**intro:** Homemade (Waterproof) Fuse, For Homemade Fireworks

It's simple, it's effective, it's waterproof.
This Instructable is for people who are playing with chemicals and making their own pyrotechnic devices.

The short video shows the fuse burning and nothing more.
The long video show exactly the same clip and three others with titles.

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**step 1: Materials**

The essentials:
- Cotton string.
- Glue
- Inorganic oxidising agent*

Tools:
- Polyethylene (HDPE) milk bottle (or similar)
- A knife or scissors
- Tape
- A mortar & pestle
- Ink/dye (optional)

*If you're making fireworks you'll have some, e.g. KNO₃.*

I'm not saying what I used, or where I got it, because it's hazardous stuff and potentially dangerous.
step 2: Funnel

The method is to coat string in a ferocious pyrotechnic mixture, made from glue and oxidiser. In order to get a nice even coating a funnel device is used, made from a piece of HDPE.

> Wash a HDPE bottle.
> Cut the bottle to extract a flat sheet.
> Save the bottom of the bottle for mixing glue.
> Dry the pieces of HDPE that you will use.
> Curl the flat sheet into a tight cone, the hole at the tip should be only slightly larger than the diameter of the string ~0.1mm.
> Secure with tape
> Thread a piece of string through the hole (sucking usually works)
step 3: Coating

The glue you use will make a difference, I use 2-part epoxy and it is by far the best that I've found so far.

> Grind the oxidiser to a fine powder using a mortar & pestle (or improvise something else).
> Mix two part epoxy, as manufacturer's instructions (add colour at this stage if you have any).
> Gradually work powdered oxidiser into the epoxy until you have a thick sticky paste.
Too little powder will give a slower, cooler, sootier flame.
Too much powder and the mixture will not stick well to the string.
Aim to have the mixture looking 'wet' but load as much powder into it before it becomes 'lumpy' and 'dry' looking.

> Add the paste to the funnel.
> Tie the string to something solid, or hold it with your fingers.
> Gently pull the cone of glue along the string, rotating as you go.
This should give you an even coat of mixture until the paste is used up.
> Hang the fuse out to dry (~30 min is enough with epoxy)
> When the fuse is just dry, wrap around e.g. a beer-can and leave to fully harden.

> Trim your ends, and you can remove the residue from the cone for burning later (see video)
**Image Notes**
1. Powdered oxidiser
2. Room for more oxidiser in here.

**Image Notes**
1. Pull this upwards, or pull the string down. Being rather thick, this can also be pulled horizontally.

**Image Notes**
1. Cone, pretty much empty, the string above is coated and drying.
2. Residual paste (pulled out of the cone), which can be burned later
3. Ready to be re-used
4. Coated string

http://www.instructables.com/id/Homemade-Waterproof-Fuse-For-Homemade-Fireworks/
step 4: Testing
Cut short sections of fuse and light them at arm's length, preferably with something that doesn't involve getting your hand too close. Dip a section in water and try again.

(As the previous step)
Slow sooty flame: too little powder, damp powder.
Good flame but doesn't burn smoothly: Uneven coating, maybe due to too much powder, the dimensions of the cone, or pulling technique.

Image Notes
1. A good coating of the red-stuff.

Related Instructables