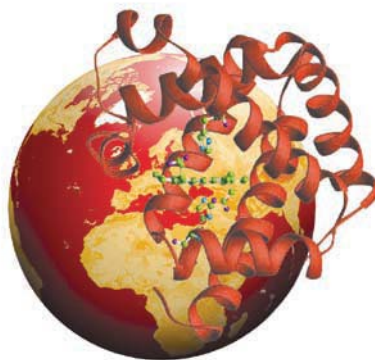


by Teknokroma
Europa[®]



Introduction

Teknokroma introduces in the market the new line of **Europa HPLC columns**.

After the versatility of our popular **mediterranea™ Sea 18** column that enables you to deal successfully with the immense variety of separations in the fields of pharmaceuticals, life sciences, environment, foods, etc. Teknokroma has focused all its efforts and all its know-how, accumulated through more than 30 years of chromatographic research and development, in offering the best reverse phase HPLC packing for identification and purification of peptides and protein compounds.

Manufactured using novel proprietary technologies, analytical and preparative Europa columns are simply the best reverse phase columns available today.

As a result of these, we launch into the market the Line of Europa HPLC columns, one of the best columns in the field of analysis of biomolecules.

The Europa HPLC columns for peptides and proteins, provide the best performance and unsurpassed efficiency, reliability and reproducibility.

There is still a consensus that the best material to use as chromatographic packing continues to be silica. The particles of silica material are physically resistant, enable multiple functions, present maximum levels of efficiency and are also compatible with practically all solvents.

Teknokroma has dedicated years of research and development in obtaining the best silica particle on the market. The silica particle on which the Europa columns is based is the result of an optimisation process, starting with extremely pure materials with unusually low metal content, and obtaining a perfectly spherical, rigid and inert particle.

Furthermore, the proprietary “porification process” (Surface Enhanced Accessibility, SEA) for Europa silica has achieved high surface area without sacrificing important properties like physical resistance and high loading capacity- making it ideal for preparative-scale processing.

In addition, the Surface Enhanced Accessibility manufacturing process creates a porous structure that ensures maximum transfer speeds for solutes between the stationary and mobile phases-resulting in higher separation efficiency.

Our “Ultra-Fast” Europa columns are made in 3-5 cm length in order to get quick analytical results, whereas the “High Efficiency” columns are normally in 15-25 cm lengths to obtain best resolution.

The Teknokroma Europa Columns are uniquely designed with optimized pore size distribution; 120Å for Peptide and 300Å for the Protein Columns.

Europa columns are available for:

Peptides: Europa C18 with 0.21, 0.30, 0.40, 0.46, 0.78, 1.0 and 2.12 cm.

Proteins: Europa C18, C8 and C4 with 0.21, 0.30, 0.40, 0.46, 0.78, and 2.12 cm.

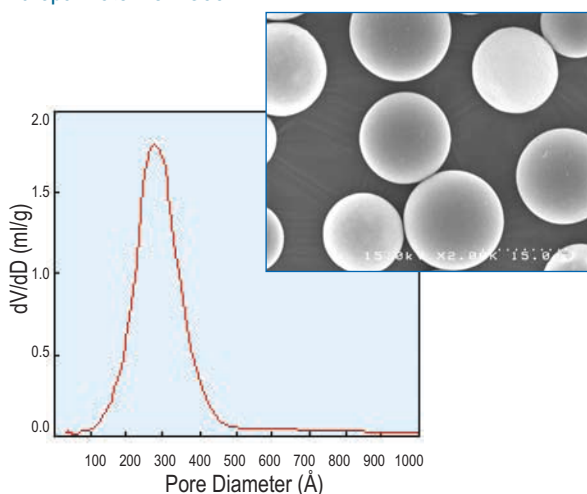
Purity of silica

The responsibility for chromatographic separation of peptides and proteins is found inside the particle-within the pores. To obtain a very homogeneous pore distribution the least possible number of nanopores is essential.

For most reverse-phase silica packings, these nanopores are not properly chemically bonded, endcapped or deactivated. So when nanopores are accessible to the peptides and proteins, surface-peptide and protein interactions frequently dominate. These interactions often result in a decrease of column efficiency.

Europa Protein C4 Pore Distribution

Europa Protein C 4 300



Deactivation Process

Thanks to our proprietary new Multifunctional Endcapping Deactivation (MED) technology used with our popular HPLC columns Mediterranea™ Sea 18, we obtain with the Europa packing a specially designed C4, C8 and C18 ligand configuration, that blocks practically all the active centres that may have remained on the surface of the silica.

As a result of this, Europa columns have an unusual low level of silanol activity, helping you to obtain symmetrical peaks for the most basic and acidic compounds. The improved high density bonding and full endcapping make them suitable to separate or purify low molecular weight compounds (especially small peptides when using Europa Peptide column 120 Å) and separate or purify high molecular weight compounds, especially proteins when using Europa Protein column 300 Å.

Europa C 18 bonding chemistries will help you to achieve an extraordinary resistance and column lifetime when running at extreme pH levels.

Wide pH Range

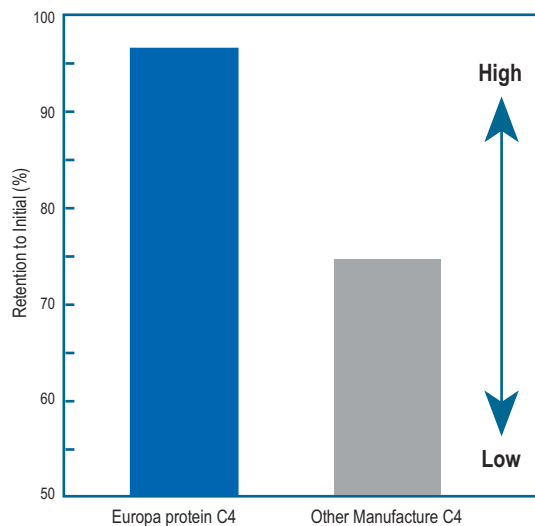
Using Europa C 18 packing materials it is possible to work with eluents from pH 1 to pH 12. Such unusual pH resistance values have been achieved as a result of phase bonding efficiency and a proprietary endcapping process which provides a protective shield against acidic and basic eluents.

Europa columns ensure greater separation efficiency, resistance to extreme pH conditions and can be used for an extended period of time.

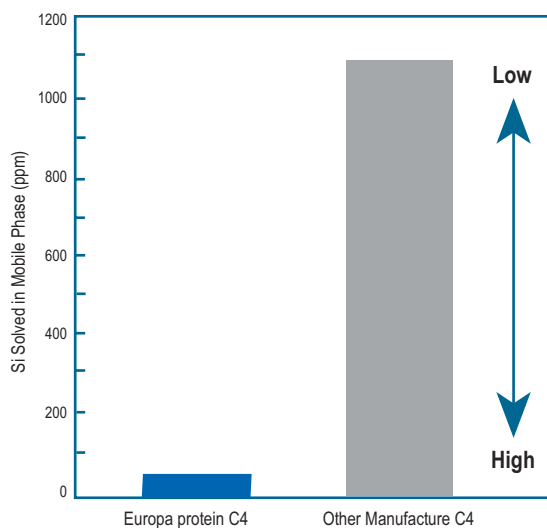
Europa Protein C4 Phase Stability

Phase stability of Europa Protein C4 columns has been checked purging one 25 x 0.78 cm column either with CH₃CN/1%TFA 10:90 (pH=1) during 15 hours at 0.9 ml/min or with CH₃CN/20 mM Na₃PO₄ 10:90 (pH=12) during 3 hours at 1.7 ml/min.

Acid Resistance pH=1



Alkali Resistance pH=12

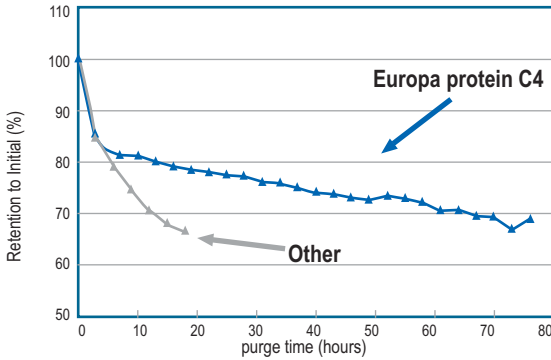


Europa HPLC Column for Peptides and Proteins **Tk**

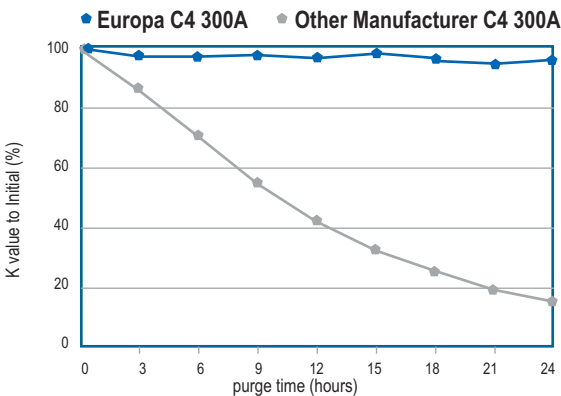
Durability comparison in Alkaline Medium/RT

The graphic below shows the durability of the column after more than 80 hours of purge time passing through one Europa Protein C4 column a flow rate of 1.0 ml of alkaline solution at pH 12, CH₃CN/0.01NaOH 10/90.

There is represented in the graphic the retention time of naphthalene after every three hours of purge, using CH₃CN / H₂O 35:65 at 1.7 ml/min and 40°C (UV detection at 254 nm). It is seen that after 80 hours, Europa columns still perform very well.

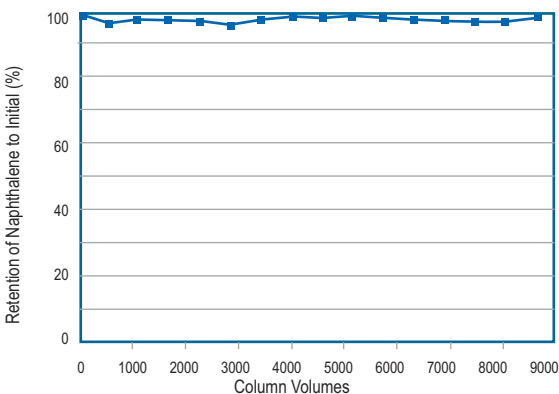


Durability comparison in Acidic Medium / K value



Durability of Europa C4 has also been compared against other manufacturers using a 15 x 0.46 cm column and CH₃CN / 1.0% TFA in water 10:90 (pH=1) at 70°C, and checking K values for naphthalene every 3 hours.

Durability under Acidic Contition



Retention time for naphthalene using the same chromatographic conditions has also been controlled after up to 9000 column volumes of CH₃CN / 0.05% TFA in water (pH=2) at a flow rate of 1.0 ml/min at room temperature. Column size was 15 x 0.46 cm

Europa C18 Peptide HPLC columns

We invite you to try our Europa C18 peptide column when you experience unsatisfactory results with your favorite column.

Europa C18 Peptide columns are suitable to separate or purify low molecular weight compounds, especially small peptides.

Europa HPLC columns for peptides provide a high performance that is unsurpassed in efficiency, reliability and reproducibility. Manufactured using novel proprietary technologies, analytical and preparative Europa columns are simply the best reverse phase columns available today. Europa columns ensure greater separation efficiency, resistance to extreme pH conditions and longer column life.

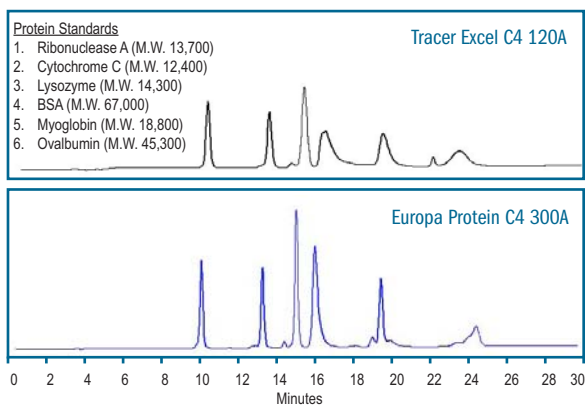
Our "Ultra-Fast" columns are made in 3-5 cm length in order to get quick analytical results, whereas the "High Efficiency" columns are normally in 15-25cm lengths to obtain the best resolution.

Specifications:

- Ultra high purity, totally spherical silica gel
- High density bonding for extreme performance proprietary fully end-capped silica
- Porous Size: 120 Å, narrow particle size distribution
- Surface Area 300 m²/g
- % of Carbon 19 %
- High loading capacity of crude peptides
- Stable under basic and extreme acidic conditions
- Packed with 5µm sized silica particles

Microbore Columns are available in: 0.21, 0.30 cm ID
 Analytical Columns are available in: 0.40 and 0.46 cm ID
 Semi-Prep Columns are available in: 0.78 and 1.0 cm
 Prep Columns are available in: 2.1 cm ID
 Larger diameter available by request

Influence of Pore size in Peak Shape



Column: 7.8 mm I.D. x 250 mm Length; Temperature: 35°C; Detector: UV 220 nm;
 Mobile Phase: A) CH₃CN/H₂O/TFA = 20/80/0.1, B) CH₃CN/H₂O/TFA = 60/40/0.1,
 Linear Gradient from A to B in 25 min and hold for 10 min; Flow Rate: 1.7 ml/min.

TK Europa HPLC Column for Peptides and Proteins



Europa packaging

Europa C18 Peptide Microbore HPLC Columns



Columns are particularly designed for LC/MS applications. The high detection sensitivity of these columns allows the use of smaller quantities of samples and also decreases the required volume of solvents.

Packing	Funct.	µm	Length		Diameter	Cat.Nbr.
			µm	cm		
Europa Peptide 120	C18	5	3	0.21		TR-010130
Europa Peptide 120	C18	5	5	0.21		TR-010131
Europa Peptide 120	C18	5	10	0.21		TR-010132
Europa Peptide 120	C18	5	15	0.21		TR-010133
Europa Peptide 120	C18	5	20	0.21		TR-010134
Europa Peptide 120	C18	5	3	0.30		TR-010135
Europa Peptide 120	C18	5	5	0.30		TR-010136
Europa Peptide 120	C18	5	10	0.30		TR-010137
Europa Peptide 120	C18	5	15	0.30		TR-010138
Europa Peptide 120	C18	5	20	0.30		TR-010139
Europa Peptide 120	C18	5	25	0.30		TR-010140

Europa C18 Peptide Analytical HPLC Columns



Packing	Funct.	µm	Length		Diameter	Cat.Nbr.
			µm	cm		
Europa Peptide 120	C18	5	3	0.46		TR-010116
Europa Peptide 120	C18	5	4	0.46		TR-010117
Europa Peptide 120	C18	5	5	0.46		TR-010118
Europa Peptide 120	C18	5	10	0.46		TR-010119
Europa Peptide 120	C18	5	15	0.46		TR-010120
Europa Peptide 120	C18	5	20	0.46		TR-010121
Europa Peptide 120	C18	5	25	0.46		TR-010122
Europa Peptide 120	C18	5	3	0.40		TR-010123
Europa Peptide 120	C18	5	4	0.40		TR-010124
Europa Peptide 120	C18	5	5	0.40		TR-010125
Europa Peptide 120	C18	5	10	0.40		TR-010126
Europa Peptide 120	C18	5	15	0.40		TR-010127
Europa Peptide 120	C18	5	20	0.40		TR-010128
Europa Peptide 120	C18	5	25	0.40		TR-010129

Europa C18 Peptide Semi Preparative HPLC Columns



Packing	Funct.	µm	Length		Diameter	Cat.Nbr.
			µm	cm		
Europa Peptide 120	C18	5	10	0.78		TR-010141
Europa Peptide 120	C18	5	15	0.78		TR-010142
Europa Peptide 120	C18	5	25	0.78		TR-010143
Europa Peptide 120	C18	5	10	1.00		TR-010144
Europa Peptide 120	C18	5	15	1.00		TR-010145
Europa Peptide 120	C18	5	25	1.00		TR-010146

Europa C18 Peptide Preparative HPLC Columns



Packing	Funct.	µm	Length		Diameter	Cat.Nbr.
			µm	cm		
Europa Peptide 120	C18	5	5	2.12		TR-010147
Europa Peptide 120	C18	5	10	2.12		TR-010148
Europa Peptide 120	C18	5	15	2.12		TR-010149
Europa Peptide 120	C18	5	25	2.12		TR-010150

Europa HPLC Column for Peptides and Proteins **Tk**

Europa C18 Protein HPLC Columns

We invite you to try our Europa C18 Protein column when you experience unsatisfactory results with your favorite column.

Europa C18 Protein columns are designed and manufactured for identification and purification of proteins and for compounds with high molecular weight.

Europa HPLC columns for proteins provide a high performance that is unsurpassed in efficiency, reliability and reproducibility. Manufactured using novel proprietary technologies, analytical and preparative Europa columns are simply the best reverse phase columns available today.

Europa columns ensure greater separation efficiency, resistance to extreme pH conditions and longer column life.

Our “Ultra-Fast” columns are made in 3-5 cm length in order to get quick analytical results, whereas the “High Efficiency” columns are normally in 15-25 cm lengths to obtain best resolution.

Specifications:

- Ultra high purity totally spherical silica gel provide a high resolution and excellent peak shape
- High loading capacity of crude proteins
- High density bonding for extreme performance proprietary fully end-capped silica
- Stable, featuring extended acidic and basic conditions
- Silica properties: ultra pure and totally spherical narrow distribution range and high density
- Fully end-capped silica
- Porous Size: 300Å narrow particle size distribution
- Surface Area 100 m²/gr.
- % of Carbon 7 %
- Packed with 5µm sized silica particles
- Available as C4, C8, and C18 columns
- Microbore Columns are available in: 0.21, 0.30 cm I.D. Analytical Columns in: 0.40 and 0.46cm I.D. Semi-Prep in: 0.70-1.0cm Prep Columns in: 2.1cm and larger diameter by request

Europa C18 Protein Preparative HPLC Columns



Packing	Funct.	µm	Length		Diameter	Cat.Nbr.
			µm	cm		
Europa Protein 300	C18	5	5	2.12		TR-010217
Europa Protein 300	C18	5	10	2.12		TR-010218
Europa Protein 300	C18	5	15	2.12		TR-010219
Europa Protein 300	C18	5	25	2.12		TR-010220

Europa C18 Protein Analytical HPLC Columns



Packing	Funct.	µm	Length		Diameter	Cat.Nbr.
			µm	cm		
Europa Protein 300	C18	5	3	0.46		TR-010158
Europa Protein 300	C18	5	4	0.46		TR-010159
Europa Protein 300	C18	5	5	0.46		TR-010160
Europa Protein 300	C18	5	10	0.46		TR-010161
Europa Protein 300	C18	5	15	0.46		TR-010162
Europa Protein 300	C18	5	20	0.46		TR-010163
Europa Protein 300	C18	5	25	0.46		TR-010164
Europa Protein 300	C18	5	3	0.40		TR-010172
Europa Protein 300	C18	5	4	0.40		TR-010173
Europa Protein 300	C18	5	5	0.40		TR-010174
Europa Protein 300	C18	5	10	0.40		TR-010175
Europa Protein 300	C18	5	15	0.40		TR-010176
Europa Protein 300	C18	5	20	0.40		TR-010177
Europa Protein 300	C18	5	25	0.40		TR-010178

Europa C18 Protein Microbore HPLC Columns



Columns are particularly designed for LC/MS applications. The high detection sensitivity of these columns allows the use of smaller quantities of samples and also decreases the required volume of solvents.

Packing	Funct.	µm	Length		Diameter	Cat.Nbr.
			µm	cm		
Europa Protein 300	C18	5	3	0.21		TR-010184
Europa Protein 300	C18	5	5	0.21		TR-010185
Europa Protein 300	C18	5	10	0.21		TR-010186
Europa Protein 300	C18	5	15	0.21		TR-010187
Europa Protein 300	C18	5	20	0.21		TR-010188
Europa Protein 300	C18	5	3	0.30		TR-010195
Europa Protein 300	C18	5	5	0.30		TR-010196
Europa Protein 300	C18	5	10	0.30		TR-010197
Europa Protein 300	C18	5	15	0.30		TR-010198
Europa Protein 300	C18	5	20	0.30		TR-010199
Europa Protein 300	C18	5	25	0.30		TR-010200

Europa C18 Protein Semi-Preparative HPLC Columns



Packing	Funct.	µm	Length		Diameter	Cat.Nbr.
			µm	cm		
Europa Protein 300	C18	5	10	0.70		TR-010211
Europa Protein 300	C18	5	5	0.70		TR-010212
Europa Protein 300	C18	5	25	0.70		TR-010213
Europa Protein 300	C18	5	10	1.00		TR-010214
Europa Protein 300	C18	5	15	1.00		TR-010215
Europa Protein 300	C18	5	25	1.00		TR-010216

TK Europa HPLC Column for Peptides and Proteins



Semi preparative and Preparative Europa HPLC Columns

Europa C8 Protein HPLC Columns

Europa C8 columns are recommended for compounds too strongly retained on C18 Phases.

Europa C8 Protein Analytical HPLC Columns



Packing	Funct.	µm	Length		Diameter	Cat.Nbr.
			µm	cm		
Europa Protein 300	C8	5	3	0.46	TR-010151	
Europa Protein 300	C8	5	4	0.46	TR-010152	
Europa Protein 300	C8	5	5	0.46	TR-010153	
Europa Protein 300	C8	5	10	0.46	TR-010154	
Europa Protein 300	C8	5	15	0.46	TR-010155	
Europa Protein 300	C8	5	20	0.46	TR-010156	
Europa Protein 300	C8	5	25	0.46	TR-010157	
Europa Protein 300	C8	5	3	0.40	TR-010165	
Europa Protein 300	C8	5	4	0.40	TR-010166	
Europa Protein 300	C8	5	5	0.40	TR-010167	
Europa Protein 300	C8	5	10	0.40	TR-010168	
Europa Protein 300	C8	5	15	0.40	TR-010169	
Europa Protein 300	C8	5	20	0.40	TR-010170	
Europa Protein 300	C8	5	25	0.40	TR-010171	

Europa C8 Protein Microbore HPLC Columns



Columns are particularly designed for LC/MS applications. The high detection sensitivity of these columns allows the use of smaller quantities of samples and also decreases the required volume of solvents.

Europa C8 columns are recommended for compounds too strongly retained on C18 Phases.

Packing	Funct.	µm	Length		Diameter	Cat.Nbr.
			µm	cm		
Europa Protein 300	C8	5	3	0.21	TR-010179	
Europa Protein 300	C8	5	5	0.21	TR-010180	
Europa Protein 300	C8	5	10	0.21	TR-010181	
Europa Protein 300	C8	5	15	0.21	TR-010182	
Europa Protein 300	C8	5	20	0.21	TR-010183	
Europa Protein 300	C8	5	3	0.30	TR-010189	

Packing	Funct.	µm	Length		Diameter	Cat.Nbr.
			µm	cm		
Europa Protein 300	C8	5	5	0.30	TR-010190	
Europa Protein 300	C8	5	10	0.30	TR-010191	
Europa Protein 300	C8	5	15	0.30	TR-010192	
Europa Protein 300	C8	5	20	0.30	TR-010193	
Europa Protein 300	C8	5	25	0.30	TR-010194	

Europa C8 Protein Semi-Preparative HPLC Columns



Packing	Funct.	µm	Length		Diameter	Cat.Nbr.
			µm	cm		
Europa Protein 300	C8	5	10	0.70	TR-010201	
Europa Protein 300	C8	5	15	0.70	TR-010202	
Europa Protein 300	C8	5	25	0.70	TR-010203	
Europa Protein 300	C8	5	10	1.00	TR-010204	
Europa Protein 300	C8	5	15	1.00	TR-010205	
Europa Protein 300	C8	5	25	1.0	TR-010206	

Europa C8 Protein Preparative HPLC Columns



Packing	Funct.	µm	Length		Diameter	Cat.Nbr.
			µm	cm		
Europa Protein 300	C8	5	5	2.12	TR-010207	
Europa Protein 300	C8	5	10	2.12	TR-010208	
Europa Protein 300	C8	5	15	2.12	TR-010209	
Europa Protein 300	C8	5	25	2.12	TR-010210	

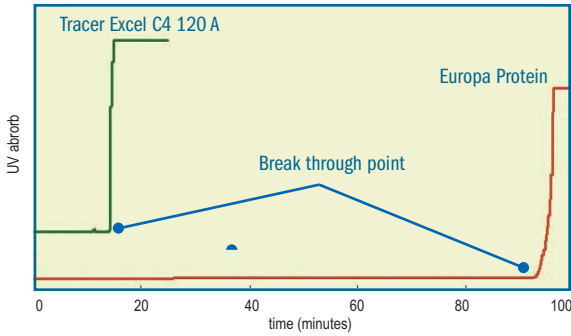
For Guard Columns please refer to pages 197-199

Europa HPLC Column for Peptides and Proteins **Tk**

Europa C4 Protein HPLC Columns

Europa Protein C4 300 A - Loading Capacity of BSA

Protein 300 exhibited the highest loading capacity for proteins

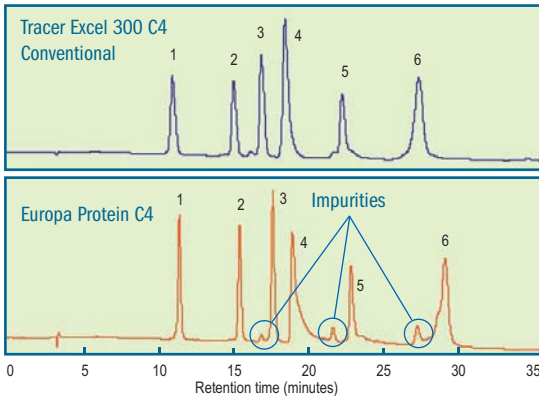


Column: 7 mm I.D. x 250 mm Length; Temperature: 35°C; Detector: UV 220 nm;
Flow Rate: 1.0 ml/min.
Feed: 10 mg/mL BSA in 0.1% TFAaq
 Europa C4 columns are recommended for compounds too strongly retained on C 18 and C 8

Europa Protein C4 300 A - Protein Separation Behaviors

- Similar Hydrophobic Selectivity
- Higher Resolution

Protein Standards	
1.	Ribonuclease A (M.W. 13,700)
2.	Cytochrome C (M.W. 12,400)
3.	Lysozyme (M.W. 14,300)
4.	BSA (M.W. 67,000)
5.	Myoglobin (M.W. 18,800)
6.	Ovalbumin (M.W. 45,300)



Column: 6 mm I.D. x 250 mm Length; Temperature: 35°C; Detector: UV 220 nm;
Mobile Phase: A) CH₃CN/H₂O/TFA = 20/80/0.1, B) CH₃CN/H₂O/TFA = 60/40/0.1,
 Linear Gradient from A to B in 25 min and hold for 10 min; Flow Rate: 1.7 ml/min.

Europa C4 Protein Analytical HPLC Columns



Packing	Funct.	µm	Length		Diameter	Cat.Nbr.
			cm	cm		
Europa Protein 300	C4	5	3	0.46	TR-010081	
Europa Protein 300	C4	5	4	0.46	TR-010082	
Europa Protein 300	C4	5	5	0.46	TR-010083	
Europa Protein 300	C4	5	10	0.46	TR-010084	
Europa Protein 300	C4	5	15	0.46	TR-010085	
Europa Protein 300	C4	5	20	0.46	TR-010086	

Packing	Funct.	µm	Length		Diameter	Cat.Nbr.
			cm	cm		
Europa Protein 300	C4	5	25	0.46	TR-010087	
Europa Protein 300	C4	5	3	0.40	TR-010088	
Europa Protein 300	C4	5	4	0.40	TR-010089	
Europa Protein 300	C4	5	5	0.40	TR-010090	
Europa Protein 300	C4	5	10	0.40	TR-010091	
Europa Protein 300	C4	5	15	0.40	TR-010092	
Europa Protein 300	C4	5	20	0.40	TR-010093	
Europa Protein 300	C4	5	25	0.40	TR-010094	

Europa C4 Protein Microbore HPLC Columns



Columns are particularly designed for LC/MS applications. The high detection sensitivity of these columns allows the use of smaller quantities of samples and also decreases the required volume of solvents.

Packing	Funct.	µm	Length		Diameter	Cat.Nbr.
			cm	cm		
Europa Protein 300	C4	5	3	0.21	TR-010095	
Europa Protein 300	C4	5	5	0.21	TR-010096	
Europa Protein 300	C4	5	10	0.21	TR-010097	
Europa Protein 300	C4	5	15	0.21	TR-010098	
Europa Protein 300	C4	5	20	0.21	TR-010099	
Europa Protein 300	C4	5	3	0.30	TR-010100	
Europa Protein 300	C4	5	5	0.30	TR-010101	
Europa Protein 300	C4	5	10	0.30	TR-010102	
Europa Protein 300	C4	5	15	0.30	TR-010103	
Europa Protein 300	C4	5	20	0.30	TR-010104	
Europa Protein 300	C4	5	25	0.30	TR-010105	

Europa C4 Protein Semi-Preparative HPLC Columns



Packing	Funct.	µm	Length		Diameter	Cat.Nbr.
			cm	cm		
Europa Protein 300	C4	5	10	0.78	TR-010106	
Europa Protein 300	C4	5	15	0.78	TR-010107	
Europa Protein 300	C4	5	25	0.78	TR-010108	
Europa Protein 300	C4	5	10	1.00	TR-010109	
Europa Protein 300	C4	5	15	1.00	TR-010110	
Europa Protein 300	C4	5	25	1.00	TR-010111	

Europa C4 Protein Preparative HPLC Columns



Packing	Funct.	µm	Length		Diameter	Cat.Nbr.
			cm	cm		
Europa Protein 300	C4	5	5	2.12	TR-010112	
Europa Protein 300	C4	5	10	2.12	TR-010113	
Europa Protein 300	C4	5	15	2.12	TR-010114	
Europa Protein 300	C4	5	25	2.12	TR-010115	