

Fibre Laser Soldering Operation and Its Effect onto Intermetallic Compound at The Solder Joint: Short Review

Nabila Tamar Jaya, Siti Rabiattull Aisha Idris ,

1 Fakulti Teknologi Kejuruteraan Mekanikal dan Automotif, Universiti Malaysia Pahang,
26600 Pekan, Pahang
rabiattull@ump.edu.my

Abstract:

Nowadays the application of laser technology in microelectronic packaging has been widely implemented in many developed countries. Its flexibility on setting the parameters by following individual's requirement, localized heating, non-contact heating, fast heating and cooling rate makes it one of the best choice for creating a joint between solder alloy and printed circuit board in microelectronic devices. Laser soldering method ease the automation process and its ability of directing the energy beam onto desired target area is seen as an advantage compared to other conventional soldering methods such as reflow soldering (infra-red and hot air), vapour phase or hot-belt soldering whereas the entire assembly is passed through an oven to form solder joint with metallurgical bonding. Meanwhile, as in conjunction to support the banned usage of lead (Pb) in electronics, the lead-free solder alloy has been proposed as the best alternative solder to replace SnPb solders. Many researchers have also studied that Sn-Ag-Cu solder alloy group have a better melting temperature that is in between 216-227 in degrees Celsius compared to Sn-Pb melting temperature (183°C). This paper will focus on fibre laser operation with regards to soldering process and also its effect towards intermetallic compound formation at the solder joint.

Keywords: Workplace Risk Assessment; Hazard Identification; Risk Assessment

References

1. Illyefalvi-Vitez, Z., et al., Laser Soldering for Lead-free Assembly. ISSE 2007 - 30th International Spring Seminar on Electronics Technology 2007; Conference Proceedings: Emerging Technologies for Electronics Packaging, 2007: p. 471-476.
2. Kibushi, R., et al., Optimal Laser Condition for Laser Soldering in Cream and Ring Solder. 2013 IEEE 3rd Cpmt Symposium Japan (Icsj 2013), 2013.
3. Nicolics, J., Optimization of Process Parameters for Laser Soldering of Surface Mounted Devices. 1992. 15(6): p. 1155-1159.
4. H. Zong-Jie, X.S.-b., W. Jian-xin, Z. Xin, Mechanical properties of QFP micro-joints soldered with lead-free solders using diode laser soldering technology. 2008: p. 2-6.
5. W. Jian-xin, X.S.-b., F. Dian-song, J. Jin-long, H. Zong-jie, Y. Li-hua, Effect of diode-laser parameters on shear force of micro-joints soldered with Sn-Ag-Cu lead-free solder on Au/Ni/Cu pad. 2006. 16: p. 1374-1378.