

CALIBRATION AND CONTROL

Calibration is the process by which we determine the intensity of the signal we measure when we analyze a sample of known concentration. The problem samples will be compared against that result by means of a calculation of proportions that will return the concentration of the sample in the same units in which we have expressed the calibrator.

The control (or internal control) is a procedure by which we verify that the calibration is valid. To do this, we use a sample of known and stable concentration over time (which can be a proprietary sample conserved especially to serve as a control, or a commercial control for which, under the calibration conditions we want to use, we verify that the result obtained is within the range of expected values.

It is important not to control with the same sample with which it is calibrated, since we will always obtain a «correct» result regardless of its functional status. Controls and calibrators must necessarily be independent and different samples.



WHEN TO CALIBRATE?

Calibration should be carried out when there is a possibility that the reagents' behaviour has changed and the results are not comparable to those that were available so far. A calibration should be performed if:

- *Reagent kit change:* The new kit may have a different state of preservation, or be from a different batch.
- *Change of working reagent:* Although the reagent comes from the same kit, the new working reagent is different from the previous one and could have some different characteristic (for example, the reaction blank value in the case of R1 or the amount of enzyme of R2).
- *When recommended after opening:* Open reagents are degrading due to exposure to air, or due to the effect of ambient temperature. Manufacturers can define periods for which calibration is maintained within reasonable values; beyond that time, the risk of the reagent being different in its characteristics increases and a new calibration that «zeroes» the system is recommended.
- *When there is evidence that the controls do not give the expected value:* Using controls within all the work series allows us to detect any alteration of the reagent if the control deviates from the expected value (for example, beyond 15% per above or below the central value). There are rules to follow the evolution of control values that indicate the need or not to recalibrate the system.
- *When the values of target and/or of increments of absorbance are significantly different from the previous results:* A signal of deterioration of the reagent is obtained when the value of target is very different, or the variation of absorbance in the reaction is clearly less than expected.

If none of these circumstances occur, it is very possible that calibration is unnecessary.

WHICH FACTORS AFFECT CALIBRATION?

As a general rule, the more the test sample resembles the calibrator, the more reliability we will have in the result. However, there are factors specific to the sample that are impossible to replicate in a calibrator, mainly because the composition of the sample is more complex than that of a calibrator.

One of the most common is the colour of the sample, for example due to a high concentration of polyphenols. The usual calibrators do not have a high colour intensity and are therefore free from interference that does exist in the sample. Using bleaching procedures can partially solve this problem only if we are sure that it does not affect the parameter to be measured.

Another element of frequent interference in the samples is the presence of particles (turbidity), which introduces unwanted light scattering phenomena. Its presence can be reduced by filtration and / or centrifugation.

Finally, one of the most difficult external factors to detect, but which can be critical in many parameters, is the water used in the system (such as water to wash, to dilute, etc.). Water is a theoretically neutral component but it can actually contain concentrations of ions (calcium, magnesium, phosphorus, nitrates, chlorides...) that are relevant for the analysis. Be sure to always use a reliable source of distilled water in both calibration and sample analysis and dilution.

Proper management of the calibration status saves unnecessary recalibration costs or second analysis, while ensuring the accuracy of the results.

Código	Nombre		Descripción	Presentación
SY2100	WINECAL	Calibrador multiparámetro	Glucosa, Fructosa, Acético, L-Láctico, L-Málico, Cítrico, Glucónico, Glicerol, Amonio	1 x 10 mL
SY2100-RTU	WINECAL-RTU	Calibrador multiparamétrico 4 niveles	Glucosa, Fructosa, Acético, L-Láctico, L-Málico, Cítrico, Glucónico, Glicerol, Amonio	4 x 5 mL
SY2108	PAN STD	1 nivel - Lím. Sup. Linealidad	Aminoácidos	1 x 5 mL
SY2109D	FREE SULFITE STD	1 nivel - Lím. Sup. Linealidad	SO ₂	1 x 5 mL
SY2110	TOTAL SULFITE STD	1 nivel - Lím. Sup. Linealidad	SO ₂	1 x 5 mL
SY2111	ACETALDEHYDE STD	1 nivel - Lím. Sup. Linealidad	Acetaldehyde	1 x 5 mL
SY2112	TARTARIC STD	1 nivel - Lím. Sup. Linealidad	Tartaric acid	1 x 5 mL
SY2115	CALCIUM STD	1 nivel - Lím. Sup. Linealidad	Calcium salt	1 x 5 mL
SY2116	CATECHINS STD		(+)-Catechin	1 x 5 mL
SY2118	COPPER STD	1 nivel - Lím. Sup. Linealidad	Copper salts	1 x 5 mL
SY2122	IRON STD	1 nivel - Lím. Sup. Linealidad	Iron salt	1 x 5 mL
SY2124	POLIPHENOLS STD	1 nivel - Lím. Sup. Linealidad	Gallic acid	1 x 5 mL
SY2125	POTASSIUM STD	1 nivel - Lím. Sup. Linealidad	Potassium chloride	1 x 5 mL
SY2128	TOTAL SUGAR	1 nivel - Lím. Sup. Linealidad	Sucrose, glucose, fructose	1 x 5 mL
SY2130	TOTAL ACIDITY	1 nivel - Lím. Sup. Linealidad	Tartaric acid	1 x 5 mL

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Sinatech: TeamWork