



Discover the secrets of the new chrom age

Chromolith® HPLC columns are made with monolithic silica technology. Chromolith® Performance RP-18e columns provide rapid high quality separation of complex mixtures, while Chromolith® SpeedROD RP-18e columns are even faster and are perfect for fast analysis of simpler mixtures.

Chromolith®, the columns for

- Dramatic savings of time
- Added separation efficiency
- Highest overall column quality
- Reduced wear of your equipment

Product Name and Description	Diameter	Length	VWR Cat. No.	Content of Package
Chromolith® SpeedROD RP-18e	4.6 mm	50 mm	48219-490	One HPLC column
Chromolith® Performance RP-18e	4.6 mm	100 mm	48219-468	One HPLC column
Chromolith® Flash RP-18e	4.6 mm	25 mm	48219-470	One HPLC column
Chromolith® Performance RP-18e	4.6 mm	100 mm	48219-742	Three HPLC column
Validation Kit				
Chromolith® Guard Cartridge RP-18e	4.6 mm	5 mm	48219-736	Three guard cartridges
Chromolith® Guard Cartridge Kit	4.6 mm	5 mm	48219-746	One starter kit
Chromolith® Guard Cartridge RP-18e	4.6 mm	10 mm	48219-738	Three guard cartridges
Chromolith® Guard Cartridge Kit	4.6 mm	10 mm	48219-748	One starter kit
Chromolith® Column Coupler	4.6 mm		48219-744	One column coupler
Chromolith® Performance RP-8e	4.6 mm	100 mm	48219-878	One HPLC column
Chromolith® Performance Si	4.6 mm	100 mm	48219-880	One HPLC column

Chromolith® HPLC Columns

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Manufactured by
Merck KGaA
Darmstadt, Germany



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Merck KGaA
Darmstadt, Germany

Particulate Columns: The classical age !

Sample throughput has increased significantly and subsequently industry in particular has enjoyed large gains in productivity. Existing technology has, however, also placed certain limitations on the further development of laboratory productivity. Not least of these limitations is the HPLC column technology available.

Until now HPLC columns have been made of particulate materials, usually silica. By their very nature small particles when packed tightly into an HPLC steel column, create a significant resistance to the flow of the solvent/sample mixture.

The result is:

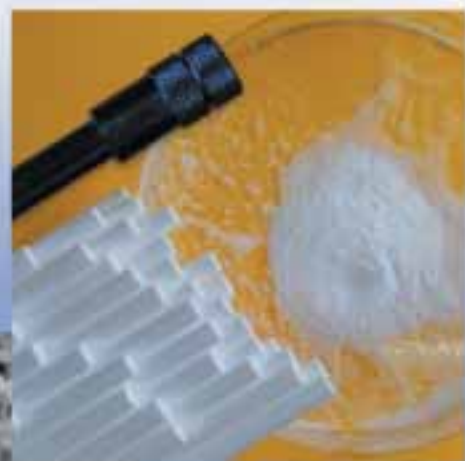
- Very high pressure sometimes has to be used to produce an acceptable flow rate otherwise separations can take up to 30 minutes or more.
- Between gradient runs the columns require a lengthy flushing or equilibration phase before the next sample injection can take place.
- The high resistance places a limitation on the flow rates employed in a method or on the length of the separation column, which can reasonably be used. Further options to improve either the separation quality or the productivity by altering the flow rate within a run or to further extend the column length are not available.
- The particulate nature of a classical silica gel column means that inlet bed settling can occur, which reduces the reliability of the separation and the reproducibility of results.
- The high pressures used also create enormous back-pressure on the instrumentation and reduce the life of pumps, its seals and the column itself.

To overcome these limitations monolithic rods of highly porous silica are now available as

“Chromolith® HPLC Columns”



Monolithic silica technology: A new age in Chromatography



Chromolith® columns are still based on metal-free silica so existing methods can be easily transferred with only minimal investment in new method development work.

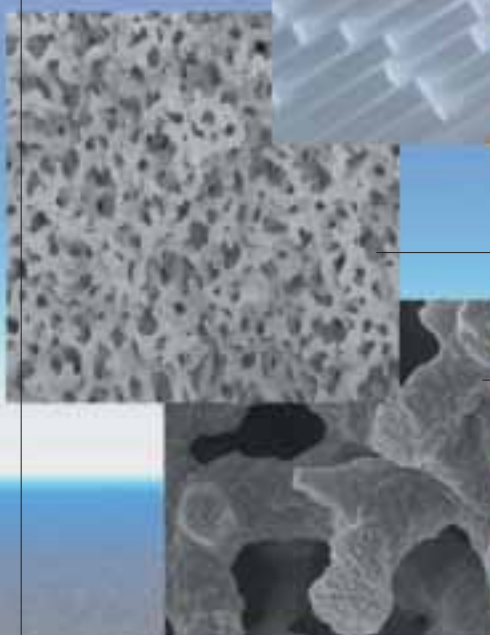
Based on the new “Sol-Gel” technology, highly porous monolithic rods of silica with a revolutionary bimodal pore structure can be formed.

Macroporous structure

Each macropore is on average 2 µm in diameter and together form a dense network of pores through which the eluent can rapidly flow at low pressure dramatically reducing separation time.

Mesoporous structure

These mesopores form the fine porous structure (13 nm) of the column interior and create a very large surface area on which adsorption of the target compounds can occur.



- This unique combination of macropores and mesopores enables the Chromolith® columns to provide excellent separations in a fraction of the time compared to a standard particulate column.

High Flow Rates

Owing to the very high porosity of the Chromolith® column, very high flow rates can be applied with very low pressures.

Classical Quality

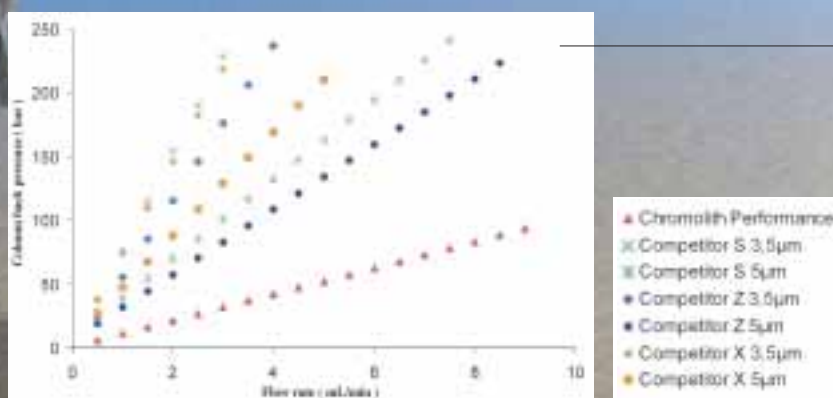
Even the traditional plate count method of measuring quality shows that the Chromolith® column is better than a standard 5 µm particulate column and as good as a 3.5 µm, but with the ability to continue up to 9 mL/min without reaching HPLC system pressure limits.

Overall Quality

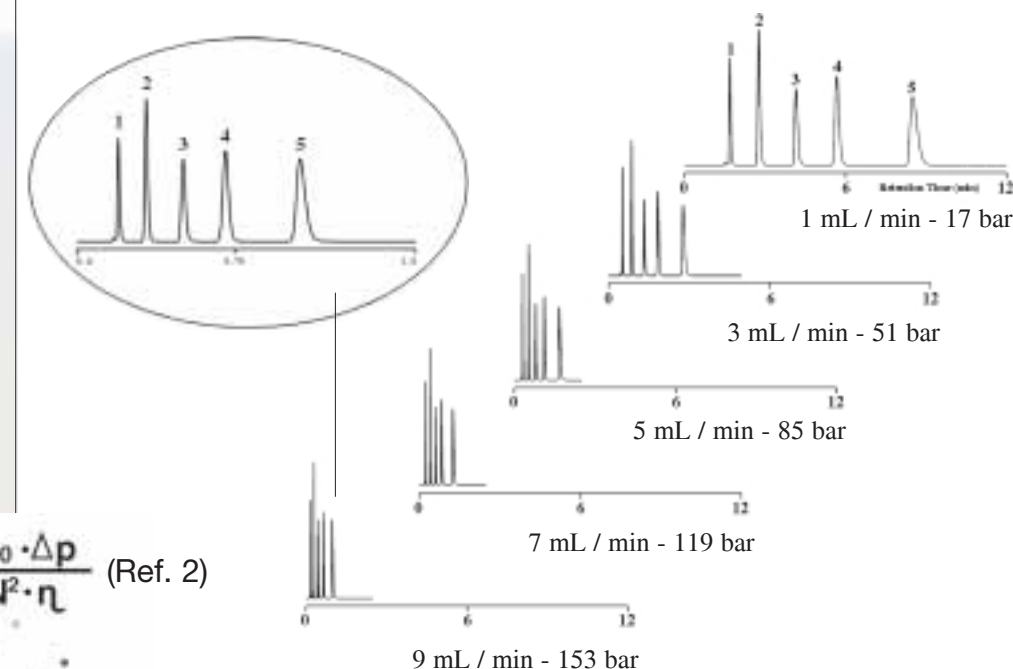
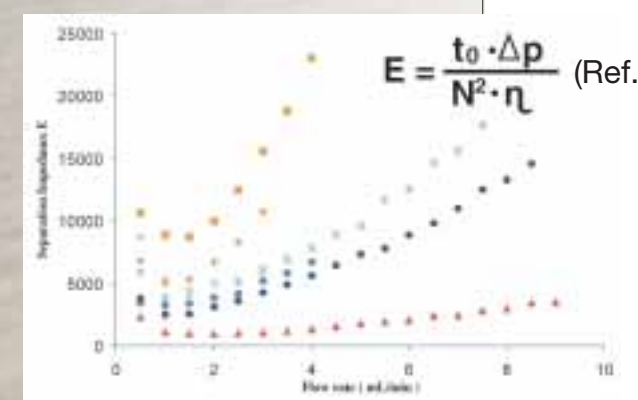
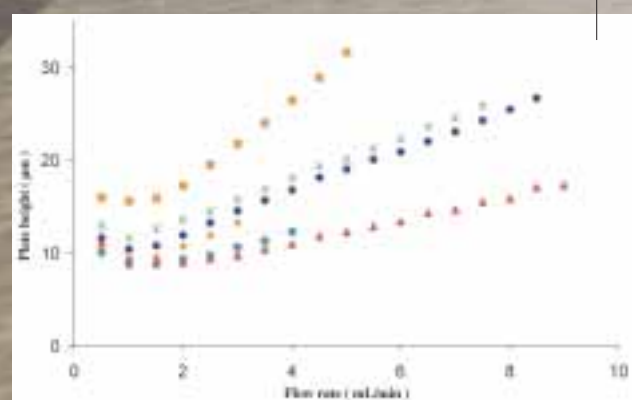
The Separation Impedance E is the measurement of overall quality of a column (Ref. 1). It combines the narrowness of the bands, the analysis time and the pressure needed to drive the separation. The Chromolith® column is clearly superior to all particulate columns available.

Speed and Quality in Practice

With Chromolith® columns, flow rates can easily be varied from 1 mL up to 9 mL per minute with the same high quality resolution.



columns standardized on dimension 100 mm x 4.6 mm, 10 µL Anthracene (10µg/mL), mobile phase 60% acetonitrile, 40% water, 25°C



Column: Chromolith® Performance RP-18e (100 mm x 4,6 mm)
 Mobile Phase: Isocratic acetonitrile / 0.1% trifluoroacetic acid in water, 20/80 (v/v)
 Pressure: Total pressure (including HPLC system)
 25°C, UV 220 nm, 5 µL Injection
 Analytes: 1) 63 µg/mL Atenolol 2) 29 µg/mL Pindolol
 3) 108 µg/mL Metoprolol 4) 104 µg/mL Celiprolol 5) 208 µg/mL Bisoprolol

Discover the secrets of Chromolith® columns

• Higher Throughput Analysis

In a modern HPLC laboratory multiple sample analysis is normal, therefore, the total working time is also dependent on the period required to re-equilibrate the column between solvent gradient runs. Chromolith® columns ensure real high throughput analysis and increases in laboratory productivity for the first time.

• New Dimensions in HPLC

Chromolith® columns add a new dimension for obtaining optimum separation in the fastest time. This new parameter is flow rate. Chromolith® columns are very responsive to changes in flow rate. Flow rates can be changed in mid flow to either enhance the peak definition of the target compound or to shorten the total separation time once the target compound has successfully eluted. This is of particular value to more clearly separate two closely eluting peaks without significantly affecting the total run time. Likewise, it can also reduce total run time when certain compounds elute much later than all the other components of the sample.

• Added Column Performance

Chromolith® HPLC columns can be linked in a series producing a column with a theoretical plate count which is significantly higher than particulate columns, while producing pressures well below the HPLC system limit. With particulate columns further column length is prevented by excessive back pressure.

• More Reliability

Because of the monolithic silica nature of Chromolith® columns, inlet bed settling or bed splitting under high pressure have simply been eliminated. Column reliability, reproducibility and long life are ensured.

Column	Length (mm)	Back Pressure (bar)	Plate Number N Anthracene
Chromolith Performance 1x	100	30	10000
Chromolith Performance 2x	200	60	19000
Chromolith Performance 3x	300	90	27000
Chromolith Performance 4x	400	120	35000
Chromolith Performance 5x	500	150	41000
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Particulate 5 µm Competitor X	250	320	16000
Particulate 5 µm Competitor Z	250	210	17500
Particulate 5 µm Competitor L	250	220	18500
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Particulate 3.5 µm Competitor X	150	330	11500
Particulate 3.5 µm Competitor Z	150	260	14000
Particulate 3.5 µm Competitor L	150	400	19000

Versatility and Quality in Routine Analysis

Chromolith® HPLC columns are not only very fast, they also provide reliable separations and quality results for routine work in the research, method development or analytical laboratories. The inner surface of the Chromolith® column sorbent can be chemically derivatized in the same way as conventional particulate materials. The Chromolith® RP-18e columns are, therefore, suitable for high performance separation of acidic, basic, nonpolar and metal chelating compounds. Their versatility of use makes them ideal as a first line routine column in the laboratory.

Column diameter 4.6 mm,
60% acetonitrile, 40% water; 3 mL/min, 25°C,
10 µL Anthracene (10 µg/mL)



Column Chromolith Performance RP-18e (100 mm x 4.6 mm)
Mobile phase A: acetonitrile
 B: 0.1% phosphoric acid in water
Double gradient

Time	%A	%B	Flow rate
0 min	35	65	3 mL/min
1.8 min	46	54	3 mL/min
2.2 min	80	20	5 mL/min
3 min	80	20	5 mL/min

Pressure 90 bar maximum total pressure
Temperature 22°C
Detection UV 254 nm
Injection 10 µL

- 1) Phenol
- 2) 2-Chlorophenol
- 3) 2-Nitrophenol
- 4) 2,4-Dinitrophenol
- 5) 4-Chloro-3-methylphenol
- 6) 2,4-Dinitro-6-methylphenol
- 7) 2,4,6 Trichlorophenol
- 8) Pentachlorophenol

0.0 2.0 4.0

