Adhesives_Sealants

Weekly Intelligence Report

2026-09-06 | 29 articles | 9 countries

troy-technical.jp

This Week's Keyword

Thermal Management

Advanced materials for AI & EV challenges

29	9	>70	>8
articles	countries	W/mK	W/mK
Total Articles	Source Countries	Max Solder Paste TC	Max cDAF TC

All 29 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	Enhanced Thermal MUF	New Product	●●●●	●●●●	●●●●	●●●●	●●●●	AI Tech unveils enhanced thermal dissipation MUF for HBM/3D DRAM, boosting package reliability.
#02	Advanced Pkg Review	Review	○○○○	○○○○	●●○○	●●●●	●●●○	MDPI review compares advanced semiconductor packaging, highlighting thermal management challenges.
#03	Indium AI TIMs/Pastes	Product Showcase	●●●○	●●●●	●●●●	●●●●	●●●●	Indium Corp showcases high thermal conductivity TIMs and sintering pastes for AI at SEMICON Taiwan.
#04	Krayden FCBGA Mats	Product Solutions	●●●○	●●●●	●●●○	●●●●	●●●●	Krayden delivers advanced material solutions for Flip Chip BGA, enhancing interconnect density and reliability.
#05	Krayden Hysol GR60 EMC	New Product	●●●○	●●●●	●●●●	●●●●	●●●●	Krayden supplies Hysol GR60 series EMC (2.2 W/mK) for IPMs, enhancing automotive/industrial reliability.
#06	Henkel Loctite CDF900	New Product	●●●●	●●●●	●●●●	●●●●	●●●●	Henkel unveils Loctite ABLESTIK CDF900 cDAF with >8 W/m-K thermal conductivity for AI/HPC packages.
#07	Saint-Gobain EV Adh	Product Solutions	●●●○	●●●●	●●●●	●●●○	●●●●	Saint-Gobain offers high-performance, PFAS-free adhesives and tapes for EV battery applications.
#08	Master Bond Underfill	Product Offering	●●○○	●●●●	●●●○	●●●●	●●●●	Master Bond offers epoxy underfill formulations to boost reliability for flip-chip and CSP assemblies.
#09	Master Bond Die Attach	Product Offering	●●○○	●●●●	●●●○	●●●●	●●●●	Master Bond offers high-strength, high-reliability die attach epoxy adhesives for microelectronics.
#10	P Equity Pkg Analysis	Analysis	○○○○	○○○○	●●●○	●●●○	●●●●	P Equity Research analyzes advanced semiconductor packaging, detailing underfill and mold roles in 2.5D/CoWoS.
#11	TSMC Hybrid Bonding	Research Update	●●●●	●●○○	●●●●	●●●○	●●●●	Tom's Hardware reports TSMC achieves 6-micron hybrid bonding, but full HBM integration delayed to HBM4E/HBM5.
#12	Adv Solder Paste	New Material	●●●●	●●●○	●●●●	●●●●	●●●●	Advanced die attach solder paste achieves >70 W/mK thermal conductivity and precision filling for high-power packaging.
#13	Master Bond Eco-Friendly	Product Offering	●●●○	●●●●	●●●○	●●●●	●●●●	Master Bond offers eco-friendly, solvent-free, halogen-free, RoHS-compliant adhesive and encapsulation solutions.

#	Article Title	Type	Tech Novelty	Market Proximity	Market Impact	Data Reliability	US/EU Relevance	Summary
#14	Moldex3D Simulation	Software Tool	High	High	High	High	High	Moldex3D compression molding simulation predicts semiconductor package defects, enhancing quality and design.
#15	Wevo WEVOSIL 26040 FL	New Product	High	High	High	High	High	Wevo unveils WEVOSIL 26040 FL, a 4 W/m·K silicone gap filler for high-performance thermal management.
#16	WEVO-CHEMIE EV BMS	New Product	High	High	High	High	High	WEVO-CHEMIE develops high-insulation, 0.8 W/m·K thermally conductive polyurethane potting for EV battery BMS.
#17	3M 5590H Interface Pad	Product Offering	Med	High	Med-High	Med-High	High	3M supplies 5590H Thermally Conductive Acrylic Interface Pad for IC chips and EV batteries.
#18	TSMC CoWoS SC	Market Report	Low	High	High	Med-High	High	TSMC's CoWoS drives AI semiconductor demand, leading Japanese material suppliers to expand in Taiwan.
#19	Saint-Gobain EV Mats	Product Solutions	High	High	High	Med-High	High	Saint-Gobain Tape Solutions develops adhesives, composites, and thermal gap fillers for EV batteries.
#20	Master Bond Medical	New Product	High	High	Med-High	High	High	Master Bond introduces EP62-1LPSPMed, an ultra-low viscosity, biocompatible epoxy for medical devices.
#21	Krayden LINQSOL EMC	New Product	High	High	High	High	High	Krayden offers LINQSOL EMC-7535, a low-stress green EMC for high-voltage, high-power semiconductors.
#22	NFION Silicone Foam	New Product	High	High	High	High	Med-High	NFION unveils NF150-788 silicone foam with ultra-low thermal conductivity for EV battery cell insulation.
#23	Master Bond R&D; Adh	Product Offering	High	High	Med-High	High	High	Master Bond offers advanced adhesives, sealants & coatings for R&D;, meeting NASA low outgassing & USP Class VI.
#24	Cyclomer "D-glue"	New Technology	High	Med-High	High	Med	High	Thermally activated "D-glue" streamlines high-value plastic recovery from end-of-life electronics.
#25	Master Bond EV Adh	New Product	High	High	High	High	High	Master Bond launches new epoxy adhesives EP37-3FLF and EP5TC-80, enhancing EV battery structural integrity and thermal management.
#26	WEVO-CHEMIE 26029 FL	New Product	High	High	High	High	High	WEVO-CHEMIE launches "WEVOSIL 26029 FL," a new 3 W/m·K thermally conductive silicone gap filler.
#27	Adv Pkg Summit 2026	Conference Report	Low	Low	Med-High	Med	High	Advanced Packaging Summit 2026 kicks off at SEMICON Taiwan, focusing on silicon integration and photonics interconnects.
#28	Kakaku.com Adh Rank	Market Report	Low	High	Low	Med-High	Low	Kakaku.com releases September 2026 adhesives & bonds popularity ranking, highlighting Cemedine and Konishi products.
#29	Indium AI Solutions	Corporate Strategy	High	High	High	Med-High	High	Indium Corporation's Jason Chou to present "Material Solutions for AI Industry" at SEMICON Taiwan.

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

Three Questions That Demand Your Decision This Week

❶ Is your HBM packaging strategy ready for hybrid bonding?

TSMC is advancing 6-micron hybrid bonding, but HBM integration is delayed to HBM4E/HBM5 (2027-late 2020s). This shift impacts material selection, process development, and competitive positioning. Are your R&D; and procurement teams tracking this roadmap to avoid obsolescence or supply chain gaps?

❷ Are your thermal solutions keeping pace with material breakthroughs?

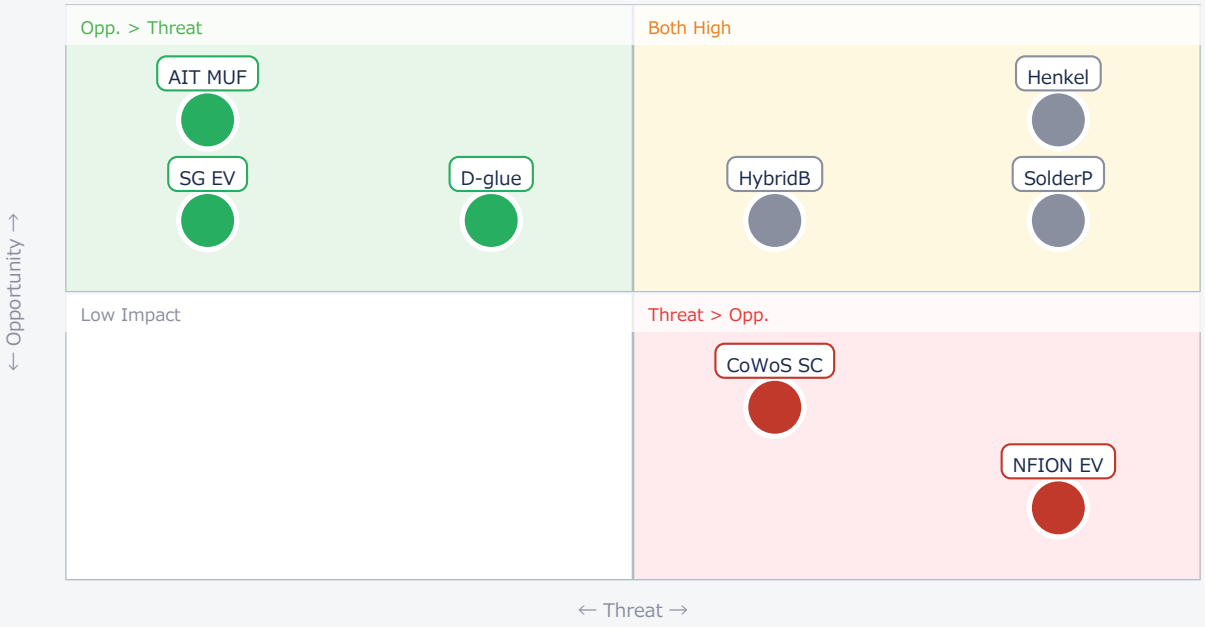
New materials like Henkel's >8 W/mK cDAF and advanced solder pastes (>70 W/mK) are setting new benchmarks for thermal management in AI/HPC and power electronics. Does your current material portfolio match or exceed these capabilities, or are you at risk of falling behind competitors in performance and reliability?

❸ How exposed is your advanced packaging supply chain to Asia?

Japanese material suppliers are expanding in Taiwan to support TSMC's CoWoS for AI semiconductors, indicating a concentration of critical material supply. Are your procurement and strategy teams assessing the geopolitical and competitive risks associated with this reliance on Asian suppliers for key underfills, ABF, and CMP slurries?

Opportunities vs. Threats for US/European Companies

Opportunity vs. Threat Matrix for US/European Companies



Item	Quadrant	↑ Opportunity	↓ Threat
● Henkel	Critical	Boost AI/HPC perf	Lag in material
● HybridB	Critical	Future integration	HBM roadmap shift
● SolderP	Critical	High-power thermal	Competitor lead
● AIT MUF	Opp.	Improve HBM reliability	—
● D-glue	Opp.	Boost recycling	—

● CoWoS SC	Threat	—	SC concentration
● NFION EV	Threat	—	Chinese competitor
● SG EV	Opp.	Green EV materials	—

Deep Dive ① — Henkel's >8 W/mK Conductive Die Attach Film

#06 | 2026/09/02 | SpecialChem (Germany) | Tech Novelty●●●●○ Proximity●●●●○ Market Impact●●●●● Data Reliability●●●●○ US/EU Relevance●●●●●

Henkel's new Loctite ABLESTIK CDF900 series conductive die attach film (cDAF) boasts thermal conductivity exceeding 8 W/m-K, a significant leap for AI accelerators and HPC processors. This film eliminates bleed-out and ensures uniform bondline thickness, crucial for large die packaging.

The cDAF's film format simplifies manufacturing by preventing contamination and maintaining consistent thermal conduction paths. This innovation directly addresses the intense heat generation in next-gen chips, bolstering performance and reliability in 5G/6G front-ends and other high-power devices.

▶ Strategic Analyst's Perspective

Strategic Analyst's Perspective: The >8 W/mK thermal conductivity for a cDAF is a highly credible and impactful performance metric, pushing the boundaries for film-based die attach. Technical barriers include ensuring long-term reliability under extreme thermal cycling for large dies and process compatibility with existing high-volume manufacturing lines. [Opportunity] for US/EU OEMs and device manufacturers to integrate this material for superior thermal management in AI/HPC platforms, gaining a competitive edge. [Threat] for US/EU materials suppliers who lag in developing comparable high-performance cDAFs, risking market share loss. Next actions: [R&D;] immediately benchmark this material against current solutions; [Procurement] engage Henkel for samples and technical data by end of month; [Strategy] assess impact on next-gen product roadmaps by next quarter.

Deep Dive ② — Hybrid Bonding Roadmap for HBM Integration

#11 | 2026/09/02 | Tom's Hardware (USA) | Tech Novelty●●●●○ Proximity●●○○○ Market Impact●●●●● Data Reliability●●●○○ US/EU Relevance●●●●●

TSMC's SoIC achieves 3.5D integration with 6-micron hybrid bonding, combining stacks with CoWoS modules. However, full HBM integration via hybrid bonding is reportedly delayed to HBM4E/HBM5 (2027-late 2020s), with SK hynix still using MR-MUF for 16-layer HBM4.

Hybrid bonding offers increased connection density and reduced thermal resistance, potentially eliminating underfill. The delay for HBM suggests significant challenges in warpage control and thermal management for high-layer stacks, impacting future AI/HPC designs and material requirements.

▶ Strategic Analyst's Perspective

Strategic Analyst's Perspective: TSMC's 6-micron hybrid bonding is a genuine breakthrough, but the HBM delay is a realistic reflection of the immense technical hurdles in scaling this for high-layer stacks. Warpage control and yield for direct copper-to-copper bonding in HBM remain significant barriers. [Opportunity] for US/EU technology licensors and IP holders in advanced bonding equipment and process control to support this transition. [Threat] for US/EU OEMs and device manufacturers if they miscalculate the HBM roadmap, investing in technologies that become obsolete or failing to secure future HBM supply. Next actions: [Strategy] conduct a detailed analysis of HBM roadmaps and hybrid bonding adoption timelines by end of month; [R&D;] initiate research into advanced warpage mitigation techniques for 3D stacking; [Procurement] engage HBM suppliers to understand their specific hybrid bonding transition plans by next quarter.

Deep Dive ③ — Advanced Die Attach Solder Paste for High-Power

#12 | 2026/08/28 | Global SMT & Packaging (Global) | Tech Novelty●●●●○ Proximity●●●○○ Market Impact●●●●○ Data Reliability●●●●○ US/EU Relevance●●●●○

New die attach solder pastes achieve >60-70 W/m·K thermal conductivity (over 70 W/m·K with Cu/Ni reinforcing phases) for high-power packaging. These tin-alloy-based pastes can reduce IGBT junction temperatures from 125°C to 105°C, significantly extending module lifespan.

Utilizing ultra-fine powders and low-viscosity formulations, these pastes ensure precise, void-free filling in confined spaces, critical for devices like solid-state LiDAR emitter modules. This innovation is vital for electric vehicles, renewable energy, and industrial control systems.

▶ Strategic Analyst's Perspective

Strategic Analyst's Perspective: The reported thermal conductivity of >70 W/mK for solder paste is highly impressive and realistic, reflecting ongoing advancements in filler technology and metallurgy. Key technical barriers include long-term reliability under extreme thermal cycling, especially for large-area die attach, and ensuring consistent void-free application in high-volume manufacturing. [Opportunity] for US/EU materials & component suppliers to develop or license similar high-performance solder pastes to capture market share in EV and power electronics. [Threat] for US/EU OEMs and device manufacturers if they fail to adopt these advanced materials, leading to lower reliability and shorter product lifespans compared to competitors. Next actions: [R&D;] immediately evaluate samples of these advanced solder pastes; [Procurement] identify and qualify suppliers for these materials within 1 month; [Business Dev] explore strategic partnerships with innovative solder paste developers by next quarter.

Other Notable Articles

AI Technology Unveils Enhanced Thermal Dissipation Molding Underfill for HBM and 3D DRAM (AI Technology, Inc.)
Tech Novelty●●●●○ Proximity●●●●○ Market Impact●●●●○

New MUF with enhanced thermal dissipation is critical for HBM/3D DRAM reliability in AI/HPC packaging.

Indium Corporation Showcases High Thermal Conductivity TIMs and Sintering Pastes for AI at SEMICON Taiwan (Indium Corporation)
Tech Novelty●●●○○ Proximity●●●●○ Market Impact●●●●○

Indium's Heat-Spring TIMs and sintering pastes offer crucial thermal management for high-power AI devices.

Krayden Supplies High Thermal Conductivity Hysol GR60 Series EMC for IPMs, Enhancing Reliability of Automotive and Industrial Modules with 2.2 W/mK (Krayden)
Tech Novelty●●●○○ Proximity●●●●○ Market Impact●●●●○

High thermal conductivity EMC (2.2 W/mK) from Krayden boosts reliability for IPMs in automotive/industrial sectors.

Moldex3D Compression Molding Simulation Achieves Semiconductor Package Defect Prediction and Quality Enhancement (Rheologist gaze & solutions (Moldex3D))
Tech Novelty●●●○○ Proximity●●●●○ Market Impact●●●●○

CAE simulation for compression molding is vital for optimizing advanced semiconductor packaging design and yield.

Thermally Activated "D-glue" Streamlines High-Value Plastic Recovery from End-of-Life Electronics (Cyclomer)
Tech Novelty●●●●○ Proximity●●●○○ Market Impact●●●●○

Debondable adhesive for electronics recycling offers a significant opportunity for circular economy initiatives.

Recommended Actions This Week

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

Immediate (this week)

- [Executive] Review AI/HPC thermal roadmap: Assess current material suppliers and internal R&D; for next-gen TIMs and die attach films (e.g., >8 W/mK cDAF).
- [Procurement] Identify alternative advanced packaging material suppliers: Investigate non-Japanese sources for underfills, ABF, and CMP slurries for CoWoS/2.5D/3D packaging.

Short-term (1 month)

- [R&D;] Evaluate debondable adhesive technologies: Initiate a technical review of debondable adhesives like "D-glue" for future electronics design-for-recycling (DfR) initiatives.
- [Strategy] Analyze hybrid bonding implications: Conduct a strategic review of the HBM hybrid bonding roadmap (HBM4E/HBM5) and its impact on future product designs and manufacturing investments.
- [Business Dev] Engage with advanced thermal material providers: Schedule meetings with suppliers offering >70 W/mK solder pastes and high-performance silicone gap fillers for EV/power electronics.

Medium-long term (quarter+)

- [R&D;] Invest in advanced thermal material R&D;: Allocate resources for internal development or strategic partnerships in ultra-high thermal conductivity materials for AI/HPC and power modules.
- [Procurement] Diversify EV battery material sourcing: Establish relationships with multiple suppliers for thermal management materials (gap fillers, foams) and structural adhesives for EV batteries, including PFAS-free options.
- [Legal/IP] Monitor advanced packaging IP landscape: Track patent filings and licensing opportunities in hybrid bonding, advanced underfills, and thermal management materials.

Adhesives_Sealants — Selected Articles

Date: 2026-09-06

Articles: 29

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#22 Master Bond Introduces EP62-1LPSPMed, an Ultra-Low Viscosity Epoxy for Medical Devices with ISO 10993-5 and USP Class VI Compliance

#23 Krayden Offers Low-Stress Green Epoxy Molding Compound LINQSOL EMC-7535 for High-Voltage, High-Power Semiconductors

#24 NFION Unveils NF150-788 Silicone Foam with Ultra-Low Thermal Conductivity for EV Battery Cell Insulation

#25 Master Bond Offers Advanced Adhesives, Sealants & Coatings for R&D, Meeting NASA Low Outgassing & USP Class VI Standards

#26 Thermally Activated "D-glue" Streamlines High-Value Plastic Recovery from End-of-Life Electronics

#27 Master Bond Launches New Epoxy Adhesives EP37-3FLF and EP5TC-80, Enhancing EV Battery Assembly Structural Integrity and Thermal Management

#28 WEVO-CHEMIE Launches "WEVOSIL 26029 FL," a New 3 W/m·K Thermally Conductive Silicone Gap Filler, Boosting High-Voltage Battery Production Efficiency

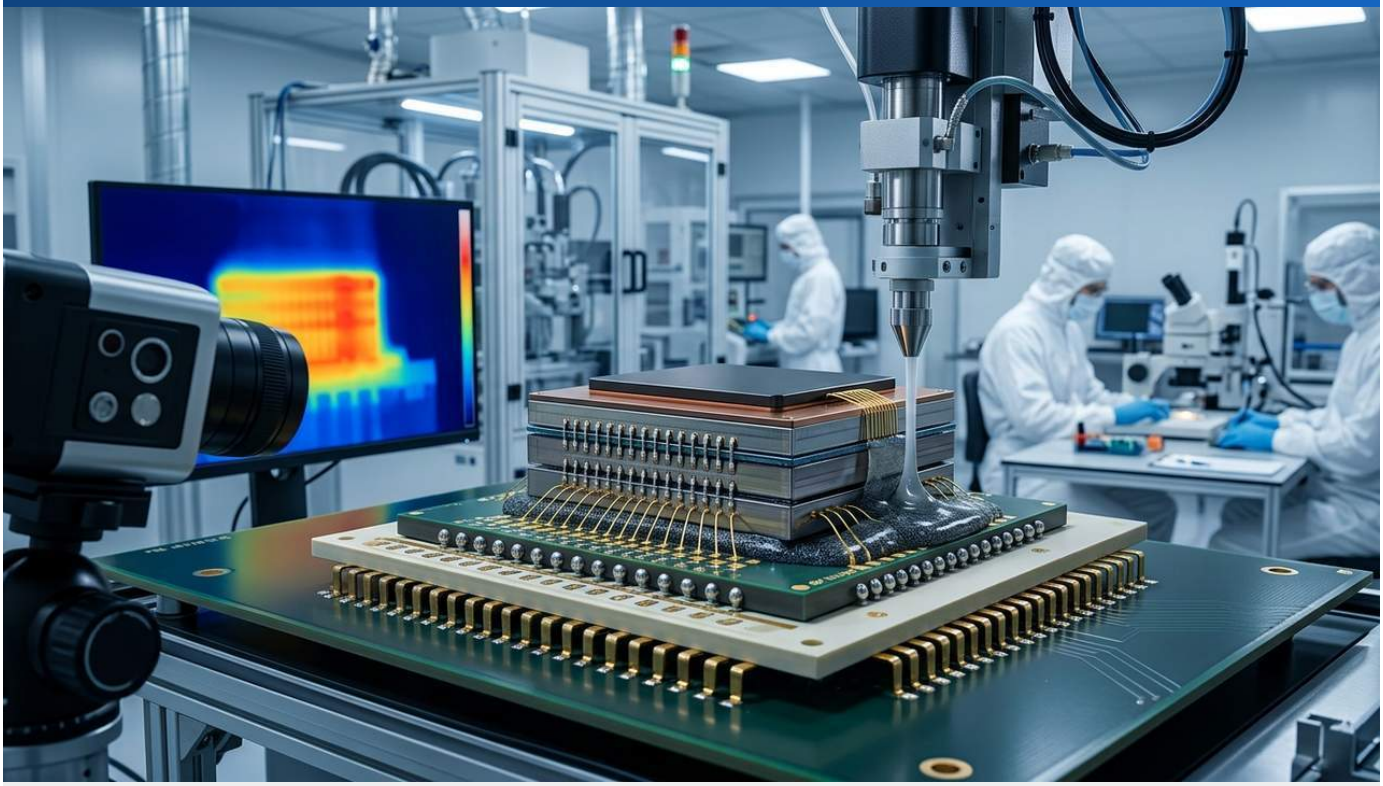
#29 Advanced Packaging Summit 2026 Kicks Off at SEMICON Taiwan, Focusing on Silicon Integration and Photonics Interconnect Innovations

#30 Kakaku.com Releases September 2026 Adhesives & Bonds Popularity Ranking, Highlighting Cemedine and Konishi Products for Diverse Applications

#31 Indium Corporation's Jason Chou to Present "Material Solutions for AI Industry" at SEMICON Taiwan

#01 AI Technology Unveils Enhanced Thermal Dissipation Molding Underfill for HBM and 3D DRAM to Boost Package Reliability

Published August 27, 2026 AI Technology, Inc. USA



OVERVIEW

AI Technology, Inc. (AIT) has announced a new Molding Underfill (MUF) with significantly enhanced thermal dissipation, targeting advanced semiconductor packaging like HBM, 3D DRAM, and AI processors. This MUF utilizes a specially formulated liquid epoxy mold compound (EMC) with low viscosity, low CTE, and thermally modified particles to optimize thermal management and reliability in high-density packages. This innovation addresses critical thermal and thermomechanical stress challenges in high-performance computing, promising improved performance and longevity for next-generation semiconductors.

IN DEPTH

Key Findings

AI Technology, Inc. (AIT) has introduced a groundbreaking Molding Underfill (MUF) technology specifically designed for advanced semiconductor packaging, including High Bandwidth Memory (HBM), 3D DRAM, and chiplet-based AI processors. This novel MUF significantly enhances thermal dissipation within high-density packages, leveraging a specially formulated liquid epoxy mold compound (EMC) that features low viscosity, a low coefficient of thermal expansion (CTE), and incorporates thermally modified particles. This development is crucial for managing the intense heat generated by modern high-performance chips and improving the thermomechanical reliability of advanced packages.

Technical Details

The AIT-developed MUF facilitates liquid underfilling and encapsulation during the Mass Reflow (MR) process, optimizing heat dissipation in stacked chip architectures. The core innovation lies in its unique epoxy mold compound, engineered with thermally modified particles optimally dispersed to create efficient thermal pathways from the chip to the external package. This mechanism actively mitigates hot spot formation, thereby reducing the risk of device performance degradation and premature failure.

- **Low Viscosity:** Ensures complete and uniform filling of the minute gaps and complex geometries found in advanced packages, preventing the formation of voids that can compromise thermal and mechanical integrity.
- **Low CTE:** Minimizes the mismatch in thermal expansion between silicon chips and substrates, effectively suppressing stress and warpage caused by thermal cycling, which is vital for long-term package reliability.
- **Thermally Modified Particles:** These specialized fillers are optimized for dispersion within the epoxy matrix, imparting superior thermal conductivity compared to conventional EMCs, thus enhancing heat removal capabilities.

In addition to the MUF, AIT also offers a range of complementary materials, including unfilled, non-conductive film adhesives for stacked chips and compressible phase-change thermal interface materials (TIMs) containing diamond and boron nitride fillers. These materials are tailored for various advanced packaging architectures, such as Fan-Out Wafer-Level Packaging (FOWLP) and Panel-Level Packaging (FOPLP), ensuring comprehensive optimization of package reliability and thermal management.

Background & Context

The relentless demand for higher performance in AI, high-performance computing (HPC), and 5G/6G applications has led to an exponential increase in semiconductor chip power density and integration complexity. Consequently, managing the heat generated by these chips has become a paramount challenge, pushing the limits of traditional packaging materials. Inadequate thermal management directly leads to performance throttling, reduced reliability, and shorter product lifespans, compelling material suppliers to innovate with more sophisticated solutions.

Strategic Significance & Outlook

AIT's thermally enhanced MUF technology represents a foundational advancement for maintaining the reliability and performance of future semiconductors, particularly AI processors and high-bandwidth memory, where performance demands will continue to escalate. This material offers increased design flexibility in thermal management solutions, from chip-level to system-level, contributing to the miniaturization, enhanced performance, and energy efficiency of next-generation electronic devices. The AI/HPC sector, currently grappling with thermal bottlenecks, is expected to be a primary driver for the expanded adoption of such advanced thermal management solutions.

Source: https://www.aitechnology.com/molding-underfill-muf-for-mass-reflow-mr-liquid-underfilling-encapsulation-with-thermal-dissipation-enhancement/

Collected: September 04, 2026 | Automated Research System (Gemini API)

#02 MDPI Review Compares Advanced Semiconductor Packaging: Spotlighting Thermal Management and Reliability Challenges

Published August 30, 2026 MDPI Switzerland

OVERVIEW

A review paper published in MDPI critically compares advanced packaging architectures, including 2D, 2.5D, and 3D integration, detailing challenges in thermal management, warpage from thermomechanical mismatch, and signal/power integrity in compact, high-power-density packages. It highlights the crucial role of high thermal conductivity heat spreaders and optimized thermal interface materials (TIMs) in reducing thermal resistance and stress. TSMC's CoWoS technology is specifically cited as a key enabler for wide-bandwidth integration of AI processors and HBM, illustrating the significant reliability and performance barriers these technologies face.

IN DEPTH

Key Findings

A recent review paper published in MDPI provides a comprehensive comparative analysis of advanced semiconductor packaging architectures, encompassing 2D, 2.5D, and 3D integration technologies. The study sharply focuses on the pressing challenges encountered in compact, high-power-density packages, specifically addressing thermal management, warpage and stress induced by thermomechanical mismatch, and signal/power integrity. This in-depth analysis offers critical guidance for enhancing the reliability and performance of modern high-performance electronic devices.

Technical / Clinical Details

The paper meticulously examines key advanced packaging techniques, including silicon interposers, localized silicon bridges, RDL (Redistribution Layer) fan-out platforms, and vertical die stacking. While these technologies promise significant advancements in chip integration density and performance, they simultaneously introduce novel physical and electrical complexities.

- **Thermal Management Challenges:** The high power densities in advanced packages generate substantial heat, which is a primary contributor to device performance degradation and shortened lifespan. The paper argues that high thermal conductivity heat spreaders and optimized Thermal Interface Materials (TIMs) are indispensable for reducing thermal resistance and ensuring efficient heat transfer.
- **Thermomechanical Mismatch:** Differences in the Coefficient of Thermal Expansion (CTE) among diverse materials within a package lead to internal stresses and warpage. These can cause fatigue in solder joints and damage to chips. The review emphasizes the importance of material selection and structural design to mitigate these stresses.
- **Signal/Power Integrity:** Maintaining high-speed signal transmission and stable power delivery is critical. Intricate interconnects and complex routing in advanced packages are susceptible to signal attenuation, noise, and power drop issues.

As a concrete example, the paper references TSMC's CoWoS (Chip-on-Wafer-on-Substrate) technology, utilized for wide-bandwidth integration of AI system processors and HBM (High Bandwidth Memory). CoWoS, a form of 2.5D packaging, integrates multiple chips via a silicon interposer, achieving high-density connectivity and superior performance, yet it demands highly sophisticated thermal management and thermomechanical stability.

Background & Context

The escalating demand for Artificial Intelligence (AI), High-Performance Computing (HPC), and edge devices is rapidly accelerating semiconductor technology evolution. Advanced packaging, such as 3D stacking and chiplet technologies, is instrumental in overcoming the limitations of traditional 2D scaling, enabling significant performance boosts and miniaturization. However, the adoption of these technologies introduces new engineering hurdles, including increased thermal density within packages and material anisotropies. Overcoming these requires continuous innovation in materials science and packaging design.

Strategic Significance & Outlook

The challenges and solutions discussed in this review paper profoundly influence the development roadmap for next-generation high-performance semiconductors like AI chips and HBM. Ongoing research and development in thermal management techniques, thermomechanical stress mitigation, and signal/power integrity are crucial for realizing more reliable and higher-performing electronic systems. In the future, these advanced packaging technologies are expected to play an indispensable role across a broad spectrum of applications, including autonomous driving, IoT, and data centers.

Source: https://www.mdpi.com/2072-666X/17/9/1039

#03 Indium Corporation Showcases High Thermal Conductivity TIMs and Sintering Pastes for AI at SEMICON Taiwan

Published September 03, 2026 Indium Corporation USA

OVERVIEW

Indium Corporation exhibited innovative materials supporting AI technology at SEMICON Taiwan, highlighting Heat-Spring® compressible metal TIMs and solder TIMs for superior thermal conductivity in high-power-density devices. The company also introduced InFORCE®MF pressure Ag sintering paste for SiC die attach and InFORCE®29 pressure Cu sintering paste for high-reliability applications, alongside WS-910 flip-chip flux. These advancements underscore Indium Corporation's commitment to sustainable and energy-efficient solutions for semiconductor packaging, addressing critical thermal challenges in next-gen electronics.

IN DEPTH

Key Findings

Indium Corporation presented a suite of innovative material solutions at SEMICON Taiwan, designed to enable advancements in Artificial Intelligence (AI) technology. Prominently featured were their Heat-Spring® compressible metal Thermal Interface Materials (TIMs) and solder TIMs, which significantly enhance thermal management capabilities in high-power-density devices. The company also showcased advanced pressure sintering pastes for silicon carbide (SiC) and GaN power devices, clearly demonstrating their contribution to improving the performance and reliability of next-generation semiconductor packaging.

Technical / Clinical Details

The core of Indium Corporation's exhibition focused on materials that improve heat dissipation performance, a critical requirement for AI accelerators and High-Performance Computing (HPC) devices. The Heat-Spring® compressible metal TIMs offer exceptional thermal conductivity, reducing thermal resistance between the die and heatsink. Solder TIMs provide long-term stable thermal performance, especially crucial in high-power-density applications.

- **Heat-Spring® Compressible Metal TIMs:** These materials offer superior thermal conductivity, enabling efficient heat transfer by filling gaps within the package. They are optimized for TIM2 applications, specifically the thermal path between the heat spreader and the main heatsink.
- **Solder TIMs:** Provide high thermal conductivity and long-term reliability, supporting stable operation in high-power-density devices.
- **InFORCE®MF Pressure Ag Sintering Paste:** Developed for SiC power semiconductor die attach, this paste achieves higher thermal conductivity, reliability, and high-temperature resistance compared to traditional solders. It forms strong, void-free bonds by sintering silver particles at low temperatures and pressures.
- **InFORCE®29 Pressure Cu Sintering Paste:** Targeted at high-reliability and high-thermal-conductivity applications, it leverages the excellent properties of copper for superior heat dissipation.

- **WS-910 Flip-Chip Flux:** Designed for compatibility with both molded underfill and capillary underfill processes, contributing to improved yield and reliability in flip-chip assembly.

These materials aim to provide sustainable and energy-efficient solutions for semiconductor packaging and assembly, contributing to maintaining device performance and extending product lifespan in high-thermal-load environments.

Background & Context

With the evolution of AI and HPC, the power consumption and heat generation of semiconductor chips are continuously increasing. This makes efficient thermal management a paramount challenge for maximizing device performance and ensuring stable system operation. Furthermore, tightening environmental regulations and growing sustainability awareness demand increased energy efficiency and reduced environmental impact in semiconductor manufacturing processes. Material suppliers like Indium Corporation play a crucial role in supporting the development of the semiconductor ecosystem by providing innovative solutions that address these industry trends.

Strategic Significance & Outlook

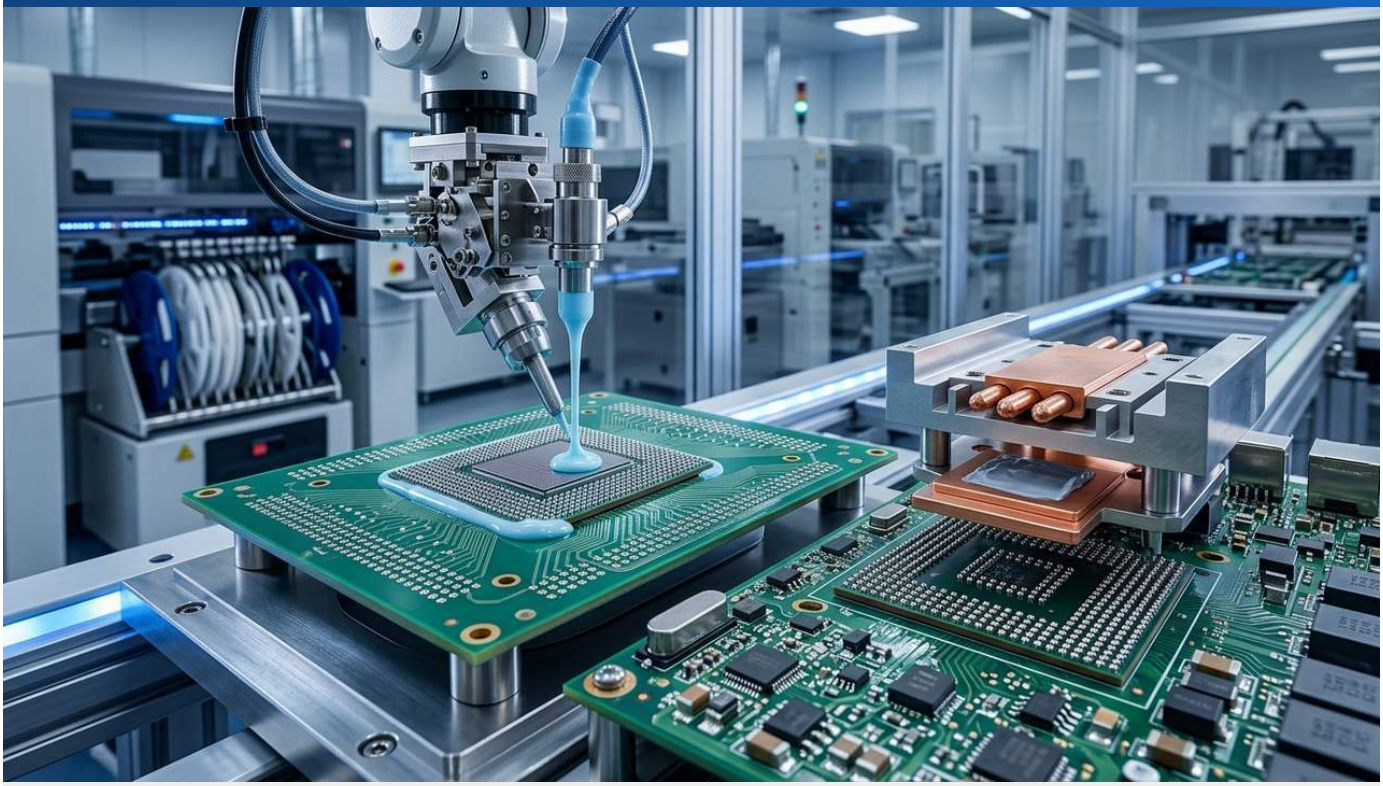
The material technologies showcased by Indium Corporation will play an indispensable role in markets requiring high power density and performance, such as next-generation AI accelerators, data centers, and power electronics for electric vehicles (EVs). These innovative TIMs and sintering pastes are expected to resolve thermal bottlenecks in devices, directly contributing to further advancements in AI computing power, improved energy efficiency, and enhanced long-term reliability of end products. The company is anticipated to continue expanding the frontiers of material technology in the semiconductor packaging sector.

Source: https://www.indium.com/blog/indium-corporation-to-showcase-innovative-materials-enabling-ai-technology-at-semicon-taiwan/

Collected: September 04, 2026 | Automated Research System (Gemini API)

#04 Krayden Delivers Advanced Material Solutions for Flip Chip BGA to Enhance Interconnect Density, Thermal Paths, Warpage Control, and Reliability

Published August 27, 2026 Krayden USA



OVERVIEW

Krayden provides comprehensive material solutions addressing critical challenges in Flip Chip Ball Grid Array (FCBGA) packages, including interconnect density, thermal path design, package warpage, and long-term reliability. Its product portfolio spans various underfills (capillary, non-conductive paste, film), protective molding compounds, lid attach adhesives, encapsulants, and thermal interface materials. These materials absorb and redistribute stresses from CTE mismatch and offer optimized thermal conductivity, flowability, and CTE control for FCBGA, FCCSP, and SiP packages, bolstering next-generation electronics performance and durability.

IN DEPTH

Key Findings

Krayden is delivering innovative materials and comprehensive solutions to address the multifaceted challenges confronting Flip Chip Ball Grid Array (FCBGA) packages, specifically high-density interconnection, efficient thermal path design, package warpage suppression, and long-term reliability. Their product range is instrumental in maximizing the potential of flip-chip technology, establishing a crucial foundation for the realization of next-generation high-performance electronic devices.

Technical / Clinical Details

Krayden's material solutions are specifically engineered to meet the stringent demands of FCBGA packages.

- **Underfill Materials:** Available in various forms, including capillary underfills, non-conductive pastes, and non-conductive films. These materials are critical for effectively absorbing and redistributing stresses arising from the Coefficient of Thermal Expansion (CTE) mismatch between solder bumps and the substrate. This significantly mitigates fatigue failures in solder joints, dramatically improving long-term reliability. They are specially developed for advanced packaging types such as FCBGA, FCCSP (Flip Chip Chip Scale Package), and SiP (System-in-Package).
- **Protective and Reinforcing Mold Package Materials:** These compounds protect chips and wires from environmental degradation while providing mechanical strength. Thermally conductive epoxy mold compounds with specific thermal conductivity, flowability, and CTE control properties contribute to maintaining the performance of high-heat-generating devices.
- **Lid Attach Adhesives:** Designed to secure the package lid and hermetically seal the internal components. They provide reliable encapsulation, preventing ingress of moisture and contaminants.
- **Encapsulants:** Enclose the entire package, ensuring environmental protection and mechanical stability.
- **Thermal Interface Materials (TIMs):** Maximize heat transfer between the chip and heatsink, enabling efficient heat dissipation.

These materials are indispensable for preventing performance degradation and extending the operational lifespan of devices in modern electronics, characterized by high-frequency signal transmission and elevated power densities.

Background & Context

Technological innovations in sectors such as smartphones, data centers, and automotive electronics necessitate ever-increasing miniaturization, performance enhancement, and reliability in semiconductor packaging. Flip-chip technology has emerged as a predominant interconnection method, superseding traditional wire bonding. However, the thermomechanical stresses and thermal management challenges inherent in this technology are critical determinants of a device's ultimate performance limits. Material suppliers are intensely focused on developing adhesives and encapsulants with advanced physical and chemical properties to address these challenges.

Strategic Significance & Outlook

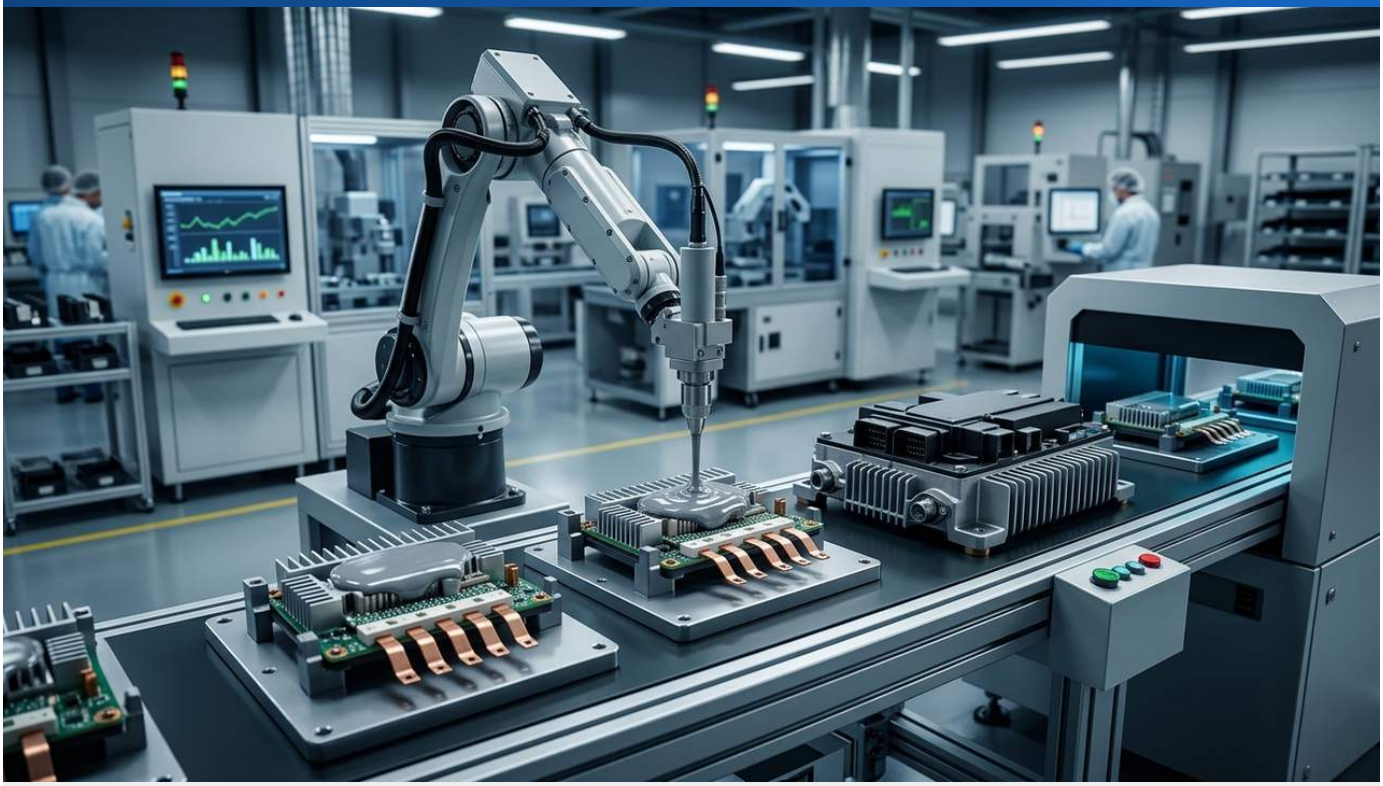
Krayden's material solutions for FCBGA are poised to play a pivotal role in rapidly expanding sectors, including AI accelerators, HPC, and 5G/6G communication modules. The company's underfills and thermally conductive molding materials will be indispensable components for ensuring stable operation and long-term reliability, particularly in environments with continually increasing thermal loads. These technologies are expected to accelerate innovation across the electronics industry, contributing to the market introduction of higher-performance and more durable products.

Source: https://www.krayden.com/articles/flip-chip-bga

Collected: September 04, 2026 | Automated Research System (Gemini API)

#05 Krayden Supplies High Thermal Conductivity Hysol GR60 Series EMC for IPMs, Enhancing Reliability of Automotive and Industrial Modules with 2.2 W/mK

Published August 27, 2026 Krayden USA



OVERVIEW

Krayden offers advanced encapsulation solutions for Intelligent Power Modules (IPMs), featuring Hysol GR60 series epoxy mold compounds (EMC) with superior thermal conductivity. The GR60 HT variant achieves a thermal conductivity of 2.2 W/mK, significantly boosting reliability for IPMs in high-thermal-load environments across motor control, industrial, and automotive electronics. Krayden also highlights direct potting with liquid encapsulants (epoxy or silicone) for optimized thermal performance, delamination resistance, and thermal cycling endurance, emphasizing material selection's critical role.

IN DEPTH

Key Findings

Krayden provides epoxy mold compound (EMC) solutions for Intelligent Power Modules (IPMs) that deliver high thermal conductivity and exceptional reliability. Specifically, Hysol's GR60 series EMC has been developed to meet the stringent thermal requirements of IPM applications, with the GR60 HT grade boasting an impressive thermal conductivity of 2.2 W/mK. This technology is crucial for ensuring the long-term performance and durability of IPMs in motor control, industrial applications, and automotive electronics.

Technical / Clinical Details

IPMs integrate power devices and control circuits, and their high level of integration and high-power operation necessitate efficient thermal management and robust environmental protection. Krayden widely employs transfer molding encapsulation, with the Hysol GR60 series EMC playing a central role.

- **High Thermal Conductivity:** The GR60 HT achieves a high thermal conductivity of 2.2 W/mK, efficiently dissipating heat generated within the IPM to the outside. This suppresses device temperature rise and prevents thermal degradation.
- **Superior Reliability:** In addition to high thermal conductivity, the GR60 series offers excellent moisture resistance, thermal cycling performance, and mechanical strength, guaranteeing the long-term reliability of IPMs in harsh operating environments. This makes them suitable for applications where failure is unacceptable, such as industrial equipment and automotive systems.
- **Flowability and CTE Control:** The flowability of the EMC is vital for uniform filling even into the intricate internal structures of IPMs. Furthermore, by minimizing the Coefficient of Thermal Expansion (CTE) mismatch between the chip and the substrate, it prevents package warpage and cracks caused by thermal stress.

Beyond transfer molding, Krayden also recommends direct potting with liquid encapsulants (epoxy or silicone resins) for power modules. In this approach, careful material selection, considering specific thermal performance, delamination resistance, and exposure to thermal cycling, is extremely important.

Background & Context

The rapid development of fields such as electric vehicles (EVs), renewable energy systems, and industrial automation has led to an increased demand for high-efficiency and reliable power electronics. IPMs are central components in these applications, requiring higher power density and performance under severe operating conditions. Consequently, thermal management and robust encapsulation of IPMs are critical factors that directly impact not only device performance but also the safety and lifespan of the entire system.

Strategic Significance & Outlook

High thermal conductivity EMCs, such as the Hysol GR60 series offered by Krayden, are indispensable technologies for accelerating the growth of the IPM market. Particularly in the automotive electronics sector, with the proliferation of EVs, the demand for IPMs in motor control and battery management systems is expanding, and improving their reliability significantly influences market competitiveness. Moving forward, the development of higher-performance, more thermally resistant, and more reliable encapsulation solutions will continue to be a major theme in the power electronics industry.

Source: https://www.krayden.com/articles/intelligent-power-module

Collected: September 04, 2026 | Automated Research System (Gemini API)

#07 Henkel Unveils Loctite ABLESTIK CDF900 Series Conductive Die Attach Film with >8 W/m-K Thermal Conductivity for AI and HPC Packages

Published September 02, 2026 SpecialChem Germany

OVERVIEW

Henkel Adhesive Technologies has introduced the new Loctite ABLESTIK CDF900 series conductive die attach film (cDAF), revolutionizing advanced packaging for AI accelerators and HPC processors. This innovative material boasts a thermal conductivity exceeding 8 W/m-K, eliminating bleed-out and ensuring uniform bondline thickness, particularly for large die packaging. It significantly enhances efficient thermal management and design flexibility for high-power-generating devices, bolstering performance and reliability in next-generation electronics, including 5G/6G front-ends.

IN DEPTH

Key Findings

Henkel Adhesive Technologies has announced the new Loctite ABLESTIK CDF900 series of conductive Die Attach Films (cDAF), poised to revolutionize advanced packaging techniques for Artificial Intelligence (AI) accelerators and High-Performance Computing (HPC) processors. This innovative material achieves an exceptionally high thermal conductivity exceeding 8 W/m-K. Critically, it completely eliminates bleed-out and guarantees a uniform bondline thickness, especially in large die packaging. These advancements dramatically improve efficient thermal management and design flexibility for high-heat-generating devices.

Technical / Clinical Details

The Loctite ABLESTIK CDF900 series is specifically engineered to address thermal challenges arising from the increasing chip density and power consumption in AI and HPC advancements. Its film format offers several distinct advantages over traditional paste adhesives:

- **Ultra-High Thermal Conductivity:** Boasting a thermal conductivity greater than 8 W/m-K, it efficiently transfers heat from high-power chips to the heatsink. This capability is indispensable for maintaining the performance and extending the lifespan of devices like AI accelerators.
- **Elimination of Bleed-Out:** As a film, it prevents the "bleed-out" phenomenon, where adhesive seeps beyond the die edges. This prevents package contamination and eliminates adverse effects on surrounding components.
- **Uniform Bondline Thickness:** The physical properties of the film ensure a consistently uniform adhesive layer thickness. This is crucial for maintaining the consistency of the thermal conduction path and enhancing overall reliability.
- **Optimization for Large Die Packaging:** Provides design flexibility to accommodate larger chips and effectively controls warpage and component stress in large packages.

In addition to this cDAF series, Henkel also offers a broad portfolio of semiconductor packaging materials, including high thermal conductivity liquid molding compounds for warpage and component stress control, and capillary underfills. These are essential for supporting the reliability and performance of advanced 5G/6G front-end modules and other highly integrated electronic devices.

Background & Context

The rapid evolution of technologies such as AI, HPC, and 5G/6G communications has led to exponential increases in semiconductor chip performance and integration density. However, the accompanying rise in power density and heat generation presents one of the biggest challenges for long-term device reliability and performance sustainability. Material suppliers are focused on developing more efficient heat transfer materials and form factors that simplify manufacturing processes and improve reliability to overcome this thermal barrier. Film-based die attach materials, due to their precise application and uniformity, are emerging as a critical solution to meet this need.

Strategic Significance & Outlook

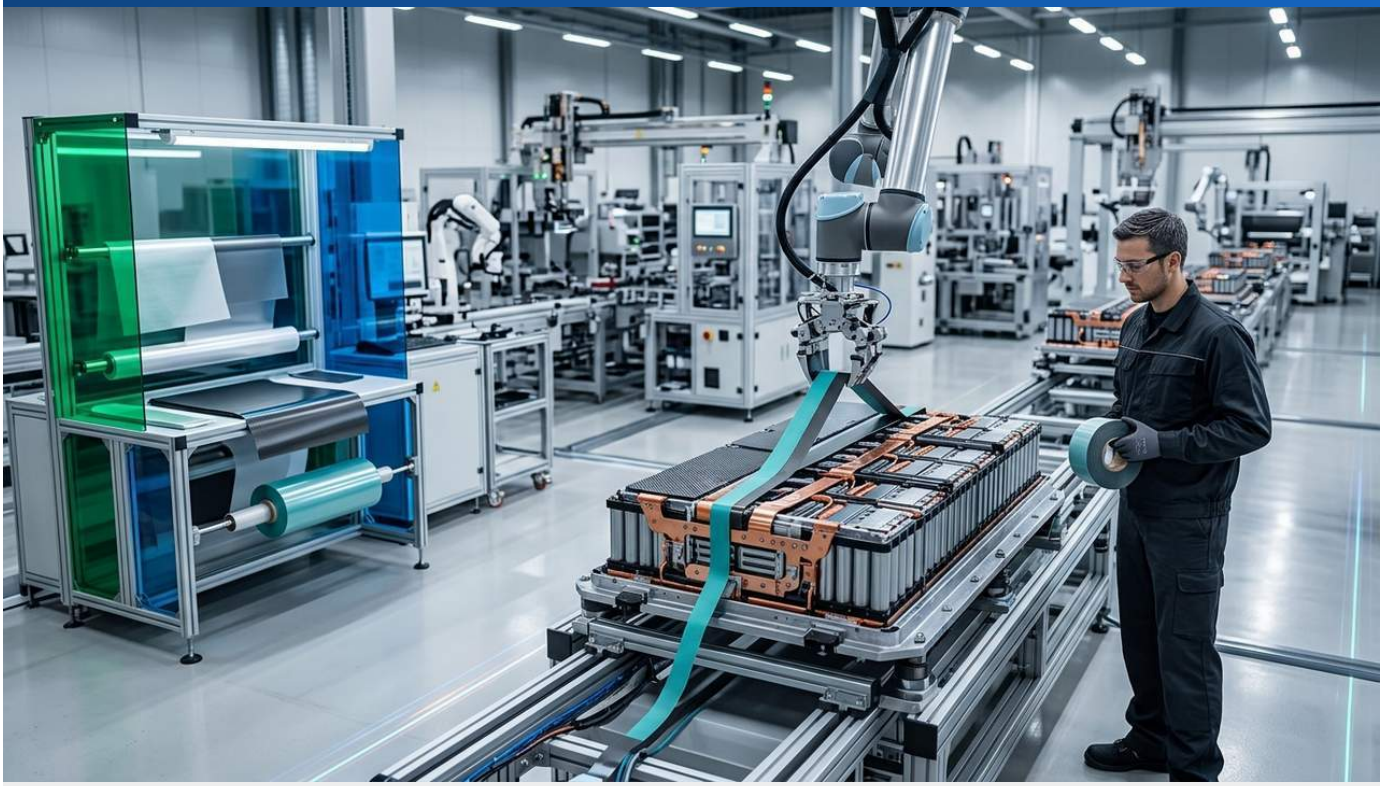
Innovative cDAFs like the Loctite ABLESTIK CDF900 series will serve as foundational technologies supporting the future growth of the AI and HPC sectors. By combining high thermal conductivity with process advantages, semiconductor manufacturers can develop and bring to market more powerful and reliable chips. This technology is expected to be widely adopted across all high-performance demanding sectors, including data centers, autonomous vehicles, and consumer electronics, accelerating the next generation of innovation. Henkel is poised to further strengthen its leadership in this domain.

Source: https://www.specialchem.com/adhesives/news/henkel-introduces-conductive-die-attach-film-for-ai-and-hpc-packages

Collected: September 04, 2026 | Automated Research System (Gemini API)

#09 Saint-Gobain Offers High-Performance Adhesives and Bonding Tapes, Including PFAS-Free Alternatives, for EV Battery Applications

Published August 27, 2026 Saint-Gobain France



OVERVIEW

Saint-Gobain provides comprehensive high-performance adhesive and bonding tape solutions, gasket foams, spacer tapes, and specialty films for demanding industries like electronics, energy, aerospace, and especially EV battery applications. The company highlights Norbond® Attachment Solutions for reliable component bonding and actively develops PFAS-free tape alternatives and adhesive materials to address environmental concerns. Its product portfolio also includes essential adhesive tapes and thermal gap fillers for EV battery thermal management and durability enhancement.

IN DEPTH

Key Findings

Saint-Gobain offers a comprehensive suite of high-performance adhesive and bonding tapes, gasket foams, spacer tapes, and specialty films for exceptionally demanding industrial sectors, including electronics, energy, aerospace, and notably, electric vehicle (EV) battery applications. The company specifically emphasizes its Norbond® Attachment Solutions for achieving reliable component bonding. Concurrently, to meet escalating environmental regulations and sustainability demands, Saint-Gobain is actively focused on the development and provision of PFAS-free tape alternatives and adhesive materials.

Technical / Clinical Details

Saint-Gobain's product portfolio is built upon advanced material technologies that address diverse industrial needs.

- **High-Performance Adhesive and Bonding Tapes:** These tapes deliver high bond strength and durability, enabling reliable component attachment in harsh environments. Their performance is particularly crucial for cell fixation within EV battery modules and for bonding thermal management components.
- **Gasket Foams and Spacer Tapes:** These materials fulfill roles in sealing, cushioning, and thermal management. They contribute to vibration absorption, impact protection, and the optimization of thermal conduction pathways.
- **Specialty Films:** Provide functionalities such as protection, insulation, and barrier properties, enhancing device performance and longevity.
- **Norbond® Attachment Solutions:** Demonstrate robust bonding performance across various applications, including automotive interior/exterior component attachment, display panel fixation, and long-term solar panel installation. They offer excellent weatherability and durability, also contributing to the simplification of assembly processes.

- **PFAS-Free Alternatives:** In response to strengthening environmental regulations, Saint-Gobain is concentrating on developing materials free from PFAS (per- and polyfluoroalkyl substances), which have been identified as hazardous. This reflects the company's commitment to reducing environmental impact throughout the product lifecycle and delivering safer products.

Specifically, EV battery adhesive tapes and thermal gap fillers are indispensable for preventing thermal runaway in battery systems, facilitating efficient heat dissipation, and protecting against vibrations, directly contributing to improved EV safety and range.

Background & Context

The electronics, aerospace, and automotive industries are constantly pursuing higher performance, lightweighting, and environmental compatibility. The proliferation of electric vehicles, in particular, has highlighted the increasing complexity of battery systems and the associated challenges in thermal management and safety. Simultaneously, PFAS regulations are tightening globally, compelling companies to accelerate the development of alternative materials. In this context, material suppliers like Saint-Gobain play a crucial role in supporting the sustainable growth of these industries by providing innovative material technologies and environmentally conscious solutions.

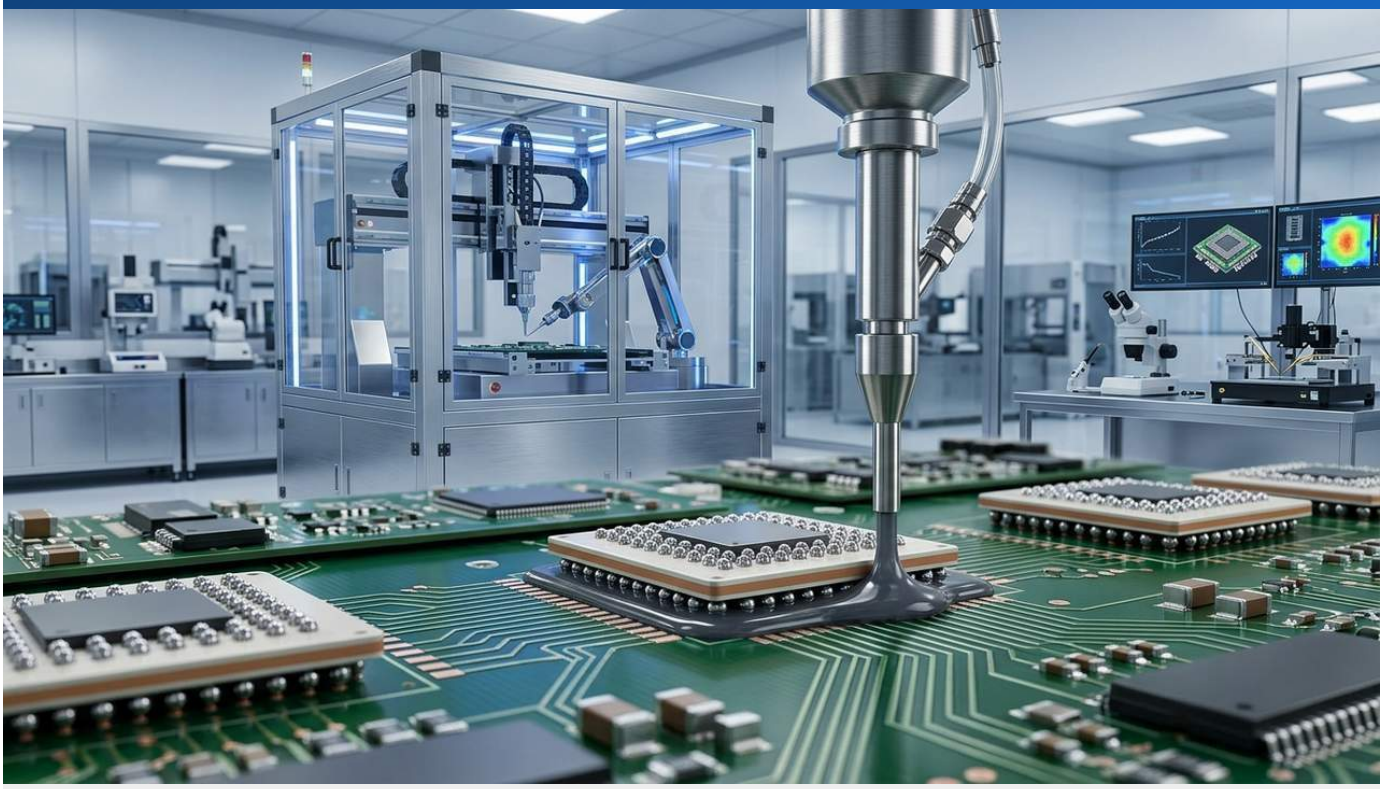
Strategic Significance & Outlook

Saint-Gobain's high-performance adhesive and bonding solutions, especially its product range for EV batteries and PFAS-free alternatives, are expected to become even more critical in future markets. The expansion of the electric vehicle market and the implementation of stricter environmental regulations will continue to stimulate demand for the company's technologies. These materials are anticipated to significantly contribute to the development of various industries by enhancing product performance, reliability, safety, and sustainability, thereby enabling next-generation innovations.

Source: https://www.tapesolutions.saint-gobain.com/en-us

#10 Master Bond Offers Epoxy Underfill Formulations to Boost Reliability for Flip-Chip and CSP Assemblies

Published August 27, 2026 Master Bond USA



OVERVIEW

Master Bond provides epoxy underfill formulations designed to significantly enhance the long-term reliability of flip-chip and chip-scale packaging (CSP) assemblies. These materials achieve excellent adhesion to die passivation and various substrates, providing enhanced mechanical support while mitigating stress on solder joints. The company highlights its EP4UF-80, a single-component, low-viscosity, high-temperature-curable epoxy, emphasizing the importance of optimal selection of modulus, adhesion, CTE, and fillet shape to address thermal and mechanical challenges in modern electronic assemblies.

IN DEPTH

Key Findings

Master Bond provides high-performance epoxy underfill formulations specifically designed to significantly enhance the long-term reliability of flip-chip and chip-scale packaging (CSP) assemblies. These materials establish superior adhesion to die passivation layers and a variety of substrates, concurrently bolstering mechanical support while effectively mitigating stress on solder joints that arises from Coefficient of Thermal Expansion (CTE) mismatch. Furthermore, they play a crucial role in protecting vital electronic components from moisture and other environmental factors.

Technical / Clinical Details

Master Bond's underfill formulations are engineered with specific properties to meet the rigorous demands of modern electronic assemblies.

- **Excellent Adhesion:** Achieves strong adhesion to die passivation layers and various substrates (e.g., organic and ceramic), preventing delamination at the interface.
- **Enhanced Mechanical Support:** Physically supports solder bumps, improving resistance to external shocks and vibrations.
- **Stress Relief for Solder Joints:** Absorbs and disperses thermal stresses caused by CTE mismatch between the chip and substrate, preventing fatigue failure of solder joints and enhancing reliability.
- **Moisture Protection:** Provides a high barrier against moisture and ionic contaminants from reaching solder joints and chip surfaces, thereby reducing the risk of short circuits and corrosion.
- **Product Example "EP4UF-80":** A notable product is EP4UF-80, a single-component, low-viscosity epoxy that is curable at high temperatures. This material combines rapid curing with excellent flowability, enabling uniform filling into fine gaps. Its low CTE effectively manages stress during thermal cycling.

To optimize these characteristics, the material's modulus, adhesion, CTE, and the fillet shape after curing are critically important. Master Bond offers solutions that precisely control these elements.

Background & Context

The advancement of smartphones, wearable devices, IoT gadgets, and High-Performance Computing (HPC) demands ever-increasing miniaturization, higher density, and enhanced performance in semiconductor packaging. Flip-chip technology and CSPs are primary approaches to meet these requirements, but they concurrently introduce challenges related to thermomechanical stress due to CTE mismatch between the chip and substrate. Underfill materials are indispensable for solving this issue and ensuring the long-term reliability of devices, thus increasing their importance.

Strategic Significance & Outlook

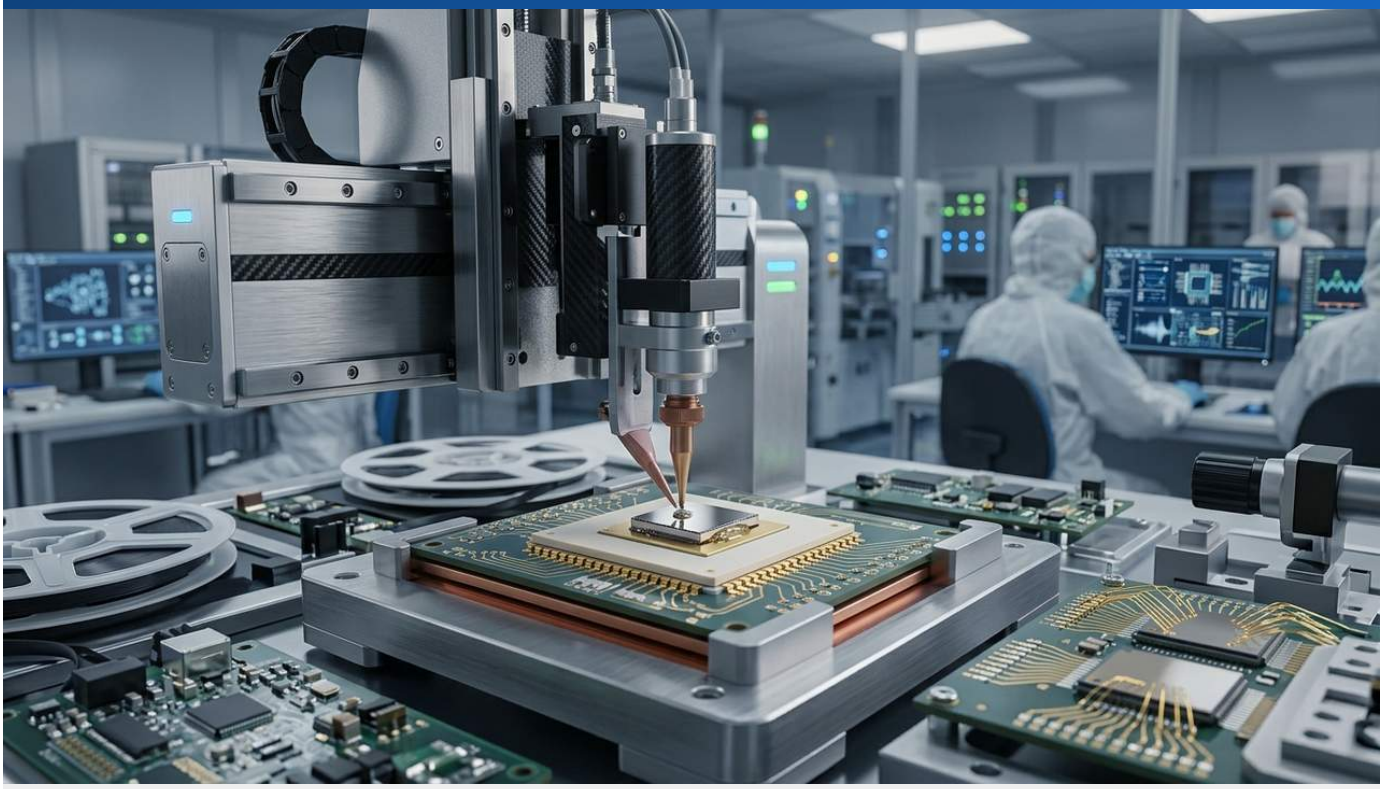
Master Bond's advanced underfill formulations will play a critical role in the future improvement of performance and reliability in electronic devices. Particularly in devices operating under harsher conditions, such as 5G/6G communication modules, AI accelerators, and automotive electronics, underfills are essential for providing thermal management, mechanical protection, and electrical stability. The company's technology is expected to support the evolution of these cutting-edge applications, contributing to the realization of smaller, more robust, and longer-lasting electronic products.

Source: https://www.masterbond.com/industries/underfill-encapsulants

Collected: September 04, 2026 | Automated Research System (Gemini API)

#11 Master Bond Offers High-Strength, High-Reliability Die Attach Epoxy Adhesives for Microelectronics

Published August 27, 2026 Master Bond USA



OVERVIEW

Master Bond provides die attach epoxy adhesives for microelectronic semiconductor packaging and chip-on-board assemblies, featuring high bond strength, thermal cycling resistance, mechanical shock/vibration resistance, dimensional stability, and low ionic impurities. Available as one-component heat-curable formulations and B-stage epoxy films, these enable rapid curing for high-volume production and robust bonding to substrates with differing Coefficients of Thermal Expansion (CTE). The electrically insulating film FL901AO and epoxy EP17HTDA-1 are specifically noted for their superior die shear strength.

IN DEPTH

Key Findings

Master Bond offers a comprehensive range of die attach epoxy adhesives characterized by exceptional bond strength, thermal cycling resistance, mechanical shock and vibration resistance, dimensional stability, and low ionic impurities. These adhesives are designed to meet the rigorous demands of microelectronic semiconductor packaging and chip-on-board assemblies. Available as both one-component heat-curable formulations and B-stage epoxy films, they facilitate rapid curing for high-volume production while ensuring robust bonding between substrates with differing Coefficients of Thermal Expansion (CTE).

Technical / Clinical Details

Master Bond's die attach epoxy adhesives represent a critical technology for supporting the performance and reliability of modern electronic devices. Their key characteristics and product examples are as follows:

- **High Bond Strength:** Provides extremely high die shear strength, permanently securing the chip to the substrate. Examples include the electrically insulating film FL901AO and the electrically insulating epoxy EP17HTDA-1, both demonstrating exceptionally high die shear strength.
- **Thermal Cycling Resistance:** Withstands stresses arising from thermal expansion and contraction between materials with different CTEs, ensuring long-term stable operation of devices. This maintains reliability even in environments exposed to extreme temperature fluctuations.
- **Mechanical Shock and Vibration Resistance:** Protects the chip and bond joint from external impacts and vibrations, enhancing device robustness.
- **Dimensional Stability:** Maintains stable dimensions after curing, a crucial factor in precise packaging applications.
- **Low Ionic Impurities:** Features extremely low levels of ionic impurities, preventing corrosion and adverse electrical effects on sensitive semiconductor devices. This directly contributes to extending device lifespan and maintaining reliability.

- **Rapid Curing:** Capable of rapid heat curing to accommodate high-volume production processes. This improves production efficiency and contributes to reduced manufacturing costs.

These adhesives can be used with various assembly technologies, including wire bonding, flip-chip, and COB (Chip-on-Board).

Background & Context

The increasing demand for semiconductors in fields such as information and communication technology, automotive electronics, and consumer electronics is driving miniaturization, higher integration, and enhanced performance. Die attach materials, in particular, serve as the heart of semiconductor packaging, responsible for thermal transfer, electrical connection, and mechanical fixation between the chip and substrate. Their performance directly impacts the overall reliability and lifespan of the device. Stricter environmental regulations also impose requirements such as halogen-free and RoHS compliance on adhesives, leading suppliers like Master Bond to develop products that meet these criteria.

Strategic Significance & Outlook

Master Bond's die attach epoxy adhesives will be indispensable materials in next-generation high-performance electronic devices, including 5G/6G communication, AI accelerators, IoT devices, and power modules for electric vehicles. The continuous evolution of these adhesives will contribute to the realization of semiconductor devices that enable higher power density, smaller form factors, and operation under more extreme environmental conditions. The company is expected to continue advancing the development of even higher-performance die attach solutions to meet market needs.

Source: https://www.masterbond.com/industries/die-attach-epoxy-adhesives

Collected: September 04, 2026 | Automated Research System (Gemini API)

#12 P Equity Research Analyzes Advanced Semiconductor Packaging: Illuminating the Roles of Underfill and Mold in 2.5D and CoWoS Architectures

Published September 01, 2026 P Equity Research Global

OVERVIEW

A P Equity Research article delves into advanced semiconductor packaging, including 2.5D and CoWoS architectures, detailing the crucial role of adhesives and encapsulants when processors and memory layers are mounted on interposers. It highlights underfill's function as a bump cushion against thermal cycling in flip-chip bonding, and epoxy mold compounds' role in encapsulating assemblies for environmental protection. The article also mentions thermal compression bonding (TCB) for HBM and hybrid bonding for direct copper-to-copper connections in 3D stacking, showcasing material technology evolution to meet complex next-gen semiconductor requirements.

IN DEPTH

Key Findings

A recent article from P Equity Research analyzes the evolution of advanced semiconductor packaging technologies, including 2.5D and CoWoS (Chip-on-Wafer-on-Substrate) architectures. It elucidates the critical role of adhesive and encapsulant materials when processor and memory layers are mounted on interposers. The article emphasizes that underfill in flip-chip bonding functions as a cushioning material for bumps against thermal cycling, and epoxy mold compounds are crucial for encapsulating assemblies to protect them from environmental elements.

Technical / Clinical Details

At the core of advanced packaging technologies lies the efficient and high-density integration of multiple chips. The article primarily focuses on the following technologies and the roles of their adhesive and encapsulant materials:

- **2.5D and CoWoS Architectures:** This configuration involves horizontally placing multiple dies, such as processors and HBM (High Bandwidth Memory), on a silicon interposer. This interposer enables high-speed, high-density electrical connections between chips. Adhesives and encapsulants play a vital role in mechanically securing this complex structure and providing thermal and environmental protection.
- **Role of Underfill in Flip-Chip Bonding:** In flip-chip bonding, chips are directly connected to the substrate via solder bumps. Due to the Coefficient of Thermal Expansion (CTE) mismatch between the chip and the substrate, stress concentrates on the bumps during thermal cycling. Underfill fills the microscopic gaps between these bumps, absorbing and dispersing stress to significantly improve the reliability and lifespan of solder joints. The article describes this as acting as a "cushioning material for bumps" against thermal cycling.
- **Role of Epoxy Mold Compounds (EMC):** While underfill provides protection around the bumps, EMC encapsulates the entire package, protecting the delicate internal components from external environmental threats such as moisture, chemicals, and mechanical shock.

- **Thermal Compression Bonding (TCB):** A technology that achieves fine bump pitches for connections in high-layer stacks like HBM. It enhances process efficiency and reliability by simultaneously introducing underfill.
- **Hybrid Bonding:** The latest technology enabling 3D stacking, achieving direct copper-to-copper connections between chips. This technology can eliminate the need for underfill materials, further improving connection density and performance.

These materials and processes are indispensable for optimizing the performance, reliability, and manufacturing yield of next-generation semiconductors.

Background & Context

Technological innovations in AI, HPC, 5G/6G, and other fields demand unprecedented levels of performance and integration density from semiconductor chips. As the limits of Moore's Law become apparent, advanced packaging has emerged as a solution. Specifically, 2.5D and 3D packaging, when combined with chiplet technology, are key to achieving system-level performance improvements and miniaturization. In such complex structures, material selection and process control are paramount in determining the quality and reliability of the final product.

Strategic Significance & Outlook

The role of adhesives and encapsulants analyzed by P Equity Research will only grow in importance for the further performance enhancement of AI accelerators and HBM, as well as the realization of more complex chiplet integration. The emergence of new technologies like hybrid bonding may also bring changes to the roles of underfill and EMC, requiring material manufacturers to continue research and development to meet these evolving requirements. These technological innovations are expected to serve as a foundation for accelerating innovation across a wide range of future fields, including data centers, autonomous vehicles, and consumer electronics.

Source: https://pequityresearch.substack.com/p/know-your-substrate-part-2-decoding

Collected: September 04, 2026 | Automated Research System (Gemini API)

#13 Tom's Hardware Reports: TSMC Achieves 6-Micron Hybrid Bonding, Full HBM Integration Potentially Delayed to HBM4E/HBM5 (2027-Late 2020s)

Published September 02, 2026 Tom's Hardware USA

OVERVIEW

Tom's Hardware reports on the 2026 status of hybrid bonding, revealing TSMC's SoIC achieves 3.5D integration by combining hybrid-bonded stacks with CoWoS modules on silicon interposers, reaching 6-micron precision. Conversely, SK hynix continues to use advanced Mass Reflow–Molded Underfill (MR-MUF) for 16-layer HBM4, reportedly showcasing non-hybrid-bonded 16-layer HBM4 samples at CES 2026. This suggests that the widespread adoption of hybrid bonding for HBM may be delayed until the HBM4E and HBM5 generations, anticipated from 2027 to the late 2020s.

IN DEPTH

Key Findings

According to a report from Tom's Hardware, the current state of hybrid bonding technology in 2026 reveals that TSMC's Systems-on-Integrated-Chiplets (SoIC) achieves 3.5D integration by combining hybrid-bonded stacks with CoWoS modules on silicon interposers, reaching a high precision of 6 microns. However, the full-scale implementation of hybrid bonding for High Bandwidth Memory (HBM) is anticipated to be delayed until the HBM4E and HBM5 generations, projected from 2027 to the late 2020s. It was confirmed that SK hynix is still employing advanced Mass Reflow–Molded Underfill (MR-MUF) technology for its 16-layer HBM4 products.

Technical / Clinical Details

Hybrid bonding is a direct copper-to-copper connection technology for chip-to-chip or chip-to-wafer, offering significant advantages over traditional flip-chip bonding with microbumps. These advantages include substantially increased connection density, improved electrical performance, and reduced thermal resistance. In some cases, it can even eliminate the need for underfill materials and reduce package height.

- **TSMC's SoIC and 3.5D Integration:** TSMC is a frontrunner in implementing hybrid bonding within its SoIC technology. This technique involves vertically stacking multiple dies (3D) and then placing them on a CoWoS (Chip-on-Wafer-on-Substrate) module, achieving an advanced packaging known as 3.5D integration. The 6-micron bonding precision enables extremely dense connections compared to previous technologies.
- **SK hynix's HBM4 Strategy:** SK hynix, a key player in HBM development, continues to utilize advanced MR-MUF technology even for its next-generation 16-layer HBM4 products. The fact that the 16-layer HBM4 samples showcased by the company at CES 2026 did not use hybrid bonding suggests that there are still technical challenges to be resolved for hybrid bonding in HBM, particularly concerning yield and manufacturing costs in high-layer stacks.

- **Delay in Hybrid Bonding Adoption for HBM:** The article points out that the full-scale adoption of hybrid bonding for HBM is likely to be pushed back to even later generations, such as HBM4E (an extended version of HBM4) and HBM5 (expected in the late 2020s). This delay is likely due to the extremely stringent manufacturing requirements for high-layer HBM stacks, especially challenges in warpage control and thermal management, which are impeding the complete practical application of hybrid bonding.

Background & Context

The rapid advancements in Artificial Intelligence (AI) and High-Performance Computing (HPC) impose unprecedented demands on semiconductor packaging technology. HBM, in particular, is a critical component that dictates the performance of AI accelerators, and further increasing its bandwidth and capacity requires the evolution of 3D integration technologies. Hybrid bonding is considered the ultimate technology for achieving this goal, but due to its complexity and manufacturing difficulty, it is being introduced incrementally. The entire industry is closely watching how this technology will be integrated into future generations of HBM.

Strategic Significance & Outlook

TSMC's pioneering adoption of hybrid bonding and its achievement of 6-micron precision clearly indicate that this technology will become a cornerstone of next-generation semiconductor packaging. However, applying it to ultra-high-layer, high-density stacks like HBM still requires further technological maturity, as suggested by the SK hynix case. The full-scale implementation of hybrid bonding in HBM4E and HBM5 from 2027 onwards will be key to dramatically enhancing AI chip performance and revolutionizing AI processing capabilities in data centers and edge devices. Material suppliers and manufacturing equipment manufacturers need to account for this delay and accelerate the development of solutions that meet future mass production requirements by strengthening collaboration with HBM manufacturers.

Source: https://www.tomshardware.com/tech-industry/semiconductors/hybrid-bonding-roadmap-

examined

#14 Advanced Die Attach Solder Paste for High-Power Packaging: Achieving >60-70 W/m·K Thermal Conductivity and Precision Filling

Published August 28, 2026 Global SMT & Packaging Global

OVERVIEW

A Global SMT & Packaging article emphasizes the critical role of die attach solder paste in high-power packaging, achieving excellent thermal conductivity of 60-70 W/m·K (and >70 W/m·K with Cu/Ni reinforcing phases), high bond strength, precise gap filling, and environmental adaptability. These tin-alloy-based pastes can significantly reduce chip junction temperatures in IGBT packaging from 125°C to 105°C, extending module lifespan. Utilizing ultra-fine powders and low-viscosity formulations ensures precise, void-free filling even in confined spaces, critical for devices like solid-state LiDAR emitter modules.

IN DEPTH

Key Findings

In the high-power packaging sector, die attach solder paste has been highlighted as playing an exceptionally critical role as a key material. These pastes achieve superior thermal conductivity, ranging from 60-70 W/m·K (and exceeding 70 W/m·K with the addition of copper/nickel reinforcing phases), demonstrate very high bond strength, enable precise gap filling capabilities, and offer broad environmental adaptability. Notably, these tin-alloy-based pastes possess groundbreaking potential to significantly reduce chip junction temperatures in IGBT (Insulated Gate Bipolar Transistor) packaging, potentially from 125°C to 105°C, thereby extending module lifespan.

Technical / Clinical Details

The evolution of die attach solder paste is particularly characterized by the following technological advancements:

- **High Thermal Conductivity:** While standard solder pastes offer thermal conductivity of 60-70 W/m·K, the addition of reinforcing phases such as copper (Cu) and nickel (Ni) can achieve thermal conductivities exceeding 70 W/m·K. This allows for efficient heat dissipation from high-heat-generating devices, suppressing device temperature rise, and improving performance and reliability.
- **High-Strength Bonding:** Provides robust mechanical bonding between the chip and substrate, enhancing durability against thermal cycling and mechanical shock. This maintains device stability even under harsh operating conditions.
- **Precise Gap Filling and Void-Free Performance:** Ultra-fine metal powders and optimized low-viscosity formulations enable precise and uniform gap filling while suppressing the formation of voids, even in very narrow spaces. This is particularly crucial for devices requiring extremely high precision, such as solid-state LiDAR emitter modules. Void reduction maximizes heat transfer efficiency and prevents hot spot formation.

- **Reduced Chip Junction Temperature:** In IGBT packaging, it has been demonstrated that chip junction temperatures can be significantly reduced, for example, from 125°C to 105°C, compared to conventional bonding technologies. This directly contributes to reducing thermal stress and extending the long-term reliability and lifespan of modules.
- **Environmental Adaptability:** Formulations compliant with lead-free standards and other environmental regulations are being developed, meeting the requirements for green electronics.

These properties are indispensable in applications demanding high power and high reliability, such as electric vehicles, renewable energy, and industrial control systems.

Background & Context

The rapid development of fields such as electric vehicles (EVs), 5G/6G communication, data centers, and industrial power electronics demands increasingly higher power density and reliability from semiconductor devices. Consequently, efficient management of the heat generated within devices has become the greatest challenge for maintaining performance and extending lifespan. As die attach materials form one of the first and most critical layers in the heat transfer path from the chip to the heatsink, improving their performance is essential for supporting technological innovation in these industries. The balance between thermal conductivity and reliability, which was difficult with conventional bonding technologies, is now becoming possible through the evolution of solder pastes.

Strategic Significance & Outlook

The continuous evolution of high thermal conductivity die attach solder pastes will further push the performance and reliability of high-power packaging. These materials are expected to play an indispensable role in applications where heat generation is a critical bottleneck, such as EV inverters, charging stations, AI servers, and high-performance LED lighting. The widespread adoption of pastes with thermal conductivities exceeding 70 W/m·K will further lower device operating temperatures, enable operation at higher current densities, and ultimately contribute significantly to the development of next-generation electronics by improving system efficiency and lifespan.

Source: https://www.fitech-solderpaste.com/news/how-does-die-attach-solder-paste-conquer-high-power-packaging.html

#15 Master Bond Offers Eco-Friendly Solvent-Free, Halogen-Free, RoHS-Compliant Adhesive and Encapsulation Solutions

Published August 27, 2026 Master Bond USA

OVERVIEW

Master Bond offers a wide range of solvent-free, halogen-free, RoHS-compliant, and energy-efficient adhesives, sealants, coatings, potting, and encapsulation compounds, emphasizing reduced environmental impact. Notably, the company also develops isocyanate-free polyurethane systems and products utilizing recyclable, repairable, and biodegradable packaging materials. EP21LV, a low-viscosity, solvent-free epoxy adhesive/sealant, and LED401, a fast-curing, solvent-free LED-curable compound, exemplify Master Bond's commitment to combining high performance with environmental compatibility to meet diverse industrial needs.

IN DEPTH

Key Findings

Master Bond clearly articulates its commitment to reducing environmental impact and promoting sustainability by offering a broad range of adhesives, sealants, coatings, potting, and encapsulation compounds characterized by solvent-free formulations, halogen-free content, RoHS compliance, and energy-efficient designs. The company has specifically developed isocyanate-free polyurethane systems and products that utilize recyclable, repairable, and biodegradable packaging materials, providing innovative solutions to the market that combine high performance with environmental compatibility.

Technical / Clinical Details

Master Bond's eco-friendly product line is characterized by the following key properties and product examples:

- **Solvent-Free Formulations:** These products contain no organic solvents, minimizing the emission of volatile organic compounds (VOCs). This contributes to a safer working environment and reduces air pollution, facilitating compliance with environmental regulations.
- **Halogen-Free:** Designed without halogenated flame retardants and other specific chemicals, reducing environmental impact during disposal and complying with RoHS directives and other environmental regulations.
- **RoHS Compliant:** Adheres to directives on the restriction of hazardous substances, meeting essential requirements for widespread market acceptance.
- **Energy-Efficient Curing:** Includes products with energy-saving curing mechanisms such as low-temperature curing and UV/LED curing. For example, LED401, a fast-curing, solvent-free LED-curable compound, enables energy-efficient and highly productive manufacturing processes.
- **Isocyanate-Free Polyurethanes:** Offers polyurethane systems that do not use hazardous isocyanate compounds, reducing health risks for workers.
- **Recyclable, Repairable, and Biodegradable Packaging Materials:** The company extends its environmental considerations beyond the products themselves to their packaging materials, pursuing sustainability throughout the entire product lifecycle.

- **Product Example "EP21LV":** A low-viscosity, solvent-free epoxy adhesive/sealant that provides excellent bond strength to various substrates. It can be widely used for electronic component protection and structural bonding.

These materials are designed to meet the high-performance and stringent environmental standards required in a wide range of industries, including electronics, medical devices, aerospace, automotive, and renewable energy.

Background & Context

Growing global environmental awareness and stringent environmental regulations worldwide (e.g., EU RoHS, REACH) are driving significant changes for suppliers of adhesives, sealants, and coating materials. Companies are urgently tasked with developing sustainable solutions that maintain product performance while eliminating hazardous substances, reducing VOC emissions, and optimizing energy consumption. Companies like Master Bond are actively responding to these market trends, strengthening their green product portfolios to establish a competitive advantage.

Strategic Significance & Outlook

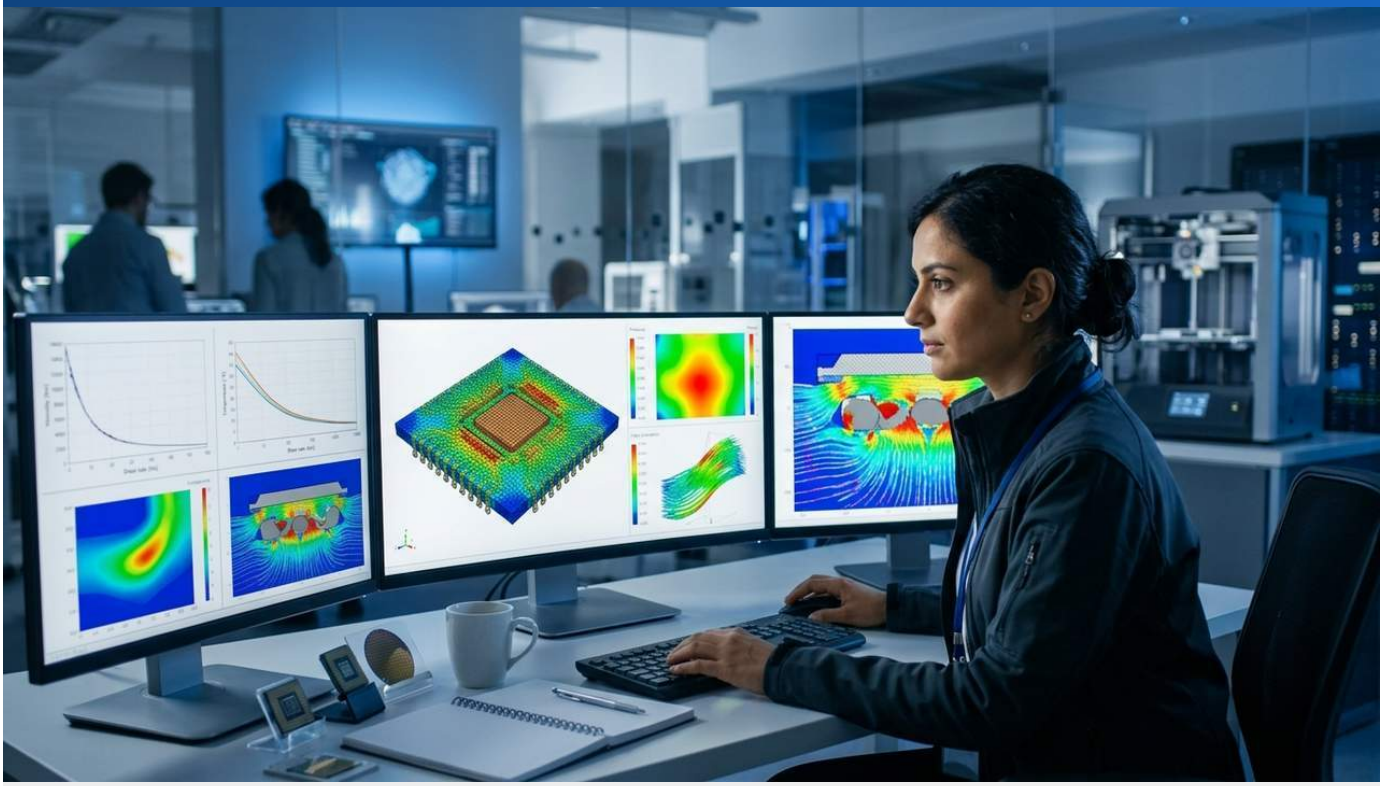
Master Bond's eco-friendly adhesive and encapsulation solutions are poised for continued market demand growth. These innovative materials will become indispensable, particularly in the electronics industry where miniaturization, performance enhancement, and increasingly strict environmental compliance demands are converging. Technologies such as LED-curable adhesives and isocyanate-free polyurethanes will also contribute to manufacturing process efficiency and safety improvements, playing a vital role in accelerating the realization of a sustainable society and the greening of industries.

Source: https://www.masterbond.com/properties/environmentally-friendly-adhesives

Collected: September 04, 2026 | Automated Research System (Gemini API)

#16 Moldex3D Compression Molding Simulation Achieves Semiconductor Package Defect Prediction and Quality Enhancement

Published August 27, 2026 Rheologist gaze & solutions (Moldex3D) Taiwan



OVERVIEW

Moldex3D provides CAE simulation tools for compression molding processes in advanced semiconductor packaging, enabling precise simulation of how encapsulating materials like epoxy mold compounds flow, compress, heat, and cure around semiconductor dies, substrates, and components. This simulation significantly aids in predicting package defects, optimizing mold design, and improving overall package quality by evaluating factors such as compression speed, mold temperature, material charge, and material properties. It is applied across IC packaging, wafer-level packaging, power semiconductor modules, and multi-chip packages, driving efficiency and reliability in design and manufacturing processes.

IN DEPTH

Key Findings

Moldex3D offers innovative CAE (Computer-Aided Engineering) simulation tools specifically for the compression molding process within advanced semiconductor packaging. This technology empowers engineers to precisely simulate how epoxy mold compounds (EMCs) and other encapsulating materials flow, compress, heat, and cure around semiconductor dies, substrates, and other internal components with exceptionally high accuracy. This precise simulation directly contributes to predicting package defects, optimizing mold design, and significantly enhancing the final product quality.

Technical / Clinical Details

Moldex3D's compression molding simulation provides advanced functionalities and benefits, including:

- **Flow Analysis:** Considers material viscosity, flow behavior, and curing kinetics to predict filling patterns and the risk of void formation within complex package structures. This allows for proactive identification of issues like incomplete filling and air traps, enabling optimization of mold design and process conditions.
- **Thermo-Mechanical Coupled Analysis:** Analyzes the impact of temperature changes and material thermal expansion/contraction on the package during the molding process. This helps predict thermomechanical defects such as warpage, stress, cracks, and delamination, and derive design and process improvements to mitigate their occurrence.
- **Process Condition Optimization:** Evaluates the influence of various process parameters—including compression speed, mold temperature, material preheat temperature, material charge amount, and holding pressure—on final package quality. This significantly reduces the number of prototyping cycles, shortening development time and costs.
- **Material Property Evaluation:** Allows for comparative evaluation of how different EMCs and encapsulating material properties (e.g., thermal conductivity, CTE, modulus, cure shrinkage) affect package performance and reliability.

This simulation technology is applicable across a wide range of advanced packaging applications, such as IC packaging, wafer-level packaging, power semiconductor modules, and multi-chip packages. Its importance is growing particularly in high-density, high-heat-generating packages like HBM (High Bandwidth Memory) and AI accelerators.

Background & Context

The semiconductor industry constantly demands smaller, higher-performing, and more reliable devices. Advanced packaging, particularly 3D stacking and chiplet technologies, is key to breaking through the limits of traditional 2D scaling. However, these technologies involve complex material behaviors and process challenges, and defects occurring during manufacturing significantly impact yield and product cost. CAE simulation serves as a powerful alternative to physical prototyping, playing an indispensable role in resolving these challenges.

Strategic Significance & Outlook

Moldex3D's compression molding simulation technology will further increase its value in the design and manufacturing of semiconductor devices that underpin next-generation technologies like AI, 5G/6G, and autonomous driving. Especially as thermal management becomes more complex and package miniaturization advances, the ability to predict defects and optimize manufacturing processes becomes a critical factor for competitiveness. This is expected to contribute to accelerated development cycles, reduced manufacturing costs, and faster time-to-market for final products, thereby driving innovation across the semiconductor industry.

Source: https://rgees.in/Compression-Molding-Simulation

Collected: September 04, 2026 | Automated Research System (Gemini API)

#17 Wevo Unveils WEVOSIL 26040 FL, a 4 W/m·K Silicone Gap Filler for High-Performance Thermal Management

Published August 27, 2026 Wevo Germany

OVERVIEW

Wevo has launched WEVOSIL 26040 FL, a new silicone gap filler thermal interface material (TIM) boasting a thermal conductivity of 4 W/m·K. Optimized for power electronics and battery technologies, this material features a very low bondline thickness of under 70 µm and high temperature resistance up to 200°C. Its UL 94 V-0 flame retardancy and mechanical robustness aim to enhance reliability and heat dissipation in demanding electronic assemblies.

IN DEPTH

Key Findings

Wevo has introduced WEVOSIL 26040 FL, a novel silicone gap filler thermal interface material (TIM) with a high thermal conductivity of 4 W/m·K, poised to revolutionize thermal management in power electronics and battery technologies. This innovation delivers superior heat dissipation, critical for the performance and longevity of high-power devices.

Technical Details

The WEVOSIL 26040 FL exhibits several key technical advancements:

- **High Thermal Conductivity:** Achieving 4 W/m·K, this material ensures efficient heat transfer, which is crucial for preventing overheating and maintaining optimal performance in high-power applications.
- **Ultra-Low Bondline Thickness:** With a bondline thickness of less than 70 µm, it minimizes thermal resistance between components and heat sinks, maximizing heat transfer efficiency.
- **Enhanced Stability:** The material demonstrates improved sedimentation stability and can withstand temperatures up to 200°C, ensuring long-term reliability in harsh operating conditions.
- **Flame Retardancy:** Meeting UL 94 V-0 standards, it provides critical safety features by reducing fire risks in electronic devices.
- **Mechanical Performance:** Its robust mechanical properties make it suitable for challenging electronic assemblies, offering reliable bonding and encapsulation.

This two-part RTV silicone also offers excellent processability, contributing to improved manufacturing efficiency and quality.

Background & Context

The relentless miniaturization and increased power density in modern power electronics and battery systems present significant thermal management challenges. Devices in electric vehicle (EV) battery modules, high-performance servers, and advanced computing units generate substantial heat, which directly impacts their performance, lifespan, and safety. Traditional TIMs often struggle to simultaneously meet the demands for high thermal conductivity, mechanical robustness, and long-term stability. Wevo's WEVOSIL 26040 FL directly addresses these critical industry gaps.

Strategic Significance & Outlook

The introduction of WEVOSIL 26040 FL is set to accelerate advancements in thermal management solutions for EV batteries and data center power devices. In a market increasingly demanding higher reliability and sustainable performance, this material has the potential to establish new industry benchmarks. Its application is expected to expand across a broader range of high-heat-generating electronic applications, significantly contributing to enhanced design flexibility and performance of future electronic systems globally. This innovation positions Wevo as a key enabler for next-generation thermal solutions.

Source: https://www.wevo-chemie.de/en/news-press/detailpage/new-silicone-gap-filler

Collected: September 04, 2026 | Automated Research System (Gemini API)

#18 WEVO-CHEMIE Develops High-Insulation, Thermally Conductive Polyurethane Potting System for EV Battery BMS

Published August 28, 2026 WEVO-CHEMIE GmbH Germany

OVERVIEW

WEVO-CHEMIE GmbH has developed WEVOPUR 60210 FL T, a polyurethane potting system for multilayer PCBs in EV battery management systems (BMS), offering 0.8 W/m·K thermal conductivity and dielectric strength exceeding 20 kV/mm. This material provides robust protection against mechanical stress, temperature changes, and moisture, while also featuring UL 94 V-0 flame retardancy. Its optimized rheology supports automated 'dam-and-fill' selective potting processes, significantly enhancing EV battery reliability and safety.

IN DEPTH

Key Findings

WEVO-CHEMIE GmbH has developed WEVOPUR 60210 FL T, a polyurethane potting system for multilayer PCBs in Electric Vehicle (EV) Battery Management Systems (BMS), featuring a thermal conductivity of 0.8 W/m·K and a dielectric strength greater than 20 kV/mm. This innovative material is designed to provide comprehensive protection against mechanical stress, temperature fluctuations, and moisture, thereby substantially improving the reliability and safety of EV batteries.

Technical Details

WEVOPUR 60210 FL T offers a range of critical properties:

- **High Electrical Insulation:** With a dielectric strength exceeding 20 kV/mm, it reliably protects PCBs from electrical failures, which is paramount in high-voltage EV battery systems.
- **Effective Thermal Conductivity:** A thermal conductivity of 0.8 W/m·K efficiently dissipates heat generated within the BMS, preventing component overheating. This contributes to stable system operation and an extended lifespan.
- **Tailored Mechanical Properties:** The material possesses optimized mechanical properties to shield electronic components from mechanical stress, temperature changes, and moisture, enhancing protection against shock and vibration.
- **Flame Retardancy:** It meets the UL 94 V-0 flammability rating, significantly improving safety in the event of a fire.
- **Excellent Processability:** Its rheological properties are optimized for automated 'dam-and-fill' selective potting processes, boosting manufacturing efficiency and ensuring consistent, high-quality encapsulation.

This material serves as an indispensable solution for guaranteeing the long-term stability and performance of BMS circuits within EV battery modules and packs.

Background & Context

With the rapid expansion of the electric vehicle market, battery safety and reliability have become top priorities for both consumers and regulatory bodies. The Battery Management System (BMS), which centrally monitors and controls battery cell health, demands high durability under harsh operating conditions. Factors such as temperature variations, moisture ingress, mechanical vibrations, and potential electrical stresses all elevate the risk of BMS failure. WEVO-CHEMIE GmbH's new potting system addresses these critical challenges, representing a significant technological contribution to accelerating EV adoption.

Strategic Significance & Outlook

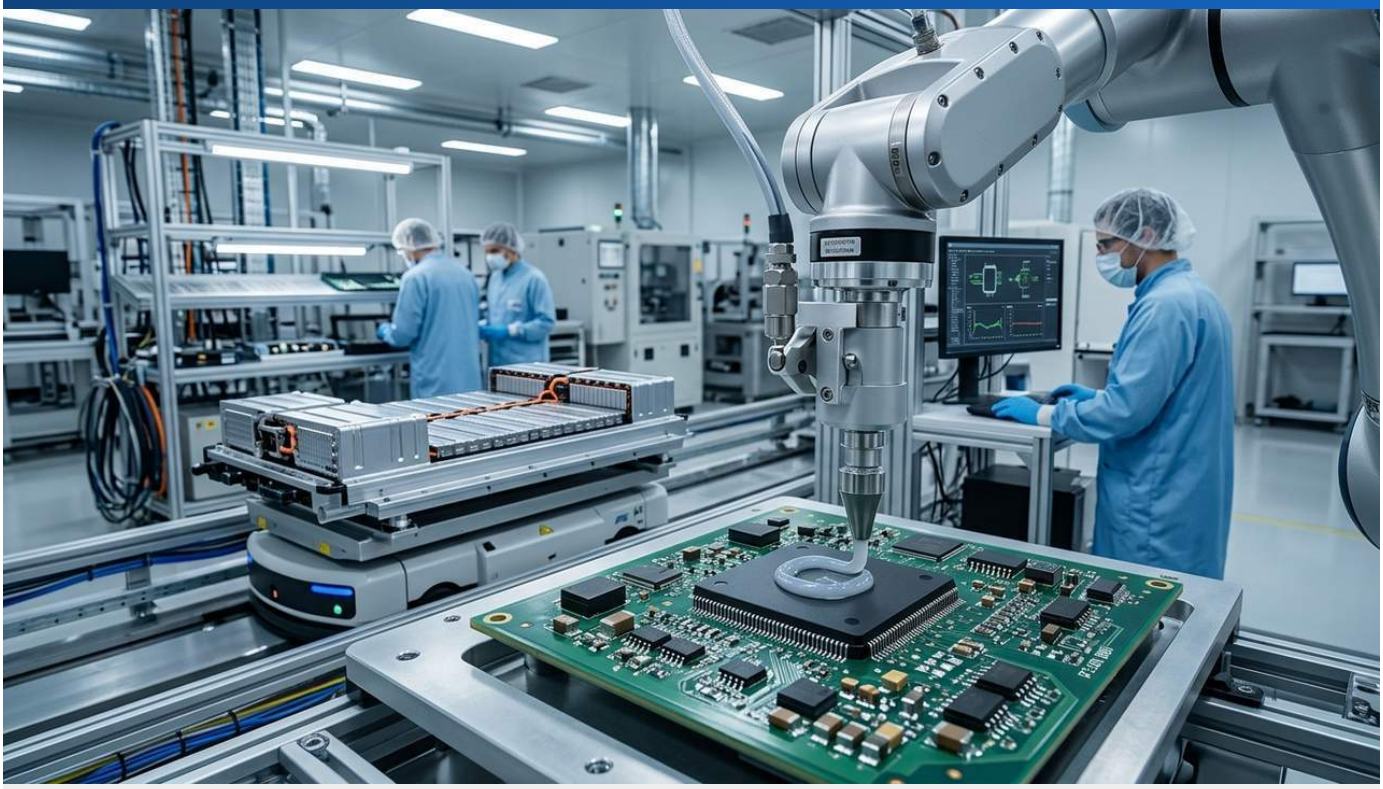
The introduction of WEVOPUR 60210 FL T is poised to set a new benchmark for safety and reliability in EV batteries. Its combination of high performance and excellent processability makes it an attractive choice for EV manufacturers. Beyond electric vehicles, this material is expected to find applications in other high-voltage and high-heat-generating systems, such as industrial power supplies and renewable energy conversion devices. This material will play a vital role in further driving technological innovation towards a sustainable mobility society.

Source: https://www.indianchemicalnews.com/electric-vehicles/polyurethane-potting-helps-protect-ev-battery-management-electronics-from-failure-31665

Collected: September 04, 2026 | Automated Research System (Gemini API)

#19 3M Supplies 5590H Thermally Conductive Acrylic Interface Pad for IC Chips and EV Batteries

Published September 02, 2026 Facebook (3M) USA



OVERVIEW

3M is supplying its 5590H Thermally Conductive Acrylic Interface Pad, designed to provide an efficient heat transfer path between high-heat-generating components like IC chips and EV batteries, and their respective heat sinks. This non-silicone acrylic elastomer pad, filled with thermally conductive ceramic particles, offers excellent conformability and tackiness. It effectively prevents overheating and enhances device reliability across consumer electronics, automotive applications, and general gap-filling needs.

IN DEPTH

Key Findings

3M is supplying the 5590H Thermally Conductive Acrylic Interface Pad, which provides a preferential heat transfer path between heat-generating components such as IC chips and Electric Vehicle (EV) batteries, and their heat sinks or spreaders. This product is crucial for preventing overheating and extending the long-term reliability of critical electronic devices.

Technical Details

Key technical features of the 3M 5590H Thermally Conductive Acrylic Interface Pad include:

- **Non-Silicone Acrylic Elastomer:** Utilizing an acrylic elastomer base without silicone eliminates the risk of siloxane contamination. This makes it suitable for use in cleanroom environments and near optical components.
- **Thermally Conductive Ceramic Particle Filling:** The material is uniformly filled with highly thermally conductive ceramic particles, creating an efficient pathway for heat transfer.
- **Excellent Conformability:** The soft pad easily conforms to irregular surfaces and minute gaps between components, minimizing thermal resistance and maximizing heat transfer efficiency.
- **Tackiness:** Its inherent tackiness allows for secure component-to-heat-sink attachment without the need for additional adhesives, simplifying the assembly process.
- **Broad Range of Applications:** The pad is effective across diverse applications, including consumer electronics (smartphones, tablets, laptops), automotive (EV batteries, in-vehicle electronic control units), and general electronic gap filling.

This pad plays a vital role in efficiently dissipating heat generated by specific components, thereby preventing system performance degradation and premature failure.

Background & Context

The advancement of AI, 5G, IoT, and EV technologies has led to increasing integration and functionality in electronic components, resulting in significant challenges related to heat generation. Particularly in EV batteries and high-performance IC chips, overheating poses severe risks to performance degradation and safety. Efficient thermal management is therefore a critical aspect of product design. High-performance thermal interface materials like the 3M 5590H have been developed to meet these escalating thermal management needs. The non-silicone nature is especially sought after in certain industries, particularly in optics and automotive electronics, due to contamination concerns.

Strategic Significance & Outlook

The 3M 5590H Thermally Conductive Acrylic Interface Pad will continue to grow in importance as a reliable and high-performing solution for ever-increasing thermal management demands. It is likely to become an indispensable material for cooling EV battery packs and dissipating heat from next-generation high-performance semiconductors. Through this product, 3M is expected to support the evolution of electronic devices across various industries, contributing to the realization of safer and higher-performing products. Its high versatility is anticipated to drive expanding adoption in both new and existing applications globally.

Source: https://www.facebook.com/Focusindustrialsolutions/posts/3m-5590h-thermally-conductive-acrylic-interface-pad-provides-a-preferential-heat/1700394938758495/

#20 TSMC's CoWoS Drives AI Semiconductor Demand, Japanese Material Suppliers Expand Ecosystem in Taiwan

Published August 28, 2026 The Economy Taiwan

OVERVIEW

TSMC's CoWoS advanced packaging technology is a primary driver for demand in AI accelerators and HBM, leading Japanese material suppliers like Namics (underfill) and Fujifilm (CMP slurry) to expand operations in Taiwan. This strategic move highlights the critical role of specialized materials in 2.5D/3D packaging and chiplet integration for AI semiconductors. The intensified collaboration aims to accelerate the growth of the broader AI semiconductor ecosystem, addressing material-limited scaling challenges.

IN DEPTH

Key Findings

TSMC's CoWoS (Chip-on-Wafer-on-Substrate) advanced packaging technology is a powerful driver for the demand in AI accelerators and High-Bandwidth Memory (HBM) semiconductors. In response to this surge in AI-related chip demand, leading Japanese material suppliers, including Namics for underfill and Fujifilm for CMP slurry, are actively expanding their operations in Taiwan, thereby strengthening TSMC's critical ecosystem.

Technical & Industry Details

CoWoS is a 2.5D packaging method that integrates multiple logic chips and HBM stacks onto a silicon interposer, which is essential for boosting the processing power of high-performance AI chips. The sophistication of this technology places significant demands on material science:

- **Underfill Materials:** High-performance underfills, such as those provided by Namics, are critical for protecting flip-chip solder bumps and mitigating thermal stresses caused by coefficient of thermal expansion (CTE) mismatches. With the high heat generated by AI chips, superior thermal conductivity and reliability are increasingly required.
- **CMP Slurry:** Chemical mechanical planarization (CMP) slurries, supplied by Fujifilm, are vital for planarizing interposer and wafer surfaces, enabling precise circuit patterning and high manufacturing yields.
- **Other Japanese Materials:** Key components for CoWoS, such as Ajinomoto Build-up Film (ABF) laminated materials, are areas where Japanese chemical manufacturers hold strong competitive advantages. These specialized materials are currently a bottleneck in CoWoS scaling, indicating that material availability, rather than equipment, is the limiting factor.

Japanese material manufacturers are demonstrating technological leadership in these advanced packaging processes. Their expansion in Taiwan directly translates into strengthening the supply chain and boosting production capacity for AI semiconductors through close collaboration with TSMC.

Background & Context

The explosive growth in AI demand is transforming the semiconductor industry. AI chip leaders like NVIDIA heavily rely on advanced packaging technologies such as CoWoS for the supply of high-performance AI accelerators. However, current production capacity is constrained by the availability of specialized materials including ABF, underfill, and thermal interface materials (TIMs). This situation underscores the increasing strategic importance of material suppliers within the AI ecosystem. Japanese companies have long been global leaders in high-functional materials for semiconductor manufacturing, making this expansion in Taiwan a logical strategic move.

Strategic Significance & Outlook

As long as TSMC's CoWoS technology remains central to AI semiconductors, Japanese material suppliers will continue to play an indispensable role in the growth of this ecosystem. Their expansion and technical partnerships in Taiwan are key to alleviating AI chip supply constraints and accelerating global AI technological development. With demand for 2.5D/3D packaging and chiplet integration projected to grow further, material innovation and stable supply will be critical factors determining the overall competitiveness of the semiconductor industry. Japanese companies are expected to maintain their advantage through continued technological development and investment in this new era.

Source: https://economy.ac/news/2026/09/202609295295

Collected: September 04, 2026 | Automated Research System (Gemini API)

#21 Saint-Gobain Tape Solutions Develops Adhesives, Composites, and Thermal Gap Fillers for EV Batteries

Published August 27, 2026 Saint-Gobain Tape Solutions USA

OVERVIEW

Saint-Gobain Tape Solutions is offering a comprehensive range of material solutions for Electric Vehicle (EV) batteries, including adhesive tapes, composites, foams, and thermal gap fillers. A company blog highlights their role in enhancing EV battery performance and safety, specifically contributing to cell insulation, fixation, and thermal management. The firm also showcases innovations in barrier tapes and material science relevant to both automotive and electronics industries.

IN DEPTH

Key Findings

Saint-Gobain Tape Solutions has announced a comprehensive portfolio of adhesive tapes, composites, foams, and thermal gap fillers designed to enhance the performance and safety of Electric Vehicle (EV) batteries. These innovative material solutions directly address critical challenges in battery module insulation, fixation, and thermal management.

Technical Details

The materials offered by Saint-Gobain Tape Solutions for EV batteries feature the following technical characteristics:

- **EV Battery Adhesive Tapes:** Provide strong and reliable fixation in the assembly of battery cells, modules, and packs. They withstand vibration, shock, and temperature variations, ensuring long-term durability.
- **Composites and Foams:** Fill voids within battery packs, acting as cushioning materials to protect against cell expansion and vibration. They also offer electrical insulation, reducing the risk of short circuits.
- **Thermal Gap Fillers:** Efficiently dissipate heat generated by battery cells and electronic components, mitigating the risk of overheating and thermal runaway. These materials boast high thermal conductivity and precisely fill gaps to minimize thermal resistance.
- **Innovations in Barrier Tapes:** The company has also developed high-performance barrier tapes that prevent moisture and chemical ingress, further enhancing the protection of battery systems.
- **Advanced Material Science:** The development of these high-performance materials is underpinned by the company's expertise in material science. They are specifically engineered to meet the stringent requirements for EV batteries, focusing on safety, durability, and lightweighting.

These materials are key to achieving both design flexibility and robust safety and reliability in battery systems.

Background & Context

The growth of the electric vehicle market is accelerating, accompanied by rapid advancements in EV battery technology. With demands for longer driving ranges, shorter charging times, and crucially, enhanced safety, thermal management, insulation, and structural integrity within battery packs have become paramount. Saint-Gobain Tape Solutions' product range is developed to meet these evolving requirements, providing practical solutions to the challenges faced by battery manufacturers.

Strategic Significance & Outlook

Saint-Gobain Tape Solutions' material solutions for EV batteries are set to further accelerate innovation in battery technology. By improving safety, performance, and durability, these materials will bolster EV adoption and contribute to the realization of a sustainable mobility society. Moving forward, the company is expected to drive further research and development in material science to meet the needs of the automotive and electronics industries, playing a pioneering role in supporting next-generation battery technologies.

Source: https://www.tapesolutions.saint-gobain.com/en-us/resources/blog

Collected: September 04, 2026 | Automated Research System (Gemini API)

#22 Master Bond Introduces EP62-1LPSPMed, an Ultra-Low Viscosity Epoxy for Medical Devices with ISO 10993-5 and USP Class VI Compliance

Published August 27, 2026 Master Bond USA

OVERVIEW

Master Bond has launched EP62-1LPSPMed, an ultra-low viscosity, two-part epoxy system that has successfully passed biocompatibility testing (ISO 10993-5 and USP Class VI) for medical device applications. This material offers a long working life, diverse curing options, and superior resistance to sterilants. Ideal for both reusable and disposable medical devices, as well as small potting and encapsulation tasks, it meets the critical demand for high-reliability bonding and sealing solutions in the healthcare sector.

IN DEPTH

Key Findings

Master Bond has introduced EP62-1LPSPMed, an ultra-low viscosity, two-part epoxy system for medical devices that has successfully passed stringent biocompatibility testing, including ISO 10993-5 (cytotoxicity) and USP Class VI (biological reactivity). This groundbreaking product meets the strict safety and performance standards of the medical sector, enhancing reliability across a wide range of medical device applications.

Technical Details

Key technical features of EP62-1LPSPMed include:

- **Biocompatibility:** Having passed rigorous ISO 10993-5 and USP Class VI tests, it is proven safe for both direct and indirect bodily contact and for use in medical environments.
- **Ultra-Low Viscosity:** Its liquid nature allows it to easily penetrate into intricate geometries and small gaps, making it excellent for filling microscopic structures. This minimizes void formation and ensures uniform encapsulation.
- **Long Working Life:** Provides an extended pot life, allowing ample time for complex assembly operations and the bonding or encapsulation of multiple components.
- **Versatile Curing Options:** Compatible with both room temperature and accelerated heat cure profiles, offering manufacturing flexibility. This allows selection of optimal curing conditions based on specific application requirements or production line constraints.
- **Superior Sterilization Resistance:** Exhibits excellent resistance to common medical sterilization processes such as autoclaving, ethylene oxide, and gamma irradiation. This makes it suitable for reusable medical devices requiring repeated sterilization.
- **Multi-Purpose:** Ideal for both reusable and disposable medical devices, it is effective in a wide array of applications including small potting, encapsulation, bonding, and sealing.

These properties enhance the safety, functionality, and durability of medical devices.

Background & Context

The medical device industry imposes the most stringent material standards to ensure patient safety and treatment efficacy. Biocompatibility, sterilization resistance, and long-term reliability are absolute prerequisites for medical-grade adhesives. These demands are intensifying with advancements in medical technology, including the miniaturization of invasive devices, the proliferation of wearable medical devices, and the increase in disposable devices. Master Bond's EP62-1LPSPMed has been specifically developed to meet these escalating requirements, assisting medical device manufacturers in bringing high-quality and safe products to market.

Strategic Significance & Outlook

The introduction of EP62-1LPSPMed will broaden the options for bonding and sealing solutions in medical device design, accelerating industry innovation. This product is likely to be adopted in the manufacturing of a wide range of medical devices, including cardiac pacemakers, catheters, sensors, surgical instruments, and diagnostic equipment. By combining biocompatibility with superior resistance, it contributes to enhanced patient safety and improved medical device performance. Master Bond is expected to establish itself as a leading supplier in the medical sector, particularly anticipating increased demand for miniaturized and implantable devices.

Source: https://www.masterbond.com/tds/ep62-1lpspmed

Collected: September 04, 2026 | Automated Research System (Gemini API)

#23 Krayden Offers Low-Stress Green Epoxy Molding Compound LINQSOL EMC-7535 for High-Voltage, High-Power Semiconductors

Published August 30, 2026 Krayden USA

OVERVIEW

Krayden is offering LINQSOL EMC-7535, a green epoxy molding compound (EMC) engineered for high-voltage and high-power semiconductor devices. This material features low modulus for reduced stress, a high glass transition temperature (Tg = 175 °C), minimal moisture absorption, a high comparative tracking index (CTI = 600 V), and a UL 94 V-0 flammability rating. These attributes ensure robust performance and high reliability in advanced packaging, addressing key challenges in high-power semiconductor applications.

IN DEPTH

Key Findings

Krayden is supplying LINQSOL EMC-7535, a low-stress, high-performance green epoxy molding compound (EMC) specifically designed for high-voltage and high-power semiconductor devices. This innovative material meets the stringent requirements of advanced packaging, significantly enhancing device reliability and durability.

Technical Details

Key technical features of LINQSOL EMC-7535 include:

- **Low Modulus, Low Stress:** Its low modulus effectively mitigates mechanical stresses arising from coefficient of thermal expansion (CTE) mismatches between the semiconductor chip and the package. This reduces the risk of chip damage and wire bond failures, improving device reliability.
- **High Glass Transition Temperature (Tg):** Boasting a high Tg of 175 °C, the material maintains its mechanical stability and properties even in high-temperature environments, which is essential for stable operation of high-power devices.
- **Minimal Moisture Absorption:** Extremely low moisture absorption prevents degradation of electrical properties and reliability due to moisture ingress into the package. This is particularly beneficial for device stability in high-humidity conditions.
- **High Comparative Tracking Index (CTI):** A high CTI value of 600 V indicates excellent resistance to surface discharge (tracking) under high voltage, ensuring electrical insulation safety.
- **UL 94 V-0 Flammability Rating:** Achieved the highest class of flammability rating, UL 94 V-0, guaranteeing safety in the event of fire.
- **Superior Reliability:** The combination of these properties ensures LINQSOL EMC-7535 delivers long-term reliability and robust performance for high-power semiconductor devices.

This EMC is ideal for encapsulating high-power devices such as power modules, IGBTs, and MOSFETs.

Background & Context

Demand for high-voltage and high-power semiconductors is rapidly expanding in sectors like electric vehicles (EVs), renewable energy systems, and industrial power supplies. While these devices are becoming more efficient and miniaturized, they also generate more heat and operate in increasingly harsh environments. This necessitates packaging materials that offer levels of thermal management, mechanical stress relief, electrical insulation, and reliability that are challenging to achieve with conventional materials. LINQSOL EMC-7535 has been developed to meet these escalating market demands, serving as a critical material to enable the commercialization of next-generation high-power devices.

Strategic Significance & Outlook

Krayden's LINQSOL EMC-7535 has the potential to establish new benchmarks for reliability and safety in the high-voltage and high-power semiconductor market. Its adoption is particularly anticipated in rapidly growing sectors such as EV inverters, charging infrastructure, and solar power systems. This material not only contributes to improved device performance and extended lifespan but also facilitates compliance with stringent safety regulations. Moving forward, designers and manufacturers of high-power semiconductors can proactively adopt advanced EMCs like LINQSOL EMC-7535 to enhance their product competitiveness.

Source: https://www.krayden.com/products/linqsol-emc-7535

Collected: September 04, 2026 | Automated Research System (Gemini API)

#24 NFION Unveils NF150-788 Silicone Foam with Ultra-Low Thermal Conductivity for EV Battery Cell Insulation

Published August 30, 2026 NFION China

OVERVIEW

NFION has introduced NF150-788, a silicone foam designed for thermal, cushioning, and electrical insulation between EV battery cells. This material boasts an ultra-low thermal conductivity of ≤0.12 W/(m·K), excellent compression recovery, UL94 V-0 flame retardancy, and reliable electrical isolation. NF150-788 protects battery modules from cell expansion, vibration, and heat transfer, thereby enhancing the safety and lifespan of EV battery packs.

IN DEPTH

Key Findings

NFION has announced NF150-788, a silicone foam developed for thermal insulation, cushioning, and electrical insulation between Electric Vehicle (EV) battery cells. This innovative material is specifically designed to enhance the safety and long-term performance of EV battery modules.

Technical Details

Key technical features of the NF150-788 silicone foam include:

- **Ultra-Low Thermal Conductivity:** Boasts a very low thermal conductivity of ≤0.12 W/(m·K). This effectively suppresses heat transfer between adjacent battery cells, preventing localized temperature spikes. It plays a crucial role in delaying the propagation of thermal runaway.
- **Excellent Compression Recovery:** Exhibits superior compression recovery, accommodating cell expansion and contraction. This ensures stable maintenance of internal battery pack spacing despite aging or pressure changes during use.
- **UL94 V-0 Flame Retardancy:** Achieved a UL94 V-0 flammability rating, significantly reducing the risk of fire propagation. This is an essential characteristic for meeting EV battery safety standards.
- **Reliable Electrical Insulation:** Provides robust electrical insulation to prevent short circuits between battery cells, ensuring safety in high-voltage battery systems.
- **Cushioning Effect:** Also functions as a cushioning material, protecting battery cells from vibration and impact. This reduces the risk of damage from mechanical stress during operation and improves battery durability.

The combination of these properties makes NF150-788 an optimal solution for protection at the module level in EV batteries.

Background & Context

With the widespread adoption of electric vehicles, battery energy density and pack sizes are continuously increasing. This makes thermal management, safety, and durability the most critical challenges in EV battery design. Specifically, there is a strong demand for effective materials that can prevent battery cell expansion and the propagation of thermal runaway. Traditional thermal insulators and cushioning materials have struggled to meet all these requirements at a high level. NFION's NF150-788 has been specially developed to address these challenges, representing a significant technical contribution to achieving both high performance and safety in EV batteries.

Strategic Significance & Outlook

The NF150-788 silicone foam is expected to contribute significantly to improving safety and performance in the EV battery industry. Its ultra-low thermal conductivity and excellent flame retardancy will be indispensable elements in the design of next-generation EV battery packs. Through this product, NFION aims to support battery manufacturers in developing safer and more reliable electric vehicles, accelerating the realization of a sustainable mobility society. Further technological evolution is anticipated, with potential applications extending to a wider range of energy storage systems.

Source: https://www.nfionthermal.com/Product/s188.html

#25 Master Bond Offers Advanced Adhesives, Sealants & Coatings for R&D, Meeting NASA Low Outgassing & USP Class VI Standards

Published August 27, 2026 Master Bond USA

OVERVIEW

Master Bond is providing a wide range of advanced adhesive, sealant, and coating formulations for Research & Development (R&D) applications, meeting rigorous certifications such as NASA low outgassing, USP Class VI, and UL 94V-0 flame resistance. The company focuses on developing new products for emerging technologies including cryogenics, display devices, microelectronics, and solar energy. These systems offer high temperature resistance, thermal/electrical conductivity, and excellent bond strength, addressing diverse R&D needs.

IN DEPTH

Key Findings

Master Bond is supplying a comprehensive range of high-performance adhesives, sealants, and coatings for Research & Development (R&D) applications, which meet stringent certification standards such as NASA low outgassing, USP Class VI biocompatibility, and UL 94V-0 flame resistance. The company is actively focused on developing new products for cutting-edge technologies, including cryogenics, display devices, microelectronics, and solar energy, providing essential support for technological breakthroughs.

Technical Details

Key technical features of Master Bond's R&D product line include:

- **Diverse Certifications:**
  - **NASA Low Outgassing:** This certification minimizes harmful gas emissions in vacuum environments, crucial for space, aerospace, and precision instruments in high-vacuum conditions.
  - **USP Class VI Biocompatibility:** Ensures safety for medical devices and applications involving biological contact.
  - **UL 94V-0 Flame Resistance:** Represents the highest level of flame retardancy, enhancing safety in fire scenarios.
- **High-Performance Properties:**
  - **High Temperature Resistance:** Maintains stable performance under extreme high-temperature environments.
  - **Thermal/Electrical Conductivity:** Materials are offered with the capability to efficiently conduct heat or electricity, depending on the specific application.
  - **Excellent Bond Strength:** Provides strong and durable adhesion to a variety of substrates.
- **Adaptation to Emerging Technologies:** The company actively develops new products specialized for state-of-the-art R&D applications, such as cryogenic environments, next-generation displays, microelectronics miniaturization, and solar energy device efficiency.

These properties provide an indispensable foundation for researchers pursuing new technological breakthroughs.

Background & Context

Today's R&D landscape constantly pushes new frontiers, demanding higher-performance and more reliable materials. Especially in fields like space exploration, advanced medicine, quantum computing, and clean energy, material performance under extreme conditions dictates the success or failure of projects. Master Bond's R&D solutions are engineered to solve the unique challenges faced by researchers and engineers in these sectors. By offering not only off-the-shelf products but also customized solutions for specific R&D requirements, the company strongly supports the realization of innovative ideas.

Strategic Significance & Outlook

Master Bond's adhesives, sealants, and coatings for R&D will continue to be indispensable tools for pushing the boundaries of science and technology. As emerging technologies become more complex and regulated, the company's materials are expected to play an even more critical role in enabling progress in these fields. Through continuous product development and technical support, Master Bond aims to solidify its position as a key partner in the global R&D community, contributing to future technological innovations. Specifically, increased demand is anticipated in areas where miniaturization, higher efficiency, and extreme environment compatibility are advancing rapidly.

Source: https://www.masterbond.com/industries/adhesives-sealants-and-coatings-research-and-development

Collected: September 04, 2026 | Automated Research System (Gemini API)

#26 Thermally Activated "D-glue" Streamlines High-Value Plastic Recovery from End-of-Life Electronics

Published August 27, 2026 Cyclomer UK

OVERVIEW

A new thermally activated adhesive, "D-glue," significantly enhances the recovery of high-value technical plastics from end-of-life electronics. This innovative adhesive loses its bonding properties at elevated temperatures, simplifying component dismantling and making recyclable polymer extraction commercially viable. The technology offers a critical solution for UK waste companies and Turkish recyclers facing stringent quality controls, supporting circular economy initiatives.

IN DEPTH

Key Findings

The newly developed thermally activated adhesive, "D-glue," offers a groundbreaking solution for efficiently recovering high-value technical plastics from end-of-life electronics. This innovative material loses its adhesive properties when exposed to high temperatures, significantly simplifying the traditionally complex dismantling process of electronic components. This breakthrough is expected to make the extraction of recyclable plastics commercially viable, thereby contributing substantially to the circular economy.

Technical Details

D-glue is engineered to undergo an internal structural change upon exposure to specific temperatures, leading to a loss of its bonding strength. This "debondable" characteristic allows for the easy and clean separation of bonded components at the end of an electronic device's lifespan. A major advantage over conventional mechanical destruction or solvent-based separation methods is the minimization of material degradation, enabling the recovery of high-purity plastics. This is particularly beneficial for preserving the value of engineering plastics commonly used in consumer electronics and automotive parts. The adhesive's performance in high-temperature environments, where it loses adhesion, ensures that valuable polymers can be cleanly separated and reprocessed.

Background & Context

The modern electronics industry is characterized by miniaturization and high performance, leading to the complex integration of diverse materials. This complexity has historically made recycling end-of-life products extremely challenging, resulting in the loss of many high-value materials to waste streams. Debondable adhesives like D-glue present a pivotal solution to this problem, aligning with global trends towards waste reduction and improved resource efficiency. The technology gains particular importance for waste management companies in the UK and recyclers in Turkey, who are operating under increasingly stringent quality control standards for plastic recovery.

Strategic Significance & Outlook

The commercialization of D-glue has the potential to trigger a significant paradigm shift in the electronics recycling industry. Advances in adhesive technology will accelerate the adoption of "Design for Recycling" (DfR) principles, where recyclability is considered from the initial product design phase. This will foster resource circulation across numerous industrial sectors in the future. The next steps for this technology are anticipated to include broader applicability to a wider range of materials and the development of more precise debonding control techniques, further solidifying its impact on sustainable manufacturing.

Source: https://cyclomer.co.uk/en/news/debondable-adhesive-electronics-plastic-recycling

Collected: September 04, 2026 | Automated Research System (Gemini API)

#27 Master Bond Launches New Epoxy Adhesives EP37-3FLF and EP5TC-80, Enhancing EV Battery Assembly Structural Integrity and Thermal Management

Published August 27, 2026 MasterBond.com USA

OVERVIEW

Master Bond has released two new epoxy products, EP37-3FLF and EP5TC-80, specifically optimized for electric vehicle (EV) battery assembly, significantly improving performance and reliability. EP37-3FLF is a highly flexible, low-viscosity, optically clear adhesive offering superior thermal cycling resistance, while EP5TC-80 is a single-component, high-thermal-conductivity epoxy for high-temperature bonding. These innovations are critical for enhancing structural integrity and efficient thermal management in lithium-ion batteries, crucial for EV performance and longevity.

IN DEPTH

Key Findings

Master Bond has introduced two innovative epoxy products, EP37-3FLF and EP5TC-80, designed to significantly boost the performance and reliability of electric vehicle (EV) battery assemblies. These adhesives are specifically engineered to withstand the harsh thermal cycling and mechanical stresses encountered in EV battery packs, contributing to extended battery life and enhanced safety.

Technical Details

EP37-3FLF is a two-component epoxy adhesive characterized by its high flexibility, low viscosity, and optical clarity. Its exceptional resistance to thermal cycling effectively mitigates stress caused by the expansion and contraction of battery cells. This property significantly reduces the risk of delamination and cracking, ensuring long-term reliability. Conversely, EP5TC-80 is a one-component, thermally conductive epoxy that provides superior heat dissipation capabilities. It efficiently transfers heat generated within the battery to external cooling systems, preventing hot spots and minimizing the risk of overheating, performance degradation, and failure. EP5TC-80 also offers excellent bonding strength at high temperatures, making it suitable for demanding operating environments. Both products are crucial for maintaining the integrity and thermal regulation of complex battery module designs.

Background & Context

The rapid expansion of the EV market has led to escalating demands for improved battery performance, safety, and durability. For lithium-ion batteries, their high energy density makes thermal management exceptionally critical. Adhesives play multifaceted roles beyond mere cell and module fixation, including ensuring thermal conduction paths, protecting against vibration and shock, and providing electrical insulation. Master Bond's new products directly address these challenges, offering vital material solutions for battery manufacturers seeking to develop higher-performance and safer EV batteries.

Strategic Significance & Outlook

The introduction of these advanced adhesives will increase design flexibility for EV batteries and contribute to more efficient manufacturing processes. By providing superior thermal management and structural integrity, these innovations also translate into tangible consumer benefits, such as extended EV range and faster charging times. Future developments are expected to focus on adhesives capable of enduring even more extreme conditions and high-speed curing adhesives compatible with automated production lines. Master Bond's technology forms a foundational support for the continued advancement of the EV industry.

Source: https://www.masterbond.com/properties/adhesives-for-electric-vehicle-battery-assembly

Collected: September 04, 2026 | Automated Research System (Gemini API)

#28 WEVO-CHEMIE Launches "WEVOSIL 26029 FL," a New 3 W/m·K Thermally Conductive Silicone Gap Filler, Boosting High-Voltage Battery Production Efficiency

Published August 27, 2026 Wevo Germany

OVERVIEW

WEVO-CHEMIE GmbH has unveiled WEVOSIL 26029 FL, a new silicone gap filler boasting 3 W/m·K thermal conductivity and optimized rheological properties for compact assemblies such as high-voltage batteries and power electronics. This material's low density and precise application in narrow gaps promise to facilitate cost-effective manufacturing and weight-optimized designs. The innovation directly addresses critical thermal management and production efficiency challenges in advanced electronics.

IN DEPTH

Key Findings

WEVO-CHEMIE GmbH has introduced WEVOSIL 26029 FL, a new silicone gap filler that is set to revolutionize production efficiency and thermal management in compact electronic assemblies like high-voltage batteries and power electronics. This material uniquely combines an excellent thermal conductivity of 3 W/m·K with optimized rheological properties, enabling precise and efficient application.

Technical Details

WEVOSIL 26029 FL is a silicone-based material designed to fill gaps, thereby creating efficient thermal conduction paths. Its notable thermal conductivity of 3 W/m·K ensures effective heat dissipation from electronic components, contributing to stable system operation and extended lifespan. Furthermore, this gap filler is engineered with a low density and specific rheological characteristics that allow for precise and uniform application in narrow, complex assembly gaps. This design minimizes material waste during manufacturing, shortens cycle times, and enhances compatibility with automated dispensing systems. The material's formulation ensures robust performance across varying operating temperatures, a critical factor for automotive and industrial applications.

Background & Context

With the proliferation of high-voltage and high-power electronic devices in electric vehicles, renewable energy systems, and industrial automation, efficient thermal management has become an urgent challenge. Especially in confined spaces like battery packs, effective heat dissipation is directly linked to system performance and safety. Conventional gap filler materials often struggled to balance high thermal conductivity with good processability, frequently leading to increased production costs and product weight. WEVOSIL 26029 FL overcomes these limitations, offering a solution tailored to meet modern industrial demands.

Strategic Significance & Outlook

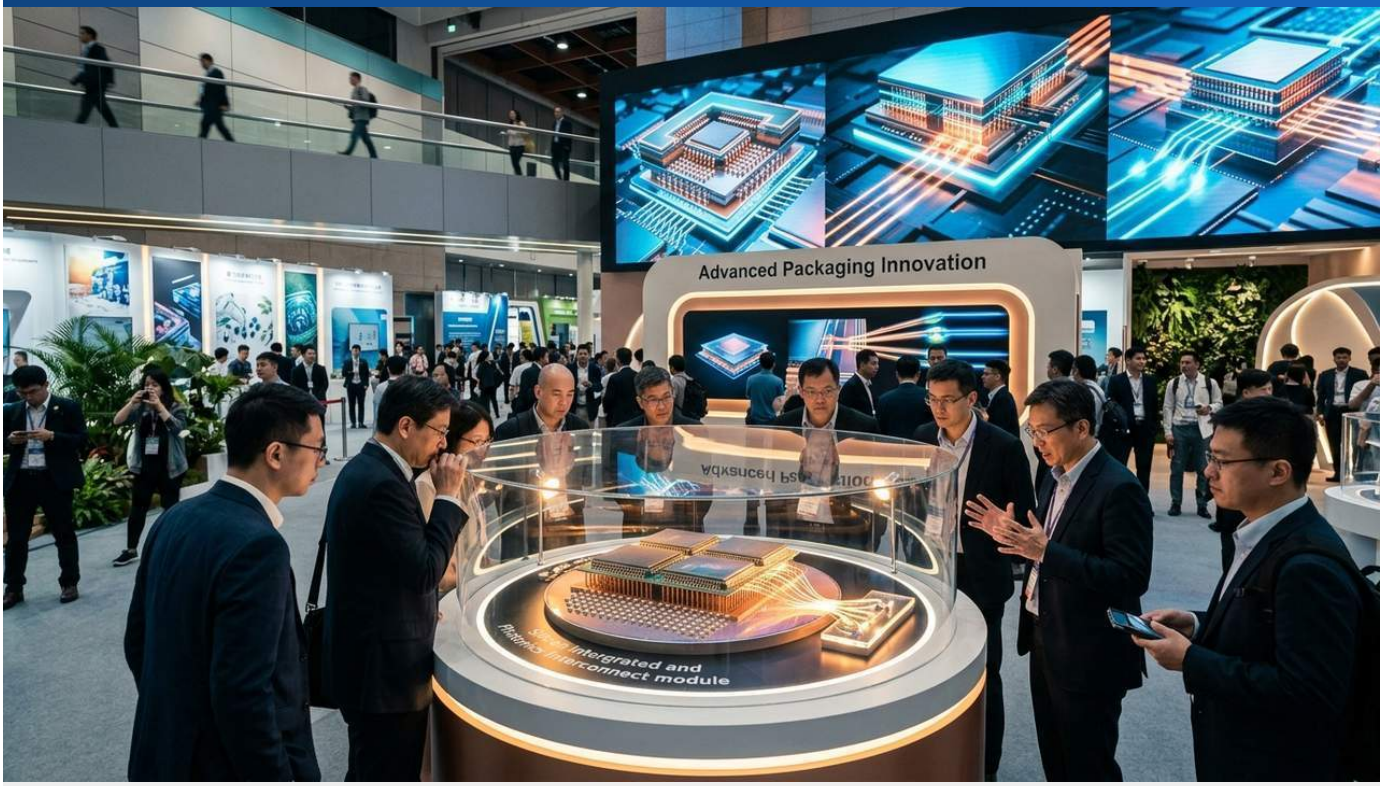
The adoption of this new silicone gap filler is anticipated to expand significantly in thermal-critical applications such as high-voltage battery modules and power electronics inverters. The dual benefits of reduced manufacturing costs and optimized product weight are crucial factors supporting competitive product development, particularly within the electric vehicle industry. WEVO-CHEMIE intends to continue contributing to enhanced electronic device reliability and sustainable production processes through the ongoing development of such high-performance materials. This innovation sets a new benchmark for material solutions in thermal management.

Source: https://www.wevochemical.hk/news-press/detailpage/new-thermally-conductive-silicone-gap-filler

Collected: September 04, 2026 | Automated Research System (Gemini API)

#29 Advanced Packaging Summit 2026 Kicks Off at SEMICON Taiwan, Focusing on Silicon Integration and Photonics Interconnect Innovations

Published August 31, 2026 SemiWiki Taiwan



OVERVIEW

The Advanced Packaging Summit 2026, co-located with SEMICON Taiwan from August 31 to September 4, 2026, will address critical innovations in advanced packaging. The summit provides a vital platform for discussing silicon-based integration technologies and photonics-based interconnects, essential for enhancing packaging productivity and scalability. Industry leaders will converge to drive the development of next-generation electronic devices, overcoming conventional scaling limits.

IN DEPTH

Key Findings

The Advanced Packaging Summit 2026, held concurrently with SEMICON Taiwan from August 31 to September 4, 2026, is a pivotal event dedicated to innovations in advanced packaging within the semiconductor industry. This summit will particularly foster in-depth discussions on cutting-edge advancements in silicon-based integration technologies and photonics-based interconnects, which are poised to significantly enhance packaging productivity and scalability.

Technical Details

Key topics at the summit will include the latest trends in advanced packaging technologies such as chiplet technology, 3D stacking, and heterogeneous integration. Specifically, discussions will cover the characterization and optimization of new materials (e.g., adhesives, encapsulants, thermal interface materials) that underpin these technologies, as well as challenges and solutions in their manufacturing processes. Photonics-based interconnect technologies, critical for achieving dramatic increases in data communication speeds, will also be a major focus, particularly their progress towards practical application in AI and High-Performance Computing (HPC) applications. These technologies are key to overcoming the limitations of traditional Moore's Law scaling and improving overall system performance and power efficiency.

Background & Context

The semiconductor industry faces dramatically increasing demands for data processing capabilities and bandwidth, driven by the rapid advancements in cloud computing, AI, and 5G communication. To meet these demands, performance improvements at the system level through packaging technology, beyond mere chip miniaturization, have become indispensable. The Advanced Packaging Summit is, therefore, a crucial forum where industry leaders, researchers, and engineers gather to share knowledge and foster networking, accelerating next-generation innovations.

Strategic Significance & Outlook

The latest research findings and industry trends presented at this summit will directly influence the development roadmap for future semiconductor products. Advances in silicon integration and photonics interconnects will enhance product performance across a wide range of sectors, including data centers, autonomous vehicles, and consumer electronics. Furthermore, the evolution of packaging technology will contribute to optimizing manufacturing costs and reducing time-to-market, thereby strengthening the competitiveness of the entire semiconductor ecosystem.

Source: https://imaps.org/events/eventdetails.aspx?id=2068023

#30 Kakaku.com Releases September 2026 Adhesives & Bonds Popularity Ranking, Highlighting Cemedine and Konishi Products for Diverse Applications

Published September 02, 2026 Kakaku.com Japan

OVERVIEW

Kakaku.com has published its September 2026 popularity ranking and price comparison for adhesives and bonds, featuring products from leading Japanese manufacturers like Cemedine and Konishi. The report emphasizes strong adhesion, quick-drying properties, and versatility across various applications, offering consumers valuable insights into commercial products. This resource helps users select optimal adhesives tailored to their specific needs.

IN DEPTH

Key Findings

Kakaku.com has released its September 2026 popularity ranking and price comparison report for the "Adhesives & Bonds" category. This ranking showcases products from leading Japanese adhesive manufacturers such as Cemedine and Konishi, providing essential indicators for general consumers when making purchasing decisions.

Technical Details

The report details specific performance characteristics for each product. For example, it highlights formulations achieving strong adhesion across diverse materials like wood, metal, and plastic, along with quick-drying properties that enhance work efficiency. It also covers water and weather resistance suitable for outdoor use, and solvent-free products developed with environmental considerations. These features are designed to meet a wide range of needs, from household DIY projects to specialized hobby applications. Comparative information includes pricing per unit volume and suitability for specific uses (e.g., plastic-specific, metal-specific, multi-purpose).

Background & Context

The adhesive market spans a broad spectrum, from consumer products to specialized industrial applications. Information provided by price comparison sites like Kakaku.com plays a crucial role in enhancing transparency for general consumers during product selection and improving the overall purchasing experience. Japanese manufacturers such as Cemedine and Konishi have established high brand credibility through years of accumulated technological expertise and responsiveness to market needs. These companies support the evolution of DIY culture and adaptation to new materials through advancements in adhesive technology.

Strategic Significance & Outlook

In the consumer adhesive market, demand for products with enhanced functionality (e.g., heat resistance, impact resistance, flexibility) tailored for more specialized uses, alongside safety and environmental considerations, is expected to continue growing. Kakaku.com's report encourages product selection that reflects these trends and serves as a valuable resource for manufacturers to understand market dynamics and inform product development directions. Digital platforms for information dissemination will continue to contribute to market transparency and consumer convenience.

Source: https://kakaku.com/ranking/stationery/0025_0003/0028/

Collected: September 04, 2026 | Automated Research System (Gemini API)

#31 Indium Corporation's Jason Chou to Present "Material Solutions for AI Industry" at SEMICON Taiwan

Published August 28, 2026 Indium Corporation USA

OVERVIEW

Indium Corporation's Jason Chou will deliver a presentation titled "Material Solutions for AI Industry from Packaging to System Assembly" at SEMICON Taiwan, held from September 2-4, 2026. His talk will focus on high-performance flux materials for microbump wafer bumping, mid-temperature solder pastes, and advanced thermal interface materials (TIMs) designed to enhance the thermal efficiency of AI computing chips. This presentation directly addresses critical thermal management challenges in the rapidly evolving AI sector.

IN DEPTH

Key Findings

Jason Chou from Indium Corporation is slated to deliver a crucial presentation titled "Material Solutions for AI Industry from Packaging to System Assembly" at SEMICON Taiwan, held from September 2-4, 2026. This presentation will spotlight cutting-edge material technologies aimed at addressing the high power consumption and thermal challenges confronting AI computing chips.

Technical Details

Jason Chou's presentation will elaborate on three primary material solutions. First, high-performance flux materials for microbump wafer bumping, which are essential for improving reliability and yield in ultra-fine interconnects. Second, mid-temperature solder pastes, offering a wider process window and lower stress bonding compared to traditional high-temperature solders. Most critically, the presentation will cover high-performance thermal interface materials (TIMs) designed to dramatically enhance the thermal efficiency of AI computing chips. These TIMs minimize thermal resistance between the chip and heatsink, effectively dissipating heat from AI processors, thereby contributing to stable operation and sustained performance.

Background & Context

The advancement of AI has exponentially increased the computational power and power consumption of semiconductor chips, making the resultant heat generation one of the biggest constraints on device performance and reliability. Particularly in data centers and High-Performance Computing (HPC) applications, efficient thermal management directly correlates with continuous system operation and energy efficiency. Material suppliers like Indium Corporation are foundational to the AI industry's progress, providing innovative material solutions to these critical challenges.

Strategic Significance & Outlook

Jason Chou's presentation will offer invaluable insights into practical material selection and application strategies for researchers and engineers at the forefront of AI chip manufacturing. The evolution of high-performance fluxes, solder pastes, and TIMs is expected to contribute to further miniaturization, enhanced performance, and improved reliability of AI processors. Ultimately, this will broaden the feasibility of diverse AI applications in areas such as autonomous driving, medical diagnostics, and space exploration. This material-centric approach is vital for unlocking the full potential of AI.

Source: https://www.indium.com/press-releases/indium-corporation-expert-to-present-ai-packaging-and-high-power-consumption-solutions-at-semicon-taiwan/

Collected: September 04, 2026 | Automated Research System (Gemini API)