

# CaptureSelect™ Protein Affinity Resins

Pub. No. MAN0017181 Rev. C



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## Product description

CaptureSelect™ 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™ 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) <sup>[1]</sup>	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™ 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	<ul style="list-style-type: none"> <li>7 × 25 mm (1 mL)</li> <li>14 × 32.5 mm (5 mL)</li> </ul>
Operating pressure	<2 bar (0.2 MPa)
Maximum pressure	3 bar (0.3 MPa)
Flow rates	<ul style="list-style-type: none"> <li>0.5–1.0 mL/minute (1-mL column)</li> <li>2.5–5.0 mL/minute (5-mL column)</li> </ul> <p><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.</p>
Storage solution	20% (v/v) ethanol

**Note:** Pre-packed CaptureSelect™ 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™ 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)	<p><b>Physiological conditions:</b> 20 mM Tris or PBS (pH 7.0–7.4)</p> <p><b>Denaturing conditions:</b> 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)</p>	<p><b>Neutral pH:</b> 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.</p> <p><b>Acidic pH:</b> 20 mM citric acid or acetic acid (pH 3–4), or 0.1 M glycine (pH 3.0)</p>

CaptureSelect™ 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)	<b>Neutral pH:</b> 20mM Tris 1.0 MgCl <sub>2</sub> + 40% (v/v) propylene glycol <b>Acidic pH:</b> 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)	<b>Neutral pH:</b> 20 mM Tris with 2 M MgCl <sub>2</sub> (pH 7.0–7.5) <b>Acidic pH:</b> 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)	<b>Neutral pH:</b> 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   <b>Acidic pH:</b> 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)	<b>Neutral pH:</b> 20 mM Tris, 2.0 M MgCl <sub>2</sub> , 0.2 M arginine (pH 7.0) <b>Acidic pH:</b> 0.1 M glycine (pH 3.0)
Transferrin (human TF)	20 mM Tris or PBS (pH 7.0–7.5)	<b>Neutral pH:</b> 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 <b>Acidic pH:</b> 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

- Pack the column.
- Equilibrate with 5–10 column volumes (CV) of the equilibration/wash buffer recommended in “Conditions for use” on page 1.
- 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™ 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](http://www.thermofisher.com/captureselect) for additional examples.

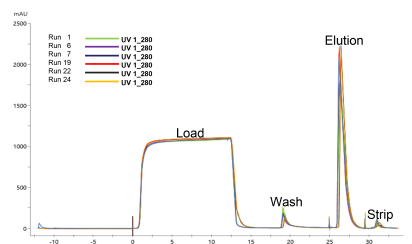


Fig. 1 Overlay of six chromatograms of the purification runs

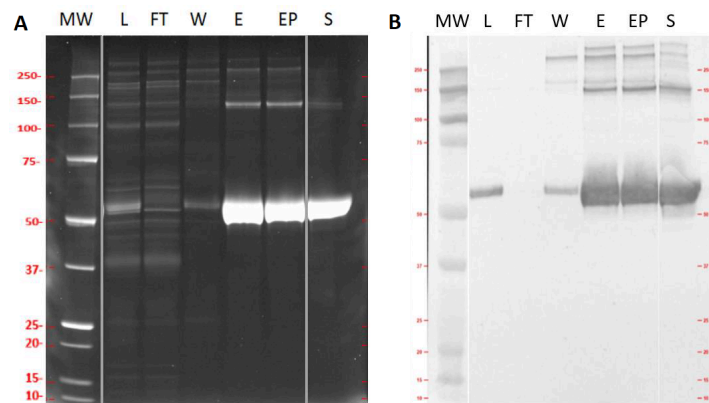


Fig. 2 Analysis of the load, flowthrough, and elution fractions of the AAT purification. 3A: SDS PAGE (Coomassie Fluor Orange stained) 3B: Western Blot (developed with AAT specific primary antibody (ThermoFisher #MA1-10626) and secondary antibody donkey anti-mouse Ig H+L (Jackson Immunoresearch, 715-055-150).

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

⑥ Lane 6: Elution of total pool (EP) cycle 1-24

⑦ AAT standard (S)

## Ordering information

**Table 4 CaptureSelect™ affinity resins**

CaptureSelect™ affinity resin and binding specificity	Amount	Cat. No.
AAT-XL (human Alpha-1 Antitrypsin)	5 mL	2943832005
	10 mL	2943832010
	50 mL	2943832050
Antithrombin III (human ATIII)	5 mL	190317005
	10 mL	190317010
	50 mL	190317050
C1-InhXL (human C1 esterase inhibitor)	5 mL	2803402005
	10 mL	2803402010
	50 mL	2803402050
C5 (human complement 5)	5 mL	2943692005
	10 mL	2943692010
	50 mL	2943692050
C-tagXL (C-terminal E-P-E-A; glutamic acid-proline-glutamic acid-alanine)	5 mL	2943072005
	10 mL	2943072010
	50 mL	2943072050
FibXL (human fibrinogen)	5 mL	2802912005
	10 mL	2802912010
	50 mL	2802912050
FSH (human follicle stimulating factor)	5 mL	194318005
	10 mL	194318010
	50 mL	194318050
GM-CSF (human granulocyte-macrophage colony-stimulating factor)	5 mL	2943472005
	10 mL	2943472010
	50 mL	2943472050
HSA (human serum albumin)	5 mL	191297005
	10 mL	191297010
	50 mL	191297050
hCG (human chorionic gonadotropin)	5 mL	194341005
	10 mL	194341010
	50 mL	194341050
hGH (human growth hormone)	5 mL	1943160005
	10 mL	1943160010
	50 mL	1943160050
MultiSpecies Albumin Depletion	5 mL	191085305
	10 mL	191085310
	50 mL	191085350
Prothrombin (human F7)	5 mL	1943452005
	10 mL	1943452010
	50 mL	1943452050
tPA (human tissue plasminogen activator)	5 mL	2943430005
	10 mL	2943430010
	50 mL	2943430050
Transferrin (human TF)	5 mL	191306005
	10 mL	191306010
	50 mL	191306050
TSH (human thyroid-stimulating hormone)	5 mL	2943562005
	10 mL	2943562010
	50 mL	2943562050

**Table 5 cGMP suitable volumes of CaptureSelect™ affinity resins**

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

CaptureSelect™ affinity resin and binding specificity	Amount	Cat. No.
C-tagXL (C-terminal E-P-E-A; glutamic acid-proline-glutamic acid-alanine)	250 mL	1943072250
	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™ 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™ 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™ 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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  - User guides, manuals, and protocols
  - Certificates of Analysis

- 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™ and POROS™ products, go to [www.thermofisher.com/captureselect](http://www.thermofisher.com/captureselect).

## Limited product warranty

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For descriptions of symbols on product labels or product documents, go to [thermofisher.com/symbols-definition](http://thermofisher.com/symbols-definition).

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

Revision	Date	Description
C	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.

The information in this guide is subject to change without notice.

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