Do-it-Yourself Latex Dip-Molding

The mold is slowly dipped in the liquid latex, taking care to create as few bubbles as possible. The resulting coat of latex is much too thick for our application, so we will need to spin everything we don’t want off.

The coated mold, with rope attached to handle, is carefully placed in the centrifuge chamber (Gatorade bottle).
The chamber is swung full-circle by hand for several minutes to thin the coating to a reasonable thickness. The Gatorade bottle protects the liquid latex on the mold from wind, as well as protecting the floor, ceiling and walls from dripping latex. The length of rope and speed of the spin determine the thickness of the latex.

The mold is then allowed to dry on-mold for approx. 4 hours, then baked (in a kitchen oven) at 150 °F for at least 8 hours.
Notes on dipping process:

- Thickness is a function of material viscosity and gravitational or inertial body force acting on the material. In this method, the inertial body force is greatly increased by centrifuging the mold, causing large amounts of latex to drip from the mold.
- Bubbles in the latex after spinning seem inevitable, and they seem to cause leaky membranes. I tried touching up the surface with dabs of latex, which appeared to work nicely, but the membranes continued to leak.
- Membrane integrity can be tested after membrane is removed from mold, but before it is trimmed. At this point, it is much like a sock, and it is straightforward to clamp one end and determine if it can hold a pressure.
- Rate of spin to thin the coating was determined entirely by human feel. Judging from the consistency of cuff thicknesses, this was approximately adequate for our purposes.
- Its is important that the rope, and thus the radius of the circle the mold spins through, be significantly longer than the length of the mold, to ensure approximately even inertial body force on the latex over the length of the mold.
- When air-drying, the latex turns from the pictured white to the amber of cured latex. When all of the white is gone, the cuff is dry. I found it unnecessary to wait 4 hours in most cases.
- Extreme caution was taken at all times to protect the unapplied latex from foreign materials and grit, extreme temperatures, and drying. The lid was removed only as long as necessary to coat each mold.
- Cuffs were trimmed after curing, and attached to stripped endotracheal tubes to test fit and seal. Cuffs were sealed to PVC ET tubes with Cyanoacrylate (Superglue). Seal integrity appeared good.