



45mm Italian Candle

by Michael Fales



Figure 1: 45 mm crosssette display candle from Italy.

Manufacturer:	<i>Panzer, Italy</i>
Total Weight:	<i>1330 g</i>
Lift Charge:	<i>8.5 grams 3FA (per shot)</i>
Star Size:	<i>1-9/16" dia. crossettes</i>
Delay Method:	<i>7/8" thick wadding w/timer spool</i>
Delay Period:	<i>3.5 seconds</i>
Tube I.D.:	<i>1-3/4"</i>
Tube O.D.:	<i>2-3/16"</i>
Tube Length:	<i>31-5/8"</i>
Tube Wall:	<i>7/32" thick</i>



Figure 2: Spiral tube plugged with metal end cap at bottom.

Construction:

This autopsy reveals the inside workings of a large caliber Italian display candle. The candle tube is spiral wound and covered with a wrap of thin blue paper both on the outside and inside of the candle. The inner layer of paper is used to cover the spiral groove in the tube wall that is inherent with spiral wound tubes. The spiral grooves can cause potential problems with fire skipping past the delay bulkheads and prematurely firing shots out of sequence, thus ruining the entire effect. The blue wrap on the inside fixes this problem by smoothing out the tube and eliminating the groove. This allows the use of more readily available and cheaper spiral wound tubes in lieu of the more expensive convolute wound type. The bottom of the tube is closed using a crimped metal end similar to what is used for mailing tubes.

The label gives the manufacturer name and factory location, along with the item number and a description of the candle in both Italian and English. The Italian effect name given on the label is "Crocetta," which refers to the crosssette effect (and here I thought "crosssette" was the Italian name!). The English description reads "Comets & Rays," with "rays" apparently referring to the splitting portion of the crosssette effect.

The candle construction is revealed in Figure 3 with half of



Figure 3: Cross section showing arrangement of eight shots.



Figure 4: Closeup of crossette, lift and delay wadding for each shot.

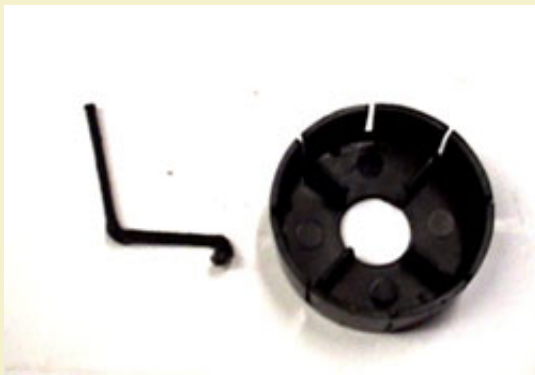


Figure 5: Plastic end cap and stick of blackmatch that are pushed down above the first shot.

the cardboard tube removed. A plastic flanged cap with a hole in the center is pushed down into the tube along with a small piece of blackmatch. This cap resides 11-1/4" down inside the tube. To display the candle the user must provide fire down into the tube to light the small piece of blackmatch or the prime on the comet. The common way is to bare the end of a long piece of quickmatch and place it into the candle. The quickmatch is then folded over the top of the candle. The plastic cap is then placed back on top of the candle holding the quickmatch in the small notch provided.

The first crossette in the tube is placed prime side up so that it can take fire from the top. The flash of fire from the prime will travel down around the comet and ignite the lift charge, thus blasting the comet and plug out of the candle. The timing elements between shots consist of a 7/8" thick felt plug with a plastic spool at the center. The center of the spool is filled with a dried black powder type slurry to provide the fire to the next shot. When lit a fierce flame approximately 6 inches long shoots from the top of the spool. After a 3.5 second burn time, a small burst of fire shoots out from the other end to ignite the next shot. A cardboard disk with a hole punched in the center sits atop the felt plug. The hole provides spacing so that the comet is not directly sitting on top of the plastic delay spool. This will keep it from getting damaged as well as providing better fire transfer during lift. Both the felt plug and cardboard disk are 1-13/16" in diameter, just 1/16" larger than the ID of the candle tube. This creates a snug fit when shoved into the tube over the previous crossette comet. The felt bulkheads create an effective firewall between each shot, yet is light and easily ejected with the next lift charge.

The lift charge consists of 3FA black powder with a very shiny coating of graphite. It is so shiny and silver in fact that it looks to be small granules of metal. The lift charge weight was evenly spread among the shots at 8.5 grams each. 🔥



Figure 6: Closeup of the crossette stars.



Figure 7: The felt wadding and timer spool used to create the delay between shots.