



## Parameter and Sample Type

Turbidity in Wine AQ3010

## Introduction

The Orion AQ3010 Turbidity Meter allows quick and simple determinations of the clarity of white, rose, and red wine samples. Because the light source is infrared, the turbidity measurement is independent of color.

## Recommended Equipment

Orion AQ3010 Turbidity Meter; Orion AC3V25 Turbidity Vials.

## Required Solutions

Orion AC301S Turbidity Standards; turbidity-free water (TFW), e.g., by filtration through 0.1 um filter or equivalent water.

## Solutions Preparation

None

## Meter Setup

None

## Meter Performance Check/Calibration Verification

Note: the Orion AC301S Orion Turbidity styrene divinylbenzene (SDVB) polymer standards never need mixing. Do not shake the standards as this will introduce bubbles and cause them to read inaccurately until the bubbles dissipate. Check meter accuracy by reading one or more turbidity standards (included with the meter) at the level of interest. For example, read the zero (0.02) and the 1 NTU standard. The zero should read <0.1 NTU and the 1 NTU standard should read within +/- 10%, e.g., 0.9 – 1.1 NTU.

If the meter performance check fails, take corrective actions as follows: 1) wipe the vial carefully with a lint-free wipe to remove all fingerprints and liquid drips from the exterior, handle the vial by the cap only, and remeasure; 2) tap the vial gently three times and let the vial sit for 60 seconds to allow for bubbles to release, then remeasure; 3) using a clean vial (which reads <0.1 NTU when filled with TFW), pour a fresh portion of turbidity standard into the clean vial, wipe carefully, and measure.

## Sample Vial (cuvette) Storage, Soaking, and Rinsing

Store vials filled with TFW. Immediately after use, clean sample vials with laboratory detergent and rinse multiple times with TFW. Note: standards may be stored in supplied glass sample vials until the standard reading is no longer in specification. See Meter Performance Check section for corrective actions when a standard reads out of specification.

## Sample Storage and Preparation

Allow the samples to warm to room temperature before measurement. Mix the sample well, but do not introduce bubbles by shaking the sample. Use a little of the sample to rinse a clean sample vial twice. Mix the sample again and fill the rinsed vial.

## Calibration

The meter is shipped precalibrated. The meter performance is very stable and does not require frequent calibration. If a standard reading is not within criteria, take all necessary corrective actions (as described in the Meter Performance Check section) to improve meter readings. If corrective actions fail and recalibration is necessary, perform the recalibration only on the points that failed and do so with fresh portions of standard poured into clean vials. Ensure that all fingerprints and liquid drips have been removed from the exterior of the vial with a lint-free wipe before using. Handle vials by the cap only.

## Analysis

Gently invert the filled sample vial a few times to mix the sample well without introducing bubbles. Wipe the sample vial to remove all traces of liquids and fingerprints, place into meter, and press the measure key. Record the reading. Press the measure key to take duplicate measurement(s). Continue until readings stabilize and results agree, for example, within 5% or +/- 0.02 NTU, whichever is higher.

## Quality Control (QC)

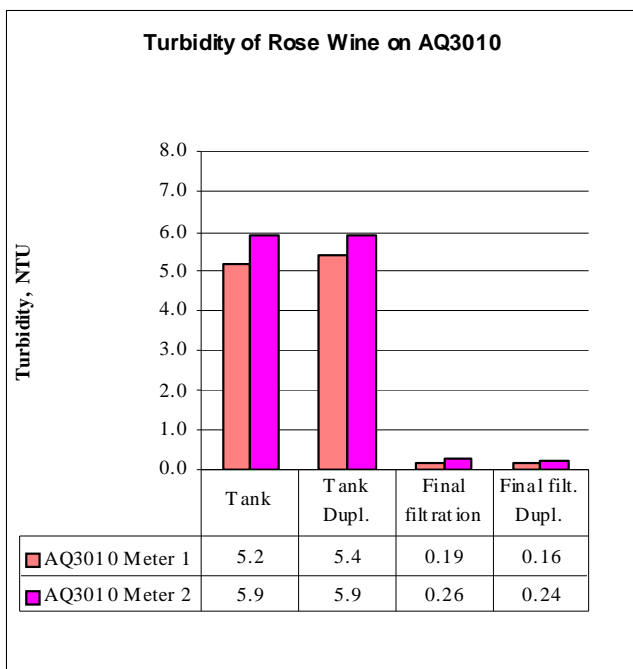
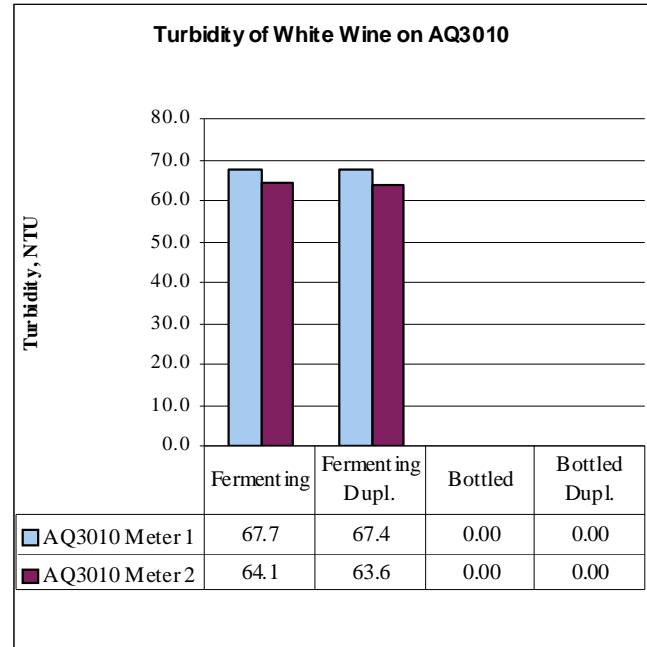
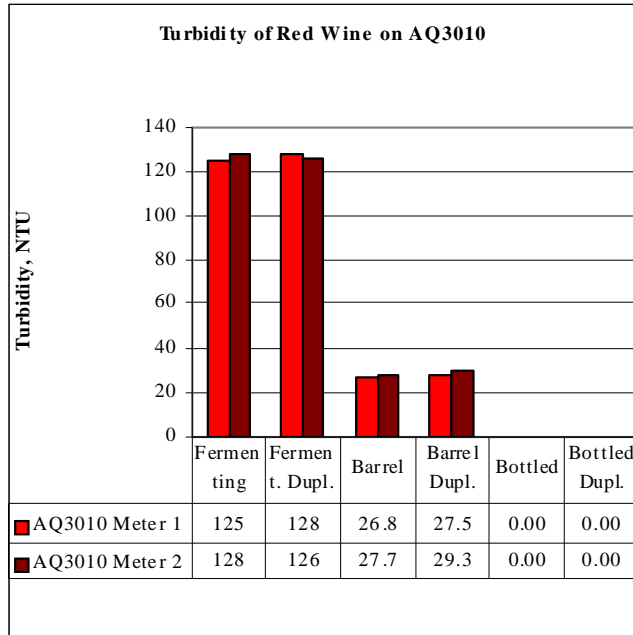
Recommended QC procedures include: calibration verification, turbidity-free water analysis (optional), and sample duplicates.

## Notes for Improved Accuracy of Low-Level Samples

If improved accuracy is desired, pay close attention to 1) the cleanliness of the sample vials; 2) the quality of the TFW; 3) the handling of the standards and samples; 4) use of matching vials; 5) storing clean vials filled with TFW; 6) use vials free of scratches or other imperfections. For improved low-level accuracy, ensure that a clean vial filled with TFW reads < 0.1 NTU before using that vial to test highly filtered wine. If a clean vial does not read <0.1 NTU, discard it or set it aside for further cleaning. If no clean vials read <0.1 NTU, the TFW may need degassing or a cleaner source of TFW may be required. See ASTM D6855 Test Method for Test Method for Determination of Turbidity Below 5 NTU in Static Mode for more information about low level turbidity readings.



Various wine samples, taken at different stages of the wine-making process, were tested for turbidity on the AQ3010. Results are listed in the charts below.



- The Orion AQ3010 turbidimeter allows accurate measurement of red, white, and rose wines at various stages of the wine-making process.
- The infrared light source allows readings which are not affected by the deep color of red wines or the blush color of rose wines.

### Results of testing turbidity standards

Expected Value	AQ3010 Meter 1	% Recovery	AQ3010 Meter 2	% Recovery
0.02NTU (<0.1)	0.00	NA	0.00	NA
20NTU	18.9	94.4%	20.1	100.5%
100NTU	96.3	96.3%	101	101.0%
800NTU	772	96.5%	798	99.8%