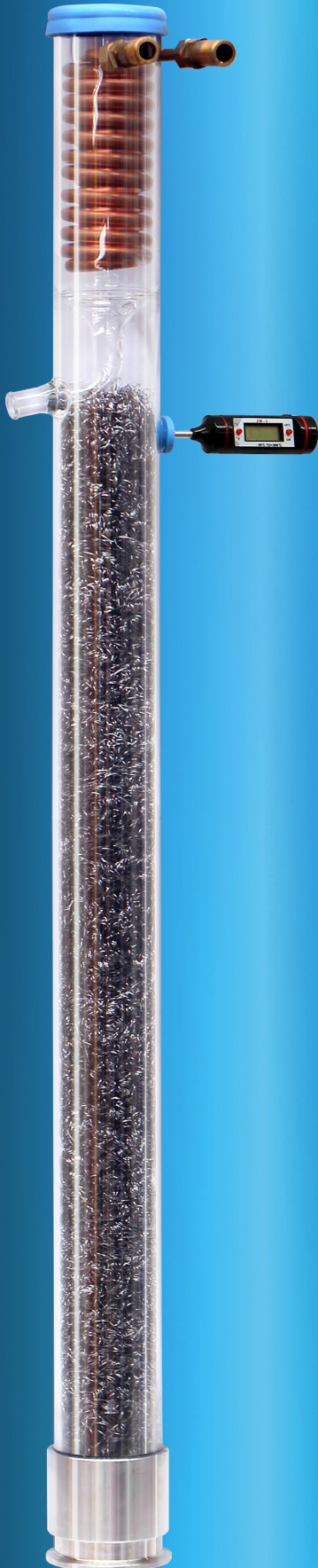


ULTRA 1000

GLASS REFLUX COLUMN



- Produces ultra high purity Alcohol up to 95%
- Simple to use
- Easily adjustable from Pot Condenser mode through to Full Reflux mode
- Fast alcohol production and high yield
- Copper condenser for odour free spirit
- Made from borosilicate laboratory glass, silicon, stainless steel and copper to ensure no contamination of your spirit
- Includes digital temperature probe
- Can be used with boilers up to 2000 watts including: essencia Express Boiler
35L Turbo Boiler
50L Keg Boiler

Introduction

The Ultra 1000 Glass Reflux Column is the ultimate in professional distillation. The unique patent pending design makes it the easiest to use on the market while still producing the best quality spirit of up to 95% purity.

The borosilicate laboratory grade glass is stronger than regular glass, making the column not only effective and attractive to look at, but robust and capable of handling rapid temperature change without cracking. The borosilicate glass is also completely clear so, unlike stills made from copper or stainless steel, you can see what is going on inside. This makes it very easy to troubleshoot any problems that might occur such as the need to add more coolant, or there is not enough reflux happening in the column.

Packing

The 'packing' is the product that you can see in the centre of the reflux column. The purpose of the packing is to give the vapour a large surface area to stick onto and suspend distillate within the column.

The Ultra 1000 comes with stainless steel wool packing. Stainless steel wool has a very high surface area, is inert and can easily handle high temperature contact with alcohol. Other types of packing media can also be used such as glass beads, marbles, ceramic or copper saddles, copper wool or any other media that will not contaminate the distillate and can handle the heat of the distillation process.

Condenser

The condenser is the copper coil that sits in the top of the still. The condenser has two functions:

1. It condenses the vapour from the boiler turning it to liquid.
2. The actual copper acts as a catalytic converter which helps to release sulphides from the distillate. This is one of the reasons many stills are made using copper. Copper helps to remove unwanted odour from the finished distillate.

Boiler

The boiler is the device that heats up the liquid that you are going to distil. The Ultra 1000 reflux column has been designed with a special coupling type so that it can be easily attached to a number of commercially available boilers including the essencia Express Boiler (2kW), the Turbo Boiler, the T500 Boiler, or it can be attached to a 50L commercial keg. To attach the Ultra 1000 to a 50L keg an additional part called a "2 inch tri-clover clamp" will need to be purchased separately.

Silicon Seals

The Ultra 1000 reflux column has all gaskets and sealing agents made with lead free, food grade silicon. Unlike other types of gaskets and sealing compounds silicon is inert and does not contaminate your distillate with toxic or harmful compounds. Silicon is odour free and will ensure the quality of your distillate is not compromised.

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

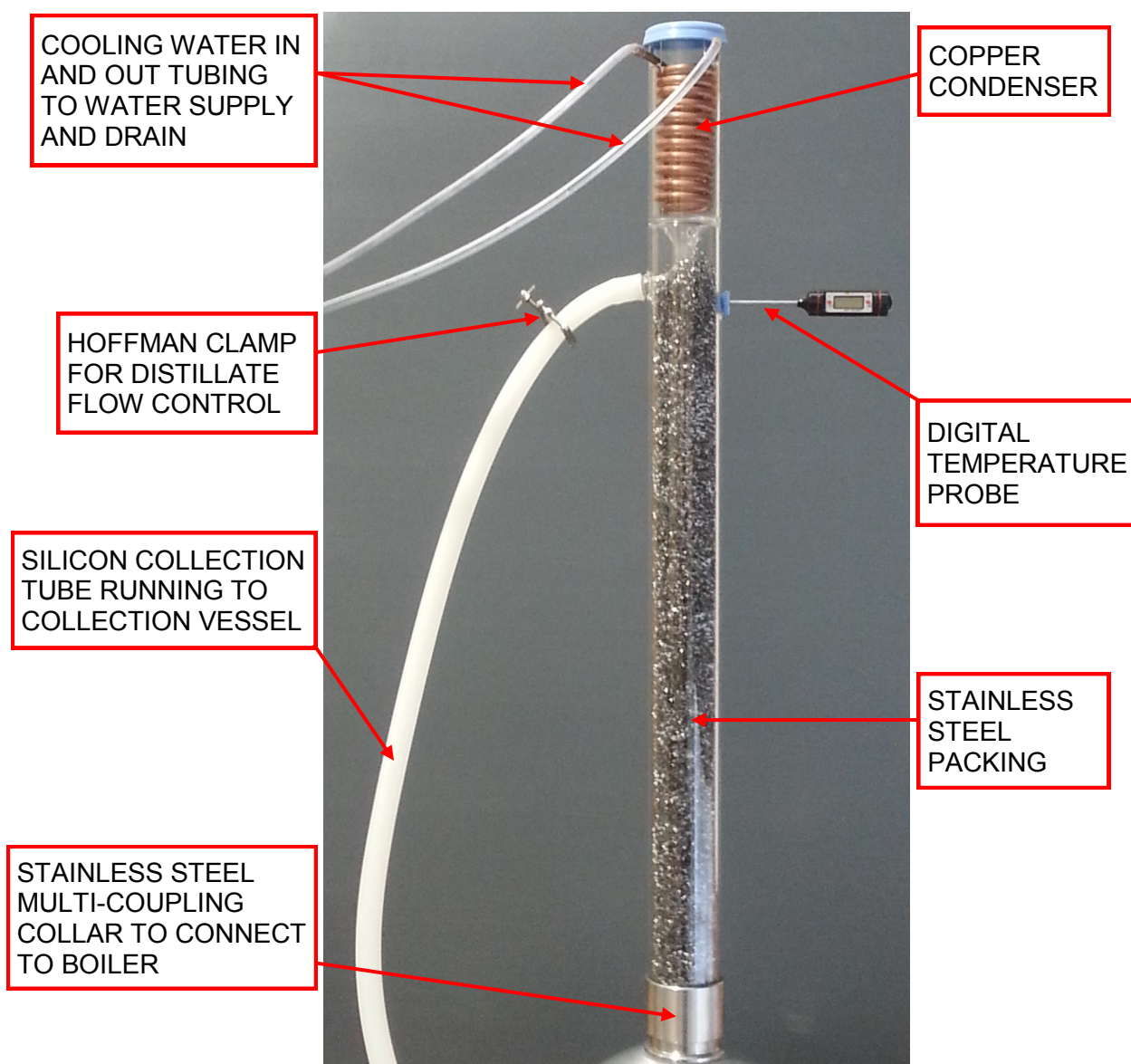
SAFETY

Regardless of what you are distilling with the Ultra 1000 column, be it water, essential oils, bio-ethanol or potable alcohol, the surfaces of the column and the boiler will be hot. Care must be taken to ensure that no one can accidentally come into contact with the hot surfaces.

When distilling bio ethanol or alcohol, extreme care must be exercised.

Because of the high purity of the distillate which the Ultra 1000 is capable of producing, the liquid distillate must be treated as highly flammable (like gasoline), and the vapour must be treated as potentially explosive.

- Always run the still in a well ventilated area.
- NEVER operate the still near a naked flame, do not smoke near the still, and keep it clear of other possible ignition sources.
- The still should not be left running unattended.
- Any distillate spills should be diluted with water and cleaned up immediately.
- Keep the area around the operating still as clear as possible.



Fermenting the Wash

The “wash” is the liquid that has been fermented to produce alcohol.

Careful attention to producing a high quality wash will result in superior tasting alcohol.

It is during the distillation process that **most** of the impurities are removed, but by producing a wash which is ‘clean’ (low in impurities), the distillation process is a lot more effective.

High temperature, fast fermentations should be avoided. The higher the fermentation temperature, the greater the amount of impurities are produced.

To achieve the highest purity alcohol, we recommend you follow these steps:

1. Clean and sterilise your fermenter and stirrer.
2. Add 10 litres (2.6 US Gal) of hot tap water.
3. Add 6 kgs (13.2 lb) white sugar and stir until completely dissolved.
4. Top fermenter up to 25 litres (6.6 US Gal) with cold water. This should result in a wash temperature of between 25 and 35°C (77 - 95°F).
5. Add 1 x packet of essencia Super 6 yeast and stir in.
6. Leave to ferment at around 25°C (77°F) for approximately 1 week.
7. The wash is finished when SG reading is at .990 or below and the wash has started to clear.
8. Add Ultra Clear or Super Clear two part finings, following the instructions on the pack.

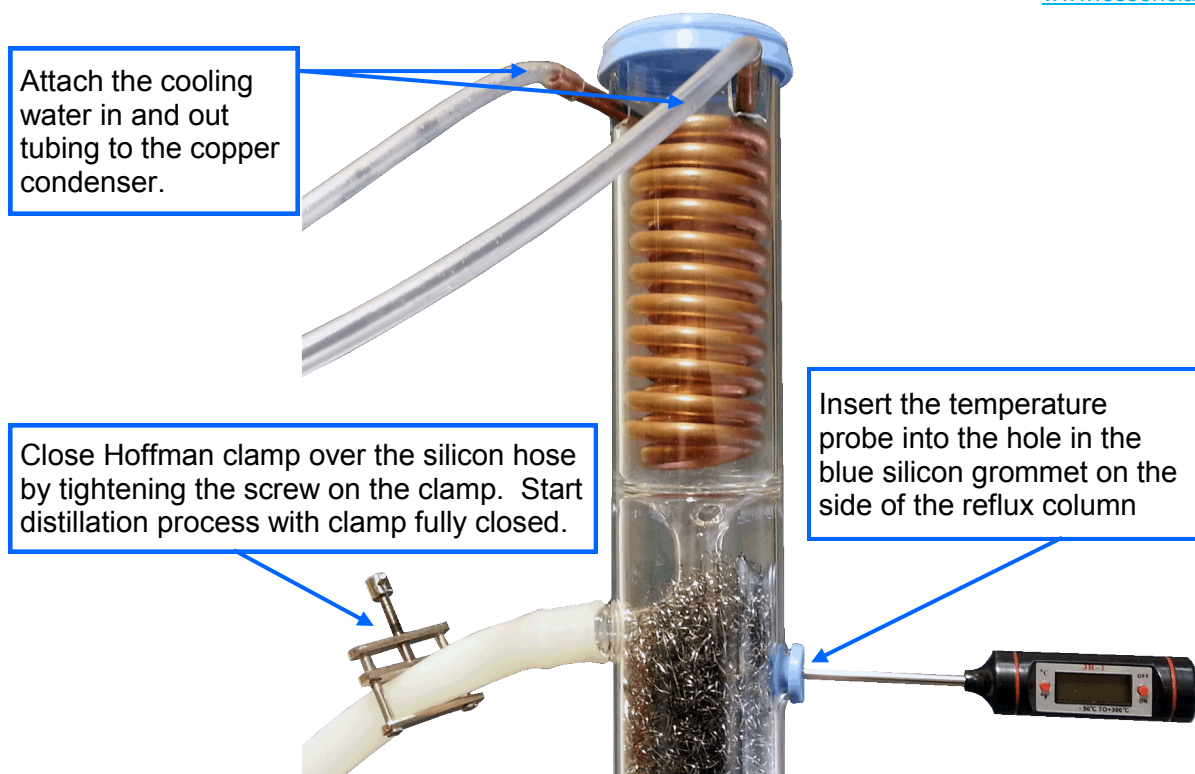
Distilling the Wash

1. Once the wash has cleared (24 hrs), carefully transfer it to your boiler, leaving as much sediment behind as possible.

NOTE: If you are using a stainless steel boiler, DO NOT allow activated carbon to come in contact with it. Activated carbon causes degradation of stainless steel and will drastically reduce the life of your boiler.

2. Add 1 x capful of essencia Foam Stop to prevent foaming of the wash during distillation.
3. Attach the reflux column to the boiler lid (ensuring the silicon washer sits between the outside of the lid and the base of the reflux column), and insert the temperature probe into the blue grommet on the side of the reflux column.
4. Attach one end of the silicon hose to the outlet of the reflux column. Fit the Hoffman clamp to the collection hose, just below the glass outlet. **Close the Hoffman clamp.**
5. Attach the cooling water in and out tubing to the copper condenser (it doesn't matter which way around these are connected), and place the condenser in the top of the column.
Tip: Softening the ends (5mm) of the tubing in a cup of hot water and using a little dishwashing liquid will make this easier.
Fit the cap to the top of the column.
6. Turn on the boiler.
7. After approximately 50 minutes you will be able to see vapour condensing on the packing in the lower part of the column. At this point you must turn on the cooling water to the copper condenser. Set the cooling water flow at approximately 1 litre (2 pints) per minute.

Check that the Hoffman clamp is closed.



8. After the wash starts boiling the temperature will rise very quickly. Within a few minutes the temperature will stabilize between 78°C and 81°C (172°F and 178°F).

9. Adjust the cooling water so that the vapour is condensing on the lower half of the copper condenser coils.

10. Once the temperature is stable and cooling water adjusted, slowly open the Hoffman clamp.

11. When collecting the spirit you **must** collect and discard the first 50ml (2oz) of distillate per 25 litres of wash. It contains by-products produced during fermentation. Collect this in a separate vessel.

12. Place a clean collection vessel under the silicon collection hose and take note of the temperature of the reflux column using the thermometer in the blue grommet. The end of the collection hose should never be submersed in spirit. If the spirit can fall and splash in the collection vessel this will aid the removal of undesired odours in the finished product.

NOTE: The degree to which the Hoffman clamp is open will vary the amount of reflux in the column and therefore the purity of the finished spirit. If the spirit is only dripping one drop at a time into your collection vessel the purity will be approximately 95%. If you fully open the Hoffman clamp or take it off the silicon hose, the spirit will flow very quickly into your collection vessel and the purity may be as low as 60%.

So there is a trade-off between **speed** and **purity** - which you have full control over.

13. When the temperature rises approximately 2°C (4°F) from the reading in step 12 then it's time to stop collecting as most of the high quality alcohol has been removed.

After this only a lower grade distillate (tails) will be produced.

It is possible to collect this lower grade alcohol and re-distil it at a later date. If doing so, collect in a separate vessel until the temperature reading is around 90°C (194°F).

14. Turn off the boiler and cooling water.

Cleaning the Reflux Column

After distillation has taken place some off-smells and flavours may remain in the column. To ensure optimum performance the column should be washed after each distillation run.

1. Allow the boiler contents to cool before emptying.
2. Place the empty boiler on the ground. Place the lid and column onto the boiler. Leave the temperature probe inserted and don't clamp the lid to the boiler.
3. Carefully remove the copper condenser from the top of the column and immerse in a solution of 2 teaspoons of citric acid dissolved in 1 litre (2 pints) of warm water (leave the cooling water tubing connected). Soak in the acid solution for 5 minutes.
4. In a jug, make up a solution of about 2 litres (4 pints) of hot tap water with some dish washing detergent.
5. Close the Hoffman clamp and pour the detergent solution into the top of the glass column so that it runs down through the packing and drains into the boiler. Then pour clean warm water down the column to rinse. Open the Hoffman clamp to release trapped water.
6. After the copper condenser has been soaking in the acid wash for **no more than 5 minutes**, remove it and neutralise with a mild alkaline wash. This can be done using dish washing detergent or sodium bicarbonate (baking soda). Rinse well with water.
7. Carefully replace the condenser in the top of the column.
8. Rinse out the boiler.

Diluting the Alcohol

Once you have collected the alcohol you will need to dilute it with water to 40% ABV prior to carbon treatment. Use a Spirit Hydrometer (alcometer) to measure the alcohol concentration (this is available in home brew stores).

NOTE: When water is added to alcohol the resulting chemical reaction will cause the overall temperature of the mixture to rise. Your alcometer is calibrated to be accurate at a specific temperature (usually 20°C (68°F)).

Below is a temperature correction table for use with a spirit hydrometer calibrated at 20°C (68°F). Use it to calculate the actual strength of your alcohol.

Temperature correction table for Spirit Hydrometer.

		Measured alcohol strength							
<u>Measured alcohol temperature</u>		30%	40%	50%	60%	70%	80%	90%	95%
	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	+2.00	+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	-5.98	-5.82	-5.40	-5.13	-4.67	-4.07	-3.54

Example: If your spirit hydrometer reads 50% ABV and your thermometer reads 30°C (86°F), then by using the temperature correction table you can see that the actual alcohol strength is: 50 – 3.78 = 46.22% ABV.

Carbon Treatment

Although the Ultra 1000 Reflux Column is capable of producing alcohol of extremely high purity, the distillation process in general is not able to remove **all** of the possible impurities. For this reason it is important that the alcohol is treated using activated carbon.

WARNING: There are a number of different types of activated carbon, designed for different applications. Be sure that the activated carbon you use is **specifically** designed for alcohol.

For the best possible results it is recommended that you carbon treat your alcohol using the essencia Carbon Filter.

The essencia Carbon Filter is the only multi stage, multi function alcohol treatment system available. Its unique design ensures that the **entire** final product is completely filtered and treated, including the water you use to dilute your alcohol.

This results in the purest, best tasting final product possible.

It's also very easy to use.

Troubleshooting

Problem	Solution
Steam is coming out of the top of the still	Cooling water is flowing too slow or cooling water is too hot. The cooling water should be supplied by mains water or an essencia Condenser pump. If you are recirculating water using a pump it is important that the cooling water never reaches more than 40°C (104°F).
Liquid is bubbling up the reflux column or the output is cloudy	This is either due to the boiler being too full or the wash is foaming and bubbling up the reflux column. Leave at least 15% head space in the boiler. Always use Foam Stop in the boiler to prevent this problem.
Alcohol purity is too low	This is due to collection of spirit being too fast because the level of reflux is too low. Tighten the Hoffman clamp to reduce the flow speed into the collection container.
Not getting the expected amount of alcohol	Ensure there are no leaks around the boiler lid seal. Ensure that the silicon washer sits between the outside of the boiler lid and the base of the column and that there is a good tight seal. Ensure steam is not escaping from the top of the column.

Water Distillation

Water distillation using the Ultra 1000 is simple.

Add the volume of water that you want to end up with to the boiler.

Add an extra 5 litres (1 gallon) of water (do not over fill the boiler).

Fit the column and lid to the boiler and connect the cooling water tubing.

Switch on the boiler.

Once you see vapour starting to condense on the packing in the lower part of the column (approx. 50 minutes for 25 litres), you must turn on the cooling water to the copper condenser. Set the cooling water flow at approximately 1 litre (2 pints) per minute.

Open the Hoffman clamp and allow the distilled water to run into the collection container.

When you have collected the required amount, switch off the boiler and turn off the cooling water supply.

Always leave enough water in the boiler to prevent it from boiling dry.

The distilled water should be run through the essencia Carbon Filter system to ensure any unwanted flavours and aromas from previous column uses are completely removed.

Warranty

To ensure you receive total satisfaction from your product we offer a free 2 year warranty to all registered owners of the Ultra 1000 who purchased their product from an authorised Ultra 1000 sales outlet.

The warranty covers the Ultra 1000 Glass Reflux Column for any defects of manufacture.

How to register

Your Ultra 1000 Reflux Column has a unique serial number (engraved on the stainless steel collar). Simply visit the essencia website at www.essencia-intl.com and follow the links to the Ultra 1000 registration page, fill in the online registration form and submit it back to us.

Additional Benefits of registration

Glass Column Replacement

The Ultra 1000 Reflux Column is made from laboratory grade borosilicate glass, which is far more robust than regular glass and is easily able to withstand the rigors of normal use. We realise however that accidents can happen, and the glass column may break if it is mishandled. Naturally this is not covered under the warranty.

In the unlikely event that the glass column gets broken, we offer all registered owners a special low cost replacement plan.

Simply return the stainless steel collar from the base of the column (with the unique serial number on it) to any authorised Ultra 1000 sales outlet and you will be supplied a replacement glass tube with stainless steel collar at a highly discounted price.

Backup

Registered owners will also be kept up to date with special offers and information to help get the best results from their Ultra 1000 column.

LEGALITIES

Distillation of alcohol

In New Zealand it is legal to distil your own alcohol for personal consumption.

Please note that in other countries it may be either completely illegal to distil alcohol, or a legal requirement that a licence to produce alcohol is obtained. The appropriate local authority should be contacted for advice on this.

Distillation of water

In most countries it is legal to distil your own water.

Please note that the laws in some countries impose restrictions on the equipment allowed for this process, such as boiler size. The appropriate local authority should be contacted for advice on this.

Distillation of essential oils

In most countries it is legal to use this equipment in the extraction of essential oils.

Please note that the law in some countries impose restrictions on the equipment allowed for this process, such as boiler size. The appropriate local authority should be contacted for advice on this.

Distillation of bio fuel

In a number of countries it is now legal to distil your own bio fuel.

Obviously the laws governing this practice vary greatly between countries, and even between areas within a country. These laws are rapidly changing as the search for alternative fuel sources evolves. The appropriate local authority should be contacted for advice on this, as well as the engine manufacturer regarding the appropriate levels that can be added.