

An update on the Vinmetrica SC-50 MLF kit

We recently made an update to the SC-50 MLF Analyzer Kit methods. In this newsletter we want to briefly explain this update and its advantages. Refer to the latest manual on line at www.vinmetrica.com/support. There is also a new video showing this system: [New SC-50/55 video](#)

The 0.00 g/L Malic Acid Standard

The major update is the inclusion of a bottle of 0.00 g/L malic acid, i.e., a “blank” solution, in addition to the 0.10 and 0.40 g/L standards that are already part of the kit. This serves two roles: as a diluent for samples and as a 0.00 standard when performing a quantitative mode procedure.

1. Diluent for samples: new sample preparation step.

Proceed as usual with heating a 10.0 mL wine sample in a microwave, then reconstituting the wine sample back to 10.0 mL with water. Now dilute the reconstituted sample with an equal volume of the 0.0 standard (e.g., add 5.0 mL of 0.00 malic acid standard to 5.0 mL reconstituted wine sample). By the way, this obviates the need to add “Boost Juice” as in the former method. Note that this requires a factor of 2 to be added to the calculation in Quantitative mode, because the wine is now 2-fold diluted (See Table 1 below).

2. Using a 0.00 standard.

If you are using your SC-50 system in Quantitative mode (see below), you’ll need to run a 0.00 standard, essentially in place of the “check vial” that used to serve as a baseline value, or “blank”.

The 0.00 standard is now included in the complete kit as well as refill kits. In addition, we’ve added more Biopressure agent at no extra charge to account for the need to use it in the 0.00 standard.

Longer incubation time (45 minutes).

For best precision we now recommend a 45 minute incubation time, rather than the 30 minutes previously used. This is based on data as shown in Figure 1. You can see that the response of a high level of malic acid plateaus at about the 45 minute mark.

Syringe for cleaning

The new kits now provide a 5 mL syringe with a dual female Luer connector. This makes it easy to clear the tubing and needle of the vial insertion assembly if it becomes plugged, as occasionally happens in normal use. If you already have the SC-50 system, you can order one of these separately, PN SC-50-18 (includes 5mL luer lock syringe and dual female luer connector).

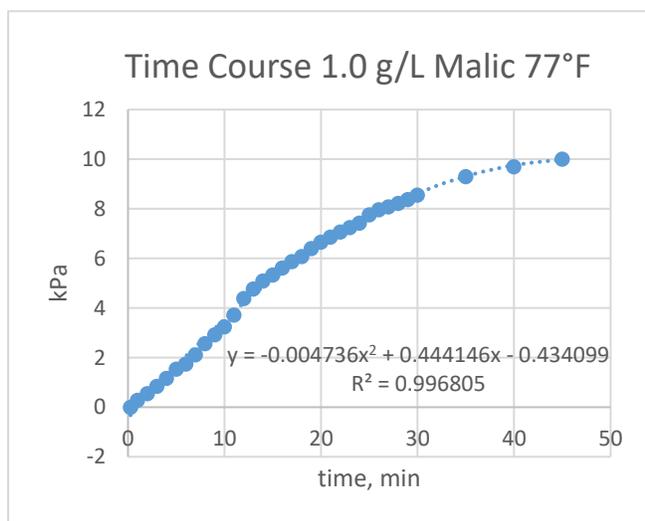


Figure 1. Time course of the MLF assay out to 45 minutes

What the 0.00 standard does

The first benefit of the 0.00 standard is its use in performing a dilution of the wine sample after heating and reconstitution. This dilution adds the needed components formerly provided by adding 5 drops of the “Boost juice”. More importantly, it improves the accuracy of the system to wines that have low levels of malic acid, in the range of 0.04 to 0.10 g/L.

The second benefit is the accuracy of the Quantitative mode. As you probably are aware, the SC-50 Analyzer can be used in a “Quick check” mode or a “Quantitative” mode. In the Quick check mode you are reading the pressure change and using its magnitude to decide whether MLF is going or nearly done. This mode is largely unchanged in the update, although you are now diluting the wine sample two-fold with this 0.00 standard, and letting the reaction go 45 minutes, rather than 30 as before. It is the Quantitative mode that benefits most from the 0.00 Malic Acid Standard.

In Quantitative mode, you run your wine sample alongside one or more malic acid standards, the goal being to determine the malic acid levels explicitly. We provide a 0.1 g/L and a 0.4 g/L standard for this mode. In the old procedure, we had you also run a “check vial”, essentially a water blank with no Biopressure agent, to use as a blank or background value in the final calculation. Now, you will run a 0.00 Malic acid standard, *with* Biopressure agent, to get this value.

In Table 1 you can see the effect of using the 0.00 g/L standard in place of the check vial. The calculations are being done as in the new manual. Note that the Pinot Noir sample calculates out to about 0.29 g/L in the new method. If we use the check vial for this calculation, the result is 0.40, over 33% higher.

Table 1. Compare calculations with 0.00 standard vs check vial

g/L malic acid	kPa	Wine	kPa	Calculation	Result, g/L Malic Acid
0.00	1.00	Pinot Noir	1.95	$2 * 0.40 * (1.95-1.00)/(3.64-1.00)$	0.29
0.40	3.64	Cabernet-1	5.38	$2 * 0.40 * (5.38-1.00)/(3.64-1.00)$	1.33
		Cabernet-2	5.68	$2 * 0.40 * (5.68-1.00)/(3.64-1.00)$	1.42
"Check Vial"	0.27	Pinot Noir	1.95	$2 * 0.40 * (1.95-0.27)/(3.64-0.27)$	0.40

The use of a 0.00 standard that mimics all conditions of the rest of the assay is consistent with good analytical lab practice. But since it requires the consumption of additional reagents, it would be OK to substitute a water blank if it gave the same response. This is what we validated when we first developed the SC-50 system. In the last year we’ve made some changes in the manufacturing of the Biopressure agent that led to better shelf life and precision of the assay. It’s likely that these changes have now revealed a discrepancy between a check vial and the 0.00 standard, as well as producing the need for slightly longer incubation times as discussed above.