



Sentia free SO₂ test:

Comparison to the FOSS WineScan™ SO₂ method

The FOSS WineScan SO₂ unit is an automated analyzer which utilises Fourier Transform Infrared (FTIR) technology. Samples analyzed for free SO₂ are acidified, before a micro-distillation is performed. The free SO₂ is subsequently converted to a gas phase and measured via a detector.

The Sentia free SO₂ wine analyzer is a hand-held device which utilises square wave technology to give rapid results for free SO₂ from a single drop of wine. When wine is added to the test strip, it dissolves dried down reagents and hydrogen sulphite converts to sulphur dioxide. This becomes directly reduced at the electrode when the square wave waveform is applied. The subsequent data obtained contains a peak, with the height of this peak directly correlating to the free SO₂ concentration in the wine sample.



A technical and cost comparison

	Sentia free SO ₂	FOSS WineScan free SO ₂
Time to test one sample	<1 minute	1 minute
Sample size	≥8 µL	>4 mL
Calibration required	no	yes
Equipment required	Sentia device	FOSS WineScan
Typical cost of equipment	\$1,950 AUD	\$180,000 AUD
Annual maintenance required	no	yes
Cost of annual maintenance	none	>\$2,000 AUD
Spare parts required	no	yes
Consumables & reagents required	free SO ₂ test strip	sample cups, phosphoric acid, cleaning solution
Cost of consumables	\$3.50 AUD	\$0.32 AUD
Dangerous & hazardous chemicals	none	phosphoric acid
Equipment & reagent checks required	none	daily (standard check, start up and shut down procedures)

Correlation between Sentia and FOSS WineScan methods

Figure 1 shows the correlation between Sentia and the FOSS WineScan in a study of 203 red and white wines. Wines which were low in free SO₂ concentration were similar in results when compared between the two methods. With increasing SO₂ levels however, the line of best fit become much steeper than the ideal fit, indicating that the FOSS WineScan is farther off at these higher SO₂ levels.

Therefore, it is expected that Sentia will give higher results than the FOSS WineScan. This is thought to be as a result of SO₂ loss during the micro-distillation process in the FOSS WineScan method.

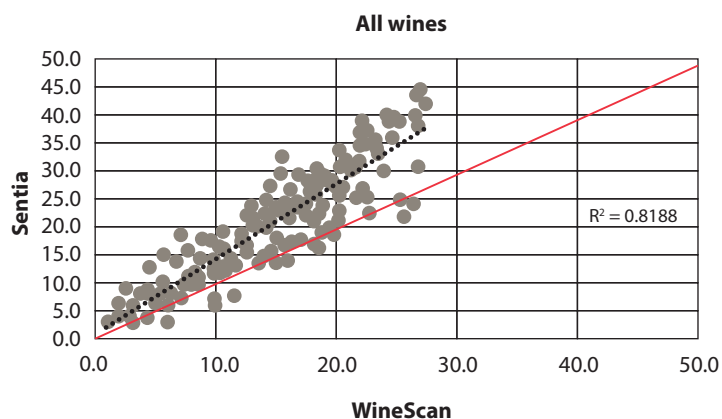


Figure 1: Sentia and FOSS WineScan™ SO₂ comparison for free SO₂ in red and white wines (n=203). (Source: Sommer, S. Sotto Method Comparison Validation Study. Fresno State Viticulture and Enology Research Center. 2020 p. 8)

Troubleshooting extreme Sentia and FOSS WineScan method result discrepancies

Low Sentia results and high FOSS WineScan results?

Conduct testing on the Sentia device first and then on the WineScan analyzer immediately after. Minimize exposure of the sample to air between analyses.

When comparing methods, ensure that the sample for each analysis is taken from the same area of the sample holding vessel.

Confirm the WineScan unit is measuring accurately by analysing a known free SO₂ standard. Checking a sample on an alternative reference method at the same time (such as the aspiration oxidation method) is also a good option.

Ensure sample taken for analysis on the Sentia device has minimal exposure to air during the pipetting process. If unsure, compare results when a 20 µL micropipette (with full amount drawn) is used.

High Sentia results and low FOSS WineScan results?

Do not delay testing on the WineScan unit after testing is conducted on the Sentia device.

When comparing methods, ensure that the sample for each analysis is taken from the same area of the sample holding vessel.

Confirm the WineScan unit is measuring accurately by analyzing a known free SO₂ standard. Checking a sample on an alternative reference method at the same time (such as aspiration oxidation method) is also a good option.
