

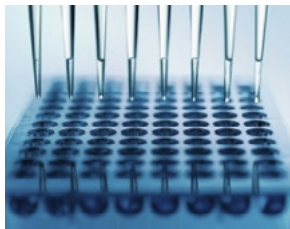


Increase liquid handling quality with easy and reliable performance verification.

Artel MVS®

Without knowing the exact volume transferred at each step of an assay the concentration of species in solution is unknown, potentially leading to unreliable results, delays, and cost overruns. Utilization of the Artel MVS for performance verification can prevent problems, bolster laboratory productivity, and provide confidence in the integrity of data.

Three simple steps to volume verification with automatic reporting.



1. Dispense the Sample Solution and Diluent into a Verification Plate and mix.



2. Measure the absorbance values with the Plate Reader.



3. Results indicate the performance of the liquid handler.

Ideal for:

- Verifying the accuracy and precision of automated liquid handlers and multichannel pipettes
- Comparing instrument performance regardless of make, model or location
- Obtaining highly accurate results traceable to national and international standards

Verify volume transfer precision and accuracy simply and traceably in your lab, and simplify regulatory compliance with the easy-to-use MVS.

System Capabilities:

- Measures performance over a wide volume range of 0.01 to 350 μ L
- Uses virtually all 96-well and 384-well microtiter plates
- Measures aqueous and non-aqueous volume transfers, including dimethyl sulfoxide (DMSO)
- Obtains volume statistics tip-by-tip and well-by-well
- Eliminates the need for rigorous environmental controls
- Simplifies verification and calibration—easy-to-use for technicians of any skill level

Key Applications:

- Facilitating of scale-up and method transfer
- Developing, troubleshooting, and validating assays, methods, and SOPs
- Ensuring reproducibility
- Site acceptance testing and establishing baseline performance of new equipment
- Verifying performance before and after maintenance
- Assessing performance of other essential liquid handling equipment such as plate shakers, plate washers, and bulk dispensers



“The MVS is easy to use, facilitating a frequent performance monitoring schedule. It has made a big difference in our laboratories, both from an efficiency point of view, as well as from a confidence standpoint.”



artel-usa.com/MVS



Ensure data quality with improved process control.

Artel VMS™

Known volumes and concentrations of reagents in microplates are critical to the success of subsequent assay steps. Without specific control, each liquid handling step in a process introduces unknown variability and opportunities for failure.

The Artel VMS is a unique, robust, easy-to-use tool that reduces the unknowns related to liquid handling in many high throughput automation processes by enabling the verification of sample volume within storage microplates.

Volume Measuring Process:



Calibrate the system for your specific plate type

384-well plates are measured in less than 2 minutes and 96-well plates are measured in less than 35 seconds.

Volumes are reported for every well and, based on specifications you set, problem wells are easily identified with color coding. Data can be exported for storage or further analysis.

Ideal for:

- verifying sample volumes when you don't have data on the accuracy and precision of the liquid handler used to generate the sample plate
- determining sample volumes for solids, suspensions, or solutions
- checking sample volumes in storage plates that may have experienced evaporation or water uptake

Know—don't guess—how much sample you have in each well of your plate, whether your sample is solid, liquid, or a mixture of the two. For plates of any well shape, color, or material.

System Capabilities:

- Customizable pass/fail specifications
- Measures well volume in-process for greater accuracy at the time of assay
- Increases efficiency by reducing wasted effort
- Measures aqueous, non-aqueous, and DMSO-based solutions
- Improves process control and data quality
- Reduces cost and time for re-work
- Measures solids and suspensions
- Integrates with plate handlers, stackers and LIMS
- Reports well-by-well volume measurements
- Compatible with virtually all 96- and 384-well plates of any shape, color, or material

Key Applications:

- In-process assay plate volume measurement
- Determination of remaining volume in storage plates
- Volume determination for accurate dilution and normalization

Specifications:

VMS Performance

Volume Range	5-500 μ L
Time Requirements	<ul style="list-style-type: none"> • 384 well plates < 110 seconds • 96 well plates < 35 seconds
Weight	14 kg
COM port	RS232

Volumetric Performance with Metal Test Plates*

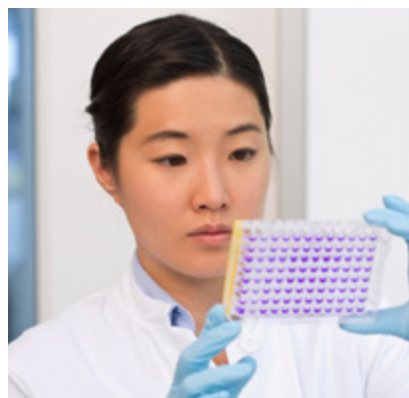
Total Volume	Random Error**	Systematic Error***
< 150 μ L	< 2 μ L	\pm 5 μ L
> 150 μ L	< 2%	\pm 3%

*Volumetric performance in 96-well and 384-well plastic microplates can vary and must be determined for each plate type.

**Random error is expressed as standard deviation of n = 96 wells. This is sometimes referred to as imprecision or repeatability.

***Systematic error is expressed as the difference between the average measured volume and the nominal volume of the metal test plate. This is sometimes referred to as bias or inaccuracy.

“The Artel VMS paid for itself in the first run by detecting lower plate volumes than expected. We would not have caught the error until all of our expensive reagent was depleted.”



artel-usa.com/VMS



Be confident in your liquid handlers, focus on your science.

Artel Liquid Handling Services

Liquid handlers continue to be integral to most laboratory processes, but the significant impact of the liquid handling component on overall assay variability is often underappreciated or ignored.

Only Artel specialists can provide expert testing using the Artel MVS® — under the real conditions in your laboratory — giving you confidence that your assay results are grounded in reliable liquid handling performance.



Consult with Artel Specialists about your liquid handling verification requirements

— you discuss how you use your liquid handlers in your everyday work and we customize the testing to cover your specific volumes, liquid types and labware.



Artel measures and verifies instrument performance for virtually any volume and any liquid handler

— using the standardized and fully traceable Artel MVS technology, accuracy and precision measurements are collected for each test volume.



Summary of measurements is provided in an auditable form

— we provide a report summarizing your liquid handler performance and recommendations for getting the best performance from your instrumentation.



Increase productivity and be confident in your assay results

— with Artel's world-class expertise and liquid measurement technology, liquid handling can be removed as a source of error in your processes.

Artel provides the only completely customized liquid handling service

You know your liquid handlers need to be verified, but you don't have the time or resources to test them as often as you or your auditors would like. You need an expert service partner with a reliable measurement method to provide you with liquid handler accuracy and precision measurements, for all of the liquid handlers in your lab, regardless of make or model.

Artel offers the only completely customizable on-site liquid handler performance measurement and optimization service providing standards-compliant, NIST-traceable results from an independent, third-party expert for all instrument types.

Once the as-found performance of your liquid handlers is established, we can help you adjust the method parameters to get the very best performance from your investment and all results will be delivered in a format that best fits your quality control process.

Services are customized to your specific requirements.

For example:

- Ensuring instrument and method compliance
- Measuring performance of a variety of equipment, such as bulk dispensers, plate washers, and mixers
- Testing the available consumables choices
- Testing results at assay level by mimicking the same parameters of an actual experiment
- Site acceptance testing of new equipment
- Thorough performance validation after repair or maintenance
- Side-by-side comparison between methods and devices
- Development and evaluation of new volume transfer strategies: Reverse mode pipetting versus forward mode; air gap use; tip touches; dispense rates/heights; wet dispense versus dry dispense

“Artel helps us to identify and correct pipetting-related issues, before they have a chance to cause problems with our assays.”



[artel-usa.com/ALHS](https://www.artel-usa.com/ALHS)

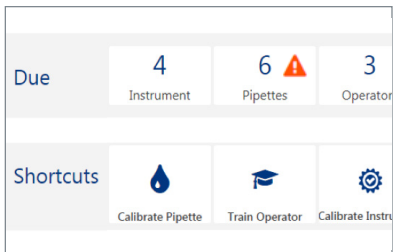


Ensure pipettes are performing properly and operator skills are standardized

Artel PCS®

Pipettes are the most frequently used instruments in the laboratory. Their performance is key to every sample dispense and dilution, and is critical for generating reliable data. The Artel PCS provides confidence in data integrity with scheduled pipette calibrations, interim performance verifications, complete documentation and pipette inventory management — and it's an ideal tool for standardizing pipetting technique and assessing operator competency.

Precise calibration in a few simple steps.



1. Identify pipette.



2. Scan calibration solutions.



3. Dispense samples.

Artel Pipette Calibration Report					
Pipette ART-101	Result PASSED				
Model: Gilson Pipetman P20	Completed: 6/28/2016 1:41:57 PM				
Serial Number:	Method: Example Plan, Version 1				
Nominal Volume: 20.0000 µL	Calibration ID: 20150628134038ART:101				
Owner: Artel Marketing (Artel)					
Location: Sample Location					
Volume	Mean	Uncertainty	Inaccuracy	Tolerance	Imprecision
20.00 µL	20.034 µL	1.45 %	0.17 %	5.00 %	1.61 %
<small>Uncertainty values reported are the maximum of the comparison of calculated measurement uncertainty and de</small>					

4. Obtain report.

Ideal for:

- Verifying the accuracy and precision of handheld pipettes
- Assessing and documenting operator competency
- Pipette QC and inventory management
- Complying with regulatory requirements

Gain confidence in the integrity of your data by ensuring your pipettes and their operators are working together to generate accurate and reproducible results

System Capabilities:

- Calibrates single channel pipettes from 0.1 μL to 5,000 μL in less than three minutes
- Allows scheduling of operator competency assessments
- Intuitive dashboard provides immediate overview of due calibrations and operator assessments
- Offers digital review and approval workflow
- Provides comprehensive reporting, including audit trail and printing of calibration labels
- Compact and portable design enables use in any laboratory
- Performs to the same tight specifications under various laboratory conditions; no special environmental controls required
- Generates results traceable to national (NIST) and international standards (SI units)
- Complies with regulatory requirements (CAP, CLIA, ISO, CLSI)
- Facilitates compliance to 21 CFR Part 11

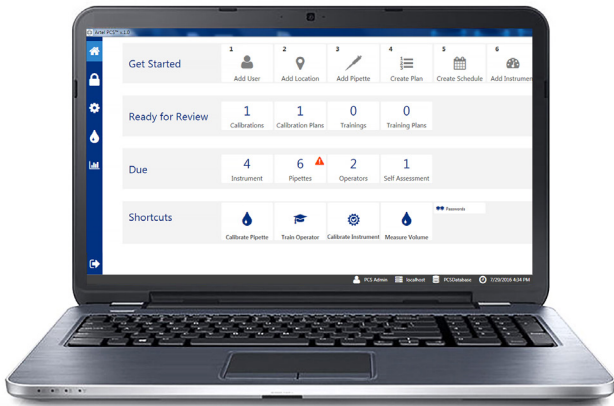
Key Applications:

- Calibrate pipettes in the lab in which they are used
- Standardize pipetting technique with scheduled and documented operator competency assessments
- Conduct interim performance verifications to supplement full calibration programs
- Verify pipette performance before and after maintenance, or following outsourced service
- Perform “quick checks” when pipetting performance or operator technique is in question

“The Artel PCS ensures that our laboratory upholds the high standards required in today’s demanding environment. Having a system that is accurate and precise supports our mission of maintaining excellence in laboratory testing.”



artel-usa.com/PCS



Provide the highest standard of quality control with simplicity and ease

Artel PCS® Software

Used in combination with the PCS Instrument, the PCS Software ensures your pipettes and their operators are working together to generate accurate and reproducible results. The PCS Software provides scheduling for pipette calibrations and interim performance verifications; complete documentation and pipette inventory management - and is ideal for standardizing pipetting technique and assessing operator competency.



Complete View

Intuitive dashboards provide a complete overview for managing and reviewing each pipette's and operator's status, from anywhere in your organization.



Workflow

Receive email notification for calibrations, competency assessments, and for overdue tasks. Review, approve and sign-off on calibration reports electronically. Generate calibration and inventory labels.



Pipette Inventory and QC

Maintain and manage your entire pipette inventory for complete QC of each device. Schedule calibrations and interim performance verification at defined intervals, and if required perform calibrations on an *ad-hoc* basis.



Operator Assessment

Schedule and document operator performance for internal and external regulatory compliance.



Testing Requirements

Customize tolerances based on your lab's requirements to provide pass/fail results.



Compliance

Facilitates compliance to 21 CFR Part 11. Allows user authentication and privilege management, electronic signatures, as well as versioning of calibration and training plans. Provides a complete audit trail.

Ensure pipettes are performing properly and operator skills are standardized

Key Applications:

- Calibrate pipettes in the lab in which they are used; review results anywhere
- Standardize pipetting technique with scheduled and documented operator competency assessments
- Conduct interim performance verifications to supplement full calibration programs
- Verify pipette performance before and after maintenance, or following outsourced service
- Perform “quick checks” when pipetting performance or operator technique is in question

Minimum requirements for using PCS Software:

- x64 Processor: 1.4 GHz or faster
- Windows 7 or Windows 10
- 4 GB of memory
- 40 GB of hard drive space
- 3 available USB ports

“Since we were starting a new Laboratory, we wanted to get the most advanced equipment available. Artel’s PCS® and software helps us to ensure that tests meet CDC requirements.”



artel-usa.com/PCS-Software



Strengthen your pipette quality program with training and certification.

Artel Training and Certification Seminars

Pipettes continue to be highly relied upon devices that are at the core of every laboratory. Building an effective liquid handling quality assurance program and minimizing pipette operator variability is no small task.

Artel training and certification seminars will provide you with a strong foundation for increasing the accuracy of your data and aligning with current quality and compliance requirements. By incorporating the content from our programs into your laboratory processes, you'll have confidence that you are getting the best performance from your pipettes and their operators.



Artel Specialists

— consult with Artel specialists about your training needs – let us know if you need to prove pipetting competency of your analysts on the bench or if you need to create/refine your pipette calibration program.



Training and Certification

— we deliver certification modules using the proven Artel Method™ and provide the knowledge and one-on-one coaching to improve the performance of your pipettes and their operators.



Data and Resource Tools

— we provide reports summarizing the pre/post training performance measurements, along with a resource library that includes lab reports, videos, SOP templates, posters and articles.



Efficiency and Standards

— with trained competent analysts and a robust liquid handling quality assurance program, you'll have increased data integrity and less rework.

Artel has a certification program that is suited for your needs...

whether you are looking for a program that will help you create or improve your internal processes for managing your pipettes or need to provide proven, standardized pipetting technique training for your operators.

Participants who meet the written and practical exam requirements will receive an *Artel Certificate of Proficiency* and a Gold, Silver or Bronze medal for pipetting excellence.



Pipette Quality Management Certification

This two-day seminar held at Artel is designed to assist you in establishing and maintaining your internal quality assurance program for your pipettes.

During this certification, we will provide you with a framework of knowledge on the following topics:

- single channel and multichannel pipetting technique
- pipette repair and preventive maintenance
- current guidelines and regulations
- laboratory ergonomics
- pipette types and causes of failure
- calibration methodologies
- pipette quality assurance

Resources and tools are provided to assist in developing a robust QA/QC program for pipettes, technologists and liquid handling processes.

Pipetting Proficiency Certification

This one-day seminar held on-site at your facility is designed to meet the needs of all laboratorians who frequently use pipettes.

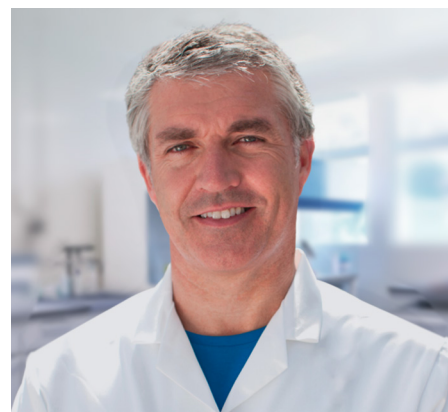
During this certification, we will provide your staff with:

- one-on-one pipetting technique coaching based on best practices technique training
- an overview of pipette types and causes of failure
- review of common laboratory ergonomic risk factors and ways to reduce their impact

Customizable modules are available for pipette repair and preventive maintenance and multichannel pipetting technique.

A detailed training summary package is provided which includes pre and post assessment data, evaluation feedback and copies of proficiency certificates and training exam.

“I’ve been working in laboratories for over thirty years and was never ‘trained’ in how to pipette, I was only shown. I often wondered why there was variability in my results, now I know why.”



artel-usa.com/training