



Pipette Service Done Right

Eppendorf Pipette Calibration

»Are Your Results Reliable?«

Premium services performed by experts ensure global quality standards

High-precision pipettes require regular maintenance and inspection to maintain optimal performance and ensure the quality of your downstream results.

Regular maintenance, calibration and adjustment services performed by Eppendorf experts can help you identify potential issues and ensure your pipettes and dispensers continue to generate reproducible results. Our global pipette services always adhere to the most recent, strict international quality standards for calibration. Calibration options include a thorough internal and external check of the pipette to ensure wearable parts like O-rings are replaced in a timely manner.

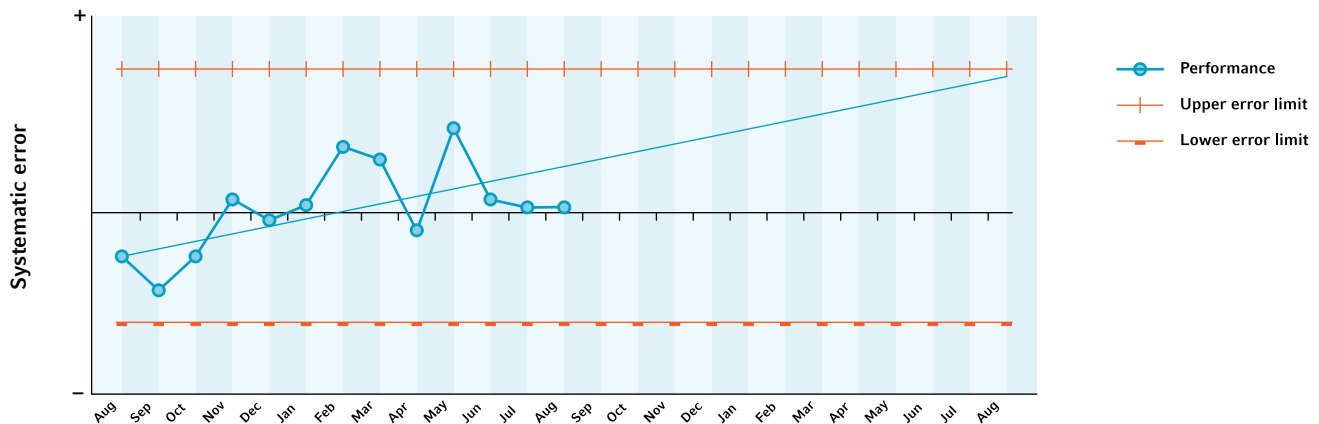


Volume Drift Due to Wear and Tear

From month to month over a yearlong testing period, a new pipette in standard lab use calibrates within the error limits shown in the graph below. But the pipette is also experiencing wear and tear, which can also be seen in the graph below as the continuous trend of the pipette's volume toward the

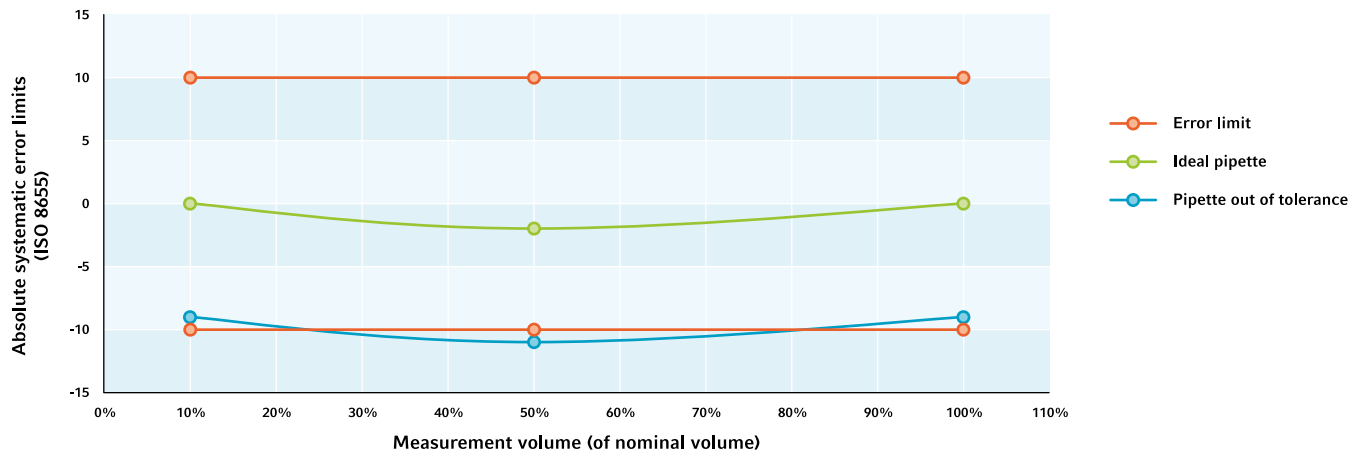
upper limit. Without carrying out any maintenance, calibration or adjustment measures, this pipette will eventually fall out of calibration, potentially causing unreliable or questionable results.

Example of a volume drift over time



What Else is Important?

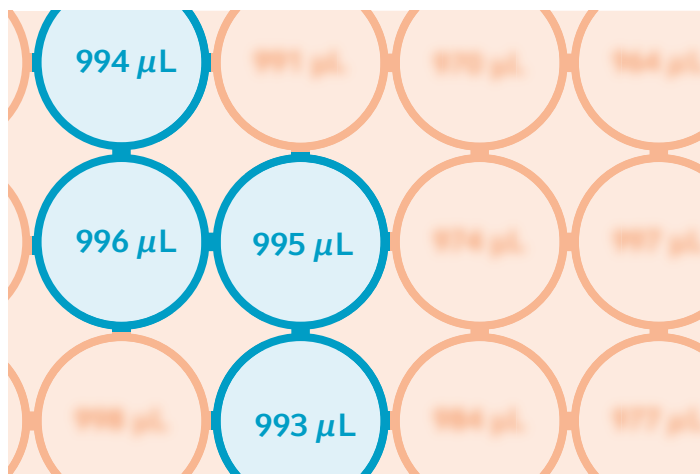
Calibrating with 3 volumes to compensate for the non-linear correlation of error and volume



ISO 8655:2022 requires three volumes to be tested during calibration: Nominal volume, 50% of nominal volume, and the lower limit of usable volume or 10% of nominal volume (whichever is greater). Since the error limits of a pipette are not linear from minimum to maximum volumes, it is possible that the 10% and 100% volumes perform within the systematic error limits, while the 50% volume does not.

The graph above demonstrates this phenomenon: The blue line represents a pipette that is out of tolerance. The user would not know this pipette is not functioning properly without testing all three volumes.

Calibrating with 10 measurements versus 4 measurements to compensate for deviations



Four measurements – average 994.46 μL , -0.55% systematic error

The images above represent a set of calibration measurements from a 1,000 μL pipette. The image on the left shows that taking only four measurements produces an error of -0.55%. As this is within the manufacturer's systematic error limit of $\pm 0.6\%$, the pipette would pass calibration. On the right, taking all ten measurements produces a



Ten measurements – average 993.77 μL , -0.62% systematic error

systematic error of -0.62%. As this is outside the manufacturer's systematic error limit of $\pm 0.6\%$, the pipette would fail calibration. More confidence in the calibration is produced and the results become statistically more accurate when using ten measurements as recommended by ISO 8655:2022.

Why Select Eppendorf for Pipette Services?



Above and beyond ISO conformity

We maintain over 5,000 pipette-manufacturer specifications and conform to manufacturers' standards when their specifications are stricter than ISO 8655:2022 standards if requested by customer.



Highly trained service technicians

Our highly qualified technicians complete 200 hours of training and must pass rigorous exams to receive certification before they can begin servicing pipettes.



Thorough maintenance

Our calibration services include a thorough internal and external check of the pipette to ensure wearable parts like O-rings are replaced in a timely manner.

Calibration Certificate

Issued by: Eppendorf Singapore Pte. Ltd
3 Magenta Drive, Singapore 437124, Singapore 138623

Issued to: Customer's company name
Address

Calibration Details:

Serial Number	023885	Work Order No.	90008871-01
Manufacturer	Eppendorf	Workstation Name/Description	Workstation 2
Model/Type	Research plus single-channel 0.1-10µl	Calibration Service	ISO 8655 with Air
Internal Customer ID		Test accuracy	00.0001-0.002
Serial ID	Eppendorf ePT 1.0 0.1-10µl (L.S. 20µl)	Manufacturer Specification	0.0001-0.002
Date of Calibration	Hobart, May 26, 2023	Method of Calibration	Gravimetric

Hardware:

Volume Model	Research plus 0.1-10µl	Climate Box Model	Research 100-100°C P1
Volume Serial Number	023885	Climate Box Serial Number	02188
Volume Calibration Due Date	12/31/24	Climate Box Calibration Due Date	02/28/24
Number of Pipette (multi-use)	1		

As-Left Measurement Result: OK not OK

Report ID: 000001170020000
Report Number: 148853

Environmental Details:

Parameter	Unit	Min	Max
Air Temperature [°C]	°C	21.7	21.9
Water Temperature [°C]	°C	21.0	21.2
Air Pressure [kPa]	kPa	1008.2	1008.2
Relative Humidity [%]	%	58.8	60.2

Fully accredited Service Centers

In our major markets, ISO/IEC 17025-accredited pipette calibration processes are available both in the field or in an Eppendorf Service Center. As an expert partner in liquid handling, we can help you meet any regulatory need.



Over 60 years of experience

Since we released the first piston stroke pipette in 1961, we continue to manufacture and service pipettes with a passion for improving user results.

epServices Test Report

Issued by: Eppendorf S.r.l.
Via R. Stucchi 6, 20128 Milan, Italy
This report applies to ISO 9001 and ISO 17025. The procedure is based on ISO 8655-2:2022, Annex A.

Issued to: VITSA/IE SPA

Model: Eppendorf Research plus 0.1 µl to 10 µl
Serial Number: 252039
Internal Customer ID: 1.1
Calibration Volume Range: 1 µl to 10 µl

Used by: Eppendorf ePT 1.0 0.1-10µl (L.S. 20µl)
Work Order: W0000210491-2
Revision Number: 030007075164789400V1.0
Date of Calibration: 2023-10-10 12:28:29

Calibration Details:

Method:	ISO 8655-2:2022, Annex A	Balance Model:	Mettler Toledo N1105PC
Type of the Test Liquid:	De-ionized water	Balance Serial Number:	820420264
Batch of the Test:	Ex	Balance Last Calibration Date:	2021-05-02
Reference Temperature:	20.00 °C	Climate Box Model:	100-100-401176
Air Temperature:	22.20 °C	Climate Box Serial Number:	011176
Barometric Pressure:	995.43 kPa	Climate Box Last Calibration Date:	2021-05-02
Relative Humidity:	57.1 %		
Cubic Thermal Coefficient:	1		

Calibration Technician: Milan | 2023-10-10
Signature of Technician: City: Milan

Audit-proof documentation

Our calibration documentation gives you peace of mind by reducing the workload for your qualification and regulatory audit process. Most of our calibration facilities worldwide use software that complies with CFR21, part 11.

Eppendorf Calibration Process

Decontamination

After verifying the customer's declaration of decontamination, Eppendorf sends all pipettes through an additional decontamination process before forwarding them to our calibration facilities.



Preventive Maintenance and Repair

- > Pipette is inspected and calibrated as required
- > Outer and inner components are cleaned, with worn parts replaced and lubrication applied if needed
- > A leak test is performed
- > Necessary repairs are performed.



Calibration and Adjustment

- > High-precision, single- and multichannel balances fulfilling ISO 8655:2022 requirements are used
- > Original manufacturer pipette tips are used
- > Measurements made according to ISO 8655:2022
- > Evaluations carried out according to manufacturer's specifications (if requested, on the basis of ISO 8655:2022 or customer SOP error limits)
- > Adjustments (incl. in 'as left') made if device is outside of its error limits
- > ISO/IEC 17025 calibration certificate available on request.



Labeling and packaging

- > Device is packed with calibration documentation and service report ready for shipment
- > Each device receives a calibration service sticker with the calibration date
- > Pipette shipped in secure packaging with our certified shipping partners to assure it arrives in peak condition.
- > Calibration Certificates are available in our Service Portal



Frequently Asked Questions

How often should you calibrate a pipette?

> You decide on the frequency of calibration within the scope of your quality standards. The frequency of calibration may vary depending on the number of users, the frequency of pipette use, the type of liquids dispensed and accepted tolerances. The recommendation is to carry out the renewal of conformity according to ISO 8655:2022 at least once per year.

What is renewal of conformity?

> Calibration/renewal of conformity consists of pipette maintenance and as-left calibration. These services strictly adhere to ISO 8655:2022 criteria, ensuring the pipette meets conformity to ISO 8655:2022 requirements or even stricter specifications like manufacturers' specifications.

What happens, if my instrument cannot be repaired?

> We will inform you and offer you an attractive trade-in option.
> On request, we will dispose of your old instrument or send it back to you.

What is an ISO/IEC 17025 calibration certificate?

> A calibration certificate compliant with ISO/IEC 17025 not only contains the data from the calibration protocol, but also includes the measurement uncertainty and the accreditation confirmation of the service center. The ISO/IEC 17025 calibration certificate along with the raw data ensure traceability for the calibration.

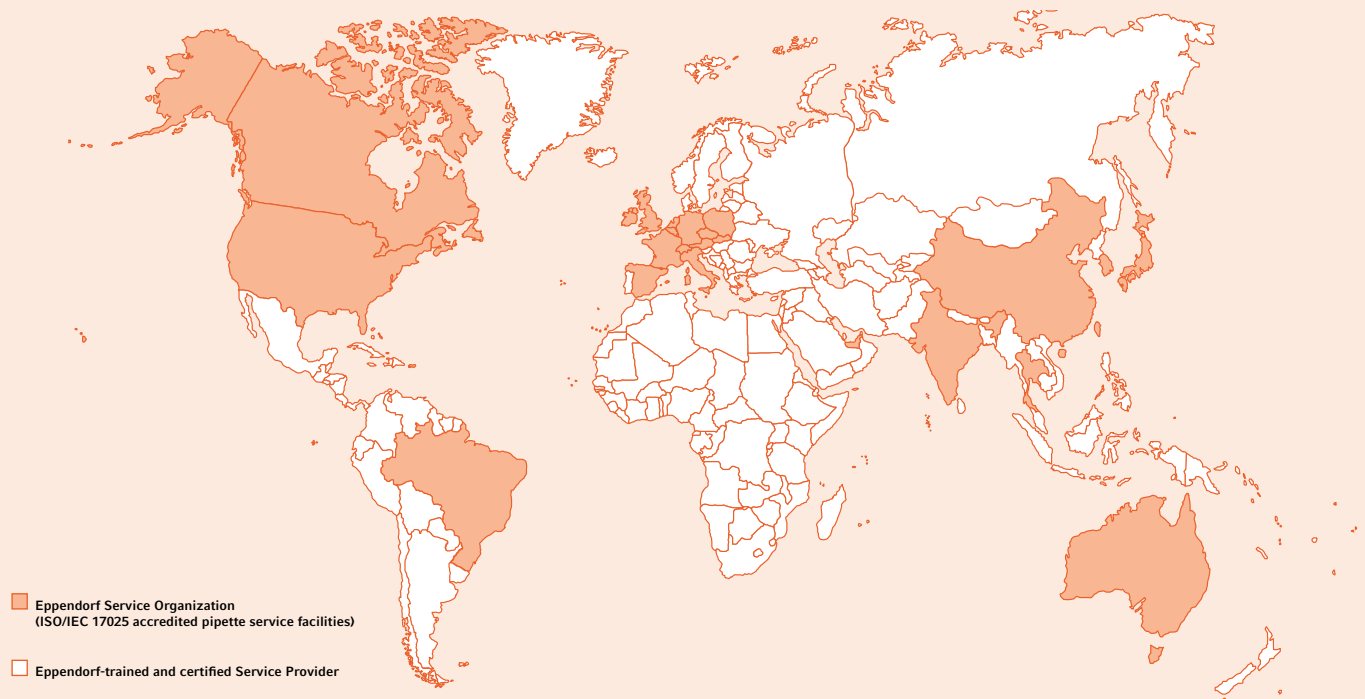
Why do I need calibration without including preventive maintenance?

> The as-found protocol is performed before the as-left calibration or renewal of conformity including maintenance. This protocol shows the calibration status of the pipette as received from the user and indicates the pipette's performance prior to renewal of conformity.



> Watch video:
www.eppendorf.group/pipette-video

Worldwide Pipette Calibration Services



Eppendorf offers pipette services around the globe through its ISO/IEC 17025-accredited corporate service centers and Eppendorf-trained and authorized service providers.

Eppendorf pipette services are standardized to ensure your pipetting results are consistent and reproducible no matter where in the world you are located.

Service Center or On-Site Services



Please contact your local Eppendorf Service Center for more information about our pipette services, which range from cost-effective calibration to calibration services carried out in facilities accredited according to ISO/IEC 17025 and located in our major markets. For fast return times, Eppendorf offers on-site and pick-up services in many countries. Register your pipettes in the Eppendorf Service Portal for a convenient pipette service ordering process and an overview of your service documents: www.eppendorf.link/service-portal

Pipette Calibration Service

Calibration services: ordering information

Service	Calibration measurements »As found«	Calibration measurements »As left«	External decontamination ²	Checking, cleaning, lubricating ⁴ before calibration	Single channel pipette/dispenser	8-channel pipette	12-channel pipette	16-channel pipette	24-channel pipette
ISO 8655 without Preventive Maintenance	10 per test volume ¹		included		0082 000 140	0082 000 161	0082 000 162	0082 000 181	0082 000 182
ISO 8655 including Preventive Maintenance		10 per test volume ¹	included	included	0082 000 142	0082 000 165	0082 000 166	0082 000 185	0082 000 186
3x4 without Preventive Maintenance	4 per test volume ¹		included		0082 000 139	0082 000 159	0082 000 160	0082 000 179	0082 000 180
3x4 including Preventive Maintenance		4 per test volume ¹	included	included	0082 000 141	0082 000 163	0082 000 164	0082 000 183	0082 000 184

Calibration service packages: ordering information

Service	Calibration measurements »As found«	Calibration measurements »As left«	External decontamination ² ; checking, cleaning, lubrication ⁴	ISO 17025 accreditation calibration	Single channel pipette/dispenser	8-channel pipette	12-channel pipette	16-channel pipette	24-channel pipette
ISO 8655 Verified	4 per test volume ¹	10 per test volume ¹	included		0082 000 234	0082 000 235	0082 000 236	0082 000 237	0082 000 238
ISO 17025 including Preventive Maintenance		10 per test volume ¹	included	included	0082 000 143	0082 000 167	0082 000 168	0082 000 187	0082 000 188
ISO 17025 Advanced	4 per test volume ¹	10 per test volume ¹	included	included ³	0082 000 227	0082 000 228	0082 000 229	0082 000 230	0082 000 231
ISO 17025 Professional	10 per test volume ¹	10 per test volume ¹	included	included	0082 000 220	0082 000 221	0082 000 222	0082 000 223	0082 000 224

Additional services: ordering information

ISO 17025 Calibration Certificate	0082 000 211
Advanced Documentation (Excel file with calibration information on all pipettes/dispensers per order)	0082 000 212

Additional services charges

On-site calibration services in your own laboratory	inquire
Labor Charge, 15 min. of repair services (time unit for one technician)	0082 000 210

¹ 10%, 50% and 100% of nominal volumes for variable volume instruments.

² Pipettes and dispensers and package equipment need to be decontaminated before sending in.

³ Calibration certificate that is compliant with ISO/IEC 17025 accreditation is included with the second calibration after maintenance is completed.

⁴ Internal parts

Service may differ by country.

Download decontamination form at www.eppendorf.link/decontamination.

We ensure our stringent, validated procedures are followed for Eppendorf and other brandname pipettes:



Qualification and Certification

ISO 8655:2022

ISO 8655:2022 defines the international standard criteria by which a pipette (piston-operated volumetric apparatus) should be calibrated and which maximum permissible error limits should be used at each volume. ISO 8655:2022 criteria include measurements at three volumes, 10 measurements at each volume, tip exchange during replicate measurement, controls for room environment and a test report without extended uncertainty of measurement.

Our ISO 8655-6 calibration services include a calibration certificate with extended uncertainty of measurement; for calibrations according to ISO 8655-7, we provide a test report without extended uncertainty.

ISO/IEC 17025

Accreditation according to ISO/IEC 17025 ensures a high level of competence and compliance with strict quality rules. ISO/IEC 17025 criteria include a traceability chain for measurement equipment, measurement uncertainty values and approved quality standards. Our ISO/IEC 17025 calibration services include certificates with all raw data and extended measurement uncertainties.

Your local distributor: www.eppendorf.com/contact

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