

## Pipette Calibration Matters

Pipettes are used daily in almost every lab. As pipettes touch virtually every experiment, they influence the accuracy and repeatability of the experimental data. Therefore, calibrating pipettes must be done on a regular basis to ensure that they meet the requirements for their intended use. Every scientist knows that pipettes need to be calibrated, but have you ever wondered how often pipettes fail to meet the calibration requirements?

### How Are Pipettes Calibrated?

Pipettes are often calibrated according to ISO 8655-6 in an ISO 17025-accredited calibration laboratory by trained service personnel. They are usually tested and adjusted in a 3-point calibration: 100% - 50% - 10% of the pipette's nominal, which is the maximum volume. During the calibration process, the different volumes of distilled or deionized water, conforming to at least grade 3, are weighed on a balance with a moisture trap in an environmentally controlled room. The measured mass is compared to expected values to determine performance deviations.

### How Often Do Pipettes Fail to Meet the Calibration Requirements?

The Sartorius accredited service laboratory in Dourdan, France, calibrates ~13,000 pipettes each year. The pipettes are from different major manufacturers and vary in age. The observed rate of non-conformity (deviation from calibration specifications) is about 15% for mechanical pipettes and 7% for electronic pipettes. Each non-conforming pipette requires service to meet specifications. There is no single reason behind why so many pipettes fail to meet the calibration requirements, but there are some practices that you can adopt to keep your pipettes working properly.



### Checklist for Your Pipettes

1. Clean and maintain pipettes on a regular basis according to the pipette manufacturer's specifications and additional requirement for your application. Following disassembly and reassembly for maintenance or cleaning, remember to check the performance of your pipette. A performance check, or in-use quality control, can be as simple as pipetting distilled or deionized water to an analytical balance, and verifying (and recording) that the results are within acceptable limits.
2. Calibrate your pipettes at an accredited service laboratory annually, or every 3–6 months depending on the frequency of use and the liquids you pipette.
3. Calibrate your pipettes after exchanging critical pipette parts, such as the piston or cylinder.
4. Check the performance of the pipette between calibrations—daily, weekly, or monthly.
5. Check the performance if the pipette is dropped on the floor.

6. Use high quality tips for the most reliable pipetting results. Sartorius pipette and tips are a system that is designed to seamlessly fit together for the best accuracy and precision
7. Store pipettes in an upright position in a pipette stand.



*For some electronic pipettes, such as Sartorius Picus® Nxt, the calibration interval can be set by activating the calibration reminder. The function will notify you when the previous calibration is about to expire. You can also lock the Sartorius Picus® Nxt pipette if you suspect that the pipette is not working properly; this prevents others from using the pipette until it has been checked.*

Further information:  
**Services for Pipetting and Dispensing Products**

**Watch Pipette Maintenance Tutorial Video**

**Pipette Calibration and Standards App Note**

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