



4" Mine w/Saettines

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Figure 1: Paper cut and ready to roll saettine cases.



Figure 2: Dowel even with tag board prior to folding the overhang.

Making the Saettines:

Saettines, also spelled siatenes or citeens or alternatively called lambetti, are a type of small report used in shells and mines. What sets them apart from other types of reports is the method by which they achieve their delayed timing. The simple paper casings are only partially filled with flash powder, into which a single strand of good quality black match is inserted. The remainder of the space is rammed with sawdust or bran such that it surrounds the black match and prevents the gasses from shooting along the sides as in piped match. This creates a reliable delay that, while not as accurate as time fuse, does the job quite well when a random barrage of salutes is desired following a color break shell or colored star mine.

Saettines are quick and easy to make, since they require no special tubes, disks or time fuse. The ones described here will measure 1" diameter by 2-1/2" long. You will only need seven to complete the 4" mine for this project, but you might as well make a good number of them because you will find yourself wanting to use them a lot and of course in fireworks, more is always better!

The case for saettines are made by rolling two pieces of paper together at once. An inner liner is made from thin chip board or manila file folder paper measuring 2-1/2" wide x 7" long. This will give you two turns around a 1" diameter case former. One 14" legal size file folder will give you enough strips to make a dozen saettines. The outer strip of paper shown in Figure 1 is a piece of 70lb kraft measuring 4-1/2" wide by 7-1/2" long, with the grain running in the short direction. The liner is placed over the kraft so that it overhangs a few inches on the end you are rolling from. The kraft is glued at the edge and the two sheets are rolled up together.



Step 1: Making the triangle fold



Step 2: Second fold.



Step 3: Third fold.



Figure 3: Bundled and fused cases ready to load.



Figure 4: Packing in the sawdust for delay.

Both ends of saettines are closed by a simple fold known as the "triangle fold." The case former is slipped down so that it is level with the inner liner. Steps 1-3 above shows how the overhanging kraft paper is folded to form the bottom of the saettine. I like to apply glue after each fold to help the pleated paper stay down. After the last fold is made, place the bottom of the case on a table and rap the case former with a rubber mallet to make the end good and flat.

As you might guess, this folded end plug is not reliably gas tight. While some claim that proper construction results in a good seal, having your shells detonate from a gas leak in one single saettine is not the best way to verify this claim. There are two methods commonly used to guard against gas leaks setting off your saettines. One is to ram an initial scoop of sawdust into the bottom of the case prior to loading the flash. The other is to paste a small square of lightweight kraft over the bottom of the case after it is loaded. I personally prefer the latter method.

Begin loading your cases by bundling them together and inserting a 5" stick of black match in each one. The quality of your black match is important, since only one strand can be used. Using multiple strands will cause a fire gap between them that will ruin the delayed effect.



Step 1: First fold



Step 2: Second fold.



Step 3: Third fold.



Figure 5: Pasted paper over bottom protects against gas leaks.



Figure 6: A clove hitch made with pasted cotton twine secures the ends.

Next load the flash powder into each case, leaving anywhere from 20% to 50% unfilled depending on how much delay you want. The unfilled space is then loaded with sawdust and tamped down to form a tight seal around the black match, which should run down the side of the case as seen in Figure 4. Note that while this consolidates the flash, it does not effect the performance of the salute. This reality is contrary to the belief sometimes held that salutes should contain only loose flash with some air space around it.

The next series of photos above shows how the triangle fold is made around the protruding black match, only this time no glue is used. Figure 5 shows the pasted kraft paper gas seal around the bottom of the loaded saettines. Omit this step at your own risk!

The saettines are finished by looping a clove hitch around the case to hold the ends down. Cotton twine wetted with wheat paste makes a good cinch when tying them off. Allow them to fully dry before loading them into any mines or shells.

WARNING: saettines are only to be used as components of other shells or mines and should never be used as hand held ground bombs. Salutes of any type using black match as the ignition method should never be lit by hand, especially when holding them!

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