

Data sheet

SepFast™ Purifier Q (400, 500, 600)
SepFast™ Purifier DEAE (400, 500, 600)
SepFast™ Purifier S (400, 500, 600)
SepFast™ Purifier CM (400, 500, 600)

1. Introduction

SepFast Purifier Q, SepFast Purifier DEAE, SepFast Purifier S and SepFast Purifier CM are, respectively, strong anion, weak anion, strong cation and weak cation exchange adsorbents. They are specially designed for large-scale purification of biological molecules in which impure components are chromatographically separated from target molecules.

SepFast Purifier media has a balanced design between loading capacity and separation power of individual components for large-scale biomanufacturing applications. The core advantages are:

- High sample loading capacity at high flow
- High separation power at high flow
- High productivity

The base matrix is made of a composite of polysaccharides that have been highly cross-linked. The media is very stable to most of the chemical conditions experienced in the bioprocessing industry.

For each type of ion exchange medium, there is a choice of three different base matrices according to pore accessibility of target molecules. The feature and selection guide is listed as follows:

400 serial	500 serial	600 serial
SepFast Purifier Q-400	SepFast Purifier Q-500	SepFast Purifier Q-600
SepFast Purifier DEAE-400	SepFast Purifier DEAE-500	SepFast Purifier DEAE-600
SepFast Purifier S-400	SepFast Purifier S-500	SepFast Purifier S-600
SepFast Purifier CM-400	SepFast Purifier CM-500	SepFast Purifier CM-600
The above media is designed to purify smaller components (e.g. M.W. <100K Dalton).	The above media is designed to purify antibodies from aggregates and other impurities.	The above media is designed to purify large proteins, plasmids or viral particles.

2. Applications

SepFast Purifier media is particularly useful, due to its high loading capacity with no loss of separation power, in a process that requires to purify molecules at reduced operational cost and reduced footprint.

Characteristics of SepFast Purifier media:

	Purifier Q-400	Purifier DEAE-400	Purifier S-400	Purifier CM-400
	Purifier Q-500	Purifier DEAE-500	Purifier S-500	Purifier CM-500
	Purifier Q-600	Purifier DEAE-600	Purifier S-600	Purifier CM-600
Matrix	Highly cross-linked polysaccharide composites			
Functional group	Quaternary ammonium strong anion	Diethylaminoethyl weak anion	Sulfo strong cation	Carboxymethyl weak cation
Total ionic capacity	0.11-0.19 mmol/ml	0.11-0.21 mmol/ml	0.09-0.18 mmol/ml	0.09-0.18 mmol/ml
Particle size	50 - 150 μ m			
Dynamic binding capacity*	>150 mg/ml BSA for Purifier Q-400	>150 mg/ml BSA for Purifier DEAE-400	>60 mg/ml hIgG for Purifier S-500	>120 mg/ml lysozyme for Purifier CM-400
Pressure-flow property**	>1000 cm/h for Q-400, DEAE-400, S-400 and CM-400; >500 cm/h for Q-500, DEAE-500, S-500 and CM-500; >300 cm/h for Q-600, DEAE-600, S-600 and CM-600			
Operational pressure	Up to 3 bar			
pH stability	2-14 (short term) and 3-12 (long term)			
Working temperature	+4°C to +30°C			
Chemical stability	All commonly used buffers; 1 M acetic acid, 1 M NaOH, 6M guanidine hydrochloride, 8 M urea, 30% isopropanol, 70% ethanol			
Avoid	Oxidizing agents, anionic detergents		Oxidizing agents, cationic detergents	
Storage	20% ethanol	20% ethanol	20% ethanol + 0.2 M sodium acetate	20% ethanol

*Measured at a breakthrough of 10%.

**Measured in a 32 mm ID column at a bed height of 20 cm.

3. Method optimization

We recommend scouting the parameters among loading capacity, flow velocity, binding pH, binding ionic strength, elution speed and gradient etc. Due to the fast pore accessibility of SepFast Purifier media, the binding step could be done in a faster flow velocity than the elution step. We recommend to pay special attention to optimize elution conditions to achieve the best separation power.

Strong ion exchange media maintain their charges (and thus their function) over a wide pH range whereas with weak ion exchange media the degree of dissociation and thus ion exchange capacity varies with pH. Therefore, it is more critical to optimize the pH if weak ion exchange media is used.

In general, balancing the degree of component separation against process throughput is the major consideration when optimizing a method. Besides, for the purification of instable or shearing-force sensitive molecules, the operational condition needs be optimised to balance the throughput and the possible damage to the target molecule.

4. Maintenance

Depending on the individual applications, the media may be used many times. For the re-use purpose, please see the following instructions.

Regeneration

After each run, elute any reversibly bound material either with a high ionic strength solution (e.g. 1M NaCl in buffer) or by increased pH.

Cleaning-in-place (CIP)

CIP is a procedure that removes strongly bound materials such as lipids, endotoxins and denatured proteins that remain in the adsorbent surface after regeneration. Regular CIP prevents the build up of contaminants in the packed bed and helps to maintain the column performance.

A specific CIP protocol should be developed for each process according to the type of contaminants present. The frequency of CIP depends on the nature of individual applications.

The following information works as a general guidance.

Salt with concentration up to 2 M can be used to clean the impurities bound by ionic interactions. The contaminants bound by hydrophobic nature can be removed by the following reagents: 1 M NaOH, low percentage non-ionic detergents (e.g. 0.1 – 2%), 30% isopropanol in basic or acidic conditions (e.g. in the presence of acetic acid or phosphoric acid). A combination of the above reagents can be explored as well. In general, the incubation time should be longer (e.g. from 30 minutes to 2 hours) to ensure full dissociation of the contaminants.

Sanitization

Sanitization using 0.5-1.0 M NaOH with a contact time of 1 hour is recommended.

5. Storage

The media should be stored in 20% ethanol (containing 0.2 M NaAC for strong cation exchange media) or 0.02% sodium azide to prevent microbial growth. Store the media at a temperature of +4°C to +30°C. Before use, equilibrate the media with at least 5 bed volume of running buffer.

6. Ordering information

Product	Quantity	Code no.
SepFast Purifier Q-400	25 ml	460101
	100 ml	460102
	1 litre	460103
Disposable SepFast Purifier Q-400 column	5 x 1 ml	460104
	1 x 5 ml	460105
	1 x 10 ml	460106
	1 x 20 ml	460107
SepFast Purifier Q-500	25 ml	460201
	100 ml	460202
	1 litre	460203
Disposable SepFast Purifier Q-500 column	5 x 1 ml	460204
	1 x 5 ml	460205
	1 x 10 ml	460206
	1 x 20 ml	460207
SepFast Purifier Q-600	25 ml	460301
	100 ml	460302
	1 litre	460303
Disposable SepFast Purifier Q-600 column	5 x 1 ml	460304
	1 x 5 ml	460305

	1 x 10 ml	460306
	1 x 20 ml	460307
SepFast Purifier DEAE-400	25 ml	460401
	100 ml	460402
	1 litre	460403
Disposable SepFast Purifier DEAE-400 column	5 x 1 ml	460404
	1 x 5 ml	460405
	1 x 10 ml	460406
	1 x 20 ml	460407
SepFast Purifier DEAE-500	25 ml	460501
	100 ml	460502
	1 litre	460503
Disposable SepFast Purifier DEAE-500 column	5 x 1 ml	460504
	1 x 5 ml	460505
	1 x 10 ml	460506
	1 x 20 ml	460507
SepFast Purifier DEAE-600	25 ml	460601
	100 ml	460602
	1 litre	460603
Disposable SepFast Purifier DEAE-600 column	5 x 1 ml	460604
	1 x 5 ml	460605
	1 x 10 ml	460606
	1 x 20 ml	460607
SepFast Purifier S-400	25 ml	460701
	100 ml	460702
	1 litre	460703
Disposable SepFast Purifier S-400 column	5 x 1 ml	460704
	1 x 5 ml	460705
	1 x 10 ml	460706
	1 x 20 ml	460707
SepFast Purifier S-500	25 ml	460801
	100 ml	460802
	1 litre	460803
Disposable SepFast Purifier S-500 column	5 x 1 ml	460804
	1 x 5 ml	460805
	1 x 10 ml	460806
	1 x 20 ml	460807
SepFast Purifier S-600	25 ml	460901
	100 ml	460902
	1 litre	460903
Disposable SepFast Purifier S-600 column	5 x 1 ml	460904
	1 x 5 ml	460905
	1 x 10 ml	460906
	1 x 20 ml	460907

SepFast Purifier CM-400	25 ml	461001
	100 ml	461002
	1 litre	461003
Disposable SepFast Purifier CM-400 column	5 x 1 ml	461004
	1 x 5 ml	461005
	1 x 10 ml	461006
	1 x 20 ml	461007
SepFast Purifier CM-500	25 ml	461101
	100 ml	461102
	1 litre	461103
Disposable SepFast Purifier CM-500 column	5 x 1 ml	461104
	1 x 5 ml	461105
	1 x 10 ml	461106
	1 x 20 ml	461107
SepFast Purifier CM-600	25 ml	461201
	100 ml	461202
	1 litre	461203
Disposable SepFast Purifier CM-600 column	5 x 1 ml	461204
	1 x 5 ml	461205
	1 x 10 ml	461206
	1 x 20 ml	461207



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