

**Hybrid Plastics' Receives a \$100,000 R&D Grant from the  
National Science Foundation to develop Nanostructured Solder Materials**

Fountain Valley, CA: Hybrid Plastics, Inc. has received a \$100,000 R&D Grant from the National Science Foundation (NSF) for the development of Nanostructured Solder Materials. This competitive Phase I Small Business Innovation Research [SBIR] award will allow the company to advance the fundamental knowledge and service performance of lead-free electronic solders.

Current lead-free electronic solders are performance limited due to thermomechanical fatigue and from their microstructural instabilities which degrade electronic performance over time. Hybrid Plastics expects to utilize its POSS<sup>®</sup> building blocks as nanoscopic chemical reinforcements to control both microstructural stability and accumulated performance degradation. Such control will afford lead free solders with higher strength, durability and dimensional stability in interconnects for aerospace, automotive, consumer and micro-electromechanical (MEMS) systems.

To develop these more reliable and durable lead free solders, Hybrid Plastics<sup>™</sup> will team with the Department of Chemical Engineering and Material Science at Michigan State University. Control of these metal alloy characteristics will afford insights into real-world solutions for metal fatigue, creep and service life issues which plague interconnects worldwide in commercial and military electronics and MEMS.

POSS<sup>®</sup> [Polyhedral Oligomeric Silsesquioxanes] is a revolutionary new Nanotechnology based on silicon-derived building blocks that provide nanometer-scale control to dramatically improve the thermal and mechanical properties of traditional polymers while offering easy incorporation using existing manufacturing protocols. These compounds have an average diameter of just 1.5 nanometers, or billionth of a meter. POSS<sup>®</sup> nanomaterials can be used both as direct replacements for hydrocarbon based materials or as low-density performance additives to traditional plastics. They release no VOCs, and, thereby, produce no odor or air pollution. They are biocompatible, recyclable, non-flammable, and competitively priced with traditional polymer feedstocks. POSS<sup>®</sup> Nanostructured<sup>®</sup> materials can be readily incorporated into virtually any existing polymer system through blending, grafting or copolymerization.

These POSS<sup>®</sup> nanobuilding-blocks were hailed by R&D magazine as globally one of the 100 most technologically significant new products for the year 2000. More recently, Hybrid Plastics was one of five finalists for the Small Times Magazine's *2002 Best of Small Tech Award* for its POSS<sup>®</sup> Nanostructured<sup>®</sup> materials. The Small Times Magazine Best of Small Tech Awards recognize the best people, products and companies in nanotechnology, MEMS and Microsystems globally.

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