HYDROMETER BASICS

A practical beginner's guide to measuring sugar, following fermentation, and estimating alcohol in homemade wine.

Why use a hydrometer?

A hydrometer measures the density (specific gravity or SG) of wine compared with water. Sugar raises SG; as yeast ferments sugar into alcohol, SG generally falls. A hydrometer does not directly measure alcohol in finished wine.

What you need

Wine hydrometer • Tall test jar • Sanitizer • Wine thief or sanitized sampling tool • Thermometer • Log sheet

How to take an accurate reading

1. **Sanitize:** Clean and sanitize the test jar, sampling tool, and anything that will contact the wine.
2. **Take a sample:** Draw enough must or wine to float the hydrometer freely. Use a separate sample; do not place an unsanitized hydrometer directly in the fermenter.
3. **Remove bubbles:** For fermenting wine, gently stir or swirl the sample to release carbon dioxide. Foam and bubbles can make the hydrometer read too high.
4. **Float and spin:** Lower the hydrometer into the jar, give it a gentle spin, and make sure it does not touch the sides or bottom.
5. **Read at eye level:** With most clear wine samples, read the SG scale at the bottom of the curved liquid surface (meniscus). Follow your hydrometer's instructions if different.
6. **Check temperature:** Note the sample temperature. Apply the manufacturer's correction if it differs significantly from the hydrometer's calibration temperature (often 60°F or 68°F).
7. **Record and discard:** Record date, SG, temperature, and observations. Do not pour the tested sample back into your batch.

How to read the scale — why the numbers seem backward

Look at the numbers printed on the narrow stem: HIGH sugar / HIGH specific gravity numbers (such as 1.100) are LOWER on the stem, closer to the weighted bulb. LOW sugar / LOW specific gravity numbers (such as 0.995) are HIGHER on the stem, toward the tip.

Why? In sugary must, the liquid is denser, so the hydrometer floats HIGHER out of the liquid. The liquid surface intersects a LOWER mark on its stem (a HIGH SG number). As yeast consumes sugar and produces alcohol, the liquid becomes less dense: the hydrometer sinks DEEPER and the surface intersects a HIGHER mark (a LOW SG number).

Remember: MORE sugar → hydrometer floats UP → read LOWER on stem → HIGH SG. LESS sugar / more fermentation → hydrometer sinks DOWN → read HIGHER on stem → LOW SG. Read the number where the liquid surface crosses the stem, at eye level, normally at the bottom of the meniscus—not at the top of the floating instrument.

Important: A low SG can indicate fermentation progress but does not directly measure alcohol percentage. For an alcohol estimate, compare the original and final SG readings using the ABV formula below.

Reading chart: what the numbers mean

SG reading	Typical interpretation
1.100	High starting sugar; higher potential alcohol
1.090	Common starting SG for many table wines
1.050	Fermentation in progress
1.020	Sugar remains; fermentation may continue

1.000	Near water density; not proof of completion
0.990–0.998	Typical final range for many dry wines

These values are reference points, not required targets. Wine style, kit instructions, temperature, and ingredients matter.

WHEN TO MEASURE

Before pitching yeast (original gravity, OG)

Measure after the must is thoroughly mixed and at a suitable temperature. This baseline is essential for estimating final alcohol.

During active fermentation

Take readings as directed by your kit, especially when deciding whether to rack or transfer. Use the SG trend, not just the number of days.

Toward the end (final gravity, FG)

Record readings at least 48–72 hours apart. Fermentation is likely finished when readings are stable near the expected final SG, consistent with the kit instructions.

Estimate alcohol by volume (ABV)

Approximate ABV (%) = (Original SG − Final SG) × 131.25

Example: OG 1.090 and FG 0.995 → (1.090 − 0.995) × 131.25 ≈ 12.5% ABV. This is an estimate; hydrometer-based calculations are less precise for unusually high-alcohol or high-extract wines.

Five common mistakes to avoid

- Reading the top of the meniscus instead of the bottom
- Reading a hydrometer while bubbles cling to its stem
- Taking a reading while the hydrometer touches the jar
- Ignoring sample temperature or the hydrometer's calibration
- Assuming an SG of 1.000 proves fermentation is complete

Quick-reference reminders

• 1.000 is the approximate SG of water at the instrument's calibration temperature.
• Dry finished wines can read below 1.000 because alcohol is less dense than water.
• A single reading cannot establish that fermentation has stopped.
• Wine with residual sugar can finish above 1.000.
• Never bottle potentially fermenting wine unless the recipe specifically calls for and safely manages that process.

Simple fermentation log

Date	SG	Temp (°F)	Notes / stage

ATC tip: Follow the specific directions for your wine kit. Different wine styles and yeast strains may reach different final gravities.