

Information in this sheet has been provided by Steve Laduke.

Six different rockets can be made using the hybrid spindle:

1. Strobe Rocket
2. Long Winded Screamer
3. Black Powder Motor
4. Hybrid Motor
5. Black Powder Whistle Assist Rocket
6. Color Tail Rocket

The Black Powder and Hybrid Motor are the only two that use a clay nozzle. A rule of thumb when making the Strobe and the Long Winded Screamer is to use four increments of the Whistle mix pressed first. After the 4th increment finish the rocket with the fuel of your choice. An increment is 7 grams, plus or minus 1 gram. It's better to be on the minus side. For the Black Powder Motor, a nozzle and black powder is all that is needed. For a different tail on the rocket, another fuel may be used other than Black Powder. I use no top-hole clay chock above the fuel in my motors except in the Hybrid Motors when lifting heavy payloads.

Fuels

#1 Black Powder

75 pt Potassium Nitrate
15 pt Ball Milled Charcoal
5 pt 80 Mesh Charcoal
15 pt 36-40 Mesh Charcoal
10 pt Sulfur
5 pt Dextrin—water & alcohol

#2 Whistle Mix A

76 pt Potassium-Perchlorate
23 pt Sodium Salicylate
1 pt Iron Oxide
2.5 pt Vaseline
Lacquer Thinner

#3 Whistle Mix B

64 pt Potassium Perchlorate
32 pt Sodium Benzoate
1 pt Iron Oxide
5 pt Vaseline
Lacquer thinner

#4 Strobe Mix

60 pt Ammonium Perchlorate
25 pt Magnalium (50:50 200 mesh)
15 pt Barium Sulfate
5 pt Potassium Dichromate
NC lacquer & acetone (about 10% mix of NC Lacquer & 90% Acetone)

Rockets

In the following sections, the # symbol indicates which fuel number to use, and the number preceding is the number of 7-gram increments. For example, “4: #2” means “4 increments of #2 (Whistle Mix) fuel.” The → symbol means “the rest of the way with this fuel.”

#1 Strobe Rocket

4: #2

→ #4 to 1/8" above the spindle, then finish with 2–3 more increments of #2 for a bulk head.

#2 Long Winded Screamer

4: #2

→ #3 all the way to the top of the rocket tube. Leave enough space to grab the motor with a vice grip to pull it off the spindle after inserting the solid rammer into it. On the increments above the spindle, I always add flake titanium in each scoop before I press it in.

#3 Black Powder Motor

1: Clay choke, about a teaspoon

→ #1 to one increment above the spindle. 2 to 3 additional increments of a slower burning fuel like willow mix or Chrysanthemum of mystery or a color fuel, as long as it doesn't have potassium chlorate for an oxidizer. You want about a 5-second delay above the rocket for which this fuel above the spindle gives you.

#4 Hybrid Motor

This motor has some latitude in how many increments of whistle mix you can use. Start with your nozzle first, then four increments of whistle mix. The first increments consist of:

- 76 pt Potassium Perchlorate
- 23pt Sodium Salicylate
- 1 pt Iron Oxide
- 10 pt Ball milled charcoal (ball mill separately from other chemicals)

I've added as many as 7 increments of the whistle mix with the added charcoal before they blow. Finish the rocket with a mix of:

- 60 pt Potassium Nitrate
- 30 pt Charcoal
- 10 pt Sulfur
- 5 pt Dextrin

This fuel has to be rice with water and alcohol before it can be used, the same as the #1 fuel. You can finish the rocket with this mix or you can press in a slower fuel such as willow mix or a color fuel about 1" above the last increment of rocket fuel. These rockets go so high it won't hurt to have that long delay built into it. The best ending to have on these rockets is to use a willow mix above the rocket fuel and use a pinch of atomized titanium in each increment as it is pressed into at least ¾" above the spindle. This gives you the nice titanium tail that hangs in the air for a while.

#5 Black Powder Whistle Assist Rocket

4: #2

→ #1 to 1" above the spindle, or 60/30/10 ratio. NO CLAY NOZZLE ON THIS ROCKET.

#6 Color Tail Rocket

4: #2

→ After the 4th increment finish the rocket with the fuel of your choice to 1" above the spindle. NO CHLORATE OXIDERS IN THIS MIX.

Conclusion

One thing to mention is that I rice all of my fuels that I use to make motors. This is a must. For all of the whistle mixes I use lacquer thinner. For the black powder fuels I use water and alcohol, and for the strobe I use acetone.

I know I've dumped a lot of information on you. It took me 35 years to develop these motors. I know you will have questions. JUST ASK. Steve LaDuke mssduke2@netzero.com