

“Fractal Fasten”

“Fractal Fasten” is a unique backside metalization developed to enhance the adherence of substrates to carriers using both paste and sheet epoxies. This unique metalization was designed with a “fractal” pattern that was perfected in cooperation with manufacturers using a variety of substrate materials, mounting configurations and carrier materials. The result is an unprecedented backside metalization that has superior adhesion, pull and shear strengths that cannot be achieved with standard metalization schemes. This metalization technique offers a surface that allows the epoxy to attach itself securely and grip firmly, therefore eliminating possible delaminating and dislodging issues. This method of attachment has proven to be effective with substrates attached to carriers or mounted directly onto kovar, aluminum and other various metal housings. ATP has spent numerous hours of electrical design simulations to ensure that the metalization does not have any adverse electrical skinning or negative ground effects on conventional microwave designs.

Film Epoxies

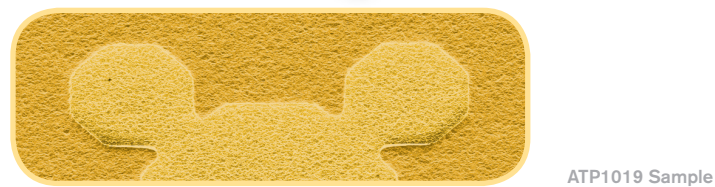
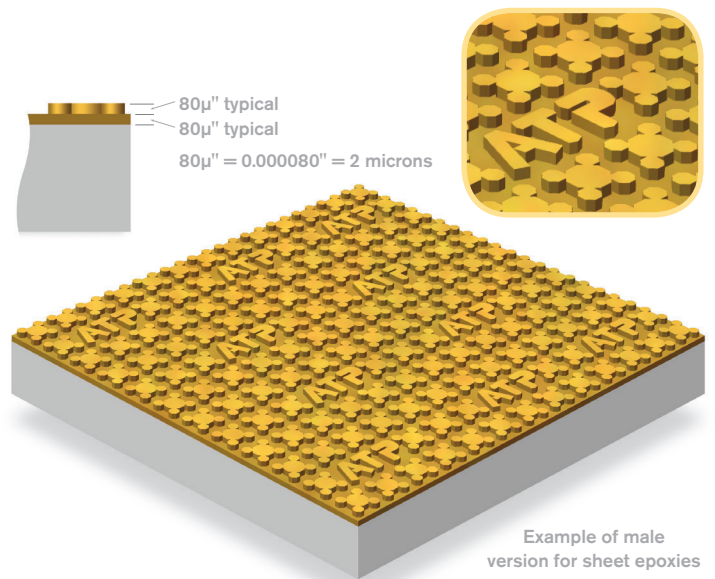
Recommended: Ablefilm 5025E

Prepare and cut a predetermined suitable size of Ablefilm 5025E to give ample coverage to the substrate to be attached. Precautions should be taken with this material since it is usually stored frozen and needs to reach room temperature before handling. Clean all surfaces to be joined with Isopropanol. Place the Ablefilm 5025E in between the housing/carrier and the **male** “Fractal Fasten” substrate to be attached in a sandwich fashion. Repeat this until all substrates have been positioned in the chain as desired. Special tooling will be required to apply even pressure to the entire assembly during the thermal compression curing cycle. The tooling can be comprised of a dead weight fixture that covers the entire assembly or it can be a series of mechanical or spring clamps to apply ample pressure to the assembly during the curing process. A neoprene, Teflon or heat-resistant silicone rubber should be used to protect and distribute the weight evenly in between the fixture and the substrate. Apply a minimum of 6 psi of pressure evenly across the entire assembly in a curing oven or hot plate while elevating the temperature of the assembly to 125°C for 120 minutes or 150°C for 30 minutes (refer to Ablefilm 5025E application notes for best results). If spring clamps are used, be aware that over time and temperature exposure, the tension of the springs can change and may need to be recalibrated for accurate pressure on the substrate assembly. Although higher pressures may be applied for optimum bonding strength, one must use caution based on thickness of substrate to eliminate breakage potential. Extreme pressures have been known to displace the polymers in the epoxy and have adverse effects. Individual experimentation will be required for optimum performance and adhesion depending on size and thickness of substrates.

ATP now offers this same unique cost effective backside metal to all of our customers wishing to attach substrates with epoxies without experiencing the usual problems, such as substrates not adhering, lifting during or after temperature shock and temperature cycling. This metalization scheme, when used and applied as directed, will result in superior adhesions in comparison to conventional-type processes, thus eliminating the age old headaches of pre-scoring or roughing up the surface of the substrate before attaching.

ATP has developed two types of backside metalization to optimize adhesion, utilizing both paste and film epoxy applications allowing our customers to attach directly to aluminum, copper, brass and kovar housings to minimize size and weight of the assembly. Contact ATP for further information on this unique backside metal or to request samples. We are very interested in discussing your individual application process and product needs.

Example of Backside Metalizations



Disclaimer: The results are based on our individual experiments to achieve optimum die shear strength. Results may vary or adjustments may be needed to achieve optimum results for individual applications. Proper cleaning must be done to each surface to achieve maximum bonding strength. Please refer to the application notes of the epoxy manufacturer.