

New Development and Availability in Die Attach Film (DAF) Adhesive for Die Bonding Applications:

AI Technology, Inc. (AIT), a pioneer in the technology of self-supporting die-attach film (DAF) adhesive has increased its manufacturing capacity in 2014 to more than 10 million square feet of its 10 micron thick ESP7660 series of insulating DAF for memory stacked chip applications and its 20 micron thick ESP8660 series of conductive DAF for power devices.

Since the 1990's, AIT has been known for manufacturing high performance die-attach film adhesives for stacked chips of over 20 layers with military reliability. Now, AIT's engineering team has successfully implemented an advanced automated line of DAF manufacturing and advanced PLC for even better control of thickness and higher capacity. This adoption of a higher capacity line under a clean room environment represents AIT's commitment to provide the best products for its semi-conductor customers domestically as well as internationally. AIT's new DAF manufacturing line is able to make DAF for the newer 450mm wafer technology that will become more important in coming years.

AIT's scientists created DAF, like the ESP7660-HK and ESP8660-HK series in response to market needs for higher glass transition temperature to that allows faster wire-bonding at temperatures as high as 250°C and molding operation up to 200°C.

AIT's ESP7660-HK and ESP8660-HK also improve the reliability of larger devices of stacked chips with polymer molecular engineering which absorbs the interfacial stress of bonding. Additionally, these films also offer improved film integrity before tacking and curing. With these new developments, AIT was the first to produce 8-10 micron insulating DAF consistently for even the largest wafer dimension of 450mm. For power devices requiring silver filled conductive DAF, AIT's ESP8660-HK has been proven to work best with thicknesses of 20 microns.

AIT engineers have successfully developed and are now producing ultra-thin ESP7660-HK-DDAF at 10 micron thick for die-attach film adhesive applications:

Die-attach-film (DAF) is engineered for "tack-and-cure" processes. This allows for tacking the die onto the substrate with low temperature (80-160°C) and low pressure (4-8 psi) for a short time (1-2 seconds). It then is followed by a curing process without needing pressure at a temperature that fits the manufacturing process.

AIT die-attach film adhesives are engineered to have high temperature bond strength to allow for wire-bonding operations up to 275°C with low stress for larger dies.

DAF has a long history of success in performing under extreme temperature and humidity. The following graph is a reflection of the low moisture absorption and potential for packaging components for lead-free soldering without pre-baking.

DAF has more than 10 years of proven success in stacking multiple chips for high reliability applications. Part of the factors contributing to AIT's DAF's success is its ability to withstand high temperatures without degradation. The following graph illustrates the unparalleled molecular stability when using DAF.

Die Attach Film (DAF) on Dicing Tape or Dicing Die-Attach Film (DDAF) is available from AI Technology for wafer level application. AIT may be the only manufacturer of DDAF that makes its own dicing tape and die-attach film adhesives in USA.

AI Technology, Inc. with headquarters of 16 acres campus in Princeton, NJ has inhouse clean room manufacturing capacity to supply die-attach film and DDAF to worldwide volume requirements.

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