

Science Together



2019

KNAUER Column Selection Guide

for HPLC/UHPLC, Prep LC, FPLC and GPC



Handy
column
care



Made in Germany

Wide
area of
application
services

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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.

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Welcome to KNAUER



**Made in Germany
since 1962**

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), and osmometry.



**Independent and
family owned**

The founder Dr. Herbert Knauer and his wife Roswitha are still active as advisers in the company to this day. The couple's daughter, Alexandra Knauer, has been managing director and owner of the company since 2000.

Several awards for outstanding products and innovations as well as entrepreneurial excellence make KNAUER a „leading employer“.



**Comprehensive service
from the manufacturer**

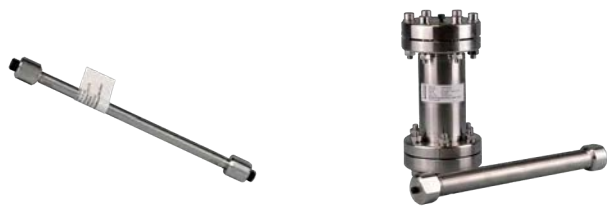
Our wide-ranging services complement our excellent instruments: The trainings are performed by experts and cover a variety of topics for beginners to experienced users.

The high-performance customer support and repair service provide fast and spot on solutions.

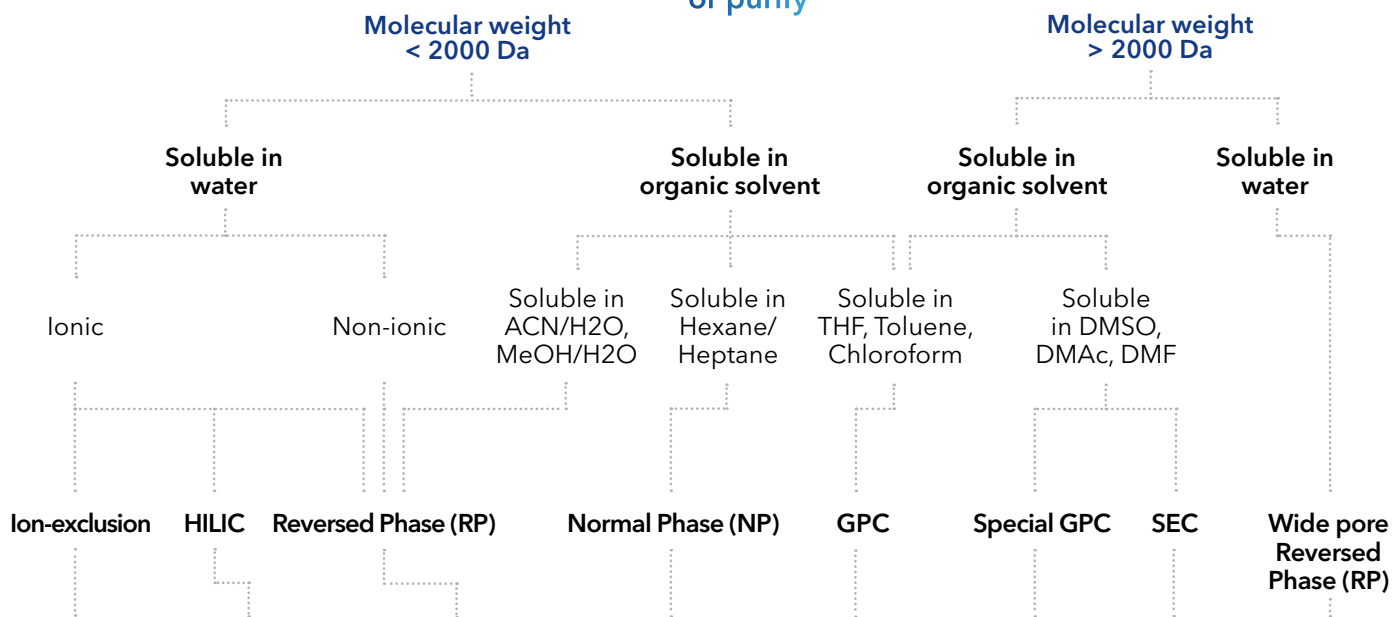
If you need support for your research project, we help you to develop applications, transfer and optimize methods or develop software.



Non-native conditions

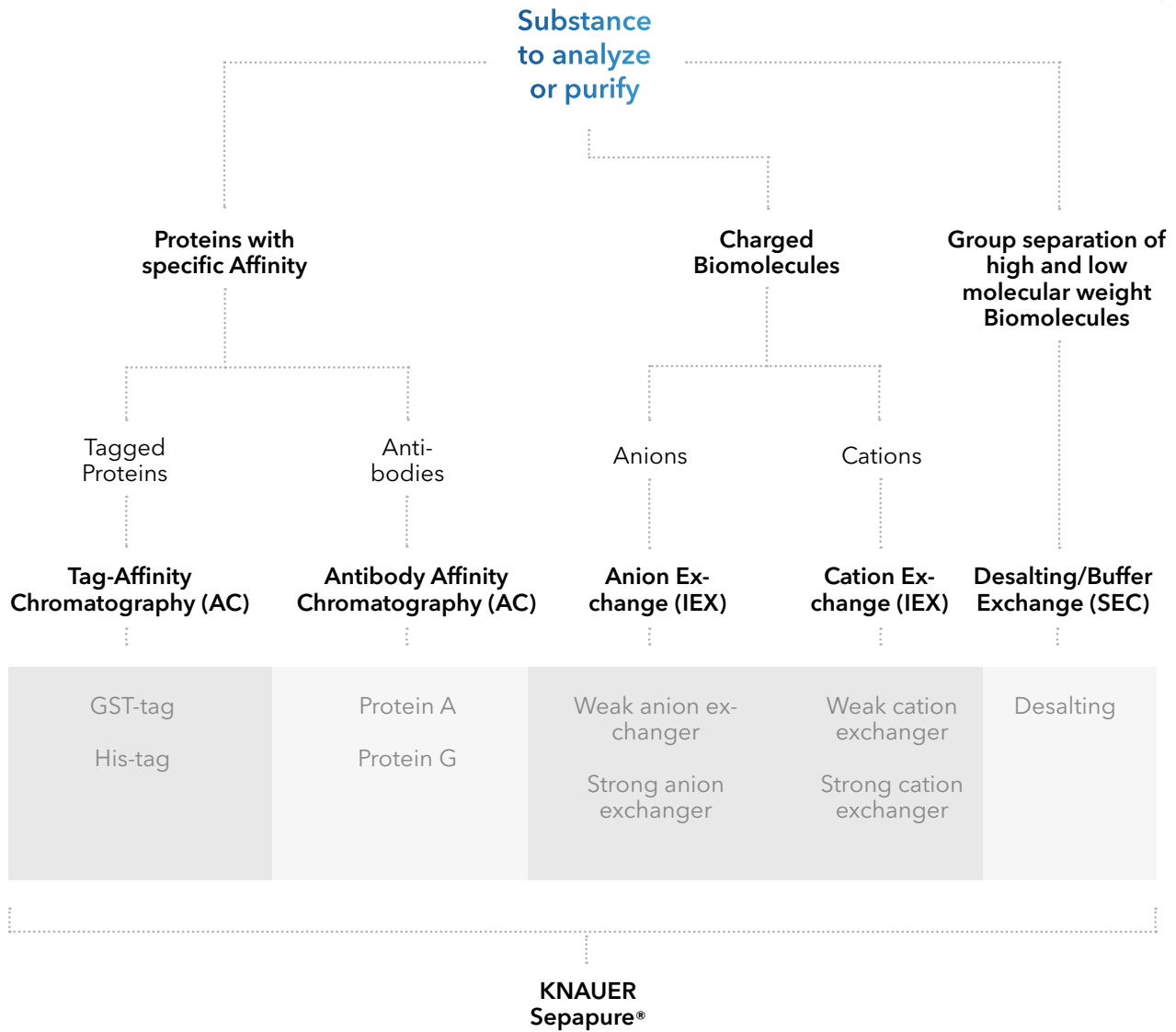


Substance to analyze or purify



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)		Applichrom® ABOA StyDiViBe	Applichrom® ABOA DMAc-Phil, DMSO-Phil	Applichrom® ABOA Super-OH	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					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

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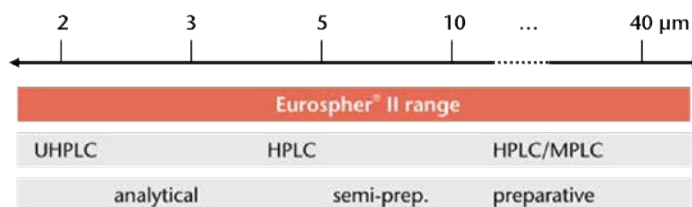
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Eurospher II

Eurospher II offers outstanding mechanical and chemical stability. With physical properties very similar to those of Kromasil 100, Eurospher II columns can be used to replace Kromasil® columns, providing excellent peak symmetry for acids, bases, and neutrals.

Compared to Kromasil® 100, Eurospher II has

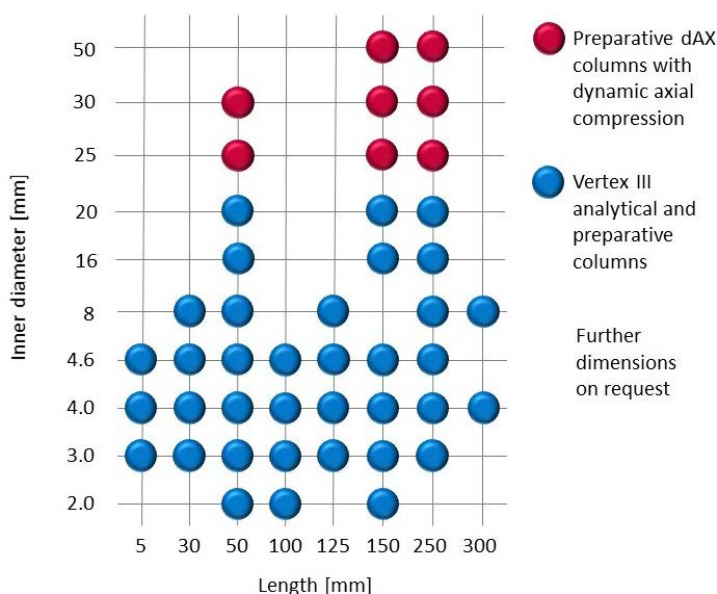
- nearly the same particle shape
- a lower metal impurity specification
- higher mechanical stability
- comparable selectivity in RP mode (Eurospher II C18 H vs. Kromasil® 100 C18)



Physical properties

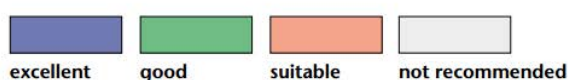
Silica gel	ultra pure, > 99.99 %
Metal content	< 10 ppm
Particle size	2 / 3 / 5 / 10 µm (15 / 20–45 µm upon request)
Particle form	spherical
Pore size	100 Å
Specific surface	320 ± 20 m ² /g
Pore volume	0.8 ml/g
Density	430 g/l

Available column dimensions



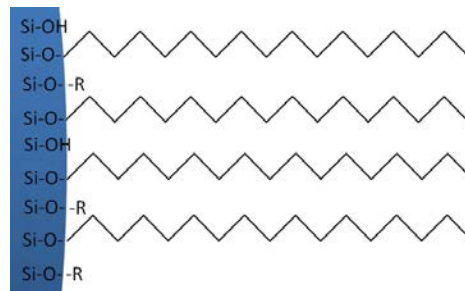
Recommended application areas

Phase type	non polar	polar	acidic	basic	Chelator	hydroph. retention	shape selectivity	extreme aqueous	pH > 9	LC-MS
C18	excellent	good	excellent	good	excellent	excellent	excellent	excellent	excellent	excellent
C18 H	excellent	good	excellent	good	excellent	excellent	excellent	excellent	excellent	excellent
C18 P	excellent	good	excellent	good	excellent	excellent	excellent	excellent	excellent	excellent
C18 A	excellent	good	excellent	good	excellent	excellent	excellent	excellent	excellent	excellent
Phenyl	excellent	good	excellent	good	excellent	excellent	excellent	excellent	excellent	excellent
C8	excellent	good	excellent	good	excellent	excellent	excellent	excellent	excellent	excellent
C8 A	excellent	good	excellent	good	excellent	excellent	excellent	excellent	excellent	excellent
C4	excellent	good	excellent	good	excellent	excellent	excellent	excellent	excellent	excellent
HILIC	excellent	good	excellent	good	excellent	excellent	excellent	excellent	excellent	excellent
NH ₂	excellent	good	excellent	good	excellent	excellent	excellent	excellent	excellent	excellent
CN	excellent	good	excellent	good	excellent	excellent	excellent	excellent	excellent	excellent
Diol	excellent	good	excellent	good	excellent	excellent	excellent	excellent	excellent	excellent
Si	excellent	good	excellent	good	excellent	excellent	excellent	excellent	excellent	excellent



Eurospher II 100 C18 - USP L1

- Ultra pure, spherical high performance HPLC phase based on silica gel
- Unpolar, monomeric C18 (Octadecyl) modification, endcapped, with 16 % carbon content (~ 50 % endcapping).



Properties

Separation mechanism: Hydrophobic interaction

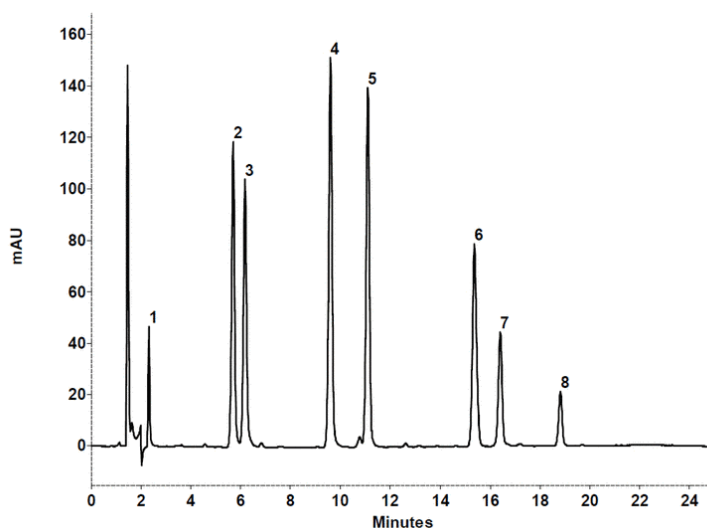
Key features

High-class HPLC phase perfectly suited to take on routine analyses as well as the most ambitious chromatography tasks, classical C18 phase with ca. 50 % endcapping and resulting 16 % carbon content, outstanding mechanical and chemical stability.

Recommended application areas

- acidic, basic and neutral analytes in reversed phase mode, for example sulphonamides
- anabolic steroids
- anti-psychotics
- beta blocker
- sudan dyes
- phenols and preservatives

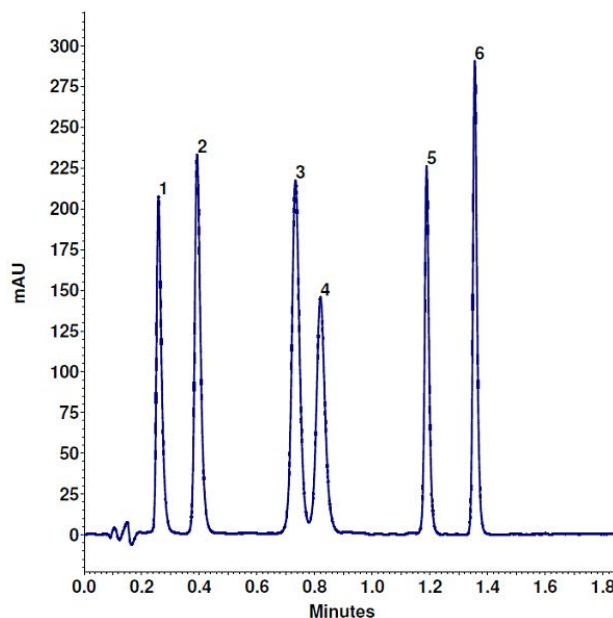
Eurospher II 100-5 C18, 150 x 2.0 mm ID
Article number: 15BE181E2J



Selectivity test mix

- | | |
|-------------------|----------------------------|
| 1. Uracil | 5. N,N-Dimethylaniline |
| 2. Aniline | 6. Benzoic acid ethylester |
| 3. Phenol | 7. Toluene |
| 4. p-Ethylaniline | 8. Ethylbenzene |

Eurospher II 100-2 C18, 50 x 2 mm ID
Article number: 05BE181E2F



Steroids

- | | |
|-------------------|------------------------|
| 1. Cortisone | 4. Deoxycorticosterone |
| 2. Corticosterone | 5. Norgestrel |
| 3. Testosterone | 6. Progesterone |



Tip: Never use classical C18 phases with 100 % aqueous mobile phase. The hydrophobic C18 chains will collapse.

Ordering information

Eurosphere II 100 C18

Column length & equipment	3 mm ID			4 mm ID			4.6 mm ID		
	Order No.	3 μ m ...E181E2G	5 μ m ...E181E2J	Order No.	3 μ m ...E181E2G	5 μ m ...E181E2J	Order No.	3 μ m ...E181E2G	5 μ m ...E181E2J
250 mm	25C...	25CE181E2G	25CE181E2J	25D...	25DE181E2G	25DE181E2J	25E...	25EE181E2G	25EE181E2J
with integrated precolumn	25X...	25XE181E2G	25XE181E2J	25W...	25WE181E2G	25WE181E2J	25V...	25VE181E2G	25VE181E2J
150 mm	15C...	15CE181E2G	15CE181E2J	15D...	15DE181E2G	15DE181E2J	15E...	15EE181E2G	15EE181E2J
with integrated precolumn	15X...	15XE181E2G	15XE181E2J	15W...	15WE181E2G	15WE181E2J	15V...	15VE181E2G	15VE181E2J
100 mm	10C...	10CE181E2G	10CE181E2J	10D...	10DE181E2G	10DE181E2J	10E...	10EE181E2G	10EE181E2J
with integrated precolumn	10X...	10XE181E2G	10XE181E2J	10W...	10WE181E2G	10WE181E2J	10V...	10VE181E2G	10VE181E2J
50 mm	05C...	05CE181E2G	05CE181E2J	05D...	05DE181E2G	05DE181E2J	05E...	05EE181E2G	05EE181E2J
5 mm precolumn cartridge	P6C...	P6CE181E2G	P6CE181E2J	P6D...	P6DE181E2G	P6DE181E2J	P6E...	P6EE181E2G	P6EE181E2J

Column length	2 mm ID		
	Order No.	2 μ m ...E181E2F	3 μ m ...E181E2G
150 mm	15B...	15BE181E2F	15BE181E2G
100 mm	10B...	10BE181E2F	10BE181E2G
50 mm	05B...	05BE181E2F	05BE181E2G

Eurosphere II 100 C18 semi-preparative standard columns

Column length & style	8 mm ID			16 mm ID		
	Order No.	5 μ m ...E181E2J	10 μ m ...E181E2N	Order No.	5 μ m ...E181E2J	10 μ m ...E181E2N
250 mm	25G...	25GE181E2J	25GE181E2N	25I...	25IE181E2J	25IE181E2N
150 mm	-	-	-	15I...	15IE181E2J	15IE181E2N
125 mm	12G...	12GE181E2J	12GE181E2N	-	-	-
50 mm	05G...	05GE181E2J	05GE181E2N	05I...	05IE181E2J	05IE181E2N
30 mm	03G...	03GE181E2J	03GE181E2N	-	-	-

Eurosphere II 100 C18 preparative standard columns

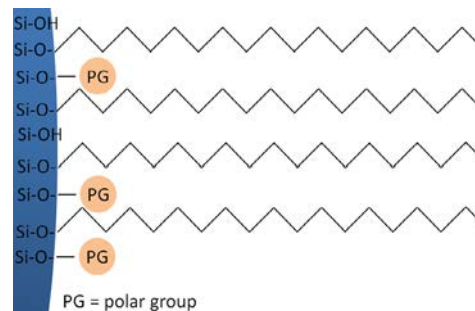
Column length & style	20 mm ID			30 mm ID			50 mm ID		
	Order No.	5 μ m ...E181E2J	10 μ m ...E181E2N	Order No.	5 μ m ...E181E2J	10 μ m ...E181E2N	Order No.	10 μ m ...E181E2N	15 μ m ...E181E2Q
250 mm	25J...	25JE181E2J	25JE181E2N	25M...	25ME181E2J	25ME181E2N	25O...	25OE181E2N	25OE181E2Q
150 mm	15J...	15JE181E2J	15JE181E2N	15M...	15ME181E2J	15ME181E2N	15O...	15OE181E2N	15OE181E2Q
50 mm	05J...	05JE181E2J	05JE181E2N	05M...	05ME181E2J	05ME181E2N	05O...	05OE181E2N	05OE181E2Q

Eurosphere II 100 C18 preparative dAX columns with dynamic axial compression

Column length & style	25 mm ID			30 mm ID			50 mm ID		
	Order No.	5 μ m ...E181E2J	10 μ m ...E181E2N	Order No.	5 μ m ...E181E2J	10 μ m ...E181E2N	Order No.	10 μ m ...E181E2N	15 μ m ...E181E2Q
250 mm	25T...	25TE181E2J	25TE181E2N	25U...	25UE181E2J	25UE181E2N	25Z...	25ZE181E2N	25ZE181E2Q
150 mm	15T...	15TE181E2J	15TE181E2N	15U...	15UE181E2J	15UE181E2N	15Z...	15ZE181E2N	15ZE181E2Q
50 mm	05T...	05TE181E2J	05TE181E2N	05U...	05UE181E2J	05UE181E2N	05Z...	05ZE181E2N	05ZE181E2Q

Eurospher II 100 C18 A - USP L1

- Ultra pure, spherical high performance HPLC phase based on silica gel
- Polar, monomeric C18 (Octadecyl) modification, polar endcapping, with 10 % carbon content (~ 50 % endcapping)



Properties

Separation mechanism: Hydrophobic and polar interaction

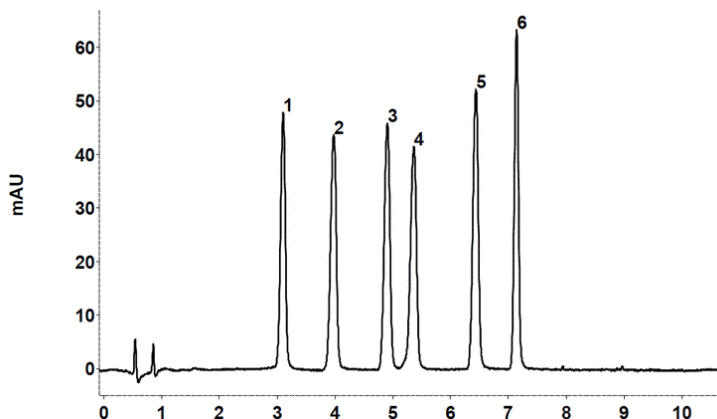
Key features

C18 A phase with alternative, more polar selectivity, suited for the use with pure aqueous mobile phases, 50 % endcapping and resulting 10 % carbon content, outstanding mechanical and chemical stability, suited for analytical as well as semi preparative and preparative applications.

Recommended application areas

Polar endcapped C18 phase for water soluble and polar analytes, 100 % aqueous eluents for analysis of very polar compounds, basic pharmaceutical ingredients, water soluble vitamins, catecholamines as well as organic acids.

Eurospher II 100-3 C18 A, 100 x 3 mm ID
Article number: 10CE184E2G

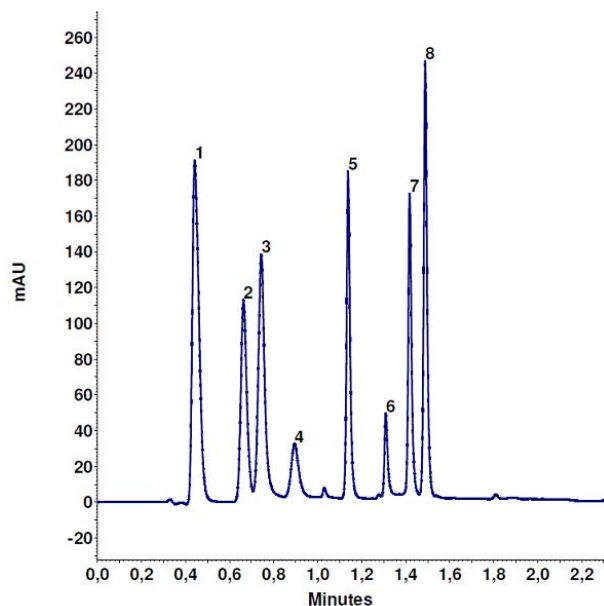


Aldehydes/Ketones

DNPH Derivates of:

- | | |
|-----------------|--------------------|
| 1. Formaldehyde | 4. Acroleine |
| 2. Acetaldehyde | 5. Propionaldehyde |
| 3. Acetone | 6. Crotonaldehyde |

Eurospher II 100-2 C18 A, 100 x 2 mm ID
Article number: 10BE184E2F



Water soluble vitamins

- | | |
|-------------------|--------------------|
| 1. Ascorbic acid | 5. Nicotinamid |
| 2. Nicotinic acid | 6. Folic acid |
| 3. Thiamine | 7. Cyanocobalamine |
| 4. Pyridoxin | 8. Riboflavin |



Tip: With an endcapping the influence of non-derivatized silanol groups can be minimized. The endcapping reagent is generally a smaller silane than used for derivatisation. This treatment reduces the unwanted interaction of polar or charged analytes (acids, bases ect.) because the amount of available silanol groups is reduced.

Ordering information

Europher II 100 C18 A

Column length & equipment	3 mm ID			4 mm ID			4.6 mm ID		
	Order No.	3 μ m ...E184E2G	5 μ m ...E184E2J	Order No.	3 μ m ...E184E2G	5 μ m ...E184E2J	Order No.	3 μ m ...E184E2G	5 μ m ...E184E2J
250 mm	25C...	25CE184E2G	25CE184E2J	25D...	25DE184E2G	25DE184E2J	25E...	25EE184E2G	25EE184E2J
with integrated precolumn	25X...	25XE184E2G	25XE184E2J	25W...	25WE184E2G	25WE184E2J	25V...	25VE184E2G	25VE184E2J
150 mm	15C...	15CE184E2G	15CE184E2J	15D...	15DE184E2G	15DE184E2J	15E...	15EE184E2G	15EE184E2J
with integrated precolumn	15X...	15XE184E2G	15XE184E2J	15W...	15WE184E2G	15WE184E2J	15V...	15VE184E2G	15VE184E2J
100 mm	10C...	10CE184E2G	10CE184E2J	10D...	10DE184E2G	10DE184E2J	10E...	10EE184E2G	10EE184E2J
with integrated precolumn	10X...	10XE184E2G	10XE184E2J	10W...	10WE184E2G	10WE184E2J	10V...	10VE184E2G	10VE184E2J
50 mm	05C...	05CE184E2G	05CE184E2J	05D...	05DE184E2G	05DE184E2J	05E...	05EE184E2G	05EE184E2J
5 mm precolumn cartridge	P6C...	P6CE184E2G	P6CE184E2J	P6C...	P6CE184E2G	P6CE184E2J	P6E...	P6EE184E2G	P6EE184E2J

Column length	2 mm ID		
	Order No.	2 μ m ...E184E2F	3 μ m ...E184E2G
150 mm	15B...	15BE184E2F	15BE184E2G
100 mm	10B...	10BE184E2F	10BE184E2G
50 mm	05B...	05BE184E2F	05BE184E2G

Europher II 100 C18 A semi-preparative standard columns

Column length & style	8 mm ID			16 mm ID		
	Order No.	5 μ m ...E184E2J	10 μ m ...E184E2N	Order No.	5 μ m ...E184E2J	10 μ m ...E184E2N
250 mm	25G...	25GE184E2J	25GE184E2N	25I...	25IE184E2J	25IE184E2N
150 mm	-	-	-	15I...	15IE184E2J	15IE184E2N
125 mm	12G...	12GE184E2J	12GE184E2N	-	-	-
50 mm	05G...	05GE184E2J	05GE184E2N	05I...	05IE184E2J	05IE184E2N
30 mm	03G...	03GE184E2J	03GE184E2N	-	-	-

Europher II 100 C18 A preparative standard columns

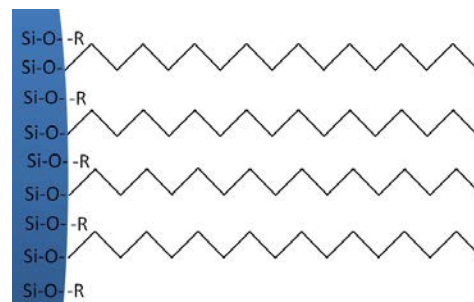
Column length & style	20 mm ID			30 mm ID			50 mm ID		
	Order No.	5 μ m ...E184E2J	10 μ m ...E184E2N	Order No.	5 μ m ...E184E2J	10 μ m ...E184E2N	Order No.	10 μ m ...E184E2N	15 μ m ...E184E2Q
250 mm	25J...	25JE184E2J	25JE184E2N	25M...	25ME184E2J	25ME184E2N	25O...	25OE184E2N	25OE184E2Q
150 mm	15J...	15JE184E2J	15JE184E2N	15M...	15ME184E2J	15ME184E2N	15O...	15OE184E2N	15OE184E2Q
50 mm	05J...	05JE184E2J	05JE184E2N	05M...	05ME184E2J	05ME184E2N	05O...	05OE184E2N	05OE184E2Q

Europher II 100 C18 A preparative dAX columns with dynamic axial compression

Column length & style	25 mm ID			30 mm ID			50 mm ID		
	Order No.	5 μ m ...E184E2J	10 μ m ...E184E2N	Order No.	5 μ m ...E184E2J	10 μ m ...E184E2N	Order No.	10 μ m ...E184E2N	15 μ m ...E184E2Q
250 mm	25T...	25TE181E2J	25TE181E2N	25U...	25UE181E2J	25UE181E2N	25Z...	25ZE181E2N	25ZE181E2Q
150 mm	15T...	15TE181E2J	15TE181E2N	15U...	15UE181E2J	15UE181E2N	15Z...	15ZE181E2N	15ZE181E2Q
50 mm	05T...	05TE181E2J	05TE181E2N	05U...	05UE181E2J	05UE181E2N	05Z...	05ZE181E2N	05ZE181E2Q

Eurospher II 100 C18 H - USP L1

- Ultra pure, spherical high performance HPLC phase based on silica gel
- Unpolar, monomeric C18 (Octadecyl) modification, high efficiency endcapping with 17 % carbon content (~ 99 % endcapping)



Properties

Separation mechanism: Hydrophobic interaction

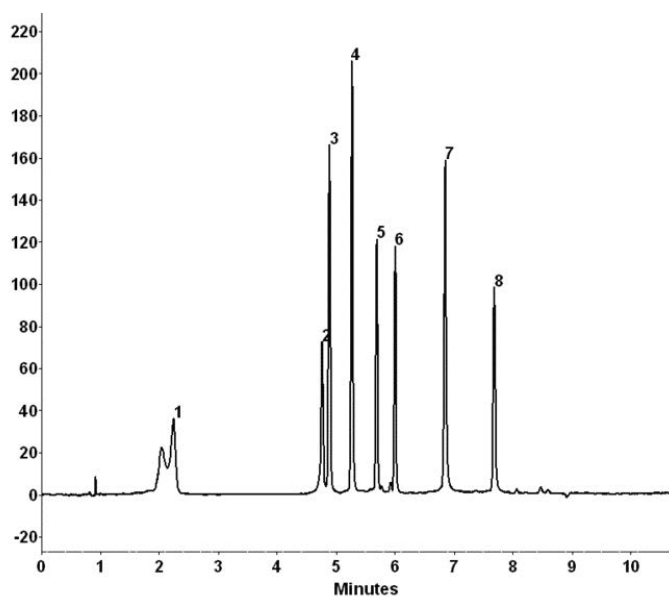
Key features

Unpolar C18 phase with high efficiency endcapping and 17 % carbon content, therewith higher pH stability in the range of 1-12, outstanding mechanical and chemical stability, suited for analytical as well as semi preparative and preparative applications.

Recommended application areas

Recommended alternative to Kromasil 100 C18, für acidic, basic and neutral analytes in reversed phase mode with extended pH range.

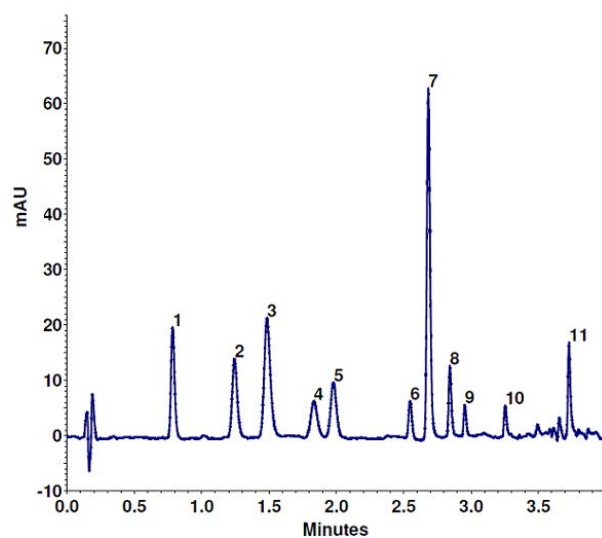
Eurospher II 100-3 C18 H, 150 x 3.0 mm ID
Article number: 15CE185E2G



Polyphenols

- | | |
|---------------------|------------------------------|
| 1. Gallic acid | 5. Rutin |
| 2. Chlorogenic acid | 6. Kaempferol-3-o-rutinoside |
| 3. Catechin | 7. Myricitin |
| 4. Epicatechin | 8. Quercetin |

Eurospher II 100-2 C18 H, 50 x 2 mm ID
Article number: 05BE185E2F



Phenols

- | | |
|-----------------------|-------------------------------|
| 1. Phenol | 7. 2-Methyl-4,6-dinitrophenol |
| 2. 4-Nitrophenol | 8. 4-Chloro-3-Methylphenol |
| 3. 2,4-Dinitrophenol | 9. 4-Dichlorophenol |
| 4. 2-Nitrophenol | 10. 6-Trichlorophenol |
| 5. 2-Chlorophenol | 11. Pentachlorophenol |
| 6. 2,3-Dimethylphenol | |



Tip: All analytical KNAUER columns can be used in reversed flow direction for example for cleaning.

Ordering information

Eurosphere II 100 C18 H

Column length & equipment	3 mm ID			4 mm ID			4.6 mm ID		
	Order No.	3 μm ...E185E2G	5 μm ...E185E2J	Order No.	3 μm ...E185E2G	5 μm ...E185E2J	Order No.	3 μm ...E185E2G	5 μm ...E185E2J
250 mm	25C...	25CE185E2G	25CE185E2J	25D...	25DE185E2G	25DE185E2J	25E...	25EE185E2G	25EE185E2J
with integrated precolumn	25X...	25XE185E2G	25XE185E2J	25W...	25WE185E2G	25WE185E2J	25V...	25VE185E2G	25VE185E2J
150 mm	15C...	15CE185E2G	15CE185E2J	15D...	15DE185E2G	15DE185E2J	15E...	15EE185E2G	15EE185E2J
with integrated precolumn	15X...	15XE185E2G	15XE185E2J	15W...	15WE185E2G	15WE185E2J	15V...	15VE185E2G	15VE185E2J
100 mm	10C...	10CE185E2G	10CE185E2J	10D...	10DE185E2G	10DE185E2J	10E...	10EE185E2G	10EE185E2J
with integrated precolumn	10X...	10XE185E2G	10XE185E2J	10W...	10WE185E2G	10WE185E2J	10V...	10VE185E2G	10VE185E2J
50 mm	05C...	05CE185E2G	05CE185E2J	05D...	05DE185E2G	05DE185E2J	05E...	05EE185E2G	05EE185E2J
5 mm precolumn cartridge	P6C...	P6CE185E2G	P6CE185E2J	P6C...	P6CE185E2G	P6CE185E2J	P6E...	P6EE185E2G	P6EE185E2J

Column length	2 mm ID		
	Order No.	2 μm ...E185E2F	3 μm ...E185E2G
150 mm	15B...	15BE185E2F	15BE185E2G
100 mm	10B...	10BE185E2F	10BE185E2G
50 mm	05B...	05BE185E2F	05BE185E2G

Eurosphere II 100 C18 H semi-preparative standard columns

Column length & style	8 mm ID			16 mm ID		
	Order No.	5 μm ...E185E2J	10 μm ...E185E2N	Order No.	5 μm ...E185E2J	10 μm ...E185E2N
250 mm	25G...	25GE185E2J	25GE185E2N	25I...	25IE185E2J	25IE185E2N
150 mm	-	-	-	15I...	15IE185E2J	15IE185E2N
125 mm	12G...	12GE185E2J	12GE185E2N	-	-	-
50 mm	05G...	05GE185E2J	05GE185E2N	05I...	05IE185E2J	05IE185E2N
30 mm	03G...	03GE185E2J	03GE185E2N	-	-	-

Eurosphere II 100 C18 H preparative standard columns

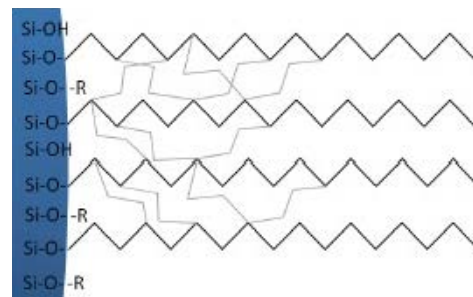
Column length & style	20 mm ID			30 mm ID			50 mm ID		
	Order No.	5 μm ...E185E2J	10 μm ...E185E2N	Order No.	5 μm ...E185E2J	10 μm ...E185E2N	Order No.	10 μm ...E185E2N	15 μm ...E185E2Q
250 mm	25J...	25JE185E2J	25JE185E2N	25M...	25ME185E2J	25ME185E2N	25O...	25OE185E2N	25OE185E2Q
150 mm	15J...	15JE185E2J	15JE185E2N	15M...	15ME185E2J	15ME185E2N	15O...	15OE185E2N	15OE185E2Q
50 mm	05J...	05JE185E2J	05JE185E2N	05M...	05ME185E2J	05ME185E2N	05O...	05OE185E2N	05OE185E2Q

Eurosphere II 100 C18 H preparative dAX columns with dynamic axial compression

Column length & style	25 mm ID			30 mm ID			50 mm ID		
	Order No.	5 μm ...E185E2J	10 μm ...E185E2N	Order No.	5 μm ...E185E2J	10 μm ...E185E2N	Order No.	10 μm ...E185E2N	15 μm ...E185E2Q
250 mm	25T...	25TE185E2J	25TE185E2N	25U...	25UE185E2J	25UE185E2N	25Z...	25ZE185E2N	25ZE185E2Q
150 mm	15T...	15TE185E2J	15TE185E2N	15U...	15UE185E2J	15UE185E2N	15Z...	15ZE185E2N	15ZE185E2Q
50 mm	05T...	05TE185E2J	05TE185E2N	05U...	05UE185E2J	05UE185E2N	05Z...	05ZE185E2N	05ZE185E2Q

Eurospher II 100 C18 P - USP L1

- Ultra pure, spherical high performance HPLC phase based on silica gel
- Unpolar, trifunctional C18 (Octadecyl) modification, high efficiency endcapping, with 20 % carbon content (~ 99 % endcapping)



Properties

Separation mechanism: Hydrophobic and steric interaction

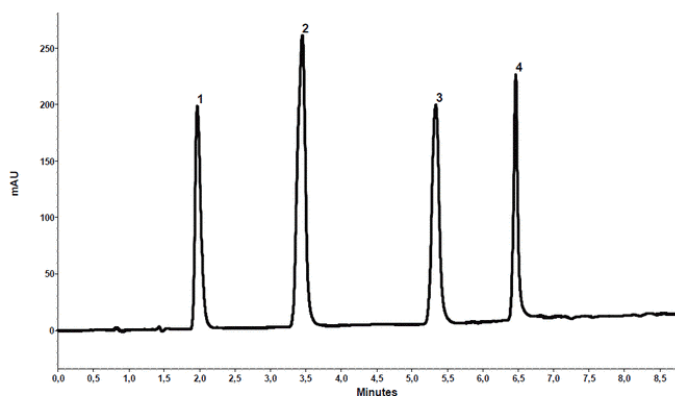
Key features

KNAUER's most unpolar C18 phase, polymeric, high efficiency endcapping of 99 % and 20 % carbon content, higher pH stability in the range of 1-12, outstanding mechanical and chemical stability, suited for analytical as well as semi preparative and preparative applications.

Recommended application areas

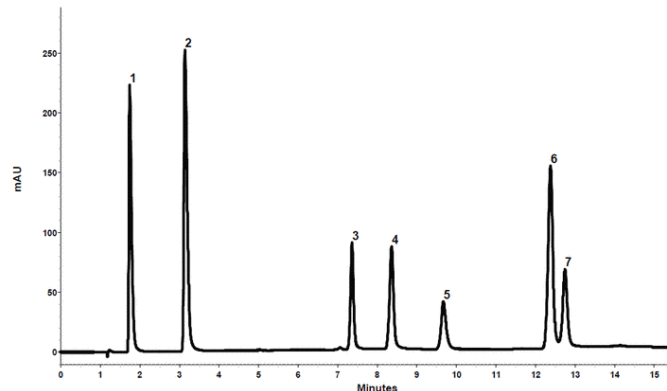
Alternative selectivity to standard C18; stationary phase in Eurospher II C18 family with the highest carbon load; fully endcapped; excellent shape selectivity and pH stability.

Eurospher II 100-3 C18 P, 100 x 3.0 mm ID
Article number: 10CE182E2G



Sedativa

- | | |
|-------------|-------------|
| 1. Barbital | 3. Prominal |
| 2. Luminal | 4. Revonal |



Softdrink additives

- | | |
|--------------|-----------------|
| 1. Acesulfam | 5. Aspartam |
| 2. Saccharin | 6. Benzoic acid |
| 3. Vanilline | 7. Sorbic acid |
| 4. Caffeine | |



Tip: Not all C18 phases are comparable! When replacing an existing column, always have a close look at the characteristics like carbon load, pore size and specific surface area.

Ordering information

Eurosphere II 100 C18 P

Column length & equipment	3 mm ID			4 mm ID			4.6 mm ID		
	Order No.	3 μ m ...E182E2G	5 μ m ...E182E2J	Order No.	3 μ m ...E182E2G	5 μ m ...E182E2J	Order No.	3 μ m ...E182E2G	5 μ m ...E182E2J
250 mm	25C...	25CE182E2G	25CE182E2J	25D...	25DE182E2G	25DE182E2J	25E...	25EE182E2G	25EE182E2J
with integrated precolumn	25X...	25XE182E2G	25XE182E2J	25W...	25WE182E2G	25WE182E2J	25V...	25VE182E2G	25VE182E2J
150 mm	15C...	15CE182E2G	15CE182E2J	15D...	15DE182E2G	15DE182E2J	15E...	15EE182E2G	15EE182E2J
with integrated precolumn	15X...	15XE182E2G	15XE182E2J	15W...	15WE182E2G	15WE182E2J	15V...	15VE182E2G	15VE182E2J
100 mm	10C...	10CE182E2G	10CE182E2J	10D...	10DE182E2G	10DE182E2J	10E...	10EE182E2G	10EE182E2J
with integrated precolumn	10X...	10XE182E2G	10XE182E2J	10W...	10WE182E2G	10WE182E2J	10V...	10VE182E2G	10VE182E2J
50 mm	05C...	05CE182E2G	05CE182E2J	05D...	05DE182E2G	05DE182E2J	05E...	05EE182E2G	05EE182E2J
5 mm precolumn cartridge	P6C...	P6CE182E2G	P6CE182E2J	P6C...	P6CE182E2G	P6CE182E2J	P6E...	P6EE182E2G	P6EE182E2J

Column length	2 mm ID		
	Order No.	2 μ m ...E182E2F	3 μ m ...E182E2G
150 mm	15B...	15BE182E2F	15BE182E2G
100 mm	10B...	10BE182E2F	10BE182E2G
50 mm	05B...	05BE182E2F	05BE182E2G

Eurosphere II 100 C18 P semi-preparative standard columns

Column length & style	8 mm ID			16 mm ID		
	Order No.	5 μ m ...E182E2J	10 μ m ...E182E2N	Order No.	5 μ m ...E182E2J	10 μ m ...E182E2N
250 mm	25G...	25GE182E2J	25GE182E2N	25I...	25IE182E2J	25IE182E2N
150 mm	-	-	-	15I...	15IE182E2J	15IE182E2N
125 mm	12G...	12GE182E2J	12GE182E2N	-	-	-
50 mm	05G...	05GE182E2J	05GE182E2N	05I...	05IE182E2J	05IE182E2N
30 mm	03G...	03GE182E2J	03GE182E2N	-	-	-

Eurosphere II 100 C18 P preparative standard columns

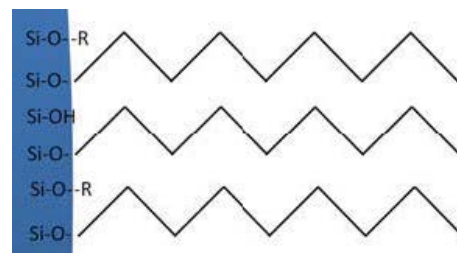
Column length & style	20 mm ID			30 mm ID			50 mm ID		
	Order No.	5 μ m ...E182E2J	10 μ m ...E182E2N	Order No.	5 μ m ...E182E2J	10 μ m ...E182E2N	Order No.	10 μ m ...E182E2N	15 μ m ...E182E2Q
250 mm	25J...	25JE182E2J	25JE182E2N	25M...	25ME182E2J	25ME182E2N	25O...	25OE182E2N	25OE182E2Q
150 mm	15J...	15JE182E2J	15JE182E2N	15M...	15ME182E2J	15ME182E2N	15O...	15OE182E2N	15OE182E2Q
50 mm	05J...	05JE182E2J	05JE182E2N	05M...	05ME182E2J	05ME182E2N	05O...	05OE182E2N	05OE182E2Q

Eurosphere II 100 C18 P preparative dAX columns with dynamic axial compression

Column length & style	25 mm ID			30 mm ID			50 mm ID		
	Order No.	5 μ m ...E182E2J	10 μ m ...E182E2N	Order No.	5 μ m ...E182E2J	10 μ m ...E182E2N	Order No.	10 μ m ...E182E2N	15 μ m ...E182E2Q
250 mm	25T...	25TE182E2J	25TE182E2N	25U...	25UE182E2J	25UE182E2N	25Z...	25ZE182E2N	25ZE182E2Q
150 mm	15T...	15TE182E2J	15TE182E2N	15U...	15UE182E2J	15UE182E2N	15Z...	15ZE182E2N	15ZE182E2Q
50 mm	05T...	05TE182E2J	05TE182E2N	05U...	05UE182E2J	05UE182E2N	05Z...	05ZE182E2N	05ZE182E2Q

Eurospher II 100 C8 - USP L7

- Ultra pure, spherical high performance HPLC phase based on silica gel
- Monomeric C8 (Octyl) modification, standard endcapping, with 10 % carbon content (~ 50 % endcapping)



Properties

Separation mechanism: Hydrophobic interaction (lower compared to C18 phases)

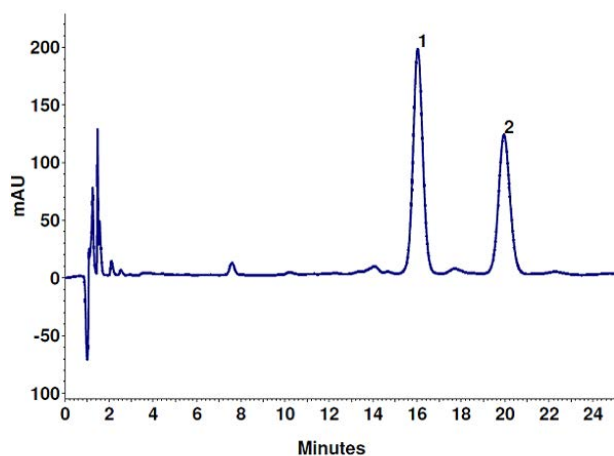
Key features

Classical C8 phase, standard 50 % endcapping and 10 % carbon load, outstanding mechanical and chemical stability, suited for analytical as well as semi preparative and preparative applications.

Recommended application areas

Similar selectivity to C18 phase but less retention due to the lower hydrophobicity; useful for determination of water soluble vitamins, steroids, catecholamines, sedatives etc.

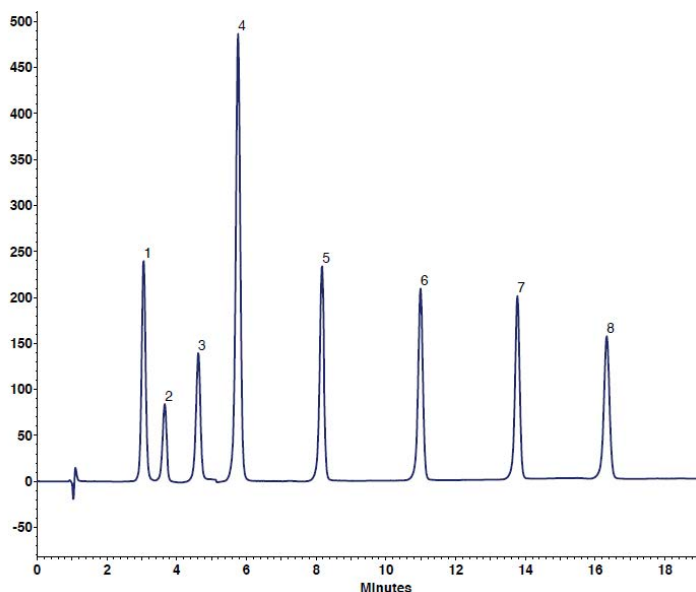
Eurospher II 100-5 C8, 150 x 4.6 mm ID
Article number: 15EE081E2J



Ingredients of cosmetics

1. Bisabolol oxide A
2. Bisabolol oxide B

Eurospher 100-5 C8, 125 x 4.0 mm ID
Article number: 12DE081ESJ



Preservatives

- | | |
|---------------------------|-----------------------------|
| 1. p-hydroxy benzoic acid | 5. p-hydroxy methylbenzoate |
| 2. 2-methoxy benzoic acid | 6. p-hydroxy ethylbenzoate |
| 3. benzoic acid | 7. p-hydroxy propylbenzoate |
| 4. sorbic acid | 8. p-hydroxy butylbenzoate |



Tip: Column lifetime can be extended by using moderate conditions like temperatures not higher than 45 °C, backpressure below the maximum pressure and a good sample preparation.

Ordering information

Eurosphere II 100 C8

Column length & equipment	3 mm ID			4 mm ID			4.6 mm ID		
	Order No.	3 μ m ...E081E2G	5 μ m ...E081E2J	Order No.	3 μ m ...E081E2G	5 μ m ...E081E2J	Order No.	3 μ m ...E081E2G	5 μ m ...E081E2J
250 mm	25C...	25CE081E2G	25CE081E2J	25D...	25DE081E2G	25DE081E2J	25E...	25EE081E2G	25EE081E2J
with integrated precolumn	25X...	25XE081E2G	25XE081E2J	25W...	25WE081E2G	25WE081E2J	25V...	25VE081E2G	25VE081E2J
150 mm	15C...	15CE081E2G	15CE081E2J	15D...	15DE081E2G	15DE081E2J	15E...	15EE081E2G	15EE081E2J
with integrated precolumn	15X...	15XE081E2G	15XE081E2J	15W...	15WE081E2G	15WE081E2J	15V...	15VE081E2G	15VE081E2J
100 mm	10C...	10CE081E2G	10CE081E2J	10D...	10DE081E2G	10DE081E2J	10E...	10EE081E2G	10EE081E2J
with integrated precolumn	10X...	10XE081E2G	10XE081E2J	10W...	10WE081E2G	10WE081E2J	10V...	10VE081E2G	10VE081E2J
50 mm	05C...	05CE081E2G	05CE081E2J	05D...	05DE081E2G	05DE081E2J	05E...	05EE081E2G	05EE081E2J
5 mm precolumn cartridge	P6C...	P6CE081E2G	P6CE081E2J	P6C...	P6CE081E2G	P6CE081E2J	P6E...	P6EE081E2G	P6EE081E2J

Column length	2 mm ID		
	Order No.	2 μ m ...E081E2F	3 μ m ...E081E2G
150 mm	15B...	15BE081E2F	15BE081E2G
100 mm	10B...	10BE081E2F	10BE081E2G
50 mm	05B...	05BE081E2F	05BE081E2G

Eurosphere II 100 C8 semi-preparative standard columns

Column length & style	8 mm ID			16 mm ID		
	Order No.	5 μ m ...E081E2J	10 μ m ...E081E2N	Order No.	5 μ m ...E081E2J	10 μ m ...E081E2N
250 mm	25G...	25GE081E2J	25GE081E2N	25I...	25IE081E2J	25IE081E2N
150 mm	-	-	-	15I...	15IE081E2J	15IE081E2N
125 mm	12G...	12GE081E2J	12GE081E2N	-	-	-
50 mm	05G...	05GE081E2J	05GE081E2N	05I...	05IE081E2J	05IE081E2N
30 mm	03G...	03GE081E2J	03GE081E2N	-	-	-

Eurosphere II 100 C8 preparative standard columns

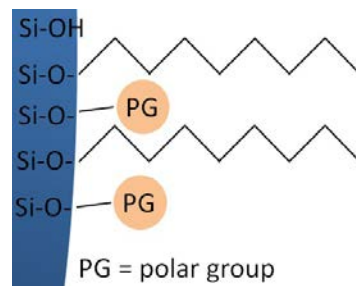
Column length & style	20 mm ID			30 mm ID			50 mm ID		
	Order No.	5 μ m ...E081E2J	10 μ m ...E081E2N	Order No.	5 μ m ...E081E2J	10 μ m ...E081E2N	Order No.	10 μ m ...E081E2N	15 μ m ...E081E2Q
250 mm	25J...	25JE081E2J	25JE081E2N	25M...	25ME081E2J	25ME081E2N	25O...	25OE081E2N	25OE081E2Q
150 mm	15J...	15JE081E2J	15JE081E2N	15M...	15ME081E2J	15ME081E2N	15O...	15OE081E2N	15OE081E2Q
50 mm	05J...	05JE081E2J	05JE081E2N	05M...	05ME081E2J	05ME081E2N	05O...	05OE081E2N	05OE081E2Q

Eurosphere II 100 C8 preparative dAX columns with dynamic axial compression

Column length & style	25 mm ID			30 mm ID			50 mm ID		
	Order No.	5 μ m ...E081E2J	10 μ m ...E081E2N	Order No.	5 μ m ...E081E2J	10 μ m ...E081E2N	Order No.	10 μ m ...E081E2N	15 μ m ...E081E2Q
250 mm	25T...	25TE081E2J	25TE081E2N	25U...	25UE081E2J	25UE081E2N	25Z...	25ZE081E2N	25ZE081E2Q
150 mm	15T...	15TE081E2J	15TE081E2N	15U...	15UE081E2J	15UE081E2N	15Z...	15ZE081E2N	15ZE081E2Q
50 mm	05T...	05TE081E2J	05TE081E2N	05U...	05UE081E2J	05UE081E2N	05Z...	05ZE081E2N	05ZE081E2Q

Eurospher II 100 C8 A - USP L7

- Ultra pure, spherical high performance HPLC phase based on silica gel
- Monomeric C8 (Octyl) modification, standard endcapping, with 10 % carbon content (~ 50 % endcapping)



Properties

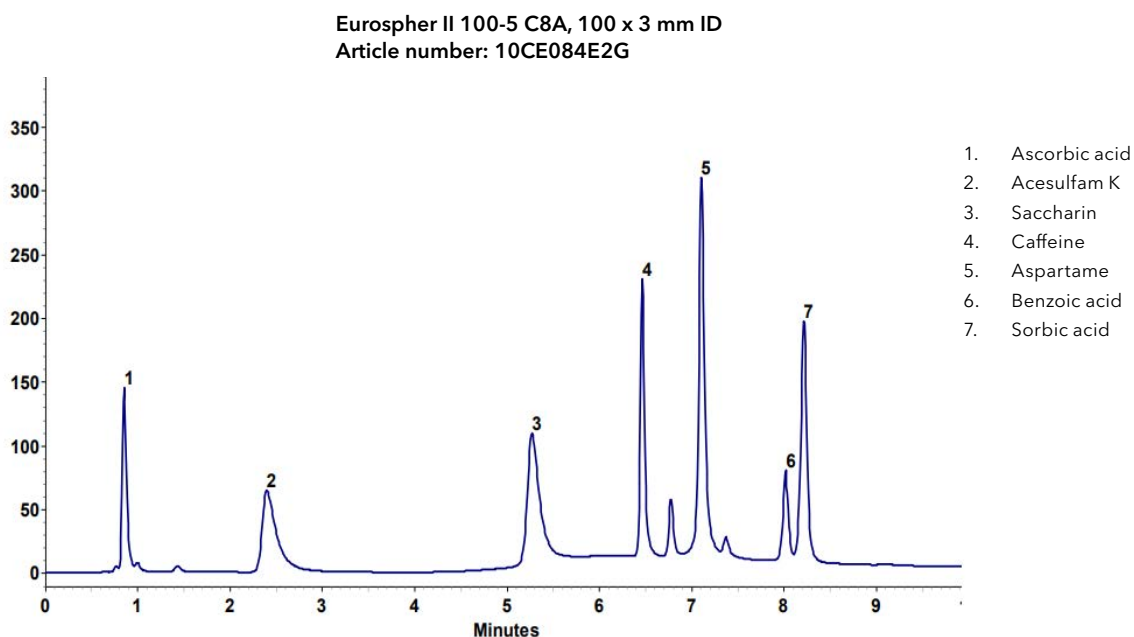
Separation mechanism: Hydrophobic interaction (lower compared to C18 phases)

Key features

Classical C8 phase, standard 50 % endcapping and 10 % carbon load, outstanding mechanical and chemical stability, suited for analytical as well as semi preparative and preparative applications.

Recommended application areas

Similar selectivity to C18 phase but less retention due to the lower hydrophobicity; useful for determination of water soluble vitamins, steroids, catecholamines, sedatives etc.



Tip: Caution! Even for short term storage all buffer solutions have to be rinsed from the column to prevent crystallization effects.

Ordering information

Eurosphere II 100 C8 A

Column length & equipment	3 mm ID			4 mm ID			4.6 mm ID		
	Order No.	3 μ m ...E084E2G	5 μ m ...E084E2J	Order No.	3 μ m ...E084E2G	5 μ m ...E084E2J	Order No.	3 μ m ...E084E2G	5 μ m ...E084E2J
250 mm	25C...	25CE084E2G	25CE084E2J	25D...	25DE084E2G	25DE084E2J	25E...	25EE084E2G	25EE084E2J
with integrated precolumn	25X...	25XE084E2G	25XE084E2J	25W...	25WE084E2G	25WE084E2J	25V...	25VE084E2G	25VE084E2J
150 mm	15C...	15CE084E2G	15CE084E2J	15D...	15DE084E2G	15DE084E2J	15E...	15EE084E2G	15EE084E2J
with integrated precolumn	15X...	15XE084E2G	15XE084E2J	15W...	15WE084E2G	15WE084E2J	15V...	15VE084E2G	15VE084E2J
100 mm	10C...	10CE084E2G	10CE084E2J	10D...	10DE084E2G	10DE084E2J	10E...	10EE084E2G	10EE084E2J
with integrated precolumn	10X...	10XE084E2G	10XE084E2J	10W...	10WE084E2G	10WE084E2J	10V...	10VE084E2G	10VE084E2J
50 mm	05C...	05CE084E2G	05CE084E2J	05D...	05DE084E2G	05DE084E2J	05E...	05EE084E2G	05EE084E2J
5 mm precolumn cartridge	P6C...	P6CE084E2G	P6CE084E2J	P6C...	P6CE084E2G	P6CE084E2J	P6E...	P6EE084E2G	P6EE084E2J

Column length	2 mm ID		
	Order No.	2 μ m ...E084E2F	3 μ m ...E084E2G
150 mm	15B...	15BE084E2G	15BE084E2J
100 mm	10B...	10BE084E2G	10BE084E2J
50 mm	05B...	05BE084E2G	05BE084E2J

Eurosphere II 100 C8 A semi-preparative standard columns

Column length & style	8 mm ID			16 mm ID		
	Order No.	5 μ m ...E084E2J	10 μ m ...E084E2N	Order No.	5 μ m ...E084E2J	10 μ m ...E084E2N
250 mm	25G...	25GE084E2J	25GE084E2N	25I...	25IE084E2J	25IE084E2N
150 mm	-	-	-	15I...	15IE084E2J	15IE084E2N
125 mm	12G...	12GE084E2J	12GE084E2N	-	-	-
50 mm	05G...	05GE084E2J	05GE084E2N	05I...	05IE084E2J	05IE084E2N
30 mm	03G...	03GE084E2J	03GE084E2N	-	-	-

Eurosphere II 100 C8 A preparative standard columns

Column length & style	20 mm ID			30 mm ID			50 mm ID		
	Order No.	5 μ m ...E084E2J	10 μ m ...E084E2N	Order No.	5 μ m ...E084E2J	10 μ m ...E084E2N	Order No.	10 μ m ...E084E2N	15 μ m ...E084E2Q
250 mm	25J...	25JE084E2J	25JE084E2N	25M...	25ME084E2J	25ME084E2N	25O...	25OE084E2N	25OE084E2Q
150 mm	15J...	15JE084E2J	15JE084E2N	15M...	15ME084E2J	15ME084E2N	15O...	15OE084E2N	15OE084E2Q
50 mm	05J...	05JE084E2J	05JE084E2N	05M...	05ME084E2J	05ME084E2N	05O...	05OE084E2N	05OE084E2Q

Eurosphere II 100 C8 A preparative dAX columns with dynamic axial compression

Column length & style	25 mm ID			30 mm ID			50 mm ID		
	Order No.	5 μ m ...E084E2J	10 μ m ...E084E2N	Order No.	5 μ m ...E084E2J	10 μ m ...E084E2N	Order No.	10 μ m ...E084E2N	15 μ m ...E084E2Q
250 mm	25T...	25TE084E2J	25TE084E2N	25U...	25UE084E2J	25UE084E2N	25Z...	25ZE084E2N	25ZE084E2Q
150 mm	15T...	15TE084E2J	15TE084E2N	15U...	15UE084E2J	15UE084E2N	15Z...	15ZE084E2N	15ZE084E2Q
50 mm	05T...	05TE084E2J	05TE084E2N	05U...	05UE084E2J	05UE084E2N	05Z...	05ZE084E2N	05ZE084E2Q

Eurospher II 100 Phenyl - USP L11

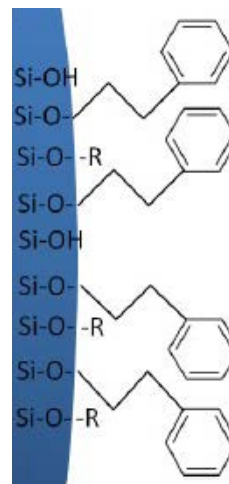
- Ultra pure, spherical high performance HPLC phase based on silica gel
- Phenyl modification (Phenylpropyl), 12 % carbon content

Properties

Separation mechanism: Pi-Pi Interactions

Key features

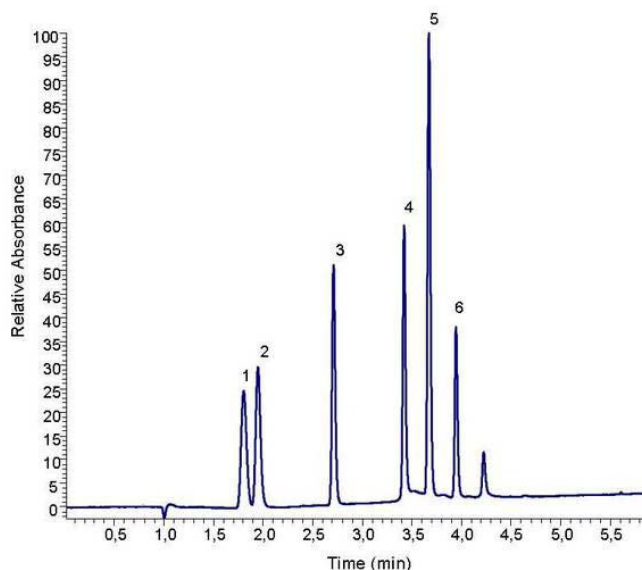
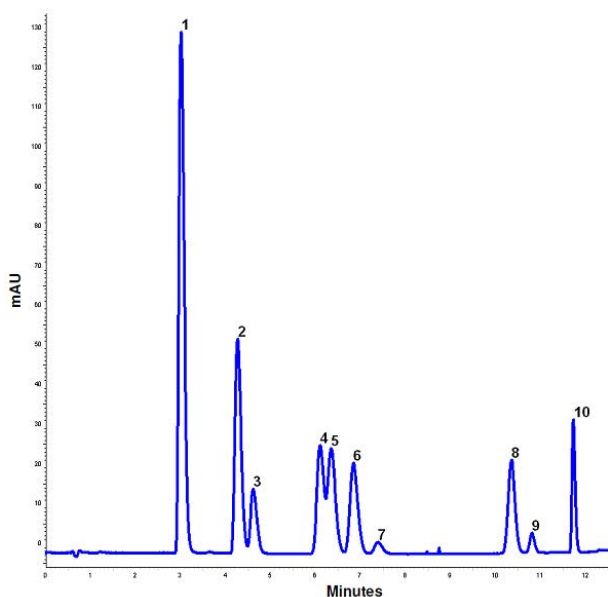
Classical phenyl phase with 12 % carbon load, outstanding mechanical and chemical stability, suited for analytical as well as semi preparative and preparative applications



Recommended application areas

Alternative selectivity for aromatic and moderately pi-pi interaction polar analytes or mixtures with varying polarity and aromaticity

Eurospher II 100-2 Phenyl, 100 x 2 mm ID Article number: 10BE050E2F



Aldehydes/Ketones

DNPH-derivatives of

- | | |
|--------------------|------------------|
| 1. Formaldehyde | 6. Acetone |
| 2. Acetaldehyde | 7. Matrix |
| 3. Matrix | 8. Butyraldehyde |
| 4. Acrolein | 9. Matrix |
| 5. Propionaldehyde | 10. Benzaldehyde |

Biocompatible polymer building monomers

- | | |
|-------------------------------|--------------------------------------|
| 1. 2-Hydroxyethylmethacrylate | 4. Ethylenglycon dimethacrylate |
| 2. N-Vinyl-2-pyrrolidon | 5. Styrene |
| 3. Methyl methacrylate | 6. Methacryloxymethyltrimethylsilane |



Tip: For UHPLC columns like Eurospher II 2 µm particle size, samples and eluents should be filtered through a 0.2 µm instead of a 0.45 µm membrane filter. Frits at column in- and outlet have smaller pores than classical HPLC columns and block more easily.

Ordering information

Eurosphere II 100 Phenyl

Column length & equipment	3 mm ID			4 mm ID			4.6 mm ID		
	Order No.	3 μ m ...E050E2G	5 μ m ...E050E2J	Order No.	3 μ m ...E050E2G	5 μ m ...E050E2J	Order No.	3 μ m ...E050E2G	5 μ m ...E050E2J
250 mm	25C...	25CE050E2G	25CE050E2J	25D...	25DE050E2G	25DE050E2J	25E...	25EE050E2G	25EE050E2J
with integrated precolumn	25X...	25XE050E2G	25XE050E2J	25W...	25WE050E2G	25WE050E2J	25V...	25VE050E2G	25VE050E2J
150 mm	15C...	15CE050E2G	15CE050E2J	15D...	15DE050E2G	15DE050E2J	15E...	15EE050E2G	15EE050E2J
with integrated precolumn	15X...	15XE050E2G	15XE050E2J	15W...	15WE050E2G	15WE050E2J	15V...	15VE050E2G	15VE050E2J
100 mm	10C...	10CE050E2G	10CE050E2J	10D...	10DE050E2G	10DE050E2J	10E...	10EE050E2G	10EE050E2J
with integrated precolumn	10X...	10XE050E2G	10XE050E2J	10W...	10WE050E2G	10WE050E2J	10V...	10VE050E2G	10VE050E2J
50 mm	05C...	05CE050E2G	05CE050E2J	05D...	05DE050E2G	05DE050E2J	05E...	05EE050E2G	05EE050E2J
5 mm precolumn cartridge	P6C...	P6CE050E2G	P6CE050E2J	P6C...	P6CE050E2G	P6CE050E2J	P6E...	P6EE050E2G	P6EE050E2J

Column length	2 mm ID		
	Order No.	2 μ m ...E050E2F	3 μ m ...E050E2G
150 mm	15B...	15BE050E2F	15BE050E2G
100 mm	10B...	10BE050E2F	10BE050E2G
50 mm	05B...	05BE050E2F	05BE050E2G

Eurosphere II 100 Phenyl semi-preparative standard columns

Column length & style	8 mm ID			16 mm ID		
	Order No.	5 μ m ...E050E2J	10 μ m ...E050E2N	Order No.	5 μ m ...E050E2J	10 μ m ...E050E2N
250 mm	25G...	25GE050E2J	25GE050E2N	25I...	25IE050E2J	25IE050E2N
150 mm	-	-	-	15I...	15IE050E2J	15IE050E2N
125 mm	12G...	12GE050E2J	12GE050E2N	-	-	-
50 mm	05G...	05GE050E2J	05GE050E2N	05I...	05IE050E2J	05IE050E2N
30 mm	03G...	03GE050E2J	03GE050E2N	-	-	-

Eurosphere II 100 Phenyl preparative standard columns

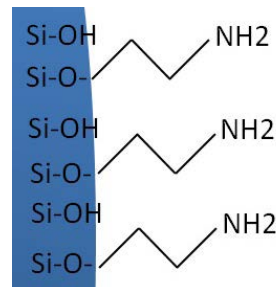
Column length & style	20 mm ID			30 mm ID			50 mm ID		
	Order No.	5 μ m ...E050E2J	10 μ m ...E050E2N	Order No.	5 μ m ...E050E2J	10 μ m ...E050E2N	Order No.	10 μ m ...E050E2N	15 μ m ...E050E2Q
250 mm	25J...	25JE050E2J	25JE050E2N	25M...	25ME050E2J	25ME050E2N	25O...	25OE050E2N	25OE050E2Q
150 mm	15J...	15JE050E2J	15JE050E2N	15M...	15ME050E2J	15ME050E2N	15O...	15OE050E2N	15OE050E2Q
50 mm	05J...	05JE050E2J	05JE050E2N	05M...	05ME050E2J	05ME050E2N	05O...	05OE050E2N	05OE050E2Q

Eurosphere II 100 Phenyl preparative dAX columns with dynamic axial compression

Column length & style	25 mm ID			30 mm ID			50 mm ID		
	Order No.	5 μ m ...E050E2J	10 μ m ...E050E2N	Order No.	5 μ m ...E050E2J	10 μ m ...E050E2N	Order No.	10 μ m ...E050E2N	15 μ m ...E050E2Q
250 mm	25T...	25TE050E2J	25TE050E2N	25U...	25UE050E2J	25UE050E2N	25Z...	25ZE050E2N	25ZE050E2Q
150 mm	15T...	15TE050E2J	15TE050E2N	15U...	15UE050E2J	15UE050E2N	15Z...	15ZE050E2N	15ZE050E2Q
50 mm	05T...	05TE050E2J	05TE050E2N	05U...	05UE050E2J	05UE050E2N	05Z...	05ZE050E2N	05ZE050E2Q

Eurospher II 100 NH2 - USP L8

- Ultra pure, spherical high performance HPLC phase based on silica gel
- Amino modification (Aminopropyl)
- 4 % carbon content (without endcapping)



Properties

Separation mechanism: Hydrophilic and ionic interactions

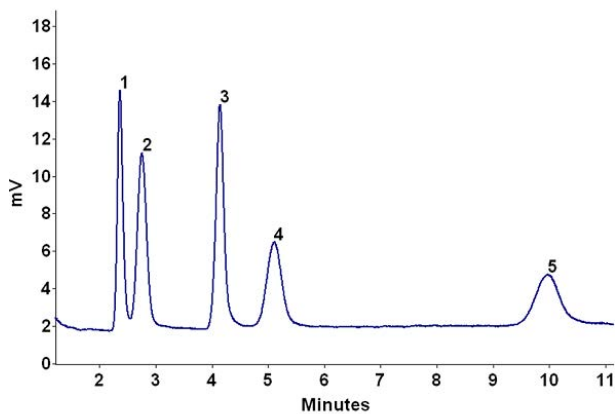
Key features

Multi mode column for RP, NP, HILIC and IC, Aminopropyl modification without endcapping, outstanding mechanical and chemical stability

Recommended application areas

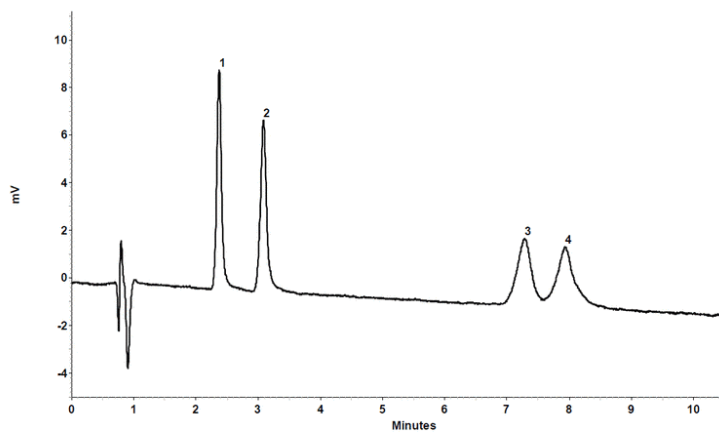
Most flexible phase in the Eurospher II family; can be used in three modes: normal phase, reversed phase and ion chromatography mode (weak anion exchanger); different selectivity to the silica packing; in reversed phase mode mainly used for analysis of carbohydrates

Eurospher II 100-3 NH2, 100 x 3.0 mm ID
Article number: 10CE190E2G



Carbohydrates

- | | |
|---------------|----------------|
| 1. Fructose | 4. Maltose |
| 2. Glucose | 5. Maltotriose |
| 3. Saccharose | |



Sweeteners

- | | |
|-------------|-------------|
| 1. Xylitol | 3. Isomalt |
| 2. Sorbitol | 4. Lactitol |



Tip: A precolumn can help to protect your analytical column. Especially when working with highly matrix afflicted samples it is highly recommended to use precolumns.

Ordering information

Eurosphere II 100 NH2

Column length & equipment	3 mm ID			4 mm ID			4.6 mm ID		
	Order No.	3 μ m ...E190E2G	5 μ m ...E190E2J	Order No.	3 μ m ...E190E2G	5 μ m ...E190E2J	Order No.	3 μ m ...E190E2G	5 μ m ...E190E2J
250 mm	25C...	25CE190E2G	25CE190E2J	25D...	25DE190E2G	25DE190E2J	25E...	25EE190E2G	25EE190E2J
with integrated precolumn	25X...	25XE190E2G	25XE190E2J	25W...	25WE190E2G	25WE190E2J	25V...	25VE190E2G	25VE190E2J
150 mm	15C...	15CE190E2G	15CE190E2J	15D...	15DE190E2G	15DE190E2J	15E...	15EE190E2G	15EE190E2J
with integrated precolumn	15X...	15XE190E2G	15XE190E2J	15W...	15WE190E2G	15WE190E2J	15V...	15VE190E2G	15VE190E2J
100 mm	10C...	10CE190E2G	10CE190E2J	10D...	10DE190E2G	10DE190E2J	10E...	10EE190E2G	10EE190E2J
with integrated precolumn	10X...	10XE190E2G	10XE190E2J	10W...	10WE190E2G	10WE190E2J	10V...	10VE190E2G	10VE190E2J
50 mm	05C...	05CE190E2G	05CE190E2J	05D...	05DE190E2G	05DE190E2J	05E...	05EE190E2G	05EE190E2J
5 mm precolumn cartridge	P6C...	P6CE190E2G	P6CE190E2J	P6C...	P6CE190E2G	P6CE190E2J	P6E...	P6EE190E2G	P6EE190E2J

Eurosphere II 100 NH2 semi-preparative standard columns

Column length & style	8 mm ID			16 mm ID		
	Order No.	5 μ m ...E190E2J	10 μ m ...E190E2N	Order No.	5 μ m ...E190E2J	10 μ m ...E190E2N
250 mm	25G...	25GE190E2J	25GE190E2N	25I...	25IE190E2J	25IE190E2N
150 mm	-	-	-	15I...	15IE190E2J	15IE190E2N
125 mm	12G...	12GE190E2J	12GE190E2N	-	-	-
50 mm	05G...	05GE190E2J	05GE190E2N	05I...	05IE190E2J	05IE190E2N
30 mm	03G...	03GE190E2J	03GE190E2N	-	-	-

Eurosphere II 100 NH2 preparative standard columns

Column length & style	20 mm ID			30 mm ID			50 mm ID		
	Order No.	5 μ m ...E190E2J	10 μ m ...E190E2N	Order No.	5 μ m ...E190E2J	10 μ m ...E190E2N	Order No.	10 μ m ...E190E2N	15 μ m ...E190E2Q
250 mm	25J...	25JE190E2J	25JE190E2N	25M...	25ME190E2J	25ME190E2N	25O...	25OE190E2N	25OE190E2Q
150 mm	15J...	15JE190E2J	15JE190E2N	15M...	15ME190E2J	15ME190E2N	15O...	15OE190E2N	15OE190E2Q
50 mm	05J...	05JE190E2J	05JE190E2N	05M...	05ME190E2J	05ME190E2N	05O...	05OE190E2N	05OE190E2Q

Eurosphere II 100 NH2 preparative dAX columns with dynamic axial compression

Column length & style	25 mm ID			30 mm ID			50 mm ID		
	Order No.	5 μ m ...E190E2J	10 μ m ...E190E2N	Order No.	5 μ m ...E190E2J	10 μ m ...E190E2N	Order No.	10 μ m ...E190E2N	15 μ m ...E190E2Q
250 mm	25T...	25TE190E2J	25TE190E2N	25U...	25UE190E2J	25UE190E2N	25Z...	25ZE190E2N	25ZE190E2Q
150 mm	15T...	15TE190E2J	15TE190E2N	15U...	15UE190E2J	15UE190E2N	15Z...	15ZE190E2N	15ZE190E2Q
50 mm	05T...	05TE190E2J	05TE190E2N	05U...	05UE190E2J	05UE190E2N	05Z...	05ZE190E2N	05ZE190E2Q

Eurospher II 100 Si

- Ultra pure, spherical high performance HPLC phase based on silica gel
- No modification, no endcapping, with 0 % carbon content

Si-OH
Si-OH
Si-OH
Si-OH
Si-OH

Properties

hydrophilic interaction

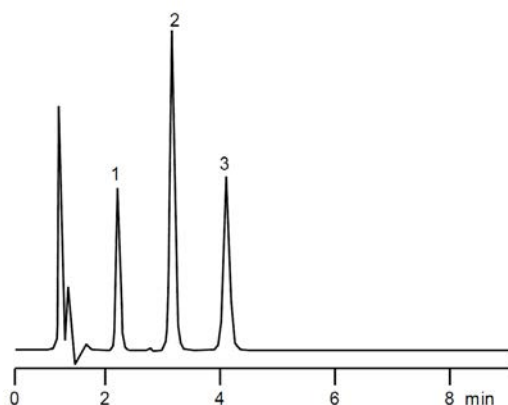
Key features

High-class HPLC phase perfectly suited to take on routine analyses as well as the most ambitious chromatography tasks, outstanding mechanical and chemical stability.

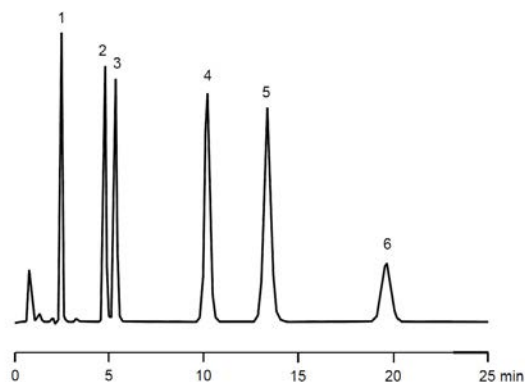
Recommended application areas

Wide range of different applications, i.e. SEC (size exclusion chromatography) but also for normal phase HPLC and HILIC; good choice for analytical and preparative purposes to separate polar compounds

Eurospher 100-5 Si, Column 150 x 4 mm
Article No.: 15DE000ESJ



1. 2-Nitroaniline
2. 3-Nitroaniline
3. 4-Nitroaniline



1. alpha-Tocopherol
2. beta-Tocopherol
3. gamma-Tocopherol
4. delta-Tocopherol
5. Vitamin D2
6. trans-Retinol



Tip: Normal phase (NP) stationary phases have been the first phases for chromatography and that is why their properties of polarity were determined as "normal". The stationary phase of a NP column has polar properties and is commonly used with nonpolar solvents as hexane or heptane. The other way round a reversed phase (RP) column has covalent characteristics and is used with more polar eluents, like mixtures of acetonitrile and water.

Ordering information

Eurosphere II 100 Si

Column length & equipment	3 mm ID			4 mm ID			4.6 mm ID		
	Order No.	3 μ m ...E000E2G	5 μ m ...E000E2J	Order No.	3 μ m ...E000E2G	5 μ m ...E000E2J	Order No.	3 μ m ...E000E2G	5 μ m ...E000E2J
250 mm	25C...	25CE000E2G	25CE000E2J	25D...	25DE000E2G	25DE000E2J	25E...	25EE000E2G	25EE000E2J
with integrated precolumn	25X...	25XE000E2G	25XE000E2J	25W...	25WE000E2G	25WE000E2J	25V...	25VE000E2G	25VE000E2J
150 mm	15C...	15CE000E2G	15CE000E2J	15D...	15DE000E2G	15DE000E2J	15E...	15EE000E2G	15EE000E2J
with integrated precolumn	15X...	15XE000E2G	15XE000E2J	15W...	15WE000E2G	15WE000E2J	15V...	15VE000E2G	15VE000E2J
100 mm	10C...	10CE000E2G	10CE000E2J	10D...	10DE000E2G	10DE000E2J	10E...	10EE000E2G	10EE000E2J
with integrated precolumn	10X...	10XE000E2G	10XE000E2J	10W...	10WE000E2G	10WE000E2J	10V...	10VE000E2G	10VE000E2J
50 mm	05C...	05CE000E2G	05CE000E2J	05D...	05DE000E2G	05DE000E2J	05E...	05EE000E2G	05EE000E2J
5 mm precolumn cartridge	P6C...	P6CE000E2G	P6CE000E2J	P6C...	P6CE000E2G	P6CE000E2J	P6E...	P6EE000E2G	P6EE000E2J

Eurosphere II 100 Si semi-preparative standard columns

Column length & style	8 mm ID			16 mm ID		
	Order No.	5 μ m ...E000E2J	10 μ m ...E000E2N	Order No.	5 μ m ...E000E2J	10 μ m ...E000E2N
250 mm	25G...	25GE000E2J	25GE000E2N	25I...	25IE000E2J	25IE000E2N
150 mm	-	-	-	15I...	15IE000E2J	15IE000E2N
125 mm	12G...	12GE000E2J	12GE000E2N	-	-	-
50 mm	05G...	05GE000E2J	05GE000E2N	05I...	05IE000E2J	05IE000E2N
30 mm	03G...	03GE000E2J	03GE000E2N	-	-	-

Eurosphere II 100 Si preparative standard columns

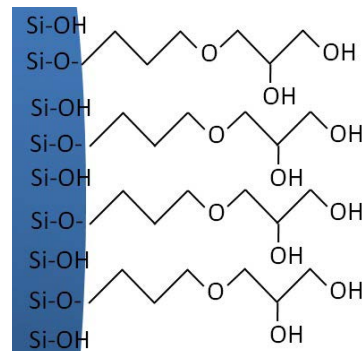
Column length & style	20 mm ID			30 mm ID			50 mm ID		
	Order No.	5 μ m ...E000E2J	10 μ m ...E000E2N	Order No.	5 μ m ...E000E2J	10 μ m ...E000E2N	Order No.	10 μ m ...E000E2N	15 μ m ...E000E2Q
250 mm	25J...	25JE000E2J	25JE000E2N	25M...	25ME000E2J	25ME000E2N	25O...	25OE000E2N	25OE000E2Q
150 mm	15J...	15JE000E2J	15JE000E2N	15M...	15ME000E2J	15ME000E2N	15O...	15OE000E2N	15OE000E2Q
50 mm	05J...	05JE000E2J	05JE000E2N	05M...	05ME000E2J	05ME000E2N	05O...	05OE000E2N	05OE000E2Q

Eurosphere II 100 Si preparative dAX columns with dynamic axial compression

Column length & style	25 mm ID			30 mm ID			50 mm ID		
	Order No.	5 μ m ...E000E2J	10 μ m ...E000E2N	Order No.	5 μ m ...E000E2J	10 μ m ...E000E2N	Order No.	10 μ m ...E000E2N	15 μ m ...E000E2Q
250 mm	25T...	25TE000E2J	25TE000E2N	25U...	25UE000E2J	25UE000E2N	25Z...	25ZE000E2N	25ZE000E2Q
150 mm	15T...	15TE000E2J	15TE000E2N	15U...	15UE000E2J	15UE000E2N	15Z...	15ZE000E2N	15ZE000E2Q
50 mm	05T...	05TE000E2J	05TE000E2N	05U...	05UE000E2J	05UE000E2N	05Z...	05ZE000E2N	05ZE000E2Q

Eurospher II 100 Diol

- Ultra pure, spherical high performance HPLC phase based on silica gel
- Diol, no endcapping, with 5 % carbon content



Properties

Hydrophilic interaction

Key features

High-class HPLC phase perfectly suited to take on routine analyses as well as the most ambitious chromatography tasks, classical Diol phase without endcapping and 5 % carbon content, outstanding mechanical and chemical stability

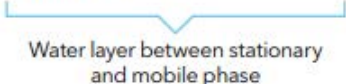
Recommended application areas

Alternative to the silica packing with shorter equilibration time and comparable selectivity; due to the lower activity of these packings it can be also used for SEC-applications



Tip: The most important column parameters for evaluation are retention time, peak symmetry and theoretical plates. Retention time to prove the reproducibility of measurements. Peak symmetry to estimate how good the column bed is packed (peak symmetry value of 1.0 is optimal). Theoretical plate numbers to determine the effectiveness of the HPLC column.

Most common HPLC modes

HPLC mode	Mobile phase	Stationary phase	Analytes
Separation of small molecules (up to 2000 Da)			
Reversed Phase RP (<200 Å)	Polar (e.g. mixtures from water and acetonitrile)	Nonpolar (e.g. C18)	Mid-polar - mid-nonpolar soluble in polar and aqueous solvents
Normal Phase NP	Nonpolar (e.g. heptan)	Polar (e.g. SiOH)	Nonpolar soluble in nonpolar solvents, insoluble in water
Hydrophilic Interaction Liquid Chromatography HILIC	Polar organic solvents + water	Polar (e.g. SiOH)	hydrophilic and highly polar not retained by RP
	 <p>Water layer between stationary and mobile phase</p>		

Ordering information

Eurosphere II 100 Diol

Column length & equipment	3 mm ID			4 mm ID			4.6 mm ID		
	Order No.	3 μ m ...E410E2G	5 μ m ...E410E2J	Order No.	3 μ m ...E410E2G	5 μ m ...E410E2J	Order No.	3 μ m ...E410E2G	5 μ m ...E410E2J
250 mm	25C...	25CE410E2G	25CE410E2J	25D...	25DE410E2G	25DE410E2J	25E...	25EE410E2G	25EE410E2J
with integrated precolumn	25X...	25XE410E2G	25XE410E2J	25W...	25WE410E2G	25WE410E2J	25V...	25VE410E2G	25VE410E2J
150 mm	15C...	15CE410E2G	15CE410E2J	15D...	15DE410E2G	15DE410E2J	15E...	15EE410E2G	15EE410E2J
with integrated precolumn	15X...	15XE410E2G	15XE410E2J	15W...	15WE410E2G	15WE410E2J	15V...	15VE410E2G	15VE410E2J
100 mm	10C...	10CE410E2G	10CE410E2J	10D...	10DE410E2G	10DE410E2J	10E...	10EE410E2G	10EE410E2J
with integrated precolumn	10X...	10XE410E2G	10XE410E2J	10W...	10WE410E2G	10WE410E2J	10V...	10VE410E2G	10VE410E2J
50 mm	05C...	05CE410E2G	05CE410E2J	05D...	05DE410E2G	05DE410E2J	05E...	05EE410E2G	05EE410E2J
5 mm precolumn cartridge	P6C...	P6CE410E2G	P6CE410E2J	P6C...	P6CE410E2G	P6CE410E2J	P6E...	P6EE410E2G	P6EE410E2J

Eurosphere II 100 Diol semi-preparative standard columns

Column length & style	8 mm ID			16 mm ID		
	Order No.	5 μ m ...E410E2J	10 μ m ...E410E2N	Order No.	5 μ m ...E410E2J	10 μ m ...E410E2N
250 mm	25G...	25GE410E2J	25GE410E2N	25I...	25IE410E2J	25IE410E2N
150 mm	-	-	-	15I...	15IE410E2J	15IE410E2N
125 mm	12G...	12GE410E2J	12GE410E2N	-	-	-
50 mm	05G...	05GE410E2J	05GE410E2N	05I...	05IE410E2J	05IE410E2N
30 mm	03G...	03GE410E2J	03GE410E2N	-	-	-

Eurosphere II 100 Diol preparative standard columns

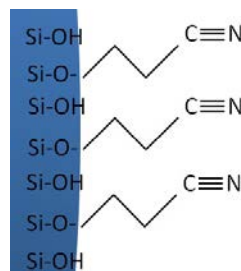
Column length & style	20 mm ID			30 mm ID			50 mm ID		
	Order No.	5 μ m ...E410E2J	10 μ m ...E410E2N	Order No.	5 μ m ...E410E2J	10 μ m ...E410E2N	Order No.	10 μ m ...E410E2N	15 μ m ...E410E2Q
250 mm	25J...	25JE410E2J	25JE410E2N	25M...	25ME410E2J	25ME410E2N	25O...	25OE410E2N	25OE410E2Q
150 mm	15J...	15JE410E2J	15JE410E2N	15M...	15ME410E2J	15ME410E2N	15O...	15OE410E2N	15OE410E2Q
50 mm	05J...	05JE410E2J	05JE410E2N	05M...	05ME410E2J	05ME410E2N	05O...	05OE410E2N	05OE410E2Q

Eurosphere II 100 Diol preparative dAX columns with dynamic axial compression

Column length & style	25 mm ID			30 mm ID			50 mm ID		
	Order No.	5 μ m ...E410E2J	10 μ m ...E410E2N	Order No.	5 μ m ...E410E2J	10 μ m ...E410E2N	Order No.	10 μ m ...E410E2N	15 μ m ...E410E2Q
250 mm	25T...	25TE410E2J	25TE410E2N	25U...	25UE410E2J	25UE410E2N	25Z...	25ZE410E2N	25ZE410E2Q
150 mm	15T...	15TE410E2J	15TE410E2N	15U...	15UE410E2J	15UE410E2N	15Z...	15ZE410E2N	15ZE410E2Q
50 mm	05T...	05TE410E2J	05TE410E2N	05U...	05UE410E2J	05UE410E2N	05Z...	05ZE410E2N	05ZE410E2Q

Eurospher II 100 CN

- Ultra pure, spherical high performance HPLC phase based on silica gel
- Cyano modification (Cyanopropyl), no endcapping, with 7 % carbon content



Properties

Hydrophobic and hydrophilic interaction

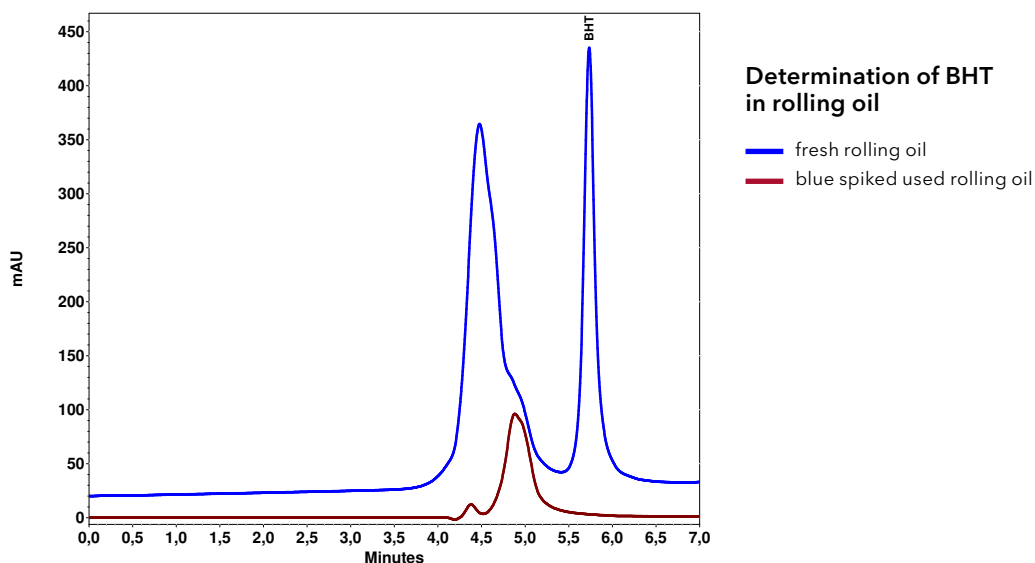
Key features

Classical phenyl phase with 7 % carbon load, outstanding mechanical and chemical stability, suited for analytical as well as semi preparative and preparative applications

Recommended application areas

For a wide range of application in normal phase mode as well as reversed phase mode (steroids, carbohydrates polar compounds)

Eurospher II 100-5 CN, 250 x 3 mm
Article number: 25CE200E2J



Ordering information

Europher II 100 CN

Column length & equipment	3 mm ID			4 mm ID			4.6 mm ID		
	Order No.	3 µm ...E200E2G	5 µm ...E200E2J	Order No.	3 µm ...E200E2G	5 µm ...E200E2J	Order No.	3 µm ...E200E2G	5 µm ...E200E2J
250 mm	25C...	25CE200E2G	25CE200E2J	25D...	25DE200E2G	25DE200E2J	25E...	25EE200E2G	25EE200E2J
with integrated precolumn	25X...	25XE200E2G	25XE200E2J	25W...	25WE200E2G	25WE200E2J	25V...	25VE200E2G	25VE200E2J
150 mm	15C...	15CE200E2G	15CE200E2J	15D...	15DE200E2G	15DE200E2J	15E...	15EE200E2G	15EE200E2J
with integrated precolumn	15X...	15XE200E2G	15XE200E2J	15W...	15WE200E2G	15WE200E2J	15V...	15VE200E2G	15VE200E2J
100 mm	10C...	10CE200E2G	10CE200E2J	10D...	10DE200E2G	10DE200E2J	10E...	10EE200E2G	10EE200E2J
with integrated precolumn	10X...	10XE200E2G	10XE200E2J	10W...	10WE200E2G	10WE200E2J	10V...	10VE200E2G	10VE200E2J
50 mm	05C...	05CE200E2G	05CE200E2J	05D...	05DE200E2G	05DE200E2J	05E...	05EE200E2G	05EE200E2J
5 mm precolumn cartridge	P6C...	P6CE200E2G	P6CE200E2J	P6C...	P6CE200E2G	P6CE200E2J	P6E...	P6EE200E2G	P6EE200E2J

Europher II 100 CN semi-preparative standard columns

Column length & style	8 mm ID			16 mm ID		
	Order No.	5 µm ...E200E2J	10 µm ...E200E2N	Order No.	5 µm ...E200E2J	10 µm ...E200E2N
250 mm	25G...	25GE200E2J	25GE200E2N	25I...	25IE200E2J	25IE200E2N
150 mm	-	-	-	15I...	15IE200E2J	15IE200E2N
125 mm	12G...	12GE200E2J	12GE200E2N	-	-	-
50 mm	05G...	05GE200E2J	05GE200E2N	05I...	05IE200E2J	05IE200E2N
30 mm	03G...	03GE200E2J	03GE200E2N	-	-	-

Europher II 100 CN preparative standard columns

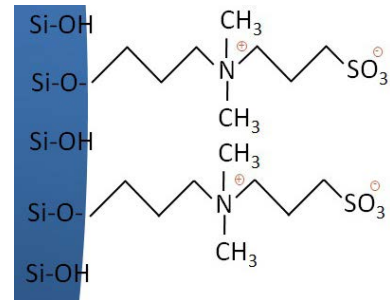
Column length & style	20 mm ID			30 mm ID			50 mm ID		
	Order No.	5 µm ...E200E2J	10 µm ...E200E2N	Order No.	5 µm ...E200E2J	10 µm ...E200E2N	Order No.	10 µm ...E200E2N	15 µm ...E200E2Q
250 mm	25J...	25JE200E2J	25JE200E2N	25M...	25ME200E2J	25ME200E2N	25O...	25OE200E2N	25OE200E2Q
150 mm	15J...	15JE200E2J	15JE200E2N	15M...	15ME200E2J	15ME200E2N	15O...	15OE200E2N	15OE200E2Q
50 mm	05J...	05JE200E2J	05JE200E2N	05M...	05ME200E2J	05ME200E2N	05O...	05OE200E2N	05OE200E2Q

Europher II 100 CN preparative dAX columns with dynamic axial compression

Column length & style	25 mm ID			30 mm ID			50 mm ID		
	Order No.	5 µm ...E200E2J	10 µm ...E200E2N	Order No.	5 µm ...E200E2J	10 µm ...E200E2N	Order No.	10 µm ...E200E2N	15 µm ...E200E2Q
250 mm	25T...	25TE200E2J	25TE200E2N	25U...	25UE200E2J	25UE200E2N	25Z...	25ZE200E2N	25ZE200E2Q
150 mm	15T...	15TE200E2J	15TE200E2N	15U...	15UE200E2J	15UE200E2N	15Z...	15ZE200E2N	15ZE200E2Q
50 mm	05T...	05TE200E2J	05TE200E2N	05U...	05UE200E2J	05UE200E2N	05Z...	05ZE200E2N	05ZE200E2Q

Eurospher II 100 HILIC

- Ultra pure, spherical high performance HPLC phase based on silica gel
- Zwitterionic modification: Ammonium - sulfonic acid
- 7 % carbon content



Properties

Separation mechanism: Hydrophilic and weak electrostatic interactions

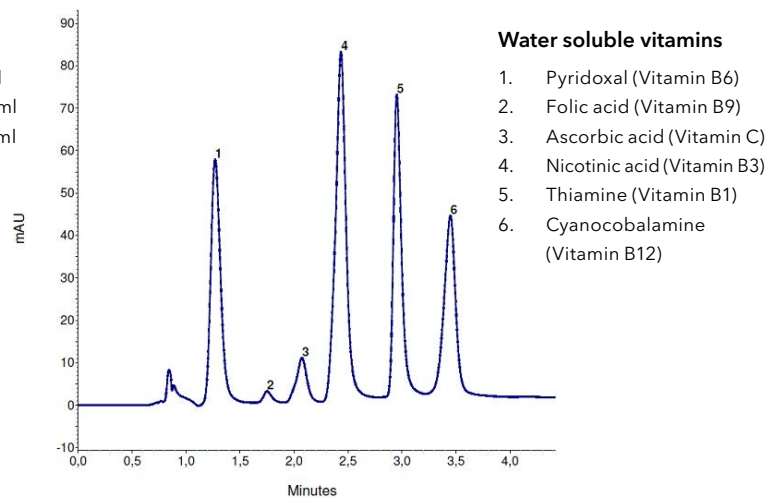
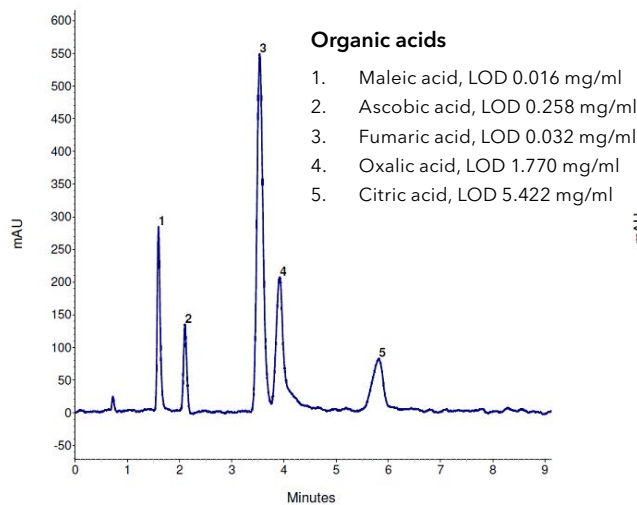
Key features

Modern HILIC phase with zwitterionic modification on the basis of ammonium- sulfonic acid outstanding mechanical and chemical stability

Recommended application areas

Especially suited for the separation of hydrophilic, polar and ionic analytes which are poorly retained on reversed phase columns; behavior is the other way round on Eurospher II HILIC compared to RP which makes it an ideal tool to enhance chromatographic separations for these molecules

Eurospher II 100-5 HILIC, 150 x 3 mm ID Article number: 15CE120E2J



Tip: HILIC applications are well-suited for coupling with MS detection. The high organic content of the applied mobile phases are qualified well for evaporation in the MS's ionization source.

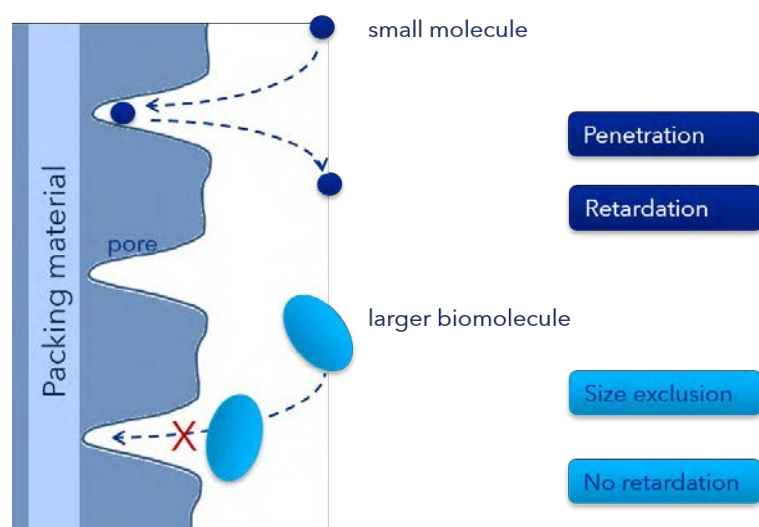
Column length & equipment	3 mm ID			4 mm ID			4.6 mm ID		
	Order No.	3 µm ...E120E2G	5 µm ...E120E2J	Order No.	3 µm ...E120E2G	5 µm ...E120E2J	Order No.	3 µm ...E120E2G	5 µm ...E120E2J
250 mm	25C...	25CE120E2G	25CE120E2J	25D...	25DE120E2G	25DE120E2J	25E...	25EE120E2G	25EE120E2J
with integrated precolumn	25X...	25XE120E2G	25XE120E2J	25W...	25WE120E2G	25WE120E2J	25V...	25VE120E2G	25VE120E2J
150 mm	15C...	15CE120E2G	15CE120E2J	15D...	15DE120E2G	15DE120E2J	15E...	15EE120E2G	15EE120E2J
with integrated precolumn	15X...	15XE120E2G	15XE120E2J	15W...	15WE120E2G	15WE120E2J	15V...	15VE120E2G	15VE120E2J
100 mm	10C...	10CE120E2G	10CE120E2J	10D...	10DE120E2G	10DE120E2J	10E...	10EE120E2G	10EE120E2J
with integrated precolumn	10X...	10XE120E2G	10XE120E2J	10W...	10WE120E2G	10WE120E2J	10V...	10VE120E2G	10VE120E2J
50 mm	05C...	05CE120E2G	05CE120E2J	05D...	05DE120E2G	05DE120E2J	05E...	05EE120E2G	05EE120E2J
5 mm precolumn cartridge	P6C...	P6CE120E2G	P6CE120E2J	P6C...	P6CE120E2G	P6CE120E2J	P6E...	P6EE120E2G	P6EE120E2J

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.

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.

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

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

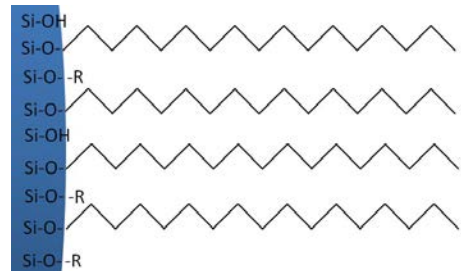
Separation mechanism: Hydrophobic interaction

Key features

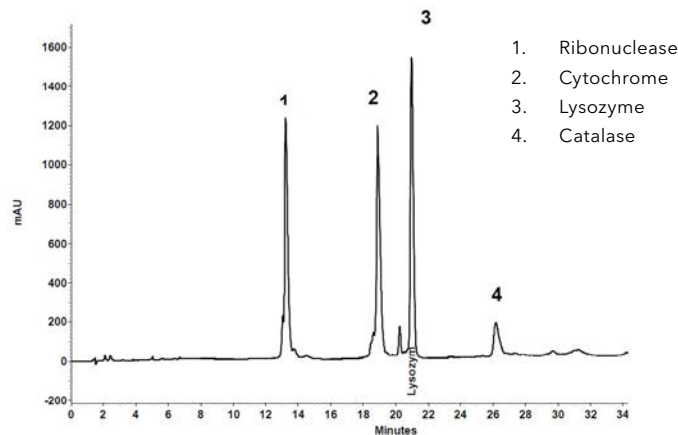
Eurosil Bioselect 300 C18 has been specifically developed for the determination and purification of peptides, proteins, and oligonucleotides up to MW approx. 5000 Da. The optimized manufacturing process guarantees excellent batch-to-batch reproducibility. The Eurosil Bioselect sorbent is the first choice for Biochromatography with silica material.

Recommended application areas

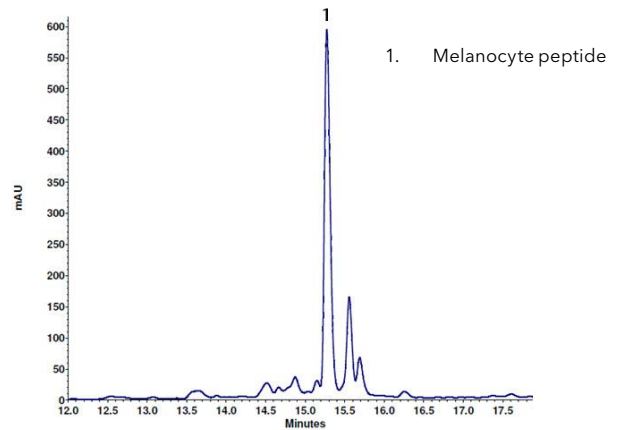
Hydrophilic biomolecules, peptides, peptide mapping after enzymatic digestion



Eurosil Bioselect 300-5 C18A, 125 x 4 mm ID
Article number: 12DK184EBJ



Eurosil Bioselect 300-5 C18A 150 x 4 mm ID
Article number: 15WK184EBJ



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

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

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

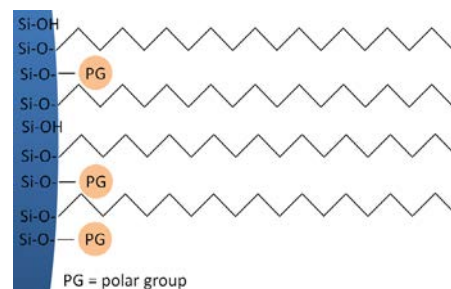
Separation mechanism: Hydrophobic interaction

Key features

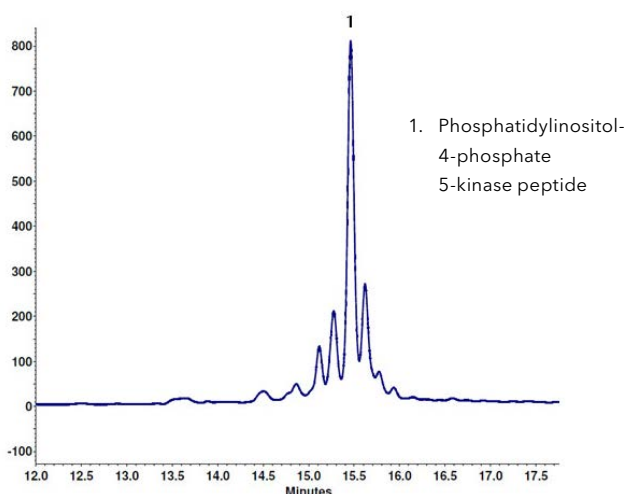
Eurosil Bioselect 300 C18A has been specifically developed for the determination and purification of peptides, proteins, and oligonucleotides up to MW approx. 5,000 Da. The optimized manufacturing process guarantees excellent batch-to-batch reproducibility. The Eurosil Bioselect sorbent is the first choice for Biochromatography with silica material.

Recommended application areas

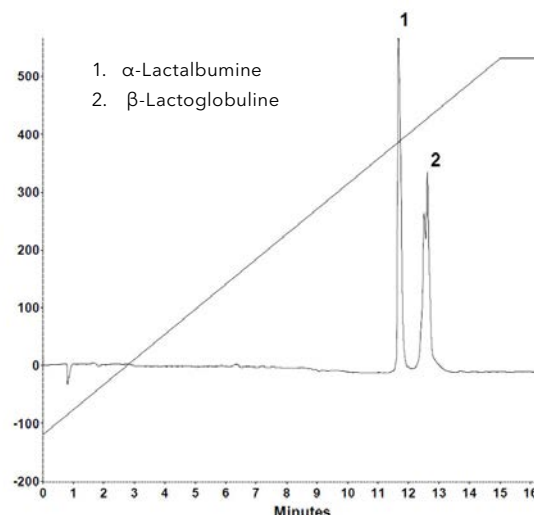
Hydrophilic and polar biomolecules, peptides, very polar biomolecules separated with 100 % aqueous eluents.



Eurosil Bioselect 300-5 C18A 150 x 4 mm
Article number: 15WK184EBJ



Eurosil Bioselect 300-3 C18A, 150 x 2.0 mm ID
Article number: 15BK184EBG

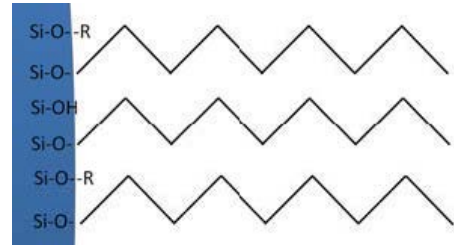


Column length & equipment	3 mm ID			4 mm ID			4.6 mm ID		
	Order No.	3 μm ...K184EBG	5 μm ...K184EBJ	Order No.	3 μm ...K184EBG	5 μm ...K184EBJ	Order No.	3 μm ...K184EBG	5 μm ...K184EBJ
250 mm	25C...	25CK184EBG	25CK184EBJ	25D...	25DK184EBG	25DK184EBJ	25E...	25EK184EBG	25EK184EBJ
with integrated precolumn	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

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

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

1. Absorption of proteins near top of the column



Aqueous mobile phase, often buffers

2. Desorption and elution of proteins



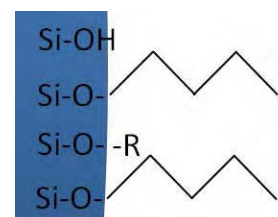
Increasing organic concentration of mobile phase

Column length & equipment	3 mm ID			4 mm ID			4.6 mm ID		
	Order No.	3 μm ...K081EBG	5 μm ...K081EBJ	Order No.	3 μm ...K081EBG	5 μm ...K081EBJ	Order No.	3 μm ...K081EBG	5 μm ...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

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

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

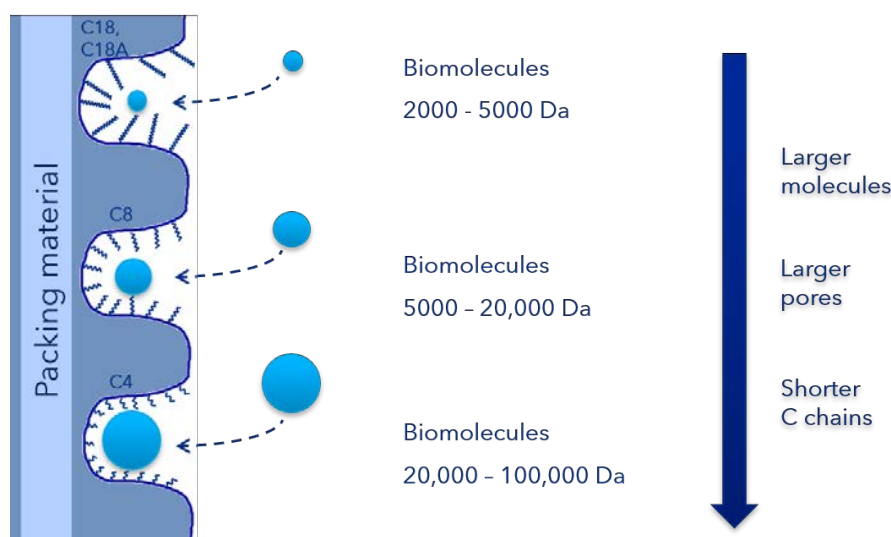
Separation mechanism: hydrophobic and hydrophilic interaction

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 & 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

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

Eurokat

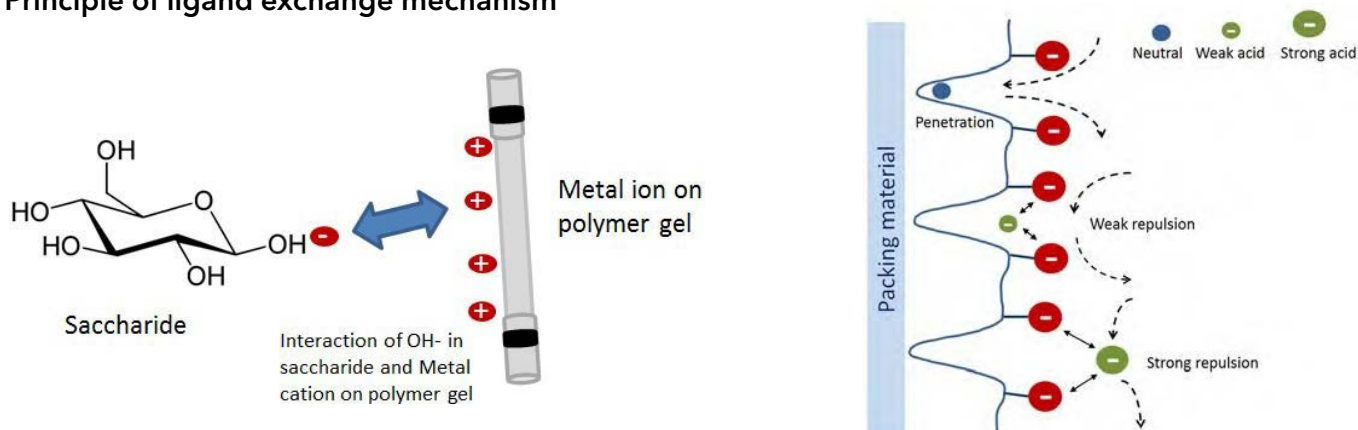
High performance polymer phase for the analysis of organic acids, carbohydrates and alcohols. Available in the ionic forms H, Ca, Pb, Na und Ag.

Characteristics

Eurokat high performance polymer phases were especially developed for the separation of organic acids, carbohydrates, alcohols and even complex mixtures of these compounds.

Eurokat is a sulfonated cross-linked styrenedivinylbenzene copolymer available in several ionic forms (H, Ca and Pb). This particular cation exchanger is characterized by an outstanding density of functional groups, making it the ideal choice for your ion exclusion, size exclusion and ligand exchange chromatography.

Principle of ligand exchange mechanism



Stability

Eurokat polymer columns are extremely stable over the whole pH range. This is one striking advantage compared with silica-based phases which have a limited lifetime at pH extremes, especially in the higher pH range. Most importantly, Eurokat phases show extraordinary column lifetime stability and are not affected by aqueous solvents.

Choice of chromatographic conditions

The Eurokat stationary phase is designed to be applicable to a wide range of diverse chromatographic conditions. All Eurokat columns can be used at temperatures up to 90 °C with no organic solvents. The best separation of sugars can be achieved using between 60 to 90 °C. To extend separation performance, it is possible to connect up to three columns of Eurokat in series. Eurokat columns require no organic solvents and thus are environmentally friendly.

Physical properties

Particle size	10 µm, 25-56 µm
Cross-linkage	ca. 8 % (H-Form) ca. 6 % (Ca, Pb, Na-Form) higher cross linkage means smaller pore size
Max. pressure	up to 100 bar
Max. temperature	up to 90 °C

Application areas

- Carbohydrates and organic acids in softdrinks and fruit juices
- Sugar substitutes
- Food preservatives
- Dairy products
- Urine analytic (Uric acid, Hippuric acid)
- Monitoring of fermentation processes

Eurokat H - USP L17

Sulfonated cross-linked styrenedivinylbenzene copolymer phase for the determination of organic acids, carbohydrates and alcohols

H-form, 8 % cross linkage

Properties

Cation exchanger, extremely long lasting lifetime when correctly handled, best results with aqueous eluents and small amounts of anorganic acids, recommended eluent 0,01 N sulfuric acid, usage of up to 10 % organic content in the mobile phase is possible

Technical Data

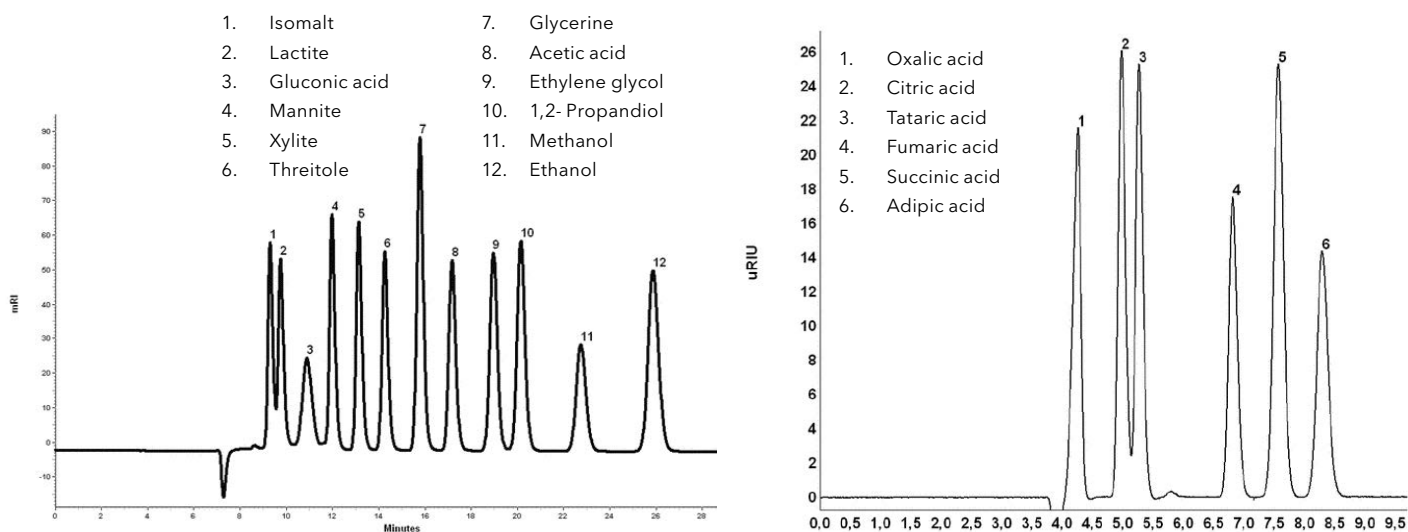
Sulfonated cross-linked styrenedivinylbenzene copolymer with 8 % cross linkage in the ionic form H, available in 10 µm particle size, pressure stable up to maximum 100 bar

Recommended application areas

Eurokat H is especially designed for the analysis of organic acids and even complex mixtures of acids, sugars and alcohols as well as sugar alcohols.

Due to a differing separation process we recommend the use of these type of columns only in 8 mm ID or 4 mm ID.

Eurokat H 10 µm, 300 x 8 mm ID Article number: 30GX340EKN



Tip: Eurokat columns are characterized by an extremely long lifetime if handled properly. Especially pressure shocks and organic solvent contents of more than 10 % in the mobile phase should be avoided absolutely.

Column length	4 mm ID		8 mm ID	
	Order No.	10 µm ...X340EKN	Order No.	10 µm ...X340EKN
300 mm	30D...	30DX340EKN	30G...	30GX340EKN
120 mm	-	-	11G...	11GX340EKN
30 mm precolumn	03D...	03DX340EKN	03G...	03GX340EKN

Eurokat Pb & Ca - USP L34 / USP L19

Polymer phase for the determination of mono- and disaccharides

Pb (USP L34) form, 6 % cross linkage

Properties

Cation exchanger, extremely long lasting lifetime when correctly handled, best results with aqueous eluents, recommended eluent is pure deionized water, usage of up to 10 % organic content in the mobile phase is possible

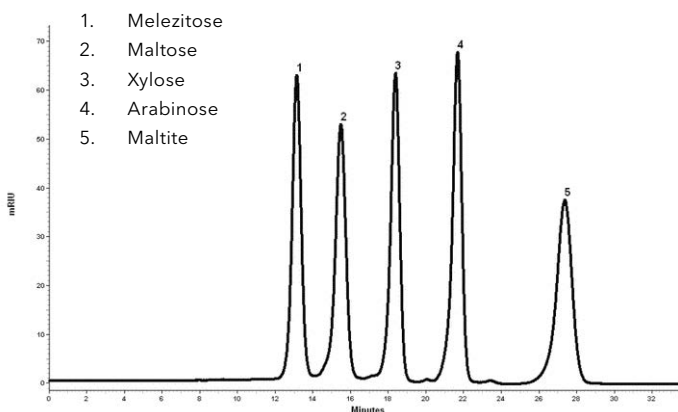
Technical Data

Sulfonated cross-linked styrenedivinylbenzene copolymer with 6 % cross linkage in the ionic form Pb, available in 10µm particle size, pressure stable up to maximum 100 bar

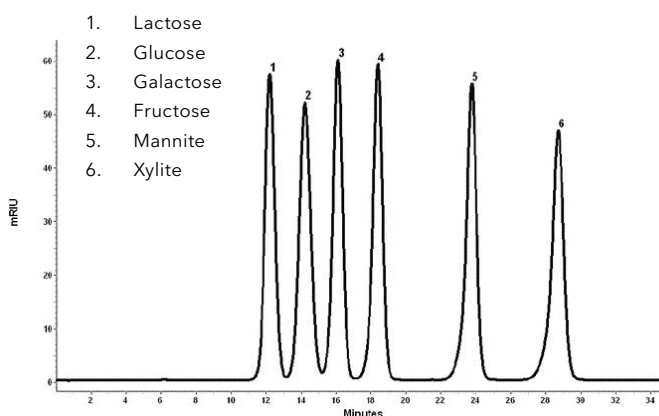
Recommended application areas

Especially designed for the analysis of small carbohydrates up to DP 4

Eurokat Pb, 300 x 8 mm ID
Article number: 30GX350EKN



Eurokat Ca, 300 x 8 mm ID
Article number: 30GX360EKN



Tip: Eurokat columns are used at high temperatures. During equilibration it is very important to have an eye on the backpressure and to start with very low flow rates and increase them only slowly and stepwise after the column has adapted to the temperature.

Eurokat Pb

Column length	4 mm ID		8 mm ID	
	Order No.	10 µm ...X350EKN	Order No.	10 µm ...X350EKN
300 mm	30D...	30DX350EKN	30G...	30GX350EKN
120 mm	-	-	11G...	11GX350EKN
30 mm precolumn	03D...	03DX350EKN	03G...	03GX350EKN

Eurokat Ca

Column length	4 mm ID		8 mm ID	
	Order No.	10 µm ...X360EKN	Order No.	10 µm ...X360EKN
300 mm	30D...	30DX360EKN	30G...	30GX360EKN
120 mm	-	-	11G...	11GX360EKN
30 mm precolumn	03D...	03DX360EKN	03G...	03GX360EKN

Eurokat Na

Polymer phase for the determination of sugar oligomers

Na form, 6 % cross linkage

Properties

Cation exchanger, extremely long lasting lifetime when correctly handled, best results with aqueous eluents, recommended eluent is pure deionized water, usage of up to 10 % organic content in the mobile phase is possible

Technical Data

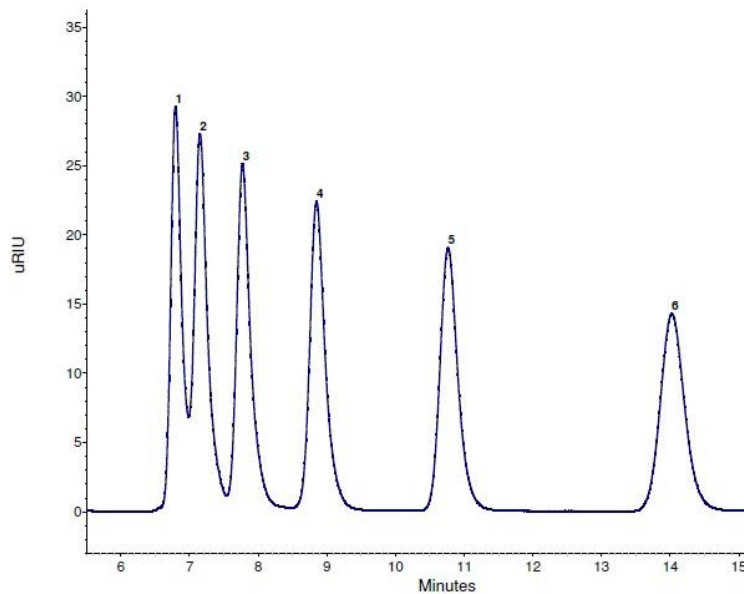
Sulfonated cross-linked styrenedivinylbenzene copolymer with 6 % cross linkage in the ionic form Na available in 10 µm particle size, pressure stable up to maximum 100 bar

Recommended application areas

Especially designed for the analysis of sugar oligomers, separates carbohydrates up to DP 8

Eurokat Na, 300 x 8 mm ID Article number: 30GX210EKN

1. Fructosylnystose
2. Nystose
3. Kestose
4. Sucrose
5. Glucose
6. Fructose



Tip: Eurokat columns are typically used with 100 % aqueous eluents. For storage, please avoid microbial growth by flushing the Eurokat column with 0.45 µm filtered ultrapure water and storing it at 4 °C.

Column length	4 mm ID		8 mm ID	
	Order No.	10 µm ...X210EKN	Order No.	10 µm ...X210EKN
300 mm	30D...	30DX210EKN	30G...	30GX210EKN
120 mm	-	-	11G...	11GX210EKN
30 mm precolumn	03D...	03DX210EKN	03G...	03GX210EKN

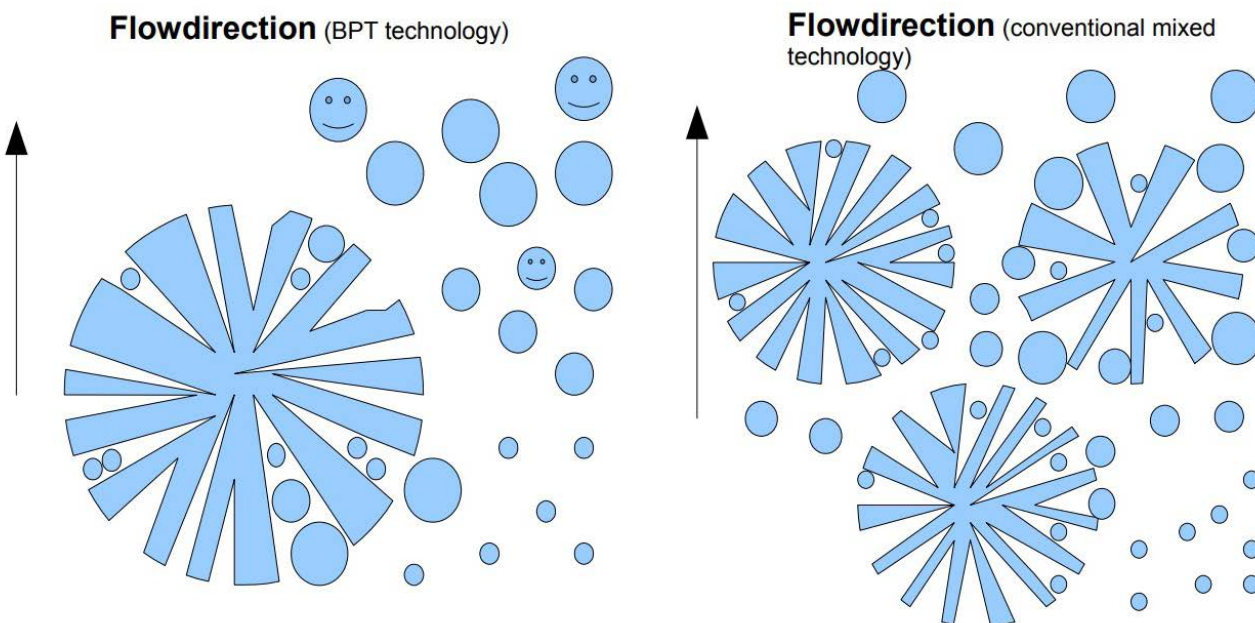
AppliChrom®

AppliChrom® ABOA columns for aqueous SEC, organic GPC and special applications

- AppliChrom® ABOA StyDiViBe Series GPC-columns for GPC analysis of organic molecules using THF, toluene, chloroform.
- AppliChrom ABOA SuperOH-P Series for aqueous GPC/SEC-analysis of mainly neutral and anionic polymers like heparins, polysaccharides, PEO, PEG,....
- AppliChrom® ABOA Cat-Phil-P Series for aqueous GPC/SEC-analysis of of special aminic and polycationic polymers like p-DADMAc, PEI/polyethylenimin, chitosan, copolymers with polyaminofunctions, but also useful for polyanions or neutral polymers like heparin or PEO/PEG, dextran or pullulan.
- AppliChrom® ABOA DMSO-Phil-P Series for DMSO GPC/SEC analysis (humic substances, UF/MUF-glue, p-NIPA, many polycondensates, protein from pea or leguminosae,...)
- AppliChrom® ABOA DMAc-Phil-P Series for GPC/SEC analysis in DMAc, DMF, NMP. Good for many medium polar substances, polyoxazolines, lignin,...

You decide between classical GPC/SEC columns with conventional mixed pore technology or AppliChrom® BPT technology:

Separate oligomers and polymers with the new GPC media line from AppliChrom® BPT synthesis technology for large range, high resolution separations with increased accuracy in calibration (Patent pending).



AppliChrom® ABOA SuperOH-P

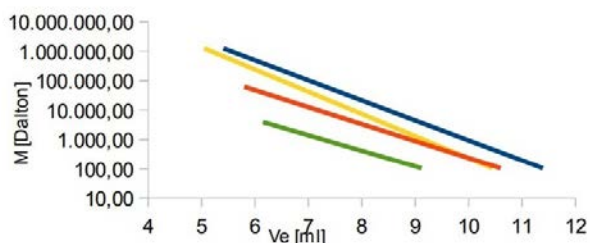
SEC in separation range of 100 - 2 500 Da

AppliChrom® GPC/SEC columns for biopolymers and aqueous polymers

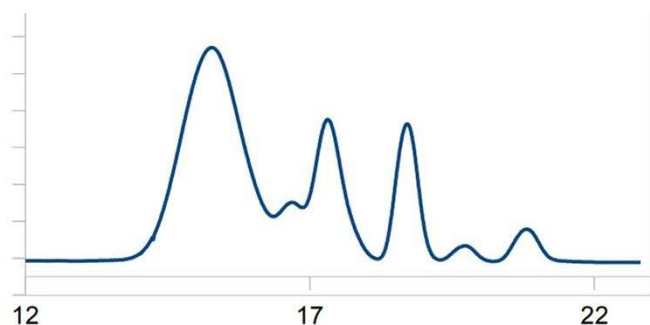
- Aqueous and highly hydrophilic polymeric base material
- Low column bleeding for low detector noise
- Large pore volume for optimal resolution
- Individual pore sizes for individual molecular weight ranges
- Multi-pore technology for a broad range of molecular sizes
- Increased lifetime of GPC/SEC columns by combination of proprietary particle and packing technology

Pore sizes:

Available pore sizes for different molecular weight ranges

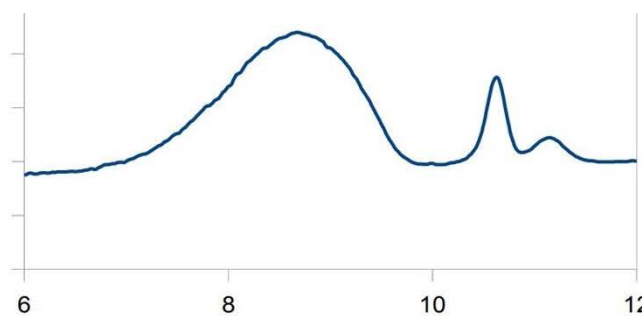


Measurement ranges for AppliChrom ABOA SuperOH GPC/SEC columns, 300 x 8 mm, measured in water using PEG/PEO-standards: Porosities **100, 200, 300, 400**



AppliChrom ABOA SuperOH-P-100

for high resolution oligosaccharide analysis:
2 x AppliChrom ABOA SuperOH-P-100, 300 x 8 mm
0,5 ml/min water, 40 °C, 20 µl injection, RI detection



AppliChrom ABOA SuperOH-P-400

For GPC/SEC analysis of pectin:
1 x AppliChrom ABOA SuperOH-P-400, 300 x 8 mm
Flow: 1 ml/min H₂O + 0.2M NaNO₃, 20°C,
Sample: 20 µl injection
Detection: RI

AppliChrom® ABOA SuperOH-P Porosity	Separation Range	Column dimensions	Order No.
AppliChrom® ABOA SuperOH-P-100	100 - 2 500 Da	300 x 8 mm	30GE460ABL
		50 x 8 mm precolumn	05GE460ABL
AppliChrom® ABOA SuperOH-P-200	100 - 20 000 Da	300 x 8 mm	30GH460ABL
		50 x 8 mm precolumn	05GH460ABL
AppliChrom® ABOA SuperOH-P-250	100 - 70 000 Da	300 x 8 mm	30GJ460ABL
		50 x 8 mm precolumn	05GJ460ABL
AppliChrom® ABOA SuperOH-P-300	1 000 - 300 kDa	300 x 8 mm	30GK460ABL
		50 x 8 mm precolumn	05GK460ABL
AppliChrom® ABOA SuperOH-P-350	2 500 - 1 000 kDa	300 x 8 mm	30GN460ABL
		50 x 8 mm precolumn	05GN460ABL
AppliChrom® ABOA SuperOH-P-400	10k - 5 000 kDa	300 x 8 mm	30GT460ABL
		50 x 8 mm precolumn	05GT460ABL
AppliChrom® ABOA SuperOH-P-Screening	100 - 1 000 000 kDa	300 x 8 mm	30GZ460ABL
		50 x 8 mm precolumn	05GZ460ABL

AppliChrom® ABOA StyDiViBe-P

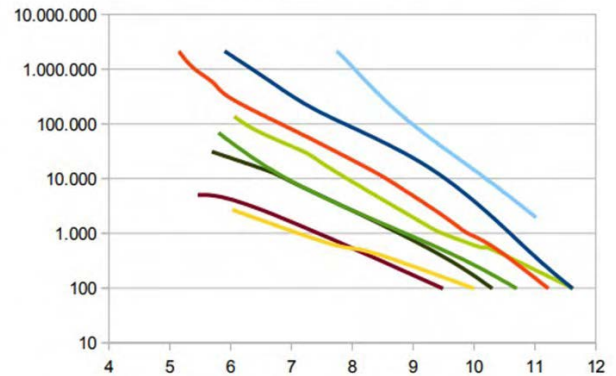
GPC in separation range of 100 - 2 500 Da

AppliChrom® GPC-columns for GPC analysis of organic molecules using THF, toluene, chloroform

- Organic polystyrene-divinylbenzene copolymer base material of high porosity for high resolution
- Low column bleeding for low detector noise
- High purity for eliminating adsorptive effects and get pure GPC combined with high livetime
- Large calibration ranges covering several decades by unique process of BPT-technology
- Range of individual porosities that can be used single or in combination
- GPC range of 100 - > 50Mio Da

Molecular sizes range of AppliChrom ABOA StyDiViBe GPC-Serie in detail:

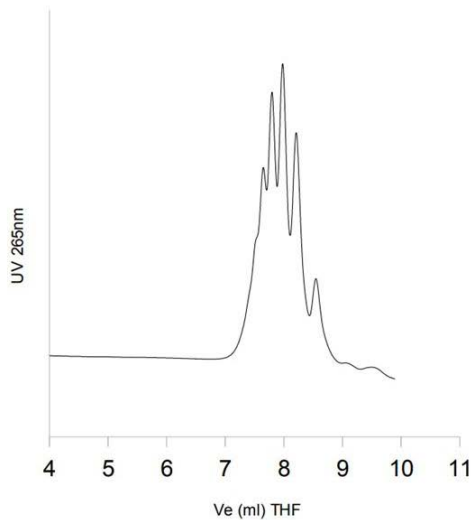
THF GPC-Calibration curves Kalibrationskurven



GPC-calibration curves AppliChrom ABOA StyDiViBe 300 x 8 mm, THF, 1 ml/min, PMMA standards, M[da] vs. V_e [ml], porosities: 35A, 100A, 500A, 10³A, 1500A-BPT, 10⁵ A-BPT, 10⁶ A-BPT, 10⁷ A-BPT

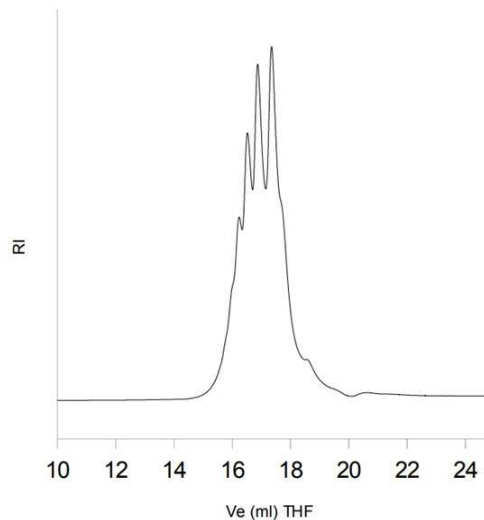
GPC Polystyrene (PS) Mp = 578Da

AppliChrom ABOA StyDiViBe 35A, 300x8mm (1x)



GPC Polyethylenglycol (PEG) 200Da in THF

AppliChrom ABOA StyDiViBe 100A, 300x8mm, 2x



AppliChrom® ABOA StyDiViBE Porosity	Separation Range	Column dimensions	Order No.
AppliChrom® ABOA StyDiViBe-P-35A	100 - 2 500 Da	300 x 8 mm	30GA470ABJ
		50 x 8 mm precolumn	05GA470ABJ
AppliChrom® ABOA StyDiViBe-P-100A	100 - 10 000 Da	300 x 8 mm	30GE470ABJ
		50 x 8 mm precolumn	05GE470ABJ
AppliChrom® ABOA StyDiViBe-P-500A	100 - 30 000 Da	300 x 8 mm	30GL470ABJ
		50 x 8 mm precolumn	05GL470ABJ
AppliChrom® ABOA StyDiViBe-P-1.000A	100 - 70 000 Da	300 x 8 mm	30GM470ABJ
		50 x 8 mm precolumn	05GM470ABJ
AppliChrom® ABOA StyDiViBe-P-1.500A	100 - 120 000 Da	300 x 8 mm	30GU470ABJ
		50 x 8 mm precolumn	05GU470ABJ
AppliChrom® ABOA StyDiViBe-P-105A-BPT	500 - 1.5Mio Da	300 x 8 mm	30GW470ABJ
		50 x 8 mm precolumn	05GW470ABJ
AppliChrom® ABOA StyDiViBe-P-106A-BPT	10 000 - 4Mio Da	300 x 8 mm	30GY470ABJ
		50 x 8 mm precolumn	05GY470ABJ
AppliChrom® ABOA StyDiViBe-P-107A-BPT	100 - 10Mio Da	300 x 8 mm	30GV470ABJ
		50 x 8 mm precolumn	05GV470ABJ

AppliChrom® ABOA DMSO-PHIL-P

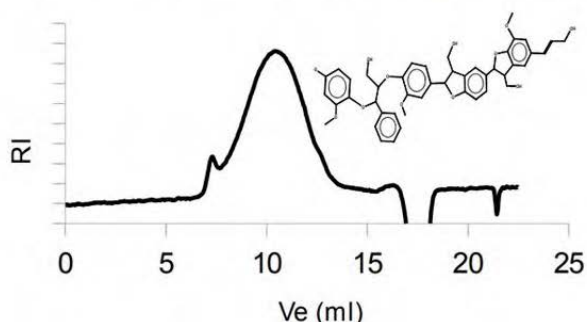
GPC/SEC in separation range of 50k - 10Mio Da

AppliChrom® ABOA DMSO-Phil optimized for DMSO-GPC applications

- Intereactionfree pure GPC/SEC
- Easy, reliable and robust GPC/SEC-calibration by dextrans, pullulans et al.
- Low column bleeding for low detectornoise for improved lightscattering or viscosity detection
- 12µm particle technology for low backpressure
- Large porevolume and optimized mass transfer for polymers giving optimized resolution
- Low costs caused by long livetime of column - result of combination of optimized proprietary particle and packingtechnology

Lignins & conifer bark extracts

Lignin GPC in DMSO – starting method



AppliChrom ABOA DMSO-Phil-P-250
separation range 100-70.000Da

Analyte:
Lignin I

AppliChrom ABOA DMSO-Phil-P-250
2 x (300x8mm)
0,5ml/min DMSO 0,075M NaNO₃,
80°C,
RI-detection,
Ve (ml) vs. RI,

AppliChrom® ABOA DMSO-PHIL-P Porosity	Separation Range	Column dimensions	Order No.
AppliChrom® ABOA DMSO-PHIL-P-100	100 - 2 500 Da	300 x 8 mm	30GE46MABO
		50 x 8 mm precolumn	05GE46MABO
AppliChrom® ABOA DMSO-PHIL-P-200	100 - 20 000 Da	300 x 8 mm	30GH46MABO
		50 x 8 mm precolumn	05GH46MABO
AppliChrom® ABOA DMSO-PHIL-P-250	100 - 70 000 Da	300 x 8 mm	30GJ46MABO
		50 x 8 mm precolumn	05GJ46MABO
AppliChrom® ABOA DMSO-PHIL-P-300	1 000 - 500 kDa	300 x 8 mm	30GK46MABO
		50 x 8 mm precolumn	05GK46MABO
AppliChrom® ABOA DMSO-PHIL-P-350	5 000 - 1 500 kDa	300 x 8 mm	30GN46MABO
		50 x 8 mm precolumn	05GN46MABO
AppliChrom® ABOA DMSO-PHIL-P-400	10k - 5Mio Da	300 x 8 mm	30GT46MABO
		50 x 8 mm precolumn	05GT46MABO
AppliChrom® ABOA DMSO-PHIL-P-450	50k - 10Mio Da	300 x 8 mm	30G446MABO
		50 x 8 mm precolumn	05G446MABO
AppliChrom® ABOA DMSO-PHIL-P-600	≤ 20Mio Da	300 x 8 mm	30G646MABO
		50 x 8 mm precolumn	05G646MABO
AppliChrom® ABOA DMSO-PHIL-P-M	100 - 1Mio Da	300 x 8 mm	30GW46MABO
		50 x 8 mm precolumn	05GW46MABO

AppliChrom® ABOA DMAC-Phil-P

GPC/SEC in separation range of 100 - 2 500 Da

AppliChrom® ABOA DMACPhil

- AppliChrom® GPC columns for GPC analyses in organic solvents (DMAc or DMF)
- organic polymer base material of high porosity for high resolution
- wide range of porosities and particle sizes
- excellent reproducibility
- high purity for eliminating adsorptive effects and get pure GPC combined with high livetime
- GPC range of 100-1.000.000Da
- applications: PMMA, PAN, cellulose, DMF and DMAc soluble polymers

AppliChrom® ABOA DMAC-PHIL-P Porosity	Separation Range	Column dimensions	Order No.
AppliChrom® ABOA DMAC-Phil-P-100	100 - 2 500 Da	300 x 8 mm	30GE46DABN
		50 x 8 mm precolumn	05GE46DABN
AppliChrom® ABOA DMAC-Phil-P-200	100 - 20 000 Da	300 x 8 mm	30GH46DABN
		50 x 8 mm precolumn	05GH46DABN
AppliChrom® ABOA DMAC-Phil-P-250	100 - 70 000 Da	300 x 8 mm	30GJ46DABN
		50 x 8 mm precolumn	05GJ46DABN
AppliChrom® ABOA DMAC-Phil-P-300	1 000 - 300 kDa	300 x 8 mm	30GK46DABN
		50 x 8 mm precolumn	05GK46DABN
AppliChrom® ABOA DMAC-Phil-P-350	1 000 - 1 000 kDa	300 x 8 mm	30GN46DABN
		50 x 8 mm precolumn	05GN46DABN
AppliChrom® ABOA DMAC-Phil-P-400	10k - > 10 000 kDa	300 x 8 mm	30GT46DABN
		50 x 8 mm precolumn	05GT46DABN
AppliChrom® ABOA DMAC-Phil-P-M	100 - > 10 000 kDa	300 x 8 mm	30GW46DABN
		50 x 8 mm precolumn	05GW46DABN

AppliChrom® ABOA CatPhil-P

SEC in separation range of 100-2,500 Da

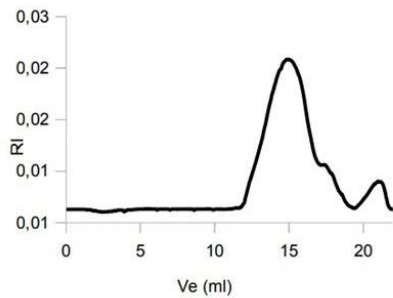
AppliChrom® ABOA CatPhil

Special GPC/SEC-columns for aqueous analysis of neutral, anionic and additional cationic polymers

For GPC / SEC analysis of

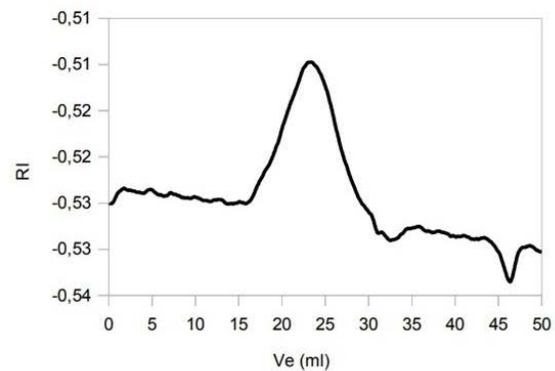
- polycations
- polyamines (chitosanes)
- polyethylenoxides
- polysaccharides
- polyanions (heparins, pectins,...)

PolyDADMAC (Polydiallyldimethylammoniumchlorid, Polyquaternium 6, Mw = 100-200kDa)



1x AppliChrom ABOA CatPhil-P-100, 300x8mm
+ 1xAppliChrom ABOA CatPhil-P-350, 300x8mm,
1ml/min 0.1M NaNO₃ + 0,2% formic acid in H₂O,
100µl sample injection,
RI-detection

GPC-Analysis of high molecular weight Chitosan, (Poliglusam, Polyglucosamin)



3x AppliChrom ABOA CatPhil-P-400, 300x8mm
1ml/min 0.1M NaNO₃ + 0,2% formic acid in H₂O,
100µl sample injection,
RI-detection

AppliChrom® ABOA DMSO-PHIL-P Porosity	Separation Range	Column dimensions	Order No.
AppliChrom® ABOA CatPhil-P-100	100 - 2 500 Da	300 x 8 mm	30GE46CABN
		50 x 8 mm precolumn	05GE46CABN
AppliChrom® ABOA CatPhil-P-200	100 - 20 000 Da	300 x 8 mm	30GH46CABN
		50 x 8 mm precolumn	05GH46CABN
AppliChrom® ABOA CatPhil-P-350	2.5k - 1Mio Da	300 x 8 mm	30GN46CABN
		50 x 8 mm precolumn	05GN46CABN
AppliChrom® ABOA CatPhil-P-400	10k - 5 000 kDa	300 x 8 mm	30GT46CABN
		50 x 8 mm precolumn	05GT46CABN

Sepapure®

In protein purification a combination of different methods is needed for a successful separation. In three steps the purity of the wanted biomolecule is increased.



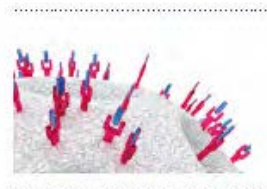
In the “capture step” the crude biomolecule is extracted from major side products. In the “intermediate step” further contaminations are removed, and the highly pure biomolecule is gained in the “polishing step”. For each step a different method and therefore different columns are used.

FPLC Sepapure® columns are dedicated for purification of biomolecules. Sepapure® media for affinity chromatography (AC) and Ion-Exchange chromatography (IEX) is based on Agarose and depending on the specific purification mode functionalized with ligands e.g. Protein A, Ni-NTA or quaternary ammonium (Q). These FPLC media are available packed in 1 ml and 5 ml cartridges or as bulk media.

Physical properties

Resin	100 µm Agarose particles with 4% or 6% crosslinking
Flowrate	Recommended: 1 CV/ml
pH Stability	3 - 9 long term
Max. pressure	3 bar

Chromatography (AC)



Chromatography (IEX)



Sepapure® Desalting columns are based on Dextran with an exclusion limit of 5 kDa and available in 1 ml and 5 ml cartridges.

Physical properties

Resin	20 - 50 µm Dextran particles
Flowrate	Recommended: 1 CV/ml
Exclusion limit	5 kDa
Max. pressure	3 bar

Chromatography (SEC)



All available bulk media at one glance:

Resin Type / Volume	5 ml	10 ml	25 ml	50 ml	100 ml	150 ml	250 ml	500 ml	1000 ml
Glutathione	•		•		•		•	•	•
Ni-NTA			•		•		•	•	•
Protein A	•		•		•		•	•	•
Protein G		•	•						
IEX-Resins			•		•			•	•
SEC 75			•	•	•	•	•	•	•
SEC 200			•	•	•	•	•	•	•

Antibody Affinity Chromatography

FPLC media based on cross-linked agarose beads with a mean diameter of 100 µm.

The FPLC media is functionalized either with Protein A or Protein G ligands for the binding of antibodies or antibody fragments.

Properties:

Sepapure® Affinity media for antibodies or antibody fragments is designed to be used with most aqueous buffer systems. It is long lasting when correctly handled and are compatible with common CIP strategies. All Sepapure® media is stored in 20% ethanol upon delivery. Available as prepacked 1 ml or 5 ml cartridge or as bulk material.

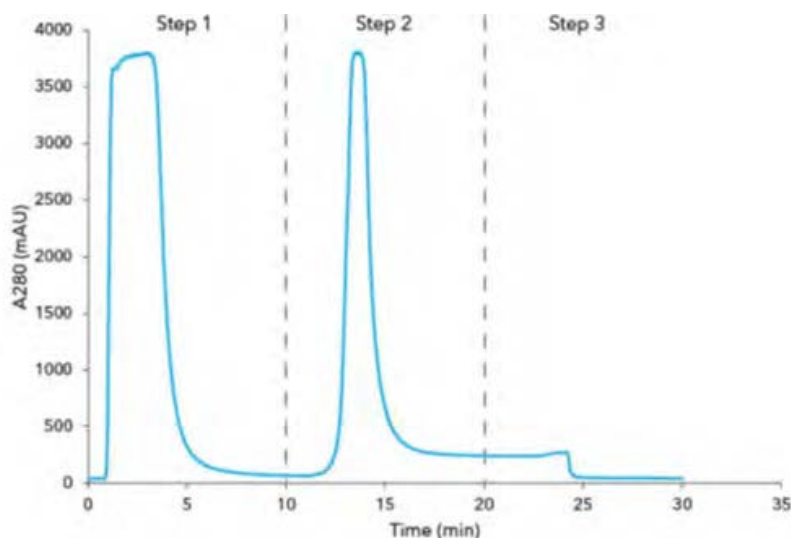
Technical data:

Agarose beads with typical loading ranges of 1 - 30 mg/l (Protein A column) or 1 - 15 mg/ml (Protein G column). The maximum operating pressure the Sepapure® columns should be used at is 3 bar, while the recommended flowrate is 1 CV/ml.

Recommended application areas:

Typically used in the first step („capture“) of an FPLC purification procedure.

Sepapure Protein A FF 1 ml
Article number: 010X40USPZ



- Step 1: injection peak of human plasma and column washing
- Step 2: elution peak of IgG
- Step 3: column equilibration

Column type	Cartridge	
	1 ml	5 ml
Sepapure® Protein A FF	010X40USPZ	020X40USPZ
Sepapure® Protein G FF	010X40VSPZ	010X40VSPZ

Resin type	Media						
	5 ml	10 ml	25 ml	100 ml	250 ml	500 ml	1000 ml
Sepapure® Protein A FF	00GX40USPZ	-	00IX40USPZ	00KX40USPZ	00NX40USPZ	00PX40USPZ	00QX40USPZ
Sepapure® Protein G FF	-	00HX40VSPZ	00IX40VSPZ	-	-	-	-

Tag-Affinity Chromatography

FPLC media based on cross-linked agarose beads with a mean diameter of 100 µm.

The FPLC media is functionalized with NTA ligands for His-Tag and glutathione ligands for GST-Tag purifications.

Properties:

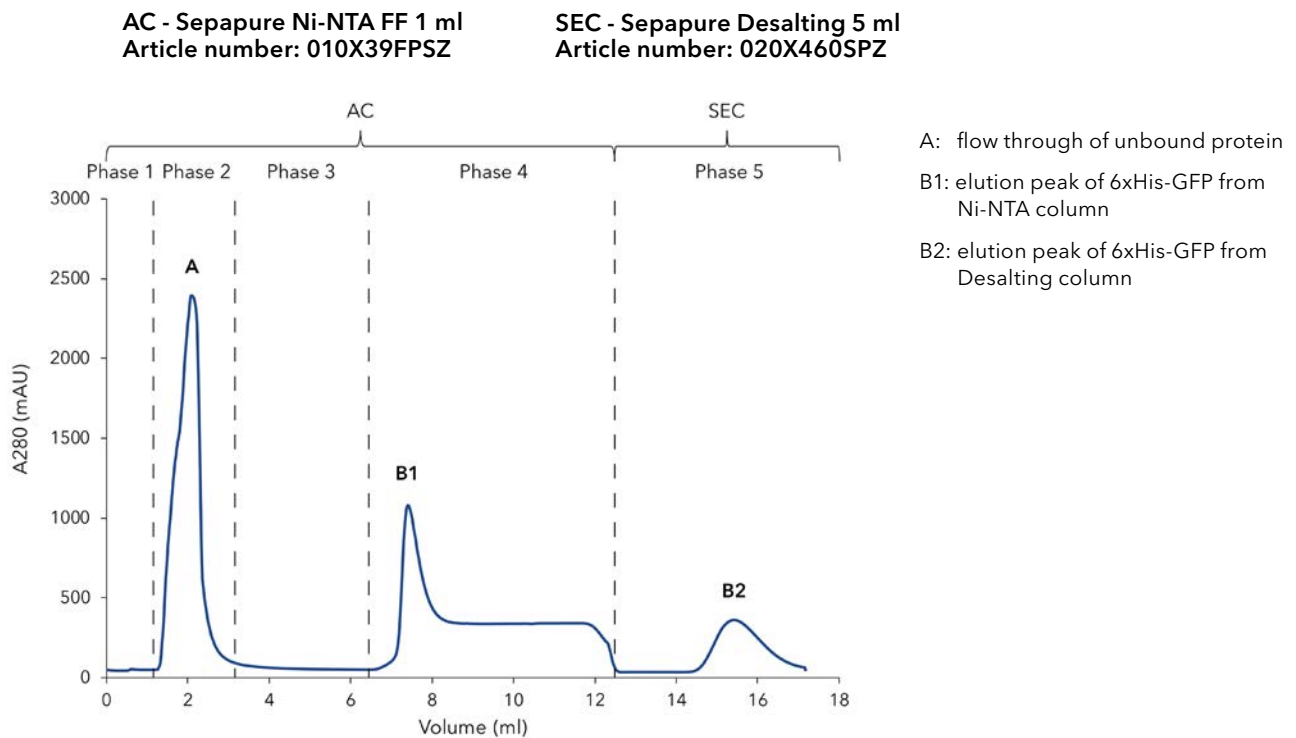
Sepapure® Affinity media for recombinantly tagged proteins is designed to be used with most aqueous buffer systems. It is long lasting when correctly handled and are compatible with common CIP strategies. All Sepapure® media is stored in 20% ethanol upon delivery. Available as prepacked 1 ml or 5 ml cartridge or as bulk material.

Technical data:

Agarose beads with typical loading ranges of 1 - 40 mg/ml (Ni-NTA) or 1 - 10 mg/ml (Glutathione). The maximum operating pressure the Sepapure® columns should be used at is 3 bar, while the recommended flowrate is 1 CV/ml. Available as prepacked 1 ml or 5 ml cartridge or as bulk material.

Recommended application areas:

Typically used in the first step („capture“) of an FPLC purification procedure.



Column / Resin type	Cartridge		Media					
	1 ml	5 ml	5 ml	25 ml	100 ml	250 ml	500 ml	1000 ml
Sepapure® Ni-NTA FF	010X39FSPZ	020X39FSPZ	-	00IX39FSPZ	00KX39FSPZ	00NX39FSPZ	00PX39FSPZ	00QX39FSPZ
Sepapure® Glutathione FF	010X39PSPZ	020X39PSPZ	00GX39PSPZ	00IX39PSPZ	00KX39PSPZ	00NX39PSPZ	00PX39PSPZ	00QX39PSPZ

Ion-Exchange Chromatography

FPLC media based on cross-linked agarose beads with a mean diameter of 100 µm.

The FPLC media is functionalized with different linkers ranging from strong anion exchange ligands to weak cation exchange ligands.

Properties:

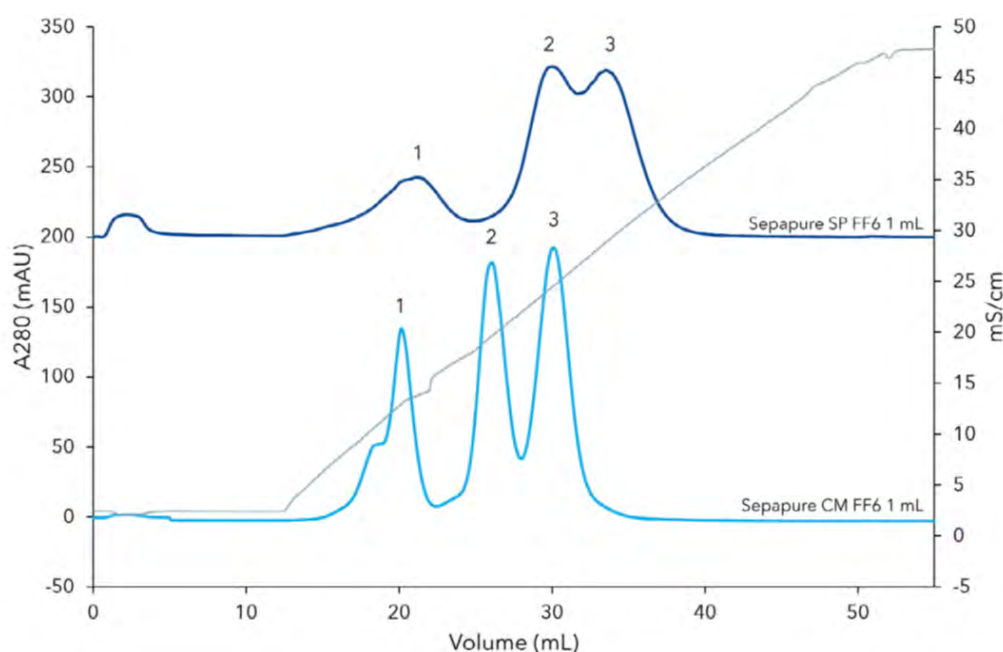
Sepapure® Ion-Exchange media is designed to be used with most aqueous buffer systems. It is long lasting when correctly handled and is compatible with common CIP strategies. All Sepapure® media is stored in 20% ethanol upon delivery.

Technical data:

The agarose beads are functionalized with a quaternary ammonium for the strong anion exchanger (Q) and with diethylaminoethyl for the weak anion exchanger (DEAE). The strong cation exchanger is functionalized with sulphopropyl (SP) and the weak cation exchanger with carboxymethyl (CM). The maximum operating pressure the Sepapure® columns should be used at is 3 bar, while the recommended flowrate is 1 CV/ml. Available as prepacked 1 ml or 5 ml cartridge or as bulk material.

Recommended application areas:

Typically used in the intermediate step of an FPLC purification procedure.



Sepapure SP FF6 1ml
Article number: 010X15RSPZ

Sepapure CM FF6 1ml
Article number: 010X15QSPZ

1. Ribonuclease A
2. Cytochrome C
3. Lysozyme

Column / Resin type	Cartridge		Media			
	1 ml	5 ml	25 ml	100 ml	500 ml	1000 ml
Sepapure® DEAE FF	010X15ISPZ	020X15ISPZ	00IX15ISPZ	00KX15ISPZ	00PX15ISPZ	00QX15ISPZ
Sepapure® Q FF	010X15HSPZ	020X15HSPZ	00IX15HSPZ	00KX15HSPZ	00PX15HSPZ	00QX15HSPZ
Sepapure® CM FF	010X15QSPZ	020X15QSPZ	00IX15QSPZ	00KX15QSPZ	00PX15QSPZ	00QX15QSPZ
Sepapure® SP FF	010X15RSPZ	020X15RSPZ	00IX15RSPZ	00KX15RSPZ	00PX15RSPZ	00QX15RSPZ

Size Exclusion Chromatography

FPLC media based on a cross-linked agarose-dextran composite with a mean particle size of 35 µm.

Properties:

Sepapure® Size-Exclusion media is designed for the preparative purification of biomolecules according to their size. They are long lasting when correctly handled and are compatible with common CIP strategies. All Sepapure® media is stored in 20% ethanol upon delivery.

Technical data:

The Sepapure® Size Exclusion beads have a fractionation range of either 3 - 70 kDa (Sepapure® SEC 75) or 6 - 600 kDa (Sepapure® SEC 200). The maximum operating pressure the Sepapure® columns should be used at is 3 bar.

Recommended application areas:

Typically used in the final step of an FPLC purification procedure.

Resin type	Media						
	25 ml	50 ml	100 ml	150 ml	250 ml	500 ml	1000 ml
Sepapure® SEC 75	00IX46SSPZ	00JX46SSPZ	00KX46SSPZ	00LX46SSPZ	00NX46SSPZ	00PX46SSPZ	00QX46SSPZ
Sepapure® SEC 200	00IX46TSPZ	00JX46TSPZ	00KX46TSPZ	00LX46TSPZ	00NX46TSPZ	00PX46TSPZ	00QX46TSPZ

Desalting Columns

FPLC media based on dextran beads with a mean diameter of 20 - 50 µm.

Properties:

Sepapure® Desalting media is designed to be used for removal of small molecules below the exclusion limit and for convenient rebuffing. It is long lasting when correctly handled and compatible with common CIP strategies. All Sepapure® media is stored in 20% ethanol upon delivery. Available as prepacked 1 ml or 5 ml cartridge or as bulk material.

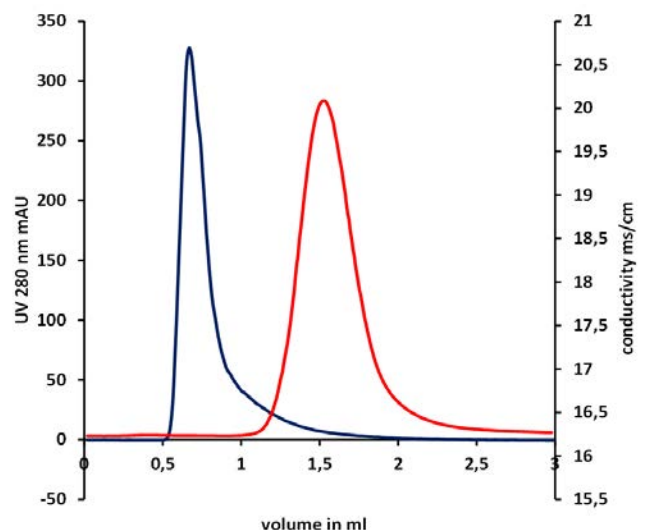
Technical data:

The Sepapure® dextran beads have an exclusion limit of 5 kDa. The maximum operating pressure of the Sepapure® columns is 3 bar, while the recommended flowrate is 1 CV/ml.

Recommended application areas:

Typically used in the final step of an FPLC purification procedure or in between steps for fast buffer exchange.

Sepapure Desalting 1ml
Article number: 010X460SPZ



1. BSA
2. NaCl

Column type	Cartridge	
	1 ml	5 ml
Sepapure® Desalting	010X460SPZ	020X460SPZ

Technical documentation

Equilibration and storage of silica gel based columns like Eurospher II

Proper storage of silica based HPLC columns

Silica based columns should be stored in an aprotic solvent. The best solvent for storage of RP packings (C18, C8, C4, C1, C30, CN and Phenyl) is acetonitrile/water (50:50 v/v). The water content should not be greater than 50%. The best solvent for storage of NP packings (Silica, Diol, Nitro, Cyano and Amino) is hexan/isopropanol 90:10 (v/v). The best solvent for storage of columns used in HILIC mode (HILIC, Amino, and Silica) is acetonitrile/water (90:10 v/v) or acetonitrile/5 mM ammonium acetate, pH 5,3 (90:10 v/v). Acetonitrile content should always be greater than 90 %.

Caution! Even for short-term storage, flush out all buffer solution from the column to prevent algal growth. Make sure that all buffers are washed out of the column before exchanging aqueous mobile phases by organic solvents. Buffer salts are not soluble in acetonitrile and can block capillary tubing and the column.

Equilibration

The equilibration time of a column depends on the column dimensions. In general, a column is equilibrated after 20 column volumes are flushed through it. The equilibration times for the most important column dimensions are summarized in the following table. You can reduce the equilibration time by simply increasing the flow rate. However, make sure to flush the column with at least 10-20 column volumes to make sure the column is equilibrated.

Eurospher II columns with 2 µm particle size, UHPLC:

Column dimension (Length x ID) [mm]	Column volume [ml]	Flow rate [ml/min]	Equilibration time [min]
50 x 2	0.11	0.5	3
100 x 2	0.21	0.5	6

Eurospher II columns, classical HPLC:

Column dimension (Length x ID) [mm]	Column volume [ml]	Flow rate [ml/min]	Equilibration time [min]
250 x 4.6	2.82	1.0	28
150 x 4.6	1.69	1.0	17
100 x 4.6	1.13	1.0	12
50 x 4.6	0.56	1.0	6
250 x 4.0	2.14	1.0	22
150 x 4.0	1.28	1.0	13
125 x 4.0	1.07	1.0	11
250 x 3.0	1.20	0.6	20
150 x 3.0	0.72	0.6	12
100 x 3.0	0.48	0.6	8
50 x 3.0	0.24	0.6	4
250 x 2.0	0.53	0.25	21
150 x 2.0	0.32	0.25	13
100 x 2.0	0.21	0.25	9
50 x 2.0	0.11	0.25	5

Regeneration of silica gel based columns like Eurospher II

Regeneration of a column

We recommend regenerating a column if a change in peak form, retention time, resolution or an increase in backpressure is observed. If the system pressure begins to rise, remove the column and check the system to find whether the pressure increase is being caused by the system or the column. Pressure increase caused by system: flush system, exchange eluent filters, frits and/or blocked capillaries.

Pressure increase caused by column: backflush the column carefully to remove particle buildup from the inlet frit (connect the column outlet to the pump/injector and flush). Do not connect the column to the detector. If the column still has a high backpressure, flush the column according to the following regeneration scheme.

Regeneration scheme

RP columns (C18, C8, C4, C1, C30, CN and Phenyl stationary phases)	NP columns (Silica, Diol, Nitro, Cyano and Amino stationary phases)	Columns used in HILIC mode (HILIC and Silica stationary phases)
20 CV* water	20 CV heptane	20 CV water
20 CV acetonitrile	5 CV isopropanol	30 CV 0.5 M ammonium acetate
5 CV isopropanol	20 CV acetonitrile	30 CV water
20 CV heptane	20 CV water	20 CV acetonitrile/water (50:50 v/v)
5 CV isopropanol	20 CV acetonitrile	20 CV acetonitrile
20 CV acetonitrile	5 CV isopropanol	20 CV acetonitrile/water (50:50 v/v)
	20 CV heptane	

* CV = column volumes

After the regeneration procedure, re-equilibrate the column with the mobile phase before analyses.

Eurokat column care and regeneration

Column maintenance tips

- The maximum pressure limit during operating should not be exceed 90 bar. The maximum pressure for the column material is 100 bar.
- Forceful mechanical handling (bumps, shocks) as well as sudden temperature changes should be strictly avoided to conserve the homogeneity of the packed column bed.
- Water used in preparation of the mobile phase should be either fresh double-distilled or HPLC-grade.
- All reagents used in sample preparation (solvents, reference compounds, etc.) should be of p.a. grade. Particulate matter and precipitates must be removed from the sample by filtration before injection.
- Changes in column temperature should only be undertaken under continuous eluent flow. As a principle, drastic temperature changes should always be carried out in gradual steps.
- The optimal temperature range for the analysis of carbohydrates is 60 - 90°C.
- During heating process from room temperature keep the flow low at 0.1 ml/min for 4 mm and 0.2 ml/min for 8 mm columns up to 60 °C.

- Flow rate changes should also only be carried out stepwise.
- Optimal flow rates are typically between 0.1 - 0.2 ml/min for 4 mm diameter columns and 0.4 - 0.8 ml/min for 8 mm diameter columns.
- If the column is not to be used for a longer period, the inlet and outlet should be sealed with appropriate blind fittings to prevent the polymer material from drying out. For longer term storage, the column should be kept at 8°C to avert bacterial growth.

Column regeneration procedure

- Eurokat columns can be regenerated in their corresponding ionic form. Regeneration of the polymer resin is important to maintaining the selectivity and lifetime of the column material. If metal ions or organic components are present in the sample, these materials may settle on the resin material or even react with the polymer, resulting in a gradual loss of column performance. Through periodic cleaning of the column, lifetime and performance can be significantly prolonged. To clean the resin, Eurokat Pb, Ca and Na columns should be flushed for at least 4 hours (preferably overnight) with double-distilled water at a flow rate of 0.2 ml/min (8 mm ID column) in the reverse direction at 60 - 75 °C. Eurokat H columns can be cleaned in a similar manner but require 0.01 N sulfuric acid.
- The column should then be rinsed for an additional hour with the same cleaning eluent in the normal flow direction at 75 - 85 °C. Maintaining this flow direction and temperature, Eurokat Pb, Ca and Na columns should then be purged with a mixture of 10 % acetonitrile and 90 % water. Eurokat H columns should be purged with 10 % acetonitrile and 90 % 0.01 N sulfuric acid.

After this cleaning process, the column is to be regenerated through purging with following parameters:

Flow rate	0.2 ml/min	
ID column	8 mm	
Time span	4 - 6 hours	
Temperature	75 - 85 °C	
Cleaning eluent	Eurokat Pb:	0.25 mol/l lead nitrate
	Eurokat Ca:	0.25 mol/l calcium nitrate
	Eurokat Na:	0.25 mol/l sodium chloride or 0.1 mol/l sodium hydroxide
	Eurokat H:	0.05 mol/l sulfuric acid

Once this procedure has been completed, the desired flow rate may be resumed gradually. The column is now ready for further analyses and can be put back into normal use once having gradually reached the working temperature.

Column using tips

- In general it is recommended that a precolumn (30 x 8 mm or 30 x 4 mm) should be used. In order to eliminate undissolved particles or precipitates, the sample should be filtered through a 0.45 µm filter unit. Particulate matter in the eluent is removed by installing a column inlet filter between the injector and the column.
- To avoid contaminating the detector's measurement cell, neither the cleaning solution nor the regenerant should pass through the measurement cell.

KNAUER - a success story

We are an established partner in science. Today and in the future.



1962
Dr.-Ing. Herbert Knauer and his wife Roswitha founded the company.



1970
At Leipzig Trade Fair in East Germany, Knauer is honored with a gold medal.



1974
Knauer develops new instruments and columns for High Performance Liquid Chromatography (HPLC).



1976
Knauer presented HPLC instruments in modular format and they quickly become well-known for their outstanding flexibility.



1987
Knauer offers HPLC columns with inner diameters ranging from 2 to 32 mm.



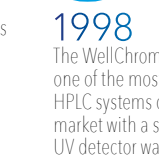
1992
Introduction of a complete range of products for preparative chromatography.



1996
Development of the smallest SMB system in the world for preparative continuous chromatography.



1995
Alexandra Knauer, daughter of the company's founder, is appointed General Manager and begins managing the company.



1998
The WellChrom HPLC line, one of the most compact HPLC systems on the market with a scanning UV detector was available.



2000
Alexandra Knauer becomes sole owner of the company.



2001
Starting in 2001, production is increasingly moved in-house to ensure quality and improve flexibility.



2003
Introduction of the modern Smartline HPLC series with a diode array detector.



2006
The Smartline Assistant can take over a variety of tasks such as sample preparation, sample injection or fraction collection.



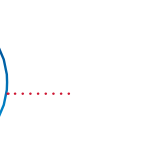
2008
PLATINblue, the new modular system for UHPLC features a pressure range of up to 1000 bar.



2009
BlueShadow, a new product line for OEM customers is developed.



2010
Alexandra Knauer wins the prestigious "Prix Veuve Clicquot" as female entrepreneur of the year in Germany.



2012
The new product line Azura with the flagship Azura Prep LC which includes numerous modules and new axially compressible columns is presented.



2013
Knauer receives the Innovation Award Berlin Brandenburg 2013.



2014
New product line Azura Analytical HPLC is launched.



2015
Introduction of the new Azura Bio LC Systems for FPLC-Applications.



2016
Knauer receives the Quality Award Berlin-Brandenburg and the Application Award 2016 in the food analysis category of the specialist magazine "Laborpraxis".



2017
The University of St. Gallen awarded the title of TOP-employer 2017 to Knauer.



2017
Knauer is a global partner to the scientific community. We support research and development both now and in the future.

Terms and conditions

1. Definition of terms

The following terms and conditions apply to every order received by KNAUER and every delivery of goods. This holds as well in case of contradictory buying conditions of the purchaser. Exceptions are only valid when confirmed by KNAUER in writing. Purchase orders are only binding if confirmed by KNAUER in writing.

2. Payment

Deliveries are due and payable, net, within 30 days of invoice date or in advance. Deductions are not allowed. Foreign deliveries must be paid by irrevocable letter of credit or in advance. All bank and transfer fees must be paid by the customer. The consequences arising out of delay are due to statutory provisions. Payments are due irrespective of an eventual notice of defect, except such defects are evidently justified.

3. Delivery

Delivery dates are not binding unless expressly stated in the contract as binding dates. Delay in delivery requires a written reminder and an adequate additional grace period set by the customer. KNAUER is only liable for claims for damages under the requirements of no. 6.

4. Claims

Condition for any warranty claim is the immediate inspection of the goods upon delivery, and complaint towards and damage assessment together with the carrier, and an immediate written complaint to KNAUER. The complaint must be made within five workdays in case of visible defects or losses.

5. Risk liability

Delivery is made at the customer's own risk. As soon as the goods leave KNAUER's plant the risk of accidental loss, destruction or deterioration passes to the customer.

6. Warranty and damages

6.1. Warranty claims

The warranty begins with receipt of the goods. If commissioning has been ordered, after commissioning. In the case of delayed commissioning, the warranty begins at the latest four weeks after receipt of the goods unless the supplier is responsible for delayed commissioning.

The warranty for osmometers and liquid chromatography instruments is limited to two years, excluding glass breakage, damages due to stoppage and consumable materials such as membranes, light bulbs, columns, bushings, gaskets and valves. KNAUER's liability shall be restricted to the replacement of defective material or repair only. Transportation costs are borne by the customer. In case of failure of replacement or repair the customer may demand a reduction in price or cancellation of the contract with respect to the defective material. The customer has to inspect the goods delivered immediately and shall immediately give written notification of any defects to KNAUER, in case of non-obvious defects within 10 working days after delivery at the very latest.

6.2. Claims for damages

The liability of KNAUER shall be restricted to intentional acts and acts of gross negligence and compensation shall only be due for direct, foreseeable damages. Liability for breach of a material, essential duty of the contract, liability because of personal injury, liability according to the stipulations of the German Law on Product Liability and liability for the lack of the condition of the contract goods guaranteed by KNAUER remain unaffected.

7. Third party rights on industrial or other intellectual property

KNAUER shall not be liable for the infringement of third party rights founded on industrial or other intellectual property caused by the use of the delivered goods. The customer is fully responsible for the products manufactured with the goods. In particular KNAUER is not obliged to indemnify and hold harmless the customer from all claims raised by third parties based on the infringement of their industrial or intellectual property rights by the use of the goods.

8. Property rights

The ownership of the goods shall remain with KNAUER until payment in full for all our claims resulting from our business relation is received. In case of improper treatment of the goods or in case of default KNAUER may demand the return of the delivered goods. This demand entails resignation of the contract only if KNAUER declares it explicitly.

Resellers are allowed to sell the goods to third parties in due course of the business. The customer herewith assigns his resale claims against third parties to KNAUER.

9. Export

Instruments and products delivered by KNAUER may not be exported to a country other than of the customer's headquarters without KNAUER's prior written permission.

10. Place of settlement and court of jurisdiction

The place of performance is Berlin. Proper venue for all claims is the competent local court at KNAUER's principal place of business - Berlin. KNAUER reserves the right to sue the customer at his principal place of business.

This agreement shall be governed by the laws of the Federal Republic of Germany excluding the UN-Convention on the International Sale of Goods (CISG).

KNAUER Wissenschaftliche Geräte GmbH
Hegauer Weg 38
14163 Berlin, Germany

These terms and conditions apply since June 1, 2016

Analytical
HPLC

Multi-Column
Chromatography,
SMB

Preparative
HPLC

FPLC

Osmometry

Dosing,
Metering,
Pumping

Detection

Technical data or prices are subject to change without notice. Prices may vary by country and do not include taxes, customs duties or delivery.

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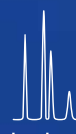
www.knauer.net/terms

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KNAUER