



Parameter and Sample Type

Turbidity in Wine on AQ4500

Introduction

The Orion AQ4500 Turbidity meter allows quick and simple determinations of the clarity of white, rose, and red wine samples. In the infrared ratio mode, the measurement is independent of color.

Result

See page 2.

Recommended Equipment

Orion AQ4500 Turbidity Meter; Orion AC2T24 Turbidity Vials.

Required Solutions

Orion AC45ST Turbidity Standards (0, 1, 10, 100, 1000 NTU, included with the meter) and AC45FZ Formazin Turbidity Standard, 4000 NTU; turbidity-free water (TFW), e.g., by filtration through 0.1 um filter or equivalent water.

Solutions Preparation

None

Meter Setup

Turn on the meter. Select the IR Ratio measurement mode by scrolling up or down until the desired mode is displayed.

Meter Performance Check/Calibration Verification

Notes: 1. The Orion AC45ST 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. 2. Review certificate of analysis of the turbidity standards and record the expected turbidity values for the IR Ratio mode. Check meter accuracy by reading one or more turbidity standards 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% from the expected value according to the C of A.

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 in IR Ratio mode (see the Initial Calibration section of the Meter User Guide and an example on page 3).

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.

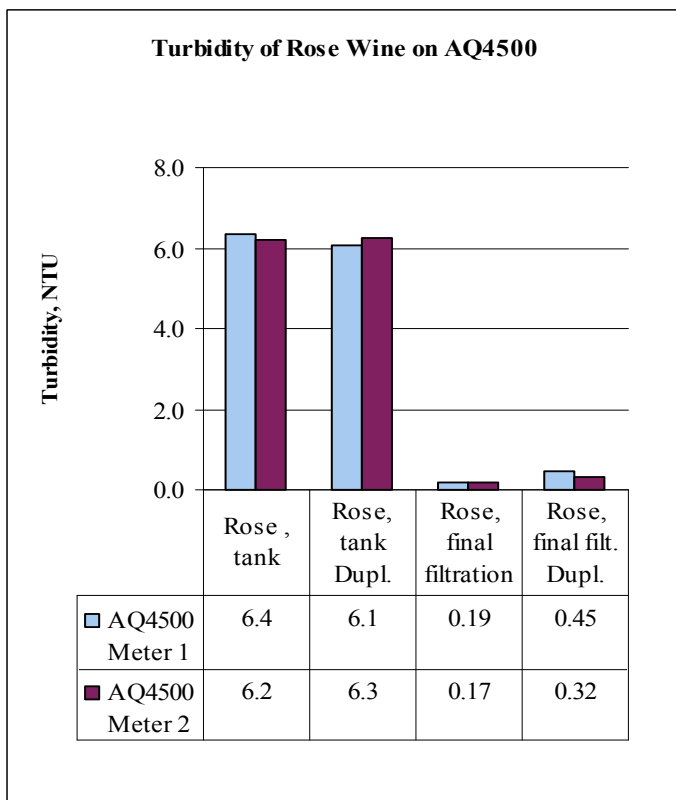
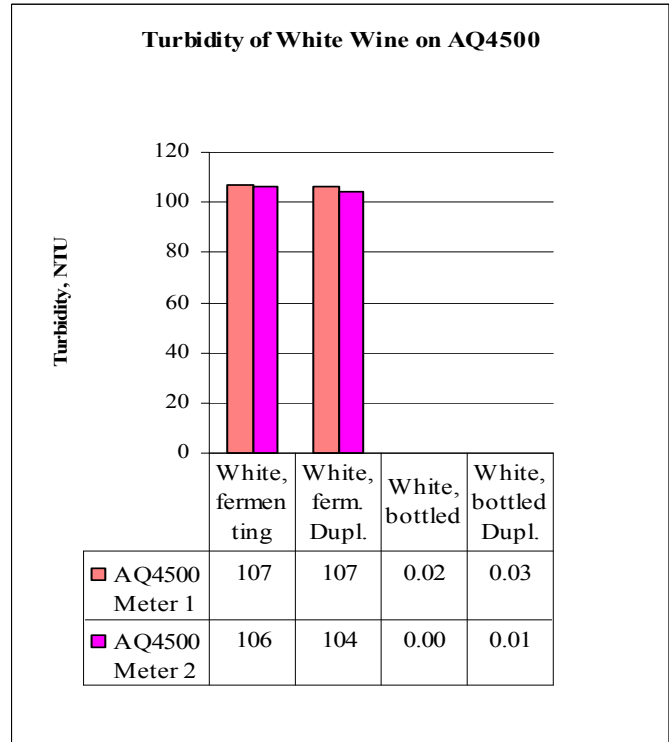
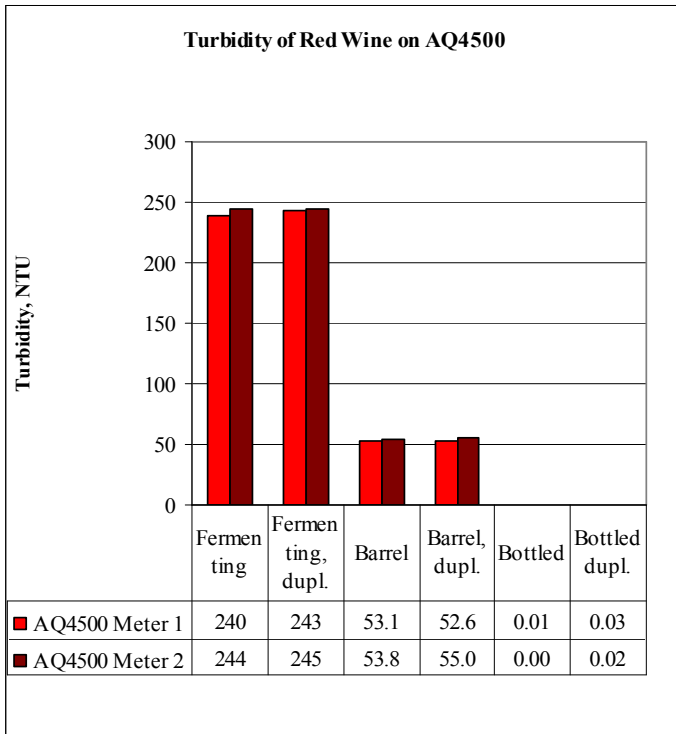
Quality Control (QC)

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 AQ4500. Results are listed in the charts below.



- The Orion AQ4500 turbidimeter allows accurate measurement of red, white, and rose wines at various stages of the wine-making process.
- When measurements are performed in the infrared ratio mode, readings are not affected by the deep color of red wines or the blush color of rose wines.

Expected Value	AQ4500 Meter 1	% Recovery	AQ4500 Meter 2	% Recovery
<0.1	0.00	NA	0.03	NA
0.93	0.95	102.2%	0.93	100.0%
9.54	9.30	97.5%	9.65	101.2%
99.4	99.6	100.2%	99.8	100.4%
708	742	104.8%	722	102.0%