Electric Match Fabrication

WARNING: Primers burn and primers explode. Therefore it is important to use as little primer as possible, and then overcoat the primer with another electric match composition that is less sensitive but will take fire from the primer and give a flame spread to the electric match.

Here is a method for making electric matches that produces excellent results:

1. To make match heads take a piece of copper clad circuit board that is very thin(1mm) and cut it into a strip 1 inch wide. Then take a 40awg preferably Nichrome (nickel-chromium)wire and wrap it on the copper clad so that it spirals down the one inch strip with a space of about 3/16 of an inch between coils. Next take liquid flux, which can be obtained at jewelry and welding supply stores and with a cotton swab coat both sides of the wire wrapped copper clad. With a good soldering iron or gun, coat both sides of board with solder there by attaching the wire completely and leaving a tiny bridge on the edge. With tin snips cut the one inch strip down the middle to make two ½ inch strips and then cut each match head off by cutting in between the wire coils.

2. Now twin lead wires should be soldered to the electric match head. Cut a piece of twin-lead Shooting Wire to length. Split the two leads apart and strip about 1/4 inch of insulation from each lead. Solder one lead on one flat side of the electric match head, and the other lead on the other side. Make sure you solder these to the back end of the electric match. This leaves the tip clear so it can be coated with the electric match composition.
3. Coat electric match tip (1/32 inch to 1/16 inch) with primer using the formula below. Allow electric matches to dry approximately 1 hour.

    Primer (also known as Dark Flash)
    This formula is well known to be friction and impact sensitive. Therefore it is critical to make and use as little as possible.

    Mixing instructions:

    To 5 grams of 200 mesh or finer potassium chlorate, mix a 5% nitrocellulose lacquer solution to achieve a syrupy consistency. Add 5 grams of antimony trisulfide (200 mesh or finer) to this mix. Stir gently until a smooth homogenous mixture is obtained. Add more NC lacquer to maintain a syrup consistency. If it starts to harden or thicken, thin it with acetone.

4. Recoat with H3/nitrocellulose lacquer(NC) or meal powder/NC, one half to two-thirds of the full length of the electric match. Allow drying overnight. H3 is Shimizu's formula of 75% potassium chlorate + 25% charcoal, air float. Meal powder is a very fine black powder. A final coat of 5% Nitrocellulose lacquer is optional but is recommended.

We recommend testing 5% of each batch made, once your electric matches are dry. Use a "AA" battery to apply voltage to the electric matches lead wires. The finished electric match should give a small snap and then burst into flame, similar to a book match.

A word about testing E-matches

Be sure to check the continuity of all electric matches with an electric match tester. This is a specially made low-voltage continuity tester that will tell you if your electric match will fire. A standard continuity tester will not work, it has the possibility of generating so much current it will actually fire the electric match. An e-match tester has a 3-volt lithium battery, which should last five years or more, and a red LED light. The measured current through a typical electric match and LED is less than 10 milliamps (mA). Although well below the 50 mA maximum test limit, all precautions should be taken. All personnel should be distant from devices under test. If you make your own e-matches, you should always test your electric matches before attempting to use them.