025-0942

HYDROMETER

50 TO 70 °BRIX MAPLE SYRUP

Measuring sugar levels

BMR GROUP
1501Ampère street, suite 200
Boucherville (Québec) J4B 5Z5
450 655-6700
1 800 361-0885
bmr.co
agrizone.co

Why is sugar content important?

- Measuring the sugar content is one of the last steps in the manufacturing process.
- A maple syrup with the right °Brix guarantees a good shelf life for the product when it is properly barreled.
- **A syrup that is too dense** (plus 67 °Brix) **promotes crystallization of the sugar** in the container.
- **A syrup with a lower density** (less than 66 °Brix) **can easily mold or ferment.**
- Penalties are even applied for the most marked deviations from this target area.

It is for these reasons that it's important to properly calibrate your maple syrup batch.

Using, reading and interpreting a hydrometer

To take measurements

- **Take a sample of the syrup to sufficiently fill the cup** and place it on a horizontal and stable surface to minimize the risk of reading error. **Do not fill the cup with the hydrometer inside** because if the syrup flows down the stem, it will affects the result.
- **Use a well cleaned hydrometer**. Residues on the hydrometer may add weight to it, which would further sink into the solution and underestimate the concentration.
- Gently lower the hydrometer into the solution to avoid covering the aerial part of the syrup, which may increase its weight and overestimate the concentration. **The hydrometer is a very fragile instrument. NEVER drop the hydrometer into the cup as it may burst.**
- The hydrometer should be left to stand for approximately 30 seconds for it to stabilize. As the syrup is measured by its density, a clear syrup will let the device flow to the bottom of the cup while a very thick syrup will make it float more.
- Depending on the temperature of the solution, there are two possibilities:
    1. If you do not want to make a temperature correction using the correction table: allow the solution to cool while keeping the container covered so as not to create evaporation so that you have the correct calibration temperature. When taking the reading, shake the solution.
    2. If you do not want to wait: take the temperature of the solution at the same time as the density measurement; consult the correct table and modify the density measurement accordingly.

In both cases, a thermometer is required.

- **It is important to take the temperature at the same time as the density because temperature influences the density of the solution.** Take the density reading as soon as the hydrometer stops oscillating. When you take the reading at the exit of the evaporator, i.e. at 211 °F (99.4 °C), if the syrup arrives equal to the level of the highest red line, you have the right density (66 °Brix). If it's under the line, the syrup is too thick. Add maple water to dilute the syrup (see table 1). If the syrup is above the line, the syrup is too liquid needs to boil longer.

Reading and interpreting a measurement

- For reading, always make sure that the eye is at the height of the surface of the liquid and must be made at the base of the meniscus formed by the maple syrup around the hydrometer (see Diagram 1).
- If the syrup is measured cold at 60 °F (15.5 °C), use the 2nd red line to measure. Finally, if you take a reading at any other temperature, refer to Table 2 to adjust the value.

Maintenance and storage

- After reading, clean the device well with water at a temperature that approaches that of the syrup being measured. If there are sugar crystals or sugar stones, soak the device in a diluted solution of vinegar (that are sold in grocery stores), then dry well with a soft, clean cloth.
- **Store vertically.**

Reading error risks

- A poorly cleaned device, therefore creating an overweight.
- A reading that is not taken at the base of the meniscus.
- A hydrometer immersed too quickly, causing the upper part to sink into the solution, adding additional weight to the device.
- A lack of solution in the container, creating a plunging eye sight and causing an incorrect measurement.
- The presence of air bubbles.
- An unsuitable graduation scale.
- The temperature not conform with that used for the calibration.
- A container that is not deep enough, so causing the instrument to lean against the bottom.

Source : " La calibration du sirop d'érable ". Info-Sirop de la FPAQ. Avril 2018 : pages 12-14
Source : "Comment utiliser un densimètre". Les Équipements d'érablière CDL. 2017 : pages 1-3
Source : "Les instruments de mesure dans la production de sirop d'érable". Donald Lemelin. 2011 : pages 15-21

Brix reduction required	Oz/ml water / gallon
0,5	1,26 oz / 37,2 ml
1	2,52 oz / 74,5 ml
1,5	3,8 oz / 112,3 ml
2	5,08 oz / 150,2 ml
2,5	6,38 oz / 188,6 ml
3	7,68 oz / 227,1 ml
3,5	8,99 oz / 265,8 ml
4	10,32 oz / 305,1 ml

Table 1

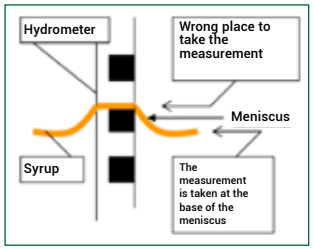

Diagram 1 : illustration of the measurement under the meniscus

Maple syrup temperature	Brix adjustment
209 °F / 98,3 °C	+ 8
202 °F / 94,4 °C	+ 7,5
193 °F / 89,4 °C	+ 7
185 °F / 85 °C	+ 6,5
176 °F / 80 °C	+ 6
167 °F / 75 °C	+ 5,5
158 °F / **70** °C	+ 5
149 °F / 65 °C	+ 4,5
140 °F / 60 °C	+ 4
130 °F / 54,4 °C	+ 3,5
120 °F / 48,8 °C	+ 3
110 °F / 43,3 °C	+ 2,5
100 °F / 37,7 °C	+ 2
90 °F / 32,2 °C	+ 1,5
80 °F / 26,6 °C	+ 1
70 °F / 21,1 °C	+ 0,5
60 °F / 15,5 °C	0
50 °F / 10 °C	- 0,5
40 °F / 4,4 °C	- 1

Table 2

Complementary products

Test cup
8 in
025-0818

Test cup
10 in
079-0769

Density
standard
054-4470

agrizone BY BMR