

PLANOVA™ S20N

Next Generation Superior Cellulose Membrane



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Planova virus removal filters were launched in 1989 and with the addition of Planova S20N, we can further meet new challenges the industry brings.

Providing seamless scalability along with high quality and reliable performance, Planova S20N is the optimal filter for removing viruses in biologicals, from antibody-based therapeutics to plasma-derived products.



Key Features of Planova S20N



Robust Virus Removal Capability

Contributes to the safety and high quality of biologics manufacturing through high virus removability for various viruses and process designs



Processing More, Faster

With a superior regenerated cellulose membrane that can withstand higher filtration pressure, Planova S20N delivers cost-effective performance with higher processing volumes and reduced processing times

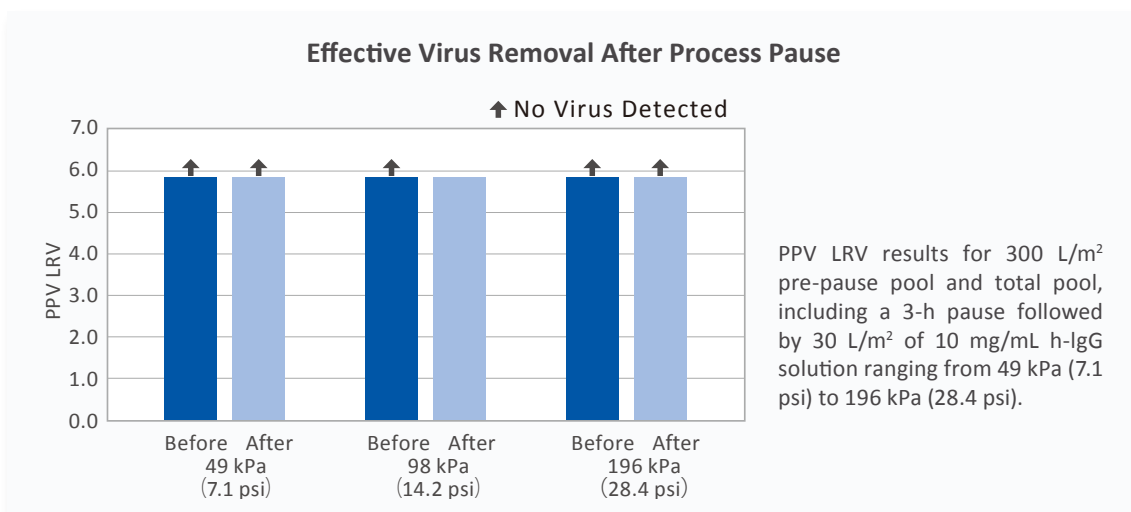
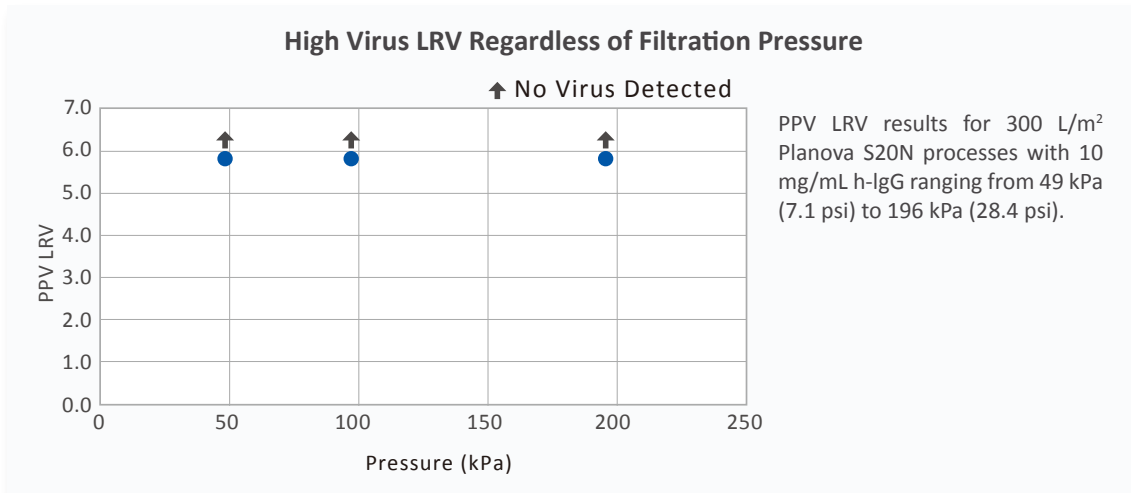


Improved Operational Efficiency

Improved operational efficiency during manufacturing by simplifying the post-use integrity test

Robust Virus Removal Capability

Planova S20N shows high virus LRV with various viruses and process designs



Virus Safety Demonstrated for Various Viruses

Virus	Size (nm)	Total pool LRV after 30-min process pause
MVM	18 - 24	≥5.3
PPV	18 - 24	≥5.8
EMCV	25 - 30	≥5.9
BVDV	50 - 70	≥5.9
HIV	80 - 120	≥4.1
PRV	120 - 200	≥5.4

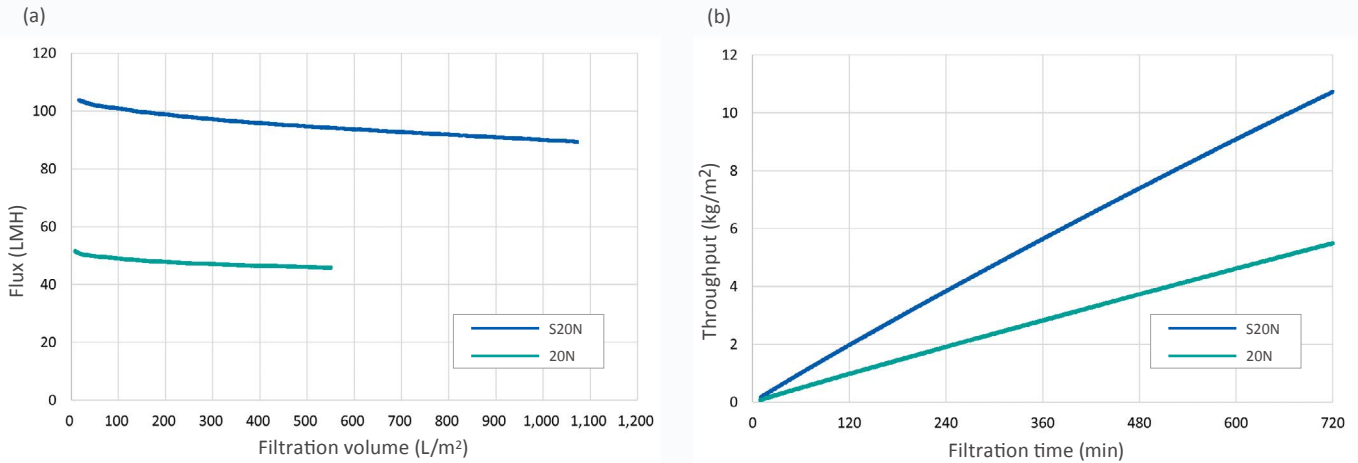
Virus LRV results for the total pool of 165 L/m², including a 30-min pause followed by 15 L/m² for Planova S20N processes with 1 mg/mL h-IgG in 100 mM NaCl at 196 kPa (28.4 psi).

Processing More, Faster

Superior Regenerated Cellulose Withstands Higher Pressure

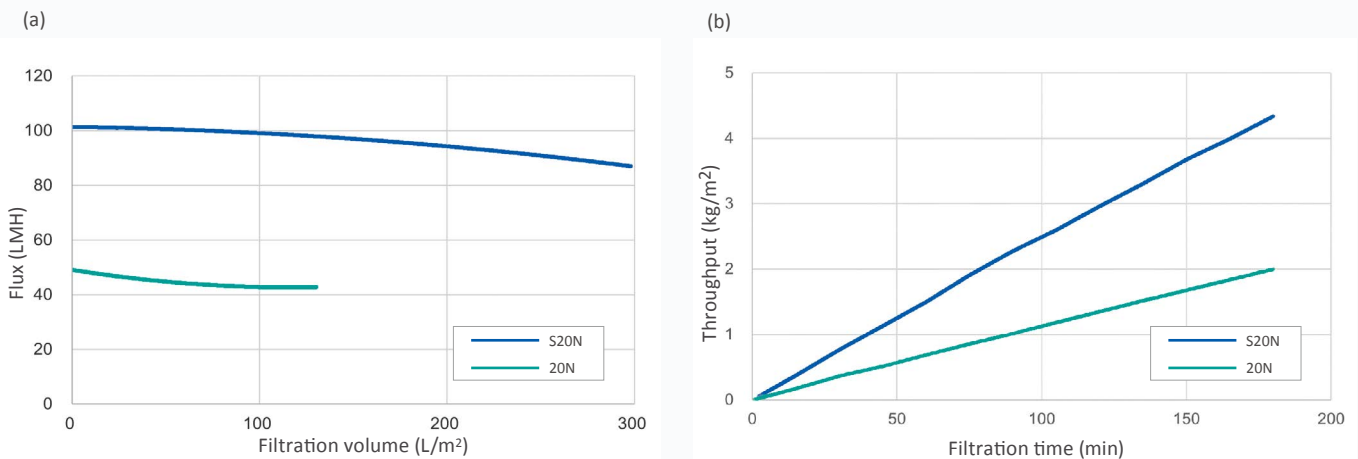
The superior regenerated cellulose membrane of Planova S20N withstands higher filtration pressure and resists clogging to deliver stable filterability with higher flux and throughput.

Higher Flux and Higher Throughput for Plasma Proteins (IgG)



Comparison of filtration performance (a) flux and (b) protein throughput of Planova S20N and Planova 20N filters for 10 mg/mL h-IgG, pH 4-5, 10.6 mS/cm. Filtration pressure was 196 kPa (28.4 psi) for Planova S20N and 98 kPa (14.2 psi) for Planova 20N.

Higher Flux and Higher Throughput for Monoclonal Antibody



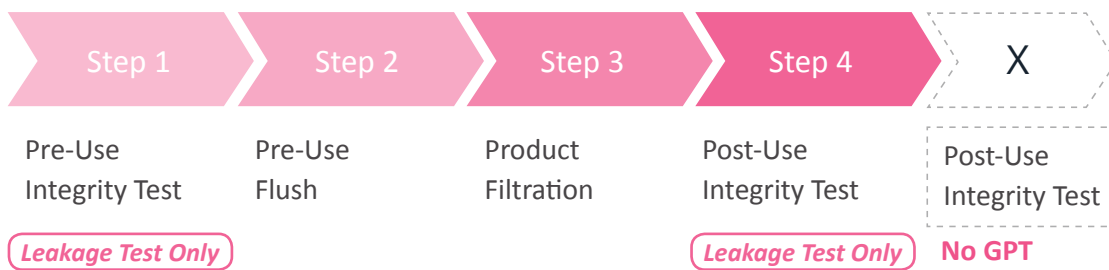
Comparison of filtration performance (a) flux and (b) protein throughput of Planova S20N and Planova 20N filters for 15 mg/mL IgG4 monoclonal antibody, pH 5.5, acetic acid buffer 100mM with 200mM NaCl. Filtration pressure was 196 kPa (28.4 psi) for Planova S20N and 98 kPa (14.2 psi) for Planova 20N.

Improved Operational Efficiency

- » Just like other Planova filters, Planova S20N arrives at your site “ready to use” – no pre-wetting or sterilization is required prior to use in filtration
- » The post-use integrity test is simplified to only a leakage test – no GPT* required
- » Planova S20N will contribute to operational efficiency during process scale-up and manufacturing

*GPT (Gold Particle Test) is a pore size distribution test conducted on post-use Planova 15N, 20N and 35N filters.

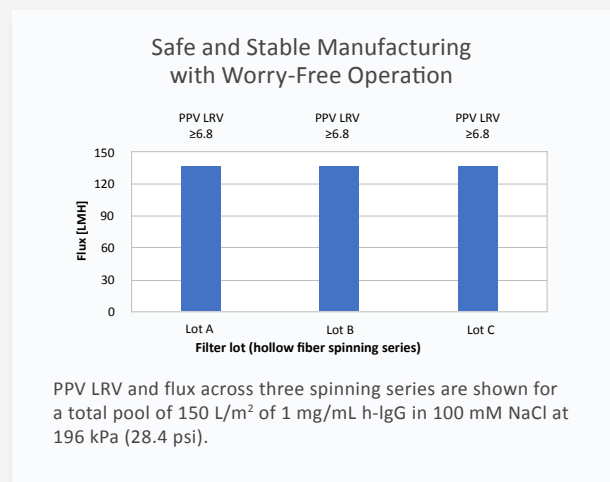
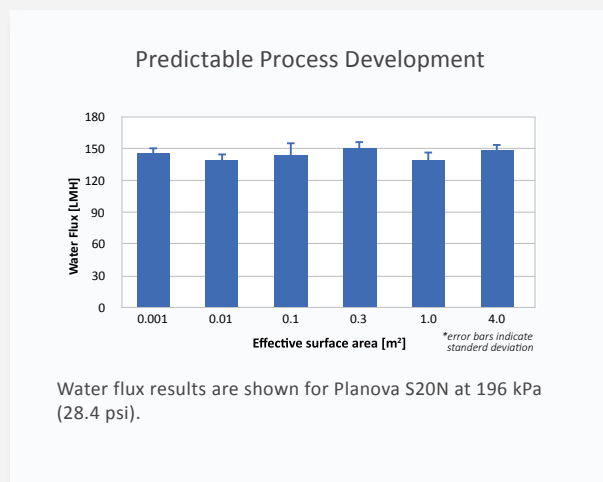
Sequence of Planova S20N Operation



Excellent Scalability and High Lot-to-Lot Consistency

Planova S20N shows

- » Consistent water flux across filter sizes
- » Stable flux and virus removal across different lots



Specifications & Operating Parameters

		Effective Surface Area (m ²)						
		4.0	1.0	0.3	0.1	0.01	0.001	
Component	Hollow fiber membrane	Cuprammonium regenerated cellulose						
	Housing and headers	Polycarbonate						
	Sealant	Polyurethane						
	O-rings	Silicone						
	Nozzle plugs	Silicone				- ^a		
	Nozzle caps	-				Silicone		
	Ferrule caps	Polycarbonate				-		
	Luer lock plugs	-				Polypropylene		
	Balloon cap holders	Polycarbonate				-		
	Gaskets ^b	Silicone				-		
	Balloon caps	Silicone				-		
	Nozzle stoppers	-	Silicone			-		
	Clamp bands	Poly-sulfone	-					
	Threaded clamps	Clamp bolts	-	Polypropylene			-	
		Clamp nuts	-	Polypropylene			-	
Lock nuts	Polycarbonate	-						
Supplied as	Filled with purified water ^c							
Sterilization method	Autoclaving							
Packaging format	Packed individually in sterilized bags							
Operating pressure (TMP)	≤216 kPa (31.3 psi)							
Operating pH	3-9							
Biological safety	Conformance with USP standards for class VI plastics							

a Not applicable

b Gaskets are used for connecting quick clamps to nozzles of Planova S20N filters with effective surface areas of 4.0, 1.0, 0.3 and 0.1 m²

c Purified water in 4.0 m² Planova S20N filters contains < 0.1% NaCl

Product Lineup & Catalog Numbers

Planova S20N	Effective Surface Area (m ²)	Catalog No.
	4.0	S20-LF40
1.0	S20-LF10	
0.3	S20-3000	
0.1	S20-1000	
0.01	S20-0100	
0.001	S20-0010	

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