

## ALM-155 is suitable for:

### Wineries...

Alcohol is the main legal parameter for bottled wines; the declaration of fake values entails severe penalties for wine producers. For this reason, the analysis of wine must be done in accordance with the official analysis method. It is very important to check density, specific gravity and alcohol content during wine fermentation, in order to verify its progress and provide notice if it stops prematurely.



### Must production...

The density of grape juice indicates the amount of sugar contained in the juice before fermentation. It can determine the expected alcohol content in wines, so it is very important to analyze its density accurately.



### Oenological labs...

In addition to providing analytical support to wineries, these laboratories can release certificates of analysis with legal validity. As well as wineries, these laboratories have to perform analyses in accordance with the official method in order to be sure of the accuracy of the values they certify.



### Distilleries and spirits...

Companies producing spirits, such as distilleries, have products with a high alcohol content. The ALM 155 is a high performance instrument working in the whole concentration range from 0.00% to 100% alcohol content. Therefore, the instrument is highly suitable for this application.



### Beer production...




Monitoring density and specific gravity during the beer production process is very important for the quality of the final product. ALM-155 can provide alcohol testing after the beer sample has been distilled.



### Vinegar making...

Vinegar is obtained by oxidation of the ethanol content of wine, cider, beer, other fermented alcoholic beverages, or raw materials such as malt, rice and raw and cooked fruit. Checking the alcohol content during the oxidation process is very important to understand when ethanol has completely turned into acetic acid.

## Specifications

Model	ALM-155 Alcohol Meter			
Measurement Range	Alcohol content	0.00~100.00 vol%		
	Density	0.69937~1.24887 g/cm <sup>3</sup>		
	Specific Gravity (20/20)	0.70000~1.25000		
Resolution	Alcohol content	0.01 vol%		
	Density	0.00001 g/cm <sup>3</sup>		
	Specific Gravity	0.00001		
Repeatability	Alcohol content	SD:0.05 vol%		
	Density	SD:0.00005 g/cm <sup>3</sup>		
	Specific Gravity	SD:0.00005		
Measurement Temperature	20°C (Fixed)			
Alcohol Table	Selectable either OIML or AOAC			
Measurement Time	ca. 8mL (for 10 seconds of sampling time)			
Min. Sample Required Automatic sucking in	2 to 4 min. (with the peristaltic pump)			
Display	Display Instrument	LCD (with a backlight)		
	Displayed contents	Item	5-2 mode	4-1 mode
		Density	x.xxxxx	x.xxxx
		Specific Gravity	x.xxxxx	x.xxxx
		Alcohol content	x.xx	x.x
Temperature	xx.xx	xx.xx		
Sampling	1) Auto Sampling by Peristaltic Pump 2) Manual by optional syringe			
Auto Start function	Number of repeat time: 2-100			
Density-Concentration Conversion	Alcohol content Fixed (Stored as Standard)			
Memory for Factor	One Memory Saved Factor Calibration Possible Only with Pure Water			
PC Software	SOFT-CAP (Data Acquisition Software)			
Interfaces	1) USB flash drive/keyboard 2) RS-232C; Dot Matrix Printer (COM1) , PC (COM2)			
Data I/O	CSV data saving to USB			
Ambient Conditions	1) Temperature: 5 to 35°C 2) Humidity: Below 85%RH (no condensation)			
Power Supply	100 to 240 VAC±10%, 50/60Hz			
Power Consumption	Approx. 30W			
Dimension	270 mm (W)×402 mm (D)×163 mm (H)			
Weight	Approx. 10 kg			
Onformity standard	CE marking EMC: EN61326-1 LVD: EN61010-1 RoHS2 Directive			
Options	IDP-100 Print er	Syringe 2mL (10pcs set)	Density Standard Liquid	
				

## Alcohol Meter ALM-155






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Your Distributor





**KYOTO ELECTRONICS  
MANUFACTURING CO., LTD.**

Kyoto Electronics Manufacturing Co., Ltd., has valuable experience and long history in the manufacturing of oscillation density technology from 1978. The technology of ALM-155 originates from our Sake alcohol analyzer DA-155 which has been sold mainly to Japanese Sake breweries for many years. Most of the Sake breweries are small family businesses, however, their demand for reliable analytical instrumentation is very strong. Therefore, KEM has been providing them with easy to use, high performance analyzer at a reasonable price.

# Introduction

The ALM-155 is a dedicated, small size & high-performance bench top density meter with oscillating capillary tube for the analysis of oenology, sprits and beer. The analysis of density and specific gravity in alcohol products has never been so easy and accessible for any budget. The ALM 155 displays results with high-resolution of 0.01% for alcohol content and 0.00001 g/cm<sup>3</sup> for density. Moreover, with the peltier thermostat system, the temperature is fixed at exactly 20°C.



## One button measurement with small sample volume

The ALM 155 is equipped with peristaltic pump for automatic sampling. The required sample volume is only 8mL and can be used for repeatability testing with the automatic repeating function. The analysis of alcohol content (on the distilled wine sample) or density (on wine as it is) is performed in two to four minutes for one measurement by pressing just one button. When high viscous sample is measured, an optional syringe can be utilized to introduce the sample into the measurement cell what makes the ALM-155 suitable for the analysis of any alcohol products.

## Simple calibration with pure water and easy maintenance

The calibration of ALM-155 does not require expensive standards, only pure water. After analysis, the unit can be cleaned by simply washing the cell with pure water or a kitchen detergent. The only replacement parts are the sampling tubes and those can be replaced by the user. The daily performance check can be easily performed by the operators and requires pure water only.

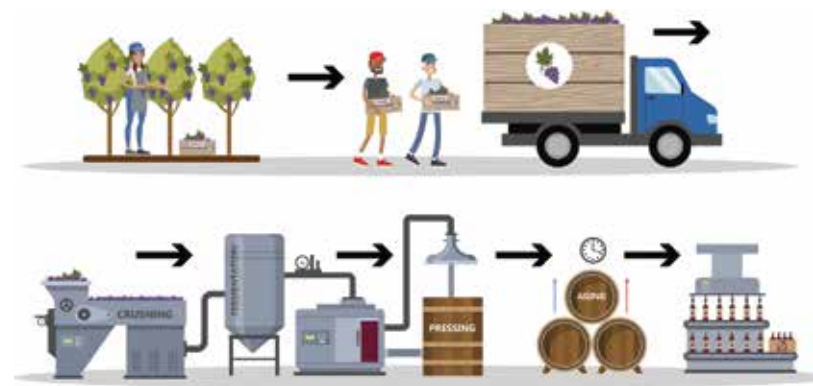
## Automatic Saving results with digital data

The results are not necessary to be recorded by hand-writing. An optional printer can automatically print out the results once the measurement is completed. The ALM-155 can also store measurement up to 100. The data can be transferred to a connected USB memory stick or to an optional PC software through an RS-232C cable.

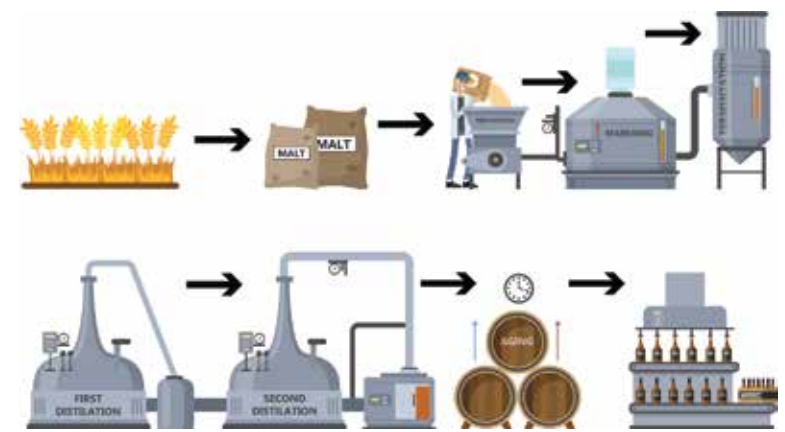
# Measurement Cycle

Alcohol and Specific gravity/density analysis are essential at all stages of the production process of alcoholic products.

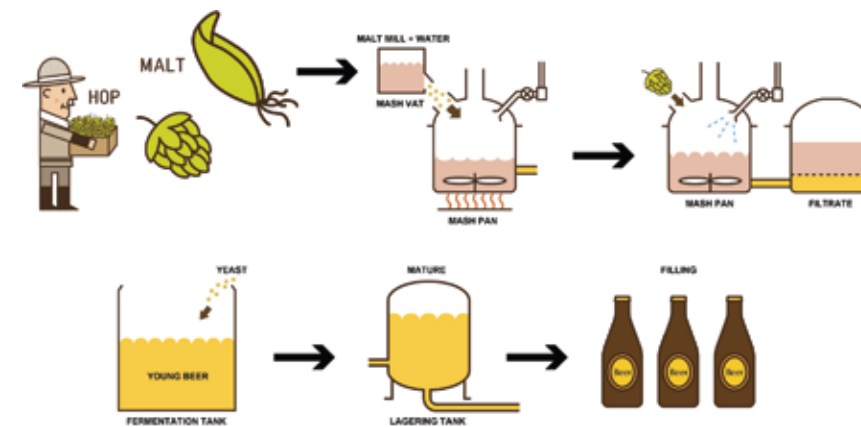
## Wine: measurement point under production



## Whiskey: measurement point under production



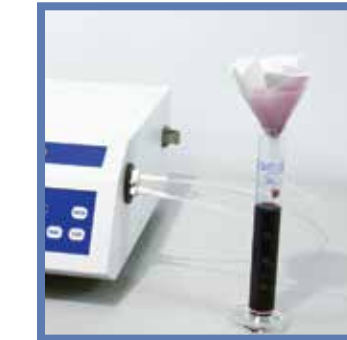
## Beer: measurement point under production



# Step by step Analysis

Specific gravity/density value.

## Wines and Musts



Filtration and degassing



Sample loading in measuring cell



Final result on display or PC



Clean and ready for next analysis

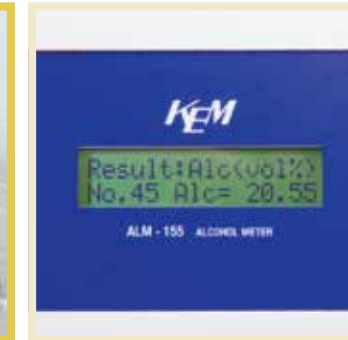
## Alcohol



Distillation and distillate recovering



Sample loading in measuring cell



Final result on display or PC



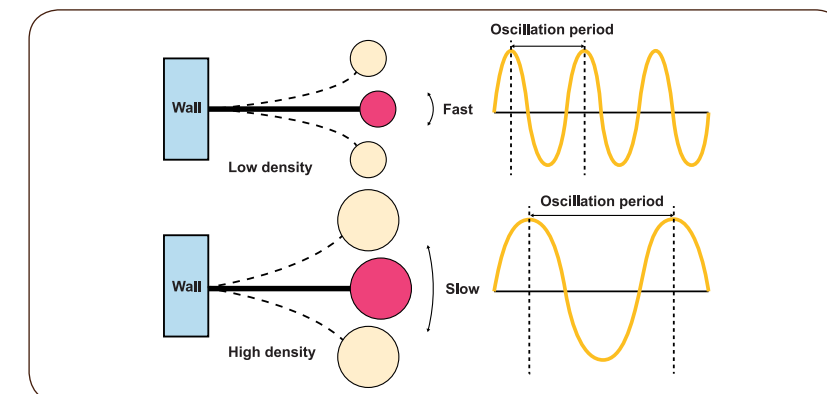
Priming and ready for next analysis

# Principle

## Measurement Principles of KEM Density/Specific Gravity Meters

Imagine the model at right, where a weight is attached to the end of a bar. If you flick the weight with your finger, the weight begins to oscillate.

You can see that it oscillates more slowly with more weight, and faster with less weight. This is because the weight will vibrate on the oscillation period specific to a substance in proportion to the mass of the weight.



This means that one can determine the density of a substance by measuring its oscillation period, since density becomes proportional to the mass when the volume is constant, i.e. a fixed tube.