

# LABORATORY SERVICES

This document outlines the analytical capabilities of the Enartis Laboratory, a support resource for our products and clients, providing reliable, data-driven insights to guide winemaking decisions.

## Core Chemistry

### pH

Measures pH by potentiometry (pH meter).

### Titratable Acidity

Measures titratable acidity (g/L) by acid-base titration with sodium hydroxide (Autotitrator).

### Tartaric Acid

Enzymatic determination of tartaric acid (g/L) (SinaTech Dionysos).

### Malic Acid

Enzymatic determination of L-malic acid (g/L) (SinaTech Dionysos).

### Lactic Acid

Enzymatic determination of L-lactic acid (g/L) (SinaTech Dionysos).

### Primary Amino Nitrogen

Colorimetric determination (OPA/NAC) of primary amino nitrogen (mg/L), combined with **Ammonia** to calculate total yeast assimilable nitrogen (SinaTech Dionysos).

### Ammonia

Enzymatic determination of ammonia (mg/L), combined with **Primary Amino Nitrogen** to calculate total yeast assimilable nitrogen (SinaTech Dionysos).

### Free Sulfur Dioxide

Measures free SO<sub>2</sub> (mg/L) by iodometric titration based on the Ripper method (Autotitrator or SinaTech Dionysos).

### Total Sulfur Dioxide

Measures total SO<sub>2</sub> (mg/L) by iodometric titration following the hydrolysis of bound SO<sub>2</sub>, based on the Ripper method (Autotitrator or SinaTech Dionysos).

### Alcohol

Measures alcohol (% by volume) by near-infrared (NIR) spectroscopy (Alcolyzer).

### Residual Sugar

Enzymatic determination of glucose and fructose (g/L) (SinaTech Dionysos).

## Filtration

### Filterability

Calculates a “filterability index” indicating the ease of filtration or potential for fouling, based on the change in flow rate measured during a simulated sterile (0.45 µm pore size) membrane filtration (Filtracheck).

### Turbidity

Measures turbidity (NTU), the ability to scatter light, monitored to assess the effectiveness of filtration and other clarification and stabilization processes (Turbidimeter).

### Pectin

Checks for the presence of pectin, grape-derived polysaccharides that can cause haze and filtration issues, based on visual inspection after destabilization with acidified ethanol.

### Glucans

Checks for the presence of glucans, microbially-derived polysaccharides (particularly from *Botrytis*) that can cause haze and filterability issues, based on visual inspection after destabilization with acidified ethanol.

## Protein Stability

### Heat Stability

Determines the potential for haze caused by heat-induced protein denaturation, via heat treatment (2 hours at 80°C) followed by **Turbidity** analysis.

### Colloid Stability

Same as Heat Stability analysis, but with a stabilizing agent added. Conducted as part of our **ZENITH UNO Panel** for white and rosé wines, to ensure no undesired interactions with wine proteins during treatment.

### Bentonite Fining Trial

Evaluation of a series of bentonite additions to determine the lowest level needed to achieve protein stability, based on **Turbidity** and **Heat Stability** analyses.

## Tartrate Stability

### Conductivity

Determines tartrate stability by measuring sample conductivity ( $\mu\text{S}/\text{cm}$ ), before and after refrigeration for 30 minutes with potassium bitartrate "seed" crystals (CheckStab or TartarCheck Plus).

### Cold Hold

Determines tartrate stability by observing crystal precipitation (% "fallout") after 6 days at  $-4^{\circ}\text{C}$ . Can be combined with spectrophotometric measurements of color to assess red wine color stability.

### Potassium

Turbidimetric determination of potassium (mg/L), the most abundant mineral element in wine, influencing juice and wine pH, acidity, and tartrate stability (Sinattech Dionysos).

### Calcium

Colorimetric determination of calcium (mg/L), another mineral element associated with tartrate instability (Sinattech Dionysos).

### Calcium Tartrate Risk Assessment

Estimates the risk of calcium tartrate precipitation based on measurements of pH, tartaric acid, and calcium.

### Crystalline Precipitate Identification

Distinguishes among crystalline precipitates (e.g. potassium bitartrate, calcium tartrate) via microscopic inspection and their solubility in water.

## ZENITH UNO Panel for White and Rosé Wines

Suite of analyses focusing on protein and tartrate stability to determine the suitability of white and rosé wines for stabilization with ZENITH UNO, our completely filterable solution of potassium polyaspartate (KPA) developed as an effective, sustainable alternative to traditional cold stabilization. Panel includes **Turbidity**, **Heat Stability**, **Colloid Stability**, **Conductivity**, and **Cold Hold** analyses.

## ZENITH COLOR Panel for Red Wine

Suite of analyses focusing on color and tartrate stability to determine the suitability of red wines for stabilization with ZENITH COLOR, our filterable and environmentally conscious blend of potassium polyaspartate (KPA) and Arabic gum, ideal for the stabilization of colored wines. Panel includes **Turbidity**, **Conductivity**, and **Cold Hold** analyses.

## Phenolics

### Anthocyanins

Colorimetric determination of anthocyanins (mg/L), skin-derived phenolics conferring color to young red wines (SinaTech Dionysos).

### Catechins

Colorimetric determination of catechins (mg/L), primarily seed-derived building blocks of tannin, responsible for bitterness and astringency (SinaTech Dionysos).

### Total Polyphenols

Colorimetric determination (Folin-Ciocalteu) of total polyphenols (mg/L), responsible for a wide range of organoleptic properties, including color, taste, and mouthfeel (SinaTech Dionysos).

## Oxidation

### Acetaldehyde

Enzymatic determination of acetaldehyde (mg/L), a byproduct of fermentation and marker for oxidation (SinaTech Dionysos).

### Iron

Colorimetric determination of iron (mg/L), a primary catalyst for oxidation (SinaTech Dionysos).

### Copper

Colorimetric determination of copper (mg/L), high residual concentrations of which can induce toxicity and accelerate oxidation (SinaTech Dionysos).

### Browning Potential

Estimates browning potential via hyperoxidation with hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) and heat (24 hr at 40°C), followed by visual and spectrophotometric inspection.

### Pinking Potential

Estimates pinking potential via hyperoxidation with hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) and low heat (24 hr at 25°C), followed by visual and spectrophotometric inspection.

## Microbiology

### Yeast Count and Viability

Determines yeast population density and viability via methylene violet staining and microscopy (Oculyze).

### Acetic Acid

Enzymatic determination of acetic acid (g/L), a marker for wine deterioration and bacterial spoilage, particularly *Acetobacter* (SinaTech Dionysos).

### Gluconic Acid

Enzymatic determination of D-gluconic acid (g/L), a marker for grape over-ripening and mold growth, particularly *Botrytis* (Sinatech Dionysos).

## Color

### Color Index

Determines basic color parameters (hue and intensity) via spectrophotometric analysis at key wavelengths.

### Tristimulus Color Profile

Quantifies color by converting spectrophotometric transmission spectra into coordinates in the three-dimensional CIELAB color space:  $L^*$  (lightness),  $a^*$  (green-red), and  $b^*$  (blue-yellow), closely emulating how the human eye perceives color.

## Sensory

### Descriptive Analysis

Employs a panel of 8-12 trained judges to generate a complete sensory profile comprising appearance, aroma, taste, and mouthfeel, as well as any specific organoleptic properties of particular interest. Generally yields the most useful information when 3+ samples are compared.

## Miscellaneous

### Foaming Capacity

Determines foamability via injection of CO<sub>2</sub> gas and measurement of the foam height and retention time (Mosalux).

### Enotimatic

Simulates accelerated ageing with oak chips (or other woods) using a cyclical, high-pressure extraction process performed under inert atmospheric conditions, allowing for the rapid comparison of different oak products and the prediction of ageing outcomes.

If you have any further questions, please contact Technical Support at (707) 838-6312, or email [support@enartis.com](mailto:support@enartis.com)