

## **Technical Note**

| Related Product: | MFC                                 |
|------------------|-------------------------------------|
| Topic described: | Bonding the MFC to a host structure |
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## 1 Motivation

A perfect bond line between the MFC and the host structure is essential for the high performance actuation of a structure using MFC type actuators. For this, we highly recommend using the common composite vacuum bagging technique.

## 2 Procedure

- 1) Cover the MFC's top surface with a self-adhesive foil to protect the MFC's Kapton layer from being torn during the bonding process
- 2) Slightly sand the surface of your host material to get a better bond strength Note: Never sand the MFC surfaces.
- 3) De-grease the MFC's bottom surface and the host material's top surface with alcohol.
- 4) Apply a thin film of the recommended epoxy glue to the MFC's bottom surface using a razor blade. Note: If the host material has a porous surface structure then it may also be necessary to apply adhesive to the surface of the host structure as well.
- 5) Apply a thin, additional epoxy strand down the middle of the MFC's bottom surface to build up a small adhesive reservoir.
- 6) Flip the MFC over and place it in the correct position on top of the structure. Note: DO NOTE press the MFC against the host surface at this time.
- 7) Fix the MFC into the correct position using 2 TESA stripes across both ends.
- 8) Press the MFC against the structure. Then, using a resin squeegee and starting from the center work your way to the edges of the MFC, squeezing as many air bubbles out of the bond line as possible, the resin flow from the reservoir will help you with this process.
- 9) Wipe off the superfluous adhesive along the MFC edges using an alcohol-soaked cloth,
- 10) Cover the MFC with a thin (1-2mm) rubber (or non-stick) mat that is a little larger in size than the MFC itself, cover either the mat or the whole structure with 1 layer of a breather cloth to absorb excess adhesive.

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- 11) Place the structure in a vacuum bagging tube, seal it and apply vacuum.
- 12) Cure the epoxy following the manufacturer instructions.
- 13) Remove vacuum bag and carefully peel off the rubber mat, the TESA stripes and the self-adhesive cover foil, being careful to avoid any damage to the MFC's top surface.

## 3 Resources

- Breather Cloth <u>https://www.acpsales.com/Breather-Cloth.html</u>
- Vacuum Bag Tube <u>https://www.acpsales.com/Nylon-Vacuum-Bag-Tubes.html</u>