

## Method for Making Falling Leaves – by John Vargo

This method was inspired by an article I read in Pyrotechnica VII, published in May, 1981. On page 25 Troy Fish wrote an article called “Green and Other Colored Flame Metal Fuel Composition Using Parlon”. On page 26 he suggests that his formulae could be used to make Falling Leaves. To the best of my knowledge, this article was the inspiration for the popular Go Getter star developed by David Johnson. In 1989 Johnson published a manual called Go Getters, in which he lists three different color formulae for the Go Getter stars. I use these formulae exactly as published with the exception of the type of metal used. (I substitute 200 mesh magnalium). The rationale is to slow down the burn rate as the Go Getters are designed to burn fast. The Falling Leaves need to burn slow.

### **Safety Considerations:**

The Falling Leaves should be made outdoors or in an extremely well-ventilated area. Follow manufacturer’s safety precautions when using these chemicals. Wear safety glasses, long-sleeve cotton clothing, and respirator. The acetone and Xylene vapors are extremely flammable, and great caution should be taken to prevent accidental ignition.

### **Formulae for Falling Leaves Composition:**

	<u>Green</u>	<u>Red</u>	<u>Yellow</u>
Barium Nitrate	63.0		37.8
Strontium Nitrate		58.0	23.2
Parlon	25.0	29.0	26.6
Magnalium	12.0	13.0	12.4
Red Gum	+3.0	+3.0	+3.0
Boric Acid	<u>+3.0</u>	<u>+3.0</u>	<u>+3.0</u>
<b>Total Parts</b>	<b>106.0</b>	<b>106.0</b>	<b>106.0</b>

*In his publication Go Getters (page 3) David Johnson states that the yellow can be produced by mixing ~ 60 % green composition and 40 % red. The color of the yellow can be adjusted by changing these percentages.*

### **Materials and Supplies:**

- Wooden spoons
- 1-qt. plastic mixing bowls
- Newspaper
- (2) 1” wide x 1/16” thick strips of wood to run the entire length of the work surface
- Non-porous rolling pin
- 4 small wood clamps
- Clothes line and spring-type clothes pins
- Gram scale
- Sharp scissors
- Felt-tipped marker

### **Chemicals:**

- Acetone (90%)
- Xylene (10%)
- Falling Leaves composition

## **Making the Falling Leave Composition:**

I start with a pre-mix of 90% acetone and 10% Xylene. I combine them in an HDPE plastic sealable bottle.

Ensure all dry chemicals are finely powdered. I ball-mill oxidizers separately. Next, I ball-mill all of the remaining chemicals together (EXCEPT the magnalium) approximately 1 – 2 hours. **CAUTION: I NEVER BALL-MILL MAGNALIUM OR ANY METAL. THE MAGNALIUM WILL BE ADDED LAST ONLY AFTER ALL OTHER CHEMICALS ARE MILLED AND MIXED.** Mix the oxidizer and other chemicals EXCEPT the magnalium in a gallon Zip-Lock freezer bag. Manually rock the bag back and forth for several minutes until ingredients appear thoroughly mixed. Add magnalium into the bag, re-seal and continue manually mixing. I generally make 1000 gram batches at a time.

For final process I weigh out 1000 grams of the mixed composition, and pour into a 1-quart mixing bowl. I now weigh out approximately 20% of the acetone/Xylene pre-mix, which happens to equal about 100 grams of the liquid; add a little more if mix is too thick.

## **Setting Up Work Area:**

Cover work table with a single layer of newspaper, laying pieces end to end with an overlap of a couple inches. Lay them up to the table edge closest to where you'll be working.

Place first wooden strip along the full length of the table and up to the table's edge, clamping each end down to the table. Lay second strip parallel to first strip. The space between them will be determined by the width of the rolling pin. Position each strip of wood on the table just wide enough for the rolling pin edges to ride on top of the wood. (The rolling pin will ride on inner edges of wooden strips like railroad tracks creating a space above the newspaper.)

## **Procedure:**

Pour acetone/Xylene mixture into the dry composition. Using a wooden spoon begin stirring. I stir for about one minute ensuring all of the composition is wetted to the consistency of pancake batter. Without hesitation pour the contents of bowl along the length of the table between wooden rails. Immediately lay single layer of newspaper end to end with a couple inches overlap between sheets, and up to edge of the table, covering wet composition.

Place rolling pin in center of work area with each edge of the rolling pin resting on inner edges of wooden rails. Begin rolling towards ends of rails, spreading composition to a uniform thickness. This composition sets up rapidly, in about one minute; therefore you must be prepared to work quickly. If left past one minute the composition becomes very difficult to roll. Immediately unclamp both wooden rails from the table and set aside. With the sharp scissors cut into sections near where the paper overlaps. Using the marker write the color on each section of newspaper: it is important to label each section of newspaper with the color being made as there is no other way to otherwise differentiate them.

Hang sheets on clothes line with clothes pins. Let dry for approximately one hour and then cut into 1/2 to 3/4 inch strips. Cut length is determined by desired burn time. Allow these strips to dry for 24 hours before priming. I prime the leaves by grasping a group of six strips between my thumb and forefinger, and dipping them together approximately 1/4" deep into a nitro-cellulose/BP slurry. I then just barely touch the primed end in a granular BP. I set these on the edge of a surface leaving the primed end overhanging. Once dry, the nitro-cellulose prime will hold the leaves together well. Leaves are ready to use in approximately 24 hours.