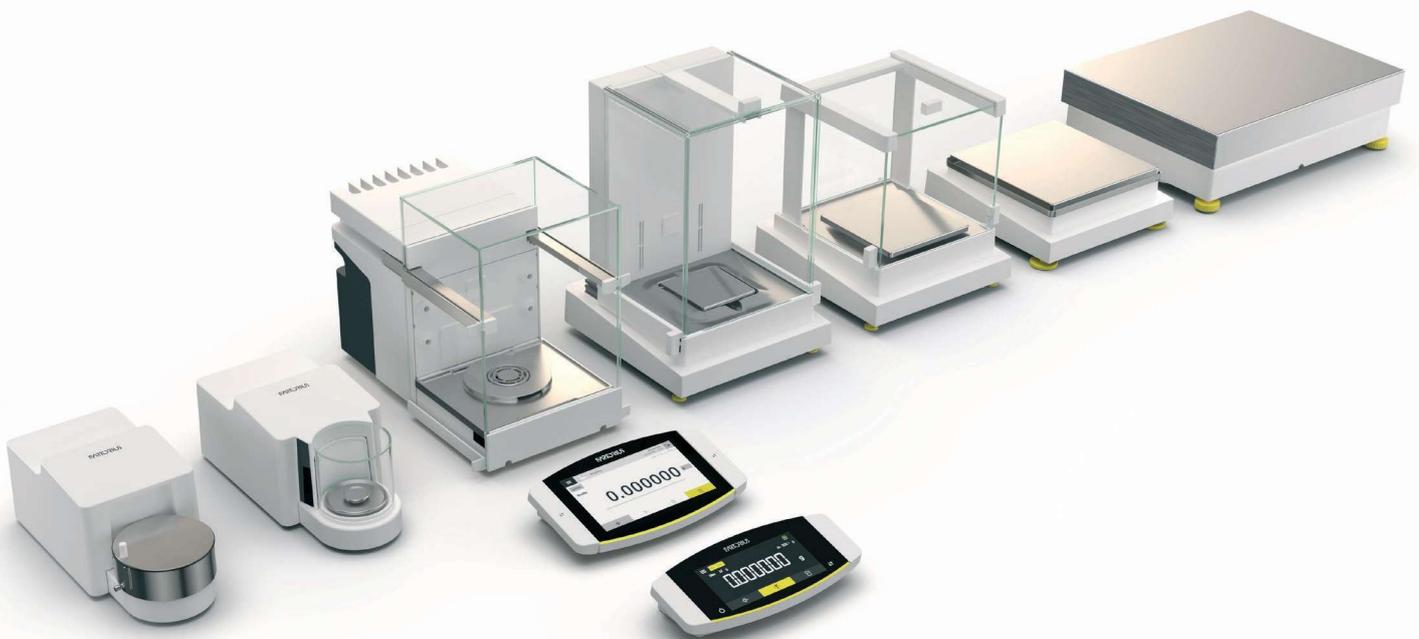


Cubis® II

The New Generation of Modular Premium Balances



Highlights

Superior weighing performance

Fast measurement time and accurate weighing results are guaranteed thanks to monolithic weighing system and built-in engineering solutions.

No more issues with charged samples

The glass draft shields coated with conductive layer prevents from outer electrostatic effects. The built-in ionizer at draft shield versions D and I effectively eliminates electrostatic charges from samples.

Cleaning process guidance

The cleaning QApp provides visual guidance, information about chemical compatibility as well as electrical tracking of these events and is now freely available in all Cubis® II MCA models.

Hardware upgradeability

Motorized draft shield function or built-in ionizer can be activated post-purchase for high-capacity and semi-micro balances. An automated inner draft shield is available as a click-in accessory.

Compliance and Data Integrity

The end-to-end data integrity, technical controls for 21 CFR Part 11 compliance, integrated audit-trail and state-of-the-art user management ensure laboratories can meet regulatory requirements. These features are directly available on the Cubis® II balances, without the need of additional software.

Balances Fleet Management

The Ingenix Suite is a flexible, open solution that works with or without an ELN/LIM system. It offers unlimited connections to easily manage the entire Cubis® II MCA lab balance fleet across all labs within the same network.

Ease of use

The teaching function with learning capability of the motorized draft shield, guided workflows for various weighing applications (QApps), automated motorized leveling and automatic internal adjustment (isoCAL) help with easy and error-free operation of the balance.

Example: Hardware Upgradeability

Motorized inner draft shield

Installation of Cubis® II high-capacity or semi-micro balances in a workbench or laminar hood with filtered air flow subjects the instrument to drafty conditions. The motorized inner draft shield YDS125A ensures best weighing performances and ease of use even under drafty conditions.



Application Example: Pipette Check

Pipette calibration kits

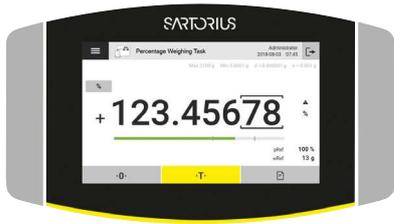
Cubis® II balances with pipette calibration kit VF988, YCP04MS or YCP07MC and software application Pipette Check Advanced (QAPP005) are a complete solution to test Pipettes according to DIN EN ISO 8655.



Product Information

The Cubis® II premium laboratory balances with a maximum load range between 2.1 g and 70 kg and a readability between 0.1 µg to 1 g provide an ideal solution for every laboratory weighing application. Because these balances are modular the display, the weighing module, the draft shield and the software QApps can be individually configured offering a flexible solution for individual needs.

Cubis® II Display and Control Units



Type	MCA	Type	MCE
Display*	7" color touch TFT display in 16:9 format with intuitive user interface	Display*	TFT touch screen for routine weighing tasks
Software	Factory installed set of basic weighing applications (license free) and licensable software packages (QPs) for various applications (QApps) and functional extensions.	Software	Factory installed set of basic weighing applications. No licensable software packages.

* LED backlight 50,000 hours (if used with max. contrast), cable length 25 cm

Technical Specifications

Cubis® II Weighing Modules Ultra-Micro Balances 0.0001 mg

	Units	2.7S
Scale interval (d)	mg	0.0001
Maximum capacity (Max)	g	2.1
Repeatability up to 5% load		
Standard deviation of the load values, tolerance	mg	0.0002
Standard deviation of the load values, typical value	mg	0.00015
Repeatability near Max		
Standard deviation of the load values, tolerance	mg	0.00025
Standard deviation of the load values, typical value	mg	0.00018
Linearity deviation		
Tolerance	mg	0.0009
Typical value	mg	0.0007
Deviation at eccentric loading, positions according to OIML R76		
Test weight	g	1
Tolerance	mg	0.0007
Typical value	mg	0.0005
Sensitivity drift between +10° C and +30° C	ppm/K	1
Tare maximum capacity: Less than 100% of maximum capacity		
Accuracy class according to Directive 2014 31 EU		I
Verification scale interval (e) according to Directive 2014 31 EU	mg	1
Minimum load (Min) according to Directive 2014 31 EU	mg	0.01
Minimum weight according to USP (United States Pharmacopeia), Chap. 41		
Optimum minimum weight	mg	0.082
Typical minimum weight	mg	0.3
Typical stabilization time	s	7
Typical measurement time	s	10
Recommended calibration weight		
External test load	g	2
Accuracy class, according to OIML R111-1		E2
isoCAL		
Temperature change	K	1.5
Time span	h	12
Dimensions		
MCE MCA Weighing module (L×W×H)*	mm	340×139×129
MCE Electronics module (L×W×H)	mm	315×240×61
MCA Electronics module (L×W×H)	mm	355×240×61
Weighing pan size	mm	Ø 20
Filter weighing pan	mm	Ø 50
Weight, approx.*	kg	6.4 7.1

* depending upon weighing pan size, filter weighing pan and draft shield

Cubis® II Weighing Modules
Micro Balances 0.001 mg

	Units	10.6S	6.6S	3.6P
Scale interval (d)	mg	0.001	0.001	0.001 0.002 0.005
Maximum capacity (Max)	g	10.1	6.1	1.1 2.1 3.1
Repeatability up to 5% load				
Standard deviation of the load values, tolerance	mg	0.001	0.001	0.003
Standard deviation of the load values, typical value	mg	0.0005	0.0005	0.0005
Repeatability near Max				
Standard deviation of the load values, tolerance	mg	0.001	0.001	0.005
Standard deviation of the load values, typical value	mg	0.0006	0.0006	0.0006
Linearity deviation				
Tolerance	mg	0.004	0.004	0.004
Typical value	mg	0.003	0.003	0.003
Deviation at eccentric loading, positions according to OIML R76				
Test weight	g	5	2	1
Tolerance	mg	0.004	0.004	0.005
Typical value	mg	0.003	0.003	0.003
Sensitivity drift between +10° C and +30° C	ppm/K	1	1	1
Tare maximum capacity: Less than 100% of maximum capacity				
Accuracy class according to Directive 2014 31 EU		I	I	I
Verification scale interval (e) according to Directive 2014 31 EU mg		1	1	1
Minimum load (Min) according to Directive 2014 31 EU	mg	0.1	0.1	0.1
Minimum weight according to USP (United States Pharmacopeia), Chap. 41				
Optimum minimum weight	mg	0.82	0.82	0.82
Typical minimum weight	mg	0.82	0.82	0.82
Typical stabilization time	s	5	5	5
Typical measurement time	s	8	8	8
Recommended calibration weight				
External test load	g	10	5	3
Accuracy class, according to OIML R111-1		E2	E2	E2
isoCAL				
Temperature change	K	1.5	1.5	1.5
Time span	h	12	12	12
Dimensions				
MCE MCA Weighing module (L×W×H)*	mm	340×139×129	340×139×129	340×139×129
MCE Electronics module (L×W×H)	mm	315×240×61	315×240×61	315×240×61
MCA Electronics module (L×W×H)	mm	355×260×61	355×260×61	355×260×61
Weighing pan size	mm	Ø 30	Ø 30	Ø 30
Filter weighing pan	mm	Ø 50	Ø 50	Ø 50
Weight, approx.*	kg	6.4 7.1	6.4 7.1	6.4 7.1

* depending upon weighing pan size, filter weighing pan and draft shield

Cubis® II Weighing Modules
High-Capacity Micro Balances 0.001 - 0.002 mg

	Units	36S	36P	66S
Scale interval (d)	mg	0.001	0.01 0.001	0.001
Maximum capacity (Max)	g	32	32 10.1	61
Repeatability up to 5% load				
Standard deviation of the load values, tolerance	mg	0.0015	0.002	0.0015
Standard deviation of the load values, typical value	mg	0.0007	0.0007	0.0007
Repeatability near Max				
Standard deviation of the load values, tolerance	mg	0.0025	0.007	0.004
Standard deviation of the load values, typical value	mg	0.0018	0.005	0.0025
Linearity deviation				
Tolerance	mg	0.012	0.015	0.02
Typical value	mg	0.005	0.006	0.005
Deviation when load is off-center, positions according to OIML R76				
Test weight	g	10	10	20
Tolerance	mg	0.015	0.02	0.02
Typical value	mg	0.006	0.008	0.01
Sensitivity drift between +10° C and +30° C	ppm/K	1	1	1
Tare maximum capacity: Less than 100% of maximum capacity				
Accuracy class according to Directive 2014 31 EU		I	I	I
Verification scale interval (e) according to Directive 2014 31 EU mg		1	1	1
Minimum load (Min) according to Directive 2014 31 EU	mg	0.1	0.1	0.1
Minimum weight according to USP (United States Pharmacopeia), Chap. 41 and Ph.Eur. 2.1.7				
Optimum minimum weight	mg	0.82	0.82	0.82
Typical minimum weight	mg	1.4	1.4	1.4
Typical stabilization time	s	3.5	3.5 2.5	3.5
Typical measurement time	s	10	10 6	10
Recommended calibration weight				
External test load	g	20	20	50
Accuracy class, according to OIML R111-1		E2	E2	E2
isoCAL				
Temperature change	K	1.5	1.5	1.5
Time span	h	12	12	12
Dimensions				
MCE MCA Weighing module (L×W×H)*	mm	486 510×240×302	486 510×240×302	486 510×240×302
Weighing pan size	mm	Ø 50	Ø 50	Ø 50
Weight, approx.*	kg	15	15	15

* depending upon weighing pan size, filter weighing pan and draft shield

Cubis® II Weighing Modules
High-Capacity Micro Balances 0.001 - 0.002 mg

	Units	66P	116S
Scale interval (d)	mg	0.01 0.001	0.002
Maximum capacity (Max)	g	61 12	111
Repeatability up to 5% load			
Standard deviation of the load values, tolerance	mg	0.002	0.004
Standard deviation of the load values typical value	mg	0.0007	0.0025
Repeatability near Max			
Standard deviation of the load values, tolerance	mg	0.01	0.01
Standard deviation of the load values, typical value	mg	0.006	0.005
Linearity deviation			
Tolerance	mg	0.02	0.03
Typical value	mg	0.008	0.02
Deviation when load is off-center, positions according to OIML R76			
Test weight	g	20	50
Tolerance	mg	0.03	0.03
Typical value	mg	0.012	0.02
Sensitivity drift between +10° C and +30° C	ppm/K	1	1
Tare maximum capacity: Less than 100% of maximum capacity			
Accuracy class according to Directive 2014 31 EU		I	I
Verification scale interval (e) according to Directive 2014 31 EU mg		1	1
Minimum load (Min) according to Directive 2014 31 EU	mg	0.1	0.2
Minimum weight according to USP (United States Pharmacopeia), Chap. 41 and Ph.Eur. 2.1.7			
Optimum minimum weight	mg	0.82	1.64
Typical minimum weight	mg	1.4	5.0
Typical stabilization time	s	3.5 2.5	3.5
Typical measurement time	s	10 6	8
Recommended calibration weight			
External test load	g	50	50
Accuracy class, according to OIML R111-1		E2	E2
isoCAL			
Temperature change	K	1.5	1.5
Time span	h	12	12
Dimensions			
MCE MCA Weighing module (L x W x H)*	mm	486 510 x 240 x 302	510 x 240 x 302
Weighing pan size	mm	Ø 50	
Weight, approx.*	kg	15	

* depending upon weighing pan size, filter weighing pan and draft shield

Cubis® II Weighing Modules
Semi-Micro Balances 0.01 mg

	Units	226S	225S	225P	125S	125P
Scale interval (d)	mg	0.005	0.01	0.01 0.1	0.01	0.01 0.1
Maximum capacity (Max)	g	220	220	120 220	120	60 120
Repeatability up to 5% load						
Standard deviation of the load values, tolerance	mg	0.01	0.015	0.015	0.015	0.015
Standard deviation of the load values, typical value	mg	0.004	0.007	0.007	0.007	0.007
Repeatability near Max						
Standard deviation of the load values, tolerance	mg	0.025	0.025	0.04	0.025	0.06
Standard deviation of the load values, typical value	mg	0.015	0.015	0.02	0.015	0.02
Linearity deviation						
Tolerance	mg	0.07	0.07	0.1	0.07	0.15
Typical value	mg	0.03	0.03	0.03	0.03	0.1
Deviation when load is off-center, positions according to OIML R76						
Test weight	g	100	100	100	50	50
Tolerance	mg	0.12	0.15	0.2	0.12	0.2
Typical value	mg	0.04	0.05	0.06	0.04	0.1
Sensitivity drift between +10° C and +30° C	ppm/K	1	1	1	1	1
Tare maximum capacity: Less than 100% of maximum capacity						
Accuracy class according to Directive 2014 31 EU		I	I	I	I	I
Verification scale interval (e) according to Directive 2014 31 EU	mg	1	1	1	1	1
Minimum load (Min) according to Directive 2014 31 EU	mg	1	1	1	1	1
Minimum weight according to USP (United States Pharmacopeia), Chap. 41						
Optimum minimum weight	mg	4.1	8.2	8.2	8.2	8.2
Typical minimum weight	mg	8.0	13.0	13.0	13.0	13.0
Typical stabilization time	s	1.5	1.5	1.5	1.5	2
Typical measurement time	s	6	4	4	4	6
Recommended calibration weight						
External test load	g	200	200	200	100	100
Accuracy class, according to OIML R111-1		E2	E2	E2	E2	E2
isoCAL						
Temperature change	K	1.5	1.5	1.5	1.5	1.5
Time span	h	12	12	12	12	12
Dimensions						
MCE MCA Weighing module (L×W×H)*	mm		301×240×301			404×240×373
MCE Electronics module (L×W×H)	mm	-	-	-	-	315×240×61
MCA Electronics module (L×W×H)	mm	-	-	-	-	355×240×61
Weighing pan size	mm	Ø 50	Ø 90			85×85
Weight, approx.*	kg		15			10.2 11.7

* depending upon weighing pan size, filter weighing pan and draft shield

** Module 125P has different dimensions than other 5-digit balances (please see Balance Dimensions)

Cubis® II Weighing Modules Analytical Balances 0.1 mg

	Units	524S	524P	324S	324P	224S	124S
Scale interval (d)	mg	0.1	0.1 0.2 0.5	0.1	0.1 0.2 0.5	0.1	0.1
Maximum capacity (Max)	g	520	120 240 520	320	80 160 320	220	120
Repeatability up to 5% load							
Standard deviation of the load values, tolerance	mg	0.08	0.08	0.08	0.08	0.07	0.1
Standard deviation of the load values, typical value	mg	0.04	0.04	0.04	0.04	0.05	0.05
Repeatability near Max							
Standard deviation of the load values, tolerance	mg	0.1	0.15	0.1	0.1	0.07	0.1
Standard deviation of the load values, typical value	mg	0.05	0.05	0.05	0.05	0.05	0.05
Linearity Deviation							
Tolerance	mg	0.4	0.5	0.3	0.5	0.2	0.2
Typical value	mg	0.2	0.2	0.2	0.2	0.13	0.13
Deviation when load is off-center, positions according to OIML R76							
Test weight	g	200	200	200	200	100	50
Tolerance	mg	0.3	0.4	0.3	0.4	0.2	0.2
Typical value	mg	0.2	0.2	0.2	0.2	0.12	0.12
Sensitivity drift between +10° C and +30° C	ppm/K	1	1	1	1	1	1
Tare maximum capacity: Less than 100% of maximum capacity							
Accuracy class according to Directive 2014 31 EU		I	I	I	I	I	I
Verification scale interval (e) according to Directive 2014 31	mg	1	1	1	1	1	1
Minimum load (Min) according to Directive 2014 31 EU	mg	10	10	10	10	10	10
Minimum weight according to USP (United States Pharmacopeia), Chap. 41							
Optimum minimum weight	mg	82	82	82	82	82	82
Typical minimum weight	mg	82	82	82	82	100	100
Typical stabilization time	s	1	1	1	1	1	1
Typical measurement time	s	3	3	3	3	3	3
Recommended calibration weight							
External test load	g	500	500	300	300	200	100
Accuracy class, according to OIML R111-1		E2	E2	E2	E2	E2	E2
isoCAL							
Temperature change	K	1.5	1.5	1.5	1.5	1.5	1.5
Time span	h	6	6	12	12	12	12
Dimensions							
Weighing module (L×W×H)*	mm	425×240×373					
Weighing pan size	mm	85×85					
Weight, approx.*	kg	8.2 10.0					

* depending upon weighing pan size, filter weighing pan and draft shield

Cubis® II Weighing Modules Precision Balances

	Units	5203S	5203P	3203S	2203S	2203P	1203S
Scale interval (d)	mg	1	1 2 5	1	1	1 10	1
Maximum capacity (Max)	g	5200	1200 2400 5200	3200	2200	1010 2200	1200
Repeatability up to 5% load							
Standard deviation of the load values, tolerance	mg	1	1	1	0.7	0.7	0.7
Standard deviation of the load values, typical value	mg	0.6	0.6	0.6	0.5	0.5	0.5
Repeatability near Max							
Standard deviation of the load values, tolerance	mg	1	1	1	1	1	0.7
Standard deviation of the load values, typical value	mg	0.6	0.6	0.6	0.6	0.6	0.6
Linearity Deviation							
Tolerance	mg	5	5	5	3	5	2
Typical value	mg	2	3	2	2	3	1
Deviation when load is off-center, positions according to OIML R76							
Test weight	g	2000	2000	1000	1000	1000	500
Tolerance	mg	2	2	2	2	3	2
Typical value	mg	1	1	1	1	2	1
Sensitivity drift between +10° C and +30° C	ppm/K	1	1	1	1	1	1.5
Tare maximum capacity: Less than 100% of maximum capacity							
Accuracy class according to Directive 2014 31 EU		I	I	I	I	I	I
Verification scale interval (e) according to Directive 2014 31 EU	mg	10	10	10	10	10	10
Minimum load (Min) according to Directive 2014 31 EU	mg	100	100	100	100	100	100
Minimum weight according to USP (United States Pharmacopeia), Chap. 41							
Optimum minimum weight	mg	820	820	820	820	820	820
Typical minimum weight	mg	1200	1200	1200	1000	1000	1000
Typical stabilization time	s	1	1	1	1	1	1
Typical measurement time	s	2	2	2	1.5	1.5	1.5
Recommended calibration weight							
External test load	g	5000	5000	3000	2000	1000	1000
Accuracy class, according to OIML R111-1		E2	E2	E2	E2	E2	E2
isoCAL							
Temperature change	K	1.5	1.5	1.5	1.5	1.5	1.5
Time span	h	6	6	6	12	12	12
Dimensions							
Weighing module (L × W × H)*	mm	425 × 240 × 122 284 373					
Weighing pan size	mm	140 × 140					
Weight, approx.*	kg	5.9 7.5 9.4 10.2					

* depending upon weighing pan size, filter weighing pan and draft shield

Cubis® II Weighing Modules Precision Balances

	Units	623S	623P	323S	14202S	14202P
Scale interval (d)	mg	1	1 2 5	1	10	10 20 50
Maximum capacity (Max)	g	620	150 300 620	320	14200	3500 7000 14200
Repeatability up to 5% load						
Standard deviation of the load values, tolerance	mg	0.7	1	0.7	10	10
Standard deviation of the load values, typical value	mg	0.4	0.4	0.4	5	5
Repeatability near Max						
Standard deviation of the load values, tolerance	mg	0.7	1	0.7	10	10
Standard deviation of the load values, typical value	mg	0.5	0.5	0.5	5	5
Linearity deviation						
Tolerance	mg	2	5	2	30	50
Typical value	mg	0.6	1.5	0.6	10	20
Deviation when load is off-center, positions according to OIML R76						
Test weight	g	200	200	200	5000	5000
Tolerance	mg	2	4	2	20	40
Typical value	mg	1	3	1	10	10
Sensitivity drift between +10° C and +30° C	ppm/K	2	2	2	1.5	1.5
Tare maximum capacity: Less than 100% of maximum capacity						
Accuracy class according to Directive 2014 31 EU		II	II	II	I	I
Verification scale interval (e) according to Directive 2014 31 EU	mg	10	10	10	100	100
Minimum load (Min) according to Directive 2014 31 EU	mg	20	20	20	1000	1000
Minimum weight according to USP (United States Pharmacopeia), Chap. 41						
Optimum minimum weight	mg	820	820	820	8200	8200
Typical minimum weight	mg	820	820	820	8200	8200
Typical stabilization time	s	0.8	0.8	0.8	0.8	0.8
Typical measurement time	s	1	1	1	1.5	1.5
Recommended calibration weight						
External test load	g	500	500	200	14000	14000
Accuracy class, according to OIML R111-1		E2	E2	E2	E2	E2
isoCAL						
Temperature change	K	2	2	2	1.5	1.5
Time span	h	12	12	12	6	6
Dimensions						
Weighing module (L×W×H)*	mm	425×240×122 284 373			425×240×95	
Weighing pan size	mm	140×140			206×206	
Weight, approx.*	kg	5.9 7.5 9.4 10.2			5.4	

* depending upon weighing pan size, filter weighing pan and draft shield

Cubis® II Weighing Modules Precision Balances

	Units	10202S	8202S	6202S	6202P	5202S	4202S	2202S
Scale interval (d)	mg	10	10	10	10 20 50	10	10	10
Maximum capacity (Max)	g	10200	8200	6200	1500 3000 6200	5200	4200	2200
Repeatability up to 5% load								
Standard deviation of the load values, tolerance	mg	7	7	7	7	6	7	7
Standard deviation of the load values, typical value	mg	5	4	4	4	2	4	4
Repeatability near Max								
Standard deviation of the load values, tolerance	mg	7	7	7	40	6	7	7
Standard deviation of the load values, typical value	mg	5	4	4	15	2	4	4
Linearity deviation								
Tolerance	mg	20	20	20	50	10	20	20
Typical value	mg	6	6	6	20	5	6	6
Deviation when load is off-center, positions according to OIML R76								
Test weight	g	5000	5000	2000	2000	2000	2000	1000
Tolerance	mg	20	30	20	30	10	30	20
Typical value	mg	10	10	10	30	5	10	10
Sensitivity drift between +10° C and +30° C	ppm/K	1.5	2	2	2	2	2	2
Tare maximum capacity: Less than 100% of maximum capacity								
Accuracy class according to Directive 2014 31 EU		II	II	II	II	I	II	II
Verification scale interval (e) according to Directive 2014 31 EU	mg	100	100	100	100	100	100	100
Minimum load (Min) according to Directive 2014 31 EU	mg	1000	500	500	500	1000	500	500
Minimum weight according to USP (United States Pharmacopeia), Chap. 41								
Optimum minimum weight	mg	8200	8200	8200	8200	8200	8200	8200
Typical minimum weight	mg	8200	8200	8200	8200	8200	8200	8200
Typical stabilization time	s	0.8	1	1	1	0.8	1	0.8
Typical measurement time	s	1.5	1.5	1.5	1.5	1	1	1
Recommended calibration weight								
External test load	g	10000	7000	5000	5000	5000	3000	1500
Accuracy class, according to OIML R111-1		E2	E2	E2	E2	E2	E2	E2
isoCAL								
Temperature change	K	1.5	2	2	2	2	2	2
Time span	h	6	12	12	12	12	12	12
Dimensions								
Weighing module (L × W × H)*	mm	425 × 240 × 95			425 × 240 × 122 284 373		425 × 240 × 95	
Weighing pan size	mm	206 × 206			140 × 140		206 × 206	
Weight, approx.*	kg	5.4			5.9 7.5 9.4 10.2		5.4	

Cubis® II Weighing Modules Precision Balances

* depending upon weighing pan size, filter weighing pan and draft shield

	Units	1202S	12201S	8201S	5201S
Scale interval (d)	mg	10	100	100	100
Maximum capacity (Max)	g	1200	12200	8200	5200
Repeatability up to 5% load					
Standard deviation of the load values, tolerance	mg	7	50	50	50
Standard deviation of the load values, typical value	mg	4	20	20	20
Repeatability near Max					
Standard deviation of the load values, tolerance	mg	7	50	50	50
Standard deviation of the load values, typical value	mg	4	20	20	20
Linearity deviation					
Tolerance	mg	20	100	100	100
Typical value	mg	6	30	30	20
Deviation when load is off-center, positions according to OIML R76					
Test weight	g	500	5000	5000	2000
Tolerance	mg	20	200	200	200
Typical value	mg	10	100	100	100
Sensitivity drift between +10° C and +30° C	ppm/K	2	4	4	4
Tare maximum capacity: Less than 100% of maximum capacity					
Accuracy class according to Directive 2014 31 EU		I	II	II	II
Verification scale interval (e) according to Directive 2014 31 EU	mg	100	1000	1000	1000
Minimum load (Min) according to Directive 2014 31 EU	mg	500	5000	5000	5000
Minimum weight according to USP (United States Pharmacopeia), Chap. 41					
Optimum minimum weight	mg	8200	82000	82000	82000
Typical minimum weight	mg	8200	82000	82000	82000
Typical stabilization time	s	0.8	0.8	0.8	0.8
Typical measurement time	s	1	1	1	1
Recommended calibration weight					
External test load	g	700	12000	8000	5000
Accuracy class, according to OIML R111-1		E2	F1	F1	F1
isoCAL					
Temperature change	K	2	4	4	4
Time span	h	6	12	12	12
Dimensions					
Weighing module (L×W×H)*	mm			425×240×95	
Weighing pan size	mm			206×206	
Weight, approx.*	kg			5.4	

* depending upon weighing pan size, filter weighing pan and draft shield

Cubis® II Weighing Modules High Capacity Balances

	Units	32202P	70201S	50201S	36201S	36201P
Scale interval (d)	mg	10 100	100	100	100	100 1000
Maximum capacity (Max)	g	4200 32200	70200	50200	36200	10200 36200
Repeatability up to 5% load						
Standard deviation of the load values, tolerance	mg	40	100	100	100	100
Standard deviation of the load values, typical value	mg	20	40	40	20	20
Repeatability near Max						
Standard deviation of the load values, tolerance	mg	40 100	100	100	100	100
Standard deviation of the load values, typical value	mg	20 50	40	40	50	20
Linearity deviation						
Tolerance	mg	200	500	500	200	200
Typical value	mg	100	150	150	100	100
Deviation when load is off-center, positions according to OIML R76						
Test weight	g	10000	20000	20000	10000	10000
Tolerance	mg	200	500	500	300	300
Typical value	mg	100	300	300	200	200
Sensitivity drift between +10° C and +30° C	ppm/K	2	2	2	2	2
Tare maximum capacity: Less than 100% of maximum capacity						
Accuracy class according to Directive 2014 31 EU		-	II	II	II	II
Verification scale interval (e) according to Directive 2014 31 EU	mg	-	1000	1000	1000	1000
Minimum load (Min) according to Directive 2014 31 EU	mg	-	5000	5000	5000	5000
Minimum weight according to USP (United States Pharmacopeia), Chap. 41						
Optimum minimum weight	mg	8200	82000	82000	82000	82000
Typical minimum weight	mg	8200	82000	82000	82000	82000
Typical stabilization time	s	2	1.5	1.5	1.5	1.5
Typical measurement time	s	2	1.5	1.5	2	2
Recommended calibration weight						
External test load	g	30000	70000	50000	30000	30000
Accuracy class, according to OIML R111-1		F1	F1	F1	F1	F1
isoCAL						
Temperature change	K	2	2	2	4	4
Time span	h	12	12	12	12	12
Dimensions						
Weighing module (L×W×H)*	mm	412×400×159			412×400×126	
Weighing pan size	mm	Ø 233			400×300	
Weight, approx.*	kg	17.1			15.8	

Cubis® II Weighing Modules High Capacity Balances

* depending upon weighing pan size, filter weighing pan and draft shield

	Units	20201S	11201S	70200S	36200S
Scale interval (d)	mg	100	100	1000	1000
Maximum capacity (Max)	g	20200	11200	70200	36200
Repeatability up to 5% load					
Standard deviation of the load values, tolerance	mg	100	100	500	500
Standard deviation of the load values, typical value	mg	20	20	200	200
Repeatability near Max					
Standard deviation of the load values, tolerance	mg	100	100	500	500
Standard deviation of the load values, typical value	mg	20	20	200	200
Linearity Deviation					
Tolerance	mg	200	200	1000	1000
Typical value	mg	60	60	200	200
Deviation when load is off-center, positions according to OIML R76					
Test weight	g	5000	5000	20000	10000
Tolerance	mg	300	300	1000	1000
Typical value	mg	200	200	600	500
Sensitivity drift between +10° C and +30° C	ppm/K	2	2	3	3
Tare maximum capacity: Less than 100% of maximum capacity					
Accuracy class according to Directive 2014 31 EU		II	II	II	II
Verification scale interval (e) according to Directive 2014 31 EU	mg	1000	1000	10000	1000
Minimum load (Min) according to Directive 2014 31 EU	mg	5000	5000	50000	50000
Minimum weight according to USP (United States Pharmacopeia), Chap. 41					
Optimum minimum weight	mg	82000	82000	820000	820000
Typical minimum weight	mg	82000	82000	820000	820000
Typical stabilization time	s	1.5	1.5	1	1
Typical measurement time	s	2	2	1.2	1.2
Recommended calibration weight					
External test load	g	20000	10000	70000	30000
Accuracy class, according to OIML R111-1		F1	F1	F1	F1
isoCAL					
Temperature change	K	4	4	2	4
Time span	h	12	12	12	12
Dimensions					
Weighing module (L×W×H)*	mm	412×400×126			
Weighing pan size	mm	400×300			
Weight, approx.*	kg	15.8			

* depending upon weighing pan size, filter weighing pan and draft shield

Technical Specifications

Electrical data

		Ultra-micro, micro, analytical, precision and high capacity balances	High-capacity micro and semi-micro balances
	Units	Value	Value
Installation Site			
AC voltage	V	100–240 (±10%)	100–240 (±10%)
Frequency	Hz	50–60 (±5%)	47–63
Current consumption, maximum	A	1.0	0.8
Overvoltage category according to IEC 60664-1		II	II
Pollution level according to IEC 61010-1 IEC 60664-1		2	2
Device power supply (secondary)			
Max. DC voltage	V	14.25–15.75 at 2 A output current	15 ± 15% at 4.3 A output current
Power, maximum	W	30	64.5
Power supply cable		According to IEC 60320-1/C14: Country-specific, 3-pin, two-sided plug	According to IEC 60320-1 C13 C14, with IEC plug, 3-pin, and with country-specific power plug
Safety of Electrical Equipment		According to EN 61010-1 / IEC 61010-1 Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 1: General Requirements	
Electromagnetic Compatibility			
Interference Immunity		Suitable for use in industrial areas	
Transient emissions		Class B; suitable for use in residential areas and areas that are directly connected to a low voltage network that (also) supplies residential buildings.	
Ambient conditions			
Standard laboratory rooms			
Installation site according to IEC 60259-1, maximum altitude above sea level	m	3000	3000
For indoor use only			
Temperature			
In operation	°C	+5 – +40	+10 – +30
In operation for conformity-assessed devices: see information on the device's ID plate			
During storage and transport	°C	-20 – +60	
Relative humidity			
At temperatures of up to 31° C	%	80	80
Then linear decrease from 80% at 31° C to 50% at 40° C			
No heat from heating systems or direct sunlight, drafts from open windows, AC systems, or doors, vibrations, "heavy traffic" areas (personnel) electromagnetic fields, dry air			

Interfaces

Specifications for the COM-RS232 Interface

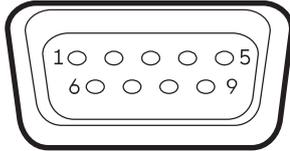
Type of interface: Serial interface

Interface operation: Full duplex

Level: RS232

Connection: D-sub connector, 9-pin

Pin assignment:



Pin 1: Not assigned

Pin 2: Data output (TxD)

Pin 3: Data input (RxD)

Pin 4: Not assigned

Pin 5: Internal ground

Pin 6: Not assigned

Pin 7: Clear to Send (CTS)

Pin 8: Request to Send (RTS)

Pin 9: Not assigned

Specifications for the USB-A Interface

Communication: USB host (master)

Connectable devices: Sartorius printers, USB sticks with software update

Specifications for the USB-B Interface

Communication: USB device (slave)

Type of interface: Virtual serial interface (virtual COM-port, VCP) and "PC direct" communication

Specifications for the USB-C Interface (high-capacity micro and semi-micro balances)

Communication: Downstream-facing port (DFP), USB host (Master)

Communication: RS232 connection with accessory YCC-USB-C-D09M

* RS232 adapter cable YCC-USB-C-D09M available for high-capacity micro and semi-micro balance

Materials

Housing: Die-cast aluminum, plastic PBT, Optiwhite float glass and stainless steel 1.4401 | 1.4404, PA handles, aluminum trim

Control unit: Die-cast aluminum, painted, float glass and plastic PBT, PP

Integrated Clock

Maximum deviation per month (RTC): 30 s

Backup Battery

Lithium battery: type CR2032

Service life at room temperature, minimum: 10 Years

Alibi Memory Value

Maximum number of data records: 150,000

Audit-Trail memory

Maximum number of data points: 300,000

Software packages

Code	Item
QP1	QApp Package Pharma
QP2	QApp Package Advanced Applications
QP3	QApp Package Utilities
QP4	QApp Package Connectivity
QP10	QApp Package Hardware

Draft Shields

Code	Item
0	Flat, stainless steel weight pan with no draft shield for weighing modules
A	Automatic, glass motorized draft shield with learning capability for user-friendly operation and easy customization to the changing requirements of different applications
E	Manual glass draft shield for precision balances
F	Manual stainless steel draft shield for weighing filters with diameters of up to 50 mm (75 mm and 90 mm pans optional)
I	Identical to the A draft shield, but also includes an integrated ionizer to eliminate interfering electrostatic charges on samples and sample containers
M	Automatic, motorized, round 100% glass draft shield with learning capability for ultra-micro balance and micro balances
R	Flat, stainless steel weighing pan draft shield (removable, with no glass components) for all precision balances
U	Manual glass analytical draft shield chamber, with smooth-action doors that open wide and provide unimpeded access to the weighing chamber without interfering braces
D	Manual glass draft shield with licensable ionizer and motors

Draft Shield Inner Dimensions

Draft Shield Version	Depth (mm)	Height (mm)	Width (mm)
F	-	33	Ø 109
M	-	67	Ø 80
U	191	261	193
I and A**	154	250	192
E	191	172	193
R	154	275	154
D	159	234	185

** max. 500,000 opening/closing cycles guaranteed if serviced at regular intervals of 100,000 cycles

Approvals

Code	Item
SØØ	Standard version non-verified, all units
SØ1	Standard version non-verified, metric units only
CCN	Balance with Type Approval Certificate for China
CEU	Verified balance with EC Type Approval Certificate (for EU except France)
CFR	Verified balance with EC Type Approval Certificate for France only
OBR	Balance with Type Approval Certificate for Brazil
OIN	Balance with Type Approval Certificate for India
OJP	Balance with Type Approval Certificate for Japan
ORU	Balance with Type Approval Certificate for Russia

Accessories

Printers and Communication	Quantity	Cat. No.
Thermal transfer thermal printer for GMP GLP printouts on continuous paper and labels	1	YDP30
Laboratory thermal transfer printer YDP30 with USB and ethernet connection	1	YDP30-NET
Wireless Nano USB Adapter	1	YWLAN01MS
WIFI Nano Router	1	YWLAN02MS
Standard paper and ink ribbon, set, 90 m, for YDP30	1	69Y03285
Self-adhesive paper and ink ribbon, 90 m, for YDP30	1	69Y03286
Standard thermal paper, 24 m roll, for YDP30 YDP40	5	69Y03287
Self-adhesive thermal paper, 13 m roll, for YDP30	5	69Y03288
Self-adhesive labels for YDP30		
58 mm × 100 mm	350	69Y03094
58 mm × 76 mm	500	69Y03093
58 mm × 30 mm	1000	69Y03092
Displays and Input Output Elements		
MCE Display	1	69MS0218
Display head MCA for balances with automatic draft shield	1	69MS0212
Display head MCA for balances without automatic draft shield	1	69MS0215
MCA display for high-capacity balances (including short distance adapter)	1	69MS0216
Motion sensor with USB connection cable	1	YHS02USB
Display stand for weigh cells with scale interval of 100 mg 1 g and weighing capacity > 20 kg for raising the operating unit	1	YDH04MS
Display stand for weigh cells with scale interval of 10 mg 100 mg for raising the operating unit	1	YDH03MS
Barcode and QR Reader with USB	1	YBR05
Foot switch for draft shield, tara, print	1	YFS02

Accessories (continued)

Hardware for Pipette Calibration (Analytical Balances)	Quantity	Cat. No.
Pipette calibration kit (hardware). Consists of moisture trap and all required adapters	1	YCP04MS
Density Determination Kits		
Density determination kit for solids and liquids for 0.1 and 0.01 mg weighing modules	1	YDK03MS
Density determination kit for solids and liquids for 1 mg weighing modules	1	YDK04MS
Filter Pans, Ionizer and Weighing Scoops		
Grid pan for model with a scale interval of 10 mg or 100 mg for weighing in laboratory hoods, safety weighing cabinets and workbenches, reduced wind attack surface of the weighing pan, replaces standard pan	1	YWP07MS
Anti-static weighing pan, 100 mm diameter, for weighing module for semi-micro balance and analytical balances with 0.1 mg or 0.01 mg scale interval	1	YWP04MS
Filter weighing pan made of titanium, diameter 52 mm, for ultra-micro and micro balances only together with F draft shield	1	YSH34
Filter weighing pan made of titanium, diameter 75 mm, for ultra-micro balance or micro balance models only together with F draft shield	1	YSH35
Safe-lock Tube Holder for reaction tubes up to 2 mL volume, for ultra-micro or micro balances only together with draft shield F	1	YSH13
Safe-lock Tube Holder for reaction tubes, up to 2 mL volume, for analytical balances	1	YSH15
Safe-lock Tube Holder for bigger reaction tubes up to 5 mL volume, for analytical balances	1	YSH19
Vial Holder for conical -, centrifuge-, round bottom- and test tubes up to 40 mL volume, for analytical balances	1	YSH23
Holder for titration vessels, round bottom flasks and test tubes with diameter up to 50 mm, for analytical balances	1	YSH37
Filter weighing pan made of titanium, diameter 90 mm, for ultra-micro balance or micro balance models only together with F draft shield	1	YSH36
Ionization blower for electrostatically charged samples	1	YIB01-ODR
Ionizer with U-shaped electrode for 230 V	1	YIB02-230V
Ionizer with U-shaped electrode for 115 V	1	YIB02-115V
Stat-Pen ionization pen for discharging electrostatically charged samples	1	YSTP01
Compact U-shaped ionizer for 230 V/115 V	1	YIB03-C
Aluminum weighing scoop, 4.5 mg for ultra-micro balance and micro balance models	250	6565-250
Aluminum weighing scoop, 52 mg for ultra-micro balance and micro balance models	50	6566-50
Weighing scoop made from chrome-nickel steel, L 90 mm × W 32 mm × H 8 mm	1	641214

Accessories (continued)

Other Accessories	Quantity	Cat. No.
Display cable, 3 m, for separate installation of MCE or MCA display and weighing unit, installation by Sartorius Service or at the factory	1	YCC01-MCD3
Cable RS232 9-pin to M12 inlet for connecting Watson-Marlow pumps 530DuN and 630DuN, 2 m	1	YCC-D09M-M12F-2M
Cable RS232 9-pin (male) to 9-pin (male) for connecting e.g. Watson-Marlow 323Du pump, 2.9 m	1	YCC-D09MM-EC-2.9M
Cable DSUB25 DIO to USB for connecting e.g. signal light, 0.5 m	1	YCC01-MC05
Ethernet extension cable, 1 m	1	YCC-RJ45-CAT7
RS232C connection cable, 9 pin male to 9 pin female, 1.5 m	1	YCC-D09MF
Below-balance weighing hook for precision balances with scale interval of 100 mg 1 g and weighing capacity > 20 kg, not for verified models	1	69EA0040
Sartorius Wedge, software for data communication between the PC and balance	1	YSW02
Pipette calibration set micro balances	1	VF988
Signal light for displays MCE and MCA	1	VF4763
Connection cable for eBox 1.2 m 2.5 m	1	VF4755
Extension cable for climate tower 0.8 m	1	VF4756
Extension cable for motion sensor 0.8 m	1	VF4757
Connection cable for fermenter	1	VF4758
RS232 analog converter	1	VF4759
YRB11Z modified for Cubis® balances	1	VF4476
External battery pack	1	YRB11Z
Weighing Tables		
Made from synthetic stone, with vibration dampening	1	YWT03
Made from wood with synthetic stone	1	YWT09
Wall console	1	YWT04
Climate Modules		
Climate module, uncalibrated, for draft shield A and user interface MCA	1	YCM20MC
Calibration of a climate module YCM20MC with DAkkS calibration certificate	1	YCM20DAkkS
Climate module with DAkkS calibration certificate for draft shield A and user interface MCA	1	YCM20MC-DAkkS
Tower for climate module, for mounting YCM20MC; incl. climate module YCM20MC; can be ported to all Cubis® II weighing modules with user interface MCA	1	YCM20MC-Tower

Accessories (continued)

For weighing modules 36S, 36P, 66S, 66P, 116S, 226S, 225S, 225P and 125S

Hardware options*	Quantity	Cat. No.
Ionizer & motorized draft shield license	1	QP10
Ionizer licence	1	QAPP1001
Motorized draft shield license	1	QAPP1002
Inner Draft Shield		
Motorized	1	YDS125A
Manual	1	YDS125U
Glass base, for height reduction of weighing compartment	1	YDSHR
Outer Draft Shield		
Left door outer draftshield	1	YCCDSL
Right door outer draftshield	1	YCCDSR
Cover slide outer draftshield	1	YCCDSU
Front panel outer draftshield	1	YCCDSF
Displays and Input Output Elements		
Motion sensor with USB connection cable	1	YHS02USB
Density Determination Kit		
Density determination set for solids and liquids	1	YDK03MC
Hardware for Pipette Calibration		
Pipette calibration kit. Consists of moisture trap and all required adapters	1	YCP07MC
Titanium Weighing Pans & Sample Holders		
90 mm weighing pan, slotted	1	YWP10-3
50 mm weighing pan, slotted, with protective plate for 50 mm	1	YWP09-3
Adjustable sample holder for vessels of up to 50 mL	1	YSH02-3
For coronary stents (up to 38 mm)	1	YSH12-3
For save-lock tubes, 1.5 mL – 2 mL	1	YSH14-3
For save-lock tubes up to 5 mL	1	YSH18-3
For vials	1	YSH22-3
For weighing boats	1	YSH26-3
For filters, 150 mm diameter	1	YSH30-3
For filters up to 75 mm	1	YSH35-3
For titration vessels and round bottom flasks	1	YSH47-3
For syringes, vertical	1	YSH46-3
Other Accessories		
Connection cable for operating display, length 3 m	1	YCC01-MCD3-3
Dust cover Cubis® II MCE ultra-high resolution	1	YDCC2MCE
Dust cover Cubis® II MCA ultra-high resolution	1	YDCC2MCA
Cleaning Kit	1	YCK01MC

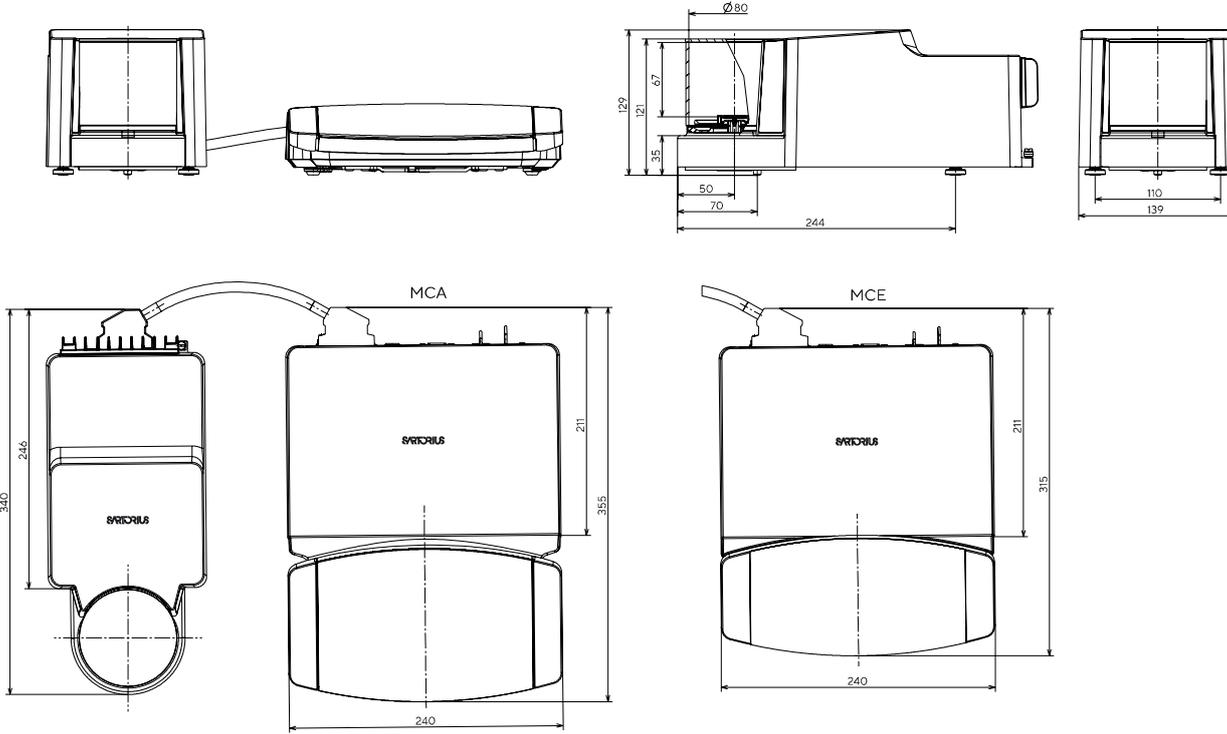
*After purchase licensing of hardware options for high-capacity micro and semi-micro balances with MCA Display only

Accessories (continued)

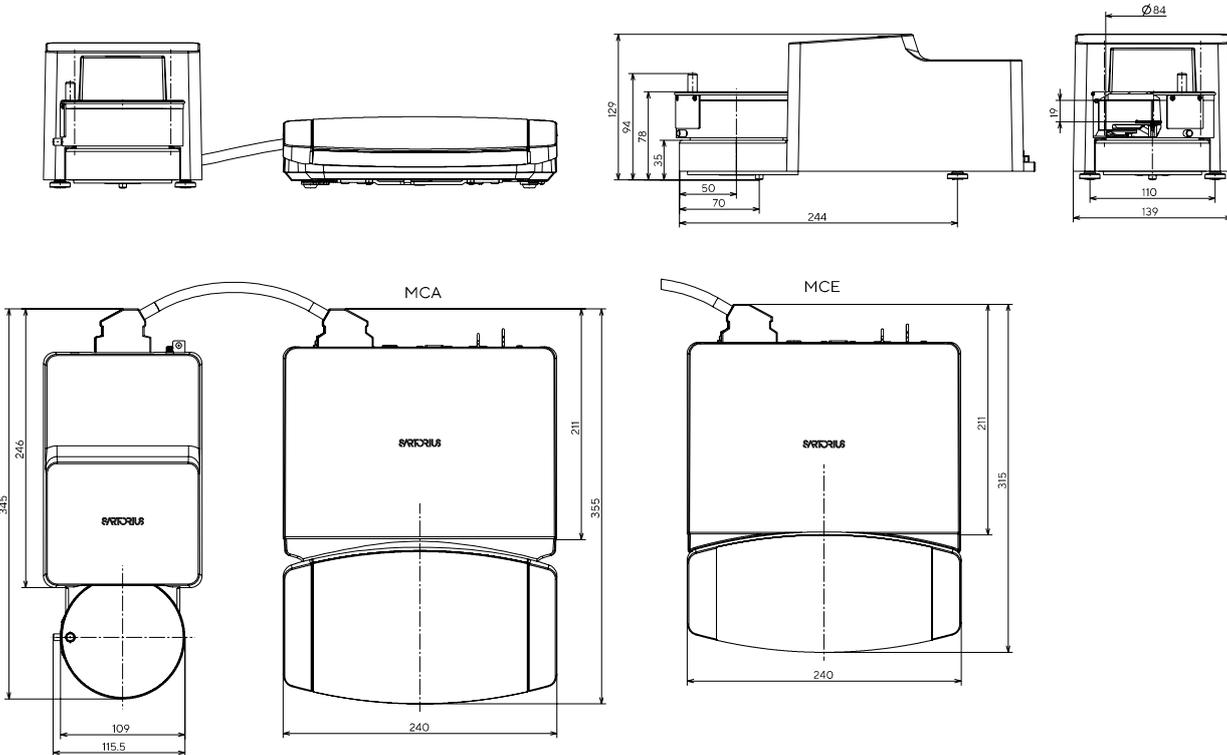
Sample Holders Made of Titanium		Quantity	Cat. No.	Balance type
Adjustable sample holder for vessels of up to 50 mL		1	YSH02-3	High capacity micro and semi-micro
For coronary stents (up to 38 mm)		1	YSH12-3	High capacity micro and semi-micro
			YSH10	Ultra-micro and micro
For save-lock tubes, 1.5 mL – 2 mL		1	YSH14-3	High capacity micro and semi-micro
			YSH13	Ultra-micro and micro
			YSH15	Analytical and weighing module 125P
For save-lock tubes up to 5 mL		1	YSH18-3	High capacity micro and semi-micro
			YSH19	Analytical and weighing module 125P
For vials		1	YSH22-3	High capacity micro and semi-micro
			YSH23	Analytical and weighing module 125P
For weighing boats		1	YSH26-3	High capacity micro and semi-micro
			YSH26	Analytical and weighing module 125P
For filters, 150 mm diameter		1	YSH30-3	High capacity micro and semi-micro
			YSH30	Analytical and weighing module 125P
For filters up to 75 mm		1	YSH35-3	High capacity micro and semi-micro
For filters up to 50 mm			YSH35	Ultra-micro and micro
For filters up to 90 mm			YSH34	Ultra-micro and micro
For titration vessels and round bottom flasks		1	YSH47-3	High capacity micro and semi-micro
				Analytical and weighing module 125P
For syringes, vertical		1	YSH46-3	High capacity micro and semi-micro
			YSH46	Analytical and weighing module 125P

Balance Dimensions

Ultra-Micro and Micro Balance | All dimensions are given in millimeters

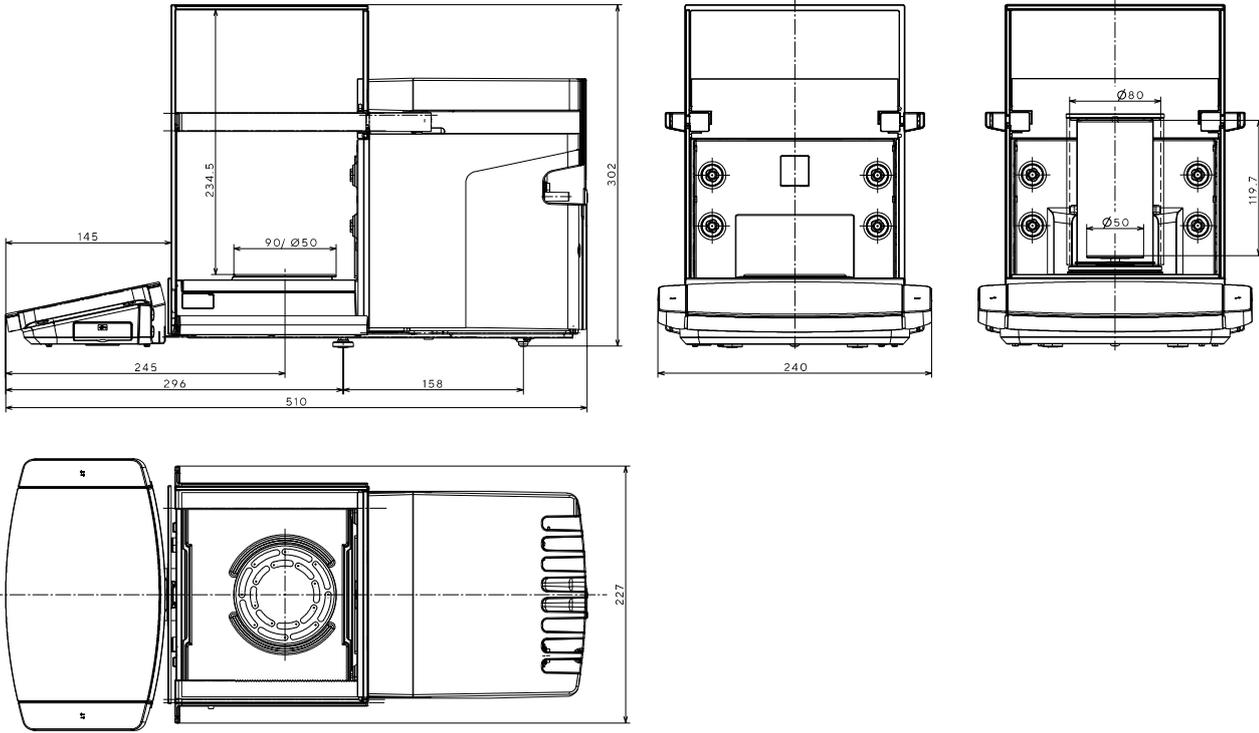


Ultra-Micro and Micro Filter Balance | All dimensions are given in millimeters

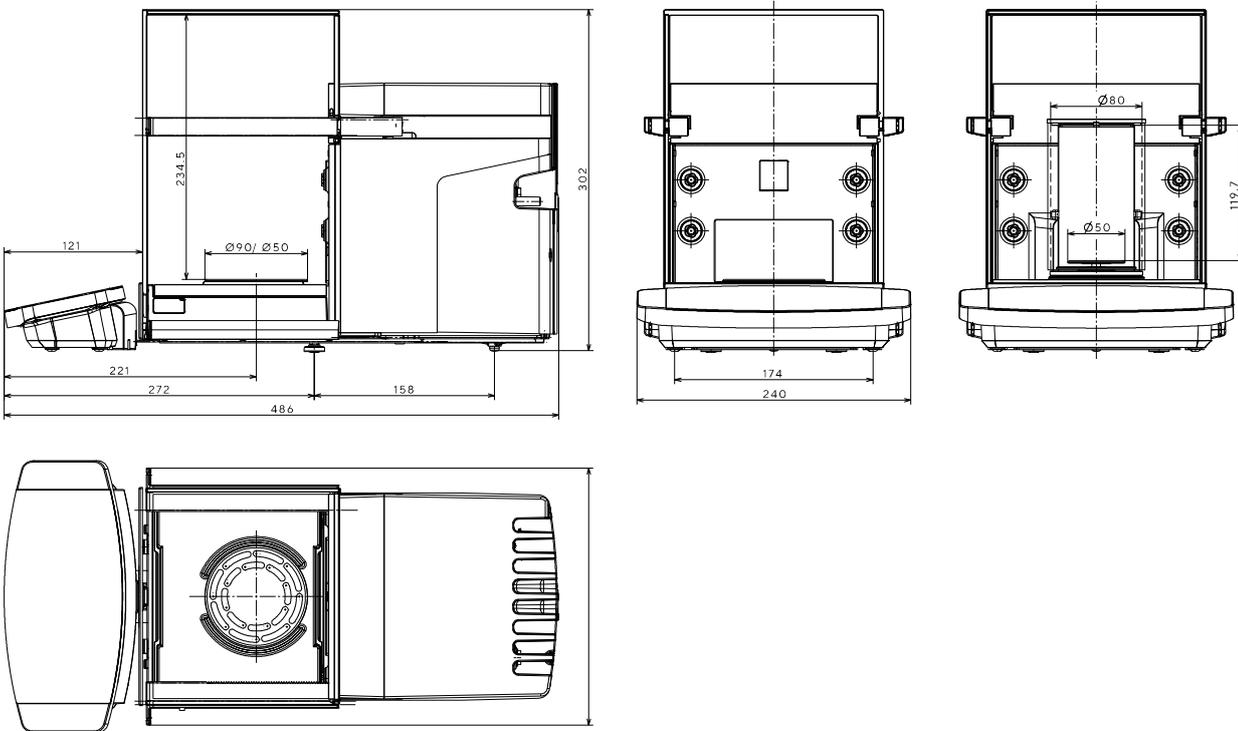


High Capacity and Semi-Micro Balances | All dimensions are given in millimeters
 Weighing modules 36S, 36P, 66S, 66P, 116S, 226S, 225S, 225P and 125S

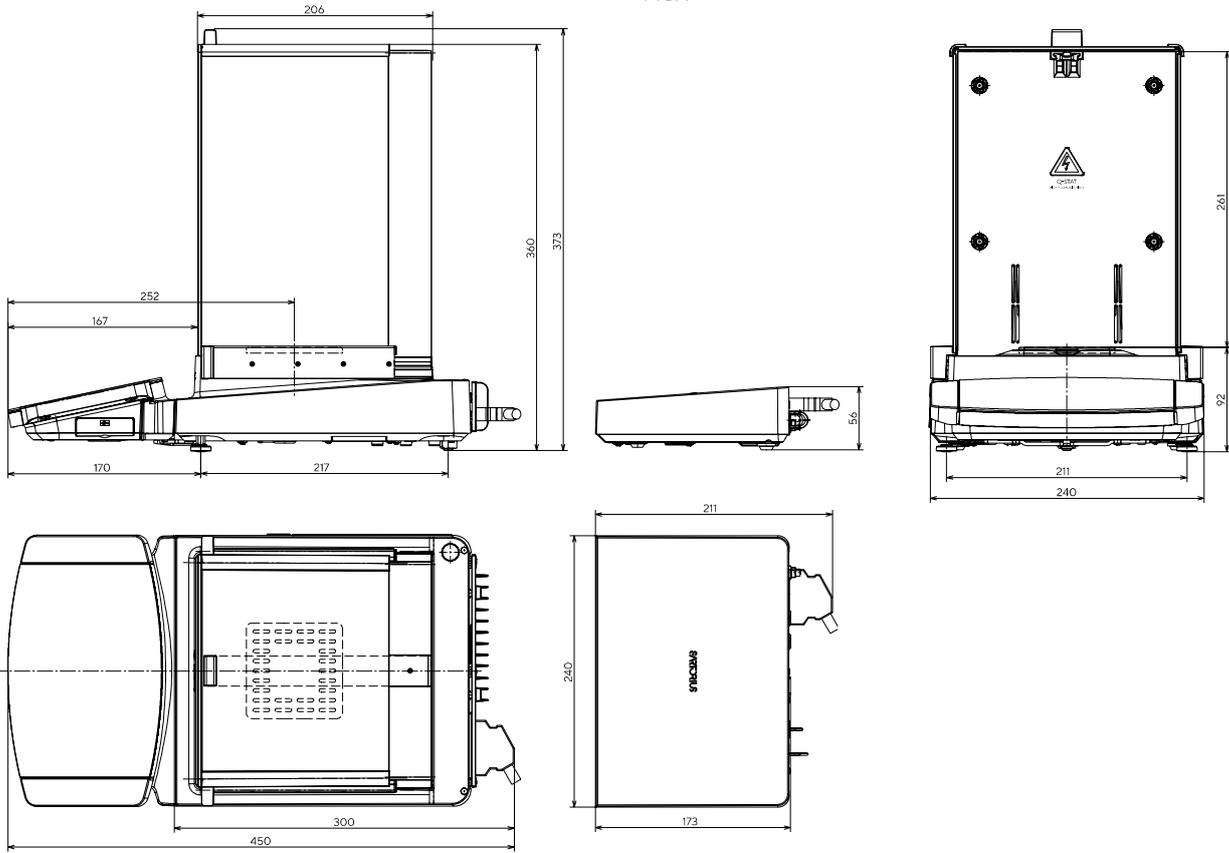
MCA



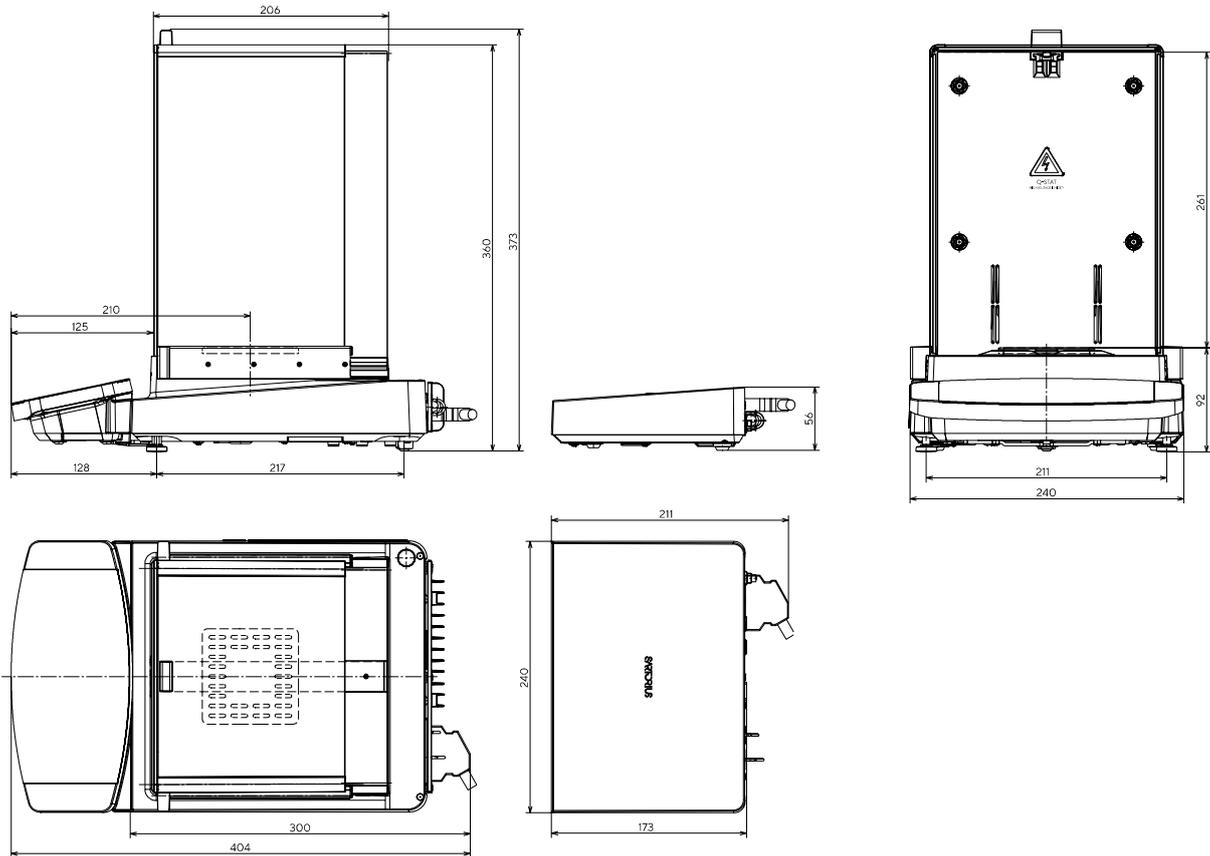
MCE



MCA

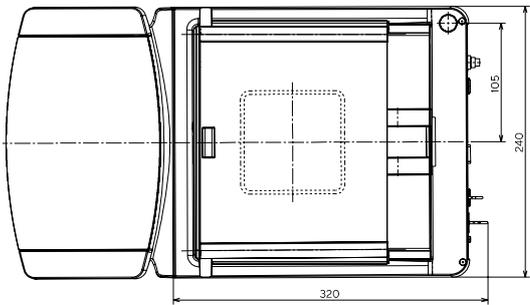
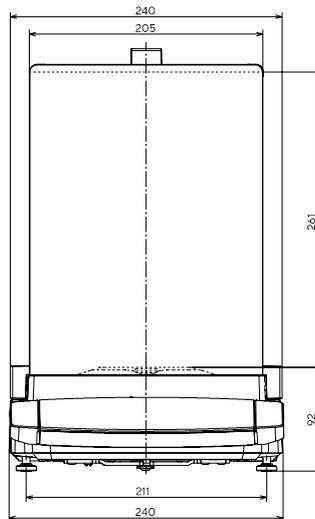
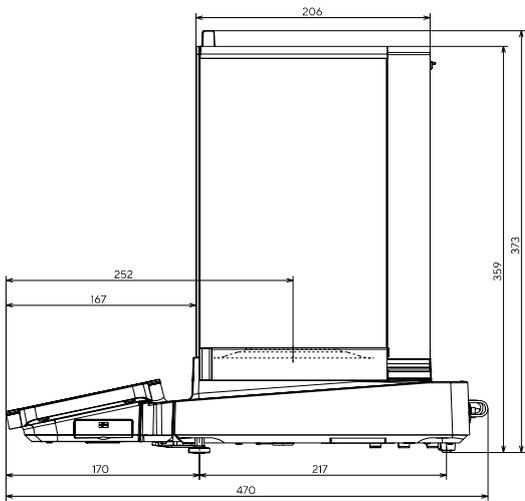


MCE

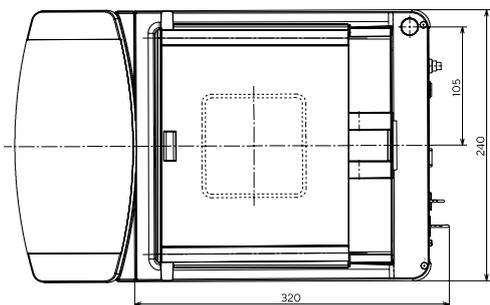
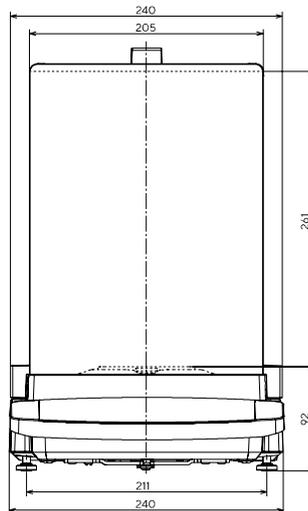
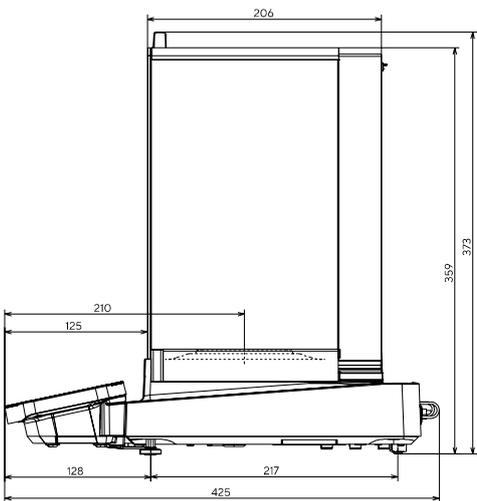


Analytical Balance | All dimensions are given in millimeters

MCA

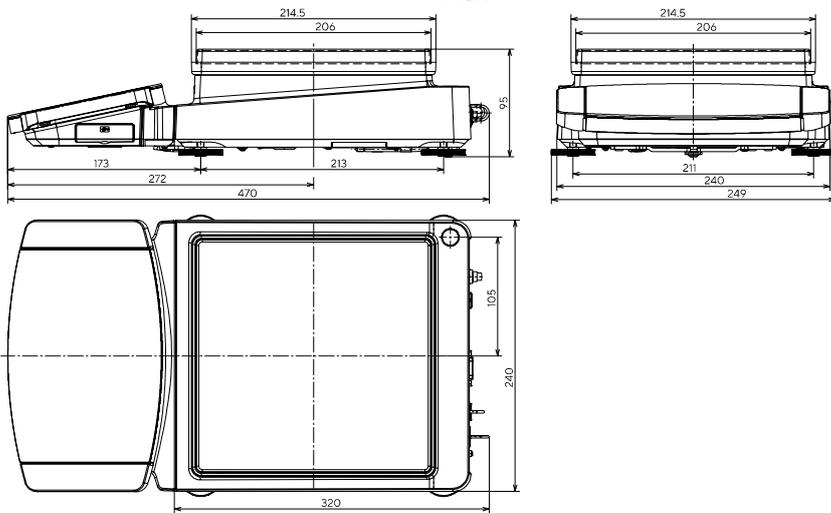


MCE

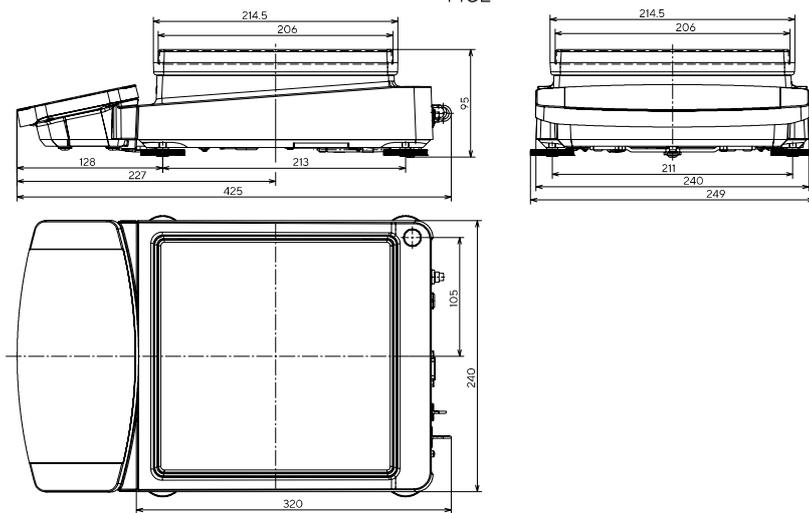


Precision Balance | All dimensions are given in millimeters

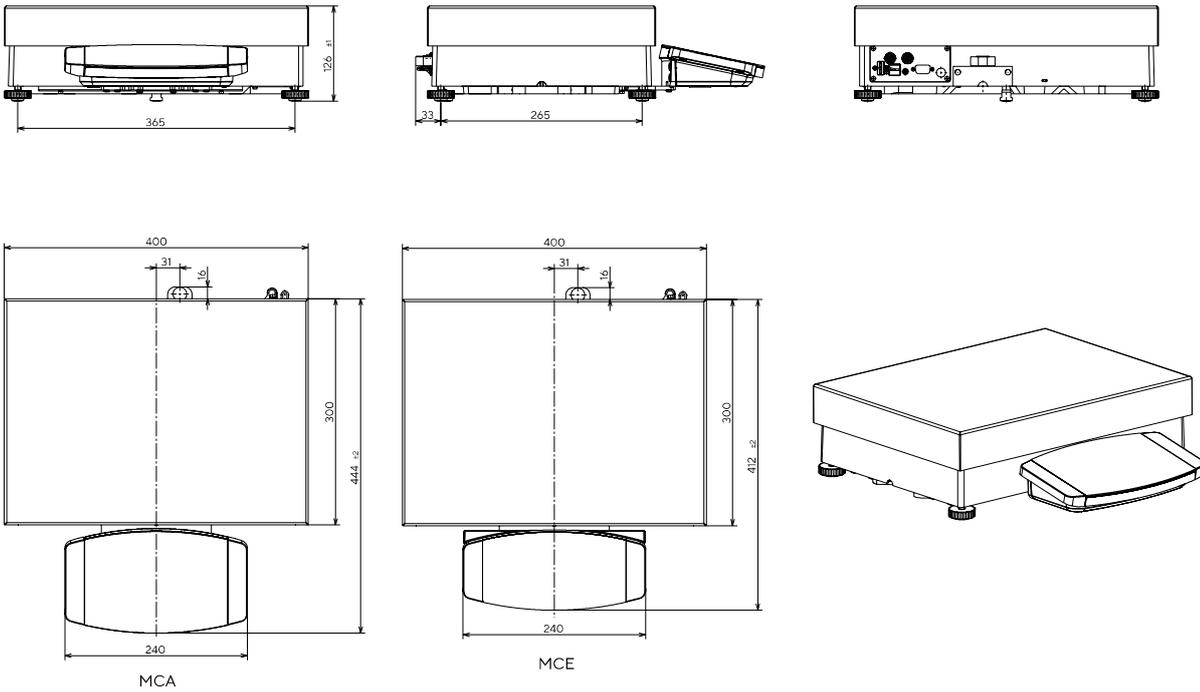
MCA



MCE



High-Capacity Balance | All dimensions are given in millimeters



SOLICITA TU COTIZACIÓN !!!
TEL. 667 7160123, 7160188
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Analizador de Humedad MA160

Gestiona sus Tareas Sofisticadas

Simplifying Progress

SARTORIUS

Análisis de Humedad Rápido, Preciso y Sencillo

Para poder realizar análisis rápidos y precisos en un diverso rango de muestras de productos, necesita un instrumento fiable que le dé la máxima flexibilidad.

El MA160 utiliza el método termogravimétrico para determinar el contenido de humedad de sustancias líquidas, pastosas y sólidas, de manera conveniente, fiable y en un mínimo de tiempo. Proporciona resultados extraordinariamente rápidos, absolutamente reproducibles y presenta un Asistente de Desarrollo de Métodos intuitivo que le permite desarrollar nuevos métodos en tan sólo tres simples pasos. El MA160 le brinda las funciones necesarias para la gestión profesional y segura de los métodos creados.

Estos métodos pueden ser almacenados y transferidos a través de una tarjeta SD a otro analizador de humedad MA160. Durante la medición, una luz indica el estado del progreso actual del proceso.

Con sólo presionar un botón, puede ejecutar la prueba de desempeño integrada con la almohadilla ReproEasy para verificar la funcionalidad de su MA160, asegurando una operación permanente y libre de fallos.

Aplicaciones

Con su unidad AURI de calentamiento optimizado, el MA160 produce mediciones de alta velocidad.

El MA160 es ideal para el análisis de humedad de una diversa variedad de muestras bajo diferentes condiciones. La función Asistencia de Desarrollo de Métodos le permite crear sus propios métodos para diferentes muestras y gestionarlos eficientemente en una biblioteca. Esto apoya su trabajo en el laboratorio de control de calidad o en el control de procesos. Las áreas típicas de aplicaciones para el MA160 incluyen análisis de humedad de alimentos, bebidas, productos farmacéuticos, sustancias químicas, materiales de papel y protección ambiental.





Características



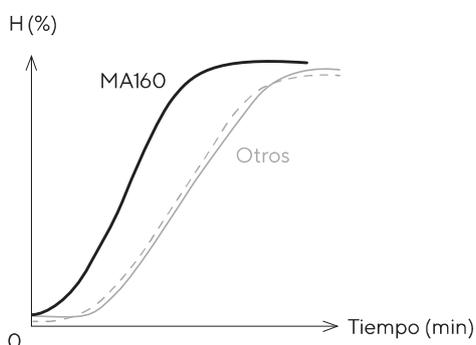
Gran capacidad de memoria

MA160 presenta una gran capacidad de memoria, permitiéndole almacenar hasta 100 métodos diferentes y manejarlos eficientemente en una biblioteca. Además, se almacenan automáticamente las últimas 999 mediciones en la memoria, asegurando documentación trazable en cumplimiento con GMP en cualquier momento.



Mediciones de alta velocidad

Tanto el calentador de alto desempeño AURI como la geometría de la cámara de la muestra aseguran un calentamiento rápido y un secado homogéneo y rápido de su muestra.



Desarrollo de métodos rápido y preciso

El Asistente de Desarrollo de Métodos del MA160 soluciona el problema de consumo de tiempo al determinar y evaluar los parámetros correctos. Le permite desarrollar métodos nuevos de forma rápida en solo tres simples pasos.





Visualización del estado de medición

La luz indica el estado actual de la medición: "running | START" ("en operación | INICIO"), "process finished | STOP" ("proceso terminado | PARO"), "analyzer OFF" ("analizador APAGADO") o "error" ("error").



Pruebas de fiabilidad de funcionamiento

Una almohadilla ReproEasy, en combinación con ensayos de desempeño integrados, le permite comprobar la funcionalidad del MA160 en su totalidad en tan solo 5 minutos. Garantiza los resultados fiables durante el uso rutinario.



Compatibilidad con MA150 de Sartorius

La compatibilidad con el analizador le permite utilizar fácilmente métodos desarrollados en el MA150. El modo MA35 adicional le permite incluso realizar análisis de humedad con parámetros desarrollados para el MA35.



Fácil de limpiar

Diseño BetterClean que permite al usuario limpiar en profundidad las partes del instrumento. Además, el módulo de calentamiento y la placa de la cámara son desmontables y aptas para limpiarse en lavavajillas.



Manejo sencillo

La interfaz de usuario intuitiva del MA160, que incluye una pantalla táctil y un menú de fácil comprensión, lo guía fácilmente, permitiéndole operar el analizador de manera sencilla sin necesidad de leer previamente el manual de usuario.

Especificaciones técnicas

Máxima capacidad de peso	200 g
Reproducibilidad, típica	A partir de un peso inicial de muestra de aprox. 1 g: $\pm 0,2\%$, A partir de un peso inicial de muestra de aprox. 5 g: $\pm 0,05\%$
Legibilidad	1 mg, 0,01%
Cantidad de muestra típica	5 g – 15 g
Pantalla de lectura	Contenido de humedad en % M y % g Materia seca en % S y g ATRO en % M S
Rango y ajustes de temperatura	40 °C – 200 °C, temperatura en "stand-by" seleccionable entre 50 °C y 120 °C en incrementos de 1 °C
Calentamiento de muestra	Calentamiento por infrarrojos usando calentador AURI, 600 W
Programas de calentamiento	Secado estándar, secado suave, modo MA35
Parámetro de apagado	Completamente automático, semiautomático, manual y por tiempo
Pinzas para muestras	Para el manejo fácil de platos de muestra
Interfaz	Mini USB, detección automática de impresora, transferencia directa a programas de Microsoft®
Transferencia de datos	Tarjeta SD, función de importación y exportación de métodos
Dimensiones carcasa (A x P x Al)	215 x 400 x 210 mm
Peso	Aprox. 6,2 kg



Accesorios

6965542	Platos de muestra desechables, 80 piezas, aluminio, Ø 90 mm
6906940	Almohadillas de fibra de vidrio para el análisis de muestras pastosas y grasas, calidad dura, 80 piezas, Ø 90 mm
6906941	Almohadillas de fibra de vidrio para análisis de líquidos y muestras grasas, calidad blanda, 200 piezas, Ø 90 mm
YHP01MA	Almohadillas ReproEasy, 10 piezas; destinadas a la evaluación del funcionamiento de la unidad de calentamiento y del sistema de pesaje del analizador
YCW512-AC-02	Pesa de calibración externa, 100 g (E2) con certificado DAkkS*
YDP40	Impresora estándar
YDP30	Impresora de laboratorio GLP premium
YCC03-D09	Cable adaptador para conexión de impresora YDP20-OCE
YDP20-OCE	Impresora de datos, apta también para aplicaciones reguladas
YST01MA	Pinzas para las muestras
YMD02B (incl. protocolo abreviado)	Servicio específico al cliente para el desarrollo individual de métodos en el laboratorio de aplicaciones Sartorius. Consulte su oficina Sartorius en su región para más información.

*DAkkS = Organismo alemán de acreditación reconocido en toda Europa

Platos desechables para muestras



Almohadilla ReproEasy





Analizador de Humedad MA37

Para el Uso Rutinario

Simplifying Progress

SARTORIUS

Su Aliado Fiable para Tareas de Rutina



El MA37 es un analizador de humedad de última generación y continúa la historia de éxito del MA35. El MA37 proporciona resultados rápidos, precisos y es fácil de operar. Este dispositivo compacto tiene un diseño "BetterClean" que logra una fácil limpieza. La luz de estado facilita revisar el estado actual de la medición. Por tanto, el MA37 es ideal para usuarios que requieran un analizador de humedad rápido y fiable que sea fácil de operar y limpiar.

Mediciones rápidas

La nueva unidad de calentamiento de alto rendimiento integrada en el MA37 asegura un secado de la muestra rápido y uniforme.

Visualización del estado de medición

La luz indica el estado del analizador. Como resultado, tendrá todo bajo control – incluso a distancia.

Fácil de operar

La interfaz de usuario intuitiva, incluyendo pantalla táctil y menú fácil de entender, simplifica de forma considerable la operación del MA37.

Fácil de limpiar

El diseño "BetterClean" permite al usuario limpiar de manera fácil y minuciosa las partes del instrumento. Además, el módulo de calentamiento y la placa de la cámara de muestra son removibles y aptas para limpiarse en lavavajillas.

Modo MA35

Este modo le permite utilizar fácilmente métodos de parámetros ya desarrollados para MA35.

 Averigüe más

Para más información, por favor visite
www.sartorius.com

Especificaciones Técnicas

Máxima capacidad de carga	70 g
Reproducibilidad, típica	A partir de un peso inicial de muestra de cerca de 1 g: $\pm 0,2\%$ A partir de un peso inicial de muestra de cerca de 5 g: $\pm 0,05\%$
Legibilidad	1 mg, 0,01 %
Cantidad de muestra típica	5 g – 15 g
Pantalla de lectura	Contenido de humedad en % M y % g materia seca en % S y g ATRO en % M S
Rango y ajustes de temperatura	40 °C – 200 °C, temperatura en “stand-by” seleccionable entre 50 °C y 120 °C en incrementos de 1 °C
Calentamiento de muestra	Calentamiento infrarrojo utilizando un calentador de tubo metálico
Programas de calentamiento	Secado estándar, secado suave, modo MA35
Parámetro de apagado	Completamente con ajuste de tiempo, semiautomático, manual y con cronómetro
Acceso a cámara muestra	Cubierta removible con amplio ángulo de apertura, mecanismo de cierre SoftClose
Programa de medición	1 programa guardado en memoria no volátil (parámetros de método de selección libre)
Memoria para almacenamiento de datos	Los resultados se guardan hasta inicio de siguiente medición
Inspección de la muestra	Cámara de muestra con luz LED, ventana de inspección con rejilla sobre la cubierta
Interfaz	Mini USB, detección automática de impresora, transferencia directa a programas de Microsoft®
Dimensiones carcasa (A x P x Al)	215 x 400 x 210 mm
Peso	Aprox. 6,2 kg

Accesorios

6965542	Platos de muestra desechables, 80 piezas, aluminio, Ø 90 mm
6906940	Almohadillas de fibra de vidrio para análisis de muestras pastosas y grasas, calidad dura, 80 piezas, Ø 90 mm
6906941	Almohadillas de fibra de vidrio para análisis de muestras pastosas y líquidas, calidad blanda, 200 piezas, Ø 90 mm
YHP01MA	Almohadillas de prueba ReproEasy, 10 piezas; destinadas a la evaluación del funcionamiento de la unidad de calentamiento y del sistema de pesaje del analizador
YCW452-AC-02	Pesa de calibración externa, 50 g (E2) con certificado DAkkS*
YDP40	Impresora estándar
YDP30	Impresora de laboratorio GLP premium
YCC03-D09	Cable adaptador para conexión de impresora YDP20-OCE
YDP20-OCE	Impresora, apta también para el uso en aplicaciones reguladas
YST01MA	Pinzas para las muestras
YMD01B (incl. protocolo abreviado)	Servicio específico al cliente para el desarrollo individual de métodos en el laboratorio de aplicaciones Sartorius. Consulte su oficina Sartorius en su región para más información.

*DAkkS = Organismo alemán de acreditación reconocido en toda Europa



SARTORIUS

Especificaciones Técnicas

MA35

Analizador de humedad infrarrojo robusto y totalmente automático para uso en el trabajo rutinario

Ventajas

- Alternativa rápida a una estufa de secado. Resultados de medición rápidos en tan solo 10-20 minutos
- Funcionamiento simple
- Diseño sólido
- Ideal para comprobaciones rutinarias sencillas
- Mejor relación precio - rendimiento con la calidad de Sartorius. Fabricado en Alemania



Descripción del producto

El MA35 es el modelo básico ideal para un análisis rápido y fiable de la humedad material de un líquido, pasta y sustancias sólidas mediante el método de termogravimetría. Las décadas de experiencia de Sartorius en el área de humedad garantiza resultados de medición rápidos y fiables y una gran facilidad de uso.

Resistencia para todas las áreas de aplicación

El diseño compacto y sólido, combinado con una gran precisión y exactitud de medición, hacen del MA 35 el dispositivo ideal para llevar a cabo tareas de medición uniformes. La selección de componentes sólidos y duraderos resistentes a la vibración y la suciedad garantiza resultados de medición fiables, incluso en un entorno adverso. Un compañero ideal para utilizarlo en la producción, recepción de mercancías o en el laboratorio.

Uso sencillo

La determinación de resultados totalmente automática de Sartorius hace que la desconexión de la programación sea un criterio innecesario. Esto ahorra tiempo porque, por un lado, las optimizaciones laboriosas ya no son necesarias y, por otro lado, el funcionamiento del dispositivo se ha simplificado para que pueda utilizarlo cualquiera sin problemas. Esto es posible gracias a la monitorización continua del ciclo de secado llevada a cabo por el MA35.

Esta monitorización detiene la medición de forma totalmente automática mediante un criterio de desconexión que se calcula en base a la curva de secado tan pronto como el peso de muestra sea constante, y a pesar del calentamiento, no se detecta ninguna pérdida de peso adicional. La exactitud de la medición necesaria para esto la proporciona el sistema de ponderación de Sartorius con una legibilidad de 1 mg, que se ha optimizado especialmente para su uso en intervalos altos de temperatura.

Resultados de medición rápidos

Para el calentamiento de muestras, el MA35 cuenta con dos potentes elementos de calentamiento de forma tubular de metal que generan 360 vatios de energía. Estos elementos posibilitan un calentamiento rápido y uniforme de las muestras y, por lo tanto, tiempos de medición breves, lo que significa una enorme cantidad de tiempo ahorrado en comparación con la estufa de secado, ya que el resultado final acabado se puede leer simplemente en un par de minutos.

Especificaciones técnicas

Capacidad de pesaje máxima	35 g
Reproducibilidad, típica del sistema de ponderación	De alrededor de 1 g de peso de muestra tomado: $\pm 0,2\%$ De alrededor de 5 g de peso de muestra tomado: $\pm 0,05\%$
Legibilidad	1 mg; 0.01%
Visualización de resultados	% de humedad, % de masa seca, % ATRO, gramos de residuo
Cantidad de muestra típica	5-15 g
Acceso al compartimento de muestras	<ul style="list-style-type: none">mediante la elevación de la cubierta con un gran ángulo de aperturacon ventana de visualización
Parabrisas	Parabrisas integrado
Criterio de desconexión	Opcional: <ul style="list-style-type: none">Totalmente automáticoDesconexión manualTiempo asignado 0,1-99 min.
Programa de calentamiento	Secado estándar
Programa de medición	El dispositivo es resistente a fallos de corriente, de manera que puede guardarse un programa (parámetro seleccionable de forma libre)
Configuración de temperatura	40-160 grados Celsius en incrementos de 1 grado Celsius
Calentamiento de muestras	Uniforme con un radiador oscuro infrarrojo (elementos de calentamiento de metal y forma tubular)
Almacenamiento de valores medidos	Los resultados se almacenan de forma segura hasta el inicio de la siguiente medición
Protocolo de impresión	<ul style="list-style-type: none">Protocolo GLP no ajustable para los resultados de medición Calibración AjusteRegistro breve que ahorra papel para los resultados de la mediciónSe utiliza una impresora externa disponible de forma opcional para la impresión (YDP20 YDP30)
Monitorización de equipo de inspección	Calibración externa mediante pesas de calibración disponibles de forma opcional; ajuste de la temperatura mediante un juego de compensación opcional
Orientación al usuario	A través de símbolos que se corresponden con las funciones seleccionadas
Selección de idioma	Inglés, alemán, francés, español, italiano y ruso
Interfaz de datos	RS232 C-S/V24-V28, 7 bits de datos (ASCII), 1 bit de paridad
Frecuencia de red	50 60 Hz
Consumo eléctrico	máx. 400 VA
Dimensiones de carcasa (An. x Pr. x Al.)	224 x 366 x 191 mm
Peso	Alrededor de 5,8 kg

Modelos disponibles

MA35M-230N	Versión estándar para Europa de 230 V +15 %, -20 %
MA35M-115N	Versión de 115 V +15 %, -20 %
MA35M-115US	Versión estándar de 115 V +15 %, -20 % con mejoras específicas del país para EE. UU.
MA35M-1CN230V1	Versión estándar de 230 V +15 %, -20 % con mejoras específicas del país para China

Accesorios

6965542	Platillos de muestra desechables, 80 unidades, Aluminio, redondo, 90 mm
6906940	Filtros de fibra de vidrio para utilizar con muestras líquidas, pastosas y aceitosas, 80 unidades, calidad dura
6906941	Filtros de fibra de vidrio para utilizar con muestras líquidas, pastosas y aceitosas, 200 unidades, calidad suave
YDS05MA	Juego de recambio de placas, placas de aluminio en lugar de placas de vidrio, para cumplir con la reglamentación según FDA/HACCP (kit de conversión)
YDP20-OCE	Impresora matricial
YDP30	Impresora de transferencia térmica
69Y03295	Cable de RS232 para conexión con la impresora YDP30
6906918	Cinta de color para la impresora matricial YDP20-OCE
6906937	Rollos de papel para la impresora YDP20-OCE, 5 unidades de 50 m
YSS43-02	Peso de calibración externa, 30 g ± 0,3 mg certificado DKD [Deutscher Kalibrierdienst; servicio de calibración alemán]
YTM15MA	Juego de ajuste de la temperatura
YMD01B	Desarrollo de método individual para el MA35 (incluido informe breve)

Alcance del suministro

- Analizador de humedad con interfaz de datos
- Alimentador
- 80 platillos de muestra de aluminio



Analizador de humedad MA100Q

Analizador de humedad por infrarrojos totalmente automático con radiador de cristal de cuarzo CQR

Analizador de humedad

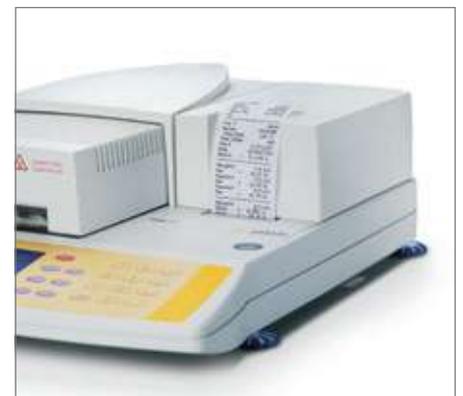


- Alternativa más rápida y confortable que el armario de secado
- Amplias opciones para una adaptación flexible a muchas tareas de secado diferentes
- Especialmente indicado para tareas de medición con ambiciones en el control de calidad o en la investigación
- La mayor seguridad gracias a un sistema con autocalibración y total capacidad GMP
- Especialmente indicado para el secado a altas temperaturas, hasta 230°C y para aplicaciones estándar

Rango de pesaje máx.	100 g
Reproducibilidad, típica	A partir de aprox. 1 g de pesaje: $\pm 0,1\%$ a partir de aprox. 5 g de pesaje: $\pm 0,02\%$
Legibilidad	1 mg, 0,01% 0,1 mg, 0,001%
Cantidad típica de muestra	5 – 15 g
Indicación del valor medido	% de humedad (opcionalmente con factor de conversión) % de masa seca valor ATRO mg de pérdida de peso g de residuo g/kg de residuo g/l de residuo
Rango de temperatura y ajuste de la misma	30°C–230°C, pasos de 1 grado centígrado, temperatura standby seleccionable 30–100°C
Calentamiento de la muestra	Radiación por infrarrojos mediante radiador de cristal de cuarzo CQR
Programas de calentamiento	Estándar, rápido, de protección, por etapas
Criterios de desconexión	A elegir: - Automatismo - SPRM (optimización sobre procedimiento de referencia) - Semiautomatismo (1–50 mg / 5–300 s) - Semiautomatismo (0,1–5,0% / 5–300 s) - Tiempo predeterminado (3x 0,1–999 min.) - Tiempo predeterminado + automatismo / semiautomatismo (2x 0,1–999 min. + automatismo) - Manual
Acceso al habitáculo de muestras	Cubierta móvil motorizada
Programa de medición	30 programas memorizados a prueba de caídas de tensión (parámetros de libre selección)
Memorización de los valores de medición	Estadística de resultados para las últimas 9999 mediciones/ programa
Guía de uso	Texto de diálogos alfanumérico guiado por menús (5 idiomas a elegir)
Introducción de parámetros datos	- Introducción de textos optimizada a través de teclas de software - Introducción de números mediante campo numérico - Posibilidad de introducción de datos opcional a través de un lector de códigos de barras
Impresión de protocolos	- La impresión se lleva a cabo por medio de la impresora interna opcional YDP01MA - Protocolo GLP de configuración variable para los resultados de la medición calibración ajuste (5 idiomas a elegir)



Fácil de limpiar



Con impresora opcional YDP01MA

Supervisión de medios de comprobación	<ul style="list-style-type: none"> – Conmutación interna de los pesos de calibración – ReproTEST automático para el sistema de pesaje – Calibración automática de la temperatura con kit opcional de compensación de temperatura YTM03MA – Protocolización acorde con los requisitos vigentes QM QS
Seguridad	Protección mediante contraseña contra el desajuste accidental de parámetros
Frecuencia de alimentación	48–60 Hz
Consumo (potencia)	máx. 700 VA
Rango temperatura de uso	10°C...30°C
Dimensiones de la carcasa (ancho × fondo × alto)	350 × 453 × 156
Peso	aprox. 8,0 kg

Modelos disponibles

	Tensión de alimentación
MA100Q-000115V1	115 V +15 %, -20 %
MA100Q-000230V1	230 V +15 %, -20 %

Accesorios

6965542	Platillos de muestra desechables, 80 uds., aluminio, redondos, Ø 90 mm
6906940	Tejido de fibra de vidrio, Ø 90 mm para muestras pastosas y grasas, calidad dura, 80 uds.
6906941	Tejido de fibra de vidrio, Ø 90 mm para muestras líquidas y grasas, calidad blanda, 200 uds.
YAT01MA	Pipetas desechables para el pesaje de muestras líquidas, 500 uds.
YSC02	SartoCollect, software para el intercambio de datos entre el analizador de humedad y el PC (el cable de conexión debe pedirse por separado) requisitos: MS Windows 2000 Windows XP Professional, Vista Ultimate, Windows 7 Ultimate.
YCW4528-02	Peso de calibración externa, 50 g (E2) con certificado DKD
YTM03MA	Kit de compensación de temperatura con certificado del fabricante para la compensación de la fuente de calor
YDP01MA	Impresora de valores de medición, acoplable
YDP20-OCE	Impresora de valores de medición, verificable de forma independiente, con función fecha, hora, estadística, contaje con cable incluido
6906918	Cinta de colores para la impresora de valores de medición
6906937	Rollos de papel para la impresora de valores de medición, 5 de 50 m cada uno

Contenido del suministro

- Analizador de humedad con interfaz de datos
- Cable de red
- Manual del usuario
- 80 platillos de muestras de aluminio
- Cubierta de protección para el teclado
- Pinzas
- Instrucciones breves laminadas (6 idiomas)

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Laboratory Filtration Products

Simplifying Progress

SARTORIUS



Table of Contents

Filtration and ultrafiltration are essential process steps in nearly all environmental, chemistry and bioscientific laboratory applications.

Sartorius supplies a wide range of individual filter papers, microporous membranes, filtration devices, ultrafiltration units and chromatography solutions to suit these applications. This catalog provides a condensed overview of the Sartorius Lab Filtration product range. Please contact us directly for specialty catalogs – available for in-depth technical information.

Ultrafiltration and Chromatography

Introduction to Lab Ultrafiltration	6
Macromolecule Concentration	10
Introduction to Lab Chromatography	53
Biomolecule Purification	54
Virus Purification	58

Filtration Devices

Introduction	66
Minisart® Standard Selection Guide	67
Minisart® PP Standard Syringe Filter	68
Minisart® NML Standard Syringe Filter	74
Claristep® Syringeless Filtration	83
Sartolab® P20 Pressure Filter Units	88
Sartolab® RF 50	90
Sartolab® RF BT	92
Sartolab® Multistation	96
Sartoclear Dynamics® Lab P15	98
Sartoclear Dynamics® Lab V	100

Basic Filtration

Introduction	106
Filter Papers	108
Glass and Quartz Microfiber Filters	113
Extraction Thimbles	118
Membrane Filters	121
Blotting Chromatography Papers & Blotting Membranes	130
Filtration Equipment	133
Large Stainless Steel Filter Holders	143
Combisart® Kits	148



Ultrafiltration and Chromatography

Table of Contents

Introduction to Lab Ultrafiltration	6
Macromolecule Concentration	
Vivaspin® 500	10
Vivaspin® 2	12
Vivaspin® Filtrate	15
Vivaspin® Turbo 4 PES	17
Vivaspin® 6	19
Vivaspin® 15R	21
Vivaspin® Turbo 15 PES	23
Vivaspin® Turbo 15 RC	25
Vivaspin® 20	27
Vivaspin® 100	30
NEW! Vivaflow® SU	33
Vivaflow® 50R	36
Vivaflow® 200	39
Ultrafiltration Membrane Discs	42
Vivapore® 5 and 10	44
Vivacon® 500	46
Vivacon® 2	49
Introduction to Lab Chromatography	53
Biomolecule Purification	
Vivaclear	54
Vivapure® IEX	55
NEW! Sartobind® Lab	56
Virus Purification	
Vivapure® Virus Purification Kits	58
Vivapure® Adenopack	59
Vivapure® Lentiselect	61

Introduction to Lab Ultrafiltration

Ultrafiltration is a convective process using anisotropic semi-permeable membranes to separate macromolecular species and solvents – primarily on the basis of size.

Ultrafiltration membranes are used to increase the solute concentration of a desired biological or inorganic species. Macromolecules are retained by the membrane when they are significantly larger than the nominal pore size, while salts and microsolute are removed with the solvent. Multiple concentration steps where an ultrafiltration device is refilled with fresh buffer can also be used to progressively purify, buffer exchange or desalt samples, replacing time-intensive techniques such as dialysis. Furthermore, ultrafiltration can be used as a cost effective method for fractionating macromolecules, provided that there is at least a 10-fold difference in molecular weight. Ultrafiltration is a gentle, non-denaturing method that is more efficient and flexible than alternative processes.

Ultrafiltration Methods

Sartorius offers a comprehensive choice of operating methods for sample ultrafiltration and diafiltration.

- Centrifugal for 0.1 to 90 mL starting volumes
- Pressure for 5 to 98 mL starting volumes
- Pressure-Fugation for 5 to 15 mL starting volumes
- Crossflow | TFF for 0.1 to 5 L starting volumes
- Solvent Absorption for 1 to 20 mL starting volumes

Further information about these methods can be found on page 8.

Typical Applications for Ultrafiltration

- Concentration | desalting of proteins, enzymes, DNA, monoclonal antibodies, immunoglobulins, extracellular vesicles, viruses and nanoparticles
- Bence Jones Protein concentration from urine samples prior to capillary electrophoresis
- Forensic DNA sample concentration prior to sequencing reaction
- Peptide fractionation in FASP (filter-aided sample preparation)
- Free drug | hormone assays
- Removal of primers from PCR amplified DNA
- Removal of labeled amino acids and nucleotides
- Deproteinization of samples
- Recovery of biomolecules from cell culture supernatants | lysates
- Mammalian cell harvesting
- Cell washing, virus purification, cell debris removal and depyrogenation
- Environmental sample clarification | concentration

Membrane Performance Characteristics

Sartorius offers an extended range of membranes to cover the great majority of ultrafiltration requirements.

- Polyethersulfone (PES)
- Regenerated Cellulose (RC)
- Hydrosart® (HY)
- Cellulose Triacetate (CTA)

Further information about the properties of these membrane materials can be found on page 9.

Process Optimization

When the highest recoveries are crucial, particularly with solute quantities in the microgram range, Sartorius recommends that users consider the following:

- Select the smallest device that suits the sample volume.
- Take advantage of the extra speed of Sartorius products by refilling a smaller device repeatedly.
- Select the lowest MWCO membrane that suits the application.
- Reduce pressure or centrifugal force to approximately half of the recommended maximum.
- Avoid over-concentration. The smaller the final concentrate volume, the more difficult it is to achieve complete recovery.
- If feasible, after sample retrieval, rinse the device with one or more drops of buffer.
- Pretreat the device overnight with a passivation solution such as 5% SDS, Tween 20 or Triton X-100, then rinse thoroughly before use.

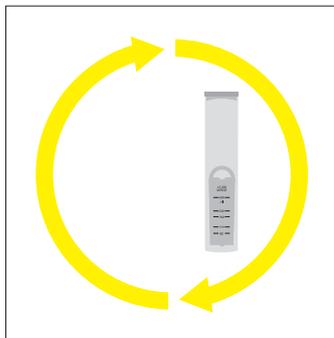


VIVASPIN® TURBO 4
10,000 MWCO

μL
50
30
10

Ultrafiltration Process Methods

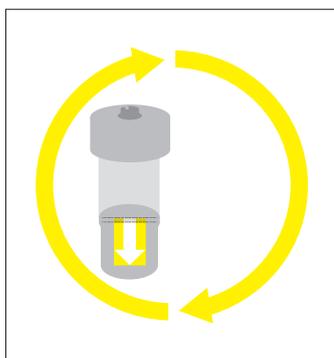
Sartorius offers a comprehensive range of ultrafiltration process methods for the concentration of your biological samples. Below is a guide to selecting the most suitable ultrafiltration method, depending on sample volume, equipment available, and the desired filtration speed and process control.



Centrifugal

Centrifugal (0.1 to 90 mL Starting Volumes)

Driven by centrifugal force, solvent and microsolute are cleared through the ultrafiltration membrane and into a filtrate container positioned below. This gentle process is quick to set up and offers fast filtration speeds with most solutions. Twelve centrifugal devices are offered from the Vivaspin® and Vivacon® families.



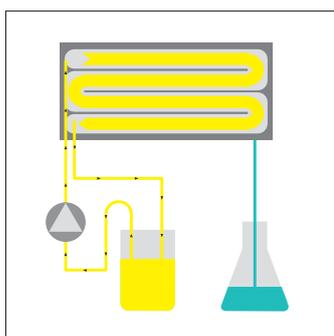
Pressure and Pressure-Fugation

Pressure (5 to 98 mL Starting Volumes)

Pressurized air or inert gas provide the filtration vector for ultrafiltration. For increased process speed, pressurized devices can be placed on an orbital shaker, where agitation impedes macromolecules from polarizing on the membrane surface. Vivaspin® 20 and 100 can be operated using gas pressure.

Pressure-Fugation (5 to 15 mL Starting Volumes)

A unique Sartorius method that combines gas pressure with centrifugation, with process times typically 30 to 50% faster than centrifugation alone. Vivaspin® 20 can be operated this way.



Crossflow | TFF

Crossflow | TFF (0.1 to 5 L Starting Volumes)

The solution to be processed is pumped under pressure across an ultrafiltration membrane and then returned to the original reservoir. The solution is progressively concentrated or purified as solvent and microsolute pass through the membrane into a separate filtrate vessel. Vivaflow® cassettes are offered for this method.



Solvent Absorption

Solvent Absorption (1 to 20 mL Starting Volumes)

An absorbent cellulose pad mounted behind the ultrafiltration membrane draws solvents and microsolute through the membrane. Retained macromolecules are concentrated into the bottom of the sample container. No additional equipment is required. Vivapore® is offered for this technique.

Membrane Performance Characteristics

Sartorius offers an extended range of membranes to cover the great majority of ultrafiltration requirements. The following is a guide to selecting the most appropriate membranes according to their typical performance characteristics. However, membrane behaviour and performance can be highly dependent on the specific characteristics of each sample. Therefore, it is recommended to experiment with multiple membrane materials when optimizing your ultrafiltration process.

Polyethersulfone (PES)

This is a low binding membrane that provides excellent performance with most solutions and exceptional recovery of negatively charged target molecules. Polyethersulfone membranes are usually preferred for their low fouling characteristics, exceptional flux and broad pH compatibility.

Regenerated Cellulose (RC)

The Sartorius regenerated cellulose membrane has been uniquely developed to ensure optimal performance in the lab ultrafiltration devices. This is a hydrophilic membrane suitable for general samples, with ultra-low protein adsorption and high chemical compatibility. Regenerated cellulose is especially well suited to ultrafiltration of oligonucleotides and peptides.

Hydrosart® Regenerated Cellulose (RC)

Demonstrating the same properties as regenerated cellulose, but with the added benefit of enhanced performance characteristics and extremely low protein binding. Hydrosart® is another membrane of choice for applications such as concentration and desalting of immunoglobulin fractions.

Cellulose Triacetate (CTA)

High hydrophilicity and very low non specific binding characterize this membrane. Cast without any support that could trap or bind passing microsolute, these membranes are preferred for sample cleaning and protein removal, and when high recoveries from the filtrate solution is of primary importance.

Membrane Selection Guide

The molecular weight cut-off (MWCO) is the molecular weight of molecules (e.g. globular proteins) which are retained by the membrane to an extent of 90%. Therefore, to ensure the highest recovery, select a membrane with a MWCO which is a maximum of one third to half the molecular weight of the solute to be retained.

Most ultrafiltration devices are designed for concentration | diafiltration applications. Therefore, the membranes in these devices are tested for retention rather than passage of macromolecules. In particular, PES, RC and Hydrosart® membranes have support structures, which may lead to some loss of molecules that permeate the membrane.

Recommended MWCO						
Application	< 5 kDa	10 kDa	30 kDa	50 kDa	100 kDa	> 300 kDa
Bacteria					■	■
Enzymes	■	■				
Extracellular vesicles					■	■
Growth factors	■	■				
IgG and mAbs			■	■	■	
Nucleic acids	■	■	■	■	■	
Oligonucleotides	■					
Peptides	■					
Viruses			■	■	■	■
Yeast					■	■

Vivaspin® 500

For general laboratory use

100 to 500 µL Samples

Vivaspin® 500 centrifugal filter units offer a simple, one-step procedure for sample preparation. They can effectively be used in fixed-angle rotors accepting 2.2 mL centrifuge tubes.

The legacy patented vertical membrane design and thin channel filtration chamber (US 5,647,990) minimize membrane fouling and provide fast concentrations – even with particle-loaded solutions.

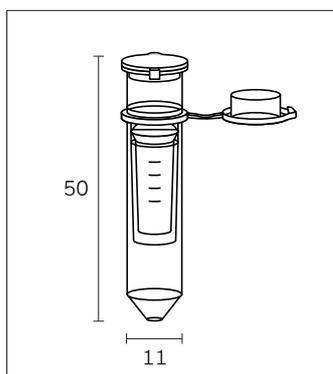
Specifications

Vivaspin® 500

Concentrator capacity	Swing bucket rotor Fixed angle rotor	do not use 500 µL
Dimensions	Length × diameter Active membrane area Hold-up volume, membrane and support Dead-stop volume	50 × 11 mm 0.5 cm ² < 5 µL 5 µL
Materials of construction	Body Filtrate vessel Concentrator cap Membrane	Polycarbonate (PC) Polypropylene (PP) Polycarbonate (PC) Polyethersulfone (PES)

Typical Performance Characteristics

	Time to concentrate up to 30x at 20 °C and solute recovery	
Rotor	Fixed angle	
Centrifugal force	12,000 g	
Start volume	500 µL	
	Time	Recovery
Aprotinin 0.25 mg/mL (6.5 kDa) 3 kDa MWCO PES	30 min	96%
BSA 1.0 mg/mL (66 kDa) 5 kDa MWCO PES	15 min	96%
10 kDa MWCO PES	5 min	96%
30 kDa MWCO PES	5 min	95%
IgG 0.25 mg/mL (150 kDa) 30 kDa MWCO PES	10 min	96%
50 kDa MWCO PES	10 min	96%
100 kDa MWCO PES	10 min	96%



Ordering Information

Vivaspin® 500 PES	Pack size	Prod. No.
3 kDa MWCO	25	VS0191
3 kDa MWCO	100	VS0192
5 kDa MWCO	25	VS0111
5 kDa MWCO	100	VS0112
10 kDa MWCO	25	VS0101
10 kDa MWCO	100	VS0102
30 kDa MWCO	25	VS0121
30 kDa MWCO	100	VS0122
50 kDa MWCO	25	VS0131
50 kDa MWCO	100	VS0132
100 kDa MWCO	25	VS0141
100 kDa MWCO	100	VS0142
300 kDa MWCO	25	VS0151
300 kDa MWCO	100	VS0152
1,000 kDa MWCO	25	VS0161
1,000 kDa MWCO	100	VS0162
0.2 µm	100	VS0172



Visit us at www.sartorius.com/Vivaspin500 to get additional info.
Find instructions on how to use Vivaspin® 500 for

- Desalting and buffer exchange
- Preparation of biological nanoparticles and medical nanocarriers
- Concentration and purification of viruses
- Concentration to a predefined volume
- Concentration of diluted samples with increased recovery

Vivaspin® 2

For general laboratory use

0.4 to 3 mL Samples

Vivaspin® 2 bridges the gap between the 500 µL and 4 mL centrifugal concentrators. This device combines the speed of the classic Vivaspin® products with low internal surface and membrane areas for superior recoveries from very dilute solutions.

Available with a choice of polyethersulfone, Hydrosart® or cellulose triacetate membranes, Vivaspin® 2 offers the highest flexibility for process optimization.

Also unique to Vivaspin® 2 is the choice of directly pipetting the concentrate from the dead-stop pocket built into the bottom of the concentrator, or alternatively reverse spinning into the concentrator cap. Both methods result in near total concentrate recoveries.

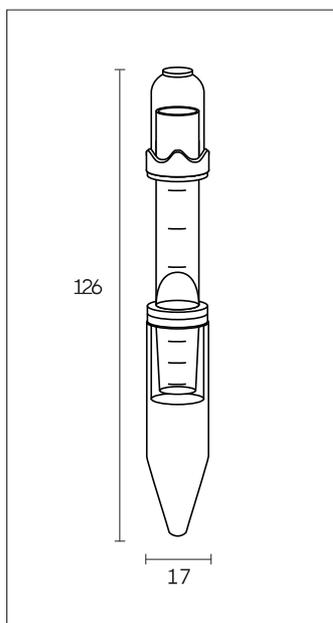
Specifications

Vivaspin® 2

Concentrator capacity	Swing bucket rotor	3 mL
	Fixed angle rotor	2 mL
Dimensions	Length × diameter	126 × 17 mm
	Active membrane area	1.2 cm ²
	Hold-up volume, membrane	< 10 µL
	Dead-stop volume	8 µL
Materials of construction	Body	Polycarbonate (PC)
	Filtrate vessel	Polycarbonate (PC)
	Concentrator cap	Polycarbonate (PC)
	Membrane	Polyethersulfone (PES)
		Hydrosart® regenerated cellulose (RC) Cellulose Triacetate (CTA)

Typical Performance Characteristics

	Time to concentrate up to 30x at 20 °C and solute recovery	
Rotor	Fixed angle	
Centrifugal force	5,000 g	
Start volume	2 mL	
	Time	Recovery
Aprotinin 0.25 mg/mL (6.5 kDa)		
3 kDa MWCO PES	50 min	96%
BSA 1.0 mg/mL (66 kDa)		
5 kDa MWCO PES	12 min	98%
5 kDa MWCO RC	22 min	98%
10 kDa MWCO PES	8 min	98%
10 kDa MWCO CTA	10 min	96%
10 kDa MWCO RC	12 min	98%
20 kDa MWCO CTA	5 min	96%
30 kDa MWCO PES	8 min	97%
30 kDa MWCO RC	5 min	97%

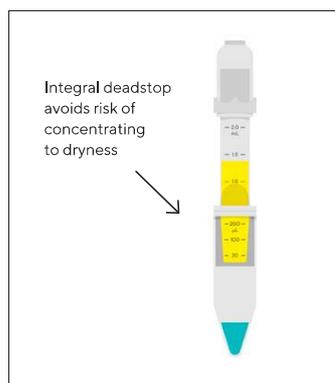


Typical Performance Characteristics

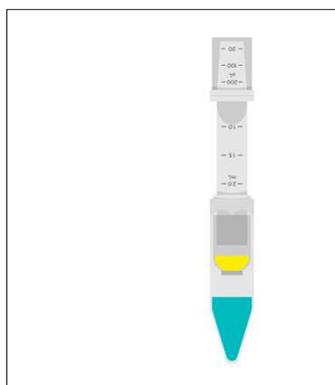
	Time to concentrate up to 30x at 20 °C and solute recovery	
Rotor	Fixed angle	
Centrifugal force	5,000 <i>g</i>	
Start volume	2 mL	
	Time	Recovery
IgG 0.25 mg/mL (150 kDa)		
20 kDa MWCO CTA	6 min	97%
30 kDa MWCO PES	10 min	96%
50 kDa MWCO PES	10 min	96%
100 kDa MWCO PES	8 min	95%

Ordering Information

Vivaspin® 2 PES	Pack size	Prod. No.
3 kDa MWCO	25	VS0291
3 kDa MWCO	100	VS0292
5 kDa MWCO	25	VS0211
5 kDa MWCO	100	VS0212
10 kDa MWCO	25	VS0201
10 kDa MWCO	100	VS0202
30 kDa MWCO	25	VS0221
30 kDa MWCO	100	VS0222
50 kDa MWCO	25	VS0231
50 kDa MWCO	100	VS0232
100 kDa MWCO	25	VS0241
100 kDa MWCO	100	VS0242



PES, HY or CTA membranes



Reverse spin concentrate retrieval

Vivaspin® 2 CTA	Pack size	Prod. No.
10 kDa MWCO	100	VS02V2
20 kDa MWCO	100	VS02X2

Vivaspin® 2 RC	Pack size	Prod. No.
2 kDa MWCO	25	VS02H91
2 kDa MWCO	100	VS02H92
5 kDa MWCO	25	VS02H11
5 kDa MWCO	100	VS02H12
10 kDa MWCO	25	VS02H01
10 kDa MWCO	100	VS02H02
30 kDa MWCO	25	VS02H21
30 kDa MWCO	100	VS02H22

Ordering Tips

- Choose a membrane pore size at least 50% smaller than the size of the molecule to be retained.
- Usually choose PES membranes for fastest concentrations.
- Usually choose CTA for protein removal or ultrafiltrate recovery.
- Usually choose Hydrosart® membranes for highest recovery of immunoglobulins.



Visit us at www.sartorius.com/Vivaspin2 to get additional info.
Find instructions on how to use Vivaspin® 2 for

- Desalting and buffer exchange
- Preparation of biological nanoparticles and medical nanocarriers
- Concentration and purification of viruses
- Concentration of diluted samples with increased recovery
- Sample preparation for radio immunoassay

Vivaspin® Filtrate

For general laboratory use



Vivaspin® Filtrate is a ready-to-use unit for low volume, centrifugal ultrafiltration to separate proteins from low molecular weight substances in biological samples.

Vivaspin® Filtrate features a unique design that enables ultrafiltration in the direction opposite to centrifugal force. This is so effective in preventing premature blockage of the filter that even whole blood samples can be deproteinized.

The ultrafiltrate is collected in the floating filtrate tube, where it is readily accessible without disassembly.

Vivaspin® Filtrate is ideal for the following applications:

- Drug binding studies
- Isolation of metabolites from serum
- Protein removal from blood samples
- Cleaning of liposomes
- Virus removal

Specifications

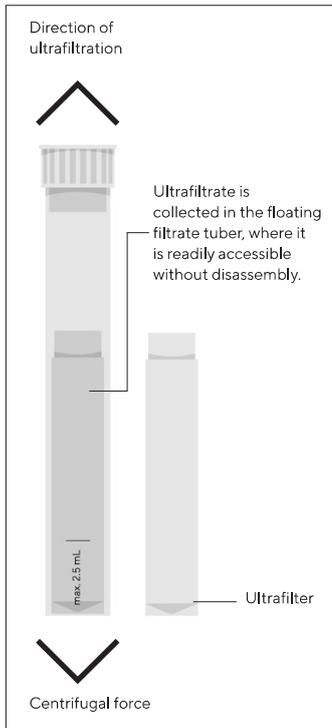
Vivaspin® Filtrate

Concentrator capacity	Swing bucket rotor	2.5 mL
	Fixed angle rotor	2.5 mL
Dimensions	Length × diameter	93 × 14 mm
	Active membrane area	0.79 cm ²
	Hold-up volume of membrane	< 5 µL
	Dead-stop volume	100 µL
Materials of construction	Centrifuge tube	Polystyrene (PS)
	Floater tube	Styrene Acrylonitrile (SAN)
	Cap	Polyethylene (PE)
	Membrane	Cellulose Triacetate (CTA) Polyethersulfone (PES)

Typical Performance Characteristics

	Time to filter and solute passage		
	Time to filter 50% of sample	Time to filter 90% of sample	Passage
Centrifugal force	2,000 g		
Start volume	2.5 mL		
BSA 1.0 mg/mL (66 kDa)			
5 kDa MWCO	300 min	N/A	0%
10 kDa MWCO	35 min	80 min	2%
20 kDa MWCO	9 min	20 min	2%
IgG 0.25 mg/mL (150 kDa)			
100 kDa MWCO	13 min	35 min	3%
Blue Dextran 0.1 mg/mL (2,000 kDa)			
300 kDa MWCO	9 min	25 min	28%

Devices can be used in conical or flat bottom centrifuge adaptors.



Ordering Information

Vivaspin® Filtrate CTA	Pack size	Prod. No.
5 kDa MWCO	12	13229-E
10 kDa MWCO	12	13239-E
20 kDa MWCO	12	13249-E
Vivaspin® Filtrate PES		
100 kDa MWCO	12	13269-GE
300 kDa MWCO	12	13279-E

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Visit us at www.sartorius.com/en/products/lab-filtration-purification/ultrafiltration-devices to get additional info.

Find instructions on how to use Vivaspin® Filtrate for the high recovery of cationized protein.

Vivaspin® Turbo 4 PES

For general laboratory use



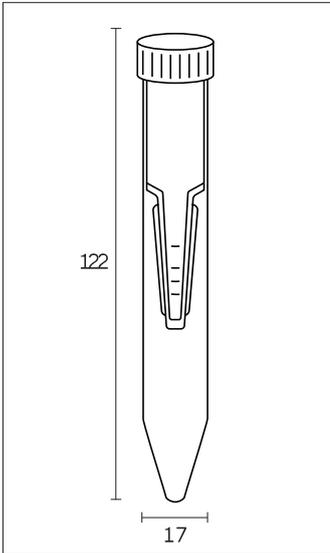
2 to 4 mL Samples

Vivaspin® Turbo 4 PES offers the fastest sample concentration with the highest recoveries. This device can handle up to 4 mL sample volumes in swing bucket and fixed angle rotors that accept 15 mL conical bottom centrifuge tubes.

The optimized design and sleek internal profile ensure maximum process speeds all the way down to the last few microliters, resulting in more than 100-fold concentration.

UV joining technology provides a smooth joint transition between membrane and housing, allowing collection of the entire concentrated sample from the unique, pipette tip-friendly angular dead-stop pocket.

Specifications



Vivaspin® Turbo 4 PES

Concentrator capacity	Swing bucket rotor	4 mL
	Fixed angle rotor	4 mL
Dimensions	Length × diameter	122.5 × 17 mm
	Active membrane area	3.2 cm ²
	Hold-up volume, membrane	< 10 µL
	Dead-stop volume, swing bucket	40 µL
	Dead-stop volume, fixed angle	30 µL
Materials of construction	Body	Styrene butadiene copolymer (SBC)
	Filtrate vessel	Polypropylene (PP)
	Concentrator cap	Polypropylene (PP)
	Membrane	Polyethersulfone (PES)

Typical Performance Characteristics

	Time to concentrate up to 30x at 20 °C and solute recovery			
	Swing bucket		Fixed angle (25°)	
Centrifuge speed	4,000 g		7,500 g	
Start volume	4 mL		4 mL	
	Time	Recovery	Time	Recovery
Cytochrome c (12.4 kDa)				
3 kDa MWCO PES	60 min	98%	80 min	96%
5 kDa MWCO PES	40 min	95%	50 min	94%
Lysozyme (14.3 kDa)				
3 kDa MWCO PES	65 min	95%	70 min	93%
5 kDa MWCO PES	50 min	94%	60 min	92%
α-Chymotrypsin (25 kDa)				
10 kDa MWCO PES	10 min	95%	8 min	95%
BSA (66 kDa)				
10 kDa MWCO PES	10 min	98%	7 min	97%
30 kDa MWCO PES	8 min	96%	6 min	97%

Typical Performance Characteristics

	Time to concentrate up to 30x at 20 °C and solute recovery			
	Time	Recovery	Time	Recovery
IgG (150 kDa)				
30 kDa MWCO PES	18 min	94%	13 min	92%
50 kDa MWCO PES	16 min	93%	12 min	90%
100 kDa MWCO PES*	17 min	94%	13 min	92%

* 3,000 g swing bucket or 5,000 g fixed angle

Ordering Information

Vivaspin® Turbo 4 PES	Pack size	Prod. No.
3 kDa MWCO	25	VS04T91
3 kDa MWCO	100	VS04T92
5 kDa MWCO	25	VS04T11
5 kDa MWCO	100	VS04T12
10 kDa MWCO	25	VS04T01
10 kDa MWCO	100	VS04T02
30 kDa MWCO	25	VS04T21
30 kDa MWCO	100	VS04T22
50 kDa MWCO	25	VS04T31
50 kDa MWCO	100	VS04T32
100 kDa MWCO	25	VS04T41
100 kDa MWCO	100	VS04T42

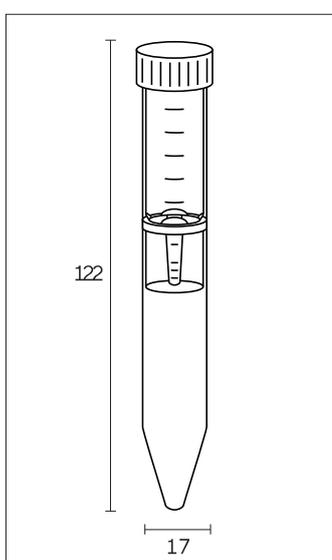


Visit us at www.sartorius.com/VivaspinTurbo4 for further information.
Here you can find instructions on how to use Vivaspin® Turbo 4 PES for:

- Desalting and buffer exchange
- Preparation of biological nanoparticles and medical nanocarriers
- Concentration and purification of viruses
- Separation of proteins and metabolites for disease detection

Vivaspin® 6

For general laboratory use



2 to 6 mL Samples

Vivaspin® 6 concentrators have been developed to offer increased volume flexibility and performance.

Vivaspin® 6 can process an impressive 6 mL in either swing bucket or fixed angle rotors accepting standard 15 mL conical bottom centrifuge tubes.

The Vivaspin® 6 features twin vertical membranes for unparalleled filtration speeds and more than 100-fold concentration. The remaining volume is easy to read off the printed graduations on the side of the concentrator and the modified dead-stop pocket further simplifies direct pipette recovery of the final concentrate.

Specifications

Vivaspin® 6

Concentrator capacity	Swing bucket rotor	6 mL
	Fixed angle rotor	6 mL
Dimensions	Length × diameter	122 × 17 mm
	Active membrane area	2.5 cm ²
	Hold-up volume of membrane	< 10 µL
	Dead-stop volume	30 µL
Materials of construction	Body	Polycarbonate (PC)
	Filtrate vessel	Polycarbonate (PC)
	Concentrator cap	Polypropylene (PP)
	Membrane	Polyethersulfone (PES)

Typical Performance Characteristics

	Time to concentrate up to 30× at 20 °C and solute recovery			
	Swing bucket		Fixed angle [25°]	
Centrifuge speed	3,000 g		7,500 g*	
Start volume	6 mL		6 mL	
	Time	Recovery	Time	Recovery
Cytochrome c 0.25 mg/mL (12.4 kDa MW)				
5 kDa MWCO PES	-	-	90 min	97%
BSA 1.0 mg/mL (66 kDa MW)				
5 kDa MWCO PES	20 min	98%	12 min	98%
10 kDa MWCO PES	13 min	98%	10 min	98%
30 kDa MWCO PES	12 min	98%	9 min	97%
IgG 0.25 mg/mL (150 kDa MW)				
30 kDa MWCO PES	18 min	96%	15 min	95%
50 kDa MWCO PES	17 min	96%	14 min	95%
100 kDa MWCO PES	15 min	91%	12 min	91%
Latex beads 0.004% in DMEM + 10% FCS (0.055 µm)				
300 kDa MWCO PES	-	-	25 min	99%
Latex beads 0.004% in DMEM + 10% FCS (0.24 µm)				
1,000 kDa MWCO PES	-	-	4 min	99%
Yeast 1.0 mg/mL (<i>S. Cerevisiae</i>)				
0.2 µm PES	4 min	97%	3 min	97%

* 6,000 g for 100K MWCO devices

Ordering Information

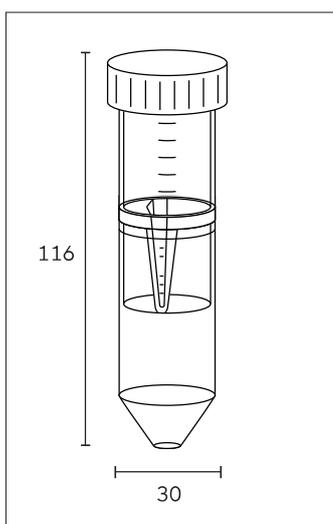
Vivaspin® 6 PES	Pack size	Prod. No.
3 kDa MWCO	25	VS0691
3 kDa MWCO	100	VS0692
5 kDa MWCO	25	VS0611
5 kDa MWCO	100	VS0612
10 kDa MWCO	25	VS0601
10 kDa MWCO	100	VS0602
30 kDa MWCO	25	VS0621
30 kDa MWCO	100	VS0622
50 kDa MWCO	25	VS0631
50 kDa MWCO	100	VS0632
100 kDa MWCO	25	VS0641
100 kDa MWCO	100	VS0642
300 kDa MWCO	25	VS0651
300 kDa MWCO	100	VS0652
1,000 kDa MWCO	25	VS0661
1,000 kDa MWCO	100	VS0662
0.2 µm	100	VS0672



Visit us at www.sartorius.com/Vivaspin6 to get additional info.
Find instructions on how to use Vivaspin® 6 for

- Desalting and buffer exchange
- Preparation of biological nanoparticles and medical nanocarriers
- Concentration and purification of viruses
- Concentration of diluted samples with increased recovery

Vivaspin® 15R



2 to 15 mL Samples

Vivaspin® 15R is designed for initial sample volumes of 2 to 15 mL and features a modified regenerated cellulose membrane; Hydrosart®. This membrane is ideal where extremely high recovery with very low adsorption is needed. Examples of these applications include desalting and concentration of Ig fractions.

Advantages

- Ultimate recovery with low adsorption (95–98%)
- Exceptionally fast concentration time (30 x in 15 min.)
- Convenient application protocol with easy handling
- Easy scale-up for large feed volumes with Vivaflow® SU TFF cassettes
- Very low hold-up volume (<20 µL)

Specifications

Vivaspin® 15R		
Concentrator capacity	Swing bucket rotor	15 mL
	Fixed angle rotor	12.5 mL
Dimensions	Length × diameter	116 × 30 mm
	Active membrane area	3.9 cm ²
	Hold-up volume of membrane	<20 µL
	Dead-stop volume	30 µL
Materials of construction	Body	Polycarbonate (PC)
	Filtrate vessel	Polycarbonate (PC)
	Concentrator cap	Polypropylene (PP)
	Membrane	Hydrosart® regenerated cellulose (RC)

Typical Performance Characteristics

	Time to concentrate up to 30× at 20 °C and solute recovery			
	Swing bucket		Fixed angle [25°]	
Centrifuge speed	3,000 g		6,000 g	
Start volume	15 mL		12.5 mL	
	Time	Recovery	Time	Recovery
Aprotinin 0.1 mg/mL* (6.5 kDa MW) 5 kDa MWCO				
	47 min	95%	45 min	95%
Cytochrome c 0.25 mg/mL* (12.4 kDa MW) 5 kDa MWCO				
	45 min	96%	45 min	96%
10 kDa MWCO				
	25 min	94%	18 min	94%
α-Chymotrypsin 0.25 mg/mL* (25 kDa MW) 5 kDa MWCO				
	50 min	98%	45 min	98%
10 kDa MWCO				
	25 min	98%	18 min	98%
Ovalbumin 1.0 mg/mL* (45 kDa MW) 10 kDa MWCO				
	20 min	98%	14 min	98%
30 kDa MWCO				
	15 min	94%	12 min	94%

Typical Performance Characteristics

	Time to concentrate up to 30× at 20 °C and solute recovery			
	Time	Recovery	Time	Recovery
BSA 1.0 mg/mL* (66 kDa MW) 30 kDa MWCO	18 min	98%	15 min	98%
IgG 0.1 mg/mL* in DMEM (160 kDa MW) 30 kDa MWCO	30 min	98%	25 min	96%

* proteins other than IgG made up in 50 mM potassium phosphate, 150 mM sodium chloride, pH 7.4

Ordering Information

Vivaspin® 15R RC	Pack size	Prod. No.
2 kDa MWCO	12	VS15RH91
2 kDa MWCO	48	VS15RH92
5 kDa MWCO	12	VS15RH11
5 kDa MWCO	48	VS15RH12
10 kDa MWCO	12	VS15RH01
10 kDa MWCO	48	VS15RH02
30 kDa MWCO	12	VS15RH21
30 kDa MWCO	48	VS15RH22

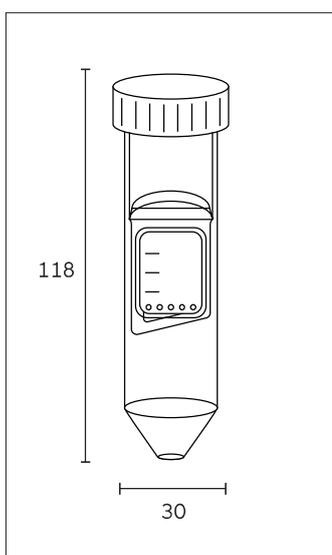


Visit us at www.sartorius.com/Vivaspin15R to get additional info.
Find instructions on how to use Vivaspin® 15R for

- Desalting and buffer exchange
- Preparation of biological nanoparticles and medical nanocarriers
- Concentration and purification of viruses
- Concentration of diluted samples with increased recovery

Vivaspin® Turbo 15 PES

For general laboratory use



4 to 15 mL Samples

Vivaspin® Turbo 15 enables the fastest sample concentration with the highest recoveries. This device can handle a sample volume of up to 110 or 15 mL in fixed angle or swing bucket rotors that accept 50 mL conical bottom centrifuge tubes.

The optimized design and sleek internal profile of Vivaspin® Turbo 15 ensure maximum process speeds all the way down to the last few microliters, which results in more than 100-fold concentration.

The UV joining technology ensures smooth joint transition between the membrane and the plastic housing – allowing removal of the entire sample concentrated in the unique, pipette-friendly dead-stop pocket.

Specifications

Vivaspin® Turbo 15 PES		
Concentrator capacity	Swing bucket rotor	15 mL
	Fixed angle rotor (25°)	9 mL
Dimensions	Total length (concentrator insert)	77 mm
	Total length (in tube with cap)	118 mm
	Diameter (concentrator insert)	27 mm
	Active membrane area	7.2 cm ²
	Hold-up volume of membrane	< 10 µL
	Dead-stop volume for swing-bucket rotor	100 µL
	Dead-stop volume for fixed-angle rotor	60 µL
Materials of construction	Body	Styrene butadiene copolymer (SBC)
	Filtrate vessel	Polypropylene (PP)
	Concentrator cap	Polypropylene (PP)
	Membrane	Polyethersulfone (PES)

Typical Performance Characteristics

	Time to concentrate up to 20× at 20 °C and solute recovery			
	Swing bucket		Fixed angle [25°]	
Centrifuge speed	4,000 g*		4,000 g*	
Start volume	15 mL		9 mL	
	Time	Recovery	Time	Recovery
Cytochrome c* (12.4 kDa MW) 5 kDa MWCO PES	30 min	98%	50 min	98%
Lysozyme* (14.3 kDa MW) 5 kDa MWCO PES	33 min	96%	50 min	96%
α-Chymotrypsin** (25 kDa MW) 10 kDa MWCO PES	10 min	95%	10 min	95%
BSA** (66 kDa MW) 10 kDa MWCO PES	10 min	99%	10 min	99%
30 kDa MWCO PES	8 min	98%	10 min	98%

*2,000 g for 100K MWCO devices

Typical Performance Characteristics

	Time to concentrate up to 20× at 20 °C and solute recovery			
	Time	Recovery	Time	Recovery
IgG** (150 kDa MW)				
30 kDa MWCO PES	23 min	95%	17 min	95%

* 0.25 mg/mL ** 1 mg/mL

Ordering Information

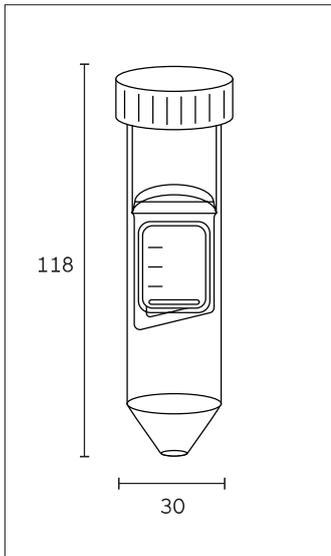
Vivaspin® Turbo 15 PES	Pack size	Prod. No.
3 kDa MWCO	12	VS15T91
3 kDa MWCO	48	VS15T92
5 kDa MWCO	12	VS15T11
5 kDa MWCO	48	VS15T12
10 kDa MWCO	12	VS15T01
10 kDa MWCO	48	VS15T02
30 kDa MWCO	12	VS15T21
30 kDa MWCO	48	VS15T22
50 kDa MWCO	12	VS15T31
50 kDa MWCO	48	VS15T32
100 kDa MWCO	12	VS15T41
100 kDa MWCO	48	VS15T42



Visit us at www.sartorius.com/VivaspinTurbo15 to get additional info.
Find instructions on how to use Vivaspin® Turbo 15 for

- Desalting and buffer exchange
- Preparation of biological nanoparticles and medical nanocarriers
- Concentration and purification of viruses
- Concentration of diluted samples with increased recovery
- Concentration to a predefined volume
- Depyrogenation of ultrafiltration devices
- Concentration of mammalian cell culture supernatants

Vivaspin® Turbo 15 RC



4 to 15 mL Samples

Vivaspin® Turbo 15 RC allows fastest sample concentration with highest recoveries. This device can handle up to 11 or 15 mL sample volumes in fixed angle or swing bucket rotors accepting 50 mL centrifuge tubes.

The Vivaspin® Turbo 15 RC optimized design and sleek internal profile ensure maximum process speeds right the way down to the last few micro litres leading to more than 100-fold concentration. The hydrophillic regenerated cellulose (RC) is suitable for general samples, with ultra-low protein absorption and high chemical compatibility. The membrane is especially well suited to oligonucleotides and peptides and has been developed uniquely for lab ultrafiltration applications.

The solvent free heat weld technology allows for a smooth transition between the membrane and plastic housing, providing complete sample recovery from the unique pipette friendly dead stop pocket. Combined with the PES counterpart the Vivaspin® Turbo range offers the best membrane, whatever the sample.

Specifications

Vivaspin® Turbo 15 PES

Concentrator capacity	Swing bucket rotor	15 mL
	Fixed angle rotor (25°)	9 mL
Dimensions	Total length (concentrator insert)	77 mm
	Total length (in tube with cap)	118 mm
	Diameter (concentrator insert)	27 mm
	Active membrane area	8.1 cm ²
	Hold-up volume of membrane	< 10 µL
	Dead-stop volume for swing-bucket rotor	100 µL
	Dead-stop volume for fixed-angle rotor	60 µL
Materials of construction	Body	Styrene butadiene copolymer (SBC)
	Filtrate vessel	Polypropylene (PP)
	Concentrator cap	Polypropylene (PP)
	Membrane	Regenerated Cellulose (RC)

Typical Performance Characteristics

	Time to concentrate up to 20× at 20 °C and solute recovery			
	Swing bucket		Fixed angle [25°]	
Rotor	Swing bucket		Fixed angle [25°]	
Centrifuge speed	4,000 g ^{***}		6,000 g	
Start volume	15 mL		11 mL	
	Time	Recovery	Time	Recovery
Cytochrome c* (12.4 kDa MW) 5 kDa MWCO RC	23 min	94%	37 min	92%
Lysozyme* (14.3 kDa MW) 5 kDa MWCO RC	23 min	94%	37 min	89%
α-Chymotrypsin** (25 kDa MW) 10 kDa MWCO RC	7 min	93%	9 min	92%
BSA** (66 kDa MW) 10 kDa MWCO RC**	8 min	94%	10 min	98%
30 kDa MWCO RC*	4 min	96%	4 min	93%
Gamma Globulin (150 kDa MW) 50 kDa MWCO RC**	17 min	95%	11 min	96%
100 kDa MWCO RC**	18 min	89%	12 min	89%

* 0.25 mg/mL ** 1 mg/mL *** 3,000 g for 100K MWCO devices

Ordering Information

Vivaspin® Turbo 15 RC	Pack size	Prod. No.
5 kDa MWCO	12	VS15TR11
5 kDa MWCO	48	VS15TR12
10 kDa MWCO	12	VS15TR01
10 kDa MWCO	48	VS15TR02
30 kDa MWCO	12	VS15TR21
30 kDa MWCO	48	VS15TR22
50 kDa MWCO	12	VS15TR31
50 kDa MWCO	48	VS15TR32
100 kDa MWCO	12	VS15TR41
100 kDa MWCO	48	VS15TR42



Visit us at www.sartorius.com/VivaspinTurbo15 to get additional info. Find instructions on how to use Vivaspin® Turbo 15 for

- Desalting and buffer exchange
- Preparation of biological nanoparticles and medical nanocarriers
- Concentration and purification of viruses
- Concentration of diluted samples with increased recovery
- Concentration to a predefined volume

Vivaspin® 20

For general laboratory use



5 to 20 mL Samples

Vivaspin® 20 centrifugal concentrators have been developed to offer increased volume flexibility and performance.

Vivaspin® 20 handles up to 140 or 20 mL in fixed angle or swing bucket rotors that accept 50 mL conical bottom centrifuge tubes. Featuring twin vertical membranes for unparalleled filtration speeds, the Vivaspin® 20 can achieve more than 100-fold concentrations. The remaining volume is easy to read off the printed graduations on the side of the concentrator and the modified dead-stop pocket further simplifies direct pipette recovery of the final concentrate.

More Process Flexibility

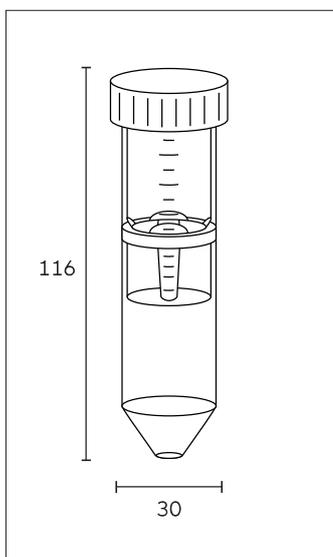
Vivaspin® 20 is available with unique accessories and operating methods that are designed to provide more process flexibility and further time savings.

Gas Pressure Filtration

When an appropriate centrifuge is unavailable or for single sample processing, Vivaspin® 20 can be filled with up to 15 mL and then pressurized for bench-top concentration. For even faster processing, gas pressure can be combined with centrifugal force. "Pressure-fugation" is particularly suitable for difficult or viscous samples, such as serum, or for use of a low process temperature, which reduces filtration speed, and generally when minimum process time is essential.



Air pressure controller, VCA002



Specifications

Vivaspin® 20		
Concentrator capacity	Swing bucket rotor	20 mL
	Fixed angle rotor	14 mL
	With pressure head	15 mL
Dimensions	Length × diameter	116 × 30 mm, 125 × 30 mm with pressure head
	Active membrane area	6.0 cm ²
	Hold-up volume of membrane	< 20 µL
	Dead-stop volume	50 µL
Materials of construction	Body	Polycarbonate (PC)
	Filtrate vessel	Polycarbonate (PC)
	Concentrator cap	Polypropylene (PP)
	Pressure head	Polyoxymethylene (POM) and Aluminium (ALU)
	Membrane	Polyethersulfone (PES)

Typical Performance Characteristics

Mode	Time to concentrate up to 30× at 20 °C and solute recovery			
	Centrifuge	Centrifuge	Bench top	Press-fuge
Rotor	Swing bucket	Fixed angle [25°]	Pressure	Swing bucket
Centrifugal speed pressure	3,000 g*	6,000 g	4 bar	3,000 g* + 4 bar
Start volume	20 mL	14 mL	10 mL	10 mL

* 2,000 g for devices with ≥100 kDa MWCO

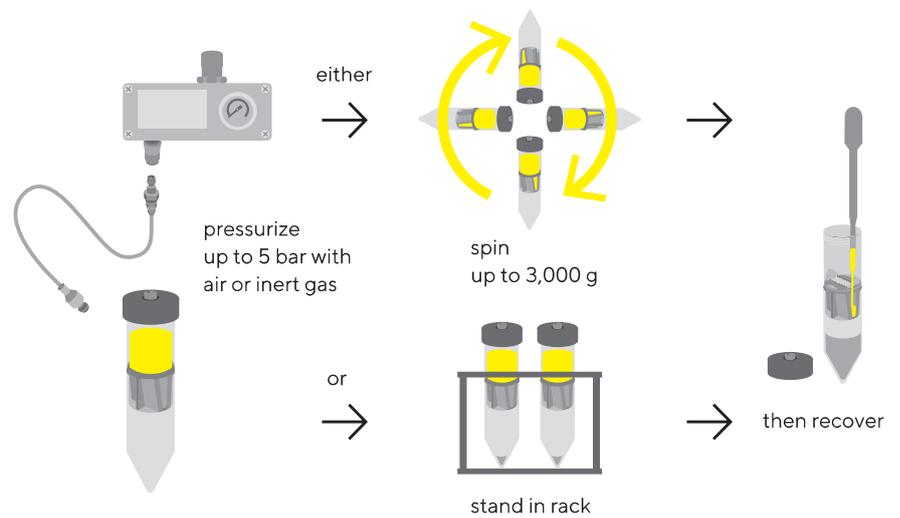
Typical Performance Characteristics

	Time to concentrate up to 30× at 20 °C and solute recovery							
	Min.	Rec.	Min.	Rec.	Min.	Rec.	Min.	Rec.
Cytochrome c 0.25 mg/mL (12.4 kDa MW)								
3 kDa MWCO PES	110	97%	180	96%	60	96%	-	-
BSA 1.0 mg/mL (66 kDa MW)								
5 kDa MWCO PES	23	99%	29	99%	50	98%	14	98%
10 kDa MWCO PES	16	98%	17	98%	32	97%	8	97%
30 kDa MWCO PES	13	98%	15	98%	32	97%	8	97%
IgG 0.25 mg/mL (150 kDa MW)								
30 kDa MWCO PES	27	97%	20	95%	46	94%	13	97%
50 kDa MWCO PES	27	96%	22	95%	46	93%	13	96%
100 kDa MWCO PES	25	91%	20	90%	42	88%	12	94%
Latex beads 0.004% in DMEM + 10% FCS (0.055 µm)								
300 kDa MWCO PES	20	99%	35	99%	10	99%	-	-
Latex beads 0.004% in DMEM + 10% FCS (0.24 µm)								
1,000 kDa MWCO PES	4	99%	12	99%	4	99%	-	-
Yeast 1.0 mg/mL (<i>S. Cerevisiae</i>)								
0.2 µm PES	15	95%	5	95%	20	95%	2	95%

Ordering Information

Vivaspin® 20 PES	Pack size	Prod. No.
3 kDa MWCO	12	VS2091
3 kDa MWCO	48	VS2092
5 kDa MWCO	12	VS2011
5 kDa MWCO	48	VS2012
10 kDa MWCO	12	VS2001
10 kDa MWCO	48	VS2002
30 kDa MWCO	12	VS2021
30 kDa MWCO	48	VS2022
50 kDa MWCO	12	VS2031
50 kDa MWCO	48	VS2032
100 kDa MWCO	12	VS2041
100 kDa MWCO	48	VS2042
300 kDa MWCO	12	VS2051
300 kDa MWCO	48	VS2052
1,000 kDa MWCO	12	VS2061
1,000 kDa MWCO	48	VS2062
0.2 µm	48	VS2072

Vivaspin® 20 Accessories	Pack size	Prod. No.
Air pressure controller (APC)	1	VCA002
Charge valve for pressure head	1	VCA005
Diafiltration cups	12	VSA005
Female coupling	1	VCA010
Male coupling	1	VCA011
Replacement extension line (4 mm pneumatic tubing, 3 m)	1	VCA012
Vivaspin® 20 pressure head	1	VCA200



Using the Vivaspin® 20 pressure head



Visit us at www.sartorius.com/Vivaspin20 to get additional info.
Find instructions on how to use Vivaspin® 20 for

- Desalting and buffer exchange
- Preparation of biological nanoparticles and medical nanocarriers
- Concentration and purification of viruses
- Concentration of diluted samples with increased recovery
- The workflow in protein research laboratories

Vivaspin® 100

20 to 98 mL Samples

Vivaspin® 100 bridges the gap between centrifugal concentrators and crossflow cassettes. These devices feature vertical membranes for high speed processing of even high particle loaded samples. In addition, a unique choice between centrifugal, pressure or pressure-shake operating methods provides unrivaled process flexibility.

Fitting swing bucket rotors accepting 250 mL bottles, Vivaspin® 100 offers the highest sample capacity available in a centrifugal device – up to an astonishing 90 mL.

Vivaspin® 100 units can also be used for single or extremely sensitive samples of up to 98 mL when pressurized and left on the bench. For temperature-sensitive samples, they can be placed into a refrigerator when pressurized. Pressurization is made easy by use of quick-release connectors and can be combined with orbital shaking for even faster sample concentration.

In whichever mode Vivaspin® 100 is used, the vertical membrane design inhibits membrane fouling while the integrated dead-stop impedes concentration to dryness and loss of sample.



Air pressure controller, VCA002

Specifications

Vivaspin® 100

Concentrator capacity	Swing bucket rotor	90 mL
	With pressure head	98 mL
Dimensions	Length × diameter	123 × 62 mm, 197 × 63 mm with pressure head
	Active membrane area	23.5 cm ²
	Hold-up volume of membrane	< 250 µL
	Dead-stop volume	350 µL
Operating requirements	Rotor type	Swing-bucket
	Rotor cavity	To fit 250 mL (62 mm) centrifuge bottles (maximum cavity depth 105 mm)
	Maximum speed	2,000 g
	Maximum pressure	5 bar (75 psi)
Materials of construction	Body	Polycarbonate (PC)
	Filtrate vessel	Polycarbonate (PC)
	Concentrator cap	Polypropylene (PP)
	Pressure head seal	Thermoplastic Elastomer (TPE)
	Pressure head	Polyoxymethylene (POM) and Aluminium (ALU)
	Membrane	Polyethersulfone (PES)

Typical Performance Characteristics

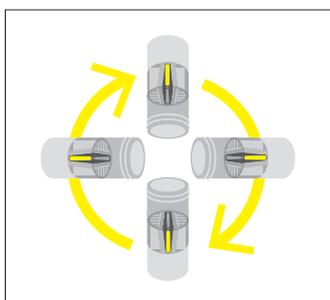
90 mL Start volume	Time to concentrate up to 30× at 20 °C			Solute recovery
	Centrifuge (swing bucket, 2,000 g)	Pressure (4 bar)		
		No agitation	Orbital shake	
BSA 1.0 mg/mL (66 kDa MW)				
5 kDa MWCO PES	22 min	75 min	25 min	96%
10 kDa MWCO PES	16 min	60 min	20 min	96%
30 kDa MWCO PES	16 min	60 min	20 min	94%
IgG 0.25 mg/mL (150 kDa MW)				
50 kDa MWCO PES	20 min	70 min	30 min	94%
100 kDa MWCO PES	20 min	85 min	30 min	90%
Latex beads 0.004% in DMEM + 10% FCS (0.055 μm)				
300 kDa MWCO PES	35 min	–	120 min	99%
Latex beads 0.004% in DMEM + 10% FCS (0.24 μm)				
1,000 kDa MWCO* PES	4 min	5 min	4 min	99%

* 2 bar (29 psi) pressure

Ordering Information

Vivaspin® 100 PES	Pack size	Prod. No.
5 kDa MWCO	2	VC1011
5 kDa MWCO	10	VC1012
10 kDa MWCO	2	VC1001
10 kDa MWCO	10	VC1002
30 kDa MWCO	2	VC1021
30 kDa MWCO	10	VC1022
50 kDa MWCO	2	VC1031
50 kDa MWCO	10	VC1032
100 kDa MWCO	2	VC1041
100 kDa MWCO	10	VC1042
300 kDa MWCO	2	VC1051
300 kDa MWCO	10	VC1052
1,000 kDa MWCO	2	VC1061
1,000 kDa MWCO	10	VC1062
0.2 μm	10	VC1072

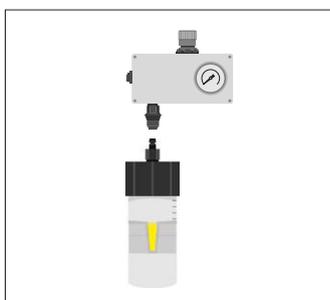
Vivaspin® 100 Accessories	Pack size	Prod. No.
Air pressure controller (APC), complete with pressure gauge, regulator, over-pressure safety valve, female connector, 1 m extension line (4 mm pressure tubing) with male and female connectors and 1 m of 6 mm inlet tubing	1	VCA002
Female coupling	1	VCA010
Male coupling	1	VCA011
4 mm pressure tubing (3 m)	1	VCA012
Replacement extension line (4 mm pneumatic tubing, 3 m)	10	VCA014
Vivaspin® 100 pressure head with seals (5x)	1	VCA800



Centrifuge

use with polypropylene concentrator cap in swing out rotor

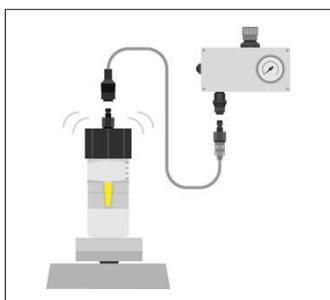
- Process convenience
- Low shear, non-foaming
- Less visual control



Pressure

use with pressure head VCA800

- Simplicity and the highest process control
- Ideal for refrigerated use
- Slower concentrations

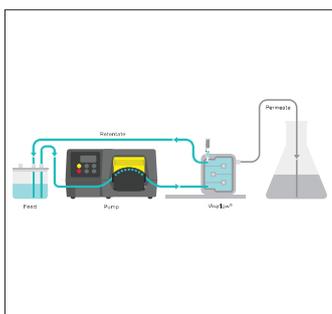


Pressure-Shake

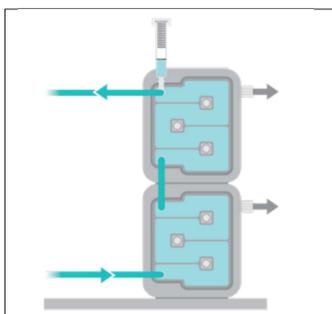
use with pressure head VCA800

- Speed and process control
- Ideal for single samples

Vivaflow® SU



Setup for ultrafiltration



Running cassettes in series

0.1 to 1 L Samples

The next generation of tangential flow filtration (TFF) for the lab is here. Vivaflow® SU makes TFF for research scientists more intuitive, efficient and sustainable than before, with a unique switchback flow path that delivers exceptional process speed for virtually any molecule, from proteins to nucleic acids, and viral vectors to nanoparticles.

Unique Features

- True Plug-and-Play: Quick and intuitive setup right out of the box
- Cost-Effective: All-in-one design eliminates the need for expensive equipment
- Optimized Performance: Advanced flow path reduces TFF effort
- Versatile Processing: High-performance membranes for maximum recovery
- Sample Integrity: No flushing or cleaning required, enhancing safety
- Reduced Waste: 30 - 60% less plastic, with only the necessary tubing provided

Unique Performance

- A single cassette can typically concentrate a 500 mL feed 10-fold in under 25 minutes
- 10 mL minimum system recirculation for the highest concentration factors
- Near total recoveries achievable with a simple buffer flush

Specifications

Vivaflow® 50

Dimensions	Overall L W H	98 13 116 mm
	Active membrane area	50 cm ²
	Minimum recirculation volume	10 mL
Operating conditions	Pump flow	200 to 400 mL/min
	Maximum pressure	3 bar (45 psi)
	Maximum temperature	40 °C
Materials of construction	Fittings	Polyamide (PA) Polypropylene (PP)
	Gasket	Silicone (SIL)
	Housing	Polycarbonate (PC)
	Membrane	Hydrosart® regenerated cellulose (RC) Polyethersulfone (PES)
	Membrane support	Polyethylene (HDPE)
	Pressure indicator	Polyamide (PA) Polyoxymethylene (POM) Polypropylene (PP) Silicone (SIL) Stainless steel (SS)
	Reservoir ¹	Polyamide (PA) Polycarbonate (PC) Polyoxymethylene (POM)
	Stand ¹	Aluminium (ALU)
	Tubing	Polyvinyl chloride (PVC)
	Packaging	Cardboard (PAP) Polyethylene (LDPE)

¹ Optional accessories

Typical Performance

Typical permeate flow and retention rates for biomolecules concentrated up to 10X.

MWCO	Feed Material	Membrane	Permeate Flow	Retention Rate
2 kDa	Vitamin B12 (1.2 kDa)	RC	1.7 mL/min	94%
5 kDa	Lysozyme (14.3 kDa)	PES	2.0 mL/min	99%
		RC	3.7 mL/min	99%
10 kDa	Alpha-chymotrypsin (25 kDa)	PES	10 mL/min	99%
		RC	12 mL/min	98%
30 kDa	Bovine serum albumin (66 kDa)	PES	22 mL/min	99%
		RC	27 mL/min	99%
50 kDa	Immunoglobulins (150 kDa)	PES	10 mL/min	99%
100 kDa	Immunoglobulins (150 kDa)	PES	11 mL/min	98%
		RC	10 mL/min	98%
300 kDa	Latex beads (0.25 µm)	PES	20 mL/min	>99%
		RC	16 mL/min	>99%
1,000 kDa	Latex beads (0.25 µm)	PES	66 mL/min	>99%
0.2 µm	<i>S. cerevisiae</i> (5–10 µm)	PES	70 mL/min	99%

Ordering Information

Package Contents for Cassettes, Equipment and Accessories

Description	Package Contents	Order No
Vivaflow® SU cassettes	2 units 1 tubing kitctvg 1 quick start guide	See next page
Peristaltic pump	1 unit 1 power cable with region-specific plug	VF-APD0001-1
Peristaltic pump head for 1.6 mm WT tubing	1 unit 1 user guide	VF-APH0001-1
Cassette stand	1 unit	VFA006
Feed reservoir	1 unit	VFA016
Tubing for diafiltration	1 unit	VF-ATD0001-1

Ordering Information

Vivaflow® SU Cassettes

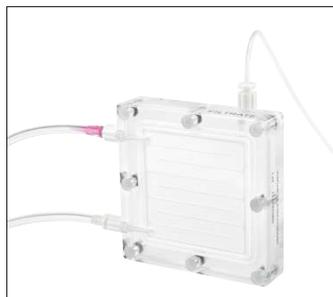
Membrane Material	MWCO	Recommended Feed Volume	
		100 – 500 mL	500 – 1,000 mL
Hydrosart® regenerated cellulose (RC)	2 kDa	VF-S050H0002-IV	VF-S050H0002-SV
	5 kDa	VF-S050H0005-IV	VF-S050H0005-SV
	10 kDa	VF-S050H0010-IV	VF-S050H0010-SV
	30 kDa	VF-S050H0030-IV	VF-S050H0030-SV
	100 kDa	VF-S050H0100-IV	VF-S050H0100-SV
	300 kDa	VF-S050H0300-IV	VF-S050H0300-SV
Polyethersulfone (PES)	5 kDa	VF-S050P0005-IV	VF-S050P0005-SV
	10 kDa	VF-S050P0010-IV	VF-S050P0010-SV
	30 kDa	VF-S050P0030-IV	VF-S050P0030-SV
	50 kDa	VF-S050P0050-IV	VF-S050P0050-SV
	100 kDa	VF-S050P0100-IV	VF-S050P0100-SV
	300 kDa	VF-S050P0300-IV	VF-S050P0300-SV
	1,000 kDa	VF-S050P1000-IV	VF-S050P1000-SV
	0.2 µm	VF-S050P2000-IV	VF-S050P2000-SV



Visit us at <https://sar.to/Vivaflow-SU> for further information, including application data for:

- Concentration of biologics from bulk material
- Lentiviral vector diafiltration and ultrafiltration
- Optimizing concentration of adeno-associated viruses

Vivaflow® 50R



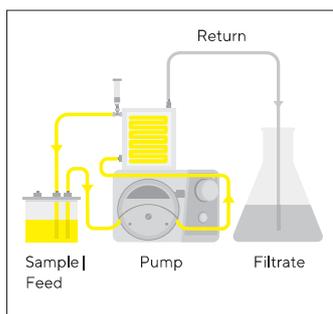
0.1 to 1 L Samples

Concentrate 100 mL to under 20 mL in just a few minutes or concentrate one liter 50-fold in less than 60 minutes. Alternatively, speed up your process by using two Vivaflow® 50R cassettes in parallel and concentrate 1 L in under 30 min.

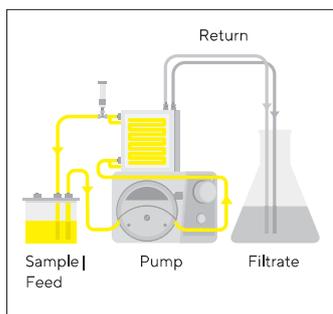
Vivaflow® 50R is a plug-and-play laboratory tangential flow filtration (TFF) cassette for concentrating up to 1 L aqueous samples.

Each cassette is supplied ready to use for ultrafiltration with a pump accepting 1.6 mm wall thickness tubing. To increase throughput or process speed, just order a tubing kit for running 2 x 50 cm² cassettes in parallel, and for processes that include a diafiltration step, a convenient length of tubing for the exchange buffer feed is also available to order separately.

- Fast and easy sample concentration
- Reusable with replacement tubing kits
- Concentrates 0.1 to 1 L feeds
- Ideal for concentrating cell of culture supernatants and viruses



Vivaflow® 50R – Single cassette



Vivaflow® 50R – Two cassettes

Specifications

Vivaflow® 50R

Dimensions	Overall L W H	24 100 100 mm
	Channel W H	7.5 0.4 mm
	Active membrane area	50 cm ²
	Hold-up volume	1.7 mL
	Min. recirculation volume	10 mL
	Non-recoverable hold-up	<0.5 mL
	Operating conditions	Pump flow
Maximum pressure		3 bar (45 psi)
Maximum temperature		60 °C
Materials of construction	Fittings	Polyamide (PA) Polypropylene (PP)
	Gaskets	Silicone (SIL)
	Housing	Polymethyl pentene (PMP)
	Membrane	Hydrosart® regenerated cellulose (RC)
	Membrane support	Polyethylene (HDPE)
	Pressure indicator	Polyamide (PA) Polyoxymethylene (POM) Polypropylene (PP)
	Reservoir ¹	Silicone (SIL) Stainless steel (SS) Polyamide (PA) Polycarbonate (PC) Polyoxymethylene (POM)
	Tubing	Polyvinyl chloride (PVC)
	Packaging	Cardboard (PAP) Polyethylene (LDPE)

¹ Optional accessory

Performance Characteristics

	Time to concentrate up to 20× at 3.0 bar inlet 2.5 bar outlet pressure, 20 °C			
	Start volume 250 mL	Average flux	Recovery Direct	25 mL rinse
Lysozyme 0.25 mg/mL (14 kDa MW)				
5 kDa MWCO RC	70 min	3.4 mL/min	96%	98%
10 kDa MWCO RC	23 min	10.3 mL/min	94%	96%
BSA 1.0 mg/mL (66 kDa)				
10 kDa MWCO RC	24 min	9.9 mL/min	98%	>99%
30 kDa MWCO RC	15 min	15.8 mL/min	97%	>99%
Immunoglobulins 1.0 mg/mL (150 kDa MW)				
100 kDa MWCO RC	46 min	5.2 mL/min	97%	>99%

Performance Characteristics

	Time to concentrate up to 20× at 3.0 bar inlet 2.5 bar outlet pressure, 20 °C			
	Start volume 250 mL	Average flux	Recovery Direct	25 mL rinse
1 L feed (one Vivaflow® 50R at 3 bar)				
10 kDa MWCO RC				
BSA 1.0 mg/mL	95 min	10.0 mL/min	98%	>99%
1 L feed (two Vivaflow® 50R in parallel at 3 bar)				
10 kDa MWCO RC				
BSA 1.0 mg/mL	48 min	19.8 mL/min	98%	>99%

Ordering Information

Vivaflow® 50R*	Pack size	Prod. No.
5 kDa MWCO RC	1	VF05H1
10 kDa MWCO RC	1	VF05H0
30 kDa MWCO RC	1	VF05H2
100 kDa MWCO RC	1	VF05H4

* Each cassette includes 1x feed tube, 1x permeate tube, 1x retentate tube, and 1x pressure indicator, for running the cassette individually

Equipment, Tubing and Fittings

Peristaltic pump	1	VF-APD0001-1
Peristaltic pump head for 1.6 mm WT tubing	1	VF-APH0001-1
Feed reservoir	1	VFA006
Flow restrictors, 0.4 and 0.8 mm	1/ea	VF-AC-0002-V
Tubing for diafiltration	1	VF-ATD0001-1
Tubing for individual cassettes	1	VF-ATI0011-1
Tubing for 2x 50 cm ² cassettes in parallel	1	VF-ATP0011-1

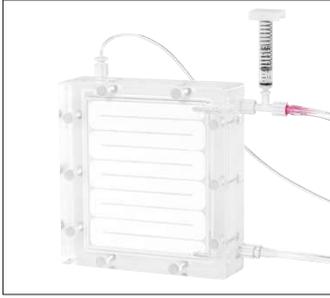


Visit us at <https://sar.to/TFF> to get additional info.

Here you can find instructions on how to use Vivaflow® 50R for

- Preparation of biological nanoparticles and medical nanocarriers
- Concentration and purification of viruses

Vivaflow® 200

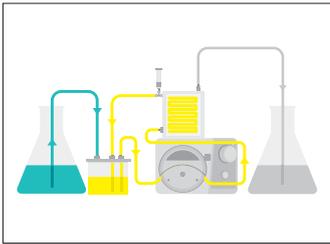


0.5 to 5 L Samples

Concentrate 250 mL to under 20 mL in just a few minutes or concentrate one liter 50-fold in less than 30 minutes. Alternatively, use two Vivaflow® 200 cassettes in parallel and concentrate 5 L in under 75 minutes.

Near-total sample recoveries can be expected with most solutions.

Each cassette is supplied ready to use for ultrafiltration with a pump accepting 1.6 mm wall thickness tubing. For processes that include a diafiltration step, a convenient length of tubing for the exchange buffer feed is available to order separately.



Vivaflow® 200 setup for diafiltration

To increase throughput or process speed, just order a tubing kit for running 2 x 200 cm² cassettes in parallel. To ensure the best performance, this setup requires a pump accepting 2.4 mm wall thickness tubing.

Specifications

Vivaflow® 200

Dimensions	Overall L W H	38 126 138 mm
	Channel W H	10 0.4 mm
	Active membrane area	200 cm ²
	Hold-up volume (module)	5.3 mL
	Min. recirculation volume	< 20 mL
	Non-recoverable hold-up	< 2 mL
Operating conditions	Pump flow	200 to 400 mL/min
	Maximum pressure	4 bar (60 psi)
	Maximum temperature	60°C
Materials of construction	Fittings	Polyamide (PA) Polypropylene (PP)
	Gaskets	Silicone (SIL)
	Housing	Polymethyl pentene (PMP)
	Membrane	Hydrosart® regenerated cellulose (RC)
		Polyethersulfone (PES)
	Membrane support	Polyethylene (HDPE)
	Pressure indicator	Polyamide (PA)
		Polyoxymethylene (POM)
		Polypropylene (PP)
		Silicone (SIL)
	Reservoir ¹	Stainless steel (SS)
Polyamide (PA)		
Polycarbonate (PC)		
Tubing	Polyoxymethylene (POM)	
	Polyvinyl chloride (PVC)	
	Packaging	Cardboard (PAP)
		Polyethylene (LDPE)
		Polyurethane (PU)

¹ Optional accessory

Performance Characteristics				
Time to concentrate up to 20× at 3 bar inlet pressure, 20 °C				
	Start volume 1 L	Average flux	Recovery Direct	25 mL rinse
Lysozyme 0.25 mg/mL (14 kDa MW)				
2 kDa MWCO RC	160 min	6 mL/min	97%	>99%
3 kDa MWCO PES	180 min	5 mL/min	97%	>99%
BSA 1.0 mg/mL (66 kDa MW)				
5 kDa MWCO PES	29 min	33 mL/min	98%	>99%
5 kDa MWCO RC	70 min	14 mL/min	98%	>99%
10 kDa MWCO PES	23 min	41 mL/min	96%	>99%
10 kDa MWCO RC	35 min	27 mL/min	98%	>99%
30 kDa MWCO PES	25 min	38 mL/min	96%	99%
30 kDa MWCO RC	20 min	48 mL/min	96%	>99%
50 kDa MWCO PES	22 min	43 mL/min	96%	98%
Immunoglobulins 1.0 mg/mL (150 kDa MW)				
100 kDa MWCO PES	54 min	18 mL/min	96%	99%
Yeast 1.0 mg/mL (<i>S. Cerevisiae</i>)				
0.2 µm PES	11 min	86 mL/min	92%	98%
Dilute solute concentration, 1 L feed at 3 bar, 10 kDa MWCO PES				
BSA 0.001 mg/mL	18 min	52 mL/min	90%	98%
BSA 0.01 mg/mL	20 min	47 mL/min	92%	98%
BSA 0.1 mg/mL	21 min	45 mL/min	94%	99%
5 L feed (two Vivaflow® 200 in parallel at 3 bar) 10 kDa MWCO PES				
BSA 1.0 mg/mL (66 kDa MW)	67 min	70 mL/min	97%	>99%



Visit us at <https://sar.to/Vivaflow200> to get additional info.
Find instructions on how to use Vivaflow® 200 for

- The measurement of soluble trace metals in seawater
- The workflow in protein research laboratories
- Preparation of biological nanoparticles and medical nanocarriers
- Concentration and purification of viruses
- Concentrating hybridoma supernatants prior to affinity chromatography

Ordering Information

Vivaflow® 200*	Pack size	Prod. No.
3 kDa MWCO PES	1	VF20P9
5 kDa MWCO PES	1	VF20P1
10 kDa MWCO PES	1	VF20P0
30 kDa MWCO PES	1	VF20P2
50 kDa MWCO PES	1	VF20P3
100 kDa MWCO PES	1	VF20P4
0.2µm PES	1	VF20P7
2 kDa MWCO RC	1	VF20H9
5 kDa MWCO RC	1	VF20H1
10 kDa MWCO RC	1	VF20H0
30 kDa MWCO RC	1	VF20H2
100 kDa MWCO RC	1	VF20H4

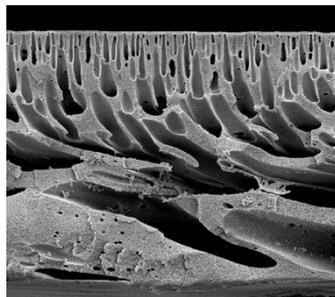
* Each cassette includes 1x feed tube, 1x permeate tube, 1x retentate tube, and 1x pressure indicator, for running the cassette individually.

Equipment, Tubing and Fittings

Peristaltic pump	1	VF-APD0001-1
Peristaltic pump head for 1.6 mm WT tubing	1	VF-APH0001-1
Peristaltic pump head for 2.4 mm WT tubing	1	VF-APH0002-1
Feed reservoir	1	VFA006
Flow restrictors, 0.4 and 0.8 mm	1/ea	VF-AC-0002-V
Tubing for diafiltration	1	VF-ATD0001-1
Tubing for individual cassettes	1	VF-ATI0011-1
Tubing for 2x 200 cm ² cassettes in parallel	1	VF-ATP0012-1

Ultrafiltration Membrane Discs

PES 146, CTA 145 and Hydrosart® 144



Polyethersulfone (PES)

This is a general purpose membrane that provides excellent performance with most solutions when retentate recovery is of primary importance. PES membranes exhibit no hydrophobic or hydrophilic interactions and are usually preferred for their low fouling characteristics, exceptional flux and broad pH compatibility.

Cellulose Triacetate (CTA)

High hydrophilicity and exceptionally low non-specific binding characterize this membrane. Cast without any membrane support that could trap or bind passing microsolute, these membranes are ideal for sample cleaning and protein removal, and when high recovery from the filtrate solution is of primary importance.

Hydrosart® Regenerated Cellulose (RC)

These membranes are also highly hydrophilic and are often preferred for their high protein recovery when processing very dilute solutions. Resistance to autoclaving, ease of cleaning and extended chemical resistance also characterize this type of membrane.

Specifications

Specifications for Polyethersulfone, Type 146

Thickness	120 µm	
pH range	1 – 14	
Water flux	10 kDa MWCO	0.2 mL/min/cm ²
Protein retention	Cytochrome C	95%

Specifications for Cellulose Triacetate, Type 145

Thickness	120 µm	
pH range	4 – 8	
Water flux	10 kDa MWCO	0.11 mL/min/cm ²
Protein retention	Cytochrome C	90%

Specifications for Hydrosart®, Type 144

Thickness	180 µm	
pH range	1 – 13	
Water flux	10 kDa MWCO	0.08 mL/min/cm ²
Protein retention	Cytochrome C	99%

Ordering Information

PES Membrane Discs, Type 146	Diameter	Pack size	Prod. No.
1 kDa MWCO	47 mm	10	14609--47-----D
	63 mm	10	14609--63-----D
	76 mm	10	14609--76-----D
5 kDa MWCO	47 mm	10	14629--47-----D
	63 mm	10	14629--63-----D
	76 mm	10	14629--76-----D
10 kDa MWCO	47 mm	10	14639--47-----D
	63 mm	10	14639--63-----D
	76 mm	10	14639--76-----D
30 kDa MWCO	47 mm	10	14659--47-----D
	63 mm	10	14659--63-----D
	76 mm	10	14659--76-----D
50 kDa MWCO	47 mm	10	14650--47-----D
100 kDa MWCO	47 mm	10	14668--47-----D
	63 mm	10	14668--63-----D
300 kDa MWCO	47 mm	10	14679--47-----D
	76 mm	10	14679--76-----D

CTA Membrane Discs, Type 145	Diameter	Pack size	Prod. No.
5 kDa MWCO	47 mm	10	14529--47-----D
10 kDa MWCO	47 mm	10	14539--47-----D
20 kDa MWCO	47 mm	10	14549--47-----D
	63 mm	10	14549--63-----D

RC Membrane Discs, Type 144	Diameter	Pack size	Prod. No.
2 kDa MWCO	63 mm	10	14419--63-----D
5 kDa MWCO	47 mm	10	14429--47-----D
	63 mm	10	14429--63-----D
	76 mm	10	14429--76-----D
10 kDa MWCO	47 mm	10	14439--47-----D
	63 mm	10	14439--63-----D
	76 mm	10	14439--76-----D
30 kDa MWCO	47 mm	10	14459--47-----D
	63 mm	10	14459--63-----D
	76 mm	10	14459--76-----D
100 kDa MWCO	47 mm	10	14468--47-----D

Additional diameters are available. Please refer to the product datasheet for more information.

Vivapore® 5 and 10

For general laboratory use

3 to 20 mL Samples

With no need for additional equipment, pressure or vacuum, solvent absorption is the most economic and user-friendly concentration technique available to the clinician and research scientist.

Just fill the unit with the solution to be concentrated, wait for the desired concentration level to be achieved and then pipette the concentrated sample from the bottom of the device.

Vivapore® is ideal for general-purpose laboratory concentration and purification prior to further analysis. It is particularly suited for labile solutions that can denature with alternative shear- or pressure-inducing methods or that require processing in a cold room environment.

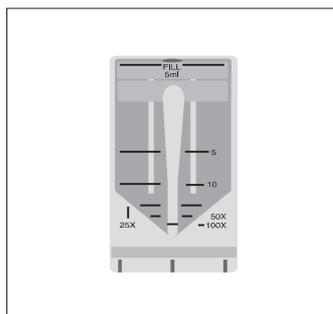
Vivapore® concentrators extend the solvent absorption technique to a totally new level of performance, application potential and ease of use.

Vivapore® Solvent Absorption concentrators are intended for general laboratory uses.

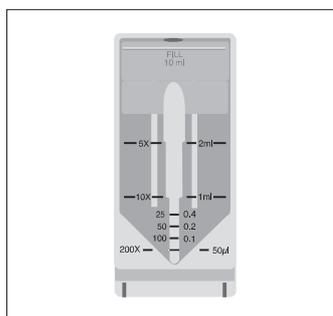
Specifications

	Vivapore® 5	Vivapore® 10
Membrane material	PES	PES
Membrane MWCO	7.5 kDa	7.5 kDa
Membrane surface area	20 cm ²	28 cm ²
Reservoir material	SAN	SAN
Volume range	1 to 5 mL	2 to 10 mL 20 mL*
Minimum concentrate volume	50 µL	50 µL
Vivapore® overall dimensions		
Width (mm)	42	46
Height (mm)	82	100

* to concentrate 20 mL please use the 10 mL expansion reservoir (VPA006)



Vivapore® 5



Vivapore® 10 | 20



Visit us at www.sartorius.com/en/products/lab-filtration-purification/diagnostic-sample-prep to get additional info.

Here you can find instructions on how to use Vivapore® Solvent Absorption Concentrators and Vivaspin® products for the concentration of urine samples.

Typical Performance Characteristics

Product	Time to concentrate			Concentrate recovery [%]		
	Vivapore [®] 5	Vivapore [®] 10		Vivapore [®] 5	Vivapore [®] 10	
Start volume	5 mL	10 mL	20 mL*	5 mL	10 mL	20 mL*
Protein (MW)						
α-chymotrypsin** (25 kDa)	204 min CF 94x	424 min CF 138x	407 min CF 34x	78%	90%	74%
IgG** (150 kDa)	155 min CF 92x	319 min CF 179x	371 min CF 34x	60%	65%	82%

* with Vivapore[®] 10 | 20 Expansion Reservoir

** Proteins were concentrated from human urine specimens (with pH of 4.5) at 20.5 C°, averaged results devices tested; n=81

Performance Characteristics

Product	Time to concentrate up to 50× [min.]			Concentrate recovery [%]		
	VP5	VP10	VP10*	VP5	VP10	VP10*
Start volume	5 mL	10 mL	20 mL	5 mL	10 mL	20 mL
Cytochrome c (12.6 kDa MW)	65	70	160	91%	88%	90%
BSA (66 kDa MW)	45	50	105	90%	90%	92%
IgG (150 kDa MW)	50	65	140	53%	65%	74%

* with additional reservoir

Ordering Information

Vivapore [®] 5*	Pack size	Prod. No.
7,500 MWCO PES	30	VP-S005P0008--3
Vivapore [®] 10**		
7,500 MWCO PES	30	VP-S010P0008--3
Accessories		
Vivapore [®] Stand for 4 Devices	6	VP-AST0001-C
Vivapore [®] 10 Expansion Reservoir	10	VP-ARV0010-D

* Vivapore[®] 5 devices supplied with one disposable stand to support up to four devices** Vivapore[®] 10 devices supplied with one disposable stand to support up to four devices, and one expansion reservoir

Vivacon® 500

For general laboratory use

Reproducible DNA and Protein Sample Desalting and Concentration

Vivacon® 500 centrifugal concentrators offer the optimal solution for DNA and protein concentration and buffer exchange applications. For optimal performance with highly dilute samples, e.g. forensic samples, Vivacon® 500 incorporates the patented regenerated cellulose membrane, Hydrosart®. High recoveries and excellent reproducibilities are combined with convenience offered by the molecular weight cutoff printed on the individual Vivacon® 500 units.

As Vivacon® 500 can be reverse spun after sample processing, this ensures complete concentrate recovery, which is especially important when working with low sample concentrations.

Vivacon® 500-PCR Grade

To use DNA amplification technologies, any traces of DNA originating from the equipment need to be eliminated.

Vivacon® 500-PCR Grade units are treated with ethylene oxide (EtO) in a validated process to denature all traces of DNA that might interfere with subsequent amplification procedures.

Reference: K. Shaw et al., Int. J. Legal Med. (2008) 122: 29–33

Specifications

Vivacon® 500		
Concentrator capacity	Fixed angle rotor	0.5 mL
Dimensions	Length × diameter	45 × 12.4 mm
		47.5 × 12.4 mm reverse spin
	Active membrane area	12.4 mm
	Hold-up volume of membrane and support	0.32 cm ²
	Dead-stop volume (40° rotor)	< 5 µL 5 µL
Materials of construction	Body	Polycarbonate (PC)
	Filtrate vessel	Polypropylene (PP)
	Membrane	Hydrosart® (HY) Cellulose Acetate (CA)

Conversion Table for Hydrosart® MWCO to Nucleotide Cutoff

Membrane	MWCO	Double-Stranded Nucleotide Cutoff (bp)
Hydrosart ⁺	2 kDa	> 10
Hydrosart ⁺	10 kDa	> 30
Hydrosart ⁺	30 kDa	> 50
Hydrosart ⁺	50 kDa	> 300
Hydrosart ⁺	100 kDa	> 600
Cellulose Acetate	125 kDa	> 650



Performance Characteristics for DNA

Start volume 0.5 mL, sample concentration 50 mg/mL.

	Molecule size (bp)	Time to concentrate up to 30× at 20 °C	Concentrate recovery	RCF
2 kDa MWCO	10	60 min.	93%	7,500 g
10 kDa MWCO	30	25 min.	94%	7,500 g
30 kDa MWCO	50	18 min.	88%	5,000 g
50 kDa MWCO	300	18 min.	91%	5,000 g
100 kDa MWCO	600	10 min.	87%	3,000 g
125 kDa MWCO	650	12 min.	85%	2,000 g
125 kDa MWCO	900	9 min.	94%	3,000 g

Performance Characteristics for Proteins

Start volume 0.5 mL, sample and concentration of proteins as specified in table.

	Test molecule	Time to concentrate up to 30× at 20 °C	Concentrate recovery	RCF
2 kDa MWCO	0.25 mg/mL cytochrome c	30 min.	95%	14,000 g
10 kDa MWCO	0.25 mg/mL cytochrome c	15 min.	92%	14,000 g
30 kDa MWCO	1.0 mg/mL BSA	10 min.	95%	14,000 g
50 kDa MWCO	1.0 mg/mL BSA	10 min.	92%	14,000 g
100 kDa MWCO	1.0 mg/mL bovine IgG	11 min.	90%	8,000 g
125 kDa MWCO	1.0 mg/mL bovine IgG	10 min.	81%	8,000 g

Ordering Information

Vivacon® 500	Pack size	Prod. No.
2 kDa MWCO	25	VN01H91
2 kDa MWCO	100	VN01H92
10 kDa MWCO	25	VN01H01
10 kDa MWCO	100	VN01H02
30 kDa MWCO	25	VN01H21
30 kDa MWCO	100	VN01H22
50 kDa MWCO	25	VN01H31
50 kDa MWCO	100	VN01H32

Vivacon® 500	Pack size	Prod. No.
100 kDa MWCO	25	VN01H41
100 kDa MWCO	100	VN01H42
125 kDa MWCO	100	VN01H82
Vivacon® 500 PCR Grade		
30 kDa MWCO	100	VN01H22ETO
100 kDa MWCO	100	VN01H42ETO
Vivacon® 500 accessories		
Additional collection tubes	100	VNCT01



Visit us at www.sartorius.com/en/products/lab-filtration-purification/ultrafiltration-devices/centrifugal to get additional info.

Find instructions on how to use Vivacon® 500 for

- Primer removal after a PCR reaction
- Filter aided sample preparation (FASP) for proteomic analysis by mass spectrometry

Vivacon® 2

For general laboratory use



Reproducible DNA Sample Desalting and Concentration

Vivacon® 2 centrifugal concentrators offer the optimal solution for DNA and protein concentration and buffer exchange applications. For optimal performance with highly dilute samples, e.g. forensic samples, Vivacon® 2 incorporates the patented regenerated cellulose membrane Hydrosart®. High recoveries and excellent reproducibilities are combined with the convenience provided by the volume graduation and molecular weight cutoff printed on the individual Vivacon® 2 units.

As Vivacon® 2 can be reverse spun after sample processing, this ensures complete concentrate recovery, which is especially important when working with low sample concentrations.

Vivacon® 2-PCR Grade

Vivacon® 2-PCR Grade units are treated with ethylene oxide (EtO) in a validated process to denature all traces of DNA that might interfere with subsequent amplification procedures.

Specifications

Vivacon® 2

Concentrator capacity	Fixed-angle rotor	2 mL
Dimensions	Length × diameter	125 × 16 mm
		115 × 16 mm reverse spin
	Active membrane area	0.95 cm ²
	Hold-up volume membrane and support	10 µL
	Dead-stop volume (25° rotor)	55 µL
Materials of construction	Body	Polycarbonate (PC)
	Filtrate vessel	Polypropylene (PP)
	Backspin vial	Polypropylene (PP)
	Concentrator cap	Polypropylene (PP)
	Membrane	Hydrosart® (HY) Cellulose Acetate (CA)

Conversion Table for Hydrosart® MWCO to Nucleotide Cutoff

Membrane	MWCO	Double-Stranded Nucleotide Cutoff (bp)
Hydrosart®	2 kDa	> 10
Hydrosart®	10 kDa	> 30
Hydrosart®	30 kDa	> 50
Hydrosart®	50 kDa	> 300
Hydrosart®	100 kDa	> 600
Cellulose Acetate	125 kDa	> 650

Performance Characteristics for DNA

Start volume 2 mL, sample concentration 50 mg/mL.

	Molecule size (bp)	Time to concentrate up to 30× at 20°C	Concentrate recovery	RCF
2 kDa MWCO	10	120 min	92%	7,500 g
10 kDa MWCO	30	60 min	94%	5,000 g
30 kDa MWCO	50	60 min	95%	2,500 g
50 kDa MWCO	300	45 min	96%	2,500 g
100 kDa MWCO	600	30 min	93%	2,500 g
125 kDa MWCO	650	30 min	88%	2,500 g
125 kDa MWCO	900	30 min	89%	2,500 g

Performance Characteristics for Proteins

Start volume 2 mL, sample and concentration of proteins as specified in table.

	Test molecule	Time to concentrate up to 30× at 20°C	Concentrate recovery	RCF
2 kDa MWCO	0.25 mg/mL cytochrome c	120 min	95%	7,500 g
10 kDa MWCO	0.25 mg/mL cytochrome c	90 min	96%	5,000 g
30 kDa MWCO	1.0 mg/mL BSA	40 min	96%	5,000 g
50 kDa MWCO	1.0 mg/mL BSA	30 min	94%	5,000 g
100 kDa MWCO	1.0 mg/mL bovine IgG	30 min	92%	5,000 g
125 kDa MWCO	1.0 mg/mL bovine IgG	27 min	81%	5,000 g

Ordering Information

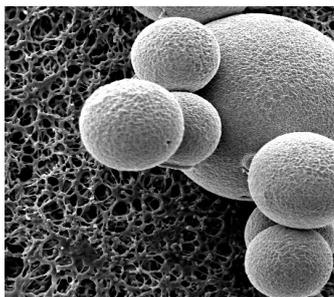
Vivacon® 2	Pack size	Prod. No.
2 kDa MWCO	100	VN02H92
10 kDa MWCO	100	VN02H02
30 kDa MWCO	100	VN02H22
50 kDa MWCO	100	VN02H32
100 kDa MWCO	100	VN02H42
125 kDa MWCO	100	VN02H82

Vivacon® 2 PCR Grade		
100 kDa MWCO	100	VN02H42ETO



SARTORIUS SARTOBIND

Introduction to Lab Chromatography



Chromatography resin beads (right) are shown on top of a membrane adsorber in this SEM. The membrane adsorber pores are more than 100x larger than bead pores.

Macromolecule purification is critical in many life science workflows. However, resin-based ion exchange or affinity chromatography methods typically require sophisticated equipment and long set-up times, exhibit low flow rates, and suffer from limited yields.

For laboratory-scale purification, Sartorius offers a range of ready-to-use units, featuring Sartobind® membrane adsorbers to overcome these challenges. The stabilized regenerated cellulose matrix displays a macroporous structure, allowing molecules to be transported to the ligands by convective flow. This results in exceptionally high flow rates, and shorter residence and cycle times.

A choice of formats from the Vivapure® and Sartobind® Lab product families provide the flexibility to purify by centrifugation, pump or FPLC system – and can even eliminate the need for specialist equipment altogether.

- Purification as simple as filtration
- Flexible handling by centrifuge, syringe or FPLC system
- Rapid, reproducible macromolecule purification and polishing
- No risk of bed cracking or channelling
- Single use or reusable membrane chromatography units
- Process-ready platform

Typical Applications

Vivapure® and Sartobind® Lab units are available with a choice of ion exchange (IEX) or affinity chromatography (AC) ligands. These are ideal for screening, scouting, optimization, and preparative purification or polishing of most macromolecules in research and development laboratories.

	Sartobind® Lab and Vivapure® IEX		Sartobind® Lab IDA	Sartobind® Lab Protein A
Interaction Principle	Anion exchange	Cation exchange	Affinity	Affinity
Ligand	Quaternary ammonium (Q), diethylamine (D)	Sulfonic acid (S)	Iminodiacetic acid (IDA)	ProteinA
Typical Capture Applications	Proteins, nucleic acids, viruses, VLP	Proteins, viruses, VLP	His-tagged proteins	Antibodies, Fc containing molecules
Typical Flowthrough Applications	DNA, host cell proteins, viruses, endotoxins	Aggregates, host cell proteins	-	-

Vivaclear

Vivaclear centrifugal filters are disposable microfiltration devices for the fast and reliable clarification | filtration of biological samples in the range 100 to 500 μL . They can be used in fixed angle rotors accepting 2.2 mL centrifuge tubes.

Product Features

- High-flux polyethersulfone membrane
- 0.8 μm pore size
- Low hold-up volume (< 5 μL)
- Fast and reproducible performance

Applications

- Clarification of samples before loading in Vivapure[®] protein purification spin columns
- Removal of particles and precipitates
- Filtration of plasma and serum
- Filtration of cells or cell debris

Specifications

Vivaclear Centrifugal Filters		
Rotor	40–45° fixed angle rotor	
Pore size	0.8 μm	
Dimensions	Length x diameter	43 x 11 mm
	Active membrane area	0.34 cm^2
	Hold-up volume, membrane plus support	< 5 μL
	Maximum RCF	2,000 g
Materials of construction	Body	Polypropylene (PP)
	Membrane	Polyethersulfone (PES)
	Filtrate collection tube	Polypropylene (PP)

Ordering Information

Vivaclear Mini PES	Pack size	Prod. No.
0.8 μm	100	VK01P042



Vivapure®

Single use membrane chromatography units for screening, scouting and optimization of IEX purification conditions.



Vivapure® IEX Mini



Vivapure® IEX Maxi

Off-the-Shelf Consistency

Avoid preparative steps and cleaning with the single use spin column format. No more column packing. Bye-bye degassing.

Purification in Parallel

Purify two, four, six or even 24 samples simultaneously to optimize or cut your already shortened process time even further. Full screen ahead.

IEX Without The CAPEX

Conserve your budget with the chromatography solution that doesn't require high-cost equipment. Your centrifuge just became your FPLC system.

Ready-to-Analyze Eluates

No need to concentrate. Membrane chromatography eliminates dilution effects to yield fractions which require no further processing before analysis.

Materials

Housing	Polycarbonate (PC)
Filtrate Tube	Polypropylene (PP)
Membrane	Stabilized regenerated cellulose
Ligand	Quaternary ammonium (Q), diethylamine (D) or sulfonic acid (S)
Packaging	Cardboard (PAP) and Polyethylene (LDPE)
User Guide	Paper (PAP)

Specifications

Type	Mini	Maxi
Bed Volume	0.24 mL	2.7 mL
Sample Capacity	0.4 mL	19 mL
Minimum Elution Volume	50 µL	2 mL
Recommended RCF	2,000 g	500 g
Binding Capacity*	4 mg/unit	60 - 80 mg/unit
Operating pH Stability	2 - 12 for Q and S 4 - 10 for D	2 - 12 for Q and S 4 - 10 for D

*For BSA on Q | D units, or cytochrome c on S units

Ordering Information

Description	Pack size	Prod. No.
Vivapure® Q Mini	24	VS-IX01QH24
Vivapure® Q Maxi	8	VS-IX20QH08
Vivapure® D Mini	24	VS-IX01DH24
Vivapure® D Maxi	8	VS-IX20DH08
Vivapure® S Mini	24	VS-IX01SH24
Vivapure® S Maxi	8	VS-IX20SH08

Sartobind® Lab

Membrane chromatography units for rapid preparative affinity or ion exchange purification, which can be re-used hundreds of times.

Cut to the Capture

Eliminate or combine preparative steps with plug and play chromatography units. No more column packing. Bye-bye degassing.

Purify More Than Ever Before

Experience faster flow rates and shorter cycle times while maximizing macromolecule yield. Offering unrivalled productivity for even the largest protein complexes and viruses.

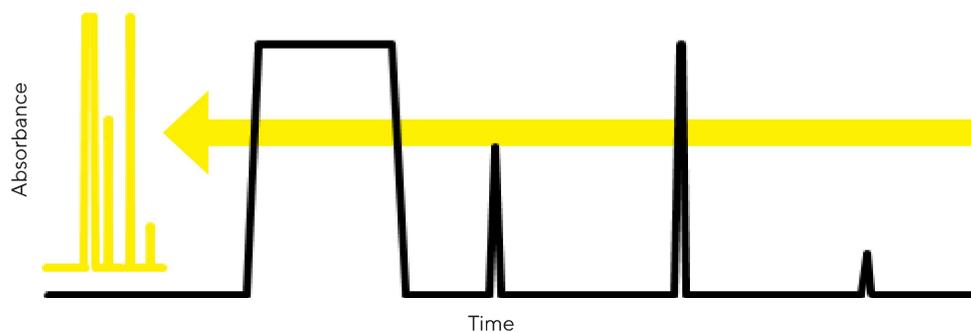
Flexibility Built In

Choose your preferred handling method without worrying about flow rate limitations. Use an FPLC system or purify equipment-free for AC or IEX without the CAPEX.

Trusted Process Ready Technology

Following proof of concept in the early development phase, easily scale your process using the same platform in capsules and cassettes. That's biopharmaceutical manufacturing covered.

Purify your macromolecules up to 10X faster by switching to Sartobind® Lab units (yellow).



Visit us at <https://sar.to/SartoBind-Rapid-A-Lab> to take your antibody purification process to affinity and beyond with Sartobind® Rapid A Lab.



Sartobind® Lab units support faster purifications with a syringe, pump or your existing chromatography system



Luer to UNF adapters are supplied in each box of Sartobind[®] Lab units, for connection to liquid chromatography systems

Materials

Adapters	Polyether ether ketone (PEEK)
Caps	Polycarbonate (PC)
Fittings ¹	Polyamide (PA)
Housing	Polypropylene (PP)
Ligand	Diethylamine (D), Iminodiacetic acid (IDA), Protein A, Quaternary ammonium (Q), Sulfonic acid (S)
Membrane	Agarose, Regenerated cellulose (RC)
Membrane support	Polyethylene terephthalate (PET)
Tubing ²	Polyvinyl chloride (PVC)
Packaging	Aluminium composite (ALU/OPA/PE), cardboard (PAP)

¹ Optional accessories

* To ensure stability of the ligand, Sartobind[®] Rapid A Lab ships with additional packaging materials.

Specifications

Modality	Ion Exchange (Q, D or S)	Metal Affinity (IDA)	Antibody Affinity (Protein A)
Bed Volume	0.41, 2.1 or 2.8 mL	2.1 mL	0.5 mL
Recommended Flow Rate	5 – 30 MV/min	5 – 30 MV/min	5 – 50 MV/min
Maximum Operating Pressure	0.6 MPa	0.6 MPa	0.8 MPa
Binding Capacity	12 – 80 mg/unit BSA on Q units	7.5 mg/unit His-tagged protein	≥17.5 mg/unit Polyclonal hIgG
Operating pH Stability	2 – 14 for Q and D 3 – 14 for S	1 - 12	2 - 14
Storage After Use	20% ethanol in equilibration buffer	0.02% sodium azide in equilibration buffer	20% ethanol in PBS

Ordering Information

Description	Pack size	Prod. No.
Sartobind [®] Q Lab, 0.41 mL	4	93IEXQ42GB-12-A
Sartobind [®] Q Lab, 2.1 mL	2	93IEXQ42DB-12-V
Sartobind [®] Q Lab, 2.8 mL	1	93IEXQ42BC-12
Sartobind [®] D Lab, 2.1 mL	2	93IEXD42DB-12-V
Sartobind [®] S Lab, 0.41 mL	4	93IEXS42GB-12-A
Sartobind [®] S Lab, 2.1 mL	2	93IEXS42DB-12-V
Sartobind [®] S Lab, 2.8 mL	1	93IEXS42BC-12
Sartobind [®] IDA Lab, 2.1 mL	2	93IDA-42DB-12-V
NEW! Sartobind [®] Rapid A Lab, 0.5 mL	1	SBLRA025EL-1
NEW! Sartobind [®] Rapid A Lab, 0.5 mL	4	SBLRA025EL-A
Sartobind [®] Lab LC system adapter kit	1	SBLAAU01-1
Peristaltic pump	1	VF-APD0001-1
Peristaltic pump head for 1.6 mm tubing	1	VF-APH0001-1
Pump tubing	1	VF-ATD0001-1

Vivapure® Virus Purification Kits

Recombinant virus vectors are the preferred method for a wide range of gene delivery applications. Especially adenovirus type 5 and VSV-G pseudotyped lentivirus are two frequently utilized viral vectors for in vitro and in vivo applications.

Recombinant Adenovirus Vectors

Recombinant adenovirus vectors are versatile tools in research and therapeutic applications for gene transfer and protein expression in cell lines that have low transfection efficiency with liposomes. After entering cells, the virus remains epichromosomal – i.e., does not integrate into the host chromosome, leaving the host genome unaffected. The delivery of RNAi into cells is becoming a major application for adenovirus vectors.

Lentivirus Vectors

Lentivirus vectors are frequently used in gene transfer studies, due to their ability of gene transfer and integration into dividing and non-dividing cells. The pseudotyped envelope with vesicular stomatitis virus envelope G (VSV-G) protein broadens their target cell range. Lentiviral vectors have been shown to deliver genes into cell types (e.g. neurons, lymphocytes and macrophages) which other retrovirus vectors could not be used for. The lentivirus vector is increasingly used to integrate siRNA efficiently in a wide variety of cell lines and primary cells, both in vitro and in vivo.

Rapid Virus Purification by Membrane Chromatography

The Sartobind® ion exchange membrane adsorber technology used in Adenopack and Lentiselect is unique in its capability to efficiently and rapidly capture and recover large virus particles. Compared with chromatography media, membrane adsorbers provide large 3,000 nm pores, allowing unrestricted access and recovery of virus from the charged adsorber surface. Convective flow through the syringe filter devices provides high-speed separations not possible with traditional chromatography, cesium chloride density gradients and ultracentrifugation methods.

Sartorius membrane adsorbers with porous matrices, high capacities, low differential pressures, high flow rates and low unspecific adsorption show excellent performance in small-scale virus purification. In addition, these syringe filter devices are scalable and comply with cGMP requirements for large-volume, high-performance separation, reducing final process time ten-fold.



Vivapure® Adenopack

Adenopack 20 | 100 | 500

The Adenopack adenovirus purification and concentration kits offer researchers who need to recover up to 3×10^{13} purified recombinant adenovirus particles for in vitro transfection a fast, safe and easy-to-use solution. The kits include all reagents and devices necessary for clarification, purification and concentration of adenovirus type 5 from HEK293 cell cultures – all within just two hours. These straightforward kits replace time-consuming and labor-intensive 48-hour CsCl density gradients.

Adenopack kits are offered as Adenopack 20, Adenopack 100 and Adenopack 500 for the purification and concentration of adenovirus type 5 from 20 to 500 mL cell cultures, resulting in 1×10^{11} to 3×10^{13} purified viral particles. For each sample volume, the most convenient handling method is provided for ultimate convenience.

To this end, preparations using Adenopack 20 are supplied in a spin column format for centrifuges. Adenopack 100 is a manually operated kit in a syringe filter format* and Adenopack 500 is a pump-driven kit.

Adenopack Advantages

Fast and Easy Virus Purification

- Purification completed in just 2 hours
- Convenient, over 10 × faster alternative to CsCl density gradient

Quantitative Yields

- In contrast to CsCl density gradient, the complete cell culture is used for virus purification and not only the viral pellet

Flexible Product Range

- Applicable from initial construct screening to large-scale virus production

Complete Kit

- Including filtration devices, Adenopack units for virus purification, Vivaspin® and all buffers

Low Endotoxin Levels

- High cell viability and infection rates due to endotoxin levels of <0.025 EU/mL

* Vivapure® Adenopack 100 can be alternatively be operated with a laboratory pump or an infusion pump, for which protocols are provided on our web page at www.sartorius-stedim.com. Additionally, the tubes and adaptors needed for these operating modes can be ordered.

Specifications

Adenovirus Purification Kit Specifications			
Product	Adenopack 20	Adenopack 100	Adenopack 500
Sample size	20 mL cell culture	20 to 200 mL of cell culture	500 mL of cell culture
Number of purifications	6 × 20 mL	2 × 20 to 60 mL 1 × 200 mL	1 × 500 mL
Virus particles (VP) per mL	Typically up to 1×10^{14} - 10^{12}	Typically up to 1×10^{13}	Typically up to 3×10^{13}
VP/IU	50 to 100	20 to 50	20 to 50
Processing time	Typically one hour	Typically two hours	
Endotoxin level	<0.025 EU/mL	<0.025 EU/mL	<0.025 EU/mL

Ordering Information

Vivapure® Adenopack 20

Vivapure® Adenopack 20	VS-AVPQ020
Vivapure® Adenopack 20 RT*	VS-AVPQ022

Vivapure® Adenopack 100

Vivapure® Adenopack 100	VS-AVPQ101
Vivapure® Adenopack 100 RT*	VS-AVPQ102

Adenopack 100 Accessories

Pump tubing set for Vivapure® Adenopack 100	VS-AVPA001
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Vivapure® Adenopack 500

Vivapure® Adenopack 500	VS-AVPQ501
Vivapure® Adenopack 500 RT*	VS-AVPQ502

* Adenopack RT-kits do not contain Benzonase**

** Benzonase® is a registered trademark of Merck



Vivapure® Lentiselect

Lentiselect 40 | 500 | 1000

The Lentiselect kits for lentivirus purification and concentration offer researchers who need to recover up to 5×10^9 infective lentivirus particles per mL for in vitro transfection or animal studies a fast and easy-to-use solution.

These straightforward kits replace time-consuming ultracentrifugation protocols, which typically take approximately one day for large sample volumes. Vivapure® Lentiselect thus reduces purification time to just a few hours.

Lentiselect kits are offered as Lentiselect 40, Lentiselect 500 and Lentiselect 1000 for the purification and concentration of VSV-G pseudotyped lentivirus from 40 to 1,000 mL cell cultures, resulting in 8×10^8 to 1×10^{10} purified infective particles. The most convenient handling method is provided for each sample volume. To this end, 40 mL sample volumes are processed manually with Lentiselect 40, while Lentiselect 500 and 1000 are pump-driven kits.

Lentiselect Advantages

Fast and Easy Virus Purification

- Purification completed in less than one to six hours, depending on sample volume
- Kit is as easy to use as filtration

No Need for Expensive Instruments

- Lentivirus purification with Lentiselect is independent of equipment, such as ultracentrifuges

High Virus Purity

- Achieve pure virus based on a chromatographic method for your experiments instead of a crude and variable cell culture supernatant pellet

Optimal for Multiple Virus Construct Screening

- With Lentiselect 40, four purification runs can be conducted in parallel with one kit

Complete Kits

- Including Lentiselect units for virus purification, Vivaspin® units for concentration | buffer exchange and all buffers and syringes necessary

Low Endotoxin Levels

- High cell viability and infection rates due to endotoxin levels of < 0.025 EU/mL

Specifications

Product	Lentiselect 40	Lentiselect 500	Lentiselect 1000
Sample size	40 mL cell culture	500 mL of cell culture	1,000 mL of cell culture
Number of purifications	4 × 40 mL	1 × 500 mL	1 × 1,000 mL
Virus particles (VP) per mL	Typically up to 3×10^9	Typically up to $2 - 5 \times 10^9$	Typically up to $4 - 6 \times 10^{13}$
VP/IU	5 to 15	5 to 15	20 to 50
Processing time	Typically up to 45 min	Typically up to 3 hours	Typically up to 6 hours
Endotoxin level	<0.025 EU/mL	<0.025 EU/mL	<0.025 EU/mL

Ordering Information

Vivapure® Lentiselect 40

Vivapure® Lentiselect 40

VS-LVPQ040

Vivapure® Lentiselect 500

Vivapure® Lentiselect 500

VS-LVPQ500

Vivapure® Lentiselect 1000

Vivapure® Lentiselect 1000

VS-LVPQ1000





60
50 ml
40
30
20
10

SARTOBIND® S15 Lot no. 8150

SCHOTT
DURAN

SARTOBIND
Sartopure® Adenopack
Loading buffer
Lot: B151205 Vol: 25ml

SARTOBIND
Sartopure® Adenopack
Washing buffer
Lot: B160301 Vol: 25ml



Filtration Devices

Table of Contents

Introduction	66
Minisart® Standard Selection Guide	67
Minisart® PP Standard Syringe Filter	68
Minisart® NML Standard Syringe Filter	74
Chemical Compatibility	80
Claristep® Syringeless Filtration	83
Sartolab® P20 Pressure Filter Units	88
Sartolab® RF 50	90
Sartolab® RF BT	92
Sartolab® Multistation	96
Sartoclear Dynamics® Lab P15	98
Sartoclear Dynamics® Lab V	100

Introduction

Syringe filters are used for many routine preparation steps in laboratories all over the world. They are convenient, ready-to-use disposables for sterile filtration of liquids and removal of particles from solutions and gases. Depending on the reagents filtered, syringe filters have to fulfill certain requirements to best serve customer's application. Sartorius offers Minisart® syringe filters and filters optimized for a wide range of relatively large volumes. The filters are reliably remove particles with no leakage. If you need to rely on the quality of your filtrate – whether it needs to be sterile prior to use or particulate-free before analysis – field-proven, high-quality Sartorius filter syringes are the No. 1 choice for reliable, convenient preparation steps.

Our Product Range

For clarification and sterilization of liquids, filtration is the optimal method. It removes microorganisms and particles reliably, without any effects on the ingredients due to adsorption or decomposition. For optimal results, Minisart® NML and High Flow Standard syringe filters with an MBS housing provide a choice of membranes with pore sizes ranging from 0.1 µm to 5 µm for high flow rates and the low adsorption characteristics. The effective filtration area of 6.2 cm² for the fast filtration is the largest among premium syringe filters available, and the MBS housing is color-coded for easy pore size identification. For a list of the types offered, please see page 74.

Elimination of particles from your samples prior to HPLC or other chromatographic analysis is essential in order to maintain the integrity of your chromatography column and to maximize its operating lifetime. Minisart® PP Standard syringe filters optimized for sample preparation consist of a polypropylene housing and membrane components featuring maximum chemical compatibility and minimum extractables to ensure excellent results. Due to the typical range of volumes from less than 1 mL to 100 mL, these filters are available in three different diameters with an effective filtration area of 0.07 cm², 1.7 cm² and 4.8 cm². For a selection guide, please see page 67.

The Sartorius medical device CE-Minisart® syringe filter with a hydrophilic (surfactant-free) cellulose acetate and hydrophobic polytetrafluoroethylene (PTFE) are the perfect choice for pharmacy admixture applications like sterile filtration and/or clarification of low volume solutions in a laboratory environment before use for patient care. The Medical Minisart® syringe filters are manufactured by Sartorius in a facility whose Quality Management System is certified for compliance with EN ISO 13485 (see page 80).

Minisart® Standard Syringe Filters are intended for general laboratory use and not for use in medical applications

Sartorius has developed a new, easy-to-use and straightforward filtration setup. The manually operated Claristep® Filtration System consisting of a station and filter units offers a novel way for clarifying your samples prior to analysis.

Claristep® Filter units are processed without syringe and are made of the purest materials. Another major benefit is that the contact time of the samples with the filters and the caps is extremely short, ensuring optimal, contamination-free results. The Claristep® Station consists of a base, a lid and an exchangeable tray for easy and accurate positioning of sample vials and Claristep® Filter units.

Claristep® syringeless filter units with RC membranes are optimized for solvents and aqueous solutions. They provide maximum chemical compatibility and exceptionally low non-specific binding of analytes.

Sartolab® filtration devices with 0.1 µm, 0.22 µm and 0.45 µm PES membranes for convenient filtration of 50 mL up to 1 L are ready to use and sterile. Sartolab® RF is a complete system that includes a receiver flask. Sartolab® BT is a bottle top filter without a receiver flask. This enables customers to use a receiver bottle of their choice and to even expand filtration capacity, depending on the particle load of the filtered liquid by filling more than one receiver flask.

Sartolab® P20 pressure filtration devices are intended for general laboratory use. They are available with a 0.2 µm and 0.45 µm PES membrane, with or without a prefilter, depending on your needs. Sartolab® P20 is designed for up to 10 L volumes and can also be used in-line. The polycarbonate housing and membrane components are ideal for filtering liquids. The versions with a prefilter are ideal for filtering environmental samples that have a high particle load prior to analyzing such samples.

Typical Applications for Filtration Devices

- Sterile filtration of liquids and gases with virtually no effect on the ingredients
- Particle removal from liquids and gases prior to downstream processes
- Venting of vials, bottles, containers, bags and bioreactors and fermenters
- Removal of precipitates and coagulates from solutions prior to use

Minisart® Standard Selection Guide

Please refer to Minisart® RC, NY, PES- or SRP for the highest chemical compatibility on page 71.

Please refer to Minisart® NML, HY or Minisart® High Flow on page 74.

Sample Composition	Aqueous		Aqueous Solvents		
	▼	▼	▼	▼	▼
	All Aqueous Solutions Buffers, Protein Analysis	All Aqueous Solutions Tissue Culture Media	Aqueous Solvent Mixtures Solvents	Solvent Mixtures Solvents	Solvents Gases Acids Bases
	▼	▼	▼	▼	▼
	CA Cellulose Acetate	PES Polyethersulfone	RC Regenerated Cellulose	NY Polyamide, Nylon	PTFE Polytetrafluoroethylene
Hydrophilic				Hydrophobic	

Pore Sizes	Sterilization		Sample Preparation Clarification Particle Removal					Prefiltration
	▼	▼	▼	▼	▼	▼	▼	▼
	Small Bacteria Mycoplasma Colloids >0.1 µm	UHPLC, etc. (Columns <3 µm Particles) Bacteria	HPLC, etc. (Columns >3 µm Particles) Particles	Particles Yeast Cells	Particles Yeast Cells	Particles Yeast Cells Platelets	Large Particles Cells	Glass Pre-Filter Glass + Membrane Highly Particle- laden Samples
	▼	▼	▼	▼	▼	▼	▼	▼
	0.1 µm	0.2 µm	0.45 µm	0.65 µm	0.8 µm	1.2 µm	5 µm	GF (Glass Fiber)

Sample Volume				
	▼	▼	▼	▼
	1 - 200 mL	1 - 100 mL	0.5 - 15 mL	0.05 - 1 mL
	▼	▼	▼	▼
	28 mm for up to 200 mL	25 mm for up to 100 mL	15 mm for up to 15 mL	4 mm for up to 1 mL

Minisart® PP Standard Syringe Filter Sample Preparation for Analytics

Reliable Removal of Particles from Liquids and Gases

Particle removal by filtration before analysis substantially increases the lifetime of your columns. Minisart® RC is optimized for aqueous liquids and solvents and is compatible with DMSO, other amides, ketones, esters and ethers. Minisart® NY is exceptionally pure compared with other common polyamide (=nylon) filters and competitor products. For this product raw materials are used which do not interfere with standard analytical methods.

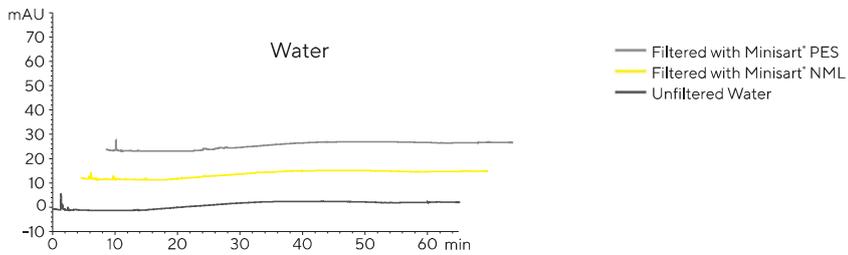
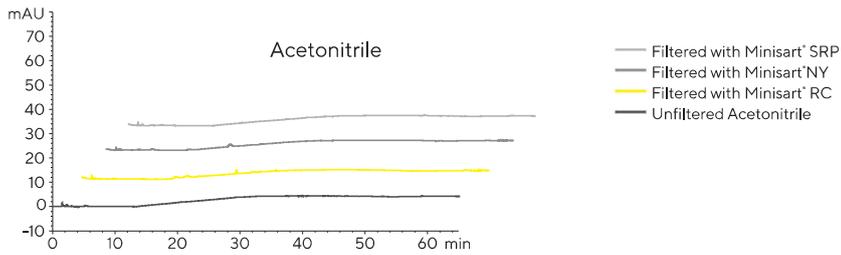
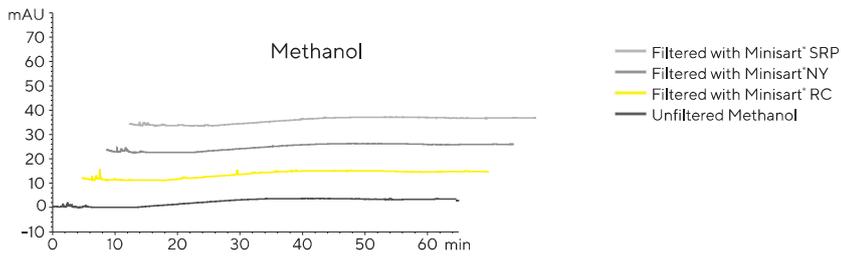
Our coating-free hydrophobic PTFE membrane used in Minisart® SRP is suitable for venting applications. The Minisart® PES- with hydrophobic polyethersulfone (PES) is suitable for venting or filtration of gases and air and can be sterilized by gamma irradiation.

Minisart® Features

- Low adsorption of analytes
- Maximum chemical compatibility
- Minimum extractables



HPLC Certification



HPLC Procedure

Column C18: 250 × 4.6 mm, Flow Rate: 1 mL/min, Wavelength: 220 nm

HPLC Injection Volume: 20 µL, Analysis Time: 65 min, Temperature: 40 °C,
Mobile Phases: A) Acetonitrile | B) Water, Gradient: Hold 60% A for 10 min,
60% to 95% A in 20 min, 95% to 100% A in 35 min

Minisart® with Polypropylene Housing

Specifications

Minisart® RC SRP NY PES- with 4 15 25 mm Ø Membrane Filtration Area	
Housing material	Polypropylene (PP)
Membranes	RC = Regenerated Cellulose NY = Polyamide SRP = Hydrophobic PTFE = Polytetrafluoroethylene PES = Polyethersulfone PES - = hydrophobic PES
Glass fiber prefilter	NY Plus: Ultrapure quartz, 0.7 µm particle retention
Max. operating pressure	RC SRP NY: 4.5 bar 65 psi PES - : 2.0 bar 29 psi (IN - OUT) or 0.5 bar 7.2 psi (OUT - IN)
Housing burst pressure	≥ 7 bar 102 psi
Max. temperature	60°C
Sterilization	Non-sterile Minisart® RC, SRP and NY can be can sterilized by autoclaving or by using ethylene oxide (EO). Non-sterile Minisart® PES- can be sterilized by ethylene oxide or gamma irradiation

Minisart® Membrane Types	RC 0.2 µm	RC 0.2 µm	RC 0.45 µm	SRP 0.2 µm	SRP 0.45 µm
Non-sterile packs: 50 (K), 200 (S), 500 (Q), 1000 (R) sterile packs: individually packaged, 50 (ACK)	K S Q R	ACK	K S Q R	K S Q ACK	K S Q
Bubble point (≥)	With water 3.0 bar 44 psi	With water 4.6 bar 67 psi	With water 2.0 bar 29 psi	With ethanol 1.1 bar 16 psi	With ethanol 0.9 bar 13 psi

Flow rate ((≥) mL/min), 4 mm Ø = 0.07 cm² filter area | Hold-up volume¹: ≤ 10 µL

■ For water at 1 bar	0.5	-	1.5	- ³	- ³
■ For methanol at 1 bar	1.5	-	3.0	2.0	4.5
■ For air at 0.1 bar	- ²	-	- ²	30	60

Flow rate ((≥) mL/min), 15 mm Ø = 1.7 cm² filter area | Hold-up volume¹: ≤ 100 µL

■ For water at 1 bar	20	10	40	- ³	- ³
■ For methanol at 1 bar	55	25	105	55	150
■ For air at 0.1 bar	- ²	- ²	- ²	800	1,600

Flow rate ((≥) mL/min), 25 mm Ø = 4.8 cm² filter area | Hold-up volume¹: ≤ 200 µL

■ For water at 1 bar	80	50	160	- ³	- ³
■ For methanol at 1 bar	160	90	325	60	260
■ For air at 0.1 bar	- ²	- ²	- ²	1,800	3,000

Water penetration point³ (≥)	-	-	-	4.0 bar 58 psi	3.0 bar 44 psi
Sterile filtration capability⁵ acc. to the bacteria challenge test	No	Yes	No	Yes	No

Non-pyrogenic according to the USP

Minisart® Membrane Types	NY 0.2 µm	NY 0.45 µm	NY Plus 0.2 µm	NY Plus 0.45 µm	PES 0.2 µm	PES -0.2 µm
Non-sterile packs: 50 (K), 200 (S), 500 (Q), 1000 (R) sterile packs: individual packaged, 50 (ACK)	K Q R ACK	K Q R ACK	K Q	K Q	K Q ACK	K Q
Bubble point (≥)	With water 3.0 bar 44 psi	With water 2.0 bar 29 psi	With water 3.0 bar 44 psi	With water 2.0 bar 29 psi	With water 3.2 bar 46 psi	With ethanol 0.95 bar 14 psi
Flow rate (≥) mL/min, 4 mm Ø = 0.07 cm² filter area Hold-up volume¹: ≤ 10 µL						
■ For water at 1 bar	-	-	-	-	1.5	-
■ For methanol at 1 bar	-	-	-	-	- ⁴	-
■ For air at 0.1 bar	-	-	-	-	- ²	-
Flow rate (≥) mL/min, 15 mm Ø = 1.7 cm² filter area Hold-up volume¹: ≤ 100 µL						
■ For water at 1 bar	20	40	-	-	40	-
■ For methanol at 1 bar	40	110	-	-	- ⁴	-
■ For air at 0.1 bar	- ²	- ²	-	-	- ²	-
Flow rate (≥) mL/min, 25 mm Ø = 4.8 cm² filter area Hold-up volume¹: ≤ 200 µL						
■ For water at 1 bar	50	100	50	100	100	-
■ For methanol at 1 bar	70	200	70	200	- ⁴	- ⁴
■ For air at 0.1 bar	- ²	1,200				
Water penetration point³ (≥)	-	-	-	-	-	2.0 bar 29 psi
Sterile filtration capability⁵ acc. to the bacteria challenge test	Yes	No	Yes	No	Yes	Yes
Non-pyrogenic according to the USP						

¹ Hold-up volume after air purge² Hydrophilic membranes can filter dry air or gas but become impermeable to air or gas when wetted!³ Hydrophobic membranes cannot be wetted with aqueous solutions unless you overcome their water penetration point or pre-wet them using an organic solvent (e.g. ethanol).⁴ PES is suitable for solutions only containing up to 30% MeOH.⁵ According to the bacterial challenge test (BCT) with $\geq 1 \times 10^7$ cfu/cm² *Brevundimonas diminuta*. Non-sterile RC Minisart® types are optimized for sample preparation and are not suitable for sterile filtration according to the bacteria challenge test. All other non-sterile Minisart® types with 0.2 µm pore size can be sterilized by autoclaving or EO before use for sterile filtration.⁶ For sterile packs ACK.

Minisart® Standard Syringe Filters are intended for general laboratory use and not for use in medical applications

Minisart® with Polypropylene Housing

Ordering Information

Minisart® RC (Regenerated Cellulose)								
Ø in mm EFA ¹	Membrane	Housing	Pore Size	Connector Outlet	Color Printing	Sterile*	Qty./Pkg.	Order No.
25mm	RC	PP	0.2 µm	Male Luer Slip	White, Printed	Yes	50	17764-----ACK
25mm	RC	PP	0.2 µm	Male Luer Slip	White, Printed	No	50	17764-----K
25mm	RC	PP	0.2 µm	Male Luer Slip	White, Printed	No	200	17764-----S
25mm	RC	PP	0.2 µm	Male Luer Slip	White, Printed	No	500	17764-----Q
25mm	RC	PP	0.45 µm	Male Luer Slip	White, Printed	No	50	17765-----K
25mm	RC	PP	0.45 µm	Male Luer Slip	White, Printed	No	200	17765-----S
25mm	RC	PP	0.45 µm	Male Luer Slip	White, Printed	No	500	17765-----Q
15mm	RC	PP	0.2 µm	Male Luer Slip	White, Printed	Yes	50	17761-----ACK
15mm	RC	PP	0.2 µm	Male Luer Slip	White, Printed	No	50	17761-----K
15mm	RC	PP	0.2 µm	Male Luer Slip	White, Printed	No	500	17761-----Q
15mm	RC	PP	0.45 µm	Male Luer Slip	White, Printed	No	50	17762-----K
15mm	RC	PP	0.45 µm	Male Luer Slip	White, Printed	No	500	17762-----Q
4mm	RC	PP	0.2 µm	Male Luer Slip	Blue Tray	No	50	17821-----K
4mm	RC	PP	0.2 µm	Male Luer Slip	Blue Tray	No	500	17821-----Q
4mm	RC	PP	0.45 µm	Male Luer Slip	Yellow Tray	No	50	17822-----K
4mm	RC	PP	0.45 µm	Male Luer Slip	Yellow Tray	No	500	17822-----Q

Minisart® SRP (Hydrophobic PTFE)								
25mm	PTFE	PP	0.2 µm	Male Luer Slip	White, Printed	Yes	50	S7575-----FXOSK
25mm	PTFE	PP	0.2 µm	Male Luer Slip	White, Printed	No	50	17575-----K
25mm	PTFE	PP	0.2 µm	Male Luer Slip	White, Printed	No	200	17575-----S
25mm	PTFE	PP	0.2 µm	Male Luer Slip	White, Printed	No	500	17575-----Q
25mm	PTFE	PP	0.2 µm	Hose Barb	White, Printed	No	500	1757A-----Q
25mm	PTFE	PP	0.45 µm	Male Luer Slip	White, Printed	No	50	17576-----K
25mm	PTFE	PP	0.45 µm	Male Luer Slip	White, Printed	No	200	17576-----S
25mm	PTFE	PP	0.45 µm	Male Luer Slip	White, Printed	No	500	17576-----Q
15mm	PTFE	PP	0.2 µm	Male Spike	White, Printed	No	50	17558-----K
15mm	PTFE	PP	0.2 µm	Male Spike	White, Printed	No	500	17558-----Q
15mm	PTFE	PP	0.2 µm	Male Luer Slip	White, Printed	Yes	50	17573-----ACK
15mm	PTFE	PP	0.2 µm	Male Luer Slip	White, Printed	No	50	17573-----K
15mm	PTFE	PP	0.2 µm	Male Luer Slip	White, Printed	No	500	17573-----Q
15mm	PTFE	PP	0.45 µm	Male Spike	White, Printed	No	50	17559-----K
15mm	PTFE	PP	0.45 µm	Male Spike	White, Printed	No	500	17559-----Q
15mm	PTFE	PP	0.45 µm	Male Luer Slip	White, Printed	No	50	17574-----K
15mm	PTFE	PP	0.45 µm	Male Luer Slip	White, Printed	No	500	17574-----Q
4mm	PTFE	PP	0.2 µm	Male Luer Slip	Blue Tray	No	500	17844-----Q
4mm	PTFE	PP	0.45 µm	Male Luer Slip	Yellow Tray	No	50	17820-----K
4mm	PTFE	PP	0.45 µm	Male Luer Slip	Yellow Tray	No	500	17820-----Q

Minisart® NY (Nylon) and NY25 Plus (Glass Fiber 0.7 µm² + Nylon)

Ø in mm EFA ¹	Membrane	Housing	Pore Size	Connector Outlet	Color Printing	Sterile*	Qty./Pkg.	Order No.
25 mm	Nylon	PP	0.2 µm	Male Luer Slip	White, Printed	Yes	50	17845-----ACK
25 mm	Nylon	PP	0.2 µm	Male Luer Slip	White, Printed	No	500	17845-----Q
25 mm	Nylon	PP	0.45 µm	Male Luer Slip	White, Printed	Yes	50	17846-----ACK
25 mm	Nylon	PP	0.45 µm	Male Luer Slip	White, Printed	No	500	17846-----Q
15 mm	Nylon	PP	0.2 µm	Male Luer Slip	White, Printed	No	50	1776B-----K
15 mm	Nylon	PP	0.2 µm	Male Luer Slip	White, Printed	No	500	1776B-----Q
15 mm	Nylon	PP	0.45 µm	Male Luer Slip	White, Printed	No	50	1776C-----K
15 mm	Nylon	PP	0.45 µm	Male Luer Slip	White, Printed	No	500	1776C-----Q
25 mm	GF+Nylon	PP	0.2 µm	Male Luer Slip	White, Printed	No	50	1784B-----K
25 mm	GF+Nylon	PP	0.2 µm	Male Luer Slip	White, Printed	No	500	1784B-----Q
25 mm	GF+Nylon	PP	0.45 µm	Male Luer Slip	White, Printed	No	50	1784C-----K
25 mm	GF+Nylon	PP	0.45 µm	Male Luer Slip	White, Printed	No	500	1784C-----Q

Minisart® PES (Polyethersulfone) Aqueous Filtration

15 mm	PES	PP	0.22 µm	Male Luer Slip	White	Yes	50	1776D-----ACK
15 mm	PES	PP	0.22 µm	Male Luer Slip	White	No	500	1776D-----Q

Minisart® PES- (Hydrophobic PES) Venting & Gas Filtration, Gamma Stable

25 mm	PES	PP	0.2 µm	Male Luer Slip	White, Printed	No	50	1757H-----K
25 mm	PES	PP	0.2 µm	Male Luer Slip	White, Printed	No	500	1757H-----Q
25 mm	PES	PP	0.2 µm	Hose Barbs ³	White, Printed	No	50	1757G-----K
25 mm	PES	PP	0.2 µm	Hose Barbs ³	White, Printed	No	500	1757G-----Q

* Sterile Minisart® syringe filters are individually packaged. If not stated otherwise, Minisart® units have been sterilized by ethylene oxide.

Non-sterilized Minisart® units: RC, PTFE and nylon can be sterilized by autoclaving at 121 °C for 30 min. or by using ethylene oxide (EO).

¹ Diameter of EFA – Effective Filtration Area

² 0.7 µm = GF particle retention ≠ pore size!

³ Hose barbs, inlet and outlet, stepped 4.4–6 mm diameter

Minisart® Standard Syringe Filters are intended for general laboratory use and not for use in medical applications.

Minisart® NML Standard Syringe Filter Clarification and Sterilization by Filtration

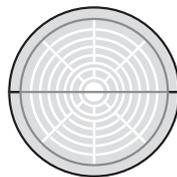
Filtration is the Optimal Method for Clarification and Sterilization of Liquids and Gases

Sterilization by filtration is the fastest method for removal of bacterial cells from liquids, while minimizing the effects on ingredients. Minisart® NML with (surfactant-free) cellulose acetate (SF)CA is the best choice for all aqueous solutions with a pH of 4 to 8. It combines fast flow rates and is available in many different pore sizes – also for the removal of larger particles. Minisart® High Flow with polyethersulfone (PES) is optimal for delivering the highest flow rates and for a broad pH compatibility range from 1 to 13. Due to the asymmetric membrane structure, the PES surface almost behaves like a prefilter.

Both Minisart® types – NML and High Flow – are available pre-sterilized by ethylene oxide (EO) or gamma irradiation. Hydrophobic PTFE filters like Minisart® HY are suitable for venting purposes and are additionally available in special formats with activated carbon.

Minisart® Features

- Largest effective filtration area (EFA) of 6.2 cm²
- Low adsorption
- High flow rate
- High total throughput
- Low hold-up volume
- Gamma-irradiated or EO-sterilized



28 mm EFA
33 mm housing diameter
(for NML and High Flow)



Minisart® High Flow with PES



Minisart® NML with (SF)CA



Minisart® HY with PTFE



Minisart® Membrane Types	GF+SFCA 0.2 µm	GF+SFCA 0.45 µm	GF+CA 1.2 µm	GF 0.7 µm	PTFE 0.2 µm	PTFE 1.0 µm	Acticosart	PTFE (Air) 0.2 µm
Non-sterile packages: 500 (Q, HYQ), 1000 (R), sterile packs: individually packaged, 50 (K, GUK, HYK, HNK)	K Q	K Q	Q	K Q	K Q	HYQ	Q	Q HNK
Bubble point (≥)	With water 3.2 bar 46 psi	With water 2.0 bar 29 psi	With water 0.7 bar 10 psi	With water 0.5 bar 7 psi	With ethanol 1.1 bar 20 psi	With ethanol 0.5 bar 7 psi	With ethanol 0.9 bar 13 psi	With ethanol 1.0 bar 14 psi
Flow rate for ²¹3 (≥ mL/min)								
28 mm Ø for water at 1 bar	60	160	350	450	-	-	-	-
15 mm Ø for air at 0.1 bar	-	-	-	-	-	-	-	800
26 mm Ø for air at 0.1 bar	-	-	-	-	2,000	4,000	2,300	-
Water penetration point³ (≥)	-	-	-	-	4.0 bar 58 psi	1.5 bar 22 psi	N.a.	3.2 bar 44 psi
Sterile filtration capability⁴ according to the bacteria challenge test	Yes	No	No	No	Yes	No	N.a.	Yes
Non-pyrogenic according to the USP					Yes ⁵			

¹ Hold-up volume after air purge

² Hydrophilic membranes can filter dry air or gas but become impermeable to air or gas when wetted!

³ Hydrophobic membranes cannot be wetted with aqueous solutions unless you overcome their water penetration point.

⁴ According to bacterial challenge test (BCT) with 1×10^7 cfu/cm² *Brevundimonas diminuta*. All non-sterile Minisart® types listed above can be sterilized according to the method recommended in this table.

⁵ For sterile packs K | GUK

*Minisart® Air can be sterilized by Gamma irradiation according to the following parameters: Range 25 – 40 kGy (validated with 50 kGy).

Minisart® Standard Syringe Filters are intended for general laboratory use and not for use in medical applications

Preparation of Aqueous Liquids

Ordering Information

Minisart® High Flow (PES – Polyethersulfone)

Ø in mm EFA ¹	Membrane	Housing	Pore Size	Connector Outlet	Color Printing	Sterile*	Qty./Pkg.	Order No.
28 mm	PES	MBS	0.1 µm	Male Luer Lock	Dark Red	Yes	50	16553-----K
28 mm	PES	MBS	0.22 µm	Male Luer Lock	Royal Blue	Yes#	50	16532-----GUK
28 mm	PES	MBS	0.22 µm	Male Luer Lock	Royal Blue	Yes	50	16532-----K
28 mm	PES	MBS	0.22 µm	Male Luer Slip	Royal Blue	Yes	50	16541-----K
28 mm	PES	MBS	0.22 µm	Male Luer Lock	Royal Blue	No	500	16532-----Q
28 mm	PES	MBS	0.22 µm	Male Luer Slip	Royal Blue	No	500	16541-----Q
28 mm	PES	MBS	0.45 µm	Male Luer Lock	Amber	Yes	50	16537-----K
28 mm	PES	MBS	0.45 µm	Male Luer Lock	Amber	No	500	16537-----Q
28 mm	PES	MBS	0.45 µm	Male Luer Slip	Amber	Yes#	50	16533-----GUK
28 mm	PES	MBS	0.45 µm	Male Luer Slip	Amber	Yes	50	16533-----K
28 mm	PES	MBS	0.45 µm	Male Luer Slip	Amber	No	500	16533-----Q

Minisart® NML ((SF)CA – (Surfactant-free) Cellulose Acetate)

28 mm	SFCA	MBS	0.2 µm	Male Luer Lock	Blue	Yes	50	S6534-----FMOSK
28 mm	SFCA	MBS	0.2 µm	Male Luer Lock	Blue	Yes#	50	S6534-----FMGUK
28 mm	SFCA	MBS	0.2 µm	Male Luer Lock	Blue	No	500	S6534-----FM--Q
28 mm	SFCA	MBS	0.2 µm	Male Luer Slip	Blue	Yes	50	S7597-----FXOSK
28 mm	SFCA	MBS	0.2 µm	Male Luer Slip	Blue	No	500	S7597-----FX--Q
28 mm	SFCA	MBS	0.45 µm	Male Luer Lock	Yellow	Yes	50	S6555-----FMOSK
28 mm	SFCA	MBS	0.45 µm	Male Luer Lock	Yellow	Yes#	50	S6555-----FMGUK
28 mm	SFCA	MBS	0.45 µm	Male Luer Lock	Yellow	No	500	S6555-----FM--Q
28 mm	SFCA	MBS	0.45 µm	Male Luer Slip	Yellow	Yes	50	S7598-----FXOSK
28 mm	SFCA	MBS	0.45 µm	Male Luer Slip	Yellow	No	500	S7598-----FX--Q
28 mm	CA	MBS	0.65 µm	Male Luer Slip	Pink	Yes	50	16569-----K
28 mm	CA	MBS	0.8 µm	Male Luer Lock	Green	Yes	50	16592-----K
28 mm	CA	MBS	0.8 µm	Male Luer Lock	Green	Yes#	50	16592-----GUK
28 mm	CA	MBS	0.8 µm	Male Luer Lock	Green	No	500	16592-----Q
28 mm	CA	MBS	1.2 µm	Male Luer Lock	Red	Yes	50	17593-----K
28 mm	CA	MBS	1.2 µm	Male Luer Lock	Red	No	500	17593-----Q
28 mm	CA	MBS	5 µm	Male Luer Lock	Brown	Yes	50	S7594-----FMOSK
28 mm	CA	MBS	5 µm	Male Luer Lock	Brown	No	500	17594-----Q

Minisart® NML Plus (Glass Fiber 0.7 µm²) + (SF)CA

Ø in mm EFA ¹	Membrane	Housing	Pore Size	Connector Outlet	Color Printing	Sterile*	Qty./Pkg.	Order No.
28 mm	GF+SFCA	MBS	0.2 µm	Male Luer Lock	Blue	Yes	50	17823-----K
28 mm	GF+SFCA	MBS	0.2 µm	Male Luer Lock	Blue	No	500	17823-----Q
28 mm	GF+SFCA	MBS	0.45 µm	Male Luer Lock	Yellow	Yes	50	17829-----K
28 mm	GF+SFCA	MBS	0.45 µm	Male Luer Lock	Yellow	No	500	17829-----Q
28 mm	GF+CA	MBS	1.2 µm	Male Luer Lock	Red	No	500	17825-----Q
28 mm	GF	MBS	0.7 µm ²	Male Luer Lock	White	No	50	17824-----K
28 mm	GF	MBS	0.7 µm ²	Male Luer Lock	White	No	500	17824-----Q

Minisart® HY (hydrophobic PTFE)

26 mm	PTFE	MBS	0.2 µm	Male Luer Lock	Clear	Yes	50	S6596-----FMOSK
26 mm	PTFE	MBS	1 µm	Male Luer Lock	Clear	No	50	1659A-----HYQ
26 mm	PTFE	MBS	0.2 µm	Male Luer Lock	Clear	No	500	S6596-----FM--Q

Minisart® High Flow (PES – Polyethersulfone)

28 mm	PES	MBS	0.1 µm	Male Luer Lock	Dark Red	Yes	50	16553-----K
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Minisart® Air (Hydrophobic PTFE)

15 mm	PTFE	MBS	0.2 µm	Male Luer Slip	Yellow	No	500	1751A-----Q
15 mm	PTFE	MBS	0.2 µm	Male Luer Slip + Needle	Yellow	Yes [#]	50	16596-----HNK

Minisart® Acticosart with Dome Reservoir + Hydrophobic PTFE

26 mm	Active carbon	MBS	0.45 µm	Male Luer Slip	Blue	No	500	17840-----Q
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* Sterilized Minisart® units are individually packaged. If not stated otherwise, Minisart® are sterilized by ethylene oxide.

[#]-mark indicates sterilization by gamma irradiation.

Non-sterilized Minisart® units: High Flow, NML, NML Plus and HY can be sterilized by ethylene oxide; High Flow, NML and NML Plus can also be sterilized by gamma irradiation

¹ Diameter of EFA – Effective Filtration Area

² 0.7 µm = GF particle retention ≠ pore size!

Minisart® Standard Syringe Filters are intended for general laboratory use and not for use in medical applications



Chemical Compatibility

	Material								Minisart® Types									
	PES membrane	SFCA membrane	PTFE membrane	RC membrane	Nylon membrane	GF depth filter	Housing MBS	Housing PP	Minisart® HighFlow	Minisart® NML Ophthalsart	Minisart® NML Plus	Minisart® NML GF	Minisart® HY Minisart® Air	Minisart® RC	Minisart® NY	Minisart® NY Plus	Minisart® SRP	Minisart® PES
Filter Membrane	PES	(SF)CA	PTFE	RC	PA				PES	(SF)CA	(SF)CA		PTFE	RC	PA	PA	PTFE	PES
Pre-Filter						GF			-	-	GF	GF	-	-	-	GF	-	-
Housing Material							MBS	PP	MBS	MBS	MBS	MBS	MBS	PP	PP	PP	PP	PP
Sterilization																		
Ethylene oxide	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
Gamma irradiation	++	++	- ¹	++	-	++	++	-	++	++	++	++	- ¹	-	-	-	-	-
Autoclaving 121°C, 30 min	++	++	++	++	++	++	-	++	-	-	-	-	-	++	++	++	++	++
Solvents																		
Acetone	-	-	++	++	++	++	-	++	-	-	-	-	-	++	++	++	++	-
Acetonitrile	-	-	++	++	++	++	-	++	-	-	-	-	-	++	++	++	++	-
Benzene	+	+	-	++	++	++	-	++	-	-	-	-	-	++	++	++	-	+
Benzyl alcohol	+	+	++	++	++	++	-	+	-	-	-	-	-	++	++	++	++	+
n-Butyl acetate	-	-	++	++	++	++	-	++	-	-	-	-	-	++	++	++	++	-
n-Butanol	++	++	++	++	++	++	+	++	+	+	+	+	+	++	++	++	++	++
Cellosolve	+	-	++	++	++	++	-	++	-	-	-	-	-	++	++	++	++	+
Chloroform	-	-	++	++	++	++	-	++	-	-	-	-	-	++	++	++	++	-
Cyclohexane	-	-	++	++	++	++	+	+	-	-	-	-	+	+	+	+	+	-
Cyclohexanone	-	-	++	++	++	++	-	+	-	-	-	-	-	+	+	+	+	-
Diethylacetamide	-	-	-	++	++	++	-	++	-	-	-	-	-	++	++	++	-	-
Diethyl ether	-	+	-	++	++	++	-	++	-	-	-	-	-	++	++	++	-	-
Dimethyl formamide	-	-	++	+	+	++	-	++	-	-	-	-	-	+	+	+	++	-
Dimethylsulfoxide	-	-	++	++	++	++	-	++	-	-	-	-	-	++	++	++	++	-
Dioxane	-	-	++	++	++	++	-	++	-	-	-	-	-	++	++	++	++	-
Ethanol, 98%	++	++	++	++	++	++	-	++	-	-	-	-	-	++	++	++	++	++
Ethyl acetate	-	-	++	++	++	++	-	+	-	-	-	-	-	+	+	+	+	-
Ethylene glycol	++	+	++	++	++	++	+	++	+	+	+	+	+	++	++	++	++	++
Formamide	++	-	+	+	++	++	++	++	++	-	-	-	+	+	++	++	++	++
Glycerin	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
n-Heptane	+	+	+	++	++	++	++	+	+	+	+	+	+	+	+	+	+	+
n-Hexane	+	+	+	++	++	++	++	+	+	+	+	+	+	+	+	+	-	+
Isobutanol	++	+	++	++	++	++	-	++	-	-	-	-	-	++	++	++	++	++
Isopropanol	++	++	++	++	++	++	-	++	-	-	-	-	-	++	++	++	++	++
Isopropyl acetate	-	-	++	++	++	++	-	++	-	-	-	-	-	++	++	++	++	-
Methanol, 98%	+	-	++	++	++	++	-	++	-	-	-	-	-	++	++	++	++	+
Methyl acetate	-	-	++	++	++	++	-	+	-	-	-	-	-	+	+	+	+	-
Methylene chloride	-	-	-	++	++	++	-	++	-	-	-	-	-	++	++	++	-	-
Methyl ethyl ketone	-	+	++	++	++	++	-	+	-	-	-	-	-	+	+	+	+	-
Methyl isobutyl ketone	-	-	++	++	++	++	-	+	-	-	-	-	-	+	+	+	+	-
Monochlorobenzene	+	+	-	++	++	++	-	+	-	-	-	-	-	+	+	+	-	+
Nitrobenzene	-	-	++	++	+	++	-	+	-	-	-	-	-	+	+	+	+	-
n-Pentane	++	++	-	++	++	++	+	+	+	+	+	+	+	+	+	+	-	+
Perchloroethylene	-	-	-	++	++	++	-	+	-	-	-	-	-	+	+	+	-	-
Petroleum ether	+	++	-	++	++	++	+	++	+	+	+	+	-	++	++	++	-	+

	Material								Minisart® Types										
	PES membrane	SFCA membrane	PTFE membrane	RC membrane	Nylon membrane	GF depth filter	Housing MBS	Housing PP	Minisart® HighFlow	Minisart® NML Ophthalbart	Minisart® NML Plus	Minisart® NML GF	Minisart® HY	Minisart® Air	Minisart® RC	Minisart® NY	Minisart® NY Plus	Minisart® SRP	Minisart® PES
Filter Membrane	PES	(SF)CA	PTFE	RC	PA				PES	(SF)CA	(SF)CA		PTFE	RC	PA	PA	PTFE	PES	
Prefilter						GF			-	-	GF	GF	-	-	-	GF	-	-	
Housing Material							MBS	PP	MBS	MBS	MBS	MBS	MBS	PP	PP	PP	PP	PP	
Solvents (continued)																			
Pyridine	-	-	++	++	++	++	-	++	-	-	-	-	-	++	++	++	++	-	
Tetrahydrofuran	-	-	-	++	++	++	-	++	-	-	-	-	-	++	++	++	-	-	
Toluene	-	+	-	++	++	++	-	+	-	-	-	-	-	+	+	+	-	-	
Trichloroethylene	-	+	++	++	++	++	-	+	-	-	-	-	-	+	+	+	+	-	
Xylene	-	+	-	++	++	++	-	+	-	-	-	-	-	+	+	+	-	-	
Acids																			
Acetic acid, 25%	+	+	++	++	-	++	+	++	+	+	+	+	+	++	-	-	++	+	
Acetic acid, 80%	-	-	++	+	-	++	-	+	-	-	-	-	-	+	-	-	+	-	
Hydrofluoric acid, 50%	+	-	++	+	-	++	-	+	-	-	-	-	-	+	-	-	+	+	
Perchloric acid, 25%	-	-	++	-	-	++	-	+	-	-	-	-	-	-	-	-	+	-	
Phosphoric acid, up to 10%	+	+	++	-	-	++	+	+	+	+	+	+	+	-	-	-	+	+	
Phosphoric acid, 86%	+	+	++	-	-	++	-	+	-	-	-	-	-	-	-	-	+	+	
Nitric acid, 30%	+	-	++	-	-	++	+	+	+	-	-	-	+	-	-	-	+	+	
Nitric acid, conc.	-	-	++	-	-	++	-	-	-	-	-	-	-	-	-	-	-	-	
Hydrochloric acid, 20%	++	-	++	-	-	++	+	+	+	-	-	-	+	-	-	-	+	+	
Sulfuric acid, 25%	+	-	++	+	-	++	++	++	+	-	-	-	++	+	-	-	++	+	
Sulfuric acid, 98%	-	-	++	-	-	++	-	-	-	-	-	-	-	-	-	-	-	-	
Trichloroacetic acid, 25%	-	-	++	++	-	++	-	+	-	-	-	-	-	+	-	-	+	-	
Bases																			
Ammonia, 1N	++	+	++	+	++	++	+	++	+	+	+	+	+	+	++	++	++	++	
Ammonium hydroxide, 25%	+	+	++	+	++	+	-	+	-	-	-	-	-	+	+	+	+	+	
Potassium hydroxide, 32%	++	-	++	-	+	+	-	++	-	-	-	-	-	-	+	+	++	++	
Sodium hydroxide, 1N	++	-	-	+	++	+	-	++	-	-	-	-	+	++	+	-	++	++	
Sodium hydroxide, 32%	++	-	-	-	+	-	-	+	-	-	-	-	-	+	-	-	-	+	
Aqueous solutions																			
Formaldehyde, 30%	+	++	++	+	++	++	+	+	+	+	+	+	+	+	+	+	+	+	
Sodium hypochlorite, 5%	++	-	++	-	-	++	+	+	+	-	-	-	+	-	-	-	+	+	
Hydrogen peroxide, 35%	++	-	++	-	-	++	+	++	+	-	-	-	+	+	-	-	++	++	
pH range																			
pH 1 to 14	-	-	++	-	-	++	-	++											
pH 1 to 13	++	-	++	-	-	++	-	++											
pH 3 to 14	+	-	++	+	++	++	-	++											
pH 3 to 12	++	-	++	++	++	++	+	++											
pH 4 to 8	++	++	++	++	++	++	++	++											

The chemical compatibility guide could be confirmed either by a literature review or by laboratory tests. Please consider that compatibilities can be influenced by various factors. Therefore, we recommend that you confirm compatibility with the liquid you want to filter by performing a trial filtration run before you start your actual filtration.

Legend

- ++ High compatibility
- + Limited compatibility
- Not compatible
- ¹ Gamma irradiation feasible for Minisart® Air



Claristep® Filtration System



The Claristep® Station consists of a base, a lid and an exchangeable tray for easy and accurate positioning of sample vials and Claristep® Filter units.

The patent-pending design features unique grooves in the station's lid and matching guide ridges on Claristep® Filter units to enable intuitively correct alignment and convenient handling of the system.

The Power of Simplicity

Preparing samples by clarification is an essential step prior to nearly all analytical techniques, such as high pressure liquid chromatography (HPLC). This filtration step to eliminate particles is crucial for maintaining the integrity of chromatography columns and for maximizing their operating life time.

In addition, as the sensitivity of automated analytical instruments continues to improve, they increasingly require less volume to operate in order to maximize throughput. Therefore, fast clarification of small volumes that does not add leachables or extractables to the original sample is indispensable for achieving the best analytical results.

To meet these requirements, Sartorius has developed a new, easy-to-use and straightforward filtration setup. The manually operated Claristep® Filtration System consisting of a station and filter units offers a novel way for clarifying your samples prior to analysis.

- Up to 8 samples are processed simultaneously
- No syringe required
- No need for a vacuum source or a power supply
- For low sample volumes ranging from 60 µL to 600 µL
- Hold-up volume < 30 µL



The grooves automatically guide the filter unit caps into the correct positions for simultaneous and accurate cap closure.



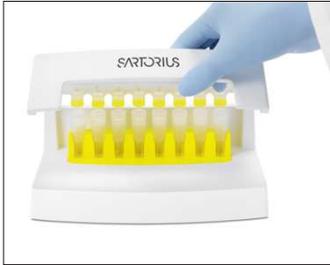
Claristep® Filter units are made of the purest materials. Another major benefit is that the contact time of the samples with the filters and the caps is extremely short, ensuring optimal, contamination-free results. Filtered liquids are collected in any 12 × 32 mm outer diameter vials of your choice based on the analytical method to be performed.

Sample Preparation for Analytics

Use the Most Ergonomic Clarification Solution

Filter 8 samples simultaneously – without needing any power supply or a vacuum | pressure source.

Simply place the filters on your vials, gently close the station and press on the station lid to filter – that's it!



1. Close the station lid. The grooves align the caps automatically, securely sealing every single Claristep® Filter unit for the most convenient processing.



2. Apply slight uniform pressure with your hand to start sample clarification. You will feel a certain resistance while liquid is pressed through each membrane.



3. Press down on the station lid so that the left and right corners touch the base plate. Hold the lid in place for 3 seconds to ensure all sample liquid is filtered through.



Claristep® Filter units press liquid through each membrane by an air pocket that forms over each filter unit when the station lid is closed. This air pocket is released when you stop holding down the lid – you will feel it in your fingertips!



Before clarification, the samples are pipetted in the filter reservoir.



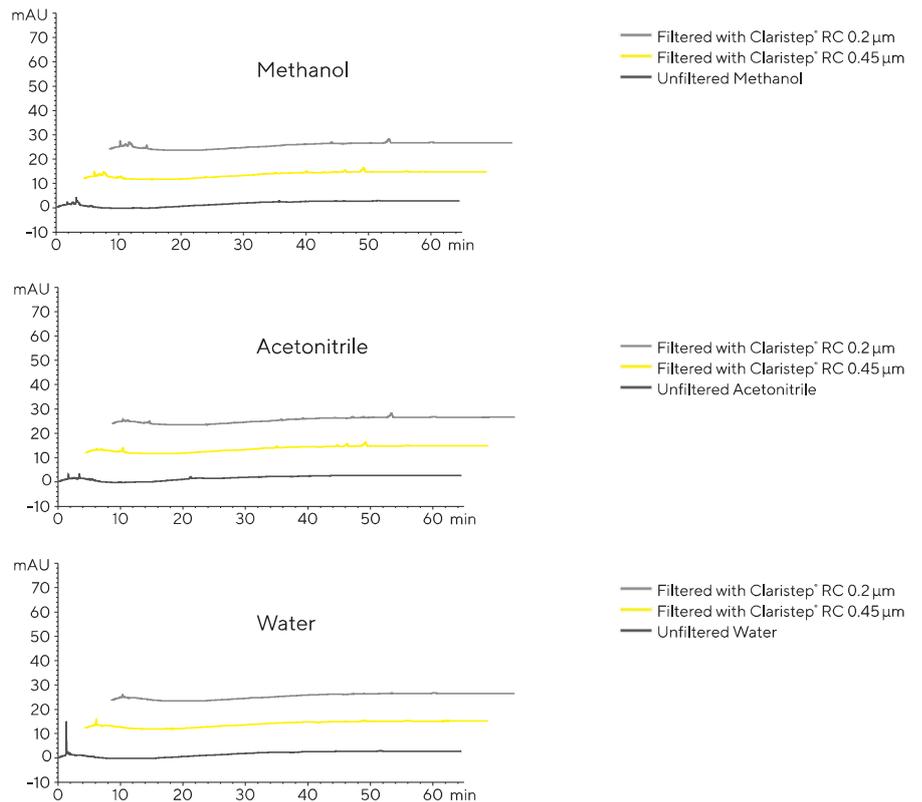
After clarification, the filtrates are collected in sample vials.

Reliable Removal of Particles

Filter Samples Without Adding Extractables and Leachables

Claristep® Filter units with RC membranes are optimized for solvents and aqueous solutions. They provide maximum chemical compatibility and exceptionally low non-specific binding of analytes.

HPLC Certification



HPLC Procedure

Column: C18: 5 µm × 250 mm × 4.0 mm, Flow Rate: 1 mL/min, Wavelength: 220 nm
Injection Volume: 20 µL, Analysis Time: 65 min, Temperature: 40 °C,
Mobile Phases: A) Acetonitrile | B) Water, Gradient: Hold 60% A for 10 min, 60% to 100% A in 20 min, 100% A for 30 min

Sample Preparation Techniques

Choose the Best Solution for Your Needs

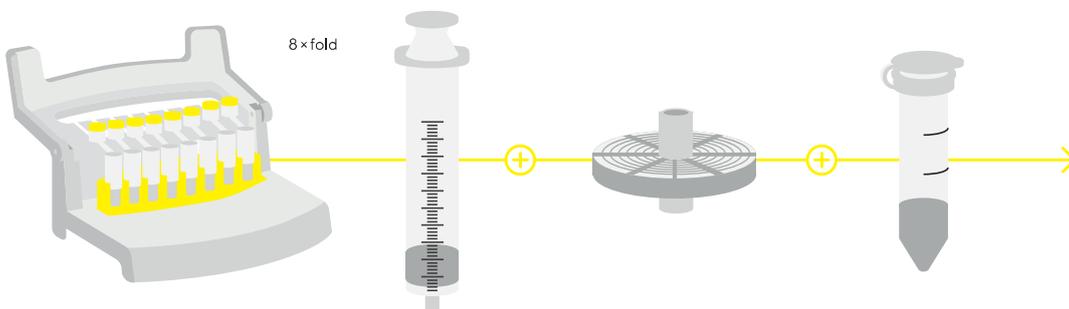
Do you process dozens of samples each day? A syringeless solution will help you reduce time, effort and waste – and minimize hand stress. If you need to analyze only a few samples a day, you will benefit from our proven combination of a syringe and syringe filter. The choice is all yours!

Claristep®
Filtration System

or

Syringe Filters

for processing one sample at a time



Analytical Sample Volumes Run Small

Get the Particle-free Volume You Really Need

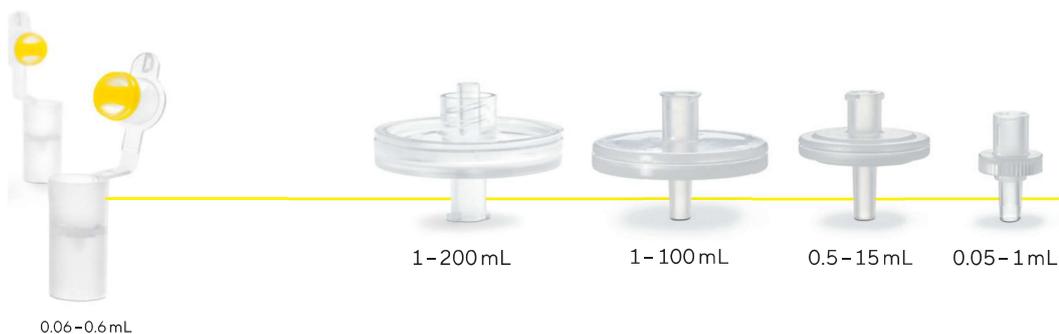
If you need to fill only 12 × 32 mm vials, a syringeless solution will help you save time and reduce sample loss!

Syringeless Solution

or

Different Diameters

for different sample volumes



Ordering Information



Claristep® Filters are available in a choice of two pore sizes

Claristep® Filters

Ø mm EFD1	Membrane	Housing	Pore Size	Sterile	Qty Pk	Order No.
9.7 mm	RC	PP	0.2 µm	No	96	17C07FT-96
9.7 mm	RC	PP	0.2 µm	No	480	17C07FT-480
9.7 mm	RC	PP	0.45 µm	No	96	17C06FT-96
9.7 mm	RC	PP	0.45 µm	No	480	17C06FT-480

¹ Effective Filtration Diameter
RC = Regenerated Cellulose

Claristep® System

Name	Qty./Pkg.	Prod. No.
Claristep® Station complete	1	17C-M8
Claristep® Single Tray	1	17C-S1



The Tray can be removed and exchanged



12 x 32 mm sample vials

Additional Components Needed

The free choice of 12 x 32 mm sample vials and lids is enabling you to choose the right vial for your particular sample and application, e.g. for light sensitive substances you can use brown glass. For small sample volumes you can use vessels with inlays. You can use glass or plastic, screw caps and | or slid lids – whatever you prefer.

Sartolab® P20 Pressure Filter Units

Compact Design for the Filtration of Large Volumes



Sartolab® P20 devices are ready-to-use pressure filter units intended for general laboratory use like the clarification and sterile filtration of media and aqueous solutions in batches from 100 mL to 10 L. Sartolab® P20 Plus with an incorporated prefilter is recommended for difficult-to-filter solutions like, for example, media that contains serum.

Membrane of Choice

Polyethersulfone (PES) is the membrane of choice for the Sartolab® P20 pressure filter units, as it combines very low protein binding properties with the highest flow rates. The Sartolab® P20 pressure filter unit is available either with 0.2 µm or 0.45 µm PES membranes, with or without a prefilter made of high purity quartz microfibers. An additional version containing glass microfibers only is also available for clarification purposes.

Compact Design

Sartolab® P20 pressure filter units have been designed to filter batches from 100 mL to 10 L, either using a syringe or in-line with a peristaltic pump, or a pressure vessel. Sartolab® P20 pressure filter units are available in different configurations, with or without PTFE automatic venting, with or without a filling bell (including cover) on the outlet and with a combination of different inlet and outlet connectors to meet the needs of most applications.

Benefits

- Highest flow rates with a large surface of filtration (20 cm²)
- Low dead volume due to an optimized membrane support
- Versions available with a prefilter for high particle load solutions

Specifications

Different Filter Materials	0.2 µm polyethersulfone 0.45 µm polyethersulfone High purity binder-free quartz microfibers High purity binder-free glass microfibers
Housing Material	Transparent polycarbonate
Filter Housing Diameter	61 mm
Filtration Area	20 cm ²
Holdup Volume	Sartolab® P20: 1 mL Sartolab® P20 Plus: 1.2 mL Sartolab® P20 Prefilter: 1 mL
Filtration Range	Sartolab® P20: 100 mL to 5 L Sartolab® P20 Plus: 100 mL to 10 L Sartolab® P20 Prefilter: 100 mL to 10 L
Recommended Max. Inlet Pressure	Sartolab® P20 and Sartolab® P20 Plus: 4 bar Sartolab® P20 Prefilter: 0.8 bar
pH Range	1–10
Housing Burst Pressure	≥ 5.0 bar
Autoclavable	121 °C

Ordering Information

Sartolab® P20

Order Number	Filter Material	Inlet	Outlet	PTFE Venting	Filling Bell	Sterilization (EO)	Qty./Pack
18075-----D	0.2 µm PES	Female Luer-Lock	Hose barb	no	no	yes	10
18075-----UPN	0.2 µm PES	Female Luer-Lock	Hose barb	no	no	no	100
18089-----D	0.2 µm PES	Hose barb	Hose barb	yes	yes	yes	10
18090-----D	0.2 µm PES	Female Luer-Lock	Male Luer-Lock	no	no	yes	10

Sartolab® P20 Plus

Order Number	Filter Material	Inlet	Outlet	PTFE Venting	Filling Bell	Sterilization (EO)	Qty./Pack
18068-----D	Quartz microfibers & 0.2 µm PES	Female Luer-Lock	Hose barb	yes	yes	yes	10
18076-----N	Quartz microfibers & 0.45 µm PES	Hose barb	Hose barb	no	no	no	100
18091-----D	Quartz microfibers & 0.2 µm PES	Hose barb	Hose barb	yes	yes	yes	10
18092-----D	Quartz microfibers & 0.2 µm PES	Female Luer-Lock	Male Luer-Lock	no	no	yes	10

Sartolab® P20 Prefilter

Order Number	Filter Material	Inlet	Outlet	PTFE Venting	Filling Bell	Sterilization (EO)	Qty./Pack
18072-----D	Glass microfibers	Female Luer-Lock	Hose barb	no	no	no	10

Sartolab® RF 50

Vacuum filtration unit for volumes of up to 50 mL



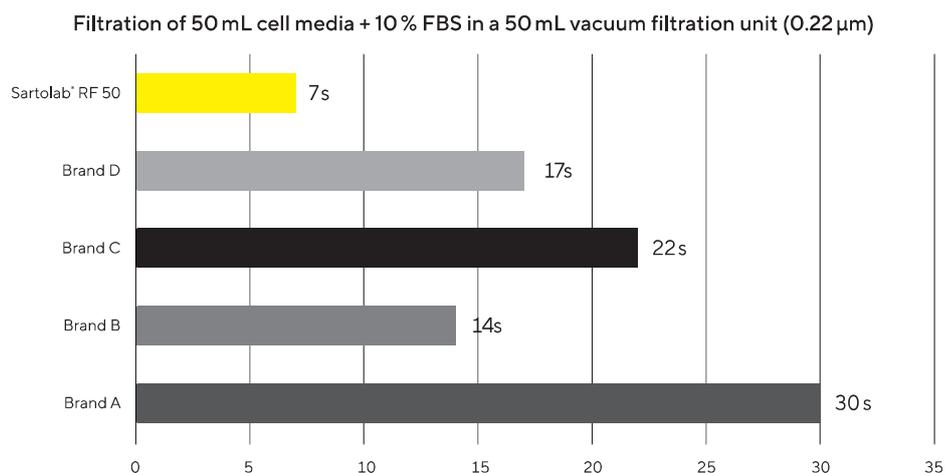
Sartolab® RF 50 vacuum filtration units are single-use units, designed for the filtration of sample volumes of up to 50 mL. They are available either with a 0.22 or a 0.45 µm polyethersulfone membrane which have been developed and manufactured by Sartorius at its own facilities. Both membranes provide fastest flow rates due to their asymmetric structure and ensure lowest protein binding as well as low extractables. The 0.22 µm version is ideal for sterile filtration of cell cultures, buffers and aqueous solutions; the 0.45 µm for clarification. Sartolab® RF 50 are available either individually packed and sterile or in bulk non-sterile.

Sartolab® RF 50 vacuum filtration unit is composed of a funnel, with dust cover, a 50 mL conical tube with graduation and writing field as well as a tubing connector for vacuum connection (sterile versions only) and a screw cap to store your filtrate in the conical tube. The design of the yellow adapter connecting the funnel to the conical tube ensures a vacuum-tight seal and enables the filtration unit to be used on the Sartolab® MultiStation for filtration of up to 6 samples in parallel with one vacuum source.

Sartolab® RF 50 can also be used alone when connecting the tubing connector delivered with each unit to your vacuum source (sterile versions only). The tubing connector and the screw cap for the conical tube are individually wrapped to maintain sterility until needed.

User Benefits

- Highest flow rates with an asymmetric membrane and a large surface area
- No loss of protein with a very low protein binding membrane
- Low dead volume thanks to an optimized membrane support
- Minimized risks of contamination with a complete ready-to-use unit (no further transfer of liquid for storage necessary)
- Designed as standalone system or for a parallel filtration of up to 6 samples with Sartolab® Multistation



Materials

Funnel with dust cover	Polystyrene (PS)
Membrane filter	0.22 µm polyethersulfone (order no. 180E01) 0.45 µm polyethersulfone (order no. 180F01)
Funnel adapter	High Density Polyethylene (HDPE)
Tubing connector for vacuum connection	High Density Polyethylene (HDPE)
Conical tube	Polypropylene
Conical tube cap	High Density Polyethylene (HDPE)

Specifications

Membrane Ø	58.5 mm
Effective filtration area	21 cm ²
Hold-up volume	1.2 mL
Filtration capacity	50 mL
Size of the 50 mL conical tube	Height: 115.5 mm, External internal diameter: 29.5 mm 27.48 mm
Autoclavable	No
Sterilization method	E-Beam (beta) irradiation
Storage temperature of the conical tube	4°C to 30°C (short-term: -80°C to max. 100°C)
Packaging	Single-packaged, sterile
Operating pressure	-350 to -700 mbar

Ordering Information

Description	Quantity	Order No.
Sartolab® RF 50, 0.22 µm, PES	24 units	180E01-----2
Sartolab® RF 50, 0.45 µm, PES	24 units	180F01-----2
Sartolab® RF 50, 0.22 µm, PES, non-sterile	96 units	180E01-----E8
Sartolab® RF 50, 0.45 µm, PES, non-sterile	96 units	180F01-----E8

Sartolab® RF | BT

Vacuum Filtration Units



Sartolab® RF | BT vacuum filtration units are convenient filtration units designed for research purposes and, therefore, for the filtration of small volumes from > 50 mL to 1 L. Sartolab® RF as a complete system includes a receiver flask to the filtration funnel. Sartolab® BT is a bottle top filter (filtration funnel) without a receiver flask, enabling customers to use their own receiver flasks and/or to expand the filtration capacity, depending on the particle load of the filtered liquid, by filling more than one receiver flask.

Membrane of Choice

Polyethersulfone is the membrane of choice for the Sartolab® RF | BT vacuum filtration units as it combines very low protein binding properties and highest flow rates. The 0.22 µm polyethersulfone membrane belongs to the best asymmetric membrane in the market.

The Sartolab® RF | BT vacuum filtration units are available in 3 different pore sizes to meet most of the applications:

- 0.1 µm for mycoplasma removal
- 0.22 µm for the sterile filtration of cell culture, media, buffers, and reagents
- 0.45 µm for the clarification of aqueous and viscous solutions

Ergonomic Design

Sartolab® RF | BT vacuum filtration units have been designed to maximally facilitate the user's daily work.

- Ergonomic design of the 150 mL to 1 L bottles for easy grip with one hand and designated writing field on the back for clear labeling of samples
- Engraved graduations on the funnels and the bottles ensure accuracy and highest readability
- The footprint of the bottles gives good stability for the unit during filtration
- No extra tightening of the funnel before filtration required (vacuum-tight sealed)
- The funnels and bottles are stackable to save space not only in the refrigerator but also in the bin
- The design of the yellow adapter connecting the funnel to the bottles enables the filtration unit to be used on the Sartolab® Multistation for filtration of up to 6 samples in parallel with one vacuum source
- The ergonomic soft blister packaging is not only easy to open but its design facilitates the transportation of several units with one hand

State-of-the-Art Production

- Sartolab® RF | BT vacuum filtration units are manufactured in an ISO 13485 certified plant and ISO
- Class 8 cleanroom to assure the highest level of purity
- All fluid path materials used in the production of the Sartolab® RF | BT vacuum filtration units are medical graded for highest quality, without any animal origin
- All products are sold sterilized and guaranteed endotoxin-free
- All fluid path component materials meet the requirements for United States Pharmacopeia (USP)
- Class VI Biological Test for Plastics, latest volume
- The fluid path component materials are determined to be non-cytotoxic in accordance to ISO 10993

Best Engineering

- Optimized membrane support for lowest hold-up volumes and for the reducing of foam formation and thus a denaturation of proteins
- Delivered with a vacuum tube connector for stand-alone filtration
- For the Sartolab® RF versions, the screw caps of the bottles are delivered extra packed to maintain sterility up to the end of filtration
- The 45 mm neck thread of the Sartolab® units ensures a vacuum-tight seal to bottles with this standard thread
- The risk of contamination is minimized with the complete ready-to-use unit Sartolab® RF versions

Technical Specifications

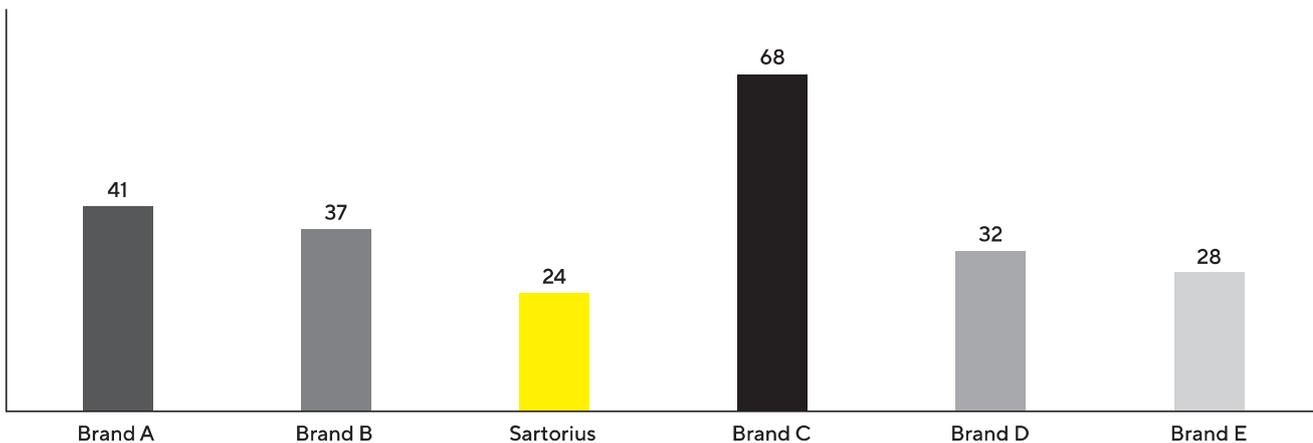
Material

Membrane filter	0.1 µm polyethersulfone (Cat. No. 180D*) 0.22 µm polyethersulfone (Cat. No. 180E*) 0.45 µm polyethersulfone (Cat. No. 180F*)
Funnel, lid, and bottle	Polystyrene (PS)
Tubing connector, funnel adapter, and screw cap	High Density Polyethylene (HDPE)
Packaging	PET PE and PE PA multilayer films

Specifications

Membrane diameter	80 mm for 150 mL and 250 mL volumes 100 mm for 500 mL and 1,000 mL volumes
Effective filtration area	43 cm ² for 150 mL and 250 mL volumes 69 cm ² for 500 mL and 1,000 mL volumes
Bottle neck size	45 mm
Autoclavable	No
Sterilization method	E-Beam (beta) irradiation (SAL 10 ⁻⁶)
Transportation and storage temperatures	-20° C to + 60° C
Operational temperatures	0° C to 70° C
Packaging	Single-packaged, soft blister, sterile
Operating pressure	-350 to -750 mbar
Hold up volumes (for water)	2.7 mL for 150 mL and 250 mL versions 4.1 mL for 500 mL and 1,000 mL versions

Comparison of Filtration Times [s] for 500 mL Cell Media + 10% FBS in Six 0.22 µm 500 mL Vacuum Filtration Units





The Sartolab® RF vacuum filtration unit is comprised of:

- A graduated funnel with a polyethersulfone (PES) membrane, a vacuum adapter and a lid
- A bottle, with graduation and writing field
- A tube connector for vacuum connection (for stand-alone filtration)
- A screw cap for storage of the filtrate (individually wrapped to maintain sterility)



The Sartolab® BT bottle top filter is comprised of:

- A graduated funnel with a polyethersulfone (PES) membrane, a vacuum adapter, and a lid
- A tubing connector for vacuum connection (for use as stand-alone)

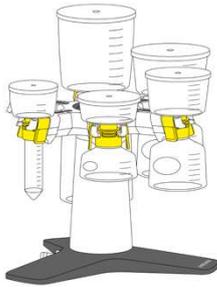
Ordering Information

Sartolab® RF

Order Number	Description	Membrane Type	Pore Size (µm)	Funnel Volume (mL)	Bottle Volume (mL)	Pkg. Unit
180E02-----E	Sartolab® RF 150	Asymmetric PES	0.22	150	150	12
180F02-----E	Sartolab® RF 150	PES	0.45	150	150	12
180D03-----E	Sartolab® RF 250	PES	0.1	250	250	12
180E03-----E	Sartolab® RF 250	Asymmetric PES	0.22	250	250	12
180F03-----E	Sartolab® RF 250	PES	0.45	250	250	12
180E04-----E	Sartolab® RF 500	Asymmetric PES	0.22	500	500	12
180F04-----E	Sartolab® RF 500	PES	0.45	500	500	12
180D05-----E	Sartolab® RF 1,000	PES	0.1	1,000	1,000	12
180E05-----E	Sartolab® RF 1,000	Asymmetric PES	0.22	1,000	1,000	12
180F05-----E	Sartolab® RF 1,000	PES	0.45	1,000	1,000	12

Sartolab® BT

Order Number	Description	Membrane Type	Pore Size (µm)	Funnel Volume (mL)	Pkg. Unit
180E12-----E	Sartolab® BT 150	Asymmetric PES	0.22	150	24
180E13-----E	Sartolab® BT 250	Asymmetric PES	0.22	250	24
180E14-----E	Sartolab® BT 500	Asymmetric PES	0.22	500	24
180E15-----E	Sartolab® BT 1,000	Asymmetric PES	0.22	1,000	24
180F15-----E	Sartolab® BT 1,000	PES	0.45	1,000	24



Accessories and Consumables

Multistation

For hands-free parallel filtration of up to six samples

Order Number	Description	Pkg. Unit
SDLC01	Sartolab® Multistation	1

Sartolab® Bottle

Delivered sterile, for filtration and storage

Order Number	Description	Volume (mL)	Pkg. Unit
180-22-----E	Sartolab® bottle 150 mL	150	24
180-23-----E	Sartolab® bottle 250 mL	250	24
180-24-----E	Sartolab® bottle 500 mL	500	24
180-25-----E	Sartolab® bottle 1,000 mL	1,000	24

Binder-Free Glass Microfiber Prefilters

High purity prefilters to prevent the clogging of the membrane when filtering viscous or particulate-loaded solutions

Order Number	Description	Filter Diameter (mm)	Pkg. Unit
FT-3-1101-080	Binder-free glass microfiber filter discs, grade MGA, for 150 and 250 mL funnels	80	100
FT-3-1101-100	Binder-free glass microfiber filter discs, grade MGA, for 500 and 1,000 mL funnels	100	100

Sartolab® Multistation

For hands-free parallel filtration of up to 6 samples

Sartolab® Multistation is a stand specially designed to hold 1 to 6 vacuum filtration units, allowing simultaneous filtration of up to 6 samples.

The Multistation is permanently connected to your vacuum source. Easily install your vacuum filtration units in the Multistation for quick and easy filtration of samples without the need for installation of extra connectors and time-consuming stabilization.

Sartolab® Multistation works with all Sartolab® RF | BT vacuum filtration units; the funnel adapter of these units is designed to fit perfectly in the bracket of the Multistation. With one click, connect the filtration unit to the device, assuring perfect filter stability. With a second click, engage the vacuum automatically and begin filtering.

Easily manipulate your samples with the rotating, multi-directional head, and easily keep track of your samples during filtration with the numbered brackets.

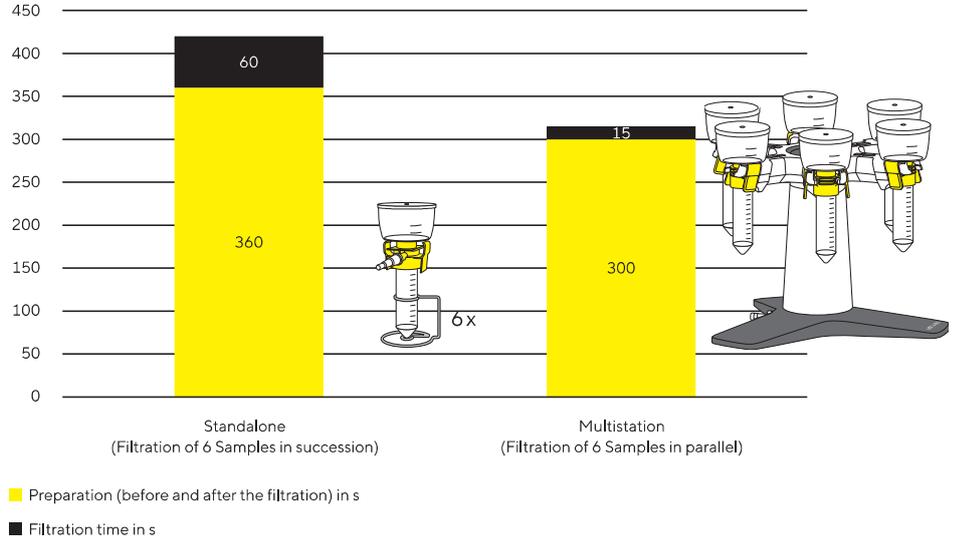
User Benefits

- Single vacuum source enables simultaneous filtration of up to 6 samples
- Time-saving (no installation time for each filter unit before use)
- Hands-free filtration



The Multistation advantage: Using the Sartolab® Multistation to filter 6x50 mL samples saves handling time compared to standalone filtration

Filtration of 50 mL cell media + 10% FBS in a 50 mL vacuum filtration unit (0.22 µm)



Specifications

Material (visible parts)	ABS Aluminum Stainless steel
Dimensions (Length x Width x Height)	307 x 348 x 281 mm
Weight	4.6 kg
Tubing connector	Designed for tubing with an inner diameter between 4 and 10 mm and with a wall thickness of minimum 3 mm

Ordering Information

Description	Quantity	Order No.
Sartolab® Multistation	1 unit	SDLC01

Sartoclear Dynamics® Lab P15

Clarification and Sterile Filtration of up to 15 mL Mammalian Cell Culture in One Step



Sartoclear Dynamics® Lab P15 is a kit for single step harvesting of 15 mL animal cell cultures with even high cell densities. With this kit, the clarification and sterile filtration of mammalian cell culture is performed in a single pressure filtration step. Inspired by the plasma industry, Sartoclear Dynamics® is based on the principles of body feed filtration.

This ready to use kit combines a 20 mL syringe pre-filled with a 0.5 g filter aid and an integrated filter* for sterile filtration. The filter aid facilitates filtration through the sterile filter while allowing complete protein recovery.

A convenient filling tube can be connected to the syringe, for the easy recovery of samples from 50 mL Falcon tubes or ambr 15 bioreactors.

As a result, this method replaces centrifugation and subsequent sterile filtration steps, leading to clarified and sterilized cell culture harvest in minutes. Your cell culture harvest will be available for following sample concentration by ultrafiltration and downstream analytics in no time.

Sartoclear® Dynamics Lab P15 Features:

- Single step mammalian cell culture harvest
- Designed for cell densities up to 20×10^6 cells and even more
- Fast and effortless filtration
- Optimized for cell culture harvest from Ambr® 15 bioreactors

* The sterile filter included in the kit contains a 0.2 µm polyethersulfone membrane and a prefilter made of 100% high-purity quartz. The choice of these materials, along with the larger surface area of the filter, enables higher flow rates.

Quick and Easy Filtration



1. Fill the syringe with cell culture broth.



2. Shake the syringe to mix the broth with the filter aid.



3. Connect the sterile filter to the syringe and filter.

Typical Results

Cell Type	Cell Density	Viability	Mab concentration before filtration	Mab concentration after filtration	Recovery Rate
CHO DG44	16×10^6 cells/mL	78%	6.02 g/L	5.77 g/L	96%
CHO DG44	38×10^5 cells/mL	48%	0.43 g/L	0.43 g/L	100%

Specifications

DE Syringe	
Syringe material	Syringe barrel and plunger rod: polypropylene; stopper: latex-free elastomer
Syringe Cap	Polyamide
Filling tube material	Polypropylene
Filter aid	0.5 g highly pure diatomaceous earth (Celpure® C300 – pharmaceutical-grade*)
Sterile Filter	
Housing material	Polycarbonate
Prefilter material	100% high-purity quartz, binder-free
Filter material	0.2 µm polyethersulfone
Filter Ø	61 mm
Filtration area	20 cm ²
Connector inlet	Female Luer-Lock
Connector outlet	Male Luer-Lock
Hold-up volume	Approx. 2.5 mL
Housing burst pressure	> 5 bar 72.5 psi
Packaging	Individually packed
Sterilization	EO sterilization

Ordering Information

Product Name	Number of units per box	Order No.
Sartoclear Dynamics® Lab P15	<ul style="list-style-type: none"> ▪ 6 × 20 mL syringes, pre-filled with 0.5 g DE, including caps and filling tubes ▪ 6 × 0.2 µm PES sterile filters 	SDLP--0015-----C

* Celpure® is a trademark of Advanced Minerals

Sartoclear Dynamics® Lab V

Clarification and Sterile Filtration of 50 mL up to 1 L Mammalian Cell Culture in One Step



Sartoclear Dynamics® Lab V kits enable clarification and sterile filtration to be performed in a single step. These kits simplify the cell harvesting process by fully eliminating the centrifugation step otherwise needed for clarification. As a result, they enable cell cultures to be efficiently clarified and sterilized in minutes – quickly and easily.

Sartoclear Dynamics® Lab kits have been designed and optimized for harvesting mammalian cell cultures, such as CHO, HEK, hybridomas and many others, with cell densities of up to 20×10^6 cells/mL.

Each kit provides filter aid pouches for clarification and Sartolab® RF vacuum filtration units for sterile filtration. The filter aid used in Sartoclear Dynamics® Lab products is made of highly-pure diatomaceous earth (DE) that is insoluble and inert. It is packed in ready-to-use pouches in pre-wetted condition to prevent the release of dust particles. The DE pouches are gamma-irradiated to rule out any contamination.

Sartoclear® Dynamics Lab V Features:

- Single step mammalian cell culture harvest
- Designed for cell densities up to 20×10^6 cells
- Fast and effortless filtration

Typical Results

Cell Type	Cell Density	Viability	Mab concentration before filtration	Mab concentration after filtration	Recovery Rate	Turbidity
CHO	14.46×10^6 cells/mL	85.2%	5.2 g/L	5.15 g/L	99%	18 NTU
HEK	8×10^6 cells/mL	70%	0.035 g/L	0.034 g/L	97%	8 NTU

Specifications

Clarification

Pouches of Filter Aid

Diatomaceous Earth (DE)	1 g, 5 g or 10 g highly pure diatomaceous earth, (Celpure® C300 – pharmaceutical grade)*, mixed with water in a ratio of 1 DE: 1.25 ultrapure water
Packaging Sterilization	Dust-free, gamma irradiated pouches

Filtration

Vacuum filtration units with receiver flasks (Sartolab® RF 150 – 1000)

Funnel, dust cover, receiver bottles	Polystyrene (PS)
Filter adapter, tubing connector, cap	High Density Polyethylene (HDPE)
Filter material	0.22 µm polyethersulfone
Packaging Sterilization	Single-packaged, sterile

Filtration

Vacuum filtration units with conical tube (Sartolab® RF 50)

Funnel, dust cover	Polystyrene (PS)
Filter adapter, tubing connector, cap	High Density Polyethylene (HDPE)
Conical tube	Polypropylene
Filter material	0.22 µm polyethersulfone (order no. 180E01) 0.45 µm polyethersulfone (order no. 180F01)
Packaging	Single-packaged, sterile

* Celpure® is a trademark of Advanced Minerals

Each Sartoclear Dynamics® Lab V kit is comprised of pouches of filter aid and Sartolab® RF vacuum filtration units that match your needs. Find the right kit in just two easy steps:

1. Determine the volume range of your sample to be filtered.
2. Then reference it to the cell density of your cell culture.

Volume	Cell density*		
	< 5 million cells/mL	5 – 10 million cells/mL	10 – 20 million cells/mL
≤ 50	SDLV-0050-01E0-2		SDLV-0050-02E0-2
> 50 – 150 mL	SDLV-0150-02E0-E		SDLV-0150-05E0-2
150 – 250 mL	SDLV-0250-05E0-2		SDLV-0250-10E0-2
250 – 500 mL	SDLV-0500-05E0-2	SDLV-0500-10E0-2	SDLV-0500-20E0-E
500 – 1,000 mL	SDLV-1000-10E0-2	SDLV-1000-20E0-E	SDLV-1000-40E0-E

* Tested with CHO cell lines with a cell viability of approx. 85%

Ordering Information

Sartoclear Dynamics® Lab V50 Kits – 0.22 µm PES

Sartoclear Dynamics Lab V, 50 mL, 1g

Description	Qty. of Units	Order No.
Filtration of up to 50 mL with 1g of DE per unit Contents: 1 × 180E01-----2 (24 × Sartolab® RF 50; 0.22 µm; PES) 1 × SDLKG-01.0-----2 (24 × pouches of filter aid, 1g)	24	SDLV-0050-01E0-2

Sartoclear Dynamics Lab V, 50 mL, 2g

Filtration of up to 50 mL with 2g of DE per unit Contents: 1 × 180E01-----2 (24 × Sartolab® RF 50, 0.22 µm PES) 2 × SDLKG-01.0-----2 (48 × pouches of filter aid, 1g)	24	SDLV-0050-02E0-2
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Sartoclear Dynamics® Lab V50 Kits – 0.45 µm PES

Sartoclear Dynamics Lab V, 50 mL, 1g

Filtration of up to 50 mL with 1g of DE per unit Contents: 1 × 180F01-----2 (24 × Sartolab® RF 50, 0.45 µm PES) 1 × SDLKG-01.0-----2 (24 × pouches of filter aid, 1g)	24	SDLV-0050-01F0-2
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Sartoclear Dynamics Lab V, 50 mL, 2g

Filtration of up to 50 mL with 2g of DE per unit Contents: 1 × 180F01-----E (24 × Sartolab® RF 50, 0.45 µm PES) 2 × SDLKG-01.0-----2 (48 × pouches of filter aid, 1g)	24	SDLV-0050-02F0-2
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Sartoclear Dynamics® Lab V150 Kits

Sartoclear Dynamics® Lab V, 150 mL, 2g

Filtration of up to 150 mL with 2g of DE per unit Contents: 1 × 180E02-----E (12 × Sartolab® RF 150, 0.22 µm PES) 1 × SDLKG-01.0-----2 (24 × pouches of filter aid, 1g)	12	SDLV-0150-02E0-E
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Sartoclear Dynamics® Lab V, 150 mL, 5g

Filtration of up to 150 mL with 5g of DE per unit Contents: 2 × 180E02-----E (24 × Sartolab® RF 150, 0.22 µm PES) 1 × SDLKG-05.0-----2 (24 × pouches of filter aid, 5g)	24	SDLV-0150-05E0-2
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Sartoclear Dynamics® Lab V250 Kits**Sartoclear Dynamics® Lab V, 250 mL, 5 g**

Description	Qty. of Units	Order No.
Filtration of up to 250 mL with 5 g of DE per unit Contents: 2 × 180E03-----E (24 × Sartolab® RF 250, 0.22 µm PES) 1 × SDLKG-05.0-----2 (24 × pouches of filter aid, 5 g)	24	SDLV-0250-05E0-2

Sartoclear Dynamics® Lab V, 250 mL, 10 g

Filtration of up to 250 mL with 10 g of DE per unit Contents: 2 × 180E03-----E (24 × Sartolab® RF 250, 0.22 µm PES) 1 × SDLKG-10.0-----2 (24 × pouches of filter aid, 10 g)	24	SDLV-0250-10E0-2
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Sartoclear Dynamics® Lab V500 Kits**Sartoclear Dynamics® Lab V, 500 mL, 5 g**

Filtration of up to 500 mL with 5 g DE per unit Contents: 2 × 180E04-----E (24 × Sartolab® RF 500, 0.22 µm PES) 1 × SDLKG-05.0-----2 (24 × pouches of filter aid, 5 g)	24	SDLV-0500-05E0-2
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Sartoclear Dynamics® Lab V, 500 mL, 10 g

Filtration of up to 500 mL with 10 g DE per unit Contents: 2 × 180E04-----E (24 × Sartolab® RF 500, 0.22 µm PES) 1 × SDLKG-10.0-----2 (24 × pouches of filter aid, 10 g)	24	SDLV-0500-10E0-2
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Sartoclear Dynamics® Lab V, 500 mL, 20 g

Filtration of up to 500 mL with 20 g DE per unit Contents: 1 × 180E04-----E (12 × Sartolab® RF 500, 0.22 µm PES) 1 × SDLKG-20.0-----E (12 × pouches of filter aid, 20 g)	12	SDLV-0500-20E0-E
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Sartoclear Dynamics® Lab V1000 Kits**Sartoclear Dynamics® Lab V, 1,000 mL, 10 g**

Filtration of up to 1 L with 10 g of DE per unit Contents: 2 × 180E05-----E (24 × Sartolab® RF 1000, 0.22 µm PES) 1 × SDLKG-10.0-----2 (24 × pouches of filter aid, 10 g)	24	SDLV-1000-10E0-2
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Sartoclear Dynamics® Lab V, 1,000 mL, 20 g

Filtration of up to 1 L with 20 g of DE per unit Contents: 1 × 180E05-----E (12 × Sartolab® RF 1000, 0.22 µm PES) 1 × SDLKG-20.0-----E (12 × pouches of filter aid, 20 g)	24	SDLV-1000-20E0-E
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Sartoclear Dynamics® Lab V, 1,000 mL, 40 g

Filtration of up to 1 L with 40 g of DE per unit Contents: 1 × 180E05-----E (12 × Sartolab® RF 1000, 0.22 µm PES) 2 × SDLKG-20.0-----E (24 × pouches of filter aid, 20 g)	12	SDLV-1000-40E0-E
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Basic Filtration

Table of Contents

Introduction	106
Filter Papers	108
Glass and Quartz Microfiber Filters	113
Extraction Thimbles	118
Membrane Filters	121
Blotting Chromatography Papers & Blotting Membranes	130
Filtration Equipment	133
Large Stainless Steel Filter Holders	143
Combisart® Kits	148

Introduction

Filters are indispensable for your routine work in laboratory and industrial applications. Sartorius supplies you with a broad range of filters for a myriad of filtration tasks and supports you with all your filtration challenges.

Our Product Range Covers:

- Filter papers
- Glass and quartz microfiber filters
- Membrane filters
- Blotting & chromatography papers & membranes
- Filtration equipment

Quality Assurance and Quality Control

Sartorius pays particular attention to continuous in-process quality control. Regular checks and exact analyses of the raw materials and each finished product assure constant high quality and product uniformity.

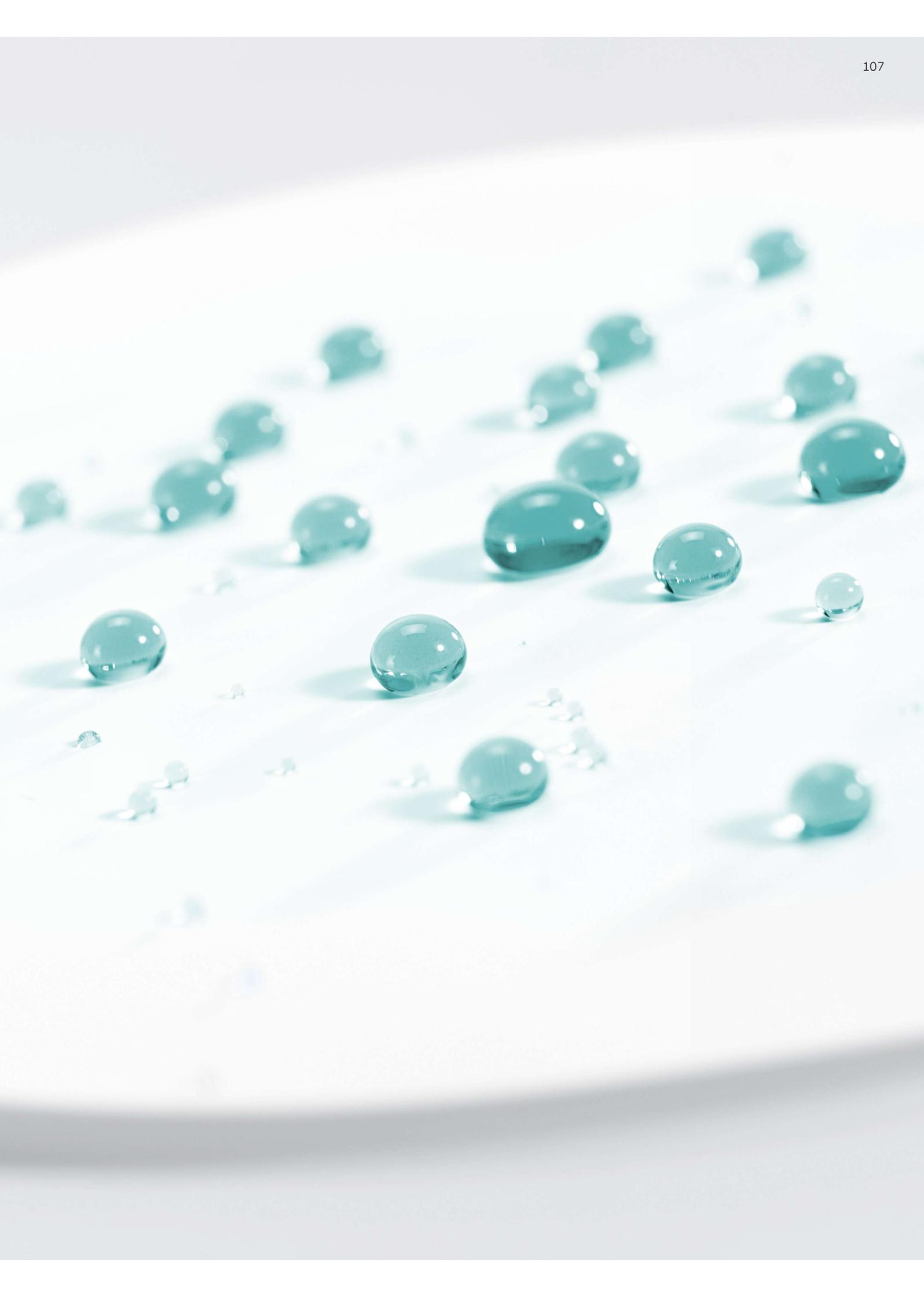
We meet the requirements set forth by the ISO 9001 quality management system and the ISO 14001 environmental management system.

How Do Filter Papers Work?

Filter papers are depth filters. Their efficiency is influenced by various parameters: the mechanical particulate retention, adsorption, pH, surface properties, thickness and strength of the filter paper as well as the shape, density and quantity of particles to be retained. The precipitates deposited on the filter form a “cake layer” which – depending on its density – increasingly affects the progress of an ongoing filtration and decisively affects the retention capability. Therefore, it is essential to select the perfect filter paper to ensure the best filtration results. This choice depends on the filtration method as well as on the amount and properties of the medium to be filtered, the size of the particulate solids to be removed and the required degree of clarification.

How Do Membrane Filters Work?

Membrane filters retain particles larger than their pore sizes. Smaller particles pass through the membrane or are captured in the membrane. Such filters are used for the filtration of smaller particles and for critical applications such as sterility testing. The choice of the right membrane type depends on the specifications of the solution to be filtered. The most important parameters for this are adsorption, chemical compatibility and the particle size to be retained.



Ash-free Filter Papers

For Quantitative and Gravimetric Analyses

These filter papers are used for quantitative and gravimetric analyses as well as for pressure or vacuum filtration. They are made out of 100% cotton linters with an α -cellulose content of > 98% and are acid-washed to make the papers ashless and achieve high purity.

Typical Values

Grade	Weight (g/m ²)	Thickness (mm)	Particle retention (μ m)	Filtration (s)	Precipitates	Properties
■ 388	84	0.21	12–15	10	Coarse crystalline	Wide-pore, loose structure, fast filtering
□ 389	84	0.19	8–12	20	Medium-fine crystalline	Medium- to wide-pore, medium fast filtering
■ 392	84	0.17	5–8	50	Fine crystalline	Medium dense, medium fast filtering
■ 390	84	0.16	3–5	100	Fine crystalline	Narrow-pore, dense, slow filtering
■ 391	84	0.15	2–3	180	Very fine crystalline	Fine-pore, dense, very slow filtering
■ 393	100	0.18	1–2	300	Very fine crystalline	Very fine-pore, very dense, very slow filtering

Ordering Information



Filter Discs, 100 pieces

Ø in mm	Grade 388	Grade 389	Grade 390	Grade 391	Grade 392	Grade 393
55	FT-3-101-055	FT-3-102-055	FT-3-103-055	FT-3-104-055	FT-3-105-055	FT-3-127-055
70	FT-3-101-070	FT-3-102-070	FT-3-103-070	FT-3-104-070	FT-3-105-070	FT-3-127-070
90	FT-3-101-090	FT-3-102-090	FT-3-103-090	FT-3-104-090	FT-3-105-090	FT-3-127-090
110	FT-3-101-110	FT-3-102-110	FT-3-103-110	FT-3-104-110	FT-3-105-110	FT-3-127-110
125	FT-3-101-125	FT-3-102-125	FT-3-103-125	FT-3-104-125	FT-3-105-125	FT-3-127-125
150	FT-3-101-150	FT-3-102-150	FT-3-103-150	FT-3-104-150	FT-3-105-150	FT-3-127-150
185	FT-3-101-185	FT-3-102-185	FT-3-103-185	FT-3-104-185	FT-3-105-185	FT-3-127-185
240	FT-3-101-240	FT-3-102-240	FT-3-103-240	FT-3-104-240	FT-3-105-240	FT-3-127-240



Folded Filters, 100 pieces

Ø in mm	Grade 388	Grade 389	Grade 390	Grade 391	Grade 392
110	FT-4-101-110	FT-4-102-110	FT-4-103-110	FT-4-104-110	FT-4-105-110
125	FT-4-101-125	FT-4-102-125	FT-4-103-125	FT-4-104-125	FT-4-105-125
150	FT-4-101-150	FT-4-102-150	FT-4-103-150	FT-4-104-150	FT-4-105-150
185	FT-4-101-185	FT-4-102-185	FT-4-103-185	FT-4-104-185	FT-4-105-185
240	FT-4-101-240	FT-4-102-240		FT-4-104-240	



Sheets in 580 × 580 mm, 100 pieces

Grade 388	Grade 389	Grade 390	Grade 391	Grade 392	Grade 393
FT-2-101-580580	FT-2-102-580580	FT-2-103-580580	FT-2-104-580580	FT-2-105-580580	FT-2-127-580580

Other dimensions are available on request

Wet-strengthened Filter Papers

For Qualitative Analyses

These qualitative filter papers are essentially used for analytical purposes and routine analyses, whenever no gravimetric analyses are required. They are wet-strengthened and can be used for pressure and vacuum filtration. They are made of refined pulp and linters with an >95% α -cellulose content and are very pure with an ash content $\leq 0.1\%$.

Typical Values

Grade	Weight (g/m ²)	Thickness (mm)	Particle retention (μm)	Filtration (s)	Precipitates	Properties
1288	84	0.21	12–15	10	Coarse crystalline	Wide-pore, loose structure, fast filtering
1289	84	0.21	8–12	20	Medium-fine crystalline	Medium- to wide-pore, medium fast filtering
1292	84	0.17	5–8	20	Fine crystalline	Medium dense, medium fast filtering
1290	84	0.15	3–5	100	Fine crystalline	Narrow-pore, dense, slow filtering
1291	84	0.15	2–3	180	Very fine crystalline	Fine-pore, dense, very slow filtering
293	80	0.15	1–2	300	Very fine crystalline	Very fine-pore, very dense, very slow filtering

Ordering Information



Filter Discs, 100 pieces

Ø in mm	Grade 1288	Grade 1289	Grade 1290	Grade 1291	Grade 1292	Grade 293
55	FT-3-206-055	FT-3-207-055	FT-3-208-055	FT-3-209-055	FT-3-210-055	FT-3-211-055
70	FT-3-206-070	FT-3-207-070	FT-3-208-070	FT-3-209-070	FT-3-210-070	FT-3-211-070
90	FT-3-206-090	FT-3-207-090	FT-3-208-090	FT-3-209-090	FT-3-210-090	FT-3-211-090
110	FT-3-206-110	FT-3-207-110	FT-3-208-110	FT-3-209-110	FT-3-210-110	FT-3-211-110
125	FT-3-206-125	FT-3-207-125	FT-3-208-125	FT-3-209-125	FT-3-210-125	FT-3-211-125
150	FT-3-206-150	FT-3-207-150	FT-3-208-150	FT-3-209-150	FT-3-210-150	FT-3-211-150
185	FT-3-206-185	FT-3-207-185	FT-3-208-185	FT-3-209-185	FT-3-210-185	FT-3-211-185
240	FT-3-206-240	FT-3-207-240	FT-3-208-240	FT-3-209-240	FT-3-210-240	



Folded Filters, 100 pieces

Ø in mm	Grade 1288	Grade 1289	Grade 1290	Grade 1291	Grade 1292	Grade 293
110	FT-4-206-110	FT-4-207-110	FT-4-208-110	FT-4-209-110	FT-4-210-110	
125	FT-4-206-125	FT-4-207-125	FT-4-208-125	FT-4-209-125	FT-4-210-125	FT-4-211-125
150	FT-4-206-150	FT-4-207-150	FT-4-208-150	FT-4-209-150	FT-4-210-150	FT-4-211-150
185	FT-4-206-185	FT-4-207-185	FT-4-208-185	FT-4-209-185	FT-4-210-185	FT-4-211-185
240	FT-4-206-240	FT-4-207-240	FT-4-208-240	FT-4-209-240	FT-4-210-240	FT-4-211-240



Sheets in 580 × 580 mm, 100 pieces

Grade 1288	Grade 1289	Grade 1290	Grade 1291	Grade 1292	Grade 293
FT-2-206-580580	FT-2-207-580580	FT-2-208-580580	FT-2-209-580580	FT-2-210-580580	FT-2-211-580580

Other dimensions are available on request

High-Purity Filter Papers

For Qualitative Analyses

These paper grades are used for analytical purposes that require a low ash content. Grades 292 and 292a are especially suitable for soil analyses because they are low in nitrogen. For phosphate or sodium determination, we recommend grades 131 and 132.

Typical Values

Grade	Weight (g/m ²)	Thickness (mm)	Particle retention (µm)	Filtration (s)	Material
292	87	0.18	5–8	45	Cotton linters, low-nitrogen and nitrates, ash content ≤ 0.06% according to DIN 54370
292a	97	0.19	4–7	60	Cotton linters, low-nitrogen and nitrates, ash content ≤ 0.06% according to DIN 54370
132	80	0.17	5–7	55	Cotton linters and refined pulp, low-phosphate and low-potassium, ash content < 0.02% according to DIN 54370
131	80	0.16	3–5	100	Cotton linters and refined pulp, low-phosphate and low-potassium, ash content < 0.02% according to DIN 54370

Ordering Information



Filter Discs, 100 pieces

Ø in mm	Grade 131	Grade 132	Grade 292	Grade 292a
55		FT-3-329-055	FT-3-205-055	FT-3-215-055
70		FT-3-329-070	FT-3-205-070	FT-3-215-070
90		FT-3-329-090	FT-3-205-090	FT-3-215-090
110		FT-3-329-110	FT-3-205-110	FT-3-215-110
125	FT-3-351-125	FT-3-329-125	FT-3-205-125	FT-3-215-125
150		FT-3-329-150	FT-3-205-150	FT-3-215-150
185		FT-3-329-185	FT-3-205-185	FT-3-215-185
240		FT-3-329-240	FT-3-205-240	FT-3-215-240



Folded Filters, 100 pieces

Ø in mm	Grade 131	Grade 132	Grade 292	Grade 292a
110	FT-4-351-110	FT-4-329-110	FT-4-205-110	FT-4-215-110
125	FT-4-351-125	FT-4-329-125	FT-4-205-125	FT-4-215-125
150	FT-4-351-150	FT-4-329-150	FT-4-205-150	FT-4-215-150
185	FT-4-351-185	FT-4-329-185	FT-4-205-185	FT-4-215-185
240		FT-4-329-240	FT-4-205-240	FT-4-215-240



Sheets in 580 × 580 mm, 100 pieces

Grade 292	Grade 292a
FT-2-205-580580	FT-2-215-580580

Other dimensions are available on request

Filter Papers

For Qualitative-Technical Analyses

These filter papers are used for routine analyses like clarification, determination of substances, but also as discs with a center hole for technical applications. Grades with a wet burst resistance >30 kPa are referred to as wet-strengthened and are therefore suitable for pressure or vacuum filtration. They are made of refined pulp and linters with an >95% α -cellulose content, are very pure with an ash content between <0.1 to 0.15%. Below you will find an overview of the most commonly used grades.

Typical Values

Grade	Surface	Weight (g/m ²)	Thickness (mm)	Particle Retention (μ m)	Filtration (s)	Wet Burst Resistance (kPa)	Properties
3 hw	Smooth	65	0.14	8–12	20	40	Medium fast filtering, filter paper for routine work in the lab
4 b	Smooth	75	0.15	8–12	22	> 15	Medium fast filtering, filtration of coarse precipitates, wick paper for seed testing
603/N	Crêped	75	0.25	> 15	8	≥ 50	Fast filtering, filtration of sugar solutions
6	Smooth	80	0.17	10–13	15	30	Fast filtering, degassing beer before analysis, clarification of spirits
100/N	Smooth	85	0.18	6–8	30	80	Medium fast filtering, ash content <0.1%, low potassium and sodium content, determination of the sugar content
5 H/N	Crêped	85	0.28	>40	3	≥ 40	Very fast filtering, wide-pore, filtration of essential oils
3 S/h	Smooth	200	0.36	5–7	55	15	Medium fast to slow filtering, narrow-pore, re-wet test for diapers

Ordering Information



Filter Discs

Ø in mm	Grade 3 hw (100 Pieces)	Grade 4 b (100 Pieces)	Grade 603/N (100 Pieces)	Grade 6 (100 Pieces)	Grade 100/N (100 Pieces)	Grade 5 H/N (100 Pieces)	Grade 3 S/h (50 Pieces)
55	FT-3-303-055	FT-3-309-055		FT-3-312-055	FT-3-328-055		FT-3-307-055
70	FT-3-303-070	FT-3-309-070		FT-3-312-070	FT-3-328-070		
90	FT-3-303-090	FT-3-309-090	FT-3-335-090	FT-3-312-090	FT-3-328-090	FT-3-423-090	FT-3-307-090
110	FT-3-303-110	FT-3-309-110	FT-3-335-110	FT-3-312-110	FT-3-328-110		FT-3-307-110
125	FT-3-303-125	FT-3-309-125	FT-3-335-125	FT-3-312-125	FT-3-328-125	FT-3-423-125	FT-3-307-125
150	FT-3-303-150	FT-3-309-150	FT-3-335-150	FT-3-312-150	FT-3-328-150	FT-3-423-150	FT-3-307-150
185	FT-3-303-185	FT-3-309-185	FT-3-335-185	FT-3-312-185	FT-3-328-185	FT-3-423-185	FT-3-307-185
240	FT-3-303-240	FT-3-309-240	FT-3-335-240	FT-3-312-240	FT-3-328-240	FT-3-423-240	FT-3-307-240



Folded Filters, 100 pieces

Ø in mm	Grade 3 hw	Grade 4 b	Grade 603/N	Grade 6	Grade 100/N	Grade 5 H/N
125	FT-4-303-125	FT-4-309-125	FT-4-335-125	FT-4-312-125		FT-4-423-125
150	FT-4-303-150	FT-4-309-150	FT-4-335-150	FT-4-312-150	FT-4-328-150	FT-4-423-150
185	FT-4-303-185	FT-4-309-185	FT-4-335-185	FT-4-312-185		FT-4-423-185
240	FT-4-303-240	FT-4-309-240	FT-4-335-240	FT-4-312-240	FT-4-328-240	FT-4-423-240
270	FT-4-303-270	FT-4-309-270	FT-4-335-270	FT-4-312-270	FT-4-328-270	FT-4-423-270
320	FT-4-303-320	FT-4-309-320	FT-4-335-320	FT-4-312-320	FT-4-328-320	FT-4-423-320



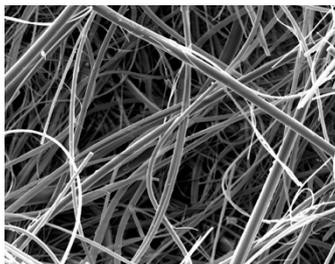
Sheets in 580 × 580 mm, 100 pieces

Grade 3 hw	Grade 4 b	Grade 603/N	Grade 6	Grade 100/N	Grade 5 H/N
FT-2-303-580580	FT-2-309-580580	FT-2-335-580580	FT-2-312-580580	FT-2-328-580580	FT-2-423-580580

Other dimensions are available on request

Glass Microfiber Filters

Without Binder



Binder-free glass microfiber filters are recommended for analytical and gravimetric analyses and also as prefilters. These filters combine fast flow rates with high load capacity and the retention of very fine particles; they are biologically inert, are resistant to most chemicals and withstand temperatures up to 500 °C (grade 550-HA up to 550 °C).

Typical Values

Grade	Weight (g/m ²)	Thickness (mm)	Penetration 0.3 μm (%)*	Particle retention in liquids (μm)	Filtration speed (mL/min)	Fulfills the requirements in EN 872:2005 (weigh loss)
MGA	54	0.24	<0.001	1.6	435	Yes
MGB	143	0.66	<0.001	1.0	500	
MGC	54	0.24	<0.001	1.2	310	Yes
MGD	118	0.51	<0.01	2.7	875	
MGF	75	0.36	<0.001	0.7	135	
MGG	65	0.29	<0.001	1.5	570	
13440	88	0.44		0.7	120	Yes
MG 160	75	0.33	<0.001	1.2	410	
MG 550-HA	65	0.27		1.5	500	

* Measurement according to EN 143 (0.3 μm, 5.3 cm/s, paraffin oil)

Ordering Information



Filter Discs

Ø in mm	MGA (100 pieces)	MG 160 (50 pieces)	MGB (50 pieces)	MGC (100 pieces)	MGD (50 pieces)
21			FT-3-1102-021		
25	FT-3-1101-025		FT-3-1102-025	FT-3-1103-025	FT-3-1104-025
37	FT-3-1101-037	FT-3-01110-037			
47	FT-3-1101-047	FT-3-01110-047	FT-3-1102-047	FT-3-1103-047	FT-3-1104-047
50	FT-3-1101-050	FT-3-01110-050	FT-3-1102-050	FT-3-1103-050	FT-3-1104-050
55	FT-3-1101-055		FT-3-1102-055	FT-3-1103-055	
70	FT-3-1101-070	FT-3-01110-070	FT-3-1102-070	FT-3-1103-070	FT-3-1104-070
80	FT-3-1101-080				
90	FT-3-1101-090	FT-3-01110-090	FT-3-1102-090	FT-3-1103-090	FT-3-1104-090
100	FT-3-1101-100	FT-3-01110-100	FT-3-1102-100	FT-3-1103-100	FT-3-1104-100
110	FT-3-1101-110	FT-3-01110-110	FT-3-1102-110	FT-3-1103-110	FT-3-1104-110
125	FT-3-1101-125		FT-3-1102-125	FT-3-1103-125	FT-3-1104-125
150	FT-3-1101-150		FT-3-1102-150	FT-3-1103-150	FT-3-1104-150
293					FT-3-1104-293

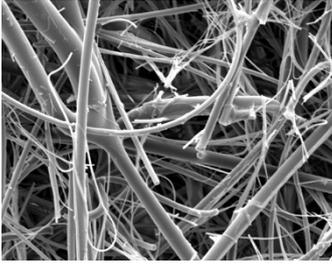
Ø in mm	MGF (100 pieces)	MGG (100 pieces)	MG 550-HA (100 pieces)	13440*
24			FT-3-01147-024	
25	FT-3-1105-025	FT-3-1106-025		
42				13440--42-----Q
44				13440--44-----Q
47	FT-3-1105-047	FT-3-1106-047	FT-3-01147-047	13440--47-----Q
50	FT-3-1105-050	FT-3-1106-050	FT-3-01147-050	13440--50-----Q
55	FT-3-1105-055	FT-3-1106-055	FT-3-01147-055	
70	FT-3-1105-070	FT-3-1106-070	FT-3-01147-070	
90	FT-3-1105-090	FT-3-1106-090	FT-3-01147-090	
100				13440-100-----K
110	FT-3-1105-110	FT-3-1106-110	FT-3-01147-110	
125	FT-3-1105-125	FT-3-1106-125	FT-3-01147-125	
130				13440-130-----K
150	FT-3-1105-150	FT-3-1106-150		
293	FT-3-1105-293			13440-293-----K

* Q = 500 pieces | K = 50 pieces
Other dimensions are available on request



Glass Microfiber Filters

With Binder



These filters are mostly used either for monitoring air and gas or as a prefilter. They are manufactured with synthetic binding agents to ensure that the filter has a defined strength. They are mechanically and chemically stable, have a temperature resistance up to 180 °C and – depending on the binding agent used – are either hydrophobic or hydrophilic.

Typical Values

Grade	Weight (g/m ²)	Thickness (mm)	Penetration 0.3 µm (%)*	Pressure drop 5.3 cm/s (Pa)	Binding agent
MG 227/1/60	60	0.32	< 0.5	260	Hydrophobic
13430	220	1.25	0.02	360	Hydrophilic
13400	73	0.39	0.015	363	Hydrophilic
MG 400 XA	75	0.35	<0.001	425	Hydrophobic
MG 1387/1	90	0.38	≤0.003	400	Hydrophilic

* Tested and classified according to the Standard EN 143

Ordering Information

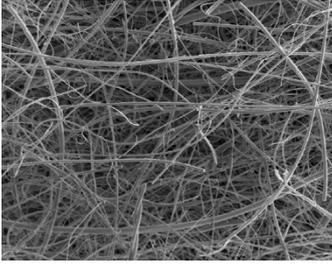


Filter Discs

Ø in mm	MG 227/1/60 (100 pieces)	13430*	13400*	MG 1387/1 (50 pieces)
13			13400--13-----S	
20			13400--20-----S	
25			13400--25-----Q	
42			13400--42-----Q	
44			13400--44-----Q	
45			13400--45-----Q	FT-3-01125-045
47		13430--47-----S	13400--47-----Q	FT-3-01125-047
50			13400--50-----Q	FT-3-01125-050
55				FT-3-01125-055
80			13400--80-----N	
100		13430-100-----K	13400-100-----K	
110				FT-3-01125-110
120			13400-120-----K	
124			13400-124-----K	
125				FT-3-01125-125
127		13430-127-----K	13400-127-----K	
130		13430-130-----K	13400-130-----K	FT-3-01125-130
142		13430-142-----K	13400-142-----K	
150	FT-3-01124-150		13400-150-----K	
257		13430-257---K	13400-257-----K	
260			13400-260---K	
279		13430-279-----K	13400-279-----K	
293		13430-293-----K	13400-293-----K	

** K= 50 pieces, N= 100 pieces, Q = 500 pieces, S= 200 pieces
Other dimensions are available on request

Quartz Microfiber Filters



The quartz microfiber material of the Sartorius pre-heated filters, grade Q3400, is made of high-purity quartz microfibers without any addition of glass microfibers or binding agents. In addition, the Q3400 filter grade is tempered to remove all chemically combined water and to give the filters excellent weight and dimensional stability. Sartorius filters are especially suitable for emissions monitoring at temperatures of up to 900 °C and wherever filters of the highest purity are needed.

Typical Values

Grade	Material	Weight (g/m ²)	Thickness (mm)	Penetration, 0.3 µm 15 cm/s*	Temperature Resistance
Q3400	100% Quartz microfiber silicium dioxide (SiO ₂)	85	0.43	<0.002	up to 900 °C

* Tested and classified according to the Standard EN 143

Ordering Information



Filter Discs



Ø in mm	Q3400
20	Q3400--20-----G
25	Q3400--25-----G
30	Q3400--30-----G
37	Q3400--37-----G
45	Q3400--45-----G
47	Q3400--47-----G
50	Q3400--50-----G
82	Q3400--82-----N
90	Q3400--90-----N
142	Q3400-142-----K
150	Q3400-150-----K

* G = 25 pieces, K = 50 pieces, N = 100 pieces
Other dimensions as well as sheets are available on request

Extraction Thimbles



To extract any component from solid material using suitable solvents, you can rely on our Extraction Thimbles. We offer two different types of Extraction Thimbles in standard sizes: C300 cellulose and G400 glass fiber.

Both grades are free of binders and offer high purity. This ensures consistent and high overall flow rates. Our glass fiber thimbles are well suited to high temperature applications, whilst cellulose can be used for very sensitive applications. Our thimbles guarantee accuracy for any extraction system with common dimensions. Typical wall thicknesses for our C300 grade are 1.3mm for inner diameters under 35mm and 1.7mm for inner diameters over 35mm.

These consumables are primarily designed to fit the Soxhlet apparatus and potential applications include environmental monitoring, i.e. separation of dust, aerosols, gas or air streams, and food control, i.e. extraction of fats, emulsifiers or additives. Our extraction thimbles can be used with any extractor (e.g. Tectator) to provide convenient, high yield extraction. Continuous extraction has never been easier!

Technical Specifications

Cellulose	Weight (g/m ²)	Wall Thickness (mm)	Air Flow at 2 bar (L/m ² sec)
19 x 90	3	1.3	15
22 x 100	2.5	1.3	18
25 x 60	2.5	1.3	18
25 x 70	3	1.3	20
25 x 80	3.5	1.3	20
25 x 100	5	1.4	30.5
28 x 60	3	1.3	15
28 x 80	3.7	1.3	20
28 x 100	4.5	1.3	25
30 x 80	3.8	1.3	21
30 x 100	5	1.3	25
33 x 60	3.2	1.3	15
33 x 80	4.3	1.3	23
33 x 90	4.6	1.3	30
33 x 94	5	1.3	30
33 x 100	5.5	1.3	32
33 x 118	6.3	1.3	35
33 x 130	7	1.3	37
33 x 205	12	1.5	60
35 x 150	9	1.3	43
40 x 100	7.2	1.7	40

Technical Specifications (continued)



Cellulose	Weight (g/m ²)	Wall Thickness (mm)	Air Flow at 2 bar (L/m ² sec)
40 x 123	10	1.7	45
43 x 123	13	1.8	50
26 x 60	2.5	1.3	15
Glass Fiber			
19 x 90	1.6	1.2	22
22 x 80	2	1.6	21
25 x 100	2.7	1.6	25
26 x 60	1.8	1.5	18
30 x 100	3	1.5	33
33 x 94	3.5	1.5	29
43 x 123	6.5	1.7	50

Ordering Information

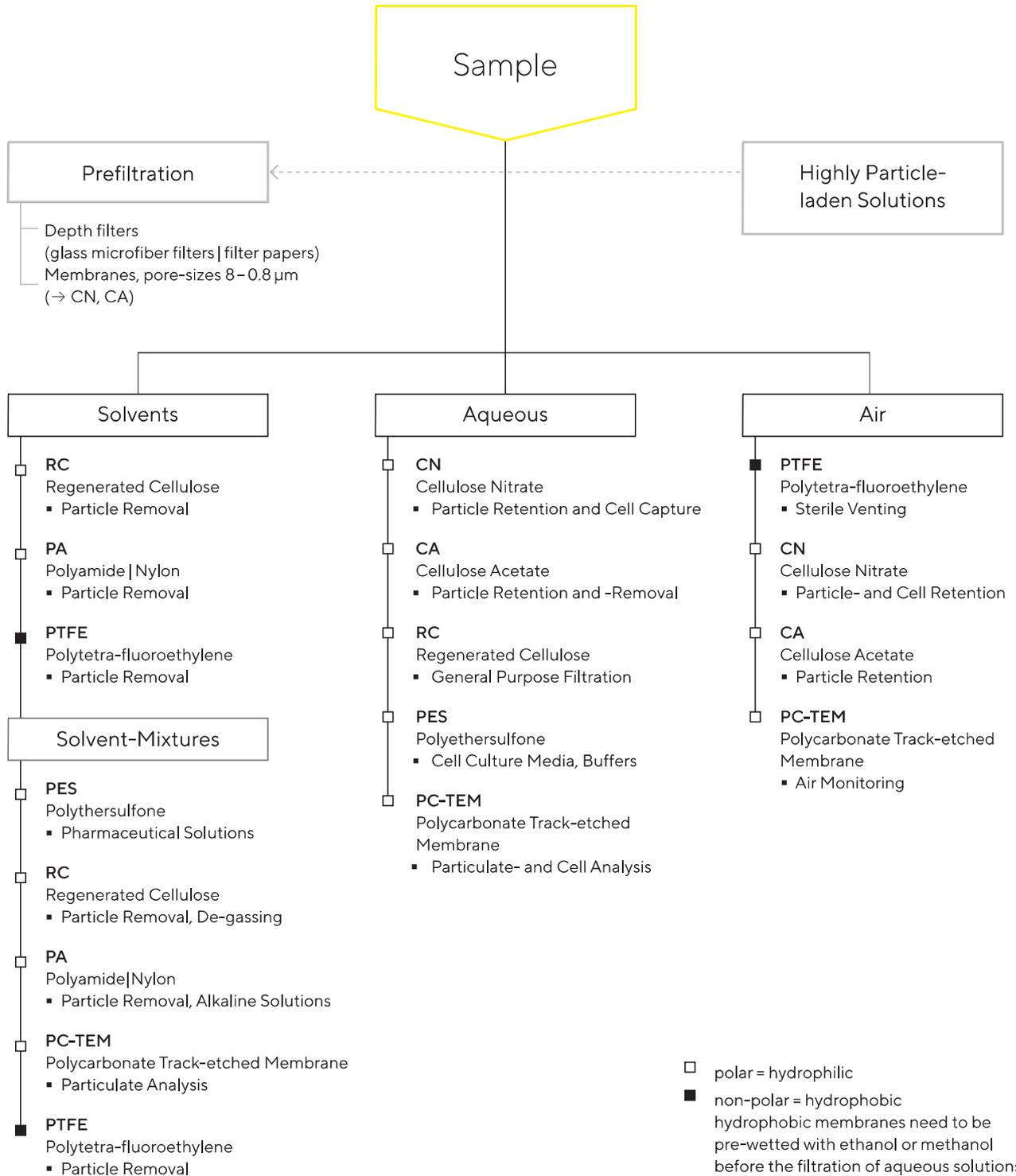
Description	Order No.
Extraction Thimble Cellulose, C300, 19 x 90 mm	FT-1201-019090
Extraction Thimble Cellulose, C300, 22 x 80 mm	FT-1201-022080
Extraction Thimble Cellulose, C300, 22 x 100 mm	FT-1201-022100
Extraction Thimble Cellulose, C300, 25 x 60 mm	FT-1201-025060
Extraction Thimble Cellulose, C300, 25 x 70 mm	FT-1201-025070
Extraction Thimble Cellulose, C300, 25 x 80 mm	FT-1201-025080
Extraction Thimble Cellulose, C300, 25 x 100 mm	FT-1201-025100
Extraction Thimble Cellulose, C300, 28 x 60 mm	FT-1201-028060
Extraction Thimble Cellulose, C300, 28 x 80 mm	FT-1201-028080
Extraction Thimble Cellulose, C300, 28 x 100 mm	FT-1201-028100
Extraction Thimble Cellulose, C300, 30 x 80 mm	FT-1201-030080
Extraction Thimble Cellulose, C300, 30 x 100 mm	FT-1201-030100
Extraction Thimble Cellulose, C300, 33 x 60 mm	FT-1201-033060
Extraction Thimble Cellulose, C300, 33 x 80 mm	FT-1201-033080
Extraction Thimble Cellulose, C300, 33 x 90 mm	FT-1201-033090
Extraction Thimble Cellulose, C300, 33 x 94 mm	FT-1201-033094
Extraction Thimble Cellulose, C300, 33 x 100 mm	FT-1201-033100
Extraction Thimble Cellulose, C300, 33 x 118 mm	FT-1201-033118
Extraction Thimble Cellulose, C300, 33 x 130 mm	FT-1201-033130
Extraction Thimble Cellulose, C300, 33 x 205 mm	FT-1201-033205
Extraction Thimble Cellulose, C300, 35 x 150 mm	FT-1201-035150
Extraction Thimble Cellulose, C300, 40 x 100 mm	FT-1201-040100
Extraction Thimble Cellulose, C300, 40 x 123 mm	FT-1201-040123

Ordering Information (continued)

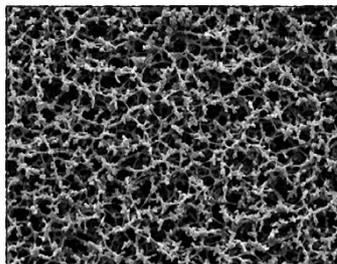


Extraction Thimble Cellulose, C300, 40 x 150 mm	FT-1201-040150
Extraction Thimble Cellulose, C300, 43 x 123 mm	FT-1201-043123
Extraction Thimble Cellulose, C300, 26 x 60 mm	FT-1201-026060
Extraction Thimble Glass Fiber, G400, 19 x 90 mm	FT-1204-019090
Extraction Thimble Glass Fiber, G400, 22 x 80 mm	FT-1204-022080
Extraction Thimble Glass Fiber, G400, 25 x 100 mm	FT-1204-025100
Extraction Thimble Glass Fiber, G400, 26 x 60 mm	FT-1204-026060
Extraction Thimble Glass Fiber, G400, 30 x 100 mm	FT-1204-030100
Extraction Thimble Glass Fiber, G400, 33 x 94 mm	FT-1204-033094
Extraction Thimble Glass Fiber, G400, 43 x 123 mm	FT-1204-043123

Membrane Filtration – Quick Selection Guide



Cellulose Nitrate (Mixed Cellulose Ester)



Cellulose nitrate membrane filters are indicated for many general laboratory applications where a membrane with a high non-specific adsorption is suitable. They are hydrophilic, have high flow rates thanks to their symmetric structure and are compatible with aqueous solutions (pH 4 to 8), hydrocarbons and several other organic solvents. The cellulose nitrate membranes are available in different pore sizes from 0.2 μm to 8 μm .

Technical Specifications and Typical Performance Characteristics

Type	Pore Size (μm)	Thickness (μm)	Bubble Point (bar)	Water Flow Rate (mL/min/cm ² /bar)	Burst Pressure (bar)
11327	0.2	130	≥ 4.4	25	≥ 0.8
11306	0.45	120	≥ 2.4	68	≥ 0.2
11305	0.65	130	≥ 2	102	≥ 0.25
11304	0.8	130	≥ 1.5	5*	≥ 0.2
11303	1.2	130	≥ 1	7*	≥ 0.2
11302	3	140	≥ 0.6	16*	≥ 0.15
11342	5	140	≥ 0.5	25*	≥ 0.15
11301	8	140	≥ 0.3	37*	≥ 0.15

*Flow rate for air [L/(m²s)]

Ordering Information

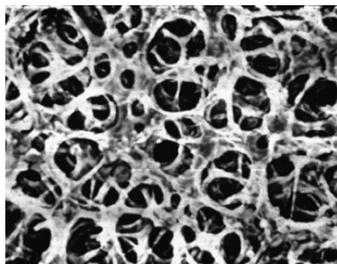


Filter Discs

Ø (mm)	0.2 µm	0.45 µm	0.65 µm	0.8 µm	1.2 µm	3 µm	5 µm	8 µm
13	11327--13-----N	11306--13-----N		11304--13-----N	11303--13-----N	11302--13-----N	11342--13-----N	11301--13-----N
20				11304--20-----N				
25	11327--25-----N	11306--25-----N	11305--25-----N	11304--25-----N	11303--25-----N	11302--25-----N	11342--25-----N	11301--25-----N
37								11301--37-----N
47	11327--47-----N	11306--47-----N	11305--47-----N	11304--47-----N	11303--47-----N	11302--47-----N	11342--47-----N	11301--47-----N
50		11306--50-----N	11305--50-----N	11304--50-----N	11303--50-----N	11302--50-----N	11342--50-----N	11301--50-----N
70								11301--70-----G
90		11306--90-----N		11304--90-----G	11303--90-----G	11302--90-----G		
100		11306--100-----N		11304--100-----G	11303--100-----G	11302--100-----G		11301--100-----N
142	11327--142-----N	11306--142-----N	11305--142-----G	11304--142-----G	11303--142-----G	11302--142-----G	11342--142-----G	11301--142-----G
				11304--142-----N	11303--142-----N		11342--142-----N	
150								11301--150-----G
293		11306--293-----G	11305--293-----G	11304--293-----G	11303--293-----G	11302--293-----G	11342--293-----G	11301--293-----G
		11306--293-----N		11304--293-----N				

G = 25 filters, N = 100 filters | Other dimensions and quantities per package are available on request

Cellulose Acetate



Cellulose acetate membranes combine high flow rates and thermal stability with very low adsorption characteristics, and are therefore excellently suited for use in pressure filtration devices. They are hydrophilic, have high flow rates thanks to their symmetric structure and are compatible with aqueous solutions (pH 4–8), oils, alcohols and other organic solvents. The 0.2 µm membrane is the filter of choice for sterile filtration of aqueous solutions, such as nutrient media, buffers and sera. The cellulose acetate membranes are available in different pore sizes from 0.2 to 5 µm.

Technical Specifications and Typical Performance Characteristics

Type	Pore Size (µm)	Thickness (µm)	Bubble Point (bar)	Water Flow Rate (mL/min/cm ² /bar)	Burst Pressure (bar)
11107	0.2	120	≥ 2.9**	24	≥ 0.8
11106	0.45	120	≥ 2.0	65	≥ 0.4
11105	0.65	120	≥ 1.3	116	≥ 0.7
11104	0.8	120	≥ 0.8	6*	≥ 0.3
12303	1.2	140	≥ 0.6	10*	≥ 0.4
12342	5	140	≥ 0.3	23	≥ 0.25

*Flow rate for air [L/(m²s)]

**with Sartochek

Ordering Information

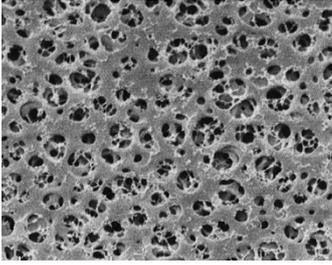


Filter Discs

Ø (mm)	0.2 µm	0.45 µm	0.65 µm	0.8 µm	1.2 µm	5 µm
13	11107--13-----N	11106--13-----N				
25	11107--25-----N	11106--25-----N	11105--25-----N	11104--25-----N	12303--25-----N	12342--25-----N
30		11106--30-----N				
37				11104--37-----N		
47	11107--47-----N	11106--47-----N	11105--47-----N	11104--47-----N	12303--47-----N	12342--47-----N
50	11107--50-----N	11106--50-----N	11105--50-----N	11104--50-----N	12303--50-----N	
85		11106--85-----N				
90	11107--90-----G	11106--90-----G	11105--90-----G	11104--90-----N		
100	11107-100-----G 11107-100-----N	11106-100-----G 11106-100-----N			12303-100-----G	
110		11106-110-----N				
142	11107-142-----G 11107-142-----N	11106-142-----G 11106-142-----N	11105-142-----G 11105-142-----N	11104-142-----G 11104-142-----N	12303-142-----G 12303-142-----N	12342-142-----G
293	11107-293-----G 11107-293-----N	11106-293-----G 11106-293-----N	11105-293-----G	11104-293-----G 11104-293-----N		

G = 25 filters, N = 100 filters | Other dimensions and quantities per package are available on request

Regenerated Cellulose



The very low adsorption membranes are hydrophilic, solvent-resistant (pH 3–12) and therefore suited for the particle removal from solvents. The membrane is reinforced with nonwoven cellulose. They are available in two pore sizes: 0.45 μm and 0.2 μm .

Technical Specifications and Typical Performance Characteristics

Type	Pore Size (μm)	Thickness (μm)	Bubble Point (bar)	Water Flow Rate (mL/min/cm ² /bar)
18407	0.2	150	≥ 4.5	16
18406	0.45	150	≥ 2.9	32

Ordering Information



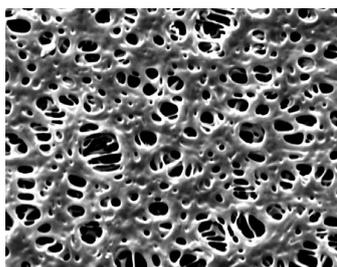
Filter Discs

\varnothing in mm	0.45 μm	0.2 μm
13	18406--13-----N	18407--13-----N
25	18406--25-----N	18407--25-----N
47	18406--47-----N	18407--47-----N
50	18406--50-----N	18407--50-----N
90	18406--90-----G	
100	18406-100-----G	18407-100-----G
142	18406-142-----G	18407-142-----G
142		18407-142-----N
293	18406-293-----G	18407-293-----G

G = 25 pieces, N = 100 pieces

Other dimensions and packaging units are available on request

Polyethersulfone



Polyethersulfone (PES) membrane filters are hydrophilic, have high flow rates, a low non-specific protein adsorption and are chemically resistant over a pH range of 1–14. They are therefore recommended for the filtration of aqueous solutions as well for protein filtration. Furthermore, the low level of extractables makes them suitable for environmental analysis.

Technical Specifications and Typical Performance Characteristics

Type	Pore Size (µm)	Thickness (µm)	Bubble Point (bar)	Water Flow Rate (mL min cm ² bar)	Burst Pressure (bar)
15458	0.1	150	≥ 2.5*	9	0.5
15407MI	0.2	150	≥ 3.2	30	0.4
15406	0.45	150	≥ 2.6	56	0.4
15404	0.8	150	≥ 1.1	125	≥ 0.2

*with isopropyl alcohol | water 60 vol% | 40 vol%

Ordering Information



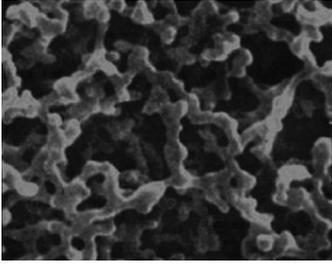
Filter Discs

Ø in mm	0.45 µm	0.2 µm	0.1 µm	0.8 µm
25	15406--25-----N	15407--25----MIN	15458--25-----N	
47	15406--47-----N	15407--47----MIN	15458--47-----N	
50	15406--50-----N	15407--50----MIN	15458--50-----N	
90		15407--90----MIK		
142	15406-142-----G	15407-142----MIG		
293		15407-293----MIG	15458-293-----G	15458-293-----G

G = 25 pieces, K = 50 pieces, N = 100 pieces

Other dimensions and packaging units are available on request

Polyamide



Polyamide membrane filters are hydrophilic and chemically resistant to alkaline solutions and organic solvents. They are therefore recommended for the particle removal from aqueous solutions and solvents for analytical determination such as HPLC, for the sterile filtration of these liquids as well as for applications where a membrane with a relatively high non-specific adsorption is suitable.

Technical Specifications and Typical Performance Characteristics

Type	Pore Size (µm)	Thickness (µm)	Bubble Point (bar)	Water Flow Rate (mL/min/cm ² /bar)	Burst Pressure (bar)
25007	0.2	110	3.3	24	≥ 0.25
25006	0.45	110	≥ 2.3	46	≥ 0.23

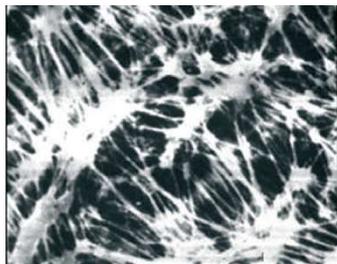
Ordering Information



Ø in mm	0.45 µm	0.2 µm
13	25006--13-----N	25007--13-----N
25	25006--25-----N	25007--25-----N
47	25006--47-----N	25007--47-----N
50	25006--50-----N	25007--50-----N
90	25006--90-----G	25007--90-----G
142	25006-142-----N	25007-142-----N
293	25006-293-----N	25007-293-----N

G = 25 pieces, N = 100 pieces
Other dimensions and packaging units are available on request

Hydrophobic PTFE



The main application of these membrane filters is the filtration of air, gases or chemicals. They are made of PTFE (polytetra-fluorethylene) only and are therefore permanently hydrophobic. Unlike other (hydrophilic) filter types, they are not wetted by air humidity, allowing unhindered passage of air at low differential pressures as well. PTFE membrane filters have an excellent chemical compatibility (pH 1 to 14), so that they are also used for the filtration of solvents and acids, to which other filter types are not resistant. Due to their hydrophobic characteristics, they must be pre-wetted with ethanol or methanol before the filtration of aqueous media.

Technical Specifications and Typical Performance Characteristics

Type	Pore Size (µm)	Thickness (µm)	Bubble Point with Isopropylalcohol [bar], visual	Isopropanol Flow Rate (mL/min/cm ² /bar)
11807	0.2	60	≥ 1.2	9
11806	0.45	80	≥ 0.9	20
11803	1.2	100		86
11842	5	100		250

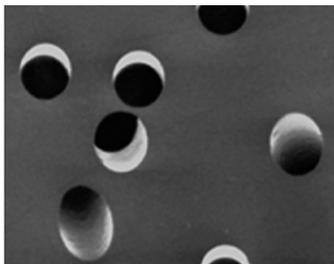
Ordering Information

Filter Discs

Ø in mm	1.2 µm	0.45 µm	0.2 µm	5 µm
13	11803--13-----N	11806--13-----N	11807--13-----N	
25	11803--25-----N	11806--25-----N	11807--25-----N	11842--25-----N
37	11803--37-----N	11806--37-----N		
42				11842--42-----N
47	11803--47-----N	11806--47-----N	11807--47-----N	11842--47-----N
50	11803--50-----N	11806--50-----N	11807--50-----N	11842--50-----N
90	11803--90-----G	11806--90-----G	11807--90-----G	
100	11803-100-----G	11806-100-----G	11807-100-----G	11842-100-----G
142	11803-142-----G	11806-142-----G	11807-142-----G	11842-142-----G
293	11803-293-----G	11806-293-----G	11807-293-----G	11842-293-----G

G = 25 pieces, K = 50 pieces, N = 100 pieces
Other dimensions and packaging units are available on request

Polycarbonate Track-Etched



Those white and hydrophilic polycarbonate track-etched filters are manufactured from high grade polycarbonate film using track-etch technology. Their capillary pore structure is uniform and precise, with a narrow pore size distribution to retain particles on their surface. Track-etched filters are an excellent choice for accurate fractionation of particulates because of their precise pore size. Track-etch technology offers the user distinct performance advantages when excellent surface capture and high sample visibility are required. Their main applications are particulate analysis, epifluorescence microscopy, fluid clarification, cytology, cell biology, bioassays, water microbiology and environmental analysis.

Technical Specifications and Typical Performance Characteristics

Type	Pore Size (µm)	Thickness (µm)	Bubble Point (bar)	Water Flow Rate (mL/min/cm ² /0.7 bar)	Burst Pressure (bar)
23058	0.1	25	≥ 7.0	≥ 0.5	≥ 0.7
23007	0.2	25	≥ 3.5	≥ 10	≥ 0.7
23006	0.4	25	≥ 2.0	≥ 30	≥ 0.7
23004	0.8	25	≥ 0.6	≥ 40	≥ 0.7
23A42	5	11	N/A	50*	N/A
23015	15	37	N/A	100*	N/A

*Flow rate for air [L/(m²s 0.7 bar)]

Ordering Information



Filter Discs, 100 Pieces

Ø in mm	0.8 µm	0.4 µm	0.2 µm	0.1 µm
25	23004--25-----N	23006--25-----N	23007--25-----N	23058--25-----N
47		23006--47-----N	23007--47-----N	23058--47-----N
50			23007--50-----N	

Other dimensions and packaging units are available on request

Blotting | Chromatography Papers



These papers are made of cotton linters only with α -cellulose content of $> 98\%$. These highly pure papers are not only ideal for blotting and chromatography, but also for a wide range of absorption applications like those common in the life sciences and diagnostics. Below you will find an overview of the most commonly used grades.

Typical Performance Characteristics

Grade	Weight (g/m ²)	Thickness (mm)	Capillary Rise (mm/30 min)	Capillary Rise (mm/10 min)	Properties
FN 4	125	0.24	95		Chromatography paper, ash content $< 0.04\%$
FN 7	150	0.32	145		Chromatography paper, ash content $< 0.04\%$
FN 30	320	0.90	240		Chromatography paper, ash content $< 0.04\%$, paper for antibiotic test strips
FN 100	195	0.35	115	70	The most commonly used chromatography and blotting paper
BF 3	330	0.76	30	130	Blotting paper to increase and maintain the transport of liquids

Ordering Information



Sheets in 580 × 600 mm

Grade FN 4 (100 Sheets)	Grade FN 7 (50 Sheets)	Grade FN 30 (25 Sheets)	Grade FN 100 (50 Sheets)	Grade BF 3 (50 Sheets)
FT-2-504-580600N	FT-2-507-580600K	FT-2-526-580600G	FT-2-527-580600K	FT-2-520-580600K

Other dimensions and packaging units are available on request

Nitrocellulose Membrane for Blotting

Sartorius nitrocellulose membranes are available in two pore sizes, 0.22 μm and 0.45 μm . Both versions combine the advantages of high protein binding capacity with low background and high membrane stability, which ensures easy handling. Due to its large surface area, the 0.22 μm membrane version is recommended for small proteins. Sartorius blotting membranes are ideal for western blotting, DNA blotting as well as dot or slot blots. They have been optimized for all protein blotting systems, such as electrotransfer, semi-dry or simple capillary blotting.

Typical Values

	0.22 μm	0.45 μm
Material	Cellulose nitrate	Cellulose nitrate
Thickness	130 μm	130 μm
Water flow rate	27 mL/(min. cm^2 bar)	70 mL/(min. cm^2 bar)
Bubble point	4.4 bar	2.4 bar
Wettability in water	≤ 1 s	≤ 1 s
Extractable content in water	$\leq 1\%$	$\leq 1\%$
Burst pressure	0.8 bar	0.2 bar
Binding capacity for IgG	200 $\mu\text{g}/\text{cm}^2$	200 $\mu\text{g}/\text{cm}^2$

Ordering Information

	Roll Size	Order No.
NC 0.22 μm	30 cm \times 3 m	11327-----41BL
NC 0.45 μm	30 cm \times 3 m	11306-----41BL

All indicated data to be understood as typical average values



Re-usable 13 mm Syringe Filter Holders

For the Ultracleaning of Small Volumes Up to About 10 mL

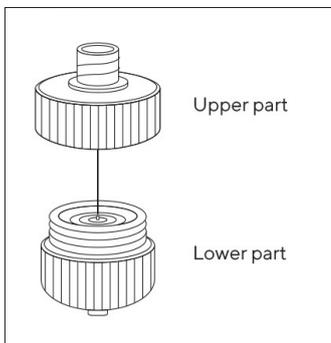


PTFE Holder for Solvents and Chemicals

Made completely of PTFE, this holder is unaffected by chemicals and contains no trace elements which could be released into the liquid being filtered. It is therefore extremely well suited for particle removal from samples and reagents for analytical methods, such as NMR samples. Other benefits of this application are the low hold-up volume, the easy cleaning and the drying at a temperature of 180 °C. The construction of the holder ensures leak proof sealing without a sealing ring, and avoids twisting of the membrane filter when the top is tightened onto the base.

Specifications

Connectors	Female Luer Lock inlet, luer slip outlet
Chemical compatibility	As for PTFE
Filtration area	0.5 cm ²
Materials	PTFE top and bottom parts
Max. operating pressure	5 bar 500 kPa 72.5 psi
Membrane filter Ø	13 mm
Sterilization	By autoclaving (max. 134 °C) or by dry heat (max. 180 °C)
Hold-up volume	Less than 0.03 mL after overcoming the bubble point (0.3 mL before)



Ordering Information

Description	Order No.
13 mm PTFE Syringe Filter Holder	16574



Polycarbonate Holder for Aqueous Solutions

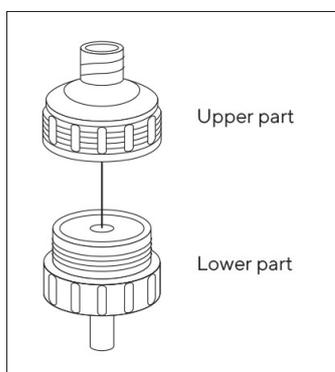
This inexpensive filter holder is made of clear, autoclavable polycarbonate. The silicone gasket enables a leak-free filtration at pressures of up to 7 bar by simply screwing it together manually. Filter supports in the top and bottom parts allow filtration in either direction.

Specifications

Connectors	Female Luer Lock inlet, luer slip outlet
Chemical compatibility	As for polycarbonate and silicone
Filtration area	0.5 cm ²
Materials	Polycarbonate top and bottom part, silicone gasket
Max. operating pressure	7 bar 700 kPa 101.5 psi
Membrane filter Ø	13 mm
Sterilization	By autoclaving at 121°C
Hold-up volume	Less than 0.2 mL after overcoming the bubble point (0.3 mL before)

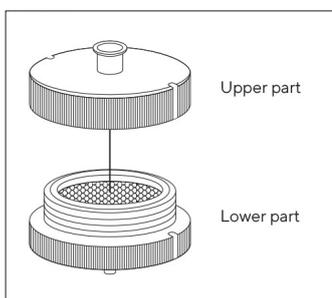
Ordering Information

Description	Order No.
13 mm Polycarbonate Syringe Filter Holder	16514-----E



Re-usable 25 mm Syringe Filter Holders

For the Ultracleaning and Sterilizing Filtration of Volumes of Up to About 100 mL



Stainless Steel Holder for Solvents and Chemicals

Made of stainless steel, this holder is heat-resistant, and the chemical compatibility depends only on the inserted filter type. The top part can easily be mounted on the bottom part using the enclosed tightening tool. Filter supports in the top and bottom parts allow filtration in either direction.

Specifications

Connectors	Female Luer Lock inlet, luer slip outlet
Chemical compatibility	As for stainless steel
Filtration area	3 cm ²
Materials	Stainless steel (1.4305) top and bottom parts
Max. operating pressure	7 bar 700 kPa 101.5 psi
Membrane filter Ø	25 mm
Sterilization	By autoclaving (max. 134°C) or by dry heat (max. 180°C)
Hold-up volume	Less than 0.1 mL after overcoming the bubble point (0.3 mL before)

Ordering Information

Description	Order No.
25 mm Stainless Steel Holder	16214
Tightening tool, Polyman 24/5	6980595



Polycarbonate Holder for Aqueous Solutions

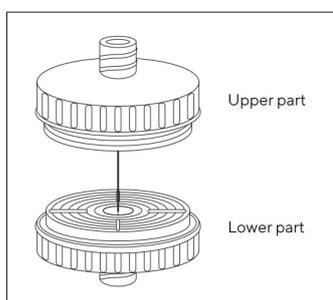
This inexpensive filter holder is made of clear, autoclavable polycarbonate. The silicone gasket enables a leak-free filtration at pressures of up to 7 bar by simply screwing it together manually. Filter supports in the top and bottom parts allow filtration in either direction.

Specifications

Connectors	Female Luer Lock inlet, luer slip outlet
Chemical compatibility	As for polycarbonate and silicone
Filtration area	3 cm ²
Materials	Polycarbonate top and bottom parts, silicone gasket
Max. operating pressure	7 bar 700 kPa 101.5 psi
Membrane filter Ø	25 mm
Sterilization	By autoclaving at 121 °C
Hold-up volume	Less than 0.3 mL after overcoming the bubble point (0.6 mL before)

Ordering Information

Description	Order No.
25 mm Polycarbonate Syringe Filter Holder, pack of 12	16517-----E
Silicone gasket, 20.5×26.5×0.5 mm, pack of 10	6980570



25 mm Glass Vacuum Filter Holder

For Hybridization Tests, Particle Testing and Clarification



This filter holder is available in two versions differing from each other only in the type of the filter support. The filter with glass frit ensures uniform distribution of retained particles and is therefore recommended when the residue on the filter surface is of interest. Because it is easy to clean, the device with the PTFE-coated screen support is preferable when the filtrate is required, or when liquids difficult to remove from glass frits must be examined.

The PTFE ring, which holds the glass frit and the screen support, allows for the autoclaving of the devices with a filter in position and protects the edge of the glass frit from breakage and potential leakage. It has a rim around the upper edge to simplify the positioning of the membrane filter when inserted and a silicone O-ring in the underside for a leak-proof seal on the filtrate side. The funnel-shaped top part simplifies filling in the sample.

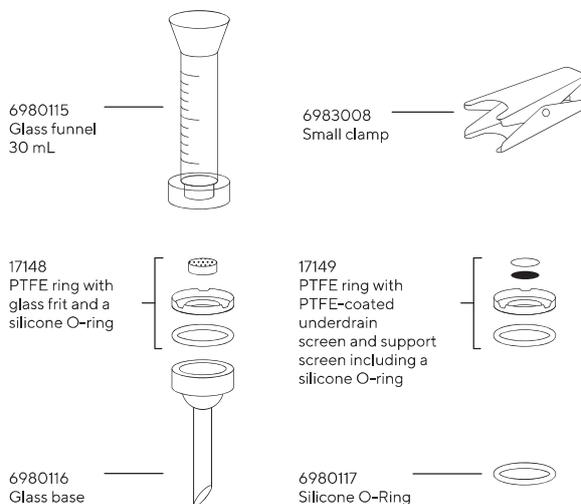
Specifications

Outlet spout	12 mm Ø
Parts and materials	Borosilicate glass funnel and base PTFE glass filter support (type 16306) or PTFE stainless steel filter support, coated with PTFE (type 16315) Silicone O-ring 25 × 3 mm Anodized Aluminium clamp
Chemical compatibility	As for glass, PTFE and silicone. The silicone O-ring can be replaced by a fluoroelastomer O-ring (order no. 00118)
Funnel capacity	30 mL
Filtration area	3 cm ²
Max. operating pressure	Only for vacuum
Suitable membrane filter Ø	25 mm (or 24 mm)
Sterilization	By autoclaving (max. 134 °C) or by dry heat (max. 180 °C)

Ordering Information

Description	Order No.
Glass vacuum filtration holder for 25 mm (or 24 mm) membrane filter, with glass frit filter support	16306
Glass vacuum filtration holder for 25 mm (or 24 mm) membrane filter, with PTFE-coated screen filter support	16315

Replacement parts are shown in the diagram.



Note: PTFE rings in sets 17148 and 17149 have different dimensions and are not interchangeable.

50 mm Glass Vacuum Filter Holder

For Particle Testing or Clarification and Sterile Filtration

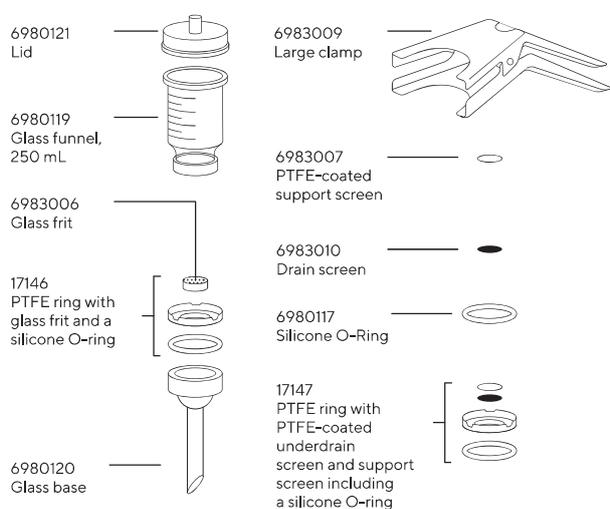


This filter holder is available in two versions differing from each other only in the type of the filter support. The device with glass frit ensures uniform distribution of retained particles and is therefore recommended, when the residue on the filter surface is of interest. Because it is easy to clean, the device with the PTFE-coated screen support is preferable when the filtrate is required, or when liquids difficult to remove from glass frits must be examined.

The PTFE ring, which holds the glass frit and the screen support, allows the autoclaving of the devices with a filter in position and protects the edge of the glass frit from breakage and potential leakage. It has a rim around the upper edge to simplify the positioning of the membrane filter when inserted and a silicone O-ring in the underside for a leak-proof seal on the filtrate side.

Specifications

Outlet spout	15 mm Ø
Parts and materials	Borosilicate glass funnel and base Silicone caoutchouc lid PTFE glass filter support (type 16307) or PTFE stainless steel filter support, coated with PTFE (type 16316) Silicone O-ring 45×3 mm Anodized Aluminium clamp
Chemical compatibility	As for glass, PTFE and silicone. The silicone O-ring can be replaced by a fluoroelastomer O-ring (order no. 00124).
Funnel capacity	250 mL
Filtration area	12.5 cm ²
Max. operating pressure	Only for vacuum
Suitable membrane filter Ø	50 mm (or 47 mm)
Sterilization	By autoclaving (max. 134 °C) or by dry heat (max. 180 °C)



Note: PTFE rings in sets 17146 and 17147 have different dimensions and are not interchangeable.

Ordering Information

Description	Order No.
Glass vacuum filtration holder for 50 mm (or 47 mm) membrane filter, with glass frit filter support	16307
Glass vacuum filtration holder for 50 mm (or 47 mm) membrane filter, with PTFE-coated screen filter support	16316

Replacement parts are shown in the diagram.

All-Glass Vacuum Filter Holder

For Analytical Determinations, Particle Removal from Solvents

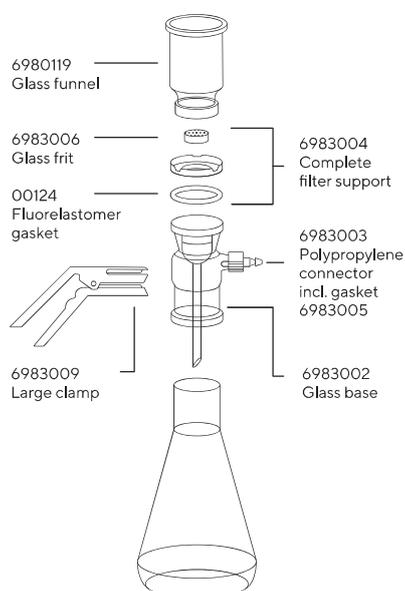


All areas, where liquid and device can come into direct contact, are made of glass or PTFE. The device, in combination with solvent-resistant, hydrophilic RC-membranes, is therefore ideal for ultracleaning and degassing solvents and solvent mixtures for HPLC, GC and AA.

Convenience of handling is ensured by several beneficial features. A 6 mm wide non-ground rim above the ground glass neck of the suction flask prevents the filtrate from contacting grease on the ground glass surface and so avoids its contamination while being poured out of the flask. The hose nipple connector is made of polypropylene for safe connection of the vacuum hose. The filtrate outlet spout ends well below the entrance to this hose nipple.

Specifications

Outlet spout	15 mm Ø
Parts and materials	Borosilicate glass funnel, base and flask, sintered glass frit in a PTFE ring and fluoroelastomer O-ring (45 × 3 mm) underneath, anodized aluminium clamp
Chemical compatibility	As for glass and PTFE
Funnel capacity	250 mL
Bottle capacity	1 L
Filtration area	12.5 cm ²
Max. operating pressure	Only for vacuum
Suitable membrane filter Ø	50 mm (or 47 mm), 40 or 42 mm prefilter
Sterilization	By autoclaving (max. 134°C) or by dry heat (max. 180°C)



Ordering Information

Description	Order No.
All-glass vacuum filter holder for 50 mm (or 47 mm) membrane filter, with vacuum-resistant flask, capacity 1 liter	16309

Replacement parts are shown in the diagram.

Polycarbonate In-Line Filter Holder

For the Filtration of Liter Volumes of Aqueous Solutions

This holder is made of stable, autoclavable polycarbonate. This practical holder is suitable for many simple laboratory filtrations. It can be connected to a peristaltic pump or a pressure container. The bell-shaped base protects the filtrate from repeated contamination while flowing in a receiver.

The holder is characterized by an excellent resistance to pressure and density setting by simple hand-tightening. The transparent top part allows the visual control of the correct fit of the O-ring. The hose nipples can be replaced by luer connectors to use it as a large area syringe filter holder.

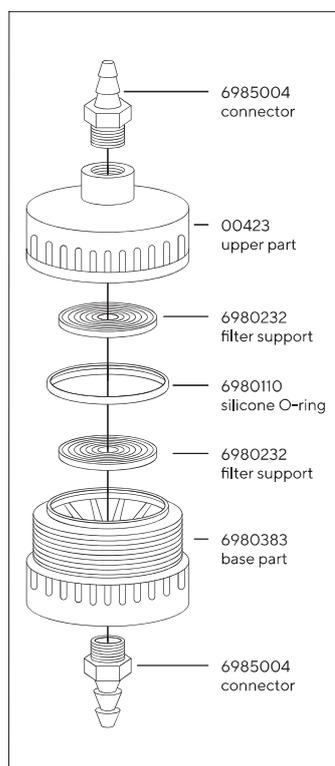
Specifications

Chemical compatibility	As for polycarbonate, polypropylene and silicone
Filtration area	12.5 cm ²
Weight	83 g
Connectors	M 12x1 male thread to hose barb DN10
Materials	Polycarbonate top part, base part and hose nipple, polypropylene filter support, silicone O-ring (40 x 5 mm)
Max. operating pressure	7 bar 700 kPa 101.5 psi
Suitable membrane filter Ø	50 mm (40 or 42 mm prefilter)
Sterilization	By autoclaving at 121 °C The material withstands repeated cycles, provided aggressive cleaning agents are completely washed off and that the boiler water does not contain anti-corrosive or anti-scaling additives.

Ordering Information

Description	Order No.
Polycarbonate in-line filter holder for 50 mm membrane filter, pack of 5.	16508-----B

Replacement parts are shown in the diagram.



25 mm Stainless Steel Filter Holder

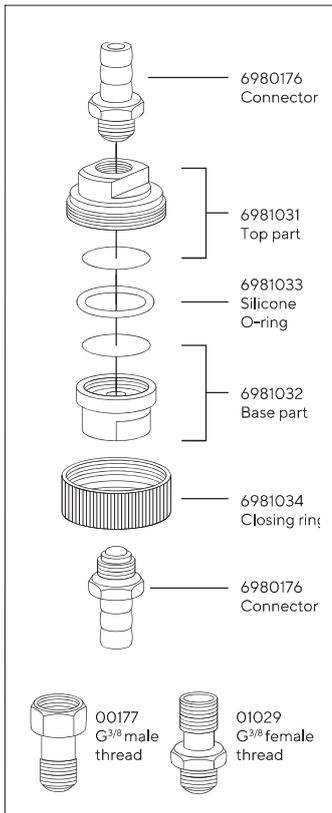
For In-Line Filtration



The G $\frac{1}{4}$ connection threads with density barrel, guarantee leak-proof sealing of the hose nipple and the holder without sealing rings. Other connectors, available as accessories, fit the holder onto reducing valves or pumps with G $\frac{3}{8}$ female thread (order no. 01029) or onto pressure tanks with G $\frac{3}{8}$ male thread (order no. 00177).

Specifications

Connectors	M 12x1 male thread to hose barb DN10
Filtration area	3 cm ²
Weight	ca. 170g
Materials	Stainless steel, except silicone O-ring (21 x 2 mm) and aluminium closing ring
Max. operating pressure	5 bar 500 kPa 72.5 psi
Suitable membrane filter	25 mm (20 mm prefilter for the filtration of liquids only)
Sterilization	By autoclaving (max. 134 °C) or by dry heat (max. 180 °C)



Ordering Information

Description	Order No.
Stainless steel pressure filter holder for 25 mm Ø membrane filter.	16251

Replacement parts are shown in the diagram.

47 mm Stainless Steel Filter Holder

For In-Line Filtration

The filter holder is suitable for a pressure of up to 20 bar. The inlet side valve is convenient for the intermittent run-off of waste water. Other connectors, available as accessories, fit the holder onto reducing valves or pumps with G $\frac{3}{8}$ female thread (order no. 17089) or onto pressure tanks with G $\frac{3}{8}$ male thread (order no. 17069) or on taps with G $\frac{3}{4}$ male thread (order no. 17068).

Specifications

Connectors	M 12x1 male thread to hose barb DN10
Filtration area	13 cm ²
Weight	ca. 490 g
Materials	Stainless steel, except silicone O-ring (42 x 3 mm), PTFE and fluoroelastomer valve seals
Max. operating pressure	20 bar 2,000 kPa 290 psi
Suitable membrane filter	47 mm (40 or 42 mm prefilter)
Sterilization	By autoclaving (max. 134 °C) or by dry heat (max. 180 °C)

Ordering Information

Description	Order No.
Stainless steel filter holder for 47 mm membrane filter (with adapter M12 x 1 male thread to hose barb DN10, Mat. 316, ref. 6980801) – Replacement parts are shown in the diagram	16254
Stainless steel filter holder for 47 mm membrane filter (with adapter M12 x 1 male thread to hose barb DN 4 to 5, Mat. 316, ref. 6981132)	16278
Stainless steel back pressure screen	6980721-----1
Stainless steel filter support screen	6980180-----1
Stainless steel underdrain screen	00181
Stainless steel connector M12 x 1 male thread to hose barb DN 4-5	6981132
Adapter Quick connect nipple length 60 mm male part to male thread M12 x 1, Mat 316	17090-----1

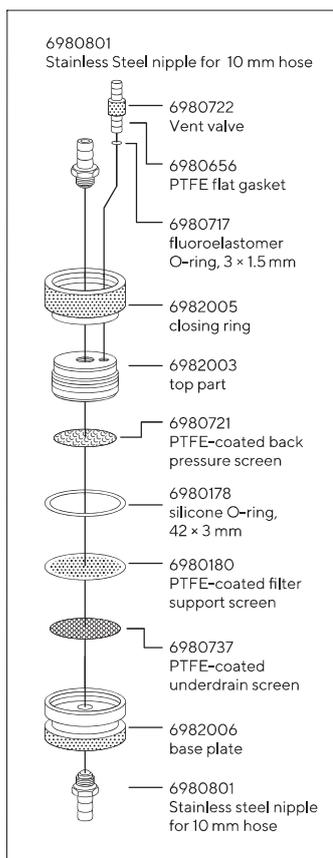


Diagram for 16254

Stainless Steel Pressure Filter Holder

For the Filtration of Up to 5 L Volumes

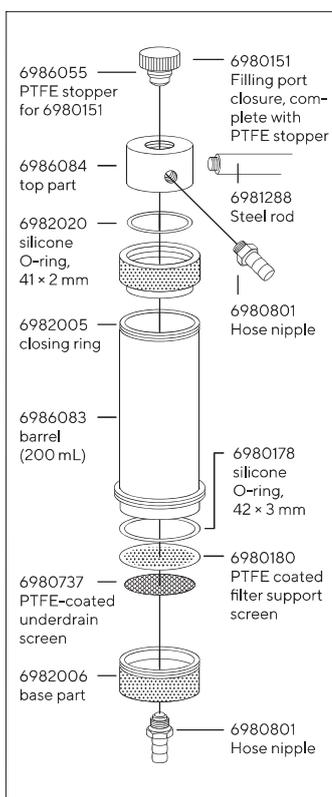


A practical filter holder for many laboratory filtrations. It can be attached to a tripod with the help of a steel rod which can be screwed in. The hose nipple is screwed into the side of the top part, leaving room for a large filling opening. This makes pouring in the sample easier, and the sample can be refilled without removing the tube connection to the pressure source.

Leak-proof sealing is achieved by hand-tightening the closing ring. For the filtration of small volumes (up to about 200 mL of soil samples or viscous liquids, such as oils), the holder is connected directly to a pressure source. For the filtration of up to 5 L volumes of relatively easily filterable liquids (e.g. buffer solutions, solutions for cell counters and tissue culture solutions), it is used in combination with a pressure tank.

Specifications

Chemical compatibility	As for stainless steel, PTFE and silicone. If required, the silicone O-ring in the filter support can be replaced by a fluoroelastomer O-ring 00179 or a PTFE O-ring 17038 (by reducing the max. operating pressure to 4 bar 58 psi); the silicone O-ring in the top part can be replaced by a fluoroelastomer O-ring 17145.
Filtration area	13 cm ²
Weight	960 g
Connectors	M 12x1 male thread to hose barb DN10
Materials	Top part, barrel, base part, corrugated iron, closing ring, closure cap, back pressure screen and stainless steel hose nipples 1.4401 (AISI 316), PTFE-coated stainless steel filter support, silicone O-rings, 41 × 2 mm (top part) and 42 × 3 mm (filter support), PTFE-sealing (cap).
Max. operating pressure	10 bar 1,000 kPa 145 psi
Suitable membrane filter Ø	47 mm (40 or 42 mm prefilter)
Sterilization	By autoclaving (max 134 °C) or by dry heat (180 °C)



Ordering Information

Description	Order No.
Stainless steel pressure filter holder	16249
Stainless steel pressure filter holder with double jacket	16249-----3

Replacement Parts

Description	Order No.
Fluoroelastomer O-ring, 42 × 3 mm	00179
PTFE O-ring, 42 × 3 mm	17038
Fluoroelastomer O-ring for upper part, 41 × 2 mm	17145

Other replacement parts are shown in the diagram or on page 138.

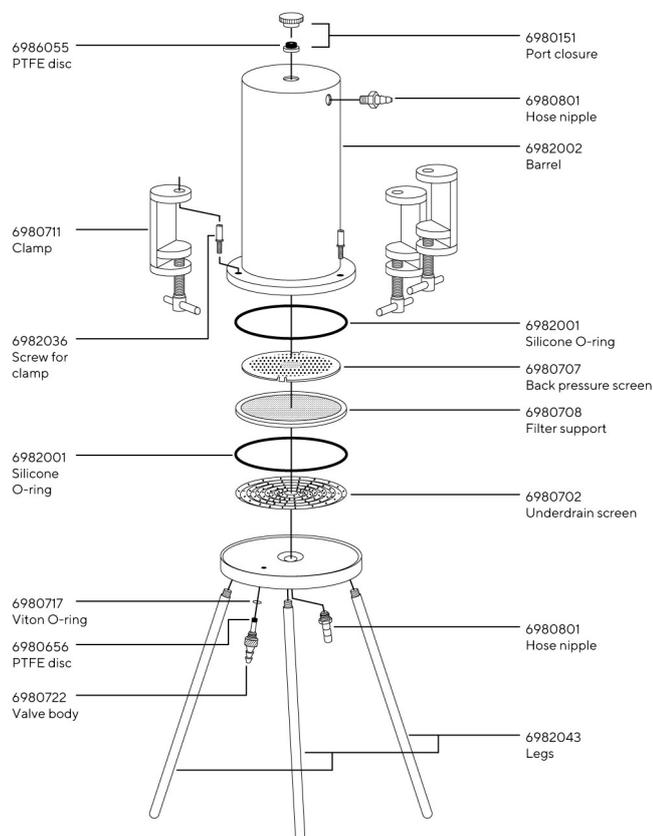
Large Stainless Steel Pressure Filter Holder

This holder is widely used in laboratories for particle removal and for sterile filtration of several liters of volume and can hold filter discs up to a diameter of 142 mm. It has a stable construction and is easy to operate. In addition, this filter holder has an integrated funnel with a capacity of 2 liters, eliminating the need for an additional pressure vessel. The large filtration area of 130 cm² ensures a high flow rate for the total filter volume.

Specifications

Stainless steel pressure filter holder (142 mm, 2000 mL)

Connectors	M 12x1 male thread to hose barb DN10
Filtration area	130 cm ²
Capacity	2000 mL
Weight	12 kg
Materials	Stainless steel 1.4401, except silicone O-ring (280 mm × 4 mm)
Max. operating pressure	7 bar
Suitable membrane filter Ø	142 mm (130 mm prefilter)
Sterilization	By autoclaving (max. 134 °C) or by dry heat (max. 180 °C)



Large Stainless Steel In-Line Filter Holder

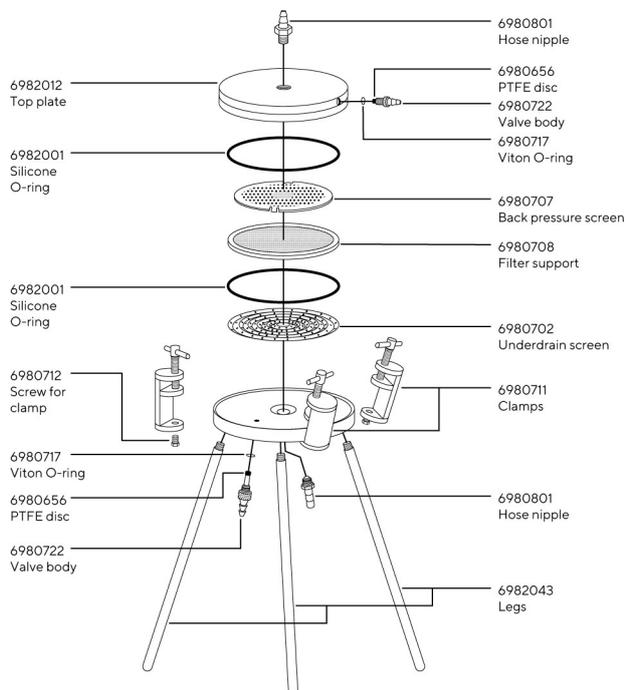


This holder is widely used in laboratories for particle removal and for sterile filtration of several liters of volume and can hold filter discs up to a diameter of 142 mm. This in-line filter is installed directly in the fluid flow path, making it easy to integrate into your filtration system. The supplied unscrewable hose nipples can be replaced by G3/8 connectors, if systems with particularly practical handling are required.

Specifications

Stainless steel in-line filter holder (142 mm)

Connectors	M 12x1 male thread to hose barb DN10
Filtration area	130 cm ²
Weight	6 kg
Materials	Stainless steel 1.4401, except silicone O-ring (280 mm × 4 mm)
Max. operating pressure	7 bar
Suitable membrane filter Ø	142 mm (130 mm prefilter)
Sterilization	By autoclaving (max. 134 °C) or by dry heat (max. 180 °C)



Ordering Information

Description	Order No.
Stainless steel pressure filter holder, 142 mm, 2000 mL	16274
Stainless steel in-line filter holder, 142 mm	16275
O-Ring EPDM 130.00 × 4.00 mm	6982071
O-Ring Fluoroelastomer 130.00 × 4.00 mm	6982070
Back pressure screen uncoated, Mat 316	6982017
Support screen uncoated, Mat 316	6982018

Large Stainless Steel In-Line Filter Holder



This holder is widely used in laboratories for particle removal and for sterile filtration of several liters of volume and can hold filter discs up to a diameter of 293 mm. It is supplied with a Tri Clamp (TC) connection, which is widely used in industries with stringent hygiene requirements because it is easy to clean and maintain. This in-line filter is installed directly in the fluid flow path, making it easy to integrate into your filtration system.

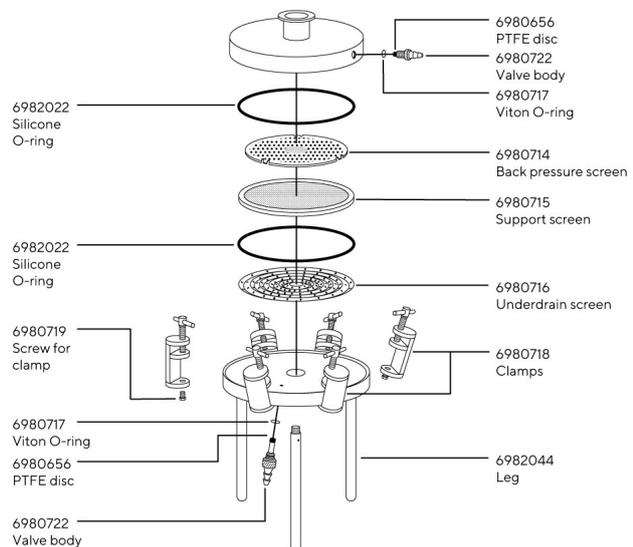
Specifications

Stainless steel in-line filter holder (293 mm)

Connectors	TC 50.5
Filtration area	560 cm ²
Weight	12 kg
Materials	Stainless steel 1.4401, except silicone O-ring (280 mm × 4 mm)
Max. operating pressure	5 bar
Suitable membrane filter Ø	293 mm (279 mm prefilter)
Sterilization	By autoclaving (max. 134 °C) or by dry heat (max. 180 °C)

Ordering Information

Description	Order No.
Stainless steel in-line filter holder, 142 mm	16276
Stainless steel in-line filter holder, 293 mm	16277
O-Ring EPDM 130.00 × 4.00 mm	6982071
O-Ring Fluoroelastomer 130.00 × 4.00 mm	6982070
Back pressure screen uncoated, Mat 316	6982017
Support screen uncoated, Mat 316	6982018
O-Ring EPDM 280.00 × 4.00 mm	6982077
O-Ring Fluoroelastomer 280.00 × 4.00 mm	6982078
Back pressure screen uncoated, Mat 316	6982027
Support screen uncoated, Mat 316	6980653



Combisart® Kits



The stainless steel manifold provides robust support, while the glass filter holder delivers unmatched clarity – together, they redefine the filtration experience. Made of high-grade stainless steel (B.S. 304S31 | AISI 304); the Combisart® accommodates any type of vacuum funnel. Stainless steel three-way valves allow the vacuum for each filter holder to be sterilely vented. The low height of the manifold ports is particularly advantageous for working on a clean bench.

The top and bottom part of the glass filter holders are easily and securely fastened together using the metal clamp. The centering rim on the filter support ensures correct positioning of the membrane filter.

The reusable and practical filter holder is made of autoclavable plastic and, thus, ideal for microbiological and analytical testing outside the laboratory

Technical Specifications

Combisart®	
Dimensions (L H D)	435 mm 103 mm 120 mm
Max. Operating Pressure	Vacuum or max. 2 bar (29 psi) pressure
Inlets	TR 20 x 2 female threads
Outlets	Hose Nipple DN 10
Sterilization	By autoclaving (134 Grad Celsius max) By dry heat (180 Grad Celsius max)
Adapters	
Material	Base – AISI 304 stainless steel Stopper – Silicone
Max. operating pressure	Vacuum only
Sterilization	By autoclaving (134 Grad Celsius max) By dry heat (180 Grad Celsius max)
Outlet	TR 20 + 2 mm male thread
Glass Filter Holder 30 mL	
Base outlet	12 mm diameter
Parts and materials	Borosilicate glass funnel and base PTFE glass filter support (16306) or PTFE stainless steel filter support, coated with PTFE (16315) Silicone O-ring 45 x 3 mm Anodized aluminum clamp
Chemical Compatibility	Same as glass, PTFE and silicone Silicone O-ring can be replaced by a fluorelastomer O-ring (00118)
Outlet	TR 20 + 2 mm male thread
Funnel capacity	30 mL
Max. operating pressure	Only for vacuum
Filtration area	3 cm ²
Suitable membrane filter diameter	25 mm
Sterilization	By autoclaving (134 Grad Celsius max) By dry heat (180 Grad Celsius max)



Technical Specifications (continued)

Glass Filter Holder 250 mL	
Base outlet	15 mm diameter
Parts and materials	Borosilicate glass funnel and base Silicone rubber lid PTFE glass filter support (16307) or PTFE stainless steel filter support, coated with PTFE (16316) Silicone O-ring 45 x 3 mm Anodized aluminum clamp
Chemical Compatibility	Same as glass, PTFE and silicone Silicone O-ring can be replaced by a fluorelastomer O-ring (00124)
Funnel capacity	250 mL
Max. operating pressure	Only for vacuum
Filtration area	12.5 cm ²
Suitable membrane filter diameter	47 mm 50 mm
Sterilization	By autoclaving (134 Grad Celsius max) By dry heat (180 Grad Celsius max)
Polycarbonate Filter Holder	
Material	Polycarbonate housing Polypropylene filter support Silicone O-ring 40 x 5 mm
Capacity	250 mL
Suitable membrane filter diameter	47 mm
Filtration area	12.5 cm ²
Max operating pressure	Vacuum or 2 bar (29 psi) pressure max.
Sterilization	By autoclaving (121 Grad Celsius max.)
Outlet	TR 20 x 2 mm male thread

Ordering Information

Description	Order No.
Combisart® Kit with three glass filter holders, 30 mL	16842-KIT-01
Combisart® Kit with three glass filter holders, 30 mL and PTFE coated filter support	16842-KIT-02
Combisart® Kit with three glass filter holders, 250 mL	16842-KIT-03
Combisart® Kit with three glass filter holders, 250 mL and PTFE coated filter support	16842-KIT-04
Combisart® Kit with three polycarbonate filter holders, 250 mL	16842-KIT-05



Accessories and Replacement Parts

Order No.	Units	Description
17575-----ACK	50	Minisart® SRP25, sterile filter for venting, 0.2 µm, individually sterile packaged, can be autoclaved 5 times
17012-----E	12	Plug Luer Lock, to close the Minisart® inlet, if sterile venting is not required
6980225	10	Plug, conical, to close the venting hole beside 3-way-valve, if sterile venting is not required
6980235	3	Silicone O-ring for manifold female threads
16306	1	Glass filter holder 30 ml / 25 mm membrane filter with glass frit filter support
16307	1	Glass filter holder 250 ml / 47 mm or 50 mm membrane filter, with glass frit filter support
16315	1	Glass filter holder 30 ml / 25 mm membrane filter with PTFE-coated screen filter support
16316	1	Glass filter holder 250 ml / 47 mm or 50 mm membrane filter with PTFE-coated screen filter support
16836	1	Adapter with 11 mm opening in stopper. Applicable for 16306 and 16315 glass filter holder
00280	1	Replacement stopper for 16836
16837	1	Adapter with 14 mm opening in stopper. Applicable for 16307 and 16316 glass filter holder
00281	1	Replacement stopper for 16837
16511	1	Polycarbonate Filter 16511 Holder 250 ml / 47 mm membrane filter



Filter Papers

for the Laboratory
and Industry

Simplifying Progress

SARTORIUS



Table of Contents

Filter papers – An Introduction	4	Chromatography Papers	23
Product Overview	5	Blotting Papers	24
Ash-free Filter Papers		Blotting Membranes	25
for Quantitative and Gravimetric Analyses	6	Glass Microfiber Filters With Binder	26
Wet-strengthened Filter Papers		Glass Microfiber Filters Without Binder	28
for Qualitative Analyses	8	Quartz Microfiber Filters	30
High-purity Filter Papers		Quality Control Test Methods	31
for Qualitative Analyses	10	Index of Grades	32
Smooth Filter Papers			
for Qualitative & Technical Analyses	12		
Crêped Filter Papers			
for Qualitative & Technical Analyses	14		
Paper Boards			
for the Filtration and Absorption of Liquids	16		
Seed Testing Papers	17		
Filter Papers for the Sugar Industry	19		
Diatomaceous Earth Filter Paper	20		
Phase Separating Paper	21		
Surface Protection Paper	22		



Filter Papers – An Introduction

High-grade filter papers are indispensable for routine work in laboratory and industrial applications. Sartorius supplies you with a broad range of filter papers for myriad filtration tasks and supports you in solving all your filtration challenges.

With this catalog, we invite you to familiarize yourself with our broad product range. Here, you will find typical examples intended to help you quickly select the filter paper that is right for your application.

Our Product range covers:

- Quantitative, qualitative filter papers
- Technical papers and boards
- Blotting and chromatography papers
- Glass and quartz microfiber filters
- And many other paper grades for special applications

Quality Assurance and Quality Control

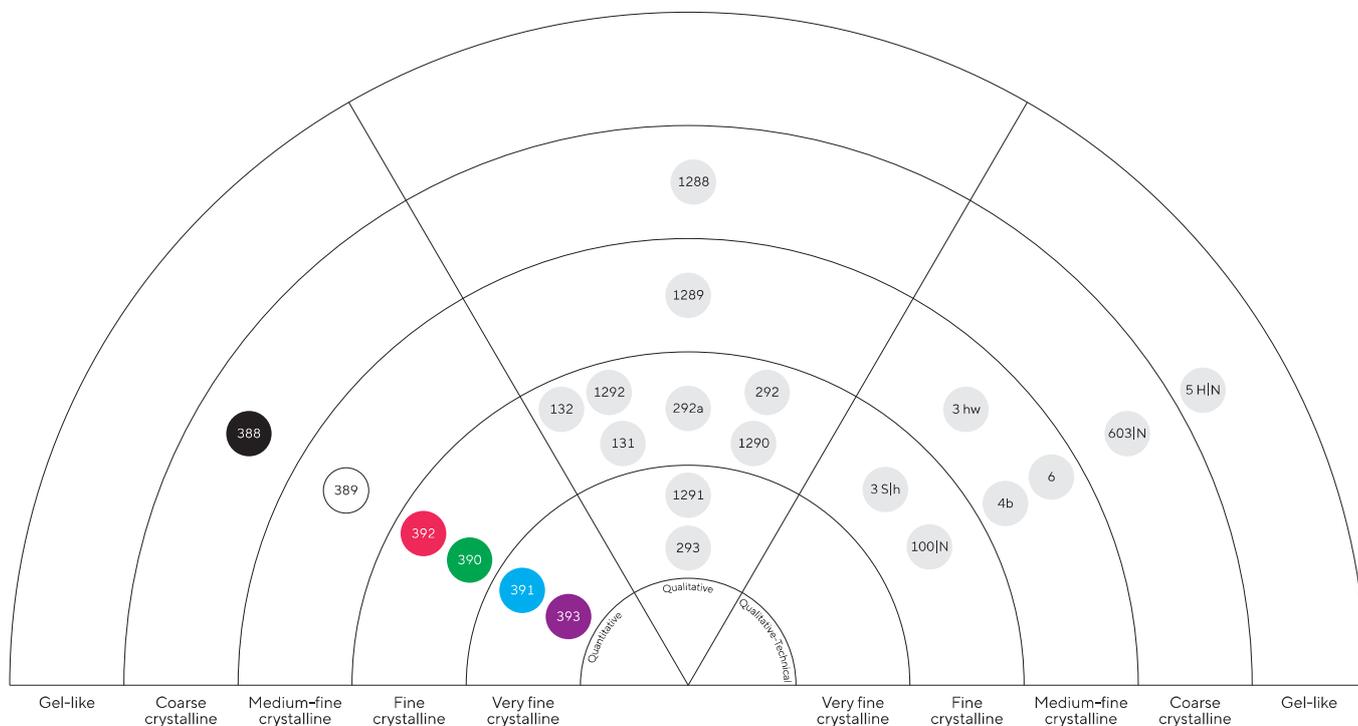
Sartorius pays particular attention to continuous in-process quality control; additionally, regular checks and exact analyses of raw material and of each individual finished product assure constant high quality and product uniformity.

The paper mill meets the requirements set by the ISO 9001 quality management system and the ISO 14001 environmental management system.

How Do Filter Papers Work?

Filter papers are actually depth filters. Various parameters influence their effectiveness: Mechanical particulate retention, absorption, pH, surface properties, thickness and strength of the filter paper as well as the shape, density and quantity of particles to be retained. The precipitates deposited on the filter form a “cake layer”, which – depending on its density – increasingly affects the progress of a filtration run and decisively affects the retention capability. For this reason, it is essential to select the right filter paper to ensure effective filtration. This choice also depends on the filtration method to be used, among other factors. In addition, the amount and properties of the medium to be filtered, the size of the particulate solids to be removed and the required degree of clarification are all decisive in making the right choice.

Product Overview



Quantitative Filter Papers

- Black dot**
 Fast filtering, wide-pore, loose structure, ash-free, wet-strengthened
- White dot**
 Medium fast filtering, medium- to wide-pore, low-fat content, ash-free, wet-strengthened
- Red dot**
 Medium fast filtering, medium density ash-free, wet-strengthened

- Green dot**
 Slow filtering, narrow-pore, dense, ash-free, wet-strengthened
- Blue dot**
 Very slow filtering, fine-pore, very dense, ash-free, wet-strengthened
- Purple dot**
 Very slow filtering, very fine-pore, very dense, ash-free, wet-strengthened

Ash-free Filter Papers for Quantitative and Gravimetric Analyses

These filter papers are used for quantitative and gravimetric analyses as well as for pressure or vacuum filtration. They are made out of 100 % cotton linters with an α -cellulose content of > 98 % and are acid-washed to make the papers ashless and achieve high purity.

In gravimetric applications, the cake layer is calcined and the residue quantified. For quantitative analysis of the filtrate, the filter paper must not give off any foreign substances. This guarantees that no test results are falsified. That is why it is important that the filters are ash-free.

For some quantitative analyses, the cake layer has to be mechanically removed from the filter (for example, with a water jet or a spatula). The filter must be wet-strengthened so that it doesn't break when the cake layer is removed.

Application Examples

Application	Grade
Determination of ash content	388
Gravimetric analysis of metals	388
Analysis of alkaline earth carbonates	389
Determining the fat content in natural raw materials	389
Gravimetric analyses in power plants	392
Filtration of fine precipitates	390
Filtration of fine-grained precipitates	391, 393
Blaine Test for cement (EN 196-6:2010)	392, 391, 390, 389

- Made of 100 % cotton linters
- Ash-free (Ash content $\leq 0.01\%$ according to DIN 54370)
- Wet-strengthened
- Color-coded box for easy selection
- Supplied in rolls, sheets, discs and folded filters



Technical Specifications

Grade	Weight (g/m ²)*	Thickness (mm)*	Particle retention (µm)	Filtration (s)*	Precipitates	Properties
■ 388	84	0.21	12-15	10	Coarse crystalline	Wide-pore, loose structure, fast filtering
□ 389	84	0.19	8-12	20	Medium-fine crystalline	Medium- to wide-pore, medium fast filtering
■ 392	84	0.17	5-8	50	Fine crystalline	Medium dense, medium fast filtering
■ 390	84	0.16	3-5	100	Fine crystalline	Narrow-pore, dense, slow filtering
■ 391	84	0.15	2-3	180	Very fine crystalline	Fine-pore, dense, very slow filtering
■ 393	100	0.18	1-2	300	Very fine crystalline	Very fine-pore, very dense, very slow filtering

* See test methods, page 31

Ordering Information



Filter Discs, 100 pieces

Ø in mm	Grade 388	Grade 389	Grade 390	Grade 391	Grade 392	Grade 393
55	FT-3-101-055	FT-3-102-055	FT-3-103-055	FT-3-104-055	FT-3-105-055	FT-3-127-055
70	FT-3-101-070	FT-3-102-070	FT-3-103-070	FT-3-104-070	FT-3-105-070	FT-3-127-070
90	FT-3-101-090	FT-3-102-090	FT-3-103-090	FT-3-104-090	FT-3-105-090	FT-3-127-090
110	FT-3-101-110	FT-3-102-110	FT-3-103-110	FT-3-104-110	FT-3-105-110	FT-3-127-110
125	FT-3-101-125	FT-3-102-125	FT-3-103-125	FT-3-104-125	FT-3-105-125	FT-3-127-125
150	FT-3-101-150	FT-3-102-150	FT-3-103-150	FT-3-104-150	FT-3-105-150	FT-3-127-150
185	FT-3-101-185	FT-3-102-185	FT-3-103-185	FT-3-104-185	FT-3-105-185	FT-3-127-185
240	FT-3-101-240	FT-3-102-240	FT-3-103-240	FT-3-104-240	FT-3-105-240	FT-3-127-240



Folded Filters, 100 pieces

Ø in mm	Grade 388	Grade 389	Grade 390	Grade 391	Grade 392
110	FT-4-101-110	FT-4-102-110	FT-4-103-110	FT-4-104-110	FT-4-105-110
125	FT-4-101-125	FT-4-102-125	FT-4-103-125	FT-4-104-125	FT-4-105-125
150	FT-4-101-150	FT-4-102-150	FT-4-103-150	FT-4-104-150	FT-4-105-150
185	FT-4-101-185	FT-4-102-185	FT-4-103-185	FT-4-104-185	FT-4-105-185
240	FT-4-101-240	FT-4-102-240		FT-4-104-240	



Sheets in 580×580 mm, 100 pieces

Grade 388	Grade 389	Grade 390	Grade 391	Grade 392	Grade 393
FT-2-101-580580	FT-2-102-580580	FT-2-103-580580	FT-2-104-580580	FT-2-105-580580	FT-2-127-580580

Other dimensions are available on request

Wet-strengthened Filter Papers for Qualitative Analyses

These qualitative filter papers are essentially used for analytical purposes and routine analyses, whenever no gravimetric analyses are required. They are wet-strengthened and can be used for pressure and vacuum filtration. They are made of refined pulp and linters with an > 95% α -cellulose content, are very pure with an ash content < 0.1%.

Application Examples

Application	Grade
Must analysis	1288
Routine filtration for malt analysis	1289
Rapid filtration of fine precipitates	1292
Analysis of coffee extracts	1290
Tannin solutions	1291
Clarification of wine	293

- Made of refined pulp and cotton linters with an > 95% α -cellulose content
- Ash content \leq 0.1% according to DIN 54370
- Wet-strengthened
- Supplied in rolls, sheets, discs and folded filters



Technical Specifications

Grade	Weight (g/m ²)*	Thickness (mm)*	Particle retention (µm)	Filtration (s)*	Precipitates	Properties
1288	84	0.21	12-15	10	Coarse crystalline	Wide-pore, loose structure, fast filtering
1289	84	0.21	8-12	20	Medium-fine crystalline	Medium- to wide-pore, medium fast filtering
1292	84	0.17	5-8	20	Fine crystalline	Medium dense, medium fast filtering
1290	84	0.15	3-5	100	Fine crystalline	Narrow-pore, dense, slow filtering
1291	84	0.15	2-3	180	Very fine crystalline	Fine-pore, dense, very slow filtering
293	80	0.15	1-2	300	Very fine crystalline	Very fine-pore, very dense, very slow filtering

* See test methods, page 31

Ordering Information



Filter Discs, 100 pieces

Ø in mm	Grade 1288	Grade 1289	Grade 1290	Grade 1291	Grade 1292	Grade 293
55	FT-3-206-055	FT-3-207-055	FT-3-208-055	FT-3-209-055	FT-3-210-055	FT-3-211-055
70	FT-3-206-070	FT-3-207-070	FT-3-208-070	FT-3-209-070	FT-3-210-070	FT-3-211-070
90	FT-3-206-090	FT-3-207-090	FT-3-208-090	FT-3-209-090	FT-3-210-090	FT-3-211-090
110	FT-3-206-110	FT-3-207-110	FT-3-208-110	FT-3-209-110	FT-3-210-110	FT-3-211-110
125	FT-3-206-125	FT-3-207-125	FT-3-208-125	FT-3-209-125	FT-3-210-125	FT-3-211-125
150	FT-3-206-150	FT-3-207-150	FT-3-208-150	FT-3-209-150	FT-3-210-150	FT-3-211-150
185	FT-3-206-185	FT-3-207-185	FT-3-208-185	FT-3-209-185	FT-3-210-185	FT-3-211-185
240	FT-3-206-240	FT-3-207-240	FT-3-208-240	FT-3-209-240	FT-3-210-240	



Folded Filters, 100 pieces

Ø in mm	Grade 1288	Grade 1289	Grade 1290	Grade 1291	Grade 1292	Grade 293
110	FT-4-206-110	FT-4-207-110	FT-4-208-110	FT-4-209-110	FT-4-210-110	
125	FT-4-206-125	FT-4-207-125	FT-4-208-125	FT-4-209-125	FT-4-210-125	FT-4-211-125
150	FT-4-206-150	FT-4-207-150	FT-4-208-150	FT-4-209-150	FT-4-210-150	FT-4-211-150
185	FT-4-206-185	FT-4-207-185	FT-4-208-185	FT-4-209-185	FT-4-210-185	FT-4-211-185
240	FT-4-206-240	FT-4-207-240	FT-4-208-240	FT-4-209-240	FT-4-210-240	FT-4-211-240



Sheets in 580 × 580 mm, 100 pieces

Grade 1288	Grade 1289	Grade 1290	Grade 1291	Grade 1292	Grade 293
FT-2-206-580580	FT-2-207-580580	FT-2-208-580580	FT-2-209-580580	FT-2-210-580580	FT-2-211-580580

Other dimensions are available on request

High-Purity Filter Papers for Qualitative Analyses

These paper grades are used for analytical purposes that require a low ash content. Grades 292 and 292a are especially suitable for soil analyses because they are low in nitrogen. For phosphate or sodium determination, we recommend grades 131 and 132.



Application Examples

Application	Grade
Malt filtration according to EBC standards	292
Determination of nitrogen content in soils	292, 292a
Determination of phosphate and sodium content in soils	131, 132

- Pure cotton linters or cotton linters with refined pulp
- No additives, such as wet-strengthening agents
- Supplied in rolls, sheets, discs and folded filters

Technical Specifications

Grade	Weight (g/m ²)*	Thickness (mm)*	Particle retention (µm)	Filtration (s)*	Material
292	87	0.18	5-8	45	Cotton linters, low-nitrogen and nitrates, ash content ≤0.06% according to DIN 54370
292a	97	0.19	4-7	60	Cotton linters, low-nitrogen and nitrates, ash content ≤0.06% according to DIN 54370
132	80	0.17	5-8	55	Cotton linters and refined pulp, low-phosphate and low-potassium, ash content <0.02% according to DIN 54370
131	80	0.16	3-5	100	Cotton linters and refined pulp, low-phosphate and low-potassium, ash content <0.02% according to DIN 54370

* See test methods, page 31

Ordering Information



Filter Discs, 100 pieces

Ø in mm	Grade 131	Grade 132	Grade 292	Grade 292a
55		FT-3-329-055	FT-3-205-055	FT-3-215-055
70		FT-3-329-070	FT-3-205-070	FT-3-215-070
90		FT-3-329-090	FT-3-205-090	FT-3-215-090
110		FT-3-329-110	FT-3-205-110	FT-3-215-110
125	FT-3-351-125	FT-3-329-125	FT-3-205-125	FT-3-215-125
150		FT-3-329-150	FT-3-205-150	FT-3-215-150
185		FT-3-329-185	FT-3-205-185	FT-3-215-185
240		FT-3-329-240	FT-3-205-240	FT-3-215-240



Folded Filters, 100 pieces

Ø in mm	Grade 131	Grade 132	Grade 292	Grade 292a
110	FT-4-351-110	FT-4-329-110	FT-4-205-110	FT-4-215-110
125	FT-4-351-125	FT-4-329-125	FT-4-205-125	FT-4-215-125
150	FT-4-351-150	FT-4-329-150	FT-4-205-150	FT-4-215-150
185	FT-4-351-185	FT-4-329-185	FT-4-205-185	FT-4-215-185
240		FT-4-329-240	FT-4-205-240	FT-4-215-240



Sheets in 580×580 mm, 100 pieces

Grade 292	Grade 292a
FT-2-205-580580	FT-2-215-580580

Smooth Filter Papers for Qualitative & Technical Analyses

These filter papers are used for routine analyses like clarification, determination of substances, but also as discs with a center hole for technical applications. Grades with a wet burst resistance > 30 kPa are referred to as wet-strengthened and are therefore suitable for pressure or vacuum filtration. White and bright particles can be easily detected with the black paper grade 918, due to the color contrast for example for the detection of fluorine or silicon in water or the detection of mycelium in mildews.



Application Examples

Application	Grade
Routine work in the lab	3 hw
Degassing beer before analysis	6
Determination of the sugar content	100/N
Clarification of clear or dyed liquids	3 m/N
Water Absorption test for mortar according to EN 1015-18	3 S/h
Durum wheat flour and semolina – Determination of yellow pigment content (ISO 11052:1994)	918

- Made of refined pulp and cotton linters with an > 95 % α -cellulose content
- Ash content between 0.1–0.15 % (grade 100/N < 0.1%)
- Wet-strengthened
- Supplied in rolls, sheets, discs and folded filters as well as customer-specific cuts

Technical Specifications

Grade	Weight (g/m ²)*	Thickness (mm)*	Filtration (s)*	Particle Retention (μ m)	Wet burst resistance (kPa)*	Properties
6	80	0.17	15	10–13	≥ 30	Fast filtering
3 w	65	0.14	15	9–13	≥ 15	Medium fast filtering
3 hw	65	0.14	20	8–12	≥ 15	Medium fast filtering
C 140	140	0.30	20	7–11	> 50	Medium fast filtering
4 b	75	0.15	22	8–12	≥ 30	Medium fast filtering
3 m/N	65	0.14	30	7–10	≥ 30	Medium fast filtering
100/N	85	0.18	30	6–8	≥ 80	Medium fast filtering, low ammonium, potassium & sodium content
918	85	0.17	45	8–10		Medium fast to slow filtering, black paper
3 S/h	200	0.36	55	5–7	≥ 15	Medium fast to slow filtering, narrow-pore

* See test methods, page 31

Ordering Information



Filter Discs

Ø in mm	Grade 100/N (100 pieces)	Grade 3 hw (100 pieces)	Grade 3 m/N (100 pieces)	Grade 3 S/h (50 pieces)
55	FT-3-328-055	FT-3-303-055	FT-3-305-055	FT-3-307-055
70	FT-3-328-070	FT-3-303-070	FT-3-305-070	FT-3-307-070
90	FT-3-328-090	FT-3-303-090	FT-3-305-090	FT-3-307-090
110	FT-3-328-110	FT-3-303-110	FT-3-305-110	FT-3-307-110
125	FT-3-328-125	FT-3-303-125	FT-3-305-125	FT-3-307-125
150	FT-3-328-150	FT-3-303-150	FT-3-305-150	FT-3-307-150
185	FT-3-328-185	FT-3-303-185	FT-3-305-185	FT-3-307-185
240	FT-3-328-240	FT-3-303-240	FT-3-305-240	FT-3-307-240

Ø in mm	Grade 3 w (100 pieces)	Grade 4 b (100 pieces)	Grade 6 (100 pieces)	Grade 918 (100 pieces)	Grade C 140 (50 pieces)
55	FT-3-308-055	FT-3-309-055	FT-3-312-055	FT-3-607-055	
70	FT-3-308-070	FT-3-309-070	FT-3-312-070		
90	FT-3-308-090	FT-3-309-090	FT-3-312-090	FT-3-607-090	FT-3-356-090
110	FT-3-308-110	FT-3-309-110	FT-3-312-110		
125	FT-3-308-125	FT-3-309-125	FT-3-312-125		
150	FT-3-308-150	FT-3-309-150	FT-3-312-150		
185	FT-3-308-185	FT-3-309-185	FT-3-312-185		FT-3-356-185
240	FT-3-308-240	FT-3-309-240	FT-3-312-240		



Folded Filters, 100 pieces

Ø in mm	Grade 100/N	Grade 3 hw	Grade 3 m/N
110		FT-4-303-110	FT-4-305-110
125		FT-4-303-125	FT-4-305-125
150	FT-4-328-150	FT-4-303-150	FT-4-305-150
185		FT-4-303-185	FT-4-305-185
240	FT-4-328-240	FT-4-303-240	FT-4-305-240
270	FT-4-328-270	FT-4-303-270	FT-4-305-270
320	FT-4-328-320	FT-4-303-320	FT-4-305-320
385		FT-4-303-385	FT-4-305-385

Ø in mm	Grade 3 S/h	Grade 3 w	Grade 4 b	Grade 6	Grade C 140
110		FT-4-308-110	FT-4-309-110	FT-4-312-110	FT-4-356-110
125		FT-4-308-125	FT-4-309-125	FT-4-312-125	FT-4-356-125
150		FT-4-308-150	FT-4-309-150	FT-4-312-150	FT-4-356-150
185		FT-4-308-185	FT-4-309-185	FT-4-312-185	FT-4-356-185
240	FT-4-307-240	FT-4-308-240	FT-4-309-240	FT-4-312-240	FT-4-356-240
270	FT-4-307-270	FT-4-308-270	FT-4-309-270	FT-4-312-270	FT-4-356-270
320	FT-4-307-320	FT-4-308-320	FT-4-309-320	FT-4-312-320	FT-4-356-320
385		FT-4-308-385	FT-4-309-385	FT-4-312-385	



Sheets in 580×580 mm, 100 pieces

Grade 100/N	Grade 3 hw	Grade 3 m/N
FT-2-328-580580	FT-2-303-580580	FT-2-305-580580

Grade 3 S/h	Grade 3 w	Grade 4 b	Grade 6
FT-2-307-580580	FT-2-308-580580	FT-2-309-580580	FT-2-312-580580

Other dimensions are available on request

Crêped Filter Papers for Qualitative & Technical Analyses

Crêped filter papers are mostly used for the rapid filtration of relatively coarse precipitates; because of their crêped structure they provide a larger filtration area than smooth filter papers. Grades with a wet burst resistance > 30 kPa are referred to as wet-strengthened and are therefore suitable for pressure or vacuum filtration. Below you will find an overview of the most commonly used grades.



Application Examples

Application	Grade
Cooking oils	39/N
Vinegar filtration	39/N
Galvanic baths	34/N
Prefilters for transformer oil	6 S/N
Quality testing in sugar industry	601/N, 603/N
Filtration of essential oils	5 H/N
Juice filtration	67/N

- Made of refined pulp and cotton linters with an > 95 % α -cellulose content
- Ash content between 0.1–0.15 %
- Wet-strengthened
- Supplied in rolls, sheets, discs and folded filters as well as customer-specific cuts

Technical Specifications

Grade	Weight (g/m ²)*	Thickness (mm)*	Filtration (s)*	Wet burst resistance (kPa)*	Air resistance (mbar)*	Properties
5 H/N	85	0.28	3	≥ 40		Very fast filtering, wide-pore
34/N	60	0.20	4	≥ 50	2.0	Very fast filtering
37/N	135	0.50	4	≥ 70	1.9	Very fast filtering, wide-pore
1602/N	70	0.23	5	≥ 30		Very fast filtering
39/N	180	0.65	5	≥ 90	2.5	Very fast filtering, wide-pore
39/N	300	0.95	5	120	2.5	Very fast filtering, wide-pore
603/N	75	0.25	8	≥ 50		Fast filtering
6 S/N	145	0.55	12	≥ 90		Medium fast filtering
601/N	65	0.19	13	≥ 30		Medium fast filtering
67/N	160	0.65	13	≥ 60	5.5	Medium fast filtering

* See test methods, page 31

Ordering Information



Filter Discs

Ø in mm	Grade 5 H/N (100 pieces)	Grade 6 S/N (50 pieces)	Grade 601/N (100 pieces)	Grade 603/N (100 pieces)	Grade 37/N (50 pieces)	Grade 39/N, 180 g/m ² (50 pieces)
47	FT-3-423-047				FT-3-480-047	
70		FT-3-314-070			FT-3-480-070	
90	FT-3-423-090	FT-3-314-090		FT-3-335-090	FT-3-480-090	
110	FT-3-423-110	FT-3-314-110	FT-3-354-110	FT-3-335-110	FT-3-480-110	FT-3-483-110
125	FT-3-423-125	FT-3-314-125	FT-3-354-125	FT-3-335-125	FT-3-480-125	
150	FT-3-423-150	FT-3-314-150	FT-3-354-150	FT-3-335-150	FT-3-480-150	
185	FT-3-423-185	FT-3-314-185	FT-3-354-185	FT-3-335-185	FT-3-480-185	FT-3-483-185
240	FT-3-423-240	FT-3-314-240	FT-3-354-240	FT-3-335-240	FT-3-480-240	
320			FT-3-354-320	FT-3-335-320		



Folded Filters, 100 pieces

Ø in mm	Grade 5 H/N	Grade 6 S/N	Grade 603/N	Grade 34/N	Grade 37/N	Grade 39/N, 180 g/m ²
125	FT-4-423-125	FT-4-314-125	FT-4-335-125	FT-4-478-125	FT-4-480-125	
150	FT-4-423-150	FT-4-314-150	FT-4-335-150		FT-4-480-150	FT-4-483-150
185	FT-4-423-185	FT-4-314-185	FT-4-335-185		FT-4-480-185	FT-4-483-185
240	FT-4-423-240	FT-4-314-240	FT-4-335-240		FT-4-480-240	FT-4-483-240
270	FT-4-423-270	FT-4-314-270	FT-4-335-270			
320	FT-4-423-320	FT-4-314-320	FT-4-335-320	FT-4-478-320	FT-4-480-320	
385	FT-4-423-385					FT-4-483-385
500	FT-4-423-500	FT-4-314-500			FT-4-480-500	FT-4-483-500



Sheets in 580 × 580 mm, 100 pieces

Grade 5 H/N	Grade 6 S/N	Grade 601/N	Grade 603/N
FT-2-423-580580	FT-2-314-580580	FT-2-354-580580	FT-2-335-580580
Grade 37/N	Grade 39/N, 180 g/m ²	Grade 39/N, 300 g/m ²	
FT-2-480-580580	FT-2-483-580580	FT-2-487-580580	

Other dimensions are available on request

Paper Boards for the Filtration and Absorption of Liquids

Among other applications, these boards are used for the filtration of cooking and transformer oils, galvanic baths and as base paper for further impregnation with certain reagents. Grades with a wet burst resistance >30 kPa are referred to as wet-strengthened and are therefore suitable for pressure or vacuum filtration.

Application Examples

Application	Grade
Cytocards	151
Fragrance test cards	C 160



- Made of refined pulp or cotton linters
- Smooth
- Supplied in sheets, discs and as well as customer-specific cuts



Technical Specifications

Grade	Weight (g/m ²)*	Thickness (mm)*	Filtration (s)*	Air resistance (mbar)*	Capillary rise (mm/10 min)*	Dry burst resistance (kPa)*	Wet burst resistance (kPa)*	Water capacity (%)
C 160	160	0.30	40	25	80		≥ 50	
1339	315	0.63		42	≥ 60	≥ 500	≥ 230	
C 350L	360	0.75		30	80		≥ 200	
151	460	1.00		19	120	≥ 400		
1220	475	1.00	200		120			
SEK 770	800	1.00						400

* See test methods, page 31

Ordering Information



Sheets in 580 × 580 mm, 100 pieces

Grade C 160

FT-2-343-580580

Seed Testing Papers

These papers satisfy the requirements for the determination of germination capability according to ISTA (International Seed Testing Association) and are ideal for ensuring optimal moisture content for the most diverse types of seeds and germination forms. Their pH ranges between 6.0 and 7.5, they are wet-strengthened and their special structure prevents fine seed roots from growing through the paper. The colored papers are produced with dyes that do not influence the growth of roots. These papers are mainly used to count more easily very fine and white roots.



PP ("Pleated Paper") Method

The pleated paper is placed in a box; the seeds are distributed among the folds of the pleated paper and covered with a wrapping strip to keep the seeds moist. The pleated papers have 50 double folds that are 20 mm in depth; usually, 2 seeds are placed in each fold. Both white and grey papers are available. Colored paper makes it easier to count white seed species.

Application Examples

Made of refined pulp or cotton linters This method is mainly applied with corn, sugar beets, wheat, barley and various grasses, but can also be used for all other seed types.

Technical Specifications & Ordering Information

Grade	Properties	Weight (g/m ²)*	Thickness (mm)*	Size (mm)	Qty per box	Order No.
20	Pleated strips, white	110	0.22	2,000 × 110	1,008**	FT-2003532000110
20, grey	Pleated strips, grey	110	0.22	2,000 × 110	1,008**	FT-2003662000110
4 b	Wrapping strips	75	0.15	110 × 580	100	FT-2-309-110580
6	Wrapping strips	80	0.17	110 × 580	500	FT-2-312-110580

* See test methods, page 31

** 112 rods à 9 pleated strips

Other dimensions are available on request

BP (“Between Paper”) Method

One wetted paper sheet is laid on top of a second, the seeds are placed on the double sheet which is then rolled up.

Application Examples

The method is used for peas and oats, among others.

Technical Specifications & Ordering Information

Grade	Properties	Weight (g/m ²)*	Thickness (mm)*	Size (mm)	Qty per box	Order No.
39/N	Crêped white paper	180	0.65	580×580	100	FT-2-483-580580

* See test methods, page 31

TP (“Top of Paper”) Method

The seeds are placed on the paper (discs or sheets) and then transferred either to petri dishes or plastic boxes. By supplying the filter with water, wick papers are used for constant moistening during the Jacobsen method. They are also supplied as blue and yellow papers to make it easier to count white seed species.



Application Examples

The method is applied to small seeds like clover species, for example.

Technical Specifications & Ordering Information

Grade	Properties	Weight (g/m ²)*	Thickness (mm)*	Size (mm)	Qty per box	Order No.
C 140	Smooth white paper	140	0.30	240×400	100	FT-2-356-240400
6 S/N	Crêped white paper	145	0.55	150×580	100	FT-2-314-150580
193	Smooth, yellow paper sheets	160	0.32	120×300	100	FT-2-381-120300
193	Smooth, yellow paper sheets	160	0.32	110×170	1000	FT-2-381-110170
191	Smooth, blue paper	700	1.35	140×200	100	FT-2-379-140200

* See test methods, page 31

Filter Papers for the Sugar Industry

In the sugar industry, filter papers are used in laboratories to assay sugar beet or cane sugar. The sugar beets are mashed and further analyzed according to the aluminum sulfate method. Potassium, nitrogen, sodium and saccharose content are measured using a spectrophotometer or the likes. These papers are wet-strengthened and either smooth or crêped. They are made of cellulose or a mixture of cellulose and diatomaceous earth.

Grade 100/N is not only supplied as discs or folded filters, but also on rolls for VENEMA systems.

Technical Specifications

Grade	Properties	Weight (g/m ²)*	Thickness (mm)*	Filtration (s)*	Wet burst resistance (kPa)*	Order No.
603/N	Crêped paper, very fast filtering	75	0.25	8	≥ 50	See page 15
6 S/N	Crêped paper, very fast filtering	145	0.55	12	≥ 90	See page 15
601/N	Crêped paper, fast filtering	65	0.19	13	≥ 30	See page 15
3 hw	Smooth paper, medium fast filtering	65	0.14	20	≥ 15	See page 13
470	Diatomaceous earth filter paper, slow filtering	140	0.32	80	30	See page 20
100/N	Smooth paper, medium fast filtering, low phosphate and low sodium	85	0.18	30	≥ 80	See below on rolls or page 13 as sheets, discs or folded filters

* See test methods, page 31

Ordering Information

Venema Rolls, Grade 100/N

Width	Length	Qty per box	Order No.
150 mm	1,000 m	1 roll	FT-1-328-1501000
240 mm	1,000 m	1 roll	FT-1-328-2401000



Other dimensions are available on request

Diatomaceous Earth Filter Paper



Grade 470 papers are made of cellulose and diatomaceous earth and offer a much better separating capability than pure cellulose papers at the same rate of filtration. This grade quickly retains the finest particles at high flow rates.

Application Examples

- Clarification of beer, wine, urine during spectrophotometric or refractometric tests
- Filtration of the finest, semi-colloidal precipitates, e.g. those consisting of proteins, clay or cold-precipitated barium

Technical Specifications

Grade	Weight (g/m ²)*	Thickness (mm)*	Filtration (s)*
470	140	0.32	80

* See test methods, page 31

Ordering Information



Filter Discs, 100 pieces

Ø in mm	Order No.
90	FT-3-606-090
110	FT-3-606-110
125	FT-3-606-125
150	FT-3-606-150
185	FT-3-606-185



Folded Filters, 100 pieces

Ø in mm	Order No.
125	FT-4-606-125
150	FT-4-606-150
185	FT-4-606-185
240	FT-4-606-240
320	FT-4-606-320

Phase Separating Paper



Grade 480 is impregnated with stabilized silicon, thus rendering it hydrophobic: It retains water, but allows solvents to flow through. The flow stops automatically when the entire solvent has passed through. In many applications, this phase separator paper eliminates the need to use separating funnels.

Application Examples

- These nonwoven grades are made of rayon or polyester and are available in different weights. They can be used for the filtration or prefiltration of viscous solutions containing particles visible with the naked eye.
- Filtration of extracting solvents in clinical or medical labs
- Separation of emulsions that are formed during the extraction of aqueous plant or drug solutions

Technical Specifications

Grade	Weight (g/m ²)*	Thickness (mm)*
480	85	0.19

* See test methods, page 31

Ordering Information



Filter Discs, 100 pieces

Ø in mm	Order No.
70	FT-3-602-070
90	FT-3-602-090
110	FT-3-602-110
125	FT-3-602-125
150	FT-3-602-150
185	FT-3-602-185



Folded Filters, 100 pieces

Ø in mm	Order No.
90	FT-4-602-090
125	FT-4-602-125
150	FT-4-602-150
185	FT-4-602-185
270	FT-4-602-270

Other dimensions are available on request

Surface Protection Paper

LabSorb is a highly absorptive grade of paper coated on one side with polyethylene. Used with the cellulose side up, the paper absorbs liquids, which are stopped by the polyethylene layer and thus prevented from soaking through. Used with the polyethylene side up, the paper is highly useful for recovery of valuable or toxic liquids.



Application Examples

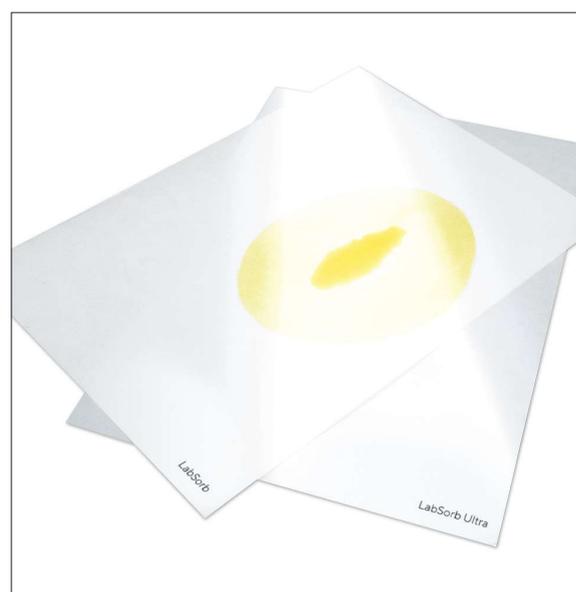
- Preventing radioactive contamination of work surfaces in radiochemical laboratories
- Recovering spilled solutions containing expensive reagents
- Protecting laboratory bench surfaces from spillage or splashes of liquids by preventing absorption and seepage of these liquids into work surfaces
- Lining animal cages for protection and hygiene
- Reducing the risk of objects breaking after falling on hard surfaces

Technical Specifications

Weight (g/m ²)	Water capacity
140	150%

Ordering Information

Grade	Format	Size	Qty per box	Order No.
LabSorb	Roll	400mm × 50m	1	FT-1-601-400050
LabSorb	Roll	400mm × 100m	1	FT-1-601-400100
LabSorb	Roll	460mm × 50m	1	FT-1-601-460050
LabSorb	Roll	600mm × 50m	1	FT-1-601-600050
LabSorb	Roll	600mm × 100m	1	FT-1-601-600100
LabSorb	Sheets	460 × 570mm	50	FT-2-601-460570K
LabSorb	Sheets	480 × 600mm	50	FT-2-601-480600K



Chromatography Papers

Chromatography papers are made of 100% cotton linters. These highly pure papers are not only ideal for blotting & chromatography, but also for a wide range of absorption applications like those common in the life sciences and diagnostics.



Technical Specifications

Grade	Weight (g/m ²)*	Thickness (mm)*	Capillary rise (mm/30 min)*
FN 3	90	0.19	95
FN 4	125	0.24	95
FN 7	150	0.32	145
FN 30	320	0.90	240
FN 100	195	0.35	115

* See test methods, page 31

Application Examples

Application	Grade
The most commonly used chromatography paper	FN 100
Analytical paper for routine and repetitive separations	FN 3
Routine analysis of proteins in serum (e.g. human albumin)	FN 3
Antibiotic test strips	FN 30

Ordering Information



Sheets

Grade	Size (in mm)	Qty per box	Order No.
FN 3	300×580	100	FT-2-503-300580N
FN 3	460×570	100	FT-2-503-460570N
FN 3	580×600	100	FT-2-503-580600N
FN 4	580×600	100	FT-2-504-580600N
FN 7	460×570	50	FT-2-507-460570K
FN 7	580×600	50	FT-2-507-580600K
FN 30	254×305	100	FT-2-526-254305N
FN 30	580×600	25	FT-2-526-580600G
FN 100	76×102	100	FT-2-527-076102N
FN 100	200×200	100	FT-2-527-200200N
FN 100	260×410	100	FT-2-527-260410N
FN 100	460×570	50	FT-2-527-460570K
FN 100	460×570	100	FT-2-520-460570K
FN 100	580×600	50	FT-2-527-580600K
FN 100	580×680	50	FT-2-527-580680K

Other dimensions are available on request

Blotting Papers

These blotting papers are made from the purest raw materials with the maximum degree of absorptiveness and cellulose content. They are available in a choice of different weights and thicknesses as well as in different formats to cover the majority of blotting applications. Furthermore, they are the ideal complement to the Sartorius nitrocellulose blotting membranes available in two pore sizes, 0.22 µm and 0.45 µm.

- Made of high-purity cotton linters for uniform buffer flow and resulting blots
- No additives to avoid any interference during the transfer
- Supplied in sheets, rolls as well as in customized sizes to save time and avoid any waste

Technical Specifications

Grade	Weight (g/m ²)*	Thickness (mm)*	Capillary rise (mm/10 min)*	Capillary rise (mm/30 min)*
BF 2	195	0.35	70	115
BF 3	330	0.76	130	
BF 4	550	1.30	160	

* See test methods, page 31

Ordering Information

Grade	Size (in mm)	Qty per box	Order No.
BF 2	80 × 90	100	FT-2-519-080090N
BF 2	130 × 210	100	FT-2-519-130210N
BF 2	200 × 200	100	FT-2-519-200200N
BF 2	460 × 570	100	FT-2-519-460570N
BF 2	580 × 600	100	FT-2-519-580600N
BF 3	135 × 155	100	FT-2-520-135155N
BF 3	200 × 200	100	FT-2-520-200200N
BF 3	460 × 570	50	FT-2-520-460570K
BF 3	580 × 600	50	FT-2-520-580600K
BF 4	110 × 170	25	FT-2-521-110170G
BF 4	150 × 150	25	FT-2-521-150150G
BF 4	580 × 580	25	FT-2-521-580580G
BF 4	580 × 600	25	FT-2-521-580600G

Application Examples

Application	Grade
For gel wicking and drying, capillary blotting using Western, Southern or semidry techniques	BF 2
To increase and maintain the transport of liquid from the buffer and as buffer reservoir in capillary and semidry blotting methods	BF 3
To transfer DNA or RNA according to the Southern technique or semidry blotting of proteins	BF 4



Blotting Membranes

Sartorius blotting membranes are ideal as a complement to the blotting papers for western blotting, DNA blotting as well as dot or slot blots. They have been optimized for all protein blotting systems, such as electrotransfer, semi-dry or simple capillary blotting.

- High membrane surface area for high binding capacity & no sample loss
- Exceptionally low background allowing longer exposure times & better results
- High membrane stability for easy handling



Technical Specifications

Description	11327	11306
Material	Cellulose Nitrate	Cellulose Nitrate
Pore size (µm)	0.22	0.45
Thickness (µm)	120	130
Water flow rate (mL/[min. cm ² bar])	27	70
Bubble point with water (bar)	4.4	2.4
Extractables in water (%)	< 1	< 1
Burst pressure (bar)	0.8	0.2
Binding capacity for IgG (µg/cm ²)	200	200

Ordering Information



Rolls

Grade	Roll Size	Order No.
11327	30cm × 3m	11327-----41BL
11306	30cm × 3m	11306-----41BL

Other dimensions are available on request

Glass Microfiber Filters With Binder



These filters are mostly used either for monitoring air and gas or as prefilter. They are manufactured with synthetic binding agents to ensure that the filter has a defined strength. They are mechanically and chemically stable, have a temperature resistance up to 180 °C and – depending on the binding agent used – are either hydrophobic or hydrophilic.

Application Examples

Application	Grade
Prefiltration	13400, MG 1387/1
Gas monitoring	MG 1387/1
Air pump protection	MG 227/1/60

- Mechanically and chemically stable
- Temperature resistant up to 180 °C
- Supplied as discs or sheets



Technical Specifications

Grade	Weight (g/m ²)*	Thickness (mm)*	Penetration 0.3µm (%)	Pressure drop 5.3 cm/s (Pa)	Binding agent
MG 227/1/60	60	0.32	<0.5	260	Hydrophobic
13430	220	1.25	0.02	360	Hydrophilic
13400	73	0.39	0.015	363	Hydrophilic
MG 400 XA	75	0.35	<0.001	425	Hydrophobic
MG 1387/1	90	0.38	≤0.003	400	Hydrophilic

* See test methods, page 31

Ordering Information



Filter Discs

Ø in mm	MG 227/1/60 (100 pieces)	13430**	13400**	MG 1387/1 (50 pieces)
13			13400--13-----S	
16			13400--16-----S	
20			13400--20-----S	
25			13400--25-----Q	
42			13400--42-----Q	
44			13400--44-----Q	
45			13400--45-----Q	FT-3-01125-045
47		13430--47-----S	13400--47-----Q	FT-3-01125-047
50			13400--50-----Q	FT-3-01125-050
55				FT-3-01125-055
80			13400--80-----N	
100		13430-100-----K	13400-100-----K	
110			13400-110-----K	FT-3-01125-110
120			13400-120-----K	
124			13400-124-----K	
125				FT-3-01125-125
127		13430-127-----K	13400-127-----K	
130		13430-130-----K	13400-130-----K	FT-3-01125-130
142		13430-142-----K	13400-142-----K	
150	FT-3-01124-150		13400-150-----K	
257		13430-257-----K	13400-257-----K	
260			13400-260-----K	
279		13430-279-----K	13400-279-----K	
293		13430-293-----K	13400-293-----K	

** K = 50 pieces,
N = 100 pieces,
Q = 500 pieces,
S = 200 pieces

Other dimensions are available on request

Glass Microfiber Filters Without Binder

Binder-free glass microfiber filters are recommended for analytical and gravimetric analyses and also as prefilters. These filters combine fast flow rates with high load capacity and the retention of very fine particles; they are biologically inert, are resistant to most chemicals and withstand temperatures up to 500 °C (grade 550-HA up to 550 °C).



Application Examples

Application	Grade
Prefiltration	13440, MGB, MGD
Analysis of suspended solids in wastewater according to EN 872	MGC
Analysis of suspended solids in wastewater according to 2540D	MG 550-HA
Clarification of buffer & reagent solutions	MGA
Clarification of protein solutions	MGF
Air Monitoring, PM10	MG 160
TCLP Test	MGF

- Manufactured from 100 % borosilicate glass
- 100 % binder free
- pH stable
- Withstand temperatures up to 500 °C (Grade MG 550-HA up to 550 °C)
- Supplied as discs or sheets

Technical Specifications

Grade	Weight (g/m ²)*	Thickness (mm)*	Penetration 0.3 μm (%)**	Particle retention in liquids (μm)	Filtration speed (mL/min)*	Fulfills the requirements in EN 872:2005 (weigh loss)
MGA	56	0.24	<0.001	1.6	435	yes
MGB	145	0.66	<0.001	1.0	500	
MGC	56	0.24	<0.001	1.2	320	yes
MGD	118	0.51	<0.01	2.7	885	
MGF	78	0.36	<0.001	0.7	135	
MGG	67	0.29	<0.001	1.5	570	
13440	88	0.44		0.7	120	yes
MG 160	73	0.33	<0.001	1.2	410	
MG 550-HA	65	0.27		1.5	500	

* See test methods, page 31

** Measurement according to EN 143 (0.3 μm, 5.3 cm/s, paraffin oil)

Ordering Information



Filter Discs

Ø in mm	MGA (100 pieces)	MG 160 (50 pieces)	MGB (50 pieces)	MGC (100 pieces)	MGD (50 pieces)
13					FT-3-1104-013
20	FT-3-1101-020				
21			FT-3-1102-021	FT-3-1103-021	
25	FT-3-1101-025		FT-3-1102-025	FT-3-1103-025	FT-3-1104-025
37	FT-3-1101-037	FT-3-01110-037			
47	FT-3-1101-047	FT-3-01110-047	FT-3-1102-047	FT-3-1103-047	FT-3-1104-047
50	FT-3-1101-050	FT-3-01110-050	FT-3-1102-050	FT-3-1103-050	FT-3-1104-050
55	FT-3-1101-055		FT-3-1102-055	FT-3-1103-055	
70	FT-3-1101-070	FT-3-01110-070	FT-3-1102-070	FT-3-1103-070	FT-3-1104-070
80	FT-3-1101-080				
90	FT-3-1101-090	FT-3-01110-090	FT-3-1102-090	FT-3-1103-090	FT-3-1104-090
100	FT-3-1101-100	FT-3-01110-100	FT-3-1102-100	FT-3-1103-100	FT-3-1104-100
110	FT-3-1101-110	FT-3-01110-110	FT-3-1102-110	FT-3-1103-110	FT-3-1104-110
125	FT-3-1101-125		FT-3-1102-125	FT-3-1103-125	FT-3-1104-125
150	FT-3-1101-150		FT-3-1102-150	FT-3-1103-150	FT-3-1104-150
185	FT-3-1101-185			FT-3-1103-185	
240	FT-3-1101-240		FT-3-1102-240		FT-3-1104-240
293					FT-3-1104-293

Ø in mm	MGF (100 pieces)	MGG (100 pieces)	MG 550-HA (100 pieces)	13440**
20		FT-3-1106-020		
24			FT-3-01147-024	
25	FT-3-1105-025	FT-3-1106-025		
37		FT-3-1106-037		
42				13440--42-----Q
44				13440--44-----Q
47	FT-3-1105-047	FT-3-1106-047	FT-3-01147-047	13440--47-----Q
50	FT-3-1105-050	FT-3-1106-050	FT-3-01147-050	13440--50-----Q
55	FT-3-1105-055	FT-3-1106-055	FT-3-01147-055	
60		FT-3-1106-060		
70	FT-3-1105-070	FT-3-1106-070	FT-3-01147-070	
90	FT-3-1105-090	FT-3-1106-090	FT-3-01147-090	
100				13440-100-----K
110	FT-3-1105-110	FT-3-1106-110	FT-3-01147-110	
125	FT-3-1105-125	FT-3-1106-125	FT-3-01147-125	
130				13440-130-----K
142	FT-3-1105-142			
150	FT-3-1105-150	FT-3-1106-150		
240	FT-3-1105-240			
293	FT-3-1105-293			13440-293-----K

** Q = 500 pieces, K = 50 pieces,
Other dimensions are available on request

Quartz Microfiber Filters

These quartz microfiber filters are made of high-purity quartz microfibers without any addition of glass microfibers and binding agents. They are especially suited for emission monitoring at temperatures of up to 900 °C and wherever filters of the highest purity are needed. In addition, the Q3400 filter grade is tempered to remove all chemically combined water and to give the filters excellent weight and dimensional stability.

- Made of 100 % quartz microfiber silicium dioxide (SiO₂)
- High-purity filters with the lowest trace metal values
- Extreme temperature resistance up to 900 °C
- Exceptional chemical resistance
- Excellent weight and dimensional stability
- Biologically inert
- Certificate on trace elements available for every batch of the grade Q3400



Application Examples

- Analysis of dust levels according to EN 13284 1:2017.
- Emission monitoring at high temperatures (air pollution)
- Analysis of hot and acidic gases
- Trace element analysis
- Analytical and gravimetric analyses
- Stationary source emissions – Determination of PM₁₀/PM_{2,5} mass concentration in flue gas – Measurement at low concentrations by use of impactors according to ISO 23210:2009 (Grade Q3400)

Technical Specifications

Grade	Weight (g/m ²)*	Thickness (mm)*	Penetration (%)**	Pressure drop 5.3 cm/s (Pa)	Dry tensile strength longitudinal (N/m)	Dry tensile strength crosswise (N/m)	Pre-Heated
Q3400	85	0.43	<0.002	450	200	80	yes
T293	85	0.43	<0.002	450	150	70	no

* See test methods, page 31

** according to EN 143 (0.3 µm, 15 cm/s, paraffin oil)

Ordering Information



Filter Discs, grade Q3400

Ø in mm	Qty per box	Order No.
20	25	Q3400--20-----G
25	25	Q3400--25-----G
30	25	Q3400--30-----G
37	25	Q3400--37-----G
45	25	Q3400--45-----G
47	25	Q3400--47-----G
50	25	Q3400--50-----G
82	100	Q3400--82-----N
90	100	Q3400--90-----N
142	50	Q3400-142-----K
150	50	Q3400-150-----K



Filter Discs, grade T293

Ø in mm	Qty per box	Order No.
13	100	FT-3-1109-013
25	50	FT-3-1109-025
37	50	FT-3-1109-037
45	50	FT-3-1109-045
47	50	FT-3-1109-047
50	50	FT-3-1109-050
70	50	FT-3-1109-070
85	50	FT-3-1109-085
90	50	FT-3-1109-090
100	50	FT-3-1109-100
110	50	FT-3-1109-110
125	50	FT-3-1109-125
150	50	FT-3-1109-150
293	25	FT-3-1109-293

Other dimensions are available on request

Quality Control Test Methods

Basis Weight According to DIN EN ISO 536

The basis weight is determined by weighing a paper sheet that is between 500 cm² and 1,000 cm² in size on a calibrated paper scale showing an accuracy of +/- 0.5%. The basis weight is expressed in grams per square meter (g/m²).

Thickness According to DIN EN ISO 20534

The thickness is measured using a thickness meter or gauge readings and is expressed in millimeters.

Filtration Speed (s)

The time required to filter 10 mL of distilled water at 20 °C through a free-hanging, fully-wetted filter disc with a diameter of 110 mm folded in quarters. The filtration rate is expressed in seconds.

Filtration Speed (mL/min – Herzberg)

The time required to filter distilled water at 20 °C through a filter surface of 10 cm² and at a constant pressure of 5 cm water column. The filtration rate is expressed in mL/min.

Ash Content According to DIN 54370

The ash content is the residue determined after ignition of 10 g of filter paper at 800 °C in a platinum crucible. The ash content is expressed in percent.

Tensile Strength According to DIN EN ISO 1924-2

A continually increasing load is applied vertically to a paper strip measuring 15 mm in width and 180 mm in length. The tensile strength is defined as the stretching force necessary to break the piece and measured lengthwise and in the transverse direction. The tensile strength is expressed in N/15 mm.

Dry Bursting Strength According to DIN ISO 2758

A paper with a surface area of 10 cm² is clamped over and subjected to increasing pressure from a rubber diaphragm. The bursting strength is the pressure reading at the time of rupture. The bursting strength is expressed in kilopascal (kPa).

Wet Burst Resistance According to DIN ISO 3689

A paper with surface area of 10 cm² is immersed in water and then clamped over a rubber diaphragm. The paper is subjected to evenly increasing pressure from the rubber diaphragm. The bursting strength is the pressure reading at the time of rupture. The wet bursting strength is expressed in kilopascal (kPa).

Air Resistance

Air resistance is the pressure drop that occurs after filtration of a defined air stream (270 L/h and | or 75 cm/s at 10 cm²) through a filter paper. The air resistance is expressed in mbar.

Capillary Rise According to DIN ISO 8787 (Klemm Method)

The capillary rise is defined as the height to which a paper strip measuring 15 mm in width and 250 mm in length, whose narrow side is immersed in prefiltered distilled water (20 °C), is wetted after 10 or 30 min. After this test period of 10 and 30 min., the wetted part of the strip is measured in mm. The capillary rise is expressed in mm per 10 min and | or 30 min.

Index of Grades

Grade	Middler number	Description	Page
100/N	328	Qualitative-technical paper, smooth	12-13,19
1220, 475 g/m ²	10389	Paper board	16
1288	206	Qualitative filter paper	8-9
1289	207	Qualitative filter paper	8-9
1290	208	Qualitative filter paper	8-9
1291	209	Qualitative filter paper	8-9
1292	210	Qualitative filter paper	8-9
131	351	Qualitative filter paper	10-11
132	329	Qualitative filter paper	10-11
1339	441	Paper board	16
13400	n.a.	Glass microfiber filter, with binder	26-27
13430	n.a.	Glass microfiber filter, with binder	26-27
13440	n.a.	Glass microfiber filter, binder-free	28-29
151	449	Paper board	16
1602/N	342	Qualitative-technical paper, crêped	14
191, blue	379	Germination test paper	18
193, yellow	381	Germination test paper	18
20	00353	Germination test paper	17
20 grey	00366	Germination test paper	17
292	205	Qualitative filter paper	10-11
292a	215	Qualitative filter paper	10-11
293	211	Qualitative filter paper	8-9
34/N, 60 g/m ²	478	Qualitative-technical paper, crêped	14-15
37/N, 135 g/m ²	480	Qualitative-technical paper, crêped	14-15
39/N, 180 g/m ²	483	Qualitative-technical paper, crêped	14-15,18
39/N, 300 g/m ²	487	Qualitative-technical paper, crêped	14-15
■ 388	101	Quantitative filter paper	6-7

Grade	Middler number	Description	Page
□ 389	102	Quantitative filter paper	6-7
■ 390	103	Quantitative filter paper	6-7
■ 391	104	Quantitative filter paper	6-7
■ 392	105	Quantitative filter paper	6-7
■ 393	127	Quantitative filter paper	6-7
3 hw	303	Qualitative-technical paper, smooth	12-13,19
3 m/N	305	Qualitative-technical paper, smooth	12-13
3 S/h	307	Qualitative-technical paper, smooth	12-13
3 w	308	Qualitative-technical paper, smooth	12-13
470	606	Diatomaceous earth filter	19-20
480	602	Phase separating paper	21
4 b	309	Qualitative-technical paper, smooth	12-13,17
5 H/N	423	Qualitative-technical paper, creped	14-15
6	312	Qualitative-technical paper, smooth	12-13,17
6 S/N	314	Qualitative-technical paper, creped	14-15, 18, 19
601/N	354	Qualitative-technical paper, creped	14-15,19
603/N	335	Qualitative-technical paper, creped	14-15,19
67/N, 160 g/m ²	477	Qualitative-technical paper, creped	14-15
918	607	Qualitative-technical paper, smooth, black	12-13
BF 2	519	Blotting paper	24
BF 3	520	Blotting paper	24
BF 4	521	Blotting paper	24
C 140	356	Qualitative-technical paper, smooth	12-13,18
C 160	343	Filter paper for liquid absorption	16
C 350L	340	Paper board	16
FN 100	527	Chromatography paper	23

Grade	Middler number	Description	Page
FN 3	503	Chromatography paper	23
FN 30	526	Chromatography paper	23
FN 4	504	Chromatography paper	23
FN 7	507	Chromatography paper	23
LabSorb	601	Surface protection paper	22
MG 1387/1	01125	Glass microfiber filter, with binder	26–27
MG 160	01110	Glass microfiber filter, binder-free	28–29
MG 227/1/60	01124	Glass microfiber filter, with binder	26–27
MG 400 XA	01123	Glass microfiber filter, with binder	27
MG 550-HA	01147	Glass microfiber filter, binder-free	28–29
MGA	1101	Glass microfiber filter, binder-free	28–29
MGB	1102	Glass microfiber filter, binder-free	28–29
MGC	1103	Glass microfiber filter, binder-free	28–29
MGD	1104	Glass microfiber filter, binder-free	28–29
MGF	1105	Glass microfiber filter, binder-free	28–29
MGG	1106	Glass microfiber filter, binder-free	28–29
Q3400	n.a.	Pre-heated quartz microfiber filter	30
SEK 770	419	Paper board	16
T293	1109	Quartz microfiber filter	30

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Sartorius Pipetting and Dispensing Products

Simplifying Progress

SARTORIUS



Table of Contents

The Sartorius product portfolio, technical data and specifications are subject to change, due to continuous product development.

Please visit the website for an up-to-date overview of Sartorius products:
sartorius.com

About Sartorius Pipetting and Dispensing		Pipetting Academy	
Introduction	4	Pipetting Academy	58
Quality	6	Pipetting Recommendations	60
How to Choose a Pipette		Calibration and Maintenance	
Electronic or Mechanical Pipette	8	Pipette Calibration and Maintenance Services	64
Electronic Pipettes		Pipette Decontamination Procedure	65
Picus® 2 Electronic Pipettes	12	Autoclaving Instructions	66
Mechanical Pipettes		Sales and Service Contacts	68
Tacta® Mechanical Pipettes	18		
Proline® Plus Mechanical Pipettes	23		
Stands and Accessories			
Pipette Stands	30		
Safe-Cone Filters	31		
Adjustment Tool	33		
Pipette Tips			
Pipette Tips	36		
Optifit Tips	38		
Safetyspace® Filter Tips	39		
Packaging Options	40		
Maxi-Volume Liquid Handling			
Midi Plus Pipetting Controller	48		
Prospenser Plus and Prospenser	50		
Biotrate Digital Burette	52		

Introduction

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[®], and the Picus[®] 2, which is an excellent example of an electronic pipette that has all these aspects combined. Tacta[®] and Picus[®] 2 are among the lightest pipettes on the market, reducing the risk of repetitive strain injury (RSI). Their high reliability, and ease of use, make them valued instruments for professionals, who strive for high quality results.

Their functional and well-rounded design has been recognised with design awards. All Sartorius pipettes are designed and manufactured in Finland, where our R&D team is constantly seeking solutions to further improve liquid handling instruments to make lab work easier.

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 emphasize 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. The Tacta[®] and the Picus[®], won the Red Dot design award, and the German Design Award. The Picus[®] was also distinguished with the Fennia Prize Honorary Mention.

Responsible Manufacturing

At our manufacturing sites, we have invested in production technologies that generate less waste. Our pipette tip production facility in Kajaani, Finland uses 100% renewable electricity and has achieved a waste recovery rate of 98%. Additionally, plastic waste from Sartorius pipette tip manufacturing is recycled for use as raw materials for other plastic products.

We are continuously working to reduce our environmental impact. To further drive this, our environmental management system in Finland is certified by an independent third party to meet the ISO 14001 standard. Our facilities in Finland work with a Carbon Neutral Waste Management service to offset their waste's carbon footprint through certified afforestation projects. In 2023, investments were made in permanent carbon sinks to neutralize waste emissions.

Read more about product sustainability at Sartorius: <https://www.sartorius.com/en/company/sustainability/product-sustainability>



Reliability

For us, reliability has many aspects, the most important being accuracy and precision of results and 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, so that they perfectly match our pipettes.

To reduce the risk of contaminating the internal components of our pipettes, we offer special Safe-Cone Filters to be used in our pipettes, as we understand that purity is a key concern in many laboratories. 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.



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.

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.



Sartorius service centers worldwide with accredited pipette calibration laboratories offer calibrations services with precise technical requirements. Their accreditation status has been granted by their national accreditation bodies. Please check sartorius.com for more information.



During production every pipette is quality tested. Pipette performance testing is carried out according to ISO 8655 standard and delivered with Quality Control certificate. Sartorius accredited pipette calibration at service follows the ISO 17025 standard.



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.



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 repetitive strain injury (RSI).



The Optiload tip loading mechanism developed by Sartorius in Tacta[®], Proline[®] Plus, and Picus[®] 2 pipettes allows tips to be loaded with constant force. This secures optimal tip sealing and minimum tip ejection force.



The Optilock[®], volume locking system in Tacta[®] gives the choice of locking and unlocking the volume the traditional way, using both hands, or specially developed convenient method, using one hand.



The Optiject[®], is a unique mechanism in Tacta[®], where the soft, levered tip ejection feature lets the tip detach in a smooth, controlled way with little force. Additionally the feature allows for hands-free ejection of the Safe-Cone filter for a truly safe disposal of contaminated filters.



Every lot of Sartorius Single Tray, Refill Pack and FlexiBulk[®] tips are certified to be free of DNase, RNase, human DNA and endotoxins, for the protection of samples from contamination. These lot specific and other certificates can be downloaded from sartorius.com. Sartorius' tip production is ISO 8 cleanroom classified, which ensures a contamination-free manufacturing environment, and products.



Most Sartorius pipetting and dispensing products are autoclavable. Please see details in the following product specific chapters.

How to Choose a Pipette

Electronic or Mechanical Pipette

Are you looking for a pipette for sterile work, or one you could easily calibrate yourself? Or do you seek 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	▪	▪



Electronic Pipettes

Features	Picus® 2
Most ergonomic	▪
Weight ¹	100g
Length ¹	210 mm
Volume range, single-channels	0.5 µL – 10 mL
Volume range, multi-channels	0.5 µL – 1.2 mL
Language options	5
Pipetting modes	8
Advanced functions	8
Repeated blow-out (advanced function)	▪
Microwell plate tracker	▪
Connectivity	Bluetooth, USB
Memory places (for storing programs)	20
Reminders for calibration & service	▪
Password protection	▪
Electronic tip ejection	▪
Calibration adjustment by user	▪
Calibration adjustment in 1, 2 or 3 points	▪
Hot key for stored programs	▪
Use of pipette while charging	▪
Fully charged in 1 hour	▪
Safe-Cone Filters	▪
Autoclavable lower parts ²	▪
Optiload in multi-channels	▪
Color coding on pipette	▪
Warranty for 2 years	▪

¹ 1,000 µL 1-channel models

² Excluding 1,200 µL multi-channel pipettes

Mechanical Pipettes

Features	Tacta®	Proline® Plus
Most Ergonomic	▪	
Ergonomic Finger Hook	▪	▪
Weight ¹	75g	82g
Length ¹	225 mm	239 mm
Volume range, single-channels	0.3 µL – 10 mL	0.3 µL – 10 mL
Volume range, multi-channels	1 – 300 µL	1 – 300 µL
Fixed-volume models		▪
Pipetting force ¹	12 N	15 N
Optiject soft tip ejection	▪	
Light tip ejection		▪
Optiload spring-loaded tip cones	all models	multi-channels only
User adjustment	▪	▪
Optilock on off volume lock	▪	
Volume locking	▪	click stops
Big, and easy to read display	▪	▪
Safe-cone Filters (models > 10 µL)	▪	▪
Filter ejector	▪	
Color coding on pipette	▪	▪
ID tags	▪	
Fully autoclavable	▪	▪
Multipacks	▪	▪
Pipette holder with pipette	▪	▪
Warranty for 2 years	▪	▪

¹ 1,000 µL 1-channel models



Tips
e DNA
ee

SARTORIUS
2029-03
REF L4-799000
LOT 1234567890

10 mL

Optifit Tips

SARTORIUS
2027-08
REF 791000
LOT 501507520

DNase, RNase, DNA,
and endotoxin free

1,000 µL

Electronic Pipettes

Table of Contents

Electronic Pipettes Picus® 2 Electronic Pipettes

12



Picus® 2 Electronic Pipettes

The Most Sophisticated and Ergonomic Pipettes Ever!

The Picus® 2 pipettes ensure reliable and repeatable pipetting results and feature an unbeatable ergonomic design that is kind to your hand. Picus® 2 is suited to anyone working in the lab, from a graduate student to an experienced laboratory professional. It is as intuitive to use as a mechanical pipette, but also offers more advanced options for experienced users.

Picus® 2 saves you time in the lab with a wide selection of pipetting modes and customizable programs to meet your every need. The most frequently used modes with specified settings can be saved on your device for quick and easy access. Safety features like password protection and calibration reminders support compliance requirements in regulated labs. By connecting Picus® 2 to your mobile device, you can use the Sartorius pipetting mobile app to smoothly run sample preparation workflows and adjust the pipette setting automatically, taking your productivity to the next level.

Picus® 2 is available in single-channel models, covering a volume range of 0.5 µL to 10,000 µL, and in multi-channel models from 0.5 µL to 1,200 µL.

Superior Ergonomics

The uniquely lightweight and streamlined design of the Picus® 2 pipette ensures an effortless pipetting experience. The pipette rests lightly in the user's hand due to the comfortable handle and finger hook, and minimal gripping force is needed.

The conveniently located soft-touch operating buttons, and electronic tip ejection, help minimize muscle strain for both left- and right-handed users, further enhancing the ergonomics of the pipette.

Reliable Results

The precise electronic pipetting system of the Picus® 2 pipettes enable accurate and precise pipetting results, independent of the user. Using the unique plate tracker increases reliability in microwell plate pipetting, by guiding the user to pipet into the correct microplate wells.



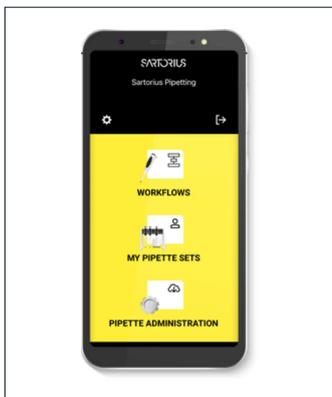
Features and Benefits



Picus® 2 lightweight pipettes, with a comfortable handle and finger hook, requiring minimal gripping force.



Adjustment wheel for quick single-handed operation and speed control.



The Sartorius Pipetting app is your handy companion for sample preparation workflows and pipette management.

Ergonomic Design for Reduced Risk of Strain Injury

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

Sartorius Pipetting App

The Sartorius pipetting app is your trusty companion for sample preparation workflows, as well as managing Sartorius pipettes. For Picus® 2 pipette users it is a must-have.

This intuitive and user-friendly app is designed to provide step-by-step guidance for various workflows for Picus® 2 pipettes. Whether you are a seasoned scientist or a novice in the field, this app offers a comprehensive and easy-to-use platform for ensuring the accuracy and reproducibility of your liquid handling workflows. The app features an ever-growing database of configurable protocols that can be adapted according to your specific application.

Innovative Technology for Reliable Results

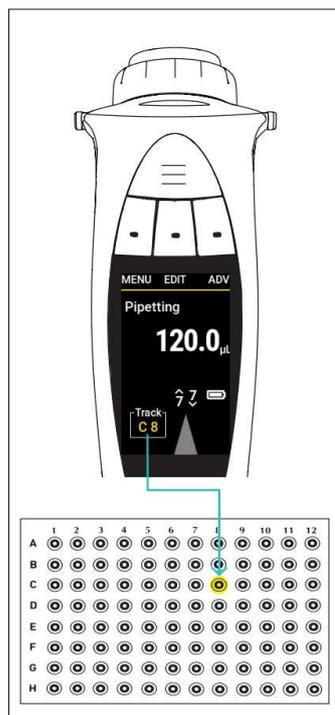
- Fully electronic functionality provides outstanding accuracy and repeatability of results
- Electronic brake stops piston movement rapidly and precisely, ensuring high precision, especially in serial dispensing
- Repeated blow-out function helps dispense the very last droplets of liquid, ensuring complete recovery

Intuitive User-Interface for Ease of Use

- Natural to use buttons
- Easy menu navigation and unique adjustment wheel make for fast setting of volumes and modes
- Hotkeys for quick access to your preset programs
- Enables ergonomic single-handed operation

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
- Multi-dispensing mode replaces the need for a stepper
- Save time in the lab with a wide selection of pipetting modes and customizable programs for every need



Microwell plate tracker in use

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
- Also available in Sartorius Pipetting app

Optiload in Multi-channel Models for Perfect Tip Sealing

- Allows tip loading with an equal constant force onto every channel
- Enables perfect tip sealing onto every individual tip cone

Safe-Cone Filters to Help Prevent Contamination

- Are available for all models >10 µL

Easy to Clean

- Easy to open for deep cleaning
- The pipette lower parts can be decontaminated by autoclaving (excl. 1,200 µL models)

Calibration Adjustment

- Define and save 5 calibration settings for different liquids, in addition to the factory setting
- The adjustment can be made in 1, 2 or 3 points by the user

Fast Charge that Lasts Several Hours

- Battery is charged in 1 hour
- Continue pipetting while charging with micro USB cable
- Most convenient way is to store your pipette in a charging stand

Safety Features

- Password protection helps to prevent unauthorized changes or use of the pipette
- Calibration and service reminders to support maintenance routines
- Pipette locking feature can be used when pipette is awaiting service or cleaning

Pipetting Modes

Pipetting Modes	Advanced functions (ADV)*							
	Plate Tracker	Mixing Before Aspiration	Mixing After Dispensing	Counter	Excess Volume Adjustment	Auto Dispensing	Repeated Blow-out	Fast Dispensing
Pipetting	■	■	■	■			■	
Multi-Dispensing	■	■		■	■	■		
Multi-Aspiration							■	
Reverse pipetting	■	■		■	■			
Sequential Dispensing		■		■	■	■		
Manual pipetting							■	
Diluting			■				■	
Titration								■

* Advanced functions are used in conjunction with the pipetting mode

Ordering Information

Picus® 2 Electronic Pipettes

Tip Selection Guide

Picus® 2 Order Code	Channels	Volume Range	Increment	Pipettes and Tips	Optifit Tip	Safetyspace® Tip	Safe-Cone Filters	
		(μL)	(μL)	Color-Code	Volume	Volume	Standard	Plus
LH-747021	1	0.5–10	0.01	■	10 μL	10 μL	-	-
LH-747041	1	5–120	0.10	■	200 μL	120 μL	721008	721018
LH-747061	1	10–300	0.20	■	350 μL	300 μL	721007	721017
LH-747081	1	50–1,000	1.00	■	1,000 μL	1,000 μL	721006	721016
LH-747101	1	100–5,000	5.00	■	5,000 μL	5,000 μL	721005	721015
LH-747111	1	500–10,000	10.00	■	10,000 μL	-	721005	721015
LH-747321	8	0.5–10	0.01	■	10 μL	10 μL	-	-
LH-747421	12							
LH-747341	8	5–120	0.10	■	200 μL	120 μL	721008	721018
LH-747441	12							
LH-747361	8	10–300	0.20	■	350 μL	300 μL	721007	721017
LH-747461	12							
LH-747391	8	50–1,200	1.00	■	1,200 μL	1,200 μL	721006	721016
LH-747491	12							

For pipette specifications (incl. Systematic and Random error limits), please see product datasheet, available at sartorius.com





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10

Mechanical Pipettes

Table of Contents

Mechanical Pipettes

Tacta® Mechanical Pipettes

18

Proline® Plus Mechanical Pipettes

23



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.



Thanks to the ergonomically designed finger hook, your Tacta® rests comfortably in your hand without extensive gripping force.

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

Sartorius proudly presents Tacta®, the 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 repetitive injury. 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 Optiject, 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.



reddot award 2016
winner



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

Safe-Cone Filters

The exchangeable Safe-Cone Filters, used in pipette tip cones, act as barriers to reduce the risk of 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 its low weight and ergonomically designed handle
- Low pipetting and tip ejection forces that reduce the risk of repetitive injury
- 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® Mechanical Pipettes

Tip Selection Guide

Tacta® Order Code	Channels	Volume Range	Increment	Pipettes and Tips	Optifit Tip	Safetyspace® Tip	Safe-Cone Filters	
		(μL)	(μL)	Color-Code	Volume	Volume	Standard	Plus
LH-729010	1	0.3-3	0.002	■	10 μL	10 μL	-	-
LH-729020	1	1-10	0.01	■	10 μL	10 μL	-	-
LH-729030	1	2-20	0.02	■	200 μL	20 μL	721014	-
LH-729050	1	10-100	0.10	■	200 μL	120 μL	721008	721018
LH-729060	1	20-200	0.20	■	200 μL	200 μL	721007	721017
LH-729070	1	100-1,000	1.00	■	1,000 μL	1,000 μL	721006	721016
LH-729080	1	500-5,000	5.0	■	5,000 μL	5,000 μL	721005	721015
LH-729090	1	1,000-10,000	10.0	■	10,000 μL	-	721005	721015
LH-729120	8	1-10	0.01	■	10 μL	10 μL	-	-
LH-729220	12							
LH-729130	8	10-100	0.10	■	200 μL	120 μL	721008	721018
LH-729230	12							
LH-729140	8	30-300	0.20	■	350 μL	300 μL	721007	721017
LH-729240	12							

For pipette specifications (incl. Systematic and Random error limits), please see product datasheet, available at sartorius.com



Tacta® Multipacks Smart and Complete Set of Pipettes and Accessories

Choose from a range of eight Multipacks that include a selection of Tacta® Mechanical Pipettes, a Linear Stand, matching Optifit Tips, and Pipette Holders.



Ordering Information Tacta® Mechanical Pipettes Multipack

Multipack Order Code	Tacta® Pipettes	Optifit Tips	Accessories
Tacta® Pipette 3-pack 10 LH-729670	1-channel <ul style="list-style-type: none"> ▪ 1-10 µL ▪ 10-100 µL ▪ 100-1,000 µL 	Tip Racks (96 tips) <ul style="list-style-type: none"> ▪ 10 µL ▪ 200 µL ▪ 1,000 µL 	Linear Stand
Tacta® Pipette 3-pack 20 LH-729671	1-channel <ul style="list-style-type: none"> ▪ 2-20 µL ▪ 20-200 µL ▪ 100-1,000 µL 	Tip Racks (96 tips) <ul style="list-style-type: none"> ▪ 200 µL ▪ 1,000 µL 	Linear Stand
Tacta® Pipette 4-pack 20 LH-729672	1-channel <ul style="list-style-type: none"> ▪ 1-10 µL ▪ 2-20 µL ▪ 20-200 µL ▪ 100-1,000 µL 	Tip Racks (96 tips) <ul style="list-style-type: none"> ▪ 10 µL ▪ 200 µL ▪ 1,000 µL 	Linear Stand
Tacta® Pipette 4-pack 100 LH-729673	1-channel <ul style="list-style-type: none"> ▪ 1-10 µL ▪ 10-100 µL ▪ 20-200 µL ▪ 100-1,000 µL 	Tip Racks (96 tips) <ul style="list-style-type: none"> ▪ 10 µL ▪ 200 µL ▪ 1,000 µL 	Linear Stand
Tacta® Pipette 5-pack 10 LH-729674	1-channel <ul style="list-style-type: none"> ▪ 1-10 µL ▪ 10-100 µL ▪ 20-200 µL ▪ 100-1,000 µL ▪ 500-5,000 µL 	Tip Racks (96 tips) <ul style="list-style-type: none"> ▪ 10 µL ▪ 200 µL ▪ 1,000 µL Tip Rack (50 tips) <ul style="list-style-type: none"> ▪ 5,000 µL 	Linear Stand
Tacta® Pipette 5-pack 20 LH-729675	1-channel <ul style="list-style-type: none"> ▪ 2-20 µL ▪ 10-100 µL ▪ 20-200 µL ▪ 100-1,000 µL ▪ 500-5,000 µL 	Tip Racks (96 tips) <ul style="list-style-type: none"> ▪ 200 µL ▪ 1,000 µL Tip Rack (50 tips) <ul style="list-style-type: none"> ▪ 5,000 µL 	Linear Stand
Tacta® Pipette 3+1-pack LH-729676	1-channel <ul style="list-style-type: none"> ▪ 1-10 µL ▪ 20-200 µL ▪ 100-1,000 µL 8-channel <ul style="list-style-type: none"> ▪ 30-300 µL 	Tip Racks (96 tips) <ul style="list-style-type: none"> ▪ 10 µL ▪ 200 µL ▪ 350 µL ▪ 1,000 µL 	Linear Stand
Tacta® Pipette 3-pack max LH-729677	1-channel <ul style="list-style-type: none"> ▪ 100-1,000 µL ▪ 500-5,000 µL ▪ 1,000-10,000 µL 	Tip Racks <ul style="list-style-type: none"> ▪ 1,000 µL (96 tips) ▪ 5,000 µL (50 tips) ▪ 10,000 µL (35 tips) 	Linear Stand



Proline® Plus Mechanical Pipettes

Dependable Durability



Fixed volume Proline® Plus pipette



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.

The Proline® Plus mechanical pipette family is designed to offer comfort and quality for your everyday manual pipetting. It combines durable construction with ease and lightness of use, and is therefore the perfect choice for liquid-handling professionals and students alike. In addition, it has the widest pipette range, including fixed volume pipettes for when volumes need to be ready-set to avoid errors.

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 overaspiration.

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



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

- Low pipetting forces that prevent repetitive injury 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 μ L (5 μ L for fixed) to 10 mL
- Easy volume setting with click stop mechanism
- Big volume display
- Color-coding of different volumes to ease the selection of matching pipette tips
- Safe-Cone Filters available for models > 10 μ L
- Fully autoclavable without disassembly
- Simple to clean and maintain with only three parts to disassemble
- Materials have high chemical and UV-resistance to secure long life-time of the pipette



Ordering Information

Proline® Plus Variable Volume
Mechanical Pipettes

Tip Selection Guide

Proline® Plus Order Code	Channels	Volume Range (μL)	Increment (μL)	Pipettes and Tips	Optifit Tip	Safetyspace® Tip	Safe-Cone Filters	
				Color-Code	Volume	Volume	Standard	Plus
728010	1	0.3–3	0.002	■	10 μL	10 μL	-	-
728020	1	1–10	0.01	■	10 μL	10 μL	-	-
728030	1	2–20	0.02	■	200 μL	20 μL	721014	-
728040	1	5–50	0.10	■	200 μL	120 μL	721008	721018
728050	1	10–100	0.10	■	200 μL	120 μL	721008	721018
728060	1	20–200	0.20	■	200 μL	200 μL	721007	721017
728070	1	100–1,000	1.00	■	1,000 μL	1,000 μL	721006	721016
728080	1	500–5,000	10.0	■	5,000 μL	5,000 μL	721005	721015
728090	1	1,000–10,000	20.0	■	10,000 μL	-	721005	721015
728120	8	1–10	0.01	■	10 μL	10 μL	-	-
728220	12							
728130	8	10–100	0.10	■	200 μL	120 μL	721008	721018
728230	12							
728140	8	30–300	0.20	■	350 μL	300 μL	721007	721017
728240	12							

For pipette specifications (incl. Systematic and Random error limits), please see product datasheet, available at sartorius.com



Ordering Information

Tip Selection Guide

Proline® Plus FIXED Volume, Single Channel

Order Code	Channels	Volume (μL)	Pipettes and Tips	Optifit Tip	Safetyspace® Tip	Safe-Cone Filters	
			Color-Code	Volume	Volume	Standard	Plus
728515	1	5	■	10 μL	10 μL	-	-
728520	1	10	■	10 μL	10 μL	-	-
728530	1	20	■	200 μL	20 μL	721014	-
728535	1	25	■	200 μL	120 μL	721008	721018
728545	1	50	■	200 μL	120 μL	721008	721018
728550	1	100	■	200 μL	120 μL	721008	721018
728560	1	200	■	200 μL	200 μL	721007	721017
728565	1	250	■	1,000 μL	1,000 μL	721006	721016
728567	1	500	■	1,000 μL	1,000 μL	721006	721016
728570	1	1,000	■	1,000 μL	1,000 μL	721006	721016
728575	1	2,000	■	5,000 μL	5,000 μL	721005	721015
728580	1	5,000	■	5,000 μL	5,000 μL	721005	721015
728590	1	10,000	■	10,000 μL		721005	721015

For pipette specifications (incl. Systematic and Random error limits), please see product datasheet, available at sartorius.com



Proline® Plus Fixed Volume Pipettes



Proline® Plus Multipacks – Complete Sets of Pipettes and Accessories

Proline® Plus Multipacks offer are sets of mechanical pipettes in an affordable package, including a Linear Stand and racks of matching tips.

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

Ordering Information

Proline® Plus Mechanical Pipette Multipacks

Multipack Order Code	Proline® Plus Pipettes	Sartorius Optifit Tips	Accessories
Proline® Plus Pipette 3-pack 10 LH-728670	1-channel <ul style="list-style-type: none"> ■ 1–10 µL ■ 10–100 µL ■ 100–1,000 µL 	Tip Racks (96 tips) <ul style="list-style-type: none"> ■ 10 µL ■ 200 µL ■ 1,000 µL 	Linear Stand
Proline® Plus Pipette 3-pack 20 LH-728671	1-channel <ul style="list-style-type: none"> ■ 2–20 µL ■ 20–200 µL ■ 100–1,000 µL 	Tip Racks (96 tips) <ul style="list-style-type: none"> ■ 200 µL ■ 1,000 µL 	Linear Stand
Proline® Plus Pipette 4-pack 20 LH-728672	1-channel <ul style="list-style-type: none"> ■ 1–10 µL ■ 2–20 µL ■ 20–200 µL ■ 100–1,000 µL 	Tip Racks (96 tips) <ul style="list-style-type: none"> ■ 10 µL ■ 200 µL ■ 1,000 µL 	Linear Stand
Proline® Plus Pipette 4-pack 100 LH-728673	1-channel <ul style="list-style-type: none"> ■ 1–10 µL ■ 10–100 µL ■ 20–200 µL ■ 100–1,000 µL 	Tip Racks (96 tips) <ul style="list-style-type: none"> ■ 10 µL ■ 200 µL ■ 1,000 µL 	Linear Stand
Proline® Plus Pipette 5-pack 10 LH-728674	1-channel <ul style="list-style-type: none"> ■ 1–10 µL ■ 10–100 µL ■ 20–200 µL ■ 100–1,000 µL ■ 500–5,000 µL 	Tip Racks (96 tips) <ul style="list-style-type: none"> ■ 10 µL ■ 200 µL ■ 1,000 µL Tip Rack (50 tips) <ul style="list-style-type: none"> ■ 5,000 µL 	Linear Stand
Proline® Plus Pipette 5-pack 20 LH-728675	1-channel <ul style="list-style-type: none"> ■ 2–20 µL ■ 10–100 µL ■ 20–200 µL ■ 100–1,000 µL ■ 500–5,000 µL 	Tip Racks (96 tips) <ul style="list-style-type: none"> ■ 200 µL ■ 1,000 µL Tip Rack (50 tips) <ul style="list-style-type: none"> ■ 5,000 µL 	Linear Stand
Proline® Plus Pipette 3+1-pack LH-728676	1-channel <ul style="list-style-type: none"> ■ 1–10 µL ■ 20–200 µL ■ 100–1,000 µL 8-channel <ul style="list-style-type: none"> ■ 30–300 µL 	Tip Racks (96 tips) <ul style="list-style-type: none"> ■ 10 µL ■ 200 µL ■ 350 µL ■ 1,000 µL 	Linear Stand
Proline® Plus Pipette 3-pack max LH-728677	1-channel <ul style="list-style-type: none"> ■ 100–1,000 µL ■ 500–5,000 µL ■ 1,000–10,000 µL 	Tip Racks <ul style="list-style-type: none"> ■ 1,000 µL (96 tips) ■ 5,000 µL (50 tips) ■ 10,000 µL (35 tips) 	Linear Stand



Stands and Accessories

Table of Contents

Stands and Accessories

Pipette Stands

30

Safe-Cone Filters

31

Adjustment Tool

33



Pipette Stands

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.

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.

Compact carousel stands are ideal for saving bench space. There is one for mechanical pipettes, and a charging carousel stand for electronic 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
LH-727650	Adapter for Mechanical Carousel Stand
LH-727640	Holder for one pipette

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



Charging Carousel Stand: 730991



Charging Stand: 730981



Linear Stand (non-charging):
725620



Carousel Stand (non-charging):
LH-725630



Adapter for Mechanical
Carousel Stand: LH-727650



Pipette Holder for one Pipette:
LH-727640

Safe-Cone Filters



Built-in filter ejector in Tacta®

Why Should You Use Safe-Cone Filters?

These unique and replaceable polyethylene (PE) filters prevent any fluids and liquid vapours from reaching the internal components of the pipette.

- Reduce the risk of contaminating the internal components of our pipettes
- Prolong the pipette's lifetime
- Reduce maintenance intervals
- Are cost-effective compared to filter tips
- We do not recommend to use Safe Cone Filters in combination with 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

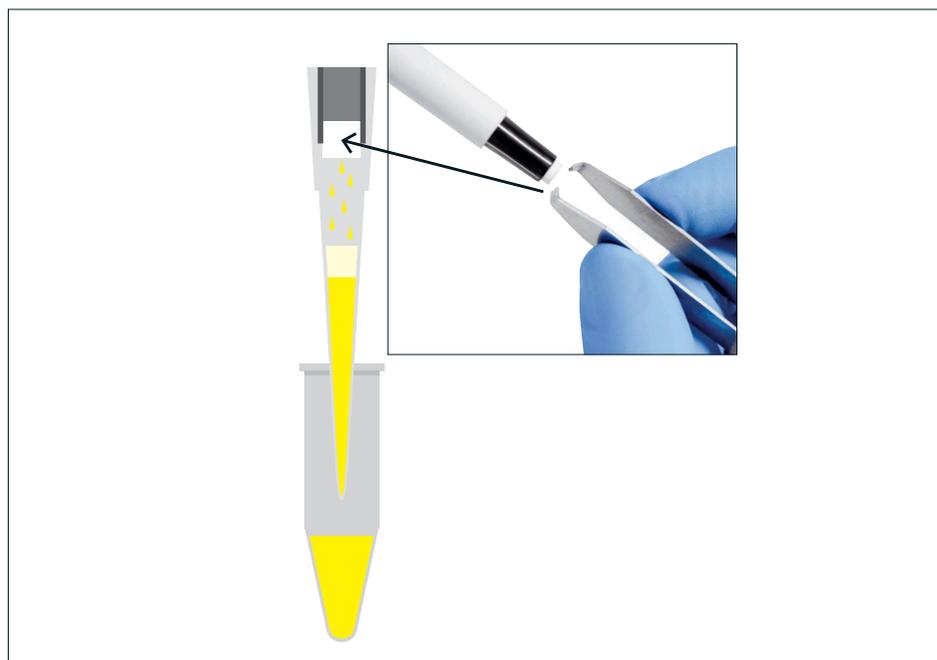
For general applications. Can be used in same type of work as the Plus filter, but needs to be changed more frequently.

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.

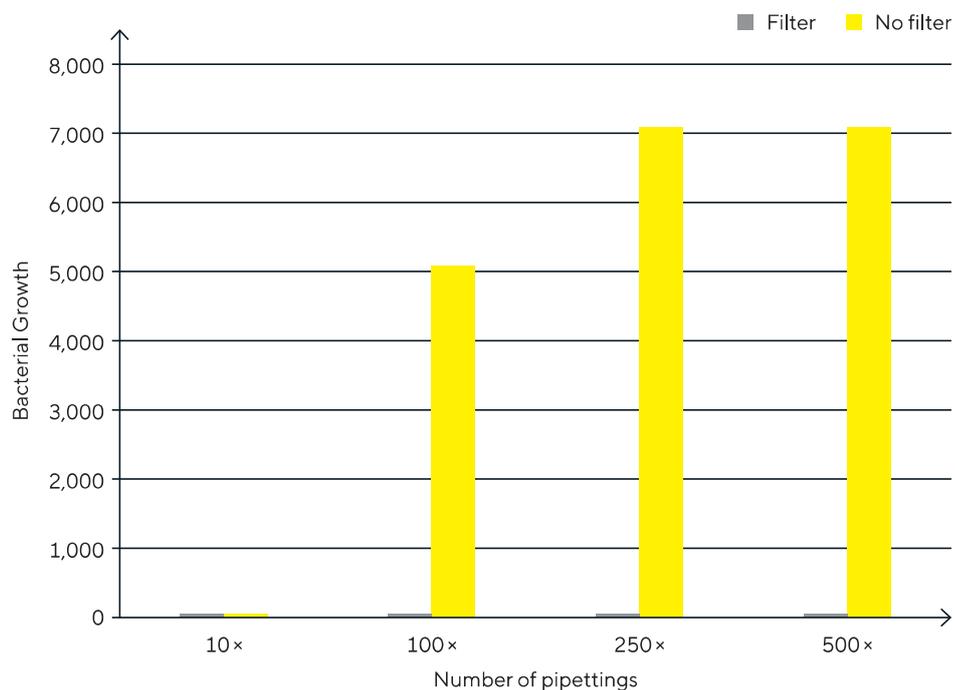
How to Change?

To ensure that the user is protected from contamination, tweezers should be used when removing used filters from the pipette tip cone. The Tacta® 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.



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

Contamination in Pipette Interior



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

Ordering Information

Safe-Cone Filters

Order Code	Item	Qty / Unit
721008	Standard Ø 2.51mm PE	50
721007	Standard Ø 3.15mm PE	50
721006	Standard Ø 5.33mm PE	50
721005	Standard Ø 6.73mm PE	50
721014	Standard Ø 1.83mm Polyolefin	50
721018	Plus Ø 2.51mm PE	50
721017	Plus Ø 3.15mm PE	50
721016	Plus Ø 5.33mm PE	50
721015	Plus Ø 6.73mm PE	50
721009	Tweezers for Safe-Cone Filters	1

PE = polyethylene

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

Adjustment Tool

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

Ordering Information

Adjustment Tool



Adjustment Tool is used for adjusting Proline® Plus pipettes.



The Adjustment Tool for adjusting the Tacta® pipette.

Order Code	Item	Qty
726203	Adjustment Tool for Proline® Plus	1
LH-727080	Adjustment Tool for Tacta®	1





Optifit Tips
Single tray 5,000 µL
1 x Sales Unit (50 tips)
Biohit family
SARTORIUS
LOT 50
17.05.2023 07:3

Optifit Tips
SARTORIUS
2027-08
REF 791000
LOT 501507590
1,000 µL
DNase, RNase, DNA, endotoxin free

Optifit Tips
DNase, RNase, DNA, endotoxin free
10 mL

Pipette Tips

Table of Contents

Pipette Tips

Pipette Tips

36

Optifit Tips

38

Safetyspace® Filter Tips

39

Packaging Options

40





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

Pipette Tips

The Perfect Match for Your Pipette

Sartorius pipette tips ensure the performance of Sartorius pipettes and repeatability of your results like no other tip can. They have been designed and manufactured to meet the highest quality and purity standards and to be the inert protectors of your samples. Moreover, correctly fitting tips protect the pipette's tip cone from wear and tear.

Sartorius tip packages are designed to make the daily work of lab professionals easier. Our offering covers a variety of functional tip package options with various purity ratings.

The high purity and consistent quality of Sartorius tips provide your valuable samples with the ultimate protection from contamination. We adhere to strict quality standards and control procedures – from raw material to automated manufacturing and packaging.

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



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 molding machines. Molding 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. 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 tip lot of Single Tray and Refill Pack for DNase, RNase, human DNA and endotoxins. Lot-specific purity certificates can be downloaded from sartorius.com.



Definitions	
Human DNA	Sartorius purity certified tips are analyzed for the presence of DNA using quantitative PCR and human DNA specific primers. The determined detection limit of the assay is < 1 pg/μL.
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 < 1*10 ⁻⁸ U/μL.
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.

* Speciality tip sterility assurance level, DNase, RNase, human DNA and endotoxin testing detection limits may differ from values reported here. Please download a batch specific certificate from sartorius.com

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® 2, Tacta® and Proline® Plus pipettes enabling ergonomic and light tip attachment and ejection
- Color-coding of tip trays allows easy matching with a corresponding color-coded Sartorius pipette
- Universal design optimized for Sartorius pipettes

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, human DNA and endotoxins: Single Trays, Refill Packs and FlexiBulk® packs certified pure by lot number
- Pre-sterilized 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
Purity	Standard	Free of DNase, RNase, human DNA & endotoxins	Pre-sterilized & free of DNase, RNase, human DNA & endotoxins
Regular pipetting applications	▪		
Applications where prevention of cross-contamination is vital		▪	▪

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, human DNA 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.

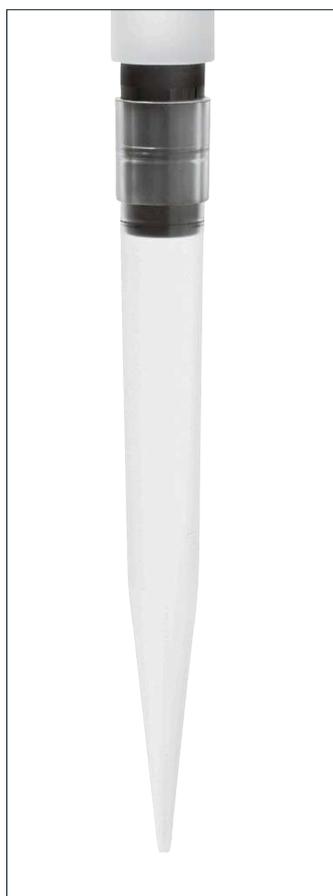


Available Packaging Options

- Single Tray Rack
- Refill Tower
- Refill Pack
- FlexiBulk® Pack
- Bulk in a Bag

Features and Benefits

- Standard non-filter tips made to Sartorius quality standards
- Perfect fitting and sealing with Sartorius Picus® 2, Tacta® and Proline® Plus pipettes
- Wide tip volume range from 10 µL to 10 mL
- Wide selection of packaging and purity options
- Available as DNase, RNase, human DNA and endotoxin-free
- e-beam pre-sterilized packaging options available
- Full traceability
- Color-coded trays to match with corresponding Sartorius pipettes
- Fully autoclavable at 121°C, at 1 bar, for 20 minutes



Optifit tips provide excellent tip sealing

Safetyspace® Filter Tips

Protect Valuable Samples



Safetyspace® Filter Tips offer optimal protection for your work from cross contamination and enable you to use the full volume of the tip with any pipetting mode. They feature the unique Safetyspace® air gap that leaves additional space 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.

Safetyspace® Filter tips are made of virgin polypropylene and are fitted with pure polyethylene filter barriers that effectively capture solid and liquid aerosol particles. The filter is made without self-sealing additives to avoid any interference with the sample or results. In addition to protecting your samples, the filter also protects your pipette.

The Safetyspace® Filter Tips are Ideal for:

- Molecular biology
- Microbiology
- Cell culture applications
- Radioactive work

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
- Safetyspace® air gap between the sample and filter reduces the risk of contaminating the internal components of our pipettes
- Enables the full use of pipettes' volume range with any pipetting mode
- Available in volumes from 10 µL to 5,000 µL
- Certified free of DNase, RNase, human DNA and endotoxins
- e-beam pre-sterilized
- Full traceability
- Color-coded trays indicate the matching color-coded Sartorius pipette

Packaging Options

Racked Tips

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, human DNA and endotoxins
- e-beam pre-sterilized option available
- Lot-specific purity certificates can be downloaded from 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 color-coded to indicate the matching, color-coded Sartorius pipette
- Covers a large range of tip volumes from 10 μ L to 10 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)



Single Tray Racks

Bulk Tips

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 μ L to 1,200 μ L
- Lot-specific purity certificates can be downloaded from sartorius.com
- Tips are fully autoclavable at 121°C, at 1 bar, for 20 minutes
- 100% recyclable tips (PP) and package (PET)



FlexiBulk®

Bulk in a Bag

- Tips made to the Sartorius quality standard in economical packaging
- Packed in re-sealable bags in cardboard boxes (100, 250 or 1,000 pcs depending on tip volume)
- Covers tip volumes 10 μ L, 5 mL and 10 mL
- Tips are fully autoclavable at 121°C, at 1 bar, for 20 minutes
- 100% recyclable tips and package



Bulk in a Bag



Single Refill Packs

Refill Tips

Single Refill Packs

- Individually packed air-tight tip trays for maximum purity with less packaging material compared to racked tips
- 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 sartorius.com
- 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 1,200 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.



Refill Towers

Refill Tower

- Space-saving with 10 \times 96 tips in one tower
- Tip trays are compatible with Single Tray racks for convenient use
- Trays are color-coded to indicate the matching, color-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



The ACT Ecolabel Commitment

With the ACT Environmental Impact Factor Label, our Refill Tower product has earned a third-party verification of its sustainable impacts.

The ACT Label (Accountability, Consistency and Transparency) is an eco-label initiative by My Green Lab, a non-profit organization dedicated to advancing sustainability across the life sciences, industrial sciences, and healthcare sectors.

Read more about pipette sustainability here:

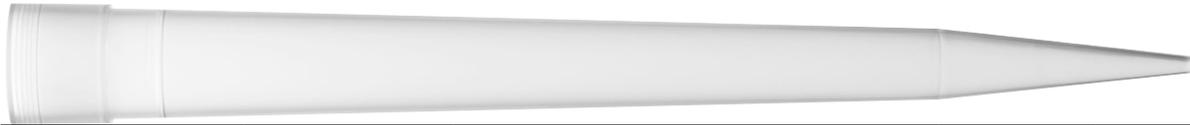
<https://www.sartorius.com/en/products/pipetting/pipetting-and-sustainability>

Ordering Information

Optifit Tips

Volume Range	Length	Packaging	Purity Level		Tips/Unit	Order Code
			Free of DNase, RNase, human DNA & endotoxins	Pre-sterilized		
 10 µL	31.5 mm	Single Tray	■		10 × 96	790010
		Single Tray	■	■	10 × 96	790011
		Refill Tower			10 × 96	790012
		Refill Pack	■	■	20 × 96	790013
		Bulk in Bag			1,000	790014
 200 µL	51 mm	Single Tray	■		10 × 96	790200
		Single Tray	■	■	10 × 96	790201
		Refill Tower			10 × 96	790202
		Refill Pack	■	■	15 × 96	790203
		FlexiBulk®	■		960	LH-B790204
 350 µL	54 mm	Single Tray	■		10 × 96	790350
		Single Tray	■	■	10 × 96	790351
		Refill Tower			10 × 96	790352
		Refill Pack	■	■	15 × 96	790353
		FlexiBulk®	■		960	LH-B790354
 1,000 µL	71.5 mm	Single Tray	■		10 × 96	791000
		Single Tray	■	■	10 × 96	791001
		Refill Pack	■		10 × 96	791002
		Refill Pack	■	■	10 × 96	791003
		FlexiBulk®	■		480	LH-B791004

For your guidance the tips are shown here in the actual size.

Volume Range	Length	Packaging	Purity Level		Tips/Unit	Order Code
			Free of DNase, RNase, human DNA & endotoxins	Pre-sterilized		
■ 1,000 µL Wide bore tip	68.5 mm	Single Tray	■		10 × 96	791020
		Single Tray	■	■	10 × 96	791021
		FlexiBulk®	■		480	LH-B791024
						
■ 1,200 µL	71.5 mm	Single Tray	■		10 × 96	791200
		Single Tray	■	■	10 × 96	791201
		Refill Pack	■		10 × 96	791202
		Refill Pack	■	■	10 × 96	791203
		FlexiBulk®	■		480	LH-B791204
						
■ 5,000 µL	150 mm	Single Tray	■		50	780304
		Single Tray	■	■	50	780305
		Bulk in Bag			100	780300
		Bulk in Bag			1,000	780308
						
■ 10,000 µL	164 mm	Single Tray	■		4 × 35	LH-799000
		Bulk in Bag			210	LH-799004
						

Note: The ordering information for 10,000 µL tip for Midi Plus can be found on page 49.

Ordering Information

Safetyspace® Filter Tips

Volume Range	Length	Packaging	Purity Level		Tips/Unit	Order Code
			Free of DNase, RNase, human DNA & endotoxins	Pre-sterilized		
 10 µL	31.5 mm	Single Tray	▪	▪	10 × 96	790011F
 20 µL	51 mm	Single Tray	▪	▪	10 × 96	790021F
 120 µL	51 mm	Single Tray	▪	▪	10 × 96	790101F
 200 µL	52.5 mm	Single Tray	▪	▪	10 × 96	790201F
 300 µL	52.5 mm	Single Tray	▪	▪	10 × 96	790301F
 1,000 µL	78 mm	Single Tray	▪	▪	10 × 96	791001F
 1,200 µL	90 mm	Single Tray	▪	▪	10 × 96	791211F
 5,000 µL	150 mm	Single Tray	▪	▪	50	LH-795001F

For your guidance the tips are shown here in the actual size.

Filter tips are not recommended to be used simultaneously with Safe-Cone Filters.

Extended Standard Tips

Volume Range	Length	Packaging	Purity Level		Tips/Unit	Order Code
			Free of DNase, RNase, human DNA & endotoxins	Pre-sterilized		
 10µL	46 mm	Single Tray	▪	▪	10×96	783210
		Single Tray	▪	▪	10×96	783211
 200µL	77.5 mm	Single Tray	▪	▪	10×96	LH-X780200
		Single Tray	▪	▪	10×96	LH-X780201
 1,000µL	119 mm	Single Tray	▪	▪	10×96	LH-X791000
		Single Tray	▪	▪	10×96	LH-X791001
 1,200µL	90 mm	Single Tray	▪	▪	10×96	791210
		Single Tray	▪	▪	10×96	791211
		Refill Pack	▪	▪	10×96	791212
		Refill Pack	▪	▪	10×96	791213

Extended Filter Tips

Volume Range	Length	Packaging	Purity Level		Tips/Unit	Order Code
			Free of DNase, RNase, human DNA & endotoxins	Pre-sterilized		
 10µL	46 mm	Single Tray	▪	▪	10×96	783201
 200µL	77.5 mm	Single Tray	▪	▪	10×96	LH-XF780201
 1,000µL	119 mm	Single Tray	▪	▪	10×96	LH-XF791001

For your guidance the tips are shown here in the actual size.
 Extended filter tips are not recommended to be used simultaneously with Safe-Cone Filters.
 The liquid handling properties of extended tips might differ from standard Optifit and Safetyspace® Filter tips.



Maxi-Volume Liquid Handling

Table of Contents

Maxi-volume Liquid Handling

Midi Plus Pipetting Controller

Prospenser Plus and Prospenser

Biotrate Digital Burette

48

50

52



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 pasteur 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.

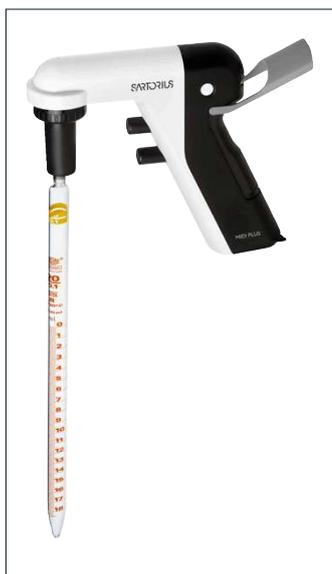
- Stepless speed control
- Hydrophobic autoclavable filter protects the device in case of over-aspiration
- Convenient fold-out bench stand supports the unit and pipette when not in use
- Low battery warning

Features

Pipette types	Plastic or glass 1 – 100 mL Pasteur pipettes 5 mL Optifit and 10 mL Midi Plus 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

Midi Plus & Accessories and Consumables



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-7129131	Replacement filter, 0.2 µm, sterile	5
LH-711019	Adapter set (standard), autoclavable, including nose-cone and silicone adapter (included in 710931)	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)	1,000
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)



Prospenser Plus and Prospenser

Dispensing Made Easy

Chemical Resistance

Prospenser and Prospenser Plus offer excellent chemical resistance thanks to their high quality materials. The ceramic piston is chemically stable and compatible with an extremely wide range of liquids.

Light to Use

The operating handle is designed to be comfortable to hold while aspirating and light to press while dispensing. The piston moves smoothly, guaranteeing excellent results in everyday use.

Easily Replaceable Valves

Valves can be easily replaced by the user so there is no need to send the unit to be serviced.

Easy to Attach Aspiration Tube

The aspiration tube is easy to attach with a secure threaded connection. This prevents air entering the system and ensures consistent results.

Volume Setting

Prospenser and Prospenser Plus have an incremental volume setting enabling you to set the exact volume every time.

Versatile Accessories

There is a wide range of accessories available including bottle adapters, dispensing heads, and aspiration tubes.

Fully Autoclavable

Prospenser and Prospenser Plus are easy to disassemble for cleaning and are fully autoclavable.



Prospenser Plus – Advanced Features



Media Recirculation System

Prospenser Plus is equipped with a media recirculation system that allows unused media to be recovered from the device and returned to the bottle. This ensures easy priming and minimizes media loss.

Smart 360° Rotating Dispensing Head

The dispensing head can be turned to the required position without needing to turn the bottle. This ensures the bottle label is always visible to the user.

Connector for Drying Tube and Filters

Prospenser Plus has a luer connection at the back of the unit for drying tubes and filters. Drying tubes are recommended for humidity sensitive liquids.



Biotrate Digital Burette for Convenient Titration

Sartorius Biotrate is a premium digital burette equipped with sophisticated functions for easy titration. Biotrate offers high chemical resistance and it is a smart solution for titrating various liquids accurately and safely. Biotrate is easy and convenient to use due to its large and clear electronic display, smooth operating wheels, and 360° rotating dispensing head.

High Chemical Resistance

- Highly resistant parts in the liquid pathway guarantee excellent chemical resistance.
- The softly-moving piston ensures reliable results.

Premium Quality

- High quality parts and materials guarantee highly accurate and precise results as well as long lifetime.

Convenient to Use

- Biotrate is comfortable to use due to soft touch operating wheels and 360° rotating dispensing head.
- Extremely smooth and light to operate.
- Biotrate offers excellent chemical resistance due to its high-quality materials, allowing the use of wide variety of liquids.

Light to Use

- The operating wheels are light and comfortable to use due to the soft touch surface and smoothly moving piston. These guarantee good ergonomics and excellent results in everyday use.

Long Life Battery

- Biotrate is powered with a long life battery so there is no need to plug in or re-charge the unit. The battery is also easy to replace by the user.

Large and Clear Display

- The display indicates clearly the measured volume, and shows whether you are measuring an aspirated or titrated volume.

Easy to Clean

- Biotrate is easy to disassemble for cleaning and autoclaving. The liquid pathway is fully autoclavable.

User Adjustment

- Biotrate can be adjusted for various liquids and it is easy to revert to factory settings. The display also indicates when a custom adjustment is in use.



Ordering Information

Prospenser and Prospenser Plus

Order Code	Item	Volume Range	Increment
LH-723070	Prospenser Plus	0.2 – 1 mL	0.05 mL
LH-723071	Prospenser Plus	0.4 – 2 mL	0.05 mL
LH-723072	Prospenser Plus	1 – 5 mL	0.10 mL
LH-723073	Prospenser Plus	2 – 10 mL	0.25 mL
LH-723074	Prospenser Plus	5 – 30 mL	0.50 mL
LH-723075	Prospenser Plus	10 – 60 mL	1.00 mL

Note: All Prospenser Plus models have A45 thread as a default and they are supplied with A32, A38, and S40 bottle adapters. Bottle not included
For pipette specifications (incl. Systematic and Random error limits), please see product datasheet, available at sartorius.com

Prospenser

Order Code	Item	Volume Range	Increment
LH-723060	Prospenser	0.2 – 1 mL	0.05 mL
LH-723061	Prospenser	0.4 – 2 mL	0.05 mL
LH-723062	Prospenser	1 – 5 mL	0.10 mL
LH-723063	Prospenser	2 – 10 mL	0.25 mL
LH-723064	Prospenser	5 – 30 mL	0.50 mL
LH-723065	Prospenser	10 – 60 mL	1.00 mL

Note: All Prospenser models have A32 thread as a default and they are supplied with A28, S40, and A45 bottle adapters. Bottle not included
For pipette specifications (incl. Systematic and Random error limits), please see product datasheet, available at sartorius.com

Biotrate Digital Burette

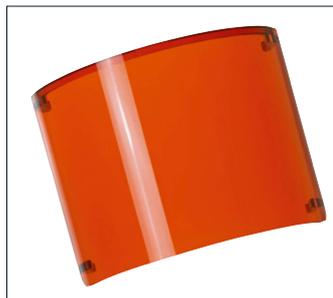
Order Code	Item	Volume Range	Increment
LH-723080	Biotrate	10 mL	0.01 mL
LH-723081	Biotrate	20 mL	0.01 mL
LH-723082	Biotrate	50 mL	0.01 mL

Note: All Biotrate models have A45 thread as a default and they are supplied with A32, A38, and 40 bottle adapters. Bottle not included
For pipette specifications (incl. Systematic and Random error limits), please see product datasheet, available at sartorius.com

Accessories

Biotrate

Order Code	Item	Material	Biotrate
LH-721650	Dispensing head, standard	FEP	▪
LH-721651	Dispensing head, fine tip	FEP	▪
LH-721648	Dispensing head, 1.5 mm spiral	FEP	▪
LH-721652	Dispensing head, 0.4 m adjustable	FEP	▪
LH-721653	Dispensing head, luer lock	FEP PP	▪
LH-721654	Dispensing head, luer lock	FEP PFA	▪
LH-721678	Aspiration tube, 310 mm	FEP	▪
LH-721679	Aspiration tube, 400 mm	FEP	▪
LH-721682	Recirculation tube, 70 mm	FEP	▪
LH-721689	Bottle adapter, A28	ETFE	▪
LH-721684	Bottle adapter, A28	PP	▪
LH-721683	Bottle adapter, A32	PP	▪
LH-721688	Bottle adapter, A32	ETFE	▪
LH-721686	Bottle adapter, A38	PP	▪
LH-721733	Bottle adapter, A38	ETFE	▪
LH-721685	Bottle adapter, A38 430	PP	▪
LH-721732	Bottle adapter, A38 430	ETFE	▪
LH-721687	Bottle adapter, S40	PP	▪
LH-721734	Bottle adapter, S40	ETFE	▪
LH-721735	Bottle adapter, NS29 32	Silicone	▪
LH-721743	Bottle support, for bottles 75 – 120 mm	Silicone	▪
LH-721744	UV-Protection Window		▪



UV-Protection Window

Biotrate is supplied with an amber colored replacement window for protecting light sensitive media.



Bottle support, for bottles
75 – 120 mm



Aspiration tube, 310 mm



Dispensing head, 1.5 mm spiral

Prospenser & Prospenser Plus

Order Code	Item	Material	Prospenser Plus	Prospenser	Prospenser
			All models	1, 2, 5 & 10 mL	30 & 60 mL
LH-721647	Dispensing head, standard	FEP	▪		
LH-721655	Dispensing head, standard	FEP		▪	
LH-721656	Dispensing head, standard	FEP			▪
LH-721648	Dispensing head, 1.5 mm spiral	FEP	▪		
LH-721649	Dispensing head, 3.0 mm spiral	FEP	▪		
LH-721657	Dispensing head, spiral	FEP		▪	
LH-721658	Dispensing head, spiral	FEP			▪
LH-721653	Dispensing head, luer lock	FEP PP	▪		
LH-721654	Dispensing head, luer lock	FEP PFA	▪		
LH-721659	Dispensing head, luer lock	FEP PP			▪
LH-721660	Dispensing head, luer lock	FEP PFA			▪
LH-721678	Aspiration tube, 310 mm	FEP	▪		▪
LH-721680	Aspiration tube, 310 mm	FEP		▪	
LH-721679	Aspiration tube, 400 mm	FEP	▪		▪
LH-721681	Aspiration tube, 400 mm	FEP		▪	
LH-721682	Recirculation tube, 70 mm	FEP	▪		
LH-721736	Bottle adapter, A25	PP		▪	▪
LH-721737	Bottle adapter, A28	PP		▪	▪
LH-721689	Bottle adapter, A28	ETFE	▪		
LH-721684	Bottle adapter, A28	PP	▪		
LH-721683	Bottle adapter, A32	PP	▪		
LH-721688	Bottle adapter, A32	ETFE	▪		
LH-721686	Bottle adapter, A38	PP	▪		
LH-721733	Bottle adapter, A38	ETFE	▪		
LH-721738	Bottle adapter, A38	PP		▪	▪
LH-721685	Bottle adapter, A38 430	PP	▪		
LH-721732	Bottle adapter, A38 430	ETFE	▪		
LH-721741	Bottle adapter, A45	ETFE		▪	▪
LH-721739	Bottle adapter, A45	PP		▪	▪
LH-721687	Bottle adapter, S40	PP	▪		
LH-721734	Bottle adapter, S40	ETFE	▪		
LH-721740	Bottle adapter, S40	PP		▪	▪
LH-721742	Bottle adapter, S40	ETFE		▪	▪
LH-721735	Bottle adapter, NS29 32	Silicone	▪		
LH-721743	Bottle support, for bottles 75–120 mm	Silicone	▪	▪	▪



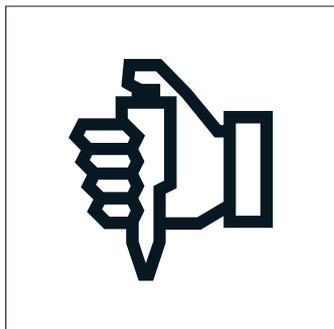
Pipetting Academy

Table of Contents

Pipetting Academy	
Pipetting Academy	58
Pipetting Recommendations	60

Pipetting Academy

Training for Better Performance, Ergonomics and Safety



Sartorius Pipetting Academy offers insight and training for pipetting related topics. It's a comprehensive combination of theory and practice that provides you with useful knowledge and tips for your daily work. Thousands of laboratory professionals around the globe have been trained at the Pipetting Academy over the last two decades.

Pipetting Academy Training Modules

We at Sartorius understand that a laboratory has professionals with different backgrounds and experience levels, and therefore we have created several different ready-made modules.

Pick and choose which modules are relevant for you and your laboratory or discuss with your Sartorius representative to tailor make or combine several different modules.

From each module a certificate can be provided upon completion for internal documentation.



Module	Description	Learning Objectives
1. Basics of Pipetting Module	Basics module brings together the essentials of pipetting techniques, ergonomics, and calibration. It is an excellent package for anyone who is new to pipetting or feels a need to polish pipetting practices.	<ul style="list-style-type: none"> ▪ To choose the right equipment ▪ The basics of pipetting techniques ▪ The best practices in lab ergonomics ▪ Daily maintenance and checking of pipettes
2. Ergonomics Module	The ergonomics module is intended for laboratory personnel and occupational and health professionals who are interested in improving the work ergonomics, minimizing ergonomic risk factors and preventing musculoskeletal disorders.	<ul style="list-style-type: none"> ▪ To recognize the ergonomic risk factors in pipetting and lab work ▪ To select the right tools and working postures ▪ To apply the best ergonomics and make your work more enjoyable
3. Pipetting Techniques Module	Pipetting is a precision task influenced by multiple factors such as equipment, pipetting techniques, liquids, and environmental conditions.	<ul style="list-style-type: none"> ▪ To understand the influence of pipetting techniques on pipetting results ▪ To identify the influence of different error sources on pipetting results ▪ How to select pipetting tools and techniques for different liquids and conditions
4. Pipetting in Cell Culture Applications Module	Working in cell culture lab has special requirements in terms of techniques and the purity of equipment.	<ul style="list-style-type: none"> ▪ How to avoid contamination ▪ The best pipetting practices for cell culture work ▪ To recognize the factors affecting your results
5. Pipetting Standards and Maintenance Module	Regular pipette maintenance and calibration ensures reliable results and conformance to regulation.	<ul style="list-style-type: none"> ▪ To define your pipette maintenance program according to ISO 8655 standard ▪ To handle pipettes as precision instruments ▪ To ensure reliable performance of your pipettes
6. Best Practices for Working with Proteins Module	To achieve the best results, protein samples should have a high concentration and maintain a high biological activity.	<ul style="list-style-type: none"> ▪ Best pipetting practices for protein work ▪ How to ensure your sample quality and yield
7. Best Pipetting Practices for Nucleic Acid Work Module	DNA and RNA extraction and qPCR assays are the cornerstones of many research in life science.	<ul style="list-style-type: none"> ▪ To maintain sample quality and purity ▪ To avoid contamination ▪ To recognize the factors affecting your results
8. Best Practices for Cell-based Sample Preparation Module	Have you ever wondered if sample preparation could be the source of variance you see in your cell-based assays?	<ul style="list-style-type: none"> ▪ The aspects that affect your cell-based assays with Incucyte or iQue® screener ▪ How to reduce variability between experiments ▪ How to speed up the workflow and improve your cell health with smart pipetting practices
9. Electronic Pipettes and Digital Workflows Module	Planning to switch to electronic pipettes? Or already done so but you need some tips and tricks about the different functionalities of an electronic pipette and how it can together with digital workflows make pipetting easier but also more accurate?	<ul style="list-style-type: none"> ▪ Functions and features of an electronic pipette ▪ How to get the most out of your electronic pipette ▪ How digital workflows can speed up your pipetting work
10. Qualification Training According to ISO 8655:10 Module	In the latest revision of ISO 8655, part 10 was introduced regarding pipette user training and qualification requirements. This module is designed to support continuous learning and development of pipette users.	<ul style="list-style-type: none"> ▪ (Re-)Qualification according to the the ISO 8655:10 requirements ▪ Certificate upon completion

Pipetting Recommendations



Hold the pipette in a vertical position during aspiration.



Avoid contamination with Safe-Cone Filters.



Tacta® value 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.

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.
- Make sure that the volume that you are pipetting is within usable volume range (ISO 8655).
- 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.
- Use racked tips when possible for best ergonomics

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.
- Tilting the pipette and placing the tip against the inside wall, when possible, can help to get the liquid out from the tip.
- 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 it 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 46, on pipette stands, for more information. Electronic pipettes should be returned to their charging stands.
- Remember that the pipette and tip combination is one complete system.
- 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.



SARTORIUS

Pipettor grease

200.0 SARTORIUS

Calibration and Maintenance

Table of Contents

Calibration and Maintenance	
Pipette Calibration and Maintenance Services	64
Pipette Decontamination Procedure	65
Autoclaving Instructions	66

Pipette Calibration and Maintenance Services

Why is Calibration and Maintenance Needed?

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.

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.

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 several decades 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.



Pipette Decontamination Procedure

Mechanical Pipettes (Tacta® and Proline® Plus)

Electronic Pipettes (Picus® 2)



1. Unscrew the tip ejector collar counter clockwise and remove it. Remove the Safe-Cone Filter if fitted.



1. Unscrew the tip ejector collar counter clockwise and remove it. Remove the Safe-Cone Filter if fitted.



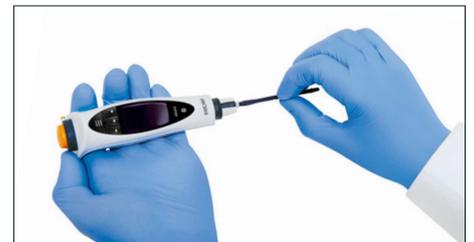
2. Unscrew the tip cone holder counter clockwise and carefully remove it along with the tip cone.



2. Unscrew the tip cone holder counter clockwise and carefully remove the tip cone holder, tip cone and spring.



3. The piston is left on the mechanical pipette.
4. 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.



3. Unscrew the piston counter clockwise from the pipette.
4. 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.



5. 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.
6. Re-grease the piston as described in the instruction manual. Replace all components including new filter if fitted.



5. 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.
6. Re-grease the piston as described in the instruction manual. Replace all components including the new filter if fitted.

Note: When opening pipette lower parts, as a matter of routine the parts should be inspected for possible wear. Always check the pipette performance after opening the lower parts.

Autoclaving Instructions



Tacta® and Proline® Plus Mechanical Pipettes

The entire Tacta® 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.

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

Picus® 2 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 1,200 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.



Note:

- Excessive heat or length of time may damage the products. Never place the handle part of the Picus® 2 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





Prospenser and Prospenser Plus

Superior Bottle-top
Dispensers

Simplifying Progress

SARTORIUS



Prospenser Plus



Prospenser

Prospenser and Prospenser Plus

Dispensing Made Easy

Prospenser and Prospenser Plus are high quality bottle-top dispensers with excellent chemical resistance. They are safe, convenient, and customizable, making them perfect for a wide range of dispensing needs.

Superior Chemical Resistance

- Both the ceramic piston and all parts in the liquid pathway are highly chemical resistant, guaranteeing versatility for a wide range of applications
- High quality materials guarantee a long lifetime

High Accuracy and Precision

- The incremental volume setup ensures accurate and repeatable results
- High quality parts and assembly ensure smooth piston movement

Easy to Use

- Easy and comfortable dispensing for various applications
- Smooth and light to operate

Prospenser and Prospenser Plus Features

Chemical Resistance

Prospenser and Prospenser Plus offer excellent chemical resistance thanks to their high quality materials. The ceramic piston is chemically stable and compatible with an extremely wide range of liquids.

Light to Use

The operating handle is designed to be comfortable to hold while aspirating and light to press while dispensing. The piston moves smoothly, guaranteeing excellent results in everyday use.

Easily Replaceable Valves

Valves can be easily replaced by the user so there is no need to send the unit to be serviced.

Easy to Attach Aspiration Tube

The aspiration tube is easy to attach with a secure threaded connection. This prevents air entering the system and ensures consistent results.

Volume Setting

Prospenser and Prospenser Plus have an incremental volume setting enabling you to set the exact volume every time.

Versatile Accessories

There is a wide range of accessories available including bottle adapters, dispensing heads, and aspiration tubes.

Fully Autoclavable

Prospenser and Prospenser Plus are easy to disassemble for cleaning and are fully autoclavable.

Find out more

For more information, please visit
www.sartorius.com/en/products/pipetting/bottle-top-dispensers

Prospenser Plus Advanced Features



Media Recirculation System

Prospenser Plus is equipped with a media recirculation system that allows unused media to be recovered from the device and returned to the bottle. This ensures easy priming and minimizes media loss.



Smart 360° Rotating Dispensing Head

The dispensing head can be turned to the required position without needing to turn the bottle. This ensures the bottle label is always visible to the user.



Connector for Drying Tube and Filters

Prospenser Plus has a Luer connection at the back of the unit for drying tubes and filters. Drying tubes are recommended for humidity sensitive liquids.



Sartorius Minisart® Syringe Filters

Sartorius Minisart® filters fit Prospenser and Prospenser Plus dispensers perfectly. Minisart® filters offer superior flow rate, high total throughput volumes, and exceptional quality.



Prospenser and Prospenser Plus can be equipped with Minisart® filters for media filtration. Dispensing heads with luer lock connection are available separately.



For filtering replacement air, Prospenser Plus can be equipped with a Minisart® filter.

Sartorius Pipettes, Pipette Tips, and Services

Our leading range of superior electronic and mechanical pipettes are the perfect solution for your liquid handling needs. Sartorius pipettes and tips fit seamlessly together maximizing pipetting performance and ensuring accuracy and precision. For more information, visit www.sartorius.com.

Sartorius also provides pipette maintenance, repair, and calibration services globally. Contact your nearest Sartorius service center or office for more information.



Technical Details

Features	Prospenser	Prospenser Plus
Volume ranges	0.2-1 mL 0.4-2 mL 1-5 mL 2-10 mL 5-30 mL 10-60 mL	0.2-1 mL 0.4-2 mL 1-5 mL 2-10 mL 5-30 mL 10-60 mL
360° rotating dispensing head	No	Yes
Media recirculation system	No	Yes
Connector for drying tube and filters	No	Yes
Threaded bottle fitting	A32	A45
Bottle adapters included	A28, S40, A45	A32, A38, S40
Extremely high chemical and thermal resistance	Ceramic piston, glass cylinder, and highly resistant fluoroplastic parts	Ceramic piston, glass cylinder, and highly resistant fluoroplastic parts
Repeatable volume setting	Yes	Yes
Operating force	Low	Low
Aspiration tube fitting	Threaded	Threaded
Delivered with quality certificate	Yes	Yes
Easily replaceable valves	Yes	Yes
Easy to dismantle for cleaning	Yes	Yes
Fully autoclavable	121 °C, 1 bar	121 °C, 1 bar

Ordering Information

Bottle-Top Dispensers

Prospenser

Order Code	Item	Volume Range
LH-723060	Prospenser	0.2-1 mL
LH-723061	Prospenser	0.4-2 mL
LH-723062	Prospenser	1-5 mL
LH-723063	Prospenser	2-10 mL
LH-723064	Prospenser	5-30 mL
LH-723065	Prospenser	10-60 mL

Prospenser Plus

Order Code	Item	Volume Range
LH-723070	Prospenser Plus	0.2-1 mL
LH-723071	Prospenser Plus	0.4-2 mL
LH-723072	Prospenser Plus	1-5 mL
LH-723073	Prospenser Plus	2-10 mL
LH-723074	Prospenser Plus	5-30 mL
LH-723075	Prospenser Plus	10-60 mL

Note: Bottle is not included.



Accessories

Order Code	Item	Material	Prospenser Plus	Prospenser	Prospenser
			All models	1, 2, 5 and 10 mL	30 and 60 mL
LH-721647	Dispensing head, standard	FEP	■		
LH-721655	Dispensing head, standard	FEP		■	
LH-721656	Dispensing head, standard	FEP			■
LH-721648	Dispensing head, 1.5 mm spiral	FEP	■		
LH-721649	Dispensing head, 3.0 mm spiral	FEP	■		
LH-721657	Dispensing head, spiral	FEP		■	
LH-721658	Dispensing head, spiral	FEP			■
LH-721653	Dispensing head, luer lock	FEP/PP	■		
LH-721654	Dispensing head, luer lock	FEP/PFA	■		
LH-721659	Dispensing head, luer lock	FEP/PP			■
LH-721660	Dispensing head, luer lock	FEP/PFA			■
LH-721678	Aspiration tube, 310 mm	FEP	■		■
LH-721680	Aspiration tube, 310 mm	FEP		■	
LH-721679	Aspiration tube, 400 mm	FEP	■		■
LH-721681	Aspiration tube, 400 mm	FEP		■	
LH-721682	Recirculation tube, 70 mm	FEP	■		
LH-721736	Bottle adapter, A25	PP		■	■
LH-721737	Bottle adapter, A28	PP		■	■
LH-721689	Bottle adapter, A28	ETFE	■		
LH-721684	Bottle adapter, A28	PP	■		
LH-721683	Bottle adapter, A32	PP	■		
LH-721688	Bottle adapter, A32	ETFE	■		
LH-721686	Bottle adapter, A38	PP	■		
LH-721733	Bottle adapter, A38	ETFE	■		
LH-721738	Bottle adapter, A38	PP		■	■
LH-721685	Bottle adapter, A38/430	PP	■		
LH-721732	Bottle adapter, A38/430	ETFE	■		
LH-721741	Bottle adapter, A45	ETFE		■	■
LH-721739	Bottle adapter, A45	PP		■	■
LH-721687	Bottle adapter, S40	PP	■		
LH-721734	Bottle adapter, S40	ETFE	■		
LH-721740	Bottle adapter, S40	PP		■	■
LH-721742	Bottle adapter, S40	ETFE		■	■
LH-721735	Bottle adapter, NS29/32	Silicone	■		
LH-721743	Bottle support, for bottles 75–120 mm	Silicone	■	■	■

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TEL. 667 7161023, 7160188

email: ecommerce@newteclab.mx

web: www.newteclab.mx



Find out more

For more information, please visit

www.sartorius.com/en/products/pipetting/bottle-top-dispensers



Entris[®] II

Balanzas de laboratorio

Simplifying Progress



Entris® II – La mejor calidad de su clase para tareas de pesaje básicas

Cada balanza de Sartorius ofrece calidad, resultados y consistencia.

La nueva balanza Entris® II siempre será la opción perfecta, independientemente de lo que desee pesar. Con una calidad inigualable y avalada por nuestros casi 150 años de experiencia en el campo de la ingeniería alemana, la Serie Entris® II se ofrece en dos líneas diferentes de balanzas, para que encuentre la que mejor se ajuste a sus necesidades específicas de pesaje.



Nuestra línea Entris® II Essential cuenta con las únicas balanzas de su clase que ofrecen isoCAL, tecnología LED táctil y 12 aplicaciones integradas a un precio asequible. Con más de 40 modelos entre los que elegir, estamos seguros de que encontrará uno que satisfaga sus necesidades de pesaje básicas.

La línea Entris® II Advanced aporta un valor adicional a la cartera de productos Entris® II, con más de 38 modelos que ofrecen ventajas como la nivelación guiada interactiva en tiempo real, sistemas de protección integrados, la función CalAuditTrail, una pantalla gráfica táctil y 13 programas de aplicación integrados.

Siga leyendo para saber por qué la gama Entris® II ofrece la mejor calidad de su clase para tareas de pesaje básicas.





Calidad, resultados y consistencia

Resultados de pesaje precisos en los que puede confiar una y otra vez

Los más altos estándares de calidad diseñados en Alemania

- Resultados extremadamente precisos año tras año
 - garantizados gracias a la tecnología de la célula de pesaje monolítica inventada por Sartorius*
- El tiempo de estabilización más rápido de su clase
 - gracias al uso de sensores de pesaje de última generación
- Mejor repetibilidad
 - con plato de pesaje rectangular
- Protección frente a la sobrecarga
 - con un diseño robusto que pesa solo hasta alcanzar la cantidad preestablecida
- Fiabilidad garantizada
 - con la función autotest «@start»
- Fabricadas en Alemania

Fácil limpieza para mejorar la eficiencia operativa y la durabilidad

- Alta resistencia a las sustancias químicas
 - garantizada por el uso de piezas fabricadas en polibutileno tereftalato (PBT) resistente, acero inoxidable y vidrio
- Previene la contaminación cruzada
 - con un diseño fácil de limpiar y piezas fáciles de desmontar

Con un eficaz protector contra corrientes de aire

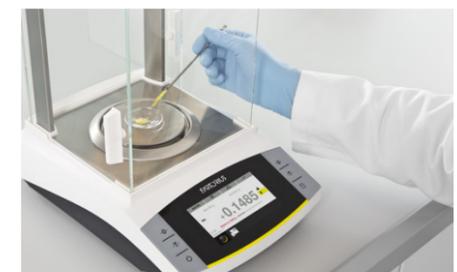
- Minimiza los errores de pesaje provocados por muestras con carga electrostática
 - empleando piezas de vidrio con un revestimiento especial

Valor añadido para la línea Entris® II Advanced:

- asistencia integrada para la nivelación en tiempo real
- Simplifica la nivelación de la balanza
 - con un sensor de nivel electrónico interno que monitorea continuamente su posición, mensajes de alarma cuando la balanza no está correctamente nivelada y con guía interactivo para el usuario

Sistemas de protección integrados

- Aumenta la fiabilidad de los resultados de pesaje
 - con tres niveles de seguridad configurables para determinar los datos de pesaje válidos y garantizar que sólo estos se transfieren a los dispositivos externos



* puede diferir para algunos modelos

Pura innovación dentro de su clase de pesaje

Para un uso sencillo y eficiente



Tecnología isoCAL (calibración y ajuste interno) que ofrece total garantía de precisión en los resultados de pesaje

- Precisión óptima y comodidad de manejo
- gracias al uso de una función que controla los cambios de temperatura o un intervalo de tiempo sin funcionamiento, exclusiva en esta clase de balanzas
- Garantiza la conformidad operativa (SOP)
- con notificaciones si la calibración se encuentra fuera del rango normal



Pantalla híbrida que aporta una legibilidad y uso excelentes

- Combina tecnología táctil, intuitiva y duradera con LED
- con una interfaz de usuario sencilla y claramente estructurada

Valor añadido para la línea

Entris® II Advanced:

Facilidad de uso aún más sencilla gracias a su pantalla gráfica táctil



Salida de datos para aplicaciones de pesaje dinámico

- Intervalo de tiempo configurable para la salida de datos



Valor añadido para la línea Entris® II Advanced: Función CalAuditTrail

Proporciona documentación integral

- con la emisión automática de informes de los procesos de calibración, de los eventos que los propiciaron y con sello de fecha y hora



Cómodo sistema "Plug-and-Play"

- Los accesorios de Sartorius se detectan automáticamente (p. ej., impresoras y segundas pantallas)
- Función "PC Direct" que permite conectarse fácilmente al ordenador para transferir los datos de pesaje directamente a hojas de cálculo o documentos de Microsoft® Excel o Word



Se adapta fácilmente a las condiciones ambientales

- Con solo un clic en la pantalla de inicio



Aplicación universal

Una garantía de futuro

El modelo adecuado para cada tarea

Encontrar el modelo adecuado para cada aplicación de pesaje es muy sencillo. Nuestra línea Entris® II Essential se compone de 40 modelos (la cartera más amplia de su clase), mientras que la línea Entris® II Advanced ofrece 38 modelos adicionales. Dependiendo del modelo que elija, su rango de pesaje puede empezar por una cantidad tan baja como 60 g y llegar a un máximo de 12 200 g, con una legibilidad de 0,1 mg a 1 g.

Valor añadido para la línea Entris® II Advanced:
Rangos de pesaje ampliados

Legibilidad	Línea Basic Essential – BCE	Línea Basic Advanced – BCA
0,1 mg	60 g, 120 g, 220 g	60 g, 120 g, 220 g, 320 g
1 mg	220 g, 320 g, 420 g, 620 g, 650 g	220 g, 320 g, 420 g, 620 g, 1200 g
0,01 g	620 g, 820 g, 1200 g, 2200 g, 3200 g, 4200 g, 6200 g	820 g, 1200 g, 2200 g, 3200 g, 4200 g, 6200 g
0,1 g	2200 g, 5200 g, 8200 g	2200 g, 5200 g, 8200 g, 10 200 g, 12 200 g
1,0 g	6200 g, 8200 g	-

Aplicaciones integradas con impresión o salida de datos conforme a GLP | GMP

- Pesaje | Dosificación
- Recuento
- Pesaje porcentual
- Mezcla | Total neto
- Componentes | Totalización
- Pesaje de animales
- Cálculo | Factor libre
- Determinación de la densidad
- Estadísticas
- Función de mantenimiento del peso máximo como referencia
- Función de control del peso
- Conversión de unidades de masa
- Pesaje hidrostático para muestras grandes

Valor añadido para la línea Entris® II Advanced:
Test inteligente de pipetas

Cámara de pesaje (si la hubiera)

- Mayor altura útil de la cámara de pesaje para manejar con facilidad incluso los contenedores más grandes
- Cómodo acceso al plato de pesaje
- Puertas deslizantes laterales y superiores fáciles de desplazar y de quitar
- El protector contra corrientes de aire puede desmontarse por completo

Métodos de conectividad modernos y actualizados

- Interfaz USB tipo C, garantía de futuro
- Interfaz de 9 pines RS232, el más usado del sector
- Compatibilidad con versiones anteriores (mediante el uso del puerto RS232)

Valor añadido para la línea Entris® II Advanced:

- Permite múltiples conexiones a dispositivos externos a través de una segunda interfaz USB tipo C
- Permite la transferencia de datos (como pesajes o informes de calibración) a memorias externas USB
- Permite impresiones individualizadas de hasta 6 perfiles exclusivos

Con 8 idiomas integrados para su uso internacional

- Inglés, alemán, francés, italiano, español, portugués, ruso y polaco

Valor añadido para la línea Entris® II Advanced: Chino, japonés, coreano, turco y húngaro

Protección por contraseña para un funcionamiento seguro

- Protege la balanza de modificaciones accidentales

Valor añadido para la línea Entris® II Advanced:
Acceso controlado a los ajustes de la balanza con capacidad de administración de usuarios



Entris® II – Especificaciones técnicas

Balanzas analíticas

Modelo	Capacidad máxima	Legibilidad	Repetibilidad típica	Tiempo de estabilización típico	Tamaño del plato de pesaje	Altura de la cámara de pesaje*	Dimensiones (An. x Pr. x Al.)	Calibración y ajuste	
								[g]	[mg]
BCA64i-1x	60	0,1	0,1	≤1,5	Ø 90	240	219×317×345	isoCAL	<input type="checkbox"/>
BCA64-1x	60	0,1	0,1	≤1,5	Ø 90	240	219×317×345		<input type="checkbox"/>
BCA124i-1x	120	0,1	0,1	≤1,5	Ø 90	240	219×317×345	isoCAL	<input type="checkbox"/>
BCA124-1x	120	0,1	0,1	≤1,5	Ø 90	240	219×317×345		<input type="checkbox"/>
BCA224i-1x	220	0,1	0,1	≤1,5	Ø 90	240	219×317×345	isoCAL	<input type="checkbox"/>
BCA224-1x	220	0,1	0,1	≤1,5	Ø 90	240	219×317×345		<input type="checkbox"/>
BCA324i-1x	320	0,1	0,1	≤1,5	Ø 90	240	219×317×345	isoCAL	<input type="checkbox"/>
BCE64i-1x	60	0,1	0,1	≤1,5	Ø 90	240	219×317×345	isoCAL	<input type="checkbox"/>
BCE64-1x	60	0,1	0,1	≤1,5	Ø 90	240	219×317×345		<input type="checkbox"/>
BCE124i-1x	120	0,1	0,1	≤1,5	Ø 90	240	219×317×345	isoCAL	<input type="checkbox"/>
BCE124-1x	120	0,1	0,1	≤1,5	Ø 90	240	219×317×345		<input type="checkbox"/>
BCE224i-1x	220	0,1	0,1	≤1,5	Ø 90	240	219×317×345	isoCAL	<input type="checkbox"/>
BCE224-1x	220	0,1	0,1	≤1,5	Ø 90	240	219×317×345		<input type="checkbox"/>

Balanzas de miligramos

Modelo	Capacidad máxima	Legibilidad	Repetibilidad típica	Tiempo de estabilización típico	Tamaño del plato de pesaje	Altura de la cámara de pesaje*	Dimensiones (An. x Pr. x Al.)	Calibración y ajuste	
								[g]	[mg]
BCA223i-1x	220	1	1	≤1,0	Ø 120	240	219×317×345	isoCAL	<input type="checkbox"/>
BCA223-1x	220	1	1	≤1,0	Ø 120	240	219×317×345		<input type="checkbox"/>
BCA323i-1x	320	1	1	≤1,0	Ø 120	240	219×317×345	isoCAL	<input type="checkbox"/>
BCA323-1x	320	1	1	≤1,0	Ø 120	240	219×317×345		<input type="checkbox"/>
BCA423i-1x	420	1	1	≤1,0	Ø 120	240	219×317×345	isoCAL	<input type="checkbox"/>
BCA423-1x	420	1	1	≤1,0	Ø 120	240	219×317×345		<input type="checkbox"/>
BCA623i-1x	620	1	1	≤1,0	Ø 120	240	219×317×345	isoCAL	<input type="checkbox"/>
BCA623-1x	620	1	1	≤1,0	Ø 120	240	219×317×345		<input type="checkbox"/>
BCA1203i-1x	1200	1	1	≤1,0	Ø 120	240	219×317×345	isoCAL	<input type="checkbox"/>
BCE223i-1x	220	1	1	≤1,0	Ø 120	240	219×317×345	isoCAL	<input type="checkbox"/>
BCE223-1x	220	1	1	≤1,0	Ø 120	240	219×317×345		<input type="checkbox"/>
BCE323i-1x	320	1	1	≤1,0	Ø 120	240	219×317×345	isoCAL	<input type="checkbox"/>
BCE323-1x	320	1	1	≤1,0	Ø 120	240	219×317×345		<input type="checkbox"/>
BCE423i-1x	420	1	1	≤1,0	Ø 120	240	219×317×345	isoCAL	<input type="checkbox"/>
BCE423-1x	420	1	1	≤1,0	Ø 120	240	219×317×345		<input type="checkbox"/>
BCE623i-1x	620	1	1	≤1,0	Ø 120	240	219×317×345	isoCAL	<input type="checkbox"/>
BCE623-1x	620	1	1	≤1,0	Ø 120	240	219×317×345		<input type="checkbox"/>
BCE653i-1x	650	1	1	≤1,0	Ø 120	50	219×317×145	isoCAL	<input type="checkbox"/>
BCE653-1x	650	1	1	≤1,0	Ø 120	50	219×317×145		<input type="checkbox"/>

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Balanzas de precisión

Modelo	Capacidad máxima	Legibilidad	Repetibilidad típica	Tiempo de estabilización típico	Tamaño del plato de pesaje	Altura de la cámara de pesaje*	Dimensiones (An. x Pr. x Al.)	Calibración y ajuste	
								[g]	[mg]
BCA822i-1x	820	10	10	≤0,9	182×182		219×317×94	isoCAL	<input type="checkbox"/>
BCA822-1x	820	10	10	≤0,9	182×182		219×317×94		<input type="checkbox"/>
BCA1202i-1x	1200	10	10	≤0,9	182×182		219×317×94	isoCAL	<input type="checkbox"/>
BCA1202-1x	1200	10	10	≤0,9	182×182		219×317×94		<input type="checkbox"/>
BCA2202i-1x	2200	10	10	≤0,9	182×182		219×317×94	isoCAL	<input type="checkbox"/>
BCA2202-1x	2200	10	10	≤0,9	182×182		219×317×94		<input type="checkbox"/>
BCA3202i-1x	3200	10	10	≤0,9	182×182		219×317×94	isoCAL	<input type="checkbox"/>
BCA3202-1x	3200	10	10	≤0,9	182×182		219×317×94		<input type="checkbox"/>
BCA4202i-1x	4200	10	10	≤0,9	182×182		219×317×94	isoCAL	<input type="checkbox"/>
BCA4202-1x	4200	10	10	≤0,9	182×182		219×317×94		<input type="checkbox"/>
BCA6202i-1x	6200	10	10	≤0,9	182×182		219×317×94	isoCAL	<input type="checkbox"/>
BCA6202-1x	6200	10	10	≤0,9	182×182		219×317×94		<input type="checkbox"/>
BCA2201i-1x	2200	100	100	≤0,9	182×182		219×317×94	isoCAL	<input type="checkbox"/>
BCA2201-1x	2200	100	100	≤0,9	182×182		219×317×94		<input type="checkbox"/>
BCA5201i-1x	5200	100	100	≤0,9	182×182		219×317×94	isoCAL	<input type="checkbox"/>
BCA5201-1x	5200	100	100	≤0,9	182×182		219×317×94		<input type="checkbox"/>
BCA8201i-1x	8200	100	100	≤0,9	182×182		219×317×94	isoCAL	<input type="checkbox"/>
BCA8201-1x	8200	100	100	≤0,9	182×182		219×317×94		<input type="checkbox"/>
BCA1020i-1x	10 200	100	100	≤0,9	182×182		219×317×94	isoCAL	<input type="checkbox"/>
BCA1020-1x	10 200	100	100	≤0,9	182×182		219×317×94		<input type="checkbox"/>
BCA1220i-1x	12 200	100	100	≤0,9	182×182		219×317×94	isoCAL	<input type="checkbox"/>
BCA1220-1x	12 200	100	100	≤0,9	182×182		219×317×94		<input type="checkbox"/>
BCE622i-1x	620	10	10	≤0,9	182×182		219×317×94	isoCAL	<input type="checkbox"/>
BCE622-1x	620	10	10	≤0,9	182×182		219×317×94		<input type="checkbox"/>
BCE822i-1x	820	10	10	≤0,9	182×182		219×317×94	isoCAL	<input type="checkbox"/>
BCE822-1x	820	10	10	≤0,9	182×182		219×317×94		<input type="checkbox"/>
BCE1202i-1x	1200	10	10	≤0,9	182×182		219×317×94	isoCAL	<input type="checkbox"/>
BCE1202-1x	1200	10	10	≤0,9	182×182		219×317×94		<input type="checkbox"/>
BCE2202i-1x	2200	10	10	≤0,9	182×182		219×317×94	isoCAL	<input type="checkbox"/>
BCE2202-1x	2200	10	10	≤0,9	182×182		219×317×94		<input type="checkbox"/>
BCE3202i-1x	3200	10	10	≤0,9	182×182		219×317×94	isoCAL	<input type="checkbox"/>
BCE3202-1x	3200	10	10	≤0,9	182×182		219×317×94		<input type="checkbox"/>
BCE4202i-1x	4200	10	10	≤0,9	182×182		219×317×94	isoCAL	<input type="checkbox"/>
BCE4202-1x	4200	10	10	≤0,9	182×182		219×317×94		<input type="checkbox"/>
BCE6202i-1x	6200	10	10	≤0,9	182×182		219×317×94	isoCAL	<input type="checkbox"/>
BCE6202-1x	6200	10	10	≤0,9	182×182		219×317×94		<input type="checkbox"/>
BCE2201i-1x	2200	100	100	≤0,9	182×182		219×317×94	isoCAL	<input type="checkbox"/>
BCE2201-1x	2200	100	100	≤0,9	182×182		219×317×94		<input type="checkbox"/>
BCE5201i-1x	5200	100	100	≤0,9	182×182		219×317×94	isoCAL	<input type="checkbox"/>
BCE5201-1x	5200	100	100	≤0,9	182×182		219×317×94		<input type="checkbox"/>
BCE8201i-1x	8200	100	100	≤0,9	182×182		219×317×94	isoCAL	<input type="checkbox"/>
BCE8201-1x	8200	100	100	≤0,9	182×182		219×317×94		<input type="checkbox"/>
BCE6200i-1x	6200	1000	1000	≤0,9	182×182		219×317×94	isoCAL	<input type="checkbox"/>
BCE6200-1x	6200	1000	1000	≤0,9	182×182		219×317×94		<input type="checkbox"/>
BCE8200i-1x	8200	1000	1000	≤0,9	182×182		219×317×94	isoCAL	<input type="checkbox"/>
BCE8200-1x	8200	1000	1000	≤0,9	182×182		219×317×94		<input type="checkbox"/>

* Medida desde el borde superior del plato de pesaje hasta el borde inferior del panel protector contra corrientes de aire
x = término para modelos específicos del país