**Pursuit™ UPS\(^1.9\) and Pursuit UPS\(^2.4\)**

**FAST UHPLC SOLUTIONS FOR ULTIMATE RESOLUTION**

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**Key Benefits**

**Pursuit UPS\(^1.9\)**

- Highest efficiency particles ensure optimum resolution.
- Narrow bore columns with minimal band broadening enhance sensitivity.
- Columns and chemistries selected to facilitate high throughput and fast separations.
- Orthogonal bonded chemistries allow rapid method development.

**Pursuit UPS\(^2.4\)**

- Minimal clogging or back pressure issues ensure ease-of-use and enhanced column lifetimes.
- Ideal for use with “greener” viscous solvents to reduce potential environmental hazards.
- Similar efficiencies to sub-2 μm particles.
- Available in C18 and diphenyl chemistries for maximum choice.

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*Pursuit UPS columns are designed for ultimate performance on any ultra-high pressure LC system. They are available in multiple formats and complimentary chemistries on 1.9 and 2.4 μm silica, for fast and easy method development in the high throughput, UHPLC environment.*

*Pursuit UPS\(^1.9\) columns deliver sub-2 μm efficiencies in applications where sensitivity, resolution, and throughput are critical.*

*Pursuit UPS\(^2.4\) columns couple highly efficient, fast separations with superior ease-of-use. They are recommended for viscous “greener” solvent applications, or samples where lifetime and back pressure are important concerns.*
**Pursuit™ UPS\textsuperscript{1.9} and Pursuit UPS\textsuperscript{2.4}**

**UPS Columns from Varian**

Our UPS 1.9 and 2.4 μm fast UHPLC columns are designed to cope with the high pressure and fast gradients demanded by today’s pharmaceutical industry. UPS columns are applicable anywhere from discovery through bioanalysis, and into QA/QC.

**Pursuit UPS\textsuperscript{1.9} Columns**

The UPS 1.9 μm delivers sub-2 μm efficiencies for applications where sensitivity, resolution, and throughput are crucial. They are designed as the first choice UHPLC solution for difficult separations.

**Transferring Methods to UPS 1.9 Allows for Improved Sensitivity and Speed**

![Graph showing comparison of Antibiotics on Pursuit XRs C18 (top) and Pursuit UPS\textsuperscript{1.9} C18 columns (bottom). 1 μL injection.]

**Pursuit UPS\textsuperscript{2.4} Columns**

With 30 - 40% lower back pressures, and near equal efficiencies, Pursuit UPS\textsuperscript{2.4} high pressure packed columns combine highly efficient, fast separations with superior ease-of-use. They are recommended for viscous or "green" solvent applications, or samples where lifetime and backpressure are an issue. Pursuit UPS columns offer tailored method development solutions for UHPLC users.

**Conditions**

- **Columns:** Pursuit XRs 5 μm C18, 250 x 4.6 mm and Pursuit UPS\textsuperscript{1.9} C18, 100 x 2.0 mm
- **Mobile Phase:** 20 mM Sodium phosphate buffer, pH 4.4:methanol - 95:5
- **HPLC Flow Rate:** 1.5 mL/min, Temp: 30 °C
- **UHPLC Flow Rate:** 0.4 mL/min, Temp: 30 °C
Pursuit™ UPS¹.⁹ and Pursuit UPS².₄

Figure 2. Comparisons of Pursuit XRs 5 μm and Pursuit UPS¹.⁹ Diphenyl (top) and Pursuit UPS¹.⁹ C18 (bottom), in the analysis of three hormone replacement steroids. Note the improvements in resolution and speed.

**Conditions**

Mobile phase: 35% Acetonitrile in water
Flow Rate: 0.5 mL/min
Temp: 40 °C
Detection: 220nm
Pursuit™ UPS<sup>1.9</sup> and Pursuit UPS<sup>2.4</sup>

**Figure 3.** “Green” solvent conversion with Pursuit UPS<sup>2.4</sup> illustrated by the analysis of three ACE inhibitors. (1. Captopril 2. Benazepril 3. Ramipril).

**Conditions**
- **Original ACN method on 1.7 μm C18 column**
  - Back pressure: 8551 psi
- **Conversion to more viscous methanol leads to increased back pressure on the same column.**
  - Back pressure: 12135 psi
- **Pursuit UPS<sup>2.4</sup> (Diphenyl) restores useable backpressure**
  - Back pressure: 7853 psi

2.4 μm Particles Leads To Reduced Back Pressures

**Figure 4.** Analysis of kava kava shows how the use of Pursuit UPS<sup>2.4</sup> greatly reduces back pressure. (1. Desmethoxyyangonin, 2. Kavain, 3. Dihydrokavain, 4. Yangonin, 5. Methysticin, 6. Dihydromethysticin).

**Conditions**
- **Vendor X 1.7 μm C18**
  - Flow Rate: 0.6 mL/min
- **Pursuit UPS<sup>2.4</sup> C18, 50 x 2 mm**
  - Flow Rate: 0.5 mL/min
- **Vendor X C18 1.7 μm**
  - Flow Rate: 0.5 mL/min
Improve Sensitivity in Bioanalysis With Column Selectivity

Pursuit UPS is available in complimentary chemistries to facilitate rapid method development. Offering truly orthogonal selectivity, Pursuit UPS Diphenyl focuses on differences in aromaticity, conjugation, and electron density, to improve the chances of achieving critical pair separation when the hydrophobic selectivity of C18 is not enough.

Separation of Beta Blockers on Pursuit UPS<sup>1.9</sup> C18

Unique Selectivity of Diphenyl Holds Moderately Polar Compounds From Void

Sensitivity Improvement of Naldolol on Pursuit UPS<sup>1.9</sup> Diphenyl Over C18

Sensitivity Improvement of Pindolol on Pursuit UPS<sup>1.9</sup> Diphenyl Over C18

Post Column Studies of Pinadol Explain the Sensitivity Gains

Figure 5. Sensitivity enhancements in LC/MS/MS bioanalysis using the unique selectivity of Pursuit UPS Diphenyl.
Pursuit™ UPS\(^{1.9}\) and Pursuit UPS\(^{2.4}\)

Some Vendors Column Offerings Show No Difference in Selectivity

![Graph](image)

Vendor X C18

Vendor X Phenyl

Varian Offers Truly Unique Selectivities

![Graph](image)

Pursuit UPS\(^{2.4}\) C18

Pursuit UPS\(^{2.4}\) Diphenyl

Figure 6. Separation of ACE inhibitors demonstrates the orthogonality of Pursuit UPS Diphenyl.

Pursuit UPS columns are designed for enhanced performance with ultra-high pressure, low dead volume chromatographic systems. To achieve similar results on conventional systems, please use our Pursuit Ultra products. See www.varianinc.com for details.

### Specifications

Pursuit UPS 1.9 and 2.4 \(\mu\)m Fast UHPLC Columns

<table>
<thead>
<tr>
<th>Property</th>
<th>UPS 2.4</th>
<th>UPS 1.9</th>
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<tbody>
<tr>
<td>Specific surface area (m(^2)/g)</td>
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<td>Pore size (Å)</td>
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<td>Pore volume (mL/g)</td>
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<td>Particle size dp (dp90 / dp10 &lt;1.8) (μm)</td>
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<td>Diphenyl</td>
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### Ordering Information

Pursuit UPS High Pressure Packed Fast LC Columns

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\*High Pressure Packed

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