Press release
Irvine, California, July 10, 2006

Henkel Develops Accelerated Cooling Process to Streamline Pb-Free Flip-Chip Assembly

New Technology Utilizes Hysol® FP5000 and Hysol® FP5001 Non-conductive Paste Materials and Process Advantages to Reduce Warpage, Eliminate Voids and Dramatically Cut Cycle Time

The electronics group of Henkel has introduced a new process, termed Accelerated Cooling (AC), to be used in conjunction with the company's two premiere, flip-chip in package non-conductive paste (NCP) underfill encapsulants. Henkel's NCP materials, Hysol® FP5000 and Hysol® FP5001, provide superior moisture resistance, excellent thermal cycling resistance, expedite the assembly process and are specifically designed for use with today's lead-free interconnects.

Hysol FP5000 and Hysol FP5001 materials provide an alternative to traditional, mechanical soldering by bonding bumps to the substrate through an innovative lead-free compatible thermal compression process, thus simplifying flip chip assembly by eliminating the need for flux application, reflow and cleaning in most cases.

Now, the effectiveness of these materials is further enhanced through the use of Henkel's patent-pending AC flip-chip assembly process. The new technique is available just as packaging companies are beginning to migrate away from face-up, wire bonded applications to flip-chip processes in order to gain footprint and performance efficiencies.

Unlike conventional thermal compression processes where the NCP material is applied onto the substrate and subsequent heating and compressing of the device occur, Henkel's AC process heats the device while it is secured by the flip-chip bonder head and then is rapidly cooled during compression onto the NCP-coated substrate. This rapid cooling process enables assembly completion prior to any excess heat exposure and, consequently, reduces package warpage, voids caused by moisture and assembly cycle time. Whereas typical cycle time including IC alignment may

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take as long as 13 seconds, Henkel's AC process cuts this by nearly 50%, delivering a 7 second cycle time.

"We are very excited about this advancement in flip-chip assembly," states Robert Chu, Henkel's Global Product Manager for CSP Underfills, Electronic Interconnect and Image Sensors. "This is arguably one of the most significant developments in packaging technology in recent years and we fully expect the AC process to facilitate rapid adoption of flip-chip assembly, enabling increased signal transfer rates and higher assembly densities. It is truly a breakthrough."

For more information on Hysol® FP5000 and Hysol® FP5001 or Henkel's remarkable AC flip-chip process, log onto www.henkelelectronics.com or call 949-789-2500.

About the electronics group of Henkel

Henkel is one of the world's leading and most progressive providers of qualified, compatible material sets for semiconductor packaging, board level assembly and advanced soldering solutions. Through its Hysol, Loctite and Multicore brands, and its global customer support infrastructure, the electronics group of Henkel delivers world-class materials products, process expertise and total solutions across the board to enable tomorrow's electronic industry.

Henkel, a Fortune Global 500 company, operates in three strategic business areas: Home Care; Personal care; and Adhesives, Sealants and Surface Treatments, which serves the transportation, electronics, aerospace, metal, durable goods, consumer goods, maintenance and repair and packaging industries, and offers a broad range of products for the craftsman and consumer. With brands and technologies, Henkel makes people's lives easier, better, and more beautiful. 50,000 employees work for Henkel worldwide. People in 125 countries around the world trust in brands and technologies from Henkel – "A Brand like a Friend".

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