

# National Association of Rocketry

# TECHNICAL REPORT

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## CONSTRUCTION OF PARAFFIN NOSE CONES

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Recently, I was experimenting with paraffin and came upon the idea of making nose cones out of paraffin. I discovered that paraffin nose cones are quite easy to make, although practice and experimentation can be two essential elements. They do, however, have a few advantages and disadvantages:

### Disadvantages:

1. They are apt to break when dropped.
  2. They are not suitable for model rockets whose nose cones do not come off to deploy the recovery system.
  3. They are not practical for model rockets in which the nose cone base is subjected directly to the engine's ejection charge.
- They are not as realistic or flawless as plastic or lathe-turned wood nose cones.

### Advantages:

1. They are inexpensive. A nose cone with a 3/4" diameter and a 2-inch length costs about 0.7 cents.
2. If the nose cone should be spoiled during construction, it can be remelted and reformed.
3. They eliminate a great deal of carving and sanding in contrast to balsa nose cones.

I take the following steps to make a paraffin nose cone:

1. A trapezoid-shaped piece of "Caslon Bond" typing paper -- this type of paper is what I have had the best results with -- a slight bit over the desired length is cut out and rolled into a paper cone. (See Figure 1) The edge of the paper is then glued. Care must be taken to prevent large bends in the cone which will leave imprints in the formed nose cone. However, small imprints can later be sanded out. The paper cone should be constructed as perfect as possible.

2. A cardboard backing the diameter of which is the external diameter of the rocket body is then cut out. A small hole is punched in it and a pencil point is inserted in it. The assembly is then pushed into the paper cone and the cardboard's horizontal position to the vertex of the cone is determined and marked with a pencil. If a weight is added (a lead slug, bolt, etc. of the desired weight), a hole in the cardboard is cut out and the weight is glued to it.

3. The nose cone mold tip is sealed with some putty, clay, or glue to hold sections) to prevent wax leakage. The paper cone is placed in a receptacle and the melted paraffin is then poured into the mold up to or a bit over the pencil line. (Ed. note: Don't heat paraffin too fast or too hot. It may break into flame.)

After about 3 minutes after pouring, the wax will begin to settle and a cone-shaped depression will occur in the center of the piece. This can be filled with more paraffin. The cardboard backing is then set into

place. If too much paraffin is poured, the sides of the mold will bulge; if too little is poured, the sides of the paper cone mold will have a tendency to fold in. If a weight is fastened to the backing, this assembly can be set in place about a minute after pouring.

5. After about 50 to 60 minutes, the wax should have hardened. The sides of the mold can be peeled away with a one--edged razor blade and the fingers. The cone itself should not be pulled, or the paraffin around the tip of the nose is apt to break.

6. A sharp tip on the nose cone can be formed by using a one-edged razor blade and fine sandpaper. Small ridges can be removed with a razor blade and then sanded with fine sandpaper.

7. A cardboard strip is cut out and rounded. This is then cemented to the cardboard backing of the nose cone. This will serve as a simple means of securing the nose cone to the rocket body. If this strip has not been placed near enough to the edge of the cone, paper strips can be glued to the cardboard strip to bring it up to the proper diameter. The paraffin can be shellacked. About two coats will do the trick. It may then be painted.

FIGURE 1

