

# Ascentis® Express UHPLC and HPLC Columns

Faster HPLC on Any System



Maximize Speed with Sharp Peaks

More Peaks in Less Time

Faster Throughput With  
Rugged Design

Wide Range of Particles and Phases

# Fast Ascentis Express UHPLC and HPLC Columns

Designed to deliver speed and resolution on all UHPLC and HPLC systems, Ascentis Express with Fused-Core® technologies exceeds the benefits of sub-2, 3 and 5 µm particles. Ascentis Express 2.7 µm delivers more resolving power per unit pressure than even sub-2 µm particles on any HPLC system (including UHPLC).

Ascentis Express 5 µm columns are able to achieve greater speed and efficiency than any other 5 µm particle-based column. This means that Ascentis Express 5 µm can be the standard column for all of your fully porous 5 µm-based methods.

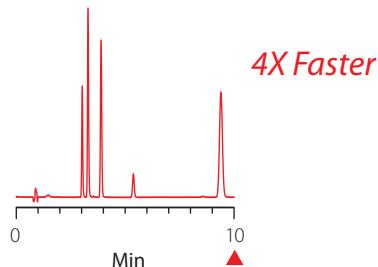
With the addition of 2.0 µm Ascentis Express UHPLC columns, we now offer three U/HPLC Fused-Core particle columns, making the Ascentis Express column line truly scalable from UHPLC to legacy HPLC systems.

## Key Features and Benefits

- Maximize speed with sharp peaks even at ultra-high flow rates
- More peaks in less time versus traditional columns
- Faster throughput per column with rugged design
- More choices for fast HPLC with 2.0, 2.7, and 5.0 µm Fused-Core particles
- Suitable for all UHPLC, HPLC and LC/MS instruments

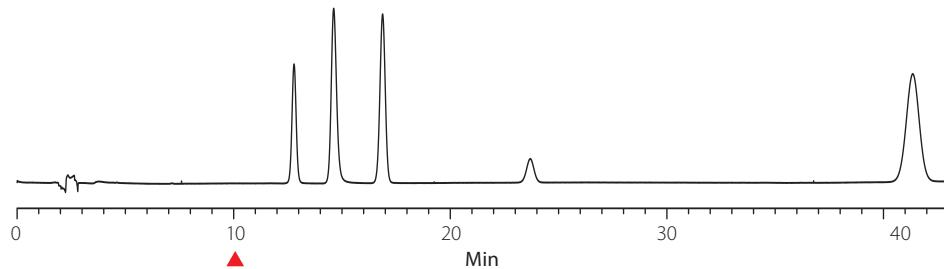
### Ascentis Express C18

10 cm × 4.6 mm I.D.,  
2.7 µm particles  
**(53827-U)**



### Standard C18

25 cm × 4.6 mm I.D.,  
5 µm particles



## Faster HPLC on Any System

With identical conditions, the Ascentis Express C18 column performs more than **4X faster** than a standard C18 column.

Conditions			Ascentis Express C18 Throughput	Standard C18 Throughput
Sample Prep	Flow Rate	HPLC System	—	—
Same	Same	Same	<b>4X Faster</b>	1X

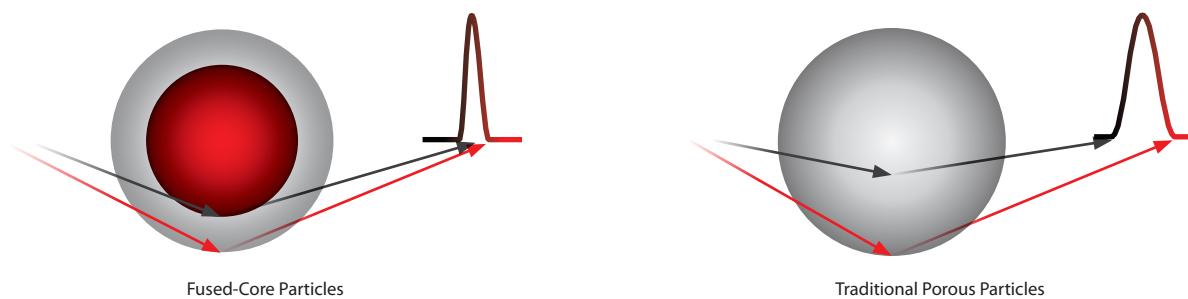
### Testimonial

*"The Ascentis Express columns packed with 2.7 µm Fused-Core particles offer a really high-separation power with modest operating pressure. The performance achieved under both gradient and isocratic condition, is comparable to those obtained with totally porous sub-2 µm particles."*

S. Fekete et al. / Journal of Pharmaceutical and Biomedical Analysis (2009) 703–709

# Maximize Performance Efficiencies With Fused-Core Technology

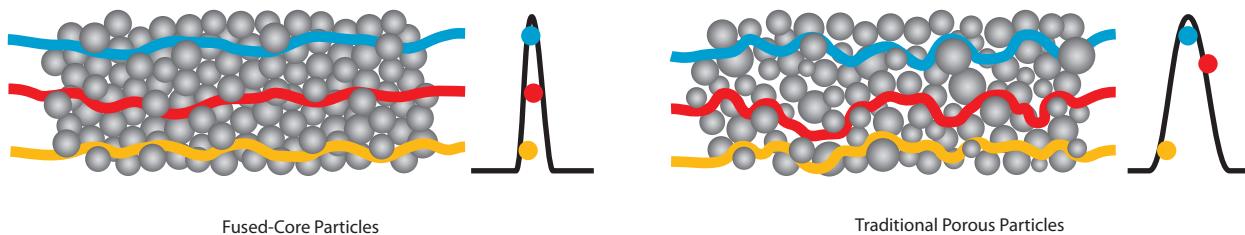
## Fast HPLC with Shorter Diffusion Path



## Narrow Particle Size Distribution and Rugged Column Design



## Consistent Bed Yields Sharper Peaks



### Testimonial

*"The partially porous stationary phase material has demonstrated equivalent resolving power to sub-2 µm materials under the ballistic gradient chromatography conditions employed, and shown to exhibit excellent resilience and performance over the analysis of thousands of protein precipitated plasma extracts, suggesting that this type of column is a valuable tool for pharmaceutical bioanalysts."*

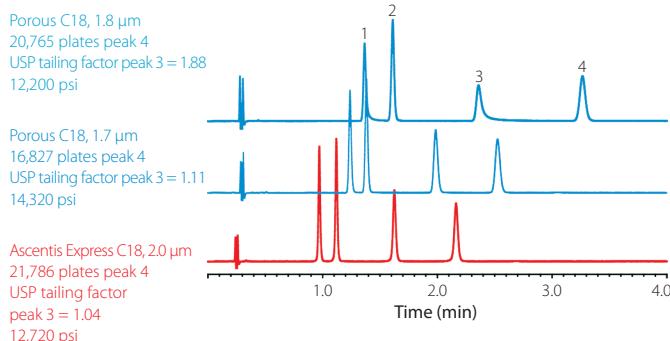
D.N. Mallett, C. Ramírez-Molina / Journal of Pharmaceutical and Biomedical Analysis (2009) 100-107

# Ascentis Express Performance Comparisons

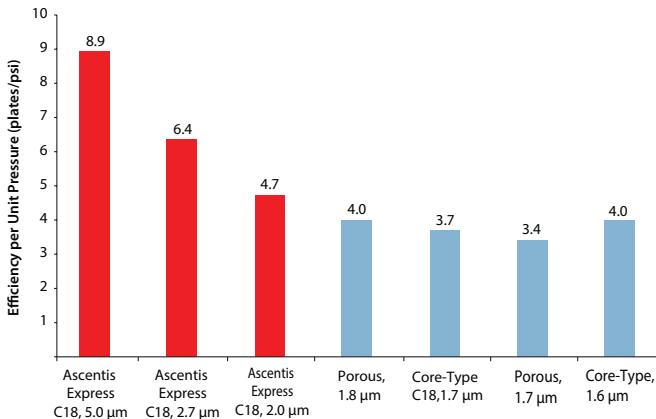
## Ascentis Express Delivers High Efficiency with Speed Compared to Smaller sub-2 $\mu\text{m}$ Particle Columns

column: Ascentis Express C18, 10 cm x 2.1 mm I.D., 2.0  $\mu\text{m}$  (50813-U)  
 mobile phase: (A) water with 0.1% formic acid; (B) acetonitrile with 0.1% formic acid; (65:35, A:B)  
 flow rate: 0.8 mL/min  
 temp.: 35 °C  
 det: UV, 240 nm  
 injection: 0.5  $\mu\text{L}$   
 sample: 50  $\mu\text{g}/\text{mL}$  in 80:20, water:methanol  
 instrument: Dionex Ultimate 3,000

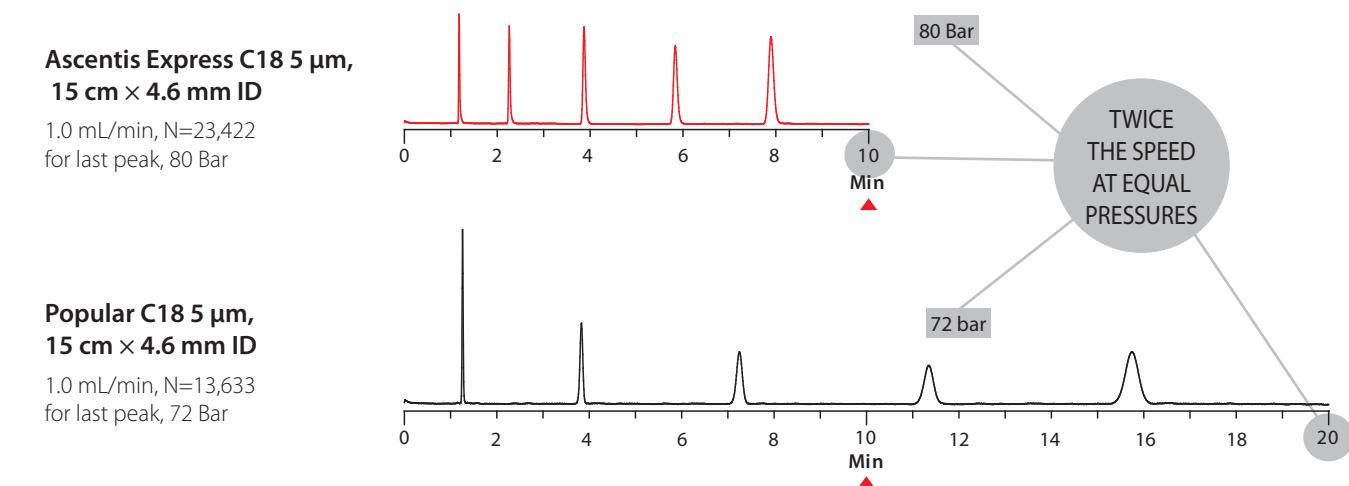
1. Oxazepam  
 2. Nordiazepam  
 3. Temazepam  
 4. Diazepam



columns: as listed, 10 cm x 2.1 mm I.D.  
 mobile phase: (A) water, (B) acetonitrile, (50:50, A:B)  
 flow rate: 0.4 mL/min  
 pressure and performance: see Table 2  
 system background pressure: 370 psi  
 column temp.: 35 °C  
 detector: UV, 250 nm  
 injection: 0.5  $\mu\text{L}$   
 sample: 75:25 water:acetonitrile  
 Instrument: Dionex UltiMate 3000



## Ascentis Express 5 $\mu\text{m}$ Outperforms Fully Porous 3 $\mu\text{m}$ and 5 $\mu\text{m}$ Columns

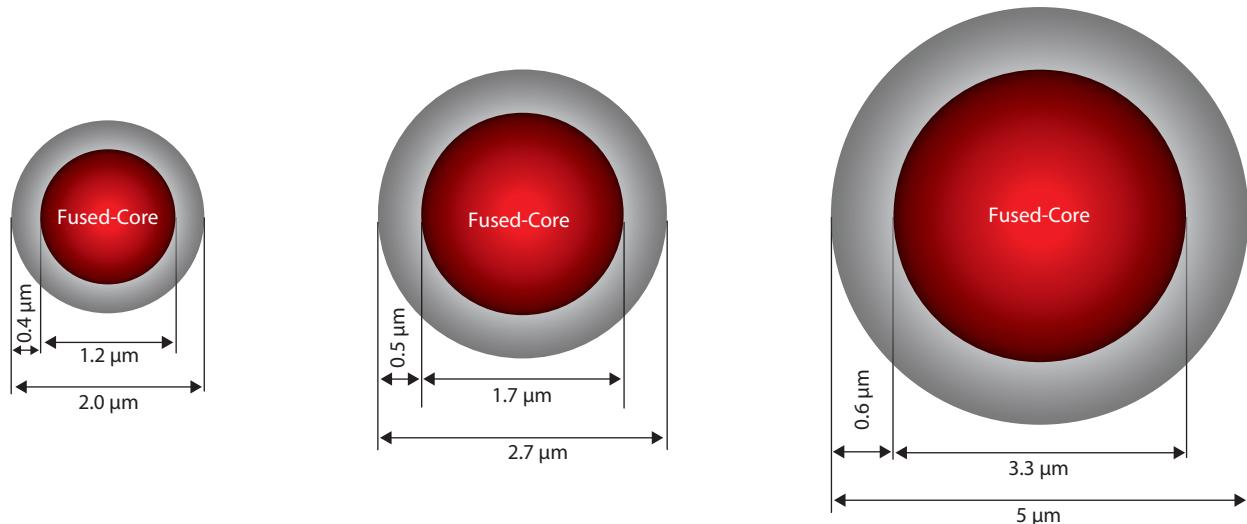


### Testimonial

"The 5  $\mu\text{m}$  Ascentis Express Fused-Core columns provide a superior kinetic performance compared to both the 3.5 and 5  $\mu\text{m}$  fully porous particles over the entire relevant range of separation conditions."

K. Broeckhoven, D. Cabooterb, G. Desmet / Journal of Pharmaceutical Analysis

# Ascentis Express Fused-Core Particles and Phases



## Best Fused-Core UHPLC Column

An optimized solution for high-throughput small molecule analysis

## Fast HPLC on ANY System

A practical solution that delivers UHPLC performance from any HPLC

## The Lab Work-Horse Column

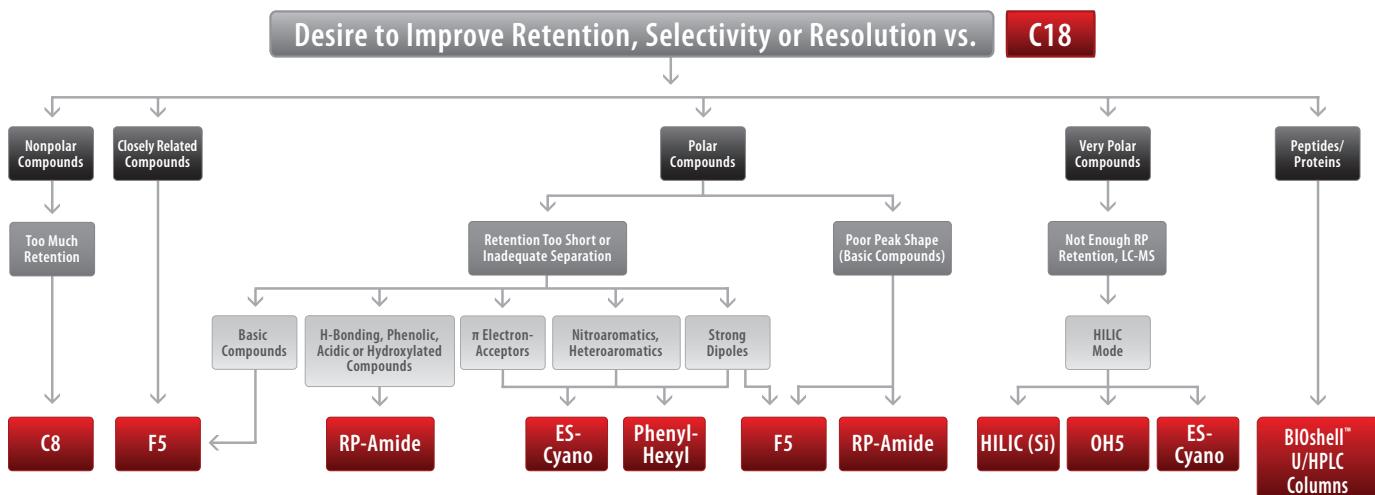
True plug and play solution for improving existing 3 or 5 μm fully porous particle HPLC columns

## Selecting an Ascentis Express Phase

Ascentis Express C18 is the first choice for starting a new method. However, when a C18 doesn't give the desired separation or your sample contains compounds that are known to be difficult to retain or resolve on a C18, consider changing stationary phases.

The range of selectivity provided by Ascentis Express makes this easy. The flow chart below helps guide in the selection of an Ascentis Express phase, based on the particular compound type or separation challenge.

## Guide to Selecting Ascentis Express UHPLC and HPLC Column Phases



## Selecting Your Ascentis® Express Fused-Core UHPLC or HPLC Column

### What particle size is right for me?

- If you desire sub-2 µm columns on your UHPLC ..... 2.0 µm
- If you desire sub-2 µm performance on HPLC..... 2.7 µm
- If you want to outperform existing 3 or 5 µm totally porous particle on any HPLC system..... 5 µm
- Highlights:
  - 2.0 outperforms other sub-2 µm particle columns
  - 2.7 µm delivers sub-2 µm performance at 3 µm back pressure
  - 5 µm outperforms 3 and 5 µm totally porous particles

### Which column ID is best for my needs?

- If you are doing Mass Spec or desire high sensitivity ....2.1 mm I.D.
- If you want solvent savings, high loading, or high performance..... 3.0 mm I.D.
- If you are doing standard HPLC..... 4.6 mm I.D.

### Which column length is best for my needs?

- If you want to maximize the speed of your application ... 2 to 7.5 cm
- If you want a balance of resolution and speed ..... 10 cm
- If you want the best resolution possible ..... 15 cm
- Also available in both **analytical** and **semi-prep** dimensions

#### 2.7 µm Columns\*

I.D.	Length
10 mm	5 cm
10 mm	10 cm
10 mm	15 cm

#### 5.0 µm Columns\*

I.D.	Length
10 mm	5 cm
10 mm	10 cm
10 mm	15 cm
10 mm	25 cm

\* Inquire for a quote on semi-prep.

### What flow rate is best for my needs?

- If you are using a column with a 4.6 mm I.D. .... 1.6 to 2.4 mL/min\*\*
- If you are using a column with a 3.0 mm I.D. .... 0.8 to 2.0 mL/min\*\*
- If you are using a column with a 2.1 mm I.D. .... 0.4 to 1.8 mL/min\*\*

\*\* Higher flow rates than indicated can be used for your system.

## Ascentis Express UHPLC and HPLC Column Features

Particle Sizes (µm)	2.0, 2.7, and 5.0							
Pore Size (Å)	90 (for all particle sizes)							
Surface Area (m <sup>2</sup> /g)	120 (2.0 µm), 135 (2.7 µm), and 90 (5.0 µm)							
Max Pressure (bar)	1,000 (2.0 µm), 600 (2.7 µm), and 600 (5.0 µm)							
Phases	C18	C8	RP-Amide	Phenyl-Hexyl	F5	HILIC (Si)	ES-CN	OH5
pH range	2–9	2–9	2–9	2–9	2–9	1–8	1–8	1–8
Endcapped	Yes	Yes	Yes	Yes	Yes	No	Yes	No
USP Code	L1	L7	L60	L11	L43	L3	L10	NA
Recommended Mode	RPLC	RPLC	RPLC	RPLC	RPLC or HILIC	RPLC or HILIC	RPLC or HILIC	RPLC or HILIC
Target Analytes	Diverse analytes ranging from polar to non-polar, Uncharged acids and bases, uncharged ion pairs	Diverse analytes ranging from polar to non-polar, Uncharged acids and bases, uncharged ion pairs	Alcohols, Acids, Phenols, Catechins	Electron-poor molecules, aromatic or unsaturated compounds (ketones, nitriles, alkenes)	Electron-rich compounds, aromatics, unsaturated compounds with double and/or triple bonds	Polar and very polar bases, acids and neutrals, especially with log P < 0.5	Polar and very polar bases, acids and neutrals	Polar analytes with Log P values near or less than 0
Best Applications	Analytes differing by an aliphatic or aromatic group	Analytes differing by an aliphatic or aromatic group	Acidic and basic analytes, heterocycles, proton donors and acceptors, highly aqueous conditions	Aromatic molecules with electron-withdrawing groups (NO <sub>2</sub> , COOH, COOR) heterocycles, benzodiazepines, highly aqueous conditions	Basic analytes at low pH, stereoisomers, steroids, taxanes, substituted aromatics, highly aqueous conditions	Enhanced sensitivity and peak shape for LC/MS analyses of basic analytes	Aromatic molecules with electron-withdrawing groups (NO <sub>2</sub> , COOH, COOR) heterocycles, benzodiazepines, highly aqueous conditions	Polar acids, bases and zwitterions that are not retained or are poorly retained with RPLC

## Ascentis Express Columns for UHPLC, HPLC, and LC/MS Instruments

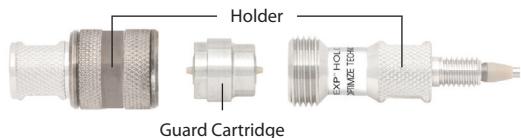
I.D.	Length	C18	C8	RP-Amide	Phenyl Hexyl	HILIC (Si)	F5	ES-Cyano	OH5
<b>Ascentis Express 2.0 µm Columns</b>									
2.1 mm	2 cm	50805-U	51652-U	51567-U	51600-U	51403-U	50857-U	51709-U	50951-U
2.1 mm	3 cm	50809-U	51654-U	51568-U	51601-U	51404-U	50858-U	51712-U	50952-U
2.1 mm	5 cm	50811-U	51656-U	51569-U	51603-U	51406-U	50859-U	51717-U	50957-U
2.1 mm	7.5 cm	50812-U	51657-U	51571-U	51605-U	51408-U	50861-U	51721-U	50958-U
2.1 mm	10 cm	50813-U	51658-U	51576-U	51608-U	51409-U	50863-U	51724-U	50959-U
2.1 mm	15 cm	50814-U	51661-U	51577-U	51609-U	51418-U	50867-U	51725-U	50962-U
3.0 mm	3 cm	50815-U	51663-U	51582-U	51611-U	51419-U	50869-U	51727-U	50963-U
3.0 mm	5 cm	50816-U	51664-U	51583-U	51614-U	51421-U	50871-U	51728-U	50964-U
3.0 mm	7.5 cm	50817-U	51672-U	51587-U	51616-U	51424-U	50876-U	51729-U	50965-U
3.0 mm	10 cm	50819-U	51673-U	51588-U	51617-U	51428-U	50879-U	51732-U	50967-U
3.0 mm	15 cm	50821-U	51674-U	51589-U	51618-U	51429-U	50881-U	51734-U	50968-U
<b>Ascentis Express 2.7 µm Columns</b>									
2.1 mm	2 cm	53799-U	53795-U	53797-U	53798-U	—	53592-U	53494-U	53779-U
2.1 mm	3 cm	53802-U	53839-U	53910-U	53332-U	53933-U	53566-U	53468-U	53748-U
2.1 mm	5 cm	53822-U	53831-U	53911-U	53334-U	53934-U	53567-U	53470-U	53749-U
2.1 mm	7.5 cm	53804-U	53843-U	53912-U	53335-U	53938-U	53568-U	53472-U	53755-U
2.1 mm	10 cm	53823-U	53832-U	53913-U	53336-U	53939-U	53569-U	53473-U	53757-U
2.1 mm	15 cm	53825-U	53834-U	53914-U	53338-U	53946-U	53571-U	53475-U	53764-U
3.0 mm	3 cm	53805-U	53844-U	53915-U	53341-U	53964-U	53574-U	53476-U	53766-U
3.0 mm	5 cm	53811-U	53848-U	53916-U	53342-U	53967-U	53576-U	53478-U	53767-U
3.0 mm	7.5 cm	53812-U	53849-U	53917-U	53343-U	53969-U	53577-U	53479-U	53768-U
3.0 mm	10 cm	53814-U	53852-U	53918-U	53345-U	53970-U	53578-U	53481-U	53769-U
3.0 mm	15 cm	53816-U	53853-U	53919-U	53346-U	53972-U	53579-U	53483-U	53771-U
4.6 mm	3 cm	53818-U	53857-U	53921-U	53347-U	53974-U	53581-U	53484-U	53772-U
4.6 mm	5 cm	53826-U	53836-U	53922-U	53348-U	53975-U	53583-U	53486-U	53774-U
4.6 mm	7.5 cm	53819-U	53858-U	53923-U	53351-U	53977-U	53584-U	53489-U	53775-U
4.6 mm	10 cm	53827-U	53837-U	53929-U	53352-U	53979-U	53590-U	53491-U	53776-U
4.6 mm	15 cm	53829-U	53838-U	53931-U	53353-U	53981-U	53591-U	53492-U	53778-U
<b>Ascentis Express 5.0 µm Columns</b>									
2.1 mm	2 cm	50507-U	50362-U	50732-U	50442-U	50255-U	50603-U	50557-U	50313-U
2.1 mm	3 cm	50508-U	50363-U	50733-U	50443-U	50256-U	50604-U	50558-U	50314-U
2.1 mm	5 cm	50509-U	50364-U	50734-U	50446-U	50257-U	50605-U	50559-U	50317-U
2.1 mm	7.5 cm	50511-U	50367-U	50735-U	50451-U	50258-U	50607-U	50562-U	50321-U
2.1 mm	10 cm	50517-U	50368-U	50737-U	50454-U	50260-U	50612-U	50563-U	50322-U
2.1 mm	15 cm	50518-U	50372-U	50739-U	50455-U	50261-U	50613-U	50564-U	50327-U
2.1 mm	25 cm	50521-U	50373-U	50747-U	50456-U	50262-U	50614-U	50566-U	50328-U
3.0 mm	3 cm	50522-U	50376-U	50749-U	50459-U	50264-U	50615-U	50567-U	50329-U
3.0 mm	5 cm	50523-U	50377-U	50751-U	50464-U	50265-U	50616-U	50568-U	50335-U
3.0 mm	7.5 cm	50525-U	50378-U	50752-U	50466-U	50268-U	50619-U	50569-U	50336-U
3.0 mm	10 cm	50526-U	50381-U	50753-U	50469-U	50269-U	50622-U	50570-U	50338-U
3.0 mm	15 cm	50527-U	50382-U	50758-U	50470-U	50270-U	50623-U	50574-U	50339-U
3.0 mm	25 cm	50528-U	50385-U	50759-U	50472-U	50276-U	50624-U	50575-U	50341-U
4.6 mm	3 cm	50529-U	50386-U	50767-U	50474-U	50278-U	50625-U	50577-U	50343-U
4.6 mm	5 cm	50530-U	50389-U	50768-U	50477-U	50284-U	50626-U	50581-U	50344-U
4.6 mm	7.5 cm	50533-U	50390-U	50769-U	50479-U	50286-U	50627-U	50583-U	50345-U
4.6 mm	10 cm	50536-U	50391-U	50773-U	50482-U	50288-U	50628-U	50585-U	50346-U
4.6 mm	15 cm	50537-U	50392-U	50774-U	50483-U	50289-U	50631-U	50588-U	50347-U
4.6 mm	25 cm	50538-U	50394-U	50775-U	50487-U	50294-U	50632-U	50591-U	50348-U

## Ascentis Express Guard Cartridges and Capillary Columns

Particle Size	I.D.	Length	C18	C8	RP-Amide	Phenyl Hexyl	HILIC (Si)	F5	ES-Cyano	OH5
<b>Ascentis Express Guard Cartridges, Pack of 3</b>										
2.0 µm	2.1 mm	0.5 cm	50822-U	51676-U	51594-U	51619-U	51430-U	50884-U	51736-U	50969-U
2.0 µm	3.0 mm	0.5 cm	50823-U	51679-U	51595-U	51623-U	51433-U	50886-U	51739-U	50973-U
2.7 µm	2.1 mm	0.5 cm	53501-U	53509-U	53514-U	53524-U	53520-U	53594-U	53495-U	53780-U
2.7 µm	3.0 mm	0.5 cm	53504-U	53511-U	53516-U	53526-U	53521-U	53597-U	53496-U	53781-U
2.7 µm	4.6 mm	0.5 cm	53508-U	53512-U	53519-U	53531-U	53523-U	53599-U	53497-U	53782-U
5 µm	2.1 mm	0.5 cm	50539-U	50395-U	50776-U	50496-U	50295-U	50633-U	50592-U	50349-U
5 µm	3.0 mm	0.5 cm	50541-U	50396-U	50777-U	50497-U	50297-U	50634-U	50593-U	50350-U
5 µm	4.6 mm	0.5 cm	50542-U	50399-U	50779-U	50498-U	50298-U	50635-U	50597-U	50355-U
<b>Ascentis Express Capillary Columns</b>										
2.7 µm	75 µm	5 cm	53982-U	53983-U	—	—	—	—	—	—
2.7 µm	75 µm	15 cm	54219-U	54229-U	—	—	—	—	—	—
2.7 µm	100 µm	5 cm	53985-U	53987-U	—	—	—	—	—	—
2.7 µm	100 µm	15 cm	54256-U	54260-U	—	—	—	—	—	—
2.7 µm	200 µm	5 cm	53989-U	53991-U	—	—	—	—	—	—

## Guard Cartridge Holder

- Ultra-low dispersion design for use in UHPLC and HPLC instruments
- Effectively filters out particulate material and prevents column inlet frit plugging
- Collects non-eluting compounds and protects column from clogging or pluggage
- Finger-tight guard cartridge design for easy replacement of cartridges
- Designed to ensure optimum connection to all HPLC and UHPLC columns



Description	Pkg. Size	Cat. No.
Universal Guard Holder Holder w/EXP Titanium Hybrid Ferrule (cartridge not included)	1	53500-U

## Get Started

Additional resources are available for helping you implement Ascentis® Express UHPLC and HPLC Columns into your laboratory.



### Web

Visit [sigma-aldrich.com/express](http://sigma-aldrich.com/express) for videos, product information, ordering and real-time availability information.



### Email

Our technical service staff is ready to answer questions.  
EU: [eurtechserv@sial.com](mailto:eurtechserv@sial.com)  
US: [techserv@sial.com](mailto:techserv@sial.com)



### In Person

A technical seminar can be arranged on-site or via the web. Request via [seminars@sial.com](mailto:seminars@sial.com).

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