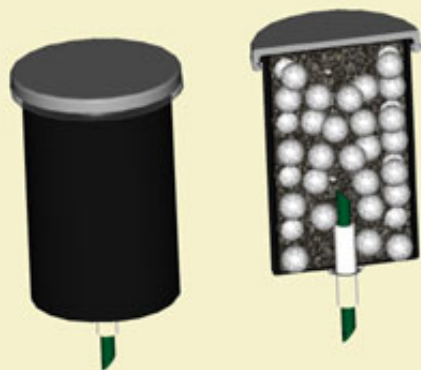




Beginner Project...

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## Film Canister Shells

 by *Michael Fales*


### Introduction:

Film canisters are usually available in great quantity (and free), making them a prime candidate for small shell casings. Albeit small they can create a good burst if done properly. The film canisters used for this project are the standard black can with either the gray or black cap that fits over the top of the container. Other round type canisters will work as well, however they may need a different size mortar to launch them. The cap measures just less than 1-1/2" in diameter and the canister is 2" in height. Most camera shops have a stockpile of canisters that they are most willing to give away. I left one shop with two garbage bags full! Film canister shells are not only simple and cheap to construct, but can also be fired immediately after it is constructed, providing a quick fix for the pyro in need as well as providing a good method for testing stars.

### Making the shell:

To start, drill through the center of the film canister bottom with a 3/16" bit. This will provide a hole for which the time fuse can be pushed through. Commercial time fuse can be used, but is not really necessary. A homemade time fuse of sorts can be created by cutting a 1-1/2" length of green visco fuse. When cutting visco fuse, cut it at an angle so it will expose more of the powder core.

When making your own time fuse using visco, you will need to add an extra fire barrier around the fuse to keep the shell from igniting too early. This is because green visco burns through the side as it is burning, unlike real time fuse. Note that there is a grade of visco that does not burn through the side, known as "end spit" visco. The green visco is the "side spit" variety, while the red visco is the "end spit" type. If you have the red visco, you can skip the masking tape step described next and use a 1/8" hole in the bottom of your film canisters.

Cut a 5.5" long piece of 3/4" wide masking tape and place the visco fuse at one end perpendicular to the tapes length. Make sure that nearly equal lengths of fuse extend to either side of the tape (see Figure 2). Roll the visco tightly into the tape creating a fire barrier. It is important to roll the fuse into the tape tight so that lift gases can not penetrate into the can on lift.

Insert the fuse into the hole on the film canister and push the tape portion half way in the canister. It should be tight enough that it takes some twisting, but does not damage the tape. The somewhat



Figure 1: Drilling the fuse holes.

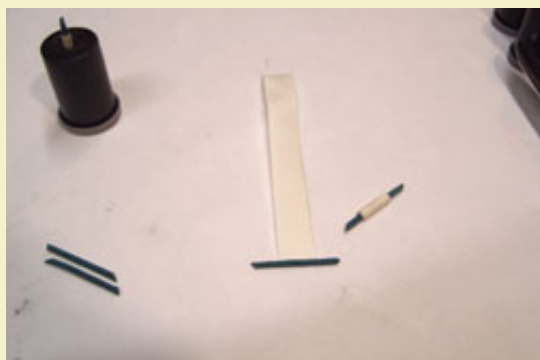


Figure 2: Insulating visco with masking tape.



Figure 3: Hot gluing the time fuses in place.

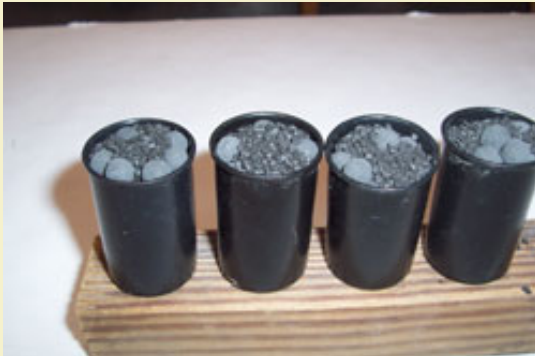


Figure 4: Shells loaded and ready to close.



Figure 5: Securing the lids with hot glue.



Figure 6: Wrapping with fiber tape.

spongy nature of the masking tape combined with the flexible canister make a good compressed seal. Apply a bead of hot glue around the taped fuse on the outside of the canister to provide a good seal against the lift gases. Be sure that the cap is removed from the film canister when doing this step, otherwise air bubbles can be pushed out through the hot glue and possibly compromise your seal.

Now to load the shell with the effects. Since the fuse of the shell is protruding from the bottom, it can not be set down level on the workspace. Drilling a 3/4" hole into a piece of wood will provide a place to set the canister so that both hands are free to work. Drilling several holes provides spaces to load many shells at one time, as seen in Figure 4.

Drop in 1/8" to 3/16" diameter stars until the canister is 1/3 full. Now sift in 3FA black powder in the space between the stars. Add 1/4 teaspoon 70/30 flash on top of the stars and tap the container to level the powder. Repeat by adding another 1/3 of the stars, black powder and 1/4 teaspoon of flash. Add the last 1/3 of the stars and black powder only, NO flash on this last addition. Level the stars and black powder to the top of the canister.

Once the canisters are loaded to the point seen in Figure 4, press on the cap while making sure that no powder is trapped between the cap and canister wall. Run a bead of hot glue under the rim of the cap to provide a seal between the canister and the cap. Avoid having the glue exceed the diameter of the cap, otherwise the shell could have problems fitting in the mortar.

#### Reinforcing:

This tiny canister will need better confinement yet to break nicely. Film canisters are made from a flexible type of plastic that does not provide much containment, which would result in weak and unsymmetrical breaks if used as-is. We will use standard 3/4" fiber reinforced strapping tape to wrap the shell with four vertical wraps. Cut a 14" length of the tape and split it down the middle lengthwise to create two 14" long x 3/8" wide strips. If you can find the 3/8" wide variety, it will save time. Start on top of the cap to one side and run the tape down the side at an angle so that it will pass the time fuse to one side. Run the tape up the back side of the shell crossing back to the side of the cap where you started and pass over the opposite side of the cap. Continue the tape down the side and pass the previous tape at an angle creating an "X" to pass the fuse on the other side. Bring the end of the tape up the back of the shell creating an "X" there as well. The strip of tape should end back on top of the cap. Now tape the shell with the other half strip of tape 90 degrees to the previous strip in the same manner passing the time fuse to either side. This is difficult to explain in words so please refer to Figures 6 and 7 to see what the pattern looks like.

Finish the shell by priming the exposed end of the visco fuse. Slit the end of the visco about 1/8" in and carefully spread open not letting the powder core fall out. Create a NC lacquer/Meal slurry and dip a small amount over the split fuse. Immediately dip the fuse into a fine grain black powder and leave to dry.



Figure 7: Priming the fuse ends.

### Usage

These shells are launched from 1-1/2" to 1-5/8" diameter mortars. The mortars are bottom fused with visco by drilling a 1/8" hole just above the plug in the bottom of the mortar. A lift charge of 3/4 teaspoon of 4FG black powder is loaded into the mortar from above prior to loading the shell. The lift charge can vary somewhat depending on the weight of your shell, so some experimentation will be necessary to find the right amount. The shell is loaded after the lift charge by sliding it into the tube with the fuse side down until it reaches the bottom. If the mortar will be stored or transported, an end cap can be made by pressing a few disks of 40 lb kraft paper into the mortar using a rod that is slightly smaller than the mortar I.D.

1-1/2" spiral wound paper tubes make great mortars for these shells. Depending on the fit of your shell to the mortar more lift may be needed.

These shells are not particularly attractive to the eye and may draw unwanted attention of your nearest self proclaimed grand master, but they do make nice breaks for their size!

### Extras:

Some simple additions can be made to enhance your film canister shells. You can create a rising tail by gluing a primed comet on top of the shell as seen in Figure 8. This is especially rewarding when firing the shells in fans or patterns. The pattern of the shells can be seen by the audience rather than just hearing the mortar fire and then seeing the shells burst a moment later. Put a dab of hot glue onto the top of your film canister shell and press a 1/2" tailing comet into the glue with the prime side up.

Double break canisters can also be made ever so simply! When creating the time fuse for your shells, use 1", rather than the 3/4", wide masking tape for the second break shell. This will create the time delay needed to break the shells slightly apart. Finish the shells as before and place the two shells together cap to cap. Wrap a couple of turns of masking tape around the two caps to connect the two shells together. Be sure to prime the top shell heavily to make sure the lift gasses transfer fire to it. Launch as before but increase the lift to 1-1/4 teaspoon of 4FG black powder and slide the shell down with the primed time fuse end up. When launched, both time fuses will be lit and the first shell will break sending the other shell in another direction where it will break shortly after.

The minimal materials, cost, and time it takes to make these shells make them ideal for first time shell builders as well as experienced pyros looking to beef up their backyard displays on short notice. 🔥



Figure 8: Attaching a rising comet.



Figure 9: A two break arrangement.



Figure 10: Using a hole cutter to make



mortar plugs.



Figure 11: Securing wood plugs into cardboard mortars with wood glue.