

# Sartobind® Q and S, 4 and 8 mm Bed Height

Process-Scale  
Strong Ion Exchange  
Membrane Adsorbers



## Benefits

- Designed for high speed flow-through polishing as well as bind and elute chromatography
- Recommended flow rate of 5 to 30 membrane volumes/min
- Easy and simple handling
- Ten times higher dynamic binding capacity for adeno- and lentivirus and other virus like particles (VLPs) compared to resins
- Reusable or disposable
- Q anion exchanger also available in validated gamma-irradiated version



## Product Information

The Sartobind® Q and S capsules and cassettes with 4 | 8 mm bed height are membrane chromatography devices for large scale capturing and impurity removal at high flow rates. Sartobind® strong anion (Q) and cation (S) ligands are covalently attached as a flexible hydrogel onto the stabilized reinforced cellulose. The membrane pore size of >3 µm allows large proteins, bioparticles and viruses to enter the macroporous structure and achieve high binding capacity without size exclusion effects. In the capsules the membrane is rolled up to form a cylinder with a bed height of 4 | 8 mm around a central core. The cassettes contain two membrane stacks of 4 or 8 mm bed height with a central spacer inbetween.

The optimized design of the fluid channels reduces the void volume significantly, resulting in sharp breakthrough curves with minimal elution volumes (see application note: Sartobind® Membrane Adsorbers for Capture and Polishing, order no.: 85034-536-64). The recommended flow rate for devices with 4 mm bed height is 10 to 30 membrane volumes (MV) per minute and for 8 mm devices 5 MV/min. The internal support structures and the outer shell of the capsules are made from polypropylene and from acrylonitrile butadiene styrene (ABS) for the cassettes. The membrane geometry and the flow path is identical in all devices. Sartobind® nano 1 or 3 mL is the recommended scale down model for the larger 4 or 8 mm devices. If sample amount is limited, Sartobind® Q or S pico units with 0.08 mL bed volume (4 mm) are available. For buffer and conditions screening, additionally 96-well plates with a bed height of 0.8 mm can be used.

If capture or polishing needs to be run under sterile conditions, Sartobind® Q cassettes are the devices of choice, as they can be delivered also gamma-irradiated and with validated sterility. Two applications that could especially benefit are virus purification processes that cannot be sterile filtered prior to filling due to the virus size, and continuous manufacturing operations that run over a prolonged period of time. Sterile Q cassettes fulfill all the same specifications as the non-sterile versions.

### Applications

Target molecules to be purified: monoclonal antibodies, recombinant proteins, conjugated proteins, glycoproteins, antibody drug conjugates (ADCs), viruses, virus like particles (VLPs), nucleic acids (pDNA, mRNA).

### Polishing

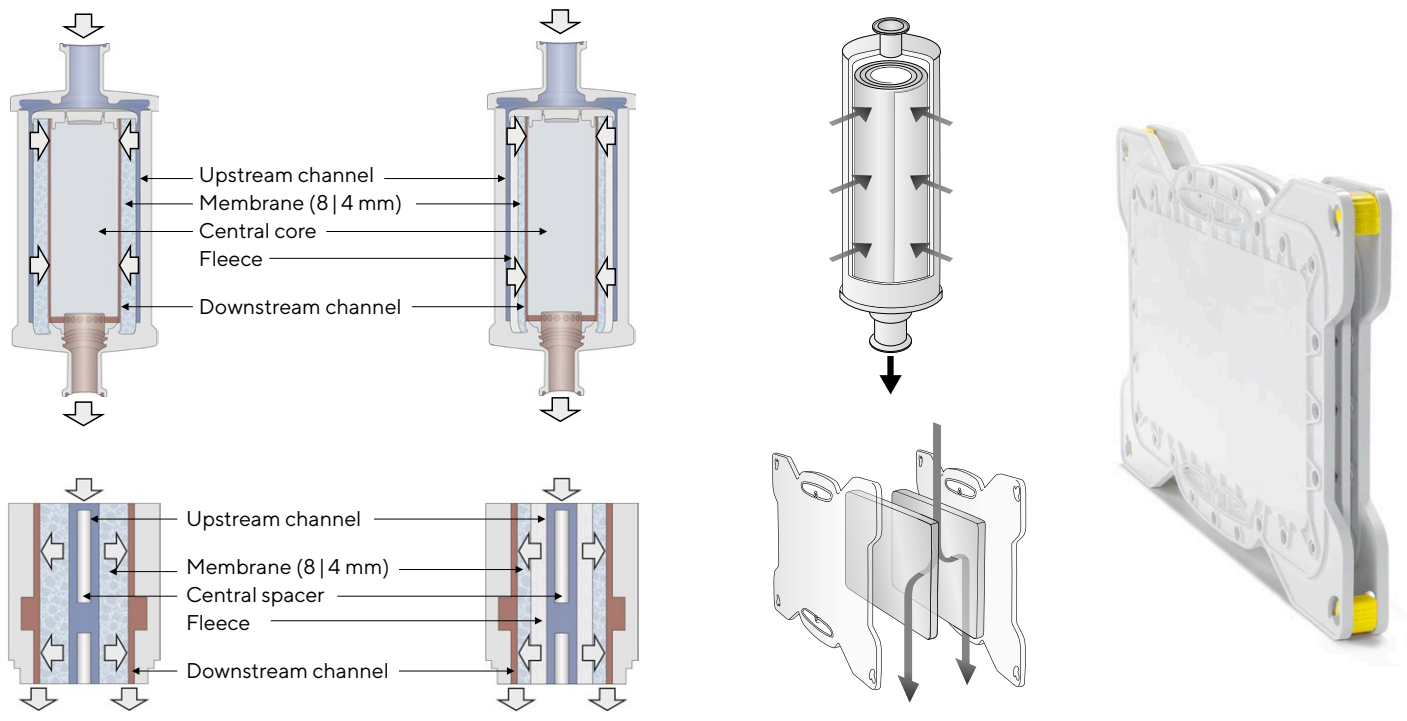
- Virus clearance >6 log
- DNA below detection limit
- Endotoxins >5 log
- Host cell proteins >99%
- Leached ligand materials
- Aggregates

### Capture

- Large proteins
- Viruses and virus like particles (VLP)
- Vaccines
- Proteins from large feed streams
- Q can be delivered in a sterile cassette version if terminal sterile filtration is not possible



96-well plates and pico devices for screening of conditions and initial tests.



Cross section view and flow path of a capsule (upper figures) and a cassette (lower figures).

# Technical Data

## Specifications

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### Membrane materials

Matrix	Stabilized reinforced cellulose
Membrane thickness   membrane volume = membrane area	275 µm   1 mL = 36.4 cm <sup>2</sup>
Nominal pore size	> 3 µm
Ion exchanger ligand Q	Strong anion Q: quaternary ammonium (R-CH <sub>2</sub> -N <sup>+</sup> (CH <sub>3</sub> ) <sub>3</sub> )
Ion exchanger ligand S	Strong cation S: sulfonic acid (R-CH <sub>2</sub> -SO <sub>3</sub> <sup>-</sup> )

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### Capsule materials

Outer cage, inner core, end caps, capsule housing, nonwoven, fleece	Polypropylene
O-ring in vent valve (except nano)	EPDM (ethylene propylene diene monomer)

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### Cassette materials

Outer cage, seal, nonwoven, fleece	ABS, silicone, polyethylene, stable to gamma irradiation
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### Operation

Depyrogenation	1 N NaOH for 30 minutes at 20 °C
Integrity testing	By the diffusion test method with Sartocheck® 4 Plus

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### Typical dynamic binding capacity at 10% breakthrough

Q (bovine serum albumin, 20 mM Tris/HCl, pH 7.5)	29 mg/mL (0.8 mg/cm <sup>2</sup> )
S (lysozyme, 10 mM potassium phosphate, pH 7.0)	25 mg/mL (0.7 mg/cm <sup>2</sup> )

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### Ligand density

Q	2 – 5 µeq/cm <sup>2</sup>
S	2 – 5 µeq/cm <sup>2</sup>

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### pH stabilities

	Short term	Long term
Q	pH 1 – 14	pH 2 – 12
S	pH 3 – 14	pH 4 – 13

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### Gamma irradiated products

	Gamma dose
Sartobind® Q cassettes 4 mm and 8 mm	≥ 25 kiloGrays (kGy), maximum dose: 50 kGy
Gamma irradiated manifold for Sartobind® cassettes	≥ 25 kiloGrays (kGy), maximum dose: 50 kGy
Gamma irradiated Sartobind® Q Nano 1 mL, 4 mm	≥ 25 kiloGrays (kGy), maximum dose: 50 kGy

## Dimensions and Connections



Size	nano	mini	5"	10"	20"	30"	Jumbo	Cassette
Membrane volume   4 mm	1 mL	10 mL	75 mL	200 mL	400 mL	600 mL	2,500 mL	800 mL
Membrane volume   8 mm	3 mL	20 mL	150 mL	400 mL	800 mL	1,200 mL	5,000 mL	1,600 mL
Membrane area cm <sup>2</sup>   4 mm	36.4	364	2,700	7,300	14,600	22,000	91,000	29,000*
Membrane area cm <sup>2</sup>   8 mm	110	728	5,500	14,600	29,000	44,000	182,000	58,000*
Void volume 4 mm MV**   mL	3.5   3.5	3.2   32	2.7   200	2.7   540	2.7   1,080	2.7   1,600	2.8   7,000	3.1   2,500*
Void volume 8 mm MV**   mL	1.3   4	1.6   32	1.3   200	1.4   540	1.4   1,080	1.3   1,600	1.4   7,000	1.8   2,900*
Dimensions one device (height x diameter) mm	37 x 31	70 - 110 x 54.5	190 - 203 x 77	350 x 100	570 x 100	810 x 100	850 x 302	634 x 387 x 49 w x h x d
Connectors	Luer female	Luer female Sanitary 3/4" 25 mm outer, 14 mm inner diameter Hose barb 1/2", 12.7 mm	Sanitary 3/4" 25 mm outer, 14 mm inner diameter Hose barb 1/2"	Sanitary 1 1/2" 50.5 mm outer, 36 mm inner diameter	Sanitary 1 1/2" 50.5 mm outer, 36 mm inner diameter	Sanitary 1 1/2" 50.5 mm outer, 36 mm inner diameter	Sanitary 1 1/2" 50.5 mm outer, 36 mm inner diameter	Sanitary 1 1/2" 50.5 mm outer, 36 mm inner diameter via manifolds (accessory)
Approximate weight	10 g	65 g	400 g	760 g	1.3 kg	1.9 kg	16 kg 20 kg wet 23 kg filled	4.9 kg* 6.0 kg* wet

\*Multiply with the number of used cassettes

\*\*MV = membrane volume (including the porosity of the membrane which is 80%)

# Ordering Information

## Sartobind® Q Capsules

Order number	Description	Quantity	Bed height [mm]	Protein binding capacity [g]	Recommended flow rate [L/min]	Maximum pressure [MPa] (bar   psig)
96IEXQ42DN-11	Sartobind® Q nano 1 mL, 4 mm, Luer female connectors, 2 PEEK adapters Luer male to UNF 10-32 female, manual, certificate	1	4	0.029	0.02	0.4 (4/58)
96IEXQ42DN-11--A	Sartobind® Q nano 1 mL, 4 mm, Luer female connectors, 2 PEEK adapters Luer male to UNF 10-32 female, manual, certificate	4	4	0.029	0.02	0.4 (4/58)
96IEXQ42D4R11--A	Sartobind® Q mini 10 mL, 4 mm, Luer female connectors, 8 PEEK adapters Luer male to UNF 10-32 female, manual, certificate	4	4	0.29	0.2	0.4 (4/58)
96IEXQ42D4RFF--A	Sartobind® Q mini 10 mL, 4 mm, ¼" sanitary clamp, manual, certificate	4	4	0.29	0.2	0.4 (4/58)
96IEXQ42D4ROO--A	Sartobind® Q mini 10 mL, 4 mm, hose barb connectors, manual, certificate	4	4	0.29	0.2	0.4 (4/58)
96IEXQ42D9MOO--A	Sartobind® Q 75 mL, 4 mm, hose barb connectors, manual, certificate	4	4	2.16	1.5	0.4 (4/58)
96IEXQ42D9MFF--A	Sartobind® Q 75 mL, 4 mm, ¼" sanitary clamp, manual, certificate	4	4	2.16	1.5	0.4 (4/58)
96IEXQ42D1GSS	Sartobind® Q 200 mL, 4 mm, ½" sanitary clamp, manual, certificate	1	4	5.8	4	0.4 (4/58)
96IEXQ42D2HSS	Sartobind® Q 400 mL, 4 mm, ½" sanitary clamp, manual, certificate	1	4	11.7	8	0.4 (4/58)
96IEXQ42D3KSS	Sartobind® Q 600 mL, 4 mm, ½" sanitary clamp, manual, certificate	1	4	17.6	12	0.4 (4/58)
96IEXQ42D3NSS	Sartobind® Q Jumbo 2.5 L, 4 mm, ½" sanitary clamp, 2 protective caps, manual, autoclaving instructions, certificate	1	4	73	50	0.3 (3/43.5)
96IEXQ42EUC11--A	Sartobind® Q nano 3 mL, 8 mm, Luer female connectors, 24 PEEK adapters Luer male to UNF 10-32 female, manual, certificate	24	8	0.088	0.015	0.4 (4/58)
96IEXQ42E4J11-A	Sartobind® Q mini 20 mL, 8 mm, Luer female connectors, 84 PEEK adapters Luer male to UNF 10-32 female, manual, certificate	84	8	0.58	0.1	0.4 (4/58)
96IEXQ42E4JFF-A	Sartobind® Q mini 20 mL, 8 mm, ¼" sanitary clamp, manual, certificate	4	8	0.58	0.1	0.4 (4/58)
96IEXQ42E4JOO-A	Sartobind® Q mini 20 mL, 8 mm, hose barb connectors, manual, certificate	4	8	0.58	0.1	0.4 (4/58)
96IEXQ42E9BFF	Sartobind® Q 150 mL, 8 mm, ¼" sanitary clamp, manual, certificate	1	8	4.35	0.75	0.4 (4/58)
96IEXQ42E1HSS	Sartobind® Q 400 mL, 8 mm, ½" sanitary clamp, manual, certificate	1	8	11.6	2	0.4 (4/58)
96IEXQ42E2LSS	Sartobind® Q 800 mL, 8 mm, ½" sanitary clamp, manual, certificate	1	8	23.3	4	0.4 (4/58)
96IEXQ42E3FSS	Sartobind® Q 1.2 L, 8 mm, ½" sanitary clamp, manual, certificate	1	8	35	6	0.4 (4/58)
96IEXQ42E3ESS	Sartobind® Q Jumbo 5 L, 8 mm, ½" sanitary clamp, 2 protective caps, 15 membrane discs 30 mm, manual, autoclaving instructions, certificate	1	8	145	25	0.3 (3/43.5)

Order number	Description	Quantity	Bed height [mm]	Protein binding capacity [g]	Recommended flow rate [L/min]	Maximum pressure [MPa] (bar   psig)
98IEXQ42D-L	Sartobind® Q Cassette 0.8 L, 4 mm, 1½" sanitary clamp via manifold set (accessory), manual, certificate	1	4	23.2	16	0.2 (2/29)
98IEXQ42E-P	Sartobind® Q Cassette 1.6 L, 8 mm, 1½" sanitary clamp via manifold set (accessory), manual, certificate	1	8	46.4	8	0.2 (2/29)
98IEXQ42DGL	Sartobind® Q Cassette 0.8 L, 4 mm, gamma irradiated at ≥ 25 kGy, max. 50 kGy, 1½" sanitary clamp via gamma manifold set (accessory), manual, certificate	1	4	23.2	16	0.2 (2/29)
98IEXQ42EGP	Sartobind® Q Cassette 1.6 L, 8 mm, gamma irradiated at ≥ 25 kGy, max. 50 kGy, 1½" sanitary clamp via gamma manifold set (accessory), manual, certificate	1	8	46.4	8	0.2 (2/29)
97IEXQ42D-U11	Sartobind® Q nano 1 mL, 4 mm, Luer female connectors, 2 PEEK adapters Luer male to UNF 10-32 female, manual, certificate	1	4	0.029	0.02	0.4 (4/58)
97IEXQ42D-U11--A	Sartobind® Q nano 1 mL, 4 mm, Luer female connectors, 2 PEEK adapters Luer male to UNF 10-32 female, manual, certificate	4	4	0.029	0.02	0.4 (4/58)
97IEXQ42E-C11	Sartobind® Q nano 3 mL, 8 mm, Luer female connectors, 2 PEEK adapters Luer male to UNF 10-32 female, manual, certificate	1	8	0.088	0.015	0.4 (4/58)
97IEXQ42E-C11--A	Sartobind® Q nano 3 mL, 8 mm, Luer female connectors, 2 PEEK adapters Luer male to UNF 10-32 female, manual, certificate	4	8	0.088	0.015	0.4 (4/58)
SBG500000	Sartobind® Q Nano 1 mL, 4 mm, gamma irradiated at ≥ 25 kGy, max. 50 kGy, Luer female connectors, 2 PEEK adapters Luer male to UNF 10-32 female, manual, certificate	1	4	0.029	0.02	0.4 (4/58)

The order codes starting with 97 are gamma-irradiatable.

## Sartobind® S Capsules

Order number	Description	Quantity	Bed height [mm]	Protein binding capacity [g]	Recommended flow rate [L/min]	Maximum pressure [MPa] (bar   psig)
96IEXS42DN-11	Sartobind® S nano 1 mL, 4 mm, Luer female connectors, 2 PEEK adapters Luer male to UNF 10-32 female, manual, certificate	1	4	0.025	0.02	0.4 (4/58)
96IEXS42DN-11--A	Sartobind® S nano 1 mL, 4 mm, Luer female connectors, 2 PEEK adapters Luer male to UNF 10-32 female, manual, certificate	4	4	0.025	0.02	0.4 (4/58)
96IEXS42D4R11--A	Sartobind® S mini 10 mL, 4 mm, Luer female connectors, 8 PEEK adapters Luer male to UNF 10-32 female, manual, certificate	4	4	0.25	0.2	0.4 (4/58)
96IEXS42D4RFF--A	Sartobind® S mini 10 mL, 4 mm, ¾" sanitary clamp, manual, certificate	4	4	0.25	0.2	0.4 (4/58)
96IEXS42D4ROO--A	Sartobind® S mini 10 mL, 4 mm, hose barb connectors, manual, certificate	4	4	0.25	0.2	0.4 (4/58)

Order number	Description	Quantity	Bed height [mm]	Protein binding capacity [g]	Recommended flow rate [L/min]	Maximum pressure [MPa] (bar   psig)
96IEXS42D9MOO--A	Sartobind® S 75 mL, 4 mm, hose barb connectors, manual, certificate	4	4	1.89	1.5	0.4 (4/58)
96IEXS42D9MFF--A	Sartobind® S 75 mL, 4 mm, ¾" sanitary clamp, manual, certificate	4	4	1.89	1.5	0.4 (4/58)
96IEXS42D1GSS	Sartobind® S 200 mL, 4 mm, 1½" sanitary clamp, manual, certificate	1	4	5.1	4	0.4 (4/58)
96IEXS42D2HSS	Sartobind® S 400 mL, 4 mm, 1½" sanitary clamp, manual, certificate	1	4	10.2	8	0.4 (4/58)
96IEXS42D3KSS	Sartobind® S 600 mL, 4 mm, 1½" sanitary clamp, manual, certificate	1	4	15.4	12	0.4 (4/58)
96IEXS42EUC11--A	Sartobind® S nano 3 mL, 8 mm, Luer female connectors, 2 PEEK adapters Luer male to UNF 10-32 female, manual, certificate	4	8	0.077	0.015	0.4 (4/58)
96IEXS42E4J11-A	Sartobind® S mini 20 mL, 8 mm, Luer female connectors, 8 PEEK adapters Luer male to UNF 10-32 female, manual, certificate	4	8	0.5	0.1	0.4 (4/58)
96IEXS42E4JFF-A	Sartobind® S mini 20 mL, 8 mm, ¾" sanitary clamp, manual, certificate	4	8	0.5	0.1	0.4 (4/58)
96IEXS42E4JOO-A	Sartobind® S mini 20 mL, 8 mm, hose barb connectors, manual, certificate	4	8	0.5	0.1	0.4 (4/58)
96IEXS42E9BFF	Sartobind® S 150 mL, 8 mm, ¾" sanitary clamp, manual, certificate	1	8	3.9	0.75	0.4 (4/58)
96IEXS42E1HSS	Sartobind® S 400 mL, 8 mm, 1½" sanitary clamp, manual, certificate	1	8	10.2	2	0.4 (4/58)
96IEXS42E2LSS	Sartobind® S 800 mL, 8 mm, 1½" sanitary clamp, manual, certificate	1	8	20	4	0.4 (4/58)
96IEXS42E3FSS	Sartobind® S 1.2 L, 8 mm, 1½" sanitary clamp, manual, certificate	1	8	31	6	0.4 (4/58)
96IEXS42E3ESS	Sartobind® S Jumbo 5 L, 8 mm, 1½" sanitary clamp, manual, certificate	1	8	127	25	0.3 (3/43.5)
98IEXS42D-L	Sartobind® S Cassette 0.8 L, 4 mm, 1½" sanitary clamp via manifold set (accessory), manual, certificate	1	4	20.3	16	0.2 (2/29)
98IEXS42E-P	Sartobind® S Cassette 1.6 L, 8 mm, 1½" sanitary clamp via manifold set (accessory), manual, certificate	1	8	40.6	8	0.2 (2/29)

## Related Products

### Sartobind® Q

Order number	Description	Quantity
99IEXQ42GC---V	Sartobind® Q 96-well plate	2
99IEXQ42GC---D	Sartobind® Q 96-well plate	10
92IEXQ42DD-11-D	Sartobind® Q pico 0.08 mL	10
92MU0142DD-11	Sartobind® Selection Kit pico 0.08 mL, Q, S and STIC PA	each 1










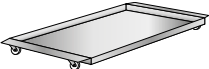
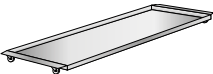
### Sartobind® S

Order number	Description	Quantity
99IEXS42GC---V	Sartobind® S 96-well plate	2
99IEXS42GC---D	Sartobind® S 96-well plate	10
92IEXS42DD-11-D	Sartobind® S pico 0.08 mL	10
92MU0142DD-11	Sartobind® Selection Kit pico 0.08 mL, Q, S and STIC PA	each 1

Sartobind® 96-well plate. Data sheet: Order No.: 85032-543-28, Sartobind® pico 0.08 mL. Data sheet: order no.: 85032-541-71



# Accessories


Order number		Description	Quantity
1ZA---0004		Adapter Luer male to UNF 10-32 female, PEEK	1
1ZAOGV0003		Adapter UNF 10-32 female to sanitary 3/4", 25 mm, polyoxymethylene	2
5ZALB-0002		Distribution adapter for 3 x 200 to 1,200 mL (10 - 30") capsules, 1 x 2", 3 x 1 1/2", sanitary, stainless steel	1
7ZAL-V0013		Reducing adapter 1 1/2" (50.5 mm) to 3/4" (25 mm), sanitary	1
7ZAL-V0010		Reducing adapter 2" (64 mm) to 1 1/2" (50.5 mm), sanitary	1
9ZGL-0102		Trolley for Jumbo 2.5 or 5 L, stainless steel	1
26787---FT---P		Sartocheck® 5 Plus Filter Integrity Tester	1
29Z-S00001		Manifold set, 1 1/2" sanitary clamp, inlet and outlet adapter plate	2
29Z-S00003		Gamma irradiated manifold set, 1 1/2" sanitary clamp, inlet and outlet adapter plate, ≥ 25 kGy, max. 50 kGy	2
2ZGL--0005		Pilot Filter Holder for Sartoclear®   Sartobind®	1
2ZGL--0006		Process Filter Holder for Sartoclear®   Sartobind®	1
2ZGL--0007		Double Process Filter for Sartoclear®   Sartobind®	1
2ZGL--0008		Drip pan for Pilot Filter Holder	1
2ZGL--0015		Drip pan for Process and double Process Filter Holder	1

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