

HOW STILLS WORK

Distillation

A still (short for distillation unit) is a device that separates a mixture of 2 or more different liquids into their individual components. For example, it will take a mixture of oil & water & separate the oil out of the water. Other common uses are the separation of petrol from crude oil & the separation of alcohol from a fermented liquor that contains alcohol & water. We will use the alcohol/water mixture to explain this process below.

Distillation works when the mixed liquids will boil at different boiling temperatures. Water boils at 100°C; ethanol (the alcohol we drink) boils at about 80°C.

If a mixture of water & ethanol is heated, it will start to boil at around 80°C. In fact, it is mainly the ethanol that is boiling, not the water. This means the steam that is rising is mainly ethanol. When this happens in a still, the ethanol rich steam is cooled so it turns back into liquid & it is collected outside the still. While this is happening, most of the water stays behind in the still which means that the ethanol has been separated from most of the water.

Basic components & how they work

Stills have two basic components. A boiler to make the steam and a condenser to cool the steam & collect the alcohol. Condensers are cooled by cold tap water running through tubes & cooling jackets around the condenser steam chambers.

The boiler constantly boils the liquid mixture (which is called the “wash” to provide steam or vapour for the condenser. The vapour that is boiled off actually contains a mix of alcohol, water & some by-products from the fermentation. This is due to the fact that some water evaporates while the alcohol is boiling. The amount of water in the vapour changes as the distillation proceeds. In the early stages of boiling a wash, the vapour is mainly alcohol with a little water. During the later stages of the distillation, the water content increases. This means the alcohol collected early will be stronger than the alcohol collected towards the end of distillation.

The condenser then cools the vapour thus turning it back into purified liquid which drips out a drain tube to be collected. The boiler & the condenser need to

be balanced so the rate of boiling matches the cooling capacity of the condenser.

The temperature of the wash also changes during distillation. When there is plenty of alcohol in the wash, it will start boiling just below 80°C. As the process proceeds & the alcohol is removed, the boiling temperature starts to go up. This increase in temperature will continue till the last bit of alcohol comes off at about 93°C. At this point, there is no alcohol left in the boiler but it does contain most of the original water. The process is now finished & the still must be turned off.

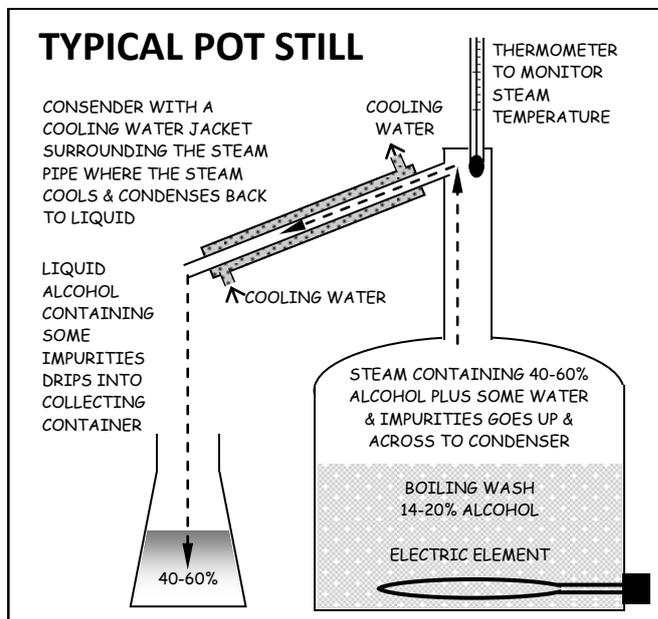
Types of Still

There are two basic types of condensers used in stills. Pot and Reflux.

Pot Stills

In a pot condenser, all the vapour that is generated by the boiler is collected and condensed back to liquid. This includes any of the impurities that are carried by the steam from the boiler. Therefore, it produces a low strength spirit which will contain some impurities that may influence the taste.

It needs to be stressed that if the wash has been produced using Still Spirits ingredients as described in the Distilling instructions these impurities are not dangerous .

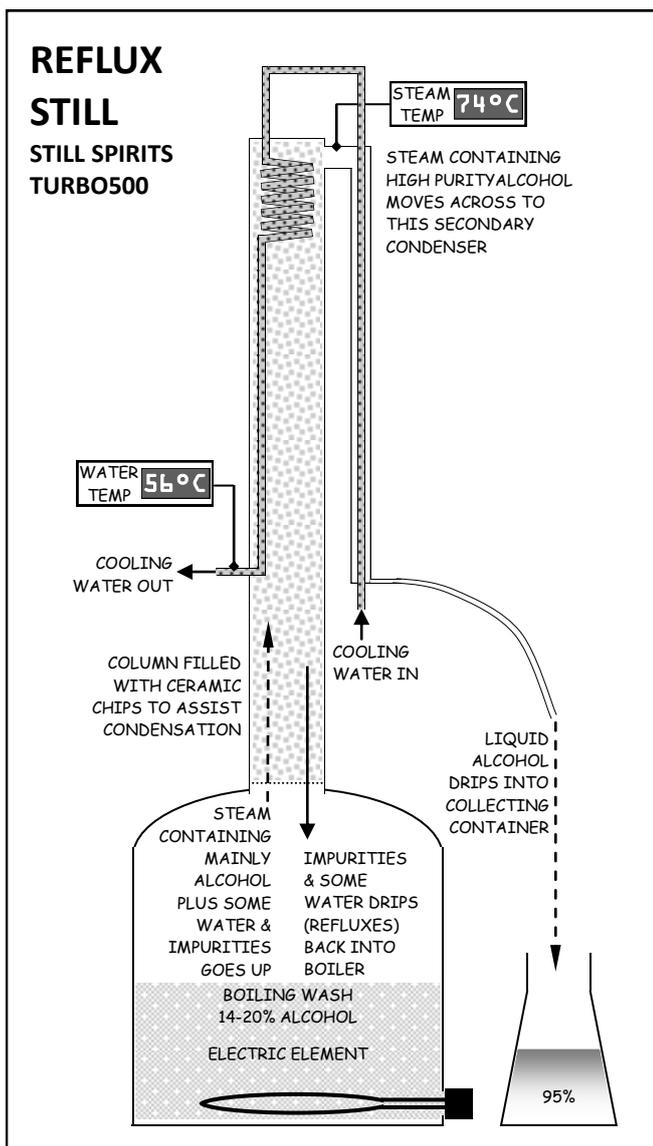


Reflux Stills

A reflux condenser is actually made up of two condensers, the first one, the reflux column, removes impurities & water from the vapour before the vapour passes through to the second condenser where it is cooled & collected.

In this type of still, the steam rises from the boiler up through the reflux column where some cooling takes place. This causes most of the impurities & water vapour to condense & run back into the boiler. The vapour that continues to rise through the reflux column is much cleaner than the steam in a pot still.

The vapour that makes it through to the second condenser is mainly alcohol vapour that having had most of the impurities & water removed. As a result the spirit collected by this type of condenser is higher in alcohol strength than a pot still and contains less by-products. The spirit collected is suitable for all types of spirits and liqueurs.



Still Spirits range of stills

Still Spirits is New Zealand's leading supplier to the home crafted spirit & liqueur market. They offer the following variations which will give different results depending on your requirements.

Turbo 500 Still

This unit has a complex reflux condenser which contains ceramic saddles that provide the ideal surface for condensation. These are housed in a column with cooling water circulating through coils inside the condenser.

This creates a controlled temperature environment where the vapour comes into contact with the ceramic saddles and bounces from one to the other as it makes its way through the condenser. This means the vapour comes into contact with a huge surface area which results in almost all impurities being removed from the alcohol vapour before it passes through to the secondary condenser where it is converted back to liquid and collected.

As a result, the spirit collected by this type of condenser is even higher in alcohol strength than either the pot still or ordinary reflux stills and contains even less by-products.

This spirit is ideal for all types of spirits and liqueurs and is particularly suitable for making gin, vodka and other delicate spirits that are drunk neat or with little added flavours to mask the flavour of the spirit.

The Turbo 500 is the best still on the market today & is the perfect choice for you if you want to excel at this fascinating hobby.



Air Still

An air still is a special type of pot still that uses air instead of water to cool the condenser. An inbuilt fan blows cool air over the cooling coils inside the top cover. This obviously provides a great saving of precious water.

Because it is a "pot" type still, the alcohol

produced will contain some impurities if they are present in the wash. This means that it is essential that the wash should be very clean to start with. The only way to achieve this is to use the very best quality yeast to ferment any wash for an Air Still.

The new Still Spirits' "Triple Distilled" Turbo Yeast has the extraordinary ability of producing alcoholic wash that is so pure, it compares with commercial "triple distilled" spirit once you run it through a still. It is now available with the Still Spirits Turbo Air Still. No other Turbo yeast product possesses the clean spirit technology of Still Spirits Triple Distilled.

Like the yeast, the Still Spirits Turbo Air Still is also the best on the market. It is a compact bench top unit that distils 4 litres of wash to give you 1 litre of drinking strength spirit each time you use it. The whole process takes about 2 hours & is completely straightforward with no complications.

A very important factor is that other air stills on the market are designed to distil water. When these are used to distil alcohol, they work too hot & fast to produce good quality spirit because more impurities are generated in these conditions.



The Still Spirits Turbo Air Still is designed to work at the correct temperature & rate for alcohol distillation & therefore produces better quality spirit.

BEWARE OF CHEAP IMITATIONS The Still Spirits Turbo Air Still is high quality stainless steel (not brushed or anodised metal) & has a heater specially designed with an altered distillation rate that is suitable for spirit distillation. Other stills are principally designed as high speed water distillers & do not produce good quality spirits.

The Air Still is a compact, easy to use, non-technical system that is an excellent choice for beginners & users who want a reliable system to make alcohol regularly. It is ideal for making smaller quantities, can be used in any kitchen & is inexpensive.

Making liquor at home

You will need some equipment & ingredients to make your own spirits & liqueurs at home. A fermenter is required to make the alcoholic base ("wash"). It is possible to ferment your alcohol up to about 20% strength & flavour this directly with any of the enormous selection of Still Spirits flavouring essences to make an amazing range of liqueurs & spirits.

If you want to make your drinks full strength (typically 40%) you can process your alcohol base through a still & then add the flavouring essence of your choice. In both cases, you need to process your spirit base through a carbon filtering system to remove the earthy smells & tastes that often occur during fermentation. A Still Spirits Carbon filter is required for this stage.

Our Information Sheet - "Making Spirits & Liqueurs" has an excellent overview of this process. Please ask for a copy.

Australian Home Brewing's Brewcraft Centres

24 Eskay Road Oakleigh South (03) 9579 1644

50 Burgundy Street Heidelberg (03) 9455 1311

143 Church St Richmond (03) 9429 2066

Terrific web site & on-line shop
www.liquorcraft.com.au

Call (03) 9579 1644 for your nearest supplier.
Or if there is no good supplier nearby, you can use our
mail order service

IMPORTANT NOTICE

Distilling without licence for own use is legal in New Zealand & several other countries.

In Australia, USA some other countries it is legal to own & use a still to make essential oils, distilled water etc but not to make alcohol.