

PRACTICAL

RUGGED

SMART

LABQUEST  
BY BOROSIL®

BE VOCAL ABOUT LOCAL

# Alcohol Distillation



QUICK



SAFE



SIMPLE

*Ideal way to measure alcohol content*

# Process of Alcohol Making

1

## MALTING

Best quality barley is first steeped in water and then spread out on malting floors to germinate. During this process enzymes are activated which convert the starch into sugar when mashing takes place.

After 6 to 7 days of germination the barley, now called green malt, goes to the kiln for drying.

This halts the germination.

The heat is kept low so that the enzymes are not destroyed.

2

## MASHING

The dried malt is ground into a coarse flour or grist, which is mixed with hot water in the mash tun. The water is added in 3 stages and gets hotter at each stage, starting around 67°C and rising to almost boiling point.

3

## FERMENTATION

The wort (malt extract plus water) is cooled to 20°C and pumped into washbacks, where yeast is added and fermentation begins. The living yeast feeds on the sugars, producing alcohol. Carbon dioxide is also produced and the wash froths violently. Revolving switches cut the head to prevent it overflowing. After about 2 days the fermentation dies down and the wash contains 6-8% alcohol by volume.

4

## POT STILLS

In distillation, the still is heated to just below the boiling point of water and the alcohol and other compounds vaporise and pass over the neck of the still into either a condenser or a worm - a large copper coil immersed in cold running water where the vapour is condensed into a liquid.

5

## DISTILLATION

The wash is distilled twice - first in the wash still, to separate the alcohol from the water, yeast and residue called pot ale - the solids of which are also saved for use in animal feeds.

The distillate from the wash still, known as low wines, and containing about 20% alcohol by volume, then goes to the spirit still for the second distillation. The more volatile compounds which distil off first - the foreshots, and the final runnings called feints where more oily compounds are vaporised, are both channelled off to be redistilled when mixed with the low wines in the next batch.

Only the pure centre cut, or heart of the run, which is about 68% alcohol by volume is collected in the spirit receiver.

6

## AGEING

While maturing, the alcohol becomes smoother, gains flavour, and draws its golden colour from the cask. A proportion of the higher alcohols turn into esters and other complex compounds which subtly enhance and gives it distinctive characteristics.

# INTRODUCING QUICK SOLUTIONS FOR MEASURING ALCOHOL CONTENT VIA DISTILLATION

## Product Features

- Borosilicate glass assembly along with SS steam generator for extended unit life.
- Process kill switch to halt the process in case of accidental door opening.
- Detachable bottom drip tray for extra protection against acidic attack during sample loadin.
- Tube sensor that enables safe operating conditions in event of tube damage.
- Operated easily with a icepack/ chiller.



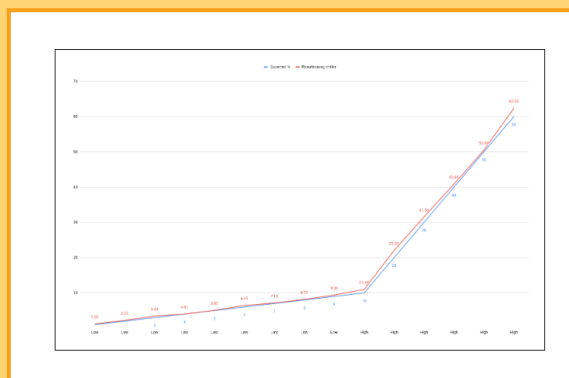
## Technical Specification

Make	Borosil
<b>Model Name</b>	<b>KD1010</b>
Tube capacity (ml)	250 ml / 500 ml
Steam addition	Automatic
Display	24 x 7 LCD
Cooling water flow rate sensor	Yes
Drip tray	Yes
Visual reagent level warning	Yes
Steam power	Adjustable
Steam output regulation	25-100%
Maximum distillation time (mins)	NA
Tube error detection	Yes
Door close sensor	Yes
Anytime alkali addition	Yes
Control button	Rotary push button
Conformity with AOAC, CE and ISO standards	Yes
Dimensions ( W x D x H)	(380 X 350 X 725)mm
Current consumption (A)	5.5 A
Power consumption (W)	1000W
Voltage	230-50/60Hz
Ordering Code	BLFAKD10100000000

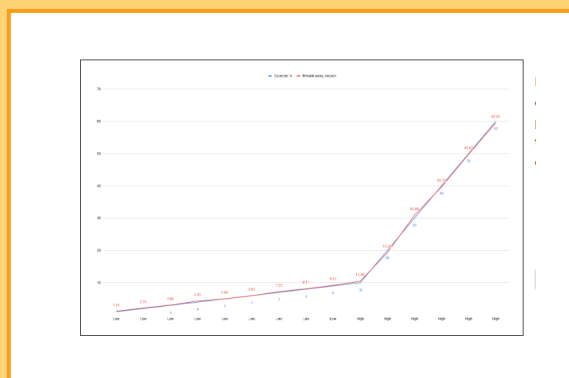
Use a chiller or ice pack for best extraction

Parameter	Chiller	Ice Pack
Avg distillation time	9.03mins	10.35mins
Avg Accuracy	±0.68%	±0.05%
Avg Precision	0.48	0.20
Avg Variance	0.49	0.07
Avg % Recovery	106.30%	102.28%

Readings obtained using ice pack as temperature controlling agent



Readings obtained using Chiller as temperature controlling agent



# Application



## Malt Industries/ Barley

Malt is germinated cereal grain that has been dried in a process known as "malting". The grain is made to germinate by soaking in water and is then halted from germinating further by drying with hot air.

Malted grain is used to make beer, whisky, malted milk, malt vinegar, confections such as Maltesers and Whoppers, flavored drinks such as Horlicks, Ovaltine, and Milo, and some baked goods, such as malt loaf, bagels, and rich tea biscuits. Malted grain that has been ground into a coarse meal is known as "sweet meal"



## Brewing and Distilling

Breweries combine the malt extract with water to form a solution called wort, which is a staple across the majority of the brewing industry. The next step includes addition of yeast to ferment the beer, and heating it to kill the yeast. Catalysts (corn and/or rye) are added to produce sugars. Mashing is the technical term for the mixing of grains and application of heat that activates the starches into sugars. In the cases of both brewing and distilling, malting / mashing accomplishes the purpose of breaking down the grains into sugar, and eventually alcohol.



## Enzymes / products used for baking

Fermentation is an anaerobic process in which microorganisms like yeast convert sugar, starch, glucose into alcohol (Ethanol), and produce carbon dioxide gas. Yeast is used for the fermentation process to produce ethanol. Yeast and water are mixed together and allow to evolve carbon dioxide and ethanol



## MANUFACTURERS OF ALCOHOL SOURCES



Molasses Fermentation is a biological process in which sucrose from molasses is converted into cellular energy that eventually produces ethanol and carbon dioxide. Molasses from sugarcane or sugar imparts an appropriate substrate for ethanol production.

Two methods are currently used to produce ethanol from grain are wet milling and dry milling

Dry mills produce ethanol, distillers' grain and carbon dioxide. The carbon dioxide is a co-product of the fermentation, and the distillers' dried grain with solubles (DDGS) is a non-animal based, high protein livestock feed supplement, produced from the distillation and dehydration process. If distillers' grains are not dried, they are referred to as distillers' wet grain (DWG).

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