

Metrohm Dosing Test



Calibration of Metrohm dosing and exchange units

Used every day – and always accurate ...

02

Everyday use

Your Metrohm dosing or exchange unit operates reliably day in, day out, or even overnight if so configured. It always dispenses an exact volume. The cylinder is filled with titrant before the sequence starts again.

You base your decisions on the results obtained because you know that you can rely on the values delivered by your Metrohm titration system.

But are these values absolutely reliable?

Yes they are, provided that your Metrohm dosing or exchange unit is new, or has been regularly serviced. Like any instrument exposed to chemicals or which has moving parts, or both in the case of a Metrohm burette, it may become less accurate over time.

Alcoholic KOH, for example, attacks the glass cylinder and can thus alter its inside diameter. Intensive use of the internal burette or just simply aging may also compromise the performance of the measuring system.

The Metrohm Dosing Test

The Metrohm Dosing Test has been developed to deal with this situation: your dosing or exchange unit is periodically inspected to verify that its accuracy and precision are still within the required tolerances.

Furthermore, the Metrohm Dosing Test is carried out by specially trained Metrohm Service Engineers at your workplace using recognized standards and procedures.

The Metrohm Dosing Test can be conducted during annual servicing of the instrument, either as a component of a Metrohm Care Contract or «on demand» to minimize disruption to your laboratory workflow.



... for very demanding requirements

Piston burettes have very demanding requirements with respect to accuracy and precision of the dosed volumes, as defined in ISO standard 8655-3:2002 «Piston-operated volumetric apparatus – Part 3: Piston burettes» and in U.S. Pharmacopeia USP 35-NF 30, General Chapter <31> «Volumetric Apparatus».

When they leave factory, Metrohm burettes fulfill these stringent requirements without exception, as confirmed by the corresponding quality certificate. This means you can rely on the accuracy and precision of your piston burette right from the start.

The Metrohm Dosing Test checks that these requirements are still being fulfilled in your daily operations and confirms continuous compliance with the respective standards.

Maximum permissible errors for motor-driven piston burettes according to ISO 8655-3:2002:

Nominal volume mL	Maximum permissible errors	
	systematic ± µL	random ± µL
≤ 1	6.0	1.0
2	10	2.0
5	15	5.0
10	20	7.0
20	40	14
50	100	25

Tolerances for burettes according to N.I.S.T. Class A (ASTM E287-02):

Designated volume mL	10 («micro» type)	25	50
Subdivisions, mL	0.02	0.1	0.1
Limit of error, mL	0.02	0.03	0.05



The Metrohm Dosing Test is based on a gravimetric method. This means that the dispensed water is weighed and the volume dosed is then calculated using the specific density of water. The calculated dosed volume is subsequently compared to the displayed volume.

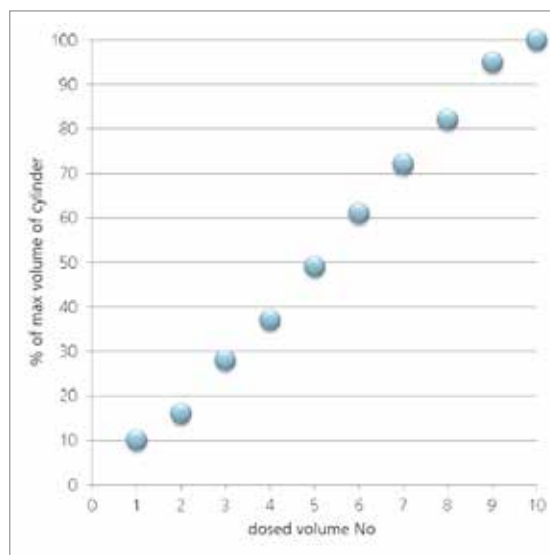
The accuracy of the results depends not only on exact determination of the mass, but on other parameters as well. These are primarily the temperature of the water and the ambient air as well as the barometric pressure. This is why the Metrohm Service Engineers are equipped with calibrated thermometers and barometers.

Metrohm Dosing Test, cumulative procedure

The general conditions of the Metrohm Dosing Test correspond to those of standard ISO 8655-6:2002. Details of the test conditions, the test procedure, and the calculations are given in Metrohm Application Bulletin 283/1 e.

In the cumulative procedure, the test volumes are dispensed from one cylinder filling without any refilling. The smallest test volume is exactly 10% of the cylinder volume, the largest is exactly 100%. The remaining 8 test volumes are randomly selected from the range between these two limits.

This procedure ensures that the entire volume range of the burette is covered. The linearity of the dosed volume can thus be reliably checked.



Stay on the safe side

The Dosing Test gives you certainty – the certainty that your Metrohm burette is dispensing the displayed value. This in turn gives you assurance that you really can rely on your results, and that this will not cause problems during auditing.

Once the Metrohm Dosing Test has been successfully completed, you will receive the corresponding certificate. This certificate confirms clearly and traceable that your burette continues to comply with the requirements as verified by the test, as well as the reference instruments used in the test.

In short, you can focus on your work knowing that you can rely 100 percent on the accuracy of your Metrohm burette.

