Колонки с поверхностно пористым диоксидом кремния (SPP)/Fused Core

ПОВЕРХНОСТНО-ПОРИСТЫЕ ЧАСТИЦЫ КРЕМНЕЗЕМА (SPP)/ ТЕХНОЛОГИЯ ПЛАВЛЕНОГО ЯДРА ®

Колонки с поверхностно пористым диоксидом кремния обеспечивают более высокую скорость и эффективность, чем полностью пористые частицы того же размера. **Колонки Fused-Core® для** ВЭЖХ , такие как**Ascentis® Express** и BIOshell™ могут превратить любую систему ВЭЖХ в быструю рабочую лошадку для ВЭЖХ с максимальной скоростью и производительностью .

Fused-Core Columns Technology

Ascentis Express HPLC columns, based on Fused-Core particle technology, provide more than twice the speed and efficiency of traditional columns at half the backpressure of sub-2-µm columns. This performance enhancement is applicable to all HPLC instruments (in addition to UHPLC systems).

Why do columns based on Fused-Core technology offer superior performance? The Fused-Core particle has three characteristic features over the traditional porous particle, resulting in a number of performance benefits - especially for Fast HPLC and UHPLC applications.

Features of Fused-Core particles over traditional porous particles

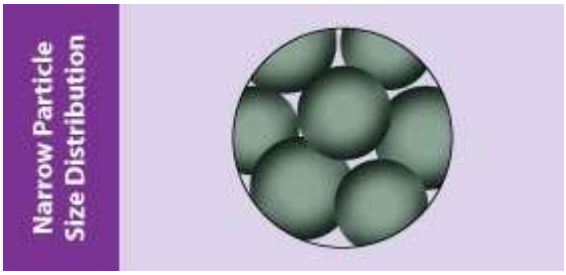
- Narrower particle size distribution
- More consistent packed bed
- Shorter diffusion path

Performance Benefits

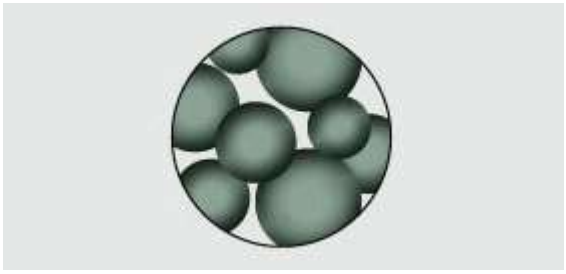
- More than double the speed of current methods
- Increased resolution over current methods
- Super rugged columns compared to sub-2-µM
- Added sensitivity (from sharper peaks)
- Easily transferable methods, from UHPLC to HPLC

For an in-depth explanation, with practical examples that demonstrate the performance benefits of Fused-Core technology, watch the presentation linked on this page.

Comparison of particle size distribution, packed bed consistency, and diffusion path length for Fused-Core particles vs. traditional porous silica particles

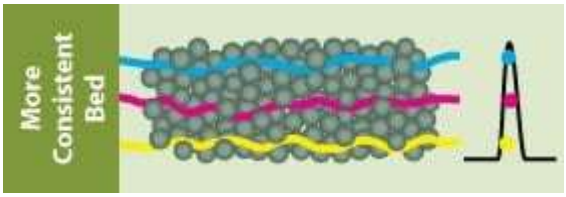


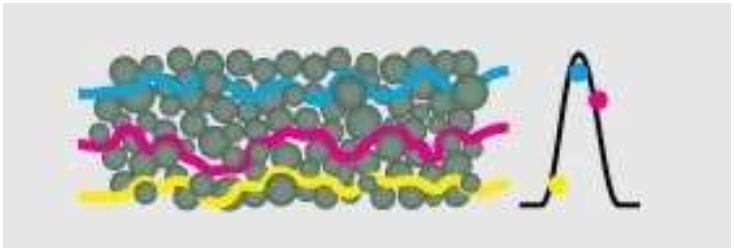
Fused-Core Particles



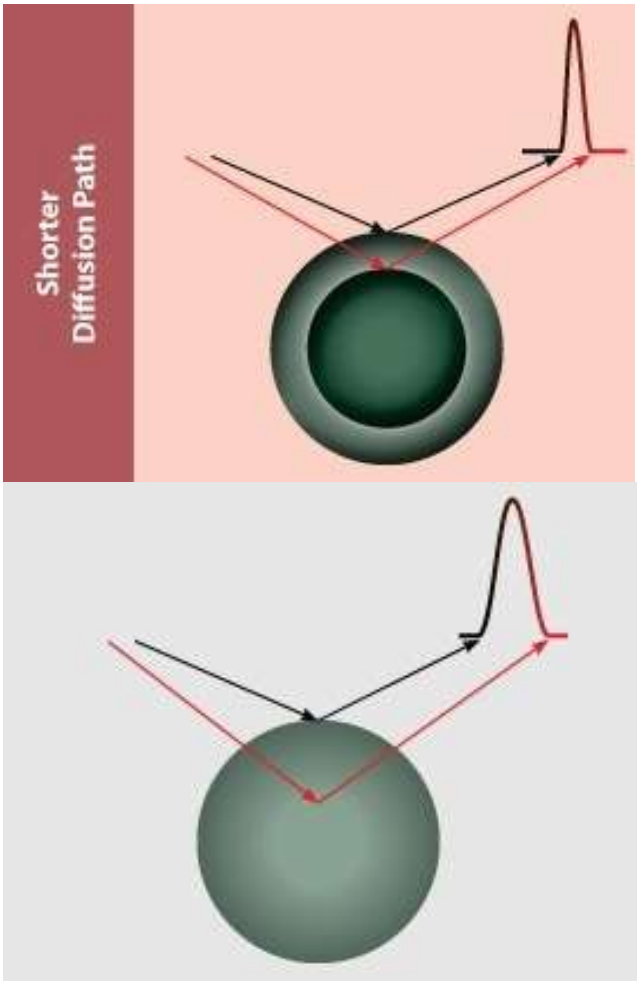
Traditional Porous Particles

The innovative manufacturing process for Fused-Core particles produces a very narrow particle size distribution. A narrow particle size distribution allows for the use of large porosity frits that resist clogging, resulting in a more rugged column. Traditional porous particles are not manufactured in a way to yield extremely narrow particle size distributions.





The “A” term in the van Deemter equation accounts for the effects of inhomogeneities in the packed bed of an HPLC column. Narrow particle size distributions form a more consistent packed bed and a consistent path length, minimizing analyte diffusion through the column. This eddy diffusion is effectively independent of mobile phase velocity.



The short diffusion path of the Fused-Core particle yields sharper peaks than traditional porous particle columns. The minimized resistance to mass transfer, the “C” term in the van Deemter equation, of the Fused-Core particle provides sharper peaks than traditional porous particles. The short diffusion path also permits the use of higher flow rates without peak broadening.

Ascentis® Express U/HPLC Column Selection

COLUMN SELECTION BY PHASE CHEMISTRY

The column selectivity has the highest influence on resolution in chromatography. Therefore, the selection of the best suitable column chemistry for the target analytes is an important selection parameter. C18 column chemistries are typically the first choice. Nevertheless, when a C18 doesn't give the desired separation or the 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 flowchart below helps guide users in the selection of an Ascentis® Express phase, based on the particular compound type or separation challenge

COLUMN SELECTION BY COLUMN DIMENSION

The separation goals, detection method and the instrument used for the separation define the column dimension and the particle size.

Select Column ID

Needs	Column ID (mm)	Typical Flow Rate (mL/min)
Best Suitability for Mass Spec and UHPLC	2.1	0.2 – 1.0
Solvent Savings in HPLC	3.0	0.5 – 2.0
Standard HPLC	4.6	1.0 – 3.0

Select Column Length

Needs	Column Length (mm)
Maximize Speed	20 - 75
Balance of Resolution and Speed	100
Maximize Resolution	150

Select Particle Size

Needs	Particle Size (µm)

Select Particle Size

UHPLC / High Throughput	2.0
Fast on any HPLC System	2.7
"Plug and Play" for Improving Existing HPLC Methods	5.0