

# Windshield to Fuselage Transition

EAA SAW Fiberglass Techniques for RVs - Project 2

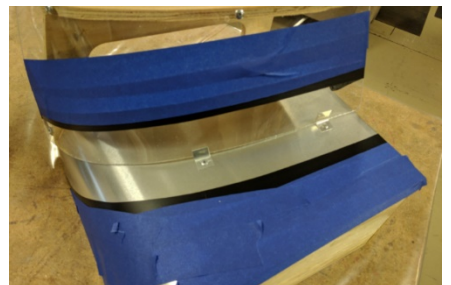
Scott VanderVeen, Instructor



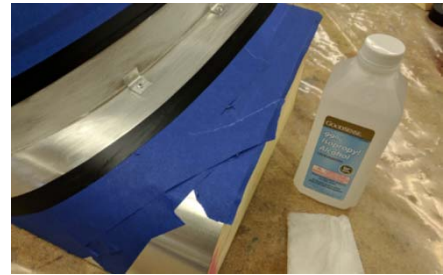
*Process as used on an RV-7*

## Step 1 – Marking and Layup

1. Establish the fairing locations by applying masking tape along both sides of Plexiglas/Aluminum seam to create an approximate 2.75" fairing. Use Blue 1.4" Masking tape on the plexiglass and aluminum sides of the transition line.
2. Apply Electrical tape along perimeter of masking tape, both on the AL and Plexi.
3. Apply blue masking tape over top and partially cover the electrical tape.
4. Remove the blue masking tape used to establish the fairing lines in step 1.
5. Mask off remaining of windshield and aircraft for protection from epoxy and paint.
6. Apply 2<sup>nd</sup> layer of Electrical Tape over top of first layer of electrical tape as a sacrificial layer of tape. Use a different color of electrical tape for easier application if available.
7. Sand Aluminum with 220 grit, and **thoroughly** scuff the surface.
8. Sand the Plexi-glass with 80 grit, and **thoroughly** scuff the surface.



9. Wipe down exposed Aluminum and with Isopropyl Alcohol, 99%. Clean off the plexiglass with a water dampened towel or vinegar.



10. Mix and apply small dollops of structural Adhesive on aluminum and spread thin with razor blade.



11. Mix epoxy, add black tint, Micro and Cotton Fiber (Flox) to make a thick filler paste that is Non-sagging, peanut butter consistency. Apply along the Plexi/AL transition area creating a 3/4" wide filet.

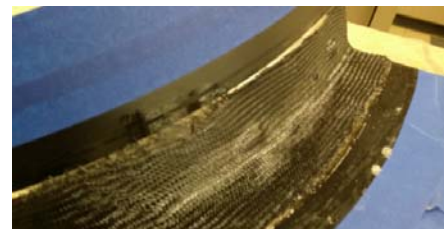


12. Cut fiberglass on the BIAS, enough to make a 2 layer 2.5" wide strip to go along the transition line.

13. Mix Epoxy with tint as required to Pre-preg the 1st set of 2-layer BID fiberglass (8.8oz Cloth 7725 Twill).

14. Cut the pre-preg layers and apply along the transition line, make sure to keep edges of BID approximately 1/8" away from electrical tape edge.

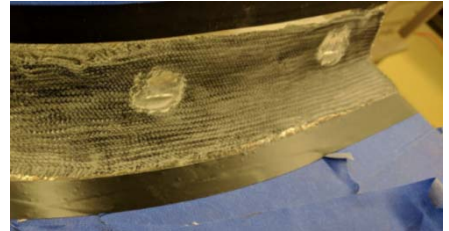
15. Add Peel Ply along the outer edges of the BID to keep them down.



INSERT PICTURE WITH  
PEEL PLY HERE

16. Cure at room temp for 8-12 hours or at elevated temp up to 120F for 3 hours or until epoxy cures.

17. When the epoxy has cured, remove the peel-ply and lightly sand fiberglass surface with 80 grit sand paper. Grind down large bumps as required.



## Step 2 – Filler and Final Layer of fiberglass

18. Vacuum dust and wipe with IPA.

19. Cut Fiberglass on the BIAS, layout on plastic in preparation for pre-preg.

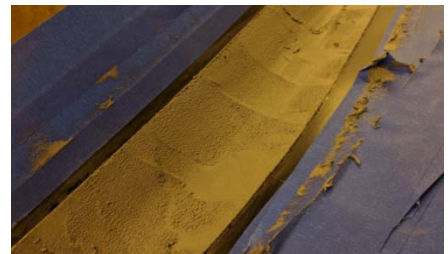
20. With a silver sharpie marker, make a template by laying out the strips 2.5” wide with a silver sharpie on the plastic.

21. Mix small amount of epoxy, wipe on fiberglass in preparation of Dry Micro filler

22. Mix epoxy, add tint, then mix with micro-balloons to create a dry micro filler with the consistency of putty. When mixed thick enough it will for peaks that do not curl over. Keep adding more micro until it is thick enough, about a 3.5 to 1 by volume mix of micro to epoxy.

23. Apply Micro filler with squeegee, aka bondo spreader, and create a large fillet along the seam line over cured fiberglass.

24. Pull second layer of electrical tape after each application of filler to form clean transition line. Reapply more electrical tape after the filler has cured.



## Application 2<sup>nd</sup> Layer of fiberglass (Note: This step was not done in class)

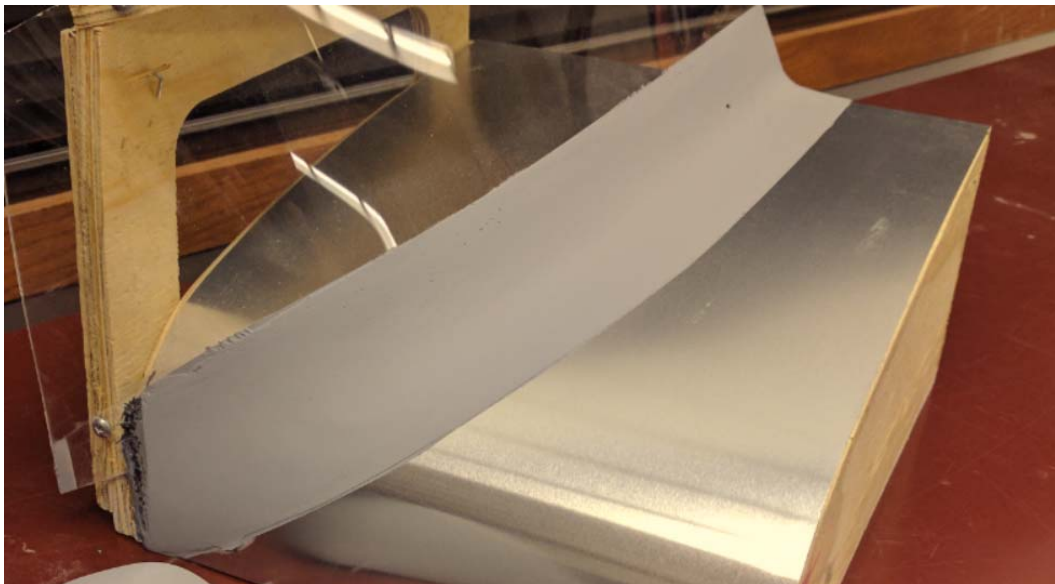
Option 1 - Let the filler cure for 8 to 12 hours at room temp (75-80F), or cure at elevated temp up to 120F. Then sand smooth with 80 grit, and go to step 24.

Option 2 – while the filler is still shapeable, proceed with the 2<sup>nd</sup> layer of pre-preg. Apply over top of uncured filler and smooth out.

25. Wet out and create 2<sup>nd</sup> Pre-preg set of 2-layer glass with dark tint.
26. Apply 2 layers of Pre-Pregged/dark tint glass to seam, make sure to keep edges approximately 1/8" away from electrical tape edge.
27. Add Peel Ply along the outer edges to smooth them out.
28. Cure at room temp for 8-12 hours or at elevated temps for 3 hours, max temp 120F.
29. After cure, pull peel-ply.
30. Scuff sand fiberglass surface with 80-grit.
31. Mix epoxy and wipe coat the cured fiberglass surface. (Skip if using Aeropoxy Light)
32. Mix epoxy, tint and micro for dry micro paste as in step 22.
33. Skim coat 1/8" or less with micro (Cheapest method) or Aeropoxy Light
34. Cure at room temp 8-12 hours or at elevated temp for 3 hours or until cured.

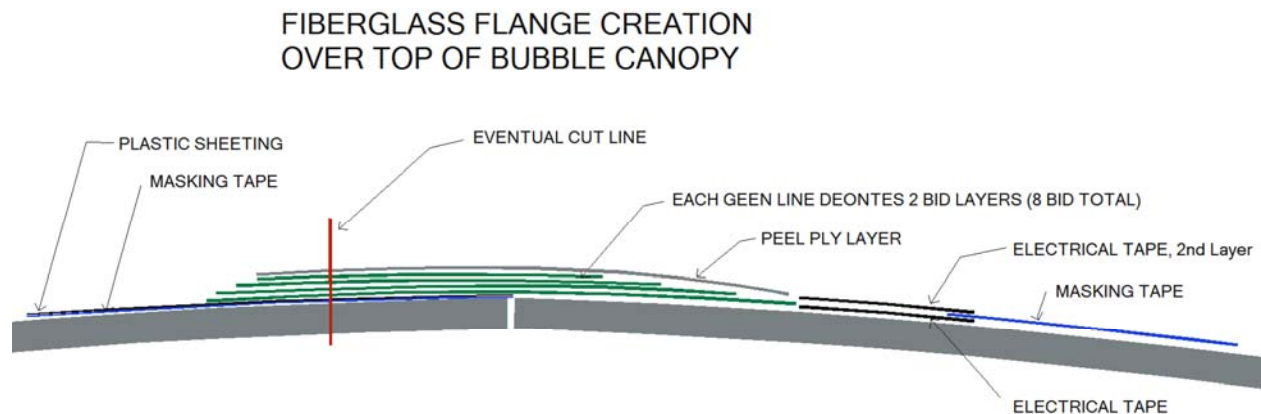
## Primer

35. Sand filler with 80-grit, then 120-grit, then 180 grit.
36. Apply spray paint filler primer allow to dry per paint specifications.
37. Sand off filler primer with 220 grit. Major scratches should be filled with the first application of primer. Spray with primer again and lightly sand when dry. The second sanding should be just enough to smooth out the paint without sanding through primer layer.
38. Blow off area or vacuum, and begin minor imperfection filling process.



## Notes for completing the RV-7

The BID layup for over the top of the canopy is 8 layers thick and can be tapered from 2 BID near the plexiglass to the full 8 BID by adding an additional 2 layers each  $\frac{1}{2}$ " going aft or 1 layer every  $\frac{1}{4}$ ". Use peel-ply to assist smoothing the BID.



The top of the canopy, aft movable section, needs to be masked off completely. When closed and snug to the forward section, an additional loose layer of plastic about 6" wide is applied up to the cut line of the canopy. The plastic is held with masking tape at the edges to make it taut and free from wrinkles along the upper surface and sides of canopy at the cut line.

The additional plastic will break free from the canopy as it is pulled backwards after the epoxy has cured.

The scuffed area on the forward section of the canopy is the width of the masking tape approximately 1.4".

**Pinhole Removal process**

1. Inspect for pinholes and minor imperfections.
2. Use polyester 2 part putty filler, note it has a 5 min work time, use small batches.
3. Apply skim coat of filler with a razor blade.
4. Cure at room temp for 30 minutes or so, or at elevated temps up to 120F for 10-15 mins or so.
5. Sand off heavy layers of filler initially with 120grit. When primer begins to show through, switch to 220-grit.
6. Inspect for pinholes, repeat steps 1-5 as necessary. Paint with primer to show pin holes but sand most of it off.
7. Proceed to 320 grit as a final sanding before last primer coat.
8. Use a final primer and let dry as specified by paint mfr.