LOCTITE

WHERE RELIABILITY BEGINS

HIGH THERMAL CONDUCTIVITY DIE ATTACH MATERIALS

FOR HIGH-PERFORMANCE APPLICATIONS

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Henkel Adhesive Technologies

HIGH THERMAL DIE ATTACH ADHESIVES

High-power and highly-integrated semiconductor device designs are seeing power density challenges and thermally-induced stresses that must be controlled to ensure long-term reliability. Effective heat removal at the source – the die interface – helps maximize performance and lifetime while delivering high reliability, which is critical for automotive, industrial, and communications applications.

Because the die attach layer is closest to the die, its thermal characteristics are among the most important for effective heat removal and CTE stress control. Henkel's expansive portfolio of high thermal die attach adhesives have been engineered to address various package types, die sizes, application reliability criteria, and processing preferences. With thermal conductivity ranging from 20 W/m-K to 165 W/m-K and in formulations that span traditional pastes to pressure-less and pressure-assisted sintering, Henkel high thermal die attach materials deliver proven performance supported by global R&D resources and a team of semiconductor packaging experts.

HIGH THERMAL DIE ATTACH MATERIALS FOR LEADFRAME PACKAGES

In the power device sector, package designs are becoming increasingly complex, miniaturized, and dense. Combined, these factors dictate the need for die attach materials that can provide excellent thermal management to overcome elevated operational heat, and lower electrical resistance to ensure good electrical performance. A range of die attach materials that offer compatibility with various leadframe finishes, die sizes, die backside metallizations, and package form factors has been engineered to enable reliable operation of some of today's most important technologies.

PORTFOLIO HIGHLIGHTS

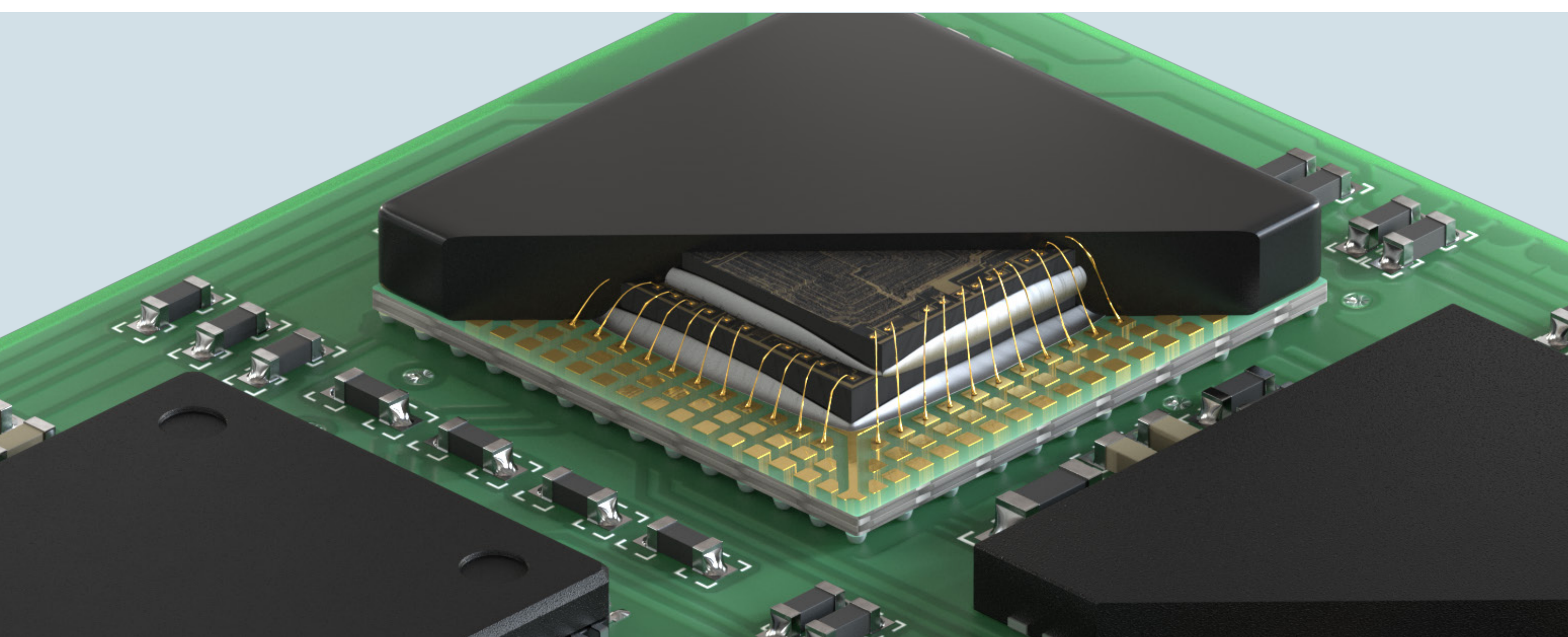
- High thermal conductivity from 20 W/m-K to 50 W/m-K
- Excellent electrical performance
- Excellent adhesion and compatibility with Ag, Cu, and PPF leadframes
- AEC-Q100 Automotive grade 0 reliability
- Applicable across a wide range of die sizes from small to large die
- Available in a variety of cure profiles
- Designed to limit the amount of volatile organic compounds (VOC) released into the air

APPLICATIONS BENEFITS

- Ideal for Power Management ICs and Power FETs including replacement for solder with or without die Backside Metallization (BSM) used in automotive, industrial, and 5G/6G infrastructure applications
- Simple drop-in solution, conventional die attach processing
- Thermal control delivers enhanced package function and in-field service life
- Highly-effective, environmentally-friendly alternative to lead-based solders

HIGH THERMAL DIE ATTACH MATERIALS FOR LAMINATE PACKAGES

Semiconductor package miniaturization and multi-chip integration are introducing new challenges in managing operational heat and thermally-induced stress and warpage from CTE mismatches. Controlling these conditions is foundational to package function, reliability, and lifetime. Robust adhesion between dies and substrates, along with efficient removal of heat at its origin, are advantages Henkel's die attach solutions offer for next-generation SiP and multi-chip package innovators.



PORTFOLIO HIGHLIGHTS

- High thermal conductivity ≥ 20 W/m-K
- Strong adhesion to a variety of Au finishes
- Excellent workability with minimal to zero resin bleed out, long open time, and precise coverage and fillet control
- Good MSL reliability

APPLICATIONS BENEFITS

- Designed for high-performance multiple wireless communication devices, including power amplifiers for RF front-end modules, and audio systems
- Facilitates complex package designs that are highly integrated, such as SiPs and multi-chip packages
- Improves package reliability with thorough heat dissipation at the die interface and protects against operational stress

Sintering Silver

Resin

Substrate

PRESSURE-LESS SINTERING FOR POWER SEMICONDUCTORS

Silver sintering is recognized as one of the most effective die attach solutions to enable the performance and reliability of power devices, meeting their stringent adhesion, thermal, and electrical requirements for demanding high power density applications in the automotive, aerospace, and industrial sectors. Henkel's pressure-less sintering materials allow these rigorous metrics to be achieved within a standard die attach process, providing excellent workability, low/no voiding, and low temperature curing. Portfolio thermal conductivity performance ranges from 50 W/m-K to 165 W/m-K.

PORTFOLIO HIGHLIGHTS

- Ultra-high thermal conductivity > 50 W/m-K
- Excellent electrical conductivity and in-package RDS(on) performance, stable RDS(on) after 1,000 thermal cycles
- Strong adhesion to a variety of lead frame finishes and compatible with different die types (bare Si or BSM)
- Excellent workability
- Meets automotive grade reliability standards

APPLICATIONS BENEFITS

- Enables extremely robust heat dissipation at the source, significantly reducing thermal stress
- Supports advancement of high-efficiency, high power density Si and WBG semiconductor device designs, overcoming the limits of solder
- Ensures maximum reliability for mission-critical power electronics
- Allows higher operating temperatures without compromise
- Pressure-less process reduces capital expenditures and complex manufacturing techniques

HIGH THERMAL DIE ATTACH MATERIALS
FOR LEADFRAME AND LAMINATE PACKAGES

Products	Thermal Conductivity (W/m.K)	Cure Methods		Die Size		Substrates			
		Oven Cure	Snap Cure	< 3x3	< 7x7	Cu Leadframe	Ag Leadframe	PPF Leadframe	Au Laminate
LOCTITE® ABLESTIK 2815A	20	✔		✔			✔		
LOCTITE® ABLESTIK ABP 8060T	20	✔	✔	✔		✔	✔	✔	
LOCTITE® ABLESTIK ABP 8062T	24	✔		✔			✔	✔	
LOCTITE® ABLESTIK ABP 8064T	22	✔		✔	✔		✔	✔	
LOCTITE® ABLESTIK ABP 8066T	25	✔		✔			✔	✔	✔
LOCTITE® ABLESTIK ABP 6395T	30	✔		✔		✔	✔	✔	✔
LOCTITE® ABLESTIK ABP 8068TD	50	✔		✔		✔	✔	✔	

**Above products work for dies with or without backside metallization*

PRESSURE-LESS SINTERING DIE ATTACH MATERIALS
FOR LEADFRAME AND LAMINATE PACKAGES

Products	Thermal Conductivity (W/m.K)	Cure Methods		Die Size		Substrates			
		Oven Cure	Snap Cure	< 3x3	< 7x7	Cu Leadframe	Ag Leadframe	PPF Leadframe	Au Laminate
LOCTITE® ABLESTIK ABP 8068TD	50	✔		✔		✔	✔	✔	
LOCTITE® ABLESTIK ABP 8068TB	100	✔		✔					✔
LOCTITE® ABLESTIK ABP 80668TI	165	✔		✔			✔	✔	

**Above products work for dies with backside metallization*

GLOBAL RESOURCES, LOCAL EXPERTISE

At Henkel, we take innovation and customer collaboration seriously. That's why we've invested in resources around the world to meet you where you are. With teams of technology experts and digital tools to connect global R&D and application centers, we help you bring new products to market faster, more sustainably, and more competitively. Discover why Henkel's approach to thinking globally and acting locally sets us – and you – apart.

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