesives, explaining that while UV resins are typically used for coatings or potting, UV adhesives are specifically formulated for bonding applications.

Technical Significance and Outlook

UV-curable adhesives are profoundly impacting various industrial sectors that require transparent material bonding. Their application spans consumer electronics (e.g., display bonding in smartphones and tablets), automotive (e.g., vehicle displays, headlight repair), medical devices (e.g., endoscopes, diagnostic equipment), optical instruments (e.g., lenses, prisms), and even arts and crafts. In fields demanding both high aesthetic appeal and critical functionality, the "invisible bond" capability of UV adhesives is a decisive factor in enhancing product value. Looking forward, with the advent of next-generation optical and electronic devices such as AR/VR headsets, flexible displays, and micro-LED displays, UV adhesives are expected to evolve further in performance and multifunctionality, increasing their indispensable role. The growing adoption of environmentally friendly UV LED curing systems will also continue to drive their widespread integration across industries.

Source: https://www.craft-resin.com/blogs/news/uv-glue-invisible-glass-acrylic-repair

Polyurethane-Modified Acrylic Resins Achieve Dual High Adhesion and Low Dielectric for Advanced Packaging Solder Resists

Published May 08, 2026 ACS Applied Polymer Materials USA

OVERVIEW

This research from ACS Applied Polymer Materials unveils novel polyurethane-modified acrylic resins that concurrently deliver both high adhesion and low dielectric properties crucial for next-generation solder resists (SR) in advanced semiconductor packaging. By functionalizing acrylic resins with isocyanatoethyl methacrylate (IEM) and tetrahydrophthalic anhydride (DMPA), the developed SR material achieves superior thermal stability and flexibility, addressing the demands of high-density interconnects and high-frequency communication for 5G and beyond.

IN DEPTH

Background and Challenges in Advanced Packaging

The evolution of high-speed communication technologies (beyond 5G) and the continuous drive for higher integration and density in semiconductors place increasingly stringent demands on solder resist (SR) materials used in printed wiring boards (PWBs) and package substrates. Critically, low dielectric constant (Dk) and low dielectric loss (Df) properties are indispensable for enhancing signal transmission speeds. Concurrently, advanced high-density packaging, characterized by multi-layer structures and fine-pitch interconnections, necessitates superior adhesion to substrates, high thermal stability against thermal cycling, and sufficient flexibility to accommodate coefficient of thermal expansion (CTE) mismatches among diverse integrated materials. Traditional SR materials have struggled to simultaneously meet these multifaceted requirements at a high performance level.

Key Findings and Research Achievements

This study, published in ACS Applied Polymer Materials, reports the successful development of an innovative solder resist material based on polyurethane-modified acrylic resins, which uniquely balances both high adhesion and low dielectric properties. The key to this breakthrough lies in the precise design and introduction of specific chemical structures.

- **Material Design**: The base material utilized was an acrylic resin with hydroxyl-functionalized side chains. This acrylic backbone was then modified with isocyanatoethyl methacrylate (IEM) and tetrahydrophthalic anhydride (DMPA) to introduce polyurethane segments. IEM contributes polyurethane characteristics, enhancing flexibility and adhesion, while DMPA plays a role in improving thermal stability and forming a robust cross-linked network after curing.
- **Achievement of Low Dielectric Properties**: By optimizing the molecular structure of the polyurethane-modified acrylic resin, the researchers achieved excellent low dielectric constant and loss tangent characteristics in high-frequency ranges. This effectively suppresses signal delay and attenuation, thereby enhancing the reliability of high-speed signal transmission.

- **High Adhesion and Flexibility**: The incorporation of polyurethane components significantly improved the adhesion to various substrate materials (e.g., copper, ceramics) compared to conventional SR materials. Moreover, the material exhibited appropriate flexibility, which strengthened its resistance to thermal cycling stress. This reduces the risk of interfacial delamination, a common issue in multi-layer structures and dissimilar material stacks.
- **Thermal Stability**: Through the introduction of DMPA and optimization of the cross-linking structure, the material demonstrated high thermal stability, maintaining stable performance even during high-temperature processes such as soldering.

Technical Significance and Outlook

This novel polyurethane-modified acrylic resin-based solder resist material is poised to significantly impact advanced semiconductor packaging technologies, particularly in the development of 5G communication modules, AI processors, and high-density memories. The simultaneous achievement of high adhesion and low dielectric properties enables the design of more complex and higher-performing packages, contributing to improved signal integrity and ensuring the long-term reliability of devices. This will accelerate the evolution of electronic equipment that supports next-generation high-speed, high-capacity data processing. Furthermore, it is expected to lead to improved manufacturing yields and greater design freedom when integrating diverse materials. Future research and development are anticipated to focus on further reducing dielectric properties, optimizing mechanical characteristics, and enhancing environmental compatibility, thereby establishing new standards for high-performance SR materials.

Source: https://pubs.acs.org/doi/10.1021/acsapm.6c01131

Collected: May 15, 2026 | Automated Research System (Gemini API)

TANAKA to Unveil Advanced High-Conductivity Die-Attach Materials for Next-Gen Power Semiconductors at SEMICON Southeast Asia 2026

Published May 14, 2026　田中貴金属グループ　Japan

OVERVIEW

TANAKA Precious Metals will showcase high-thermal-conductivity and high-reliability silver sintering pastes and AgSn TLP sheets for next-generation SiC and GaN semiconductors at SEMICON Southeast Asia 2026. The silver sintering pastes boast over 200 W/m·K thermal conductivity, while AgSn TLP sheets support large chips up to 20mm for high-current applications with bond strengths exceeding 50 MPa. The group will also highlight its precious metal recovery and refining technologies, emphasizing its commitment to the circular economy.

IN DEPTH

Background and Demands of the Power Semiconductor Market

Sectors such as Electric Vehicles (EVs), Hybrid Electric Vehicles (HEVs), renewable energy systems, and industrial infrastructure are undergoing rapid advancements in efficiency and miniaturization, elevating the importance of power semiconductors. Next-generation power semiconductors, particularly Silicon Carbide (SiC) and Gallium Nitride (GaN) devices, offer superior characteristics like high breakdown voltage, low power loss, and high-speed switching compared to conventional silicon (Si) devices, leading to their increasing adoption in these applications. However, high-power-density operation generates significant heat within these devices, making efficient thermal management and high-performance die-attach materials indispensable. Furthermore, considerations for sustainability within the precious metal materials supply chain represent a new industry challenge.

Key Developments and TANAKA's Technologies

TANAKA Precious Metals Group has announced its intention to prominently feature advanced die-attach materials designed to enhance the performance and reliability of next-generation power semiconductors, alongside its circular economy initiatives, at SEMICON Southeast Asia 2026. The main exhibits will include:

- **Silver Sintering Pastes**: TANAKA will showcase silver sintering pastes specifically engineered as conductive die-attach materials for wide-bandgap semiconductors like SiC and GaN. These pastes achieve exceptionally high thermal conductivity, exceeding 200 W/m·K, coupled with superior reliability in high-temperature environments. Their robust resistance to thermomechanical stress during power cycling contributes significantly to extended device lifetimes.
- **AgSn TLP Sheets**: Also featured will be AgSn (Silver-Tin) Transient Liquid Phase Sintering (TLPS) sheets capable of accommodating large chip sizes up to 20mm. These sheets are designed for high-power applications in EVs, HEVs, and industrial infrastructure, where high currents flow, providing bond strengths of over 50 MPa and ensuring long-term reliability. Their sheet form factor also facilitates easier integration into manufacturing processes.

- **Bonding Wires**: A comprehensive range of bonding wires will be presented, including gold, silver, copper, aluminum, and palladium-coated copper. These wires are crucial for reliable electrical interconnections within semiconductor packages.
- **Precious Metal Recovery and Refining Technologies**: Leveraging its strength as a precious metal supplier, TANAKA will also highlight its technologies for recovering and refining precious metals from used products. This demonstrates the company's commitment to the effective utilization of limited resources and a circular economy, contributing to a sustainable society.

Impact and Future Outlook

The die-attach materials unveiled by TANAKA Precious Metals are expected to play an indispensable role in maximizing the performance of next-generation power semiconductors, driving improvements in EV power conversion efficiency, enhancing the reliability of renewable energy systems, and bolstering industrial infrastructure. Specifically, sintering materials that combine high thermal conductivity and high reliability will broaden the application scope of SiC/GaN devices and accelerate the trend toward higher power output and miniaturization. The presentation of precious metal recovery and refining technologies also underscores the commitment of material manufacturers to actively contribute to reducing the environmental footprint and enhancing resource efficiency across the entire supply chain, marking a crucial step towards building a sustainable electronics industry. As the power semiconductor market continues its growth trajectory, demand for these advanced material technologies and circular approaches is projected to intensify.

Source: https://thhere.com/jcn-newswire/tanaka-to-showcase-advanced-semiconductor-materials-and-circular-economy-initiatives-at-semicon-southeast-asia-2026/

Optical Bonding: The Critical Technology Enhancing Outdoor Readability and Durability of TFT LCD Displays

Published May 15, 2026 CHENGHAO Display China

OVERVIEW

Optical bonding technology offers a crucial solution for addressing inherent industrial challenges in TFT LCD displays, including sunlight readability, durability, and moisture resistance. By filling the air gap between the display cell and cover glass with optically clear adhesives, this technique drastically reduces internal reflections and prevents fogging from moisture or damage from physical impact. Utilizing LOCA or OCR, optical bonding provides enhanced flexibility and reliability for diverse applications in harsh environments.

IN DEPTH

Background and Challenges in Industrial Displays

TFT LCD displays used across various sectors such as industrial, automotive, medical, and aerospace demand high reliability and performance under harsh environmental conditions. A major challenge has been poor sunlight readability, where internal reflections significantly impair visibility in outdoor or brightly lit environments. Furthermore, in high-humidity settings, condensation within the air gap between the display cell and cover glass can cause screen fogging and degrade display quality. Beyond these, robustness against physical stresses like vibration, shock, and drops is essential for industrial displays, a requirement that traditional non-bonded structures struggled to meet effectively.

Key Findings and Technical Advantages of Optical Bonding

Optical bonding has emerged as an innovative and widely adopted technology to overcome these challenges. This technique involves filling the air gap between the LCD panel (TFT LCD cell) and the front cover glass (or touch panel) of a display module with a specialized, optically clear adhesive. This provides several significant advantages:

- **Improved Readability (Sunlight Readability)**: One of the most prominent benefits is the dramatic improvement in readability under direct sunlight. By eliminating the air gap, light refraction and reflection within the display are suppressed, leading to an enhanced contrast ratio. This ensures that screen content remains clear and visible even in outdoor or bright ambient conditions.
- **Enhanced Durability**: The absence of an internal air gap significantly boosts the display's resistance to external impacts and vibrations. The adhesive layer acts as a shock absorber, reducing the risk of glass breakage. It also prevents the ingress of foreign particles and dust.
- **Improved Moisture and Anti-Fogging Properties**: As the adhesive completely seals the air gap, it prevents moisture from penetrating the display interior and causing condensation. This ensures stable display quality even in high-temperature and high-humidity environments.

- **Better Thermal Dissipation**: The adhesive, by becoming part of the thermal conduction path, also helps to efficiently transfer heat from the display to the cover glass, facilitating heat dissipation.

The article primarily discusses two main bonding methods: Optically Clear Adhesive (LOCA) and Optically Clear Resin (OCR). LOCA, being liquid, is suitable for large and curved displays, while OCR, available as gels or sheets, is better suited for high-volume production. Silicone-based OCRs are noted for their high flexibility, and acrylic-based OCRs for their superior adhesive strength.

Technical Significance and Outlook

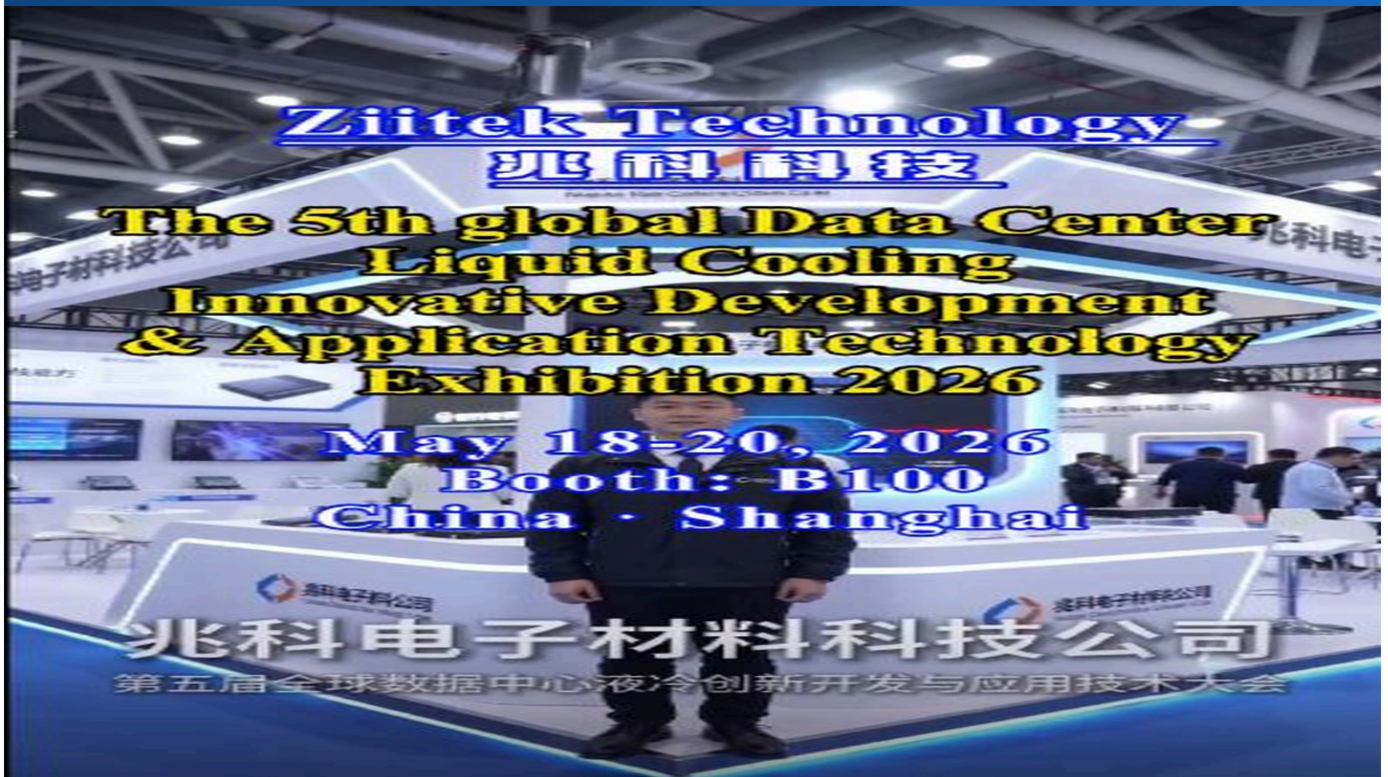
Optical bonding technology is becoming indispensable in the industrial display market. Its adoption is accelerating in sectors where reliability and visibility are paramount, such as construction machinery, marine vessels, aircraft, medical devices, POS systems, and military applications. This technology enables displays to be more robust, user-friendly, and to have longer operational lifespans. In the future, new applications are anticipated in smart city outdoor signage, advanced automotive Human-Machine Interfaces (HMIs), and optical systems for AR/VR devices. Optical bonding clearly demonstrates the critical role of adhesive technology in pushing the boundaries of display performance and fundamentally improving the user experience.

Source: https://www.chenghaodisplay.com/optical-bonding-for-tft-lcd-displays-solving-sunlight-readability-and-durability-challenges-in-industrial-environments/

Collected: May 15, 2026 | Automated Research System (Gemini API)

Ziitek Technology Unveils Next-Gen Liquid Cooling Systems and Advanced Thermal Management Materials for Data Centers

Published May 13, 2026   Ziitek Technology   China



OVERVIEW

Ziitek Technology announced it will showcase two decades of thermal innovation at the 2026 Global Data Center Liquid Cooling Exhibition, presenting full-stack thermal management solutions from advanced thermal interface materials (TIMs) to high-performance liquid cooling systems. Their modular liquid cooling systems, designed for next-generation data centers, advanced servers, and power distribution units, address high-power-density heat dissipation demands. These solutions aim to foster greener, low-carbon, and highly efficient data center operations.

IN DEPTH

Background and Thermal Challenges in Data Centers

In today's information-driven society, data centers form the backbone of digital infrastructure, and their processing capabilities are undergoing exponential growth. Driven by advancements in AI, cloud computing, and big data analytics, the power density of servers and processors housed within data centers continues to escalate. This increased density creates severe thermal management issues, pushing traditional air-cooling systems beyond their limits. Excessive heat not only leads to degraded equipment performance, increased failure rates, and shortened lifespans but also significantly inflates the operational costs of data centers, particularly in terms of power consumption for cooling. Consequently, the development of more efficient and sustainable thermal management solutions has become an urgent priority.

Key Developments and Ziitek Technology's Innovations

Ziitek Technology has announced its participation in the 2026 Global Data Center Innovative Development and Application of Liquid Cooling Technical Exhibition, where it will present the culmination of over 20 years of thermal management innovations. The company offers comprehensive thermal management solutions spanning from materials to full systems, highlighting the following key achievements:

- **Advanced Thermal Interface Materials (TIMs)**: Ziitek has developed a range of high-thermal-conductivity TIM products designed to minimize thermal resistance between processors and heat sinks. This portfolio includes thermally conductive pastes, gap fillers, and phase change materials, catering to diverse thermal design needs for various components.
- **High-Performance Liquid Cooling Systems**: To overcome the limitations of conventional air cooling, Ziitek will introduce next-generation modular liquid cooling systems. These systems are designed to provide direct cooling at the server rack or individual component level, achieving extremely high heat dissipation efficiency. They are specifically engineered for high-power-density servers, power distribution units (PDUs), and telecommunications equipment, enabling highly effective heat removal.

- **Material Integration and Customized Design**: The company excels in integrating thermal management materials with cooling systems, offering customized cooling designs tailored to specific customer application requirements. This granular approach ensures optimal thermal performance across the diverse needs of data centers.

Impact and Future Outlook

Ziitek Technology's liquid cooling systems and advanced TIMs are poised to establish new benchmarks in data center thermal management, dramatically improving operational efficiency and sustainability. The adoption of these solutions will bring substantial benefits to data centers in the following areas:

- **Enhanced Energy Efficiency**: Liquid cooling is significantly more efficient than air cooling, leading to a substantial reduction in power consumption dedicated to cooling. This improves the data center's Power Usage Effectiveness (PUE) and contributes to lower operational costs.
- **Facilitating High-Density Deployment**: Efficient heat removal enables higher IT equipment density per server rack, maximizing the processing capacity per floor area of the data center.
- **Contribution to Decarbonization**: Reduced power consumption directly translates to lower carbon emissions, promoting the "greenification" of data centers and contributing to a more sustainable society.
- **Improved Equipment Reliability**: By enabling equipment to operate at stable temperatures, thermal stress is reduced, leading to lower failure rates for servers and processors and extending their product lifespan.

Looking ahead, as AI and machine learning workloads continue to proliferate, the importance of liquid cooling and advanced thermal management materials in data centers will intensify. End-to-end solution providers like Ziitek Technology are set to drive innovation in this field, playing an indispensable role in shaping the future of digital infrastructure.

Source: https://www.thermalconductivematerials.com/news/ziitek-technology-will-showcase-20-years-of-

thermal-innovation-at-2026-global-data-center-innovative-323529.html

Collected: May 15, 2026 | Automated Research System (Gemini API)

CTE-Gradient Interconnect Technology Drastically Reduces Thermal Cycling Damage in SiC Inverters

Published May 14, 2026 PatSnap Eureka USA

OVERVIEW

PatSnap Eureka reveals an innovative approach to mitigate thermal cycling damage in SiC power inverter modules by creating biomimetic interconnects with a Coefficient of Thermal Expansion (CTE) gradient. This is achieved by incorporating Ga-In eutectic microdroplets into sintered nanosilver paste via Transient Liquid Phase Sintering (TLPS). This technique significantly reduces shear stress at the SiC-die interface by over 50% compared to conventional sintering, drastically enhancing thermomechanical fatigue resistance and extending the lifespan of high-reliability SiC inverters.

IN DEPTH

Background and Reliability Challenges in SiC Power Semiconductors

Silicon Carbide (SiC) power semiconductors have become indispensable components in electric vehicles (EVs), industrial equipment, and renewable energy systems due to their superior power conversion efficiency and high-temperature operational capabilities. However, the high power density and switching frequencies of SiC devices expose them to rapid temperature fluctuations (thermal cycling), which generate significant thermomechanical stress within the package. Critically, the large Coefficient of Thermal Expansion (CTE) mismatch between SiC dies and conventional copper (Cu) circuit substrates concentrates shear stress in the interconnect layers, leading to fatigue cracks and delamination. This has been a severe limiting factor for the reliability and lifespan of SiC power modules.

Key Findings and Technical Solution

According to the latest analysis by PatSnap Eureka, an innovative interconnect technology is proposed to effectively mitigate thermal cycling damage in SiC power inverter modules. This approach combines advanced material design with process technology to overcome the limitations of conventional sintered silver bonding.

- **Formation of Biomimetic CTE-Gradient Interconnects**: At the heart of this technology is the introduction of Ga-In (Gallium-Indium) eutectic microdroplets into a sintered nanosilver paste. By mixing and curing these components through a Transient Liquid Phase Sintering (TLPS) process, a "biomimetic interconnect" with a continuous CTE-gradient architecture is formed within the bonding layer. The term "biomimetic" refers to mimicking biological structures, applying nature's excellent stress-relaxation mechanisms.
- **Drastic Reduction in Shear Stress**: This gradient structure allows thermomechanical shear stress, resulting from the CTE mismatch between the SiC die and the copper circuit, to be gradually relaxed across the entire bonding layer. Studies have shown a reduction in shear strain at the SiC-die interface by over 50% compared to conventional uniform sintered silver bonds. This effectively disperses stress concentrations, which are primary sources of fatigue initiation.

- **Maintained Thermal and Electrical Conductivity**: The excellent thermal and electrical conductivities inherent to sintered silver are preserved. This ensures that the improved thermomechanical reliability is achieved without compromising the device's heat dissipation performance or electrical characteristics. The Ga-In eutectic forms a liquid phase at lower temperatures, then solidifies to robustly bond silver particles, contributing to optimized microstructure.

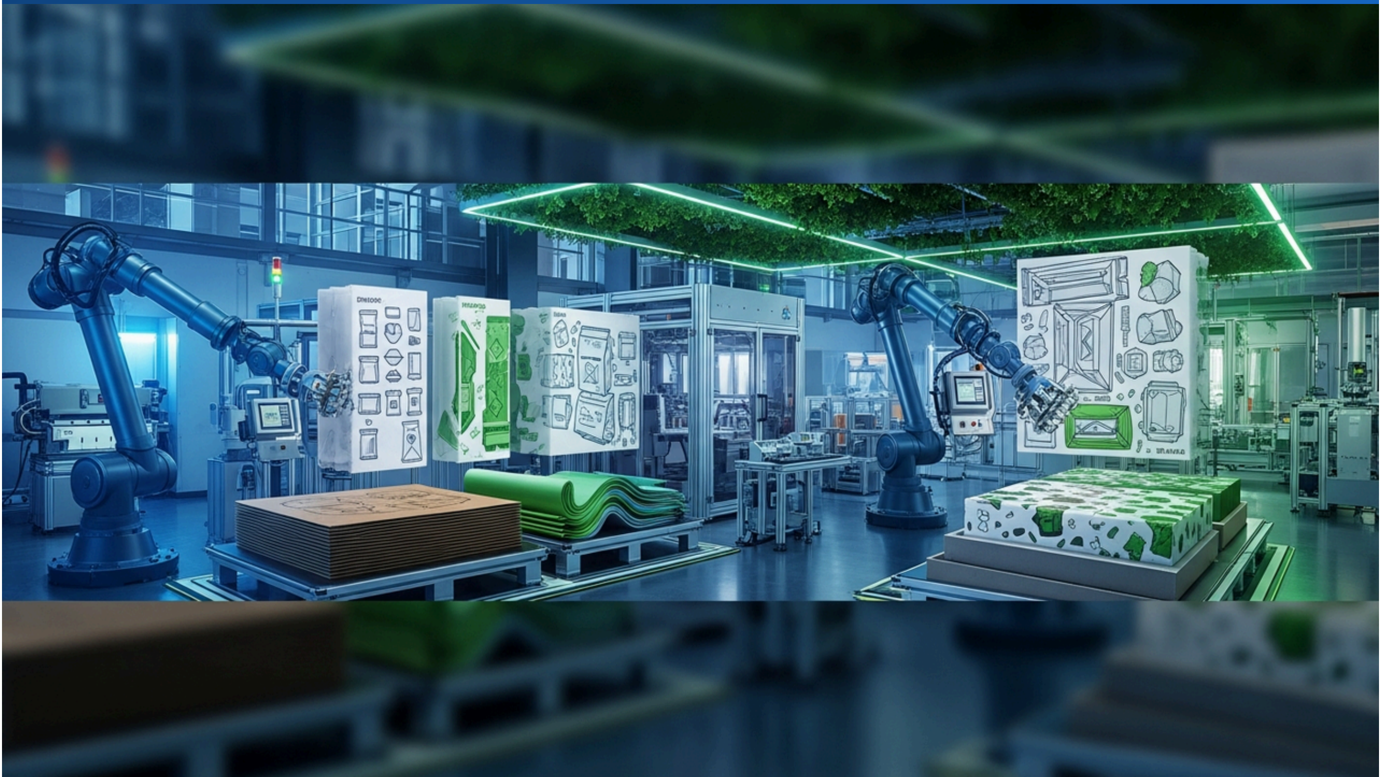
Technical Significance and Outlook

This CTE-gradient biomimetic interconnect technology represents a breakthrough solution for dramatically enhancing the thermomechanical fatigue resistance of SiC power semiconductor modules. It promises to significantly extend the long-term reliability and operational lifespan of SiC inverters, enabling their deployment in even harsher operating environments, such as advanced EV charging infrastructure and high-frequency switching applications. Device manufacturers can gain increased design flexibility, extend product warranties, and ultimately contribute to lower maintenance costs. This technology has the potential to become a next-generation standard for high-power-density power electronics, strongly supporting the wider adoption of SiC devices and the advancement of power conversion technologies crucial for realizing a sustainable society.

Source: https://eureka.patsnap.com/blog/tech-solutions/prevent-thermal-cycling-damage-sic-inverters/

Henkel Upgrades Packaging Competence Center to Accelerate Sustainable Packaging Innovation and Circular Economy Transition

Published May 13, 2026 Henkel Germany



OVERVIEW

Henkel has modernized its Packaging Competence Center in Düsseldorf, Germany, to accelerate the development of sustainable packaging solutions. Featuring state-of-the-art laminating and coating systems developed in partnership with Nordmeccanica, the center enables customers and partners to test adhesive and coating technologies for recyclable mono-material packaging formats. This strategic investment underscores Henkel's commitment to addressing stricter environmental regulations and facilitating the transition to a circular economy by developing low-environmental-impact packaging materials.

IN DEPTH

Background and Pressure for Sustainability in the Packaging Industry

The global packaging industry is undergoing a significant transformation, driven by heightened environmental awareness and the urgent need to address plastic pollution. Increasingly stringent government regulations on single-use plastics, corporate commitments to sustainability goals, and evolving consumer preferences for eco-friendly products are compelling packaging material manufacturers to develop more recyclable and environmentally benign solutions. A particular challenge lies with multi-material laminated films, which are notoriously difficult to recycle. Consequently, there's a strong industry push towards mono-material (single-material) packaging that retains equivalent functional properties, a transition critically dependent on innovations in adhesive and coating technologies.

Key Developments and Henkel's Strategic Investment

In response to these pervasive industry trends, Henkel has announced a substantial modernization of its Packaging Competence Center in Düsseldorf, Germany, with a focused emphasis on accelerating sustainable packaging innovation.

- **Introduction of State-of-the-Art Equipment**: The upgraded facility now boasts advanced laminating and coating systems, developed through a strategic partnership with leading packaging machinery manufacturer Nordmeccanica. This allows for the testing and evaluation of new adhesive and coating technologies under conditions closely simulating real-world production environments.
- **Focus on Recyclable Mono-Material Packaging**: The center's primary focus will be on the development and testing of adhesive and coating technologies specifically designed for recyclable mono-material packaging formats. This initiative aims to overcome the recycling challenges of multi-layered films, striving to create truly circular solutions, particularly in flexible packaging.
- **Promoting Digitalization and Collaborative Development**: The facility is also equipped with enhanced digitalization tools to accelerate the product development process. It serves as a collaborative platform, enabling customers and partners to leverage Henkel's expertise and state-of-the-art equipment for co-developing sustainable packaging solutions.

- **Pivotal Role of Adhesives and Coatings**: Henkel recognizes that adhesives and coatings play a central role in enabling recyclability while maintaining essential packaging functionalities such as barrier properties and strength. The company is significantly increasing its investment in this critical area.

Impact and Future Outlook

Henkel's investment in its Packaging Competence Center is set to powerfully bolster the industry-wide efforts towards achieving sustainable packaging solutions. This facility is expected to facilitate the market introduction of a greater number of recyclable or bio-based packaging materials. Such advancements will contribute to reducing plastic waste, improving resource efficiency, and lowering overall CO_2 emissions within the packaging sector. By meeting stringent regulatory requirements and evolving consumer expectations, Henkel aims to strengthen its market leadership and, through its ecosystem of partners, foster new business models grounded in circular economy principles. This initiative unequivocally demonstrates that adhesive and coating technologies are crucial enablers for addressing contemporary environmental challenges.

Source: https://www.globalcosmeticsnews.com/henkel-upgrades-packaging-competence-center-to-accelerate-sustainable-packaging-innovation/

Dexerials to Showcase Advanced Functional Materials at AutoSens USA and The Battery Show Europe, Targeting Automotive and EV Markets

Published May 15, 2026 Dexerials Corporation Japan

OVERVIEW

Dexerials Corporation announced its participation in AutoSens USA 2026 (Detroit) and The Battery Show Europe (Stuttgart) in May 2026. The company will highlight its functional materials, including Anisotropic Conductive Film (ACF), Optical Elastic Resin (SVR), and industrial adhesives, catering to diverse sectors like smartphones, automotive, and EV batteries. These exhibitions serve as crucial platforms for Dexerials to globally present its advanced material solutions for the rapidly evolving automotive sensing and EV battery technology markets.

IN DEPTH

Background and Expanding Demand for Functional Materials

The modern electronics and automotive industries are driven by constantly evolving technological trends, leading to a rapidly expanding demand for high-performance and high-reliability functional materials. Mobile devices, epitomized by smartphones, necessitate thinner, higher-resolution displays and complex internal structures. In the automotive sector, the shift towards Electric Vehicles (EVs) and advancements in autonomous driving technologies demand higher capacity and enhanced safety for batteries, alongside elevated performance for automotive sensors. These trends collectively underscore the increasing importance of material technologies enabling dissimilar material joining, optical property optimization, reliable bonding and encapsulation, and efficient thermal management.

Key Developments and Dexerials' Exhibition Strategy

Dexerials Corporation, leveraging its extensive portfolio of functional materials, has announced plans to exhibit at two major international trade shows in May 2026:

- **AutoSens USA 2026 (Detroit)**: This exhibition primarily focuses on automotive sensor technology, Advanced Driver-Assistance Systems (ADAS), and autonomous driving technologies. Dexerials is expected to showcase applications of its optical materials (e.g., Optical Elastic Resin SVR) and adhesive materials in automotive camera modules, LiDAR, and radar systems. These materials are critical for ensuring the reliability and performance of advanced sensing systems.
- **The Battery Show Europe (Stuttgart)**: As Europe's largest exhibition for EV battery technology, it addresses battery management systems, charging technologies, cell technologies, and manufacturing processes. Dexerials will likely present adhesive materials, thermal management materials, or specific insulating film technologies relevant to inter-cell bonding, module fixation, thermal management, and insulation within EV battery packs.

The company's core product categories include:

- **Anisotropic Conductive Film (ACF)**: Precision bonding materials essential for flexible printed circuit board connections in displays and semiconductor packaging.

- **Optical Elastic Resin (SVR)**: Transparent resins used for optical bonding in displays, lens fixation in camera modules, and sensor protection.
- **Industrial Adhesives**: Reliable and durable bonding solutions for a wide range of industrial applications requiring high integrity.

These exhibitions signify Dexerials' intent to strengthen its technological leadership in the high-growth automotive and EV battery sectors.

Impact and Future Outlook

Dexerials' proactive participation in these exhibitions clearly indicates the potential for its advanced materials to play a central role in future automotive and EV battery technology innovations. The demand for sophisticated sensor technologies in autonomous vehicles and the need for higher performance and extended lifespan in EV batteries represent significant growth opportunities for the company's material solutions. Showcasing products and technologies at leading international events will foster new customer acquisitions and collaborative development opportunities, further enhancing Dexerials' global market presence. Furthermore, addressing international environmental regulations and safety standards through these showcases will contribute to the realization of a sustainable mobility society. Dexerials, leveraging its expertise in materials science, is positioned as a critical enabler supporting the underlying development of next-generation electronics and automobiles, warranting continued attention.

Source: https://www.dexerials.jp/en/

Collected: May 15, 2026 | Automated Research System (Gemini API)

Henkel Japan Unveils Electrically Disassemblable Adhesive and UV-Curing Insulating Coating to Boost EV Battery Repair and Recycling

Published May 12, 2026 ヘンケルジャパン Japan

OVERVIEW

Henkel Japan introduced the 'LOCTITE Easy Disassembly Adhesive (Electric Type)' for improved EV battery repair and recyclability, alongside 'LOCTITE UV-Curing Insulating Coating' for enhanced manufacturing efficiency, at the Automotive Engineering Exposition 2026 YOKOHAMA. These innovations address critical sustainability and performance demands throughout the EV battery lifecycle. The exhibit also featured a wide array of bonding, sealing, and thermal management solutions for battery applications.

IN DEPTH

Background and EV Battery Sustainability & Manufacturing Challenges

As the adoption of electric vehicles (EVs) accelerates globally, the sustainability and efficient manufacturing throughout the entire EV battery lifecycle have emerged as pressing challenges. While extended battery lifespan is crucial, technologies that facilitate the repair, repurposing, and ultimate recycling of end-of-life batteries are indispensable for achieving a circular economy. Traditional battery packs, often assembled with robust adhesives, are exceedingly difficult to disassemble, complicating and increasing the cost of repair and recycling processes. Furthermore, the use of conventional materials like PET films for insulating battery cells and modules presented manufacturing hurdles, added costs, and inherent risks of defects.

Key Developments and Henkel Japan's Innovative Technologies

Henkel Japan unveiled groundbreaking material technologies at the Automotive Engineering Exposition 2026 YOKOHAMA, specifically designed to address these critical challenges:

- **LOCTITE Easy Disassembly Adhesive (Electric Type)**: This innovative disassemblable adhesive functions as a structural adhesive for EV battery pack assembly, yet it can be significantly weakened at room temperature by applying a specific electrical signal. This unique feature enables the easy disassembly of battery modules or cells. Consequently, diagnostic, repair, component replacement, and recycling processes for end-of-life batteries are dramatically simplified, contributing to cost reduction and enhanced resource efficiency. This technology expands the possibilities for battery repurposing and reuse, making it a vital enabler for the circular economy.
- **LOCTITE UV-Curing Insulating Coating**: This newly developed UV-curable insulating coating is a revolutionary material that cures in just a few seconds upon UV light exposure. It is positioned as a superior alternative to traditional PET films used for inter-cell insulation and circuit protection within battery packs. By eliminating the need for film application processes, it contributes to automation and acceleration of manufacturing, resulting in reduced labor costs and shorter production cycle times. Moreover, the uniform coating layer ensures stable insulation quality and reduced defect risks.

- **Other Battery-Specific Solutions**: The exhibition also showcased a broad spectrum of adhesive, sealing, and thermal management materials designed to enhance the safety, thermal performance, durability, and reliability of EV batteries. These included thermally conductive adhesives, thermal gap fillers, potting compounds, fire-retardant coatings for batteries, and liquid gaskets for battery pack sealing.

Impact and Future Outlook

These technologies introduced by Henkel Japan are poised to significantly impact the sustainable development of the EV industry. The easy-disassembly adhesive fundamentally improves EV battery reparability, allowing for the replacement of only faulty modules instead of the entire expensive battery pack, thereby offering economic benefits to consumers. Concurrently, it contributes to higher battery recycling rates and promotes the circular utilization of scarce resources. The UV-curable insulating coating will contribute to cost reduction and increased productivity in EV battery manufacturing through process efficiency, further supporting EV adoption. These innovations are indispensable for shaping a future where EVs reduce environmental impact across their entire lifecycle and become more economical and sustainable mobility solutions. Henkel is expected to lead the transformation of the automotive industry through its advanced material technologies.

Source: https://www.engineering-japan.com/news/110545-henkel%E3%80%81automotive-engineering-exposition%E3%81%A7ev%E5%90%91%E3%81%91%E6%9D%90%E6%96%99%E6%8A%80%E8%A1%93%E3%82

Collected: May 15, 2026 | Automated Research System (Gemini API)

Heraeus Electronics Unveils Advanced Die-Attach Materials for High-Reliability Power Electronics at PCIM Europe 2026

Published May 12, 2026   Heraeus Electronics   Germany

OVERVIEW

Heraeus Electronics unveiled cutting-edge material technologies for power electronics at PCIM Europe 2026. New offerings include mAgic® PE340 silver pressure sintering paste for high-density packaging with precision printability, and Microbond® solder preforms utilizing low-melt Innolot® technology for IGBTs. The exhibit also featured the award-winning mAgic® PE360 sintering paste, boasting over 200 W/mK thermal conductivity for SiC modules, all designed to enhance reliability and performance in high-power-density applications.

IN DEPTH

Background and Evolution of Power Electronics

Power electronics are undergoing rapid advancements in performance, efficiency, and miniaturization across sectors such as electric vehicles (EVs), industrial power supplies, and renewable energy systems. With the increasing adoption of wide-bandgap (WBG) semiconductors like SiC (Silicon Carbide) and GaN (Gallium Nitride), the heat generated by these devices has substantially increased, making extremely efficient and reliable thermal management and bonding technologies indispensable. Conventional bonding materials have faced limitations in high-temperature operational stability and fatigue resistance under thermal cycling, making it challenging to fully unlock the potential of next-generation power semiconductor modules.

Key Developments and Heraeus Electronics' Innovations

At PCIM Europe 2026, Heraeus Electronics unveiled a portfolio of groundbreaking power electronics materials designed to meet these evolving demands. Highlights of their exhibit included:

- **mAgic® PE340 Silver Pressure Sintering Paste (New Product)**: This newly developed silver pressure sintering paste is engineered for high-density packaging, offering precise printability and compatibility with multiple processes. Its ability to sinter at low pressure minimizes potential damage to devices during manufacturing while providing high-reliability bonding for power semiconductors such as SiC and IGBTs (Insulated Gate Bipolar Transistors). It delivers excellent thermal conductivity and long-term reliability.
- **Microbond® Solder Preforms (New Product)**: These novel solder preforms leverage Heraeus's proprietary low-melting Innolot® technology. This enables high bonding reliability for IGBT applications with operating temperatures up to 150°C. The preform format allows for precise deposition of material, contributing to improved yields and simplified manufacturing processes.
- **mAgic® PE360 Sintering Paste**: An award-winning sintering paste (recipient of the 2025 Global Technology Award), mAgic® PE360 boasts an exceptionally high thermal conductivity exceeding 200 W/mK. It supports SiC module attach applications operating above 150°C and is already qualified in automotive projects, ensuring reliability in demanding high-power-density and high-temperature environments.

These solutions collectively aim to provide superior thermal performance, bonding reliability, and manufacturing process flexibility for increasingly complex power electronics devices.

Impact and Future Outlook

The advanced die-attach materials presented by Heraeus Electronics hold significant potential to substantially enhance the performance and reliability of power semiconductors, particularly SiC and IGBT modules. The mAgic® PE340 and Microbond® solder preforms address thermal management challenges in high-power-density applications, contributing to extended device lifespans and stable operation. The mAgic® PE360, with its proven track record in the automotive sector, is critical for improving the efficiency of power conversion systems in EVs and HEVs. These materials will enable the miniaturization, higher power output, and long-term reliability of power electronics components, thereby accelerating the development of next-generation EVs, renewable energy inverters, and industrial drives. Heraeus Electronics is expected to contribute to the realization of a sustainable and high-performance power electronics society through its continuous innovations in material technology.

Source: https://smttoday.com/2026/05/12/heraeus-electronics-creates-lasting-connections-with-advanced-power-materials-and-people-at-pcim-europe-2026/

Henkel Unveils Sustainable Sealants for Beverage and Food Cans at METPACK 2026, Meeting Evolving Safety and Efficiency Demands

Published May 13, 2026 Henkel Germany

OVERVIEW

Henkel introduced its next-generation, eco-friendly sealants for beverage and food cans at METPACK 2026. New offerings include water-based Darex WBC 4020 and Darex WBC 833 with superior application properties, phthalate-free Darex COV designed for energy efficiency, and allergen-free Darex WBC 9000-63-2. These sealants address growing demands for safety, productivity, and sustainability in the packaging industry, aligning with tightening environmental regulations and consumer expectations.

IN DEPTH

Background and Strengthening Environmental Regulations in the Packaging Industry

The beverage and food packaging industry faces increasing scrutiny driven by heightened consumer health and safety awareness, alongside tightening environmental regulations concerning plastics and chemical substances. Specifically, there's growing pressure to eliminate endocrine-disrupting chemicals like phthalates and to ensure materials used for can sealing are free from intentionally added allergens. Furthermore, reducing energy consumption and carbon emissions during manufacturing processes represents a significant challenge, necessitating the development of water-based and high-efficiency sealant technologies. These factors are crucial for reducing environmental impact and building sustainable supply chains while maintaining product safety and quality.

Key Developments and Henkel's New Sealant Technologies

At METPACK 2026, Henkel unveiled its next-generation sealant technologies designed to meet these stringent market requirements. The company's new product portfolio is characterized by its ability to combine environmental consideration with high performance:

- **Darex WBC 4020 Water-Based Beer & Beverage Can Sealant**: This next-generation water-based sealant offers excellent application properties and a global formulation, making it ideal for the internal sealing of beer and soft drink cans. It enables efficient use on production lines and provides stable sealing performance. Its water-based nature contributes to reduced volatile organic compound (VOC) emissions, improving workplace environments.
- **Darex WBC 833 Water-Based Food Can Sealant**: This cost-effective water-based sealant delivers high productivity and robust lining performance. Used for internal sealing of food cans, it ensures the safety and shelf-life of the contents.
- **Darex COV Phthalate-Free Next-Generation Sealant**: Designed to reduce energy consumption and carbon emissions, this phthalate-free sealant eliminates the risk of endocrine-disrupting substances, providing a highly safe packaging solution.

- **Darex WBC 9000-63-2 Allergen-Free Sealant**: Formulated without any intentionally added allergenic substances, this sealant maximizes safety, especially for food applications where consideration for allergic consumers is paramount.

These sealant innovations are also complemented by smart digital equipment solutions, supporting intelligent manufacturing processes and quality control.

Impact and Future Outlook

Henkel's new sealant solutions provide a comprehensive answer to the challenges of sustainability, safety, and efficiency facing the beverage and food can industry. Characteristics such as water-based formulations, phthalate-free composition, and allergen-free properties support companies in achieving their Environmental, Social, and Governance (ESG) objectives and enhancing brand image. Moreover, features contributing to improved productivity lead to optimized manufacturing costs and strengthened market competitiveness. As environmental regulations become globally stricter and consumer health and safety awareness grows, the demand for such eco-friendly and high-performance sealants is expected to expand further. Henkel, through its expertise in material science, is poised to drive advancements in food packaging safety and sustainability, establishing new industry standards.

Source: https://www.cantechonline.com/news/42586/henkel-showcased-smart-digital-equipment-solutions-and-advanced-material-technologies-at-metpack-2026/

Collected: May 15, 2026 | Automated Research System (Gemini API)

ASMC 2026 Convenes Global Semiconductor Leaders to Tackle Advanced Manufacturing Challenges and Accelerate Innovation

Published May 11, 2026 SEMI USA

OVERVIEW

The Advanced Semiconductor Manufacturing Conference (ASMC 2026), held from May 11-14, brought together semiconductor manufacturers, equipment and materials suppliers, and academia to discuss innovative strategies and methodologies for resolving critical manufacturing challenges. The conference facilitated the sharing of latest research on new process technologies, advanced materials, and packaging innovations, significantly contributing to the collective manufacturing expertise and accelerating technological advancements across the semiconductor industry.

IN DEPTH

Background and Evolution of Semiconductor Manufacturing

Semiconductors serve as the core technology underpinning the digital foundations of modern society, with manufacturing processes continuously evolving. As the limits of scaling approach, innovative techniques such as EUV lithography, advanced packaging (3D stacking, chiplets), and heterogeneous integration have become critical for enhancing semiconductor device performance and reducing costs. However, the adoption of these cutting-edge technologies also introduces new challenges, including increased manufacturing complexity, difficulties in yield management, and rising demands for novel materials and equipment. Industry-wide knowledge sharing and collaboration are essential to overcome these hurdles and drive sustained technological innovation.

Key Findings and Outcomes of ASMC 2026

The Advanced Semiconductor Manufacturing Conference (ASMC 2026), held from May 11 to 14, served as a vibrant forum for discussing the latest trends and research findings in semiconductor manufacturing technology. Co-sponsored by SEMI and IEEE, ASMC is one of the premier international technical conferences dedicated to semiconductor manufacturing. Key topics and presentations included:

- **Optimization of Manufacturing Process Technologies**: Reports highlighted new optimization methods for advanced lithography, etching, deposition, and Chemical Mechanical Planarization (CMP) processes, along with advancements in process control and monitoring. Numerous presentations also focused on AI-driven yield enhancement techniques and the automation and smartification of fabrication facilities.
- **Advancements in Materials Development**: Research and development outcomes for innovative materials catering to new device architectures and manufacturing processes were unveiled. These included semiconductor encapsulation materials, die-attach materials, underfills, photoresists, and high-purity chemicals. Particular attention was paid to next-generation materials exhibiting properties such as high thermal conductivity, low dielectric constant, and low stress.

- **Innovation in Packaging Technologies**: Advanced packaging techniques in the back-end, such as chiplet integration, 3D stacking, fan-out packages, and heterogeneous integration, were central themes. Insights were shared on thermal management solutions, stress mitigation techniques, and reliability assessment methodologies, fostering discussions on approaches to resolve challenges in high-density integration.
- **Supply Chain Resilience and Sustainability**: Enhancing the resilience of the semiconductor supply chain, alongside environmentally friendly manufacturing processes, energy conservation, and recycling technologies aimed at reducing environmental impact, were also significant topics of discussion.

Selected outstanding papers presented at ASMC will subsequently be published in a special issue of IEEE Transactions on Semiconductor Manufacturing, ensuring broader dissemination of their academic and industrial value.

Technical Significance and Outlook

ASMC 2026 provided an invaluable platform for knowledge exchange and networking among engineers, researchers, and business leaders at the forefront of semiconductor manufacturing. The insights and technological innovations shared at this conference are expected to improve the efficiency, reliability, and sustainability of semiconductor manufacturing, thereby accelerating the realization of next-generation electronic devices. Crucially, close collaboration among material suppliers, equipment manufacturers, and device makers is indispensable in increasingly complex manufacturing processes, and ASMC plays a vital role in fostering this cooperation. As semiconductor technology continues to advance, platforms like ASMC will remain essential for addressing new challenges and continuously supporting the development of the digital society.

Source: https://www.semi.org/en/connect/events/advanced-semiconductor-manufacturing-conference-asmc

Resonac Raises Mid-Year Profit Outlook, Driven by Robust Demand for AI Semiconductor Materials

Published May 13, 2026　レゾナック　Japan

OVERVIEW

Resonac announced a significant upward revision to its consolidated net profit forecast for the first half of 2026, from 20 billion JPY to 38 billion JPY, driven by strong performance in its AI semiconductor materials business. This represents a substantial 93% year-on-year increase, underscoring the market's high valuation of Resonac's material solutions in High-Performance Computing (HPC) and advanced packaging. The company aims for further business expansion amidst the rapid growth of the AI semiconductor market.

IN DEPTH

Background and Rapid Growth of the AI Semiconductor Market

The global demand for AI semiconductors has exploded in recent years, propelled by the proliferation of generative AI and the evolution of large language models (LLMs). High-Performance Computing (HPC) processors, exemplified by NVIDIA's GPUs, require immense computational power, and the underlying semiconductor chips necessitate cutting-edge materials that enable high performance, high density, and superior thermal management. As a key supplier of material solutions for these advanced semiconductor manufacturing processes, Resonac is significantly influenced by shifts in market demand.

Key Developments and Resonac's Upward Performance Revision

On May 13, 2026, Resonac announced an upward revision to its consolidated financial forecast for the first half of 2026 (January to June). Specifically, the company increased its consolidated net profit forecast by 18 billion JPY, from the previous estimate of 20 billion JPY to 38 billion JPY. This revised figure is expected to represent a substantial 93% year-on-year increase.

The primary factors contributing to this upward revision are:

- **Strong Performance in AI Semiconductor Materials Business**: Demand for advanced packaging materials (e.g., polishing slurries, encapsulation materials, die-attach films, thermal management materials) used in AI semiconductors and HPC devices significantly exceeded initial expectations and continued to be robust. Resonac holds strong technological capabilities and market share in these areas, benefiting maximally from the expanding AI semiconductor market.
- **Improved Profitability**: In addition to the increased sales volume of advanced materials, optimization of the product mix and successful cost-efficiency initiatives also contributed to an overall improvement in profitability.

This revised outlook clearly indicates that the flourishing AI market is providing a strong tailwind for the company's semiconductor materials business.

Impact and Future Outlook

Resonac's upward revision in performance suggests that the AI semiconductor market is not merely a temporary boom but rather a long-term growth trend. The company's material technologies are foundational to enhancing the performance and ensuring the high reliability of AI semiconductors, and the recent strong results validate the soundness of its strategic positioning. Moving forward, Resonac is expected to further strengthen its investments in advanced material development for AI semiconductors, aiming to establish next-generation technological standards through collaboration with customers. The evolution of advanced packaging technologies such as chiplets, 3D stacking, and HBM will bring additional growth opportunities for the company's material solutions. As the global AI market is projected for exponential expansion, Resonac is anticipated to support this growth through innovative materials and contribute to the overall development of the semiconductor industry. Concurrently, building resilient supply chains to address geopolitical risks and supply chain fluctuations will remain a critical management priority.

Source: https://finance.biggo.jp/news/9muIIZ4BrX5PFN7BjLZq

Collected: May 15, 2026 | Automated Research System (Gemini API)