



Technique...

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Attaching Large Comets to Shells



Figure 1: Running the optional lowering cord through the comet.



Figure 2: Applying a continuous bead of hot glue around inner and outer edge of comet where it will contact the shell.



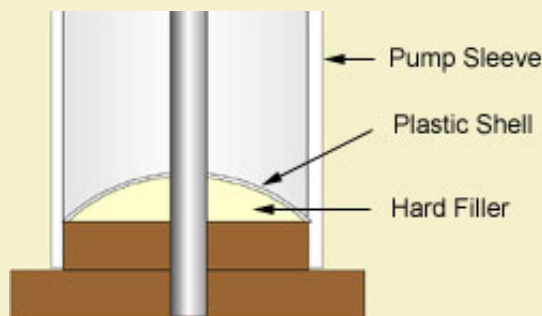
Figure 3: Cutting tabs in the paste strip before pasting.

Introduction:

The only thing better than a BIG comet is a BIG comet with a shell attached to it! The ball shells shown here are fitted with the large 4" comets described a few months ago. To read more about making the comets themselves, click [here](#).

The biggest hurdle to overcome in order to make these comets is the special tooling required to get the right curvature on the end of the comet that mates with the ball shell. It is important that the comet fits snugly against the shell wall in order to reduce air gaps that can cause the comet to crack from the setback during lift. Gaps around the joint will also allow the comets own flame front to work its way under the comet and jettison it from the shell during the flight, resulting in a comet going one way and the shell spinning off in some other unrelated direction.

The comet pump I made for these special comets was fabricated from wood, using a lathe to turn down a radius on the spindle base equal to the measured radius of a finished 6" ball shell. It may also be possible to get creative with some Durhams Rock Hard Putty and a plastic hemisphere for 6" shells. Try cutting out a section from the plastic shell casing so that it fits down inside your comet pump sleeve. You will have to drill a 3/4" hole dead center in the hemi section so that it can fit over the spindle. Then with the sleeve on your pump base, pour some putty into the bottom and press the plastic shell piece down on top. Push it down so the putty fills in all the space under the plastic piece, as seen in the figure below. It should be possible to press a comet on this after it dries. There's no guarantees, since I haven't actually tried doing this myself. I'm just suggesting this as one possible do-it-yourself method to avoid the need for a lathe.



The comets I use for this type of shell are made a little shorter than a stand alone comet, mainly to cut down on the centrifugal forces that work to rip the comet from the shell as it spins. Typically between 2.5" to 3" in height will work well. The burn time will remain constant regardless of the height due to the center bore, which sets the burn time limitation to 1-3/8" of composition (measured from the edge of the center hole to the edge of the comet). Unless



Figure 4: Rolling on two turns of the pasted 70lb virgin kraft.



Figure 5: Finished attachment ready for drying.



Figure 6: Hot glueing the leaders up the side of the comet.



Figure 7: Finishing paper wrapped around comet and leader.

you are using an unusually slow mix, the comet will always burn out before the shell breaks, assuming a time fuse duration of at least 4.5 seconds.

These comets are not finished with an end disk on one side like the stand-alone versions. They are simply pasted in on the sides only with two turns of 70lb virgin kraft.

Your shell will be a bit heavier once these comets are attached and you may wish to add some twine for lowering the shell into the mortar without ripping the shell leader. If you do this, the twine is fed through the comet prior to attachment, as seen in Figure 1.

The comet is initially fastened to the shell using hot glue, which doubles as a fastener and a sealer to prevent the flame front from working it's way under the comet. A minimum of two complete beads of hot glue are run around the inner and outer perimeter at the concave end of the comet as seen in Figure 2, then quickly press it onto the shell.

It is now necessary to secure the comet with at least two turns of pasted 70lb virgin kraft paper. Recycled kraft will not work for this application unless you use quite a few more additional turns. You really need strong paper to keep the comet from ripping lose during flight.

Figures 3, 4 and 5 show how the comet is pasted onto the shell. The dry paper strip is prepared by cutting tabs to half the paper width to allow the paper to form onto the shell. The paper is then pasted and broken in the usual way before wrapping it around the shell.

After the comet wrap has fully dried, the leader is glued up the side of the shell and comet using hot glue, as seen in Figure 6. A final few turns of 30lb kraft are glued around the comet and tied off around the time fuse to protect the exposed comet from accidental ignition.

I have never seen one of these comets fail to take fire, but if you are concerned about fire transfer you can use a paper punch to cut a small hole in the leader right where it passes over the comet. This will allow the quickmatch gasses to spray out the hole and insure ignition of the comet before the lift charge even fires. 🔥

