

## XBridge Prep Columns: Scalability and Loadability for Preparative Separations

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### Abstract

This application note details about the efficiency of XBridge Prep Columns.

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## Benefits

BEH Technology, the second generation of patented organic–inorganic hybrid particle technology (HPT), is the new benchmark for HPLC columns. Waters XBridge Prep Columns reach a new level of maximum loadability and direct scalability.

## Introduction

XBridge Columns were designed to be the most pH-stable phases commercially available, while still providing maximum efficiency, peak shape, and robustness. For method development consideration, we offer C<sub>18</sub>, C<sub>8</sub>, phenyl and RP<sub>18</sub> chemistries, available 2.5, 3.5, and 5 µm particle sizes and dimensions from analytical to prep. XBridge Prep Columns are manufactured with the patent pending Optimum Bed Density (OBD) design, which helps us to achieve direct scale-up from analytical to preparative columns, with the same efficiency and excellent column lifetimes.

## Experimental

### Scalability

|                   |                                                                                          |
|-------------------|------------------------------------------------------------------------------------------|
| Columns:          | XBridge C <sub>18</sub> 5 µm 4.6 x 100 mm; XBridge Prep C <sub>18</sub> 5 µm 19 x 100 mm |
| Mobile phase A:   | 10 mM ammonium bicarbonate buffer at pH 10                                               |
| Mobile phase B:   | Acetonitrile/100 mM ammonium bicarbonate buffer, pH 10 (90/10)                           |
| Flow rate:        | 1.06 mL/min (analytical); 18 mL/min (preparative)                                        |
| Gradient:         | 10-min linear from 5% to 95% B                                                           |
| Injection volume: | 30 µL (analytical); 510 µL (preparative)                                                 |

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Sample: Econazole and miconazole in DMSO (100 mg/mL each)

Instrument: Waters AutoPurification System

## Loadability

Columns: XBridge Prep C<sub>18</sub> 5 µm 19 x 50 mm

Mobile phase A: 0.1% diethylamine in water

Mobile phase B: 0.1% diethylamine in acetonitrile

Flow rate: 23.9 mL/min

Gradient: 8-min linear from 5% to 95% B

Injection volume: 660 µL

Sample: Labetolol (50 mg/mL), quinine (50 mg/mL), diltiazem (50 mg/mL), verapamil (100 mg/mL) and amitriptyline (50 mg/mL) in DMSO

Instrument: Waters AutoPurification System

## Results and Discussion

The retention and separation of two antifungal drugs on the analytical XBridge C<sub>18</sub> Column is shown in Figure 1A. Under the total load of 6 mg, we observe very symmetric peaks. The mass load was proportionally scaled-up and run on the preparative XBridge Prep C<sub>18</sub> Column, as shown in Figure 1B. Note the direct scale up, excellent peak shapes, and total mass load of 102 mg.

The separation and loadability of five basic analytes on XBridge Prep C<sub>18</sub> Column under high pH mobile phase conditions is shown in Figure 2. We successfully loaded 198 mg of bases on a 19 x 50 mm column without sacrificing peak shape.

## Conclusion

XBridge Prep Columns provide highly efficient separations, direct scale-up, and maximum loadability, crucial for isolation of critical mixture components.

## Featured Products

- [AutoPurification System <https://www.waters.com/10007147>](https://www.waters.com/10007147)

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