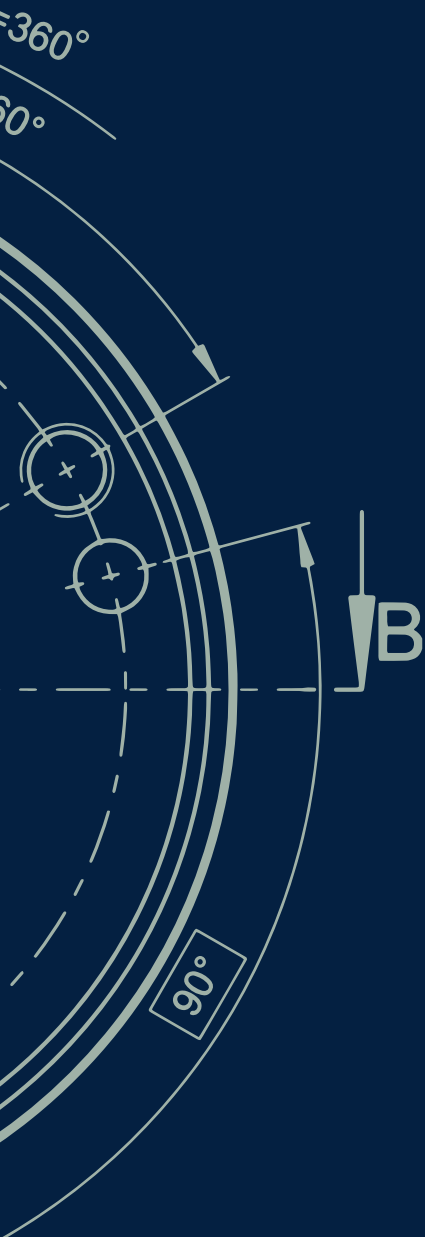


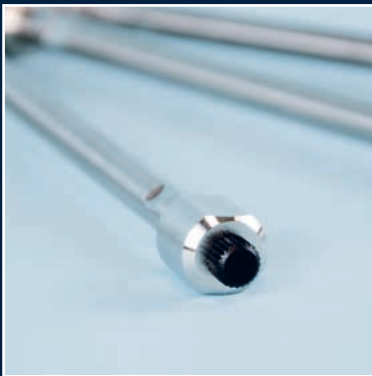
Science with Passion



Column Selection Guide

2023/2024

for (U)HPLC, Prep. LC, FPLC and GPC



Welcome to KNAUER



About KNAUER

Based in Berlin, KNAUER is a medium-sized, owner-managed company that has been serving the sciences since 1962. We develop and manufacture scientific instruments of superior quality for liquid chromatography. The range includes systems and components for analytical HPLC/UHPLC, preparative HPLC, fast protein liquid chromatography (FPLC), multi-column chromatography/simulated moving bed (SMB), gel permeation chromatography/size exclusion chromatography (GPC/SEC), osmometry and Skids for the production of lipid nanoparticles (LNP).

Sustainability & ecological commitment

We are committed to protect the environment for ourselves and our children. KNAUER contributes to the conservation of a healthy environment by basing our work on an environmental management system according to DIN EN ISO 14001. The KNAUER quality management system according to DIN EN ISO 9001 and EN ISO 13485:2016 makes sure that we continuously manufacture products in the best quality possible. As a family business with about 190 employees, KNAUER focuses on sustainability and takes responsibility for our future.

Some of our ecological activities:

- The regular creation of an input and output balance for the determination and evaluation of energy and resource flows
- Environmentally friendly product development, energy-efficient production, and shipping with biodegradable packaging materials and re-usable packaging with local suppliers
- Fixed specifications for the development of new products according to ecological aspects such as low solvent consumption, repairability, and longevity of the products
- Complete modernization of the company building included thermal insulation, new windows, electric blinds, and a green rooftop, which resulted in a 50 % heating energy saving
- 100 % green electricity and generation of solar power with our photovoltaic system on the roof
- Guidelines for business travel from an environmental, economic, and social perspective
- Tips and instructions for clients to reduce solvent consumption during instrument use
- Environmentally compatible working and manufacturing of HPLC instruments and accessories, e.g. by using energy-efficient working equipment and reducing the use of solvents and harmful substances
- A life cycle assessment to optimize the manufacturing process and concentrate on electricity saving components

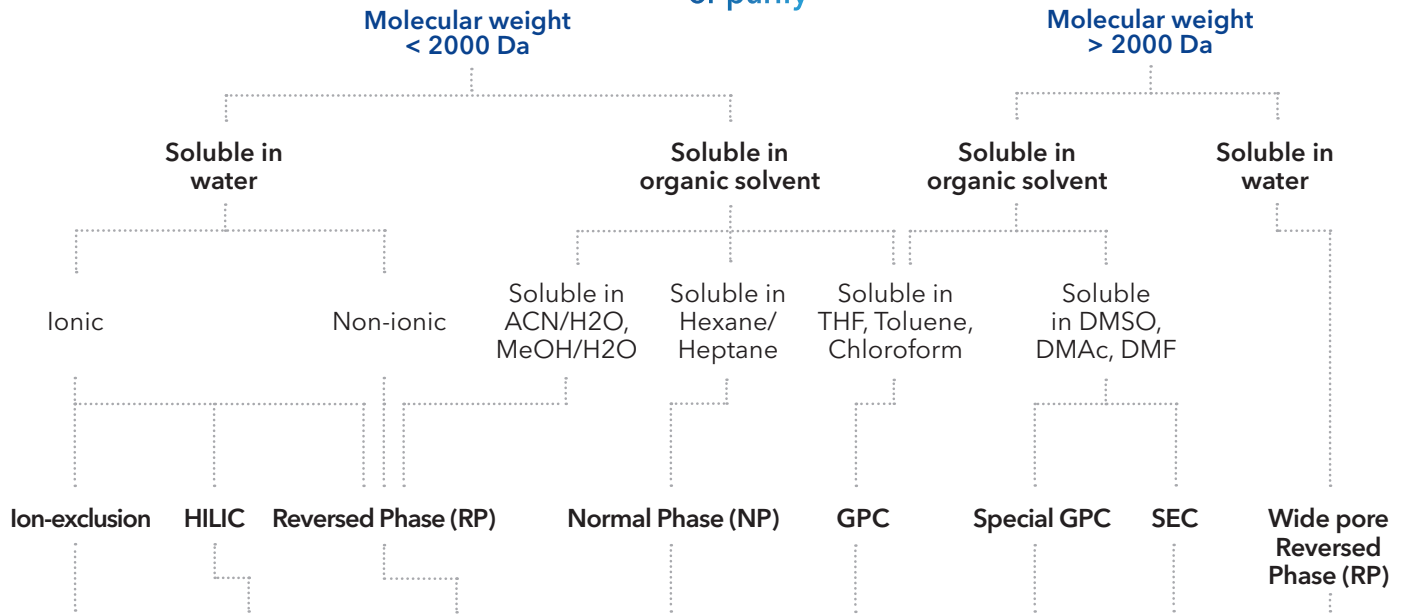
Sustainability: #KNAUERforFuture

Many KNAUER employees have good ideas for sustainability, and so we all get better together every year. We would like to inspire YOU to implement sustainability in many areas of your company, too. May these short videos keep you entertained and invite you to act! www.knauer.net/sustainable.

Non-native conditions

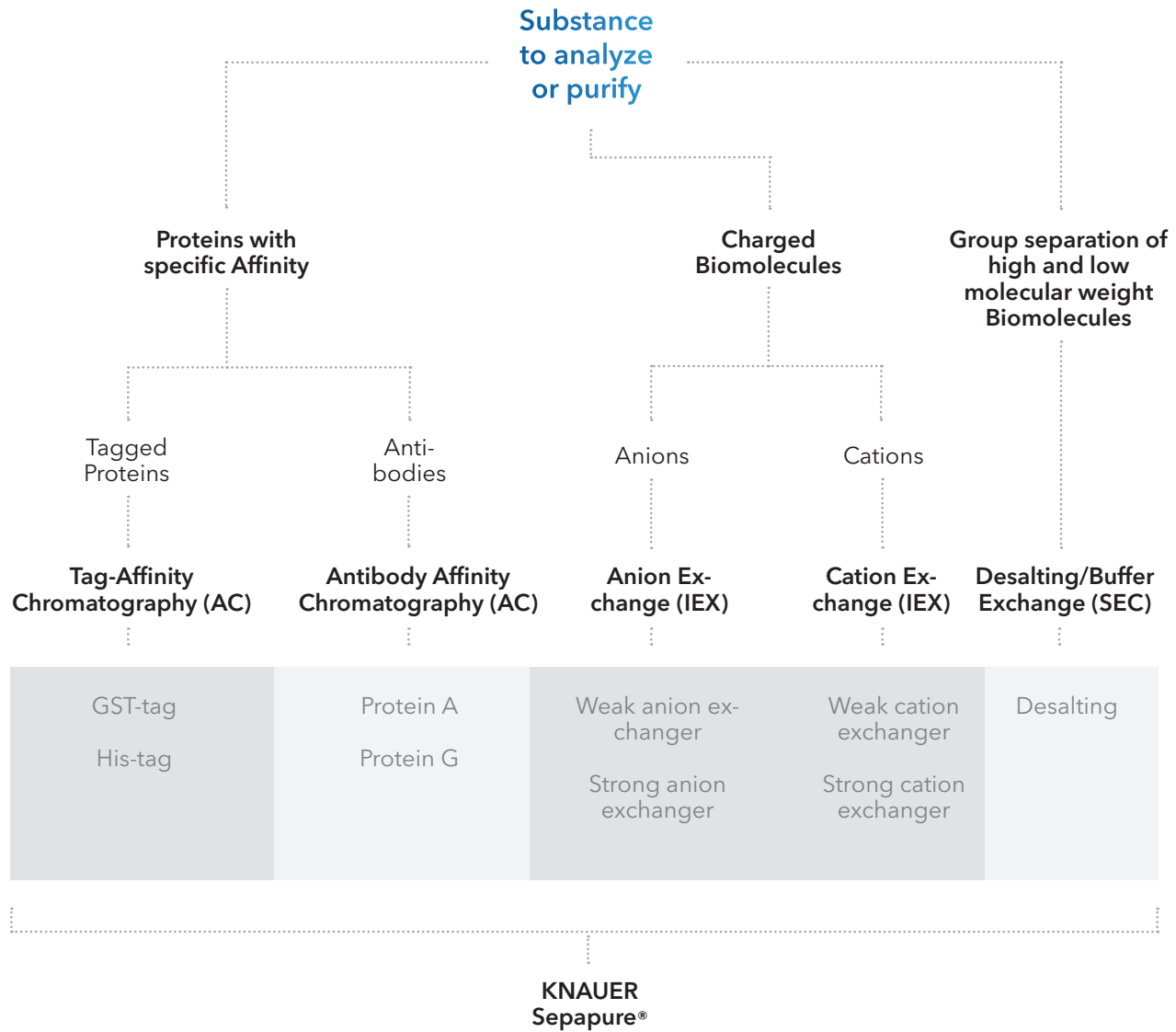


Substance to analyze or purify



H-form (USP L17)	Silica (USP L3)	Classical C18 (USP L1)	Silica (USP L3)	Porous styrene-divinylbenzene	Special GPC polymer material	Hydrophilic polymer material	Wide pore classical C18 (USP L1)
Ca-form (USP L19)	NH2 (USP L8)	Hydrophilic/ aqueous C18 (USP L1)	NH2 (USP L8)				Wide pore C18A hydrophilic/ aqueous (USP L1)
Pb-form (USP L34)	Zwitter-ionic HILIC (USP -)	Hydrophobic/ pH stable C18 (USP L1)	Diol (USP L20)				Wide pore C8 (USP L7)
Na-form (USP -)		Classical C8 (USP L7)	Cyano (USP L10)				Wide pore C4 (USP L26)
		Hydrophilic/ aqueous C8 (USP L7)					
		Hydrophobic/ pH stable C8 (USP L7)					
		C4 (USP L26)					
		CN (USP L10)					
		Phenyl (USP L11)					
Eurokat		KNAUER Eurosphere Eurosphere II		Applichrom® ABOA StyDiViBe	Applichrom® ABOA DMAc-Phil, DMSO-Phil	Applichrom® ABOA Super-OH	KNAUER Eurosil Bioselect

Native conditions



Find more information

Finding the best fitting column for your HPLC/UHPLC, GPC or FPLC application always starts with looking closely at the substances you want to analyse or purify.

This flow chart gives you a guideline how to select the right column for your application. Start at the top and follow the decision lines all the way down to find a column recommendation.

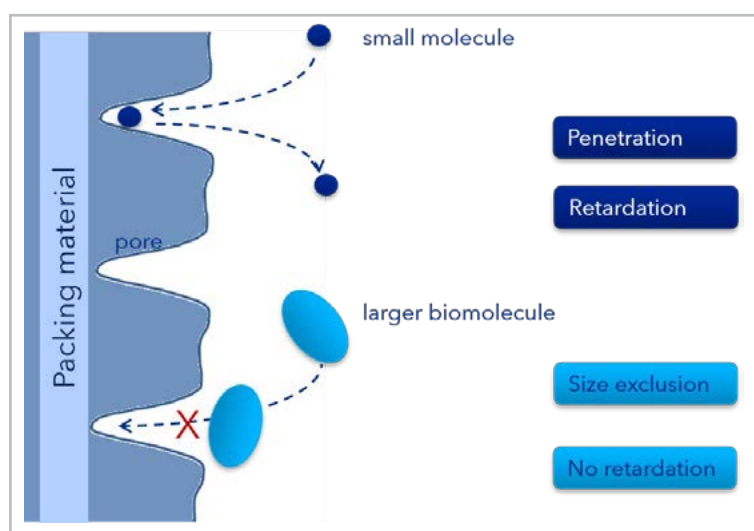
More details about KNAUER columns and phases can be found in the Column Product Selection Guide and online:
www.knauer.net/columns

Eurosil Bioselect

Eurosil Bioselect columns for HPLC feature a wide-pore (300 Å) stationary phase and were specifically designed to separate large biomolecules, such as proteins and peptides.

The use of larger pore silica-based bonded phases leads to improvements in resolution, capacity and recovery of proteins and other biomolecules, due to a reduction in size exclusion mechanism and enhanced molecular diffusion rates.

A pore size of 300 Å has become the accepted standard for wide pore silica gels because it has been found to be suitable for a broad range of molecular weight proteins, peptides and oligonucleotides. In general, peptides exceeding approximately 50 amino acids and oligonucleotides greater than 25 residues are preferentially analyzed on 300 Å materials.



Physical properties

Silica gel	ultra pure, > 99.99 %
Metal content	< 10 ppm
Particle size	3 µm, 5 µm, 10 µm (15 µm, 20 - 45 µm on request)
Particle shape	spherical
Pore size	300 Å
Specific surface	90 ± 5 m ² /g
Pore volume	0.8 ml/g
Density	450 g/l

Characteristics

- Eurosil Bioselect columns are available in 4 modifications, useful for a wide range of separation tasks involving large molecules up to 100 000 Da.
- Strict manufacturing procedures ensure a very narrow pore size distribution.
- Interfering anions or heavy metal ions on the silica surface are not present in Eurosil Bioselect columns because only ultra pure silica gel and high quality chemical modifications are employed.

Biomolecules 2000 - 5000 Da	Eurosil Bioselect C18/C18A
Biomolecules 5000 - 20,000 Da	Eurosil Bioselect C8
Biomolecules 20,000 - 100,000 Da	Eurosil Bioselect C4

Separation mechanism of Eurosil Bioselect

To separate larger molecules, they need to freely access the interior of the pores of the packing material. Therefore, the analytes' diameter must be smaller than the average pore diameter.

For higher molecular weight solutes, the use of lower pore size materials (60-120 Å) as typically used for the analysis of small molecules may result restricted diffusion in the material's pores and therewith reduced column efficiency.

Modifications

The recommended modification of Eurosil Bioselect depends on the molecular weight of the analytes.

Eurosil Bioselect 300 C18 - USP L1

- Ultra pure, spherical wide pore HPLC phase based on silica gel
- Unpolar, monomeric C18 (Octadecyl) modification, endcapped
- 7.5 % carbon content (conventional endcapping).

Properties

Separation mechanism: Hydrophobic interaction

Key features

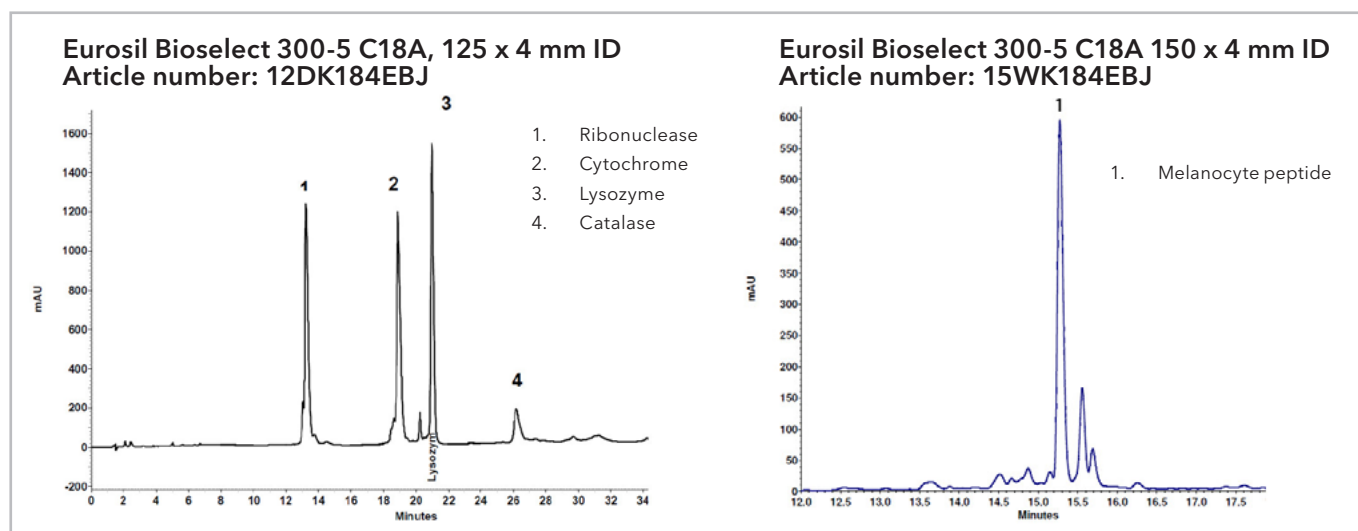
Eurosil Bioselect 300 C18 has been specifically developed for the determination and purification of peptides, proteins, and oligonucleotides up to MW



approx. 5000 Da. The optimized manufacturing process guarantees excellent batch-to-batch reproducibility. The Eurosil Bioselect sorbent is the first choice for biochromatography with silica material.

Recommended application areas

Hydrophilic biomolecules, peptides, peptide mapping after enzymatic digestion



Column length	2 mm ID		
	Order No.	3 μm ...K181EBG	5 μm ...K181EBJ
150 mm	15B...	15BK181EBG	15BK181EBJ
100 mm	10B...	10BK181EBG	10BK181EBJ
50 mm	05B...	05BK181EBG	05BK181EBJ



Tip: Caused by the larger pore size of 300 Å, Eurosil Bioselect phases are not as mechanical stable as classical silica gel phases with up to 150 Å and should not be used above 200 bar pressure.

Column length & equipment	3 mm ID			4 mm ID			4.6 mm ID		
	Order No.	3 μm ...K181EBG	5 μm ...K181EBJ	Order No.	3 μm ...K181EBG	5 μm ...K181EBJ	Order No.	3 μm ...K181EBG	5 μm ...K181EBJ
250 mm	25C...	25CK181EBG	25CK181EBJ	25D...	25DK181EBG	25DK181EBJ	25E...	25EK181EBG	25EK181EBJ
with integrated precolumn	25X...	25XK181EBG	25XK181EBJ	25W...	25WK181EBG	25WK181EBJ	25V...	25VK181EBG	25VK181EBJ
150 mm	15C...	15CK181EBG	15CK181EBJ	15D...	15DK181EBG	15DK181EBJ	15E...	15EK181EBG	15EK181EBJ
with integrated precolumn	15X...	15XK181EBG	15XK181EBJ	15W...	15WK181EBG	15WK181EBJ	15V...	15VK181EBG	15VK181EBJ
100 mm	10C...	10CK181EBG	10CK181EBJ	12D...	12DK181EBG	12DK181EBJ	12E...	12EK181EBG	12EK181EBJ
with integrated precolumn	10X...	10XK181EBG	10XK181EBJ	12W...	12WK181EBG	12WK181EBJ	12V...	12VK181EBG	12VK181EBJ
50 mm	05C...	05CK181EBG	05CK181EBJ	05D...	05DK181EBG	05DK181EBJ	05E...	05EK181EBG	05EK181EBJ
5 mm precolumn cartridge	P6C...	P6CK181EBG	P6CK181EBJ	P6C...	P6CK181EBG	P6CK181EBJ	P6E...	P6EK181EBG	P6EK181EBJ

Eurosil Bioselect 300 C18A - USP L1

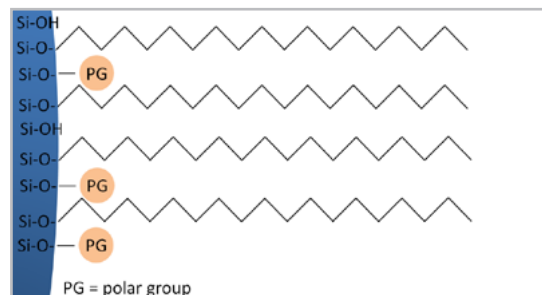
- Ultra pure, spherical wide pore HPLC phase based on silica gel
- Unpolar, monomeric C18 (Octadecyl) modification, endcapped, with 7 % carbon content (hydrophilic endcapping).

Properties

Separation mechanism: Hydrophobic interaction

Key features

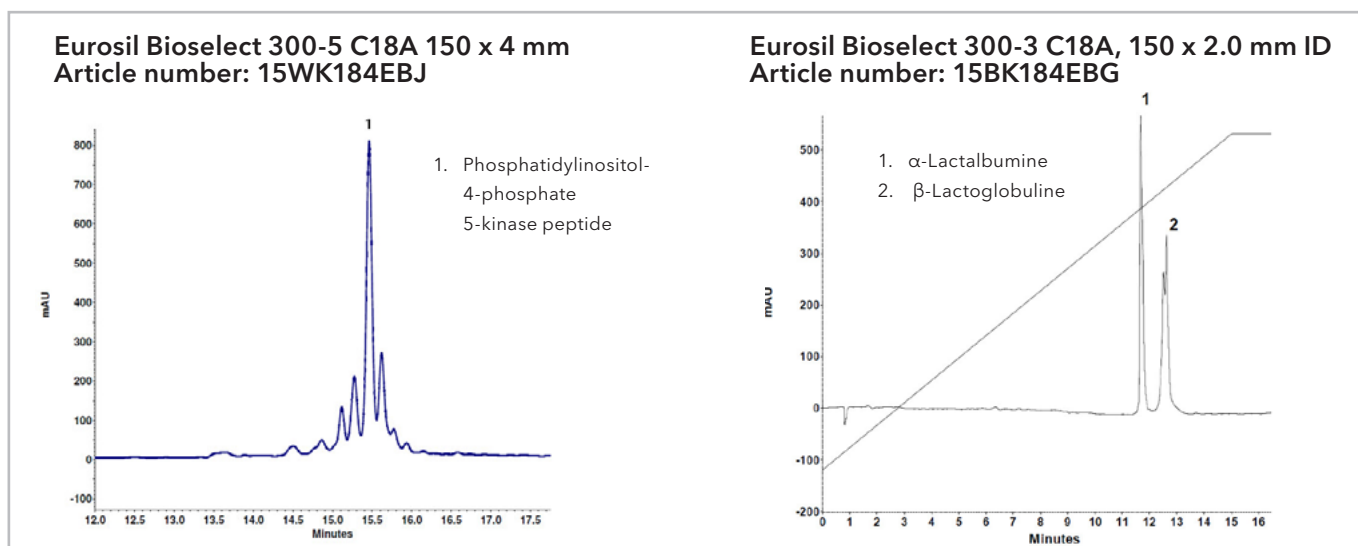
Eurosil Bioselect 300 C18A has been specifically developed for the determination and purification of peptides, proteins, and oligonucleotides up to MW approx. 5 000 Da. The optimized manufacturing



process guarantees excellent batch-to-batch reproducibility. The Eurosil Bioselect sorbent is the first choice for Biochromatography with silica material.

Recommended application areas

Hydrophilic and polar biomolecules, peptides, very polar biomolecules separated with 100 % aqueous eluents.

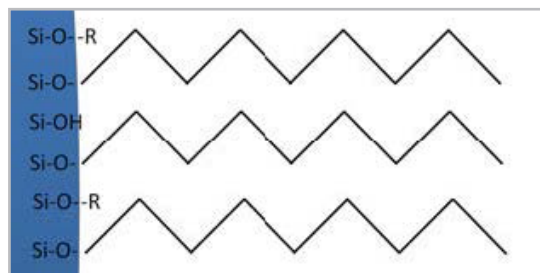


Column length	2 mm ID		
	Order No.	3 μm ...K184EBG	5 μm ...K184EBJ
150 mm	15B...	15BK184EBG	15BK184EBJ
100 mm	10B...	10BK184EBG	10BK184EBJ
50 mm	05B...	05BK184EBG	05BK184EBJ

Column length & equipment	3 mm ID			4 mm ID			4.6 mm ID		
	Order No.	3 μm ...K184EBG	5 μm ...K184EBJ	Order No.	3 μm ...K184EBG	5 μm ...K184EBJ	Order No.	3 μm ...K184EBG	5 μm ...K184EBJ
250 mm	25C...	25CK184EBG	25CK184EBJ	25D...	25DK184EBG	25DK184EBJ	25E...	25EK184EBG	25EK184EBJ
with integrated precolumn	25X...	25XK184EBG	25XK184EBJ	25W...	25WK184EBG	25WK184EBJ	25V...	25VK184EBG	25VK184EBJ
150 mm	15C...	15CK184EBG	15CK184EBJ	15D...	15DK184EBG	15DK184EBJ	15E...	15EK184EBG	15EK184EBJ
with integrated precolumn	15X...	15XK184EBG	15XK184EBJ	15W...	15WK184EBG	15WK184EBJ	15V...	15VK184EBG	15VK184EBJ
100 mm	10C...	10CK184EBG	10CK184EBJ	12D...	12DK184EBG	12DK184EBJ	12E...	12EK184EBG	12EK184EBJ
with integrated precolumn	10X...	10XK184EBG	10XK184EBJ	12W...	12WK184EBG	12WK184EBJ	12V...	12VK184EBG	12VK184EBJ
50 mm	05C...	05CK184EBG	05CK184EBJ	05D...	05DK184EBG	05DK184EBJ	05E...	05EK184EBG	05EK184EBJ
5 mm precolumn cartridge	P6C...	P6CK184EBG	P6CK184EBJ	P6C...	P6CK184EBG	P6CK184EBJ	P6E...	P6EK184EBG	P6EK184EBJ

Eurosil Bioselect 300 C8 - USP L7

- Ultra pure, spherical wide pore HPLC phase based on wide pore silica gel
- Unpolar, monomeric C8 modification, endcapped
- 4.5 % carbon content (conventional endcapping)



Properties

Separation mechanism: Hydrophobic interaction

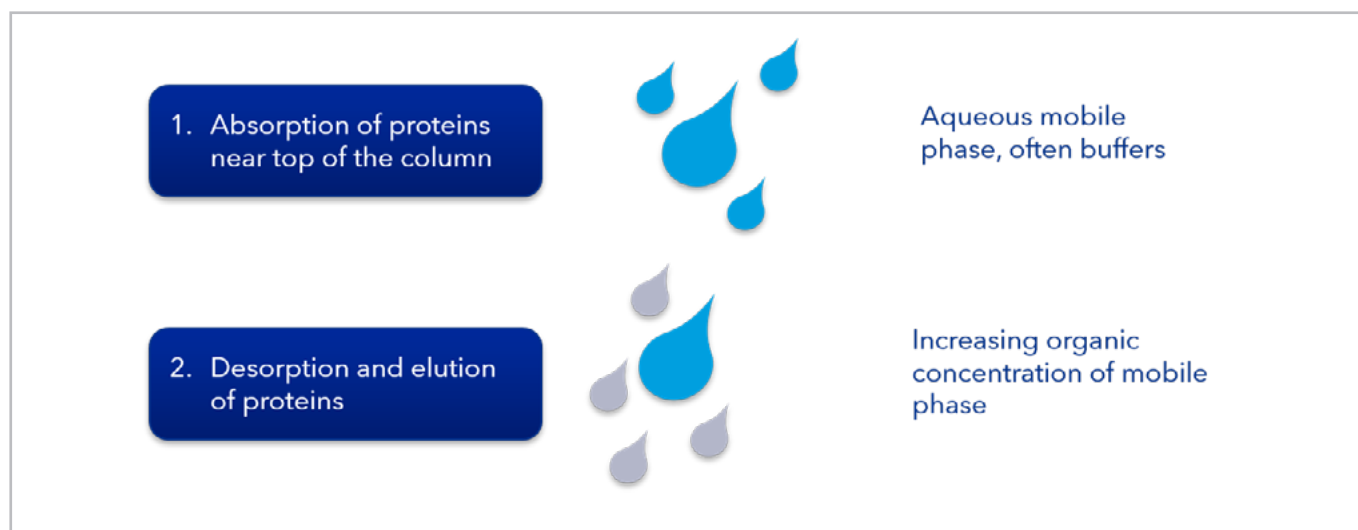
Key features

Eurosil Bioselect 300 C8 has been specifically developed for the determination and purification of peptides, proteins, and oligonucleotides up to MW

approx. 20 000 Da. The optimized manufacturing process guarantees excellent batch-to-batch reproducibility. The Eurosil Bioselect sorbent is the first choice for Biochromatography with silica material.

Recommended application areas

Hydrophilic biomolecules, peptides, peptide mapping after enzymatic digestion



Column length	2 mm ID		
	Order No.	3 μ m ...K081EBG	5 μ m ...K081EBJ
150 mm	15B...	15BK081EBG	15BK081EBJ
100 mm	10B...	10BK081EBG	10BK081EBJ
50 mm	05B...	05BK081EBG	05BK081EBJ

Column length & equipment	3 mm ID			4 mm ID			4.6 mm ID		
	Order No.	3 μ m ...K081EBG	5 μ m ...K081EBJ	Order No.	3 μ m ...K081EBG	5 μ m ...K081EBJ	Order No.	3 μ m ...K081EBG	5 μ m ...K081EBJ
250 mm	25C...	25CK081EBG	25CK081EBJ	25D...	25DK081EBG	25DK081EBJ	25E...	25EK081EBG	25EK081EBJ
with integrated precolumn	25X...	25XK081EBG	25XK081EBJ	25W...	25WK081EBG	25WK081EBJ	25V...	25VK081EBG	25VK081EBJ
150 mm	15C...	15CK081EBG	15CK081EBJ	15D...	15DK081EBG	15DK081EBJ	15E...	15EK081EBG	15EK081EBJ
with integrated precolumn	15X...	15XK081EBG	15XK081EBJ	15W...	15WK081EBG	15WK081EBJ	15V...	15VK081EBG	15VK081EBJ
100 mm	12C...	12CK081EBG	12CK081EBJ	12D...	12DK081EBG	12DK081EBJ	12E...	12EK081EBG	12EK081EBJ
with integrated precolumn	12X...	12XK081EBG	12XK081EBJ	12W...	12WK081EBG	12WK081EBJ	12V...	12VK081EBG	12VK081EBJ
50 mm	05C...	05CK081EBG	05CK081EBJ	05D...	05DK081EBG	05DK081EBJ	05E...	05EK081EBG	05EK081EBJ
5 mm precolumn cartridge	P6C...	P6CK081EBG	P6CK081EBJ	P6C...	P6CK081EBG	P6CK081EBJ	P6E...	P6EK081EBG	P6EK081EBJ

Eurosil Bioselect 300 C4 - USP L26

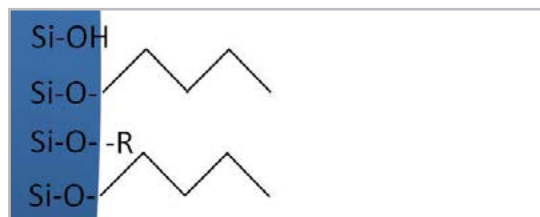
- Ultra pure, spherical wide pore HPLC phase based on wide pore silica gel
- Unpolar, monomeric C4 modification, endcapped
- 2 % carbon content (conventional endcapping)

Properties

Separation mechanism: hydrophobic and hydrophilic interaction

Key features

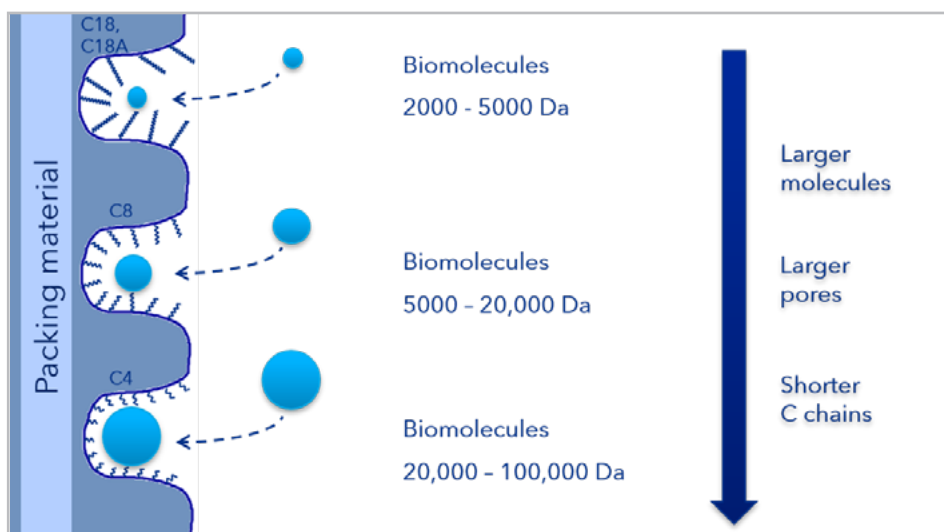
Eurosil Bioselect 300 C4 has been specifically developed for the determination and purification of



peptides, proteins, and oligonucleotides up to MW approx. 100 000 Da. The optimized manufacturing process guarantees excellent batch-to-batch reproducibility. The Eurosil Bioselect sorbent is the first choice for Biochromatography with silica material.

Recommended application areas

Hydrophilic biomolecules and especially peptides larger than 10 000- 20 000 Da



Column length	2 mm ID		
	Order No.	3 µm ...K041EBG	5 µm ...K041EBJ
150 mm	15B...	15BK041EBG	15BK041EBJ
100 mm	10B...	10BK041EBG	10BK041EBJ
50 mm	05B...	05BK041EBG	05BK041EBJ

Column length & equipment	3 mm ID			4 mm ID			4.6 mm ID		
	Order No.	3 µm ...K041EBG	5 µm ...K041EBJ	Order No.	3 µm ...K041EBG	5 µm ...K041EBJ	Order No.	3 µm ...K041EBG	5 µm ...K041EBJ
250 mm	25C...	25CK041EBG	25CK041EBJ	25D...	25DK041EBG	25DK041EBJ	25E...	25EK041EBG	25EK041EBJ
with integrated precolumn	25X...	25XK041EBG	25XK041EBJ	25W...	25WK041EBG	25WK041EBJ	25V...	25VK041EBG	25VK041EBJ
150 mm	15C...	15CK041EBG	15CK041EBJ	15D...	15DK041EBG	15DK041EBJ	15E...	15EK041EBG	15EK041EBJ
with integrated precolumn	15X...	15XK041EBG	15XK041EBJ	15W...	15WK041EBG	15WK041EBJ	15V...	15VK041EBG	15VK041EBJ
100 mm	12C...	12CK041EBG	12CK041EBJ	12D...	12DK041EBG	12DK041EBJ	12E...	12EK041EBG	12EK041EBJ
with integrated precolumn	12X...	12XK041EBG	12XK041EBJ	12W...	12WK041EBG	12WK041EBJ	12V...	12VK041EBG	12VK041EBJ
50 mm	05C...	05CK041EBG	05CK041EBJ	05D...	05DK041EBG	05DK041EBJ	05E...	05EK041EBG	05EK041EBJ
5 mm precolumn cartridge	P6C...	P6CK041EBG	P6CK041EBJ	P6C...	P6CK041EBG	P6CK041EBJ	P6E...	P6EK041EBG	P6EK041EBJ

Get in touch

Sales

If you want to learn more about our products and services or get a quote, the experts from our sales team are happy to assist you with your request.

Phone: +49 30 809727-0 (workdays 9-17h CET)

Fax: +49 30 8015010

E-mail: sales@knauer.net

Support

Do you have questions about the installation or the operation of your device or software?

International Support:

Contact your local KNAUER partner for support:

www.knauer.net/en/Support/Distributors-worldwide

Phone: +49 30 809727-111 (workdays 9-17h CET)

Fax: +49 30 8015010

E-mail: support@knauer.net



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