HDC II

MEMBRANE FILTERS

HDC II pleated polypropylene (PP) filters use fibers of varying diameters to produce a pore size distribution from coarse (upstream) to fine (downstream). This construction permits more contaminant to be trapped in the outer and inner layers of the membrane, substantially increasing dirt-holding capacity.

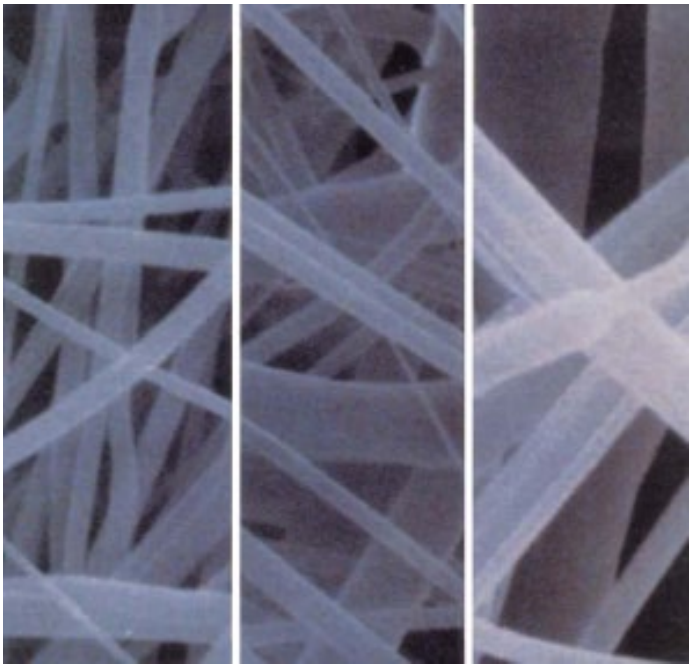
They are available in absolute removal ratings from 0.6 to 70 µm and are all PP for compatibility with a wide range of fluids. The filters have more open area and pores than filters of similar appearance.

HDC II filters are optimized for pharmaceuticals, with benefits that include:

- Absolute rating:
  - 99.98% absolute removal efficiency
  - Consistent, verifiable filtration
- Varied fiber diameter:
  - High dirt holding capacity
  - Low cost per volume of filtrate
- Fixed pore structure:
  - No solids unloading
  - No fiber migration
- Pure PP construction:
  - Wide chemical compatibility
  - No surfactants or binder resins
  - Meets FDA requirements
  - Low protein binding



Fig 1. HDC II membrane in 254mm (10 in.) and 127mm (5 in.) AB cartridges, SLK7001 and SLK 7002 cartridges.



Downstream layer Middle layer Outermost layer

Fig 2. The varying fiber diameter used in the HDC II filter. This proprietary construction enables the filter cartridge to hold more contaminant and have longer life.

Applications

HDC II filters are specifically designed for use in applications where economy and reliability are critical. All materials of construction are FDA listed for direct food contact, and all components have been tested according to the USP <88> Class VI biological tests for plastics at 121°C. HDC II filters are designed to meet the filtration requirements of:

- **Viral vectors:** lentivirus clarification.
- **Bioprocessing:** liquid growth media, make-up water, intermediates, additives, exhaust gas prefiltration, downstream processing, and final liquid products.
- **Biologicals:** serum and serum fractions, tissue culture media, vaccine preparations, microbiological growth media, media make-up water, and diagnostic sera.
- **Pharmaceuticals:** small and large volume parenterals, ophthalmics, and oral medications.
- **Veterinary:** parenterals and therapeutic sera.

Specifications

Removal ratings (liquid)*

Membrane code	J006	J012	J025	J045	J060	J100	J200	J400	J700
Removal rating (µm)	0.6†	1.2	2.5	4.5	6.0	10	20	40	70

* > 99.98% by modified OSU-F2 test. 0.6 to 20 µm in water, 40 and 70 µm in oil.
† Extrapolated value.

Removal ratings (gas)

Membrane code	J006	J012	J025	J045	J060	J100
Removal rating for 0.3 µm aerosols	99.9998%	99.996%	99.95%	99.75%	99%	93%

Based on mineral oil test.

HDC II filter compatibility data

Chemical classification	Examples	Compatibility	Maximum temperature
Inorganic acids	Hydrochloric, sulfuric, dilute nitric, boric, phosphoric	Generally recommended (GR)	82.2°C
Organic acids	Acetic, formic	GR	65.6°C
Bases (alkalis)	Sodium hydroxide, potassium hydroxide, amines, quaternary ammonium hydroxide	GR	82.2°C
Salt solutions	Aluminum chloride, sodium sulfate, sodium nitrate	GR	82.2°C
Brines	Sodium chloride, potassium chloride, sodium bromide, calcium chloride	GR	82.2°C
Oxidizers	Peroxides, peracids	Not recommended (NR)	N/A
Organic solvents	Esters, amides, ketones, alcohols, cellosolves, glycols	GR	
	Benzene, toluene, xylene, gasoline, kerosene	NR	
	Hexane, octane, fats, oils, propylene, freon, methylene chloride, ethers, perchloroethylene	Testing recommended	
Water	Without oxidants With oxidants	GR NR	
Air	Ambient and hot	NR	

Disclaimer: The compatibility data presented in this chart is for general guidance only.
Because so many factors can affect the chemical resistance of a given product, you should pretest under your own operating conditions observing applicable safety practices such as those given on the Material Safety Data Sheet for each chemical. If any doubts exist about specific applications, please contact Cytiva.

HDC II junior style filter cartridges

Technical specifications

Typical liquid flow rates for SLK7002 and MCY4463 styles

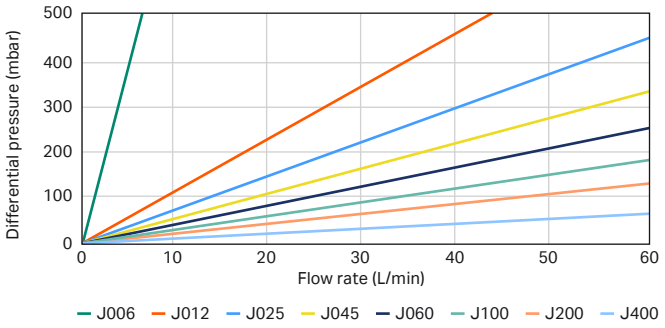


Fig 3. Typical liquid flow rates per 133 mm (5.2 in.) filter element; water at 20°C, viscosity 1 cP.

Operating conditions

	Sealkleen style (SLK7001/SLK7002)	Junior style (MCY2220, MCY4440, MCY4463)
Maximum operating temperature	50°C	80°C
Maximum differential pressure	5.5 bard (80 psid)	4.1 bard (60 psid)

* With compatible fluids which do not soften, swell or adversely affect the filter or its materials of construction.

Materials of construction

Filter membrane	PP
Support and drainage	PP
Core, cage and endcaps	PP
O-ring	Silicone

Nominal dimensions

	SLK7001	SLK7002	MCY2220	MCY4440	MCY4463
Length	64 mm	127 mm	66 mm	133 mm	133 mm
Diameter	57 mm	57 mm	57 mm	57 mm	57 mm

Nominal filter area

Filter grade	SLK7001 style	MCY4440	MCY4463 and SLK7002 styles
J006	0.11 m^2	-	0.22 m^2
J012	0.12 m^2	0.21 m^2	0.26 m^2
J025	0.16 m^2	0.26 m^2	0.32 m^2
J045	0.15 m^2	0.25 m^2	0.31 m^2
J060	0.07 m^2	0.12 m^2	0.14 m^2
J100	0.09 m^2	0.15 m^2	0.19 m^2
J200	0.09 m^2	-	0.19 m^2

Sterilization

Maximum steam-sterilizing temperature	Up to 140°C *in-situ* or autoclave

Ordering information

Sealkleen style (SLK)

Single open-ended 57 mm (2.25 in.) diameter element (excluding flange). Incorporates a patented sealing arrangement that eliminates any chance of fluid bypass via the seal, from the upstream side of the filter element to the downstream side. The housing elastomeric O-ring is placed on a special flange, which is an integral part of the element outlet end cap.

Code	Nominal length	HDC II filter grade	Removal rating	Product code
7001	66 mm (2.5 in.)	J006	0.6 µm†	SLK7001J006P
		J012	1.2 µm	SLK7001J012P
		J025	2.5 µm	SLK7001J025P
		J045	4.5 µm	SLK7001J045P
		J060	6.0 µm	SLK7001J060P
		J100	10 µm	SLK7001J100P
		J200	20 µm	SLK7001J200P
		J400	40 µm	SLK7001J400P
7002	133 mm (5.2 in.)	J006	0.6 µm	SLK7002J006P
		J012	1.2 µm	SLK7002J012P
		J025	2.5 µm	SLK7002J025P
		J045	4.5 µm	SLK7002J045P
		J060	6.0 µm	SLK7002J060P
		J100	10 µm	SLK7002J100P
		J200	20 µm	SLK7002J200P
		J400	40 µm	SLK7002J400P

Junior style (MCY)

Single open-ended 57 mm (2.25 in.) diameter element.

Code	Adaptor	Nominal length	HDC II filter grade	Removal rating	Product code
2220	Plug seal with locking tabs and double external silicone O-rings	66 mm (2.5 in.)	J006	0.6 µm†	MCY2220J006PH4
			J012	1.2 µm	MCY2220J012PH4
			J025	2.5 µm	MCY2220J025PH4
			J045	4.5 µm	MCY2220J045PH4
			J060	6.0 µm	MCY2220J060PH4
			J100	10 µm	MCY2220J100PH4
			J200	20 µm	MCY2220J200PH4
			J400	40 µm	MCY2220J400PH4
4440		133 mm (5.2 in.)	J006	0.6 µm	MCY4440J006PH4
			J012	1.2 µm	MCY4440J012PH4
			J025	2.5 µm	MCY4440J025PH4
			J045	4.5 µm	MCY4440J045PH4
			J060	6.0 µm	MCY4440J060PH4
			J100	10 µm	MCY4440J100PH4
			J200	20 µm	MCY4440J200PH4
			J400	40 µm	MCY4440J400PH4
4463	Internal plug seal with single silicone O-ring	133 mm (5.2 in.)	J006	0.6 µm	MCY4463J006PH4
			J012	1.2 µm	MCY4463J012PH4
			J025	2.5 µm	MCY4463J025PH4
			J045	4.5 µm	MCY4463J045PH4
			J060	6.0 µm	MCY4463J060PH4
			J100	10 µm	MCY4463J100PH4
			J200	20 µm	MCY4463J200PH4
			J400	40 µm	MCY4463J400PH4

† Extrapolated value.

Other O-ring options are available upon request.

HDC II filter cartridges

Technical specifications

Typical liquid flow rates.

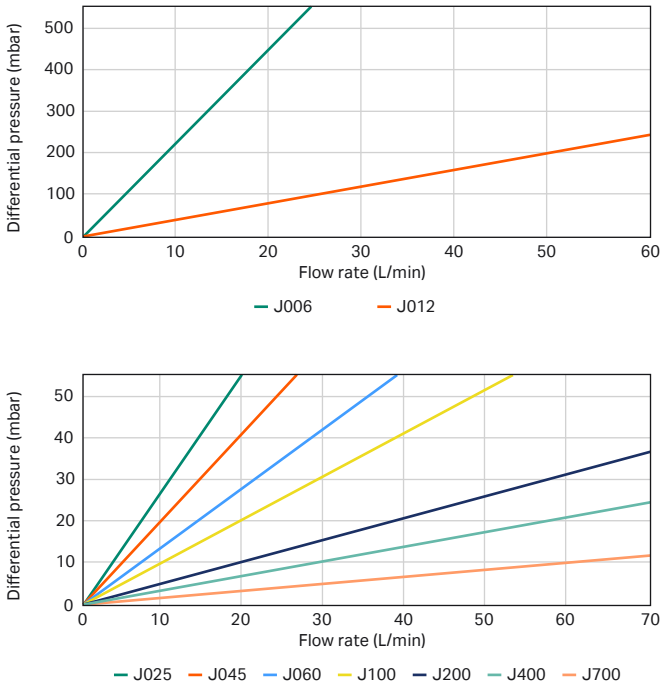


Fig 4. Typical liquid flow rates per 254 mm (10 in.) element; water at 20°C, viscosity 1 cP.

Operating conditions

Maximum differential pressure and temperature[†]	5.5 bard (80 psid) to 50°C
	4.1 bard (60 psid) to 80°C

[†] With compatible fluids which do not soften, swell or adversely affect the filter or its materials of construction.

Materials of construction

Filter membrane	PP
Support and drainage layers	PP
Core, cage and end caps	PP
P grade code 7 adapters	PP with encapsulated stainless steel ring
O-ring	Silicone[*]

[*] Other materials available upon request.

Nominal dimensions

Lengths	254 mm (10 in.), 508 mm (20 in.), 762 mm (30 in.), 1016 mm (40 in.)
Diameter	70 mm (2.75 in.)

Nominal filter area

Filter grade	254 mm (10 in.) capsule	508 mm (20 in.) capsule	762 mm (30 in.) capsule	1016 mm (40 in.) capsule
J006	0.63 m^2	1.26 m^2	1.89 m^2	2.52 m^2
J012	0.70 m^2	1.40 m^2	2.10 m^2	2.8 m^2
J025	0.88 m^2	1.76 m^2	2.64 m^2	3.52 m^2
J045	0.88 m^2	1.76 m^2	2.64 m^2	3.52 m^2
J060	0.42 m^2	0.84 m^2	1.26 m^2	1.68 m^2
J100	0.55 m^2	1.10 m^2	1.65 m^2	2.2 m^2
J200	0.55 m^2	1.10 m^2	1.65 m^2	2.2 m^2
J400	0.38 m^2	0.76 m^2	1.14 m^2	1.52 m^2
J700	0.38 m^2	0.76 m^2	1.14 m^2	1.52 m^2

Sterilization[‡]

Maximum steam-sterilizing temperature	140°C *in-situ* or autoclave

[‡] Filters should be qualified in actual use. Contact Cytiva for recommended procedures.

Ordering information

Code 7 style filters, with double silicone O-ring, bayonet lock and fin end[§]

Nominal length	Removal rating	Product code
254 mm (10 in.)	0.6 µm	AB1J0067PH4
	1.2 µm	AB1J0127PH4
	2.5 µm	AB1J0257PH4
	4.5 µm	AB1J0457PH4
	6.0 µm	AB1J0607PH4
	10 µm	AB1J1007PH4
	20 µm	AB1J2007PH4
	40 µm	AB1J4007PH4
	70 µm	AB1J7007PH4
508 mm (20 in.)	0.6 µm	AB2J0067PH4
	1.2 µm	AB2J0127PH4
	2.5 µm	AB2J0257PH4
	4.5 µm	AB2J0457PH4
	6.0 µm	AB2J0607PH4
	10 µm	AB2J1007PH4
	20 µm	AB2J2007PH4
	40 µm	AB2J4007PH4
	70 µm	AB2J7007PH4
762 mm (30 in.)	0.6 µm	AB3J0067PH4
	1.2 µm	AB3J0127PH4
	2.5 µm	AB3J0257PH4
	4.5 µm	AB3J0457PH4
	6.0 µm	AB3J0607PH4
	10 µm	AB3J1007PH4
	20 µm	AB3J2007PH4
	40 µm	AB3J4007PH4
	70 µm	AB3J7007PH4
1016 mm (40 in.)	0.6 µm	AB4J0067PH4
	1.2 µm	AB4J0127PH4
	2.5 µm	AB4J0257PH4
	4.5 µm	AB4J0457PH4
	6.0 µm	AB4J0607PH4
	10 µm	AB4J1007PH4
	20 µm	AB4J2007PH4
	40 µm	AB4J4007PH4
	70 µm	AB4J7007PH4

[§] Other cartridge styles and O-ring materials are available. Please contact Cytiva for more information.

HDC II filter in Kleenpak™ capsules

Technical specifications

Typical liquid flow rates

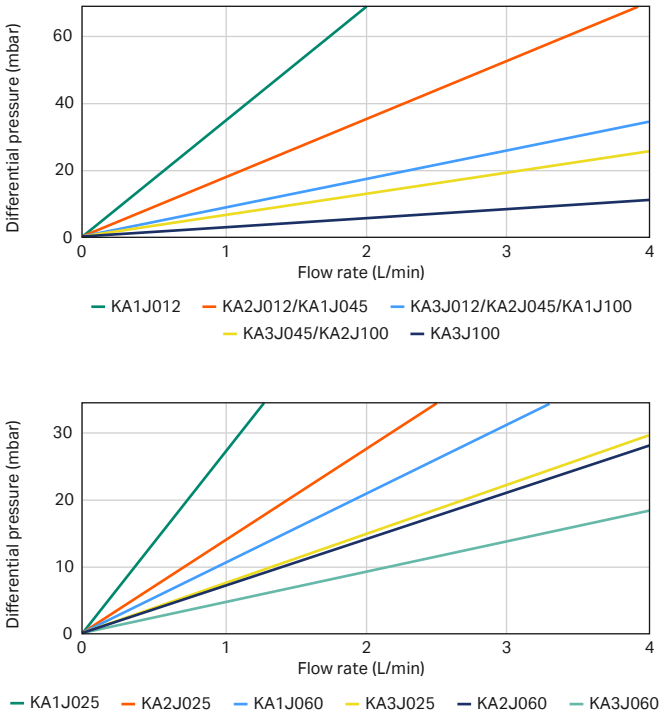


Fig 5. Typical initial clean differential pressure, water at 20°C. Values shown are for 38 mm (1½ in.) sanitary flange connections.

Values with other connections are available upon request. For assistance in filter sizing, contact your local Cytiva representative.

Typical air flow rates (at 2 barg [30 psig] inlet pressure)

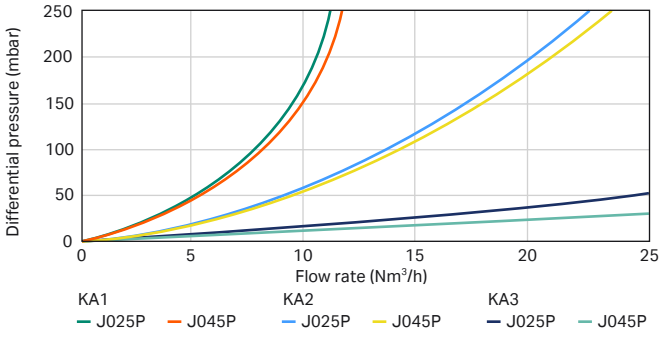


Fig 6. Typical initial clean differential pressure, air at 20°C. Values shown are for 38 mm (1½ in.) sanitary flange connections.

Values with other connections are available upon request. For gases other than air or nitrogen, contact your local Cytiva representative.

Operating conditions (liquids)*

Maximum operating pressure and temperature	5.2 barg (75 psig) at 40°C
Maximum differential pressure and temperature	4.1 bard (60 psid) at 40°C

* With compatible fluids which do not soften, swell or adversely affect the filter or its materials of construction.

Operating conditions (gases)†

Maximum operating pressure and temperature	3.5 barg (50 psig) at 40°C
Maximum differential pressure and temperature	3.5 barg (50 psig) at 40°C

† In air/N_2 service or other compatible gases which do not soften, swell or adversely affect the filter or its materials of construction.

Materials of construction

Filter membrane	PP
Support, drainage, core, cage, end caps and capsule	PP
Vent and drain valve O-rings	Ethylene propylene (EPDM)

Connections (inlet and outlet)

KA1 and KA2 styles	38 mm (1½ in.) sanitary flange 6 to 13 mm (¼ to ½ in.) stepped hose barb
KA3 and KA4 styles	38 mm (1½ in.) sanitary flange 14 mm (9/16 in.) stepped hose barb

Nominal dimensions

Size code	KA1	KA2	KA3	KA4
Maximum diameter of bowl (including valves)	94 mm	94 mm	109 mm	109 mm
Nominal length (including 1½ in. sanitary flange connection)	117 mm	158 mm	174 mm	286 mm
Nominal length (including stepped hose barb connection)	158 mm	199 mm	-	-
Nominal length (including hose barb connection)	-	-	210 mm	325 mm

Nominal filter areas

	KA1	KA2	KA3	KA4
J006	-	0.10 m^2	0.20 m^2	0.38 m^2
J012	0.06 m^2	0.10 m^2	0.20 m^2	0.45 m^2
J025	0.06 m^2	0.10 m^2	0.20 m^2	0.57 m^2
J045	0.06 m^2	0.11 m^2	0.22 m^2	-
J060	0.03 m^2	0.05 m^2	0.10 m^2	0.26 m^2
J100	0.03 m^2	0.07 m^2	0.13 m^2	0.33 m^2

Sterilization (steam autoclaving)

Maximum cumulative autoclave time‡	50 hours at 140°C

‡ Laboratory tests (1 hour cycles) establish multi-cycle resistance. Filters should be qualified in actual use.

Warning: Kleenpak filters must not be steamed *in-situ* by passing steam through under pressure.

Ordering information

Capsule size	Grade	Removal ratings in liquids[§]	Connectors	Product code
KA1	J006	0.6 µm	38 mm (1½ in.) sanitary flange	KA1J006P1
			6 to 13 mm stepped hose barb	KA1J006P2
	J012	1.2 µm	38 mm (1½ in.) sanitary flange	KA1J012P1
			6 to 13 mm stepped hose barb	KA1J012P2
	J025	2.5 µm	38 mm (1½ in.) sanitary flange	KA1J025P1
			6 to 13 mm stepped hose barb	KA1J025P2
	J045	4.5 µm	38 mm (1½ in.) sanitary flange	KA1J045P1
			6 to 13 mm stepped hose barb	KA1J045P2
	J060	6.0 µm	38 mm (1½ in.) sanitary flange	KA1J060P1
			6 to 13 mm stepped hose barb	KA1J060P2
	J100	10 µm	38 mm (1½ in.) sanitary flange	KA1J100P1
			6 to 13 mm stepped hose barb	KA1J100P2
KA2	J006	0.6 µm	38 mm (1½ in.) sanitary flange	KA2J006P1
			6 to 13 mm stepped hose barb	KA2J006P2
	J012	1.2 µm	38 mm (1½ in.) sanitary flange	KA2J012P1
			6 to 13 mm stepped hose barb	KA2J012P2
	J025	2.5 µm	38 mm (1½ in.) sanitary flange	KA2J025P1
			6 to 13 mm stepped hose barb	KA2J025P2
	J045	4.5 µm	38 mm (1½ in.) sanitary flange	KA2J045P1
			6 to 13 mm stepped hose barb	KA2J045P2
	J060	6.0 µm	38 mm (1½ in.) sanitary flange	KA2J060P1
			6 to 13 mm stepped hose barb	KA2J060P2
	J100	10 µm	38 mm (1½ in.) sanitary flange	KA2J100P1
			6 to 13 mm stepped hose barb	KA2J100P2
KA3	J006	0.6 µm	38 mm (1½ in.) sanitary flange	KA3J006P1
			14 mm (9/16 in.) hose barb	KA1J006P6
	J012	1.2 µm	38 mm (1½ in.) sanitary flange	KA3J012P1
			14 mm (9/16 in.) hose barb	KA3J012P6
	J025	2.5 µm	38 mm (1½ in.) sanitary flange	KA3J025P1
			14 mm (9/16 in.) hose barb	KA3J025P6
	J045	4.5 µm	38 mm (1½ in.) sanitary flange	KA3J045P1
			14 mm (9/16 in.) hose barb	KA3J045P6
	J060	6.0 µm	38 mm (1½ in.) sanitary flange	KA3J060P1
			14 mm (9/16 in.) hose barb	KA3J060P6
	J100	10 µm	38 mm (1½ in.) sanitary flange	KA3J100P1
			14 mm (9/16 in.) hose barb	KA3J100P6
KA4	J006	0.6 µm	38 mm (1½ in.) sanitary flange	KA4J006P1
			14 mm (9/16 in.) hose barb	KA1J006P6
	J012	1.2 µm	38 mm (1½ in.) sanitary flange	KA4J012P1
			14 mm (9/16 in.) hose barb	KA4J012P6
	J025	2.5 µm	38 mm (1½ in.) sanitary flange	KA4J025P1
			14 mm (9/16 in.) hose barb	KA4J025P6
	J045	4.5 µm	38 mm (1½ in.) sanitary flange	KA4J045P1
			14 mm (9/16 in.) hose barb	KA4J045P6
	J060	6.0 µm	38 mm (1½ in.) sanitary flange	KA4J060P1
			14 mm (9/16 in.) hose barb	KA4J060P6
	J100	10 µm	38 mm (1½ in.) sanitary flange	KA4J100P1
			14 mm (9/16 in.) hose barb	KA4J100P6

[§] Based on modified OSU F-2 test. Contact Cytiva for further details.

HDC II filter in Kleenpak Nova capsules

Technical specifications

Typical water flow rates for empty capsules at 20°C.

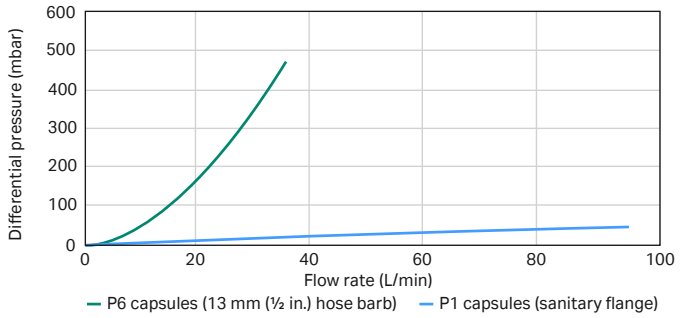


Fig 6. Kleenpak Nova NP style empty capsule, typical water flow rates at 20°C.

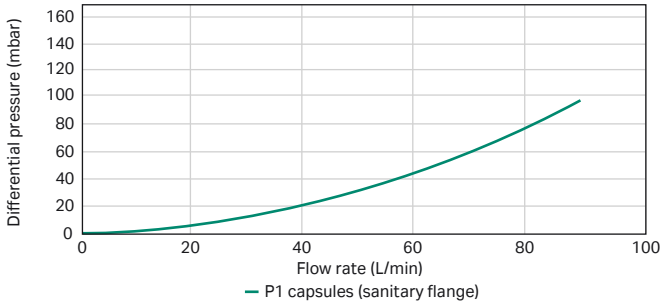


Fig 7. Kleenpak Nova NT style empty capsule, typical water flow rates at 20°C.

Note: Empty Kleenpak Nova capsules for water at 20°C, 1 cP. For other liquids, multiply pressure times the viscosity in centipoise. For complete assembly, including AB-style filter cartridge, add empty capsule and filter cartridge pressure-drop values, contact Cytiva for assistance.

Operating conditions*

Maximum operating temperature	40°C
Maximum operating pressure	3 barg (43.5 psig) at 40°C

* With compatible fluids which do not soften, swell or adversely affect the filter or its materials of construction.

Materials of construction

Filter membrane	PP
Support, drainage, core, cage, end caps	PP
Housing bowl	PP
Housing head†	PP
O-rings	Silicone elastomer

† Formulated with titanium dioxide (TiO_2) whitener which does not contribute to organic extractables.

Nominal dimensions

In-line style capsules	NP6	NP7	NP8
Maximum diameter (including valves)	154 mm	154 mm	154 mm
Length with hose barb inlet and outlet	397 mm	644 mm	895 mm
Length with sanitary inlet and outlet	335 mm	584 mm	834 mm

T-style capsules	NT6	NT7	NT8
Maximum diameter (including valves)	240 mm	240 mm	240 mm
Length	349 mm	598 mm	848 mm

Sterilization

Autoclave (maximum)	Single-cycle, 135°C, for 1 hour
Gamma irradiation	Maximum dosage: 50 kGy

Warning: Kleenpak Nova filters must not be steamed *in-situ* by passing steam through under pressure.

Ordering information

For non-sterilized Kleenpak Nova capsules, with Stäubli compatible vent connection and stepped hose barb drain.

Other inlet and outlet connections, other vent and drain options, and presterilized capsules are available. Please contact Cytiva for details.

In-line style capsule

Filter size	Removal rating	Product code	
		1–1½ in. sanitary flange inlet and outlet	½ in. single-barb hose barb inlet and outlet
254 mm (10 in.)	0.6 µm	NP6J006P1G	NP6J006P6G
	1.2 µm	NP6J012P1G	NP6J012P6G
	2.5 µm	NP6J025P1G	NP6J025P6G
	4.5 µm	NP6J045P1G	NP6J045P6G
	6.0 µm	NP6J060P1G	NP6J060P6G
	10.0 µm	NP6J100P1G	NP6J100P6G
	20.0 µm	NP6J200P1G	NP6J200P6G
	40.0 µm	NP6J400P1G	NP6J400P6G
	70.0 µm	NP6J700P1G	NP6J700P6G
508 mm (20 in.)	0.6 µm	NP7J006P1G	NP7J006P6G
	1.2 µm	NP7J012P1G	NP7J012P6G
	2.5 µm	NP7J025P1G	NP7J025P6G
	4.5 µm	NP7J045P1G	NP7J045P6G
	6.0 µm	NP7J060P1G	NP7J060P6G
	10.0 µm	NP7J100P1G	NP7J100P6G
	20.0 µm	NP7J200P1G	NP7J200P6G
	40.0 µm	NP7J400P1G	NP7J400P6G
	70.0 µm	NP7J700P1G	NP7J700P6G
762 mm (30 in.)	0.6 µm	NP8J006P1G	NP8J006P6G
	1.2 µm	NP8J012P1G	NP8J012P6G
	2.5 µm	NP8J025P1G	NP8J025P6G
	4.5 µm	NP8J045P1G	NP8J045P6G
	6.0 µm	NP8J060P1G	NP8J060P6G
	10.0 µm	NP8J100P1G	NP8J100P6G
	20.0 µm	NP8J200P1G	NP8J200P6G
	40.0 µm	NP8J400P1G	NP8J400P6G
	70.0 µm	NP8J700P1G	NP8J700P6G

T-style capsule

Inlet and outlet connection	Filter size	Removal rating	Product code
1–1½ in. sanitary flange inlet and outlet	254 mm (10 in.)	0.6 µm	NT6J006P1G
		1.2 µm	NT6J012P1G
		2.5 µm	NT6J025P1G
		4.5 µm	NT6J045P1G
		6.0 µm	NT6J060P1G
		10.0 µm	NT6J100P1G
		20.0 µm	NT6J200P1G
		40.0 µm	NT6J400P1G
		70.0 µm	NT6J700P1G
	508 mm (20 in.)	0.6 µm	NT7J006P1G
		1.2 µm	NT7J012P1G
		2.5 µm	NT7J025P1G
		4.5 µm	NT7J045P1G
		6.0 µm	NT7J060P1G
		10.0 µm	NT7J100P1G
		20.0 µm	NT7J200P1G
		40.0 µm	NT7J400P1G
		70.0 µm	NT7J700P1G
	762 mm (30 in.)	0.6 µm	NT8J006P1G
		1.2 µm	NT8J012P1G
		2.5 µm	NT8J025P1G
		4.5 µm	NT8J045P1G
		6.0 µm	NT8J060P1G
		10.0 µm	NT8J100P1G
		20.0 µm	NT8J200P1G
		40.0 µm	NT8J400P1G
		70.0 µm	NT8J700P1G

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