



4" Red Falling Leaves



Manufacturer:	<i>Vulcan</i>
Shell Weight:	<i>245g</i>
Lift Charge:	<i>53g 4Fg black powder</i>
Burst Charge:	<i>85g KP on rice hulls</i>
Stars:	<i>80 leaves 2-1/2" x 1-3/8"</i>
Casing:	<i>Chinese hemi, 3-3/8" I.D., 1/8" wall</i>
Time Fuse:	<i>Double piped chinese time fuse, 3 sec delay</i>

Autopsy Report:

This is another product from Vulcan that shows fine craftsmanship. Again they are using the plastic wrapped shell leaders that come standard on Vulcan shells (they also sell just the leaders separate if any wholesalers are interested in getting your hands on some).

Figure 1 shows that the shell leader is taped to the plastic lift bag, not tied in. It has been my own experience that tying in the leader tends to choke it off at the tie point, making a dud more likely if your black match has a weak spot or you are only using one strand. Keeping the pipe fully open all the way into the lift will reduce the chances of a hang fire or dud.

Also visible in Figure 1 are the dual piped time fuses. Note that one piece of cross match was used to fuse both fuses, which is a subtle innovation that was probably done to reduce the step of having to pick up a second piece of match in the assembly process. The cross match used is actually a thin diameter type of rapid burning visco that has been coated with black powder slurry on the outside to aid with side ignition.

Like most shells from China, this shell was initially constructed with hollow tubes that are later plugged with the actual timing elements. This is done so that the shell contents can be loaded in a damp state and then dried following the pasting operation. The tubes allow the moisture to escape from the inside of the shell during drying, then they are later plugged with the time fuse. The large wrapping of string around the base of both time fuses helps prevent gas leaks around the edges of the inserted fuse, which would result in a flower pot on lift.



Figure 1: Bagged lift with plastic coated leader.



Figure 2: Shell contents.



Figure 3: Leaves with burst charge removed.

The paste wrap on this shell was remarkably thin, about two layers of 40lb kraft. The intent is to pop the shell open and let the burning leaves drop out as a condensed clump, after which they drift apart as they fall.

Figure 2 shows how the burst was distributed among the leave stars. A total of 80 leaves were packed into the shell, with a stack of 40 fitting into each hemisphere.

The leaves themselves were nothing more than rectangular pieces of 30lb kraft paper that had been coated with a slow burning color composition and primed on both ends with black powder. This was probably accomplished by dunking the leaves into a tray full of composition watered down to a slurry form.

Shimizu describes the construction of the falling leaves effect using a special type of gampi tissue paper that has a good wet strength, making it unlikely to tear during manufacture. However, no such paper was used in this shell. Just plain old brown kraft paper.

The leave stars were rather stiff, which indicates that they must have been loaded in a damp state in order to get them to conform to the shape of the shell. The fact that many of them were stuck to each other also suggested a damp state when loaded.

The burn rate of the leaves varied greatly depending on how much comp was on them. Some of the leaves would not even stay lit while burning on the ground, but the added oxygen present when falling through the air is likely to correct this problem.

A slow burning lance composition would be a good starting point for anyone wishing to make their own leave stars. 🔥



Figure 4: Closeup of a leave star.



Figure 5: Forty leaves packed in each hemi.

