**Airframe Fiber glass Layout Routine July 11, 2023**

**Materials:** Fiber glass (Fiber glast 2000) **laminating epoxy**, 2060 (60 minute) Epoxy **hardener/Cure,** Acetone, Gloves, Goggles, Face Mask, open space, Sand paper.

**Chamfer leading and trailing edges** – sanding

1. Determine number of layers……………..
2. Determine orientation pattern………………..
3. Cut out top layer paper reference
4. **Determine scale of change between layers**
   1. Use top layer to cut out other refs
   2. Label the refs starting from top to bottom ref
5. Trace the paper refs onto the fiber glass in correct orientation (212.62 grams)
6. Label the cloths in order
7. **Surface Preparation** Sand the surface of the base material (Low grit sand paper)
8. Apply acetone and wipe clean the surface
9. Remove as much surface dust/material as possible
10. Pour drops of water on the surface for the water break test
    1. If drops bubble up, return to step 9
    2. If surface is sufficiently smooth, re-do step above
    3. Once water break test passes, proceed
11. Cover part with foil/anything to keep it dust free. (a saran wrap is advised)
12. Determine weight of Epoxy needed
13. Weigh all fiber glass material, should be ratio of **1:1** (**fiber glass cloth to Epoxy itself)**
14. For the series of epoxy, measure **3:1 epoxy/ hardener**
15. Pour out amount of epoxy and hardener into separate large bowls
16. Start 60 minute timer, pour epoxy and hardener into a cup
17. Mix for at least 3 minutes, as thorough as possible
18. **Prepreg** –pre-impregnating the fibrous material with a synthetic resin.
19. Lay out fiber cloth on table, pour epoxy over it
20. Squash out the epoxy until the material is all soaked, wipe out the extra material
21. Always travel in the weave direction, not tangential to it
22. Apply to object being fiber glassed, smooth out bubbles wrinkles.
23. Repeat step above. **Avoid bubbles** for good surface attachment
24. Finally, place and press down a **dry** piece of peel ply on top to soak up excess epoxy
25. Cure time - **24 hours**

Epoxy will soak clean through the fiber glass weave to create strength. Adhesion of the fiber glass layup to the rocket through a strong bond is essential, and **surface prep** is how you get a good bond. For the surface preparation, using higher grit sandpaper will increase the surface area for good bonding.

Surface Prep and actual application of epoxy should be **15-30 minutes window,** to avoid dust build up.

**Water break test**- To see if the surface is good enough to bond. Good surface is where water and the surface have a low break angle (good friends) i.e. water spreads out as far as possible.