Sartoclear® Depth Filter

Cell Clarification and Contaminant Removal Technologies

Product Information

The Sartoclear® Depth Filter product family is cellulose-based filters, which contain diatomaceous earth. Due to their high capacity for solids, the filters are used for demanding clarification applications in the biotechnology and pharmaceutical industries. These double layer (DL) formats are available to serve you with cell broth filtration, with cell densities <15 × 10^6/mL from process development to commercial manufacturing.

Applications
- Mammalian cell culture harvests
- Microbial lysates
- Removal of precipitates from serum and plasma
- Particle and colloid removal from process intermediates
- Media filtration

Sartoclear® Depth Filter Media

Sartoclear® DL-Series are high-capacity depth filters made of two distinct filtration layers. The primary coarse layer is followed by a second, finer layer, which enables the removal of a broader spectrum of particles in a single step.
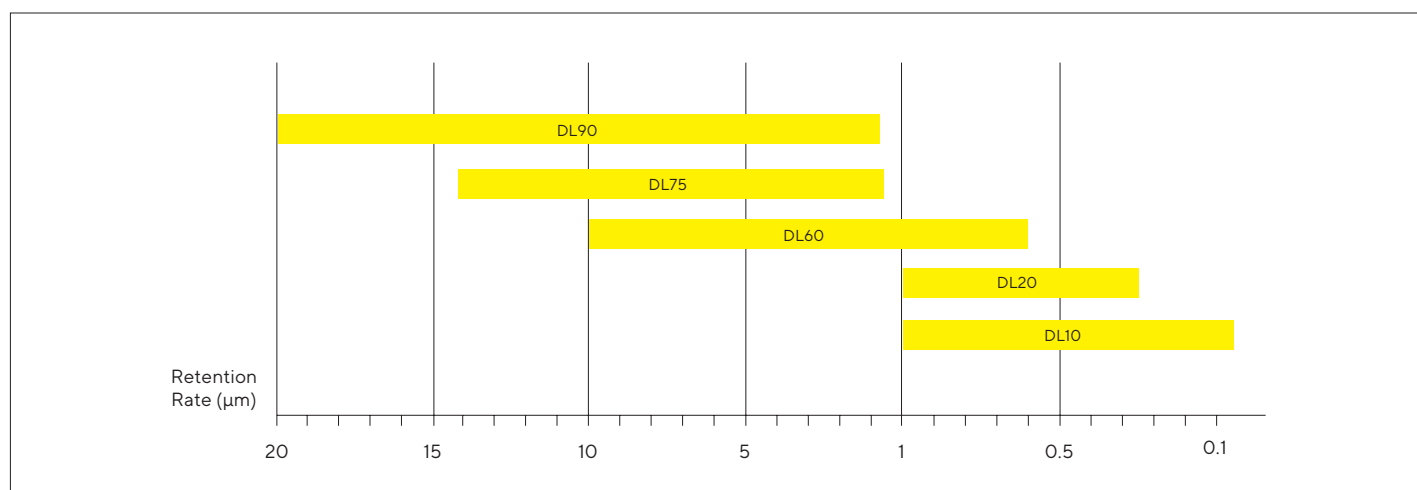
The Sartoclear® DL-Series is pre-selected and optimized to serve the most common biopharmaceutical applications.

Grade	Description	Application Examples[1]
DL90	Very coarse primary grade on top of a coarse secondary filter for filtrations with high solid concentrations	Primary clarification of mammalian cell cultures, insect cell cultures, microbial fermentations, vaccines
DL75	Pure cellulose pre-filter combined with a coarse secondary filter	Primary clarification of mammalian cell cultures, insect cell cultures, microbial fermentations, vaccines
DL60	Coarse primary grade with a secondary, fine filtration grade for lower to moderate solid concentrations	Post-perfusion bioreactors, vaccines
DL20	Fine filtration grade combined with a standard bioburden reduction grade for the removal of particles	Post-centrifuge mammalian cell cultures, post primary depth filtration, process precipitates
DL10	Fine filtration grade followed by a tight secondary filter for the removal of high concentrations of small particles	Post-centrifuge microbial (e.g., *E. coli*) lysates, post-primary depth filtration step, process precipitates

[1] The listed examples are indicative and should be confirmed by small scale tests.

Technical Data

Grade	Primary Layer	Secondary Layer	Water Flow (100 kPa) [L/m²/min]
DL10	S080	S010	26
DL20	S080	S040	45
DL60	S400	S080	160
DL75	S600	S200	302
DL90	SX00	S200	315

Average retention rate for each filter grade

Sartoclear® Depth Filter Formats

Sartoclear® Depth Filters are available in various formats to serve you from the first steps, throughout clinical phases and up to large-scale manufacturing while always keeping the same filter material.

Sartoclear® Depth Filter caps are easy-to-use screening devices that help you to find the best grade for your application. All packages contain three units of the same grade and come with plug-in Luer adapters for the easiest possible exchange of filters.

Sartoclear® Depth Filter midscale cassettes are developed for scale-up filtrations with volumes between five to 10 liters (depending on the cell density). They are designed in gradient shape for mechanical reinforcement to meet the application conditions.

Sartoclear® Depth Filter cassettes are single-use filtration devices specially designed for biopharmaceutical clarification applications. The modular devices provide linear scalability from small- to large-scale processes. Three different sizes of filter holder allow for a seamless adaptation to different process fluid volumes.

Sartoclear® Depth Filter modules are stackable, lenticular-shaped depth filters for use in stainless steel housings, which are often used in large-scale manufacturing facilities for biologicals.

Technical Information

	Sartoclear® Depth Filter Caps	Sartoclear® Depth Filter Midscale Cassettes	Sartoclear® Depth Filter Cassettes	Sartoclear® Depth Filter Modules	Inlet and Outlet Adapter Plate (Manifold Set) for Sartoclear® Depth Filter Cassettes
Materials					
Filter media	Cellulosic fibers with inorganic filter aids and polymeric binder	Cellulosic fibers with inorganic filter aids and polymeric binder	Cellulosic fibers with inorganic filter aids and polymeric binder	Cellulosic fibers with inorganic filter aids and polymeric binder	
Gasket	–	Silicone	Silicone	Silicone	Silicone
Plastics	–	ABS | Glass Fiber Reinforced	ABS | Glass Fiber Reinforced	Polypropylene | Separate stainless steel housing should be ordered	ABS | Glass Fiber Reinforced
Core		–		Stainless steel	–
End caps	Polypropylene	–	–	–	–
Male luer adapter	Polypropylene	–	–	–	–
Filtration area	25 cm²	DL: 800 cm²	DL: 0.2 m², 0.4 m², 0.8 m²	SL*: 12": 1.9 m² 16": 3.7 m² DL: 16": 1.9 m²	–
Cells per module	–	–	–	SL: 16 DL: 8	–
Dimensions H × W × D (mm)	–	DL: 182 x 250 x 144	0.2 m²: 387 × 634 × 36 0.4 m²: 387 × 634 × 59 0.8 m² | 1.0 m²: 387 × 634 × 104	Diameter SL: 12", 16" DL: 16" Height SL: 276 mm DL: 185 mm	387 × 634 × 58
Drain and vent		ABS			ABS + silicon tubing
Operating Parameters					
Max. allowable pressure	2.0 bar | 29 psi	2.0 bar | 29 psi	Liquid: 1.5 bar | 21.8 psi Gaseous: 0.5 bar | 7.2 psi		Liquid: 1.5 bar | 21.8 psi Gaseous: 0.5 bar | 7.2 psi
Max. allowable back Pressure	0.03 bar | 0.4 psi	2.0 bar | 29 psi	0.7 bar | 10.2 psi	0.03 bar | 0.4 psi	0.7 bar | 10.2 psi
Max. allowable differential pressure		2.0 bar | 29 psi		2.0 bar | 36 psi	
Temperature range		4°C – 40 °C	4°C – 40 °C		

*SL = Single Layer
Only Sartoclear® Depth Filter modules are available in SL format.

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Connections					
Inlet	Hose barb	¾" Tri Clamp			1½" Tri Clamp
Outlet	Hose barb	¾" Tri Clamp			1½" Tri Clamp
Adapter	Male Luer for insertion in Inlet to quick connect 8" (3.2 mm ID) tubing	–		Flat Adapter FA	
Drain and vent		¼" Hose Barb			¼" Hose Barb
Safety (for all materials with direct fluid contact)					
Endotoxins		< 0.25 EU/mL	< 0.25 EU/mL		< 0.25 EU/mL
Biosafety			Passing of USP Plastic Class VI tests in accordance with the USP <88> for all component materials		Passing of USP Plastic Class VI tests in accordance with the USP <88> for all component materials
TSE/BSE		Complying with the EMA/410/01	Complying with the EMA/410/01		Complying with the EMA/410/01
CE Pressure equipment directive			Designed according to the requirements of the Pressure Equipment Directive 97/23/EC.		Designed according to the requirements of the Pressure Equipment Directive 97/23/EC.
Steam sterilization		121°C at 1 bar for 60 min.			121°C at 1 bar for 60 min.
Hot water flush		80°C at 1 bar for 30 min.			80°C at 1 bar for 30 min.

Ordering Information

Family Type	**Technical Specification | Grade**		**Format**	**Filtration Area**	**Connection**
29C: Capsules	S: Single Layer	–	12: Module 12"	if 29L then	FA: Flat Adapter
29L: Module	DL: Double Layer		16: Module 16"	–: Module	FF: Sanitary Flansh ¾
29X: Midscale and Filter Cassette			FC: Midscale and Filter Cassette	if 29C then	
			CA: Capsules	C: 0.0025 m²	
				if 29X then	
				A: 0.2 m²	
				B: 0.4 m²	
				C: 0.8 m²	
				F: 0.08 m²	

Sartoclear® Depth Filter Caps Double Layer

Art-No.	Adapters	Grade	Filtration area	Retention rate	Units/Pack
29CDL10-CACHH--M	Hose barb	DL10	25 cm²	0.8/0.1 µm	3
29CDL20-CACHH--M	Hose barb	DL20	25 cm²	0.8/0.4 µm	3
29CDL60-CACHH--M	Hose barb	DL60	25 cm²	8.0/0.8 µm	3
29CDL75-CACHH--M	Hose barb	DL75	25 cm²	10/2.0 µm	3
29CDL90-CACHH--M	Hose barb	DL90	25 cm²	15/2.0 µm	3

Sartoclear® Depth Filter Midscale Cassette Double Layer

Art-No.	Adapters	Grade	Filtration area	Retention rate	Units/Pack
29XDL10-FCFFF	TC ¾"	DL10	0.08 m²	0.8/0.1 µm	1
29XDL20-FCFFF	TC ¾"	DL20	0.08 m²	0.8/0.4 µm	1
29XDL60-FCFFF	TC ¾"	DL60	0.08 m²	8.0/0.8 µm	1
29XDL75-FCFFF	TC ¾"	DL75	0.08 m²	10/2.0 µm	1
29XDL90-FCFFF	TC ¾"	DL90	0.08 m²	15/2.0 µm	1

Sartoclear® Depth Filter Cassettes Double Layer

Art–No.	Grade	Filtration area	Retention rate	Units/Pack
29XDL10-FCA	DL10	0.2 m²	0.8/0.1 µm	1
29XDL20-FCA	DL20	0.2 m²	0.8/0.4 µm	1
29XDL60-FCA	DL60	0.2 m²	8.0/0.8 µm	1
29XDL75-FCA	DL75	0.2 m²	10/2.0 µm	1
29XDL90-FCA	DL90	0.2 m²	15/2.0 µm	1
29XDL10-FCB	DL10	0.4 m²	0.8/0.1 µm	1
29XDL20-FCB	DL20	0.4 m²	0.8/0.4 µm	1
29XDL60-FCB	DL60	0.4 m²	8.0/0.8 µm	1
29XDL75-FCB	DL75	0.4 m²	10/2.0 µm	1
29XDL90-FCB	DL90	0.4 m²	15/2.0 µm	1
29XDL10-FCC	DL10	0.8 m²	0.8/0.1 µm	1
29XDL20-FCC	DL20	0.8 m²	0.8/0.4 µm	1
29XDL60-FCC	DL60	0.8 m²	8.0/0.8 µm	1
29XDL75-FCC	DL75	0.8 m²	10/2.0 µm	1
29XDL90-FCC	DL90	0.8 m²	15/2.0 µm	1

Inlet and Outlet Adapter Plate (Manifold Set)

Art–No.	Adapters	Description	Units/Pack
29Z-S00001	1½" Tri Clamp	Inlet and outlet plate with pre-installed silicone tubing incl. pinch clamp and MPC quick connectors on the ventilation and drain ports	1

Sartoclear® Depth Filter Modules Single Layer

Art–No.	Adapters	Grade	Filtration area	Retention rate	Units/Pack
29LS010-12-FA	12"	Flat	S010	1.9 m²	0.1 µm	1
29LS020-12-FA	12"	Flat	S020	1.9 m²	0.2 µm	1
29LS040-12-FA	12"	Flat	S040	1.9 m²	0.4 µm	1
29LS080-12-FA	12"	Flat	S080	1.9 m²	0.8 µm	1
29LS200-12-FA	12"	Flat	S200	1.9 m²	2.0 µm	1
29LS400-12-FA	12"	Flat	S400	1.9 m²	8.0 µm	1
29LS010-16-FA	12"	Flat	S010	3.7 m²	0.1 µm	1
29LS020-16-FA	12"	Flat	S020	3.7 m²	0.2 µm	1
29LS040-16-FA	12"	Flat	S040	3.7 m²	0.4 µm	1
29LS080-16-FA	12"	Flat	S080	3.7 m²	0.8 µm	1
29LS200-16-FA	12"	Flat	S200	3.7 m²	2.0 µm	1
29LS400-16-FA	12"	Flat	S400	3.7 m²	8.0 µm	1

Sartoclear® Depth Filter Modules Double Layer

Art–No.	Adapters	Grade	Filtration area	Retention rate	Units/Pack
29LDL90-16-FA	16" | Flat	DL90	1.9 m²	15/ 2.0 µm	1
29LDL75-16-FA	16" | Flat	DL75	1.9 m²	10/ 2.0 µm	1
29LDL60-16-FA	16" | Flat	DL60	1.9 m²	8.0/ 0.8 µm	1
29LDL20-16-FA	16" | Flat	DL20	1.9 m²	0.8/ 0.4 µm	1
29LDL10-16-FA	16" | Flat	DL10	1.9 m²	0.8/ 0.1 µm	1