

VWR ergonomic system for liquid handling

01. SINGLE & MULTI-CHANNEL PIPETTORs

02. FILTERED & NON-FILTERED PIPET TIPS IN A VARIETY
OF SIZES AND PACKAGING OPTIONS



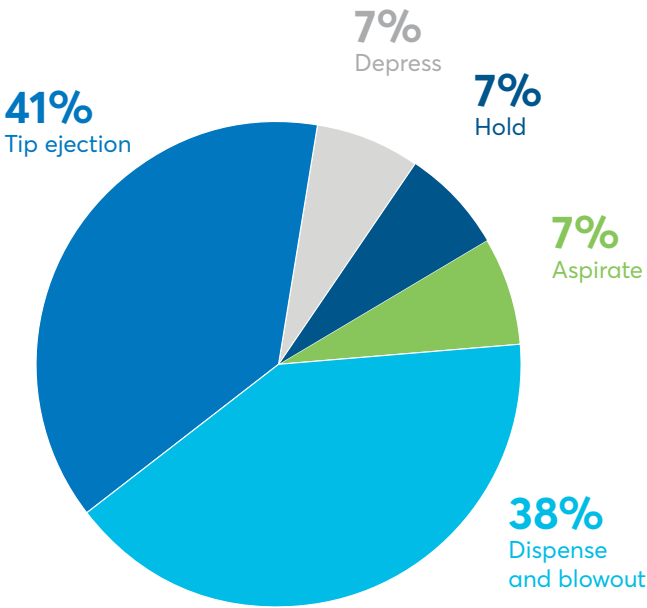
Ergonomics is the science of refining tools to optimize them for human use

Advanced ergonomics can lead to decreased muscle fatigue, increased productivity, and a reduction in the number and severity of work-related musculoskeletal disorders. It is the study of optimizing safety and productivity using:

- Tools created with superior design
- A comfortable work environment
- Safe practices

In a laboratory environment there are many contributing factors that can be associated with musculoskeletal disorders. These include bending, reaching overhead, working in awkward body postures and performing the same or similar tasks repetitively. The VWR Pipetting System focuses on reducing the forces associated with the pipetting cycle which can help lower fatigue and help your lab save money, save time, and yield more reproducible data.

This graph shows the average manual pipetting force for the different steps of the pipetting cycle. There are many scientific studies that have found a direct link between fatigue induced by poor ergonomics and poor pipetting performance due to user error. The VWR Ergonomic System focuses on minimizing ejection force, the highest force in this cycle. It is recommended by ergonomists to only use 30% of maximum force for thumb activities. Forces greater than 30% with repetitive activities like pipetting can lead to increased fatigue and a higher risk of RSI/ RSD. The chart below shows the average and recommended force for both men and women during thumb activities.



Using this chart and additional scientific research on the subject of ergonomics, the VWR ergonomic system is designed to keep your ejection force well-below the dynamic forces recommended by professionals regardless of your technique for inserting the tip.

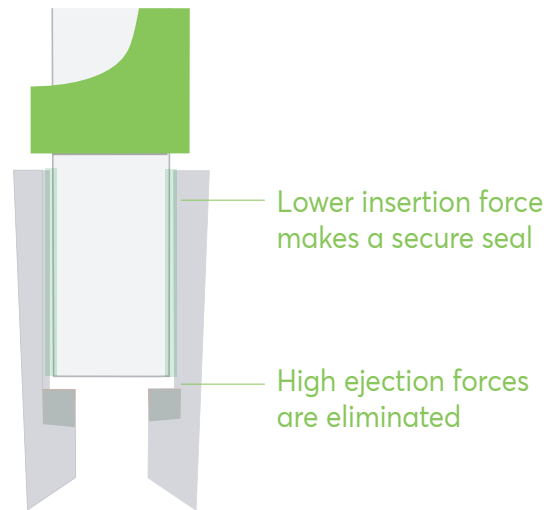
Thumb Activities	% of Max Strength	Force	
		Men	Women
Max Strength		10 kg	7 kg
Dynamic Force	30%	3 kg	2.1 kg

VWR

- Flexible Proximal End feature creates a secure seal on contact with the pipette
- The thin, flexible walls of the seal area creates a very low force fit
- Positive Stop Feature allows for consistently low-ejection forces on LTS pipettors; prevents jamming
- Dramatic reduction in tip ejection force

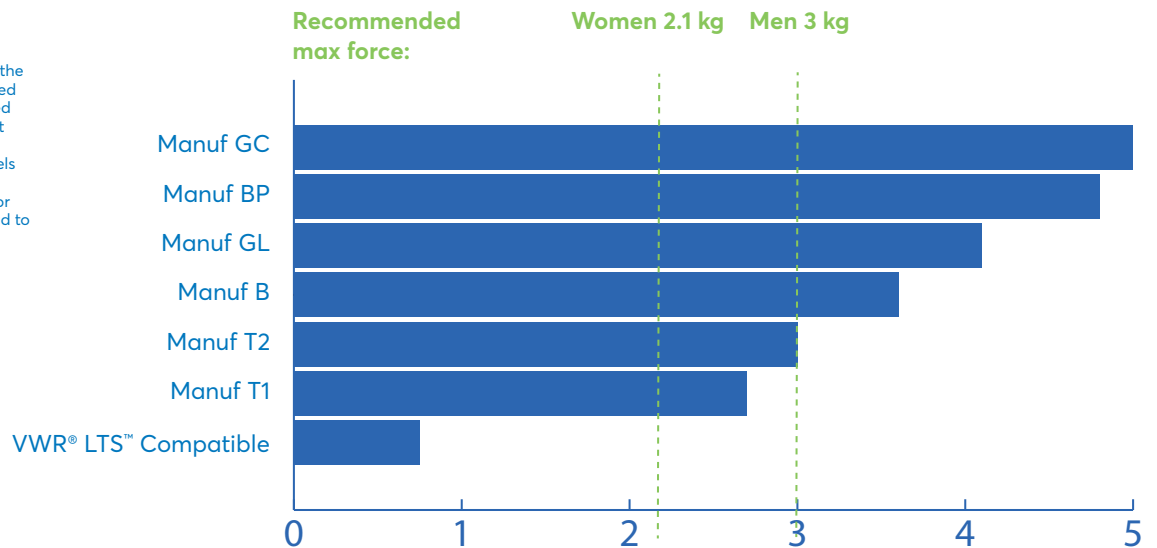
UNIVERSAL

- Thick walls with a large variable sealing area
- High force, friction fit
- No perceivable feedback to confirm when tip sealing has occurred, often resulting in jamming of tips to secure a seal
- Allows the pipette to wedge deep in the tip creating high ejection forces



Manufacturers' pipettor model

This figure shows a comparison between traditional universal pipetting systems and the VWR ergonomic system. For this test we used a continuous insertion force of 5kg averaged across three tip sizes. The positive stop built into the VWR ergonomic system keeps the ejection force below the recommended levels by ergonomists for both men and women. All competitors are above either the men- or women-recommended levels which can lead to increased fatigue and risk of RSI/RSD.





VWR® LTS™ COMPATIBLE SINGLE CHANNEL PIPETTERS

Exclusive ejection technology reduces fatigue to improve your lab's ergonomics. Designed with durable and lightweight components to produce a precise and accurate liquid transfer while maintaining hand comfort.

- Compatible with VWR LTS™ Compatible Pipet Tips and Rainin® LTS™ Pipet Tips
- Lighter springs give a more comfortable and controlled draw and dispense
- Constructed with durable lightweight materials
- The ejector is cushioned to reduce dynamic stress on your thumb
- Precision piston design produces accurate and precise measurements with low channel-to-channel variability in multichannels
- Hitting the positive stop ensures that you've made a secure seal on both single and multichannels – no more guessing or reattaching tips

Volume	Accuracy	Precision	Cat. No.
0.2 - 2.0 µl	±12% at 0.2 µl, ±1.5% at 2.0 µl	±6% at 0.2 µl, ±0.7% at 2.0 µl	76335-568
0.5 - 10 µl	±2.5% at 1 µl, ±1% at 10 µl	±1.2% at 1 µl, ±0.4% at 10 µl	76335-570
2.0 - 20 µl	±7.5% at 2 µl, ±1% at 20 µl	±2% at 2 µl, ±0.3% at 20 µl	76335-572
10 - 100 µl	±3.5% at 10 µl, ±0.8% at 100 µl	±1% at 10 µl, ±0.15% at 100 µl	76335-742
20 - 200 µl	±2.5% at 20 µl, ±0.8% at 200 µl	±1% at 20 µl, ±0.15% at 200 µl	76335-744
30 - 300 µl	±2.5% at 30 µl, ±0.8% at 300 µl	±1% at 30 µl, ±0.15% at 300 µl	76335-746
100 - 1000 µl	±3% at 100 µl, ±0.8% at 1000 µl	±0.6% at 100 µl, ±0.15% at 1000 µl	76335-748



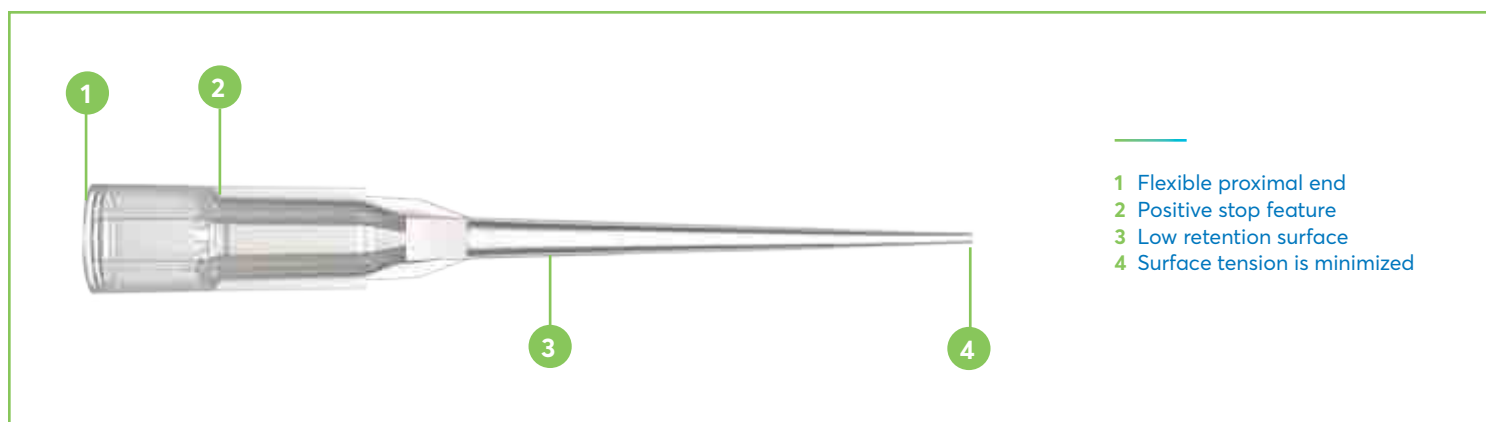
VWR® LTS™ COMPATIBLE MULTICHANNEL PIPETTERS

These multichannel pipettors achieve the highest standards for accuracy and precision while providing perfect balance and low operating forces. The positive stop technology keeps ejection forces low, even on multichannel models. Engineered with light force springs and low drag seals to provide you a seamless draw and dispense.

- Fully compatible with Rainin™ LTS™
- Available in 8- and 12-channel models
- Made with lightweight, durable materials for comfortable everyday use
- Accurate and precise measurements with low channel-to-channel variation
- Symmetrical design allows for easy left- or right-hand use without any adjustments

Volume	Accuracy	Precision	Cat. No.
8-Channel			
0.5 - 10 µl	±4.0% at 1 µl, ±1% at 10 µl	±5% at 1 µl, ±0.5% at 10 µl	76382-694
2.0 - 20 µl	±7.5% at 2 µl, ±1% at 20 µl	±4% at 2 µl, ±0.5% at 20 µl	76382-696
20 - 200 µl	±2.5% at 20 µl, ±0.8% at 200 µl	±1.2% at 20 µl, ±0.3% at 200 µl	76382-698
30 - 300 µl	±2.5% at 30 µl, ±0.8% at 300 µl	±1.5% at 30 µl, ±0.25% at 300 µl	76382-700
12-Channel			
0.5 - 10 µl	±4.0% at 1 µl, ±1% at 10 µl	±5% at 1 µl, ±0.5% at 10 µl	76382-702
2.0 - 20 µl	±7.5% at 2 µl, ±1% at 20 µl	±4% at 2 µl, ±0.5% at 20 µl	76382-704
20 - 200 µl	±2.5% at 20 µl, ±0.8% at 200 µl	±1.2% at 20 µl, ±0.3% at 200 µl	76382-706
30 - 300 µl	±2.5% at 30 µl, ±0.8% at 300 µl	±1.5% at 30 µl, ±0.25% at 300 µl	76382-708

Perfect ergonomic system



Flexible proximal end

- Requires less insertion force than competitor models to make a secure seal, reducing the risk of repetitive stress injury
- Tips don't fall off multichannel pipettors
- Completes the ergonomic system on LTS pipettors
- Makes every pipettor more ergonomic

Positive stop feature

- Allows for consistently low-ejection forces on LTS pipettors
- Aligns the tips for even liquid levels on multichannels

Low retention surface

- Maximizes sample recovery
- Improves accuracy across your experiments

Surface tension is minimized

- Eliminates hanging droplet formation
- Saves time by reducing the need for tip touch off
- Increases accuracy and precision

VWR® LTS™ Compatible Pipet Tips

These tips use a low retention resin that is up to ten times more hydrophobic than other polypropylene pipet tips, enabling viscous samples like protein and DNA solutions to dispense easily without collecting inside the tip.

Racked Tips are available in Filtered Sterile and Non-Filtered Sterile (both sterilized after packaging for an extra level of protection) and Non-Filtered Non-Sterile. Each lot is put through our rigorous QC testing and certified free of DNase, RNase, endotoxins, pyrogens, ATP and PCR inhibitors.

VWR® LTS™ COMPATIBLE FILTERED PIPET TIPS, RACKED STERILE

- Sintered polyethylene filters that deliver a secure barrier to block aerosol contaminants with a 99.99% bacterial filter efficiency
- Sustainable rack design uses 30% less plastic than leading competitors
- Certified free of DNase, RNase, endotoxins, pyrogens, ATP, and PCR inhibitors
- Filter tips are sterilized using radiation after packaging for added protection
- Flexible proximal end, positive stop feature, low retention surface, and minimized surface tension

VWR® LTS™ COMPATIBLE NON-FILTERED PIPET TIPS, RACKED STERILE

- Sustainable rack design using 30% less plastic than leading competitors
- Color coded snapcards match the compatible pipette's plunger cap
- Autoclaveable at 121°C, no dry cycle
- Flexible proximal end, positive stop feature, low retention surface, and minimized surface tension



Volume	Packaging	Cat. No.	Available Units
Racked, Filtered Sterile			
0.2-20 µL	10 Racks/Pack	76322-158	Pack of 960 / Case of 4800
20-200 µL	10 Racks/Pack	76322-160	Pack of 960 / Case of 4800
20-300 µL	10 Racks/Pack	76322-162	Pack of 960 / Case of 4800
100-1000 µL	8 Racks/Pack	76322-164	Pack of 768 / Case of 3840
100-1200 µL	8 Racks/Pack	76327-216	Pack of 768 / Case of 3840
Racked, Non-Filtered Sterile			
0.2-20 µL	10 Racks/Pack	76323-944	Pack of 960 / Case of 4800
20-200 µL	10 Racks/Pack	76323-946	Pack of 960 / Case of 4800
20-300 µL	10 Racks/Pack	76323-932	Pack of 960 / Case of 4800
100-1000 µL	8 Racks/Pack	76323-934	Pack of 768 / Case of 3840
100-1200 µL	8 Racks/Pack	76327-218	Pack of 768 / Case of 3840
Racked, Non-Filtered Non-Sterile			
0.2-20 µL	10 Racks/Pack	76323-936	Pack of 960 / Case of 4800
20-200 µL	10 Racks/Pack	76323-938	Pack of 960 / Case of 4800
20-300 µL	10 Racks/Pack	76323-940	Pack of 960 / Case of 4800
100-1000 µL	8 Racks/Pack	76323-942	Pack of 768 / Case of 3840
100-1200 µL	8 Racks/Pack	76327-220	Pack of 768 / Case of 3840

VWR® LTS™ COMPATIBLE NON-FILTERED PIPET TIPS, RELOAD

The VWR reload solution allows user to simply press on the top of the stack and the empty rack will be refilled at the bottom. Packs are available non-filtered sterile and non-filtered, non-sterile.

Convenience

- Uses 1/5 the footprint as a pack of racked tips
- Inserts are easy to transfer to your empty rack, one at a time or all at once
- Clear bag and colored snapcards make tip volume identification easy

Sustainability

- Easily recyclable
- Uses ~50% less plastic than racked tips

Contamination prevention

- Resealable bag with sterilized and non-sterilized options
- Arrives hermetically sealed
- Contains no contaminating cardboard or paper



Description	Packaging	Cat. No.	Available Units
Reload, Non-Filtered Sterile			
0.1 - 20 µL	10 Racks/Pack	76322-530	Pack of 960 / Case of 4800
20 - 200 µL	10 Racks/Pack	76322-532	Pack of 960 / Case of 4800
20 - 300 µL	10 Racks/Pack	76322-534	Pack of 960 / Case of 4800
100 - 1000 µL	8 Racks/Pack	76322-180	Pack of 768 / Case of 3840
100 - 1200 µL	8 Racks/Pack	76327-212	Pack of 768 / Case of 3840
Reload, Non-Filtered Non-Sterile			
0.1 - 20 µL	10 Racks/Pack	76322-172	Pack of 960 / Case of 4800
20 - 200 µL	10 Racks/Pack	76322-174	Pack of 960 / Case of 4800
20 - 300 µL	10 Racks/Pack	76322-176	Pack of 960 / Case of 4800
100 - 1000 µL	8 Racks/Pack	76322-178	Pack of 768 / Case of 3840
100 - 1200 µL	8 Racks/Pack	76327-210	Pack of 768 / Case of 3840
Reloads, Autoclavable			
Empty Racks	10 Racks/Pack	76323-406	Pack of 10
Empty Racks	10 Racks/Pack	76323-408	Case of 40



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