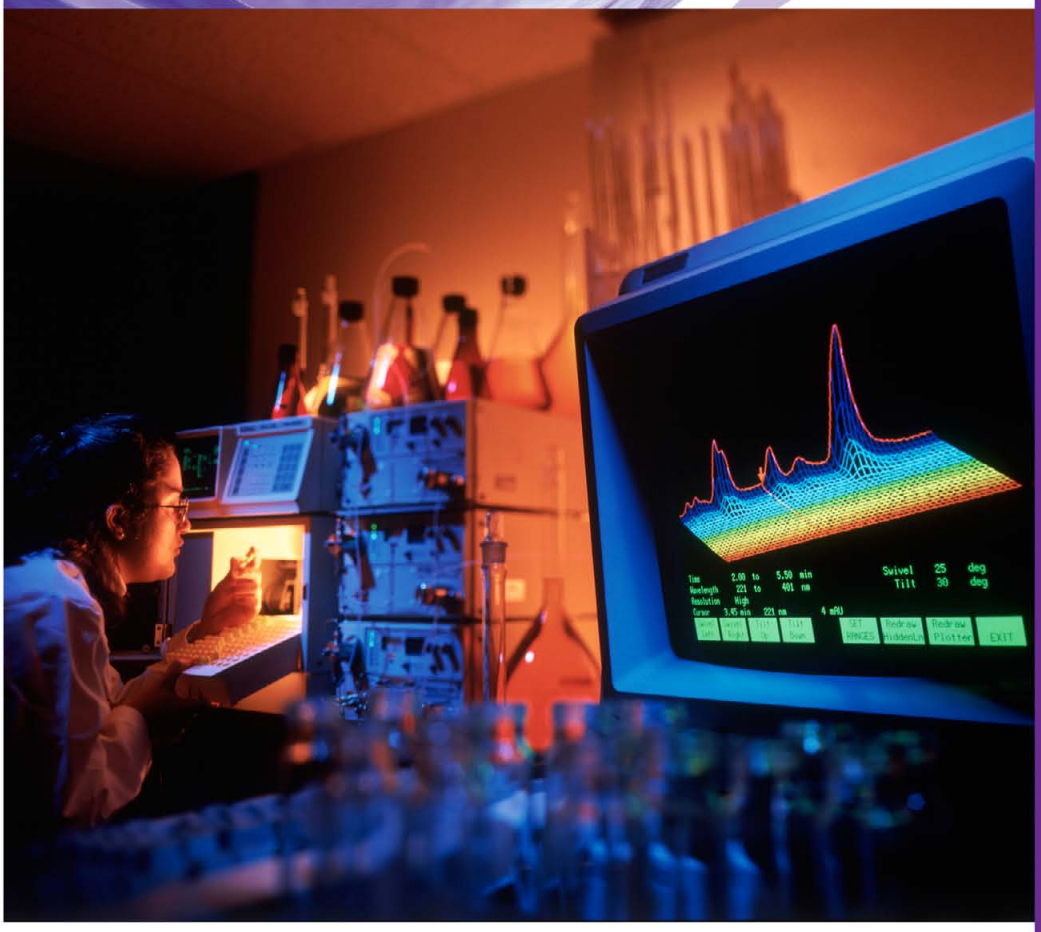
OmniSep™

Packed Columns



Agarose-and Dextran-Based Media for High Performance Chromatography Purification

Omnifit labware

CHROMATOGRAPHIC SPECIALTIES INC.
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1-800-267-8103 • sales@chromspec.com • tech@chromspec.com

OmniSep™ Packed Columns & Bulk Media by Omnifit® Labware

OmniSep packed columns are cost-effective turnkey chromatography labware that save technicians the time-consuming, manual labor process of packing delicate, low-pressure chromatography media in reusable glass columns or single use polyprolene columns. OmniSep adheres to rigorous standards for consistency and quality to ensure efficiency and repeatability in the lab.

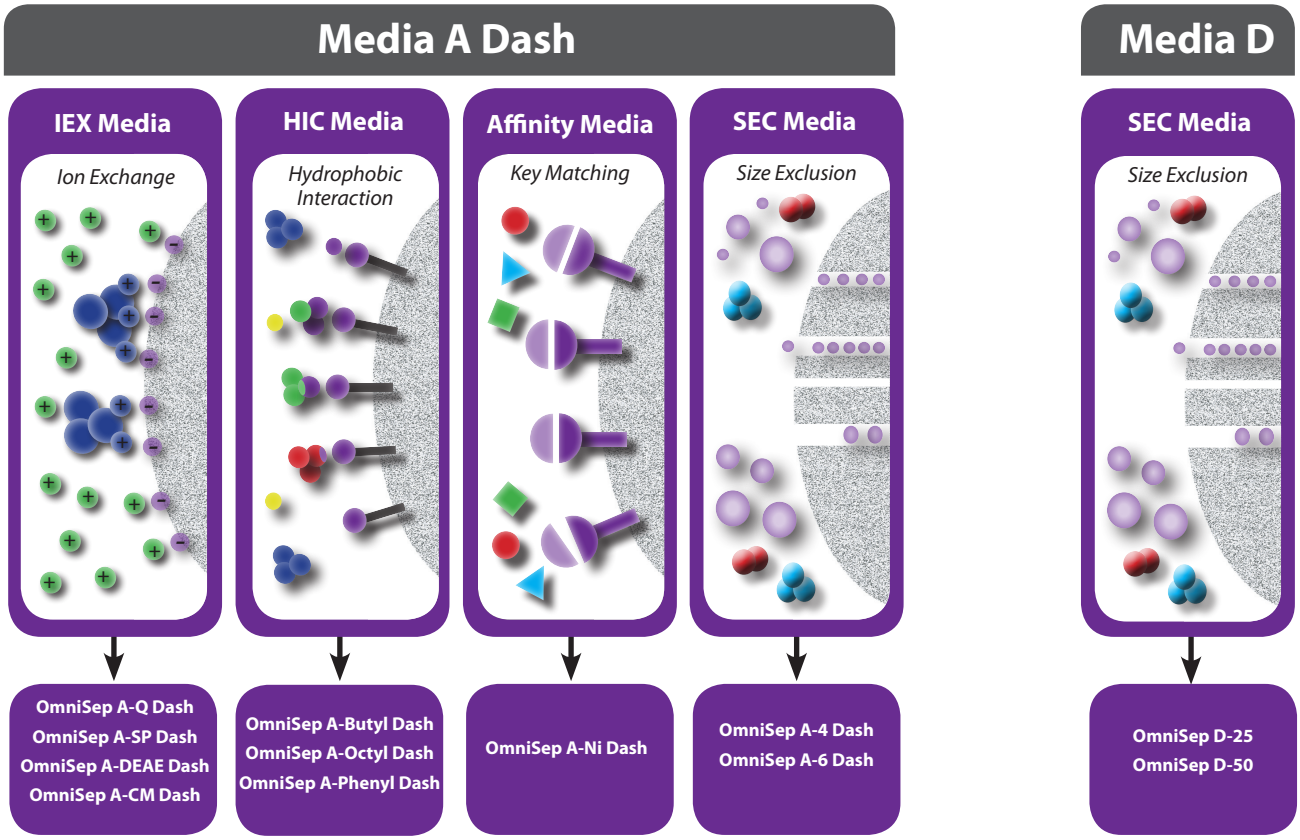
OmniSep offers columns packed with twelve types of cross-linked agarose- and dextran-based media that are commonly used by laboratories for preparative chromatography applications. The OmniSep media structure gives the adsorbent high chemical, physical and thermal stabilities, making it ideal for all stages of purification. The rigidity of the cross-linked media permits high volumetric flow rates resulting in fast separations with good resolution. OmniSep media are easy to use, and they tolerate the typical conditions of temperature, pH and chemical agents, including cleaning-in-place (CIP) reagents, routinely employed in biomolecule purification and separation processes.

OmniSep media are packed into Omnifit Benchmark™ glass columns, products long-known for quality and consistency in LPLC. Omnifit Benchmark columns are constructed of borosilicate glass with PE frits and machined PTFE end pieces, fixed on one end and adjustable on the other, for reliable, long-term use. Omnifit columns feature a trademark simple design, enabling high visibility and ease of use. They are offered in a range of sizes to cover the gamut of preparatory applications. In addition, some OmniSep media are offered in 1ml and 5 ml polypropylene columns for use as low cost "scouts."

OmniSep media is now offered in bulk packaging for customers who want to reuse their columns. Details are listed with each media type and also on page 19.

OmniSep packed columns, bulk media and Omnifit Labware precision chromatography columns are offered by Diba, specialists in fluid handling, with facilities in the US, the UK and Asia. Diba is a Halma company.

OmniSep Media Selection Guide



OmniSep SEC Media Types and Specifications

OMNISEP SEC MEDIA TYPES

OMNISEP A-4	OMNISEP A-6	OMNISEP D-25	OMNISEP D-50
OmniSep A-4 is an agarose-based media with 4% cross-linked beads used for separating biomolecules via size exclusion chromatography which is stable in all commonly used aqueous buffers with a working pH range of 3.8 -13. OmniSep A-4 provides commercially equivalent performance to the leading agarose-based media.	OmniSep A-6 is an agarose-based media with 6% cross-linked beads used for separating biomolecules via size exclusion chromatography which is stable in all commonly used aqueous buffers with a working pH range of 3.8 -13. The 6% cross-linked beads enable more efficient elutins. OmniSep A-6 provides commercially equivalent performance to the leading agarose-based media.	OmniSep D-25 is a dextran-based media used for separating biomolecules via size exclusion chromatography which is stable in all commonly used aqueous buffers with a working pH range of 2-13. OmniSep D-25 provides commercially equivalent performance to the leading dextran-based media.	OmniSep D-50 is a dextran-based media used for separating biomolecules via size exclusion chromatography which is stable in all commonly used aqueous buffers with a working pH range of 2-13. Size exclusion cut off for OmniSep D-50 is 2-5x greater than OmniSep D-25. OmniSep D-50 provides commercially equivalent performance to the leading dextran-based media.

OMNISEP SEC MEDIA SPECIFICATIONS

	OMNISEP A-4	OMNISEP A-6	OMNISEP D-25	OMNISEP D-50
Bead Geometry:	Spherical	Spherical	Spherical	Spherical
Bead Structure:	Highly cross-linked agarose	Highly cross-linked agarose	Highly cross-linked dextran	Highly cross-linked dextran
Bead Size Range:	45 -165 micron	45 -165 micron	20–80 micron (dry)	20–80 micron (dry)
Mean Bead Size (approx):	90 micron	90 micron	50 micron	50 micron
Thermal Stability (autoclave):	120^{C} for 20 min in H_20	120^{C} for 20 min in H_20	121^{C} for 30 min at pH7	121^{C} for 30 min at pH7
pH Stability (working):	pH 3.8-13	pH 3.8-13	pH 2-13	pH 2-13
pH Stability (short term i.e. CIP):	pH 1.8-14	pH 1.8-14	pH 2-13	pH 2-13
Chemical Stability:	Most commonly used aqueous and organic solutions including: 1 M NaOH, 8M Urea, 5M guanidine HCl, 75% ethanol	Most commonly used aqueous and organic solutions including: 1 M NaOH, 8M Urea, 5M guanidine HCl, 75% ethanol	Most commonly used buffers including: 0.2M NaOH, 0.2M HCl, 1M Acetic Acid, 1% SOS, 8M Urea, 6M guanidine HCl, 24% ethanol, 30% propanol, 30% acetonitrile	Most commonly used buffers including: 0.2M NaOH, 0.2M HCl, 1M Acetic Acid, 1% SOS, 8M Urea, 6M guanidine HCl, 24% ethanol, 30% propanol, 30% acetonitrile
Bead Agarose %:	4%	6%	N/A	N/A
Fractionation Range Exclusion Limit:	4x10^{4} to 3x10^{7}	1x10^{4} to 4x10^{6}	5 kD for proteins and 10 bp for nucleic acids	25 kD for proteins and 20 bp for nucleic acids
Maximum Flow Rate (at 15 cm bed height):	<500 cm/h	<1,000 cm/h	<450 cm/h	<450 cm/h
Maximum Pressure (at 15 cm bed height):	>150 kPa	>150 kPa	>300 kPa	>300 kPa
Antimicrobial Agent:	20% Ethanol	20% Ethanol	None - supplied as dry powder in bulk	None - supplied as dry powder in bulk
Recommended Storage Temperature:	4-30^{0}C	4-30^{0}C	Ambient	Ambient
Ligand:	N/A	N/A	N/A	N/A
Ligand Density (per ml of media approx):	N/A	N/A	N/A	N/A
Dynamic Binding Capacity (per ml of media approx):	N/A	N/A	N/A	N/A

SEC columns are designed to capture and purify bio-pharmaceuticals by separating biomolecules via size exclusion chromatography.

- Exhibit high chemical stability
- Permit standard cleaning-in-place (CIP) protocols
- Can be used interchangeably with commerically available agarose or dextran based media on LPLC equipment such as ÄKTA.

OMNISEP SEC PACKED COLUMN SPECIFICATIONS

	OMNISEP A-4/A-6 DASH		OMNISEP D-25/D-50		
	10 MM x 400 MM	15 MM x 150 MM	25 MM x 150 MM	7 MM x 25 MM	16 MM x 25 MM
Bed Volume:	23.5 ml	17.7 ml	49 ml	1 ml	5 ml
Bed Dimensions:	10 mm x 300 mm	15 mm x 100 mm	25 mm x 100 mm	7 mm x 25 mm	16 mm x 25 mm
Column Dimensions:	10 mm x 400 mm	15 mm x 150 mm	25 mm x 150 mm	7 mm x 25 mm	16 mm x 25 mm
Optimum Flow Rate:	0.1 - 1.0 ml/min	0.5 - 2.0 ml/min	9 - 31 ml/min	1 ml/min	5 ml/min
Flow Rate Range:	6 ml/min1)	6 ml/min	1 - 40 ml/min	<4 ml/min	<20 ml/min
Flow Velocity	6 ml/min1)	6 ml/min	<450 cm/hr	>15 cm/hr	>15 cm/hr
Column Efficiency (N)	>3000 plates per meter	>3000 plates per meter	>3000 plates per meter	N/A	N/A
Column Asymmetry (As)	0.8 - 1.2	0.8 - 1.2	0.8 - 1.2	0.8 - 1.2	0.8 - 1.2
Storage Conditions	4 to 30°C, 20% Ethanol	4 to 30°C, 20% Ethanol	4 to 30°C, 20% Ethanol	4 to 30°C, 20% Ethanol	4 to 30°C, 20% Ethanol
Maximum Pressure*	3 bar [0.3 MPa] (42psi)	3 bar [0.3 MPa] (42psi)	3 bar [0.3 MPa] (42psi)	3 bar [0.3 MPa] (42psi)	3 bar [0.3 MPa] (42psi)

OMNISEP SEC ORDERING INFORMATION

SEC PACKED COLUMNS							
MEDIA TYPES	LENGTH	6.6 MM ID	10 MM ID	15 MM ID	25 MM ID	1 ML - 5 PACK	5 ML - 5 PACK
OmniSep A-4 Dash Packed Column	400 MM		006PCS-1040-A4				
OmniSep A-4 Dash Packed Column	150 MM			006PCS-1515-A4			
OmniSep A-6 Dash Packed Column	400 MM		006PCS-1040-A6				
OmniSep A-6 Dash Packed Column	150 MM			006PCS-1515-A6			
OmniSep D-25 Packed Column	150 MM				006PCS-2515-D25		
OmniSep D-25 Packed Columns - 5 Pack	63 MM					006PCS-1ML-D25	006PCS-5ML-D25
OmniSep D-50 Packed Column	150 MM				006PCS-2515-D50		
OmniSep D-50 Packed Columns - 5 Pack	63 MM					006PCS-1ML-D50	006PCS-5ML-D50

SEC BULK MEDIA					
MEDIA TYPES	100 ML	200 ML	1,000 ML	10,000 ML	PRODUCT DESCRIPTION
OmniSep A-4 Dash Bulk Media		006BM-A4-200	006BM-A4-1L	ON REQUEST	20% Suspension in Denatured Ethanol
OmniSep A-6 Dash Bulk Media		006BM-A6-200	006BM-A6-1L	ON REQUEST	20% Suspension in Denatured Ethanol
MEDIA TYPES	100 GM	200 GM	1,000 GM	10,000 GM	PRODUCT DESCRIPTION
OmniSep D-25 Dash Bulk Media	006BM-D25-100	ON REQUEST	ON REQUEST	ON REQUEST	Dry Powder
OmniSep D-50 Dash Bulk Media	006BM-D50-100	ON REQUEST	ON REQUEST	ON REQUEST	Dry Powder

OmniSep D-25 and a Leading Dextran-Based Column Comparison

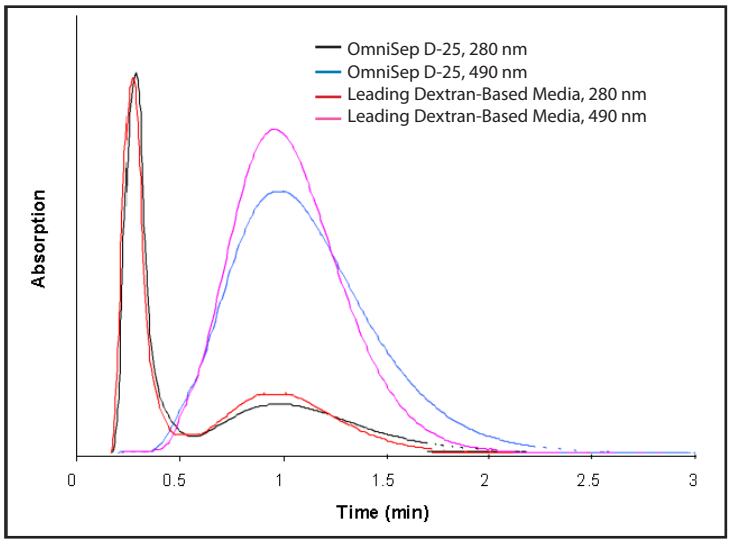
OmniSep performance in the lab for any of the ten media will yield patterned results which will enable researchers to maintain existing protocols. OmniSep D-25 media is manufactured to be commercially equivalent to the leading dextran-based media. When for example packed into 5 mL LPLC columns and tested side-by-side, OmniSep D-25 produces separations which are equivalent to the leading dextran-based media.

Test Procedure: The objective of this test was to compare the OmniSep D-25 5mL LPLC desalting column with a leading dextran-based 5mL desalting LPLC column.

Materials Used:

OmniSep D-25 bead diameter 20 – 50 µm packed into a 5mL LPLC column
Leading dextran-based media desalting column, 5 mL

The test protocol was performed utilizing the following conditions and mixtures of bovine serum albumin(BSA) and fluorescein amidite (FAM):

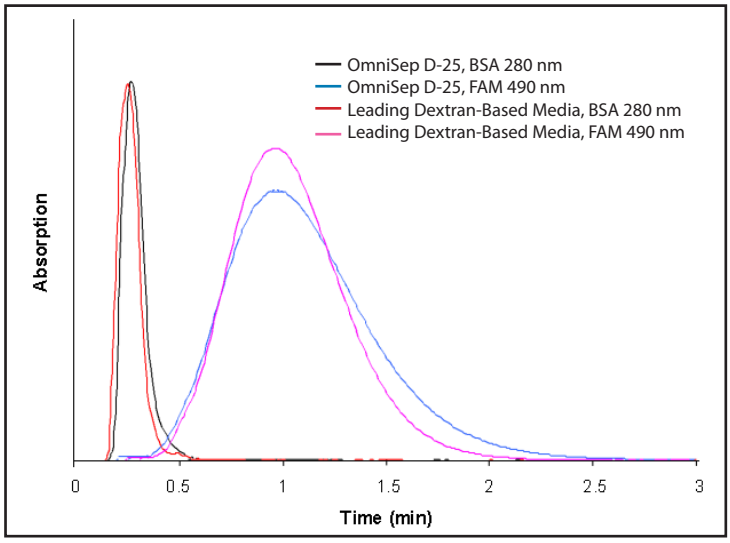


a) Comparison of OmniSep D-25 and the leading dextran-based 5ML column with an overlay of four runs. Spectra were measured at 280nm and 490nm.

Eluent: PBS pH 7.4 (0.05 NaN3)

Flow rate: 10 ml/min

Sample: 1 ml of 2 mg/ml BSA + 100 µM 5-Carboxyfluorescein (FAM) in PBS pH 7.4 (0.05 % NaN3)



b) Comparison of OmniSep D-25 and the leading dextran-based media. BSA and fluorescein ran separately each on OmniSep and the leading media with an overlay of four runs. Spectra were measured at 280nm and 490nm.

Eluent: PBS pH 7.4 (0.05 % NaN3)

Flow rate: 10 ml/min

Sample: 1 ml of 2 mg/ml BSA in PBS pH 7.4 (0.05 % NaN3) @ 280 nm
1 ml of 100 µM FAM in PBS pH 7.4 (0.05 % NaN3) @ 490 nm

OmniSep IEX Media Types and Specifications

OMNISEP IEX MEDIA TYPES

OMNISEP A-Q DASH	OMNISEP A-SP DASH	OMNISEP A-DEAE DASH	OMNISEP A-CM DASH
OmniSep A-Q is an agarose-based quaternary amine ($^{-}N^{+}(CH_3)_3$) media used for separating biomolecules via strong anion exchange which is stable in all commonly used aqueous buffers with a working pH range of 2-12. It is a 4% cross-linked semi-rigid agarose bead with an ionic capacity of around 0.20 mmol Cl-/ml medium. OmniSep A-Q provides commercially equivalent performance to the leading A agarose-based media.	OmniSep A-SP is an agarose-based propyl sulphonic acid ($^{-}CH_2CH_2CH_2SO_3$) media used for separating biomolecules via strong cation exchange which is stable in all commonly used aqueous buffers with a working pH range of 4-13. It is a 4% cross-linked semi-rigid agarose bead with an ionic capacity of around 0.2 mmol H+/ml medium. OmniSep A-SP provides commercially equivalent performance to the leading SP agarose-based media.	OmniSep A-DEAE is an agarose-based diethylaminoethyl ($^{-}N^{+}(C_2H_5)_2H$) media used for separating biomolecules via weak anion exchange which is stable in all commonly used aqueous buffers with a working pH range of 2-12. It is a 4% cross-linked semi-rigid agarose bead with an ionic capacity of around 0.15 mmol Cl-/ml medium four micromoles of a quaternary amine covalently attached. OmniSep A-DEAE provides commercially equivalent performance to the leading DEAE agarose-based media.	OmniSep A-CM is an agarose-based carboxy methyl ($^{-}O^{-}CH_2COO^{-}$) media used for separating biomolecules via weak cation exchange which is stable in all commonly used aqueous buffers with a working pH range of 4-13. It is a 4% cross-linked semi-rigid agarose bead with an ionic capacity of around 0.11 mmol H^{+}/ml medium four micromoles of a quaternary amine covalently attached. OmniSep A-CM provides commercially equivalent performance to the leading CM agarose-based media.

OMNISEP IEX MEDIA SPECIFICATIONS

	OMNISEP A-Q DASH	OMNISEP A-SP DASH	OMNISEP A-DEAE DASH	OMNISEP A-CM DASH
Bead Geometry:	Spherical	Spherical	Spherical	Spherical
Bead Structure:	Highly cross-linked agarose	Highly cross-linked agarose	Highly cross-linked agarose	Highly cross-linked agarose
Bead Size Range:	45 -165 micron	45 -165 micron	45 -165 micron	45 -165 micron
Mean Bead Size (approx):	90 micron	90 micron	90 micron	90 micron
Thermal Stability (autoclave):	120^{C} for 20 min in H_20	120^{C} for 20 min in H_20	120^{C} for 20 min in H_20	120^{C} for 20 min in H_20
pH Stability (working):	pH 2-12	pH 2-12	pH 2-12	pH 2-12
pH Stability (short term i.e. CIP):	pH 2-14	pH 2-13	pH 2-12	pH 2-13
Chemical Stability:	Most commonly used aqueous and organic solutions including: 1 M NaOH, 8M Urea, 5M guanidine HCl, 75% ethanol	Most commonly used aqueous and organic solutions including: 1 M NaOH, 8M Urea, 5M guanidine HCl, 75% ethanol	Most commonly used aqueous and organic solutions including: 1 M NaOH, 8M Urea, 5M guanidine HCl, 75% ethanol	Most commonly used aqueous and organic solutions including: 1 M NaOH, 8M Urea, 5M guanidine HCl, 75% ethanol
Bead Agarose %:	4%	4%	4%	4%
Fractionation Range Exclusion Limit:	3 x 10^7	3 x 10^7	3 x 10^7	3 x 10^7
Maximum Flow Rate (at 15 cm bed height):	<300 cm/h	<300 cm/h	<300 cm/h	<300 cm/h
Maximum Pressure (at 15 cm bed height):	>150 kPa	>150 kPa	>150 kPa	>150 kPa
Antimicrobial Agent:	20% Ethanol	20% Ethanol	20% Ethanol	20% Ethanol
Recommended Storage Temperature:	4-30^{0}C	4-30^{0}C	4-30^{0}C	4-30^{0}C
Ligand:	quaternary amine ($-N^{+}(CH_3)_3$) $-CH_3$)	propyl sulphonic acid ($-CH_2CH_2CH_2SO_3$) $-CH_3$)	diethylaminoethyl ($-N^{+}(C_2H_5)_2H$)	carboxy methyl ($-O-CH_2COO-$)
Ligand Density (per ml of media approx):	~0.20 mmol Cl-	~0.20 mmol H+	~0.15 mmol Cl-	~0.11 mmol H+
Dynamic Binding Capacity (per ml of media approx):	>72mg/ml (HSA) HSA=Human Serum Albumin	> 95mg/ml (lysozyme)	>72mg/ml (HSA) HSA=Human Serum Albumin	> 95mg/ml (lysozyme)

IEX columns are designed to capture and purify bio-pharmaceuticals by separating biomolecules via ion exchange.

- Exhibit high chemical stability
- Permit standard cleaning-in-place (CIP) protocols
- Can be used interchangeably with commercially available agarose or dextran-based media on LPLC equipment such as ÄKTA.

OMNISEP IEX PACKED COLUMN SPECIFICATIONS

OMNISEP A-Q, A-SP, A-DEAE AND A-CM DASH PACKED COLUMNS		
	15 MM X 150 MM	5 ML SCOUT COLUMN KIT
Bed Volume:	17.7 ml	5 ml
Bed Dimensions:	15 mm x 100 mm	16 mm x 25 mm
Column Dimensions:	15 mm x 150 mm	16 mm x 25 mm
Optimum Flow Rate:	2 ml/min	5 ml/min
Flow Rate Range:	2 ml/min - 10 ml/min	2 ml/min
Flow Velocity:	<300 cm/h	<20 ml/min
Column Efficiency (N):	>3000 plates per meter	N/A
Column Asymmetry (As):	0.8 - 1.2	0.8 - 1.2
Storage Conditions:	4 to 30°C, 20% Ethanol	4 to 30°C, 20% Ethanol
Maximum Pressure*:	1.5 bar [0.15 MPa] (22psi)**	3 bar [0.3 MPa] (42psi)**

**Column packed bed during operation* ***The column packed bed pressure depends on a range of criteria such as the chromatography medium, eluent viscosity and the system/column tubing used*

OMNISEP IEX ORDERING INFORMATION

IEX PACKED COLUMNS							
MEDIA TYPES	LENGTH	6.6 MM ID	10 MM ID	15 MM ID	25 MM ID	1 ML-4 PACK	5 ML - 4 PACK
OmniSep A-Q Dash Packed Column	150 MM			006PCI-1515-QD			
OmniSep A-SP Dash Packed Column	150 MM			006PCI-1515-SD			
OmniSep A-DEAEl Dash Packed Column	150 MM			006PCI-1515-DD			
OmniSep A-CM Dash Packed Column	150 MM			006PCI-1515-CD			
OmniSep IEX Scout Column Kit - includes one column each of all 4 IEX media	63 MM						006PCK-5ML-IEX

IEX BULK MEDIA					
MEDIA TYPES	100 ML	500 ML	1,000 ML	10,000 ML	PRODUCT DESCRIPTION
OmniSep A-Q Dash Bulk Media		006BM-QD-500	ON REQUEST	ON REQUEST	20% Suspension in Denatured Ethanol
OmniSep A-SP Dash Bulk Media		006BM-SD-500	ON REQUEST	ON REQUEST	20% Suspension in Denatured Ethanol + 1% Sodium Acetate
OmniSep A-DEAE Dash Bulk Media		006BM-DD-500	ON REQUEST	ON REQUEST	20% Suspension in Denatured Ethanol
OmniSep A-CM Dash Bulk Media		006BM-DD-500	ON REQUEST	ON REQUEST	20% Suspension in Denatured Ethanol

OmniSep A-Q Dash and a Leading Q Agarose-Based Column Comparison

Two identical columns were used for the evaluation, separation and purification. They were packed in the OmniSep manufacturing facility utilizing OmniFit Benchmark Columns (Part Number – 006BCC-15-15-AF) - 15mm packed to a bed height of 10cm. One column was packed with OmniSep A-Q Dash and the other with a leading Q agarose-based media. When the packing process was completed the columns were run sequentially on an ÄKTA™ [1] using identical conditions:

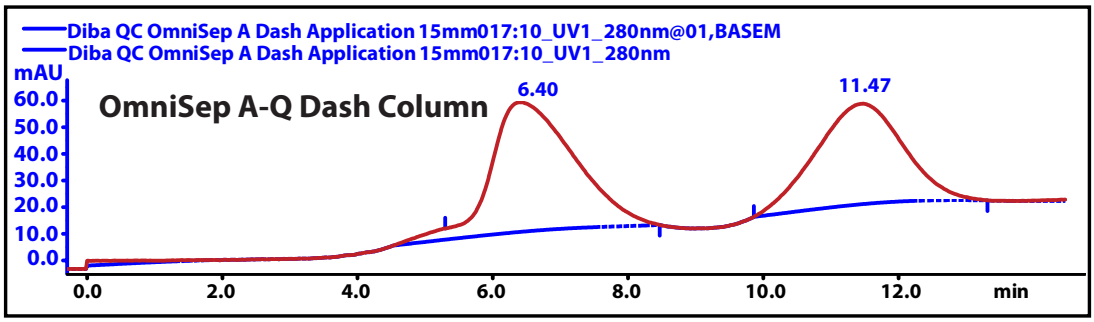


Figure 1: UV chromatogram of glycoprotein samples on an OmniSep A-Q Dash column

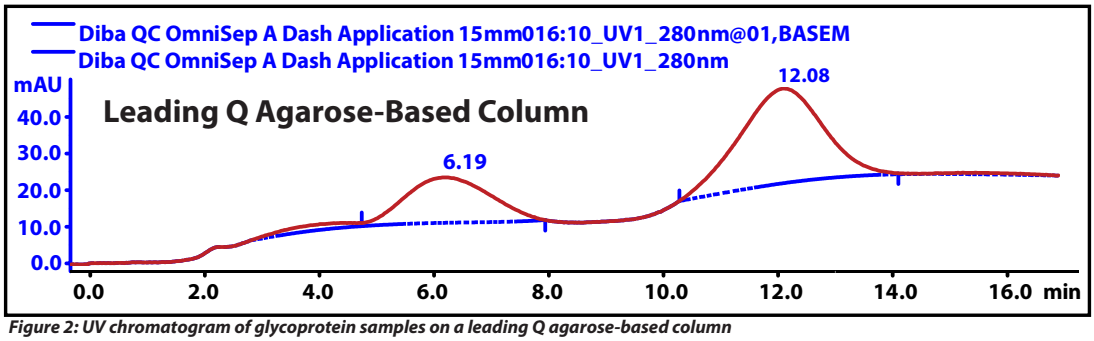


Figure 2: UV chromatogram of glycoprotein samples on a leading Q agarose-based column

Results

Data was collected on the ÄKTA using the ÄKTA Unicorn software version 5.0 and the chromatograms integrated to provide values for N – Column Efficiency in plates per metre, As – Column Asymmetry and Plate Height.

Chromatograms and chromatographic reports from the ÄKTA are included to the left (Fig.1 and Fig.2) and show no significant difference in the separation profiles between the OmniSep A-Q Dash and the leading Q agarose-based columns, with similar retention times, efficiencies and asymmetries.

OmniSep A-SP Dash and a Leading SP Agarose-Based Column Comparison

Two identical columns were used for the evaluation, separation and purification. They were packed in the OmniSep manufacturing facility utilizing OmniFit Benchmark Columns (Part Number – 006BCC-15-15-AF) - 15 x 150mm with one adjustable and one fixed end fitting. These columns have a column volume of ~18mL when packed to a bed height of 10cm. One column was packed with OmniSep A-SP Dash and the other with a leading SP agarose-based media. When the packing process was completed the columns were run sequentially on an ÄKTA using identical conditions:

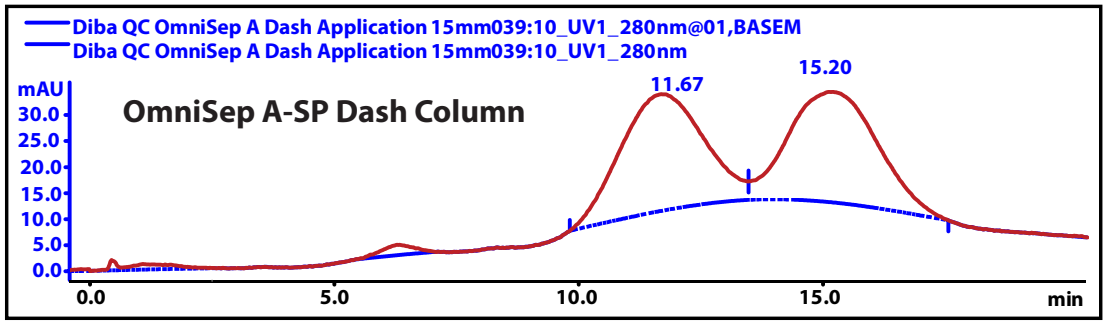


Figure 1: UV chromatogram of Chymotrypsinogen and a Cytochrome C samples on an OmniSep A-SP Dash column

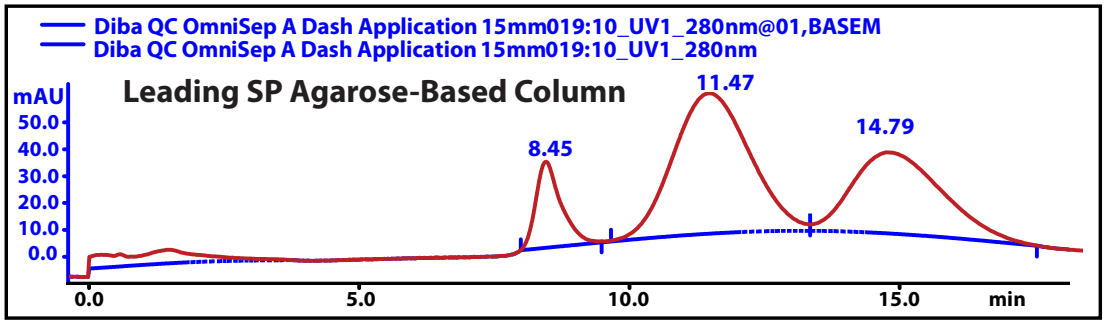


Figure 2: UV chromatogram of Chymotrypsinogen and a Cytochrome C samples on a leading SP agarose-based column

Results

Data was collected on the ÄKTA using the ÄKTA Unicorn software version 5.0 and the chromatograms integrated to provide values for N – Column Efficiency in plates per metre, As – Column Asymmetry and Plate Height.

Chromatograms and chromatographic reports from the ÄKTA are included on the left (Fig. 1 and Fig.2) and show no significant difference in the separation profiles between the OmniSep A-SP Dash and the leading SP agarose-based columns, with similar retention times, efficiencies and asymmetries.

OmniSep A-DEAE Dash and a Leading DEAE Agarose-Based Column Comparison

Two identical columns were used for the evaluation, separation and purification. They were packed in the OmniSep manufacturing facility utilizing OmniFit Benchmark Columns (Part Number – 006BCC-15-15-AF) - 15 x 150mm with one adjustable and one fixed end fitting. These columns have a column volume of ~18mL when packed to a bed height of 10cm. One column was packed with OmniSep A-DEAE Dash and the other with a leading DEAE agarose-based media. When the packing process was completed the columns were run sequentially on an ÄKTA using identical conditions:

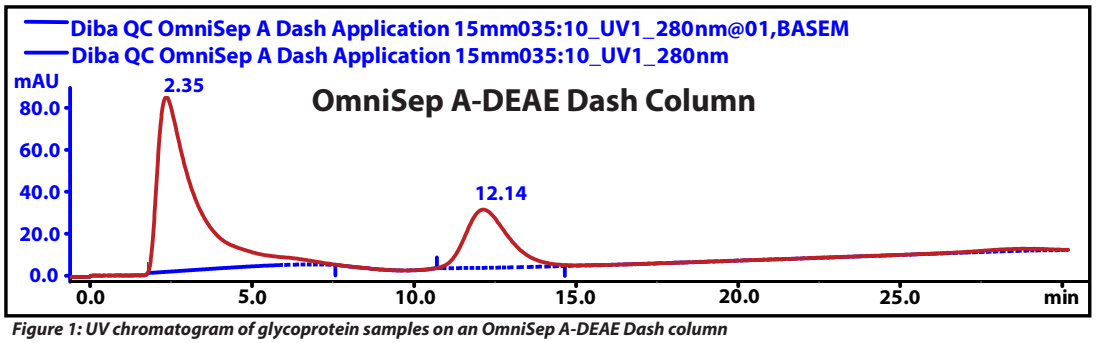


Figure 1: UV chromatogram of glycoprotein samples on an OmniSep A-DEAE Dash column

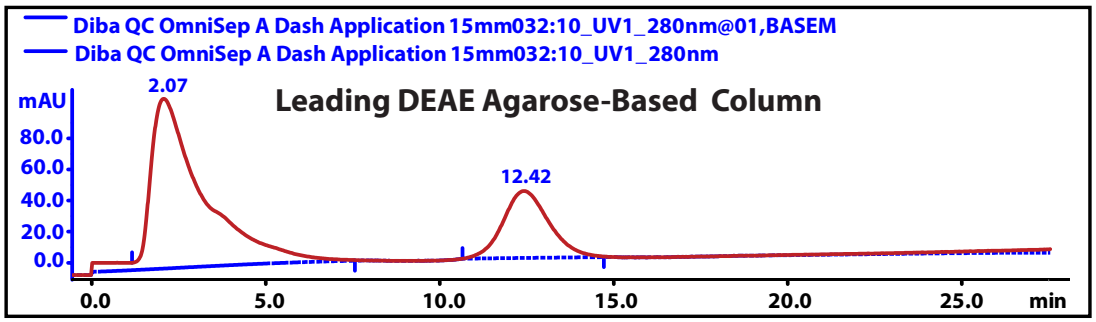


Figure 2: UV chromatogram of glycoprotein samples on a leading DEAE agarose-based column

Results

Data was collected on the ÄKTA using the ÄKTA Unicorn software version 5.0 and the chromatograms integrated to provide values for N – Column Efficiency in plates per metre, As – Column Asymmetry and Plate Height.

Chromatograms and chromatographic reports from the ÄKTA are included to the left (Fig.1 and Fig.2) and show no significant difference in the separation profiles between the OmniSep A-DEAE Dash and the leading DEAE agarose-based columns, with similar retention times, efficiencies and asymmetries.

OmniSep A-CM Dash and a Leading CM Agarose-Based Column Comparison

Two identical columns were used for the evaluation, separation and purification. They were packed in the OmniSep manufacturing facility utilizing OmniFit Benchmark Columns (Part Number – 006BCC-15-15-AF) - 15 x 150mm with one adjustable and one fixed end fitting. These columns have a column volume of ~18mL when packed to a bed height of 10cm. One column was packed with OmniSep A-CM Dash and the other with a leading CM agarose-based media. When the packing process was completed the columns were run sequentially on an ÄKTA using identical conditions:

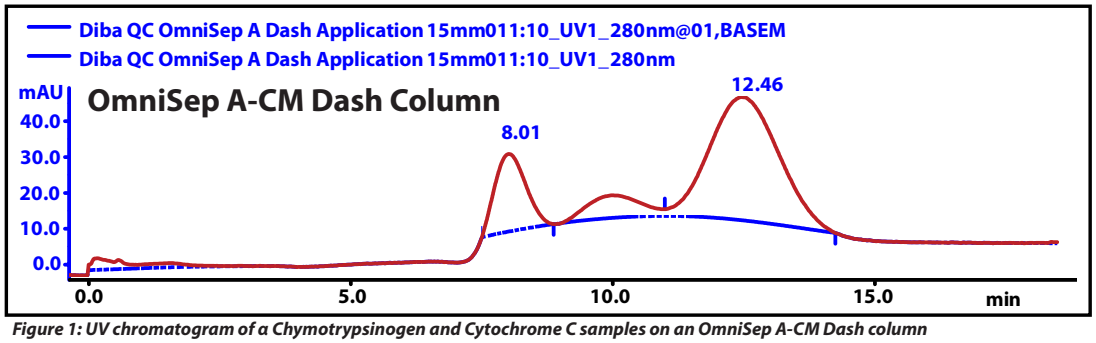


Figure 1: UV chromatogram of a Chymotrypsinogen and Cytochrome C samples on an OmniSep A-CM Dash column

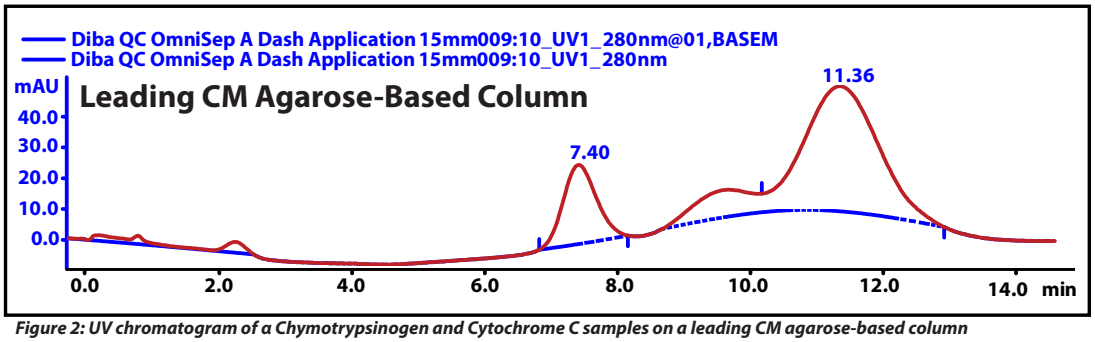


Figure 2: UV chromatogram of a Chymotrypsinogen and Cytochrome C samples on a leading CM agarose-based column

Results

Data was collected on the ÄKTA using the ÄKTA Unicorn software version 5.0 and the chromatograms integrated to provide values for N – Column Efficiency in plates per metre, As – Column Asymmetry and Plate Height.

Chromatograms and chromatographic reports from the ÄKTA are included on the left (Fig. 1 and Fig.2) and show no significant difference in the separation profiles between the OmniSep A-CM Dash and the leading CM agarose-based columns, with similar retention times, efficiencies and asymmetries.

OmniSep HIC Media Types and Specifications

OMNISEP HIC MEDIA TYPES

OMNISEP A-BUTYL DASH	OMNISEP A-OCTYL DASH	OMNISEP A-PHENYL DASH
OmniSep A-Butyl is an agarose-based C4 aliphatic ligand ($-(CH_2)_3-CH_3$) modified media used for separating biomolecules via hydrophobic interaction chromatography (HIC) which is stable in all commonly used aqueous buffers with a working pH range of 3-13. It is a 4% cross-linked semi-rigid agarose bead with forty micromoles of a butyl groups covalently attached per ml of gel producing a media with minimal leaching and no ionic properties. OmniSep A-Butyl provides commercially equivalent performance to the leading butyl agarose-based media.	OmniSep A-Octyl is an agarose-based C8 aliphatic ligand ($-(CH_2)_7-CH_3$) modified media used for separating biomolecules via hydrophobic interaction chromatography (HIC) which is stable in all commonly used aqueous buffers with a working pH range of 3-12. It is a 4% cross-linked semi-rigid agarose bead with forty micromoles of a octyl groups covalently attached per ml of gel producing a media with minimal leaching and no ionic properties. OmniSep A-Octyl provides commercially equivalent performance to the leading octyl agarose-based media.	OmniSep A-Phenyl is an agarose-based phenyl aromatic ligand modified media used for separating biomolecules via hydrophobic interaction chromatography (HIC) which is stable in all commonly used aqueous buffers with a working pH range of 3-12. It is a 6% cross-linked semi-rigid agarose bead with forty micromoles of a phenyl groups covalently attached per ml of gel producing a media with minimal leaching and no ionic properties. OmniSep A-Phenyl provides commercially equivalent performance to the leading phenyl agarose-based media.

OMNISEP HIC MEDIA SPECIFICATIONS

	OMNISEP A-BUTYL DASH	OMNISEP A-OCTYL DASH	OMNISEP A-PHENYL DASH
Bead Geometry:	Spherical	Spherical	Spherical
Bead Structure:	Highly cross-linked agarose	Highly cross-linked agarose	Highly cross-linked agarose
Bead Size Range:	45 -165 micron	45 -165 micron	45 -165 micron
Mean Bead Size (approx):	90 micron	90 micron	90 micron
Thermal Stability (autoclave):	120C for 20 min in H20	120C for 20 min in H20	120C for 20 min in H20
pH Stability (working):	pH 3-13	pH 3-12	pH 3-12
pH Stability (short term i.e. CIP):	pH 2-14	pH 2-14	pH 2-14
Chemical Stability:	Most commonly used aqueous and organic solutions including: 1 M NaOH, 8M Urea, 5M guanidine HCl, 75% ethanol	Most commonly used aqueous and organic solutions including: 1 M NaOH, 8M Urea, 5M guanidine HCl, 75% ethanol	Most commonly used aqueous and organic solutions including: 1 M NaOH, 8M Urea, 5M guanidine HCl, 75% ethanol
Bead Agarose %:	4%	4%	6%
Fractionation Range Exclusion Limit:	3×10^7	3×10^7	3×10^7
Maximum Flow Rate (at 15 cm bed height):	<300 cm/h	<300 cm/h	<300 cm/h
Maximum Pressure (at 15 cm bed height)	>150 kPa	>150 kPa	>150 kPa
Antimicrobial Agent:	20% Ethanol	20% Ethanol	20% Ethanol
Recommended Storage Temperature:	4-30°C	4-30°C	4-30°C
Ligand:	C4 aliphatic ligand $(-(CH_2)_3-CH_3)$	C8 aliphatic ligand $(-(CH_2)_7-CH_3)$	phenyl aromatic
Ligand Density (per ml of media approx):	~40 µmol Butyl	~5 µmol Octyl	~25 µmol Phenyl
Dynamic Binding Capacity (per ml of media approx):	N/A	N/A	N/A

HIC columns are designed to capture and purify bio-pharmaceuticals by separating biomolecules via hydrophobic interaction.

- Exhibit high chemical stability
- Permit standard cleaning-in-place (CIP) protocols
- Can be used interchangeably with commerically available agarose or dextran based media on LPLC equipment such as ÄKTA.

OMNISEP HIC PACKED COLUMN SPECIFICATIONS

OMNISEP A-BUTYL, A-OCTYL AND A-PHENYL DASH PACKED COLUMNS		
	15 MM X 150 MM	**25 MM X 150 MM**
Bed Volume:	17.7 ml	49 ml
Bed Dimensions:	15 mm x 100 mm	25 mm x 100 mm
Column Dimensions:	15 mm x 150 mm	25 mm x 150 mm
Optimum Flow Rate:	3 ml/min	8 ml/min
Flow Rate Range:	2 ml/min - 10 ml/min	2 ml/min - 13 ml/min
Flow Velocity:	<300 cm/h	<300 cm/h
Column Efficiency (N):	>3000 plates per meter	>3000 plates per meter
Column Asymmetry (As):	0.8 - 1.2	0.8 - 1.2
Storage Conditions:	4 to 30°C, 20% Ethanol	4 to 30°C, 20% Ethanol
Maximum Pressure*:	1.5 bar [0.15 MPa] (22psi)**	1.5 bar [0.15 MPa] (22psi)**

**Column packed bed during operation* ***The column packed bed pressure depends on a range of criteria such as the chromatography medium, eluent viscosity and the system/column tubing used*

OMNISEP HIC ORDERING INFORMATION

HIC PACKED COLUMNS							
MEDIA TYPES	**LENGTH**	**6.6 MM ID**	**10 MM ID**	**15 MM ID**	**25 MM ID**	**1 ML**	**5 ML**
OmniSep A-Butyl Dash Packed Column	150 MM			006PCH-1515-BD	006PCH-2515-BD		
OmniSep A-Octyl Dash Packed Column	150 MM			006PCH-1515-OD	006PCH-2515-OD		
OmniSep A-Phenyl Dash Packed Column	150 MM			006PCH-1515-PD	006PCH-2515-PD		

HIC BULK MEDIA					
MEDIA TYPES	**100 ML**	**200 ML**	**1,000 ML**	**10,000 ML**	**PRODUCT DESCRIPTION**
OmniSep A-Butyl Dash Bulk Media		006BM-BD-200	ON REQUEST	ON REQUEST	20% Suspension in Denatured Ethanol
OmniSep A-Octyl Dash Bulk Media		006BM-OD-200	ON REQUEST	ON REQUEST	20% Suspension in Denatured Ethanol
OmniSep A-Phenyl Dash Bulk Media		006BM-PD-200	ON REQUEST	ON REQUEST	20% Suspension in Denatured Ethanol

OmniSep A-Butyl Dash and a Leading Butyl Agarose-Based Column Comparison

Two identical columns were used for the evaluation, separation and purification. They were packed in the OmniSep manufacturing facility utilizing OmniFit Benchmark Columns (Part Number – 006BCC-15-15-AF) - 15 x 150mm with one adjustable and one fixed end fitting. These columns have a column volume of ~18mL when packed to a bed height of 10cm. One column was packed with OmniSep A- Butyl Dash and the other with a leading butyl agarose-based media. When the packing process was completed the columns were run sequentially on an ÄKTA using identical conditions:

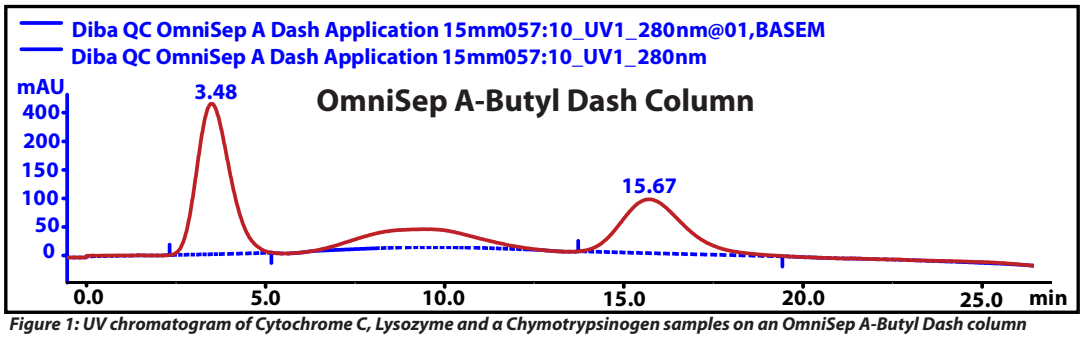


Figure 1: UV chromatogram of Cytochrome C, Lysozyme and a Chymotrypsinogen samples on an OmniSep A-Butyl Dash column

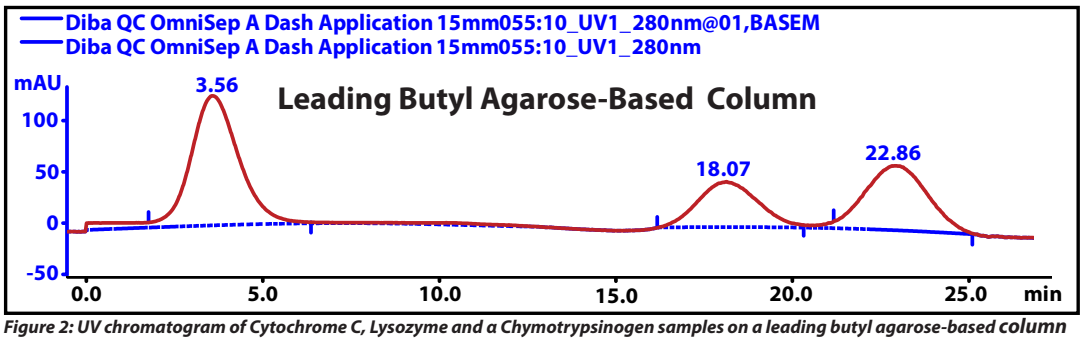


Figure 2: UV chromatogram of Cytochrome C, Lysozyme and a Chymotrypsinogen samples on a leading butyl agarose-based column

Results

Data was collected on the ÄKTA using the ÄKTA Unicorn software version 5.0 and the chromatograms integrated to provide values for N – Column Efficiency in plates per metre, As – Column Asymmetry and Plate Height.

Chromatograms and chromatographic reports from the ÄKTA are included on the left (Fig. 1 and Fig.2) and show no significant difference in the separation profiles and elution order between the OmniSep A-Butyl Dash and the leading butyl agarose-based columns, efficiencies and asymmetries.

OmniSep A-Octyl Dash and a Leading Octyl Agarose-Based Column Comparison

Two identical columns were used for the evaluation, separation and purification. They were packed in the OmniSep manufacturing facility utilizing OmniFit Benchmark Columns (Part Number – 006BCC-15-15-AF) - 15 x 150mm with one adjustable and one fixed end fitting. These columns have a column volume of ~18mL when packed to a bed height of 10cm. One column was packed with OmniSep A- Octyl Dash and the other with a leading octyl agarose-based media. When the packing process was completed the columns were run sequentially on an ÄKTA using identical conditions:

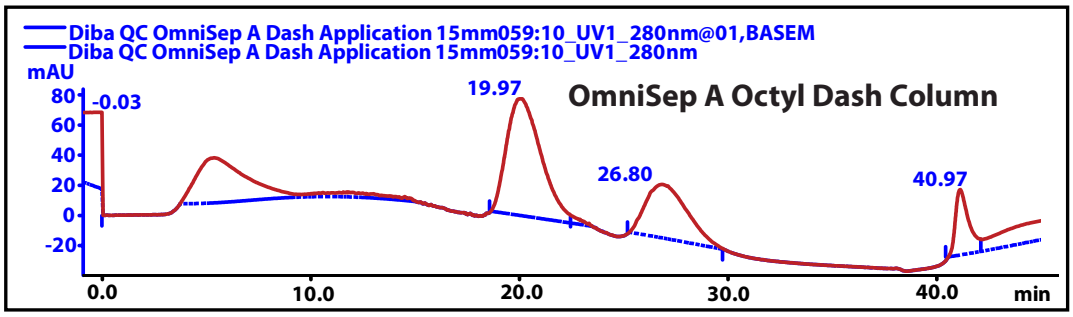


Figure 1: UV chromatogram of Cytochrome C, Lysozyme and a Chymotrypsinogen samples on an OmniSep A-Octyl Dash column

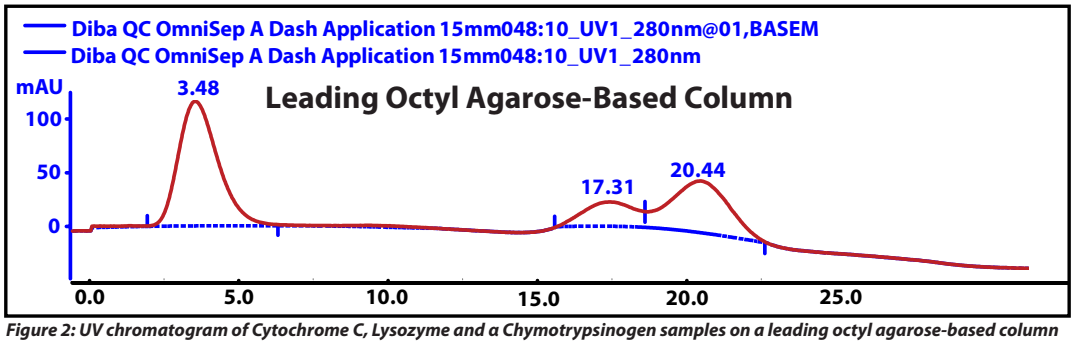


Figure 2: UV chromatogram of Cytochrome C, Lysozyme and a Chymotrypsinogen samples on a leading octyl agarose-based column

Results

Data was collected on the ÄKTA using the ÄKTA Unicorn software version 5.0 and the chromatograms integrated to provide values for N – Column Efficiency in plates per metre, As – Column Asymmetry and Plate Height.

Chromatograms and chromatographic reports from the ÄKTA are included on the left (Fig. 1 and Fig.2) and show no significant difference in the separation profiles between the OmniSep A-Octyl Dash and the leading octyl agarose-based media columns, with similar retention times, efficiencies and asymmetries.

OmniSep A-Phenyl Dash and a Leading Octyl Phenyl Agarose-Based Column Comparison

For the comparison of OmniSep A-Phenyl Dash and a leading phenyl agarose-based media, the sample purified was a mixture of Cytochrome C, Lysozyme and α-Chymotrypsinogen.

Cytochrome C proteins are found loosely associated with the inner membrane of the mitochondrion. Cytochrome C is a small (molecular weight about 12,000 Dalton's), highly soluble protein, unlike other cytochromes, with a solubility of about 100 g/L and is an essential component of the electron transport chain, where it carries one electron. It is capable of undergoing oxidation and reduction, but does not bind oxygen.

Cytochrome C is a highly conserved protein across many species, found in animals, plants, and many unicellular organisms. Its structure consists of a chain of 100 amino acids. The Cytochrome C molecule has been studied in evolutionary biology; its amino acid sequence is conserved in mammals differing by only a few residues. For example, the sequences of cytochrome c in humans are identical to that of chimpanzees (our closest relatives).

Lysozyme, also known as muramidase is a glycoside hydrolase enzyme that damages bacterial cell walls. Lysozyme is present in a number of secretions, such as tears, saliva, human milk, and mucus and large amounts of lysozyme can be found in hen egg white.

Chymotrypsinogen is a proteolytic enzyme and is a precursor of chymotrypsin a digestive enzyme. It is constructed of a single polypeptide chain consisting of 245 amino acid residues and is synthesized in the cells of the pancreas and stored. The cell when stimulated by either a hormonal signal or a nerve impulse empties the stored contents into a duct leading into the duodenum. Chymotrypsinogen must be inactive until it gets to the digestive tract. This prevents damage to the pancreas and other organs.

Two identical columns were used for the evaluation, separation and purification. They were packed in the OmniSep manufacturing facility utilizing OmniFit Benchmark Columns (Part Number – 006BCC-15-15-AF) - 15 x 150mm with one adjustable and one fixed end fitting. These columns have a column volume of ~18mL when packed to a bed height of 10cm. One column was packed with OmniSep A- Phenyl Dash and the other with a leading phenyl agarose-based media. When the packing process was completed the columns were run sequentially on an ÄKTA using identical conditions:

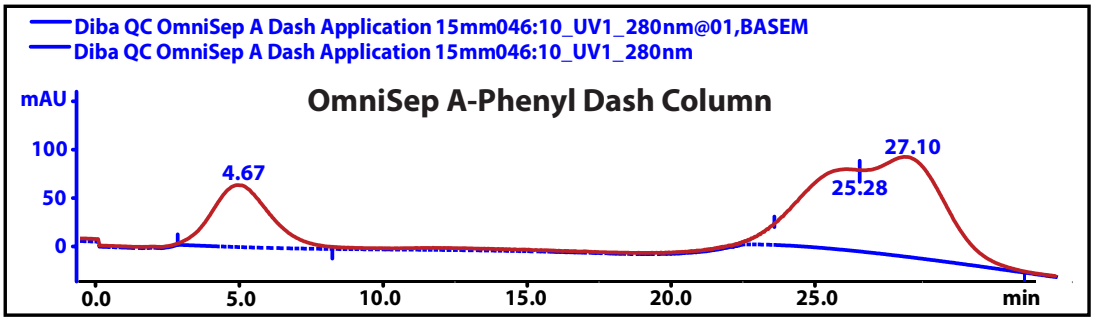


Figure 1: UV chromatogram of Cytochrome C, Lysozyme and a Chymotrypsinogen samples on an OmniSep A-Phenyl Dash column

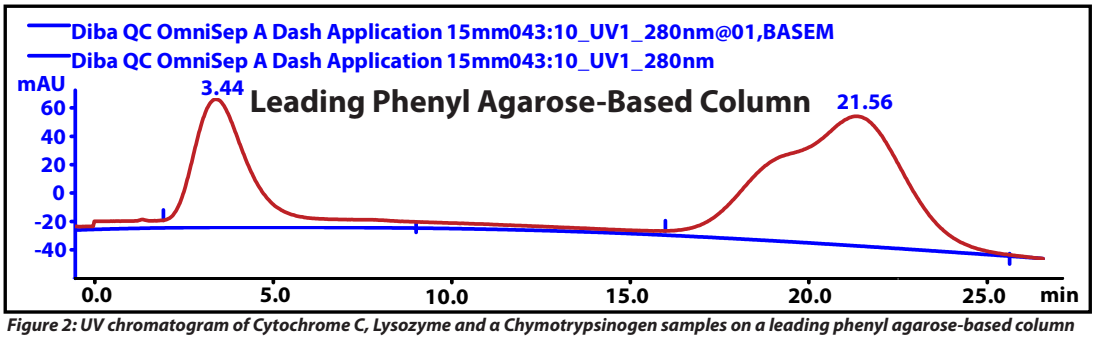


Figure 2: UV chromatogram of Cytochrome C, Lysozyme and a Chymotrypsinogen samples on a leading phenyl agarose-based column

Results

Data was collected on the ÄKTA using the ÄKTA Unicorn software version 5.0 and the chromatograms integrated to provide values for N – Column Efficiency in plates per metre, As – Column Asymmetry and Plate Height.

Chromatograms and chromatographic reports from the ÄKTA are included on the left (Fig. 1 and Fig.2) and show no significant difference in the separation profiles and elution order between the OmniSep A-Phenyl Dash and the keading phenyl agarose-based columns, efficiencies and asymmetries.

OmniSep AFFINITY Media Type and Specifications

OMNISEP AFFINITY MEDIA TYPE

OMNISEP A-Ni DASH

OmniSep A-Ni Dash is an agarose-based media derivatized with Iminodiacetic acid (IDA) and loaded with divalent nickel ions Ni^{2+}. The nickel ions separate histidine-tagged proteins via immobilized metal chelate affinity chromatography (IMAC) which is stable in all commonly used aqueous buffers with a working pH range of 3-13 (for Ni^{2+} stripped media). It is a 6% cross-linked semi-rigid agarose bead with ~15 µmol Ni^{2+} groups loaded per ml of gel with little Ni leaching. OmniSep™ A-Ni provides commercially equivalent performance to the leading nickel agarose-based media.

Affinity columns are designed to capture and purify bio-pharmaceuticals by separating biomolecules via affinity (key matching) chromatography.

- Exhibit high chemical stability
- Permit standard cleaning-in-place (CIP) protocols
- Can be used interchangeably with commerically available agarose or dextran based media on LPLC equipment such as ÄKTA.

OMNISEP AFFINITY MEDIA SPECIFICATIONS

OMNISEP A-Ni DASH	
Bead Geometry:	Spherical
Bead Structure:	Highly cross-linked agarose
Bead Size Range:	20 -50 micron
Mean Bead Size (approx):	35 micron
Thermal Stability (autoclave):	120^{C} for 20 min in H_20
pH Stability (working):	pH 2-12
pH Stability (short term i.e. CIP):	pH 3-13 for Ni^{2+} stripped media
Chemical Stability:	Most commonly used aqueous and organic solutions including: 1 M NaOH, 8M Urea, 5M guanidine HCl, 75% ethanol
Bead Agarose %:	6%
Fractionation Range Exclusion Limit:	$4x10^6$
Maximum Flow Rate (at 15 cm bed height):	<300 cm/h
Maximum Pressure (at 15 cm bed height):	>300 kPa
Antimicrobial Agent:	20% Ethanol
Recommended Storage Temperature:	4-30^{o}C
Ligand:	Iminodiacetic acid (IDA) loaded with Ni^{2+}
Ligand Density (per ml of media approx):	~15 µmol Ni^{2+}
Dynamic Binding Capacity (per ml of media approx):	110 mg DHAK-(6x His) DHAK=Dehydroxyacetone kinase (6x His)

OMNISEP AFFINITY PACKED COLUMN SPECIFICATIONS

OMNISEP A-NI DASH				
	6.6 MM x 150 MM	**15 MM x 150 MM**	**7 MM x 25 MM**	**16 MM x 25 MM**
Bed Volume:	3.4 ml	17.7 ml	1 ml	5 ml
Bed Dimensions:	6.6 mm x 100 mm	15 mm x 100 mm	7 mm x 25 mm	16 mm x 25 mm
Column Dimensions:	6.6 mm x 150 mm	15 mm x 150 mm	7 mm x 25 mm	16mm x 25 mm
Optimum Flow Rate:	30 - 300 cm/hr	30 - 300 cm/hr	1 ml/min	5 ml/min
Flow Rate Range:	30 -450 cm/hr	>10 ml/min	<4 ml/min	<20 ml/min
Flow Velocity	<450 cm/h	<450 cm/h	>15 cm/h	>15 cm/h
Column Efficiency (N)	>3000 plates per meter	>3000 plates per meter	N/A	N/A
Column Asymmetry (As)	0.8 - 1.2	0.8 - 1.2	0.8 - 1.2	0.8 - 1.2
Storage Conditions	4 to 30°C, 20% Ethanol	4 to 30°C, 20% Ethanol	4 to 30°C, 20% Ethanol	4 to 30°C, 20% Ethanol
Maximum Pressure*	3 bar [0.3 MPa] (42psi)	3 bar [0.3 MPa] (42psi)	3 bar [0.3 MPa] (42psi)	3 bar [0.3 MPa] (42psi)

**Column packed bed during operation* ***The column packed bed pressure depends on a range of criteria such as the chromatography medium, eluent viscosity and the system/column tubing used*

OMNISEP AFFINITY ORDERING INFORMATION

AFFINITY PACKED COLUMNS							
MEDIA TYPE	**LENGTH**	**6.6 MM ID**	**10 MM ID**	**15 MM ID**	**25 MM ID**	**1 ML - 5 PACK**	**5 ML - 5 PACK**
OmniSep A-Ni Dash Packed Column	150 MM	006PCA-0615-NI		006PCA-1515-NI			
OmniSep A-Ni Dash Packed Columns - 5 Pack	63 MM					006PCA-1ML-NI	006PCA-5ML-NI

AFFINITY BULK MEDIA					
MEDIA TYPE	**100 ML**	**200 ML**	**1,000 ML**	**10,000 ML**	**PRODUCT DESCRIPTION**
OmniSep A-Ni Dash Bulk Media	006BM-NI-100	ON REQUEST	ON REQUEST	ON REQUEST	20% Suspension in Denatured Ethanol

OmniSep A-Ni Dash and a Leading Nickel Agarose-Based Column Comparison

Testing conditions were employed for both the OmniSep A-Dash Ni 5ml and a leading nickel agarose-based 5ml column. Two (2) 5 ml columns were attached together to operate in tandem. Binding buffer A: 20 mM Tris, 500 mM NaCl, 20 mM imidazole, pH 7.5. Elution buffer B: 20 mM Tris, 500 mM NaCl, 500 mM imidazole, pH 7.5 All purifications were performed using either an Akta PrimePlus or an Akta Purifier10.

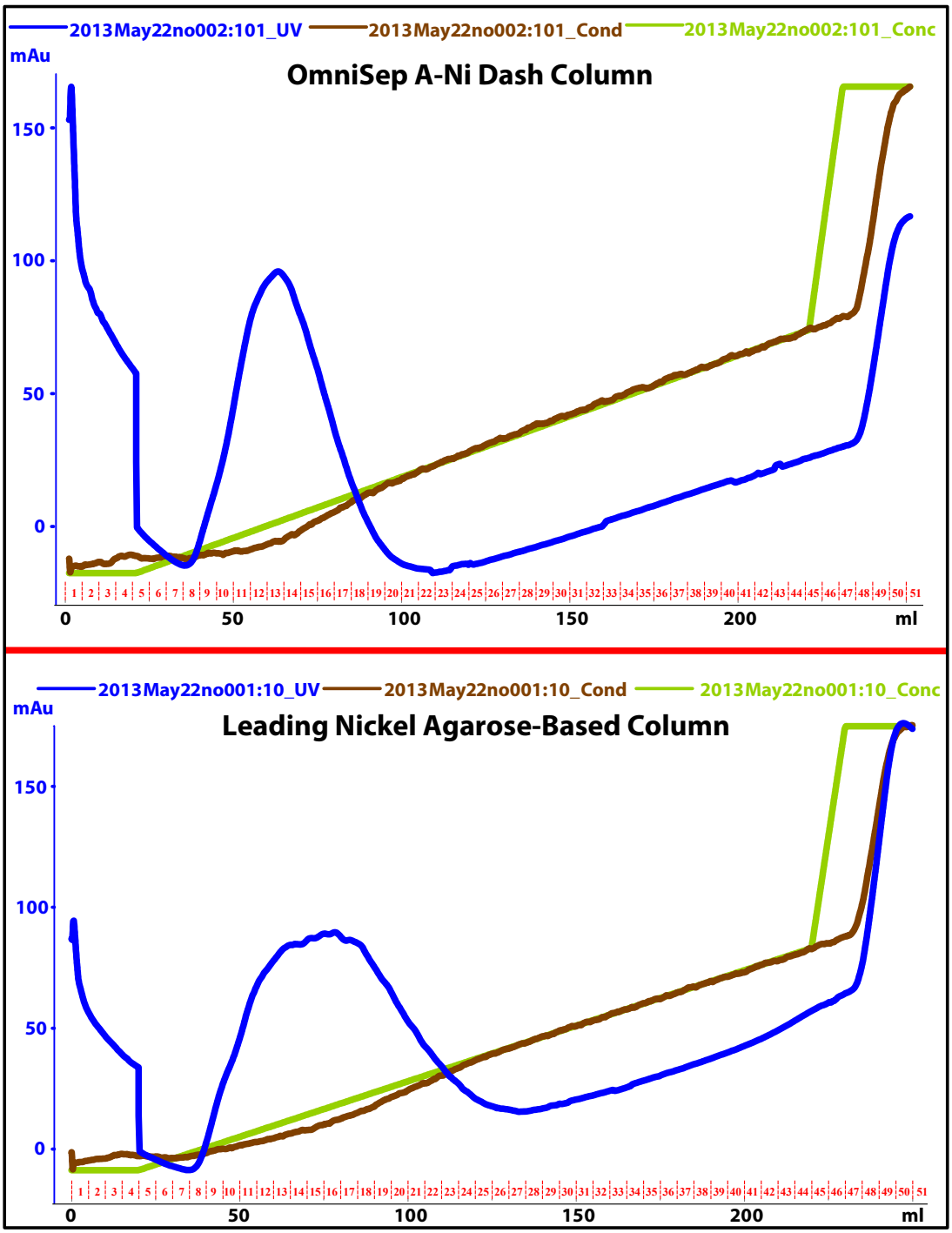


Figure 3. Comparison Chromatograms for the purification of Protein 9 on a 5ml OmniSep A-Ni Dash column (top) and a 5ml leading nickel agarose-based column (bottom).

Results

Chromatograms and chromatographic reports from the ÄKTA are included on the left (Fig. 1 and Fig.2) and show It can be seen that equivalent separations for all proteins are obtained for the OmniSep A-Ni Dash columns and the leading nickel agarose-based columns. In some cases from a chromatographic perspective the separations on the OmniSep columns is superior, eluting as a sharper peak in a smaller volume.

OmniSep Specifications and Ordering Charts For All Media Types

OMNISEP COMPLETE MEDIA SPECIFICATIONS CHART

	IEX Media				HIC Media		
	OmniSep A-Q Dash	**OmniSep A-SP Dash**	**OmniSep A-DEAE Dash**	**OmniSep A-CM Dash**	**OmniSep A-Butyl Dash**	**OmniSep A-Octyl Dash**	**OmniSep A-Phenyl Dash**
Bead Geometry:	Spherical	Spherical	Spherical	Spherical	Spherical	Spherical	Spherical
Bead Structure:	Highly cross-linked agarose	Highly cross-linked agarose	Highly cross-linked agarose	Highly cross-linked agarose	Highly cross-linked agarose	Highly cross-linked agarose	Highly cross-linked agarose
Bead Size Range:	45 -165 micron	45 -165 micron	45 -165 micron	45 -165 micron	45 -165 micron	45 -165 micron	45 -165 micron
Mean Bead Size (approx):	90 micron	90 micron	90 micron	90 micron	90 micron	90 micron	90 micron
Thermal Stability (autoclave):	120^{o}C for 20 minutes in H_20	120^{o}C for 20 minutes in H_20	120^{o}C for 20 minutes in H_20	120^{o}C for 20 minutes in H_20	120^{o}C for 20 minutes in H_20	120^{o}C for 20 minutes in H_20	120^{o}C for 20 min-utes in H_20
pH Stability (working):	pH 2-12	pH 2-12	pH 2-12	pH 2-12	pH 3-13	pH 3-12	pH 3-12
Ph Stability (short term i.e. CIP):	pH 2-14	pH 2-13	pH 2-12	pH 2-13	pH 2-14	pH 2-14	pH 2-14
Chemical Stability:	Most commonly used aqueous and organic solutions including: 1 M NaOH, 8M Urea, 5M guanidine HCl, 75% ethanol	Most commonly used aqueous and organic solutions including: 1 M NaOH, 8M Urea, 5M guanidine HCl, 75% ethanol	Most commonly used aqueous and organic solutions including: 1 M NaOH, 8M Urea, 5M guanidine HCl, 75% ethanol	Most commonly used aqueous and organic solutions including: 1 M NaOH, 8M Urea, 5M guanidine HCl, 75% ethanol	Most commonly used aqueous and organic solutions including: 1 M NaOH, 8M Urea, 5M guanidine HCl, 75% ethanol	Most commonly used aqueous and organic solutions including: 1 M NaOH, 8M Urea, 5M guanidine HCl, 75% ethanol	Most commonly used aqueous and organic solutions including: 1 M NaOH, 8M Urea, 5M guanidine HCl, 75% ethanol
Bead Agarose %:	4%	4%	4%	4%	4%	4%	6%
Fractionation Range Exclusion Limit:	$3x10^7$	$3x10^7$	$3x10^7$	$3x10^7$	$3x10^7$	$3x10^7$	$4x10^6$
Maximum Flow Rate (at 15 cm bed height):	<300 cm/h	<300 cm/h	<300 cm/h	<300 cm/h	<300 cm/h	<300 cm/h	<300 cm/h
Maximum Pressure (at 15 cm bed height):	>150 kPa	>150 kPa	>150 kPa	>150 kPa	>150 kPa	>150 kPa	>150 kPa
Antimicrobial Agent:	20% Ethanol	20% Ethanol	20% Ethanol	20% Ethanol	20% Ethanol	20% Ethanol	20% Ethanol
Recommended Storage Temp:	4-30°C	4-30°C	4-30°C	4-30°C	4-30°C	4-30°C	4-30°C
Ligand:	quater-nary amine ($-N^+(CH_3)_3$)	propyl sulphonic acid ($-CH_2CH_2CH_2SO_3^-$)	diethyl-aminoethyl ($-N^+(C_2H_5)_2H$)	carboxy methyl ($-O-CH_2COO^-$)	C4 aliphatic ligand ($-(CH_2)_3-CH_3$)	C8 aliphatic ligand ($-(CH_2)_7-CH_3$)	phenyl aromatic
Ligand Density (per ml of media approx):	~0.20 mmol Cl-	~0.20 mmol H+	~0.15 mmol Cl-	~0.11 mmol H+	~40 µmol Butyl	~5 µmol Octyl	~25 µmol Phenyl
Dynamic Binding Capacity (per ml of media approx):	>72mg/ml (HSA) HAS=Human Serum Albumin	> 95mg/ml (lysozyme)	>72mg/ml (HSA) HAS=Human Serum Albumin	> 95mg/ml (lysozyme)	N/A	N/A	N/A

	AFFINITY Media	SEC Media			
	OmniSep A-Ni Dash	**OmniSep A-4 Dash**	**OmniSep A-6 Dash**	**OmniSep D-25**	**OmniSep D-50**
	Spherical	Spherical	Spherical	Spherical	Spherical
	Highly cross-linked agarose	Highly cross-linked agarose	Highly cross-linked agarose	Highly cross-linked dextran	Highly cross-linked dextran
	20 -50 micron	45 -165 micron	45 -165 micron	20–80 micron (dry)	20–80 micron (dry)
	35 micron	90 micron	90 micron	50 micron	50 micron
	120°C for 20 minutes in H_20	120°C for 20 minutes in H_20	120°C for 20 minutes in H_20	121°C for 30 minutes at pH7	121°C for 30 minutes at pH7
	pH 2-12	pH 3.8-13	pH 3.8-13	pH 2-13	pH 2-13
	pH 3-13 for Ni^{2+} stripped media	pH 1.8-14	pH 1.8-14	pH 2-13	pH 2-13
	Most commonly used aqueous and organic solutions including: 1 M NaOH, 8M Urea, 5M guanidine HCl, 75% ethanol	Most commonly used aqueous and organic solutions including: 1 M NaOH, 8M Urea, 5M guanidine HCl, 75% ethanol	Most commonly used aqueous and organic solutions including: 1 M NaOH, 8M Urea, 5M guanidine HCl, 75% ethanol	Most commonly used buffers including: 0.2M NaOH, 0.2M HCl, 1M Acetic Acid, 1% SOS, 8M Urea, 6M guanidine HCl, 24% ethanol, 30% propanol, 30% acetonitrile	Most commonly used buffers including: 0.2M NaOH, 0.2M HCl, 1M Acetic Acid, 1% SOS, 8M Urea, 6M guanidine HCl, 24% ethanol, 30% propanol, 30% acetonitrile
	6%	4%	6%	N/A	N/A
	$4x10^6$	$4x10^4$ to $3x10^7$	$1x10^4$ to $4x10^6$	5 kD for proteins and 10 bp for nucleic acids	25 kD for proteins and 20 bp for nucleic acids
	<300 cm/h	<500 cm/h	<1,000 cm/h	<450 cm/h	<450 cm/h
	>300 kPa	>150 kPa	>150 kPa	>300 kPa	>300 kPa
	20% Ethanol	20% Ethanol	20% Ethanol	None - Supplied as Dry Powder	None - Supplied as Dry Powder
	4-30°C	4-30°C	4-30°C	Ambient	Ambient
	Iminodiacetic acid (IDA) loaded with Ni^{2+}	N/A	N/A	N/A	N/A
	~15 µmol Ni^{2+}	N/A	N/A	N/A	N/A
	110 mg DHAK-(6x His) DHAK=Dehydroxyacetone kinase (6x His)	N/A	N/A	N/A	N/A

OmniSep A-Ni Dash, a nickel chelating media used for affinity separations, is sold in standard 100 ml packages.

OmniSep A-SP Dash media is used for purification via strong cation exchange. It is sold in 500 ml packages, as are the other media for weak cation and strong or weak anion exchange.

OMNISEP PACKED COLUMN ORDERING INFORMATION

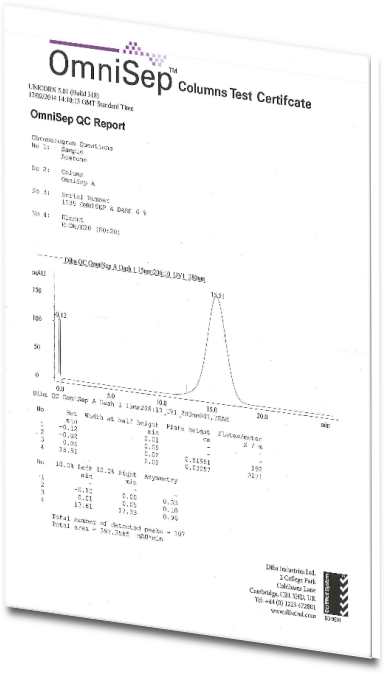
MEDIA TYPE		LENGTH	PART NUMBERS					
			PACKED COLUMN SIZE					
			6.6 MM ID	10 MM ID	15 MM ID	25 MM ID	1 ML - 4 PACK	5 ML - 4 PACK
IEX	OmniSep A-Q Dash	150 MM			006PCI-1515-QD			
IEX	OmniSep A-SP Dash	150 MM			006PCI-1515-SD			
IEX	OmniSep A-DEAE Dash	150 MM			006PCI-1515-DD			
IEX	OmniSep A-CM Dash	150 MM			006PCI-1515-CD			
IEX	OmniSep IEX Scout Column Kit - includes one column each of all 4 IEX media	63 MM						006PCK-5ML-IEX
			PACKED COLUMN SIZE					
			6.6 MM ID	10 MM ID	15 MM ID	25 MM ID	1 ML	5 ML
HIC	OmniSep A-Butyl Dash	150 MM			006PCH-1515-BD	006PCH-2515-BD		
HIC	OmniSep A-Octyl Dash	150 MM			006PCH-1515-OD	006PCH-2515-OD		
HIC	OmniSep A-Phenyl Dash	150 MM			006PCH-1515-PD	006PCH-2515-PD		
			PACKED COLUMN SIZE					
			6.6 MM ID	10 MM ID	15 MM ID	25 MM ID	1 ML - 5 PACK	5 ML - 5 PACK
Affinity	OmniSep A-Ni Dash	150 MM	006PCA-0615-NI		006PCA-1515-NI			
Affinity	OmniSep A-Ni Dash - 5 Pack	63 MM					006PCA-1ML-NI	006PCA-5ML-NI
			PACKED COLUMN SIZE					
			6.6 MM ID	10 MM ID	15 MM ID	25 MM ID	1 ML - 5 PACK	5 ML - 5 PACK
SEC	OmniSep A-4 Dash	400 MM		006PCS-1040-A4				
SEC	OmniSep A-4 Dash	150 MM			006PCS-1515-A4			
SEC	OmniSep A-6 Dash	400 MM		006PCS-1040-A6				
SEC	OmniSep A-6 Dash	150 MM			006PCS-1515-A6			
SEC	OmniSep D-25	150 MM				006PCS-2515-D25		
SEC	OmniSep D-25 - 5 Pack	63 MM					006PCS-1ML-D25	006PCS-5ML-D25
SEC	OmniSep D-50	150 MM				006PCS-2515-D50		
SEC	OmniSep D-50 - 5 Pack	63 MM					006PCS-1ML-D50	006PCS-5ML-D50

OMNISEP BULK MEDIA ORDERING INFORMATION

MEDIA TYPE		PART NUMBERS				PRODUCT DESCRIPTION
		← BULK MEDIA PACK SIZE →				
		100 ML	500 ML	1,000 ML	10,000 ML	
IEX	OmniSep A-Q Dash Bulk Media		006BM-QD-500	ON REQUEST	ON REQUEST	20% Suspension in Denatured Ethanol
IEX	OmniSep A-SP Dash Bulk Media		006BM-SD-500	ON REQUEST	ON REQUEST	20% Suspension in Denatured Ethanol + 1% Sodium Acetate
IEX	Omnisep A-DEAE Dash Bulk Media		006BM-DD-500	ON REQUEST	ON REQUEST	20% Suspension in Denatured Ethanol
IEX	OmniSep A-CM Dash Bulk Media		006BM-CD-500	ON REQUEST	ON REQUEST	20% Suspension in Denatured Ethanol
		← BULK MEDIA PACK SIZE →				
		100 ML	200 ML	1,000 ML	10,000 ML	
HIC	OmniSep A Butyl Dash Bulk Media		006BM-BD-200	ON REQUEST	ON REQUEST	20% Suspension in Denatured Ethanol
HIC	OmniSep A Octyl Dash Bulk Media		006BM-OD-200	ON REQUEST	ON REQUEST	20% Suspension in Denatured Ethanol
HIC	OmniSep A Phenyl Dash Bulk Media		006BM-PD-200	ON REQUEST	ON REQUEST	20% Suspension in Denatured Ethanol
		← BULK MEDIA PACK SIZE →				
		100 ML	200 ML	1,000 ML	10,000 ML	
Affinity	OmniSep A-Ni Dash Bulk Media	006BM-NI-100	ON REQUEST	ON REQUEST	ON REQUEST	20% Suspension in Denatured Ethanol
		← BULK MEDIA PACK SIZE →				
		100 ML	200 ML	1,000 ML	10,000 ML	
SEC	OmniSep A-4 Dash Bulk Media		006BM-A4-200	006BM-A4-1L	ON REQUEST	20% Suspension in Denatured Ethanol
SEC	OmniSep A-6 Dash Bulk Media		006BM-A6-200	006BM-A6-1L	ON REQUEST	20% Suspension in Denatured Ethanol
		100 GM	200 GM	1,000 GM	10,000 GM	
SEC	OmniSep D-25 Bulk Media	006BM-D25-100	ON REQUEST	ON REQUEST	ON REQUEST	Dry Powder
SEC	OmniSep D-50 Bulk Media	006BM-D50-100	ON REQUEST	ON REQUEST	ON REQUEST	Dry Powder

Quality Certification

OmniSep packed columns are tested and certified by media lot or individually by column for a modest additional fee. The test consists of injecting 200 ml of a test sample onto the column. The chromatogram produced by the test sample is then measured for efficiency and asymmetry. The results are compared against defined performance specifications. A QC certificate is included with each column shipment. Batch-tested columns are the standard offering; if your application requires individual column certification, please specify this at the time of ordering.



Omnifit Labware BenchMark Columns

All OmniSep packed columns are outfitted with Omnifit BenchMark columns, designed to suit the majority of chromatography applications. They are chosen a the best material fit for packing with OmniSep media. They are ideal for aqueous systems and compatible with solvents used in common liquid chromatography applications such as protein purification.

BENCHMARK COLUMNS SPECIFICATIONS

OPERATING PARAMETERS	
Operating Temperature:	4-20°C
pH Stability:	1-14
Chemical Stability:	Resistant to aqueous solutions and most solvents used in liquid chromatography. Not resistant to acetone, ketones, chlorinated hydrocarbons, aliphatic esters, phenol, > 10% NaOH, > 10% HCl, > 5% acetic acid, or strong mineral acid

MATERIALS	
Glass Column:	Borosilicate glass
Endpiece:	PTFE
Frit (bed support):	PE
O-Ring:	FKM/FPM
Adjusting Nut:	Acetal
Retaining Cap:	Acetal
Connection Cap:	Glass-filled polypropylene
Fitting Nuts:	Glass-filled polypropylene

OPERATING PRESSURES	
6.6mm	900 psi (60 bar)
10mm	600 psi (40 bar)
15mm	300 psi (20 bar)
25mm	200 psi (20 bar)
35mm	150 psi (10 bar)
50mm	100 psi (6.7 bar)

Polypropylene connection cap – accepts ¼"-28 UNF threaded fittings to connect column in-line.

Acetal Adjusting nut - enables fine adjustment of plunger in situ.

Acetal Retaining nut – screws onto glass threads to secure endpiece.

Glass column – precision bore gives consistent bed width and ground glass threads provide secure attachment of endpiece to column.

FKM/FPM O-rings – provides additional seal.

PTFE endpiece – makes primary seal to glass and has distribution pattern to give even application of sample across bed surface. A PE frit provides bed support.

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