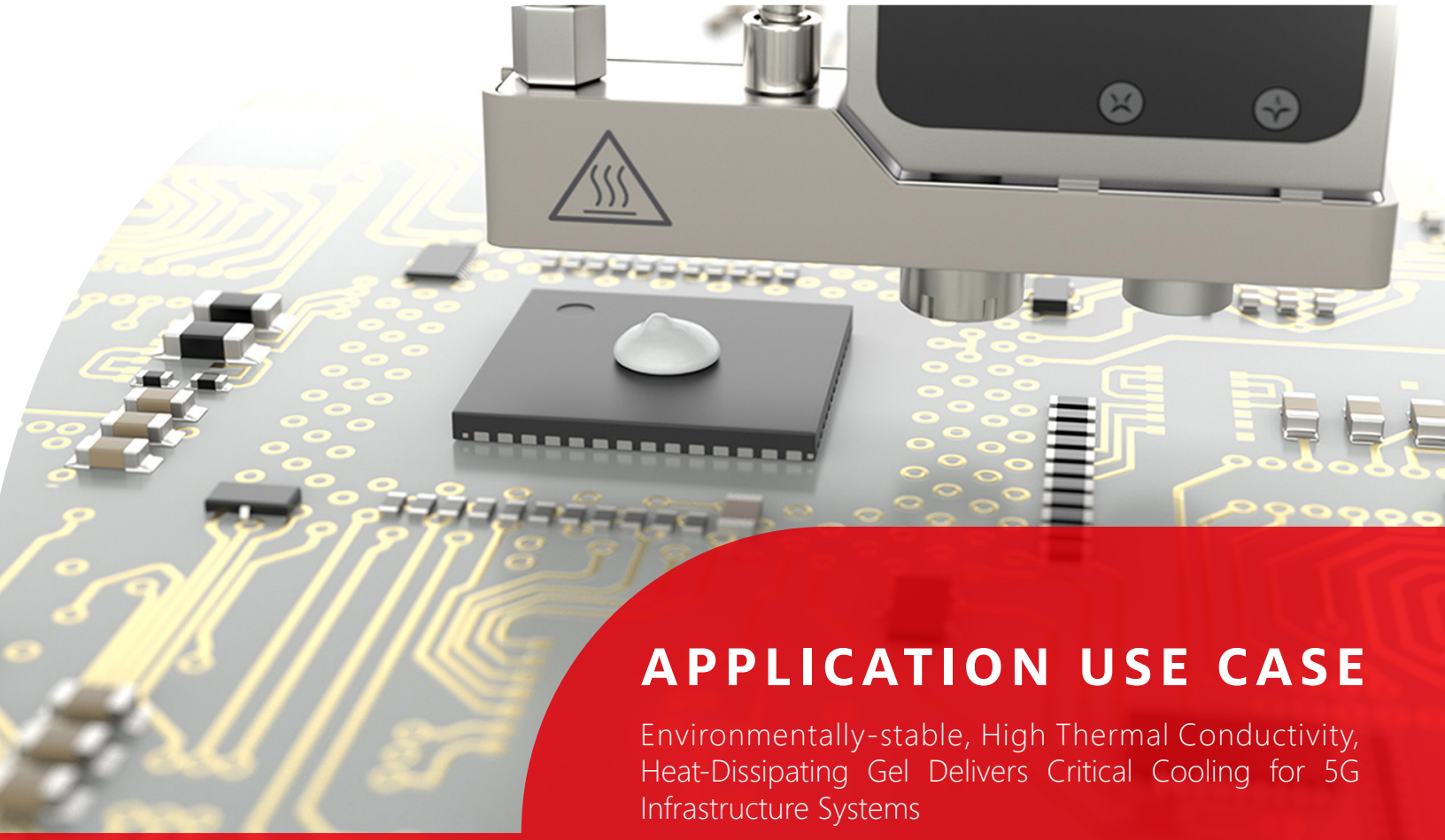
LOCTITE®

BERGQUIST®



APPLICATION USE CASE

Environmentally-stable, High Thermal Conductivity, Heat-Dissipating Gel Delivers Critical Cooling for 5G Infrastructure Systems

01 Application Challenges and Objectives

In order to manage the 10x increase in cellular data transfer capability, 5G telecom infrastructure systems including remote radio, antenna and base station units have higher-power, more complex electronic designs than their 4G predecessors.

A range of environmental and thermal challenges need to be addressed:

- Systems often located in hard-to-service positions.
- Outdoor temperature fluctuations and conditions are unpredictable with no active cooling. Only passive cooling is present and is dependent on environmental conditions.
- Operational heat dissipation demands vary dramatically during peak use times.

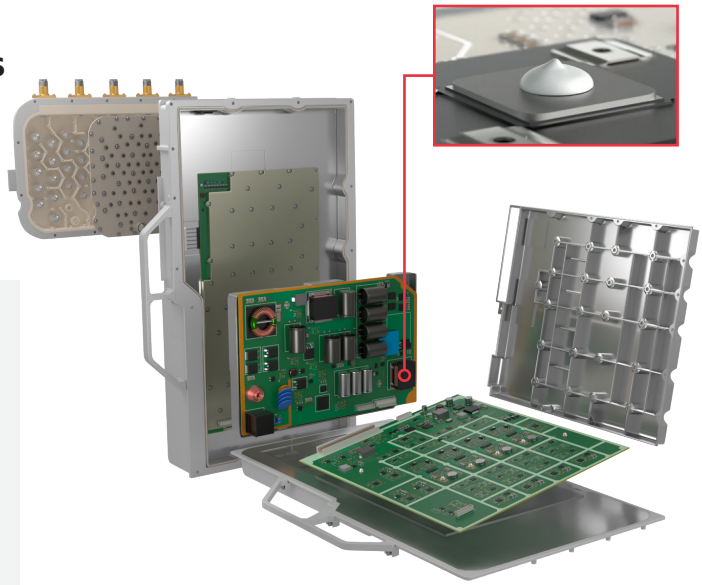
5G telecom systems use multiple types of electronic components, each with different functions, thermal loads and dimensional tolerance challenges.

Henkel

02 Process and Performance Requirements

The high power densities combined with operational and environmental heat exposure of 5G telecom infrastructure devices require a thermal interface material solution that satisfies multiple metrics:

- High thermal conductivity > 6.0 W/m-K
- Heat transfer capabilities must accommodate for no active cooling with operational efficiency during peak use.
- Ability to mitigate for various component dimensional tolerances and coefficient of thermal expansion (CTE) differences.



To enable high volume production, the thermal solution has to be automation-friendly with adaptability for dispense volume variations.

Because systems are often stationed in difficult-to-reach locations, may be horizontally or vertically positioned, and integrate components with different dimensional gap tolerances, high long-term reliability and high gap stability of the thermal interface material solution are critical.

03 Henkel Solution and Results

Henkel developed **BERGQUIST® *LIQUI-FORM* TLF 6000HG**, a thermal gel that balances high thermal conductivity, dispensability and in-application stability, to address the demands of 5G telecom infrastructure systems.

- The material's thermal conductivity and high gap stability provide efficient heat dissipation and high reliability in demanding outdoor environments.
- Thermal conductivity of 6.0 W/m-K enables high heat dissipation needed for 5G systems.
- Pre-cured liquid gel can accommodate gaps up to 3.0 mm and stays in place once dispensed even in a vertical orientation.
- Withstands stress, movement, various CTE tolerances, fluctuating operational states (peak use) of heat and external thermal conditions.

Dispensable, one-part liquid formable gel enables high automation with the ability to automatically dispense small amounts (mass deposits of ≥ 0.2 g) all the way up to large surface area volumes to enable heat dissipation across an entire assembly. Suitable for multiple 5G telecom infrastructure applications that require robust thermal control, allowing for simplified supply chain management.

» Henkel's global manufacturing, distribution, service and support network provides worldwide coverage for 5G innovators deploying systems and network infrastructures in various geographic regions.

Today, ***BERGQUIST LIQUI-FORM* TLF 6000HG** is being used in 5G remote radio units, base band units and antennas globally with great success.

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To Find Out More On The Latest Innovations In Data & Wireless Technology:

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