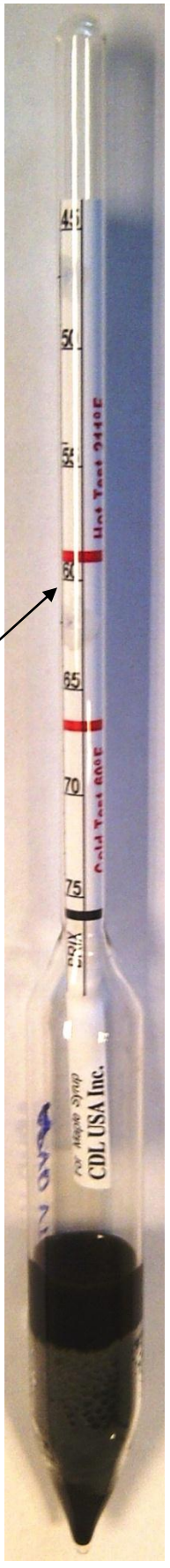
HOW TO USE A HYDROMETER

Maple syrup can only be legally offered for sale if it has a density of at least 66% sugar (66°Brix). To obtain this minimum density, the syrup should be boiled until it reaches a temperature of 3.94°C (7.10°F) above the boiling point of water. A hydrometer is an instrument whose function is based on Archimedes principle. This principle states that a body (the hydrometer) immersed in a fluid is buoyed up by a force equal to the weight of the displaced fluid. The hydrometer measures the weight of the liquid displaced by the volume of the hydrometer.

How to use a Maple Syrup or Sap Hydrometer

How to Use Your Syrup Hydrometer:

Fill the hydrometer test cup with syrup until it is approximately 1 to 2 inches from the top and place it on a level surface. Do not fill the hydrometer cup with the hydrometer inside, as the syrup on the stem will add weight and affect the reading. Slowly lower the hydrometer into the syrup until it is floating on its own or resting on the bottom of the hydrometer cup. This is a very fragile instrument. **DO NOT** drop the hydrometer into the syrup, as this can cause the hydrometer to shatter.

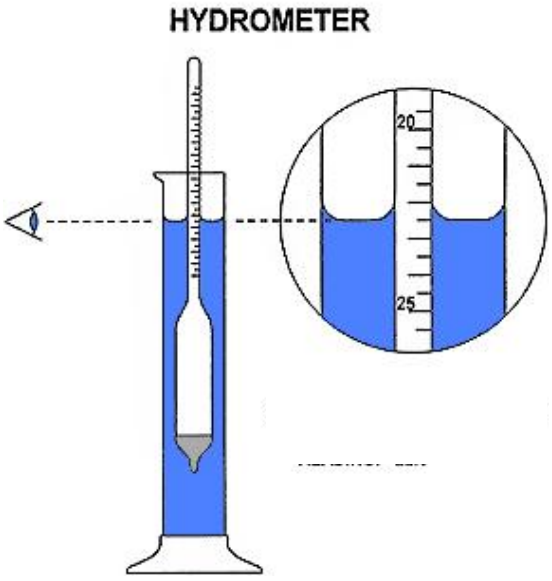


Hot syrup (at 211^{0}F) measurement line

Reading the Hydrometer:

It is important to take a temperature reading at the same time as the hydrometer reading, because density changes with temperature. Take the hydrometer reading once the hydrometer has stopped bobbing. If you take the reading right from the evaporator draw-off (at 211^{0}F), if the syrup is even with the top red line, you have the right density. If it's below the line, the syrup is heavy. Add some sap to the boiling syrup to dilute. If the syrup is above the line, the syrup is light. Continue to boil the syrup.

Between readings, clean the hydrometer with hot water or sap.



If you take the reading with cold syrup at 60^0F, use the bottom red line to measure. Finally, it you want to take a reading at any other temperature, use the following chart to adjust the brix reading.

SYRUP TEMPERATURE (^{0}F)	BRIX ADJUSTMENT
209	+8
202	+7.5
193	+7
185	+6.5
176	+6
167	+5.5
158	+5
149	+4.5
140	+4
130	+3.5
120	+3
110	+2.5
100	+2
90	+1.5
80	+1
70	+0.5
60	0
50	-0.5
40	-1

For example, if you get a reading of 64 brix at 100^0F, add 2 brix to the reading. So, you really have syrup at 66 brix.

IMPORTANT: In Vermont every syrup hydrometer has to be state inspected to be legal.

If the syrup is too heavy, this is the quantity of sap you need to add to bring back a gallon of syrup.

Brix reduction required	Fluid oz of sap / gallon
0.5	1.26
1.0	2.52
1.5	3.80
2.0	5.08
2.5	6.38
3.0	7.68
3.5	8.99
4.0	10.32

USE A SAP HYDROMETER

A sap hydrometer can be used at any temperature, water having the same density at any temperature.

There are different models of sap hydrometers with different scales whether you want to measure raw sap or concentrate and with the required precision.

The sap hydrometer is read the same way as a syrup hydrometer.

Note: Keep the hydrometer in an upright position to prevent the red column from separating when not in use.