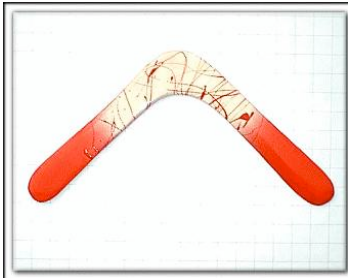
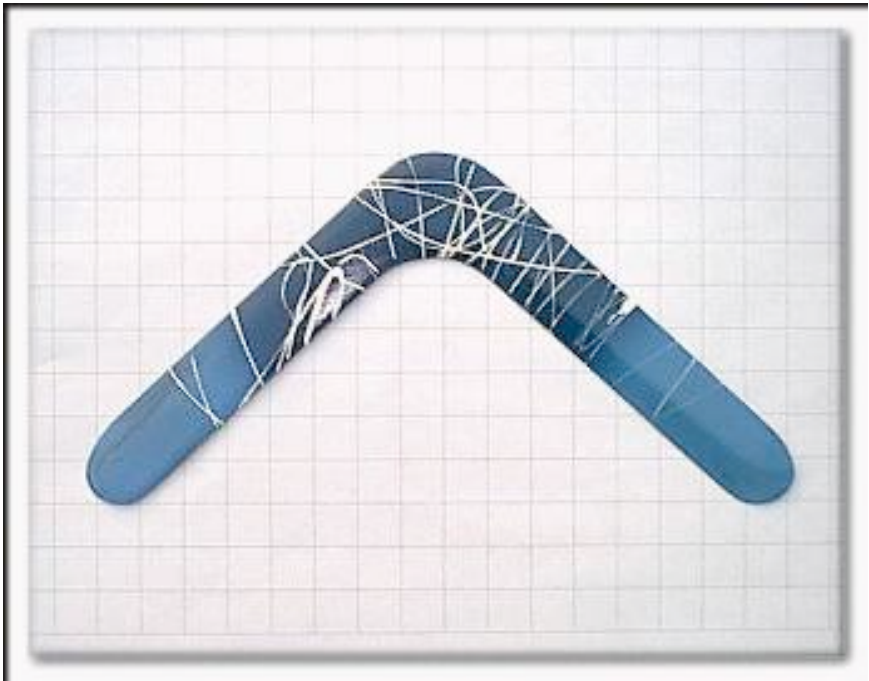


<p align="center">Reinforced Molding (closed mold) Individual Module: 33</p>	<p>TEL 204: Polymer Molding & Forming Department of Technology</p>	<p>Student Name: (PRINT)</p>
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Overview:

Matched mold hand lay-up is a reinforced plastic molding process. You will use a two-part mold, polyester resin, and glass reinforcing fabric to construct a boomerang, dish or other object. Matched molds will be cleaned, waxed, waxed, waxed, waxed, waxed, and then coated with mold release. Gel coat will be applied to both parts of the mold. Then resin and glass is added in layers. Molds are clamped shut and the resin is allowed to cure. Alternatively, you may create a small hand lay-up project utilizing a single part mold or plug. Use as little resin as possible as the resin adds considerable weight to the product but not strength.



Module Grade:

Surface Finish (30)	Cracks (30)	Excess Resin (30)	Glass completely wetted out (30)	Air Bubbles (30)	Edges of product sealed (30)	Structure Warped (30)	Exposed Fibers (30)	Lumps & Bumps (30)	Lessons Learned (30)
Total:									

Molding Procedures: DAY ONE

1. Wear safety glasses! You will be using MEKP (Methyl Ethyl Ketone Peroxide) which can blind you!
2. Wear latex gloves and prepare your entire work area with newspapers!
3. Prepare the matched mold. You may need to refurbish the mold surfaces with 400 or 600 grit wet/dry sandpaper.
4. Drill out the overflow resin holes!
5. Clean the mold completely .
6. Wax all mold surfaces, edges, and the back, with **5 coats** of hard paste wax! Allow to dry and hand buff with a soft cloth between each coat. This will take at least **10 minutes between coats!** Mold release wax is needed on the **OUTSIDE** of the mold in case of resin leaks.
7. Brush on at least one coat of PVA mold release. Allow to dry.
8. First apply a gel coat. This is a light coating of just resin (use thickener and/or colorant if desired). The gel coat should partially set up before you apply additional layers of resin and glass. You will need **less than 1 ounce** of resin. You may want to use an extra drop of catalyst so that the gel coat sets up faster. When the gel coat has set (but not necessarily hardened) you should complete the rest of the molding process.

Molding Procedures: DAY TWO

9. Cut 2 layers of fiberglass mat and 1 layer of fiberglass cloth using the template available and scissors. Do not leave pencil marks on the mat, as they could be visible on the finished product.
10. To start molding, mix 2-3 ounces of **general purpose** polyester resin. Add 1% dark colorant *if desired*. Stir the resin and colorant before adding the MEKP catalyst. Catalyst should be used at the rate of 10 drops per ounce.
11. Make sure the layup is wet, or resin rich. Apply resin and lay in precut pieces of glass reinforcing. Be sure that the glass fibers are completely “wetted out”. They will change from white to transparent when they are sufficiently saturated with resin. Use a brush to stipple out all air bubbles.
12. Align the male mold over the female mold and **LIGHTLY** clamp with 3 C-clamps. A small amount of resin should squeeze out of the overflow holes or mold seams. Make sure some mold release is rubbed on the clamps.
13. Let cure for 24 hours.
14. De-mold by tightening the clamps slightly, tapping mold with dead blow hammer, using water to dissolve the mold release, and/or placing mold in 200 degree oven for a short time.
15. File, sand, and buff the finished product. Fill any voids with polyester resin and/or body plastic and paint if desired.

Brush Cleaning Procedures:

16. Brushes used with polyester resin can be cleaned with acetone.
17. Clean dirty brush in acetone jug # 1.
18. Clean dirty brush on newspaper.
19. Clean dirty brush in acetone jug # 2.
20. Clean dirty brush on newspaper.
21. Clean dirty brush in acetone jug # 3.
22. Clean brush on newspaper.
23. SNAP ALL JUGS CLOSED.

Lessons Learned:

List the most important lessons learned from this polymer module.

1. _____

2. _____

3. _____

Using the boomerang:

Grasp the boomerang near one end. The flat side should face away from you. Throw the boomerang overhand. Do not throw too hard. A sharp snap of the wrist as you let go will impart a good spin. With a little practice you will be amazed at the flight pattern of the boomerang. Best flights are made on calm days. If there is a slight wind, throw into or slightly across the wind. In windy weather the flights are usually very erratic. CAUTION: Throw only in an open area when there is NO danger of breaking windows or causing property damage. Keep small children away as this can hurt and can cause injury.