

## **Effect of Reflow Soldering Profile on Intermetallic Compound Formation**

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### **ABSTRACT**

Reflow soldering in a nitrogen atmosphere is a common process in surface mount technology assembly since it can increase solder joint reliability. The present study investigated the effect of different reflow soldering atmospheres, either air or nitrogen, on intermetallic compound (IMC) formation and growth. Several techniques of materials characterisation including optical, image analysis, scanning electron microscopy and energy dispersive X-ray analysis were used to characterise the intermetallics. Besides, the effects of cooling rate and isothermal ageing were also studied. In summary, reflowing under nitrogen atmosphere had better effect on IMC formation and growth compared to reflowing under air. Besides, the cooling rate of solder during reflow also appears to have an effect on the final structure of the solder joint, and controlling the growth behaviour of the IMC during subsequent isothermal ageing. However, further research can be carried out to determine the solder joint's strength produced by both reflow soldering profiles.

**KEYWORDS:** reflow soldering; cooling rate; IMC; intermetallic compound