



Heater Bloc's Guide to Building a Tent-Safe Copper Coil Alcohol Heater

Caring for others is hot, actually.



Copper Coil Alcohol Burners are:

- **Great** for small enclosed spaces like tents or a small room
- **Safe** to use indoors
- **Bad** for outdoor use – the flame blows out easily
- Can be used for heating or cooking.
- (Sometimes called an Alcohol Jet Burner)

A complete heating kit will include:

- An Alcohol Burner
- A Safety Enclosure
- A few lighters (preferable the long stemmed kind)
- A Gallon of fuel
- Tissue or paper towels to clean the burner coil
- *Optional:* a second, smaller, wire mesh cylinder for cooking and a milk crate to keep it off the floor

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How do they work?

The burner uses nothing but fumes from the alcohol fuel. What makes alcohol so dangerous to burn is the fact that it's so incredibly flammable. This design mitigates that danger and actually uses it to our advantage. Alcohol fumes or vapors from the liquid fuel in the jar collect in the copper pipe and when the pipe is heated, the fumes expand and are forced out a tiny hole at the bottom of the copper loop (the fume or jet hole). These fumes combust as soon as they exit and hit the open flame which then heats the top of the copper loop. It's creates a constant cycle of vaporized fumes being forced out of the hole and then combusting.

The alcohol fumes will burn until the flow is interrupted by tipping the burner sideways or blowing it out like a candle. This adds extra safety as they will go out automatically if they tip over. The jar is sealed, making them spill proof, as well.

Is alcohol safe to burn indoors?

Yes, alcohol burns very clean and is safe to use indoors. There are more details on this in the "Fuel" section on pages 5-6. The recommended fuels are Isopropyl or Ethanol Alcohol (most commonly found as rubbing alcohol or liquid hand sanitizer). A 6-8oz. Jar of alcohol like we use in this design can burn for 5-6 hours. It's also safe to cook over, so you can roast marshmallows or use a frying pan or pot to cook over the flame.

How do you light it?

The copper coil has to be heated until the fumes expand enough to start flowing out the tiny hole at the bottom of the copper loop so they can combust.

Basically, hold a lighter (or other open flame like another lit alcohol burner) against the copper near the fume hole until you see the flame start to grow larger. This can take 10-30 seconds depending on how cold the copper is.

The easiest way to light the burner is to first turn it completely upside down for a few seconds and fill the copper loop with alcohol fuel. When you put it upright the alcohol will drain back into the jar but this leaves extra fumes behind and its easier to light.

Note: If the flame goes out, but the copper is still hot, it can be re-lit almost instantly.

If you are using the same 1/2 inch wire mesh that we use in our design, you can reach a long-stemmed "grill lighter" through the holes in the wire to light or re-light the burner without moving any part of the enclosure.

Why does the heater need the safety enclosure?

This design is intended for tents and similar structures. Open flames can burn a tent wall or start other things on fire in an enclosed space. The jar needs a stable surface in a tent that is often full of bedding or might have an uneven floor. Stability is provided by the heavy dinner plate on the bottom that acts as a weighted, flat base. The wire mesh cage ensures that the burner has a steady supply of oxygen for safety and keeps things from brushing against the open flame and igniting, accidentally. It also stays cool to the touch. The Terra Cotta pot on top helps contain and control the open flame and also heats up to provide efficient, radiant heat.

If you have the burner sitting on steady flat surface like a table inside a building and there is nothing flammable around it and there is no danger of it tipping over or pets disturbing it or getting burned and you promise not to burn yourself playing with the flames too much... then you don't need an enclosure. Although, the Terra Cotta pot does help radiate the heat to a smaller area around the burner if you are using it for heat in a power outage or emergency situation.

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