



Color to Report Cake

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Introduction:

Cake items are deceptively laborious items to create, which could explain why so little is written about their construction. On the plus side, cakes require very little composition to produce while also providing a long effect duration compared with chemical hungry items such as aerial shells. They are ideal for the beginner with a low budget or limited shoot sites, since 100g batches of color comp can make several cakes and shooting them does not attract much attention in areas where class C items are already legal.

Cakes can range from simple arrays of single shot star guns to complex assortments containing timed volleys of whistles, shells, tourbillions and essentially anything that can be shot out of a tube. The limited space constraints and timing issues provide many challenges for the pyrotechnician to master, and attempting to make this type of device brings a new level of appreciation for the extreme level of refinement the Chinese have achieved in this area.

Hobbyists who specialize in this particular spectrum of pyro are often referred to as "micro guys," since they must create very tiny effects to fit in the small tubes cakes require. A few micro guys even go so far as decorating their cakes with authentic looking wrappers, complete with warning labels, directions and of course a Chinese sounding name!

The construction method shown here is used in many common cake effects, so it is a good starting point for learning about basic cake construction. Many cake loads consist of a thin walled tube plugged at one end with a recessed clay plug, with a rising effect composition filling the recess and providing the timing. The tube can contain a report, breaks of colored stars, spinning effects, flying fish fuse or whistles to name a few. For this project the effect will be a colored rising comet to a report.

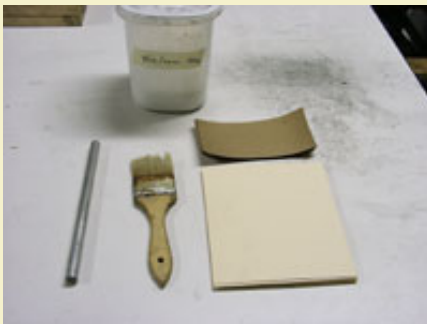


Figure 1: Materials for hand rolling tubes.



Figure 2: Applying diluted white glue to paper before rolling.

Making the Shot Tubes:

There are two tubes you will need to make this type of cake: the mortar and the shot. If you can buy both tubes in the size you need, then you can save yourself some work. But usually you have one tube on hand and must roll the other. I prefer to roll the shot to match whatever I have laying around for mortars, since the shot tube is smaller. I happen to have a very large supply of 6" long x 5/8" I.D. tubes that were given to me by a very generous passfire member, so I will use that as the mortar and design around it. The size is not critical, so feel free to adjust things to match what you have. If you make the shot exactly as shown here, you can shoot it out of tubes ranging from 5/8" to 3/4" I.D. with a length between 4" and 6". Shorter tubes will just require slightly more lift.

The shot tubes are 1-1/2" long with a 1/2" I.D. and an O.D. just under 5/8". I make these by first rolling 6" long tubes and then cutting them into four segments as seen in Figure 3. Each tube is rolled from a 6" square sheet of file folder paper, which makes very strong tubes that are also easy to roll. The first turn is wrapped around the former, as seen in Figure 2, then a mixture of white glue diluted 50% with water is brushed onto the remainder of the sheet and also on the small strip of 30 lb kraft that will make up the last few turns. The purpose of the thin kraft sheet is to keep the stiffer file folder paper from



Figure 3: Cutting 6" tubes into 1-1/2" segments.



Figure 4: Clay plugs rammed and drilled.

unrolling once it is rolled.

Do not be tempted to use dry-rolled tubes for cake shots, as the lift pressure will blow the core through and telescope the case like a Chinese yo-yo! The layers of paper must be bound to each other to prevent this problem.

Cutting the tubes into segments while they are still on the former is the best way to get a nice clean edge, although it does tend to score up your rolling rod. Pressing down with a good sharp knife while moving it forward to spin the rod around should separate the tubes after about two complete turns.

You will need 24 shots to make this cake, but it is good to roll a few extra for tests. A food dehydrator can be used to accelerate the drying of these tubes, or even a wooden box heated with a 100W light bulb will do the trick.

Once the tubes are dry, you will need to ram a thin clay plug at the end of each one such that it is recessed from the end by 1/4". A block of wood with a segment of aluminum or wood dowel sticking out by 1/4" is required for making the plug, as seen in Figure 4. The plug only needs to be about 1/8" thick, and it doesn't need to be rammed as hard as a rocket or gerb nozzle would be.

Next you will need to drill a 1/8" passfire hole through all the plugs. You can fabricate your ramming base with a 1/8" pin and use a hollow drift if you want to form the hole and the plug in one operation. Make the pin at least 1/2" long if you go this route.

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