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How to Make Comets

CAUTION!!

Working with pyrotechnic devices is a very rewarding endeavor that can become a lifetime passion. To ensure continued enjoyment of this hobby, please follow appropriate safety guidelines. Work in an open area outdoors, keep all pyrotechnic mixtures in closed containers, limit any compositions to only the amount needed for a particular item, store finished items in an appropriate day box or magazine, be sure to wear appropriate non-synthetic clothing, wear eye protection and keep a source of water nearby. FireSmith cannot be held responsible for any accidents or incidents resulting from the construction and use of any pyrotechnic devices. It is highly recommended to check and adhere to all local, state and federal regulations. Please consider joining the PGI and any pyro clubs in your area so that you may construct pyrotechnic items in a safe and legal environment. Additional information can be found at www.pgi.org.

Comets are versatile bits of pyro that can be incorporated into a wide range of effects and devices. They can be used as stars in any number of shells, fired directly from mortar tubes or used as rising effects on shells and rocket motors. There are literally hundreds of star and comet formula that produce all sorts of streamer, glitter, firefly and colored effects. Pressing comets is a very simple task that is not only easy to learn but also produces consistent results, even for the beginner. As an added quality, comets are quick to produce, dry and prepare for firing.

Required Materials:

- Comet Pump
- Extraction Tube
- 3/16" Hex Key
- Hydraulic Press
- Chemicals for the Comet Formula
- Plastic Bag
- Rubber Gloves
- Putty Knife
- 8-12 Mesh Screen
- Water
- Denatured Alcohol
- Meal Powder
- Kraft Paper & Paste
- Small Plastic or Paper Tub



Step 1

Screen the composition 2-3 times. If the formula being used contains any coarse metals (titanium, ferro-titanium, magnesium or aluminum) mix a separate batch of composition that does not contain any metal. This second batch of composition can be relatively small (approximately 10% of the size of the metal bearing composition).



Step 2

After screening the composition, transfer the mix into a large plastic bag.



Step 3

Add 5-8% moisture to the composition. Most formula are bound with water that includes an additional 10-15% denatured alcohol to help break the surface tension. The exact amount of water and alcohol mix added will vary with the type of composition being used.



Step 4

Close the plastic bag and knead the mixture for 1-2 minutes. This step allows the composition to fully absorb the water/alcohol mix.



Step 5

Empty the mixture onto an 8-12 mesh screen.



Step 6

Screen the mixture 5-6 times. This step helps to fully integrate the individual ingredients and the wetting agent.



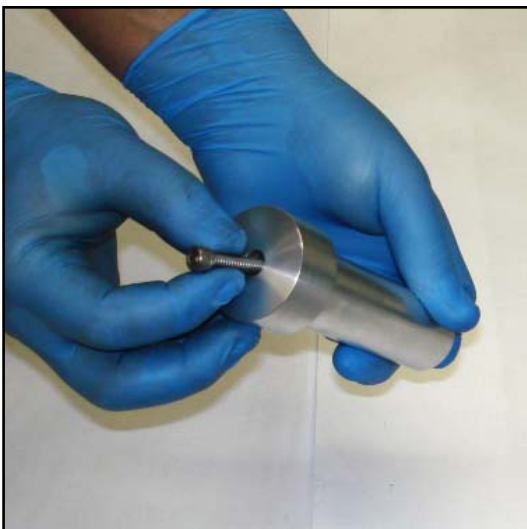
Step 7

Transfer the composition to a small container. As a matter of safety, only keep small amounts (no more than 500 grams) on hand for pressing. Additional comp should be stored in a closed day box. Keep any composition being worked with covered when not in use.



Step 8

Insert the flush pressing tip into the end of the piston.

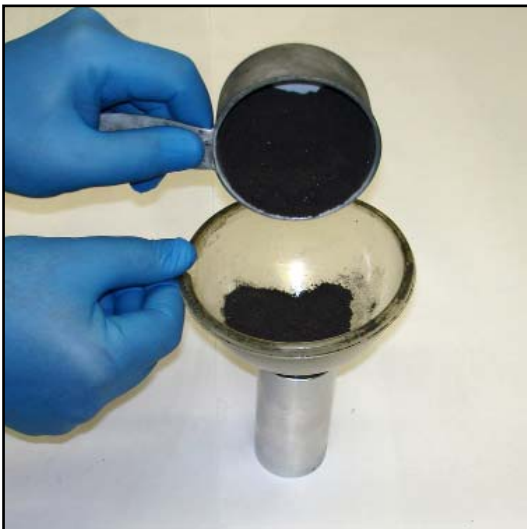


Step 9

Insert the socket-head cap screw through the back of the piston.



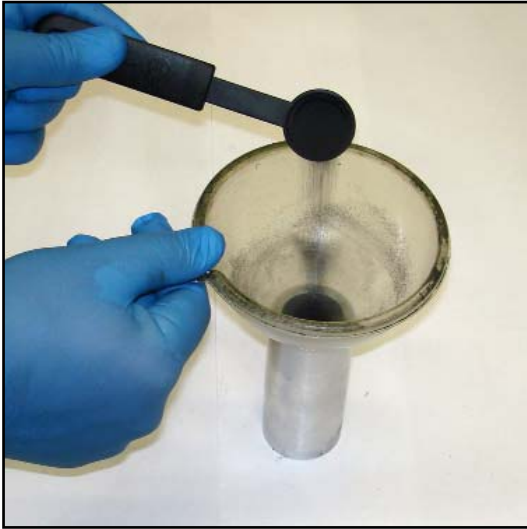
Step 10
Secure the flush pressing tip to the piston with a 3/16" hex key.



Step 11
Using a funnel, fill the sleeve with composition.



Step 12
Insert the piston into the sleeve and compress the mixture using only hand pressure.



Step 13 (This step applies to any mixture that contains coarse metals)
Remove the piston from the sleeve and pour a small amount of the composition that doesn't contain metal into the sleeve. Once again, seat the piston by hand.

By introducing a small layer of non-metal bearing comet mixture a "washer" of composition is formed between the piston and sleeve. This dramatically reduces binding and potential tool damage when coarse metals are being used.



Step 14
Place the entire assembly into a hydraulic press.



Step 15
Compress the comet to 1,500-2,000psi on the composition. Though this is a bit higher pressure than what may be standard practice, this increased loading pressure reduces the amount of moisture needed while producing a comet that dries much faster.



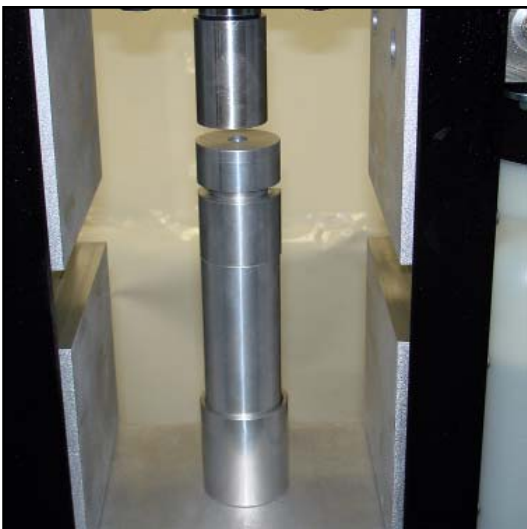
Step 16

Remove the comet pump assembly from the press and set the sleeve into the recess of the extraction tube.



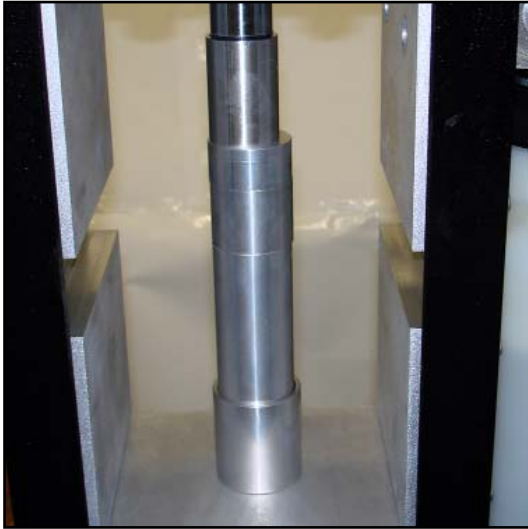
Step 17

Place the horseshoe spacer in between the sleeve and the head of the piston.



Step 18

Place the entire assembly back into the press.



Step 19

Lower the ram of the press until the horseshoe spacer is captured between the piston and the sleeve of the comet pump.



Step 20

Remove the comet pump from the press. Use a putty knife to trim the extruded portion of the comet from the sleeve.



Step 21

After trimming, the comet should be flush with the sleeve of the pump.



Step 22

Remove the horseshoe spacer and place the comet pump with the extraction tube into the press.



Step 23

Lower the ram until the piston contacts the sleeve. The comet will be ejected into the cavity of the extraction tube.

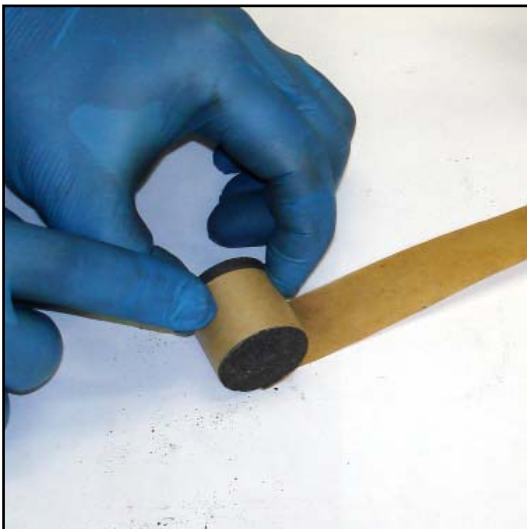


Step 24

Remove the comet pump and the extraction tube from the press.



Step 25
Set the completed comet aside to dry.



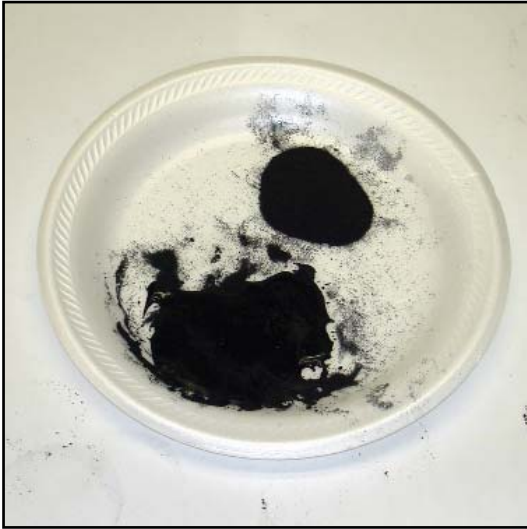
Step 26
Once the comet is dry, wrap it with 2-3 turns of pasted kraft paper.

Should the comet need to be faster burning, this paste wrap can be omitted.

Should the comet need to be slower burning, simply glue a paper disc over one end of the comet prior to paste wrapping. Be sure to pleat the paste wrap over the end disc to help secure it in place.



Step 27
Trim the paper flush with the ends of the comet.



Step 28
Mix a slurry of BP and water.



Step 29
Dip each end of the comet into the BP slurry.



Step 30
Dip each end of the comet into dry, fine-grained BP. Once dry, these comets are ready to be loaded into a shell, lifted and leadered or attached to a rocket or shell as a rising effect.