Substrate Metallization Considerations for Soldering

Special Consideration when using an Indium-Containing Alloy on Copper

Copper and high copper alloys diffuse into indium, which forms a copper-indium intermetallic that may compromise the mechanical integrity of the joint.

Copper diffuses into indium even at room temperature when solid, a process known as solid state diffusion. The copper-indium intermetallic can result in a weakening of joint strength and may result in joint failure under certain circumstances. Because this phenomenon is a function of temperature and time, the weakening effect of the diffusion may not be immediately evident. One effective method to prevent this diffusion is to have a barrier layer of a minimum of 50 microinches of nickel plated between the copper and indium. Metallizations, such as gold, can then be plated on top of the nickel to create a more solderable surface.

Reference: Effect Of Au On The Reliability Of Fine Pitch Surface Mount Solder Joints by Judith Glazer (Hewlett Packard Company, Palo Alto, California) and Pamela A. Kramer and J.W. Morris, Jr. (Department of Material Science and Mineral Engineering, University of California and Materials Science Division Lawrence Berkeley Laboratory, Berkeley, California)

APPLICATION NOTE

This application note is provided for general information only. It is not intended, and shall not be construed, to warrant or guarantee the performance of the products described which are sold subject exclusively to written warranties and limitations thereon included in product packaging and invoices. All Indium Corporation's products and solutions are designed to be commercially available unless specifically stated otherwise.

Form No. 97774 R2

www.indium.com askus@indium.com

ASIA: Singapore, Cheongju, Malaysia: +65 6268 8678
CHINA: Suzhou, Shenzhen: +86 (0)512 628 34900
EUROPE: Milton Keynes, Torino: +44 (0) 1908 580400
USA: Utica, Clinton, Chicago, Rome: +1 315 853 4900

ISO 9001 REGISTERED

©2016 Indium Corporation