

Extend Your Application Reach with Achiral and Chiral SFC Columns

Agilent InfinityLab Poroshell 120 and ZORBAX columns
for supercritical fluid chromatography



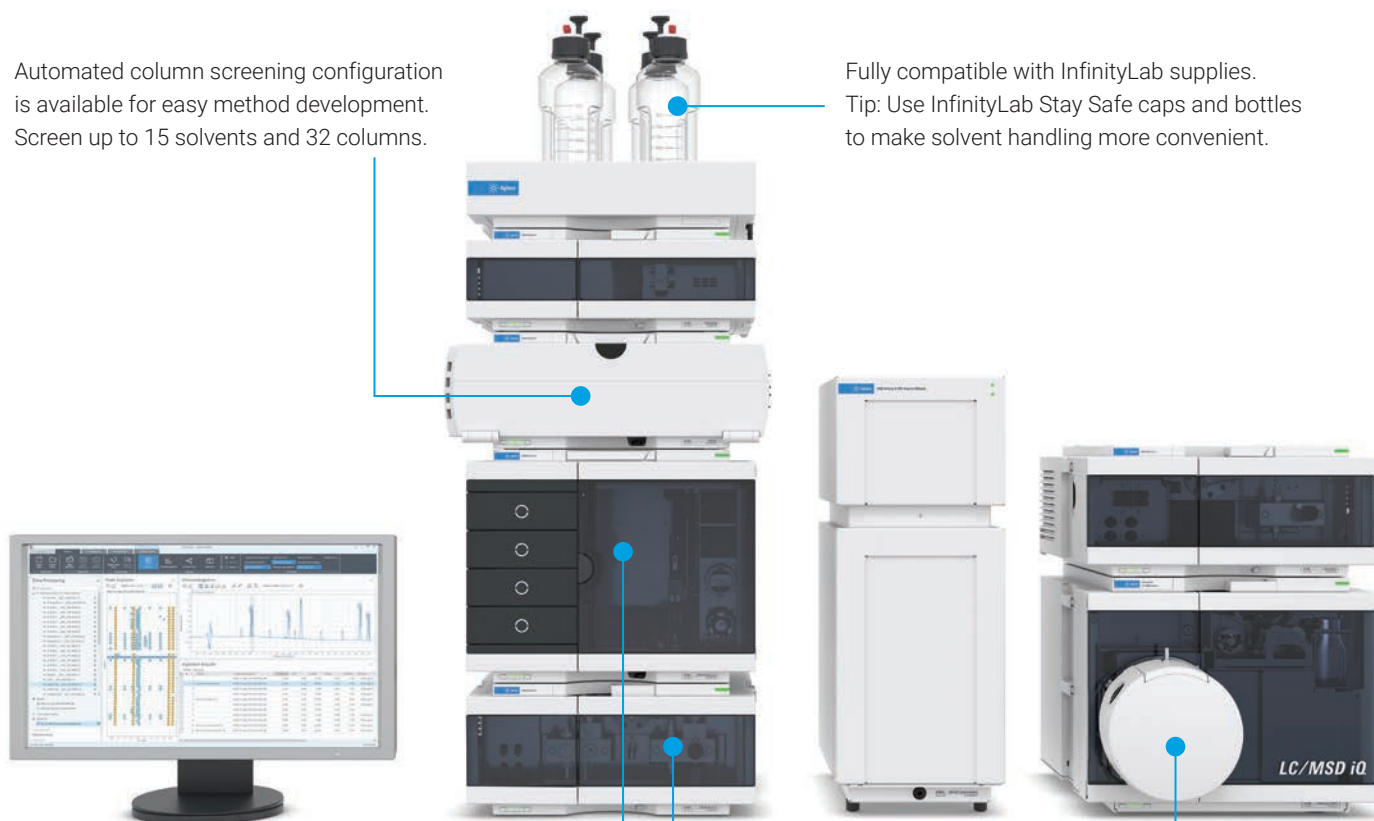
Unleash the Power of Our Complete SFC Workflow

The Agilent InfinityLab Supercritical Fluid Chromatography (SFC) Solutions combine superior instruments and columns, smart supplies, intuitive software, and dedicated services. All are designed to maximize efficiency, use less solvent, and lower costs—while being fully compatible with Agilent mass spectrometers.

Agilent 1260 Infinity II SFC System

Automated column screening configuration is available for easy method development. Screen up to 15 solvents and 32 columns.

Fully compatible with InfinityLab supplies. Tip: Use InfinityLab Stay Safe caps and bottles to make solvent handling more convenient.



Revolutionary FEED injection technology:

- Offers a wide injection range (0.1 to 90 μL) without sample loop change.
- Provides LC-like injection reproducibility for more confidence in your SFC results.
- Protects your column from pressure spikes and eliminates sample diluent effects.

Compatibility with a wide range of Agilent's Mass Spectrometers adds SFC-MS capability

Full application reach: Industry-leading power range (up to 600 bar at up to 5 mL/min).



"Agilent's SFC system is reliable and robust."

- **Li Lin, PhD**
Director of Analysis at Bellen Chemistry Co., Ltd.

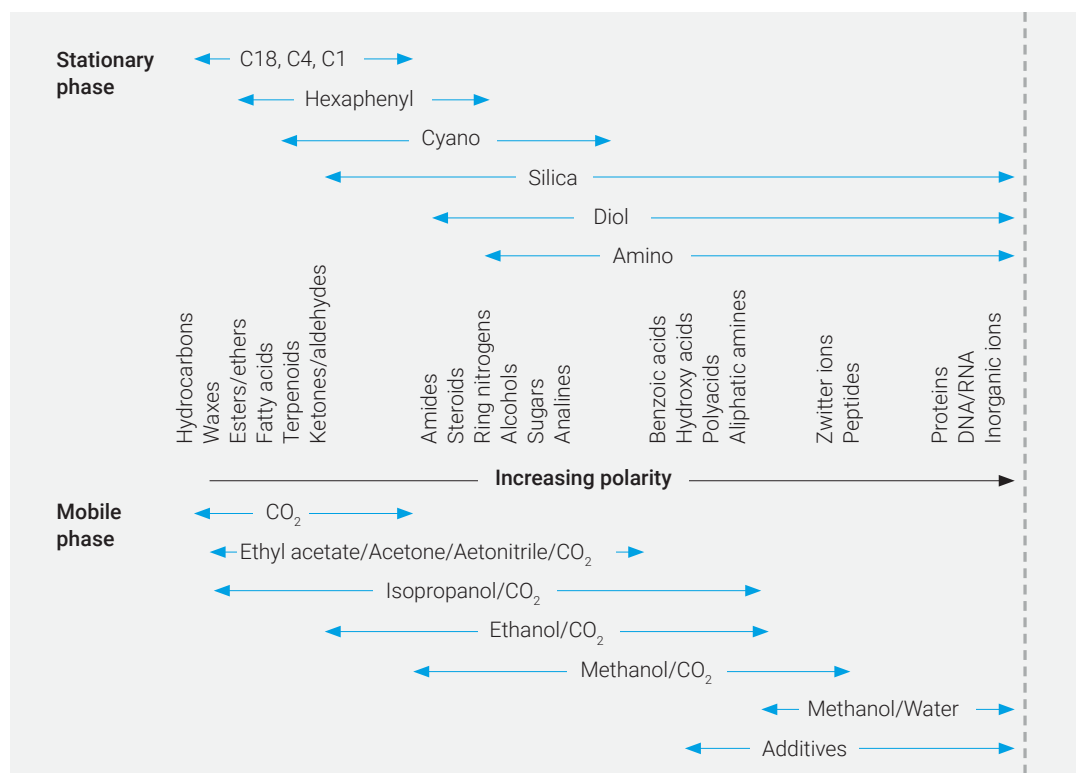
Which Column Is Best for My SFC?

Here are some tips that will help you make the right choice. For more detailed information, we recommend the Agilent SFC primer ([5991-5509EN](#)).

- Both HPLC and UHPLC columns will work with SFC, because the technique uses carbon dioxide as an HPLC mobile phase. Due to the faster diffusion and lower viscosity, higher separation efficiency at significantly lower backpressures—typically less than 400 bar—can be achieved.
- As a rule, any compound soluble in methanol, or a less polar solvent, is a good candidate for separation by SFC.
- SFC has a retention mechanism similar to “normal phase LC” because peaks elute from lower to higher polarity. Most Agilent normal-phase columns—like those with a hydrophilic stationary phase such as amino, cyano, zwitterionic, or pure silica—will give you good retention.
- For very hydrophobic compounds, you can use reversed phase stationary phases like C18, C8, or C3. However, they require an apolar modifier, such as heptane or MTBE.

Quick guide to matching stationary phases to analytes

There are usually several stationary phases that might lead to successful separations for specific classes of compounds. Based on years of research, the following recommendations can help to find the right entry point for column and solvent screening during method development.



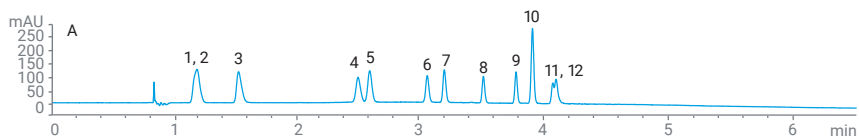
Specific mobile and stationary phases are matched with solute families. Progressively more polar solutes require progressively more polar mobile and stationary phases.

InfinityLab Poroshell 120 Columns: Advanced Performance for SFC Separations

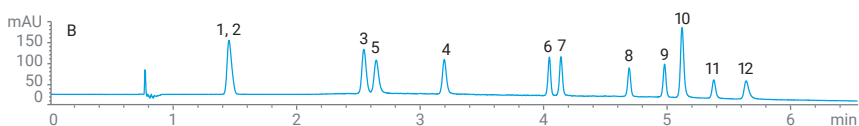
Cover the entire polarity range with lower pressures

Agilent InfinityLab Poroshell 120 HILIC columns are perfectly suited for SFC. Their superficially porous character reduces backpressures for high-modifier gradients or high-speed separations on 400-bar legacy SFC instruments. What's more, independent studies have shown that Poroshell 120 HILIC columns deliver superior peak shape and resolution compared to most other superficially porous columns [1,2].

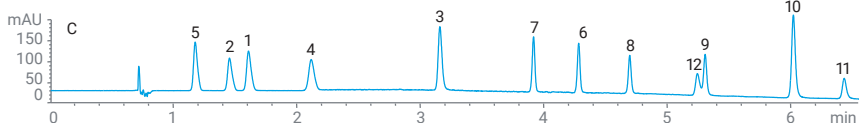
InfinityLab Poroshell 120 HILIC, 4.6 x 150 mm, 2.7 µm



InfinityLab Poroshell 120 HILIC-OH5, 4.6 x 150 mm, 2.7 µm



InfinityLab Poroshell 120 HILIC-Z, 4.6 x 150 mm, 2.7 µm



1. Ibuprofen
2. Gemfibrozil
3. Naproxen
4. Theophylline
5. Caffeine
6. Estradiol
7. Prednisone
8. Prednisolone
9. Estriol
10. Sulfamerizine
11. Sulfadiazine
12. Hypoxanthine

Separation of a set of analytes on InfinityLab Poroshell HILIC (A), HILIC-OH5 (B), and HILIC-Z (C) with SFC-MSD highlighting the orthogonality of the portfolio. Agilent 1260 Infinity II SFC system, 2 mL/min, 1 min: 10% MeOH, 9 min: 90% MeOH, 40 °C, BPR: 100 bar, 400 µL/min feed speed, 4 µL overfeed volume, feed solvent methanol.

Poroshell 120 columns recommended for SFC

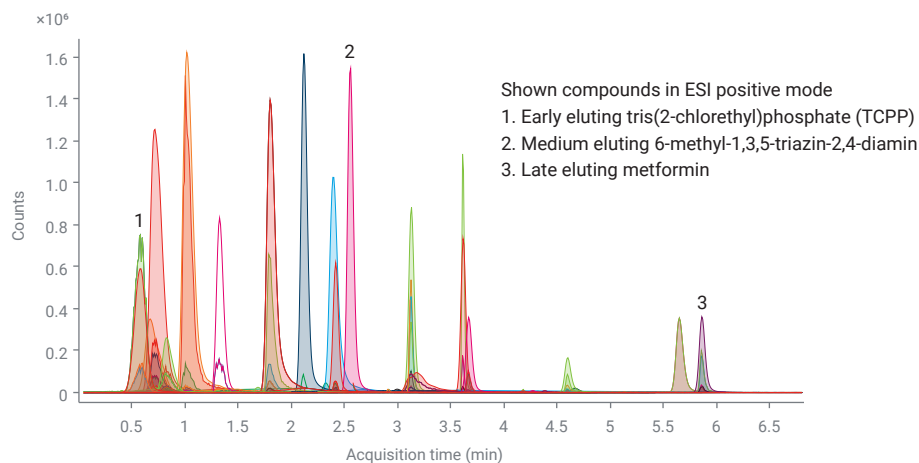
Column Chemistry	Stationary Phase	Particle Size and Dimensions	Pressure Range	Recommended Use
InfinityLab Poroshell 120 HILIC	Pure silica	Particle size: 1.9, 2.7, 4 µm id: 2.1, 3, 4.6 mm Length: 50, 100, 150, 250 mm	1300 bar (1.9 µm) 600 bar (2.7, 4 µm)	Universal SFC column, ideal starting point for method development
InfinityLab Poroshell 120 HILIC-Z	Zwitterionic	Particle size: 2.7 µm id: 2.1, 3, 4.6 mm Length: 50, 100, 150 mm	600 bar	Well suited if ionic interactions would benefit the separation
InfinityLab Poroshell 120 HILIC-OH5	Polyhydroxy fructan phase	Particle size: 2.7 µm id: 2.1, 3, 4.6 mm Length: 50, 100, 150 mm	400 bar	Alternative selectivity with strong hydrogen bonding capabilities
InfinityLab Poroshell 120 EC-CN	Cyano	Particle size: 2.7 µm id: 2.1, 3, 4.6 mm Length: 50, 100, 150 mm	600 bar	Alternative selectivity

[1] V. Desfontaine et al. / *J. Chromatography A* 1562 (2018) 96–107

[2] A.G.-G. Perrenoud et al. / *J. Chromatography A* 1360 (2014) 275–287

Traditional fully porous columns for your SFC

Many Agilent ZORBAX columns can be operated under SFC conditions. Their fully porous particles provide excellent high-volume sample capacity, particularly when using Agilent FEED injection technology. Select from a broad range of phases that boost your method development with unique selectivity.



Separation of 46 highly polar compounds typically found in river water with SFC-QTOF and modifier gradients from 5-95%. A: CO₂, B: methanol + 3 mM NH₄Ac, ZORBAX RRHD HILIC Plus, 3.0 x 100 mm, 1.8 μm, 40 °C, 140 bar BPR, ESI positive. For more information, please view Agilent application note 5994-1096EN.

ZORBAX columns recommended for SFC

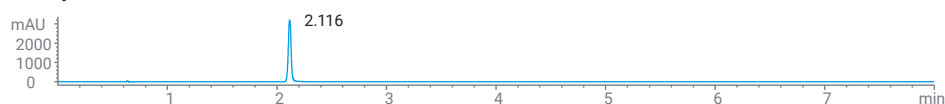
Column Chemistry	Stationary Phase	Particle Size and Dimensions	Pressure Range	Applications
ZORBAX Rx-SIL	Pure silica	Particle size: 1.8, 5 μm id: 2.1, 3, 4.6 mm Length: various (50–250 mm)	600 bar (1.8 μm) 400 bar (5 μm)	Universal SFC column, best starting point for method development
ZORBAX HILIC Plus	Pure silica	Particle size: 1.8, 3.5 μm id: 2.1, 4.6 mm Length: 50, 100 mm	1200 bar (1.8 μm) 400 bar (3.5 μm)	Universal SFC column, often less retentive than the Rx-Sil
ZORBAX Bonus-RP	C14 with amide linkage	Particle size: 1.8, 3.5, 5 μm id: 2.1, 3, 4.6 mm Length: various (50–250 mm)	600 bar (1.8 μm) 400 bar (3.5, 5 μm)	If alternative selectivity is required
ZORBAX NH ₂	Amino	Particle size: 1.8, 3.5 μm id: 2.1, 4.6 mm Length: 50, 150, 250 mm	600 bar (1.8 μm) 400 bar (5 μm)	If alternative selectivity is required
ZORBAX SB-CN	Cyano	Particle size: 1.8, 3.5, 5 μm id: 2.1, 3, 4.6 mm Length: various (50–250 mm)	600 bar (1.8 μm) 400 bar (3.5, 5 μm)	If alternative selectivity is required

Run Your Chiral Separations Faster Than Ever

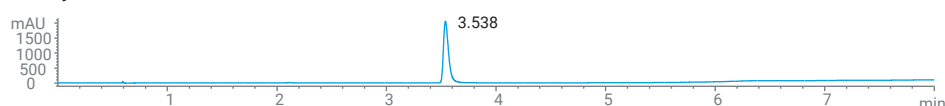
Poroshell 120 Chiral columns are a milestone in chiral column technology. Their 2.7 μm superficially porous particles enable high-resolution and ultrafast separations. They are fully compatible with SFC, so you can meet your most difficult chiral separation challenges.

Not sure which column is right for your application? Select your chiral columns and mobile phases using Agilent InfinityLab SFC Method Development. You can also simplify your worklist creation and data analysis with Agilent Method Scouting Wizard.

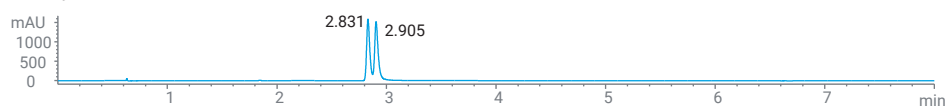
InfinityLab Poroshell 120 Chiral-CF



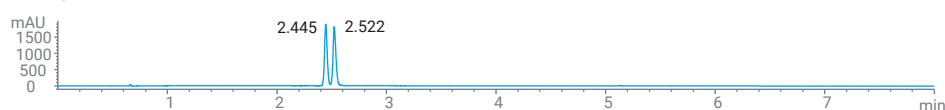
InfinityLab Poroshell 120 Chiral-V



InfinityLab Poroshell 120 Chiral-T



InfinityLab Poroshell 120 Chiral-CD



Typical result of a fast chiral screening of carprofen on InfinityLab Poroshell Chiral columns using SFC. A: CO_2 , B: methanol + 0.1% TEA + 0.1% TFA, Poroshell Chiral CF/T/V/CD, 4.6 x 150 mm, 40 $^\circ\text{C}$, 140 bar BPR pressure, 2.5 mL/min isocratic mode, 40% B, 2 μL injection, 1000 $\mu\text{L}/\text{min}$ feed speed, 1.5 μL overfeed volume, overfeed solvent MeOH.

Chiral columns recommended for SFC

Column Chemistry	Chiral Selector (Bonded Chemistry)	Particle Size and Dimensions
InfinityLab Poroshell 120 Chiral-T	Teicoplanin (macrolide antibiotic)	Particle size: 2.7 μm id: 2.1, 4.6 mm Length: 50, 100, 150 mm
InfinityLab Poroshell 120 Chiral-V	Vancomycin (macrolide antibiotic)	Particle size: 2.7 μm id: 2.1, 4.6 mm Length: 50, 100, 150 mm
InfinityLab Poroshell 120 Chiral-CF	Derivatized cyclofructan (CF6)	Particle size: 2.7 μm id: 2.1, 4.6 mm Length: 50, 100, 150 mm
InfinityLab Poroshell 120 Chiral-CD	Hydroxypropylated- β -cyclodextrin	Particle size: 2.7 μm id: 2.1, 4.6 mm Length: 50, 100, 150 mm



“Our SFC method development strategy always includes stationary phases of Agilent Technologies, Inc. We strongly appreciate the robustness of polar ZORBAX and Poroshell phases, such as ZORBAX Rx-SIL and Poroshell 120 HILIC. They exhibit good selectivity and high separation performance, which is key for successful and efficient method development in SFC. The broad spectrum of available column dimensions has great advantage for the optimization of separations and allows us to adjust the column dimension to obtain the most efficient separations.”

– **Dr. Stefan Bieber**
Managing Director of AFIN-TS GmbH

AFIN-TS GmbH provides a broad spectrum of services in the field of nontarget screening of complex samples. In recent years, the company has gathered great expertise in the separation of polar and very polar organic compounds by LC and SFC. The company provides consulting and support for SFC applications and offers customer-specific SFC method development across Europe.

Selected SFC applications for InfinityLab Poroshell 120 and ZORBAX columns

Application	Industry	Column Used	Application Note Title	Publication Number
Analysis of highly polar river water residues using SFC-QTOF	Environmental	Poroshell 120 HILIC-Z ZORBAX Plus HILIC ZORBAX SB-CN ZORBAX Rx-SIL	Analysis of Highly Polar Compounds by SFC/Q-TOF MS with Identification Using Database and Library Searches	5994-1096EN
Analysis of small molecule pharmaceuticals using SFC-TOF	Pharma	Poroshell 120 HILIC ZORBAX Rx-SIL ZORBAX Bonus-RP Polaris NH2	The Agilent 1260 Infinity Analytical SFC System with Time-of-Flight Mass Spectrometric Detection	5994-0251EN
Separation of fat soluble and water soluble vitamins	Food	ZORBAX SB-Aq ZORBAX SB-C18	Analysis of Vitamins Using an SFC/UHPLC Hybrid System with a Triple Quadrupole LC/MS for Quantification	5991-9192EN
Separation of polycyclic aromatic hydrocarbons (PAHs)	Environmental	Poroshell 120 EC-C18	Accelerating Modifier-Free SFC Separations with the Agilent 1260 Infinity II SFC System	5991-8492EN
Detection of beta blockers in urine using SFC-QQQ	Doping Control	ZORBAX NH2	Determination of Beta-Blockers in Urine Using Supercritical Fluid Chromatography and Mass Spectrometry	5991-6437EN

Want more application notes? Consult our SFC application compendium ([5991-8554EN](#)).

Reliable, efficient, always innovating for your best result

You can rely on Agilent InfinityLab LC instruments, columns, and supplies to deliver rugged quality and robust analytical results. But our promise to you does not stop there. Every component of the Agilent InfinityLab family is designed to work together to help you improve your workflow, increasing efficiency and reducing operational costs.

Learn more about InfinityLab at www.agilent.com/chem/infinitylab



Learn more:

www.agilent.com/chem/LCcolumns

Find technical support and Agilent channel partners:

www.agilent.com/chem/contactus

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