

for the Determination of Color and Total Phenols in Wine

## Color determination of wine

Analytical techniques have become a valuable tool of modern wine makers. The definition and the processing techniques to obtain the desired wine color are of key importance. The right decisions taken during maturation of the grapes, processing, aging and blending, all strongly influence the final resulting wine color.

The color of wine is always read after removal of suspended matter. There are mainly two color components present, yellow and red but also a blue or green hue may appear. The color hue is the ratio between the yellow color concentrations over the red one, and is an indication about the degree of evolution.

	Color Density (I.C.)	Total Phenols (g/L)
White Wines	0.05 to 0.15	0.4 to 1.2
Red Wines	4 to 6	2 to 5

TINT	STATE	VALUE (O.D.420./O.D.525)
Purple-Red	Young wine	less than 0.44
Red	Mature wine	0.44 to 1
Red-Yellow	Very mature wine	greater than 1

The yellow color in wine comes from the presence of tannins (polymers of flavonoid-procyanidins type, and non-flavonoid phenols) and can be read without dilution. The increase of the yellow-brown color in older wines is due to aging or oxidation.

The red colors of wines are caused by free anthocyanins, copigments of anthocyanins, and polymerized phenolic compounds. The color of these pigments is pH dependent and can be intensely dark. It is therefore necessary to dilute the wine sample taking care not to change the original wine pH. HANNA recommends using its special wine solvent to minimize possible errors due to dilution.

## Phenol determination of wine

Phenolic compounds are important for several reasons since they (i) affect the color of the wine, (ii) have an astringent taste, (iii) may cause pungent odor, (iv) are a source of oxygen reduction, and (v) are sources of browning substances.

Wine can contain a large variety of phenolic compounds and with traditional analytical techniques it is difficult to distinguish between total phenols and specific phenols. Although some progress has been made with HPLC, the most common analyses for total phenols remain the reaction of phenolic substances with the Folin-Ciocalteu reagent. Other methods like the direct spectrophotometric determinations are less accurate, because of difference in specific molar absorptivity, and color present of non phenolic substances.

### ORDERING INFORMATION

**HI 83742-01** (115V) and **HI 83742-02** (230V) is supplied with sample cuvettes (2) and caps, reagents for 5 tests (HI 83742-O, HI 83742A-O, HI 83742B-O, HI 83742C-O), 200 µL automatic pipette with (2) tips and instruction sheet, 2000 µL automatic pipette with tips (2), 5 mL syringe with tip, 1 mL plastic pipette, 3 mL plastic pipette, 12 VDC adapter, 1.5V AA batteries (4), tissue for wiping cuvettes and instructions in a rigid carrying case.

### REAGENT SETS

- HI 83742-20** Phenols reagent set (20 tests)  
**HI 83742-25** Color reagent set for wine (20 tests) containing HI 83742-0 Wine Solvent 1  
**HI 83742-27** Color reagent set for wine (20 tests) containing HI 83742-3 Wine Solvent 3

### ACCESSORIES

- DEMI-10** Bottle to prepare 10 liters of demineralized water  
**HI 731318** Tissue for wiping cuvettes (4)

- HI 731321** Glass cuvettes (4)  
**HI 731325W** Caps for cuvettes (4)  
**HI 93703-50** Cuvet cleaning solution (250 mL)  
**HI 740226** 5 mL graduated syringe  
**HI 731340** 200 µL automatic pipette  
**HI 731350** Plastic tips for 200 µL automatic pipette (25)  
**HI 731342** 2000 µL automatic pipette  
**HI 731352** Plastic tips for 2000 µL automatic pipette (25)  
**HI 740157** Plastic refilling pipette (20)



SPECIFICATIONS	HI 83742 Phenol and Color Photometer		
		WHITE WINE	RED WINE
Range	Color Density (I.C.)	0.000 to 1.000	0.00 to 15.00
	Tint (O.D.420/O.D.525)	0.00 to 9.99	0.00 to 9.99
	Total Phenols (g/L)	0.000 to 0.750	0.00 to 5.00
Resolution	Color Density (I.C.)	0.001	0.01
	Tint (O.D.420/O.D.525)	0.01	0.01
	Total Phenols (g/L)	0.001	0.01
Precision	Color Density (I.C.)	±0.010 @ 0.200	±0.20 @ 5.00
	Tint (O.D.420/O.D.525)	±0.03 @ 0.75	±0.03 @ 0.75
	Total Phenols (g/L)	±0.015 @ 0.350	±0.10 @ 2.00
Light Source	Tungsten lamp with narrow band interference filter @ 420 nm, 520 nm and 610 nm		
Sensor	Silicon photocell		
Method	Colorimetric		
Environment	0 to 50°C (32 to 122°F); max 95% RH non-condensing		
Battery Type	(4) 1.5V AA batteries/12 VDC adapter		
Auto Shut-off	After 15 minutes of non-use		
Dimensions	225 x 85 x 80 mm (8.7 x 3.3 x 3.1")		
Weight	500 g (17.6 oz.)		