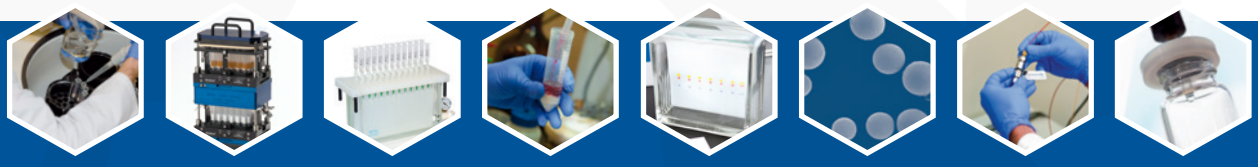
ANALYTICAL CHEMISTRY CATALOG



SILICYCLE Inc.®
UltraPure SILICA GELS

About SiliCycle

We provide solutions to the global chemical industry.

Founded in 1995, SiliCycle® Inc. is a worldwide leader in the development, the manufacturing and the commercialization of high value silica-based and specialty products for chromatography, analytical and organic chemistry. Our business extends to more than fifty countries and our customer portfolio includes companies in a wide range of markets.

At SiliCycle, we are at the forefront of the chromatography industry, owing to the extraordinary purity of our silica gels and polymeric sorbents, combined with our capacity to rapidly adapt our products to meet the specific requirements of scientists worldwide.

We lead the way in offering innovative first-rate *UltraPure* products. Our automated manufacturing processes are continuously optimized to ensure high purity and a low percentage of fine particles, thereby guaranteeing optimal performance. With our multi-ton manufacturing capacity, we are your partner of choice for all your analysis, metal removal, catalysis, synthesis, and purification requirements.

SiliCycle is also a leading service provider, offering turnkey solutions based on its expertise in organic chemistry, material science, analytical chemistry to name only a few. With stateof-the-art instrumentation in the areas of chromatography, spectroscopy, and manufacturing combined to an applications support laboratory, we are devoted to extend your R&D and make your project a success.

SiliCycle has several sales offices in many countries such as China, India, European Union (*France & Germany*) just to name a few. All products are available worldwide through SiliCycle or via distributors.

We are committed to providing you with the highest quality products and services in the industry

Information about SiliCycle is available at www.SiliCycle.com

Analytical Chemistry Fields

Quality Commitment for SiliCycle Products

SiliCycle has developed products that are used in many fields of the analytical industry to help customers for their analytical needs. The SiliCycle Analytical Chemistry Catalog is designed in the same way that scientists are developing their applications, starting by the sample treatment *(extraction, purification, enrichment, filtration)*, to the final analysis *(determination, recovery, yield and selectivity)* including the use of consumables and accessories. In order to facilitate selection of the best product for your requirements, SiliCycle has introduced icons representing each field of the analytical industry.

Bio-Pharma

Pharmaceutical

Biotechnological & Pharmaceutical

Products and applications for each step of the drug discovery & development, purification, characterization, manufacturing and quality control of small pharmaceutical molecules to large peptides and proteins.

Food

Food & Beverage

Products and applications available for food & beverage industry including the food safety testing, fragrance & flavor, quality control testing of intermediate and final products, neutraceutical and natural products analysis.

Forensic

Forensic

Products and applications used for forensic analysis, clinical study and toxicology testing from the preparation of the sample through the analysis.

Environment

Environment

Products and applications covering environmental testing of broad range of matrices such as water, waste water, soil, sludge and air.

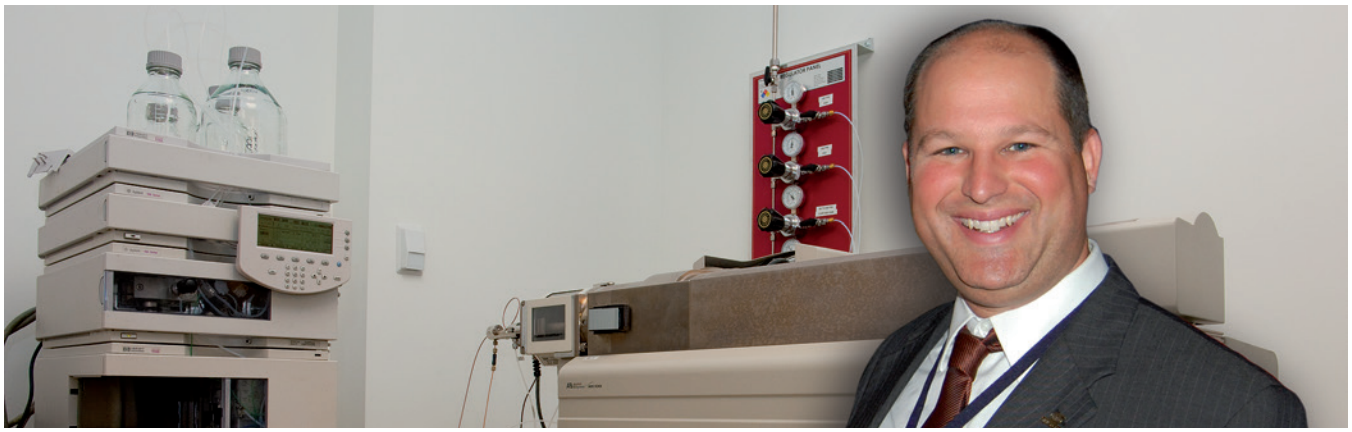
Energy

Energy

Products and applications covering the petrochemical, biodiesel and alternative fuels development, testing and analysis.

SILICYCLE

Word from the President



Dear Colleague,

We are pleased to present you our New SiliCycle Analytical Chemistry Catalog.

The importance of analytical chemistry has never been greater than it is today. Therefore, we have created this new catalog as an essential tool in providing solutions to today's demand for safe food, pure water, safe consumer goods, and safe APIs. Whether you come from the pharmaceutical or biopharmaceutical industry, from agriculture and food, from petrochemicals, environmental industry, quality assurance, quality control or any other analytical lab, this catalog is meant for you.

It is part of our quest to offer you the most appropriate selection of high quality products providing solutions to the most challenging analytical applications. Included within this new catalog, you will find our silica-based best-selling products such as our Silia*Chrom*® HPLC columns, Silia*Prep*™ and Silia*PrepX*™ SPE cartridges and well plates, Silia*Sphere*™ spherical silica gels, Silia*Plate*™ TLC plates, and Silia*Quick* QuEChERS solutions.

In May 2012, we acquired Chromatography Sciences Company *(CSC)* Inc. Founded in 1980, CSC was a Canadian pioneer in the manufacturing of HPLC columns and the marketing of other analytical products for the market of research laboratories in North America. With this acquisition, all manufacturing operations, equipments, and know-how of CSC were transferred to SiliCycle state of the art facility, in Quebec City. The key personnel of CSC, including its President, Mr. Denis Boudriau, also joined the SiliCycle team.

We are confident that you will find herein the perfect fit for your day-to-day work. We invite you to visit our Multi-Currency eCommerce website at www.SiliCycle.com for a secure, fast and easy ordering experience, and to get complementary information with regards to our full product lines and services.

You may also contact our highly skilled representatives and knowledgeable technical support people who are available to assist you in application development, and in finding the right solution to any questions you may encounter in your work.

Finally, with over 20 years of market leadership as a worldwide provider of the highest quality products and services, we remain committed to offering you the best and most diversified product lines for analytical and organic chemistry, as well as chromatography, purification and sample clean-up.

To remain at the forefront of the industry, we have increased our presence worldwide in the past few years. Follow us and meet us through our numerous participations in the major trade shows and conferences around the world. It's always a pleasure to meet our fellow colleagues.

Thank you for your confidence and support.

Hugo St-Laurent

President & CEO

Quality Commitment for SiliCycle Products

Quality assurance

Having rigorous quality controls *(QC)* with high standards does not guarantee absolute satisfaction of the customer. This is why SiliCycle created a Quality Assurance department with a clear goal: always ensure that products are consistently produced and controlled to the quality standards appropriate to their intended use. SiliCycle bases its quality management system *(QMS)* on the ISO standard.

SiliCycle is ISO 9001:2008 certified. This registration shows that we constantly improve the effectiveness of our quality management system; we follow our policies and fulfill our objectives which lead to customer satisfaction.

You can be sure of the outstanding quality of SiliCycle's silica gels because of the tightly controlled manufacturing conditions at our new state of the art facility. Our tight control of every manufacturing process step, affords identical and reproducible properties *(chemical, physical and structural)* and ensures consistant chromatographic selectivities.

Furthermore, our stringent Quality Control and Quality Assurance ensures high performance with no scale-up limitations. Every product meets our quality specifications and is shipped with a Certificate of Analysis *(CofA)*. Individual data sheets are also available directly from our website.

Audits

For many years, SiliCycle products have been used by major players in the industry *(pharmaceutical, biotechnology, etc.)* who are regulated by strict rules *(GMP for example)*. SiliCycle has been audited by several customers and successfully passed each one.

Bare Silica Gel

The backbone of most of SiliCycle's products is Silia*Flash* F60 *(40-63 µm, 60 Å)* silica gel. It provides superior performance for chromatographic applications due to its narrow particle size distribution and high purity.

Before functionalization, every silica is rigorously characterized and analyzed by the procedures below to ensure lot-to-lot reproducibility.

Functionalized Silica Gel

The process for functionalizing the silica is highly dependent on the group being attached. However, it is still possible to functionalize 90% of the surface, verified by ^{29}Si MAS NMR. The remaining 10% of the surface may be endcapped to provide a completely inert support. After being functionalized, the product is submitted to further analysis and quality control as outlined below.

Quality Control Testing	
Type of Analysis	**Performed by:**
Bare Silica Gel	
Carbon, nitrogen & sulfur content	Elemental analyzer
Total trace metal	ICP-OES
Surface area & porosity	Nitrogen adsorption analyzer
Particle size distribution	Laser light diffraction
Tapped density analysis	Density measurement
Water content	Moisture balance
pH	pH-meter
Functionalized Silica Gel	
Residual solvent content	Moisture balance
Specific reactivity analysis	GC-FID, GC-MS, LC-MS/MS, ICP-OES
Organic function signature	Infrared spectroscopy
Purity analysis	GC-MS

Analytical Products

Silia*Chrom*®
HPLC Columns

INSIDE THIS SECTION

SILICYCLE Inc.
UltraPure SILICA GELS

Silia*Chrom* HPLC Columns

Using Silia*Chrom* in chromatographic applications ensures the following:

- Excellent column efficiency.
- Long lifetime and column-to-column reproducibility.
- Broad pH range from 0.8 to 12.
- Compatibility with 100% aqueous and organic mobile phases.
- High surface coverage presenting no bleeding for LC-MS applications.

Presentation of the SiliaChrom HPLC Column Series

SiliCycle has been manufacturing and packing HPLC columns for more than 15 years now and we offer more than 40 different phases for your different needs. We are working on enhancing that portfolio to suit your very needs and offer unique and performant new phases through our R&D facilities. Our raw materials and finished HPLC columns go through our ISO 9001-2008 registered manufacturing facilities under strict SOP's and standard QC laboratory column performance testing assuring column performance, peak symmetry and lot-to-lot reproducibility.

Our unique sol-gel process technology used to produce this material offers total solution for all the HPLC end-users, whether you require a silica-based material for use in a wide range of pH, 100% aqueous or organic mobile phases, low bleed for LC-MS applications. We have the solution for you.

The Silia*Chrom* portfolio ranges from reversed-phase to normal phase columns, SEC for large proteins and peptides, columns for biochromatography of large molecules and SFC for API separations. An incredibly wide range of column dimensions and granulometries are available to accommodate the vast majority of your applications.

NEW! Silia*Chrom* Plus Columns

Years of research and development have led to the release of this new proprietary silica-based material for your more challenging separations requiring high column performance and resolution, enhanced chromatographic performance, lot-to-lot reproducibility and extended column lifetime.

Reduced silanol activity, high surface area and controlled surface from lot-to-lot have indeed led to exceptional silica producing reliable HPLC columns with high performance and peak symmetry for your QA/QC labs and research laboratories. Built on our renowned SiliCycle silica backbone, this new material is rapidly becoming an extremely popular packing material for scientists all over the world facing more challenging separations regularly.

This new range of Silia*Chrom* Plus serie unables us to offer robust columns for your everyday work.

SiliCycle; Experts in HPLC Column Packing

Superior HPLC columns can be produced only with excellent packing materials and excellent packing techniques. Silia*Chrom* columns are made from extremely pure silicas and are well known for their high efficiency and high resolution capacity. Based on spherical, totally porous silica, Silia*Chrom* columns provide enhanced chemical and mechanical stability as well as very high loading capacity and full end-capping.

All Silia*Chrom* and Silia*Chrom* Plus columns are packed using our proprietary slurry packing process to achieve a uniform column-to-column reproducibility. All our Silia*Chrom* Columns have good phase selectivities, resolution, performance, good peak symmetry and long lifetimes when used according to the phase and material specifications, for acidic, neutral and basic compounds, polar or non-polar.

Column Packing Reproducibility

SiliCycle is recognized for its strong expertise in column packing technology. All Silia*Chrom* columns are packed using a consistent packing methodology to achieve an extremely stable and uniform column packing bed leading to high column lifetime and column-to-column reproducibility. To prove this, we packed and tested several analytical columns 4.6 x 250 mm using the same Silia*Sphere* C18 3 µm, 100 Å for reproducibility and high efficiency evaluation.

Chromatographic conditions

Sample mixture in mobile phase: Uracil / Phenol / Nitrobenzene / Naphtalene

Injection volume:	2 µL	Flow rate:	0.8 mL/min
Temperature:	30°C	Mobile phase:	15% Water, 85% Methanol

Observed Column Parameters for Napthalene

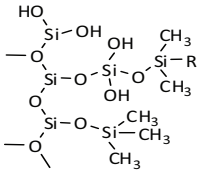
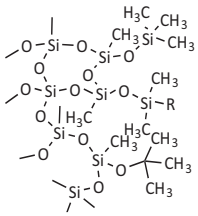
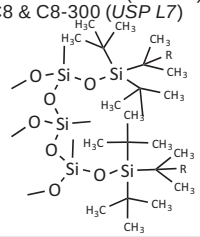
Column Number	Retention Time (*min*)	Theoretical Plates Number per meter	Tailing Factor
1	9.148	28,481	1.01
2	9.382	28,391	1.00
3	9.398	28,712	1.00
4	8.998	28,150	1.01
5	9.307	28,393	1.00
6	9.307	28,267	1.03
7	9.015	28,153	1.04
8	9.373	28,801	1.06
9	9.298	28,357	1.00
10	9.298	28,206	1.04
Average	9.252	28,391	1.02
Standard Deviation	0.147	222	0.02
Relative Standard Deviation	1.589	0.783	2.14

« SiliCycle has been able to repeatedly come through and produce high quality semi-prep HPLC columns (50+ mm ID) for several different projects that we have done. For many of these projects price is not the driving force, the timing is.»

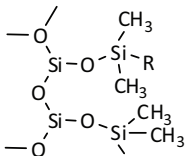
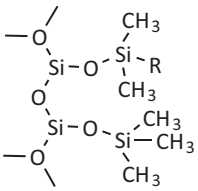
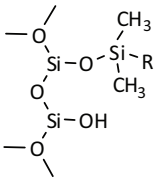
Jason Blanchard from Ricerca Biosciences, Concord, OH, USA

HPLC Family Overview

With a broad range of family phases available, using SiliCycle HPLC columns ensure flexibility and scalability.

HPLC Family Overview			
SiliaChrom Plus	**SiliaChrom dt**	**SiliaChrom XT & XT Fidelity**	**SiliaChrom SB**
For your everyday separations	**100% aqueous compatible**	**For high pH conditions**	**For extremely low pH conditions**
• C18 & C18-300 (*USP L1*) • C8 & C8-300 (*USP L7*) • C4 & C4-300 (*USP L26*) • Amino (*USP L8*) • Cyano (*USP L10*) • Diol (*USP L20*) • PFP (*USP L43*) • Phenyl (*USP L11*) • Silica (*USP L3*) • SAX (*USP L14*) • SCX (*USP L9*) Proprietary Structure	• C18 (*USP L1*) • C8 (*USP L7*) • Silica (*USP L3*) 	• C18 (*USP L1*) 	• C18 & C18-300 (*USP L1*) • C8 & C8-300 (*USP L7*) 
Main Characteristics			
• Wide range of selectivities • Ultra-pure metal-free silica (*99.9999% purity*) • High column performance and resolution • Enhanced batch-to-batch reproducibility • Extended column lifetime • Reduced silanol activity, better peak symmetry • Extremely low bleeding for LC-MS applications • Easy scale-up to preparative formats	• Ultra-pure metal-free silica (*99.9999% purity*) • High sensitivity for LC-MS • Stable from 100% aqueous to 100% organic mobile phase • Universal: acidic, neutral and basic analysis • Enhanced retention of hydrophilic molecules • Inertness for acidic and basic analytes	• Coated with a monomeric prepolymer for excellent durability at high pH • Ideal for basic compounds and metabolic studies	• Protecting group that shields the silica surface for extremely low pH stability • Extremely low bleeding for LC-MS applications under acidic conditions
Particle Size			
• 3 - 10 µm	• 2.5 - 10 µm	• 3 - 10 µm	• 3 - 10 µm
Pore Size and Typical Surface Area*			
• 100 Å / 370 - 430 m^2/g: C18, C8, C4, Amino, Cyano, Diol, Phenyl & Silica • 120 Å / 320 - 360 m^2/g: PFP • 300 Å / 80 - 120 m^2/g: C18, C8, C4 & SAX	• 100 Å / 410 - 440 m^2/g	• 100 Å / 200 m^2/g: XT Fidelity • 150 Å / 380 m^2/g: XT	• 150 Å / 200 m^2/g • 300 Å / 80 m^2/g
Carbon Load*			
• C18: 15% (*100 Å*), 8% (*300 Å*) • C8: 8% (*100 Å*), 5% (*300 Å*) • C4: 6% (*100 Å*), 3% (*300 Å*) • Amino: 8% • Cyano & Diol: 7% • Phenyl: 11% • PFP: 9% • SCX & SAX : proprietary information	• C18: 18% • C8: 14%	• XT: 15% • XT Fidelity: 21%	• C18: 12% (100 Å), 5% (300 Å) • C8: 7% (100 Å), 3% (300 Å)
Endcapping			
• Proprietary endcapping	• Endcapped	• Double endcapped	• Proprietary endcapping
pH Stability			
• 2 - 8	• 1.5 - 9	• 1.5 - 12	• 0.5 - 7.5: C18 (*150 Å & 300 Å*) • 1 - 7.5: C8 (*150 Å & 300 Å*)
Temperature Stability			
• 60°C	• 60°C	• 60°C	• 60°C
Pressure Stability			
• 100 Å: 5,500 psi • 300 Å: 4,000 psi	• 5,000 psi	• 5,000 psi	• 4,500 psi

HPLC Family Overview

SiliaChrom XDB	SiliaChrom XDB1 & XDB2	SiliaChrom HILIC	SiliaChrom GF
For large hydrophobic molecules	**For your QC analyses**	**For highly polar analytes**	**For biomolecules separation**
• C18 (*USP L1*) • C8 (*USP L7*) • Silica (*USP L3*) 	• C18 & C18-300 (*USP L1*) • C8 & C8-300 (*USP L7*) • C1 & C1-300 (*USP L13*) 	• HILIC & HILIC-300 (*Urea*) 	• GF & GF-300 • GF AMIDE & GF AMIDE-300
Main Characteristics			
• High loading capacity • Low surface area, allowing shorter retention times for large hydrophobic molecules • Ideal for separation of barbiturates, fat-soluble vitamins, fatty acids and steroids	• High loading capacity • Great column-to-column and batch-to-batch reproducibility • Good peak shape for acidic, neutral and basic analytes • Stronger separation power for isomers	• Unique chemistry (urea) • Compatible with reversed-phase and normal-phase conditions • Rapid equilibration • Enhanced sensitivity in mass spectrometry • Approved phase for SFC	• Separation and determination of peptides, proteins and nucleic acids • Two exclusion ranges: from 5,000 to 100,000 Dalton (*100 Å*) and from 50,000 to 1,000,000 Dalton (*300 Å*)
Particle Size			
• 5 µm	• 3 - 10 µm	• 3 - 10 µm	• 5 - 10 µm
Pore Size and Typical Surface Area*			
• 150 Å / 200 m^2/g	• 100 Å / 380 - 400 m^2/g • 300 Å / 80 m^2/g	• 100 Å / 380 m^2/g • 300 Å / 80 m^2/g	• 100 Å / 340 m^2/g • 300 Å / 80 m^2/g
Carbon Load*			
• C18: 15% • C8: 8%	• C18: 22% (*XDB1-100 Å*), 18% (*XDB2-100 Å*), 8% (*300 Å*) • C8: 14% (*100 Å*), 4% (*300 Å*) • C1: 3% (*100 Å*), 1% (*300 Å*)	• 100 Å: 8% • 300 Å: 2.5%	• 100 Å: 5% • 300 Å: 1%
Endcapping			
• Double endcapped	• Double endcapped	• Non endcapped	• Endcapped
pH Stability			
• 1.5 - 9	• 1.5 - 10: XDB1 C18 • 1.5 - 9: XDB1 C18-300 & XDB2 C18 • 1.5 - 8.5: C8, C8-300, C1 & C1-300	• 2 - 8	• 2 - 8
Temperature Stability			
• 60°C	• 60°C	• 60°C	• GF: 45°C • GF Amide: 60°C
Pressure Stability			
• 5,500 psi	• 5,500 psi	• 5,000 psi	• 4,000 psi

Silia*Chrom* HPLC Columns Characteristics

Silia*Chrom* HPLC columns are available in various dimensions and can also be ordered online on our website.

Silia*Chrom* & Silia*Chrom* Plus HPLC Column Characteristics									
Silia*Chrom* Phases	Particle Size (*µm*)	Pore Size (*Å*)	Specific Surface Area (m^2/g)	Carbon Load (%)	pH Range	USP Code	T Limit* (°C)	Pressure Limit (*psi*)	Page
Silia*Chrom* Plus C18	3, 5, 10	100	370 - 430	15	2.0 - 8.0	L1	60	5,500	122
Silia*Chrom* Plus C18-300	3, 5, 10	300	80 - 120	8	2.0 - 8.0	L1	60	4,000	
Silia*Chrom* Plus C8	3, 5, 10	100	370 - 430	8	2.0 - 8.0	L7	60	5,500	
Silia*Chrom* Plus C8-300	3, 5, 10	300	80 - 120	5	2.0 - 8.0	L7	60	4,000	
Silia*Chrom* Plus C4	3, 5, 10	100	370 - 430	6	2.0 - 8.0	L26	60	5,500	
Silia*Chrom* Plus C4-300	3, 5, 10	300	80 - 120	3	2.0 - 8.0	L26	60	4,000	
Silia*Chrom* Plus PFP	3, 5, 10	120	320 - 360	9	2.0 - 8.0	L43	60	5,500	
Silia*Chrom* Plus Cyano	3, 5, 10	100	370 - 430	7	2.0 - 8.0	L10	60	5,500	
Silia*Chrom* Plus Amino	3, 5, 10	100	370 - 430	8	2.0 - 8.0	L8	60	5,500	
Silia*Chrom* Plus Diol	3, 5, 10	100	370 - 430	7	2.0 - 8.0	L20	60	5,500	
Silia*Chrom* Plus Phenyl	3, 5, 10	100	370 - 430	11	2.0 - 8.0	L11	60	5,500	
Silia*Chrom* Plus Silica	3, 5, 10	100	370 - 430	-	2.0 - 8.0	L3	60	5,500	
Silia*Chrom* Plus SAX	3, 5, 10	Proprietary information			2.0 - 8.0	L14	60	4,000	
Silia*Chrom* Plus SCX	3, 5				2.0 - 8.0	L9	60	4,500	
Silia*Chrom* dt C18	2.5, 3, 5, 10	100	410 - 440	18	1.5 - 9.0	L1	60	5,000	128
Silia*Chrom* dt C8	3, 5, 10	100	410 - 440	14	1.5 - 9.0	L7	60	5,000	
Silia*Chrom* dt Si	3, 5, 10	100	410 - 440	-	1.5 - 9.0	L3	60	4,500	
Silia*Chrom* XT C18	3, 5, 10	150	200	15	1.5 - 12.0	L1	60	5,000	136
Silia*Chrom* XT Fidelity C18	3, 5, 10	100	380	21	1.5 - 12.0	L1	60	5,000	
Silia*Chrom* SB C18	3, 5, 10	150	200	12	0.5 - 7.5	L1	60	4,500	139
Silia*Chrom* SB C18-300	5	300	80	5	0.5 - 7.5	L1	60	4,500	
Silia*Chrom* SB C8	5	150	200	7	1.0 - 7.5	L7	60	4,500	
Silia*Chrom* SB C8-300	5	300	80	3	1.0 - 7.5	L7	60	4,500	
Silia*Chrom* XDB C18	5	150	200	15	1.5 - 9.0	L1	60	5,500	144
Silia*Chrom* XDB C8	5	150	200	8	1.5 - 9.0	L7	60	5,500	
Silia*Chrom* XDB Si	5	150	200	-	1.5 - 9.0	L3	60	5,000	
Silia*Chrom* XDB1 C18	3, 5	100	380 - 400	22	1.5 - 10.0	L1	60	5,500	142
Silia*Chrom* XDB1 C18-300	5, 10	300	80	8	1.5 - 9.0	L1	60	5,500	
Silia*Chrom* XDB1 C8	5, 10	100	380 - 400	14	1.5 - 8.5	L7	60	5,500	
Silia*Chrom* XDB1 C8-300	5	300	80	4	1.5 - 8.5	L7	60	5,500	
Silia*Chrom* XDB1 C1	5	100	380 - 400	3	1.5 - 8.5	L13	60	5,500	
Silia*Chrom* XDB1 C1-300	5	300	80	1	1.5 - 8.5	L13	60	5,500	
Silia*Chrom* XDB2 C18	3, 5, 10	100	380	18	1.5 - 9.0	L1	60	5,500	144
Silia*Chrom* HILIC	3, 5, 10	100	380	8	2.0 - 8.0	-	60	5,000	150
Silia*Chrom* HILIC-300	5	300	80	2.5	2.0 - 8.0	-	60	5,000	
Silia*Chrom* GF	5, 10	100	340	5	2.0 - 8.0	-	45	4,000	153
Silia*Chrom* GF-300	5, 10	300	80	1	2.0 - 8.0	-	45	4,000	
Silia*Chrom* GF AMIDE	5, 10	100	340	5	2.0 - 8.0	-	60	4,000	
Silia*Chrom* GF AMIDE-300	5, 10	300	80	1	2.0 - 8.0	-	60	4,000	

*At pH range 5.0 - 7.5. Other phases could be available on a custom basis. Contact us.

SiliaChrom HPLC Selection Guide by USP Code

The table below helps you to select the right column for different United States Pharmacopeia (USP) codes.

Selection Guide by USP Code			
USP Code	**Packing Type**	**Description**	**SiliCycle's Product**
L1	Bonding: Octadecyl (C18) Particle size: 1.5 – 10 µm (silica)	Octadecyl silane chemically bonded to porous or non-porous silica or ceramic micro-particles, 1.5 to 10 µm in diameter, or a monolithic rod	SiliaChrom Plus C18 SiliaChrom dt C18 SiliaChrom XT C18 SiliaChrom XT Fidelity C18 SiliaChrom SB C18 SiliaChrom XDB C18 SiliaChrom XDB1 C18 SiliaChrom XDB2 C18
L2	Bonding: Octadecyl (C18) Particle size: 30 – 50 µm (silica)	Octadecyl silane chemically bonded to spherical silica gel , 30 to 50 µm in diameter.	SiliaSphere PC C18
L3	Bonding: Silica Particle size: 1.5 – 10 µm (silica)	Porous silica particles, 1.5 to 10 µm in diameter, or a monolithic silica rod.	SiliaChrom Plus Silica SiliaChrom dt Si SiliaChrom XDB Si SiliaChrom XDB1 Si
L4	Bonding: Silica Particle size: 30 – 50 µm (silica)	Silica gel of controlled surface porosity bonded to a solid spherical core, 30 to 50 µm in diameter.	SiliaSphere PC Silica
L6	Bonding: Silica Particle size: 30 – 50 µm (silica)	Strong cation-exchange packing-sulfonated fluorocarbon polymer coated on a solid spherical core, 30 to 50 µm in diameter.	SiliaSphere PC SCX
L7	Bonding: Octyl (C8) Particle size: 1.5 – 10 µm (silica)	Octylsilane chemically bonded to totally or superficially porous silica particles, 1.5 to 10 µm in diameter, or a monolithic silica rod.	SiliaChrom Plus C8 SiliaChrom dt C8 SiliaChrom SB C8 SiliaChrom XDB C8 SiliaChrom XDB1 C8
L8	Bonding: Amine (NH2) Particle size: 1.5 – 10 µm (silica)	An aminopropylsilane chemically bonded to totally porous silica gel support, 1.5 to 10 µm in diameter.	SiliaChrom Plus Amino SiliaChrom XDB1 Amino
L9	Bonding: Strong cation exchange Particle size: 3 – 10 µm (silica)	Irregular or spherical, totally porous silica gel having a chemically bonded, strongly acidic cation-exchange coating, 3 to 10 µm in diameter.	SiliaChrom Plus SCX
L10	Bonding: Nitrile (CN) Particle size: 1.5 – 10 µm (silica)	Nitrile groups chemically bonded to porous silica particles, 1.5 to 10 µm in diameter.	SiliaChrom Plus Cyano SiliaChrom XDB1 CN
L11	Bonding: Phenyl Particle size: 1.5 – 10 µm (silica)	Phenyl groups chemically bonded to porous silica particles, 1.5 to 10 µm in diameter.	SiliaChrom XDB1 Phenyl
L12	Bonding: Strong anion exchange Particle size: 30 – 50 µm (silica)	A strong anion-exchange (quartenary amine) bonded to a solid silica spherical core, 30 to 50 µm in diameter.	SiliaSphere PC SAX
L13	Bonding: TMS (C1) Particle size: 3 – 10 µm (silica)	Trimethylsilane chemically bonded to porous silica particles, 3 to 10 µm in diameter.	SiliaChrom Plus Phenyl SiliaChrom XDB1 C1
L14	Bonding: Strong anion exchange Particle size: 5 – 10 µm (silica)	Silica gel having a chemicallly bonded, strongly basic quaternary ammonium anion-exchange coating, 5 to 10 µm in diameter.	SiliaChrom Plus SAX
L20	Bonding: Diol Particle size: 1.5 – 10 µm (silica)	Dihydroxypropane groups chemically bonded to porous silica or hybrid particles, 1.5 to 10 µm in diameter.	SiliaChrom XDB1 Diol
L26	Bonding: Butyl (C4) Particle size: 1.5 – 10 µm (silica)	Butyl silane chemically bonded to totally porous silica particles, 1.5 to 10 µm in diameter.	SiliaChrom Plus C4 SiliaChrom XDB1 C4
L27	Bonding: Silica Particle size: 30 – 50 µm (silica)	Porous silica particles, 30 to 50 µm in diameter.	SiliaSphere PC Silica
L42	Bonding: Mixed-mode C18/C8 Particle size: ~5 µm (silica)	Octylsilane and octadecylsilane groups chemically bonded to porous silica particles, 5 µm in diameter.	SiliaChrom C18/C8
L43	Bonding: Pentafluorophenyl (PFP) Particle size: 3 – 10 µm (silica)	Pentafluorophenyl groups chemically bonded to silica particles by a propyl spacer, 1.5 to 10 µm in diameter.	SiliaChrom Plus PFP

Silia*Chrom* HPLC Selection Guide by Manufacturer

To find a suitable SiliCycle alternative to another manufacturer's columns, refer to the selection guide below. SiliCycle's alternative phases are selected based on physical and chemical similarities. These alternatives are not guaranteed to provide the same retention or selectivity, but should be sufficiently similar in character to allow a similar or improved separation to be achieved after some method optimization.

The user should refer to the individual phase information to ensure that the characteristics of the alternative match the requirements of their separation. SiliCycle takes no responsibility for any error or omission relating to this information.

HPLC Column Selection by Manufacturer

Manufacturer	Phase	Pore Size (Å)	Surface Area (m^2/g)	Carbon Load (%)	Endcapping	Recommended SiliCycle's Alternative
Advanced Chromatography Technologies™ (ACT)	ACE™ C18 100	100	300	15.5	NF	Silia*Chrom* Plus C18
	ACE™ C8	100	300	9	NF	Silia*Chrom* Plus C8
	ACE™ Phenyl	100	300	9.5	NF	Silia*Chrom* XDB1 Phenyl
	Ace™ AQ	100	300	14	NF	Silia*Chrom* dt C18
	Ace™ C18-300	300	100	9	Yes	Silia*Chrom* Plus C18-300
	Ace™ C8-300	300	100	5	Yes	Silia*Chrom* Plus C8-300
	Ace™ C4-300	300	100	2.6	Yes	Silia*Chrom* Plus C4-300
Agilent Technologies™	Poroshell™ 120 EC-C18	120	120	8	Yes, double	SunShell™ C18
	Poroshell™ 120 EC-C8	120	120	5	Yes, double	SunShell™ C8
	Poroshell™ 120 Phenyl-Hexyl	120	120	9	Yes, double	SunShell™ Phenyl
	Zorbax™ Eclipse XDB-C18	80	180	10	Yes, double	Silia*Chrom* XDB C18
	Zorbax™ Eclipse XDB-C8	80	180	8	Yes, double	Silia*Chrom* SB C8
	Zorbax™ Eclipse XDB-Phenyl	80	180	8	Yes, double	CSC-Sil 80Å/Phenyl
	Zorbax™ Eclipse Plus C18	95	160	8	Yes, double	CSC-Advantisil ODS
	Zorbax™ Eclipse Plus C8	95	160	6	Yes, double	CSC-Advantisil C8
	Zorbax™ SB-C18	80	180	10	No	Silia*Chrom* SB C18
	Zorbax™ SB-18	300	45	3	No	Silia*Chrom* SB C18-300
	Zorbax™ SB-C8	80	180	6	No	Silia*Chrom* SB C8
	Zorbax™ SB-C8	300	45	2	No	Silia*Chrom* SB C8-300
Advanced Materials Technology™, Inc. (AMT)	Halo™ C18	90	150	NF	NF	SunShell™ C18
	Halo™ C8	90	150	NF	NF	SunShell™ C8
	Halo™ HILIC	90	150	NF	NF	Sunshell HILIC-Amide
	Halo™ PFP	90	150	NF	NF	SunShell™ PFP
	Halo™ Phenyl-Hexyl	90	150	NF	NF	SunShell™ Phenyl
EMD Millipore - Merck KGaA™	Lichrospher™ 100 RP-18	100	350	21	No	CSC-Lichrospher 100 RP-18
	Lichrospher™ 100 RP-18e	100	350	22	Yes	CSC-Lichrospher 100 RP-18e
	Lichrospher™ 100 RP-8	100	350	13	No	CSC-Lichrospher 100 RP-8
	Lichrospher™ 100 RP-8e	100	350	13	Yes	CSC-Lichrospher 100 RP-8e
	Lichrospher™ 100 CN	100	350	7	NF	CSC-Lichrospher 100 CN
	Lichrospher™ 100 NH2	100	350	5	NF	CSC-Lichrospher 100 NH2
	Lichrospher™ 100 Diol	100	350	8	NF	CSC-Lichrospher 100 Diol
	Superspher™ RP-18	100	350	21	Yes	CSC-Superspher RP-18
GL Sciences™	Inertsil™ C4	150	320	8	Yes	Silia*Chrom* XDB1 C4
	Inertsil™ Phenyl	150	320	10	Yes	Silia*Chrom* XDB1 Phenyl
	Inertsil™ C8	150	320	11	Yes	Silia*Chrom* C8
	Inertsil™ ODS2	150	320	18.5	Yes	Silia*Chrom* dt C18
	Inertsil™ ODS3 or ODS3V	100	450	15	Yes	Silia*Chrom* Plus C18
Grace Discovery Sciences™	Alltima™ HP C18 AQ	100	450	20	Yes	Silia*Chrom* dt C18
	Alltima™ HP C18 HiLoad	100	450	24	Yes	Silia*Chrom* XDB1 C18
	Vydac™ 208TP	300	60-110	8	Yes	Silia*Chrom* Plus C8-300
	Vydac™ 214TP	300	60-110	4	Yes	Silia*Chrom* Plus C4-300
	Vydac™ 218TP	300	60-110	8	Yes	Silia*Chrom* Plus C18-300
Kromasil™	Kromasil™ C18	100	340	19	Yes	Silia*Chrom* dt C18
	Kromasil™ C8	100	340	12	Yes	Silia*Chrom* dt C8
	Kromasil™ C4	100	340	8	Yes	Silia*Chrom* Plus C4
	Kromasil™ Silica	100	340	-	No	Silia*Chrom* Plus Silica
Macherey-Nagel™	Nucleodur™ C18ec	110	340	18	Yes	Silia*Chrom* dt C18
	Nucleodur™ C18	110	340	18	Yes	Silia*Chrom* dt C18
	Nucleodur™ CN	110	340	7	Yes	Silia*Chrom* Plus CN
	Nucleoshell™ RP18	90	130	7.5	Yes, multi	SunShell™ C18
	Nucleoshell™ Phenyl-Hexyl	90	130	4.5	Yes, multi	SunShell™ Phenyl
	Nucleoshell™ PFP	90	130	3	Yes, multi	SunShell™ PFP

NF: information not found; Trademarks: All trademarks and registered trademarks are the property of their respective owners.

HPLC Column Selection by Manufacturer

Manufacturer	Phase	Pore Size (Å)	Surface Area (m^2/g)	Carbon Load (%)	Endcapping	Recommended SiliCycle's Alternative
Macherey-Nagel™ (con't)	Nucleosil™ C18	100	350	15	Yes	SiliaChrom Plus C18
	Nucleosil™ C8	100	350	9	No	SiliaChrom Plus C8
	Nucleosil™ C6H5 (Phenyl)	100	350	8	No	SiliaChrom XDB1 Phenyl
	Nucleosil™ CN	100	350	5	No	SiliaChrom Plus CN
	Nucleosil™ NH2	100	350	3.5	No	SiliaChrom Plus NH2
	Nucleosil™ OH (Diol)	100	350	NF	NF	SiliaChrom XDB1 Diol
	Nucleosil™ SA	100	350	7	No	SiliaChrom Plus SCX
	Nucleosil™ Silica	100	350	-	No	SiliaChrom Plus Silica
	Nucleosil™ C18	120	200	11	Yes	CSC-Advantisil ODS
	Nucleosil™ C8	120	200	7	No	CSC-Advantisil C8
	Nucleosil™ CN	120	200	3	NF	CSC-Advantisil CN
	Nucleosil™ 300 C18	300	100	6.5	Yes	SiliaChrom Plus C18-300
	Nucleosil™ 300 C8	300	100	3	Yes	SiliaChrom Plus C8-300
	Nucleosil™ 300 C4	300	100	2	Yes	SiliaChrom Plus C4-300
Phenomenex™	AQUA™ C18	125	320	15	Yes, proprietary	SiliaChrom dt C18
	Luna™ C18	100	440	19	Yes	SiliaChrom XDB1 C18
	Luna™ C18(2)	100	400	17.5	Yes	SiliaChrom XDB1 C18
	Luna™ C8	100	440	14.75	Yes	SiliaChrom XDB1 C8
	Luna™ C8(2)	100	400	13.5	Yes	SiliaChrom XDB1 C8
	Luna™ CN	100	400	7	Yes	SiliaChrom Plus CN
	Luna™ NH2	100	400	9.5	No	SiliaChrom Plus NH2
	Luna™ PFP(2)	100	400	11.5	Yes	SiliaChrom Plus PFP
	Luna™ SCX	100	400	N/A	No	SiliaChrom Plus SCX
	Luna™ Silica (2)	100	400	-	No	SiliaChrom Plus Silica
	Kinetex™ C18	100	200	12	Yes	SunShell™ C18
	Kinetex™ C8	100	200	8	Yes	SunShell™ C8
	Kinetex™ HILIC	100	200	0	No	SunShell™ HILIC-Amide
	Kinetex™ PFP	100	200	9	Yes	SunShell™ PFP
	Kinetex™ Phenyl-Hexyl	100	200	11	Yes	SunShell™ Phenyl
	Synergi™ Hydro-RP	80	475	19	Yes, proprietary	SiliaChrom dt C18
	Prodigy™ C8	150	310	13	Yes	SiliaChrom XDB1 C8
	Prodigy™ ODS2	150	310	18	Yes	SiliaChrom XDB1 C18
	Prodigy™ ODS-3	100	450	16	Yes	SiliaChrom Plus C18
	Prodigy™ ODS-3V	100	450	16	NF	SiliaChrom Plus C18
	Gemini™ C18	110	375	14	Yes	SiliaChrom Plus C18
	Jupiter™ C18	300	170	13	Yes	SiliaChrom Plus C18-300
	Jupiter™ C4	300	170	5	Yes	SiliaChrom Plus C4-300
Restek™	Pinnacle™ C18	120	170	10	Yes	CSC-Advantisil ODS
	Pinnacle™ C8	120	170	6	Yes	CSC-Advantisil C8
	Pinnacle™ CN	120	170	5	Yes	CSC-Advantisil CN
	Pinnacle™ DB C18	140	NF	11	Yes	CSC-Advantisil BDS/ODS
	Pinnacle™ DB C8	140	NF	6	Yes	CSC-Advantisil BDS/C8
	Pinnacle™ DB Cyano	140	NF	4	Yes	CSC-Advantisil BDS/CN
	Pinnacle™ NH2	120	170	2	NF	CSC-Advantisil NH2
	Pinnacle™ Phenyl	120	170	5	Yes	CSC-Advantisil Phenyl
	Pinnacle™ Silica	120	170	-	No	CSC-Advantisil Silica
Supelco™	Ascentis™ C18	100	450	25	Yes	SiliaChrom XDB1 C18
	Ascentis™ C8	100	450	15	Yes	SiliaChrom XDB1 C8
	Ascentis™ Express C18	90	135	NF	Yes	SunShell™ C18
	Ascentis™ Express C8	90	135	NF	Yes	SunShell™ C8
	Ascentis™ Express F5	90	135	NF	Yes	SunShell™ PFP
	Ascentis™ Express HILIC	90	135	NF	No	SunShell™ HILIC-Amide
	Ascentis™ Express Phenyl-Hexyl	90	135	NF	Yes	SunShell™ Phenyl
	Supelcosil™ LC-18	120	170	11	Yes	CSC-Advantisil ODS
	Supelcosil™ LC-18-DB	120	170	11	Yes	CSC-Advantisil BDS/ODS
	Supelcosil™ LC-8	120	170	6	Yes	CSC-Advantisil C8
	Supelcosil™ LC-CN	120	170	4	Yes	CSC-Advantisil CN
	Supelcosil™ LC-NH2	120	170	3	Yes	CSC-Advantisil NH2
	Supelcosil™ LC-Si	120	170	-	No	CSC-Advantisil Silica
	Discovery™ C18	180	200	12	Yes	SiliaChrom XDB C18
	Discovery™ C8	180	200	7.5	Yes	SiliaChrom XDB C8

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HPLC Column Selection by Manufacturer

Manufacturer	Phase	Pore Size (Å)	Specific Surface Area (m^2/g)	Carbon Load (%)	Endcapping	Recommended SiliCycle's Alternative
Thermo Scientific™	Hypersil™-ODS	120	170	10	Yes	CSC-Advantisil ODS
	Hypersil™-ODS2	80	220	11	Yes	CSC-Select ODS2
	Hypersil™-MOS	120	170	6.5	No	CSC-Advantisil C8
	Hypersil™-Phenyl-2	120	170	5	Yes	CSC-Advantisil Phenyl
	Hypersil™-CPS-2	120	170	4	Yes	CSC-Advantisil CN
	Hypersil™-APS-2	120	170	1.9	No	CSC-Advantisil NH2
	Hypersil™-Silica	120	170	-	No	CSC-Advantisil Silica
	Hypersil™-BDS/ODS	130	170	11	Yes	CSC-Advantisil BDS/ODS
	Hypersil™-BDS/C8	130	170	7	Yes	CSC-Advantisil BDS/C8
	Hypersil™-BDS/Phenyl	130	170	5	Yes	CSC-Advantisil BDS/Phenyl
	Hypersil™-BDS/Cyano	130	170	4	Yes	CSC-Advantisil BDS/CN
	Hypersil™ Gold C18	175	220	11	Yes	SiliaChrom XDB C18
	Hypersil™ Gold C8	175	220	8	Yes	SiliaChrom XDB C8
	Hypersil™ Gold Silica	175	220	-	No	SiliaChrom XDB Silica
	Hypersil™ Gold HILIC	175	220	6	No	SiliaChrom HILIC
	Accucore™ C18	80	130	9	Yes	SunShell™ C18
	Accucore™ C8	80	130	5	Yes	SunShell™ C8
	Accucore™ Phenyl Hexyl	80	130	6	Yes	SunShell™ Phenyl
	Accucore™ PFP	80	130	5	Yes	SunShell™ PFP
	Accucore™ HILIC	80	130	NF	NF	Sunshell HILIC-Amide
	Syncronis™ C18	100	320	16	Yes	SiliaChrom Plus C18
	Syncronis™ C8	100	320	10	Yes	SiliaChrom Plus C8
	Syncronis™ AQ	100	320	19	Yes, polar	SiliaChrom dt C18
	Syncronis™ Phenyl	100	320	11	Yes	SiliaChrom XDB1 Phenyl
	Syncronis™ Amino	100	320	4	Yes	SiliaChrom Plus Amino
	Syncronis™ Silica	100	320	-	No	SiliaChrom Plus Silica
	Syncronis™ HILIC	100	320	5	NF	SiliaChrom HILIC
	Acclaim™ 120 C18	120	300	18	Yes	SiliaChrom Plus C18
	Acclaim™ 300 C18	300	100	8	Yes	SiliaChrom Plus C18-300
Waters Corporation™	Atlantis™ T3	100	300	14	Yes	SiliaChrom dt C18
	µBondapak™ C18	125	330	10	Yes	CSC-Sil 80 Å/ODS2
	µBondapak™ CN	125	330	6	Yes	CSC-Sil 80 Å/CN
	µBondapak™ NH2	125	330	4	No	CSC-Sil 80 Å/NH2
	µBondapak™ Phenyl	125	330	9.3	Yes	CSC-Sil 80 Å/Phenyl
	Spherisorb™ ODS1	80	200	6	No	CSC-Select ODS1
	Spherisorb™ ODS2	80	200	12	Yes	CSC-Select ODS2
	Spherisorb™ C8	80	200	6	Yes	CSC-Select C8
	Spherisorb™ C6	80	200	5	Yes	CSC-Select C6
	Spherisorb™ Phenyl	80	200	3	No	CSC-Sil 80A/Phenyl
	Spherisorb™ C1 (TMS)	80	200	3	No	CSC-Sil 80A/C1 (TMS)
	Spherisorb™ CN	80	200	3	No	CSC-Sil 80A/CN
	Spherisorb™ NH2	80	200	2	No	CSC-Sil 80A/NH2
	Spherisorb™ SAX	80	200	4	No	CSC-Sil 80A/SAX
	Spherisorb™ Silica	80	220	-	No	CSC-Sil 80A/Silica
	SunFire™ C18	100	340	16	Yes	SiliaChrom Plus C18
	SunFire™ C8	100	340	12	Yes	SiliaChrom XDB1 C8
	SunFire™ Silica	100	340	NF	NF	SiliaChrom Plus Silica
	Symmetry™ C18	100	335	19	Yes	SiliaChrom dt C18
	Symmetry™ C8	100	335	12	Yes	SiliaChrom dt C8
	Cortecs™ C18	90	100	6.6	Yes, proprietary	SunShell™ C18
	Cortecs™ HILIC	90	100	0	No	SunShell™ HILIC-Amide
	XBridge™ C18	130	185	18	Yes	SiliaChrom XT Fidelity C18
YMC™	YMC-Pack™ C4	120	300	7	Yes	SiliaChrom Plus C4
	YMC-Pack™ C8	120	300	10	Yes	SiliaChrom Plus C8
	YMC-Pack™ ODS-AQ	120	300	14	Yes, proprietary	SiliaChrom dt C18
	YMC-Pack™ ODS-A	120	300	17	Yes	SiliaChrom Plus C18
	YMC-Pack™ ODS-A	300	150	7	Yes	SiliaChrom Plus C18-300
	YMC-Pack™ CN	120	300	7	Yes	SiliaChrom Plus CN
	YMC-Pack™ Diol-NP	120	300	NF	NF	SiliaChrom XDB1 Diol
	YMC-Pack™ NH2	120	300	NF	NF	SiliaChrom Plus NH2
	YMC-Pack™ Phenyl	120	300	9	Yes	SiliaChrom XDB1 Phenyl
	YMC-Pack™ Pro C18	120	350	16	Yes	SiliaChrom Plus C18
	YMC-Pack™ Si	120	300	-	No	SiliaChrom Plus Silica
	YMC-Pack™ TMS (C1)	120	300	4	NF	SiliaChrom XDB1 C1

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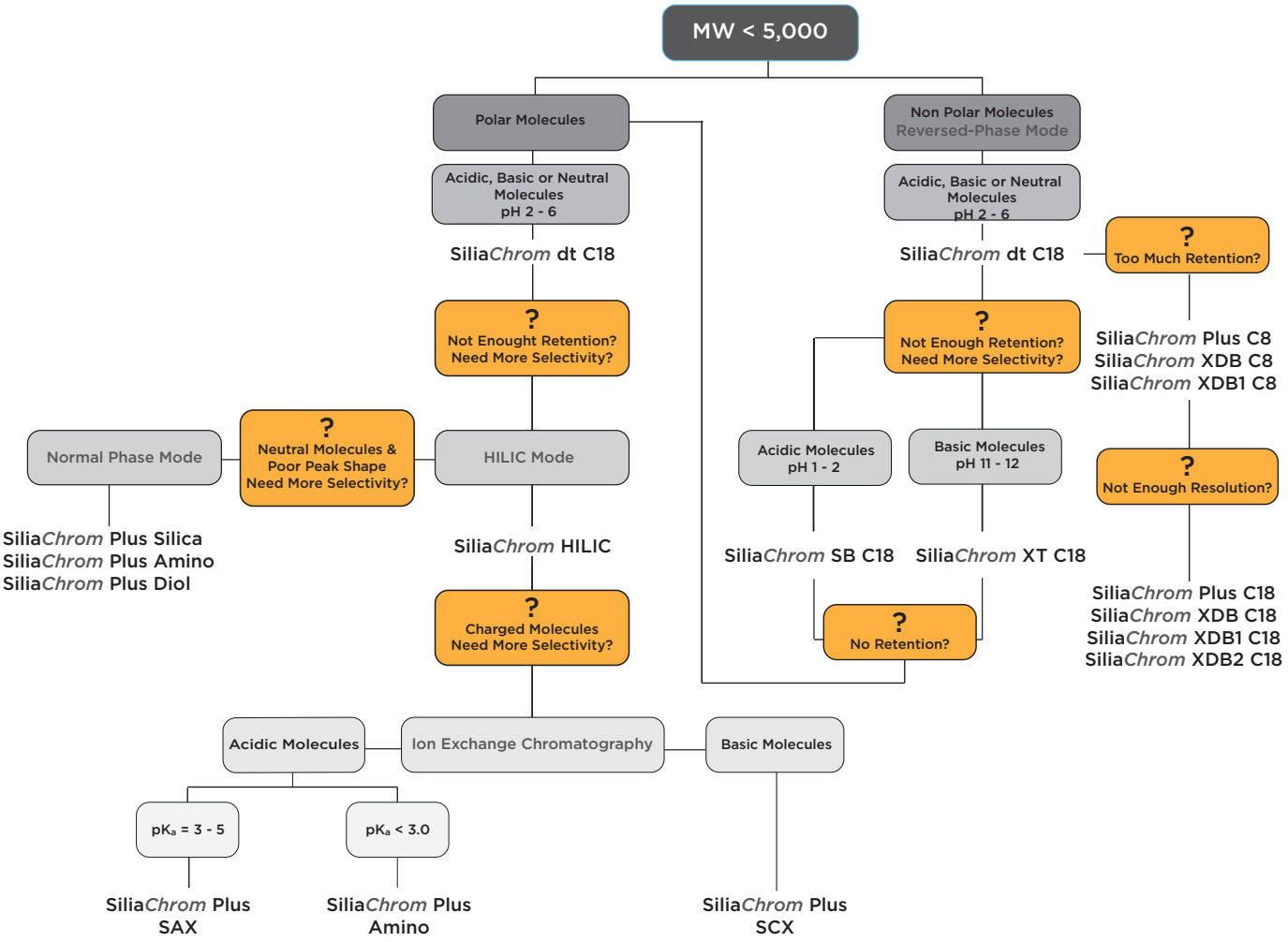
SiliaChrom Selection Guide for Small Molecules



Silia*Chrom* Plus Family

Description

Silia*Chrom* Plus phases were designed to help you with your everyday analyses, requiring improved performance and resolution. The perfectly controlled particle size, pore size and bonding coverage of these phases allow for better reproducibility and scalability of your methods.

All Silia*Chrom* Plus columns are available in 3, 5 & 10 µm.

Structure

- Proprietary information

Silia*Chrom* Plus Family Main Characteristics

- Wide range of selectivities
- Ultra-pure metal-free silica (*99.9999% purity*)
- High column performance and resolution
- Enhanced batch-to-batch reproducibility
- Extended column lifetime
- Reduced silanol activity, better peak symmetry
- Extremely low bleeding for LC-MS applications
- Easy scale-up to preparative formats

Silia*Chrom* Plus Sorbent Characteristics

Silia*Chrom* Plus Sorbent Characteristics						
Silia*Chrom* Phases	Description	USP Code	%C	Pore Size (Å)	Surface Area (m^2/g)	pH Stability Range
Reversed-Phases						
Silia*Chrom* Plus C18	3 levels of hydrophobicity for almost all your everyday analytes.	L1	15	100	370 - 430	2.0 - 8.0
Silia*Chrom* Plus C8		L7	8	100	370 - 430	2.0 - 8.0
Silia*Chrom* Plus C4		L26	8	100	370 - 430	2.0 - 8.0
Silia*Chrom* Plus C18-300	3 levels of hydrophobicity to separate your larger analytes.	L1	8	300	80 - 120	2.0 - 8.0
Silia*Chrom* Plus C8-300		L7	5	300	80 - 120	2.0 - 8.0
Silia*Chrom* Plus C4-300		L26	3	300	80 - 120	2.0 - 8.0
Silia*Chrom* Plus PFP	Highly retentive phase for aromatic and polar compounds.	L43	9	120	320 - 360	2.0 - 8.0
Silia*Chrom* Plus Phenyl	Highly retentive phase for aromatic and unsaturated compounds.	L11	11	100	370 - 430	2.0 - 8.0
Normal Phases						
Silia*Chrom* Plus Si	Designed for normal phase conditions, to analyse small polar compounds.	L3	-	100	370 - 430	2.0 - 8.0
Silia*Chrom* Plus Diol	Excellent for normal phase applications with the highest hydrophobic activity.	L20	7	100	370 - 430	2.0 - 8.0
Silia*Chrom* Plus CN	For small polar analytes, works in normal and reversed-phase conditions.	L10	7	100	370 - 430	2.0 - 8.0
Silia*Chrom* Plus Amino	Recommended for normal phase analysis, especially for sugar analysis.	L8	8	100	370 - 430	2.0 - 8.0
Ion Exchange Phases						
Silia*Chrom* SAX	Strong anion exchange phase, for weak or medium acids separation.	L14	Proprietary Information			2.0 - 8.0
Silia*Chrom* SCX	Strong cation exchange phase, for weak or medium bases separation.	L9				2.0 - 8.0

SiliaChrom Plus SCX

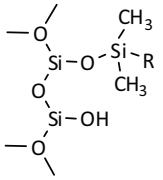
Description

For most chromatographers, nitrogen containing compounds have always presented a challenge in method development with typical phases like C8 and C18. Therefore SiliCycle has elected to extend its portfolio with this new and unique SCX phase.

This improved silica-based Strong Cation Exchanger phase, based on benzene sulfonic acid chemistry, offers great stability under various buffer and pH conditions. In most cases, the compounds of interest are positively charged strong and weak bases.

SiliaChrom Plus SCX provides excellent resolution and peak shape for cationic analytes. The benzene sulfonic acid function of the SiliaChrom SCX is providing the cationic phase and also the π - π *(aromatic)* interaction. The SiliaChrom SCX is used for specific analysis of amino acids, anilines, drug salts, inorganic cations, and nucleosides.

Structure



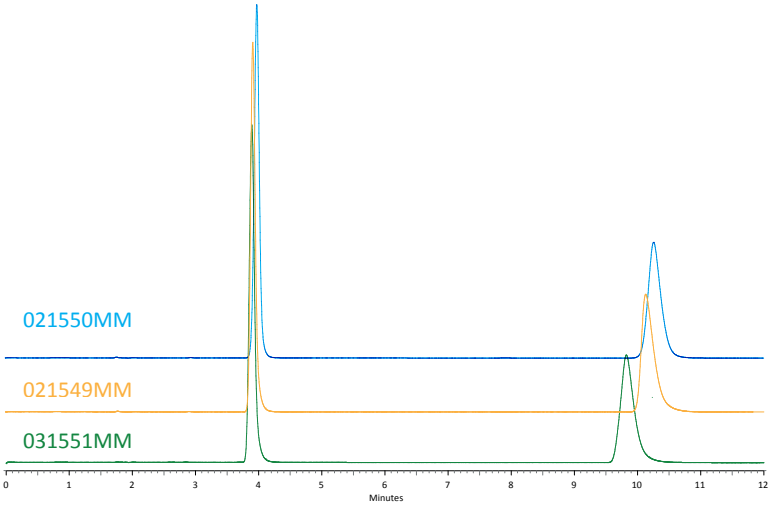
R = $(CH_2)_2$ C_6H_4 $SO_3^-H^+$

SiliaChrom Plus SCX Main Characteristics

- Wide range of selectivities
- Ultra-pure metal-free silica (*99.9999% purity*)
- High column performance and resolution
- Enhanced batch-to-batch reproducibility
- Extended column lifetime
- Reduced silanol activity, better peak symmetry
- Extremely low bleeding for LC-MS applications
- Easy scale-up to preparative formats

Chromatographic conditions

Column:	SiliaChrom SCX, 3 µm
Column size:	4.6 x 150 mm
SiliCycle PN:	HPL-S900003-N150
Mobile phase:	1.7% (w/v) Ammonium dihydrogen phosphate/ACN (3:1) pH 3.0
Temperature:	40°C
Flow rate:	1.000 mL/min
Standard solution:	Melamine (2 µg/mL) and Metformin Hydrochloride (5 µg/mL)



Conclusion

The chromatographic conditions used to separate Melamine and Metformin Hydrochloride on the new and improved SiliaChrom Plus SCX show extremely good reproducibility from lot-to-lot/column-to-column. This method is robust, rapid and sensitive and can be used to evaluate the performance of the SiliaChrom Plus SCX columns prior to customer's use.

The introduction of the above method for column validation and quality control will therefore serve as the new template for all the SiliaChrom Plus SCX column CoA.

This new phase, available in prepacked columns only, is offered in various column dimensions both in 3 and 5 µm particle sizes.

SiliaChrom Plus HPLC Columns Ordering Information

SiliaChrom Plus HPLC Column Ordering Information							
Dimension	Particle Size (µm)	SiliaChrom Plus C18	SiliaChrom Plus C18-300	SiliaChrom Plus C8	SiliaChrom Plus C8-300	SiliaChrom Plus C4	SiliaChrom Plus C4-300
2.1 x 33 mm	3 µm	HPL-S03203E-A-G033	HPL-S03203M-G033	HPL-S30803E-A-G033	HPL-S30803M-G033	HPL-S32703E-A-G033	HPL-S32703M-G033
2.1 x 50 mm	3 µm	HPL-S03203E-A-G050	HPL-S03203M-G050	HPL-S30803E-A-G050	HPL-S30803M-G050	HPL-S32703E-A-G050	HPL-S32703M-G050
2.1 x 100 mm	3 µm	HPL-S03203E-A-G100	HPL-S03203M-G100	HPL-S30803E-A-G100	HPL-S30803M-G100	HPL-S32703E-A-G100	HPL-S32703M-G100
2.1 x 150 mm	3 µm	HPL-S03203E-A-G150	HPL-S03203M-G150	HPL-S30803E-A-G150	HPL-S30803M-G150	HPL-S32703E-A-G150	HPL-S32703M-G150
3.0 x 33 mm	3 µm	HPL-S03203E-A-H033	HPL-S03203M-H033	HPL-S30803E-A-H033	HPL-S30803M-H033	HPL-S32703E-A-H033	HPL-S32703M-H033
3.0 x 50 mm	3 µm	HPL-S03203E-A-H050	HPL-S03203M-H050	HPL-S30803E-A-H050	HPL-S30803M-H050	HPL-S32703E-A-H050	HPL-S32703M-H050
3.0 x 100 mm	3 µm	HPL-S03203E-A-H100	HPL-S03203M-H100	HPL-S30803E-A-H100	HPL-S30803M-H100	HPL-S32703E-A-H100	HPL-S32703M-H100
3.0 x 150 mm	3 µm	HPL-S03203E-A-H150	HPL-S03203M-H150	HPL-S30803E-A-H150	HPL-S30803M-H150	HPL-S32703E-A-H150	HPL-S32703M-H150
4.6 x 33 mm	3 µm	HPL-S03203E-A-N033	HPL-S03203M-N033	HPL-S30803E-A-N033	HPL-S30803M-N033	HPL-S32703E-A-N033	HPL-S32703M-N033
4.6 x 50 mm	3 µm	HPL-S03203E-A-N050	HPL-S03203M-N050	HPL-S30803E-A-N050	HPL-S30803M-N050	HPL-S32703E-A-N050	HPL-S32703M-N050
4.6 x 100 mm	3 µm	HPL-S03203E-A-N100	HPL-S03203M-N100	HPL-S30803E-A-N100	HPL-S30803M-N100	HPL-S32703E-A-N100	HPL-S32703M-N100
4.6 x 150 mm	3 µm	HPL-S03203E-A-N150	HPL-S03203M-N150	HPL-S30803E-A-N150	HPL-S30803M-N150	HPL-S32703E-A-N150	HPL-S32703M-N150
4.6 x 250 mm	3 µm	HPL-S03203E-A-N250	HPL-S03203M-N250	HPL-S30803E-A-N250	HPL-S30803M-N250	HPL-S32703E-A-N250	HPL-S32703M-N250
2.1 x 33 mm	5 µm	HPL-S03205E-A-G033	HPL-S03205M-G033	HPL-S30805E-A-G033	HPL-S30805M-G033	HPL-S32705E-A-G033	HPL-S32705M-G033
2.1 x 50 mm	5 µm	HPL-S03205E-A-G050	HPL-S03205M-G050	HPL-S30805E-A-G050	HPL-S30805M-G050	HPL-S32705E-A-G050	HPL-S32705M-G050
2.1 x 100 mm	5 µm	HPL-S03205E-A-G100	HPL-S03205M-G100	HPL-S30805E-A-G100	HPL-S30805M-G100	HPL-S32705E-A-G100	HPL-S32705M-G100
2.1 x 150 mm	5 µm	HPL-S03205E-A-G150	HPL-S03205M-G150	HPL-S30805E-A-G150	HPL-S30805M-G150	HPL-S32705E-A-G150	HPL-S32705M-G150
2.1 x 250 mm	5 µm	HPL-S03205E-A-G250	HPL-S03205M-G250	HPL-S30805E-A-G250	HPL-S30805M-G250	HPL-S32705E-A-G250	HPL-S32705M-G250
3.0 x 33 mm	5 µm	HPL-S03205E-A-H033	HPL-S03205M-H033	HPL-S30805E-A-H033	HPL-S30805M-H033	HPL-S32705E-A-H033	HPL-S32705M-H033
3.0 x 50 mm	5 µm	HPL-S03205E-A-H050	HPL-S03205M-H050	HPL-S30805E-A-H050	HPL-S30805M-H050	HPL-S32705E-A-H050	HPL-S32705M-H050
3.0 x 100 mm	5 µm	HPL-S03205E-A-H100	HPL-S03205M-H100	HPL-S30805E-A-H100	HPL-S30805M-H100	HPL-S32705E-A-H100	HPL-S32705M-H100
3.0 x 150 mm	5 µm	HPL-S03205E-A-H150	HPL-S03205M-H150	HPL-S30805E-A-H150	HPL-S30805M-H150	HPL-S32705E-A-H150	HPL-S32705M-H150
3.0 x 250 mm	5 µm	HPL-S03205E-A-H250	HPL-S03205M-H250	HPL-S30805E-A-H250	HPL-S30805M-H250	HPL-S32705E-A-H250	HPL-S32705M-H250
4.6 x 33 mm	5 µm	HPL-S03205E-A-N033	HPL-S03205M-N033	HPL-S30805E-A-N033	HPL-S30805M-N033	HPL-S32705E-A-N033	HPL-S32705M-N033
4.6 x 50 mm	5 µm	HPL-S03205E-A-N050	HPL-S03205M-N050	HPL-S30805E-A-N050	HPL-S30805M-N050	HPL-S32705E-A-N050	HPL-S32705M-N050
4.6 x 100 mm	5 µm	HPL-S03205E-A-N100	HPL-S03205M-N100	HPL-S30805E-A-N100	HPL-S30805M-N100	HPL-S32705E-A-N100	HPL-S32705M-N100
4.6 x 150 mm	5 µm	HPL-S03205E-A-N150	HPL-S03205M-N150	HPL-S30805E-A-N150	HPL-S30805M-N150	HPL-S32705E-A-N150	HPL-S32705M-N150
4.6 x 250 mm	5 µm	HPL-S03205E-A-N250	HPL-S03205M-N250	HPL-S30805E-A-N250	HPL-S30805M-N250	HPL-S32705E-A-N250	HPL-S32705M-N250
10 x 150 mm	5 µm	HPL-S03205E-A-Q150	HPL-S03205M-Q150	HPL-S30805E-A-Q150	HPL-S30805M-Q150	HPL-S32705E-A-Q150	HPL-S32705M-Q150
10 x 250 mm	5 µm	HPL-S03205E-A-Q250	HPL-S03205M-Q250	HPL-S30805E-A-Q250	HPL-S30805M-Q250	HPL-S32705E-A-Q250	HPL-S32705M-Q250
21.2 x 50 mm	5 µm	HPL-S03205E-A-T050	HPL-S03205M-T050	HPL-S30805E-A-T050	HPL-S30805M-T050	HPL-S32705E-A-T050	HPL-S32705M-T050
21.2 x 100 mm	5 µm	HPL-S03205E-A-T100	HPL-S03205M-T100	HPL-S30805E-A-T100	HPL-S30805M-T100	HPL-S32705E-A-T100	HPL-S32705M-T100
21.2 x 150 mm	5 µm	HPL-S03205E-A-T150	HPL-S03205M-T150	HPL-S30805E-A-T150	HPL-S30805M-T150	HPL-S32705E-A-T150	HPL-S32705M-T150
21.2 x 250 mm	5 µm	HPL-S03205E-A-T250	HPL-S03205M-T250	HPL-S30805E-A-T250	HPL-S30805M-T250	HPL-S32705E-A-T250	HPL-S32705M-T250
30 x 50 mm	5 µm	HPL-S03205E-A-V050	HPL-S03205M-V050	HPL-S30805E-A-V050	HPL-S30805M-V050	HPL-S32705E-A-V050	HPL-S32705M-V050
30 x 100 mm	5 µm	HPL-S03205E-A-V100	HPL-S03205M-V100	HPL-S30805E-A-V100	HPL-S30805M-V100	HPL-S32705E-A-V100	HPL-S32705M-V100
30 x 150 mm	5 µm	HPL-S03205E-A-V150	HPL-S03205M-V150	HPL-S30805E-A-V150	HPL-S30805M-V150	HPL-S32705E-A-V150	HPL-S32705M-V150
30 x 250 mm	5 µm	HPL-S03205E-A-V250	HPL-S03205M-V250	HPL-S30805E-A-V250	HPL-S30805M-V250	HPL-S32705E-A-V250	HPL-S32705M-V250
4.6 x 150 mm	10 µm	HPL-S03207E-A-N150	HPL-S03207M-N150	HPL-S30807E-A-N150	HPL-S30807M-N150	HPL-S32707E-A-N150	HPL-S32707M-N150
4.6 x 250 mm	10 µm	HPL-S03207E-A-N250	HPL-S03207M-N250	HPL-S30807E-A-N250	HPL-S30807M-N250	HPL-S32707E-A-N250	HPL-S32707M-N250
10 x 150 mm	10 µm	HPL-S03207E-A-Q150	HPL-S03207M-Q150	HPL-S30807E-A-Q150	HPL-S30807M-Q150	HPL-S32707E-A-Q150	HPL-S32707M-Q150
10 x 250 mm	10 µm	HPL-S03207E-A-Q250	HPL-S03207M-Q250	HPL-S30807E-A-Q250	HPL-S30807M-Q250	HPL-S32707E-A-Q250	HPL-S32707M-Q250
21.2 x 50 mm	10 µm	HPL-S03207E-A-T050	HPL-S03207M-T050	HPL-S30807E-A-T050	HPL-S30807M-T050	HPL-S32707E-A-T050	HPL-S32707M-T050
21.2 x 100 mm	10 µm	HPL-S03207E-A-T100	HPL-S03207M-T100	HPL-S30807E-A-T100	HPL-S30807M-T100	HPL-S32707E-A-T100	HPL-S32707M-T100
21.2 x 150 mm	10 µm	HPL-S03207E-A-T150	HPL-S03207M-T150	HPL-S30807E-A-T150	HPL-S30807M-T150	HPL-S32707E-A-T150	HPL-S32707M-T150
21.2 x 250 mm	10 µm	HPL-S03207E-A-T250	HPL-S03207M-T250	HPL-S30807E-A-T250	HPL-S30807M-T250	HPL-S32707E-A-T250	HPL-S32707M-T250
30 x 50 mm	10 µm	HPL-S03207E-A-V050	HPL-S03207M-V050	HPL-S30807E-A-V050	HPL-S30807M-V050	HPL-S32707E-A-V050	HPL-S32707M-V050
30 x 100 mm	10 µm	HPL-S03207E-A-V100	HPL-S03207M-V100	HPL-S30807E-A-V100	HPL-S30807M-V100	HPL-S32707E-A-V100	HPL-S32707M-V100
30 x 150 mm	10 µm	HPL-S03207E-A-V150	HPL-S03207M-V150	HPL-S30807E-A-V150	HPL-S30807M-V150	HPL-S32707E-A-V150	HPL-S32707M-V150
30 x 250 mm	10 µm	HPL-S03207E-A-V250	HPL-S03207M-V250	HPL-S30807E-A-V250	HPL-S30807M-V250	HPL-S32707E-A-V250	HPL-S32707M-V250
50 x 50 mm	10 µm	HPL-S03207E-A-W050	HPL-S03207M-W050	HPL-S30807E-A-W050	HPL-S30807M-W050	HPL-S32707E-A-W050	HPL-S32707M-W050
50 x 100 mm	10 µm	HPL-S03207E-A-W100	HPL-S03207M-W100	HPL-S30807E-A-W100	HPL-S30807M-W100	HPL-S32707E-A-W100	HPL-S32707M-W100
50 x 150 mm	10 µm	HPL-S03207E-A-W150	HPL-S03207M-W150	HPL-S30807E-A-W150	HPL-S30807M-W150	HPL-S32707E-A-W150	HPL-S32707M-W150
50 x 250 mm	10 µm	HPL-S03207E-A-W250	HPL-S03207M-W250	HPL-S30807E-A-W250	HPL-S30807M-W250	HPL-S32707E-A-W250	HPL-S32707M-W250

*HPLC columns are always sold in pack of one column. Other dimensions and/or particle sizes are available on a custom basis. Contact us.

SiliaChrom Plus HPLC Columns Ordering Information

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Dimension	Particle Size (µm)	SiliaChrom Plus Amino	SiliaChrom Plus Cyano	SiliaChrom Plus Diol	SiliaChrom Plus PFP	SiliaChrom Plus Phenyl	SiliaChrom Plus Silica
2.1 x 33 mm	3 µm	HPL-S52003E-A-G033	HPL-S38003M-G033	HPL-S35003E-A-G033	HPL-S67503G-A-G033	HPL-S34003E-A-G033	HPL-S10003E-A-G033
2.1 x 50 mm	3 µm	HPL-S52003E-A-G050	HPL-S38003M-G050	HPL-S35003E-A-G050	HPL-S67503G-A-G050	HPL-S34003E-A-G050	HPL-S10003E-A-G050
2.1 x 100 mm	3 µm	HPL-S52003E-A-G100	HPL-S38003M-G100	HPL-S35003E-A-G100	HPL-S67503G-A-G100	HPL-S34003E-A-G100	HPL-S10003E-A-G100
2.1 x 150 mm	3 µm	HPL-S52003E-A-G150	HPL-S38003M-G150	HPL-S35003E-A-G150	HPL-S67503G-A-G150	HPL-S34003E-A-G150	HPL-S10003E-A-G150
3.0 x 33 mm	3 µm	HPL-S52003E-A-H033	HPL-S38003M-H033	HPL-S35003E-A-H033	HPL-S67503G-A-H033	HPL-S34003E-A-H033	HPL-S10003E-A-H033
3.0 x 50 mm	3 µm	HPL-S52003E-A-H050	HPL-S38003M-H050	HPL-S35003E-A-H050	HPL-S67503G-A-H050	HPL-S34003E-A-H050	HPL-S10003E-A-H050
3.0 x 100 mm	3 µm	HPL-S52003E-A-H100	HPL-S38003M-H100	HPL-S35003E-A-H100	HPL-S67503G-A-H100	HPL-S34003E-A-H100	HPL-S10003E-A-H100
3.0 x 150 mm	3 µm	HPL-S52003E-A-H150	HPL-S38003M-H150	HPL-S35003E-A-H150	HPL-S67503G-A-H150	HPL-S34003E-A-H150	HPL-S10003E-A-H150
4.6 x 33 mm	3 µm	HPL-S52003E-A-N033	HPL-S38003M-N033	HPL-S35003E-A-N033	HPL-S67503G-A-N033	HPL-S34003E-A-N033	HPL-S10003E-A-N033
4.6 x 50 mm	3 µm	HPL-S52003E-A-N050	HPL-S38003M-N050	HPL-S35003E-A-N050	HPL-S67503G-A-N050	HPL-S34003E-A-N050	HPL-S10003E-A-N050
4.6 x 100 mm	3 µm	HPL-S52003E-A-N100	HPL-S38003M-N100	HPL-S35003E-A-N100	HPL-S67503G-A-N100	HPL-S34003E-A-N100	HPL-S10003E-A-N100
4.6 x 150 mm	3 µm	HPL-S52003E-A-N150	HPL-S38003M-N150	HPL-S35003E-A-N150	HPL-S67503G-A-N150	HPL-S34003E-A-N150	HPL-S10003E-A-N150
4.6 x 250 mm	3 µm	HPL-S52003E-A-N250	HPL-S38003M-N250	HPL-S35003E-A-N250	HPL-S67503G-A-N250	HPL-S34003E-A-N250	HPL-S10003E-A-N250
2.1 x 33 mm	5 µm	HPL-S52005E-A-G033	HPL-S38005M-G033	HPL-S35005E-A-G033	HPL-S67505G-A-G033	HPL-S34005E-A-G033	HPL-S10005E-A-G033
2.1 x 50 mm	5 µm	HPL-S52005E-A-G050	HPL-S38005M-G050	HPL-S35005E-A-G050	HPL-S67505G-A-G050	HPL-S34005E-A-G050	HPL-S10005E-A-G050
2.1 x 100 mm	5 µm	HPL-S52005E-A-G100	HPL-S38005M-G100	HPL-S35005E-A-G100	HPL-S67505G-A-G100	HPL-S34005E-A-G100	HPL-S10005E-A-G100
2.1 x 150 mm	5 µm	HPL-S52005E-A-G150	HPL-S38005M-G150	HPL-S35005E-A-G150	HPL-S67505G-A-G150	HPL-S34005E-A-G150	HPL-S10005E-A-G150
2.1 x 250 mm	5 µm	HPL-S52005E-A-G250	HPL-S38005M-G250	HPL-S35005E-A-G250	HPL-S67505G-A-G250	HPL-S34005E-A-G250	HPL-S10005E-A-G250
3.0 x 33 mm	5 µm	HPL-S52005E-A-H033	HPL-S38005M-H033	HPL-S35005E-A-H033	HPL-S67505G-A-H033	HPL-S34005E-A-H033	HPL-S10005E-A-H033
3.0 x 50 mm	5 µm	HPL-S52005E-A-H050	HPL-S38005M-H050	HPL-S35005E-A-H050	HPL-S67505G-A-H050	HPL-S34005E-A-H050	HPL-S10005E-A-H050
3.0 x 100 mm	5 µm	HPL-S52005E-A-H100	HPL-S38005M-H100	HPL-S35005E-A-H100	HPL-S67505G-A-H100	HPL-S34005E-A-H100	HPL-S10005E-A-H100
3.0 x 150 mm	5 µm	HPL-S52005E-A-H150	HPL-S38005M-H150	HPL-S35005E-A-H150	HPL-S67505G-A-H150	HPL-S34005E-A-H150	HPL-S10005E-A-H150
3.0 x 250 mm	5 µm	HPL-S52005E-A-H250	HPL-S38005M-H250	HPL-S35005E-A-H250	HPL-S67505G-A-H250	HPL-S34005E-A-H250	HPL-S10005E-A-H250
4.6 x 33 mm	5 µm	HPL-S52005E-A-N033	HPL-S38005M-N033	HPL-S35005E-A-N033	HPL-S67505G-A-N033	HPL-S34005E-A-N033	HPL-S10005E-A-N033
4.6 x 50 mm	5 µm	HPL-S52005E-A-N050	HPL-S38005M-N050	HPL-S35005E-A-N050	HPL-S67505G-A-N050	HPL-S34005E-A-N050	HPL-S10005E-A-N050
4.6 x 100 mm	5 µm	HPL-S52005E-A-N100	HPL-S38005M-N100	HPL-S35005E-A-N100	HPL-S67505G-A-N100	HPL-S34005E-A-N100	HPL-S10005E-A-N100
4.6 x 150 mm	5 µm	HPL-S52005E-A-N150	HPL-S38005M-N150	HPL-S35005E-A-N150	HPL-S67505G-A-N150	HPL-S34005E-A-N150	HPL-S10005E-A-N150
4.6 x 250 mm	5 µm	HPL-S52005E-A-N250	HPL-S38005M-N250	HPL-S35005E-A-N250	HPL-S67505G-A-N250	HPL-S34005E-A-N250	HPL-S10005E-A-N250
10 x 150 mm	5 µm	HPL-S52005E-A-Q150	HPL-S38005M-Q150	HPL-S35005E-A-Q150	HPL-S67505G-A-Q150	HPL-S34005E-A-Q150	HPL-S10005E-A-Q150
10 x 250 mm	5 µm	HPL-S52005E-A-Q250	HPL-S38005M-Q250	HPL-S35005E-A-Q250	HPL-S67505G-A-Q250	HPL-S34005E-A-Q250	HPL-S10005E-A-Q250
21.2 x 50 mm	5 µm	HPL-S52005E-A-T050	HPL-S38005M-T050	HPL-S35005E-A-T050	HPL-S67505G-A-T050	HPL-S34005E-A-T050	HPL-S10005E-A-T050
21.2 x 100 mm	5 µm	HPL-S52005E-A-T100	HPL-S38005M-T100	HPL-S35005E-A-T100	HPL-S67505G-A-T100	HPL-S34005E-A-T100	HPL-S10005E-A-T100
21.2 x 150 mm	5 µm	HPL-S52005E-A-T150	HPL-S38005M-T150	HPL-S35005E-A-T150	HPL-S67505G-A-T150	HPL-S34005E-A-T150	HPL-S10005E-A-T150
21.2 x 250 mm	5 µm	HPL-S52005E-A-T250	HPL-S38005M-T250	HPL-S35005E-A-T250	HPL-S67505G-A-T250	HPL-S34005E-A-T250	HPL-S10005E-A-T250
30 x 50 mm	5 µm	HPL-S52005E-A-V050	HPL-S38005M-V050	HPL-S35005E-A-V050	HPL-S67505G-A-V050	HPL-S34005E-A-V050	HPL-S10005E-A-V050
30 x 100 mm	5 µm	HPL-S52005E-A-V100	HPL-S38005M-V100	HPL-S35005E-A-V100	HPL-S67505G-A-V100	HPL-S34005E-A-V100	HPL-S10005E-A-V100
30 x 150 mm	5 µm	HPL-S52005E-A-V150	HPL-S38005M-V150	HPL-S35005E-A-V150	HPL-S67505G-A-V150	HPL-S34005E-A-V150	HPL-S10005E-A-V150
30 x 250 mm	5 µm	HPL-S52005E-A-V250	HPL-S38005M-V250	HPL-S35005E-A-V250	HPL-S67505G-A-V250	HPL-S34005E-A-V250	HPL-S10005E-A-V250
4.6 x 150 mm	10 µm	HPL-S52007E-A-N150	HPL-S38007M-N150	HPL-S35007E-A-N150	HPL-S67507G-A-N150	HPL-S34007E-A-N150	HPL-S10007E-A-N150
4.6 x 250 mm	10 µm	HPL-S52007E-A-N250	HPL-S38007M-N250	HPL-S35007E-A-N250	HPL-S67507G-A-N250	HPL-S34007E-A-N250	HPL-S10007E-A-N250
10 x 150 mm	10 µm	HPL-S52007E-A-Q150	HPL-S38007M-Q150	HPL-S35007E-A-Q150	HPL-S67507G-A-Q150	HPL-S34007E-A-Q150	HPL-S10007E-A-Q150
10 x 250 mm	10 µm	HPL-S52007E-A-Q250	HPL-S38007M-Q250	HPL-S35007E-A-Q250	HPL-S67507G-A-Q250	HPL-S34007E-A-Q250	HPL-S10007E-A-Q250
21.2 x 50 mm	10 µm	HPL-S52007E-A-T050	HPL-S38007M-T050	HPL-S35007E-A-T050	HPL-S67507G-A-T050	HPL-S34007E-A-T050	HPL-S10007E-A-T050
21.2 x 100 mm	10 µm	HPL-S52007E-A-T100	HPL-S38007M-T100	HPL-S35007E-A-T100	HPL-S67507G-A-T100	HPL-S34007E-A-T100	HPL-S10007E-A-T100
21.2 x 150 mm	10 µm	HPL-S52007E-A-T150	HPL-S38007M-T150	HPL-S35007E-A-T150	HPL-S67507G-A-T150	HPL-S34007E-A-T150	HPL-S10007E-A-T150
21.2 x 250 mm	10 µm	HPL-S52007E-A-T250	HPL-S38007M-T250	HPL-S35007E-A-T250	HPL-S67507G-A-T250	HPL-S34007E-A-T250	HPL-S10007E-A-T250
30 x 50 mm	10 µm	HPL-S52007E-A-V050	HPL-S38007M-V050	HPL-S35007E-A-V050	HPL-S67507G-A-V050	HPL-S34007E-A-V050	HPL-S10007E-A-V050
30 x 100 mm	10 µm	HPL-S52007E-A-V100	HPL-S38007M-V100	HPL-S35007E-A-V100	HPL-S67507G-A-V100	HPL-S34007E-A-V100	HPL-S10007E-A-V100
30 x 150 mm	10 µm	HPL-S52007E-A-V150	HPL-S38007M-V150	HPL-S35007E-A-V150	HPL-S67507G-A-V150	HPL-S34007E-A-V150	HPL-S10007E-A-V150
30 x 250 mm	10 µm	HPL-S52007E-A-V250	HPL-S38007M-V250	HPL-S35007E-A-V250	HPL-S67507G-A-V250	HPL-S34007E-A-V250	HPL-S10007E-A-V250
50 x 50 mm	10 µm	HPL-S52007E-A-W050	HPL-S38007M-W050	HPL-S35007E-A-W050	HPL-S67507G-A-W050	HPL-S34007E-A-W050	HPL-S10007E-A-W050
50 x 100 mm	10 µm	HPL-S52007E-A-W100	HPL-S38007M-W100	HPL-S35007E-A-W100	HPL-S67507G-A-W100	HPL-S34007E-A-W100	HPL-S10007E-A-W100
50 x 150 mm	10 µm	HPL-S52007E-A-W150	HPL-S38007M-W150	HPL-S35007E-A-W150	HPL-S67507G-A-W150	HPL-S34007E-A-W150	HPL-S10007E-A-W150
50 x 250 mm	10 µm	HPL-S52007E-A-W250	HPL-S38007M-W250	HPL-S35007E-A-W250	HPL-S67507G-A-W250	HPL-S34007E-A-W250	HPL-S10007E-A-W250

*HPLC columns are always sold in pack of one column. Other dimensions and/or particle sizes are available on a custom basis. Contact us.

SiliaChrom Plus HPLC Columns Ordering Information

SiliaChrom Plus HPLC Column Ordering Information							
Dimension	Particle Size (µm)	SiliaChrom Plus SAX	SiliaChrom Plus SCX	Dimension	Particle Size (µm)	SiliaChrom Plus SAX	SiliaChrom Plus SCX
2.1 x 30 mm	3 µm	HPL-S66503E-A-G033	HPL-S90003-G033	10 x 150 mm	5 µm	HPL-S66505E-A-Q150	HPL-S90005-Q150
2.1 x 50 mm	3 µm	HPL-S66503E-A-G050	HPL-S90003-G050	10 x 250 mm	5 µm	HPL-S66505E-A-Q250	HPL-S90005-Q250
2.1 x 100 mm	3 µm	HPL-S66503E-A-G100	HPL-S90003-G100	21.2 x 50 mm	5 µm	HPL-S66505E-A-T050	HPL-S90005-T050
2.1 x 150 mm	3 µm	HPL-S66503E-A-G150	HPL-S90003-G150	21.2 x 100 mm	5 µm	HPL-S66505E-A-T100	HPL-S90005-T100
3.0 x 30 mm	3 µm	HPL-S66503E-A-H033	HPL-S90003-H033	21.2 x 150 mm	5 µm	HPL-S66505E-A-T150	HPL-S90005-T150
3.0 x 50 mm	3 µm	HPL-S66503E-A-H050	HPL-S90003-H050	21.2 x 250 mm	5 µm	HPL-S66505E-A-T250	HPL-S90005-T250
3.0 x 100 mm	3 µm	HPL-S66503E-A-H100	HPL-S90003-H100	30 x 50 mm	5 µm	HPL-S66505E-A-V050	HPL-S90005-V050
3.0 x 150 mm	3 µm	HPL-S66503E-A-H150	HPL-S90003-H150	30 x 100 mm	5 µm	HPL-S66505E-A-V100	HPL-S90005-V100
4.6 x 30 mm	3 µm	HPL-S66503E-A-N033	HPL-S90003-N033	30 x 150 mm	5 µm	HPL-S66505E-A-V150	HPL-S90005-V150
4.6 x 50 mm	3 µm	HPL-S66503E-A-N050	HPL-S90003-N050	30 x 250 mm	5 µm	HPL-S66505E-A-V250	HPL-S90005-V250
4.6 x 100 mm	3 µm	HPL-S66503E-A-N100	HPL-S90003-N100	4.6 x 150 mm	10 µm	HPL-S66507E-A-N150	HPL-S90007-N150
4.6 x 150 mm	3 µm	HPL-S66503E-A-N150	HPL-S90003-N150	4.6 x 250 mm	10 µm	HPL-S66507E-A-N250	HPL-S90007-N250
4.6 x 250 mm	3 µm	HPL-S66503E-A-N250	HPL-S90003-N250	10 x 150 mm	10 µm	HPL-S66507E-A-Q150	HPL-S90007-Q150
2.1 x 30 mm	5 µm	HPL-S66505E-A-G033	HPL-S90005-G033	10 x 250 mm	10 µm	HPL-S66507E-A-Q250	HPL-S90007-Q250
2.1 x 50 mm	5 µm	HPL-S66505E-A-G050	HPL-S90005-G050	21.2 x 50 mm	10 µm	HPL-S66507E-A-T050	HPL-S90007-T050
2.1 x 100 mm	5 µm	HPL-S66505E-A-G100	HPL-S90005-G100	21.2 x 100 mm	10 µm	HPL-S66507E-A-T100	HPL-S90007-T100
2.1 x 150 mm	5 µm	HPL-S66505E-A-G150	HPL-S90005-G150	21.2 x 150 mm	10 µm	HPL-S66507E-A-T150	HPL-S90007-T150
2.1 x 250 mm	5 µm	HPL-S66505E-A-G250	HPL-S90005-G250	21.2 x 250 mm	10 µm	HPL-S66507E-A-T250	HPL-S90007-T250
3.0 x 30 mm	5 µm	HPL-S66505E-A-H033	HPL-S90005-H033	30 x 50 mm	10 µm	HPL-S66507E-A-V050	HPL-S90007-V050
3.0 x 50 mm	5 µm	HPL-S66505E-A-H050	HPL-S90005-H050	30 x 100 mm	10 µm	HPL-S66507E-A-V100	HPL-S90007-V100
3.0 x 100 mm	5 µm	HPL-S66505E-A-H100	HPL-S90005-H100	30 x 150 mm	10 µm	HPL-S66507E-A-V150	HPL-S90007-V150
3.0 x 150 mm	5 µm	HPL-S66505E-A-H150	HPL-S90005-H150	30 x 250 mm	10 µm	HPL-S66507E-A-V250	HPL-S90007-V250
3.0 x 250 mm	5 µm	HPL-S66505E-A-H250	HPL-S90005-H250	50 x 50 mm	10 µm	HPL-S66507E-A-W050	HPL-S90007-W050
4.6 x 30 mm	5 µm	HPL-S66505E-A-N033	HPL-S90005-N033	50 x 100 mm	10 µm	HPL-S66507E-A-W100	HPL-S90007-W100
4.6 x 50 mm	5 µm	HPL-S66505E-A-N050	HPL-S90005-N050	50 x 150 mm	10 µm	HPL-S66507E-A-W150	HPL-S90007-W150
4.6 x 100 mm	5 µm	HPL-S66505E-A-N100	HPL-S90005-N100	50 x 250 mm	10 µm	HPL-S66507E-A-W250	HPL-S90007-W250
4.6 x 150 mm	5 µm	HPL-S66505E-A-N150	HPL-S90005-N150				
4.6 x 250 mm	5 µm	HPL-S66505E-A-N250	HPL-S90005-N250				

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SiliaChrom Plus HPLC Column Ordering Information					
Dimension	Particle Size (µm)	SiliaChrom Plus PFP	Dimension	Particle Size (µm)	SiliaChrom Plus PFP
2.1 x 30 mm	3 µm	HPL-S67503G-A-G033	10 x 150 mm	5 µm	HPL-S67505G-A-Q150
2.1 x 50 mm	3 µm	HPL-S67503G-A-G050	10 x 250 mm	5 µm	HPL-S67505G-A-Q250
2.1 x 100 mm	3 µm	HPL-S67503G-A-G100	21.2 x 50 mm	5 µm	HPL-S67505G-A-T050
2.1 x 150 mm	3 µm	HPL-S67503G-A-G150	21.2 x 100 mm	5 µm	HPL-S67505G-A-T100
3.0 x 30 mm	3 µm	HPL-S67503G-A-H033	21.2 x 150 mm	5 µm	HPL-S67505G-A-T150
3.0 x 50 mm	3 µm	HPL-S67503G-A-H050	21.2 x 250 mm	5 µm	HPL-S67505G-A-T250
3.0 x 100 mm	3 µm	HPL-S67503G-A-H100	30 x 50 mm	5 µm	HPL-S67505G-A-V050
3.0 x 150 mm	3 µm	HPL-S67503G-A-H150	30 x 100 mm	5 µm	HPL-S67505G-A-V100
4.6 x 30 mm	3 µm	HPL-S67503G-A-N033	30 x 150 mm	5 µm	HPL-S67505G-A-V150
4.6 x 50 mm	3 µm	HPL-S67503G-A-N050	30 x 250 mm	5 µm	HPL-S67505G-A-V250
4.6 x 100 mm	3 µm	HPL-S67503G-A-N100	4.6 x 150 mm	10 µm	HPL-S67507G-A-N150
4.6 x 150 mm	3 µm	HPL-S67503G-A-N150	4.6 x 250 mm	10 µm	HPL-S67507G-A-N250
4.6 x 250 mm	3 µm	HPL-S67503G-A-N250	10 x 150 mm	10 µm	HPL-S67507G-A-Q150
2.1 x 30 mm	5 µm	HPL-S67505G-A-G033	10 x 250 mm	10 µm	HPL-S67507G-A-Q250
2.1 x 50 mm	5 µm	HPL-S67505G-A-G050	21.2 x 50 mm	10 µm	HPL-S67507G-A-T050
2.1 x 100 mm	5 µm	HPL-S67505G-A-G100	21.2 x 100 mm	10 µm	HPL-S67507G-A-T100
2.1 x 150 mm	5 µm	HPL-S67505G-A-G150	21.2 x 150 mm	10 µm	HPL-S67507G-A-T150
2.1 x 250 mm	5 µm	HPL-S67505G-A-G250	21.2 x 250 mm	10 µm	HPL-S67507G-A-T250
3.0 x 30 mm	5 µm	HPL-S67505G-A-H033	30 x 50 mm	10 µm	HPL-S67507G-A-V050
3.0 x 50 mm	5 µm	HPL-S67505G-A-H050	30 x 100 mm	10 µm	HPL-S67507G-A-V100
3.0 x 100 mm	5 µm	HPL-S67505G-A-H100	30 x 150 mm	10 µm	HPL-S67507G-A-V150
3.0 x 150 mm	5 µm	HPL-S67505G-A-H150	30 x 250 mm	10 µm	HPL-S67507G-A-V250
3.0 x 250 mm	5 µm	HPL-S67505G-A-H250	50 x 50 mm	10 µm	HPL-S67507G-A-W050
4.6 x 30 mm	5 µm	HPL-S67505G-A-N033	50 x 100 mm	10 µm	HPL-S67507G-A-W100
4.6 x 50 mm	5 µm	HPL-S67505G-A-N050	50 x 150 mm	10 µm	HPL-S67507G-A-W150
4.6 x 100 mm	5 µm	HPL-S67505G-A-N100	50 x 250 mm	10 µm	HPL-S67507G-A-W250
4.6 x 150 mm	5 µm	HPL-S67505G-A-N150			
4.6 x 250 mm	5 µm	HPL-S67505G-A-N250			

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SiliaChrom Plus Guard Cartridges Columns Ordering Information

SiliaChrom Plus Guard Cartridge Ordering Information							
Dimension	Particle Size (µm)	SiliaChrom Plus C18	SiliaChrom Plus C18-300	SiliaChrom Plus C8	SiliaChrom Plus C8-300	SiliaChrom Plus C4	SiliaChrom Plus C4-300
2.1 x 10 mm	3 µm	HPLG-S03203E-A-G010	HPLG-S03203M-G010	HPLG-S30803E-A-G010	HPLG-S30803M-G010	HPLG-S32703E-A-G010	HPLG-S32703M-G010
2.1 x 20 mm	3 µm	HPLG-S03203E-A-G020	HPLG-S03203M-G020	HPLG-S30803E-A-G020	HPLG-S30803M-G020	HPLG-S32703E-A-G020	HPLG-S32703M-G020
4.0 x 10 mm	3 µm	HPLG-S03203E-A-N010	HPLG-S03203M-N010	HPLG-S30803E-A-N010	HPLG-S30803M-N010	HPLG-S32703E-A-N010	HPLG-S32703M-N010
4.0 x 20 mm	3 µm	HPLG-S03203E-A-N020	HPLG-S03203M-N020	HPLG-S30803E-A-N020	HPLG-S30803M-N020	HPLG-S32703E-A-N020	HPLG-S32703M-N020
2.1 x 10 mm	5 µm	HPLG-S03205E-A-G010	HPLG-S03205M-G010	HPLG-S30805E-A-G010	HPLG-S30805M-G010	HPLG-S32705E-A-G010	HPLG-S32705M-G010
2.1 x 20 mm	5 µm	HPLG-S03205E-A-G020	HPLG-S03205M-G020	HPLG-S30805E-A-G020	HPLG-S30805M-G020	HPLG-S32705E-A-G020	HPLG-S32705M-G020
4.0 x 10 mm	5 µm	HPLG-S03205E-A-N010	HPLG-S03205M-N010	HPLG-S30805E-A-N010	HPLG-S30805M-N010	HPLG-S32705E-A-N010	HPLG-S32705M-N010
4.0 x 20 mm	5 µm	HPLG-S03205E-A-N020	HPLG-S03205M-N020	HPLG-S30805E-A-N020	HPLG-S30805M-N020	HPLG-S32705E-A-N020	HPLG-S32705M-N020
10 x 10 mm	5 µm	HPLG-S03205E-A-Q010	HPLG-S03205M-Q010	HPLG-S30805E-A-Q010	HPLG-S30805M-Q010	HPLG-S32705E-A-Q010	HPLG-S32705M-Q010
21.2 x 10 mm	5 µm	HPLG-S03205E-A-T010	HPLG-S03205M-T010	HPLG-S30805E-A-T010	HPLG-S30805M-T010	HPLG-S32705E-A-T010	HPLG-S32705M-T010
30 x 10 mm	5 µm	HPLG-S03205E-A-V010	HPLG-S03205M-V010	HPLG-S30805E-A-V010	HPLG-S30805M-V010	HPLG-S32705E-A-V010	HPLG-S32705M-V010
4.0 x 10 mm	10 µm	HPLG-S03207E-A-N010	HPLG-S03207M-N010	HPLG-S30807E-A-N010	HPLG-S30807M-N010	HPLG-S32707E-A-N010	HPLG-S32707M-N010
4.0 x 20 mm	10 µm	HPLG-S03207E-A-N020	HPLG-S03207M-N020	HPLG-S30807E-A-N020	HPLG-S30807M-N020	HPLG-S32707E-A-N020	HPLG-S32707M-N020
10 x 10 mm	10 µm	HPLG-S03207E-A-Q010	HPLG-S03207M-Q010	HPLG-S30807E-A-Q010	HPLG-S30807M-Q010	HPLG-S32707E-A-Q010	HPLG-S32707M-Q010
21.2 x 10 mm	10 µm	HPLG-S03207E-A-T010	HPLG-S03207M-T010	HPLG-S30807E-A-T010	HPLG-S30807M-T010	HPLG-S32707E-A-T010	HPLG-S32707M-T010
30 x 10 mm	10 µm	HPLG-S03207E-A-V010	HPLG-S03207M-V010	HPLG-S30807E-A-V010	HPLG-S30807M-V010	HPLG-S32707E-A-V010	HPLG-S32707M-V010
Dimension	Particle Size (µm)	SiliaChrom Plus Amino	SiliaChrom Plus Cyano	SiliaChrom Plus Diol	SiliaChrom Plus PFP	SiliaChrom Plus Phenyl	SiliaChrom Plus Silica
2.1 x 10 mm	3 µm	HPLG-S52003E-A-G010	HPLG-S38003M-G010	HPLG-S35003E-A-G010	HPLG-S67503G-A-G010	HPLG-S34003E-A-G010	HPLG-S10003E-A-G010
2.1 x 20 mm	3 µm	HPLG-S52003E-A-G020	HPLG-S38003M-G020	HPLG-S35003E-A-G020	HPLG-S67503G-A-G020	HPLG-S34003E-A-G020	HPLG-S10003E-A-G020
4.0 x 10 mm	3 µm	HPLG-S52003E-A-N010	HPLG-S38003M-N010	HPLG-S35003E-A-N010	HPLG-S67503G-A-N010	HPLG-S34003E-A-N010	HPLG-S10003E-A-N010
4.0 x 20 mm	3 µm	HPLG-S52003E-A-N020	HPLG-S38003M-N020	HPLG-S35003E-A-N020	HPLG-S67503G-A-N020	HPLG-S34003E-A-N020	HPLG-S10003E-A-N020
2.1 x 10 mm	5 µm	HPLG-S52005E-A-G010	HPLG-S38005M-G010	HPLG-S35005E-A-G010	HPLG-S67505G-A-G010	HPLG-S34005E-A-G010	HPLG-S10005E-A-G010
2.1 x 20 mm	5 µm	HPLG-S52005E-A-G020	HPLG-S38005M-G020	HPLG-S35005E-A-G020	HPLG-S67505G-A-G020	HPLG-S34005E-A-G020	HPLG-S10005E-A-G020
4.0 x 10 mm	5 µm	HPLG-S52005E-A-N010	HPLG-S38005M-N010	HPLG-S35005E-A-N010	HPLG-S67505G-A-N010	HPLG-S34005E-A-N010	HPLG-S10005E-A-N010
4.0 x 20 mm	5 µm	HPLG-S52005E-A-N020	HPLG-S38005M-N020	HPLG-S35005E-A-N020	HPLG-S67505G-A-N020	HPLG-S34005E-A-N020	HPLG-S10005E-A-N020
10 x 10 mm	5 µm	HPLG-S52005E-A-Q010	HPLG-S38005M-Q010	HPLG-S35005E-A-Q010	HPLG-S67505G-A-Q010	HPLG-S34005E-A-Q010	HPLG-S10005E-A-Q010
21.2 x 10 mm	5 µm	HPLG-S52005E-A-T010	HPLG-S38005M-T010	HPLG-S35005E-A-T010	HPLG-S67505G-A-T010	HPLG-S34005E-A-T010	HPLG-S10005E-A-T010
30 x 10 mm	5 µm	HPLG-S52005E-A-V010	HPLG-S38005M-V010	HPLG-S35005E-A-V010	HPLG-S67505G-A-V010	HPLG-S34005E-A-V010	HPLG-S10005E-A-V010
4.0 x 10 mm	10 µm	HPLG-S52007E-A-N010	HPLG-S38007M-N010	HPLG-S35007E-A-N010	HPLG-S67507G-A-N010	HPLG-S34007E-A-N010	HPLG-S10007E-A-N010
4.0 x 20 mm	10 µm	HPLG-S52007E-A-N020	HPLG-S38007M-N020	HPLG-S35007E-A-N020	HPLG-S67507G-A-N020	HPLG-S34007E-A-N020	HPLG-S10007E-A-N020
10 x 10 mm	10 µm	HPLG-S52007E-A-Q010	HPLG-S38007M-Q010	HPLG-S35007E-A-Q010	HPLG-S67507G-A-Q010	HPLG-S34007E-A-Q010	HPLG-S10007E-A-Q010
21.2 x 10 mm	10 µm	HPLG-S52007E-A-T010	HPLG-S38007M-T010	HPLG-S35007E-A-T010	HPLG-S67507G-A-T010	HPLG-S34007E-A-T010	HPLG-S10007E-A-T010
30 x 10 mm	10 µm	HPLG-S52007E-A-V010	HPLG-S38007M-V010	HPLG-S35007E-A-V010	HPLG-S67507G-A-V010	HPLG-S34007E-A-V010	HPLG-S10007E-A-V010
Dimension	Particle Size (µm)	SiliaChrom Plus SAX	SiliaChrom Plus SCX	SiliaChrom Guard Holder			
2.1 x 10 mm	3 µm	HPLG-S66503-G010	HPLG-S90003-G010				
2.1 x 20 mm	3 µm	HPLG-S66503-G020	HPLG-S90003-G020				
4.0 x 10 mm	3 µm	HPLG-S66503-N010	HPLG-S90003-N010				
4.0 x 20 mm	3 µm	HPLG-S66503-N020	HPLG-S90003-N020				
2.1 x 10 mm	5 µm	HPLG-S66505-G010	HPLG-S90005-G010				
2.1 x 20 mm	5 µm	HPLG-S66505-G020	HPLG-S90005-G020				
4.0 x 10 mm	5 µm	HPLG-S66505-N010	HPLG-S90005-N010				
4.0 x 20 mm	5 µm	HPLG-S66505-N020	HPLG-S90005-N020				
10 x 10 mm	5 µm	HPLG-S66505-Q010	HPLG-S90005-Q010				
21.2 x 10 mm	5 µm	HPLG-S66505-T010	HPLG-S90005-T010				
30 x 10 mm	5 µm	HPLG-S66505-V010	HPLG-S90005-V010				
4.0 x 10 mm	10 µm	HPLG-S66507-N010	HPLG-S90007-N010				
4.0 x 20 mm	10 µm	HPLG-S66507-N020	HPLG-S90007-N020				
10 x 10 mm	10 µm	HPLG-S66507-Q010	HPLG-S90007-Q010				
21.2 x 10 mm	10 µm	HPLG-S66507-T010	HPLG-S90007-T010				
30 x 10 mm	10 µm	HPLG-S66507-V010	HPLG-S90007-V010				

SiliaChrom Guard Cartridges Package Information:
- 2.1 and 4.0 mm Guard Cartridges are sold in pack of 4 cartridges
- 10 mm Guard Cartridges is sold in pack of 2 cartridges
- 21.2 and 30 mm Guard Cartridges are sold in pack of 1 cartridge

SiliaChrom Guard Holder information:
- HPH-N010 (*for 2.1 x 10 mm & 4.0 x 10 mm Guard Cartridges*)
- HPH-N020 (*for 2.1 x 20 mm & 4.0 x 20 mm Guard Cartridges*)
- HPH-Q010 (*for 10 x 10 mm Guard Cartridges*)
- HPH-T010 (*for 21.2 x 10 mm Guard Cartridges*)
- HPH-V010 (*for 30 x 10 mm Guard Cartridges*)

*Other dimensions and particle sizes could be available on a custom basis. Contact us.

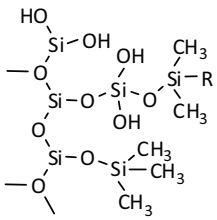
Silia*Chrom* dt Family

Description

Silia*Chrom* dt phases are universal columns compatible with 100% aqueous conditions. They show good peak shapes for any type of molecules (acidic, neutral, basic). The ultra-pure metal-free silica allows high sensitivity for LC-MS applications.

All Silia*Chrom* dt columns are available in 2.5, 3, 5 & 10 µm.

Structure



For C18 R = $(CH_2)_{17}CH_3$
For C8 R = $(CH_2)_7CH_3$

Silia*Chrom* dt Family Main Characteristics

- Compatible with 100% aqueous and 100% organic mobile phases
- Ultra-pure metal-free silica (*99.9999% purity*)
- High sensitivity for LC-MS applications
- Enhanced retention of hydrophilic compounds
- Inertness for acidic and basic analytes
- Endcapped

Silia*Chrom* dt Sorbent Characteristics

Silia*Chrom* dt Sorbent Characteristics						
Silia*Chrom* Phases	Description	USP Code	%C	Pore Size (Å)	Surface Area (m^2/g)	pH Stability Range
Reversed-Phases						
Silia*Chrom* dt C18	Separation of hydrophobic molecules in aqueous or organic conditions.	L1	18	100	410 - 440	1.5 - 9.0
Silia*Chrom* dt C8		L7	14	100	410 - 440	1.5 - 9.0
Normal Phases						
Silia*Chrom* Silica	Separation of polar analytes in 100% aqueous conditions.	L3	-	100	410 - 440	1.5 - 9.0

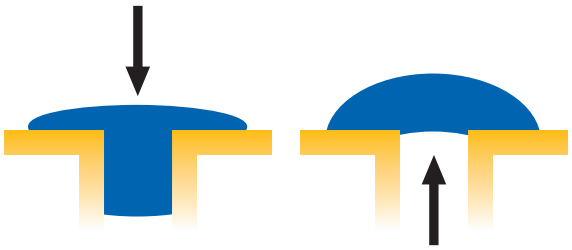
Pharmaceutical Forensic

Dewetting Phenomena

The dewetting phenomena is the formation of drops on the solid surface caused by hydrophobic repulsions of highly hydrophobic sorbents. This phenomena is illustrated by the following scheme.

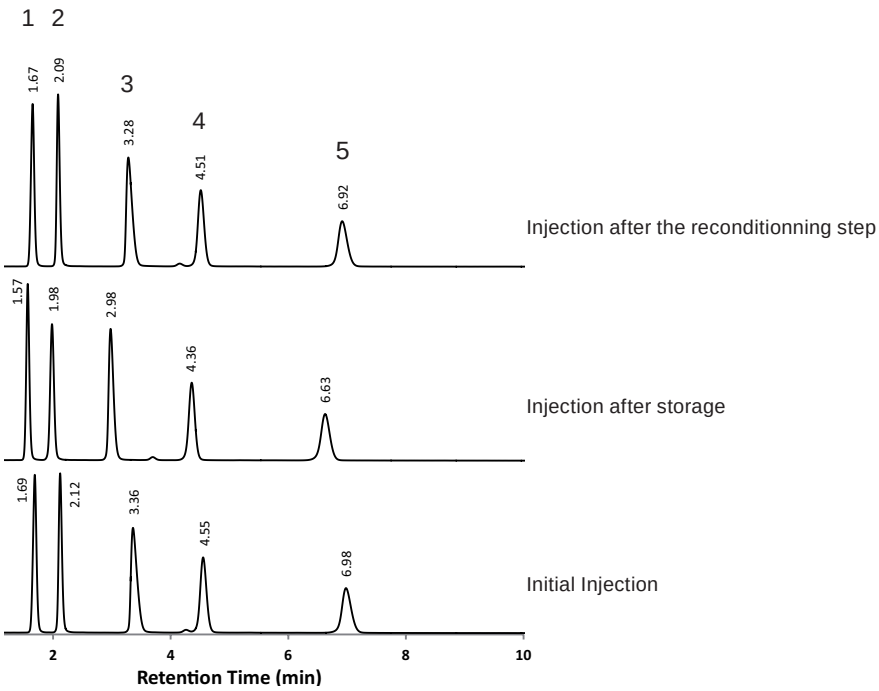
General procedure

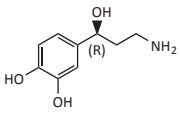
1. The mixture of catecholamines is eluted on the column
2. The flow is then stopped
3. The column is stored in this condition during 18 h
4. The mixture is then re-injected after a reconditioning step

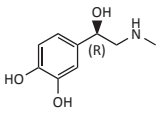


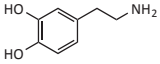
Chromatographic conditions

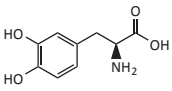
Column:	Silia*Chrom* dt C18, 5 µm
Column size:	4.6 x 150 mm
SiliCycle PN:	H141805E-N150
Mobile phase:	1% acetic acid in water
Temperature:	23°C
Flow rate:	1.000 mL/min
Detector:	UV at 265 nm
Injection volume:	5 µL

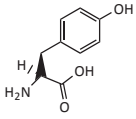



1.Norepinephrine


2.Epinephrine


3.Dopamine


4.Levodopa


5.Tyrosine

Conclusion: A small decrease in retention time is observed, but is not significant. The displacement has been resolved after the reconditioning step. The Silia*Chrom* dt C18 does not present the dewetting phenomena.

Pharmaceutical

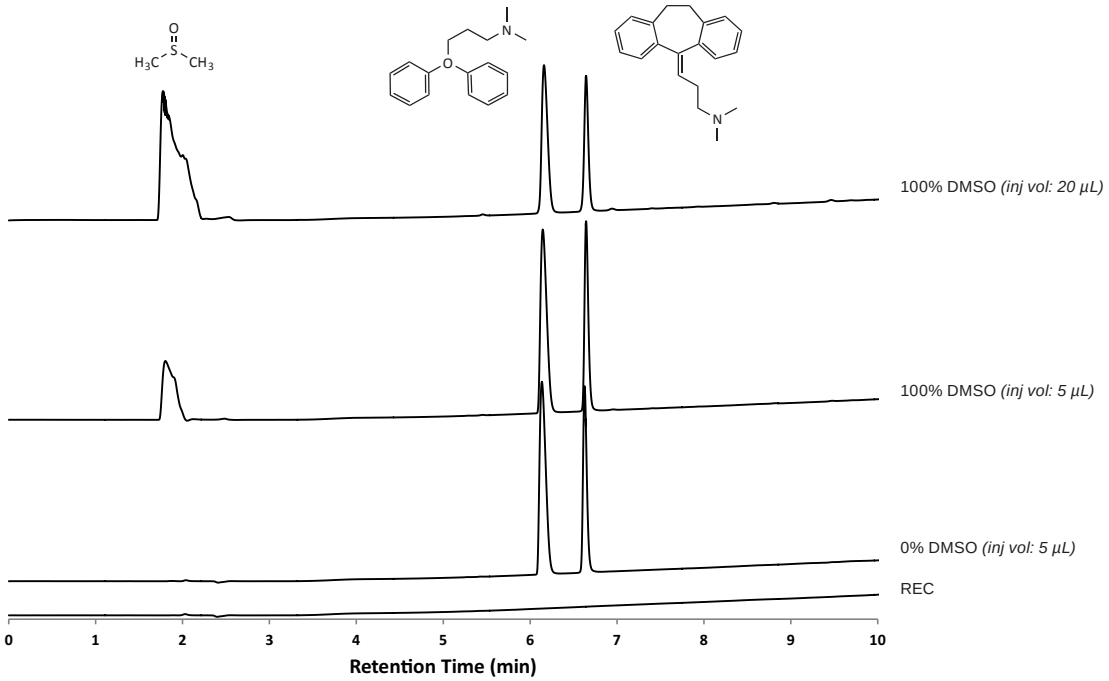
Retention Capacity of DMSO on Silia*Chrom* dt C18

DMSO *(Dimethylsulfoxide)* is an excellent solvent to solubilize most compounds. Unfortunately, this solvent is not volatile and with some C18 columns, the DMSO can interact with the stationary phase and decrease the selectivity. In this case, the only way to inhibit this effect is to use preparative chromatography. In this study, we show that DMSO does not interact with our Silia*Chrom* dt C18. A linear gradient has been used from a highly aqueous mobile phase to a highly organic phase.

Chromatographic conditions

Column: Silia*Chrom* dt C18, 5 µm
Column size: 4.6 x 150 mm
SiliCycle PN: H141805E-N150
Mobile phase: MPA 0.1% formic acid in water
MPB 0.1% formic acid in ACN
Temperature: 23°C
Flow rate: 1.000 mL/min
Detector: UV at 254 nm
Reconstitution solution *(REC)*: DMSO

Gradient		
Time (*min*)	% MPA	% MPB
0	90	10
9	10	90
10	10	90
11	90	10



Statistic Analysis Results						
Conditions	As $_{DMSO}$	Tr $_{DMSO}$ (*min*)	K'$_{DMSO}$	W$_{DMSO}$	Tr $_{diphenhydramine}$ (*min*)	Tr $_{amitriptyline}$ (*min*)
0% DMSO 5 µL	-	-	-	-	6.14	6.63
100% DMSO 5 µL	2.29	1.80	0.09	0.3	6.15	6.64
100% DMSO 20 µL	4.10	1.78	0.08	0.5	6.16	6.64

Conclusion: The study shows that DMSO does not interact with the Silia*Chrom* dt C18. No specific retention is observed. The Silia*Chrom* dt C18 is an excellent choice to purify components contaminated with DMSO.

Pharmaceutical

Ropinirole and Amitriptyline Detection in Human Plasma

SiliaChrom dt C18 presents low bleeding and is excellent for dirty samples. Partial endcapping allows for some interactions with free silanol groups. The use of SiliaPrep CleanDRUG prior to injection onto the column will insure a very clean sample which results in very low ionic suppression when used in LC-MS/MS analysis. Another big advantage is the high selectivity of SiliaChrom dt C18 for all concentration levels.

Chromatographic conditions

Column:	SiliaChrom dt C18, 2.5 µm
Column size:	3.0 x 30 mm
SiliCycle PN:	H141802E-H030
	Sample preparation by SPE SiliaPrep CleanDRUG 3 mL/200 mg PN: SPEC-R651230B-03G
Mobile phase:	MPA: 1 mM ammonium formate in *(ACN/water, 10/90)*, 0.1% formic acid *(v/v)* MPB: 1 mM ammonium formate in *(ACN/water, 90/10)*, 0.1% formic acid *(v/v)*

Gradient		
Time (*min*)	MPA (%)	MPB (%)
0.00 - 0.20	85	15
0.21 - 1.20	50	50
1.21 - 1.60	0	100
1.61 - 3.50	85	15

Temperature: 23°C

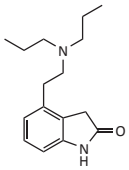
Flow rate: 1.000 mL/min

MS splitting flow: 0.30 mL/min

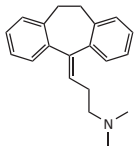
Injection volume: 5 µL

Tandem mass spectroscopy conditions

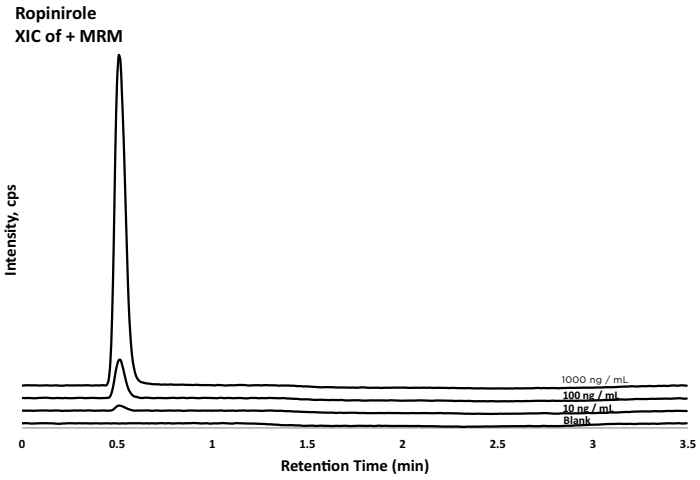
Detector:	Sciex API 3000, Applied Biosystem
Ion Source:	Positive Electrospray *(ESI+)*
Turbolon Ion Spray heater gas flow: 8000 cc/min	
Turbolon Ion Spray heater temperature: 375°C	
MRM Transition:	Ropinirole: m/z *(261.2 → 114.2)* Amitriptyline: m/z *(278.4 → 233.1)*

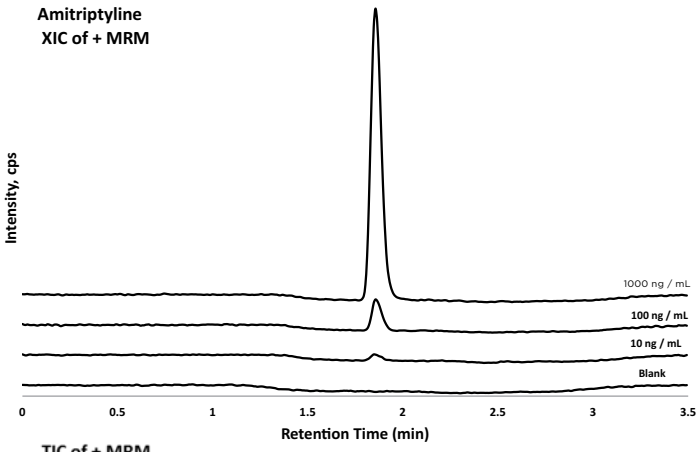


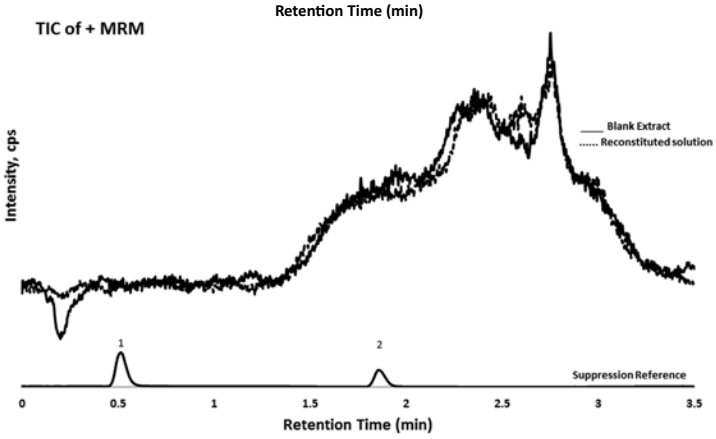
Ropinirole



Amitriptyline



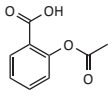




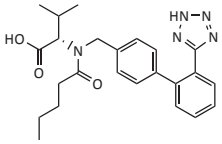
Assay for QC Testing of Blood Pressure and Cholesterol Medication

Pharmaceutical

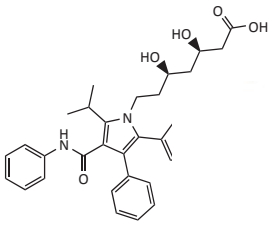
The Silia*Chrom* dt C18 presents a high lot-to-lot reproducibility, which makes it an excellent choice for quality control analysis in phamaceutical laboratories.



A: Aspirine



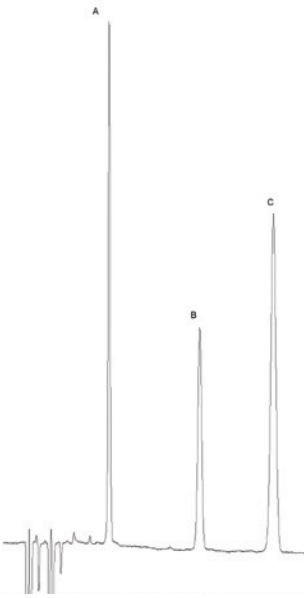
B: Valsartan



C: Atorvastatin

Chromatographic conditions

Column:	Silia*Chrom* dt C18, 5 µm
Column size:	4.6 x 150 mm
SiliCycle PN:	H141805E-N150
Mobile phase:	Methanol/H2O *(70/30)*, 0.1% *(v/v)* formic acid
Temperature:	30°C
Flow rate:	0.800 mL/min
Detector:	UV at 280 nm
Injection volume:	10 µL



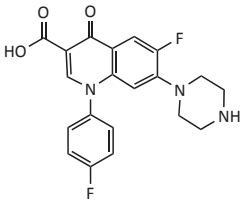
Peak Shape Evaluation for Zwetterion Fluoroquinolones

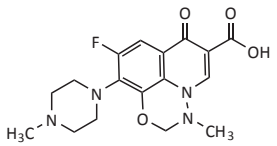
Pharmaceutical

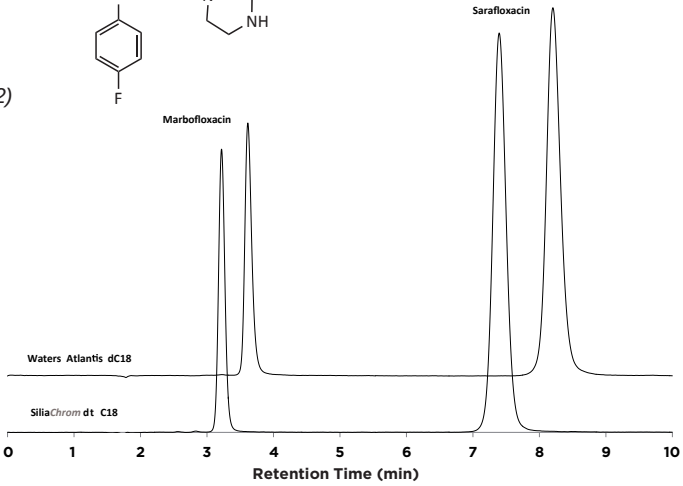
The Silia*Chrom* dt C18 presents a high separation capacity for zwetterion analysis.

Chromatographic conditions

Column:	Silia*Chrom* dt C18, 5 µm
Column size:	4.6 x 150 mm
SiliCycle PN:	H141805E-N150
Mobile phase:	2.5 mM potassium phosphate monobasic *(adjust to pH 2.5 with H3PO4)*/ethanol *(68/32)*
Temperature:	23°C
Flow rate:	1.000 mL/min
Detector:	UV at 275 nm
Injection volume:	10 µL



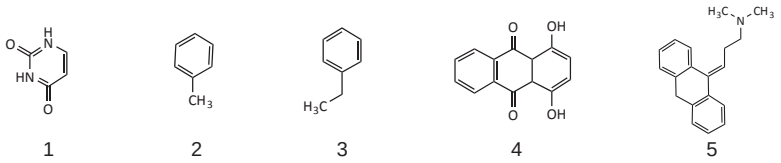




Peak Shape Results		
Product	Asymmetry (*USP*) Silia*Chrom* dt C18	Asymmetry (*USP*) Atlantis dC18
Marbofloxacin	1.11	1.29
Sarafloxacin	1.08	1.14

SiliaChrom dt C18 is Highly Efficient for Basic Compounds

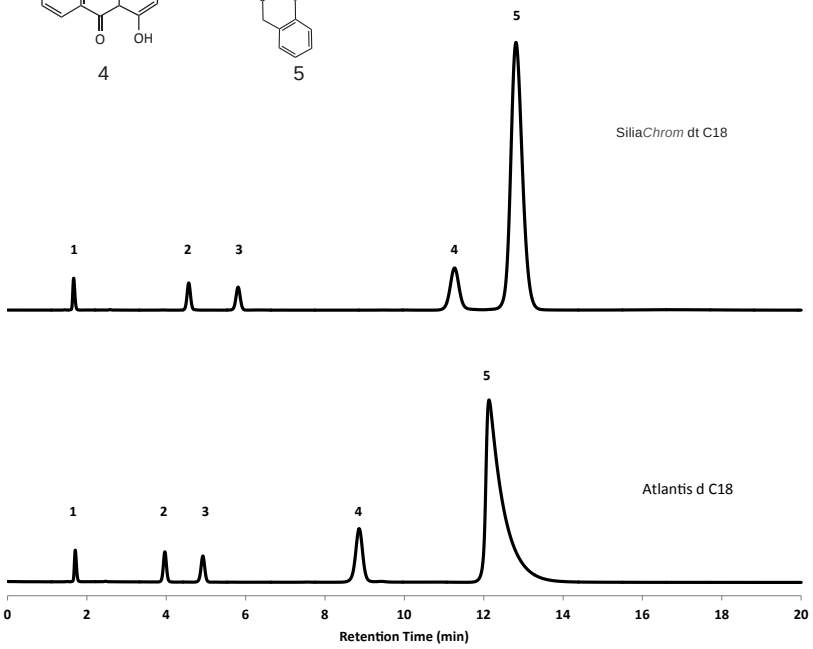
Amitriptyline, a strong basic compound, can be adsorbed on residual silanols on the surface of the packing material. With the traditional endcapping technique, this results in poor peak shapes. SiliCycle has developed a new method of silanol deactivation to eliminate the peak tailing from adsorption of compounds on residual silanol groups. This enables highly qualitative and quantitative analysis of strong basic compounds.



1 2 3 4 5

Chromatographic conditions

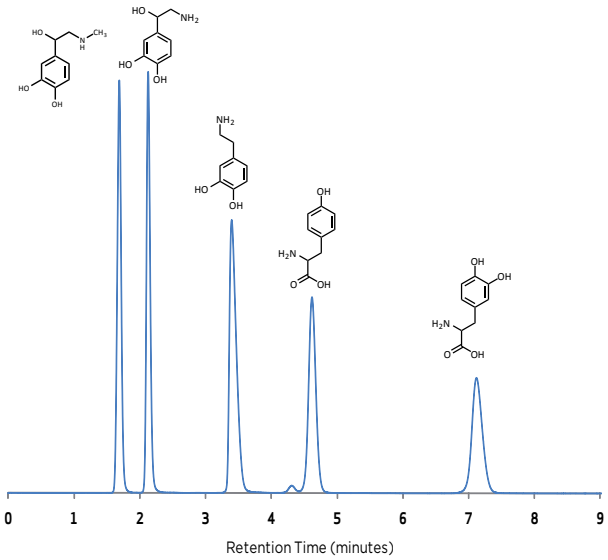
Column:	SiliaChrom dt C18, 5 µm
Column size:	4.6 x 150 mm
SiliCycle PN:	H141805E-N150
Mobile phase:	80/20 methanol/20 mM potassium phosphate pH 7.00
Temperature:	23°C
Flow rate:	1.000 mL/min
Detector:	UV at 254 nm
Injection volume:	1 µL



Forensic

Separation of Catecholamines in Acidic Mobile Phase

Catecholamines are hydrophilic compounds with acidic functions. The mobile phase needs to be acidic to have the catecholamines under the molecular configuration and use the sorbent hydrophilic character to drive the separation.



Chromatographic conditions

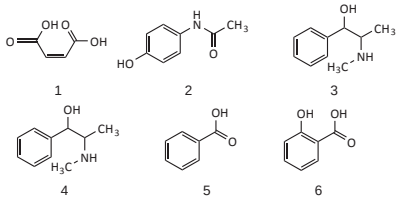
Column:	SiliaChrom dt C18, 5 µm
Column size:	4.6 x 150 mm
SiliCycle PN:	H141805E-N150
Mobile phase:	1% Acetic Acid in water
Temperature:	23°C
Temperature:	23°C
Flow rate:	1.000 mL/min
Detector:	UV at 265 nm
Injection volume:	5 µL

« Polar metabolites separation is very challenging. Using SiliaChrom dt C18 in normal phase solved the problem. »

Huns Nejad from BASF, Research Triangle Park, NC, USA

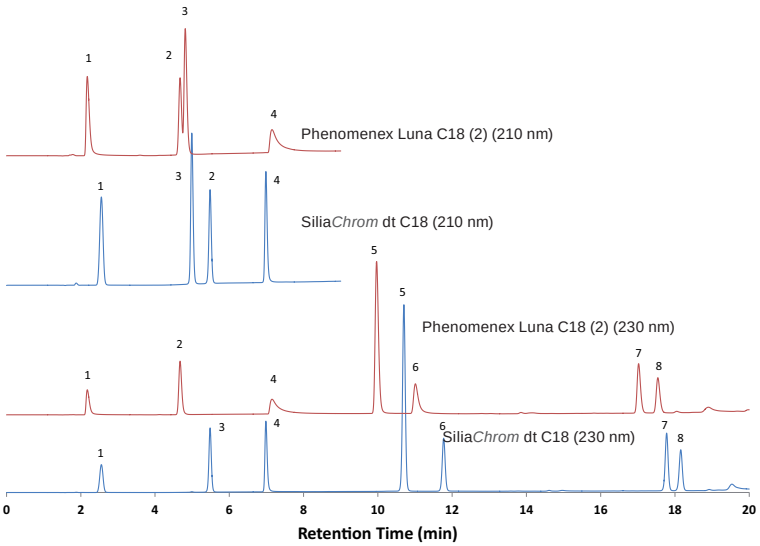
Evaluation of Resolution and Peak Shape

The Silia*Chrom* dt C18 column is universal, efficient even for mixtures of basic and acidic compounds.



Chromatographic conditions

Column:	Silia*Chrom* dt C18, 5 µm Phenomenex Luna, C18 *(2)* 5 µm
Column size:	4.6 x 150 mm
SiliCycle PN:	H141805E-N150
Mobile phase:	MPA: 5 mM potassium phosphate monobasic *(adjust to pH 2.5 with H_3PO_4)*/ACN *(90/10)* MPB: 5 mM potassium phosphate monobasic *(adjust to pH 2.5 with H_3PO_4)*/ACN *(10/90)*
Temperature:	23°C
Flow rate:	1.000 mL/min
Detector:	UV at 254 nm
Injection volume:	5 µL



Silia*Chrom* dt HPLC Columns Ordering Information

Silia*Chrom* dt HPLC Column Ordering Information

Dimension	Particle Size (*µm*)	Silia*Chrom* dt C18	Silia*Chrom* dt C8	Silia*Chrom* dt Silica
2.1 x 30 mm	**2.5 µm**	H141802E-G030	H140802E-G030	H143002E-G030
2.1 x 50 mm	**2.5 µm**	H141802E-G050	H140802E-G050	H143002E-G050
2.1 x 100 mm	**2.5 µm**	H141802E-G100	H140802E-G100	H143002E-G100
3.0 x 30 mm	**2.5 µm**	H141802E-H030	H140802E-H030	H143002E-H030
3.0 x 50 mm	**2.5 µm**	H141802E-H050	H140802E-H050	H143002E-H050
3.0 x 100 mm	**2.5 µm**	H141802E-H100	H140802E-H100	H143002E-H100
4.6 x 50 mm	**2.5 µm**	H141802E-N050	H140802E-N050	H143002E-N050
4.6 x 100 mm	**2.5 µm**	H141802E-N100	H140802E-N100	H143002E-N100
2.1 x 20 mm	**3 µm**	H141803E-G020	H140803E-G020	H143003E-G020
2.1 x 30 mm	**3 µm**	H141803E-G030	H140803E-G030	H143003E-G030
2.1 x 50 mm	**3 µm**	H141803E-G050	H140803E-G050	H143003E-G050
2.1 x 100 mm	**3 µm**	H141803E-G100	H140803E-G100	H143003E-G100
2.1 x 150 mm	**3 µm**	H141803E-G150	H140803E-G150	H143003E-G150
3.0 x 30 mm	**3 µm**	H141803E-H030	H140803E-H030	H143003E-H030
3.0 x 50 mm	**3 µm**	H141803E-H050	H140803E-H050	H143003E-H050
3.0 x 100 mm	**3 µm**	H141803E-H100	H140803E-H100	H143003E-H100
3.0 x 150 mm	**3 µm**	H141803E-H150	H140803E-H150	H143003E-H150
4.6 x 50 mm	**3 µm**	H141803E-N050	H140803E-N050	H143003E-N050
4.6 x 100 mm	**3 µm**	H141803E-N100	H140803E-N100	H143003E-N100
4.6 x 150 mm	**3 µm**	H141803E-N150	H140803E-N150	H143003E-N150
2.1 x 30 mm	**5 µm**	H141805E-G030	H140805E-G030	H143005E-G030
2.1 x 50 mm	**5 µm**	H141805E-G050	H140805E-G050	H143005E-G050
2.1 x 100 mm	**5 µm**	H141805E-G100	H140805E-G100	H143005E-G100
2.1 x 150 mm	**5 µm**	H141805E-G150	H140805E-G150	H143005E-G150
2.1 x 250 mm	**5 µm**	H141805E-G250	H140805E-G250	H143005E-G250
3.0 x 30 mm	**5 µm**	H141805E-H030	H140805E-H030	H143005E-H030
3.0 x 50 mm	**5 µm**	H141805E-H050	H140805E-H050	H143005E-H050
3.0 x 100 mm	**5 µm**	H141805E-H100	H140805E-H100	H143005E-H100
3.0 x 150 mm	**5 µm**	H141805E-H150	H140805E-H150	H143005E-H150
3.0 x 250 mm	**5 µm**	H141805E-H250	H140805E-H250	H143005E-H250
4.6 x 30 mm	**5 µm**	H141805E-N030	H140805E-N030	H143005E-N030
4.6 x 50 mm	**5 µm**	H141805E-N050	H140805E-N050	H143005E-N050
4.6 x 100 mm	**5 µm**	H141805E-N100	H140805E-N100	H143005E-N100
4.6 x 150 mm	**5 µm**	H141805E-N150	H140805E-N150	H143005E-N150
4.6 x 250 mm	**5 µm**	H141805E-N250	H140805E-N250	H143005E-N250
10 x 150 mm	**5 µm**	H141805E-Q150	H140805E-Q150	H143005E-Q150
10 x 250 mm	**5 µm**	H141805E-Q250	H140805E-Q250	H143005E-Q250
20 x 50 mm	**5 µm**	H141805E-Y050	H140805E-Y050	H143005E-Y050
20 x 100 mm	**5 µm**	H141805E-Y100	H140805E-Y100	H143005E-Y100
20 x 150 mm	**5 µm**	H141805E-Y150	H140805E-Y150	H143005E-Y150
20 x 250 mm	**5 µm**	H141805E-Y250	H140805E-Y250	H143005E-Y250
30 x 50 mm	**5 µm**	H141805E-V050	H140805E-V050	H143005E-V050
30 x 100 mm	**5 µm**	H141805E-V100	H140805E-V100	H143005E-V100
30 x 150 mm	**5 µm**	H141805E-V150	H140805E-V150	H143005E-V150
30 x 250 mm	**5 µm**	H141805E-V250	H140805E-V250	H143005E-V250
4.6 x 150 mm	**10 µm**	H141807E-N150	H140807E-N150	H143007E-N150
4.6 x 250 mm	**10 µm**	H141807E-N250	H140807E-N250	H143007E-N250
10 x 150 mm	**10 µm**	H141807E-Q150	H140807E-Q150	H143007E-Q150
10 x 250 mm	**10 µm**	H141807E-Q250	H140807E-Q250	H143007E-Q250
20 x 50 mm	**10 µm**	H141807E-T050	H140807E-Y050	H143007E-Y050
20 x 100 mm	**10 µm**	H141807E-Y100	H140807E-Y100	H143007E-Y100
20 x 150 mm	**10 µm**	H141807E-Y150	H140807E-Y150	H143007E-Y150
20 x 250 mm	**10 µm**	H141807E-Y250	H140807E-Y250	H143007E-Y250
30 x 50 mm	**10 µm**	H141807E-V050	H140807E-V050	H143007E-V050
30 x 100 mm	**10 µm**	H141807E-V100	H140807E-V100	H143007E-V100
30 x 150 mm	**10 µm**	H141807E-V150	H140807E-V150	H143007E-V150
30 x 250 mm	**10 µm**	H141807E-V250	H140807E-V250	H143007E-V250
50 x 50 mm	**10 µm**	H141807E-W050	H140807E-W050	H143007E-W050
50 x 100 mm	**10 µm**	H141807E-W100	H140807E-W100	H143007E-W100
50 x 150 mm	**10 µm**	H141807E-W150	H140807E-W150	H143007E-W150
50 x 250 mm	**10 µm**	H141807E-W250	H140807E-W250	H143007E-W250

*HPLC columns are sold in pack of one column. Other dimensions and/or particle sizes are available on a custom basis. Contact us.

SiliaChrom dt Guard Cartridges Ordering Information

SiliaChrom dt Guard Cartridge Ordering Information					
Dimension	Particle Size (µm)	SiliaChrom dt C18	SiliaChrom dt C8	SiliaChrom dt Silica	SiliaChrom Guard Holder
4.0 x 10 mm	3 µm	HG141803E-N010	HG140803E-N010	HG143003E-N010	**SiliaChrom Guard Cartridges Package Information:** - 2.1 and 4.0 mm Guard Cartridges are sold in pack of 4 cartridges - 10 mm Guard Cartridges is sold in pack of 2 cartridges - 21.2 and 30 mm Guard Cartridges are sold in pack of 1 cartridge **SiliaChrom Guard Holder information:** - HPH-N010 (*for 2.1 x 10 mm & 4.0 x 10 mm Guard Cartridges*) - HPH-N020 (*for 2.1 x 20 mm & 4.0 x 20 mm Guard Cartridges*) - HPH-Q010 (*for 10 x 10 mm Guard Cartridges*) - HPH-T010 (*for 21.2 x 10 mm Guard Cartridges*) - HPH-V010 (*for 30 x 10 mm Guard Cartridges*) *Other dimensions and particle sizes could be available on a custom basis. Contact us
4.0 x 10 mm	5 µm	HG141805E-N010	HG140805E-N010	HG143005E-N010	
10 x 10 mm	5 µm	HG141805E-Q010	HG140805E-Q010	HG143005E-Q010	
21.2 x 10 mm	5 µm	HG141805E-T010	HG140805E-T010	HG143005E-T010	
30 x 10 mm	5 µm	HG141805E-V010	HG140805E-V010	HG143005E-V010	
4.0 x 10 mm	10 µm	HG141807E-N010	HG140807E-N010	HG143007E-N010	
10 x 10 mm	10 µm	HG141807E-Q010	HG140807E-Q010	HG143007E-Q010	
21.2 x 10 mm	10 µm	HG141807E-T010	HG140807E-T010	HG143007E-T010	
30 x 10 mm	10 µm	HG141807E-V010	HG140807E-V010	HG143007E-V010	

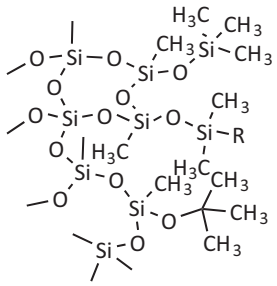
Silia*Chrom* XT & XT Fidelity Family

Description

Silia*Chrom* XT and XT Fidelity phases are coated with a monomeric methyltriethoxysilane/tetraethoxysilane prepolymer and submitted to a special thermic treatment to get a rigid surface. This hybrid surface is less soluble at high pH than silica, allowing separations at pH up to 12.

Silia*Chrom* XT and XT Fidelity are available in 3, 5 & 10 µm.

Structure



R = $(CH_2)_{17}CH_3$

Silia*Chrom* XT Family Main Characteristics

- Excellent durability at high pH (*up to 12*)
- Ideal for basic compounds
- Double endcapped

Silia*Chrom* XT & XT Fidelity Sorbent Characteristics

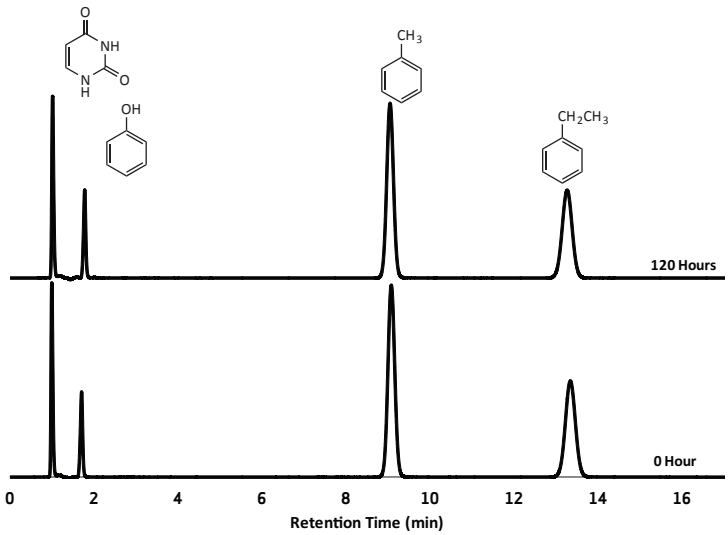
Silia*Chrom* XT & XT Fidelity Sorbent Characteristics						
Silia*Chrom* Phases	Description	USP Code	%C	Pore Size (Å)	Surface Area (m^2/g)	pH Stability Range
Reversed-Phases						
Silia*Chrom* XT C18	Stable at high pH, ideal for separation of basic analytes highly hydrophobic.	L1	15	150	200	1.5 - 12.0
Silia*Chrom* XT Fidelity C18	Stable at high pH, ideal for separation of basic analytes less hydrophobic.	L1	21	100	380	1.5 - 12.0

Stability of SiliaChrom XT C18 Fidelity at High pH Conditions

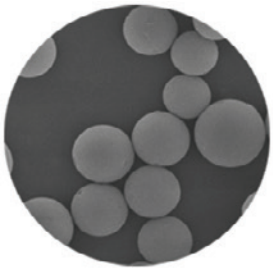
For some applications, it is necessary to work at high pH to increase the selectivity or to optimize peak shape. This is the case with basic organic compounds *(pK_a > 9.0)*. It is the reason why it is important to have chromatographic phases stable at alkaline pH. This study demonstrates the stability of the SiliaChrom XT C18 Fidelity at high pH.

Chromatographic conditions

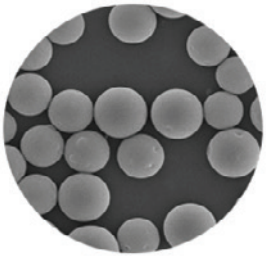
Column:	SiliaChrom XT C18 Fidelity, 5 µm
Column size:	4.6 x 150 mm
SiliCycle PN:	HF171805H-N150
Mobile phase:	0.2% TEA in ACN/water *(55/45) (v/v)* Solution pH: 11.5
Temperature:	23°C
Flow rate:	1.000 mL/min
Detector:	UV at 270 nm



SiliaChrom XT C18 Fidelity (*Ethylbenzene*)			
Time (*hour*)	RT (*min*)	TF (*USP*)	N (*USP*)
0	13.35	1.01	13,623
24	13.29	1.01	13,648
48	13.27	1.01	13,689
72	13.25	1.00	13,604
96	13.24	1.00	13,649
120	13.28	1.00	13,582
Mean	13.28	1.01	13,633
RSD (%)	0.29	0.54	0.28



SiliaChrom XT C18 Fidelity before



SiliaChrom XT C18 Fidelity after

The HPLC column was used under extreme pH conditions, and even after 5 days of continuous injections, the number of theoretical plates *(N)*, the tailing factor *(TF)* and the retention times *(RT)* remain constant. The sorbent kept its chemical and structural integrity, which we have proven with similar chromatograms and scanning electron microscope *(SEM)* pictures before and after 120 hours of use.

In conclusion, our SiliaChrom XT C18 Fidelity column is stable at high pH conditions.

« The high quality nature of the HPLC columns and plates from SiliCycle has allowed us to achieve a level of reproducibility with our compound libraries that would be unheard of with any other production line. »

Steven Marois from Boston University CMLD, Boston, MA, USA

SiliaChrom XT HPLC Columns Ordering Information

SiliaChrom XT HPLC Column Ordering Information							
Dimension	Particle Size (µm)	SiliaChrom XT C18	SiliaChrom XT C18 Fidelity	Dimension	Particle Size (µm)	SiliaChrom XT C18	SiliaChrom XT C18 Fidelity
2.1 x 20 mm	3 µm	H171803H-G020	HF171803E-G020	10 x 150 mm	5 µm	H171805H-Q150	HF171805E-Q150
2.1 x 30 mm	3 µm	H171803H-G030	HF171803E-G030	10 x 250 mm	5 µm	H171805H-Q250	HF171805E-Q250
2.1 x 50 mm	3 µm	H171803H-G050	HF171803E-G050	20 x 50 mm	5 µm	H171805H-Y050	HF171805E-T050
2.1 x 100 mm	3 µm	H171803H-G100	HF171803E-G100	20 x 100 mm	5 µm	H171805H-Y100	HF171805E-Y100
2.1 x 150 mm	3 µm	H171803H-G150	HF171803E-G150	20 x 150 mm	5 µm	H171805H-Y150	HF171805E-Y150
3.0 x 30 mm	3 µm	H171803H-H030	HF171803E-H030	20 x 250 mm	5 µm	H171805H-Y250	HF171805E-Y250
3.0 x 50 mm	3 µm	H171803H-H050	HF171803E-H050	30 x 100 mm	5 µm	H171805H-V100	HF171805E-V100
3.0 x 100 mm	3 µm	H171803H-H100	HF171803E-H100	30 x 150 mm	5 µm	H171805H-V150	HF171805E-V150
3.0 x 150 mm	3 µm	H171803H-H150	HF171803E-H150	30 x 250 mm	5 µm	H171805H-V250	HF171805E-V250
4.6 x 50 mm	3 µm	H171803H-N050	HF171803E-N050	4.6 x 150 mm	10 µm	H171807H-N150	HF171807E-N150
4.6 x 100 mm	3 µm	H171803H-N100	HF171803E-N100	4.6 x 250 mm	10 µm	H171807H-N250	HF171807E-N250
4.6 x 150 mm	3 µm	H171803H-N150	HF171803E-N150	10 x 150 mm	10 µm	H171807H-Q150	HF171807E-Q150
4.6 x 250 mm	3 µm	H171803H-N250	HF171803E-N250	10 x 250 mm	10 µm	H171807H-Q250	HF171807E-Q250
2.1 x 30 mm	5 µm	H171805H-G030	HF171805E-G030	20 x 50 mm	10 µm	H171807H-Y050	HF171807E-Y050
2.1 x 50 mm	5 µm	H171805H-G050	HF171805E-G050	20 x 150 mm	10 µm	H171807H-Y150	HF171807E-Y150
2.1 x 100 mm	5 µm	H171805H-G100	HF171805E-G100	20 x 250 mm	10 µm	H171807H-Y250	HF171807E-Y250
2.1 x 150 mm	5 µm	H171805H-G150	HF171805E-G150	30 x 100 mm	10 µm	H171807H-V100	HF171807E-V100
3.0 x 30 mm	5 µm	H171805H-H030	HF171805E-H030	30 x 150 mm	10 µm	H171807H-V150	HF171807E-V150
3.0 x 50 mm	5 µm	H171805H-H050	HF171805E-H050	30 x 250 mm	10 µm	H171807H-V250	HF171807E-V250
3.0 x 100 mm	5 µm	H171805H-H100	HF171805E-H100	50 x 150 mm	10 µm	H171807H-W150	HF171807E-W150
3.0 x 150 mm	5 µm	H171805H-H150	HF171805E-H150	50 x 250 mm	10 µm	H171807H-W250	HF171807E-W250
4.6 x 50 mm	5 µm	H171805H-N050	HF171805E-N050				
4.6 x 100 mm	5 µm	H171805H-N100	HF171805E-N100				
4.6 x 150 mm	5 µm	H171805H-N150	HF171805E-N150				
4.6 x 250 mm	5 µm	H171805H-N250	HF171805E-N250				

*HPLC columns are sold in pack of one column. Other dimensions and/or particle sizes are available on a custom basis. Contact us

SiliaChrom XT Guard Cartridges Ordering Information

SiliaChrom XT Guard Cartridge Ordering Information				
Dimension	Particle Size (µm)	SiliaChrom XT C18	SiliaChrom XT C18 Fidelity	SiliaChrom Guard Holder
4.0 x 10 mm	3 µm	HG171803H-N010	HFG171803E-N010	**SiliaChrom Guard Cartridges Package Information:** - 2.1 and 4.0 mm Guard Cartridges are sold in pack of 4 cartridges - 10 mm Guard Cartridges is sold in pack of 2 cartridges - 21.2 and 30 mm Guard Cartridges are sold in pack of 1 cartridge **SiliaChrom Guard Holder information:** - HPH-N010 (*for 2.1 x 10 mm & 4.0 x 10 mm Guard Cartridges*) - HPH-N020 (*for 2.1 x 20 mm & 4.0 x 20 mm Guard Cartridges*) - HPH-Q010 (*for 10 x 10 mm Guard Cartridges*) - HPH-T010 (*for 21.2 x 10 mm Guard Cartridges*) - HPH-V010 (*for 30 x 10 mm Guard Cartridges*) *Other dimensions and particle sizes could be available on a custom basis. Contact us.
4.0 x 10 mm	5 µm	HG171805H-N010	HFG171805E-N010	
10 x 10 mm	5 µm	HG171805H-Q010	HFG171805E-Q010	
21.2 x 10 mm	5 µm	HG171805H-T010	HFG171805E-T010	
30 x 10 mm	5 µm	HG171805H-V010	HFG171805E-V010	
4.0 x 10 mm	10 µm	HG171807H-N010	HFG171807E-N010	
10 x 10 mm	10 µm	HG171807H-Q010	HFG171807E-Q010	
21.2 x 10 mm	10 µm	HG171807H-T010	HFG171807E-T010	
30 x 10 mm	10 µm	HG171807H-V010	HFG171807E-V010	

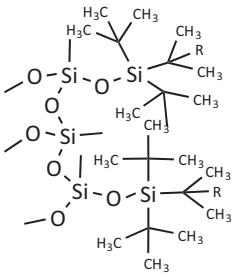
SiliaChrom SB Family

Description

SiliaChrom SB phases are treated with an organic form of silicon to increase the number of silanol on the surface, the surface is then bonded with a group acting like a shield and protecting the surface from any acid attack from the mobile phase (*thanks to this steric shield, the H_3O^+ ion can't access to the surface to break the O-Si bond*).

All SiliaChrom SB columns are available in 3, 5 & 10 µm.

Structure



For C18: R = $(CH_2)_{17}CH_3$
For C8: R = $(CH_2)_7CH_3$

SiliaChrom SB Family Main Characteristics

- Extremely low pH limits *(0.5 - 7.5)*
- Compatible with 100% aqueous and 100% organic mobile phases
- Extremely low bleeding for LC-MS applications under acidic conditions
- Non endcapped

SiliaChrom SB Sorbent Characteristics

SiliaChrom SB Sorbent Characteristics

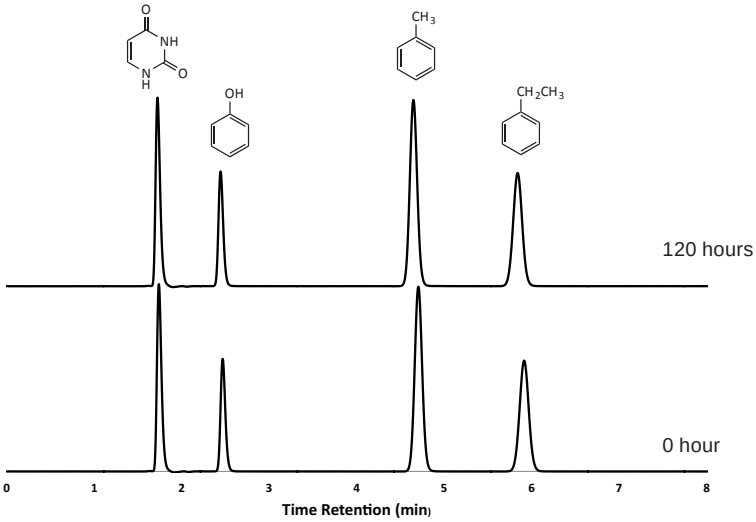
SiliaChrom Phases	Description	USP Code	%C	Pore Size (Å)	Surface Area (m^2/g)	pH Stability Range
Reversed-Phases						
SiliaChrom SB C18	Mid-level hydrophobicity, stable at very low pH.	L1	12	150	200	0.5 - 7.5
SiliaChrom SB C18-300		L1	5	300	80	0.5 - 7.5
SiliaChrom SB C8	Rather low hydrophobicity, stable at very low pH.	L7	7	150	200	1.0 - 7.5
SiliaChrom SB C8-300		L7	3	300	80	1.0 - 7.5

Stability of Silia*Chrom* SB C18 at Low pH Conditions

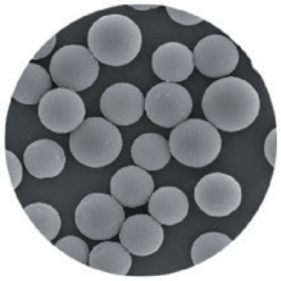
Acidic mobile phases have widespread applications in the reversed phase HPLC separation of many important pharmaceutical and environmental compounds. Analytes such as pharmaceuticals and biomolecules often show peak shape, retention and selectivity changes when the mobile phase pH is changed from neutral to acidic pH *(pH 1.0)*. In fact, lowering the pH helps to suppress silanol interactions between basic compounds and the residual surface silanols, thus resulting in less tailing and better retention of acidic compounds *(pK_a lower than 2)*.

Chromatographic conditions

Column:	Silia*Chrom* SB C18, 5 µm
Column size:	4.6 x 150 mm
SiliCycle PN:	H101805H-N150
Mobile phase:	2% TFA in ACN/water *(60/40)* Solution pH: 1.00
Temperature:	23°C
Flow rate:	1.000 mL/min
Detector:	UV at 270 nm
Injection volume:	10 µL

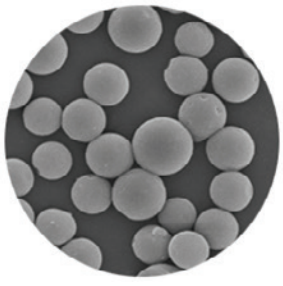


Silia*Chrom* SB C18 (*Ethylbenzene*)			
Time (*hour*)	RT (*min*)	TF (*USP*)	N (*USP*)
0	5.91	1.01	14,014
24	5.89	1.02	14,085
48	5.77	1.02	14,023
72	5.83	1.02	14,076
96	5.85	1.01	14,087
120	5.84	1.02	14,050
Mean	5.85	1.02	14,056
RSD (%)	0.84	0.51	0.23



Silia*Chrom* SB C18 before

No column degradation under extreme pH conditions



Silia*Chrom* SB C18 after

The HPLC column was used under extreme pH conditions and, even after 5 days of continuous injections, the number of theoretical plates *(N)*, the tailing factor *(TF)* and the retention time *(RT)* are comparable. The sorbent kept its chemical and structural integrity, which we have proven with similar chromatograms and scanning electron microscope pictures *(SEM)* before and after 120 hours of use.

In conclusion, our Silia*Chrom* SB C18 and SB C8 columns are stable at low pH conditions.

SiliaChrom SB HPLC Columns Ordering Information

SiliaChrom SB HPLC Column Ordering Information					
Dimension	Particle Size (µm)	SiliaChrom SB C18	SiliaChrom SB C18-300	SiliaChrom SB C8	SiliaChrom SB C8-300
2.1 x 30 mm	3 µm	H101803H-G030	H101803M-G030	H100803H-G030	H100803M-G030
2.1 x 50 mm	3 µm	H101803H-G050	H101803M-G050	H100803H-G050	H100803M-G050
2.1 x 100 mm	3 µm	H101803H-G100	H101803M-G100	H100803H-G100	H100803M-G100
2.1 x 150 mm	3 µm	H101803H-G150	H101803M-G150	H100803H-G150	H100803M-G150
3.0 x 30 mm	3 µm	H101803H-H030	H101803M-H030	H100803H-H030	H100803M-H030
3.0 x 50 mm	3 µm	H101803H-H050	H101803M-H050	H100803H-H050	H100803M-H050
3.0 x 100 mm	3 µm	H101803H-H100	H101803M-H100	H100803H-H100	H100803M-H100
3.0 x 150 mm	3 µm	H101803H-H150	H101803M-H150	H100803H-H150	H100803M-H150
4.6 x 50 mm	3 µm	H101803H-N050	H101803M-N050	H100803H-N050	H100803M-N050
4.6 x 100 mm	3 µm	H101803H-N100	H101803M-N100	H100803H-N100	H100803M-N100
4.6 x 150 mm	3 µm	H101803H-N150	H101803M-N150	H100803H-N150	H100803M-N150
4.6 x 250 mm	3 µm	H101803H-N250	H101803M-N250	H100803H-N250	H100803M-N250
2.1 x 30 mm	5 µm	H101805H-G030	H101805M-G030	H100805H-G030	H100805M-G030
2.1 x 50 mm	5 µm	H101805H-G050	H101805M-G050	H100805H-G050	H100805M-G050
2.1 x 100 mm	5 µm	H101805H-G100	H101805M-G100	H100805H-G100	H100805M-G100
2.1 x 150 mm	5 µm	H101805H-G150	H101805M-G150	H100805H-G150	H100805M-G150
3.0 x 30 mm	5 µm	H101805H-H030	H101805M-H030	H100805H-H030	H100805M-H030
3.0 x 50 mm	5 µm	H101805H-H050	H101805M-H050	H100805H-H050	H100805M-H050
3.0 x 100 mm	5 µm	H101805H-H100	H101805M-H100	H100805H-H100	H100805M-H100
3.0 x 150 mm	5 µm	H101805H-H150	H101805M-H150	H100805H-H150	H100805M-H150
4.6 x 50 mm	5 µm	H101805H-N050	H101805M-N050	H100805H-N050	H100805M-N050
4.6 x 100 mm	5 µm	H101805H-N100	H101805M-N100	H100805H-N100	H100805M-N100
4.6 x 150 mm	5 µm	H101805H-N150	H101805M-N150	H100805H-N150	H100805M-N150
4.6 x 250 mm	5 µm	H101805H-N250	H101805M-N250	H100805H-N250	H100805M-N250
10 x 150 mm	5 µm	H101805H-Q150	H101805M-Q150	H100805H-Q150	H100805M-Q150
10 x 250 mm	5 µm	H101805H-Q250	H101805M-Q250	H100805H-Q250	H100805M-Q250
20 x 50 mm	5 µm	H101805H-Y050	H101805M-Y050	H100805H-Y050	H100805M-Y050
20 x 100 mm	5 µm	H101805H-Y100	H101805M-Y100	H100805H-Y100	H100805M-Y100
20 x 150 mm	5 µm	H101805H-Y150	H101805M-Y150	H100805H-Y150	H100805M-Y150
20 x 250 mm	5 µm	H101805H-Y250	H101805M-Y250	H100805H-Y250	H100805M-Y250
30 x 100 mm	5 µm	H101805H-V100	H101805M-V100	H100805H-V100	H100805M-V100
30 x 150 mm	5 µm	H101805H-V150	H101805M-V150	H100805H-V150	H100805M-V150
30 x 250 mm	5 µm	H101805H-V250	H101805M-V250	H100805H-V250	H100805M-V250
4.6 x 150 mm	10 µm	H101807H-N150	H101807M-N150	H100807H-N150	H100807M-N150
4.6 x 250 mm	10 µm	H101807H-N250	H101807M-N250	H100807H-N250	H100807M-N250
10 x 150 mm	10 µm	H101807H-Q150	H101807M-Q150	H100807H-Q150	H100807M-Q150
10 x 250 mm	10 µm	H101807H-Q250	H101807M-Q250	H100807H-Q250	H100807M-Q250
20 x 50 mm	10 µm	H101807H-Y050	H101807M-Y050	H100807H-Y050	H100807M-Y050
20 x 150 mm	10 µm	H101807H-Y150	H101807M-Y150	H100807H-Y150	H100807M-Y150
20 x 250 mm	10 µm	H101807H-Y250	H101807M-Y250	H100807H-Y250	H100807M-Y250
30 x 100 mm	10 µm	H101807H-V100	H101807M-V100	H100807H-V100	H100807M-V100
30 x 150 mm	10 µm	H101807H-V150	H101807M-V150	H100807H-V150	H100807M-V150
30 x 250 mm	10 µm	H101807H-V250	H101807M-V250	H100807H-V250	H100807M-V250
50 x 150 mm	10 µm	H101807H-W150	H101807M-W150	H100807H-W150	H100807M-W150
50 x 250 mm	10 µm	H101807H-W250	H101807M-W250	H100807H-W250	H100807M-W250

*HPLC columns are sold in pack of one column. Other dimensions and/or particle sizes are available on a custom basis. Contact us.

SiliaChrom SB Guard Cartridges Columns Ordering Information

SiliaChrom SB Guard Cartridge Ordering Information						
Dimension	Particle Size (µm)	SiliaChrom SB C18	SiliaChrom SB C18-300	SiliaChrom SB C8	SiliaChrom SB C8-300	SiliaChrom Guard Holder
4.0 x 10 mm	3 µm	HG101803H-N010	HG101803M-N010	HG100803H-N010	HG100803M-N010	
4.0 x 10 mm	5 µm	HG101805H-N010	HG101805M-N010	HG100805H-N010	HG100805M-N010	**SiliaChrom Guard Holder information:** - HPH-N010 (*for 2.1 x 10 mm & 4.0 x 10 mm Guard*) - HPH-N020 (*for 2.1 x 20 mm & 4.0 x 20 mm Guard*) - HPH-Q010 (*for 10 x 10 mm Guard*) - HPH-T010 (*for 21.2 x 10 mm Guard*) - HPH-V010 (*for 30 x 10 mm Guard*) *Other dimensions and particle sizes could be available on a custom basis. Contact us.
10 x 10 mm	5 µm	HG101805H-Q010	HG101805M-Q010	HG100805H-Q010	HG100805M-Q010	
21.2 x 10 mm	5 µm	HG101805H-T010	HG101805M-T010	HG100805H-T010	HG100805M-T010	
30 x 10 mm	5 µm	HG101805H-V010	HG101805M-V010	HG100805H-V010	HG100805M-V010	
4.0 x 10 mm	10 µm	HG101807H-N010	HG101807M-N010	HG100807H-N010	HG100807M-N010	
10 x 10 mm	10 µm	HG101807H-Q010	HG101807M-Q010	HG100807H-Q010	HG100807M-Q010	
21.2 x 10 mm	10 µm	HG101807H-T010	HG101807M-T010	HG100807H-T010	HG100807M-T010	
30 x 10 mm	10 µm	HG101807H-V010	HG101807M-V010	HG100807H-V010	HG100807M-V010	

Note: 2.1 and 4.0 mm Guard Cartridges are sold in pack of 4 cartridges; 10 mm is sold in pack of 2 cartridges; 21.2 and 30 mm are sold in pack of 1 cartridge

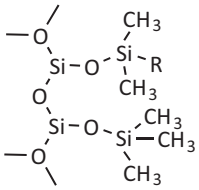
Silia*Chrom* XDB1 Family

Description

Silia*Chrom* XDB1 phases offer a wide range of hydrophobicity with phases from C18 to C1. The high bonding density allows for a really inert phase with few secondary interactions between analytes and free silanols remaining on the silica surface. These phases are recommended for samples containing small mid-hydrophobic compounds.

All SiliaChrom XDB1 columns are available in 3, 5 & 10 µm.

Structure



For C18: R = $(CH_2)_{17}CH_3$
For C8: R = $(CH_2)_7CH_3$
For C1: R = CH_3

Silia*Chrom* XDB1 Family Main Characteristics

- Inert phase, very few secondary interactions
- High loading capacity
- Great column-to-column and batch-to-batch reproducibility
- Double endcapped

Silia*Chrom* XDB1 Sorbent Characteristics

Silia*Chrom* XDB1 Sorbent Characteristics						
Silia*Chrom* Phases	**Description**	**USP Code**	**%C**	**Pore Size (Å)**	**Surface Area (m^2/g)**	**pH Stability Range**
Reversed-Phases						
Silia*Chrom* XDB1 C18	Maximum hydrophobicity and efficiency for dirty samples.	L1	22	100	380 - 400	1.5 - 10.0
Silia*Chrom* XDB1 C18-300		L1	8	300	80	1.5 - 9.0
Silia*Chrom* XDB1 C8	Exceptionally stable with high bonding coverage and low silanol activity.	L7	14	100	380 - 400	1.5 - 8.5
Silia*Chrom* XDB1 C8-300		L7	4	300	80	1.5 - 8.5
Silia*Chrom* XDB1 C1		L13	3	100	380 - 400	1.5 - 8.5
Silia*Chrom* XDB1 C1-300		L13	1	300	80	1.5 - 8.5

SiliaChrom XDB1 HPLC Columns Ordering Information

SiliaChrom XDB1 HPLC Column Ordering Information							
Dimension	Particle Size (µm)	SiliaChrom XDB1 C18	SiliaChrom XDB1 C18-300	SiliaChrom XDB1 C8	SiliaChrom XDB1 C8-300	SiliaChrom XDB1 C1	SiliaChrom XDB1 C1-300
2.1 x 30 mm	3 µm	H121803E-G030	-	H120803E-G030	-	-	-
2.1 x 50 mm	3 µm	H121803E-G050	-	H120803E-G050	-	-	-
2.1 x 100 mm	3 µm	H121803E-G100	-	H120803E-G100	-	-	-
2.1 x 150 mm	3 µm	H121803E-G150	-	H120803E-G150	-	-	-
3.0 x 30 mm	3 µm	H121803E-H030	-	H120803E-H030	-	-	-
3.0 x 50 mm	3 µm	H121803E-H050	-	H120803E-H050	-	-	-
3.0 x 100 mm	3 µm	H121803E-H100	-	H120803E-H100	-	-	-
3.0 x 150 mm	3 µm	H121803E-H150	-	H120803E-H150	-	-	-
4.6 x 50 mm	3 µm	H121803E-N050	-	H120803E-N050	-	-	-
4.6 x 100 mm	3 µm	H121803E-N100	-	H120803E-N100	-	-	-
4.6 x 150 mm	3 µm	H121803E-N150	-	H120803E-N150	-	-	-
4.6 x 250 mm	3 µm	H121803E-N250	-	H120803E-N250	-	-	-
2.1 x 30 mm	5 µm	H121805E-G030	H121805M-G030	H120805E-G030	H120805M-G030	H120105E-G030	H120105M-G030
2.1 x 50 mm	5 µm	H121805E-G050	H121805M-G050	H120805E-G050	H120805M-G050	H120105E-G050	H120105M-G050
2.1 x 100 mm	5 µm	H121805E-G100	H121805M-G100	H120805E-G100	H120805M-G100	H120105E-G100	H120105M-G100
2.1 x 150 mm	5 µm	H121805E-G150	H121805M-G150	H120805E-G150	H120805M-G150	H120105E-G150	H120105M-G150
3.0 x 30 mm	5 µm	H121805E-H030	H121805M-H030	H120805E-H030	H120805M-H030	H120105E-H030	H120105M-H030
3.0 x 50 mm	5 µm	H121805E-H050	H121805M-H050	H120805E-H050	H120805M-H050	H120105E-H050	H120105M-H050
3.0 x 100 mm	5 µm	H121805E-H100	H121805M-H100	H120805E-H100	H120805M-H100	H120105E-H100	H120105M-H100
3.0 x 150 mm	5 µm	H121805E-H150	H121805M-H150	H120805E-H150	H120805M-H150	H120105E-H150	H120105M-H150
4.6 x 50 mm	5 µm	H121805E-N050	H121805M-N050	H120805E-N050	H120805M-N050	H120105E-N050	H120105M-N050
4.6 x 100 mm	5 µm	H121805E-N100	H121805M-N100	H120805E-N100	H120805M-N100	H120105E-N100	H120105M-N100
4.6 x 150 mm	5 µm	H121805E-N150	H121805M-N150	H120805E-N150	H120805M-N150	H120105E-N150	H120105M-N150
4.6 x 250 mm	5 µm	H121805E-N250	H121805M-N250	H120805E-N250	H120805M-N250	H120105E-N250	H120105M-N250
10 x 150 mm	5 µm	H121805E-Q150	H121805M-Q150	H120805E-Q150	H120805M-Q150	H120105E-Q150	H120105M-Q150
10 x 250 mm	5 µm	H121805E-Q250	H121805M-Q250	H120805E-Q250	H120805M-Q250	H120105E-Q250	H120105M-Q250
20 x 50 mm	5 µm	H121805E-Y050	H121805M-Y050	H120805E-Y050	H120805M-Y050	H120105E-Y050	H120105M-Y050
20 x 100 mm	5 µm	H121805E-Y100	H121805M-Y100	H120805E-Y100	H120805M-Y100	H120105E-Y100	H120105M-Y100
20 x 150 mm	5 µm	H121805E-Y150	H121805M-Y150	H120805E-Y150	H120805M-Y150	H120105E-Y150	H120105M-Y150
20 x 250 mm	5 µm	H121805E-Y250	H121805M-Y250	H120805E-Y250	H120805M-Y250	H120105E-Y250	H120105M-Y250
30 x 100 mm	5 µm	H121805E-V100	-	H120805E-V100	-	-	-
30 x 150 mm	5 µm	H121805E-V150	-	H120805E-V150	-	-	-
30 x 250 mm	5 µm	H121805E-V250	-	H120805E-V250	-	-	-
4.6 x 150 mm	10 µm	H121807E-N150	-	H120807E-N150	-	-	-
4.6 x 250 mm	10 µm	H121807E-N250	-	H120807E-N250	-	-	-
10 x 150 mm	10 µm	H121807E-Q150	-	H120807E-Q150	-	-	-
10 x 250 mm	10 µm	H121807E-Q250	-	H120807E-Q250	-	-	-
20 x 50 mm	10 µm	H121807E-Y050	-	H120807E-Y050	-	-	-
20 x 150 mm	10 µm	H121807E-Y150	-	H120807E-Y150	-	-	-
20 x 250 mm	10 µm	H121807E-Y250	-	H120807E-Y250	-	-	-
30 x 100 mm	10 µm	H121807E-V100	-	H120807E-V100	-	-	-
30 x 150 mm	10 µm	H121807E-V150	-	H120807E-V150	-	-	-
30 x 250 mm	10 µm	H121807E-V250	-	H120807E-V250	-	-	-
50 x 150 mm	10 µm	H121807E-W150	-	H120807E-W150	-	-	-
50 x 250 mm	10 µm	H121807E-W250	-	H120807E-W250	-	-	-

*HPLC columns are sold in pack of one column. Other dimensions and/or particle sizes are available on a custom basis. Contact us.

SiliaChrom XDB1 Guard Cartridges Columns Ordering Information

SiliaChrom XDB1 Guard Cartridge Ordering Information							
Dimension	Particle Size (µm)	SiliaChrom XDB1 C18	SiliaChrom XDB1 C18-300	SiliaChrom XDB1 C8	SiliaChrom XDB1 C8-300	SiliaChrom XDB1 C1	SiliaChrom XDB1 C1-300
4.0 x 10 mm	3 µm	HG121803E-N010	-	HG120803E-N010	HG120803M-N010	-	-
4.0 x 10 mm	5 µm	HG121805E-N010	HG121805M-N010	HG120805E-N010	HG120805M-N010	HG120105E-N010	HG120105M-N010
10 x 10 mm	5 µm	HG121805E-Q010	HG121805M-Q010	HG120805E-Q010	HG120805M-Q010	HG120105E-Q010	HG120105M-Q010
21.2 x 10 mm	5 µm	HG121805E-T010	HG121805M-T010	HG120805E-T010	HG120805M-T010	HG120105E-T010	HG120105M-T010
30 x 10 mm	5 µm	HG121805E-V010	HG121805M-V010	HG120805E-V010	HG120805M-V010	HG120105E-V010	HG120105M-V010
4.0 x 10 mm	10 µm	HG121807E-N010	-	HG120807E-N010	-	-	-
10 x 10 mm	10 µm	HG121807E-Q010	-	HG120807E-Q010	-	-	-
21.2 x 10 mm	10 µm	HG121807E-T010	-	HG120807E-T010	-	-	-
30 x 10 mm	10 µm	HG121807E-V010	-	HG120807E-V010	-	-	-

Note: 2.1 and 4.0 mm Guard Cartridges are sold in pack of 4 cartridges; 10 mm is sold in pack of 2 cartridges; 21.2 and 30 mm are sold in pack of 1 cartridge

Silia*Chrom* XDB & XDB2 Family

Description

Silia*Chrom* XDB phases present a larger pore size and a lower surface area than the other SiliCycle's brands. So Silia*Chrom* XDB reversed-phase columns allow the separation of large hydrophobic molecules with shorter retention times.

All Silia*Chrom* XDB columns are available 5 µm.

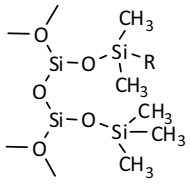
Silia*Chrom* XDB2 C18 is designed to be a universal QC column, with a standard 18% carbon load to avoid excessive retention of hydrophobic compounds.

Silia*Chrom* XDB2 is available in 3, 5 & 10 µm.

Silia*Chrom* XDB2 Family Main Characteristics

- Strong separation power for isomers
- Double endcapped

Structure



For C18: R = $(CH_2)_{17}CH_3$
For C8: R = $(CH_2)_7CH_3$

Silia*Chrom* XDB Family Main Characteristics

- High loading capacity
- Low surface area, allowing shorter retention times for large hydrophobic molecules
- Ideal for separation of barbiturates, fat soluble vitamins, fatty acids and steroids
- Double endcapped

Silia*Chrom* XDB & XDB2 Sorbent Characteristics

Silia*Chrom* XDB & XDB2 Sorbent Characteristics

Silia*Chrom* Phases	Description	USP Code	%C	Pore Size (Å)	Surface Area (m^2/g)	pH Stability Range
Reversed-Phases						
Silia*Chrom* XDB C18	Separation of large hydrophobic molecules with shorter retention times.	L1	15	150	200	1.5 - 9.0
Silia*Chrom* XDB C8		L7	8	150	200	1.5 - 9.0
Silia*Chrom* XDB2 C18	Balanced hydrophobic adsorption to avoid excessive retention.	L1	18	100	380 - 400	1.5 - 9.0
Normal Phases						
Silia*Chrom* XDB Silica	Separation of polar analytes with normal phase conditions.	L3	-	150	200	1.5 - 9.0

Resolution and Peak Shape of a Highly Hydrophobic Domestic Insecticide

Environment

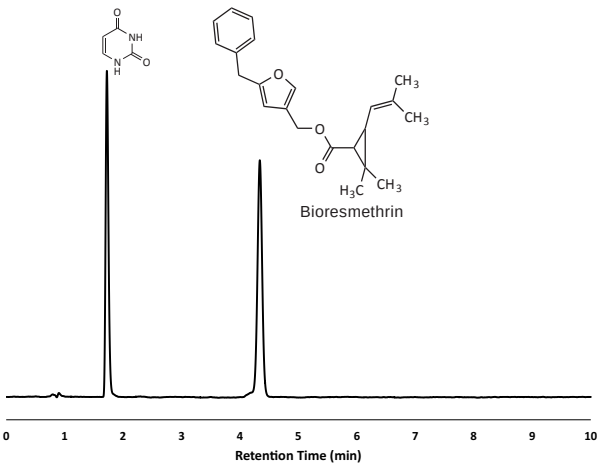
This application illustrates the high separation efficiency of the Silia*Chrom* XDB C18 for very hydrophobic compounds.

Chromatographic conditions

Column:	Silia*Chrom* XDB C18, 5 µm
Column size:	4.6 x 150 mm
SiliCycle PN:	H111805H-N150
Mobile phase:	ACN/water *(90/10)*
Temperature:	23°C
Flow rate:	1.000 mL/min
Detector:	UV at 235 nm
Injection Volume:	1 µL

Column Performance Results

Asymmetry Factor: 1.03
Theoretical Plates: 14,090



SiliaChrom XDB & XDB2 HPLC Columns Ordering Information

SiliaChrom XDB & XDB2 HPLC Column Ordering Information					
Dimension	Particle Size (µm)	SiliaChrom XDB C18	SiliaChrom XDB C8	SiliaChrom XDB2 C18	SiliaChrom XDB Silica
2.1 x 30 mm	3 µm	-	-	H131803E-G030	
2.1 x 50 mm	3 µm	-	-	H131803E-G050	
2.1 x 100 mm	3 µm	-	-	H131803E-G100	
2.1 x 150 mm	3 µm	-	-	H131803E-G150	
3.0 x 30 mm	3 µm	-	-	H131803E-H030	
3.0 x 50 mm	3 µm	-	-	H131803E-H050	
3.0 x 100 mm	3 µm	-	-	H131803E-H100	
3.0 x 150 mm	3 µm	-	-	H131803E-H150	
4.6 x 50 mm	3 µm	-	-	H131803E-N050	
4.6 x 100 mm	3 µm	-	-	H131803E-N100	
4.6 x 150 mm	3 µm	-	-	H131803E-N150	
4.6 x 250 mm	3 µm	-	-	H131803E-N250	
2.1 x 30 mm	5 µm	H111805H-G030	H110805H-G030	H131805E-G030	H110005H-G030
2.1 x 50 mm	5 µm	H111805H-G050	H110805H-G050	H131805E-G050	H110005H-G050
2.1 x 100 mm	5 µm	H111805H-G100	H110805H-G100	H131805E-G100	H110005H-G100
2.1 x 150 mm	5 µm	H111805H-G150	H110805H-G150	H131805E-G150	H110005H-G150
3.0 x 30 mm	5 µm	H111805H-H030	H110805H-H030	H131805E-H030	H110005H-H030
3.0 x 50 mm	5 µm	H111805H-H050	H110805H-H050	H131805E-H050	H110005H-H050
3.0 x 100 mm	5 µm	H111805H-H100	H110805H-H100	H131805E-H100	H110005H-H100
3.0 x 150 mm	5 µm	H111805H-H150	H110805H-H150	H131805E-H150	H110005H-H150
4.6 x 50 mm	5 µm	H111805H-N050	H110805H-N050	H131805E-N050	H110005H-N050
4.6 x 100 mm	5 µm	H111805H-N100	H110805H-N100	H131805E-N100	H110005H-N100
4.6 x 150 mm	5 µm	H111805H-N150	H110805H-N150	H131805E-N150	H110005H-N150
4.6 x 250 mm	5 µm	H111805H-N250	H110805H-N250	H131805E-N250	H110005H-N250
10 x 150 mm	5 µm	H111805H-Q150	H110805H-Q150	H131805E-Q150	H110005H-Q150
10 x 250 mm	5 µm	H111805H-Q250	H110805H-Q250	H131805E-Q250	H110005H-Q250
20 x 50 mm	5 µm	H111805H-Y050	H110805H-Y050	H131805E-Y050	H110005H-Y050
20 x 100 mm	5 µm	H111805H-Y100	H110805H-Y100	H131805E-Y100	H110005H-Y100
20 x 150 mm	5 µm	H111805H-Y150	H110805H-Y150	H131805E-Y150	H110005H-Y150
20 x 250 mm	5 µm	H111805H-Y250	H110805H-Y250	H131805E-Y250	H110005H-Y250
30 x 100 mm	5 µm	-	-	H131805E-V100	
30 x 150 mm	5 µm	-	-	H131805E-V150	
30 x 250 mm	5 µm	-	-	H131805E-V250	
4.6 x 150 mm	10 µm	-	-	H131807E-N150	
4.6 x 250 mm	10 µm	-	-	H131807E-N250	
10 x 150 mm	10 µm	-	-	H131807E-Q150	
10 x 250 mm	10 µm	-	-	H131807E-Q250	
20 x 50 mm	10 µm	-	-	H131807E-Y050	
20 x 150 mm	10 µm	-	-	H131807E-Y150	
20 x 250 mm	10 µm	-	-	H131807E-Y250	
30 x 100 mm	10 µm	-	-	H131807E-V100	
30 x 150 mm	10 µm	-	-	H131807E-V150	
30 x 250 mm	10 µm	-	-	H131807E-V250	
50 x 150 mm	10 µm	-	-	H131807E-W150	
50 x 250 mm	10 µm	-	-	H131807E-W250	

*HPLC columns are sold in pack of one column. Other dimensions and/or particle sizes are available on a custom basis. Contact us.

SiliaChrom XDB & XDB2 Guard Cartridges Columns Ordering

SiliaChrom XDB & XDB2 Guard Cartridge Ordering Information					
Dimension	Particle Size (µm)	SiliaChrom XDB C18	SiliaChrom XDB C8	SiliaChrom XDB2 C18	SiliaChrom XDB Silica
4.0 x 10 mm	3 µm	-	-	HG131803E-N010	
4.0 x 10 mm	5 µm	HG111805H-N010	HG110805H-N010	HG131805E-N010	HG110005H-N010
10 x 10 mm	5 µm	HG111805H-Q010	HG110805H-Q010	HG131805E-Q010	HG110005H-Q010
21.2 x 10 mm	5 µm	HG111805H-T010	HG110805H-T010	HG131805E-T010	HG110005H-T010
30 x 10 mm	5 µm	HG111805H-V010	HG110805H-V010	HG131805E-V010	HG110005H-V010
4.0 x 10 mm	10 µm	HG121807H-N010	-	HG131807E-N010	
10 x 10 mm	10 µm	HG121807H-Q010	-	HG131807E-Q010	
21.2 x 10 mm	10 µm	HG121807H-T010	-	HG131807E-T010	
30 x 10 mm	10 µm	HG121807H-V010	-	HG131807E-V010	

Note: 2.1 and 4.0 mm Guard Cartridges are sold in pack of 4 cartridges; 10 mm is sold in pack of 2 cartridges; 21.2 and 30 mm are sold in pack of 1 cartridge

How to Choose the Right Silia*Chrom* C18 Phase

C18 reversed-phase is the most used sorbent for HPLC applications. SiliCycle has developed over the years several C18 phases for specific analytes and/or matrices. The table below presents all Silia*Chrom* C18 phases available in the SiliCycle portfolio including a short description and characteristics. This table will help you choose the right Silia*Chrom* C18 phase based on your separation needs.

Silia*Chrom* C18 Reversed-Phase Characteristics

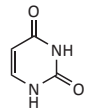
Silia*Chrom* Phases	Description	%C	Pore Size (Å)	Surface Area (*m2/g*)	pH Stability Range	Phase Description Page
Silia*Chrom* Plus C18	**For your everyday separations**	15	100	370 - 430	2.0 - 8.0	122
Silia*Chrom* dt C18	**Universal 100% aqueous compatible C18 column.** Most versatile column of the SiliCycle portfolio. Great retention for hydrophilic compounds. High sensitivity for LC-MS analysis. Same C18 functionalization but the Silia*Chrom* dt C18 is free of metal content.	18	100	410 - 440	1.5 - 9.0	128
Silia*Chrom* SB C18	**Column designed for extremely low pH conditions** Compatibility with 100% aqueous mobile phase. Great sensitivity for LC-MS.	12	150	200	0.5 - 7.5	139
Silia*Chrom* XT C18	**High stability under high pH conditions** Ideal for basic compounds.	15	150	200	1.5 - 12.0	136
Silia*Chrom* XT Fidelity C18	**Excellent stability under extreme pH conditions** Ideal HPLC column for either metabolic or metabolite analysis.	21	100	380	1.5 - 12.0	136
Silia*Chrom* XDB1 C18	**Highest level of hydrophobicity of the SiliCycle C18 phases** Designed for dirty samples. Oldest C18 phase technology.	22	100	380 - 400	1.5 - 10.0	142
Silia*Chrom* XDB2 C18	**Mid-level hydrophobicity and most popular phase for QC analysis** Typical average value of carbon loading.	18	100	380 - 400	1.5 - 9.0	144
Silia*Chrom* XDB C18	**Lowest level of hydrophobocity of the SiliCycle C18 phase** Ideal for separation of highly hydrophobic molecules such as fatty acids, barbiturates, fat-soluble vitamins & steroids.	15	150	200	1.5 - 9.0	144
Silia*Chrom* XDB1 C18-300	**Highest level of hydrophobicity for a C18 with wide pore size** Designed for biochromatography applications *(peptides, proteines or nucleic acids)*.	8	300	80	1.5 - 9.0	142

SiliaChrom Reversed-Phase HPLC Column Character Evaluation

Our SiliaChrom HPLC columns are evaluated by USP and NIST tests for classification purpose and based on the selectivity chart. These tests allow the characterization and the comparison of various HPLC columns in order to determine the following parameters: void volume, retention capacity of hydrophobic compound, selectivity, efficiency and silanol activity. To run this test, we use a mixture of the five organic compounds listed below. Furthermore, we used the same test for side-by-side comparison on various SiliaChrom C18 columns against three well-known suppliers[1].

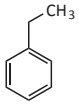
Reaction Mixture

- **Uracil (1)**: void volume marker (T_0)
- **Toluene (2)**: retention capacity of hydrophobic compounds (k'_{Tol})
- **Ethylbenzene (3)**: marker for the calculation of column efficiency for hydrophobic compounds ($k'_{Ethylbenzene}$)
- **Ratio Toluene/Ethylbenzene**: determination of selectivity ($\alpha_{Ethylbenzene/Toluene}$)
- **Quinizarin (4)**: activity towards chelating reagents (*metal contamination evaluation*)
- **Amitriptyline (5)**: activity towards bases (*silianol activity evaluation*)

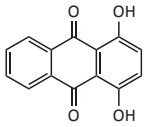


Uracil (1)

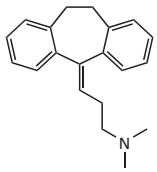
Toluene (2)



Ethylbenzene (3)



Quinizarin (4)



Amitriptyline (5)

Description of the Column Aspects Evaluated

Hydrophobicity is measured by the retention factor of the hydrophobic analyte *(ethylbenzene)* using the following equation:

$$k' = \frac{(T_R - T_0)}{T_0} = \frac{\text{Ethylbenzene retention time – Uracil retention time } \textit{(Void volume)}}{\text{Uracil retention time } \textit{(Void volume)}}$$

Selectivity (α) is measured by the retention factor ratio between two similar compounds, ethylbenzene *(k_2)* and toluene *(k_1)*:

$\alpha = k_2/k_1$

Column Efficiency is usally measured by the plate count *(N)* obtained for the ethylbenzene peak.

Tailing Factor of Amitriptyline (*Amitr.*) – Silanol Activity is measured by the peak symmetry of amitriptyline *(basic compound)*. Important silanol activity is often associated with peak tailing or an asymmetric peak. In other words, a highly deactivated column will have a lower peak asymmetry.

Chelating Tailing Factor – Metal Content is measured by the quinizarin peak symmetry. A symmetric peak shape indicates low activity toward chelating agent *(absence of metals)* and an asymmetric peak shape indicates the presence of metals by peak tailing *(high activity toward chelating reagents)*.

Chromatographic conditions:

HPLC System:	Thermo Surveyor with PDA
HPLC Software:	Xcalibur handling version 2.0
Column Size:	All HPLC columns: 4.6 x 150 mm, 5 µm
Mobile Phase:	Methanol/buffer *(80/20, v/v)*
Buffer:	20 mM of phosphate buffer adjusted at pH=7.0
Temperature:	30°C
Flow rate:	1.000 mL/min
Temperature:	UV scan *(PDA)*, Total scan 200-600 nm

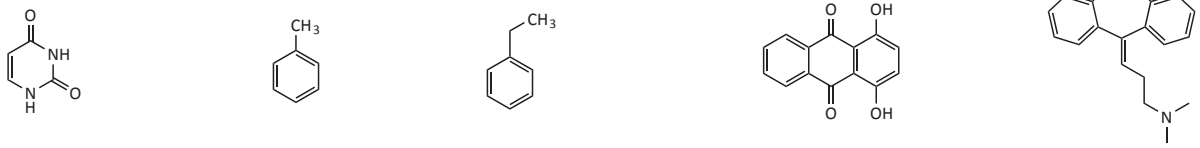
« Needed a set of columns that work with a wide pH range. SiliaChrom XT columns did the trick. »

Victor Nicolaev from Sanofi, Oro Valley, AZ, USA

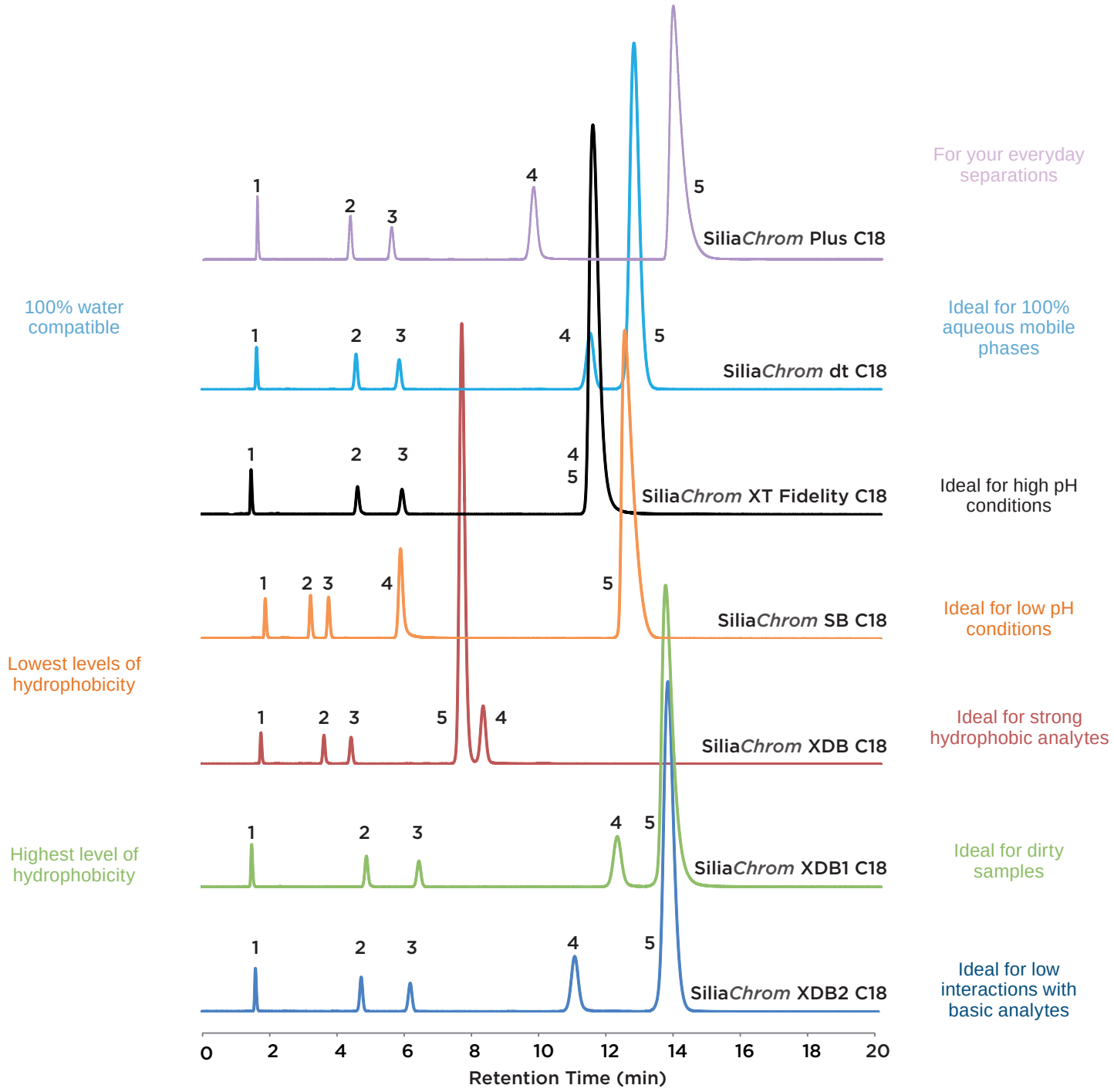
*([1]Pharmacopeial Forum, Vol. 31(2) March-Apr. **2005**, p.637)*

Full Range of Selectivity with Silia*Chrom* C18 HPLC Columns

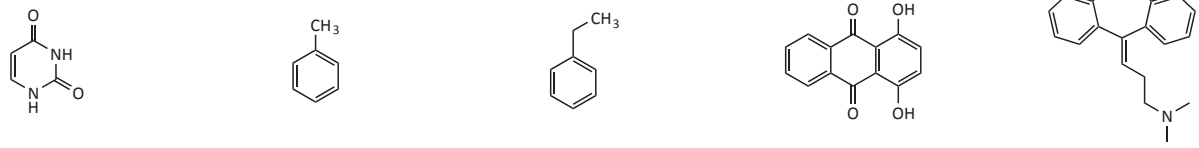
Our most popular Silia*Chrom* reversed-phase C18 HPLC columns were evaluated by USP and NIST tests for classification purpose based on the selectivity chart. Select the most suitable Silia*Chrom* C18 based on your sample's properties.



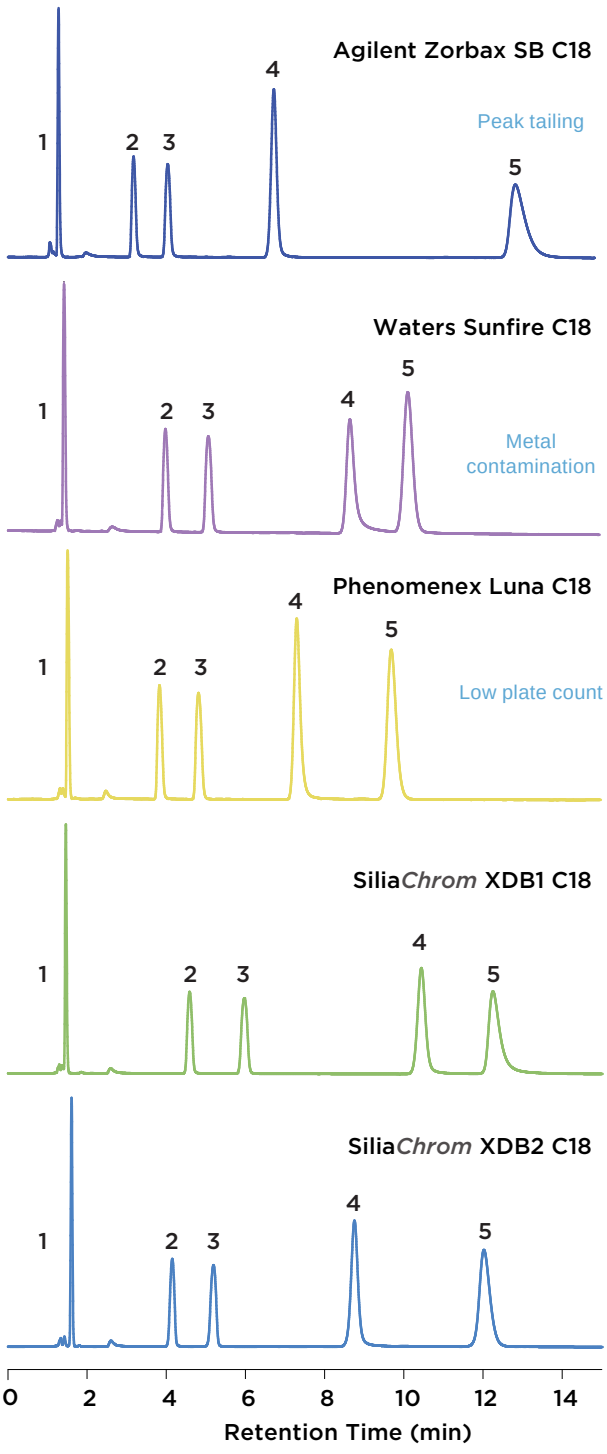
Uracil (1) Toluene (2) Ethylbenzene (3) Quinizarin (4) Amitriptyline (5)



SiliaChrom C18 HPLC Columns Versus the Competition



Uracil (1) Toluene (2) Ethylbenzene (3) Quinizarin (4) Amitriptyline (5)



C18 Column Character Evaluation Comparaison

HPLC Columns	Hydrophobicity k' Toluene	Hydrophobicity k' Ethylbenz.	Selectivity α Ethylbenz./Tol.
SiliaChrom XDB1 C18	2.14	3.09	1.44
SiliaChrom XDB2 C18	0.61	2.22	1.41
Phenomenex Luna C18	1.50	2.13	1.42
Agilent Zorbax SB C18	1.38	2.01	1.45
Waters Sunfire C18	1.72	2.45	1.43

C18 Column Character Evaluation Comparaison

HPLC Columns	Efficiency N (/ meter) Ethylbenz.	Efficiency R	Metal Content A_s Quinizarin	Silanol Activity TF Amitr.
SiliaChrom XDB1 C18	45,000	4.73	1.09	1.65
SiliaChrom XDB2 C18	28,000	3,30	1.10	1.18
Phenomenex Luna C18	22,000	2.90	1.23	1.20
Agilent Zorbax SB C18	25,000	3.20	1.10	1.55
Waters Sunfire C18	35,500	3.90	1.80	1.12

Results interpretation:

SiliaChrom columns compared advantageously over the competition; they present high column performances and with our wide portfolio, you can select the most suitable phase depending on the compound's nature. For example:

Basic analytes: SiliaChrom XDB2
Less polar analytes: SiliaChrom XDB1

The SiliaChrom columns performed very well compared to the competition. The Phenomenex Luna C18 has a lower efficiency as shown by its plate count *(N)*. The Waters Sunfire C18 column, shows peak tailing for amitriptyline which means that there are still some free OH presents on the surface *(activity towards bases)*. Finally, the Agilent Zorbax SB C18 seems to have high metal impurities as shown by the peak asymmetry obtained for quinizarin.

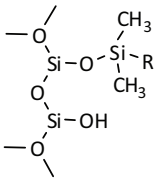
Silia*Chrom* HILIC Family

Description

Silia*Chrom* HILIC (hydrophilic interaction chromatography) offers a complementary selectivity to reversed-phase columns (with a higher retention for polar compounds) and normal phase columns (with a greater stability and reproducibility). This phase is ideal for MedChem laboratories and is approved for SFC applications.

Silia*Chrom* HILIC is available in 3, 5 & 10 µm.

Structure



$R = (CH_2)_3NH\text{-}CO\text{-}NH_2$

Silia*Chrom* HILIC Main Characteristics

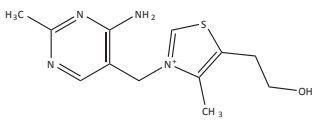
- Unique chemistry (*urea*)
- Compatible with reversed-phase and normal-phase conditions
- Rapid equilibration
- Enhanced selectivity in mass spectrometry

Silia*Chrom* HILIC Sorbent Characteristics

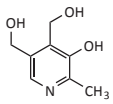
Silia*Chrom* HILIC Sorbent Characteristics						
Silia*Chrom* Phases	Description	USP Code	%C	Pore Size (Å)	Surface Area (m^2/g)	pH Stability Range
Reversed-Phases						
Silia*Chrom* HILIC	Great retention of highly polar compounds.	-	8	100	380	2.0 - 8.0
Silia*Chrom* HILIC-300		-	2.5	300	80	2.0 - 8.0

Food

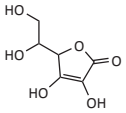
Silia*Chrom* HILIC: Separation of Vitamin B Complex and Vitamin C



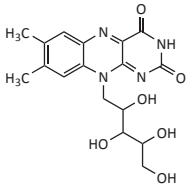
A. Thiamine (B1)



B. Pyridoxine (B6)



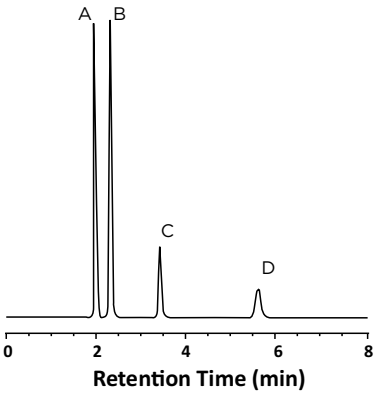
C. Vitamin C



D. Riboflavine (B2)

Chromatographic conditions

Column:	Silia*Chrom* HILIC, 5 µm
Column size:	4.6 x 200 mm
SiliCycle PN:	H131805E-N150
Mobile phase:	0.1% TFA in water/0.1% in ACN (90/10)
Flow rate:	1.000 mL/min
Detector:	UV at 280 nm



SiliaChrom HILIC HPLC Columns Ordering Information

SiliaChrom HILIC HPLC Column Ordering Information							
Dimension	Particle Size (µm)	SiliaChrom HILIC	SiliaChrom HILIC-300	Dimension	Particle Size (µm)	SiliaChrom HILIC	SiliaChrom HILIC-300
2.1 x 30 mm	3 µm	H160003E-G030	-	10 x 150 mm	5 µm	H160005E-Q150	H160005M-Q150
2.1 x 50 mm	3 µm	H160003E-G050	-	10 x 250 mm	5 µm	H160005E-Q250	H160005M-Q250
2.1 x 100 mm	3 µm	H160003E-G100	-	20 x 50 mm	5 µm	H160005E-Y050	H160005M-Y050
2.1 x 150 mm	3 µm	H160003E-G150	-	20 x 100 mm	5 µm	H160005E-Y100	H160005M-Y100
3.0 x 30 mm	3 µm	H160003E-H030	-	20 x 150 mm	5 µm	H160005E-Y150	H160005M-Y150
3.0 x 50 mm	3 µm	H160003E-H050	-	20 x 250 mm	5 µm	H160005E-Y250	H160005M-Y250
3.0 x 100 mm	3 µm	H160003E-H100	-	30 x 100 mm	5 µm	H160005E-V100	-
3.0 x 150 mm	3 µm	H160003E-H150	-	30 x 150 mm	5 µm	H160005E-V150	-
4.6 x 50 mm	3 µm	H160003E-N050	-	30 x 250 mm	5 µm	H160005E-V250	-
4.6 x 100 mm	3 µm	H160003E-N100	-	4.6 x 150 mm	10 µm	H160007E-N150	-
4.6 x 150 mm	3 µm	H160003E-N150	-	4.6 x 250 mm	10 µm	H160007E-N250	-
4.6 x 250 mm	3 µm	H160003E-N250	-	10 x 150 mm	10 µm	H160007E-Q150	-
2.1 x 30 mm	5 µm	H160005E-G030	H160005M-G030	10 x 250 mm	10 µm	H160007E-Q250	-
2.1 x 50 mm	5 µm	H160005E-G050	H160005M-G050	20 x 50 mm	10 µm	H160007E-Y050	-
2.1 x 100 mm	5 µm	H160005E-G100	H160005M-G100	20 x 150 mm	10 µm	H160007E-Y150	-
2.1 x 150 mm	5 µm	H160005E-G150	H160005M-G150	20 x 250 mm	10 µm	H160007E-Y250	-
3.0 x 30 mm	5 µm	H160005E-H030	H160005M-H030	30 x 100 mm	10 µm	H160007E-V100	-
3.0 x 50 mm	5 µm	H160005E-H050	H160005M-H050	30 x 150 mm	10 µm	H160007E-V150	-
3.0 x 100 mm	5 µm	H160005E-H100	H160005M-H100	30 x 250 mm	10 µm	H160007E-V250	-
3.0 x 150 mm	5 µm	H160005E-H150	H160005M-H150	50 x 150 mm	10 µm	H160007E-W150	-
4.6 x 50 mm	5 µm	H160005E-N050	H160005M-N050	50 x 250 mm	10 µm	H160007E-W250	-
4.6 x 100 mm	5 µm	H160005E-N100	H160005M-N100				
4.6 x 150 mm	5 µm	H160005E-N150	H160005M-N150				
4.6 x 250 mm	5 µm	H160005E-N250	H160005M-N250				

*HPLC columns are sold in pack of one column. Other dimensions and/or particle sizes are available on a custom basis. Contact us

SiliaChrom HILIC Guard Cartridges Columns Ordering Information

SiliaChrom HILIC Guard Cartridge Ordering Information				
Dimension	Particle Size (µm)	SiliaChrom HILIC	SiliaChrom HILIC-300	SiliaChrom Guard Holder
4.0 x 10 mm	3 µm	HG160003E-N010	-	**SiliaChrom Guard Holder information:** - HPH-N010 (*for 2.1 x 10 mm & 4.0 x 10 mm Guard Cartridges*) - HPH-N020 (*for 2.1 x 20 mm & 4.0 x 20 mm Guard Cartridges*) - HPH-Q010 (*for 10 x 10 mm Guard Cartridges*) - HPH-T010 (*for 21.2 x 10 mm Guard Cartridges*) - HPH-V010 (*for 30 x 10 mm Guard Cartridges*) *Other dimensions and particle sizes could be available on a custom basis. Contact us.
4.0 x 10 mm	5 µm	HG160005E-N010	HG160005M-N010	
10 x 10 mm	5 µm	HG160005E-Q010	HG160005M-Q010	
21.2 x 10 mm	5 µm	HG160005E-T010	HG160005M-T010	
10 x 10 mm	10 µm	HG160007E-Q010	-	
21.2 x 10 mm	10 µm	HG160007E-T010	-	
30 x 10 mm	10 µm	HG160007E-V010	-	

Note: 2.1 and 4.0 mm Guard Cartridges are sold in pack of 4 cartridges; 10 mm is sold in pack of 2 cartridges; 21.2 and 30 mm are sold in pack of 1 cartridge

Silia*Chrom* HPLC Columns for Biochromatography

Bio-Pharma

Description

Biochromatography is about the separation and purification of biomolecules like proteins and peptides. They include SEC (*Size Exclusion Chromatography*), Ion Exchange (*IE*), HIC (*Hydrophobic Interaction Chromatography*), Affinity Chromatography, Reverse Phase Chromatography and much more specialized methods.

In fact, the rapid progression in the areas of genomics, proteomics, metabolomics and other biotechnology sectors has pushed scientists to develop innovative and efficient chromatographic methods. These methods have opened the way to a better understanding of biomolecules and now offer impactful solutions effective at each level of the development of new commercial pharmaceutical ingredients.

The separation and determination of proteins, peptides and nucleic acids can be done through different chromatography techniques. This section will highlight the Silia*Chrom* HPLC columns available and used for the different separation techniques. Our biochromatography product line offers scientists tools for the separation and purification of biomolecules such as proteins, peptides and other large molecules wether it is through wide pore ion-exchange, SEC (*Size Exclusion Chromatography*) or reversed-phase HPLC.

Silia*Chrom* Reversed-Phases for Biochromatography (*MW < 5,000 Da*)

Silia*Chrom* Reversed-Phases for Biochromatography (*MW < 5,000 Da*)					
Silia*Chrom* Phases	Pore Size (Å)	%C	pH Stability Range	Characteristics	Phase Description
Silia*Chrom* Plus C18	100	15	2.0 - 8.0	Most popular C18 for almost all your everyday purifications.	122
Silia*Chrom* XT C18	150	15	1.5 - 12.0	Superior separation of basic & hydrophobic compounds Excellent peak shape in every condition. Excellent durability.	136
Silia*Chrom* XT C18 Fidelity	150	21	1.5 - 12.0		
Silia*Chrom* dt C18	100	18	1.5 - 9.0	Superior separation of hydrophilic compounds. Mobile phase compatibility 100% aqueous to 100% organic. Inert and stable for acidic & basic analytes.	128

Silia*Chrom* Reversed-Phases for Biochromatography (*MW 5,000 - 100,000 Da*)

Silia*Chrom* Reversed-Phases for Biochromatography (*MW 5,000 - 100,000*)					
Silia*Chrom* Phases	Pore Size (Å)	%C	pH Stability Range	Characteristics	Phase Description
Silia*Chrom* Plus C18-300	300	8	2.0 - 8.0	Silia*Chrom* C18 phases with wide pore size specialy designed for peptide & protein separation.	122
Silia*Chrom* SB C18-300	300	5	0.5 - 7.5		139
Silia*Chrom* XDB1 C18-300	300	8	1.5 - 9.0		142
Silia*Chrom* Plus C8-300	300	5	2.0 - 8.0	Silia*Chrom* C8 phases with wide pore diameter presenting lower hydrophobicity than C18.	122
Silia*Chrom* SB C8-300	300	3	1.0 - 7.5		139
Silia*Chrom* XBD1 C8-300	300	4	1.5 - 8.5		142
Silia*Chrom* Plus C4-300	300	3	2.0 - 8.0	Silia*Chrom* C4 phase with wide pore diameter presenting lower hydrophobicity than C8, ideal for protein separation.	122

SiliaChrom GF Family

Description

SiliaChrom GF phases are designed to be used for Gel Filtration Chromatography (*GFC*), in aqueous conditions. Small molecules enter the pores and get trapped whereas large molecules are excluded with almost no retention. The average time spent in the pores depends on the analyte hydrodynamic volume and the pore size itself.

All SiliaChrom GF columns are available in 5 & 10 µm.

SiliaChrom GF Family Main Characteristics

- For size exclusion chromatography applications
- Separation and determination of peptides, proteins and nucleic acids
- 2 exclusion ranges: 5,000 to 100,000 Dalton (*100 Å*) and 50,000 to 1,000,000 Dalton (*300 Å*)

SiliaChrom GF Sorbent Characteristics

SiliaChrom GF Sorbent Characteristics

SiliaChrom Phases	Description	Exclusion Range	%C	Pore Size (Å)	Surface Area (m^2/g)	pH Stability Range
SiliaChrom GF (Diol)	For small proteins, peptides and PEGylated peptides applications	5,000 to 100,000 Da	5	100	340	2.0 - 8.0
SiliaChrom AMIDE		5,000 to 100,000 Da	5	100	340	2.0 - 8.0
SiliaChrom GF-300 (Diol)	For large proteins and PEGylated immunoglobulins applications.	50,000 to 1,000,000 Da	1	300	80	2.0 - 8.0
SiliaChrom AMIDE-300		50,000 to 1,000,000 Da	1	300	80	2.0 - 8.0

SiliaChrom GF HPLC Columns Ordering Information

SiliaChrom GF HPLC Column Ordering Information

Dimension	Particle Size (µm)	SiliaChrom GF	SiliaChrom GF-300	SiliaChrom GF Amide	SiliaChrom GF Amide-300
4.6 x 150 mm	**5 µm**	H90005E-N150	H90005M-N150	H90005E-N150	H90005M-N150
4.6 x 250 mm	**5 µm**	H90005E-N250	H90005M-N250	H90005E-N250	H90005M-N250
7.8 x 300 mm	**5 µm**	H90005E-M300	H90005M-M300	H90005E-M300	H90005M-M300
10 x 150 mm	**5 µm**	H90005E-Q150	H90005M-Q150	H90005E-Q150	H90005M-Q150
10 x 250 mm	**5 µm**	H90005E-Q250	H90005M-Q250	H90005E-Q250	H90005M-Q250
4.6 x 150 mm	**10 µm**	H90007E-N150	H90007M-N150	H90007E-N150	H90007M-N150
4.6 x 250 mm	**10 µm**	H90007E-N250	H90007M-N250	H90007E-N250	H90007M-N250
7.8 x 300 mm	**10 µm**	H90007E-M300	H90007M-M300	H90007E-M300	H90007M-M300
10 x 150 mm	**10 µm**	H90007E-Q150	H90007M-Q150	H90007E-Q150	H90007M-Q150
10 x 250 mm	**10 µm**	H90007E-Q250	H90007M-Q250	H90007E-Q250	H90007M-Q250

*HPLC columns are sold in pack of one column. Other dimensions and/or particle sizes are available on a custom basis. Contact us.

Silia*Chrom* Phases for Supercritical Fluid Chromatography (*SFC*)

Pharmaceutical

Description

In its early days, Supercritical Fluid Chromatography (SFC) was known and considered as High Pressure Gas Chromatography. It is now better known as a green chromatographic technique for the separation of enantiomeric compounds and complex mixtures. Because there is no need for solvent disposal in SFC, ecologically concerned laboratories have considered SFC has an interesting alternative for analytical and purification applications. The use of CO_2 also presents the advantage that it is reused after being discarded by several other industrial processes.

The principles of SFC are extremely similar to those of normal phase chromatography but it uses CO_2 as the main mobile phase or supercritical fluid. In fact, both techniques use the ability of the mobile phase to solvate the analytes. Changing from a liquid mobile phase to carbon Dioxide greatly increases the resolution. Modifiers used in the mobile phase interact with the stationary phase creating a final surface changing the analyte selectivities. SFC columns have always depended on the advances in HPLC normal phase column media production and improved column packing techniques.

For decades, SFC has been considered the preferred technique for preparative chromatography. The recent advances in preparative and analytical equipment for SFC coupled with the industry demand for reliable rapid analysis chromatography has created the need for a dependable source of SFC columns. The use of carbon dioxide based mobile phases enables the use of high performance preparative columns (*10 to 50 mm I*D) with a variety of particle sizes from 3 to 10 µm. The most commonly used particle size is 5 µm because it is small enough to give high performances and resolution since smaller particles have a tendancy to reduce permeability and increase the column backpressure.

Many SFC separations use stationary phases from normal phase HPLC such as unmodified silica, diol, Amino and cyano without the need for special packing techniques or hardware. The low viscosity of supercritical CO_2 allows separations to occur 3 to 5 times faster with 70-90% less in solvent usage than those of normal phase HPLC. All these considerations have made SFC a desirable preparative chromatographic technique for purifying chemical mixtures.

Silia*Chrom* Phases for Supercritical Fluid Chromatography

Hydrophobicity: - ↓ +

Silia*Chrom* Phases	Pore Size (*Å*)	Carbon Loading (%)	Particle Size (*µm*)	Phase Description
Silia*Chrom* Plus Si	100	-	3, 5, 10	
Silia*Chrom* Plus Diol	100	7	3, 5, 10	
Silia*Chrom* Plus Amino	100	8	3, 5, 10	
Silia*Chrom* Plus Cyano	100	7	3, 5, 10	
Silia*Chrom* HILIC	100	8	3, 5, 10	
Silia*Chrom* Plus PFP	120	9	3, 5, 10	

SiliaChrom Preparative HPLC columns

SiliCycle offers most of its HPLC phases in preparative formats to help you achieve your purification needs. Columns are available up to 50 mm internal diameter and 250 mm length.

HPLC Method Scaling Up or Scaling Down Theory

When your experimental conditions are well optimized to get the most suitable purification, it is possible to scale up/down your method by keeping the same particle size and sorbent using these two equations:

Adjustment of the Sample Load

$$x_2 = \frac{x_1 \times r_2^2 \times C_L}{r_1^2} \quad \text{where} \quad \left[C_L = \frac{L_2}{L_1}\right]$$

Where:

- x_1: is the maximum sample load in initial column
- x_2: is the maximum sample load in final column
- r_1: is the radius of the initial column
- r_2: is the radius of the final column
- L_1: is the length of the initial column
- L_2: is the length of the final column

Adjustment of the Flow Rate

$$V_2 = \frac{V_1 \times r_2^2}{r_1^2}$$

Where:

- V_1: is the flow rate use with the initial column
- V_2: is the flow rate use with the final column
- r_1: is the radius of the initial column
- r_2: is the radius of the final column

To help you choose the right dimensions for your project, here is a chart giving you the typical sample loading and flow rate depending on the column size.

Choosing the right SiliaChrom Preparative Column

Length	Internal Diameter				
	4.6 mm	10 mm	21.2 mm	30 mm	50 mm
50 mm	0.5 - 2	2 - 10	10 - 45	20 - 90	50 - 250
100 mm	1 - 5	4 - 25	20 - 105	40 - 210	120 - 600
150 mm	2 - 7	10 - 35	30 - 160	70 - 300	200 - 850
250 mm	3 - 10	12 - 45	60 - 220	120 - 430	320 - 1200
	1 – 1.5	4 – 10	20 – 30	40 – 70	110 – 250

Sample Load (mg)

Typical Flow Rate (mL/min)

HPLC Column Packing Services

In may 2012, the acquisition of Chromatography Sciences Company (CSC) Inc., a major player in analytical chemistry products and services in Canada, added more than 30 years of HPLC column packing knowledge and experience to SiliCycle's already important and well established expertise in the field.

SiliCycle still continues to serve CSC's existent and new customers from several different fields of expertise, manufacturing the same great HPLC columns from well-known commercially available media manufacturer and still provides you with the same excellent customer service you have been offered in the past.

Most of the sorbents used to pack these CSC HPLC columns have been on the market for a great number of years now, are often part of validated methods, in some cases hard to find elsewhere, but are still available through SiliCycle's extensive portfolio. Please check with our customer service department for column availability as some of the columns may not appear on the list below.

In fact, this new value proposition, added to our great products and customer service, states why customers want to do business with SiliCycle and what sets us apart from the competition.

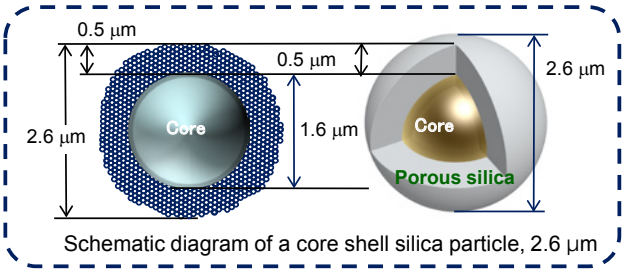
Available CSC Columns	
CSC Columns Phases	**Description**
CSC-Sil 80 Å	**Excellent alternative for Waters Spherisorb (*Phase Separations*) columns (*methods prior to 1995*).** The CSC-Sil 80 Å material is a spherical silica-based material for older non-demanding general purpose applications. CSC-Sil 80 Å columns are available in several RP and NP phases. It is the material of choice to replace Waters-Spherisorb columns for methods prior to 1995 at a fraction of the cost.
CSC-Select 100 Å	**Closest alternative to Waters Spherisorb columns (*methods developed after 1995*).** The CSC-Select 100 Å material is a spherical silica-based material for older non-demanding general purpose applications. CSC-Sil 80 Å columns are available in several RP and NP phases. Closest alternative to Waters-Spherisorb columns for methods developed on Waters-Spherisorb after 1995.
CSC-Advantisil	**Excellent alternative for Hypersil columns.** The CSC-Advantisil material is a spherical silica-based material for older non-demanding general purpose applications and represents our closest equivalent to the popular Hypersil range of HPLC columns. CSC-Advantisil columns are available in several RP and NP phases.
CSC-Advantisil BDS	**Excellent alternative for Hypersil BDS columns.** The CSC-Advantisil BDS material is a spherical silica-based material for older non-demanding general purpose applications and represents our closest equivalent to the popular Hypersil BDS range of HPLC columns. CSC-Advantisil BDS columns are available in several RP and NP phases.
CSC-Lichrosorb	The CSC-Lichrosorb material is a high quality and well established fully porous irregular (*amorphous*) silica-based material for older non-demanding general purpose applications. CSC-Lichrosorb columns are available in a few typical phases.
CSC-Lichrospher/ Superspher	The CSC-Lichrospher material is a high quality fully porous spherical silica-based material for older non-demanding general purpose applications. It is our spherical equivalent to the irregular Lichrosorb material. CSC-Lichrospher and CSC-Superspher (*4µm version of the Lichrospher material*) columns are available in several phases.

HPLC Columns Distributed by SiliCycle

SiliCycle has signed a distribution agreement with various companies for the distribution of HPLC columns in different territories. Contact us for all the details.

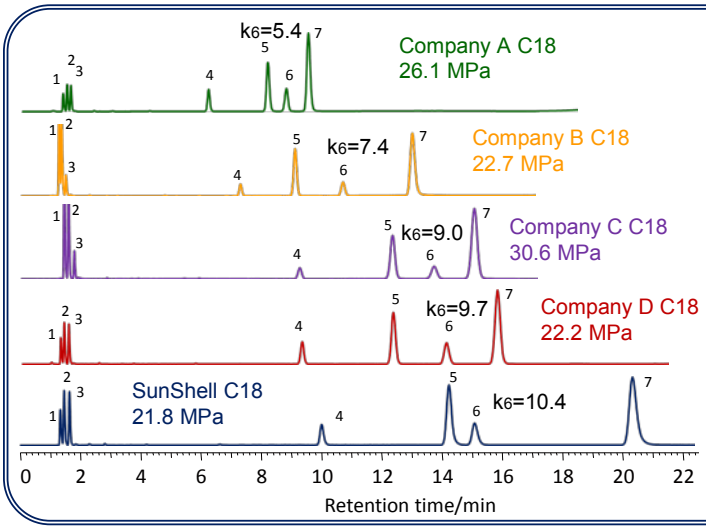
ChromaNik Technologies Inc.

The next generation of Core Shell particle from a Japanese manufacturer.



Schematic diagram of a core shell silica particle, 2.6 µm

Comparison of standard samples between core shell C18s

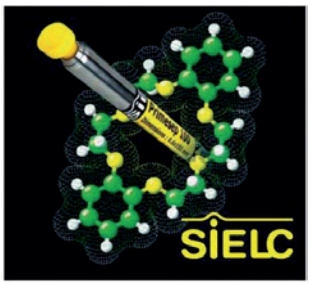


Column:
Company A C18, 2.6 µm 150 x 4.6 mm (26.1 MPa)
Company B C18, 2.6 µm 150 x 4.6 mm (22.7 MPa)
Company C C18, 2.7 µm 150 x 4.6 mm (30.6 MPa)
Company D C18, 2.7 µm 150 x 4.6 mm (22.2 MPa)
SunShell C18, 2.6 µm 150 x 4.6 mm (21.8 MPa)
Mobile phase: CH_3OH/H_2O=75/25
Flow rate: 1.0 mL/min, Temperature: 40 ºC
Sample: 1 = Uracil, 2 = Caffeine, 3 = Phenol, 4 = Butylbenzene
5 = o-Terphenyl, 6 = Amylbenzene, 7 = Triphenylene

	Hydrogen bonding (Caffeine/Phenol)	Hydrophobicity (Amylbenzene/Butylbenzene)	Steric selectivity (Triphenylene/o-Terphenyl)
Company A C18	0.48	1.54	1.20
Company B C18	0.35	1.56	1.50
Company C C18	0.42	1.57	1.25
Company D C18	0.44	1.60	1.31
SunShell C18	0.39	1.60	1.46

BISCHOFF CHROMATOGRAPHY

SiliCycle, is the official Canadian distributor of the full range of ProntoSIL® HPLC columns



SilliCycle is a canadian distributor of the Sielc HPLC columns portfolio. We resale lines as Primesep®,Obelisc™, Promix™, Legacy™ and newest technology SHARC™

nacalai tesque
The quality for certainty.

We also distribute the COSMOSIL HILIC columns for hydrophilic interaction chromatography with Triazole bonded silica packing material.

Silia*Chrom* Guard Cartridges and Holders

Silia*Chrom* HPLC Guard Cartridges are designed to effectively protect both analytical and preparative HPLC columns. The usage of these cartridges is highly recommended to protect and prolong column lifetime and has limited influence on your chromatography while saving you time and money. Silia*Chrom* Guard Cartridges are extremely cost effective and easy to use as a pre-filter to remove contaminants prior to your injection. Contaminants introduced into the stream through the injector path or the mobile phase have an extremely high impact and can cause the following:

- Higher backpressure
- Loss of resolution
- Baseline noise or drift
- Peak shape alterations (*tailing or peak splitting*)
- Irreversible damages *(column and/or system)*

Silia*Chrom* Guard Cartridges Packing and Dimensions

For optimal results and maximal protection, it is highly recommended to always use a guard cartridge packed with the same packing material than the HPLC column. However, in most cases only the same chemistry is really needed. Particle size can be different (*in that case it is better to have smaller particles in the guard column than the HPLC column in order not to lose column efficiency*) but it is highly recommended to match the characteristics of the HPLC column used.

Silia*Chrom* Plus Guard Cartridges are available in different lengths (*10 and 20 mm for analytical and 10 mm for preparative columns*) and are also available in various internal diameters. In most cases, a 10 mm length would be enough but if the sample contains important quantity of impurities, the 20 mm would then be more suitable. The guard cartridge internal diameter should be the same as the HPLC column or slightly smaller. Never use a guard cartridge with a larger ID than the HPLC column (*efficiency loss*).

Silia*Chrom* Guard Cartridges and HPLC Column Combinations

Guard Internal Diameter		2.1 mm	4.0 mm	10 mm	21.2 mm	30 mm
Column Silia*Chrom* & Silia*Chrom* Plus Internal Diameter (*mm*)	2.0 - 2.1	X				
	3.0	X				
	4.0 - 4.6		X			
	10			X		
	20 - 21.2				X	
	30 - 50					X

Silia*Chrom* Guard Holders

Appropriate Silia*Chrom* Guard Holder

Product Number		Length	Silia*Chrom* Guard Cartridges Internal Diameter				
			2.1 mm	4.0 mm	10 mm	21.2 mm	30 mm
Holders	HPH-N010	10 mm	X	X			
	HPH-N020	20 mm	X	X			
	HPH-Q010	10 mm			X		
	HPH-T010	10 mm				X	
	HPH-V010	10 mm					X

Installation Procedure

1. If a new capillary tubing has been installed or if the LC system has not been operated for some time, flush the lines free of particulate before connecting the guard column holder and the guard cartridge.
2. Insert the stainless cartridge with the PEEK encapsulated SS frits into the metallic guard cartridge holder.
3. Tighten both parts of the holder together using 2 wrenches or a vise and a key. Take care not to overtighten in order to avoid cold welding together the 2 threaded metallic parts.
4. Connect the assembled Silia*Chrom* Guard Holder into the male fitting of the HPLC tuning system.
5. Connect the outlet to the detector and start pumping the mobile phase through the system at a low flow rate to equilibrate the system.
6. Gradually increase the flow rate to working conditions and check for leaks. If leaking persists at the guard column level, retighten the fittings until the leaking stops.

Silia*Chrom* Cleaning and Regeneration Procedures

If adequate care is taken, it is possible to maintain column efficiency and reliability over an extended period of time. This section is intended to give information on the different procedures to help extend HPLC column lifetime.

Difference between cleaning and regeneration

We usually make the assumption that, after a separation, all the material initially present in the column or cartridge has been eluted. After a run, the column is simply washed with 2-3 column volumes of the initial solvent mixture before starting a new separation. However, some impurities that are strongly retained on the column will accumulate at the intlet, if the mobile-phase composition is not strong enough to elute them during a regular run. Some non-negligible problems can arise when this happen: loss of performance, back-pressure build up, peak tailing, retention time shift or baseline drift. To avoid this, it is highly recommended to perform regular cleaning of the column before any of these symptoms occurs. This process is simple and does not require modification of the usual chromatographic set up. When cleaning is not sufficient, a more thorough treatment, i.e. regeneration, may be necessary to avoid discarding the column.

Suggested Cleaning and Regeneration Procedures

The more you use a cleaning procedure, the less rigorous conditions be necessary. Cleaning should be performed after running a known “dirty” sample. Regeneration procedure should be performed prior to column storage, or when a column seems clogged.The flow rate is usually set lower than during the separation *(typically from 20% to 50%)*.

Column Volume *(packing’s volume included)* in mL = π * [Column Radius in cm]^2 * [Column Length in cm]

Silia*Chrom* Suggested Cleaning and Regeneration Procedures

Silia*Chrom* HPLC Column	Suggested Cleaning Procedure	Suggested Regeneration Procedure
Suggested Procedure:	- Set the flow rate (*20 to 50% of the usual one*) - Rinse with 2-3 column volumes of each of the following solvents	- Backflush the column - Set the flow rate (*20 to 50% of the usual one*) - Rinse with 10 column volumes of each of the following solvents
Reversed-Phase Columns *(C18, C8, C4, C1, Amine, Cyano, Phenyl, PFP, etc.)*	- Water/ACN *(95/5)* to remove buffer - Water/ACN *(5/95)* - Mobile phase used during the separation	- Water/ACN (*95/5*) - THF - Water/ACN (*5/95*) - Mobile phase used during the separation
Normal Phase Columns *(Amine, Cyano, Diol, etc.)* *Note: Never use water.*	- MeOH/$CHCl_3$ *(50/50)* - Ethyl Acetate - Mobile phase used during the separation	- MeOH/$CHCl_3$ *(50/50)* - Isopropanol and ethyl acetate - Mobile phase used during the separation
Unbonded Silica Columns *(Silica)*	- Hexane, isopropanol and dichloromethane - Mobile phase used during the separation	- Hexane, isopropanol and dichloromethane - Mobile phase used during the separation
Ion Exchange Columns *(SCX, SAX, etc.)*	- 5 mM Phosphate Buffer pH 7.00 - Acetic Acid/Water *(10/90)* - Water, methanol and water	- 5 mM Phosphate Buffer pH 7.00 - Acetic Acid/Water *(10/90)* - Water, methanol and water

Silia*Chrom* Suggested Storage Conditions

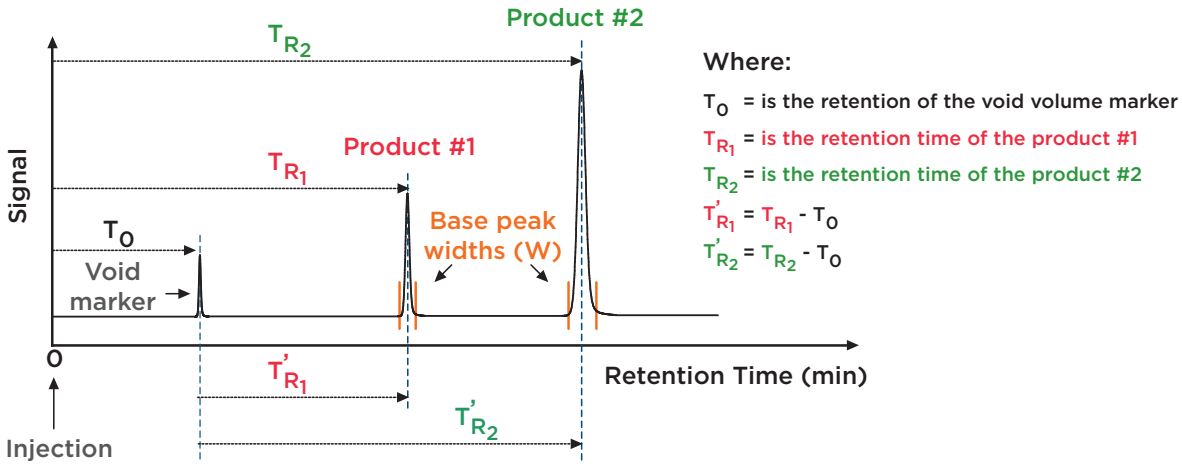
When Silia*Chrom* HPLC Columns are not used for an extended period of time, do not allow high aqueous or high salt mobile phases to remain in the column. Remove aqueous buffers remaining in the column by washing with 20-30 column volumes of a 50% methanol or acetonitrile aqueous solution, followed by 20 column volumes of organic solvent such as methanol or acetonitrile. Each column is shipped with two removable column end plugs to prevent the drying of the column bed. Always put these plugs back on tightly before column storage or when column is not being used.

Silia*Chrom* Suggested Storage Conditions

Silia*Chrom* HPLC Columns		Recommended Storage Solvent
Silia*Chrom* Plus C18 & C18-300 Silia*Chrom* Plus C8 & C8-300 Silia*Chrom* Plus C4 & C4-300 Silia*Chrom* Plus Cyano Silia*Chrom* Plus PFP Silia*Chrom* Plus Phenyl Silia*Chrom* Plus SCX & SAX Silia*Chrom* dt C18 & dt C8 Silia*Chrom* XT C18 & XT Fidelity C18	Silia*Chrom* SB C18 & C18-300 Silia*Chrom* SB C8 & C8-300 Silia*Chrom* XDB C18 & XDB C8 Silia*Chrom* XDB1 C18 & C18-300 Silia*Chrom* XDB1 C8 & C8-300 Silia*Chrom* XDB1 C1 & C1-300 Silia*Chrom* XDB2 C18 Silia*Chrom* HILIC Silia*Chrom* GF & GF-300 Silia*Chrom* GF Amide & GF Amide-300	50-70% Methanol or Acetonitrile in water
Silia*Chrom* Plus Amino		Butyl Chloride/Methanol
Silia*Chrom* Plus Silica Silia*Chrom* dt Silica	Silia*Chrom* XDB Silica Silia*Chrom* Plus Diol	Isooctane/Ethanol

Important HPLC Definitions and Equations

Typical Chromatogram in liquid chromatography



Capacity Factor or Retention Factor *(k')* is measured by the retention factor of the analyte compared to an unretained peak *(void volume marker)* using the following equation:

$$k' = \frac{(T_R - T_0)}{T_0}$$

Where:

T_R: is the retention time of the analyte

T_0: is the retention time of the unretained product

Efficiency *(N)* is usually measured by the plate count *(N or also called theoretical plate number)* using various equations. The most popular ones are:

By USP (United States Pharmacopeia)

$$N = 16 \times \left[\frac{t}{W}\right]^2$$

Where:

N: is the number of theoretical plates

t: is the retention time of the analyte

W: is the width at the base of the analyte

By DAB (German Pharmacopeia)

$$N = 5.54 \times \left[\frac{t}{W_{0.5}}\right]^2$$

Where:

N: is the number of theoretical plates

t: is the retention time of the analyte

$W_{0.5}$: is the width-at-half-height of the analyte

Selectivity *(α)* is measured by the retention factor ratio between two similar compounds.

$$\alpha = \frac{k'_2}{k'_1}$$

Where:

K_1': is the retention factor of product #1

K_2': is the retention factor of product #2

Separation's difficulty based on the selectivity value. If the selectivity is:

≥ 2:	Easy separation
1.5 - 2:	Possible separation*
1.2 - 1.5:	Difficult separation
≤ 1.2:	Very difficult separation**

* Method adjustment could be required

** Selectivity's optimization may be required

Important HPLC Definitions and Equations (*con't*)

Resolution *(R)* can be expressed using the two following equations

$$R = \frac{\sqrt{N}}{4} \times \left(\frac{\alpha - 1}{\alpha}\right) \times \left(\frac{1 + k'_2}{k'_2}\right)$$

Where:

N: is the number of theoretical plates

α: is the selectivity

K_2': is the retention factor of product #2

$$R = \frac{2(t_2 - t_1)}{W_2 + W_1}$$

Where:

T_1: is the retention time of the product #1

T_2: is the retention time of the product #2

W_1: is the width at the base of the product #1

W_2: is the width at the base of the product #2

Summary of Influencing Factors in HPLC

To choose the most suitable HPLC column, various parameters need to be taken into account: the desired selectivity and the sample load as well as the efficiency and the resolution. All these parameters are influenced by different factors in HPLC summarized in the table below.

Liquid Chromatography Influencing Factors

Properties	Typical Parameters	Affected Influencing Factors	Limitations
Chromatographic Conditions	Solvent	Retention, Efficiency	Back-pressure & phase stability
	pH	Selectivity, Resolution & Retention	Phase stability
	Flow Rate	Analysis Time, Efficiency & Resolution	Back-pressure & phase stability
Packing Characteristics	Chemistry *(SiO_2, C18, etc.)*	Selectivity, Resolution & Retention	Solvent used
	Pore Size (Å)	Sample Load & Selectivity	Size of the molecule
	Particle Size (µm)	Back-pressure, Efficiency & Resolution	Back-pressure & flow rate
HPLC Column Dimensions	Internal Diameter	Sample Load & Sensitivity	Back-pressure & flow rate
	Length	Analysis Time & Resolution	Back-pressure & analysis time too long

How to Select the Right Silia*Chrom* HPLC Column

To select the right HPLC Column to use in your method development, read the section below to select the most appropriate Silia*Chrom* HPLC column to try first. However, before going forward in the selection, you need to have an idea of the sample quantity you need to purify as well as the liquid chromatography equipment available.

Remember: Resolution $R = \frac{\sqrt{N}}{4} \times \left(\frac{\alpha - 1}{\alpha}\right) \times \left(\frac{1 + k'_2}{k'_2}\right)$

Step 1. Find the Desired Selectivity by Selecting the Chemistry

When selecting an HPLC column, the most important factor is the selectivity in order to achieve an optimal resolution. A good knowledge of the composition of the sample mixture is crucial to select the most suitable chromatography mode to use in order to have good interactions between the sorbent and the compounds.

In liquid chromatography, there are various modes of operation possible based on the interaction mechanism of the solute with the stationary phase. Please refer you to previous sections to choose the most suitable phases to get optimal separation results.

Step 2. Select the Pore Diameter

To select the right pore diameter to use, find out the molecular weight of the solute. Typically, for small molecules, 100 - 150 Å pore size is recommended *(molecular weights below 5,000 Da)*. For large molecules, such as peptides and proteins, 300 Å or higher is recommended.

Step 3. Find the Desired Efficiency & Resolution

Once you found the right selectivity, the second step is;

Be able to separate your sample with the shortest possible analysis time WITH optimal efficiency.

Two factors can influence the efficiency of a chromatography:

1. The particle size: influence on the resolution and back-pressure
2. The column dimensions *(internal diameter & length)*: influence on the resolution and the sample load

Step 3.1. Select the Particle Size

For analytical applications, different particle sizes are available. The most common one being the 5 µm due to a good price/performance ratio. However, if you require a better separation and want to decrease analysis time, then 3 µm would be a better choice. Keep in mind that with a smaller particle size the backpressure will be higher.

For preparative applications, a larger particle size is usually used *(most frequently used is 10 µm)* with a larger column diameter *(≥ 20 mm)*.

How to Select the Right Silia*Chrom* HPLC Column *(con't)*

Step 3.2 Select the Column Dimensions *(Influence on the Resolution)*

For analytical applications, the most often recommended format for initial trial is the 4.6 x 150 mm. Then, if you need more resolution, look at: decreasing the internal diameter or increasing the column length.

3.2.1 Select the Internal Diameter *(Influence on the Sample Load)*

With smaller internal diameters, you reduce solvent consumption due to lower flow rate required but increase analysis time. Furthermore, loading capacity is decreased as the diameter decreases. The table below identifies typical applications associated with typical internal diameters used in HPLC.

Select the Internal Diameter (*ID*)

Type of columns	ID (*mm*)	Typical Sample Load	Typical Flow Rate	Typical Applications
Narrow Bore	2.1	0.04 - 1.5 mg	0.1 - 0.3 mL/min	Used with low sample volumes or when more sensitivity and selectivity are needed over 3 mm ID.
	3.0	0.08 - 3.0 mg	0.2 - 0.6 mL/min	Used to reduce flow rate and solvent consumption over 4.6 mm ID. It is gaining popularity.
Analytical	4.6	0.2 - 7.0 mg	0.5 - 1.5 mL/min	This is the most common ID used for traditional quantitative analysis.
Semi-Preparative	10	0.95 - 33.0 mg	2.5 - 7.0 mL/min	Used for small-scale *(mg)* preparative purifications.
Preparative	20	4.0 - 132.0 mg	9.0 - 28.0 mL/min	Used for large-scale *(hundreds of mg to gram)* purifications. The higher the diameter, the greater the loading capacity.
	30	8.5 - 297.0 mg	20.0 - 60.0 mL/min	
	50	24.0 - 800.0 mg	60.0 - 175.0 mL/min	
	100	96.0 - 3,200.0 mg	240.0 - 700.0 mL/min	

3.2.2 Select the Column Length (*Influence on the Resolution*)

The rule of thumb is that in presence of the same packing, longer columns provide better resolution and efficiency over shorter ones but with longer retention times and higher pressure. In general, it is preferable to try using the shortest column length possible. If the resolution is not good enough, increase the column length or use a smaller particle size with the same length. The table below presents the most suitable length/particle combinations.

Select the Column Length

Length (*mm*)	Most Suitable Particle Size (*µm*)	Typical Applications
30 & 50	3 µm or smaller	Used to reduce flow rate and solvent consumption over 100 & 150 mm lengths.
100 & 150	3 or 5 µm	These are the most common lengths used for traditional quantitative analysis.
200 & 250	5 µm or larger	For difficult separations or for higher resolution.

Acceptable Modifications to an HPLC Validated Method

Even if you are using an FDA validated or a USP recommanded method, some operating conditions can be adjusted if the modifications respect the acceptable specifications proposed by Pharmacopeias[1-3] and the FDA[4]. A side-by-side comparison of both the original and the adjusted method needs to be performed to demonstrate that the method's accuracy and precision is not affected by these modifications.

Acceptable Modifications to an HPLC Validated Method		
Parameters	**Allowable modification**	**Examples of possible modifications**
Mobile phase pH	± 0.2 units	Validated pH: 7.0 Allowed pH range: 6.8 - 7.2
Concentration of salts in buffer	± 10%	Validated concentration: 20 mM Allowed concentration range: 18 - 22 mM
Ratio of components in mobile phase	Only the minor components can be adjusted by ± 30% or ± 2% absolute *(i.e.: in regards to the total mobile phase)*, whichever is the larger but should never exceed ± 10% absolute or removed totally.	**Binary mixtures:** Validated ratio: 50/50 Allowed ratio: 40/60 to 60/40 Validated ratio: 95/5 Allowed ratio: 93.5/6.5 to 96.5/3.5 **Ternary mixtures**: Validated ratio: 60/35/5 Allowed % of the 1st component: 60% Allowed % of the 2nd component: 25 - 45% Allowed % of the 3rd component: 3.5 - 6.5% The total of the three components together need to be 100%.
Wavelength of UV detector	No modification allowed.	n/a
Column length	± 70%	Validated length: 150 mm Allowed length range: 45 - 255 mm
Column inner diameter	± 50%	Validated inner diameter: 4.6 mm Allowed inner diameter range: 2.3 - 10.6 mm
Flow rate	± 50%	Validated flow rate: 1.00 mL/min Allowed flow rate range: 0.5 - 1.5 mL/min
Injection volume	May be increased to as much as 2 times if no adverse effects on LOD and repeatability.	n/a
Particle size	No increase permitted. May be decreased by as much as 50%.	Validated particle size: 5 µm Allowed particle size range: 2.5 - 5 µm
Column temperature	± 20%	Validated temperature: 23°C Allowed length range: 18.4 - 27.6°C

1. USP. USP 32–NF 27, Chromatography <621>. Rockville, MD: USP; 2009:227.
2. USP. Second Supplement to USP 32–NF 27. Rockville, MD: USP; 2009:4147.
3. USP. USP 32–NF 27, Verification of Compendial Procedures <1226>. Rockville, MD: USP; 2009:736.
4. ORA Laboratory Procedure, Food and Drug Administration, modification criteria.

Silia*Chrom* HPLC Column Storage Cabinet

Protect your HPLC Column Inventory with the Silia*Chrom* Column Storage Cabinet

The Silia*Chrom* Column Storage Cabinet has been designed to safely store your HPLC column investment. Poor column storage can lead to reduced column performance and decreased product life.

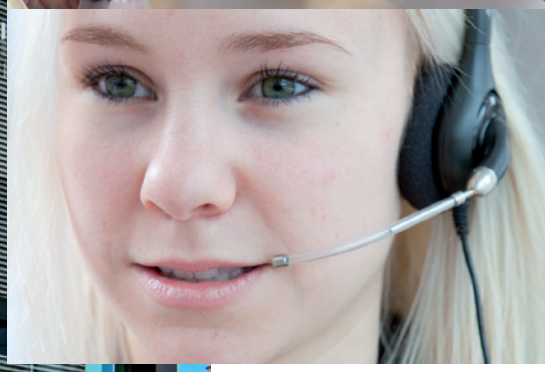
The Silia*Chrom* Column Storage Cabinet is a bench top storage unit of solid steel construction with chrome-plated D-ring handles for added resistance. Up to 30 columns of 300 mm long *(or shorter)* can be stored in 5 separate drawers. Each drawer has a 6 position secure molded foam insert providing several storage possibilities. The foam insert can easily be customized to accommodate shorter columns, guard cartridges or HPLC tools and fittings. Each storage cabinet is stackable and supplied with rubber mounts. With the addition of a mounting bracket *(sold separately)*, your Silia*Chrom* Column Storage Cabinet can be expanded to a multi-unit storage device.

The Silia*Chrom* Column Storage Cabinet is a cost-effective, expandable solution to conveniently index and store your HPLC column inventory.

Using the Silia*Chrom* HPLC Column Storage Cabinet ensures the following benefits

- Easy column identification.
- No more misplaced or lost columns.
- Increases column lifetime.
- Saves time and storage space.

Silia*Chrom* Column Storage Cabinet Characteristics	
Column Storage Cabinet PN	AUT-0167
Mounting Bracket PN	AUT-0168
Dimensions (*W x H x D*)	279 x 325 x 408 mm
Drawer Height	51 mm
Column Formats	From 20 to 300 mm lenght
Column Storage Cabinet Weight	12 Kg



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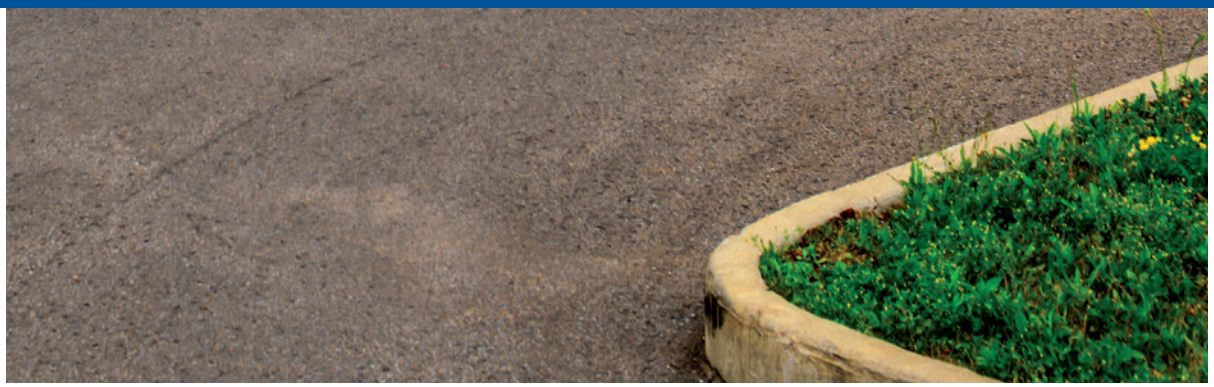


SILICYCLE Inc.®
UltraPure SILICA GELS

Check Out SiliCycle's Pharmaceutical Catalog for Further Insights into our Vast Array of Innovative Products

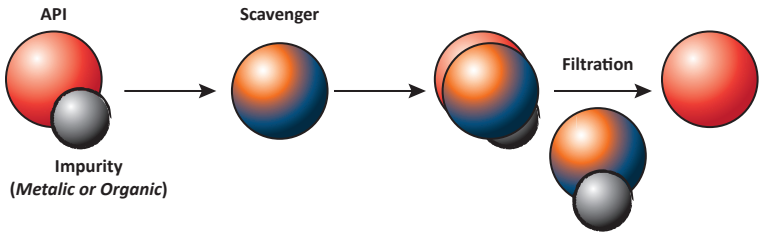
Drug Purification: Immobilised Scavengers for Metal and Organic Removal Technology (Silia*MetS*® & Silia*Bond*®)

This technology has proven to be extremely effective for a variety of fields such as pharmaceuticals, organic chemistry labs, agrochemicals, mining, fine chemicals, water and waste treatments.

SiliCycle has pioneered the field of functionalized silicas, so you can benefit from our scavenging expertise.

Our functionalized silicas are an elegant and practical approach for the removal of metals or organic impurities in your final compound or solution. Challenging purifications in chemistry can now be overcome creatively and elegantly!

A functional group is bound to a silica backbone, that will specifically react with a product either excess reagents (*unreacted*) or impurities. Your molecule of interest is then recovered by simple filtration:



This is a clean, easy, fast, cheap and strongly effective strategy for drug purification, with great compatibility for a myriad of experimental conditions, solvents, pH and temperature.

We have over 20 years of know-how in silica-grafting and scavenging technology and the broadest portfolio on the market of scavengers with associated applications.

This also means the widest range of formats (*bulk, SPE...*), addressing all purification scales (*from laboratory to plant scale*), and the largest range of metals and organics that can be scavenged.

Functionalized Silicas for Metal & Organic Scavenging		
Silia*MetS* Metal Scavengers	Both Metal & Organic Scavengers	Silia*Bond* Organic Scavengers
AMPA (***R85130B***)	Amine (***R52030B***)	Maleimide (***R71030B***)
Cysteine (***R80530B***)	Diamine (***R49030B***)	Propylsulfonic Acid (***R51230B***)
DMT (***R79030B***)	Triamine (***R48030B***)	Tosic Acid (***R60530B***)
DOTA (***R91030B***)	DEAM (***R54430B***)	Isocyanate (***R50030B***)
Imidazole (***R79230B***)		Tosyl Chloride (***R44030B***)
TAAcOH (***R69030B***)		Carboxylic (***R70030B***)
TAAcONa (***R69230B***)		TMA Acetate (***R66430B***)
Thiol (***R51030B***)		DMAP (***R75530B***)
Thiourea (***R69530B***)		Piperazine (***R60030B***)
		Guanidine (***R68230B***)
		Carbonate (***R66030B***)
		Diol (***R35030B***)

Check Out SiliCycle's Pharmaceutical Catalog for Further Insights into our Vast Array of Innovative Products

Immobilisation of different organic functionalities is an elegant, clean and practical strategy to overcome these concerns. These unique and strongly effective materials offer a whole new range of possibilities to medicinal, process, R&D and screening chemists, researchers and manufacturers.

Functionalized Silicas for Heterogeneous Catalysis			
SiliaCat Catalyst	SiliaBond Oxidants	SiliaBond Reagents	
Si-DPP-Pd (***R390-100***)	Si-$KMnO_4$ (***R23030B***)	Aluminium Chloride (*Si-AlCl*x) (**R74030B**)	DMAP (*Si-DMAP*) (***R75530B***)
Si-Pd0 (***R815-100***)	Si-PCC (***R24030B***)	Carbodiimide (*Si-DCC*) (**R70530B**)	HOBt (*Si-HOBt*) (***R70730B***)
Si-Pt0 (***R820-100***)	Si-PDC (***R24530B***)	Dichlorotriazine (*Si-DCT*) (**R52230B**)	Morpholine (*Si-MOR*) (***R68030B***)
		EDC (*Si-EDC*) (***R70630B***)	Piperidine (*Si-PIP*) (***R71530B***)
		Diphenylphosphine (*Si-DPP*) (***R39030B***)	

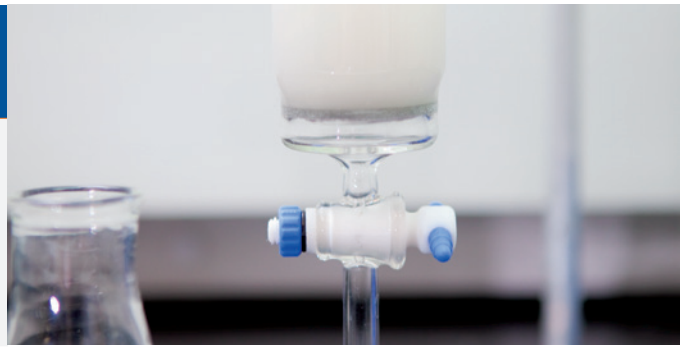
Our silica gels are ideal for both analytical and preparative chromatography, from laboratory to pilot-plant processes and production scale.

Check Out SiliCycle's Pharmaceutical Catalog for Further Insights into our Vast Array of Innovative Products

Drug Purification: Functionalized Silicas as Chromatographic & Ion Exchange Phases (SiliaBond® & SiliaSphere® PC)

Silica is the most wodely used matrix in chromatography. These bare and grafted supports process great properties for uses as stationary phases and are particularly appreciated for their high mechanical resistance.

We offer the largest range of functionalized silicas, all available with capped or uncapped residual silanol groups.



In a mixture, the interactions between the two phases will generate the separation. Hence, depending on the analyte's polarity, the appropriate stationary phase has to be chosen, and the mobile phase's polarity has to be tuned.

I**n an ion exchange process**, the silica support is modified by a function carrying a charge with its counter ion. This counter ion is exchangeable with other ions in solution. If the immobilized phase is carrying an anion, the exchangeable species is a cation. Inversely, if the immobilized phase carries a cation, the ion exchangeable species will be an anion.

Functionalized Silicas for Chromatography

SiliaBond Reversed-Phases	SiliaBond Normal Phases	SiliaBond Ion-Exchange Phases
Si-C18, C8, C6, C4, C1	Amine (*R52130B*)	Amine (*R52130B*)
Si-Cyano (*R38030B*)	Bare Silica (*R10030B*)	Diethylamine (Si-WAX2) (*R76630B*)
Si-PHE (*R33830B, R34030B, R34130B*)	Si-Cyano nec (*R38130B*)	TMA Chloride (Si-SAX) (*R66230B*)
Si-PFP (*R67530B*)	Si-Diol (*R35030B*)	TMA Acetate (Si-SAX2) (R66430B)
	AgNO3 (*R23530B*)	Tosic Acid (Si-SCX) (*R60430B*)
		Propylsulfonic Acid (SCX-2) (*R51430B*)
		Carboxylic Acid (WCX) (*R70130B*)

SiliCycle Prepacked Flash Cartridges (SiliaSep™)

The use of flash cartridges improves purification efficiency by offering superior reproducibility and productivity compared to conventional manual flash chromatography.

More tight & more homogeneous packing equals better separation.

Our silica-based flash cartridges offer superior performances over competitive cartridges. They are availabla in various silica gel grades (*40-63 & 15-40 µm*) and in the most vast array of functionnalities (*reversed, normal, ion-exchange phases, functionnalized with metal & organic scavengers etc.*)

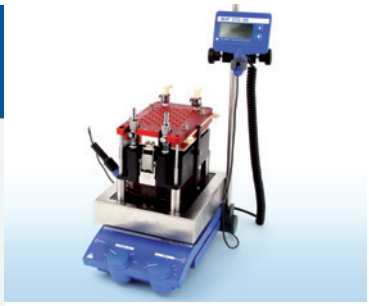
Small scale purification	Production scale purification
up to 1.6 kg	up to 40 kg cartridge

Check Out SiliCycle's Pharmaceutical Catalog for Further Insights into our Vast Array of Innovative Products

SiliCycle MiniBlock XT: Multifunctional Synthesis Platform

SiliCycle MiniBlock XT is a compact easy-to-use reaction block designed for synthesis and screening reactions.

SiliCycle MiniBlock XT is widely used by chemists working in biopharma, chemical, petrochemical and polymers.



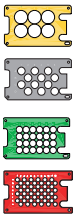
Applications include synthesis of small organic molecules, optimization of critical process parameters and screening for optimal reaction conditions.

It enables reactions to be run under stringent conditions, allowing complete freedom when choosing a synthetic route.

- Parallel Synthesis
- Reaction Screening
- Catalyst Screening
- Reflux and Inerting

Inert Conditions

Continuous inert gas flow enables air/moisture sensitive reactions. Easily add reagents through the septum layer.

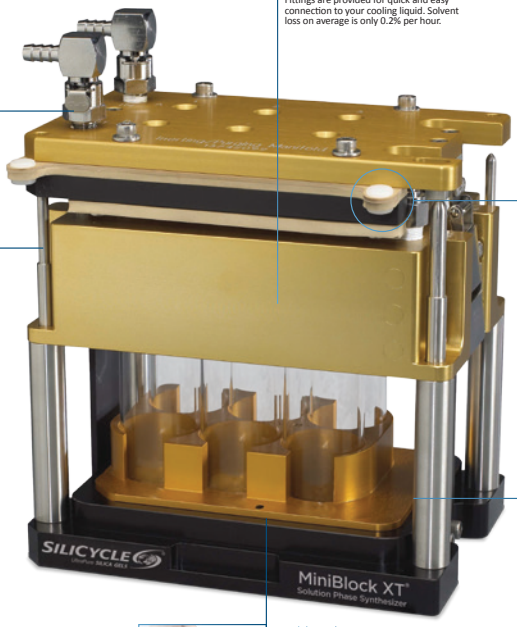


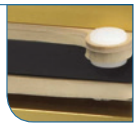
Configure Your SiliCycle MiniBlock XT to Suit Your Needs

Easily configure the SiliCycle MiniBlock XT to choose the scale and number of experiments based on your project requirements.

Efficient Reflux

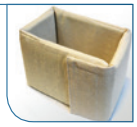
Single reflux jacket cools all vessels. No need for individual condensers. Fittings are provided for quick and easy connection to your cooling liquid. Solvent loss on average is only 0.2% per hour.





Easy Reaction Setup

All vessels are sealed with a single septum layer and allow easy access to reactions.



Heating and Cooling

Precision heating to 120°C and cooling down to -20°C are achieved using modular heat transfer jackets. Temperature uniformity and reproducibility is within 1°C at 80°C.

Modular Racks

Readily interchangeable reaction vessel racks enable simple conversion between 6, 12, 24, and 48-Positions arrays. The 24 and 48-Positions vessel racks are compatible with parallel centrifugal evaporators.

SiliCycle R&D Services

We aim at establishing long-term partnership with our customers by offering all-inclusive service.

SiliCycle is devoted to serving the global chemical industry and constantly focuses on quality. Our flexible approach for each project brings added value to our services to match each client's requirement.

Our mandate is to offer on-time tailored package of work with communication report format, cost and timeframe in lined with your projects.

Portofolio of some available services:

- Scavenging
- Screening
- Catalysis services
- Organic services
- Chromatography, purification & analytical services
- Material science services
- Custom HPLC packing services

Terms and Conditions

General

Unless otherwise stated, all transactions are expressly subject to these Terms and Conditions. Modifications or additions will be recognized only if accepted in writing by an officer of SiliCycle Inc. *(hereinafter named SiliCycle)*, or an officially designated representative. Provisions of buyer's Purchase Order or other documents that add to or differ from these Terms and Conditions are expressly rejected. No waiver of these Terms and Conditions or acceptance of others shall be construed as failure of the Company to raise objections.

Privacy Policy

Because your clientele is our most vital asset, we take privacy very seriously and won't share your personal information with anyone. Your information is used only to personalize your profile and to facilitate the transaction. You can change or update your information at any time.

Quotation and Published Prices

Quotations automatically expire 30 calendar days from the date issued unless otherwise stated. Quotes are subject to withdrawal with notice within that period. Prices shown on the published price lists and other published literature issued by SiliCycle are not unconditional offers to sell, and are subject to change without notice.

Warranty

SiliCycle guarantees to the original buyer that the products sold conform to the composition and purity described therein at the time of their shipment. The buyer's sole remedy in the event that SiliCycle fails to meet said warranty shall be the replacement of the unused portion of the product*(s)*, or if approved by SiliCycle, a refund *(at the purchase price)* provided that the buyer returns the alleged non-conforming product*(s)* within 30 days after reception of product*(s)*. SiliCycle makes no other guarantee of suitability for a particular purpose or of the merchantability in the use or handling of the product, and does not accept any liability for consequential, special, indirect or incidental damages resulting therefrom.

Changes

The buyer may, with the express written consent of SiliCycle, make changes in the specifications for products or work covered by the contract. In such an event, the contract price and delivery dates shall be equitably adjusted. SiliCycle shall be entitled to payment for reasonable profit plus costs and expenses incurred by work and materials rendered unnecessary as a result of such changes and for work and materials required to effect said changes.

If the buyer has made a mistake on his/her purchase order, and the material has already been shipped and received, SiliCycle may approve the exchange of said material *(if price is identical)*; however the buyer will be responsible for all shipping costs. See return authorization policy section on the next page to obtain a return merchandize authorization form prior to returning goods.

Cancellation

Undelivered parts of any order may be cancelled by the buyer only with the written approval of SiliCycle. If the buyer makes an assignment for the benefit of creditors, or in the event that SiliCycle, for any reason feels insecure about buyer's willingness or ability to perform, SiliCycle shall have the unconditional right to cancel the sales transaction or demand full or partial payment.

In the event of any cancellation of this order by either party, the buyer shall pay SiliCycle for reasonable costs and expenses incurred by the SiliCycle prior to receipt of the cancellation notice, plus SiliCycle's usual rate of profit for similar work.

Taxes

The Company's prices do not include any applicable sales, goods and services, use, excise or similar taxes and the amount of any such tax SiliCycle may be required to pay or collect will be added to each invoice and paid by the buyer.

Terms of Payment

All merchandise purchased remains the property of SiliCycle until such time as all invoices for the merchandise have been paid in full. Except for purchases paid online, or unless explicitly stated elsewhere in writing, terms are cash net 30 days from date of invoice. Additional fees of 2% per month *(26.8% per year)* will accrue on all accounts past due. If any payment is in default, and it becomes necessary to hire a recovery agency or lawyer, the client accepts to pay, in addition to the outstanding balance, recovery fees equal to 20% of the balance in capital and interests. By reason of the financial condition of buyer or otherwise, SiliCycle may require full or partial payment in advance.

Certain orders may require a deposit or progressive payments as referenced in the quote. Such deposits may be increased upon receipt of purchase order based upon the buyer's most current credit rating. Subject to the warranties stated in this policy, all sales are final without right of return.

Return Policy

Our Customer Service Department is available to assist you at any time should a problem arise with your order. Please make sure to inspect your packages immediately upon receipt and notify us within the next two *(2)* business days of any damage and/or discrepancies. Should a product be sent to you incorrectly, as the result of an error on our part, we will take quick and appropriate action to correct the problem at no charge to you. In order to maintain the quality of our products and continue to provide competitive prices, some products may not be returned for credit. SiliCycle will not grant credit for:

(i) Shelf-worn, used or defaced products;
(ii) Scavengers, reagents, catalysts, or any other bounded silica whose containers have been opened;
(iii) Products that are personalized or customized;
(iv) Refrigerated or temperature-controlled products;
(v) Products that have been discontinued;
(vi) Products not directly purchased from SiliCycle

Products sold in distribution by SiliCycle will be subject to the Terms and Conditions Policy of the respective manufacturer.

Prior to any return, an authorization and a return material authorization *(RMA)* number must be obtained from our Customer Service Department. Shipping instructions will also be provided at this point. The RMA will ensure the safe and proper handling of material; it should therefore be referenced on all shipping labels.

The buyer has 30 days from the issuance of the RMA to return the goods. Returns made without an authorization number will not be accepted and will be returned to the buyer.

Returns are subject to a 50% restocking and/or disposal fee.

Shipping Policy

SiliCycle uses a two-day or five-day delivery *(or equivalent)* depending on weight and availability of product. Standard overnight delivery can also be arranged. Freight charges are prepaid and added to the invoice unless special instructions are requested by the customer. These conditions apply to all North American shipments. International delivery delays will vary according to orders and destination countries.

Delivery

Delivery dates indicated in the contract documents are approximate and based on prompt receipt of all necessary information regarding the product covered by the contract. SiliCycle will use reasonable efforts to meet the indicated delivery dates, but cannot be held responsible for its failure to do so.

In the event of any delivery delay caused by the buyer, SiliCycle will store and handle all items ordered at buyer's risk and will invoice buyer for the unpaid portion of the contract price, plus storage, insurance, and handling charges on or after the date on which the product is ready for delivery. The invoice will be payable in full within 30 days from the invoice date, unless otherwise expressly agreed to in writing by SiliCycle.

SiliCycle will not hold orders unless specifically approved. SiliCycle has the right to make partial shipments and bill for those shipments; the buyer will make payment in accordance with the terms mentioned in this policy.

Shipping and Handling Charges

Shipping charges plus the applicable company handling charges will be prepaid and billed as a separate item on the product invoice. Title to the product and risk of loss shall pass to buyer upon delivery to a carrier.

Application

All products are sold for laboratory or manufacturing uses. Only professional laboratory staff should handle the chemicals.

Ordering Information

How to order

You can order any SiliCycle product on-line through the new SiliCycle e-commerce website at www.SiliCycle.com.

Orders can also be placed by phone, fax, mail or e-mail. If you prefer, you can reach us by e-mail *(info@silicycle.com)* or by phone *(1 418.874.0054 or Toll free for North America only 1 877.745.4292)*. Please have the following information on hand:

- Your name
- Company name, billing and shipping address
- Purchase order number
- Credit card information
- Product number and description
- Size, quantity and unit of measure
- E.I.N. or F.I.N. *(for United States clients only)*

Technical Support

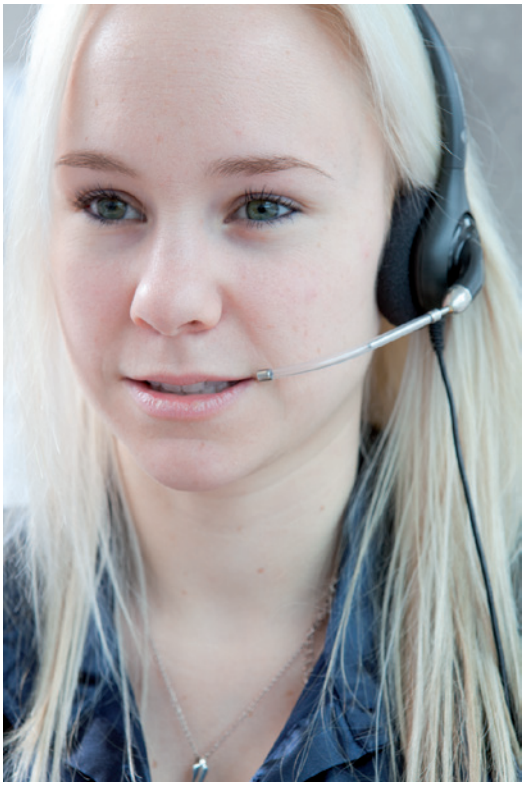
At SiliCycle, we are committed to providing the best technical support possible. Our worldwide Technical Support Group is comprised of a team of highly qualified M.Sc., Engineers and PhD Chemists, Technical Support Professionals and Service Coordinators who are prepared to troubleshoot, answer questions, and provide solutions for your service and applications needs.

In order to better respond to your technical inquiries, feel free to contact us in three different ways:

- E-mail: support@silicycle.com
- Phone: International 1 418.874.0054
  North America 1 877.745.4292 *(Toll-Free)*

SiliCycle headquarters address:

2500, Parc-Technologique Blvd
Quebec City, Quebec
G1P 4S6, CANADA



Solvent Properties and Miscibility Chart

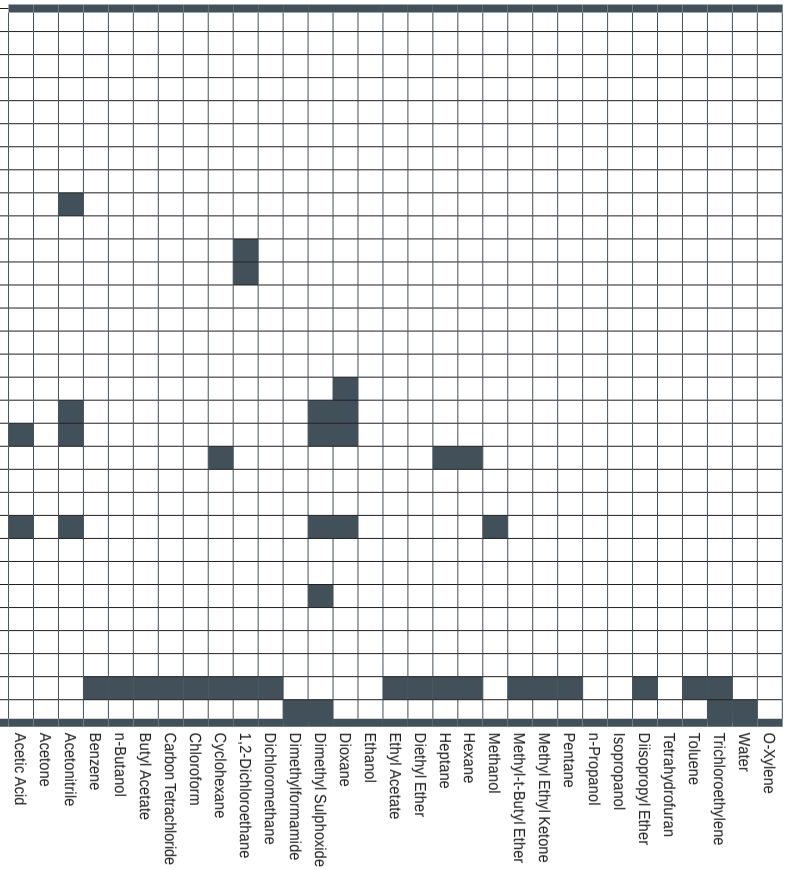
SILICYCLE Inc.
UltraPure SILICA GELS

Your Partner of Choice for HPLC Analysis

Solvent Properties and Miscibility Chart

Solvent Strength	Polarity Index	UV Cutoff (nm)	Refractive Index	Viscosity (cP, 20°C)	Boiling Point (°C)	Water Solubility (w/w%)	Solvent
0.01	1.0	200	1.391	0.50	99	0.0002	Isooctane
0.04	0.0	200	1.410	0.92	174	0.01	n-Decane
0.05	0.1	200	1.407	0.44	49	0.01	Cycloheptane
0.1	1.0	220	1.402	0.45	78	0.11	1-Cyclobutane
0.21	2.1	220	1.397	0.64	142	0.19	n-Butyl Ether
0.28	2.4	220	1.368	0.37	68	0.62	Isopropyl Ether
0.42	3.1	233	1.424	0.44	40	1.6	Methylene Chloride
0.43	4.2	334	1.396	0.51	117	-	Methyl Butyl Ketone
0.47	4.7	320	1.451	2.00	156	-	Cyclohexanone
0.55	5.5	210	1.402	1.72	125	Miscible	Methoxyethanol
0.6	4.5	260	1.362	0.37	57	-	Methyl Acetate
0.64	6.0	380	1.344	0.67	101	2.1	Nitromethane
0.65	6.5	268	1.438	0.84	166	Miscible	N,N'-Dimethylacetamide
0.69	6.0	265	1.447	1.65	182	-	N-Methylformamide
1.11	6.9	210	1.432	19.9	198	Miscible	Ethylene Glycol
2	6.0	260	1.372	1.26	118	Miscible	Acetic Acid
0.56	5.1	330	1.359	0.36	56	Miscible	Acetone
0.65	5.8	190	1.344	0.38	82	Miscible	Acetonitrile
-	2.7	238	1.501	0.65	80	0.18	Benzene
0.39	3.9	215	1.399	2.98	117	7.8	n-Butanol
-	4.0	254	1.394	0.73	126	0.43	Butyl Acetate
-	1.6	265	1.460	0.97	77	0.08	Carbon Tetrachloride
0.4	4.1	245	1.446	0.57	61	0.815	Chloroform
0.04	0.2	200	1.427	1.00	81	0.01	Cyclohexane
-	3.5	228	1.445	0.79	83	0.81	1,2-Dichloroethane
-	3.1	235	1.424	0.44	40	1.3	Dichloromethane
0.64	6.4	268	1.431	0.92	153	Miscible	N,N'-Dimethylformamide
0.62	7.2	270	1.478	2.24	189	Miscible	Dimethyl Sulphoxide
0.56	4.8	220	1.422	1.37	101	Miscible	Dioxane
0.88	4.3	210	1.361	1.20	79	Miscible	Ethanol
0.58	4.4	260	1.372	0.45	77	8.7	Ethyl Acetate
-	2.8	218	1.352	0.23	35	6.89	Diethyl Acetate
0.01	0.1	200	1.388	0.40	98	0.0004	n-Heptane
0.01	0.1	200	1.375	0.31	69	0.0012	n-Hexane
0.95	5.1	205	1.329	0.55	65	Miscible	Methanol
0.35	2.5	220	1.369	0.27	55	4.8	Methyl-t-Butyl Ether
0.51	4.7	329	1.379	0.43	80	24	Methyl Ethyl Ketone
-	0.0	190	1.358	0.23	36	0.004	Pentane
0.82	4.0	210	1.385	2.30	97	Miscible	n-Pentanol
0.82	3.9	205	1.378	2.40	82	Miscible	Isopropanol
-	2.2	220	1.368	0.37	68	-	Diisopropyl Ether
0.45	4.0	212	1.407	0.55	66	Miscible	Tetrahydrofuran
0.29	2.4	285	1.496	0.59	111	0.05	Toluene
-	1.0	273	1.477	0.57	87	0.11	Trichloroethylene
2	10.2	190	1.000	1.00	100	-	Water
0.26	2.5	288	1.506	0.81	144	0.018	O-Xylene

Immiscible *(2 phases are produced when both solvents are mixed)*



References:

CRC Handbook of Chemistry and Physics, 73rd Edition
The HPLC Solvent Guide, 2nd Edition, Paul C Sadek
HPLC Columns, Theory, Technology & Practice, Uwe D Neue
High-Performance Liquid Chromatography, 5th Edition, Veronica R Meyer
The Merck Index, 12th Edition

TEL.: 1 418 874.0054 FAX: 1 418 874.0355 TOLL-FREE: 1 877.SILICYCLE (NORTH AMERICA ONLY) WWW.SILICYCLE.COM INFO@SILICYCLE.COM

As a recognized industry leader in the development, manufacturing and commercialization of innovative silica gel products, and with multi-ton manufacturing capability, SiliCycle® is your partner of choice for all your METAL REMOVAL, CATALYSIS, SYNTHESIS, and PURIFICATION requirements.

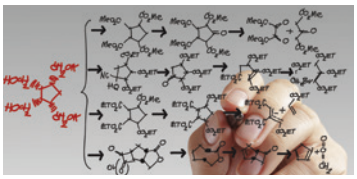
METAL & ORGANIC SCAVENGING

Removal of:
- Metals
- Electrophiles & Nucleophiles
- Potential Genotoxic Impurities (*PGI*)

CATALYSIS & SYNTHESIS

- Couplings (*Suzuki, Stille, Heck, ...*)
- Debenzylation & Hydrogenation
- Oxidation
- And Many More Reactions

ACIDS, BASES & REAGENTS



- Acids & Bases
- Amide Couplings
- Reductive Aminations
- Other Reactions

LOW PRESSURE CHROMATOGRAPHY

- Bulk Silica Gels (*Irregular & Spherical*)
- Bonded Phases
- TLC Plates
- Prepacked Flash Cartridges

SAMPLE PREPARATION

- SPE & Well Plates
- Micro-SPE Tips
- QuEChERS
- SPE Hardware & Manifold

HIGH PRESSURE CHROMATOGRAPHY

- Bulk Sorbents
- HPLC & UHPLC Columns
- SEC & SFC Columns
- Guard Cartridges & Accessories

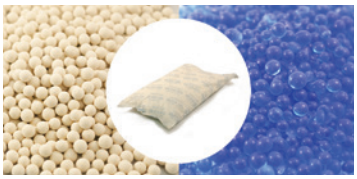
CONSUMABLES

- Vials & Caps
- Syringe Filters
- Membrane Filters

EQUIPMENTS

- Parallel Synthesis Station - SiliCycle MiniBlock® Family
- TLC Scanner
- Vacuum Manifold

DESICCANTS & OTHER BULK ABSORBENTS



- Desiccant
- Activated Alumina
- Molecular Sieve

R&D SERVICES

- Scavenging Screening
- Method Development & Optimization
- Impurities Determination
- Custom Column Packing

CONTACT INFORMATION:

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