



# Hydrometer Usage

Whether making wine or beer, your hydrometer is your most important piece of equipment.

The hydrometer is glass and is designed to float and the reading you are looking for is the reading at the point where the surface of the liquid meets the hydrometer scale. Most hydrometers are what are called triple scale hydrometers but they measure only one thing: the sugar content present in the liquid as compared to water. If the hydrometer is placed in water it should break the surface of the water at 1.000 on the specific gravity scale, a 0% on the potential alcohol scale and at 0 on the Brix (or Balling) scale.

Using the hydrometer (usually using the Specific Gravity, or SG, scale) the winemaker or brewer can measure the progress of the fermentation by changes in the amount of sugar present as the sugars are converted to alcohol.

A winemaker or brewer can use the hydrometer for the following:

- To measure Specific Gravity (SG);
- To estimate the potential alcohol;
- To calculate alcohol production;
- To measure sugar present;
- To measure fermentation progress; and
- To determine if fermentation has stopped.

Most winemaking shops (including BlueStem) sell hydrometers which have three scales.

The most frequent scale used is the Specific Gravity (or SG) scale. SG is a measurement of the density of the solution as compared to water. That is why the hydrometer will float to the 1.000 mark when placed in water. If the hydrometer reading is higher than 1.000 sugar remains in the must or wort. If the reading is lower than 1.000 the sugars are nearing complete conversion (usually around .992 or .994) to alcohol. The reason that readings go below 1.000 is that alcohol is lighter than water. Hydrometers sold at BlueStem Winery read SG in a range from 0.982 to 1.160.

The potential alcohol scale provides the home winemaker or brewer (at the start of the fermentation process) with the maximum alcohol that the must or wort will produce. In the case of a wine must that starts with a SG reading of 1.090, the reading on the Potential Alcohol (PA) scale will be just slightly below the 12% mark. This means that if the wine is fermented to 1.000 on the SG scale (or 0% on the PA scale), the alcohol present will be approximately 12%. If fermentation stops (or is stopped) at an SG reading of 1.007 (or 1% on the PA scale), the estimated alcohol will be 11% (12% minus 1% equals 11%).

The third scale on the hydrometer is the Brix (or Balling) scale measures sugar content as a percentage and is typically used by winemakers to determine if grapes are ready for harvest.

Hydrometers sold at BlueStem Winery are calibrated to 60° F and minor adjustments to SG and PA readings are required if the ambient temperature is more or less than 60° F (see the instruction sheet provided with your hydrometer or go to the link to the hydrometer temperature adjustments page).

Most hydrometers will require the usage of a piece of equipment called a hydrometer jar. This is a slender plastic (or glass) tube with a base. This cylinder is filled to within a couple of inches of the top with your wine must or beer wort and the hydrometer is inserted into the jar.

Initial readings will find the hydrometer floating high in the jar because the must or wort is high in sugar content. As fermentation proceeds (the sugar is being converted into alcohol) additional readings should see the hydrometer drop lower and lower in the jar.

The correct reading is obtained by noting where the hydrometer breaks the surface of the liquid (this is called the *meniscus*). Please note that the liquid will cling to the side of the hydrometer jar and this point will actually be higher than the reading point. The correct reading will be where the hydrometer itself breaks the surface of the liquid.

## *Specific Gravity Testing with your Hydrometer*

Cleanse and sanitize your hydrometer and hydrometer jar (or wine thief).

Place hydrometer jar on a flat surface.

Draw a sample from your must or wort using either a poultry baster (if using a hydrometer jar) or a wine thief. If using a jar then squirt the sample into the jar until the must or wort is within a couple inches of the top. Note: The poultry baster needs to be cleansed and sanitized, too! Make sure the sample drawn is a *clean* sample without any solid matter present as this will affect your hydrometer reading.

Lower the hydrometer into either the test jar or the wine thief. As you place the hydrometer into the jar or thief, gently spin it to keep bubbles from attaching to the hydrometer (these, too, affect readings).

Make sure the hydrometer is floating freely (not touching the sides) and take your reading where the hydrometer breaks the surface of the liquid (the meniscus).

Enter your findings in your record log.