ETHANOL

Contents

In this guide I will teach you how to produce Ethanol using bad fruits, in my case, I am using apples, but you can use anything that has sugar in it for this process, the bad apples are less expensive than processed sugar.

Before you start producing your own ethanol, you will need to fill in the form that you can find on the download page and apply for an alcohol / ethanol permit. It's free to apply.

TOOLS:

Here are all the necessary tools you are going to need for these project.

First we will need a  and a  to smash the apples.Another tool we use is the  and the

along with the

to fasten some pieces.

We will also use the to solder some cooper pipes.

To cut the cooper pipes we will need a .

One of the tool we will also need is  along with the  to boil and distill the mixture.

These are the tolls you will need to start this project.

Materials:

1or 2 Bags of bad apples;

5 kg’s of sugar;

2 packets of yeast;

3 barrels;

Some cooper pipes;

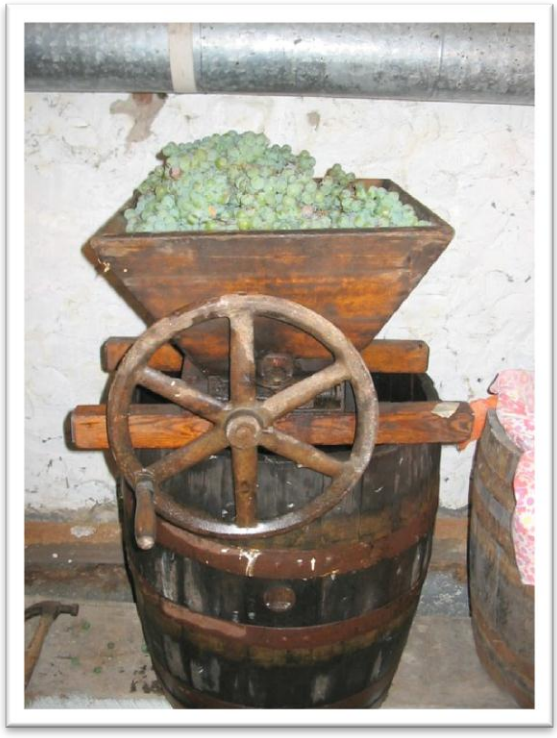
Some cooper elbows.

Step 1: Smashing and mixing:

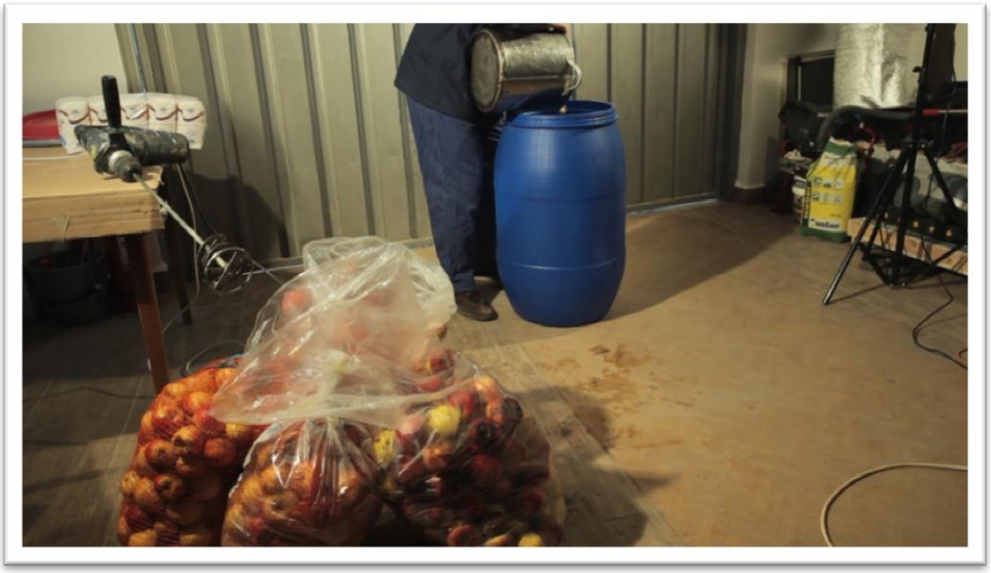
These are the bad apples that I purchased with 15 cents/kg from super market.

I am using a drill and a cement mix tool to mash the apples. You can use any type of tool you like for this process, but I used what I had laying around.

You can also use a grapes crushing machine like you see in this photo.

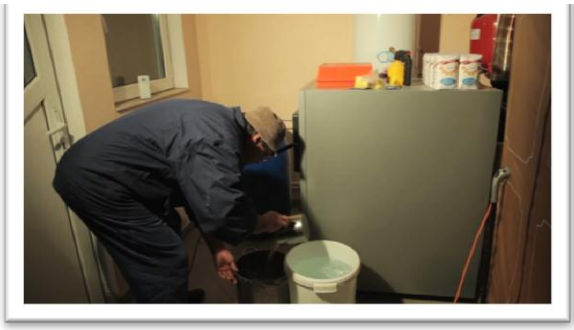


I will proceed with the remaining apples until the plastic barrel is approximately 1/3 full. It's important to not exceed this amount, as the barrel may overflow during fermentation.



Now I will add water and yeast to the barrel. Although standard yeast can be used, it is best to use ethanol tolerant yeast from a wine-making supply store.

Add between 1 and 2 packets to the barrel.



This will work without adding sugar, but I will add an extra 5 kg's of sugar to have the mix a bit more concentrated.

After I mixed all the ingredients, I will check the sugar content daily with a hydrometer.

Over the course of approximately 10 days, the sugar content should reduce gradually until none is left.

To make sure that the process will run smoothly, the temperature inside the room where you hold the barrel, should be around 20 Degrees Celsius or 70 Degrees Fahrenheit.

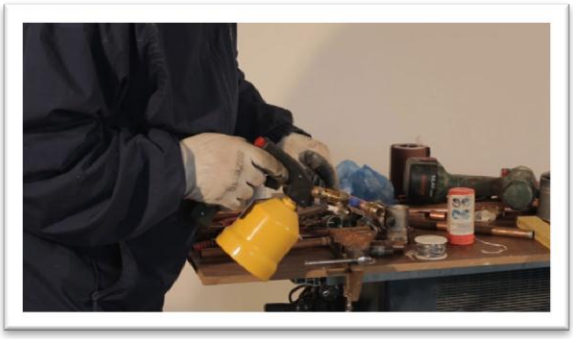
If the temperature is higher than that, the process should be completed in a smaller period of time, that's why it's important to monitor the level of sugar.

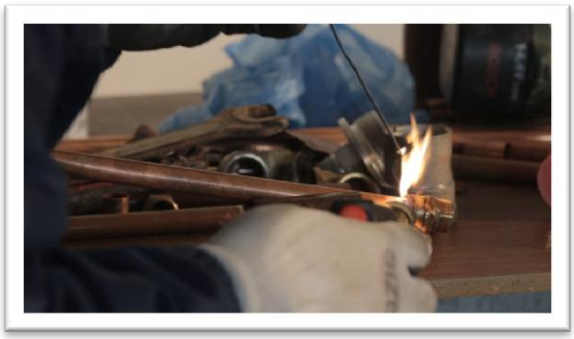
Step 2: Building the distiller equipment:

In the meanwhile I begin working on the distiller equipment. You can purchase it already made, but that will be far more expensive than building it by yourself.

It's a straight forward process, to solder copper you will need a blowtorch, etching paste and solder.

The etching paste is applied first, and then heat is applied until the copper color turns into a dark red and you can apply the solder to weld both pieces together.

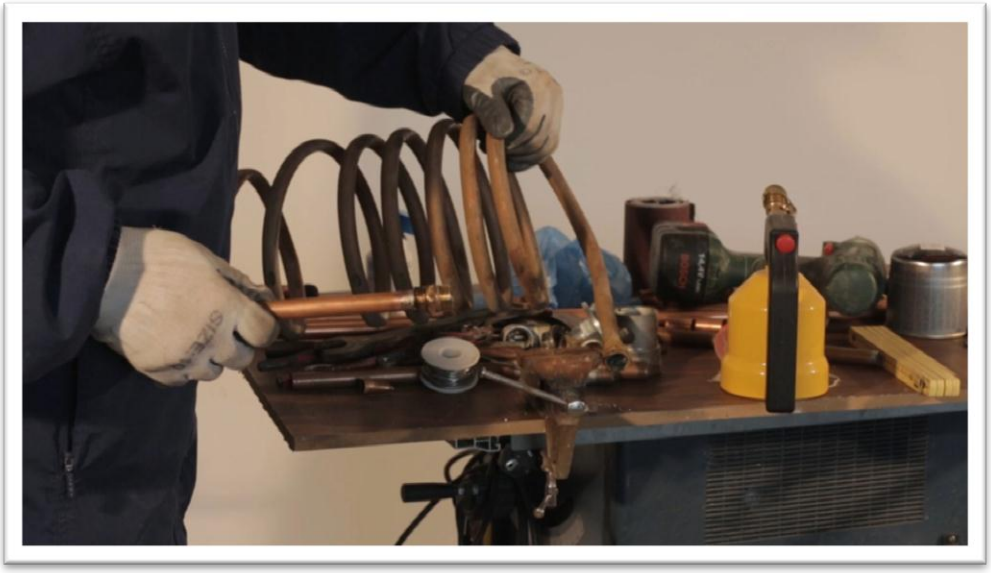




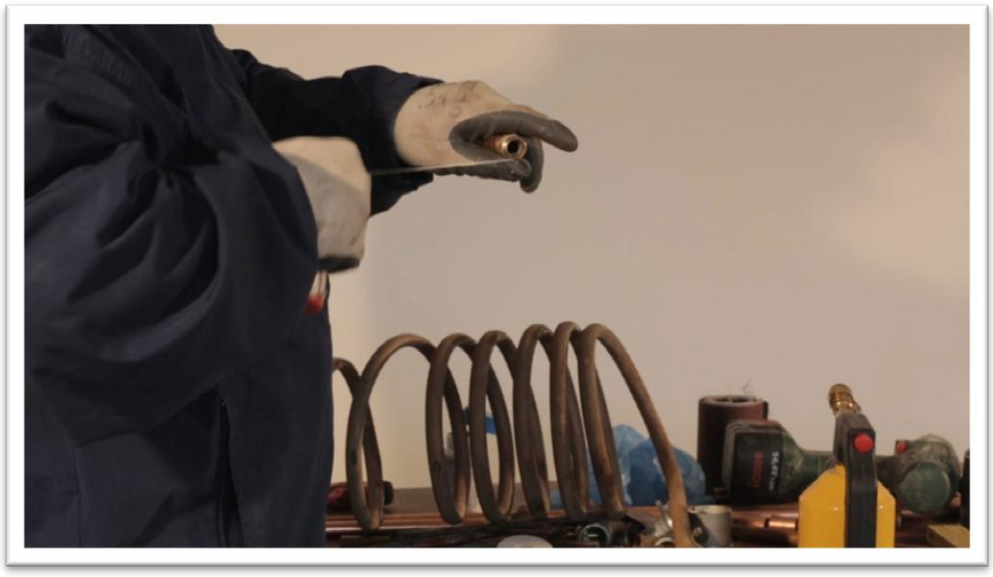
It may look intimidating at first, but after you do your first weld, you will see that it gets pretty easy process to do.

I am reusing a copper coil that I did in the past for one of my projects, but it’s very easy to do. Take a piece of pipe or a cylinder that has the dimension you want for the coil and start turning the copper pipe on it.

If your copper pipe is too thin, you can add sand inside the pipe then start modeling the coil. The sand will prevent the pipe from collapsing when it's being turned.



I am using pipe sealing string when connecting the pieces together.



I will insert this coil inside a plastic barrel full of water, so I will seal the exit whole with some asbestos.

I am adding some Vaseline to keep the asbestos together.

To secure the coil in place, I will use this steel ribbon.

I fit another connection piece to the other end of the coil now, using the same soldering process.

The recipient where the mixture will be boiled, has to be made out of copper or aluminum.

I am using this beer barrel which I’ve bought for 30 bucks from a local bar.

I’ve made this fitting part on a lathe, which is matching the thread of the barrel. This added to my costs another 20 bucks.

Now I need to connect the barrel to my distiller.

I am almost done with the piping job, I need to measure and cut the last one now.

The mixture is ready now to be distilled.

Step 3: Distilling process:

I will light the gas stove and put the aluminum barrel on top.

I fill half of the barrel then connect the pipes and start creating the first batch of ethanol.

I will fill the second barrel with cold water, so the steam coming from the aluminum barrel is being transformed into liquid when it pass through the cold copper coil.

You can see that this actually burn from the first pass of the distilling process.

You can measure the alcohol level and if it's not high enough, you can run the distilling process again, instead of apple mixture, you put back the resulted alcohol and let it distillate again.

You need to keep testing the alcohol level from the exit pipe, if you keep it too long on the gas stove, water will start dripping in and you don't want that.

The reason that the alcohol comes first, is because it's boiling at a lower temperature than water, so it will transform to steam sooner. Eventually, water will start boiling too after no alcohol is left.

Now I am going to run the alcohol one more pass to obtain a high quality ethanol.

After the last step is completed, we are ready now to test this out.

Step 4: Make the mixture and test it:

In order to run the regular gas engines with ethanol, we need to add in the mixture 20% of gasoline, so it will be 80% pure alcohol and 20% of gasoline.

This is required for the engines to lubricate, the ethanol is much dryer than gasoline, if the engine is not lubricated adequately, you may risk breaking it, so make sure that you are using the right mixture for your engine to run smoothly.

My car runs on diesel, so I will test the ethanol on an electricity generator which runs on regular gas.

We will do the burning test again, so you can see that our final product actually burn very well.

Now I am going to mix the regular gasoline with ethanol and start this generator.

Now I am going to mix the regular gasoline with ethanol and start this generator.

I will plug our lights which are consuming 1000W each.

I hope that you enjoyed our video guide and that you have all the information you need to start producing your own ethanol. Make sure that you are doing this legally though, because it's a free application in the first place and you have no reason to go against the law just from commodity.