

New Fire using Alcohol and Colorants

New Fire Brazier

Used at the Easter Vigil Mass during the rite for blessing the new fire from which the Paschal candle is lit.

Tray is 13" in diameter with Aluminum liner and wood handles.



Always have a fire extinguisher and plan of action ready when igniting any alcohol fire!
Be careful and practice several times before the Great Vigil – Do this at your own risk!

Alcohol fires are a quick, easy way to light a small fire. Alcohol, possessing a low flash point and being highly flammable, is extremely easy to light. It does not burn as hot as more conventional fires, allowing for a relatively cool flame and reduced risk of damaging surrounding surfaces.

Basic Alcohol Fires:

Ingredients:

Alcohol (either Isopropyl or Ethyl, 70% or 90+%)

Sodium Chloride (table or rock salt), if desired.

Magnesium Sulfate (Epsom salt), if desired

Procedures:

Isopropyl Alcohol

This type of alcohol will always burn primarily yellow, even when you add colorants to it. This type of fire is fairly benign. The more alcohol, the higher the flame and the hotter it will burn. The wider the opening of the container you use, the faster the burn time, also.

Alcohol may be burned in either metal or stone containers.

If you add salt, the flame will turn gold at the end of the burn if properly mixed. It may turn the flame slightly more golden during the burn, but typically isopropyl alcohol mostly burns yellow anyway.

Epsom Salt is believed to tame the fire a bit. It does not produce a noticeable effect on the flame color with isopropyl alcohol.

The alcohol and salt should be mixed a little in advance (a half-hour or hour is fine). A 1:1 mix is suggested.

It will be very easy to ignite either with a match, or a spark from flint and steel.

Ethyl Alcohol

At 70% concentration (what you can buy at the drug store) it will burn mostly blue with a bit of yellow capping the flame off, depending on the impurities present in solution and container. 90+% should burn almost totally blue or even almost invisible.

The procedure for using ethyl alcohol is the same as isopropyl alcohol.

Ethyl alcohol is more easily influenced by colorants to alter the flame color. Table salt or rock salt will cause a gold/yellow flame. Epsom salt will be a lighter flame that retains some of the blue base that is visible with the pure ethyl alcohol.

Basic Warnings:

- Alcohol fires flare prominently when ignited. Care must be used when lighting.
- When using flint, remember to strike the sparks toward the vessel with the ingredients but not toward people or combustible items.

Advanced Alcohol Fires:

READ ALL WARNINGS IN THIS DOCUMENT AND ON YOUR CHEMICALS. This is real chemistry, please take it seriously.

Ingredients:

Alcohol (either Isopropyl or Ethyl)

Colorant:

Magnesium Sulfate (Epsom Salt) – Yellow or white flame

Flame Color	Chemical
Blue	<u>Cupric chloride, 125g</u>
Red	<u>Lithium chloride, 100g</u>
	<u>Strontium chloride, 100g</u>
Green	<u>Copper sulfate, 500g</u>
	<u>Borax (Sodium borate), 1lb.</u>
Orange	<u>Calcium chloride, 500g</u>
Purple	<u>Potassium chloride, 100g</u>
Yellow	<u>Sodium chloride, 500g</u>
	<u>Sodium carbonate, 1lb.</u>
White sparks	<u>Magnesium ribbon, 12"</u>
Yellow sparks	<u>Iron filings, 1lb.</u>

Most of the colorants and the 95% ethyl alcohol are available at the Science Company's website.

<http://www.sciencecompany.com/sci-exper/flamecolors.htm#2>

Advanced Warnings:

- Most of the metal salts listed above are caustic. Care must be used to avoid contact with skin and eyes. Children should not be allowed in the area of this material.
- ***Some materials react more prominently with alcohol! Lithium chloride generates heat instantly. Copper/cupric chloride burns somewhat violently! Use extreme care with it. TEST all of your burn projects in small amounts first. Then test again with the same amount you will be using for your final display.***
- Keep a record of the quantities you are using and the length of time that the fire lasts. Use the same vessel for testing as for the church service because the depth and width of the vessel impacts the length of time that a flame lasts. Make sure your flame can last as long as the Service of Light portion of the Great Vigil. Assign someone to remain with the brazier (not process) such as an usher. If the flame lasts longer than anticipated and the procession begins, you will want someone to watch over the brazier until the flame goes out.
- Strontium chloride reacts with some metals. Do not use it in a metal container.

Procedures:

Follow the same guidelines as for the basic fires; add a small quantity of the colorant.

Isopropyl alcohol does not readily display different colors. For example, if you mix lithium chloride, you will get some red flames, but the principal flames will remain yellow. For table salt, you will get a yellow flame until the end, when it will turn golden.

Ethyl alcohol is therefore required for colored flames. The metal salt must be premixed with the alcohol, but not more than sixty minutes in advance. Several will react with the alcohol and form a paste that may require a bit more alcohol added to keep them wet.