

UHPLC Columns

► BlueOrchid



Columns for ultra high-performance liquid chromatography

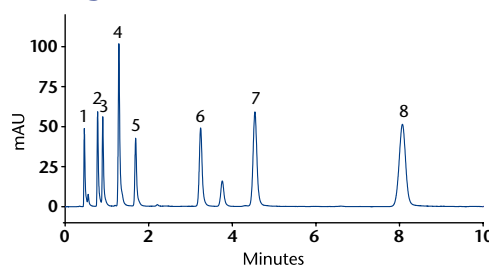
BlueOrchid sub-2 μm columns represent a new level of performance in HPLC, offering faster separations with improved resolution.

Compared to conventional HPLC applications using 3–5 μm particle sizes, ultra fast separations with superior efficiency are made possible through the use of sub-2 μm particles on UHPLC systems, with significant improvements in sensitivity and resolution as well. BlueOrchid columns packed with 1.8 μm particles feature a very narrow particle size distribution to minimize column back pressures to values in reach of conventional HPLC systems. BlueOrchid also offers outstanding peak symmetry, even for basic compounds.

Advantages

- faster analysis (up to 10 times)
- improved resolution
- enhanced sensitivity
- low back pressure
- excellent peak shape

Engelhardt test



UHPLC column hardware – The BlueOrchid stationary phase is packed in our new Vertex plus UHP hardware, specially designed for ultra high-performance applications which demand pressure resistance up to 1 000 bar (15 000 psi) and extremely low dead volumes. Instead of traditional sieve-filter sandwiches, thin frits retain the packing material in the column for low dispersion. Various dimensions are available, providing more flexibility to adapt resolution and analysis speed.

Available column dimensions

30 x 2 mm 50 x 2 mm 100 x 2 mm 150 x 2 mm

Reproducibility To obtain the most accurate results when performing quantitative analyses, it is important that retention time and peak area remain consistent. BlueOrchid columns are manufactured in ISO 9001:2008 accredited laboratories employing strict manufacturing procedures and 100% quality control testing. BlueOrchid columns show excellent reproducibility, column after column.

Back pressure Due to its narrow particle size distribution, the column back pressure of BlueOrchid columns is lower than other high speed column materials on the market.

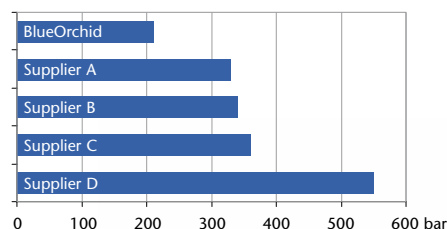
Typical back pressure¹⁾ Dimensions

320 bar (4 800 psi)	50 x 2 mm
550 bar (8 250 psi)	100 x 2 mm
780 bar (11 700 psi)	150 x 2 mm

¹⁾ measured with BlueOrchid C18 columns at ambient temperature at 500 µl/min, acetonitrile/water, 50:50

Pressures up to 1 000 bar (15 000 psi) are possible. To preserve the column's lifetime, we recommend that BlueOrchid columns generally be used at pressures below 800 bar (10 000 psi). This is an optimal balance between speed, resolution and column lifetime.

Back pressure²⁾ for sub-2 µm RP columns



²⁾ measured with BlueOrchid C18, 50 x 2 mm at ambient temperature, flow rate: 500 µl/min, acetonitrile/water, 65:35



Column types Seven bonded phases for reversed phase and normal phase chromatography are available. Every BlueOrchid column type features:

- exceptional peak symmetry and resolution
- 1.8 µm narrow particle size distribution for low back pressure
- next-generation ultra pure spherical silica
- outstanding pH stability

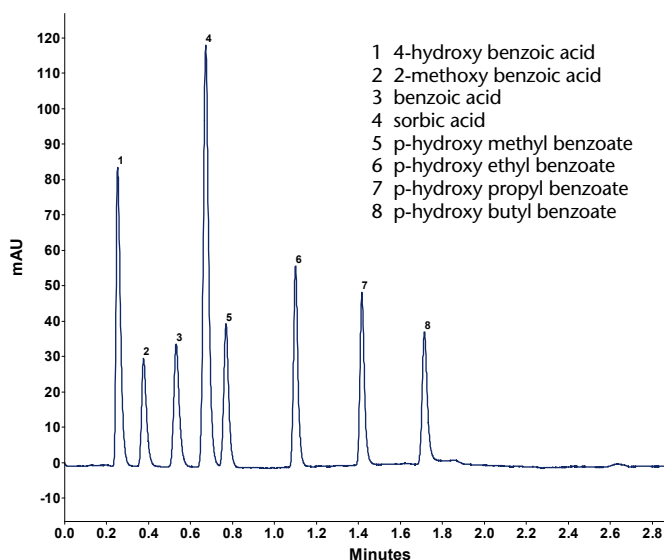
Modification	Carbon load (%)	rec. pH range	USP code	Order no.
C18	10	1–11	L1	xxBI181BOE
C18 A	12	2–9	L1	xxBI184BOE
C8	8	2–9	L7	xxBI081BOE
PFP	8	2–8	L43	xxBI057BOE
Phenyl	8	2–8	L11	xxBI050BOE
CN	4	2–8	L10	xxBI200BOE
Si	–	2–8	L3	xxBI000BOE

Application areas Ultra high pressure liquid chromatography (UHPLC) is based on a modification to traditional liquid chromatographic systems that makes it possible to use sub-2 µm columns by allowing increased operating pressures. By decreasing the particle size of the packing material, the analyst can maximize the number of theoretical plates, making shorter column lengths possible. At the same time, the optimum range of mobile phase linear velocities is greatly expanded. As a result, higher flow rates can be used without loss of separation performance. Both factors result in faster analysis times and increased sample throughput.



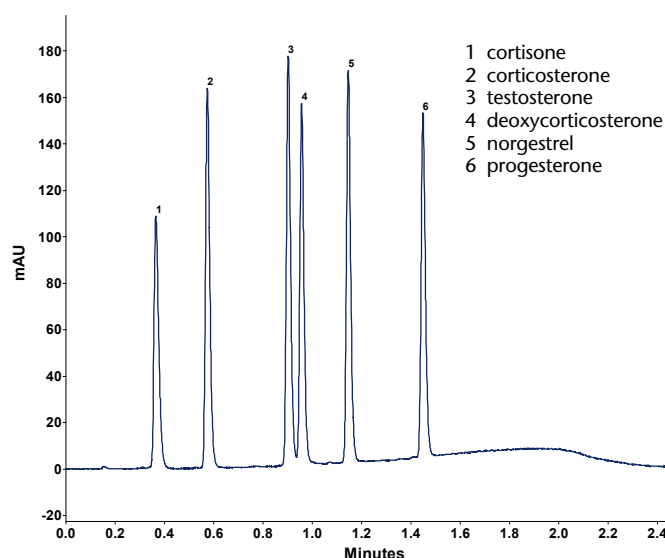
Modification	Application areas	Separation mechanism
C18	offers an extended pH range for analysis of acidic, basic and neutral analytes in reversed-phase mode (sulphonamides, anabolic steroids, anti-psychotics, beta blockers, Sudan dyes, phenols, preservatives, etc.)	hydrophobic interaction
C18 A	polar endcapped C18 phase for alternative selectivity; designed for use with 100% aqueous eluents for analysis of very polar compounds, basic pharmaceutical ingredients, water soluble vitamins, catecholamines as well as organic acids	hydrophobic and polar interaction
C8	similar selectivity to C18 phase but less retention due to lower hydrophobicity, useful for analysis of water soluble vitamins, steroids, catecholamines, sedatives etc.	reduced hydrophobic interaction compared to C18
PFP	alternative selectivity to C18 phase, especially developed for analysis of fluorinated and other halogenated polar compounds (halogenated phenols, taxane samples, polar compounds with hydroxyl, carboxyl, nitro or other polar groups)	hydrophobic and polar interaction
Phenyl	alternative selectivity for aromatic and moderately polar analytes or mixtures with varying polarity and aromaticity	pi-pi interaction with aromatics
CN	for a wide range of applications in normal-phase as well as reversed-phase modes (steroids, carbohydrates, polar compounds)	hydrophobic and hydrophilic interaction

Preservatives: BlueOrchid C18



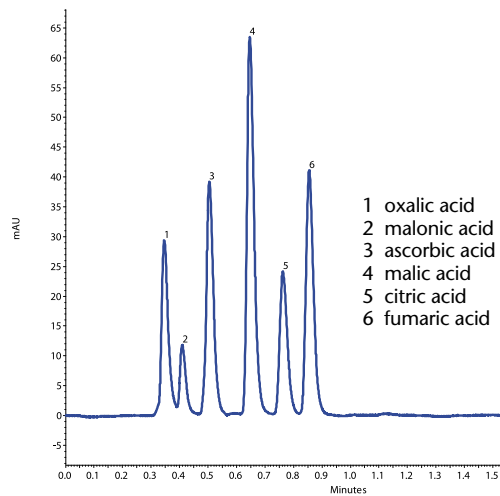
Column: BlueOrchid C18, 1.8 μm 50 x 2 mm
 Mobile phase: A: ammonium formiate buffer/MeOH, 70:30
 B: ammonium formiate buffer/MeOH, 40:60
 Gradient: 0–0.1 min 100% A
 0.1–0.5 min 100% A–60% A
 0.5–1.2 min 60% A–0% A (0.8 min hold)
 Flow rate: 0.85 ml/min
 Temp: 40 °C
 Detection: UV 240 nm
 Inj. volume: 0.5 μl

Anabolic steroids: BlueOrchid C18



Column: BlueOrchid C18, 1.8 μm 50 x 2 mm
 Mobile phase: A: water (+0.1% formic acid)
 B: ACN (+0.1% formic acid)
 Gradient: 0–1.5 min 35%–75% B
 Flow rate: 1 ml/min
 Temp: 30 °C
 Detection: UV 254 nm
 Inj. volume: 0.5 μl

Organic acids: BlueOrchid C18 A



Column: BlueOrchid C18 A, 1.8 µm 50 x 2 mm
 Mobile phase: 0.2 g NaH₂PO₄ (pH 2.5); isocratic
 Flow rate: 0.7 ml/min
 Temp: 30 °C
 Detection: UV 210 nm (2 µl flow cell)
 Inj. volume: 1 µl

- 1 oxalic acid
- 2 malonic acid
- 3 ascorbic acid
- 4 malic acid
- 5 citric acid
- 6 fumaric acid

BlueOrchid columns are your first choice for new method development.
 Experience a new level of performance with BlueOrchid columns from KNAUER.

Ordering information

Order No.	BlueOrchid C18	Order No.	BlueOrchid Phenyl
03BI181BOE	1.8 µm, 30 x 2 mm ID	03BI050BOE	1.8 µm, 30 x 2 mm ID
05BI181BOE	1.8 µm, 50 x 2 mm ID	05BI050BOE	1.8 µm, 50 x 2 mm ID
10BI181BOE	1.8 µm, 100 x 2 mm ID	10BI050BOE	1.8 µm, 100 x 2 mm ID
15BI181BOE	1.8 µm, 150 x 2 mm ID	15BI050BOE	1.8 µm, 150 x 2 mm ID
Order No.	BlueOrchid C18 A	Order No.	BlueOrchid CN
03BI184BOE	1.8 µm, 30 x 2 mm ID	03BI200BOE	1.8 µm, 30 x 2 mm ID
05BI184BOE	1.8 µm, 50 x 2 mm ID	05BI200BOE	1.8 µm, 50 x 2 mm ID
10BI184BOE	1.8 µm, 100 x 2 mm ID	10BI200BOE	1.8 µm, 100 x 2 mm ID
15BI184BOE	1.8 µm, 150 x 2 mm ID	15BI200BOE	1.8 µm, 150 x 2 mm ID
Order No.	BlueOrchid C8	Order No.	BlueOrchid Si
03BI081BOE	1.8 µm, 30 x 2 mm ID	03BI000BOE	1.8 µm, 30 x 2 mm ID
05BI081BOE	1.8 µm, 50 x 2 mm ID	05BI000BOE	1.8 µm, 50 x 2 mm ID
10BI081BOE	1.8 µm, 100 x 2 mm ID	10BI000BOE	1.8 µm, 100 x 2 mm ID
15BI081BOE	1.8 µm, 150 x 2 mm ID	15BI000BOE	1.8 µm, 150 x 2 mm ID
Order No.	BlueOrchid PFP	Order No.	BlueOrchid RP Method Development Kit
03BI057BOE	1.8 µm, 30 x 2 mm ID	A66100	BlueOrchid C18, 1.8 µm, 50 x 2 mm ID
05BI057BOE	1.8 µm, 50 x 2 mm ID		BlueOrchid C18 A, 1.8 µm, 50 x 2 mm ID
10BI057BOE	1.8 µm, 100 x 2 mm ID		BlueOrchid C8, 1.8 µm, 50 x 2 mm ID
15BI057BOE	1.8 µm, 150 x 2 mm ID		

Technical data are subject to change without notice.

Visit www.knauer.net for details on complete HPLC systems, HPLC columns, and osmometers.

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