

Sartorius Liquid Handling Products



■ Table of Contents

□ About Sartorius Liquid Handling

- 5 About Us
- 7 Responsible Manufacturing
- 8 Outstanding Product Quality
- 10 Ergonomics, Design and Reliability

□ Pipette Selection Guide

- 12 Electronic or Mechanical Pipette

□ Electronic Pipettes

- 17 Picus® and Picus® NxT
- 22 eLINE®
- 25 Pipette Tip Selection Guide

□ Mechanical Pipettes

- 28 Tacta®
- 32 mLINE®
- 36 Proline® Plus
- 42 Proline®
- 46 Pipette Tip Selection Guide

□ Stands & Accessories

- 50 Pipette Stands
- 51 Elbow Pad
- 52 Safe-Cone Filters
- 54 Reagent Vessel
- 54 Calibration Tool | Tube Opener & Colour-coding Caps

□ Pipette Tips

- 58 Pipette Tips
- 60 Optifit Tips
- 62 SafetySpace Filter Tips
- 63 Low Retention Tips
- 64 Packaging Options
- 66 Ordering Information

□ Maxi-volume Liquid Handling

- 72 Midi Plus Pipetting Controller
- 74 Proline® Prospenser Bottle-top Dispenser
- 75 Prospenser Bottle-top Dispenser
- 76 Biotrate Digital Burettes
- 77 Ordering Information and Performance Specifications

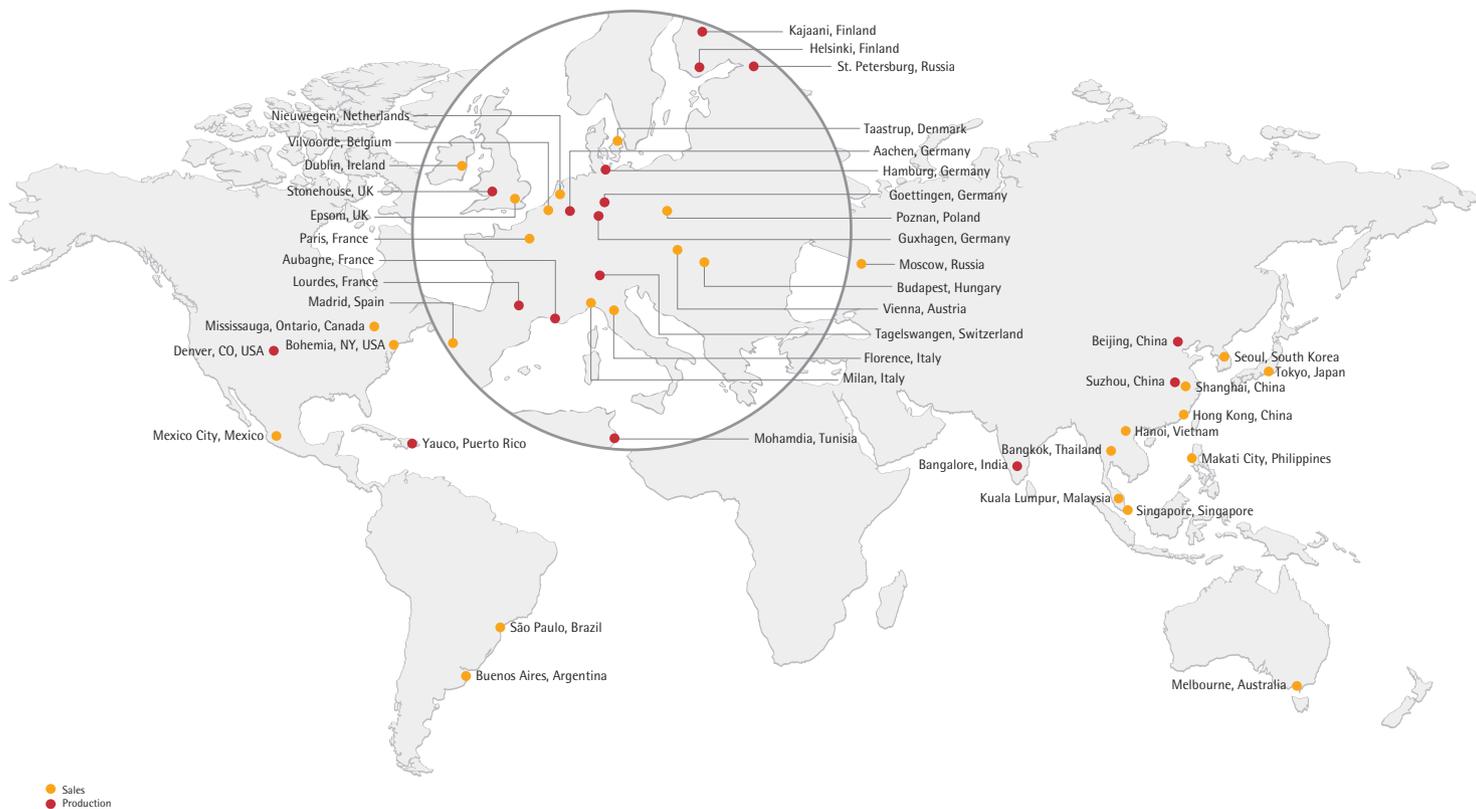
□ Pipetting Academy

- 80 Pipetting Academy
- 81 Pipetting Recommendations

□ Calibration and Maintenance Services

- 86 Pipette Calibration and Maintenance Services
- 90 Pipette Decontamination Procedure
- 91 Autoclaving Instructions
- 92 Troubleshooting Guide





■ About Us

Sartorius Liquid Handling business unit is a leading, global provider of electronic and mechanical pipettes, disposable pipette tips and related services, for pharmaceutical and chemical industry, clinical laboratories, research institutes and universities.

Known as the forerunner in developing ergonomic pipettes with user comfort and health in mind, Sartorius is a trusted supplier to laboratory professionals, who want to reduce their risk of work-related injuries. Strong technical innovations and the use of the newest technologies both in design and manufacturing ensure the highest reliability and quality of Sartorius' liquid handling products. Sartorius offers pipette maintenance, repair and calibration services globally through its certified service centres.

Sartorius' liquid handling competence center is based in Helsinki, Finland, while the products are manufactured both in Finland and in China. The sales network of Sartorius is global, covering 110 countries.

Sartorius is one of the world's leading providers of laboratory and process technologies and equipment, covering the segments of Bioprocess Solutions and Lab Products & Services. Founded in 1870, the company, based in Göttingen, Germany, currently employs more than 5 500 people around the world. Sartorius has its own production facilities in Europe, Asia and America.



■ Responsible Manufacturing



We pay particular attention to the environmental impact of our operations. We aim to minimize the environmental load of our products throughout their lifecycle.



Environmentally Friendly Design and Manufacturing

Sartorius complies with ISO 14001 environmental standards. Already at the design stage, we look into ways of reducing the usage of hazardous substances and materials. Our products are also designed to minimise waste during manufacturing and use. For example, the tip refill system reduces waste up to 61% compared to racked tips, and the FlexiBulk® tip pack up to 50%, compared to traditional bulk tip packages. We have invested in production technologies that generate less waste. We also use environmentally friendly carbon-free electricity at our production facility in Kajaani, Finland.



Recyclable Materials

The plastic materials used for the products and their packaging are suitable for use in waste-to-energy facilities. For example, the tips and the tip racks made of 100% polypropylene (PP) can be fully recycled as energy waste – PP could also be reused. The cardboard packages can be recycled (reused).



□ In Practice

- Package materials are suitable for recycling either as materials or as energy waste
- Package sizes are minimised in order to use less material and to ensure efficient logistics
- Pipette tips and racks are 100% recyclable as energy waste or as material
- Cadmium-free plastics have been used since 1994
- Cadmium-free batteries have been used since 1996
- Tacta[®], mLINE[®] and Proline[®] Plus mechanical pipettes are more than 90% recyclable as energy waste
- Electronic pipettes are WEEE | RoHS compliant, which means controlled recycling by national authorities
- Environmentally friendly carbon-free electricity is used at our production facility in Kajaani, Finland
- Minimum possible amount of paper and energy is used in our offices
- Environmentally friendly paper is used for printing

■ Outstanding Product Quality

Sartorius' products are developed and manufactured according to the requirements of the ISO 9001, ISO 13485 and ISO 14001 quality and environmental standards. Tip production also follows the ISO 14644-1 standard, in order to fulfil ISO class 8 cleanroom conditions. Our accredited pipette calibration follows the ISO 17025 standard. Our pipettes are supplied with individual quality control certificates.

We continuously develop our products and processes in order to meet, and often exceed, the demands of regulatory authorities, environmental bodies, and most importantly, our customers.



Sartorius' products are developed and manufactured according to the requirements of the ISO 9001, ISO 13485 and ISO 14001 quality and environmental standards. Tip production also abides by the ISO 14644-1 standard, in order to fulfil ISO Class 8 Cleanroom conditions. ISO 13485 is a specific standard for medical device quality systems, and supplementing the more generic ISO 9001 standard, which applies to many industries.



The Finnish national accreditation body operates independently as part of the Measurement Technology Centre (MIKES). Accredited pipette calibration laboratories in Finland, Germany, France, UK, China and Japan calibrate pipettes according to precise technical requirements. Our calibration laboratories in Finland, Germany, France, UK, China and Japan have been granted this status by their national accreditation bodies.



Sartorius offers a 2-year warranty for all mechanical and electronic pipettes. The low lifetime cost and environmental friendliness of our products, which have long warranty periods, give a high return on investment.

We follow these manufacturing quality standards

ISO 9001 · ISO 13485 · ISO 14001 · ISO 17025 · ISO 8655



The ergonomic design label indicates products, which Sartorius has designed specifically to reduce the risk of work-related hand, arm and shoulder disorders, such as Work Related Upper Limb Disorder (WRULD).



The Optiload tip loading mechanism developed by Sartorius in Tacta[®], mLINE[®], Proline[®] Plus, eLINE[®], Picus[®] and Picus[®] NxT pipettes allows tips to be loaded with constant force. This secures optimal tip sealing and minimum tip ejection force.



Every lot of Sartorius Single Tray, Refill Pack and FlexiBulk[®] tips are certified to be free of DNase, RNase and endotoxins, for the protection of samples from contamination. This certificate can be downloaded from www.sartorius.com, in the Liquid Handling section. Sartorius' tip production is ISO 8 cleanroom classified, which ensures a contamination-free manufacturing environment, and products.



Most Sartorius liquid handling products are autoclavable. Please see details in the following product specific chapters.



The Sartorius pipette is intended, designed and manufactured to dispense liquids in a variety of applications and to be used in combination with Optifit Tips or SafetySpace Filter Tips. The Sartorius pipette and tip combination, fall within the scope of in-vitro diagnostics, and can be used as a diagnostic medical device in related applications. Thereby, Sartorius pipettes and tips fulfil the relevant demands of the Directive 98/97/EC of the European Parliament.

■ Ergonomics, Design and Reliability

Three key factors – ergonomics, design and reliability – form the cornerstone of our product development. These and other factors have been combined to produce a perfectly balanced mechanical pipette, the Tacta®, the newest family member, after the Picus® NxT, which is an excellent example of all of these aspects having been combined in an electronic pipette. Both are amongst the lightest pipettes on the market, reducing the risk of WRULD. Their high reliability and ease of use make them a valued instruments for professionals, who strive for high quality results.

Thanks to their functional and well-rounded design suitable for a laboratory setting, they have both been recognised with design awards. All Sartorius Liquid Handling products are designed in Finland, where our R&D team is constantly seeking solutions to further improve liquid handling instruments to make lab life easier.



Designing products that people work with on a daily basis is always challenging. Many users are interviewed and multiple aspects need to be taken into account, to combine excellent ergonomics and easy usability with today's technology and features. To solve this puzzle and come up with a great product is an exciting, but sometimes tough, journey. However, it is always rewarding in the end."

– Ville Hintikka, Chief Designer at Sartorius

□ Ergonomics

When designing a pipette, we always consider the shape and function of the human hand. As we understand the risks of repetitive pipetting, we emphasise ergonomic design in every product we make. Simply put, this means products that you can use in a comfortable posture with minimum muscle power. Our pipettes and dispensers are designed for both right- and left-handed users. Their operating buttons are located sufficiently close together, within ergonomic reach of the thumb.

□ Design

We provide products with a timeless and light, yet practical, design, suitable for laboratory settings and pleasing to the eye of the user. Both of our premium pipettes, the Tacta® and the Picus®, won the Red Dot design award, in 2016 and 2012 respectively. Additionally, the Picus® was distinguished with the Fennia Prize Honorary Mention in 2012, as well as the German Design Award in 2014. Our other electronic pipette family, eLINE®, was given an honorary mention in the Pro Finnish Design competition at the time of its launch.



□ Reliability

For us, reliability has many aspects, the most important being the accuracy and precision of the results and the secured purity.

The core of a pipette lies in its **accuracy and precision**. For this reason, we have used the newest technologies together with in-house innovations, to achieve even more reliable pipetting results. Our electronic brake, piston control system and plate tracker for electronic pipettes are our latest innovations. They increase accuracy, precision and reliability of the device. Another important factor in achieving reliable results is the optimal tip fit, which we can guarantee by designing and producing the tips ourselves, to perfectly match our pipettes.

Because **purity** is the key concern in many laboratories, we offer special Safe-Cone Filters for our pipettes, to prevent them from being contaminated by aspirated samples. We strive to produce as many autoclavable products as possible, both pipettes and tips. Our pipette tips are manufactured in ISO Class 8 Cleanroom conditions. We test every certified tip lot for DNase, RNase and endotoxins at an external laboratory. We also offer an innovative SafetySpace Filter Tip range for safer and contamination-free pipetting.



■ Pipette Selection Guide

□ Electronic or Mechanical Pipette

Are you looking for a pipette for sterile work, or one you could easily calibrate yourself? Or are you seeking for a really light and ergonomic solution? Perhaps you need a pipette with a certain pipetting mode to speed up your work? By consulting the tables below, you can choose the instrument that best suits your needs.

Electronic or Mechanical Pipette

Features	Electronic Pipettes	Mechanical Pipettes
Highest ergonomics	✓	
Fastest pipetting	✓	
User-independent results	✓	
Multiple pipetting modes	✓	
Fully autoclavable		✓
Adjustment by user	✓ ¹	✓

1) Picus® and Picus® NxT only

Mechanical Pipettes

Features	Tacta®	mLINE®	Proline® Plus	Proline®
Most ergonomic	✓			
Ergonomic finger hook	✓	✓	✓	✓
Weight ¹	75 g	77 g	82 g	84 g
Length ¹	225 mm	240 mm	239 mm	224 mm
Volume range, single-channels	0,1 µl-10 ml	0,1 µl-10 ml	0,1 µl-10 ml	0,1 µl-5 ml
Volume range, multi-channels	0,5-300 µl	0,5-300 µl	0,5-300 µl	0,5-300 µl
Fixed-volume models			✓	✓
Pipetting force ¹	12 N	13 N	15 N	20 N
Optiject soft tip ejection	✓			
Light tip ejection		✓	✓	
Optiload spring-loaded tip cones	all models	all models	multi-channels only	
User adjustment	✓	✓	✓	✓
Optilock on/off volume lock	✓			
Volume locking	✓	✓	click stops	click stops
Big, and easy to read display	✓	✓	✓	
Weight ¹	77 g	77 g	82 g	84 g
Safe-Cone Filters (models >10 µl)	✓	✓	✓	
Filter ejector	✓	✓		
Colour-coding on pipette	✓	✓	✓	
Interchangeable coloured caps		✓	✓	
ID tags	✓	✓		
Fully autoclavable	✓	✓	✓	
Starter Kits		✓	✓	
Pipette holder with pipette	✓	✓	✓	✓
Carousel stand for 6 pipettes	✓	✓	✓	✓
Warranty for 2 years	✓	✓	✓	✓

1) 1000 µl 1-channel models

Electronic Pipettes

Features	Picus® NxT	Picus®	eLINE®
Most ergonomic	✓	✓	
Weight ¹	100 g	100 g	170 g
Length ¹	210 mm	210 mm	241 mm
Volume range, single-channels	0,2 µl-10 ml	0,2 µl-10 ml	0,1 µl-5 ml
Volume range, multi-channels	0,2 µl-1,2 ml	0,2 µl-1,2 ml	0,2 µl-1,2 ml
Language options ²	5	5	1
Pipetting modes	9	8	7
Advanced functions	7	6	3
Repeated blow-out (advanced function)	✓		
Microwell plate tracker	✓	✓	
Protocols - memory places	3		
Memory places (for storing programs)	10	10	6
Reminders	✓		
Information on service & calibration intervals		✓	
Password protection	✓		
Certificate of accredited 3-point calibration	✓		
Electronic tip ejection	✓	✓	✓
Calibration adjustment by user	✓	✓	
Hot key for stored programs	✓	✓	
Safe-Cone Filters	✓	✓	✓
Autoclavable lower parts ³	✓	✓	✓
Optiload in multi-channels	✓	✓	✓
Colour-coding on pipette	✓	✓	✓
Warranty for 2 years	✓	✓	✓

1) 300 µl 1-channel models

2) English, French, German, Chinese and Russian

3) Excluding 1200 µl multi-channel pipettes



■ Electronic Pipettes

Table of Contents

17	Picus® and Picus® NxT
22	eLINE®
25	Pipette Tip Selection Guide





 sartorius

■ Picus® and Picus® NxT Electronic Pipettes

The Most Sophisticated and Ergonomic Pipettes Ever!

The award-winning Picus® is designed to revolutionize pipetting. Being the smallest and lightest electronic pipette on the market, it eases the user's workload and provides protection from Work Related Upper Limb Disorder (WRULD). Its new generation technology, electronic brake and piston control system guarantee accurate and precise pipetting results. By guiding pipetting steps, the unique plate tracker increases reliability in microwell plate work.

These same qualities can also be found in Picus® NxT with added features for increased efficiency and safety in strictly regulated laboratories.

Picus® and Picus® NxT are available in single-channel models, covering a volume range of 0,2-10 000 µl and in multi-channel models from 0,2 µl to 1200 µl.

Superior Ergonomics

The uniquely lightweight and streamlined design of the Picus® pipettes ensures effortless pipetting experience. The comfortable handle and the finger hook enable the pipette to rest lightly in the user's hand, with minimum effort.

The conveniently located soft-touch operating button and electronic tip ejection help minimize muscle strain, further enhancing the ergonomics of the pipette.

Reliable Results

The electronic brake and piston control system guarantee accurate and precise pipetting results, independent of the user. Using the unique plate tracker increases reliability in microwell plate dispensing, by guiding the steps to pipette into the correct microplate wells.

Safe-Cone Filters, inserted in the tip cone, reduce the risk of contamination, cost-effectively.

Fast Execution of Pipetting Tasks

The unique adjustment wheel of Picus® pipettes offers extremely fast volume setting and menu navigation. The user can perform pipetting tasks quickly and easily with the extensive range of pipetting modes, from diluting and titrating to serial dispensing.

The pipetting functions are quick to learn, using the intuitive user interface, available in a choice of language options: English, French, German, Russian and Chinese.

Picus® NxT for Highly Regulated Laboratories

The following features are only available with Picus® NxT pipettes, which are especially intended to conform to the strictest laboratory regulations and requirements:

- Certificate of accredited 3-point calibration (per ISO 17025 and ISO 8655)
- Maintenance and calibration reminders alert you when service is required
- Advanced password protection for settings and pipetting protocol memory
- Possibility to lock the pipette, when its use is to be prevented, e.g. in case of contamination
- User-definable protocols speed up routine pipetting sequences
- Repeated blow-out function helps dispense every last droplet, ensuring complete sample recovery

□ Features and Benefits

Ergonomic Design for Reduced Risk of Strain Injury

- Extremely compact and light (down to only 100 g) design maximizes user comfort
- Conveniently located, soft-touch operating button and electronic tip ejection help minimize muscle strain and reduce the risk of WRULD
- Comfortable handle design and finger hook allow the pipette to rest effortlessly in hand

Innovative Technology for Reliable Results

- Enhanced DC-motor concept provides outstanding accuracy and repeatability of results
- Electronic brake stops piston movement rapidly and precisely, ensuring high precision, especially in serial dispensing
- Optical sensor controls and monitors piston movement in real time, ensuring unbeatable accuracy and reliability
- With Picus® NxT only: Repeated blow-out function helps dispense the very last droplets of liquid, ensuring complete recovery

Intuitive User-Interface for Ease of Use

- Available with five language options: English, Chinese, French, German and Russian

Comprehensive Range of Pipetting Modes for Speed of Use

- The main modes combined with the advanced functions enable fast and handy execution of various pipetting tasks



Autoclavable
lower parts



Fast charging, here with Charging Carousel



Adjustment wheel for quick single-handed operation and speed control



Safe-Cone Filters for insertion into every channel's tip cone, to prevent contamination of pipette.



Optiload for a tight fit and equal sealing on every channel's tip cone



Microwell plate tracker in use



Calibration Adjustment in use as indicated by ADJ1

Handy Adjustment Wheel for Fast and Effortless Operation

- Offers extremely fast volume setting and easy menu navigation
- Enables ergonomic one-handed operation
- Controls accurately, manual pipetting and titrating speed, with just a light touch of the thumb

Microwell Plate Tracker for Improved Efficiency and Reliability

- Unique built-in tracker for 96 and 384 well plates guides the user to pipette into the correct wells
- Improves work efficiency and reliability of results

Optiload for Perfect Tip Sealing

- Allows tip loading with an equal constant force onto every channel
- Enables perfect tip sealing onto every individual tip cone
- Is available in multi-channel models

Safe-Cone Filters to Prevent Contamination

- Are available in all models > 10 µl

Autoclavable Lower Parts for Easy Sterilisation

- Enable easy cleaning for reduced risk of contamination (excl. 1200 µl models)

Calibration Adjustment

- Enables better accuracy of the results e.g. with non-aqueous liquids (viscous, volatile)
- The adjustment can be made in 1, 2 or 3 points by the user.

Fast Charging

- Li-Polymer battery enables charging time of approx. 1 hour

□ Pipetting Modes

Picus® & Picus® NxT

Pipetting Modes	Advanced Functions*						
	Tracker	Mixing	Counter	Excess Volume Adjustment	Auto-dispensing	Repeated Blow-out**	Fast Dispensing
Pipetting	✓	✓	✓	✓		✓	
Reverse Pipetting	✓	✓		✓	✓		
Multi-dispensing	✓	✓			✓		
Manual Pipetting	✓					✓	
Diluting	✓	✓				✓	
Sequential Dispensing	✓			✓			
Multi-aspiration	✓					✓	
Titration	✓						✓
Protocols **/ ***	✓	✓		✓	✓	✓	✓

* Advanced functions are used in conjunction with the pipetting mode.

** Only available in Picus® NxT models

*** Availability of the advanced functions varies according to the pipetting mode selected for the protocol.



Ordering Information

Picus®	Picus® NxT	Channels	Volume Range (µl)	Colour-Coding	Increment (µl)	Test Volume (µl)	Systematic Error* (%)	Random Error* (%)	Safe-Cone Filters Standard	Plus
735021	LH-745021	1	0,2-10	●	0,01	10 5 1	0,90 1,00 2,50	0,40 0,70 1,50	-	-
735041	LH-745041	1	5-120	●	0,10	120 60 12	0,40 0,60 2,00	0,15 0,20 1,00	721008	721018
735061	LH-745061	1	10-300	●	0,20	300 150 30	0,40 0,60 1,50	0,15 0,20 0,80	721007	721017
735081	LH-745081	1	50-1000	●	1,00	1000 500 100	0,40 0,60 1,50	0,15 0,20 0,50	721006	721016
735101	LH-745101	1	100-5000	●	5,00	5000 2500 500	0,50 0,80 1,00	0,15 0,20 0,40	721005	721015
735111	LH-745111	1	500-10000	●	10,00	10000 5000 1000	0,60 1,20 3,00	0,20 0,30 0,60	721005	721015
735321	LH-745321	8	0,2-10	●	0,01	10 5 1	0,90 1,50 4,00	0,50 0,80 3,00	-	-
735341	LH-745341	8	5-120	●	0,10	120 60 12	0,50 0,70 2,00	0,20 0,30 1,50	721008	721018
735361	LH-745361	8	10-300	●	0,20	300 150 30	0,50 0,70 2,00	0,20 0,30 1,00	721007	721017
735391	LH-745391	8	50-1200	●	1,00	1200 600 120	0,50 1,00 2,50	0,20 0,30 1,00	721006	721016
735421	LH-745421	12	0,2-10	●	0,01	10 5 1	0,90 1,50 4,00	0,50 0,80 3,00	-	-
735441	LH-745441	12	5-120	●	0,10	120 60 12	0,50 0,70 2,00	0,20 0,30 1,50	721008	721018
735461	LH-745461	12	10-300	●	0,20	300 150 30	0,50 0,70 2,00	0,20 0,30 1,00	721007	721017
735491	LH-745491	12	50-1200	●	1,00	1200 600 120	0,50 1,00 2,50	0,20 0,30 1,00	721006	721016

* The listed systematic and random error values are valid for Pipetting (P) mode only and are achieved under strictly controlled conditions during type tests per ISO 8655. Due to the continuous product development by Sartorius, the systematic and random error values are subject to change without prior notice.

All pipettes are supplied with a universal charger (EU, UK, US | JPN, KOR, AUS and CHN plugs)

■ eLINE® Electronic Pipettes

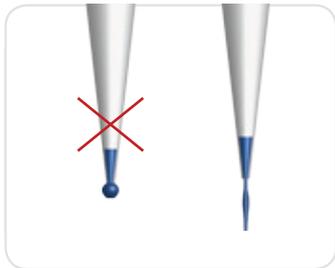
Proven Convenience, Reliability and Speed



Optiload for a tight fit and equal sealing on every channel's tip cone.



With Optiload, no rocking is needed when attaching tips.



The increased liquid dispensing speed of the eLINE® 0,1-5µl pipette with Super Pipetting feature enables liquid dispensing in the air, emptying the tip completely, without a droplet remaining.

The electronic eLINE® pipette family offers a great price-performance ratio for any user looking for a cost-effective companion for repetitive pipetting, where convenience, accuracy and speed are mission-critical.

eLINE®'s ergonomic design eases the user's workload. The fully electronic operation with electronic piston control secures accurate and precise results independent of the user.

eLINE® is available as single-channel models, covering a volume range of 0,1 to 5000 µl, and as multi-channel models from 0,2 to 1200 µl.

Convenience

Fully electronic operation minimizes the force needed to operate the pipette and the electronic tip ejection ensures light removal of tips also with multi-channel models. The ergonomic design of the handle, and

the easy-to-reach operating buttons, allow for convenient single-handed operation for both right and left-handed users. The convenient finger hook provides proper support to minimize grip force.

Reliable Results

Electronic piston control guarantees accurate and reliable pipetting results, independent of the user. The Optiload feature in multi-channel models permits tip loading with perfect tip sealing onto every tip cone for secured accuracy. Safe-Cone Filters prevent the risk of contamination cost-effectively.

Speed

The versatile pipetting modes reduce the work stages needed, enabling significantly faster liquid handling than a mechanical pipette. Electronic multi-channel models enable pipetting on microwell plates considerably faster than mechanical ones.

□ Features and Benefits

Ergonomic Design for Reduced Risk of Strain Injuries

- Conveniently located, soft-touch operating button and electronic tip ejection help minimize muscle strain and reduce the risk of repetitive strain injuries (WRULD)
- Comfortable handle design and finger hook allow the pipette to rest effortlessly in hand

Innovative Technology for Reliable Results

- Enhanced DC-motor concept provides outstanding accuracy and repeatability of the results
- Electronic brake stops piston movement rapidly and precisely, ensuring high precision, especially in serial dispensing
- Optical sensor controls and monitors piston movement in real time, ensuring unbeatable accuracy and reliability

Wide Selection of Pipetting Modes for Speed of Use

- The 7 pipetting modes enable fast and handy execution of various pipetting tasks

Optiload for Perfect Tip Sealing

- Allows tip loading with an equal constant force onto every channel
- Enables perfect tip sealing onto every individual tip cone
- Is available in multi-channel models

Safe-Cone Filters to Prevent Contamination

- Are available in all models > 10 µl

Autoclavable Lower Parts for Easy Sterilisation

- Enable easy cleaning for reduced risk of contamination (excl. 1200 µl models)



□ Pipetting Modes

Pipetting Modes	Advanced Functions		
	Mixing	Counter	Auto-dispensing (Timed)
Pipetting	✓	✓	✓
Reverse Pipetting	✓		
Manual Pipetting ¹	✓		
Multi-dispensing	✓		✓
Diluting	✓	✓	
Sequential Dispensing ²	✓		
Multi-aspirating	✓		
Super Pipetting	✓	Only available in eLINE® 0,1-5 µl	

1) Not available in eLINE® multi-channel pipettes

2) Not available in eLINE® 0,1-5 µl



Autoclavable
lower parts

Ordering Information

eLINE®

Order Code	Channels	Volume Range (µl)	Colour-Coding	Increment (µl)	Test Volume (µl)	Systematic Error* (%)	Random Error* (%)	Safe-Cone Standard	Filters Plus
730011	1	0,1-5	●	0,05	5	1,20	0,70	-	-
					2,5	2,00	1,20		
					0,5	12,00	8,00		
730021	1	0,2-10	●	0,05	10	1,00	0,40	-	-
					5	1,40	0,70		
					1	4,00	2,30		
730041	1	5-120	●	0,50	120	0,60	0,20	721008	721018
					60	0,90	0,20		
					12	3,00	1,00		
730061	1	10-300	●	1,00	300	0,60	0,15	721007	721017
					150	0,60	0,20		
					30	1,50	0,80		
730081	1	50-1000	●	5,00	1000	0,40	0,15	721006	721016
					500	0,60	0,20		
					100	1,60	0,50		
730101**	1	100-5000	●	10,0	5000	0,50	0,17	721006	721016
					2500	0,80	0,20		
					500	1,60	0,40		
730321	8	0,2-10	●	0,05	10	0,90	0,60	-	-
					5	1,50	0,90		
					1	4,00	3,50		
730341	8	5-120	●	0,50	120	0,80	0,30	721008	721018
					60	0,80	0,35		
					12	3,00	1,50		
730361	8	10-300	●	1,00	300	0,70	0,20	721007	721017
					150	0,90	0,30		
					30	3,00	1,20		
730391	8	50-1200	●	5,00	1200	0,90	0,30	721006	721016
					600	1,20	0,30		
					120	2,50	0,80		
730421	12	0,2-10	●	0,05	10	0,90	0,60	-	-
					5	1,50	0,90		
					1	4,00	3,50		
730441	12	5-120	●	0,50	120	0,80	0,30	721008	721018
					60	0,80	0,35		
					12	3,00	1,50		
730461	12	10-300	●	1,00	300	0,70	0,20	721007	721017
					150	0,90	0,30		
					30	3,00	1,20		
730491	12	50-1200	●	5,00	1200	0,90	0,30	721006	721016
					600	1,20	0,30		
					120	2,50	0,80		

All pipettes are supplied with a universal charger (EU, UK, US | JPN, AUS, KOR and CHN plugs)

* The listed systematic and random error values are valid for Pipetting (P) mode only and are achieved under strictly controlled conditions during type tests per ISO 8655. Due to the continuous product development by Sartorius, the systematic and random error values are subject to change without prior notice.

** Note: Minimum volume in P-mode is 500 µl. 100 µl is possible in multi-dispensing (d) mode.

Pipette Tip Selection Guide

The best compatibility is achieved when combining Sartorius pipettes and Sartorius tips. The systematic error and random error results, in tests, have been achieved using the listed Sartorius tips and pipettes.

Electronic Pipettes			Optifit Tips, Non-filter*										SafetySpace Filter Tips*							
Colour Code	Volume Range (µl)		10	10 Ext**	200	350	1000	1000 WB	1200	1200 Ext	5000	10 000	10	10 Ext**	20	120	200	300	1000	1200
Picus® & Picus® NxT 1-channel	● 0,2-10		●	●									●	●						
	● 5-120				●	●										●	●			
	● 10-300					●												●		
	● 50-1000						●	●												●
	● 100-5000										●									
	● 500-10000											●								
Picus® & Picus® NxT 8-channel	● 0,2-10		●	●									●	●						
	● 5-120				●	●										●				
	● 10-300					●												●		
	● 50-1200								●	●										●
Picus® & Picus® NxT 12-channel	● 0,2-10		●	●									●	●						
	● 5-120				●	●										●				
	● 10-300					●												●		
	● 50-1200								●	●										●
eLINE® 1-channel	● 0,1-5		●	●									●	●						
	● 0,2-10		●	●									●	●						
	● 5-120				●	●										●				
	● 10-300					●												●		
	● 50-1000						●	●												●
	● 100-5000										●									
eLINE® 8-channel	● 0,2-10		●	●									●	●						
	● 5-120				●	●										●				
	● 10-300					●												●		
	● 50-1200								●	●										●
eLINE® 12-channel	● 0,2-10		●	●									●	●						
	● 5-120				●	●										●				
	● 10-300					●												●		
	● 50-1200								●	●										●

* Note: Low Retention Tips are available in volumes up to 1200 µl.

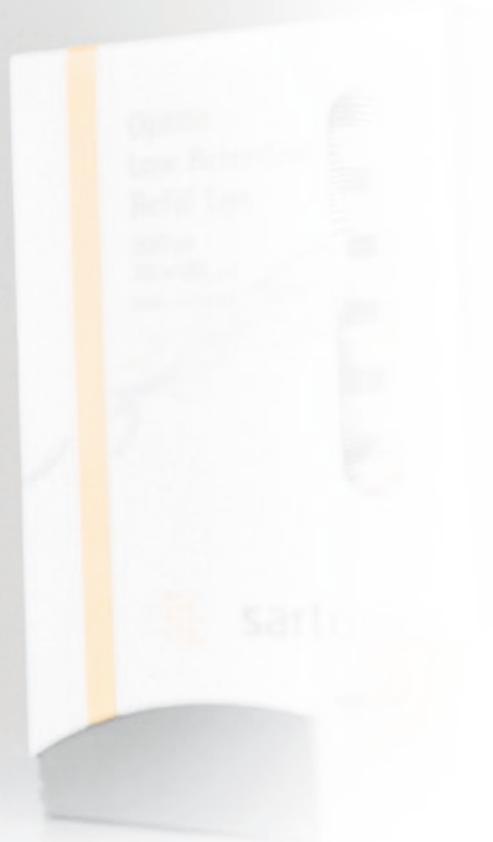
** Filter tip with regular air gap. The 10 µl Extended tip's systematic error and random error results, in tests, deviated slightly from those of the 10 µl tip



■ Mechanical Pipettes

Table of Contents

28	Tacta®
32	mLINE®
36	Proline® Plus
42	Proline®
46	Pipette Tip Selection Guide



■ Tacta® Mechanical Pipettes

Perfectly Balanced



Tacta's Optilock feature helps to prevent accidental volume changes during pipetting.



Easy adjustment ensures accurate results with a variety of liquids. The handy adjustment key is included in the package.



Unique to Tacta®, is its Safe-Cone Filter ejector, which enables the removal of used filters without tweezers or human contact with contaminated filters.

Have you ever considered the overall user experience in pipetting? We have.

Sartorius proudly presents Tacta®, the new premium mechanical pipette with superb comfort and reliability. Tacta® makes pipetting effortless and safe, while producing accurate and reliable results time after time.

At Sartorius, we listened to our customers and combined their views with our extensive experience, and state-of-the-art R&D, to create the exceptionally balanced design of Tacta®. Tacta® is designed to feel great in your hand, and it is easy and comfortable to use. All materials used for Tacta® have been carefully selected, and each component is designed to meet the highest standards.

Superior Ergonomics

Tacta® rests lightly in your hand thanks to its ergonomically designed handle and finger hook. Tacta® is effortless to use and exceptionally comfortable to hold. Tacta® eases your workload and protects you from strain, even when you pipette for extended periods of your working day. The unique handle and finger hook design lets the pipette rest lightly in your hand, with no need to grip the handle tightly. Tacta® is effortless to use and exceptionally comfortable to hold. Tacta® eases your workload and protects you from strain, even when you pipette for extended periods of your working day. The unique handle and finger hook design lets the pipette rest lightly in your hand, with no need to grip the handle tightly.

Low Pipetting, Tip Loading and Ejection Forces

The forces needed for a pipetting cycle, from tip attachment to pipetting and finally tip ejection, are exceptionally low with Tacta®, protecting you from WRULD. The Optiload feature, with spring-loaded tip cones in both the single and multichannel models, secures tip loading with perfect sealing and minimal force. Consequently, Optiload also ensures light tip ejection to protect your hand. The light tip ejection is further enhanced by Sartorius Optijet, the soft, levered tip ejection feature that lets the tip detach in a smooth, controlled way with little force.

Large, Clear Display

The large, easy-to-read display helps you to see all four digits of the set volume from a distance without straining your eyes. The volume is easy to read even when the pipette is angled – eliminating the need to turn your head into an uncomfortable position.

Adjustment

Tacta® is very easy to adjust, for various types of liquids, using a simple adjustment key. The adjustment scale shows the degree of adjustment. By noting this value for a specific liquid, you can return to that setting any time. Easy calibration adjustment ensures accurate results with a variety of liquids.

Volume Adjustment

Use the Sartorius Optilock feature to prevent accidental volume changes during pipetting. Either hold down the volume lock button with one hand and adjust the volume with the

other, then release to lock, or with just one hand, slide the volume lock up, adjust the volume and slide down to lock again. The choice is in your hands.

Safe-Cone Filters

The exchangeable Safe-Cone Filters, used in pipette tip cones, act as barriers to prevent sample aerosols and fluids from contaminating

the internal components of the pipette. The unique Safe-Cone Filter ejector enables the removal of used filters without human contact with contaminated filters. Safe-Cone Filters are available for all Tacta® models greater than 10 µl and offer a cost-effective method to reduce contamination. Filters should be changed regularly, and always after over-aspiration.

Easy Cleaning

Tacta® is the quickest and easiest pipette, on the market, to clean, with only three parts to be disassembled for cleaning and no tools are needed for disassembly. Tacta® can also be steam-sterilized or autoclaved as-is, without disassembly. It has also high UV and chemical resistance.



□ Features and Benefits

Feel the Comfort

- Comfortable to hold due to the ergonomically designed handle
- Low pipetting and tip ejection forces that reduce the risk of Work Related Upper Limb Disorder (WRULD)
- Controlled and smooth tip ejection with the new Sartorius Optiject technology

- The unique Sartorius Optilock system provides flexibility for volume adjustment and locking

Achieve Reliable Results

- Reliable results, even over lengthy pipetting periods
- Calibration adjustment to provide accurate results for various liquid types

- 4-digit display for accurate and easy volume setting

Safe from Contamination

- Safe-Cone Filters provide cost-effective contamination prevention
- Easy to clean, with only three parts to disassemble
- Fully autoclavable

Ordering Information

Tacta®

Order Code	Channels	Volume Range (µl)	Colour-Coding	Increment (µl)	Test Volume (µl)	Systematic Error* (%)	Random Error* (%)	Safe-Cone Standard	Filters Plus
LH-729010	1	0,1-3	●	0,002	3 1,5 0,3	1,30 2,40 10,00	0,80 1,60 6,00	-	-
LH-729020	1	0,5-10	●	0,01	10 5 1	1,00 1,50 2,50	0,60 1,00 1,50	-	-
LH-729030	1	2-20	●	0,02	20 10 2	0,90 1,20 3,00	0,40 1,00 2,00	721014	-
LH-729050	1	10-100	●	0,10	100 50 10	0,80 1,00 2,00	0,15 0,40 1,00	721008	721018
LH-729060	1	20-200	●	0,20	200 100 20	0,60 0,80 2,30	0,15 0,30 0,90	721007	721017
LH-729070	1	100-1000	●	1,00	1000 500 100	0,70 0,70 2,00	0,20 0,20 0,50	721006	721016
LH-729080	1	500-5000	●	10,0	5000 2500 500	0,50 0,60 2,00	0,20 0,30 0,60	721005	721015
LH-729090	1	1000-10000	●	20,0	10000 5000 1000	0,60 1,20 3,00	0,20 0,30 0,60	721005	721015
LH-729120	8	0,5-10	●	0,01	10 5 1	1,50 2,50 4,00	1,00 2,50 4,00	-	-
LH-729130	8	5-100	●	0,10	100 50 10	0,70 1,00 3,00	0,25 0,70 1,50	721008	721018
LH-729140	8	30-300	●	0,20	300 150 30	0,60 1,00 2,00	0,25 0,50 1,00	721007	721017
LH-729220	12	0,5-10	●	0,01	10 5 1	1,50 2,50 4,00	1,00 2,50 4,00	-	-
LH-729230	12	5-100	●	0,10	100 50 10	0,70 1,00 3,00	0,25 0,70 1,50	721008	721018
LH-729240	12	30-300	●	0,20	300 150 30	0,60 1,00 2,00	0,25 0,50 1,00	721007	721017

* The listed systematic and random error values have been achieved under strictly controlled conditions during type tests per ISO 8655. Due to continuous product development by Sartorius, the systematic and random error values are subject to change without prior notice.

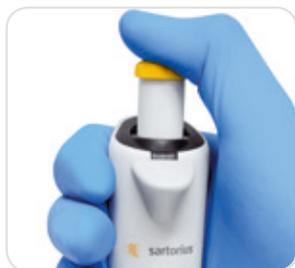


Fully autoclavable



■ mLINE® Mechanical Pipettes

Effortless Accuracy



mLINE®'s low pipetting forces protect laboratory workers from injury.



Optiload secures even tip sealing onto every individual tip cone, and allows tips to be loaded and ejected with minimum force.



Safe-Cone Filters protect the pipette from contamination, and should be changed regularly.

Sartorius' mechanical pipette family – the mLINE® – offers excellent ergonomics, performance and safety in manual pipetting. It is designed to maintain high accuracy and precision in repetitive and long-lasting manual pipetting. Its excellent ergonomics minimize the risk of work related hand, arm and shoulder disorders and Work Related Upper Limb Disorder (WRULD).

It covers the full volume range of 0.1 µl to 10 ml and is available in single- and multi-channel models.

Excellent Ergonomics with Low Pipetting Forces

Excellent ergonomics and low pipetting forces protect laboratory workers from injury. mLINE® has exceptionally light pipetting and tip ejection forces due to its patented spring mechanism. The light pipetting force improves pipetting precision in long pipetting series.

The starting forces in mLINE® pipettes are always constant, regardless of the set volume. This improves pipetting results especially for small volumes.

Optiload- Loading Tips with Minimum Force

mLINE® pipettes have spring-loaded tip cones – the Optiload mechanism – on both single and multi-channel models. Optiload secures even tip sealing onto every individual tip cone, and allows tips to be loaded and ejected with minimum force. This is an advantage especially when working with multi-channel models that otherwise would require more force for tip loading and ejection than a single-channel model.

Safe-Cone Filters Protect the Pipette

The replaceable Safe-Cone Filter located inside the tip-cone prevents aerosols and fluids from penetrating the pipette, also in cases of over-aspiration. The use of Safe-Cone Filters lengthens the maintenance interval of the pipette.

Safe-Cone Filters are available for all mLINE® models greater than 10 µl. They must be replaced regularly, and always in cases of over-aspiration. Safe-Cone Filters can easily and safely be ejected by removing the colour cap and pressing down the operating button.



□ Features and Benefits

- Low pipetting forces that prevent WRULD and improve results in long pipetting series
- Ergonomic finger support minimizes the grip force needed to hold the pipette
- Optiload mechanism in both single- and multi-channel models for easy and light tip loading with perfect tip sealing
- Single and multi-channel models
- Volume adjustment locking for preventing accidental volume changes
- Easy-to-read volume display
- Colour-coding of volumes to ease the selection of corresponding pipette tips
- Safe-Cone Filters available for models > 10 µl with convenient filter ejection mechanism
- Fully autoclavable without disassembly
- Simple to clean and maintain with only three parts to disassemble
- Easy user adjustment e.g. for different liquids
- Materials have high chemical and UV-resistance to ensure a long life span for the pipette



Ordering Information

mLINE®

Order Code	Channels	Volume Range (µl)	Colour-Coding	Increment (µl)	Test Volume (µl)	Systematic Error* (%)	Random Error* (%)	Safe-Cone Standard	Filters Plus
725010	1	0,1-3	●	0,002	3	1,30	0,80	-	-
					1,5	2,40	1,60		
					0,3	10,00	6,00		
725020	1	0,5-10	●	0,01	10	1,00	0,60	-	-
					5	1,50	1,00		
					1	2,50	1,50		
725030	1	2-20	●	0,02	20	0,90	0,40	721014	-
					10	1,20	1,00		
					2	3,00	2,00		
725050	1	10-100	●	0,10	100	0,80	0,15	721008	721018
					50	1,00	0,40		
					10	2,00	1,00		
725060	1	20-200	●	0,20	200	0,60	0,15	721007	721017
					100	0,80	0,30		
					20	2,30	0,90		
725070	1	100-1000	●	1,00	1000	0,70	0,20	721006	721016
					500	0,70	0,20		
					100	2,00	0,50		
725080	1	500-5000	●	10,0	5000	0,50	0,20	721005	721015
					2500	0,60	0,30		
					500	2,00	0,60		
725090	1	1-10 ml	●	20,0	10000	0,60	0,20	721005	721015
					5000	1,20	0,30		
					1000	3,00	0,60		
725120	8	0,5-10	●	0,01	10	1,50	1,00	-	-
					5	2,50	2,50		
					1	4,00	4,00		
725130	8	5-100	●	0,10	100	0,70	0,25	721008	721018
					50	1,00	0,70		
					10	3,00	1,50		
725140	8	30-300	●	0,20	300	0,60	0,25	721007	721017
					150	1,00	0,50		
					30	2,00	1,00		
725220	12	0,5-10	●	0,01	10	1,50	1,00	-	-
					5	2,50	2,50		
					1	4,00	4,00		
725230	12	5-100	●	0,10	100	0,70	0,25	721008	721018
					50	1,00	0,70		
					10	3,00	1,50		
725240	12	30-300	●	0,20	300	0,60	0,25	721007	721017
					150	1,00	0,50		
					30	2,00	1,00		

* The listed systematic and random error values have been achieved under strictly controlled conditions during type tests per ISO 8655. Due to continuous product development by Sartorius, the systematic and random error values are subject to change without prior notice.



mLINE® Multipacks come with a linear stand.



mLINE® Multipacks include matching tips in single tray racks.



mLINE® Pipette 5-pack



mLINE® Pipette 3-pack 20

□ mLINE® Multipacks

mLINE® Multipacks offer a set of our premium mechanical pipettes in an affordable package, where a Linear Stand and racks of matching tips are included.

The Multipacks allow the affordable renewal of existing pipettes, or to set up new workstations, with a set of highly ergonomic pipettes with excellent accuracy and precision.

□ Ordering Information

Order Code	Item
LH-725661	mLINE® Pipette 3-pack 10 - mLINE® pipettes: 0,5-10 µl, 10-100 µl and 100-1000 µl - Linear Stand - Matching Optifit Tip Single Tray rack (96 tips)
LH-725662	mLINE® Pipette 3-pack 20 - mLINE® pipettes: 2-20 µl, 20-200 µl and 100-1000 µl - Linear Stand - Matching Optifit Tip Single Tray rack (96 tips)
LH-725663	mLINE® Pipette 4-pack - mLINE® pipettes: 0,5-10 µl, 10-100 µl, 20-200 µl and 100-1000 µl - Linear Stand - Matching Optifit Tip Single Tray rack (96 tips)
LH-725664	mLINE® Pipette 5-pack - mLINE® pipettes: 2-20 µl, 10-100 µl, 20-200 µl, 100-1000 µl and 500-5000 µl - Linear Stand - Matching Optifit Tip Single Tray rack (96 tips)
LH-725665	mLINE® Pipette 3+1 -pack - mLINE® pipettes: 0,5-10 µl, 20-200 µl, 100-1000 µl and 8-channel 30-300 µl - Linear Stand - Matching Optifit Tip Single Tray rack (96 tips)

■ Proline® Plus Mechanical Pipettes

Dependable Durability



Proline® Plus has a comfortable handle and an ergonomic finger support for effortless pipetting.



Safe-Cone Filters protect the pipette from contamination, and should be changed regularly.



Proline® Plus pipettes have only three parts that need cleaning and maintenance.

Sartorius' mechanical pipette Proline® Plus is designed to offer comfort and quality to manual pipetting. While it shares many of the excellent features of mLINE®, it has a personal design and a robust feel for heavier use. In addition, it has the widest pipette range, including fixed volume pipettes, for when volumes need to be ready-set to avoid errors. Proline® Plus pipettes are an excellent choice for both experienced laboratory professionals and students.

Ergonomic Design

Proline® Plus has low pipetting forces, a comfortable handle and an ergonomic finger support for effortless pipetting. Good fit in hand minimizes the grip force needed to hold the pipette, thereby reducing the risk of strain injury.

Loading Tips on Multi-channel Pipettes with Minimum Force

Loading and ejecting tips with multi-channel pipettes requires relatively high forces. Proline® Plus multi-channel pipettes have spring loaded tip cones – the Optiload mechanism.

Optiload allows tips to be loaded and ejected with minimum force, which reduces the risk of hand injuries. Moreover, it secures even tip sealing onto every individual tip cone.

Protect the Pipette with Safe-Cone Filters

The replaceable Safe-Cone Filter located inside the tip-cone prevents aerosols and fluids from penetrating the pipette, also in case of over-aspiration. The use of Safe-Cone Filters lengthens the maintenance interval of the pipette. Safe-Cone Filters are available for all Proline® Plus models greater than 10 µl. They must be replaced regularly, and always in case of over-aspiration.

Easy Maintenance and Adjustment

No opening tools are needed for cleaning and maintaining Proline® Plus pipettes, and only three parts need to be cleaned. These pipettes are also easy to adjust using the adjustment tool that is provided with the pipette.



□ Features and Benefits

- Low pipetting forces that prevent WRULD and improve results in long pipetting series
- Ergonomic finger support minimizes the grip force needed to hold the pipette
- Optiload mechanism in multi-channel models for easy and light tip loading with perfect tip sealing
- Wide variety of adjustable single and multi-channel models as well as fixed single-channel models
- Volume range from 3 µl (5 µl for fixed) to 10 ml
- Easy volume setting with click stop mechanism
- Easy-to-read volume display
- Colour-coding of different volumes to ease the selection of matching pipette tips
- Safe-Cone Filters available for models > 10 µl
- Fully autoclavable without disassembly
- Simple to clean and maintain with only three parts to disassemble
- Easy user adjustment e.g. for different liquids
- Materials have high chemical and UV-resistance to secure long lifetime of the pipette



Ordering Information

Proline® Plus

Order Code	Channels	Volume Range (µl)	Colour-Coding	Increment (µl)	Test Volume (µl)	Systematic Error* (%)	Random Error* (%)	Safe-Cone Filters	
								Standard	Plus
728010	1	0,1 – 3	●	0,002	3	1,30	0,80	-	-
					1,5	2,40	1,60		
					0,3	10,00	6,00		
728020	1	0,5 – 10	●	0,01	10	1,00	0,60	-	-
					5	1,50	1,00		
					1	2,50	1,50		
728030	1	2 – 20	●	0,02	20	0,90	0,40	721014	-
					10	1,20	1,00		
					2	3,00	2,00		
728040	1	5 – 50	●	0,10	50	1,00	0,30	721008	721018
					25	1,40	0,50		
					5	3,00	1,50		
728050	1	10 – 100	●	0,10	100	0,80	0,15	721008	721018
					50	1,00	0,40		
					10	2,00	1,00		
728060	1	20 – 200	●	0,20	200	0,60	0,15	721007	721017
					100	0,80	0,30		
					20	2,30	0,90		
728070	1	100 – 1000	●	1,00	1000	0,70	0,20	721006	721016
					500	0,70	0,20		
					100	2,00	0,50		
728080	1	500 – 5000	●	10,0	5000	0,50	0,20	721005	721015
					2500	0,60	0,30		
					500	2,00	0,60		
728090	1	1 – 10 ml	●	20,0	10000	0,60	0,20	721005	721015
					5000	1,20	0,30		
					1000	3,00	0,60		
728120	8	0,5 – 10	●	0,01	10	1,50	1,00	-	-
					5	2,50	2,50		
					1	4,00	4,00		
728130	8	10 – 100	●	0,10	100	0,70	0,25	721008	721018
					50	1,00	0,70		
					10	3,00	1,50		
728140	8	30 – 300	●	0,20	300	0,60	0,25	721007	721017
					150	1,00	0,50		
					30	2,00	1,00		
728220	12	0,5 – 10	●	0,01	10	1,50	1,00	-	-
					5	2,50	2,50		
					1	4,00	4,00		
728230	12	10 – 100	●	0,10	100	0,70	0,25	721008	721018
					50	1,00	0,70		
					10	3,00	1,50		
728240	12	30 – 300	●	0,20	300	0,60	0,25	721007	721017
					150	1,00	0,50		
					30	2,00	1,00		

* The listed systematic and random error values have been achieved under strictly controlled conditions during type tests per ISO 8655. Due to continuous product development by Sartorius, the systematic and random error values are subject to change without prior notice.

□ Ordering Information

Proline® Plus FIXED Volume, Single-Channel

Order Code	Channels	Volume (µl)	Colour-Coding	Test Volume (µl)	Systematic Error* (%)	Random Error* (%)	Safe-Cone Standard	Filters Plus
728515	1	5	●	5	1,30	1,20	-	-
728520	1	10	●	10	0,80	0,80	-	-
728530	1	20	●	20	0,60	0,50	721014	-
728535	1	25	●	25	0,50	0,30	721008	721018
728545	1	50	●	50	0,50	0,30	721008	721018
728550	1	100	●	100	0,50	0,30	721008	721018
728560	1	200	●	200	0,40	0,20	721007	721017
728565	1	250	●	250	0,40	0,20	721006	721016
728567	1	500	●	500	0,30	0,20	721006	721016
728570	1	1000	●	1000	0,30	0,20	721006	721016
728575	1	2000	●	2000	0,30	0,15	721005	721015
728580	1	5000	●	5000	0,30	0,15	721005	721015
728590	1	10 ml	●	10000	0,60	0,20	721005	721015

* The listed systematic and random error values have been achieved under strictly controlled conditions during type tests per ISO 8655.

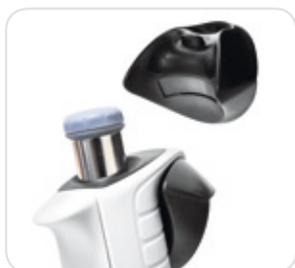
Due to the continuous product development by Sartorius, the systematic and random error values are subject to change without prior notice.



The Proline® Plus 5-Pack comes with a Carousel Stand



The Proline® Plus Starter Kits and 5-Pack include matching tips in single tray racks.



Pipette Holder



Calibration Tool or Tube Opener

□ Proline® Plus Starter Kits and 5-Pack

Proline® Plus Starter Kit offers an opportunity to test and get started with Proline® Plus. You can choose between four Starter Kits, with two or three single-channel Proline® Plus pipettes. All kits include a range of useful accessories, such as a pipette holder, and calibration tool that also acts as a tube opener.

The Proline® Plus 5-Pack is an affordable choice for renewing mechanical pipettes or setting up new workstations. The pack includes five pipettes, a Carousel Stand, 200 µl Optifit Tips (11 x 96 tips) and an Elbow Pad – all ready for work to begin.

□ Ordering Information

Proline® Plus Starter Kits and 5-Pack

Order Code	Item
728650	Proline® Plus Starter Kit 1 - Proline® Plus pipettes: 0,1-3 µl and 0,5-10 µl - Matching Optifit Tip Single Tray rack (96 tips) - Pipette Holder x 2 - Calibration Tool Tube Opener x 2
728651	Proline® Plus Starter Kit 2 - Proline® Plus pipettes: 0,5-10 µl, 10-100 µl and 100-1000 µl - Matching Optifit Tip Single Tray rack (96 tips) - Pipette Holder x 3 - Calibration Tool Tube Opener x 3
728652	Proline® Plus Starter Kit 3 - Proline® Plus pipettes: 2-20 µl, 20-200 µl and 100 1000 µl - Matching Optifit Tip Single Tray rack (96 tips) - Pipette Holder x 3 - Calibration Tool Tube Opener x 3
728653	Proline® Plus Starter Kit 4 - Proline Plus pipettes: 500-5000 µl and 1000-10000 µl - Matching Optifit Tips: 5 ml Bulk (100 tips), 10 ml Bulk (50 tips) - Pipette Holder x 2 - Calibration Tool Tube Opener x 2
LH-728654	Proline® Plus 5-Pack - Proline Plus pipettes: 0,5-10 µl, 10-100 µl, 20-200 µl, 100-1000 µl and 500-5000 µl - Carousel Stand - Elbow Pad - Matching Optifit Tip Single Tray rack (96 tips), and Refill Tower (10 x 96 tips)



■ Proline® Mechanical Pipettes

Affordable Reliability

The fact that Proline®, our first mechanical pipette, is still in use in many laboratories by over 200 000 users, testifies to its timeless, practical design and reliability. Being the most affordable pipette in Sartorius' range of mechanical pipettes, it is ideal for universities and colleges, or any laboratory seeking a cost-efficient liquid handling tool.

Due to its relatively light weight, high accuracy and precision, it is also used by many professionals.

Proline® can be used with many universal tip brands and the range includes also fixed volume models, which makes it a flexible tool for various laboratories.

□ Features and Benefits

- Wide range of pipettes, both adjustable and fixed volume
- Volume range from 2,5 µl (5 µl for fixed) to 5 ml
- Easy volume setting with click stop mechanism
- Safe-Cone Filters available for models > 10 µl
- User adjustment e.g. for different liquids





□ Ordering Information

Proline®

Order Code	Channels	Volume Range (µl)	Colour-Coding	Increment (µl)	Test Volume (µl)	Systematic Error* (%)	Random Error* (%)	Safe-Cone Filters Standard	Plus
720010	1	0,1 – 2,5	●	0,05	2,5 1,25 0,25	2,50 3,00 12,00	2,00 3,00 6,00	-	-
720015	1	0,5 – 10	●	0,10	10 5 1	1,00 1,50 2,50	0,80 1,50 1,50	-	-
720080	1	2 – 20	●	0,50	20 10 2	0,90 1,20 3,00	0,40 1,00 2,00	721008	721018
720025	1	5 – 50	●	0,50	50 25 5	0,60 0,90 2,00	0,30 0,60 2,00	721008	721018
720050	1	10 – 100	●	1,00	100 50 10	0,80 1,00 3,00	0,20 0,40 1,00	721007	721017
720070	1	20 – 200	●	1,00	200 100 20	0,60 0,80 2,50	0,20 0,30 0,80	721007	721017
720060	1	100 – 1000	●	5,00	1000 500 100	0,60 0,70 2,00	0,20 0,25 0,70	721006	721016
720110	1	1000 – 5000	●	50,0	5000 2500 1000	0,50 0,60 0,70	0,20 0,30 0,30	721005	721015
720210	8	0,5 – 10	●	0,10	10 5 1	1,50 2,50 4,00	1,50 2,50 4,00	-	-
720220	8	5 – 50	●	0,50	50 25 5	1,00 1,50 3,00	0,50 1,00 2,00	721014	-
720240	8	50 – 300	●	5,00	300 150 50	0,70 1,00 1,50	0,25 0,50 0,80	721014	-
720310	12	0,5 – 10	●	0,10	10 5 1	1,50 2,50 4,00	1,50 2,50 4,00	-	-
720320	12	5 – 50	●	0,50	50 25 5	1,00 1,50 3,00	0,50 1,00 2,00	721014	-
720340	12	50 – 300	●	5,00	300 150 50	0,70 1,00 1,50	0,25 0,50 0,80	721014	-

* The listed systematic and random error values have been achieved under strictly controlled conditions during type tests per ISO 8655. Due continuous product development by Sartorius, the systematic and random error values may change without prior notice.

□ Ordering Information

Proline® FIXED Volume

Order Code	Channels	Volume (µl)	Colour-Coding	Test Volume (µl)	Systematic Error* (%)	Random Error* (%)	Safe-Cone Standard	Filters Plus
722001	1	5	●	5	1,30	1,20	-	-
722004	1	10	●	10	0,80	0,80	-	-
722010	1	20	●	20	0,60	0,50	721008	721018
722015	1	25	●	25	0,50	0,30	721008	721018
722020	1	50	●	50	0,50	0,30	721008	721018
722025	1	100	●	100	0,50	0,30	721007	721017
722030	1	200	●	200	0,40	0,20	721007	721017
722035	1	250	●	250	0,40	0,20	721006	721016
722040	1	500	●	500	0,30	0,20	721006	721016
722045	1	1000	●	1000	0,30	0,20	721006	721016
722050	1	2000	●	2000	0,30	0,15	721005	721015
722055	1	5000	●	5000	0,30	0,15	721005	721015

* The listed systematic and random error values have been achieved under strictly controlled conditions during type tests per ISO 8655.

Due to continuous product development by Sartorius, the systematic and random error values are subject to change without prior notice.

Pipette Tip Selection Guide

The best compatibility is achieved when combining Sartorius pipettes and Sartorius tips. The systematic error and random error results, in tests, have been achieved using the listed Sartorius tips and pipettes.

Mechanical Pipettes			Optifit Tips, Non-filter*							SafetySpace Filter Tips*						
			10	10 Ext**	200	350	1000	1000 WB	5000	10 000	10	10 Ext**	20	120	200	300
	Colour Code	µl														
Tacta® & mLINE® 1-channel	●	0,1-3	●	●							●	●				
	●	0,5-10	●	●							●	●				
	●	2-20			●								●			
	●	10-100			●	●							●			
	●	20-200			●	●								●	●	
	●	100-1000					●	●								●
	●	500-5000							●							
	●	1-10 ml								●						
Tacta® & mLINE® 8-channel	●	0,5-10	●	●							●	●				
	●	5-100			●	●							●			
	●	30-300				●									●	
Tacta® & mLINE® 12-channel	●	0,5-10	●	●							●	●				
	●	5-100			●	●							●			
	●	30-300				●									●	
Proline® Plus 1-channel	●	0,1-3	●	●							●	●				
	●	0,5-10	●	●							●	●				
	●	2-20			●								●			
	●	5-50			●								●			
	●	10-100			●	●							●			
	●	20-200			●	●								●	●	
	●	100-1000					●	●								●
	●	500-5000							●							
●	1-10 ml								●							
Proline® Plus 8-channel	●	0,5-10	●	●							●	●				
	●	10-100			●	●							●			
	●	30-300				●									●	
Proline® Plus 12-channel	●	0,5-10	●	●							●	●				
	●	10-100			●	●							●			
	●	30-300				●									●	

* Note: Low Retention Tips are available in volumes up to 1200 µl.

** Filter tip with regular air gap. The 10 µl Extended tip's systematic error and random error results, in tests, deviated slightly from those of the 10 µl tip.



■ Stands & Accessories

Table of Contents

50	Pipette Stands
51	Elbow Pad
52	Safe-Cone Filters
54	Reagent Vessel
54	Calibration Tool Tube Opener & Colour-coding Caps

■ Pipette Stands



Charging Carousel Stand



Charging Stand



Linear Stand (non-charging)



Carousel Stand
(non-charging)

When the pipette is not in use, it should be stored in an upright position in order to avoid contamination from work surfaces. Sartorius provides stands for all of its pipettes. It is recommended that electronic pipettes be stored and charged on a charging stand whenever they are not in use. In this way, their batteries always remain charged for when work begins.

Compact carousel stands are ideal for saving bench space. There is one for

mechanical pipettes, and a charging carousel stand for electronic pipettes.

The Linear Stand is designed for all Sartorius mechanical and electronic pipettes. This stand is also compatible with a wide range of other pipette makes.

The simplest of all are the pipette holders which are attached to the front edge of a shelf. These are suitable for mechanical pipettes.

□ Ordering Information

Pipette Stands

Order Code	Item
730981	Charging Stand for one electronic pipette*
730991	Charging Carousel for 4 electronic pipettes*
725620	Linear Stand for all Sartorius pipette models
LH-725630	Carousel Stand for 6 mechanical pipettes
725610	Holder for one mLINE® Proline® Plus pipette
721259	Holder for one Proline® pipette
LH-727640	Holder for one Tacta® pipette

* Supplied with a universal charger (EU, UK, US|JPN, AUS, KOR and CHN plugs)



Pipette Holder for one Tacta®
pipette



Pipette Holder for one mLINE®
or Proline® Plus pipette



Pipette Holder for one
Proline® pipette



■ Elbow Pad



The Elbow Pad provides comfort while pipetting. The visco-elastic material of the pad relieves contact stress, pain and discomfort under the elbow.

The Elbow Pad is Ideal for

- long periods of pipetting
- work requiring high concentration, e.g. micro plate work
- any work where a cushion beneath the elbow or wrist is needed

□ Features and Benefits

- Improves pipetting ergonomics
- Conforms to any elbow size or shape
- Coating is pleasant to the skin
- The compact size takes up little bench space
- Very durable
- Easy to clean with washing up liquid, or ethanol (70%)
- Not autoclavable

□ Ordering Information

Elbow pad

Order Code	Item	Qty
723103	Elbow Pad	1



■ Safe-Cone Filters



Tweezers for exchanging filters in pipettes are supplied with all pipettes excluding Tacta® and mLINE®.



Built-in filter ejector in Tacta®

Why Should You Use Safe-Cone Filters?

These unique and replaceable polyethylene (PE) filters act as a final barrier to prevent any fluids and liquid vapours from reaching the internal components of the pipette.

- Protect the pipette and sample from contamination
- Prolong the pipette's lifetime
- Reduce maintenance intervals
- Are cost-effective compared to filter tips

When Should You Use them?

The ultimate pipette protectors are available in two types:

Plus Filter

For more demanding applications such as radioactive work, cell culture, bacterial and virological work and molecular biology.

Standard Filter

For general applications. Can be used in same type of work as the Plus filter, but needs to be changed more frequently.

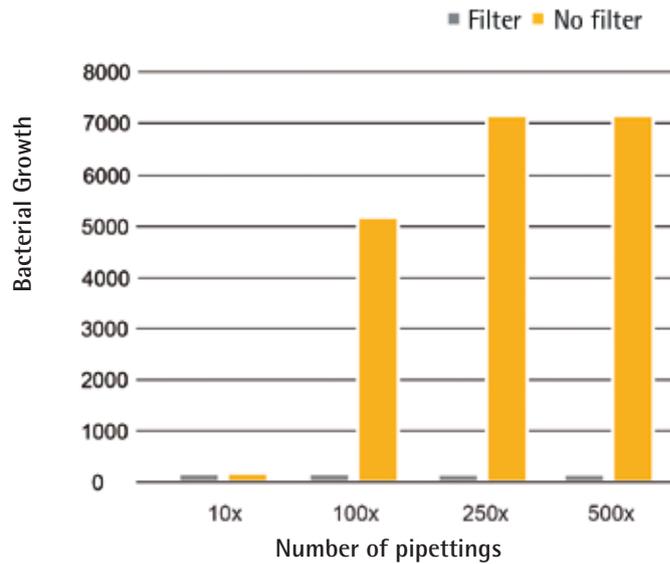
How Often Should You Change?

The interval of changing the filter depends completely on the application and the sample. However, according to studies, the filter is recommended to be changed daily (after 50 to 250 pipettings) and immediately in case of over-aspiration.

How to Change?

To ensure that the user is protected from contamination, tweezers should be used when removing used filters from the pipette tip cone. The Tacta® and the mLINE® feature a built-in filter ejectors, so tweezers are unnecessary. In addition, the tip cone should be cleaned with ethanol (70%) prior to the insertion of a new filter.

□ Contamination in Pipette Barrel



Pipette contamination in pipette barrel when pipetting liquid culture of bacteria *Micrococcus Luteus*.

□ Ordering Information

Safe-Cone Filters

Order Code	Item	Qty/Unit
721008	Standard Ø 2,51 mm PE	50
721007	Standard Ø 3,15 mm PE	50
721006	Standard Ø 5,33 mm PE	50
721005	Standard Ø 6,73 mm PE	50
721014	Standard Ø 1,83 mm PE	50
721018	Plus Ø 2,51 mm PE	50
721017	Plus Ø 3,15 mm PE	50
721016	Plus Ø 5,33 mm PE	50
721015	Plus Ø 6,73 mm PE	50

PE= polyethylene

See the pipette ordering information charts for corresponding filters and pipettes.

■ Reagent Vessel



Made from polypropylene, the autoclavable and durable reagent vessel is chemically resistant to all common reagents.



□ Ordering Information

Reagent Vessel

Order Code	Item	Qty
783500	Reagent Vessel (capacity 120 ml)	16

■ Calibration Tool | Tube Opener & Colour-coding Caps



Calibration tool | Tube opener is used for adjusting mLINE® and Proline® Plus pipettes.

The Calibration tool | Tube opener is used for adjusting mLINE® and Proline® Plus pipettes.

The Tacta® Adjustment Tool is used to adjust the pipette in situations where the factory calibration is not applicable.



The Colour-coding Caps can be used for personalizing the mLINE® pipette.



The Adjustment Tool for adjusting the Tacta® pipette

□ Ordering Information

Calibration Tool | Tube Opener and Colour-coding Caps

Order Code	Item	Qty
726203	Calibration Tool Tube Opener for mLINE® Proline® Plus	1
LH-727080	Adjustment Tool for Tacta®	1
726001	Colour-coding Caps for mLINE®	5



Colour-coding Caps for personalizing the mLINE® pipette.





■ Pipette Tips

Table of Contents

58	Pipette Tips
60	Optifit Tips
62	SafetySpace Filter Tips
63	Low Retention Tips
64	Packaging Options
66	Ordering Information



■ Pipette Tips

The Perfect Match for Your Pipette



Optiload for a tight fit and equal sealing on every channel's tip cone.

In liquid handling, accurate pipetting results are not dependent on the pipette or the tip alone, but a combination of these and the comfort of the user. Our non-filter Optifit Tips and SafetySpace Filter Tips are designed and manufactured to perfectly fit for our pipettes, enabling maximal accuracy, precision and ergonomics. Moreover, well-matching tips protect the pipette tip cone from wear and tear.

The unique Optiload mechanism of our pipettes allows tip attachment and loading with reduced force, but with complete sealing, which is vital to get accurate results.

Sartorius tips correspond with the colour-coding of Sartorius pipettes, to allow easy matching of corresponding volumes.



The factory in Kajaani, Finland.

□ Premium Quality and Purity

Manufacturing the tips in our own production facility allows us to maintain the highest quality and purity standards, by selecting the best plastic materials and controlling the manufacturing process from beginning to end. Our quality

management system follows not only ISO 9001 and ISO 14001, but also ISO 13485. Tip production also abides by the ISO 14644-1 standard, in order to fulfil ISO Class 8 cleanroom conditions for secured tip purity.



Lot-specific purity certificate

□ Contamination Free Tips

To avoid contamination through human contact, we have automated the entire tip manufacturing process. Pure virgin polypropylene (PP) plastic is automatically fed from silos into moulding machines. Moulding machines and robots located in isolated clean cells, load the tips automatically into tip trays and packaging. HEPA filters and higher air pressure are applied for purity within the cell. All Sartorius Single Tray tip racks, Single Refill Packs and FlexiBulk® packs are individually and automatically packed in air-tight plastic, in order to rule out any danger of contamination.

Additionally, our highly experienced and trained personnel are equipped with specially designed coveralls, masks, hair nets and gloves, in order to further diminish risks of contamination.

An independent laboratory checks every FlexiBulk®, Single Tray and Refill Pack tip lot for RNase, DNase and endotoxins. Lot-specific purity certificates can be downloaded from www.sartorius.com (select from the navigation bars: -> Liquid Handling -> Tip Purity Certificates).





Definitions:

DNase	A deoxyribonuclease (DNase) is any enzyme that catalyzes the degradation of DNA. The absence of DNase is tested by using fluorometric assay. The detection level of the assay is 6,25* 10 ⁻⁵ U/μl when DNase I is used as a standard.
RNase	Ribonuclease (RNase) is an enzyme that catalyzes the degradation of RNA into smaller components and can be generally found from organisms. The absence of RNase is tested by using fluorometric assay. The detection level of the assay is 3,125* 10 ⁻⁹ U/μl, when RNase A is used as a standard.
Endotoxins	Endotoxins are lipopolysaccharides found in the Gram-negative bacteria and can cause several serious health effects in humans and animals. Limulus Amebocyte Lysate (LAL) Gel Clot method is used to detect the presence of endotoxins on the pipette tips. The detection level of the LAL assay is 0,005 IU/ml (EU/ml).
Sterilization	The destruction of all microbial life, including bacterial endospores. Can be accomplished e.g. using steam, heating, chemicals, or radiation. We use e-beam irradiation.

Features and Benefits

Best Fit – Highest Possible Accuracy

- Perfect fitting and sealing with Sartorius pipettes secure the highest possible accuracy and precision
- Compatible with Optiload feature in Sartorius Picus[®] NxT, Picus[®], Tacta[®], eLINE[®], mLINE[®] and Proline[®] Plus pipettes enabling ergonomic and light tip attachment and ejection
- Colour-coding of tip trays allows easy matching with a corresponding colour-coded

- Sartorius pipette
- Compatible with most other pipette makes

Premium Quality and Purity:

- Strict quality standards, ISO 9001 and ISO 13485, are followed from R&D to production and delivery
- Manufactured in ISO 8 classified clean room conditions
- Manufacturing process free of DNase, RNase and endotoxins: Single Trays, Refill Packs and FlexiBulk[®] packs certified pure by

lot number

- Pre-sterilised tips are e-beam irradiated
- All tip packages, including individual racks, are lot numbered for full traceability
- The highest quality virgin polypropylene used as raw material

Tip Selection Guide per Application

Tip Type	Optifit Tips			SafetySpace Filter Tips	Low Retention Tips
	Standard	Free of DNase, RNase & endotoxins	Pre-sterilized & free of DNase, RNase and endotoxins		
Regular pipetting applications	✓				
Applications where prevention of cross-contamination is vital		✓	✓	✓	
Pipetting liquids with low surface tension (e.g. detergents, solvents)					✓

■ Optifit Tips

Standard Tips for Various Needs



Sartorius Optifit tips are an excellent choice for various laboratories and pipetting tasks with their wide range of packaging and purity options. The Optifit tips are packed in single tray racks, refill towers, single refill packs, and bulk packages. Optifit tips are available DNase, RNase and endotoxin free, as well as e-beam pre-sterilized.

The Single Tray tip racks are ideal for easy tip loading and for contamination-free pipetting. In order to reuse the empty tip racks and to create less waste, you may fill the empty racks with Refill tips, either using the refill tower or purity certified refill pack tips. The FlexiBulk® pack is the choice, if you need a cost-effective, yet purity-certified solution, in bulk tip format.

□ Available Packaging Options

- Single tray rack
- Refill tower
- Refill pack
- FlexiBulk® pack
- Bulk in a box

See details on packaging options on pages 64 and 65.

□ Features and Benefits

- Standard non-filter tips made to Sartorius quality standards
- Low Retention Tip range also available for liquids with low surface tension
- Perfect fitting and sealing with Sartorius Picus® NxT, Picus®, Tacta®, eLINE®, mLINE®, Proline® Plus, and Proline® pipettes
- Wide tip volume range from 10 µl to 10 ml
- Wide selection of packaging and purity options
- Available as DNase, RNase and endotoxin-free
- e-beam pre-sterilized packaging options available
- Full traceability
- Colour-coded trays to match with corresponding Sartorius pipettes
- Fully autoclavable at 121 °C, at 1 bar, for 20 minutes

■ SafetySpace Filter Tips

Protect Valuable Samples



SafetySpace Filter Tips, made of virgin polypropylene, feature filter barriers that effectively capture solid and liquid aerosol particles. The filter is made of polyethylene without self-sealing additives to avoid any interference with the sample and results. The filter protects the sample against contamination. In addition, it protects the pipette and prolongs the maintenance interval of the pipette.

The SafetySpace Filter Tips are Ideal for:

- molecular biology
- microbiology
- cell culture applications
- radioactive work

The unique feature with SafetySpace Filter Tips is the additional space left between the sample and the filter that conventional filter tips do not have. This extra space prevents the liquid from touching, and permeating, the filter and thus guarantees the pipetting accuracy. Any liquid types and pipetting techniques can be applied without the risk of the liquid permeating the filter.

The Extra Space is Particularly Useful in the Following Applications:

- pipetting foaming liquids such as buffers and proteins
- pipetting solvents
- multiple dispensing functions of electronic pipettes
- reverse pipetting

□ Available Packaging Options

- Single Tray Rack

□ Features and Benefits

- Filter minimizes the risk of aerosol contamination
- Large empty volume between the sample and filter prevents liquid from contacting the filter
- Covers tip volumes from 10 μ l to 1200 μ l
- Certified free of DNase, RNase and endotoxins
- e-beam pre-sterilized
- Full traceability
- Colour-coded trays indicate the matching colour-coded Sartorius pipette

Low Retention Tips

Ensure Optimal Sample Recovery



The four tips on the right are low retention tips, providing maximum sample recovery.

Pipetting liquids that contain detergents can be problematic when using standard pipette tips. Some liquid residue often remains in the tip due to differences in surface energies between the plastic pipette tip and the sample. The residue causes imprecision in pipetting and loss of valuable samples or reagents.

We use an advanced technology to manufacture Low Retention Tips that have an extremely even and durable hydrophobic surface. Unlike some other hydrophobic tips on the market, our low retention tips do not contain any leachables that might risk your sample.

Low Retention Tips maximize the sample recovery, when handling detergent containing or other liquids with low surface tension. Better reproducibility in pipetting is especially beneficial in sensitive molecular biology applications, where reagents often contain detergents, for example in:

- PCR, real-time PCR
- Cloning, sequencing and other DNA & RNA techniques
- SDS-PAGE and other protein analysis methods
- Protein purification techniques



Packaging options for Low Retention tips.



Available Packaging Options

- Single Tray Rack
- Refill Tower

Features and Benefits

- Extremely hydrophobic tips surface
- Maximum sample recovery for fluids with low surface tension
- Durable, high chemical resistance, no leachables
- Covers tip volumes from 10 μ l to 1200 μ l
- Filter (SafetySpace) and non-filter (Optifit) tip options are available
- DNase, RNase and endotoxin-free packaging options available
- e-beam pre-sterilized packaging options available
- Full traceability
- Colour-coded trays indicate the matching colour-coded Sartorius pipette
- Non-filter tips are fully autoclavable at 121°C, at 1 bar, for 20 minutes



■ Packaging Options

□ Racked Tips



Single Tray Racks



Single Tray Rack

- 96 tips in convenient and reusable tray racks (sales unit contains 10 tray racks, total 960 tips)
 - Certified free of DNase, RNase and endotoxins
 - e-beam pre-sterilized option available
 - Lot-specific purity certificates can be downloaded from www.sartorius.com
 - Informative rack labelling: volume, product number, lot number improves tip identification and traceability
- Air-tight plastic wrapping around the rack secures purity during transport and storage (wrapping is regular waste)
 - Tip trays are colour-coded to indicate the matching, colour-coded Sartorius pipette
 - Covers a large range of tip volumes from 10 µl to 5 ml
 - Fully autoclavable at 121°C, at 1 bar, for 20 minutes
 - Tray racks can be easily reloaded with Refill tips
 - Racks, trays and tips are 100% recyclable polypropylene (PP)

□ Refill Tips



Refill Towers

Refill Tower

- Space-saving with 10x96 tips in one tower
 - Tip trays are compatible with Single Tray racks for convenient use
 - Trays are colour-coded to indicate the matching, colour-coded Sartorius pipette
- Covers the most widely used tip sizes: 10 µl, 200 µl and 350 µl
 - Trays and tips are fully autoclavable at 121°C, at 1 bar, for 20 minutes
 - 100% recyclable cardboard packaging, and plastic (PP) trays and tips



Single refill packs



Single Refill Packs

- 10, 15 or 20 trays of 96 tip trays, depending on tip volume
- Certified free of DNase, RNase and endotoxins
- e-beam pre-sterilized option available
- Lot-specific purity certificates can be downloaded from www.sartorius.com
- Individually packed air-tight tip trays for maximum purity with less packaging material compared to racked tips
- Tip trays are compatible with Single Tray racks for convenient use
- Informative rack labelling: volume, product number, lot number improves tip identification and traceability
- Tip trays are colour-coded to indicate the matching, colour-coded Sartorius pipette
- Covers a large range of tip volumes from 10 µl to 1200 µl
- Trays and tips are fully autoclavable at 121°C, at 1 bar, for 20 minutes
- 100% recyclable trays and tips (PP). Container lid is regular waste.

Bulk Tips



FlexiBulk®



FlexiBulk®

- Tips made to the Sartorius quality standard in economical packaging
- Packed orderly in compact re-sealable plastic packages (480 or 960 pcs depending on tip volume)
- Covers a large range of tip volumes from 200 µl to 1200 µl
- Certified free of DNase, RNase and endotoxins
- Lot-specific purity certificates can be downloaded from www.sartorius.com
- Tips are fully autoclavable at 121°C, at 1 bar, for 20 minutes
- 100% recyclable tips (PP) and package (PET)



Bulk in a box

Bulk in a Box

- Tips made to the Sartorius quality standard in economical packaging
- Packed in re-sealable bags in cardboard boxes (100, 250 or 1000 pcs depending on tip volume)
- Covers tip volumes 10 µl, 5 ml and 10 ml
- Tips are fully autoclavable at 121°C, at 1 bar, for 20 minutes
- 100% recyclable tips and package

Ordering Information

Optifit Tips

Volume Range	Length	Packaging	Low Retention	Purity Level		Tips/ Unit	Order Code		
				Free of RNase, DNase, endotoxins	Pre-sterilised				
 ● 0,1-10 µl	31,5 mm	Single Tray	●	●	●	10 x 96	790010		
		Single Tray				●	●	10 x 96	LH-L790010
		Single Tray				●	●	10 x 96	790011
		Refill Tower				●	●	10 x 96	790012
		Refill Tower				●	●	10 x 96	LH-L790012
		Refill Pack				●	●	20 x 96	790013
		Bulk in Box				●	●	1000	790014
 ● 0,1-10 µl Extended	46 mm	Single Tray	●	●	●	10 x 96	783210		
		Single Tray				●	●	10 x 96	783211
 ● 0,5-200 µl	51 mm	Single Tray	●	●	●	10 x 96	790200		
		Single Tray				●	●	10 x 96	LH-L790200
		Single Tray				●	●	10 x 96	790201
		Refill Tower				●	●	10 x 96	790202
		Refill Tower				●	●	10 x 96	LH-L790202
		Refill Pack				●	●	15 x 96	790203
		FlexiBulk®				●	●	960	LH-B790204
 ● 5-350 µl	54 mm	Single Tray	●	●	●	10 x 96	790350		
		Single Tray				●	●	10 x 96	LH-L790350
		Single Tray				●	●	10 x 96	790351
		Refill Tower				●	●	10 x 96	790352
		Refill Tower				●	●	10 x 96	LH-L790352
		Refill Pack				●	●	15 x 96	790353
		FlexiBulk®				●	●	960	LH-B790354
 ● 10-1000 µl	71,5 mm	Single Tray	●	●	●	10 x 96	791000		
		Single Tray				●	●	10 x 96	LH-L791000
		Single Tray				●	●	10 x 96	791001
		Refill Pack				●	●	10 x 96	791002
		Refill Pack				●	●	10 x 96	791003
		Refill Pack				●	●	10 x 96	791003
		FlexiBulk®				●	●	480	LH-B791004

For your guidance the tips are illustrated in the actual size.

Empty Tip Boxes for Refill System (Tips and Trays are Not Included)

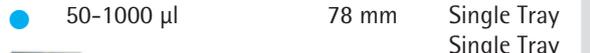
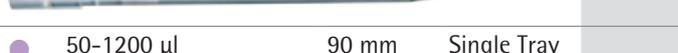
Item	Tip Type (Non-filter Tips)	Racks/Unit	Order Code
Empty Tip Box for Refill System	10, 200, 350 µl	10	790910
Empty Tip Box for Refill System	1000, 1200 µl	10	790920

Volume Range	Length	Packaging	Low Retention	Purity Level		Tips/ Unit	Order Code			
				Free of RNase, DNase, endotoxins	Pre-sterilised					
● 10-1000 µl	Wide bore tip	68,5 mm	Single Tray	•	•	10 x 96	791020			
						Single Tray	•	•	10 x 96	791021
						FlexiBulk®	•	•	480	LH-B791024
										
● 50-1200 µl	71,5 mm	Single Tray	•	•	•	10 x 96	791200			
						Single Tray	•	•	10 x 96	LH-L791200
						Single Tray	•	•	10 x 96	791201
						Refill Pack	•	•	10 x 96	791202
						Refill Pack	•	•	10 x 96	791203
						FlexiBulk®	•	•	480	LH-B791204
										
● 50-1200 µl	Extended	90 mm	•	•	•	10 x 96	791210			
						Single Tray	•	•	10 x 96	LH-L791210
						Single Tray	•	•	10 x 96	791211
						Refill Pack	•	•	10 x 96	791212
						Refill Pack	•	•	10 x 96	791213
										
● 100-5000 µl	150 mm	Single Tray	•	•	•	50	780304			
						Single Tray	•	•	50	780305
						Bulk in Box	•	•	100	780300
						Bulk in Box	•	•	1000	780308
										
● 1-10 ml	155 mm	Bulk in Box				250	LH-780316			
										

Note: The ordering information for 10 ml tip for Midi Plus can be found on page 69.

NOTE! Tip compatibility with pipettes are shown in the Tip Selection Guides at Electronic Pipettes, page 25, and Mechanical Pipettes, pages 46 - 47.

SafetySpace Filter Tips

Volume Range	Length	Packaging	Low Retention	Purity Level		Tips/ Unit	Order Code
				Free of RNase, DNase, endotoxins	Pre-sterilised		
● 0,1-10 µl 	31,5 mm	Single Tray Single Tray	●	● ●	● ●	10 x 96 10 x 96	790011F LH-LF790011
● 0,5-20 µl 	51 mm	Single Tray Single Tray	●	● ●	● ●	10 x 96 10 x 96	790021F LH-LF790021
● 2-120 µl 	51 mm	Single Tray Single Tray	●	● ●	● ●	10 x 96 10 x 96	790101F LH-LF790101
● 5-200 µl 	52,5 mm	Single Tray Single Tray	●	● ●	● ●	10 x 96 10 x 96	790201F LH-LF790201
● 5-300 µl 	52,5 mm	Single Tray Single Tray	●	● ●	● ●	10 x 96 10 x 96	790301F LH-LF790301
● 50-1000 µl 	78 mm	Single Tray Single Tray	●	● ●	● ●	10 x 96 10 x 96	791001F LH-LF791001
● 50-1200 µl 	90 mm	Single Tray Single Tray	●	● ●	● ●	10 x 96 10 x 96	791211F LH-LF791211

For your guidance the tips are illustrated in the actual size.
Filter tips are not recommended to be used simultaneously with Safe-Cone Filters

Filter Tips with Regular Air Gap

Volume Range	Length	Packaging	Low Retention	Purity Level	Tips/ Unit	Order Code
				Free of RNase, DNase, endotoxins	Pre-sterilised	
● 0,1-10 µl Extended	46 mm	Single Tray		•	•	10x96 783201



NOTE! Tip compatibility with pipettes are shown in Tip Selection Guides at Electronic Pipettes, page 25, and Mechanical Pipettes, pages 46 - 47.



sartorius
C/A

Ultrapure Water

TOC

■ Maxi-volume Liquid Handling

Table of Contents

72	Midi Plus Pipetting Controller
74	Proline® Prospenser Bottle-top Dispenser
75	Prospenser Bottle-top Dispenser
76	Biotrate Digital Burettes
77	Ordering Information and Performance Specifications



■ Midi Plus Pipetting Controller

Excellent Performance and Ergonomics

The Midi Plus is a lightweight electronic cordless pipetting controller, which allows aspiration from bottles and tubes, without the arm and hand elevations required in the case of serological or volumetric pipettes. It fits all commonly used 1 - 100 ml glass or plastic pipettes, but can also be used with Sartorius 5 ml and 10 ml disposable tips. The speed can be fine-tuned by applying varying finger pressure to the operating buttons.

The Midi Plus is ideal, for example, in microbiological work: dispensing

into a culture media dish can be performed carefully, drop by drop, without breaking the fine surface of the medium.

- Stepless speed control
- Hydrophobic autoclavable filter protects the device in case of over-aspiration
- Convenient fold-out bench stand supports the unit and pipette when not in use
- Low battery warning



Stepless speed control

- Allows the aspiration and dispensing speed to be adjusted easily and precisely to suit either large or small volume pipettes.

Fold-out stand

- Prevents pipette contamination
- Saves space
- Allows the unit to be rested on a table with a pipette attached

Hydrophobic autoclavable filter prevents over-aspiration

Autoclavable pipette adapter set

Fits all commonly used 1-100 ml glass or plastic pipettes

Operating buttons



□ Features

Pipette types	Plastic or glass 1– 100 ml Pasteur pipettes 5 ml and 10 ml Sartorius pipette tips
Rechargeable during use	Yes
Speed control	Stepless adjustable control
Gravity dispensing	Yes
Stand	Attached support
Weight	207 g
Low battery indicator	Yes
Autoclavable parts	Nose cone, pipette holder and filter

□ Ordering Information

Order Code	Item	Qty/ Unit
710931	Midi Plus Pipetting Controller with Universal Charger ¹	1
LH-7129120	Replacement filter, 0,45 µm, non-sterile, autoclavable	5
LH-7129130	Replacement filter, 0,2 µm, sterile	5
LH-711019	Adapter set (standard), autoclavable, including nose-cone and silicone adapter	1
LH-711017	Adapter set for 5 ml pipette tip, autoclavable, including nose-cone and silicone adapter	1
LH-711018	Adapter set for 10 ml pipette tip, autoclavable, including nose-cone and silicone adapter	1
780300	Optifit Tip 5 ml (length 150 mm)	100
780308	Optifit Tip 5 ml (length 150 mm)	1000
780310	Midi Plus Tip 10 ml (length 242 mm)	100

1) Supplied with a universal charger (incl. EU, UK, US | JPN, AUS, KOR and CHN plugs)



■ Proline® Prospenser

Easy-to-use Bottle-top Dispenser

Proline® Prospenser has been designed for trouble-free and reliable bottle-top dispensing of liquids, including concentrated acids, bases, saline solutions, as well as many organic solvents.

- Dispensing directly from the supply bottle
- Fully autoclavable at 121°C, 2 bar, 20 minutes
- Accuracy of delivery within $\pm 0,5\%$
- Chemically resistant fluid pathway
- Anti-drip closure cap included
- Easy-to-use volume adjustment for reproducible dispensings
- Easy to dismantle for cleaning and maintenance
- Wide range of adapters included to fit the most common bottle sizes
- Optional flexible dispense tube extension (max length 800 mm) with safety handle enables fast and precise dispensing even into narrow tubes
- Each unit is supplied with performance certificate and tested according to ISO 8655

Volume setting easy to adjust

Borosilicate glass barrel protected with a transparent polypropylene sleeve

Anti-drip closure cap

Wide range of bottle adapters included

Chemically resistant liquid pathway



Optional flexible dispense tube extension

- Coiled
- Length 800 mm



Fully autoclavable

Prospenser

Bottle-top Dispenser with Anti-drip Valve

The Prospenser bottle-top dispenser delivers safe and precise liquid dispensing, including of strong acids, bases and solvents. Special features include an easy-to-adjust calibration mechanism and precision valve for enhanced accuracy and usability.

- Dispensing directly from the supply bottle
- Easy-to-adjust calibration mechanism
- Fully autoclavable at 121°C, 2 bar, 20 minutes
- Accuracy of delivery within $\pm 0,3\%$
- Chemically resistant fluid pathway
- Anti-drip precision valve mechanism ensures easy priming and minimum waste with no leakage back into the reservoir
- Easy-to-use volume adjustment for reproducible dispensing
- Unlike other bottle-top dispensers, Prospenser's glass barrel can be disassembled from the pedestal for thorough cleaning
- Wide range of adapters included to fit the most common bottle sizes
- Optional dispense tube extension allows fast and safe dispensing even into narrow tubes
- Manufactured to ISO9002 standards, each unit is supplied with an individual calibration certificate

Easy-to-adjust calibration mechanism.



Borosilicate glass barrel protected with a transparent polypropylene sleeve

Easily removable PTFE piston for cleaning and smooth action

Chemically resistant liquid pathway

Precision valve mechanism ensures that the Prospenser stays fully primed all day

Bubble free dispensing

Anti-drip tap valve

Set of adaptors available



Optional dispense tube extension
- Allows fast and safe dispensing into narrow tubes



■ Biotrate Digital Burettes

Ranges of 0 – 30 ml and 0 – 50 ml

The streamlined Biotrate digital burette and dispenser delivers accurate, precise and convenient bottle-top titration, as well as optimum operator safety. Due to its life-long battery concept, there is no need for an electrical outlet. This feature makes Biotrate ideal for both laboratory and field-based analyses, where it can be easily moved from one place to another.

- Chemically resistant and autoclavable liquid-path construction is made of borosilicate glass, PTFE, PVDF, FEP and ceramic components
- Based on positive displacement principle for maximum accuracy
- An automatic low battery indication is shown on the large easy-to-read LCD display
- Simple for user to calibrate and restore factory calibration
- With a zero reset feature, it is easy to move from one titration to another



Rotating head and clear numbers on the display increase working reliability

Chemically resistant and autoclavable liquid pathway

Simple user calibration and factory reset for ISO 9000 and GLP requirements

Visible borosilicate glass barrel protected with a transparent polypropylene sleeve allows inspection of liquid before dispensing

Anti-drip tap

Bubble-free dispensing



□ Ordering Information and Performance Specifications

Proline® Prospenser

Order Code	Item	Increment	Max Volume	Systematic Error (%)	Random Error (%)
723045	Proline® Prospenser 0,5 – 5 ml (with 25, 28, 32, 38 and 40 mm adaptors)	0,1 ml	5 ml	0,5	0,1
723046	Proline® Prospenser 1 – 10 ml (with 25, 28, 32, 38 and 40 mm adaptors)	0,2 ml	10 ml	0,5	0,1
723047	Proline® Prospenser 2,5 – 25 ml (with 32, 38 and 40 mm adaptors)	0,5 ml	25 ml	0,5	0,1
723048	Proline® Prospenser 5 – 50 ml (with 32, 38 and 40 mm adaptors)	1,0 ml	50 ml	0,5	0,1
721633	Flexible tube extension for 5 and 10 ml Proline® Prospensers				
721634	Flexible tube extension for 25 and 50 ml Proline® Prospensers				

Prospenser

Order Code	Item	Increment	Max Volume	Systematic Error (%)	Random Error (%)
723049	Prospenser 0,01 – 2,5 ml (with 38, 40 and 45 mm adaptors)	0,05 ml	2,5 ml	0,3	0,1
723050	Prospenser 0,1 – 5 ml (with 38, 40 and 45 mm adaptors)	0,1 ml	5 ml	0,3	0,1
723051	Prospenser 0,2 – 10 ml (with 38, 40 and 45 mm adaptors)	0,2 ml	10 ml	0,3	0,1
723052	Prospenser 1 – 30 ml (with 38, 40 and 45 mm adaptors)	1,0 ml	30 ml	0,3	0,1
723053	Prospenser 1 – 50 ml (with 38, 40 and 45mm adaptors)	1,0 ml	50 ml	0,3	0,1
721998	Dispense tube extension				

Biotrate Digital Burette

Order Code	Item	Increment	Systematic Error (%)	Random Error (%)
723054	Biotrate 0 – 30 ml (with 33, 38 and 45 mm adaptors)	0,01 ml	0,2	0,1
723055	Biotrate 0 – 50 ml (with 33, 38 and 45 mm adaptors)	0,01 ml	0,2	0,1
721998	Expandable delivery jet			



■ Pipetting Academy

Table of Contents

80	Pipetting Academy
81	Pipetting Recommendations

■ Pipetting Academy

Training for Better Performance, Ergonomics and Safety

Seminars include both theory and practice!

Videos and animations support learning.

Are you concerned about the results of your work due to poor pipetting practices or WRULD?

Have you considered that the pain in your hand or arm may be related to the instruments or techniques you use?

Do you know which pipetting technique to use with different types of liquids?

Do your results vary between users?

The Pipetting Academy seminar offers a comprehensive tutorial package, developed to answer these questions together with you. During the seminars, you will learn to recognise pipetting-related risk factors and increase your knowledge of ergonomics, safety and pipetting techniques, in order to avoid these risks in your daily work.

What Will You Learn?

- Get hands-on training in pipetting techniques that will help you and your co-workers to obtain more accurate and precise results in the lab
- Gain a better understanding of the influence of pipetting techniques and environmental factors on testing results
- Be guided through the essentials of laboratory ergonomics
- Gain a better understanding of the ergonomic risks in the laboratory environment and liquid handling in particular
- Learn how to avoid these risks by choosing the most appropriate working postures, liquid handling devices and accessories
- Appreciate how you can help make savings in both direct and indirect costs due to bad ergonomics
- Become able to instruct your employees on all of these issues, making work more efficient and enjoyable.



□ Build Your Own Seminar

Pipetting Academy offers you various seminars for different purposes.

You May Choose from

Ergonomics

Learn about the optimal posture for pipetting and become familiar with tools that can help you work

ergonomically and efficiently. Understand the risks and learn about the solutions.

Pipetting Techniques

Master your working tool. Handle the pipette correctly. Be guided through the many techniques of which your pipette is capable.

Pipette Service

Learn which aspects to consider to keep your pipette in good working condition to deliver accurate results repeatedly, year after year.

□ How to Sign Up for Seminars?

- To sign up for the seminar, contact your local Sartorius representative
- The seminar will be held in the location most suitable to you and your colleagues
- The trainer will be certified to hold Pipetting Academy seminars
- Each participant will receive a certificate of participation after the seminar

Gain access to educational material, videos and animations

Once you have signed up and participated in the seminar, you will automatically gain access to educational videos, animations and presentations on ergonomics, pipetting techniques and calibration.

- Through these animations, you will be guided step by step in the correct handling of the pipette and

through reverse pipetting, diluting and all other pipetting modes, to make your work easier and more efficient

- A Certified Professional Ergonomist will guide you through the essentials of ergonomics
- Presentations with explanations and illustrations on calibration and quality standards, are also available

See You at the Pipetting Academy!

■ Pipetting Recommendations



Hold the pipette in a vertical position during aspiration.



Avoid contamination with Safe-Cone Filters.



Tacta® volume lock can be used in two ways, by pressing it while changing the volume, or by sliding it up to open it, and back to lock it.



mLINE® volume lock prevents volume changes during pipetting.

Preparations Before Pipetting

- Use the tip specified by the manufacturer.
- Ensure that the pipette and the tip have been tested according to ISO 8655 and the tip is seated correctly.
- Make sure pipettes have been correctly calibrated.
- Check that the pipette, tip and liquid are all at the same temperature.
- When pipetting liquids with temperatures different to the ambient temperature, do not pre-rinse the tip. Change the tip after each pipetting.
- Ensure that any fluid viscosity variations have been accounted for and the correct technique is employed, i.e. reverse pipetting.
- If handling infectious or radioactive agents make sure appropriate shielding and other precautions protect the operator.
- Use Safe-Cone Filter in the tip cone whenever possible.

While Pipetting

- Hold the pipette in a vertical position, while aspirating. Tilting the pipette at an angle causes a volume greater than the set volume of liquid to enter the tip.
- In most cases, pre-rinsing of the tip is recommended, to achieve accurate results. Do not pre-rinse the tip, if the temperature of the liquid is different to the ambient temperature.
- When aspirating fluid, the pipette tip should normally be immersed to a depth of 2-3 mm.
- When using a mechanical pipette, operate the piston with a smooth and consistent thumb action, for repeated results without foaming or bubbles.
- You should pipette against the inside wall of the receiving vessel. Remove the tip by drawing it upwards against the inside wall.
- Ensure that the pipette blow out action is fully activated.
- Ensure that the volume is still set at the required position. A pipette with a volume locking mechanism is recommended, in order to avoid accidental volume change during pipetting.
- Avoid laying the pipette on its side while there is liquid in the tip. It may seep up into the mechanism.



Charging while pipetting is possible with Sartorius electronic pipettes.



Load the tip onto the pipette carefully and take advantage of the Optiload tip loading mechanism.



Clean the pipette before sending it to service.

Other Precautions

- Store the pipette on a stand when not in use – see page 50, on pipette stands, for more information. Electronic pipettes should be returned to their charging stands.
- Avoid dropping the pipette or allowing contact with dirt or grease.
- Change the Safe-Cone Filter regularly (recommendation after 50 to 250 pipetting cycles), and in every case of over-aspiration.
- Never strike the tip cone against the tip tray when loading the tip, as this can damage the pipette.
- Avoid exposing the unit to extreme temperature changes, humidity and dust (operating temperature from 15°C to 40°C).
- Service the pipette regularly.
- Clean the pipette thoroughly before sending it in for service. Decontaminate the pipette with 70% ethanol. Notify the service personnel of the purpose for which the instrument has been used. Postal services may refuse to deliver instruments used for hazardous materials. Make sure that a qualified person services the pipette.



■ Calibration and Maintenance Services

Table of Contents

86	Pipette Calibration and Maintenance Services
90	Pipette Decontamination Procedure
91	Autoclaving Instructions
92	Troubleshooting Guide

■ Pipette Calibration and Maintenance Services



Why is Calibration and Maintenance Needed?

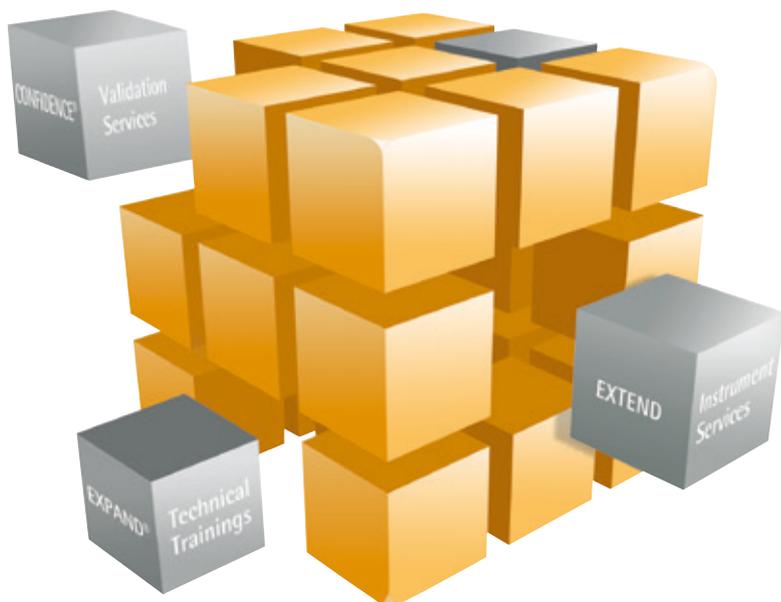
All pipette manufacturers recommend that regular maintenance and calibration is applied to maintain reliable pipetting results and to maximize the lifetime of the pipette.

Pipette calibration is a fundamental part of Good Laboratory Practice (GLP) and quality systems and must be considered a vital part of any laboratory regime where precise volumes of fluid need transferring or diluting. Pipette performance is measured as accuracy and precision or how close the dispensed volumes are to the target and how close the results are to each other.

Sartorius Service Centres

It is vitally important to Sartorius that our customers receive world class service and support, from the first phone call to the moment the engineer leaves, with the customer's equipment in perfect working condition.

Sartorius provides a global network of service centers for calibration of all makes and models of pipettes, burettes, bottle top dispensers and other liquid handling instruments. With over 20 years of experience in pipettes and liquid handling instrument services, the global organization provides world class services tailored to customers' needs, simultaneously fulfilling standards and regulatory body requirements. With the Sartorius concept of "all makes and models liquid handling services" you can be certain that your instruments are handled according to the international ISO 8655 standard defining the use and calibration of pipettes and other liquid handling instruments. Sartorius provides reliability of operation, reduced instrument downtime and confidence, so that your work is according to the strictest requirements.





□ Maintenance, Repair and Calibration Services

Maintenance consists of the cleaning and lubrication of the piston and tip cone(s) of the pipette, and the replacement of parts prone to wear, in order to guarantee a long lifetime and consistently accurate and precise results.

As with all mechanical devices, pipettes may need repairs. It is usually worth the expense to maintain and repair the pipettes rather than to dispose of them. This is also an ecologically sustainable choice. Sartorius provides spare parts and repairs for any make and model. If the pipettes are beyond economical repair, then we offer replacements.

Calibration and maintenance can be done either at a dedicated calibration laboratory, or at the customer site. Laboratory conditions can provide a smaller uncertainty of measurement in calibration, but the quickest turnaround time is often achieved by performing maintenance and calibration on-site.

Services Provided

- Maintenance and calibration for all makes and models of pipettes and other liquid handling instruments, including cleaning, relubrication and adjustment of instruments

- Pipette calibration done according to ISO 8655 standard by our network of ISO 17025 accredited pipette calibration laboratories around the world
- Pipette maintenance and calibration services available either as mail-in service at service centers or as on-site service at the customer's laboratory
- Repair services and spare parts for all makes and models of pipettes available
- Extended Warranty for an additional 12 months

Benefits

- Maximum reliability and lifetime with regular maintenance and original spare parts
- Confidence in the quality of your work provided by regular calibration
- All documentation needs met by our detailed service and calibration documentation, including ISO 17025 accredited calibration certificates with measurement results traceable to international standards
- Efficient and time saving services provided either at your site or as a mail-in service, which includes courier collection and delivery
- Affordable, planned warranty of your equipment



□ Accreditation and Calibration Standards



Good Laboratory Practices (GLP), accredited processes and quality systems require traceability of measurement and compliance with a multitude of standards. Sartorius operates a global network of accredited calibration laboratories, providing services around the world.

What is ISO 17025?

The ISO 17025 standard specifies the general requirements for the competence of calibration laboratories to carry out tests and calibrations. A pipette calibration laboratory with an ISO 17025 accreditation provides the highest level of reliability and confidence in pipette calibration, proven with a Measurement Uncertainty Certificate provided with each calibration, when required. Gaining and maintaining an ISO 17025 accreditation requires extensive reviewing and development of personnel, procedures and facilities, audited annually by the accreditation body.

Sartorius provides ISO 17025 accredited pipette calibration services in various countries, for example DAKKS in Germany, Cofrac in France, UKAS in the United Kingdom, A-Class in the USA, JCSS in Japan, and FINAS in Finland. All European accreditation bodies are members of the European Co-operation for Accreditation (EA) and signatories of the Multilateral

Recognition Agreements (MLA) ensuring that accredited pipette calibration certificates are accepted around the world.

Ask your local Sartorius representative for more information on accredited pipette calibration services available for you.

What is ISO 8655?

The ISO 8655 standard specifies the requirements for piston operated volumetric apparatus (pipettes) and pipette calibration laboratories, providing detailed requirements for procedures and equipment used in pipette calibration. Pipettes calibration, according to ISO 8655, is done in a carefully controlled environment, with no drafts or vibrations, using repeatable and reliable measurement technology. Sartorius balances meet such specifications and calibration is always done according to the strictest, repeatable procedures.

Making sure your pipettes are calibrated according to ISO 8655, Sartorius provides the best confidence in the reliability of results. Sartorius pipette calibration is always done according to ISO 8655.



□ In Conclusion

Adopting a regular calibration and maintenance routine for your pipette has the following benefits:

Confidence

Your pipettes are operating correctly with the accuracy and precision you know.

Reliability

With maintenance and calibration and operational qualification you are able to trust the instrument's operational capability.

Efficiency and Effectiveness

With properly working pipettes you can work uninterrupted and be more efficient.

Sustainability

Extending the lifespan of your pipette reduces waste, and consequently is an environmentally considerate choice.

□ Frequently Asked Questions

Question: What makes and models of pipettes does Sartorius service?

Answer: Sartorius provides calibration and maintenance services for all manufacturers' pipettes. With over 20 years of experience in the field we have the skill and ability to service any pipette.

Question: What is pipette calibration?

Answer: It is when a pipette is tested for inaccuracy, imprecision and linearity to determine the uncertainties of measurement for each volume calibrated. Test volumes and data points are selected according to the customer requirements.

Question: Can I have my pipettes calibrated in my laboratory, as I need them every day?

Answer: Yes. Sartorius offers calibration and maintenance services both at our workshops and at your laboratory site. Ask for on-site services, especially if you need your

pipettes every day.

Question: Why should I get a Service Contract?

Answer: Often the most economical and easiest way to handle your calibration and maintenance needs, is to enter into a contract with a service provider. This saves time, and is usually the most economical choice. Sartorius service technicians are experts in pipettes and also offer training in the use of instruments. They can also offer replacements for worn out pipettes.

Question: How often should my pipettes be calibrated?

Answer: The ISO 8655 standard states that pipettes should be calibrated regularly, at least annually, or more often, for example every 3-6 months. It depends on the accuracy requirements of your work as well as the nature of liquids used – corrosive or volatile liquids create more wear and tear on your pipettes.

■ Pipette Decontamination Procedure

Mechanical Pipettes (Tacta®, mLINE® and Proline® Plus)



1. Unscrew the tip ejector collar counter clockwise and remove it.



2. Unscrew the tip cone holder counter clockwise and carefully remove it along with the tip cone. Remove the Safe-Cone Filter if fitted.



3. Unscrew the piston counter clockwise from the pipette.



- Place the tip ejector collar, tip cone holder, tip cone and tip cone cylinder into a beaker containing 70% ethanol and leave for at least 30 minutes.
- After performing the procedure described above, remove the components from the beaker and rinse them with distilled water, then dry preferably with warm air, for at least an hour.
- Re-grease the piston as described in the instruction manual. Replace all components including new filter if fitted.

Electronic Pipettes (Picus®, Picus® NxT and eLINE®)



1. Unscrew the tip ejector collar counter clockwise and remove it.



2. Unscrew the tip cone holder counter clockwise and carefully remove the tip cone holder, tip cone and spring. Remove the Safe-Cone Filter if fitted.



3. Unscrew the piston counter clockwise from the pipette.



- Place the tip cone, tip cone holder, tip ejector collar, piston and spring into a beaker containing 70% ethanol and leave for at least 30 minutes.
- After performing the procedure described above, remove the components from the beaker and rinse them with distilled water, then dry preferably in warm air, for at least an hour.
- Re-grease the piston as described in the instruction manual. Replace all components including the new filter if fitted.

Note: When performing the decontamination procedure, as a matter of routine the o-ring seal should be checked for possible wear on every sixth occasion, and replaced if necessary. Calibration should also be checked at the same time.

■ Autoclaving Instructions



Tacta[®], mLINE[®] and Proline[®] Plus Mechanical Pipettes

The entire Tacta[®], mLINE[®] and Proline[®] Plus mechanical pipette can be steam sterilized by autoclaving at 121°C (252°F), at 1 bar (15 p.s.i.), for 20 minutes. The dispensing head of the multi-channel pipettes must be unscrewed 360° counter clockwise before autoclaving.

- Remove the Safe-Cone Filter (if fitted)
- Place the pipette into the sterilisation bag and place it into the autoclave
- After autoclaving the pipette must be cooled down and left to dry overnight before use

It is recommended that you check the performance of the pipette after every autoclaving, and grease the piston | seal of the pipette after every 10th autoclaving.

Picus[®], Picus[®] NxT and eLINE[®] Electronic Pipettes Lower Parts

The dispensing head (tip ejector collar, tip cone holder, tip cone, spring and piston) of the single-channel and multi-channel models (except for multi-channel 1200 µl) can be autoclaved (121°C, at 1 bar, for 20 minutes). These parts can be autoclaved as one unit or separately

as individual parts. It is also possible to clean the parts and grease the piston prior to autoclaving.

- Remove the Safe-Cone Filter (if fitted).
- Put the dispensing head into the sterilisation bag and place it into the autoclave
- After autoclaving the parts must be cooled down and left to dry before use

It is recommended that you check the performance of the pipette after every autoclaving, and grease the piston | seal of the pipette after every 10th autoclaving.

Tips and Tip Boxes

- Place the bulk tips into the sterilisation bag and the tip tray as such in the autoclave
- Autoclave, at 1 bar, for 20 minutes at a temperature of 121°C
- Cool before use

Note:

- Excessive heat or length of time may damage the products. Never place the handle part of the Picus[®], Picus[®] NxT or eLINE[®] into the autoclave
- The lower ends of multi-channel pipettes are not interchangeable between 8 and 12-channel pipettes
- The cover of the tip tray should be closed during autoclaving

■ Troubleshooting Guide

Problem	Cause	Solution
Droplets left inside the tip	Unsuitable tip	Use original Sartorius tips
	Non-uniform wetting of the tip plastic	Attach new tip and pre-wet it
	Optiload not fully utilised and thus tip does not fit very well	Pick up the tip so that it strikes the lower edge of the tip ejector collar
Leakage or pipetted volume too small	Tip incorrectly attached	Attach firmly
	Unsuitable tip	Use original Sartorius tips
	Tip is leaking and or Optiload not fully utilized	Replace a new tip or see above for Optiload
	Plunger movement not uniform, constant or balanced	It is very important that the plunger movement is slow and that this is always done in the same way during pipetting cycles. Volumes 1ml and greater: if plunger is released too quickly upon aspirating, it will affect the amount of liquid drawn.
Test results are incorrect and or results are non-linear	Improper maintenance of lower parts	Clean and re-grease lower parts as per instructions in the pipette's manual, only applies to single-channel pipettes
	Piston or tip cone damaged non-linear	Replace part with new one, only applies to single-channel pipettes
	Dirt on stop surfaces inside the machinery	Clean the stop surfaces interior of the machinery as per instructions
	Uneven piston movement inconsistent pipetting technique rhythm	It is very important that the plunger movement is slow and that this is always done in the same way during pipetting cycles. Volumes 1ml and greater: if the plunger is released too quickly upon aspirating, it will affect the amount of liquid drawn.
	Display not sitting properly (in particular the lower edge of the display does not fit)	Calibration wheel (726066) not properly in place
Counter reading does not make sense and or counter feels very slack	The wings on the lead screw have come out of the grooves on the machinery	Return the wings to the grooves
	The wings on the lead screw have been broken	Replace machinery with new parts
	There is something broken inside the machinery	Replace machinery with new parts
Multi-channel pipettes: tip cone(s) does not draw liquid	Tip cone (bajonet connection) has accidentally come off	Refit tip cone
	Piston(s) is not connected to the piston support plate	Refit piston(s) so that they connect to the piston support plate properly
	Piston tip cone damaged	Replace parts with new ones
	Improper maintenance	Maintain lower parts as per instructions

Problem	Cause	Solution
Pipette does not draw liquid at all	Magnet holder magnet is disconnected from the lower part	Remove the dispensing head and refit it so that the magnet holder magnet is properly connected to the dispensing head
Multi-channel pipettes: Tip ejection does not work tip does not fit	Tip ejection bar has come off (the snap fit is disengaged)	Make sure that the tip ejection bar is properly connected
Electronic pipettes: Error in the display and motor is unable to start	Discharged battery defective battery	Recharge battery replace battery
	Actuator rod jammed	Clean and lubricate actuator rod
	Penetration of solvent vapours and thus actuator rod tip ejection mechanism jammed	Clean tip ejection mechanism and clean lubricate actuator rod
Electronic pipette can start but is unable to complete self test when switched on (error blinking on the display)	Failure in the handle parts (upper body parts)	Check error messages
	Discharged battery defective battery	Recharge battery replace battery
Tip ejector jammed or moves erratically	Tip ejector mechanism jammed contaminated	Clean tip ejection mechanism and clean lubricate actuator rod
	Failure in the handle parts (upper body parts)	Check error messages
	Internal error has occurred	Check error messages and proceed accordingly
Tip ejector feels slack	Ejector mechanism contaminated	Clean lower parts of pipette
	Ejector mechanism damaged	Replace damaged parts
Tip ejector feels slack	Ejector mechanism damaged	Replace damaged parts
Fading display and or segment missing	Display damaged or incorrectly attached to the PCU-board defective PCU board	Open handle cover and check the display
Autotest (a test programmed by service engineer) failed	Discharged battery defective battery	Replace a battery
	Failure in the handle parts (upper body parts)	Check error counters and autotest counters and proceed accordingly
Pipette not charging	Pipette incorrectly positioned in the charging stand carousel	Check the position of the pipette
	AC-adaptor damaged	Replace AC-adaptor
	Charging carousel stand damaged	Open the bottom, check wires and replace the unit if needed
	Battery contacts inside the battery compartment damaged oxidated flattened	Clean battery contacts
	Battery damaged	Replace battery
Reduced operating time with fully charged batteries	Batteries damaged	Replace battery