

Why and How to Check your Hydrometer's Accuracy

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Hydrometers are a critical tool for making high-quality, legal-density maple syrup. A \$20 to \$30 investment in an accurate hydrometer can yield a valuable return in income for the producer.

Using an inaccurate hydrometer which reads high will have you packing syrup which is actually below proper density. This low-density syrup can spoil and ferment making it pretty much worthless. Additionally, you are apt to lose customers when they find your syrup to be thin and moldy. It also reflects poorly on the whole maple industry.

If your hydrometer reads low then you will be packing syrup which is over-density. The extra sugar in over-density syrup will eventually form sugar crystals in the bottom of a container. You may lose a customer this way as well if they think you have added sugar to your maple syrup, or the customer may think there is broken glass in their syrup jug. And you'll be losing money, since you'll have boiled off several gallons that you could have sold!

Automatic-draw off devices are a great tool, but their accuracy should be confirmed with an accurate hydrometer. If buying or selling sap with an inaccurate sap hydrometer, either the buyer or seller is losing potential income.

When to Test Hydrometers

Anytime and often is the best answer. At your annual association meetings, maple schools, and summer tours. Producers should get into the habit of having hydrometers checked for accuracy at least annually. A state or provincial maple association could obtain everything needed for checking hydrometers for approximately \$600 or less and test member's hydrometers at every function they have as a service to their members. See "Developing a Hydrometer Accuracy Checking Program for Maple Syrup Producer Associations" at <https://mapleresearch.org/pub/hydrocheck-2/>.

Visually Inspect Hydrometers Before Testing

If you don't have access to a hydrometer testing program, many hydrometer issues can be detected by a thorough visual inspection of your own hydrometers. Hydrometers crusted with calcium scale or dried sugar have extra weight, causing them to sink lower in your test cup and to read higher than they should for correct density syrup. This means your syrup may actually be a bit lower density than what your hydrometer shows. This crusted hydrometer may read 66 Brix when in reality the syrup may be 65 Brix or lower. If a hydrometer is crusted with a calcium scale or niter or syrup residue, it is im-

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portant to clean thoroughly before use. Vinegar, or the product CLR (Calcium, Lime, Rust Remover) and a Teflon pan cleaning pad will aid in removal of calcium scale and niter. Heavily crusted or scratched hydrometers should be replaced.

With the aid of a bright light, closely inspect the hydrometer tip on the weighted bottom with a magnifying glass to check for cracks or missing glass. Cracked or missing glass on the tip allows moisture to find its way into the bowl adding weight and causing it to read heavy. Do not use a hydrometer with cracked or missing glass on the tip, it should be discarded. This is when you'll be glad you have a second hydrometer.

Using a magnifying glass, inspect the glue dots on the paper to see if they are loose. Also check the accuracy verification thread or wax dot (if it has one) to confirm they are intact. Look down the hydrometer stem, a straight line will be observed on the paper. If the line is not straight and has a twist to it, then one of the glue dots has loosened and the paper twist makes the hydrometer unusable. Papers with a twist can read slightly inaccurate ($1/2$ to $3/4$ °Brix) to greatly inaccurate ($2+$ °Brix) depending on the severity of the twist. If both glue points have loosened paper shift happens (up or down). Hydrometers will read light if paper shifts up or heavy if paper shifts down.

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Suggestions for Visual Hydrometer Inspection

- Calcium scale – scale should be cleaned off before checking. It adds extra weight giving a false reading.
- Cracked or missing glass anywhere – do not use. Hydrometer should be discarded due to possible inaccuracy and potential glass contamination in syrup.
- Twisted paper, even a slight twist – do not use. It will get worse with time and can give a false reading of several Brix/Baume
- Do not attempt to read the hydrometer with the error built-in. Factored incorrectly, the error would be doubled leading to making under- or over-density syrup.
- Always check a newly purchased

hydrometer. It is rare, but brand-new hydrometers can become inaccurate during shipping.

A Final Reminder

Producers should always have a minimum of two hydrometers. One always seems to break when needed the most. Not having a backup hydrometer can lead to off-density issues and will cost you money. Always use two hydrometers. Floating both at the same time to assure they are reading the same is good practice. If one starts reading off, it is detected right away, not after drums or containers develop problems with fermented syrup or sugar crystals. This is when a 3rd hydrometer is handy - you will always have two to compare to each other, plus a spare if needed. A third hydrometer is also handy when your neighboring sugarmaker drops and breaks his only hydrometer in the middle of a big boil and needs to borrow one.



Candy & Cream Combination Machine

This machine has a 4 gallon water jacketed hopper with heating element to maintain temperature of product in process. The unit comes standard with rheostat and 3 way valve for convenient filling of jars and candy molds. This machine can be used for candy or cream. Power source required: 230 volt, Single Phase, 1½ HP motor.

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Cone Sifter

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