# Introduction

The following is a list of tests with various composite materials. Each test includes lessons learned, fiber used, matrix used, and overall quality descriptions.

## Test 1 – 12-16-2023

* Fiber – Bondo fiberglass by 3M (PN: 20128)
* Matrix – Bondo fiberglass resin and hardener combo by 3M (PN: 20124)
* Vendor – Home Depot
* Description:
  + This was the first test of composite manufacturing at a hobby level. The goal of this test and likely the following test(s) was to judge the production quality of a mold and layup using the financially cheapest and least intensive methods possible. It is well known that the result would not be anything near as good as professional grade productions. The intent is to use the knowledge captured to advance the attention on only the most lackluster parts of the manufacturing process in order to avoid wasting money on parts that can be done for cheap.
  + The mold selected was an RC foam wing with an outer layer of tape and paint protecting the inside foam. This RC wing had seen an unknown number of flight hours previously. The surface of the mold was NOT cleaned prior to layup. Locally sourced fiberglass, resin, and hardener were purchased from Home Depot. No release film or release agent was applied to the mold prior to layup. The layup was held in place by gravity and matrix was manually dispersed using hand tools and gloved hands. No vacuum bagging techniques were used.
  + Surprisingly, the fiberglass mold, though severely underperforming by any standards, did release from the mold with no noticeable damage to the mold aside from capturing some of the paint. It would be interesting to see if the RC wing with tape exterior could survive multiple layups without release agent, or exothermal curing reactions, without degradation.
* Quality – 3/10
  + Inconsistent matrix, severely lacking stiffness, surprisingly clean release from untreated mold, some areas of fiber disturbance prior to cure.
* Lessons learned:
  + Certain surfaces may not need a release agent, which would be pleasant, since plastic release films require careful constraining to avoid wrinkles. The specific matrix mixture created potent fumes similar to gasoline. More ventilation perhaps. Experiment with humidity exposure in the future. Experiment with laminates and multiple layers of matrix applied at certain time intervals.