

# Copperhead Distilling System



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PLEASE READ ALL OF THESE INSTRUCTIONS CAREFULLY BEFORE USING YOUR STILL.

#### SAFETY

The high purity of the alcohol produced by the Copperhead Still is far more flammable and potentially explosive than the lower purity alcohol produced from previous home distilling technologies. It should be regarded as being as flammable as gasoline and it is quite capable of forming an explosive mixture in the air at normal room temperature.

- The Still should always be run in a well-ventilated area.
- It should never be left running unattended.
- Smoking, open flames or other possible ignition sources must be banned.
- If you spill any alcohol, dilute it with water, clean it up immediately and rinse any cloths or paper towels you use, to reduce the alcohol level before disposal.

Your Copperhead Still comes with the following components.

- Column assembly with condenser water connections and alcohol take-off.
- Digital temperature sensor (Thermometer).
- Water and alcohol tubing.
- Boiler suitable for distilling up to a 25l wash.

#### PREPARE YOUR WASH

There a number of different varieties of yeast available from your Home Brew Retailer. Please refer to the specific instructions on the packet to prepare your wash.

#### GETTING STARTED

##### 1. FIT THE BOILER LID TO THE COLUMN

Fit the O-ring to the base of the column. Slide the bush through the hole in the lid from inside.

Screw the bush into the column firmly.

To tighten the bush firmly a pair of long nose pliers can be used to grip and turn the inner grating.

##### 2. THERMOMETER

Fit the thermometer into the water outlet block (A) near the top of the column. Check the thermometer is working and set to Celsius. A switch on the back allows you to turn the thermometer on and off. A second switch allows you to set the thermometer to Celsius or Fahrenheit.

Place the column and lid on a bench.

##### 3. FIT TUBES

Connect the 1,100mm (3'7") length of tubing onto the "Water in" connection (lower nipple). This will connect to the tap adaptor.

Connect the 1,500mm (5') length of tubing onto the "Water out" (upper nipple).

Water will flow from this to your outlet drain/sink.

#### MAINTENANCE

If storing the Condenser for an extended period, the thermometer can be turned off by the on/off switch on the back.

Your Copperhead Column is now ready to fit on the Boiler.



## OPERATING INSTRUCTIONS

### IMPORTANT

### BOILER INSTRUCTIONS

Your boiler has 2 heat settings for the correct operation of the pot condenser. The settings are controlled by the switches on the side.

Note, the switches are “on” when pushed in at top.

Switch 1 (left) – on/off switch

Switch 2 (right) – temperature control

Setting 1 – Switch 1 on, switch 2 on, red light on – output is 2000 watts.

Setting 2 – Switch 1 on, switch 2 off, green light on – output is 1000 watts.

Distilling the recommended wash of 25 litres (6% US Gal) made with 6kg (13 % lb) white sugar, will take about 3 ½ hours from start to finish. Please ensure you can give your full attention to operating the Copperhead Distilling System for this time period.

You will need to have

- Clock or timer
- 1 litre calibrated jug
- 5L Jug or Vessel to collect Alcohol
- Spirit Hydrometer (to test collected spirit)

Cooling water supply. Under normal conditions the water supply will need to be about 600-800mls (1 -1 1/2 pints) per minute. Alcohol coming out of condenser should be cool to touch. If not, increase water flow through condenser.

#### STEP 1

Place the boiler body on a firm, level, bench where the waste can discharge into a drain or sink. It is important that the still is vertical and not tilted, otherwise the condensate will not reflux evenly.

#### STEP 2

Add the wash to the Copperhead Boiler. The still is designed for a normal 25 litre (6.5 US Gal) wash with 23 to 24 litres (6 to 6.5 US Gal) of cleared wash to be distilled.

If you use a larger wash do not fill beyond the maximum level line on the boiler.

#### STEP 3

Place the Column and Boiler lid assembly onto the Boiler Base. Ensure you can clearly see the thermometer. Close the clips over the lid.

#### STEP 4

Fit the rubber tap adaptor to cold water tap.

Place the Water outlet tube into the sink or drain.

Place the collection jug or vessel under condenser.

#### STEP 5

Connect the power supply and turn on the Boiler. The wash will take 60-80 minutes to heat to boiling temperature. Once the thermometer shows 68°C, turn the switch on the side of the boiler to 1000 watts (green light only).

#### STEP 6

Before the wash begins to boil, turn on the cooling water.

Once the wash starts boiling, heated vapours will rise into the column and the temperature on the Thermometer will increase quickly.

#### STEP 7

VERY IMPORTANT-Collect and discard the first 100mls of Alcohol that flows.

The first 100 mls (4oz) of Alcohol must be collected separately and discarded. Your fermentation may have produced a very small amount of by-products that will evaporate at a much lower temperature than Ethanol (the alcohol we can consume).

#### STEP 8

The thermometer temperature will slowly rise as the alcohol is boiled off. This is normal. The collection of alcohol may continue until the temperature reaches 97°C. Do not collect past this temperature. Discard the rest of the remaining wash.

#### STEP 9

When the Distillation is finished, turn the Boiler power off and disconnect from the power outlet. Turn off the cooling water supply.

The depleted wash left in the Boiler will be dangerously hot. Allow it to cool to a safe temperature before emptying it. Note: The spent wash is rich in nutrients and makes an ideal fertiliser for your garden.

#### STEP 10

Remove the Column and Boiler lid assembly, and rinse the Boiler of all wash and debris. Rinse the Column by filling with clean water several times to remove any debris carried up by the rising vapours.

Be careful not to get any water on the thermometer during cleaning.

#### WATERING THE ALCOHOL DOWN

Float a Spirit Hydrometer or Alcometer in the spirit to measure the alcohol content. Alcohol is thinner than water so the higher in strength the alcohol is, the further down the hydrometer floats. Read the line where the level of the spirit cuts across the hydrometer. Additives such as flavouring and Liquid Glucose will distort the hydrometer readings. Take good care of your Spirit Hydrometer as it is very fragile. Wash & sterilise with cold water only. See over for a simple formula to help you work out how much water to add. Spirit hydrometers should only be used to test spirit before any additives such as flavouring or liquid glucose are mixed and at the calibrated temperature. Still Spirits Spirit Hydrometers are calibrated at a temperature of 20°C (68°F). If the spirit is a different temperature to this then you can refer to the Temperature Correction Chart. Taking readings of warmer liquids may damage your hydrometer.

## TEMPERATURE CORRECTION ADJUSTMENT CHART EXAMPLE

Your Spirit Hydrometer reads 50% at a temperature of 25°C (77°F), look up the Correction Adjustment chart and you will see the value is minus 1.88. You then adjust your reading by that number-in this case subtract 1.88 from your reading of 50% AN which will give you a realistic reading of 48.12% AN.

20 deg C	Alcohol % / Volume							
68 deg F	30	40	50	60	70	80	90	98
Temp								
10°C (50°F)	4.12	3.98	3.67	3.42	3.19	2.92	2.45	2.06
15°C (59°F)	2.03	2	1.85	1.73	1.61	1.47	1.25	1.06
20°C (68°F)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25°C (77°F)	-2.01	-1.95	-1.88	-1.76	-1.65	-1.51	-1.31	-1.12
30°C (86°F)	-4.06	-3.94	-3.78	-3.55	-3.33	-3.05	-2.67	-2.31
35°C (95°F)	-6.15	-5.89	-5.82	-5.40	-5.13	-4.67	-4.07	-3.54
40°C (104°F)	-8.29	-8.05	-7.92	-7.41	-7.03	-6.35	-5.5	-4.8

After carbon purifying, the spirit should be watered down in strength to 40% prior to drinking.

### ADJUSTING YOUR ALCOHOL STRENGTH DOWN TO 40%

#### EXAMPLE

To convert 45% strength alcohol to 40% use the following calculation:

$$4.5 \text{ litres} \times 45 / 40 = 5.06 \text{ litres}$$

$$(1.2 \text{ USg} \times 45 / 40 = 1.33 \text{ USg})$$

If you collect 4.5 litres (1.2 US Gallons) of spirit and this measures 45% after carbon purifying, then Multiply 4.5 x 45. Divide this by 40% and you will need to make the total spirit up to 5.06 litres (1.33 US Gallons) with water. In other words add 590mls (20 US fl oz) of water.

This is a rough guide only. Watering down the spirit to 40%, or less, is very important as people unused to high strength spirit can easily overdose resulting in nausea and in extreme cases, death.

**WE STRONGLY ADVISE AGAINST MAKING HIGHER STRENGTH SPIRIT.**

## **TIPS FOR DISTILLING A FRUIT MASH**

This page is to assist you in the process of distilling a fruit mash, but due to the large number of variables, is not intended as comprehensive instructions.

First – research, research, research.

The internet is a goldmine of information, and there are numerous pages that can assist you in this process.

Find a recipe that suits the fruit you are intending to use.

Prior to fermenting your fruit, clean and rinse your fermentation equipment.

Below are some links to web pages containing useful tips.

<http://homedistiller.org/fruit/wash-fruit/method>

<http://www.distilling.net/mash.html>

You can also use fruit wine recipes, and then distill the finished product to produce fruit brandy.

<http://www.fruitwinemaker.com/>

## **IMPORTANT**

Once your fermentation is complete, you must strain your wash. Only put liquid into your boiler as heavy material can accumulate on the bottom of the boiler. This causes excessive heat to build up and will trip the safety cutout.

## **DISTILLING GUIDELINES**

Set up your still as per the previous instructions.

Add the liquid.

Turn on the boiler using 2000 watt setting to heat. Once your thermometer reads 68°C, turn on the cooling water.

Change the heat setting on the side of your boiler to 1000 watts.

Collect and discard the first 100 mls collected. This is the head.

Keep collecting spirit until you no longer like the taste/smell, or stop when your hydrometer shows the spirit coming out of the still is below 40% abv.

When you check the reading on your hydrometer, you will also need to check the temperature of the collected spirit. A spirit hydrometer reads accurately at 20°C. If your spirit is not this temperature, a correction chart is included in the main body of these instructions. See page 5.

## **TIPS FOR DISTILLING ESSENTIAL OILS**

This page is to assist you in the process of distilling essential oils, but due to the large number of variables, is not intended as comprehensive instructions.

First – research, research, research.

The internet is a goldmine of information, and there are a number of things you need to do prior to starting.

- Identify your plant matter.
- When is the best time in the growing season to harvest?
- Do you need to dry your plant matter?
- What is the best method of drying your plant matter?
- What is the best medium to extract the oil – water or alcohol?
- Does the oil in your selected plant matter need a high temperature or a lower temperature to be extracted?

Once you have determined the above, you still have to decide how to extract the oil.

There are two methods of extracting oil:

### **STEAM DISTILLATION**

This method utilises steam to extract the oils. You can either use water or alcohol in the boiler. Your choice of plant matter will dictate what medium is best.

### **IMMERSION**

Place your plant matter into your boiler taking care not to pack it in tightly. Liquid needs to circulate freely. You can either use water or water and alcohol in the boiler. Your choice of plant matter will dictate what medium is best.

You are now ready to start distilling.

First, clean and rinse all your equipment, including the collection vessel, hydrometer and trial jar. This is to remove the risk of contamination of your finished product.

Set up your still as per the previous instructions.

If you are using steam distillation, place the basket(s) into the boiler and note where the bottom of the basket is. When you add liquid to the boiler, ensure you leave a sufficient space between the liquid and the base of the basket that liquid does not come into direct contact with your plant material. Place your plant matter into the basket, taking care to pack in it firmly but take care not to overfill. Place the basket into the boiler.

If you are using the immersion method, place an inverted distilling basket (or fine mesh raised cake rack) into the boiler. This is to stop heavy materials accumulating on the bottom of the boiler and tripping the safety cutout. Place your plant matter into the boiler up to 60% capacity. Add liquid to take the total volume up to 75% total volume.

Turn on the boiler using 2000 watt setting to heat. Once your thermometer reads 68°C, turn on the cooling water.

If your plant matter needs a high temperature to release oil, keep using the still on 2000 watts.

If your plant matter needs a lower temperature to release oil, switch the boiler to 1000 watts.