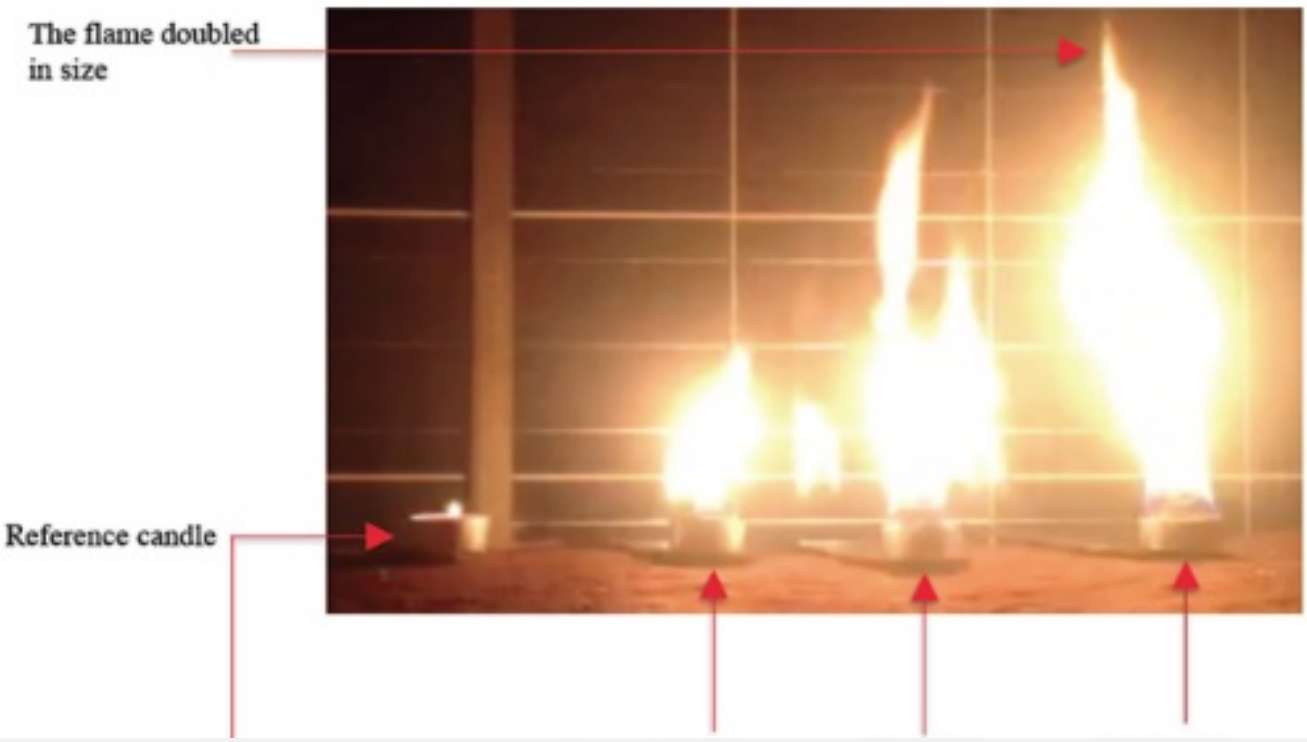
Paraffin Burner

Parafin



https://wiki.lowtechlab.org/wiki/Br%C3%BBleur_%C3%A0_paraffine/en-gb

Dernière modification le 22/10/2019

Difficulty **Very easy**

Duration **5 minute(s)**

Cost **0,1 EUR (€)**

Description

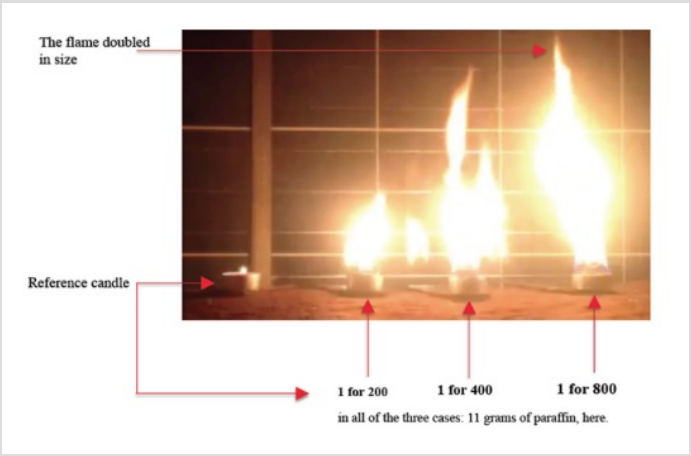
Getting instant powerful energy from paraffin for a variety of applications (light, fire, heating, cooking).

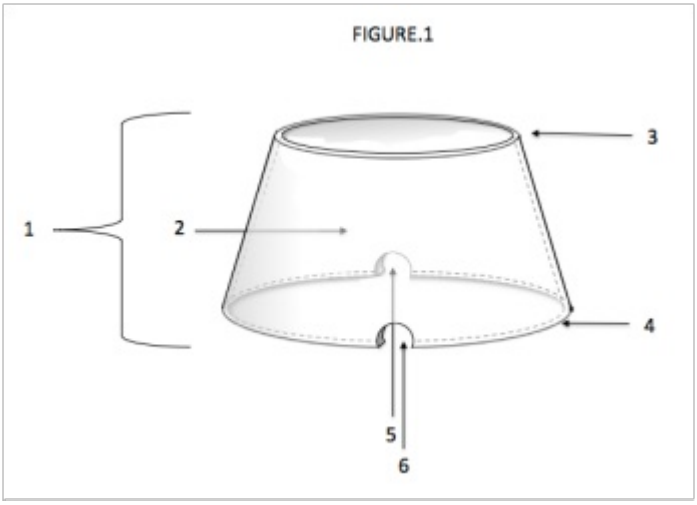
Summary

Contents

Introduction

Paraffin, which is essentially the substance that standard candles are made of, has an energy value equivalent to that of all traditional hydrocarbon fuels. Its calorific value is 3 times higher than wood or coal.
Paraffin is a product that is readily available, cheap, reliable and non-toxic (it can even be eaten), can be preserved indefinitely and is relatively safe.
It has impressive properties but tends unfortunately to be used mostly in the manufacture of candles which only produce a very small amount of power (from the flame). In spite of this, it is able to be readily used in all sorts of energy-based applications (lighting, heating, cooking, fire-lighting) either on an ad-hoc or day to day basis.
It is important to understand the following:
1. A candle works by creating a combustion reaction self-fuelled by burning the wax (paraffin).
2. The size of the flame produced depends on how much fuel is supplied to the "reactor" : the more fuel is supplied, the bigger the flame gets.
3.It is the wick supplying paraffin for this reaction that effectively limits the provision of fuel.
4. This has always tended to be a characteristic of wicks used with paraffin wax as they are made up of 87% cellulose and 13% 'other materials'.
5. It is the 13% 'other materials' (alkalines, fibres) which hinders the paraffin from reaching the flame, consequently limiting its size. (This is why paraffin tends not to be used in applications that require reasonable amounts of energy).
6. However, using wicks and burners which have pure cellulose in them removes this limitation.
7. Pure cellulose is common, cheap and widely available: it can be found in that form in all toilet papers and kitchen rolls as these are made of 100% pure cellulose.
8. By making wicks and burners from pure cellulose, you can then quickly and easily harness the energy potential of paraffin.
9. The cellulose simply needs to be in a form that is suitable for intended use (i.e. for light, heating, cooking, fire-lighting) and the paraffin block used with it.
You can easily get it to the right shape with the aid of moulds made out of everyday objects and using water; once you have got it into shape, simply leave to dry, impregnate it with paraffin, leave to dry again and your brand-new burner/wick is then ready to use (just connect it to the appropriate paraffin block to fuel it).
10. The size of the flame depends on the size and shape of the wick or the burner you made. The bigger it is, the bigger the flame will be.
Notes:
There is no magic involved here!
Paraffin burnt in this way is used up much more quickly as maximal combustion is achieved during this process (almost 100%). Therefore, whereas a 11 gram standard household candle provides a very small flame over 4 hours, the same candle equipped with the burner and a paraffin wick made of pure cellulose will produce a much more intense flame that will burn for 20 - 30 minutes, depending on its shape.
Size and shape of the Burner
This will depend on the intended use, whether that is lighting, heating, cooking or fire-lighting.
For a high performance fire-lighter, which works better than anything else around, simply dip a sheet of kitchen roll into paraffin, leave it to dry and then cut the sheet into 4x6cm strips (with a knife, cutter or scissors): you will then end up with a very powerful fire-lighter weighing less than 1 gram (as opposed to 12 grams which is average for what you can buy in the shops) and which will produce a much more intense flame that burns for an equivalent period (6 - 8 minutes).
If used for cooking, it is best to make a burner/wick in the shape of a cylinder (ring) by using 2 tubes which can be freely slotted one inside the other (fill the free space between the two tubes with wet cellulose, leave to it dry, remove the mould, soak it in paraffin and then it is ready to use). Dimensions could be e.g. 5cm diameter x 3cm high x 0.5cm thick (wall)
In general,
- the bigger you want the flame to be, the thicker/denser the burner/wick needs to so that it is sufficiently reinforced to withstand the intensity of the heat produced.
- The burner need not contain a great deal of cellulose: The denser the burner/wick, the slower the paraffin will move towards the flame.
- A perforated burner (with an empty core) is more effective than a closed-in burner.
- The efficiency of the burner can be improved by making air holes in the base: this draws air in which boosts combustion.
- Various items (e.g. protection, grill, glass plate etc.) can be added to the burner/paraffin-coated wick + paraffin block to adapt it for the intended use (lighting, cooking, heating) and to get maximum benefit from the energy generated.
- The Illustrations show different examples of paraffin burners (in various shapes) for their given uses.





Materials

1. Paraffin wax
2. Pure cellulose (toilet paper, kitchen roll etc.)
3. Water (optional but makes it easier to shape the cellulose material - see Tools)

Tools

Step 1 - How to Make the Burner