

Data sheet

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

1. Introduction

SepFast Capture Q, SepFast Capture DEAE, SepFast Capture S and SepFast Capture CM are, respectively, strong anion, weak anion, strong cation and weak cation exchange adsorbents. They are specially designed for cost-effective large-scale capturing of biological molecules in the initial downstream recovery step.

SepFast Capture media has a balanced design between mechanical strength and mass transfer property of individual particles. The core advantages to large-scale biomanufacturings are:

- Very high dynamic binding capacity at high flow
- High productivity
- Reduced cost

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 Capture Q-400	SepFast Capture Q-500	SepFast Capture Q-600
SepFast Capture DEAE-400	SepFast Capture DEAE-500	SepFast Capture DEAE-600
SepFast Capture S-400	SepFast Capture S-500	SepFast Capture S-600
SepFast Capture CM-400	SepFast Capture CM-500	SepFast Capture CM-600
The above media is designed to capture smaller proteins or peptides (e.g. M.W. <100K Dalton).	The above media is designed to capture antibodies or other molecules of similar size.	The above media is designed to capture large proteins, plasmids or viral particles.

2. Applications

SepFast Capture media is particularly useful, due to its very high dynamic binding capacity, in a process that requires to concentrate a large volume of feedstock at limited time frame.

Due to the low resin cost and high binding capacity, it could become affordable for SepFast Capture Q-600, SepFast Capture DEAE-600, SepFast Capture S-600 and SepFast Capture CM-600 being single used in a process purifying plasmids or viral materials, without the concern of batch-to-batch cleaning validations.

Characteristics of SepFast Capture media:

	Capture Q-400	Capture DEAE-400	Capture S-400	Capture CM-400
	Capture Q-500	Capture DEAE-500	Capture S-500	Capture CM-500
	Capture Q-600	Capture DEAE-600	Capture S-600	Capture 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 at 1 min residence time for Capture Q-400	>150 mg/ml BSA at 1 min residence time for Capture DEAE-400	>100 mg/ml hlgG at 1 min residence time for Capture S-500	>150 mg/ml lysozyme at 1 min residence time for Capture 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 for optimal binding pH and for optimal ionic strength. Due to the fast pore accessibility of SepFast Capture media, the binding step could be done in a faster flow velocity. We recommend to pay special attention to optimize elution conditions to avoid un-necessary tailing.

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 product recovery against process throughput is the major consideration when optimizing a method. However, for the purification of shearing-force sensitive molecules, the operational flow velocity need 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 or single used. 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 Capture Q-400	25 ml	450101
	100 ml	450102
	1 litre	450103
Disposable SepFast Capture Q-400 column	5 x 1 ml	450104
	1 x 5 ml	450105
	1 x 10 ml	450106
	1 x 20 ml	450107
SepFast Capture Q-500	25 ml	450201
	100 ml	450202
	1 litre	450203
Disposable SepFast Capture Q-500 column	5 x 1 ml	450204
	1 x 5 ml	450205
	1 x 10 ml	450206
	1 x 20 ml	450207
SepFast Capture Q-600	25 ml	450301
	100 ml	450302
	1 litre	450303
Disposable SepFast Capture Q-600 column	5 x 1 ml	450304
	1 x 5 ml	450305

	1 x 10 ml	450306
	1 x 20 ml	450307
SepFast Capture DEAE-400	25 ml	450401
	100 ml	450402
	1 litre	450403
Disposable SepFast Capture DEAE-400 column	5 x 1 ml	450404
	1 x 5 ml	450405
	1 x 10 ml	450406
	1 x 20 ml	450407
SepFast Capture DEAE-500	25 ml	450501
	100 ml	450502
	1 litre	450503
Disposable SepFast Capture DEAE-500 column	5 x 1 ml	450504
	1 x 5 ml	450505
	1 x 10 ml	450506
	1 x 20 ml	450507
SepFast Capture DEAE-600	25 ml	450601
	100 ml	450602
	1 litre	450603
Disposable SepFast Capture DEAE-600 column	5 x 1 ml	450604
	1 x 5 ml	450605
	1 x 10 ml	450606
	1 x 20 ml	450607
SepFast Capture S-400	25 ml	450701
	100 ml	450702
	1 litre	450703
Disposable SepFast Capture S-400 column	5 x 1 ml	450704
	1 x 5 ml	450705
	1 x 10 ml	450706
	1 x 20 ml	450707
SepFast Capture S-500	25 ml	450801
	100 ml	450802
	1 litre	450803
Disposable SepFast Capture S-500 column	5 x 1 ml	450804
	1 x 5 ml	450805
	1 x 10 ml	450806
	1 x 20 ml	450807
SepFast Capture S-600	25 ml	450901
	100 ml	450902
	1 litre	450903
Disposable SepFast Capture S-600 column	5 x 1 ml	450904
	1 x 5 ml	450905
	1 x 10 ml	450906
	1 x 20 ml	450907

SepFast Capture CM-400	25 ml	451001
	100 ml	451002
	1 litre	451003
Disposable SepFast Capture CM-400 column	5 x 1 ml	451004
	1 x 5 ml	451005
	1 x 10 ml	451006
	1 x 20 ml	451007
SepFast Capture CM-500	25 ml	451101
	100 ml	451102
	1 litre	451103
Disposable SepFast Capture CM-500 column	5 x 1 ml	451104
	1 x 5 ml	451105
	1 x 10 ml	451106
	1 x 20 ml	451107
SepFast Capture CM-600	25 ml	451201
	100 ml	451202
	1 litre	451203
Disposable SepFast Capture CM-600 column	5 x 1 ml	451204
	1 x 5 ml	451205
	1 x 10 ml	451206
	1 x 20 ml	451207



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