SILICONE TECHNOLOGIES DIVISION
1100 Governor Lea Road, Bear, DE 19701
(302) 834-2100 (302) 834-4021 (Fax)

Thermabond® Application Notes –D003

Platen Press Curing and Vacuum Bag Curing of Thermabond® Adhesives

Thermabond® adhesives must be cured with heat and pressure in order to bond properly. The material has been specially formulated with low-temperature peroxide initiators. Recommended cure temperature range is 100-150°C (212-300°F) depending on the specific grade of Thermabond®. Please note that the specific temperature required depends on the assembly design as heat flows through the assembly and then Thermabond® comes to temperature. Thermocouples should be used to establish the heat lag time for the assembly. Pressure can be applied in one of two methods; platen press or a vacuum bag. Platen press curing is preferred due to its direct heat and pressure control. For populated printed circuit boards (PCB's), vacuum bag processing is required to apply pressure without disturbing or damaging the components. The amount of pressure required for optimal flow, adhesive surface mating, and ultimately bond strength should be determined experimentally for each assembly design. However, pressures between 10 and 50 psi are recommended. For vacuum bag processing in a conventional mechanically circulating hot air oven, a silicone reusable vacuum bag or a polyester turkey bag can be used to apply lamination. Vacuum bagging procedures are similar to that for composites processing.

Vacuum bagging is not recommended for Thermabond® adhesives with high plasticity (Williams plasticity higher than 3mm). Thermabond® adhesives with low plasticity (Williams plasticity from 2 to 3 mm) such as 99510Nxxx, 99990Axxx, and 48991Axxx can be cured by vacuum bagging where the assembly is under pressure for a minimum of 15 minutes at temperatures ranging from 100-150°C (212-300°F) depending on the grade. For pressing the unpopulated PCB's, adjust the vacuum to get a pressure between 10 and 50 psi. For populated PCB's, use a pressure between 10 and 15 psi. In either assembly, it is recommended that the optimal pressure be determined experimentally.

For bonding uneven PCB's or PCB's with thickness variance, a step cure approach can be used to help the adhesive flow and eliminate any entrapped air between the rigid planar substrates. A typical step cure process is to press the assembly between 10 and 50 psi for 30 minutes at 50°C (122°F) and then move to the adhesive cure temperature and time as described above. Thermabond® adhesives start to crosslink and lose the fluidity at a temperature above 50°C (122°F). Care should be taken to make sure that Thermabond® adhesive is not exposed to temperature above 50°C (122°F) before proceeding to the final curing step. The best way to ensure this is to use a thermocouple at the Thermabond® adhesive layer in the assembly.