Using a Maple Syrup Hydrometer

Hydrometers are thin glass, precisely weighted tubes with printed graduations sealed inside. They are the most commonly used instrument for measuring the density of pure maple syrup. All that is needed is a relatively inexpensive but accurate hydrometer, an accurate thermometer and a hydrometer cup. Maple syrup hydrometers are calibrated to a specific temperature, usually 60F. If used at any other temperatures a thermometer and temperature correction *(this card)* must be used since the viscosity of pure maple syrup can differ greatly depending on it's temperature. Hydrometers will float higher in colder syrup and lower in warmer syrup. Most syrup hydrometers include 'Hot' and 'Cold Test' lines. The Cold Test line is the point at which syrup at the minimum legal density would float *(at the calibrated temperature)*. The Hot Test line is essentially an offset that allows for the density of hot syrup *(usually directly from the evaporator)* to be estimated.

Willits C.O. and Hills, C.H. Maple Syrup Producers Manual 1976, USDA Agricultural Research Service. Agricultural Handbook No. 134

Syrup Hydrometer Range

Syrup Temperature *(Degrees F)*	Visible Hydrometer °Brix Reading **For syrup hydrometers calibrated in °Brix at 60° F**	
	MIN = 66.9 °Brix Syrup	MAX = 68.9 °Brix Syrup
209°	59.0	61.0
202°	59.60	61.60
195°	60.10	62.10
190°	60.25	62.25
185°	60.50	62.50
180°	60.75	62.75
175°	61.0	63.0
170°	61.25	63.25
165°	61.55	63.55
160°	61.80	63.80
155°	62.10	64.10
150°	62.35	64.35
145°	62.65	64.65
140°	62.90	64.90
135°	63.15	65.15
130°	63.40	65.40
125°	63.65	65.65
120°	63.90	65.90
115°	64.15	66.15
110°	64.40	66.40
100°	64.90	66.90
90°	65.40	67.40
80°	65.90	67.90
70°	66.40	68.40
***60°**	***66.90***	***68.90***

Concept for table by Deborah Fuller, Vermont, 2023

DENSITY REDUCTION

Volume of water added to 1 US gallon of syrup to lower its density a desired amount

	Density reduction of syrup desired (°Brix)							
	0.5°	1°	1.5°	2°	2.5°	3°	3.5°	4°
	Fluid US ounces (oz.) of water to add per US gallon of syrup to reduce density							
0° (Water)	1.26	2.52	3.8	5.08	6.38	7.68	8.99	10.32

Always make sure water used to dilute syrup is potable and everything is well mixed before taking another hydrometer reading.

Adapted from Table 8.3, North American Maple Syrup Producers Manual, Third Edition 2022
University of Vermont in cooperation with The North American Maple Syrup Council
Perkins, T.D., Heiligmann, R.B., Koelling, M.R. and van den Berg, A.K. Editors

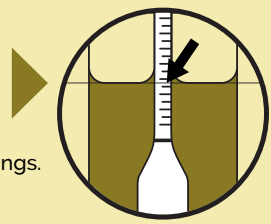
HYDROMETER TIPS & CARE

Hydrometers are delicate, glass instruments that can provide years of use but are also easily damaged or rendered inaccurate if not used properly.

Make sure to test hydrometers for accuracy and ***retest periodically***.

Occasionally the paper inside a hydrometer can shift. Place a recently tested hydrometer next to a piece of paper or cardboard and mark the location of the "hot test" and "cold test" lines. Save this template and check the marks as reference to see if the paper has shifted in the future.

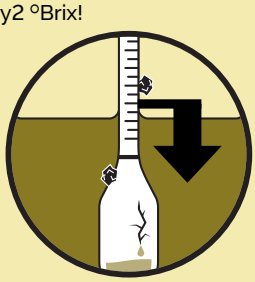
Read the point on the hydrometer stem where the syrup level crosses and not the highest point the syrup reaches (minuscus).



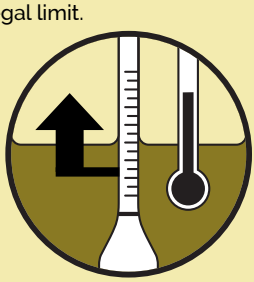
Gently lower the hydrometer into syrup.
Pouring syrup over hydrometer can result in syrup clinging to the stem, thus causing inaccurate readings.

Most hydrometers are calibrated at 60°F & most ***marks are in 1 °Brix increments***.

Keep Hydrometer clean!
Extra weight from syrup, sugar crystals or niter clinging to the glass or liquid seeped through small cracks will make syrup appear less dense than it is, causing producers to boil longer, resulting in syrup that is over the density limit. Just 0.5g of extra weight can throw the reading off by2 °Brix!



It is critical to know the temperature of the syrup in which the hydrometer is floating. Use a good, accurate thermometer. Syrup that has cooled more than a producer suspects will appear more dense than it is and result low density syrup. Research suggests that >75% of syrup that fails to meet density standards is BELOW the legal limit.



Check out the UVM Extension Maple instructional video on density and hydrometers

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