



Die Attach Workshop (DAW) – 22nd November 2018

Die attach is a critical process in the assembly of electronic devices. The current status and future prospects for this process were presented by several national and international industrial companies at the IMAPS-UK organised Die Attach Workshop and hosted at MTC, Coventry on 22 November 2018. The workshop was sponsored by Inseto and Accelonix.

This workshop was attended by 66 people to listen to and engage with leading players in the field of die attach. It covered a comprehensive range of topics, including: overview of die attach processes, equipment and tooling, new materials and process developments and quality/testing/reliability.



Overview of Die Attach Processes

Eamonn Redmond of Inseto described the factors to consider for using conductive and non-conductive die attach adhesives for flat and bumped devices and several new developments in adhesives for high temperature applications (250°C), MEMS die attach and light curable adhesives.

Steve Riches of Tribus-D presented an overview of solder and sintering processes, highlighting the advantages and challenges in implementing inorganic die attach materials in production, particularly where high thermal and electrical conductivity are required compared to conductive adhesives.

Thomas Oppert of Pactech covered the opportunities for providing UBM (Under Bump Metallisation), electroplating for RDL (Redistribution Layers), solder bumping/balling and laser chip bonding to facilitate flip chip bonding. Most of the processes are carried out at a wafer level.

Equipment, Tooling and Optimisation



Thomas Reith of Amadyne described the features of flexible automatic pick and place equipment, where one system can cover a range of processes and technologies to aid in fast turnaround development and prototype manufacture.

Alex Tresky of Tresky AG presented a range of manual die attach and flip chip bonding equipment with accurate alignment technology and capabilities for carrying out several processes including solder, adhesive, microwelding and diffusion soldering.

New Process Development/Materials

Sergei Valev of Honeystone (representing Boschmann) described their silver sintering process and bonding equipment for electric vehicles and sustainable energy applications. Current developments on their equipment will include atmospheric control for improved processing.

Ly May Chew of Hereaus revealed some material developments for bonding silver sinter materials to copper and to difficult to bond aluminium and nickel. Relatively stable bonding had been achieved to bare copper as assessed by thermal cycling (-40°C to +150°C) and high temperature storage (250°C). For bonding

to aluminium and nickel bonding had been achieved and further work is underway to examine the nature of the interface between the sinter material and metal.

Quality, Testing and Reliability

Richard Carr of Nordson-Sonoscan reviewed the use of scanning acoustic microscopy for non-destructive inspection of die attach bonds to reveal voids and delaminations. Normally samples for inspection are immersed in water, but non-immersion couple methods are being developed to allow inspection of components during production.



Stewart McCracken of MCS highlighted the benefits of an inert gas plasma technique for a no deformation sample preparation technique (as opposed to grinding/polishing and FUB (Focus Ion Beam)). This process allows microstructural artefacts to be fully revealed, which can assist in resolving quality issues.

Bob Sykes of XYZtech presented a thorough review of die shear and pull testing methods to assess the quality of die bonded samples. The main principle of trying to test to produce the failure mode of interest was described, together with possible tool modifications to achieve that goal.

Die Attach Q&A Surgery



A short packaging surgery was held covering bond line thickness control, low cost materials for power die attach applications and optimised patterns for adhesive deposition.

The attendees also had the chance to network during the refreshment breaks. This workshop was very well received and it is hoped that another event on this important topic will be held in the future.

For further information, please visit IMAPS-UK (www.imaps.org.uk)

This event was sponsored by:



and

