

Protein Workflow Solutions

Protein purification & analysis products for life science research



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FF = Fast Flow; HP = High Performance

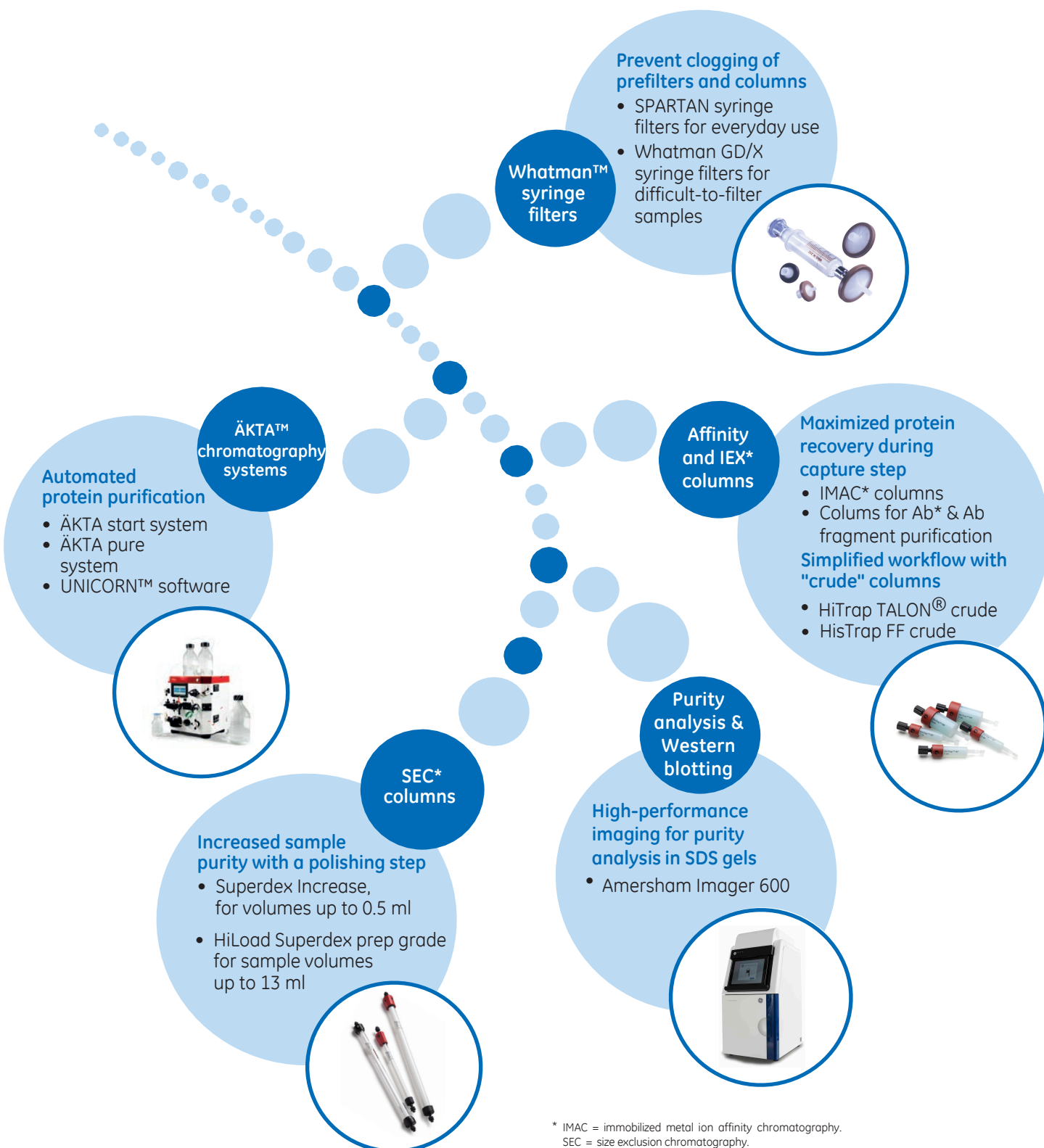
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Looking for more protein purification resources?
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Protein purification workflow solutions.



* IMAC = immobilized metal ion affinity chromatography.
 SEC = size exclusion chromatography.
 IEX = ion-exchange chromatography.
 Ab = antibody.

Whatman filters and accessories for the lab.



SPARTAN syringe filters



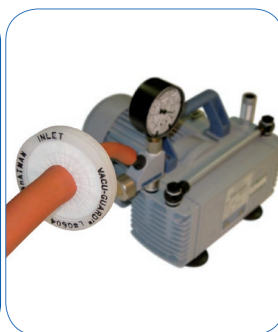
Mini Uni-Prep syringeless filters



Benchkote protection paper



pH papers



Vacu-Guard pump protection filters

Description	Products	Dimension	Cat. No.	Qty/pack
SPARTAN syringe filters <ul style="list-style-type: none"> Versatile: Use for any application requiring a chemically resistant, hydrophilic, low protein-binding membrane 	SPARTAN HPLC - certified syringe filters, Regenerated cellulose (RC)	30 mm, 0.2 µm	97005-230	500
		30 mm, 0.45 µm	97005-234	500
Mini Uni-Prep syringeless filters <ul style="list-style-type: none"> Provides a faster, easier way to remove particulates from samples being prepared for HPLC/UHPLC analysis 	Mini Uni-Prep syringeless filters, PES, Translucent housing	0.2 µm	14224-914	100
		0.45 µm	10147-936	100
Benchkote bench protection papers <ul style="list-style-type: none"> High-quality, smooth, absorbent Whatman paper Quickly absorbs liquid spills and protects the working surface Benchkote Plus is thicker and more absorbent 	Benchkote	460 x 570 mm	52855-001	50
		460 mm x 50 m	52856-004	1 reel
	Benchkote Plus	500 x 600 mm	52854-994	50
		600 mm x 50 m	52857-997	1 reel
Puradisc syringe filters <ul style="list-style-type: none"> Combine quality and economy for filtration of samples up to 100 ml. Pigment-free polypropylene housing Standard inlet and outlet luer connectors 	Puradisc syringe filters, PES	25 mm, 0.2 µm	28137-942	200
		25 mm, 0.45 µm	28137-944	200
	Puradisc syringe filters, PVDF	25 mm, 0.2 µm	89233-770	200
		25 mm, 0.45 µm	70240-170	200
Whatman GD/X syringe filters <ul style="list-style-type: none"> Excellent for difficult to filter samples that are heavily laden with particles. Increased volume throughput: Volume of sample filtered can be three to seven times greater than conventional filters 	Whatman GD/X syringe filters, PES	25 mm, 0.2 µm	28138-166	150
		25 mm, 0.45 µm	28138-168	150
	Whatman GD/X syringe filters, RC	25 mm, 0.2 µm	89233-780	150
		25 mm, 0.45 µm	89233-782	150
pH Indicator Papers <ul style="list-style-type: none"> Range of pH indicator and test papers for the rapid determination of pH values in many applications 	Colour Bonded, 0.0 to 14.0 range, strips	6 x 80 mm	28297-426	100
	Standard Full Range, Reel, 1.0 to 14.0 range	7 mm x 5 m	14217-670	1
	Standard Narrow Range, Reel, 4.0 to 7.0 range	7 mm x 5 m	14217-674	1
Pump protection filters <ul style="list-style-type: none"> Protects vacuum pump systems from aqueous aerosols. Hydrophobic PTFE membranes retain 99.99% or airborne particles > 0.1 µm 	Vacu-Guard	50 mm	28137-858	10

* For more product and pack size information plus additional products, please visit vwr.com.

Desalting and sample concentration.

Vivaspin sample concentrators

Vivaspin sample concentrators offer up to 30-fold concentration of the sample with recovery of the target molecule typically exceeding 95%. The entire process is performed in a single tube with an upper compartment containing sample and a lower compartment separated by a semipermeable membrane with a molecular weight cutoff (MWCO) selected by the user.

- One-step sample concentration in a single tube
- Patented dead-stop technology
- Vertical polyethersulfone membrane



Figure 1. Vivaspin sample concentrators are designed for fast, nondenaturing concentration of biological samples by membrane ultrafiltration.

Volume range	Product	MWCO value					
		3 000 Cat. No.	5 000 Cat. No.	10 000 Cat. No.	30 000 Cat. No.	50 000 Cat. No.	100 000 Cat. No.
100-500 µl	Vivaspin 500	95056-172	95056-174	95056-176	95056-178	95056-180	95056-182
400 µl to 2 ml	Vivaspin 2	95055-988	95055-990	95055-992	95055-994	95055-996	95055-914
2-6 ml	Vivaspin 6	95055-826	95055-828	95055-830	95055-832	95055-834	95055-836
5-20 ml	Vivaspin 20	95056-124	95056-126	95056-128	95056-130	95056-132	95056-134

Desalting and buffer exchange

Prepacked, single-use PD-10 desalting columns and 96-well filter PD plates for buffer exchange and cleanup of biological samples (e.g. proteins and carbohydrates).

- Convenient and rapid cleanup with high reproducibility
- High desalting capacity
- A wide range of applications including desalting, buffer exchange and the removal of low-molecular weight compounds



Figure 2. PD Desalting & buffer exchange products.*

Products	Quantity	Cat. No.
PD-10 Desalting Columns	30 columns	95017-001
PD SpinTrap G-25	50 columns	95055-982
PD MultiTrap G-25	4 × 96-well plates	95056-248
PD MiniTrap G-25	50 columns	95055-984
PD MidiTrap G-25	50 columns	95056-250
MiniSpin Adapter	10	95055-862
MidiSpin Adapter	10	95056-064
PD-10 Spin Adapter	10	95056-066
PD MiniTrap G-10	50 columns	95056-252

Products	Quantity	Cat. No.
HiTrap Desalting columns	5 × 5 ml	95056-006
HiTrap Desalting ¹ columns	100 × 5 ml	97068-014
HiPrep 26/10 Desalting	1 × 53 ml	95055-814
HiPrep 26/10 Desalting	4 × 53 ml	95055-870

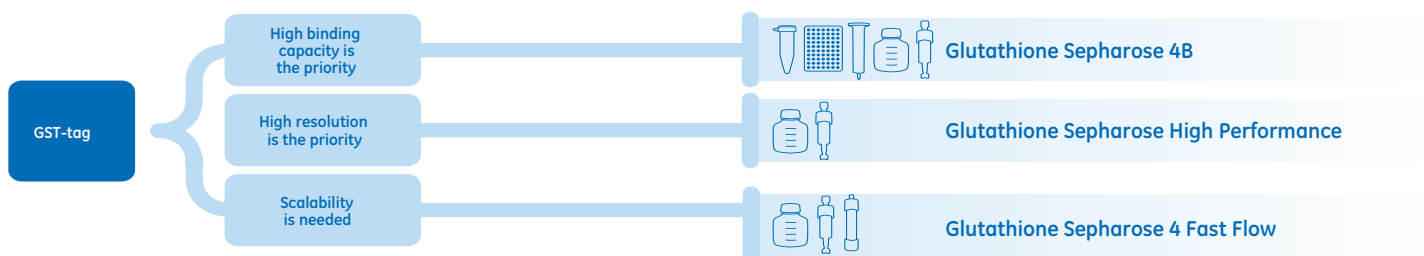
¹ Special pack size, please contact your local VWR Sales representative to order.

Related products	Quantity	Cat. No.
Collection plate 500 µl V-bottom	5 × 96-well plates	95056-282

* For more product and pack size information plus additional products, please visit vwr.com.

GST-tagged protein purification.

Glutathione S-transferase (GST) is a versatile means for expression, purification and detection of tagged proteins. GST-tagged proteins are purified by affinity chromatography utilizing immobilized glutathione, such as Glutathione Sepharose™ High Performance and Glutathione Sepharose 4 Fast Flow. Glutathione Sepharose HP is for high performance and high resolution purification of GST-tagged proteins. Glutathione Sepharose FF is for easy scale-up.



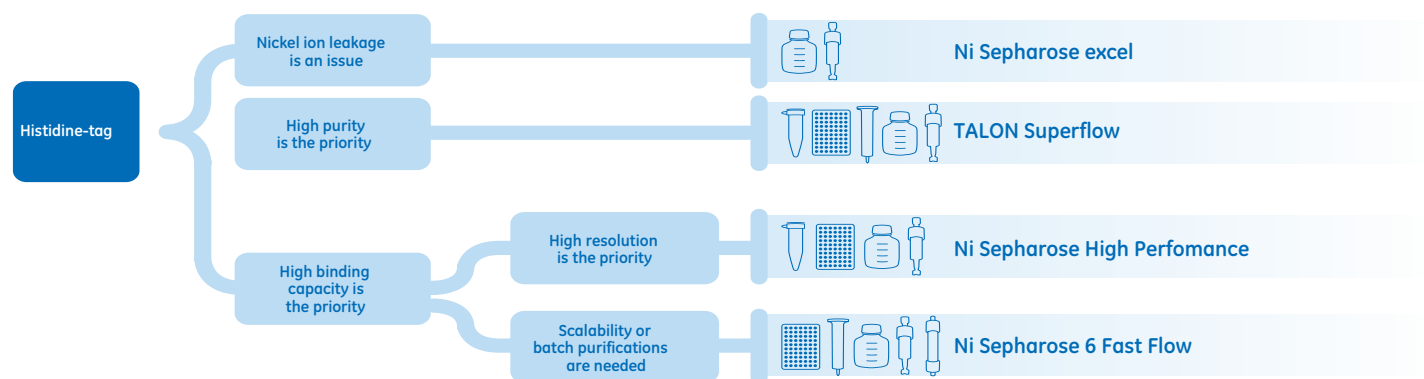
Products	Cat. No.
Glutathione Sepharose High Performance, 25 ml	95056-014
Glutathione Sepharose 4 Fast Flow, 25 ml	95017-172
GSTrap HP, 5 × 1ml	95056-212
GSTrap HP, 1 × 5 ml	95056-018
GSTrap HP, 5 × 5 ml	95056-020

* GSTrap columns are prepacked with Glutathione Sepharose; HP = High performance; FF = Fast flow

Products	Cat. No.
GSTrap FF, 5 × 1 ml	95055-894
GSTrap FF, 1 × 5 ml	95056-094
GSTrap FF, 5 × 5 ml	95056-096
PreScission protease, 500U	95017-584
Thrombin, 500U	95017-586

Histidine-tagged protein purification.

We offer products for fast and convenient histidine-tagged recombinant protein purification using immobilized metal ion affinity chromatography (IMAC). Ni Sepharose media are precharged with nickel ions (Ni²⁺) and TALON® Superflow™ medium is precharged with cobalt ions (Co²⁺). Ni Sepharose excel is designed for capture and purification of his-tagged proteins with minimized Ni-leakage and maximized protein recovery when stripping agents are present in the sample.



Products	Cat. No.
Ni Sepharose High Performance, 25 ml	95055-838
Ni Sepharose 6 Fast Flow, 25 ml	95017-178
Ni Sepharose 6 Fast Flow, 500 ml	95017-182
HisTrap HP, 5 × 1 ml	95055-912
HisTrap HP, 5 × 5 ml	95056-206
HisTrap FF, 5 × 1 ml	95056-022

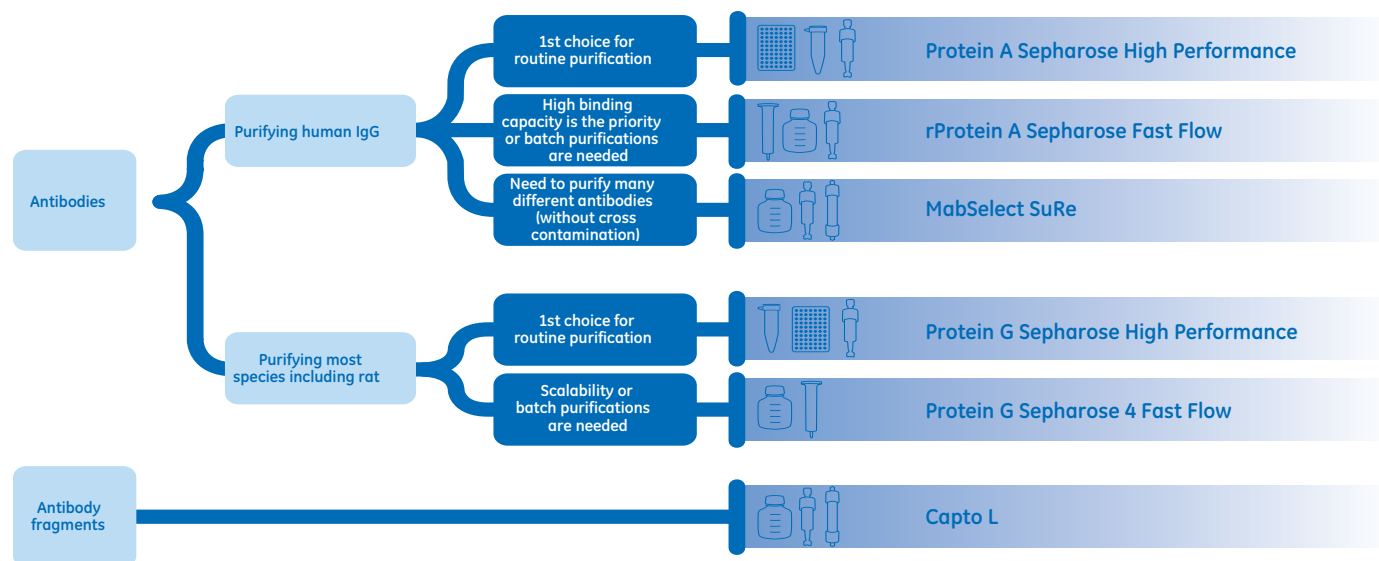
* HisTrap columns are prepacked with Ni Sepharose; HP = High performance; FF = Fast flow.

Products	Cat. No.
HisPrep FF 16/10	89128-894
HisTrap FF Crude, 5 × 5 ml	95056-136
TALON Superflow, 10 ml	71006-006
HiTrap TALON crude, 5 × 5 ml	71006-000
Ni Sepharose excel, 25 ml	89428-612
HisTrap excel, 5 × 5 ml	89233-414

* HisPrep FF 16/10 and HisTrap FF Crude columns are prepacked with precharged Ni Sepharose 6 Fast Flow.

Antibody purification.

We offer tools for the purification of monoclonal (MAbs) and polyclonal antibodies from different sources. The basis for antibody affinity purification is the high affinity and specificity of protein G and protein A for the Fc region of IgG from a variety of species. We offer chromatography media with protein G and protein A immobilized to several different matrices resulting in an excellent means of isolating IgG and IgG subclasses from ascites, cell culture supernatants, and serum.



Products	Cat. No.
HiTrap Protein A HP, 5 × 1 ml	95056-032
HiTrap Protein A HP, 5 × 5 ml	95055-846
Protein A HP SpinTrap columns, Pack of 16	95056-280
Protein A HP MultiTrap plates, Pack of 4	95056-240
HiTrap Protein G HP, 5 × 1 ml	95055-944
HiTrap Protein G HP, 5 × 5 ml	95056-034
Protein G HP SpinTrap columns, Pack of 16	95056-166
Protein G HP MultiTrap plates, Pack of 4	95056-242
Protein G Sepharose 4 FF, 25 ml	95016-926
HiTrap rProtein A FF, 5 × 1 ml	95056-088

* For more product and pack size information plus additional products, please visit vwr.com.

Products	Cat. No.
HiTrap rProtein A FF, 2 × 1 ml	95055-868
HiTrap rProtein A FF, 1 × 5 ml	95056-008
HiTrap rProtein A FF 5 × 5 ml	95056-090
rProtein A Sepharose 4 FF, 5 ml	97067-986
rProtein A Sepharose 4 FF, 25 ml	95017-086
HiTrap MabSelect SuRe, 1 × 5 ml	95056-024
HiTrap MabSelect SuRe, 5 × 1 ml	95055-926
Capto L, 5ml	89234-988
Capto L, 25ml	89234-984

GE format guide

Type of purification	Manual purification			Manual or system purification		System purification	
Format	Spin columns	96-well plates	Gravity flow columns	Bottles of chromatography media (resins)	Small-column cartridges	Other columns	
Format name	SpinTrap	MultiTrap	GraviTrap, MiniTrap, MidiTrap, PD10	Lab pack	HiTrap	HiScreen™, HiPrep, HiLoad, RESOURCE™, Tricorn™, and Precision	
Use	Screening and quick desalting of small sample quantities using a centrifuge	High-throughput screening and small scale purification using centrifuge or vacuum equipment	Simple one-step purification of proteins or sample desalting without the need for equipment	Batch purification and self-packing	Easy to use with a syringe, peristaltic pump, or a chromatography system	Larger scale or high performance applications	

New generation columns for SEC.

Size-exclusion chromatography (SEC) is used for final polishing steps (Fig. 3). We offer three columns pre-packed with new generation Superdex Increase and Superose Increase resins (Table 1). These columns are used for small-scale preparative purification and analysis (sample volume 4 to 500 µl). Preparative grade columns and resins are also available for larger sample volumes (see next page).

Choose from three pre-packed column sizes to meet your different analysis and polishing needs.

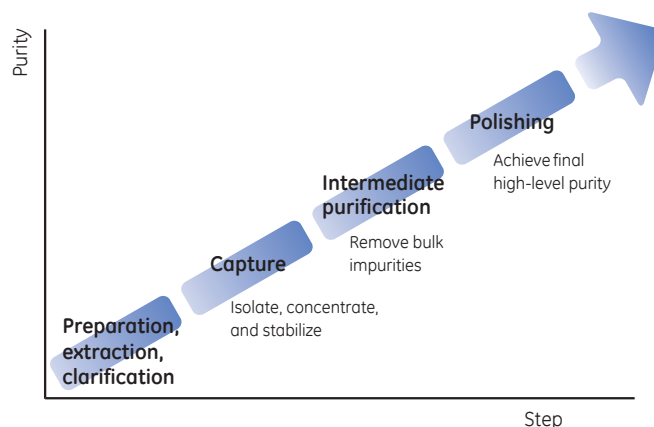


Figure 3. CIPP Purification Strategy. The capture phase reduces the amount of unwanted proteins and concentrates the target protein. Intermediate purification removes most contaminants that are closely related to the target protein. Polishing removes specified contaminants and unwanted forms of the target protein that may have been formed during isolation and purification.

Table 1. Superdex 75 Increase, Superdex 200 Increase, and Superose 6 Increase columns.

Type of protein	Product name	Characteristics and benefits
Recombinant tagged proteins For Mr 3-70 kDa	Superdex 75 Increase	Compared with original Superdex columns: Higher resolution Reduced runtimes with maintained resolution
MABs and other antibodies For Mr 10-600 kDa	Superdex 200 Increase	Compared with original Superdex columns: Higher resolution using existing run times/flow rates Up to half the run time with maintained resolution columns
Large proteins and complexes For Mr 5-5000 kDa (wide fractionation range)	Superose 6 Increase	Compared with original Superose columns: Improved resolution and run time

Ordering information

Dimensions (mm)	Superdex 75 Increase Cat. No.	Superdex 200 Increase Cat. No.	Superose 6 Increase Cat. No.
10 × 300	75799-300	89497-272	10192-228
5 × 150	75799-302	89497-274	10192-230
3.2 × 300	75799-304	89497-276	10192-226

Broad range of SEC columns and resins.

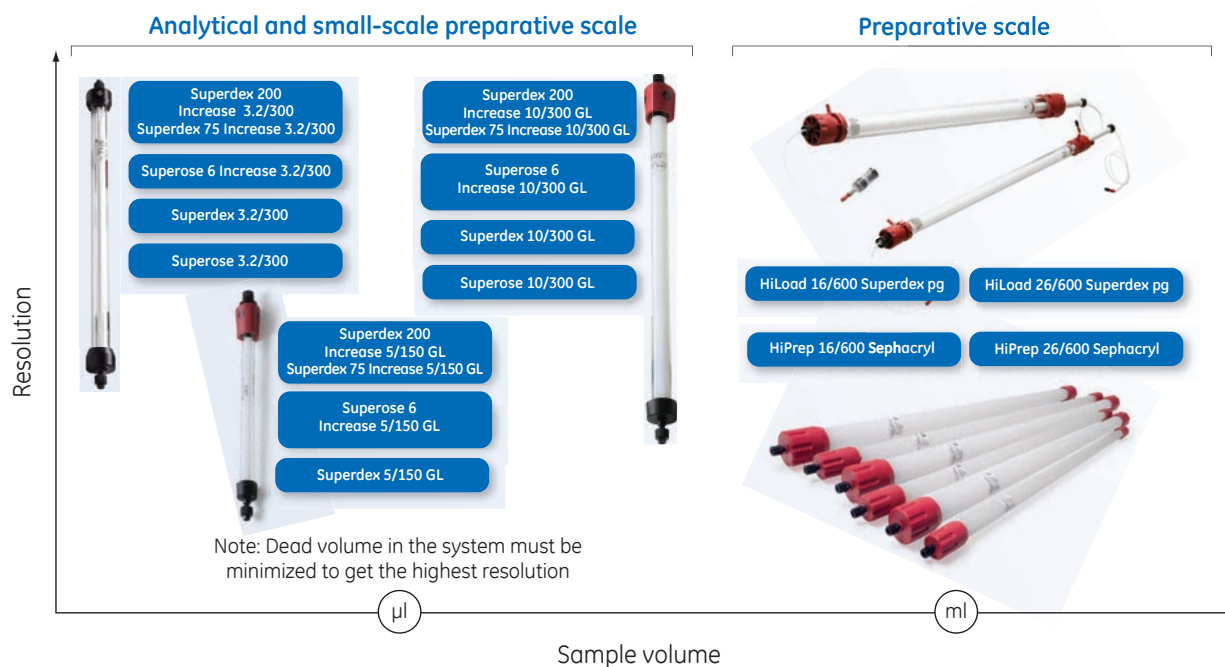


Figure 4. Schematic overview of resolution and sample volume for prepacked, high-resolution SEC columns. For best performance and convenience use prepacked SEC columns.

Products	Cat. No.	Products	Cat. No.
Superdex Peptide 3.2/300	10048-752	Superose 6 Increase 3.2/300	10192-226
Superdex Peptide 10/300 GL	97067-864	Superose 6 Increase 10/300 GL	10192-228
Superdex 75 Increase 3.2/300	75799-304	Superose 6 Increase 5/150 GL	10192-230
Superdex 75 Increase 10/300 GL	75799-300	HiPrep 16/60 Sephacryl S-100 HR	95056-000
Superdex 75 Increase 5/150 GL	75799-302	HiPrep 26/60 Sephacryl S-100 HR	95055-806
Superdex 75 3.2/300*	10048-734	HiPrep 16/60 Sephacryl S-200 HR	95056-002
Superdex 75 10/300 GL*	97067-860	HiPrep 26/60 Sephacryl S-200 HR	95055-808
Superdex 75 5/150 GL*	97067-868	HiPrep 16/60 Sephacryl S-300 HR	95056-004
Superdex 200 Increase 3.2/300	89497-276	HiPrep 26/60 Sephacryl S-300 HR	95055-810
Superdex 200 Increase 10/300 GL	89497-272	HiPrep 16/60 Sephacryl S-400 HR	97067-768
Superdex 200 Increase 5/150 GL	89497-274	HiPrep 26/60 Sephacryl S-400 HR	97067-770
HiLoad 16/600 Superdex 30 pg	71002-662	HiPrep 16/60 Sephacryl S-500 HR	97067-772
HiLoad 26/600 Superdex 30 pg	71002-664	HiPrep 26/60 Sephacryl S-500 HR	97067-774
HiLoad 16/600 Superdex 75 pg	71002-666	Superdex 30 prep grade, 150 ml	95017-026
HiLoad 26/600 Superdex 75 pg	71002-668	Superdex 75 prep grade, 150 ml	95017-072
HiLoad 16/600 Superdex 200 pg	71002-670	Superdex 200 prep grade, 150 ml	95017-068
HiLoad 26/600 Superdex 200 pg	71002-672	Superose 12 prep grade, 125 ml	95055-854
Superose 12 3.2/300	10048-756	Superose 6 prep grade, 125 ml	95055-852
Superose 12 10/300 GL	97067-858	Sephacryl S-200 HR, 150 ml	95016-904

* Superdex 75 columns are to be replaced by new generation Superdex 75 Increase columns. The original Superdex 75 columns will be available until December 15, 2018

* For more product and pack size information plus additional SEC resin products, please visit vwr.com.

Western Blotting.

Blotting

Amersham Hybond™ PVDF blotting membranes

- High protein binding capacity results in high sensitivity.
- Suitable for Western blotting applications with stripping and reprobing.
- Amersham Hybond P recommended for chemiluminescence detection.
- Amersham Hybond LFP specifically optimized for fluorescence detection methods.



Imaging

Amersham Hyperfilm ECL detection film

- Sensitive film for the detection of chemiluminescent signals in Western blotting assays.
- Clear background for excellent contrast and band visibility.
- Publication-quality images.



Blotting paper

	Quantity	Cat. No.
Whatman 3MM blotting paper	46 × 57 cm	28458-005

Amersham Western blotting membranes

Amersham Protran™ 0.2 µM Nitrocellulose	1 roll, 30 cm × 4 m	10120-004
Amersham Protran 0.45 µM Nitrocellulose	1 roll, 30 cm × 4 m	10063-173
Amersham Protran Premium 0.2 µM Nitrocellulose	1 roll, 30 cm × 4 m	10119-996
Amersham Protran Premium 0.45 µM Nitrocellulose	1 roll, 30 cm × 4 m	10120-006
Amersham Hybond P 0.2 µM PVDF	1 roll, 26 cm × 4 m	10120-022
Amersham Hybond P 0.45 µM PVDF	1 roll, 30 cm × 4 m	10061-492
Amersham Hybond LFP 0.2 µM PVDF	1 roll, 25.4 cm × 4 m	10120-024

Molecular weight markers

Amersham ECL DualVue™ Markers – visible on the gel, blot, film, and imager	25 loadings	95038-574
Amersham ECL Rainbow™ Marker-Full range	250 µl	95040-114
Amersham ECL Plex Fluorescent Rainbow Marker	120 µl	95040-080

Secondary antibodies

Amersham ECL Mouse IgG, HRP-Linked Whole Ab	1 ml	95017-332
Amersham ECL Rabbit IgG, HRP-Linked Whole Ab	1 ml	95017-556

Autoradiography film

Amersham Hyperfilm ECL, 5 × 7"	50 sheets	95017-653
Amersham Hyperfilm ECL, 18 × 24 cm	50 sheets	95017-655
Amersham Hyperfilm ECL, 8 × 10"	50 sheets	95017-659

* For more product and pack size information plus additional products, please visit vwr.com.

Amersham ECL Western blotting detection reagents.

Amersham ECL Start

	Quantity	Cat. No.
Amersham ECL start Western blotting detection reagent	200 ml for 2000 cm ² membrane	10662-310
Amersham ECL start Western blotting detection reagent	400 ml for 4000 cm ² membrane	10662-312

Amersham ECL

Amersham ECL Western blotting detection reagent	100 ml for 1000 cm ² membrane	95038-560
Amersham ECL Western blotting detection reagent	200 ml for 2000 cm ² membrane	95038-562
Amersham ECL Western blotting detection reagent	400 ml for 4000 cm ² membrane	95038-564
Amersham ECL Western blotting detection reagent	600 ml for 6000 cm ² membrane	95038-566

Amersham ECL Prime

Amersham ECL Prime Western blotting detection reagent	100 ml for 1000 cm ² membrane	89168-782
Amersham ECL Prime Western blotting detection reagent	300 ml for 3000 cm ² membrane	89238-012

Amersham ECL Select

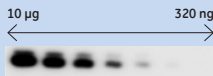
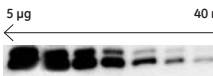
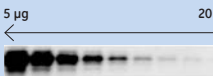
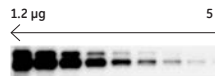

Amersham ECL Select Western blotting detection reagent	100 ml for 1000 cm ² membrane	89233-310
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Amersham ECL Plex

Amersham ECL Plex Combination Pack (includes Cy TM 3, Cy5, Amersham ECL Plex Marker, and Amersham Protran Premium)	For 1000 cm ² membrane	95040-084
Amersham ECL Plex Combination Pack (includes Cy3, Cy5, Amersham ECL Plex Marker, and Amersham Protran Premium)	For 1000 cm ² membrane	95040-086
Amersham ECL Plex goat- α -mouse IgG-Cy2, Cy3, Cy5	For 1000 cm ² or 4000 cm ² membrane	
Amersham ECL Plex goat- α -rabbit IgG-Cy2, Cy3, Cy5	For 1000 cm ² or 4000 cm ² membrane	

* For more product and pack size information plus additional products, please visit vwr.com.

Selection guide outlining the differences between ECL reagents.

Product	Amersham ECL start	Amersham ECL	Amersham ECL Prime	Amersham ECL Select	Amersham ECL Plex TM
	Detection of high to medium abundant proteins	Reliable detection of high to medium abundant proteins	Quantitative analysis of high to low abundant proteins	Quantitative analysis of medium to very low abundant proteins	Multiplex protein analysis and quantitation of high to very low protein levels
Detection type	Chemiluminescence	Chemiluminescence	Chemiluminescence	Chemiluminescence	Fluorescence
Optimal membrane	Amersham Protran	Amersham Protran	Amersham Hybond P Amersham Protran	Amersham Hybond P Amersham Protran	Amersham Hybond LFP Amersham Protran Premium
Recommended detection	Amersham Hyperfilm (X-ray film) or ImageQuant TM LAS 500	Amersham Hyperfilm (X-ray film) or ImageQuant LAS 500	Amersham Imager 600 series X-ray film is also an option	Amersham Imager 600 series X-ray film is also an option	Typhoon TM FLA series Amersham Imager 600RGB
Signal duration	< 3 h	< 2 h	< 24 h	< 2 h	> 3 months
Typical applications	<ul style="list-style-type: none"> Routine protein detection Highly expressed proteins e.g. housekeeping proteins Tagged proteins 	<ul style="list-style-type: none"> Routine protein detection Protein confirmation Overexpressed proteins Tagged proteins 	<ul style="list-style-type: none"> Protein quantitation Protein confirmation Protein regulation and expression analysis 	<ul style="list-style-type: none"> Protein quantitation Protein confirmation Protein regulation and expression analysis 	<ul style="list-style-type: none"> Multiplex analysis Normalization to housekeeping protein Analysis of post translational modification and isoforms
Typical results	 <p>WB ERK 1/2; LOD 320 ng; DR</p>	 <p>WB ERK 1/2; LOD: 40 ng; DR: 2.1</p>	 <p>WB ERK 1/2; LOD: 20 ng; DR: 2.4</p>	 <p>WB ERK 1/2; LOD: 5 ng; DR: 2.4</p>	 <p>WB ERK 1/2 (Cy5 on FLA 9500); LOD 10 ng; DR: 3</p>

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