## CaptureSelect™ Protein Affinity Resins

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**WARNING!** Read the Safety Data Sheets (SDSs) and follow the handling instructions. Wear appropriate protective eyewear, clothing, and gloves. Safety Data Sheets (SDSs) are available from **thermofisher.com/support**.

### Product description

CaptureSelect<sup>™</sup> affinity resins can be used for the purification and isolation of proteins and/or antibodies and antibody subtypes from complex sources such as plasma, serum, and cell culture supernatants.

## Storage

Store all resins and columns at 2-8°C. Do not freeze.

## **Product specifications**

Table 1 Available CaptureSelect™ protein affinity resins

CaptureSelect <sup>™</sup> affinity resin and binding specificity	Resin and particle size	Dynamic binding capacity per mL of resin
AAT-XL (human alpha-1 antitrypsin) <sup>[1]</sup>	Epoxide-activated agarose, 65 ± 10 µm	>15 mg
Antithrombin III (human ATIII)	NHS-activated agarose, 90 ± 10 µm	>6 mg
C1-InhXL (human C1 esterase inhibitor)	Epoxide-activated POROS™ resin, 50 ± 10 μm	>4 mg
C5 (human complement component 5)	Epoxide-activated agarose, 65 ± 10 µm	t.b.d.
Ctag-XL (C-terminal E-P- E-A; glutamic acid-proline- glutamic acid-alanine) <sup>[1]</sup>	Epoxide-activated agarose, 65 ± 10 µm	>400 nmol
FibXL (human fibrinogen)	Epoxide-activated POROS™ resin, 50 ± 10 μm	>15 mg
FSH (human follicle stimulating factor) <sup>[1]</sup>	Aldehyde-activated agarose, 65 ± 10 µm	~3 mg
FX (human Factor X) <sup>[1]</sup>	Epoxide-activated agarose, 65 ± 10 μm	>10 mg
GM-CSF (human granulocyte-macrophage colony-stimulating factor)	Epoxide-activated agarose, 65 ± 10 µm	>2 mg
hCG (human chorionic gonadotropin) <sup>[1]</sup>	Aldehyde-activated agarose, 65 ± 10 µm	~4 mg
hGH (human growth hormone)[1]	Aldehyde-activated agarose, 65 ± 10 µm	~3 mg
HSA (human serum albumin) <sup>[1]</sup>	Aldehyde-activated agarose, 65 ± 10 µm	~15 mg
MultiSpecies Albumin Depletion (MSA)	Aldehyde-activated agarose, 35 ± 10 µm	t.b.d.
Prothrombin (human F7)	Epoxide-activated agarose, 65 ± 10 µm	>5 mg
tPA (human tissue plasminogen activator) <sup>[1]</sup>	Aldehyde-activated agarose, 65 ± 10 µm	>8 mg

CaptureSelect <sup>™</sup> affinity resin and binding specificity	Resin and particle size	Dynamic binding capacity per mL of resin
Transferrin (human TF)	Aldehyde-activated agarose, 35 ± 10 µm	>8 mg
TSH (human thyroid- stimulating hormone) <sup>[1]</sup>	Epoxide-activated agarose, 65 ± 10 µm	>5 mg

<sup>[1]</sup> Available in volumes suitable for cGMP, see Table 5.

Table 2 Pre-packed CaptureSelect™ C-tagXL column specifications

Specification	Description
Column volume	1 mL and 5 mL
Column dimension	• 7 × 25 mm (1 mL)
	• 14 × 32.5 mm (5 mL)
Operating pressure	<2 bar (0.2 MPa)
Maximum pressure	3 bar (0.3 MPa)
Flow rates	0.5–1.0 mL/minute (1-mL column)
	<ul> <li>2.5–5.0 mL/minute (5-mL column)</li> </ul>
	<b>Note:</b> Lower flow rates, especially during sample loading, can increase the dynamic binding capacity of the columns due to prolonged contact time of the sample with the affinity resin.
Storage solution	20% (v/v) ethanol

Note: Pre-packed CaptureSelect  $^{\text{\tiny TM}}$  columns are not appropriate for process development.

## Conditions for use

Agarose based resins have flow rates of 50-200 cm/hour and a pressure limit of 2 bar. POROS<sup>™</sup> based resins are suited for high flow rates and have a pressure limit of 100 bar (1,450 psi, 10 MPa).

Table 3 CaptureSelect™ affinity resin conditions

CaptureSelect™ affinity resin	Equilibration/wash buffer	Elution buffer
AAT-XL (human alpha-1 antitrypsin )	50 mM Tris, 150 mM NaCl (pH 7)	20 mM Tris, 2.0 M MgCl <sub>2</sub> (pH 6.0)
ATIII (human)	20 mM Tris or PBS (pH 7.0–7.5)	20 mM Tris, 2.0 M MgCl <sub>2</sub> (pH 7.0)
C1-InhXL (human C1 esterase inhibitor)	20 mM Tris or PBS (pH 7.0–7.5)	50 mM sodium acetate, 1.0 M MgCl <sub>2</sub> (pH 5.0)
C5 (human complement component 5)	PBS or 50 mM Tris, 150 mM NaCl (pH 7)	100 mM Glycine (pH 3.0)
Ctag-XL (C-terminal E-P-E-A; glutamic acid-proline-glutamic acid-alanine)	Physiological conditions: 20 mM Tris or PBS (pH 7.0–7.4) Denaturing conditions: 50 mM Tris, up to 8 M Urea (pH 7.0–7.4) – 50 mM Tris, up to 1 M guanidine (pH 7.0–7.4)	Neutral pH: 20 mM Tris, 2.0 M MgCl <sub>2</sub> (pH 7), 20 mM Tris, 1.0 M NaCl, 50% (v/v) propylene glycol, 20 mM Tris, 2 mM S- E-P-E-A. Acidic pH: 20 mM citric acid or acetic acid (pH 3–4), or 0.1 M glycine (pH 3.0)



CaptureSelect <sup>™</sup> affinity resin	Equilibration/wash buffer	Elution buffer
FibXL (human fibrinogen)	20 mM Tris (when MgCl <sub>2</sub> is used for elution) or PBS (pH 7.0-7.5)	Neutral pH: 20mM Tris 1.0 MgCl <sub>2</sub> + 40% (v/v) propylene glycol Acidic pH: 50 mM citric or acetic acid pH 3.0, 0.1 M glycine (pH 3.0)
FSH (human follicle stimulating factor)	20 mM Tris or PBS (pH 7.0–7.5)	Neutral pH: 20 mM Tris with 2 M MgCl <sub>2</sub> (pH 7.0–7.5) Acidic pH: 0.1 M glycine (pH 3.0)
FX (human Factor X)	50 mM Tris, 150 mM NaCl, 5 mM CaCl <sub>2</sub> (pH 7)	50 mM Tris, 150 mM NaCl, 5 mM EDTA (pH 7)
GM-CSF (human granulocyte- macrophage colony- stimulating factor)	20 mM Tris or PBS (pH 7.0–7.5)	50 mM citric or acetic acid (pH 3.0), 0.1 M glycine (pH 3.0)
hCG (human chorionic gonadotropin)	20 mM Tris or PBS (pH 7.0–7.5)	50 mM citric or acetic acid (pH 3.0), 0.1 M glycine (pH 3.0)
hGH (human growth hormone)	20 mM Tris or PBS (pH 7.0–7.5)	50 mM citric acid (pH 3.0)
HSA (human serum albumin)	20 mM Tris or PBS (pH 7.0–7.5)	Neutral pH: 20 mM Tris (pH 7.4), with 2 M MgCl <sub>2</sub> or with 1 M NaCl + 50%(v/v) propylene glycol or with 1 M NaCl + 0.5 M L-arginine   Acidic pH: 0.1 M glycine (pH 3.0)
MSA (Albumin Depletion)	20 mM Tris or PBS (pH 7.0–7.5)	
Prothrombin (human F7)	50 mM Tris, 150 mM NaCl, 5 mM CaCl <sub>2</sub> (pH 7)	50 mM Tris, 150 mM NaCl, 5 mM EDTA (pH 7)
tPA (human tissue plasminogen activator)	20 mM Tris or PBS, 0.15 M NaCl (pH 6–8)	Neutral pH: 20 mM Tris, 2.0 M MgCl <sub>2</sub> , 0.2 M arginine (pH 7.0) Acidic pH: 0.1 M glycine (pH 3.0)
Transferrin (human TF)	20 mM Tris or PBS (pH 7.0–7.5)	Neutral pH: 20mM Tris (pH 7.0), 2.0 M MgCl <sub>2</sub> , 20mM Tris (pH 7.0), 1.0 M NaCl, 50% (v/v) propylene glycol Acidic pH: 20mM Citric acid (pH 3.0)
TSH (human thyroid- stimulating hormone)	20 mM Tris or PBS, 0.15 M NaCl (pH 6–8)	20 mM Citric acid (pH 3.0), 0.1 M Glycine (pH 3)

## Instructions for use

- 1. Pack the column.
- Equilibrate with 5–10 column volumes (CV) of the equilibration/wash buffer recommended in "Conditions for use" on page 1.
- 3. Prepare and load the sample.
  - The sample loading volume depends on the concentration of the target molecule and the dynamic binding capacity of the resin. See "Storage" on page 1.
  - Dissolve, dilute, or exchange samples into the equilibration buffer. This is particularly important for large samples (greater than 25% of the column volume).
  - Centrifuge and filter samples (0.22 µm or 0.45 µm) before injection.

- Wash with 5 to 10 CV of the equilibration/wash buffer recommended in "Conditions for use" on page 1, or until you see a stable baseline.
- Elute with 5–10 CV of the elution buffer recommended in "Conditions for use" on page 1, or until you see a stable baseline.
- Re-equilibrate with 5–10 CV of the equilibration/wash buffer recommended in "Conditions for use" on page 1, or until you see a stable baseline.
- Re-equilibrate in equilibration/wash buffer.
   If the column will not be used immediately, store the resin in 20% ethanol at 4°C (39°F), stable for up to 1 year.

# Example application with CaptureSelect™ AAT-XL affinity resin

In this example, AAT was purified in 24 purification runs, loading 1 L feed/run on the same 89 mL column with partially purified human plasma containing ~1 g AAT/ L. This resulted in high and consistent yield and purity over all 24 runs. The following conditions were used:

- Column 88.6 mL (CV) (5 x 4.5 cm) CaptureSelect<sup>™</sup> AAT-XL Affinity Matrix
- Equilibration—TBS, pH 7
- Load Partial purified human plasma 1 g/L AAT, pH 7.2 50 mS/cm loaded to 15.6 g AAT/L resin
- Wash—20 mM Tris, 0.4 M MgCl<sub>2</sub>, pH 7.2
- Elution buffer 20 mM Tris, 2 M MgCl<sub>2</sub>, pH 6.0
- Strip-0.1 M Glycine, pH 2.0

Go to www.thermofisher.com/captureselect for additional examples.

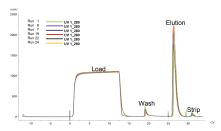


Fig. 1 Overlay of six chromatograms of the purification runs

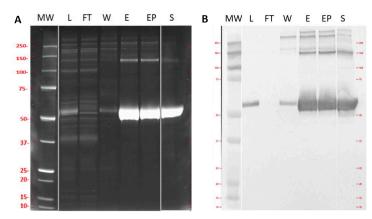


Fig. 2 Analysis of the load, flowthrough, and elution fractions of the AAT purification. 3A: SDS PAGE (Coomassie Fluor Orange stained) 3B: Western Blot (developed with AAT specific primary antibody (ThermoFisher #MA1-10626) and secondary antibody donkey anti-mouse Ig H+L (Jackson Immunoresearch, 715-055-150).

- 1 Lane 1: MW marker (MW)
- 2 Lane 2: Load (L)
- 3 Lane 3: Flow through (FT)
- 4 Lane 4: Wash (W)
- 5 Lane 5: Elution pool (E) cycle 7-14

## Ordering information

## Table 4 CaptureSelect™ affinity resins

AAT-XL (human Alpha-1 Antitrypsin)  AAT-XL (human Alpha-1 Antitrypsin)  Antithrombin III (human ATIII)  Antithrombin III (human ATIII)  Antithrombin III (human ATIII)  S mL 190317010  10 mL 190317010  50 mL 190317010  50 mL 190317050  To mL 2803402050  10 mL 2803402050  10 mL 2803402050  10 mL 2803402050  10 mL 2943692010  50 mL 2943692050  10 mL 2943692050  To mL 2943072050  10 mL 2943072050  FibXL (human fibrinogen)  FibXL (human fibrinogen)  FSH (human follicle stimulating factor)  FSH (human follicle stimulating factor)  FSH (human serum albumin)  GM-CSF (human granulocyte-macrophage colonystimulating factor)  FSH (human serum albumin)  FSH (human chorionic gonadotropin)  ACG (human chorionic gonadotropin)  ACG (human growth hormone)  ACG (human growth hormone)  ACG (human growth hormone)  ACG (human growth hormone)  ACG (human serum albumin)  ACG (human growth hormone)  ACG (human	CaptureSelect <sup>™</sup> affinity resin and binding specificity	Amount	Cat. No.
S0 mL   2943832050     Antithrombin III (human ATIII)   5 mL   190317010     50 mL   190317010     50 mL   2803402005     10 mL   2803402005     10 mL   2803402010     50 mL   2803402050     10 mL   2943692010     50 mL   2943072005     50 mL   2943072010     50 mL   294318005     10 mL   194318005     10 mL   2943472010     50 mL   2943472010     50 mL   2943472010     50 mL   2943472050     10 mL   2943472050     10 mL   2943472050     10 mL   194318005     10 mL   191297005     10 mL   194318005     10 mL   194341005     50 mL   194341000     50 mL   194345200     10 mL   1943600     10 mL   1943600     10 mL   1943600     10 mL   194360     10 mL   1943	AAT-XL (human Alpha-1 Antitrypsin)	5 mL	2943832005
Antithrombin III (human ATIII)    S mL		10 mL	2943832010
10 mL		50 mL	2943832050
C1-InhXL (human C1 esterase inhibitor)	Antithrombin III (human ATIII)	5 mL	190317005
C1-InhXL (human C1 esterase inhibitor)  C5 (human complement 5)  C5 (human complement 5)  C5 (human complement 5)  C-tagXL (C-terminal E-P-E-A; glutamic acid-proline-glutamic acid-alanine)  FibXL (human fibrinogen)  FibXL (human fibrinogen)  FSH (human follicle stimulating factor)  FSH (human follicle stimulating factor)  GM-CSF (human granulocyte-macrophage colonystimulating factor)  FSA (human serum albumin)  FSA (human chorionic gonadotropin)  hCG (human chorionic gonadotropin)  FG mL 194318005  10 mL 2802912050  5 mL 194318005  10 mL 194318005  10 mL 2943472010  50 mL 2943472010  50 mL 194318050  10 mL 191297005  10 mL 191297005  10 mL 191297010  50 mL 191297010  50 mL 194341005  10 mL 194341005  10 mL 194341005  10 mL 1943160050  10 mL 1943160050  10 mL 1943360010  50 mL 1943360010  50 mL 1943452050  10 mL 1943452050  10 mL 1943452050  10 mL 1943452050  10 mL 2943430050  10 mL 2943430050  Transferrin (human TF)  F mL 1943065005  TSH (human thyroid-stimulating hormone)  5 mL 294362005  10 mL 191306650  5 mL 191306650  TSH (human thyroid-stimulating hormone)  5 mL 2943562010		10 mL	190317010
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C5 (human complement 5)    5 mL   2943692005     10 mL   2943692050     10 mL   2943692050     5 mL   2943692050     10 mL   2943072005     10 mL   2943072005     10 mL   2943072050     10 mL   2943072050     10 mL   2802912005     10 mL   2802912005     10 mL   2802912010     50 mL   2802912010     50 mL   2802912050     10 mL   194318005     10 mL   194318005     10 mL   194318050     10 mL   2943472010     50 mL   194318050     10 mL   2943472010     50 mL   194318050     10 mL   194312005     10 mL   191297005     10 mL   191297010     50 mL   191297010     50 mL   191297010     50 mL   191297050     10 mL   194341005     10 mL   194341005     10 mL   194341005     10 mL   1943160010     50 mL   1943160010     50 mL   1943160050     10 mL   1943160050     10 mL   1943452010     50 mL   19108530     10 mL   1943452010     50 mL   1943452010     50 mL   1943452050     10 mL   1943452010     50 mL   1943452050     10 mL   19434		10 mL	2803402010
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C-tagXL (C-terminal E-P-E-A; glutamic acid-proline-glutamic acid-alanine)	C5 (human complement 5)	5 mL	2943692005
C-tagXL (C-terminal E-P-E-A; glutamic acid-proline-glutamic acid-alanine)         5 mL         2943072005           FibXL (human fibrinogen)         5 mL         2802912005           FibXL (human fibrinogen)         5 mL         2802912005           10 mL         2802912010         50 mL         2802912050           FSH (human follicle stimulating factor)         5 mL         194318005         10 mL         194318050           GM-CSF (human granulocyte-macrophage colony-stimulating factor)         5 mL         2943472005         10 mL         2943472005           HSA (human serum albumin)         5 mL         191297005         10 mL         191297010           MCG (human chorionic gonadotropin)         5 mL         194341005         10 mL         194341005           MGH (human growth hormone)         5 mL         194341005         10 mL         1943160005           MultiSpecies Albumin Depletion         5 mL         1943160050         10 mL         1943160050           MultiSpecies Albumin Depletion         5 mL         191085305         10 mL         191085305           Prothrombin (human F7)         5 mL         1943452005         10 mL         1943452005           10 mL         2943430000         5 mL         2943430000         10 mL         2943430000 <t< td=""><td></td><td></td><td>2943692010</td></t<>			2943692010
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FibXL (human fibrinogen)  FibXL (human fibrinogen)  FSH (human follicle stimulating factor)  FSH (human follicle stimulating factor)  FSH (human granulocyte-macrophage colonystimulating factor)  GM-CSF (human granulocyte-macrophage colonystimulating factor)  FSH (human serum albumin)  FS mL 194318050  GM-CSF (human granulocyte-macrophage colonystimulating factor)  FS mL 2943472005  10 mL 2943472010  50 mL 2943472010  50 mL 191297005  10 mL 191297010  50 mL 191297050  AMULTIC (human chorionic gonadotropin)  FML 194341010  50 mL 194341010  50 mL 194341010  50 mL 194341050  10 mL 194341005  10 mL 1943160005  10 mL 1943160005  10 mL 1943160005  10 mL 1943160010  50 mL 191085305  10 mL 191085305  10 mL 1943452005  10 mL 1943452010  50 mL 1943452010  50 mL 1943452010  50 mL 1943452005  10 mL 2943430005  10 mL 2943430050  Transferrin (human TF)  FML 191306005  10 mL 191306005  10 mL 191306005  10 mL 191306005  10 mL 191306050  TSH (human thyroid-stimulating hormone)  FML 29435620010		5 mL	2943072005
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FSH (human follicle stimulating factor)  FSH (human follicle stimulating factor)  FSH (human follicle stimulating factor)  FSH (human granulocyte-macrophage colonystimulating factor)  GM-CSF (human granulocyte-macrophage colonystimulating factor)  FS mL 194318050  10 mL 2943472005  10 mL 2943472010  50 mL 191297005  10 mL 191297010  50 mL 191297010  50 mL 191297050  hCG (human chorionic gonadotropin)  FML 194341005  10 mL 194341005  10 mL 194341005  10 mL 1943160005  10 mL 1943160005  10 mL 191085305  Prothrombin (human F7)  FML 191085305  10 mL 191085350  Frothrombin (human F7)  FML 1943452005  10 mL 1943452005  10 mL 1943452005  10 mL 2943430005  TPA (human tissue plasminogen activator)  FML 191306005  TSH (human thyroid-stimulating hormone)  TSH (human thyroid-stimulating hormone)  FML 2943562010	FibXL (human fibrinogen)		
FSH (human follicle stimulating factor)    5 mL			
10 mL			
S0 mL	FSH (human follicle stimulating factor)		
GM-CSF (human granulocyte-macrophage colonystimulating factor)       5 mL 2943472005         10 mL 2943472050         HSA (human serum albumin)       5 mL 191297005         10 mL 191297010         50 mL 191297050         hCG (human chorionic gonadotropin)       5 mL 194341005         10 mL 194341005         10 mL 194341005         10 mL 194341005         10 mL 1943160005         10 mL 1943160005         10 mL 191085305         10 mL 191085310         50 mL 191085350         Prothrombin (human F7)       5 mL 1943452005         10 mL 1943452010         50 mL 1943452050         10 mL 2943430005         10 mL 2943430050         Transferrin (human TF)       5 mL 191306005         10 mL 191306010         50 mL 191306050         TSH (human thyroid-stimulating hormone)       5 mL 2943562010			
Stimulating factor)			
HSA (human serum albumin)			
HSA (human serum albumin)  5 mL 191297005 10 mL 191297050 50 mL 191297050 50 mL 194341005 10 mL 194341005 10 mL 194341010 50 mL 1943416005 10 mL 1943160005 10 mL 1943160010 50 mL 1943160050 10 mL 191085310 50 mL 191085310 50 mL 191085310 50 mL 191085350 10 mL 1943452005 10 mL 1943452005 10 mL 1943452050 10 mL 2943430050 10 mL 2943430050 10 mL 191306050 10 mL 191306050 10 mL 191306050 10 mL 191306050 10 mL 2943562005 10 mL 2943562005 10 mL 2943562005	Stirridiating factor)		
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## Table 5 $\,$ cGMP suitable volumes of CaptureSelect $^{\scriptscriptstyle{\text{TM}}}$ affinity resins

CaptureSelect <sup>™</sup> affinity resin and binding specificity	Amount	Cat. No.
AAT-XL (human Alpha-1 Antitrypsin)	250 mL	1943832250
	1 L	194383201L
	5 L	194383205L

CaptureSelect <sup>™</sup> affinity resin and binding specificity	Amount	Cat. No.
C-tagXL (C-terminal E-P-E-A; glutamic acid-proline-	250 mL	1943072250
glutamic acid-alanine)	1 L	194307201L
	5 L	194307205L
FSH (human follicle stimulating factor)	250 mL	1943180250
	1 L	19431801L
	5 L	19431805L
FX (human Factor X)	250 mL	1943702250
	1 L	194370201L
	5 L	194370205L
HSA (human serum albumin)	250 mL	1912970250
	1 L	19129701L
	5 L	19129705L
hCG (human chorionic gonadotropin)	250 mL	1943410250
	1 L	19434101L
	5 L	19434105L
hGH (human growth hormone)	250 mL	1943160250
	1 L	194316001L
	5 L	194316005L
tPA (human tissue plasminogen activator)	250 mL	1943430250
	1 L	194343001L
	5 L	194343005L
TSH (human thyroid-stimulating hormone)	250 mL	1943562250
	1 L	194356201L
	5 L	194356205L

Table 6 CaptureSelect™ Pre-packed columns

CaptureSelect <sup>™</sup> Pre-packed columns and binding specificity	Amount	Cat. No.
C-tagXL (C-terminal 4 amino acid tag E-P-E-A / independent of species)	5 × 1 mL prepacked column	494307201
	1 × 5 mL prepacked column	494307205

Table 7 CaptureSelect™ Robocolumn

CaptureSelect <sup>™</sup> Robocolumn and binding specificity	Amount	Cat. No.
C-tagXL (C-terminal 4 amino acid tag E-P-E-A / independent of species)	200 µL (robocolumn)	5943072200
hGH (human growth hormone)	200 μL (robocolumn)	5943160200
AAT-XL (human alpha1-antitrypsin)	200 µL (robocolumn)	5943832200

Table 8 CaptureSelect™ Minichrom

CaptureSelect <sup>™</sup> Minichrom and binding specificity	Amount	Cat. No.
C-tagXL (C-terminal 4 amino acid tag E-P-E-A /independent of species)	1 mL (minichrom)	5943072001
C-tagXL (C-terminal 4 amino acid tag E-P-E-A /independent of species)	5 mL (minichrom)	5943072005

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 Safety Data Sheets (SDSs; also known as MSDSs)
 Note: For SDSs for reagents and chemicals from other manufacturers, contact the manufacturer.

#### For more information

For more information on CaptureSelect<sup>™</sup> and POROS<sup>™</sup> products, go to www.thermofisher.com/captureselect.

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For descriptions of symbols on product labels or product documents, go to thermofisher.com/symbols-definition.

#### Revision history: Pub. No. MAN0017181 C

Revision	Date	Description
С	14 May 2024	Update regulatory statement and C1-InhXL binding capacity.
B.0	31 October 2023	Updates to Product specifications, Conditions for use, Example application, and Ordering information.
A.0	27 June 2017	Replaces 4486257. Added new product information.

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14 May 2024