

Problems with Parylene Adhesion to Kapton® or Polyimide?

VSI Parylene's KAPhesion™ is the bonding solution for your flex circuits and polyimide products. KAPhesion™ promotes superior adhesion of parylene onto polyimide and Kapton® substrates. VSI's exclusive adhesion prep process will advance your product reliability for flex circuits, medical devices, IOT and wearable technology.

For wet adhesion promotion, A-174 silane is widely employed due to the ability of the alkoxy silane functional group to crosslink with hydroxyl groups, which commonly occur and are easily generated on many substrates. However, polyimide substrates lack available hydroxyl groups and cannot cross-link with alkoxy silane functional groups. As a result, with the use of A-174 adhesion promotion solution, poor adhesion of parylene onto polyimide typically leads to delamination, as can be seen in Figure 2b.

The R&D engineers at VSI Parylene conducted a series of experiments to create the optimal adhesion promotion solution for parylene onto polyimide substrates. A variation of chemistries, solvents, concentration, time and temperatures were variables in the experimental design. The ASTM D3359-09e2 adhesion measurement by tape test method was used to quantify parylene adhesion onto polyimide substrates after adhesion promotion and parylene coating. A formula with an average of 90% adhesion (3B classification) was achieved, with samples of up to 100% adhesion (5B) demonstrated, see Figure 1. While A-174 samples result in complete delamination (0% adhesion, 0B), KAPhesion™ provides a verified solution to the polyimide adhesion promotion problem.

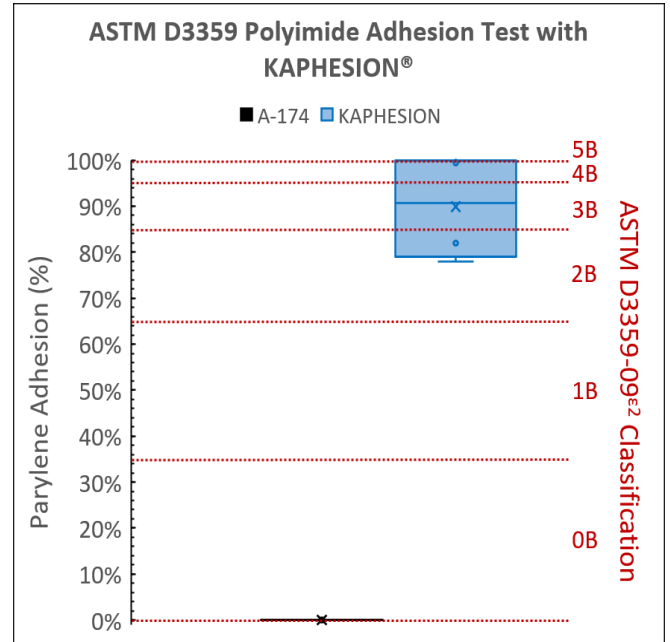


Figure 1 Plot of parylene adhesion and ASTM D3359 tested polyimide samples with A-174 (0B) and KAPhesion (3B average) adhesion promotion formulas.

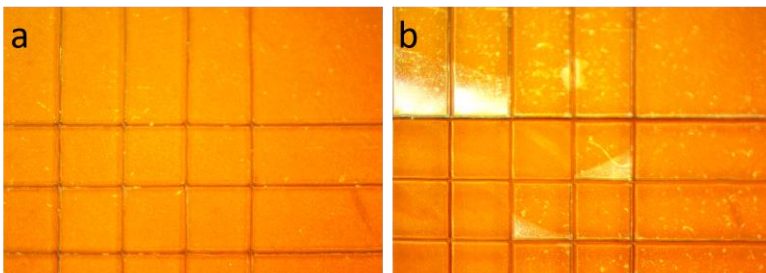


Figure 2 Parylene C on polyimide substrate, cut into 1 mm x 1 mm squares, and pulled by ASTM D3359 tape test: case of a) full adhesion and b) delamination.

KAPhesion™ is available **exclusively** from VSI Parylene. Contact us about your application and let us impress you! Because each customer's part is unique, our engineers bring their extensive experience in fixturing and manufacturing processes to ensure that every part is coated to your unique specifications. For products requiring innovative solutions, there is no better choice than VSI Parylene.