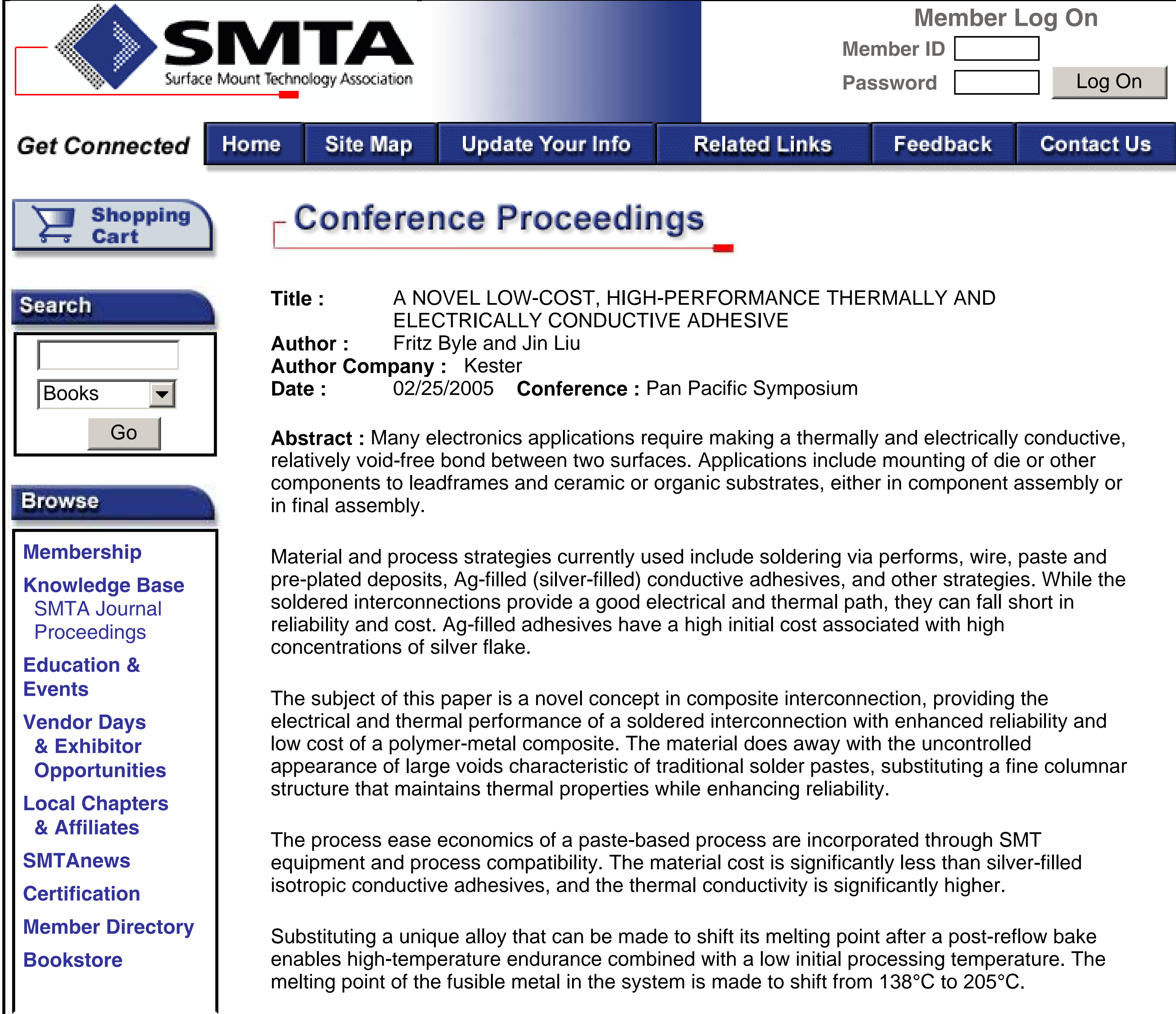

Conference Proceedings

Title : A NOVEL LOW-COST, HIGH-PERFORMANCE THERMALLY AND ELECTRICALLY CONDUCTIVE ADHESIVE
Author : Fritz Byle and Jin Liu
Author Company : Kester
Date : 02/25/2005 **Conference :** Pan Pacific Symposium

Abstract : Many electronics applications require making a thermally and electrically conductive, relatively void-free bond between two surfaces. Applications include mounting of die or other components to leadframes and ceramic or organic substrates, either in component assembly or in final assembly.

Material and process strategies currently used include soldering via performs, wire, paste and pre-plated deposits, Ag-filled (silver-filled) conductive adhesives, and other strategies. While the soldered interconnections provide a good electrical and thermal path, they can fall short in reliability and cost. Ag-filled adhesives have a high initial cost associated with high concentrations of silver flake.

The subject of this paper is a novel concept in composite interconnection, providing the electrical and thermal performance of a soldered interconnection with enhanced reliability and low cost of a polymer-metal composite. The material does away with the uncontrolled appearance of large voids characteristic of traditional solder pastes, substituting a fine columnar structure that maintains thermal properties while enhancing reliability.

The process ease economics of a paste-based process are incorporated through SMT equipment and process compatibility. The material cost is significantly less than silver-filled isotropic conductive adhesives, and the thermal conductivity is significantly higher.

Substituting a unique alloy that can be made to shift its melting point after a post-reflow bake enables high-temperature endurance combined with a low initial processing temperature. The melting point of the fusible metal in the system is made to shift from 138°C to 205°C.

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