

[CORTECS 2.7 μ m COLUMNS]

surpass all
possibilities



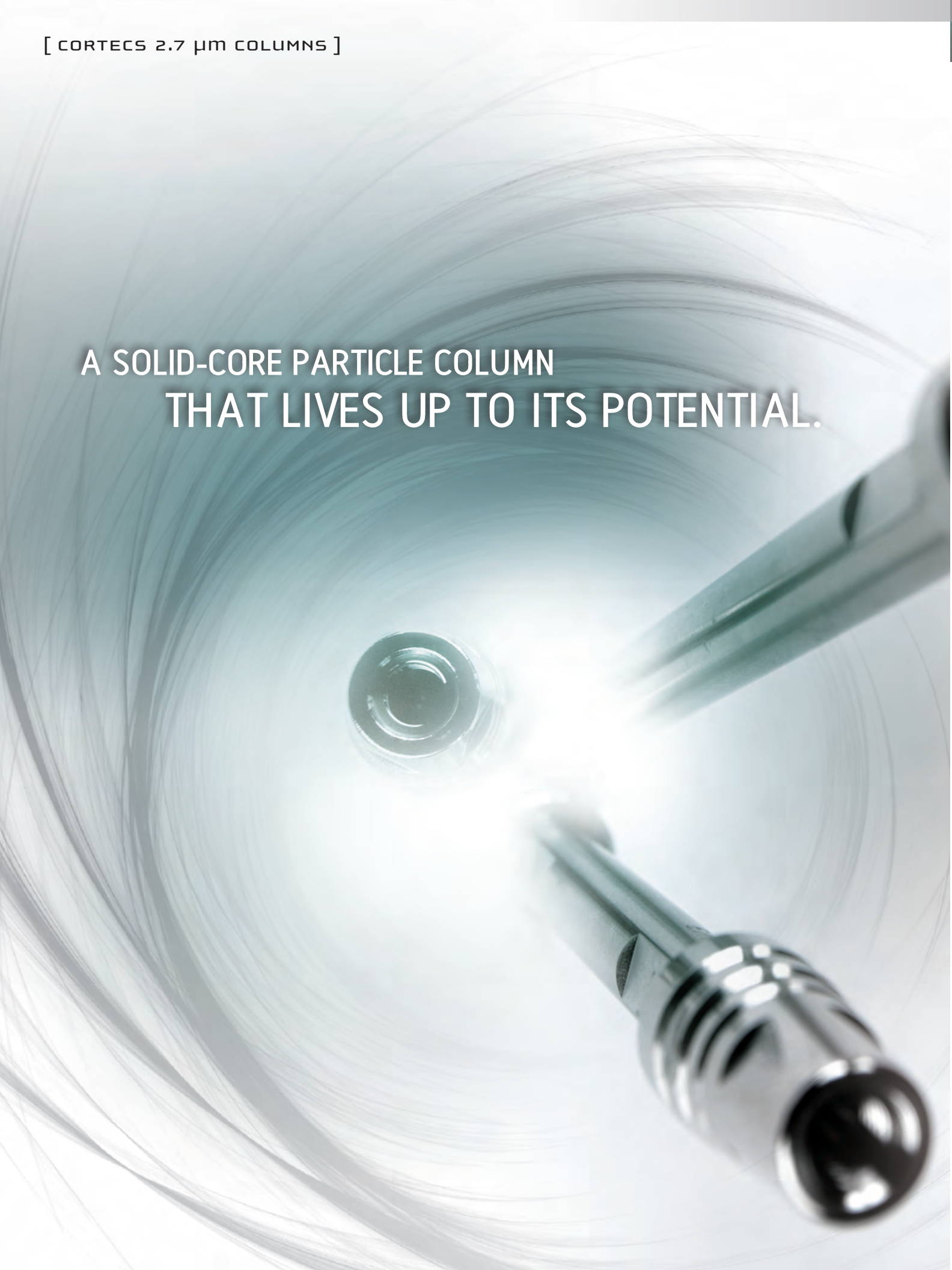
CORTECS[®]
COLUMNS

Waters

THE SCIENCE OF WHAT'S POSSIBLE.[®]

[CORTECS 2.7 μm COLUMNS]

A SOLID-CORE PARTICLE COLUMN
THAT LIVES UP TO ITS POTENTIAL.





C₁₈⁺

C₁₈

HILIC

2.7 μm SOLID-CORE PARTICLE COLUMNS FOR HPLC AND UHPLC SEPARATIONS

Unleash the power of your laboratory's instrumentation. CORTECS® 2.7 μm Solid-Core Particle Columns are designed to maximize performance of HPLC or UHPLC systems by maximizing efficiency, resulting in enhanced resolution and peak capacity—at HPLC- and UHPLC-optimized pressures. Whether you are developing a quality control method or transferring an LC separation, CORTECS Columns will exceed your LC column expectations.

TRUTH BEHIND INCREASED EFFICIENCY WITH SOLID-CORE PARTICLES

Efficiency gains of solid-core particle columns were previously credited to the shorter diffusion path in solid-core particles versus fully-porous particles. This shorter diffusion path resulted in faster mass transfer kinetics. However, for analytes of low molecular weight which have high diffusion rates, mass transfer kinetics have been found to play a minimal role in efficiency improvement. Recent research suggests that solid-core particles demonstrate improved performance by lowering the three terms of the van Deemter equation:

- Solid-core particles may pack more uniformly—lowering the *A* term
- Their lower particle porosity reduces axial diffusion—lowering the *B* term
- Their solid core may improve heat transfer, diminishing radial temperature gradients—lowering the *C* term

$$HETP = A + \frac{B}{v} + C \cdot v$$

G. Guiochon and F. Gritti, J. Chrom. A 1218, 2011, 1915 - 1938.



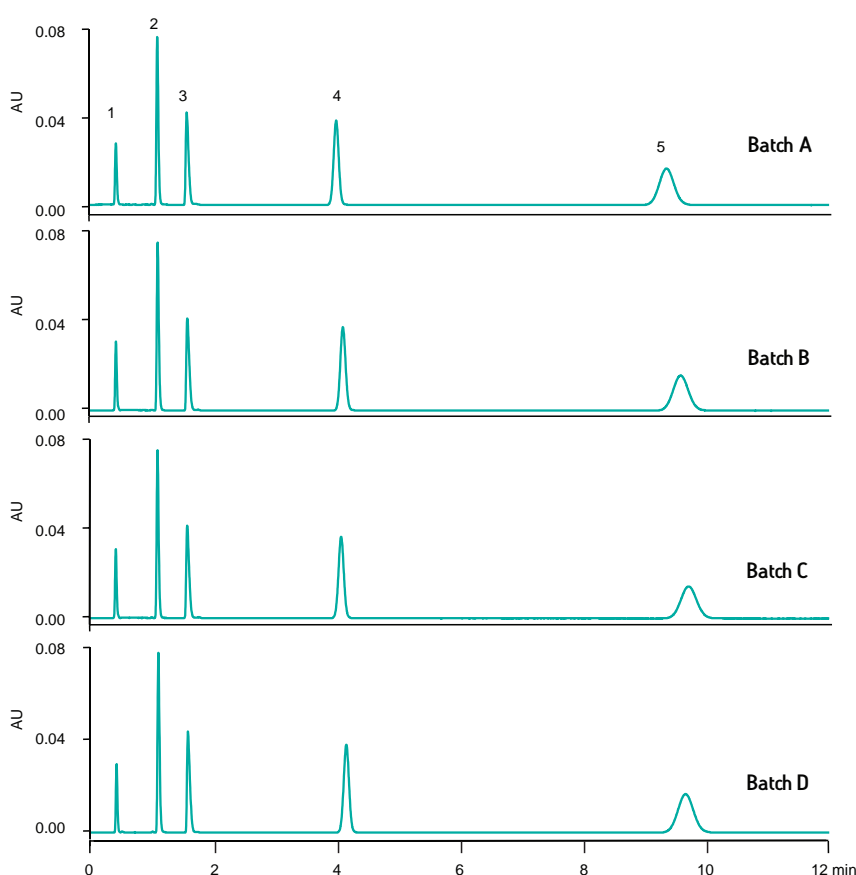
CORTECS[®]
COLUMNS

Waters CORTECS Columns are designed to maximize efficiency, throughput, and performance. Additionally, they fulfill the promise of solid-core particle columns.

SETTING THE STANDARD FOR REPRODUCIBILITY

Waters' cutting-edge manufacturing facilities are dedicated to producing columns that maximize laboratory performance. As a primary manufacturer of silica and hybrid particles, we are able to continually monitor and control the manufacturing process over the lifetime of a product. Controlled manufacturing processes ensure you receive the best, most reliable column possible for consistent performance year after year. CORTECS Columns are created using state-of-the-art column packing techniques and bonding and endcapping processes. The result is consistent, reproducible performance, and long column lifetimes.

Excellent Batch-to-Batch Reproducibility for CORTECS C₁₈, 2.7 μm Columns

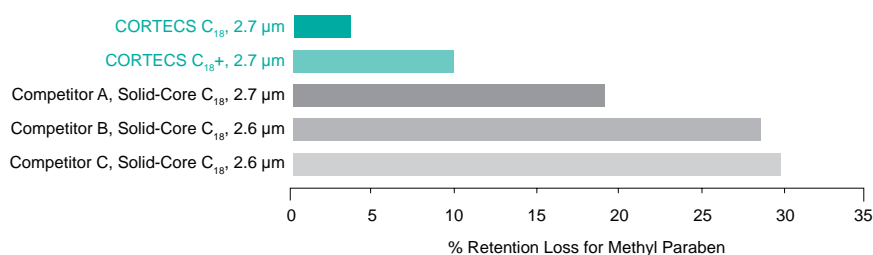


System: ACQUITY UPLC® H-Class System with ACQUITY PDA
 Column: CORTECS C₁₈, 2.7 μm, 2.1 x 50 mm (p/n 186007365)
 Mobile phase: Acetonitrile/15.4 mM ammonium formate, pH 3 (35/65, v/v)
 Flow rate: 0.25 mL/min
 Injection volume: 3 μL
 Column temp.: 30 °C
 Detection: UV at 254 nm
 Sample diluent: Mobile phase

- Compounds:
1. Uracil (1 μg/mL)
 2. Promethazine (3.0 μg/mL)
 3. Amitriptyline (8.0 μg/mL)
 4. Butylparaben (3.5 μg/mL)
 5. Naphthalene (20 μg/mL)

Separations obtained using columns containing four different batches of bonded material demonstrate the excellent reproducibility that can be expected from CORTECS Columns, assuring the long-term reproducibility of your analytical method.

Stability at Low pH: 21 Hour Exposure to 0.5% TFA at 60 °C

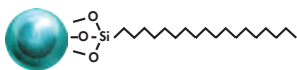
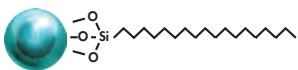



In this test, the loss in retention of the neutral marker methyl paraben indicates bonded phase loss due to acid hydrolysis. CORTECS Columns resist bonded phase loss due to novel bonding and endcapping processes resulting in good column lifetimes.

EMPOWERING METHOD DEVELOPMENT

There are several factors to consider when developing a method. Parameters that influence your separation include mobile phase composition, temperature, and column chemistry. With three phases to choose from, CORTECS 2.7 μm Columns offer both reversed-phase and orthogonal HILIC selectivity, giving you flexibility and the power to develop methods for challenging separations. With different particle characteristics and innovative charged surface modifications, CORTECS 2.7 μm Columns are suitable for use in a wide variety of applications.

CORTECS CHEMISTRY CHARACTERISTICS

	C ₁₈ ⁺	C ₁₈	HILIC
Chemistry			
Intended Use	General purpose, high-efficiency, reversed-phase column. A positively charged surface delivers excellent peak shape for basic compounds at low ionic strength acidic mobile phases.	General purpose, high-efficiency, reversed-phase column. Balanced retention of acids, bases, and neutrals at low- and mid-range pH.	High-efficiency column designed for retention of extremely polar analytes. Offers orthogonal selectivity vs. C ₁₈ columns.
Ligand Type	Trifunctional C ₁₈	Trifunctional C ₁₈	None
Surface Charge Modification	+	None	None
Endcap Style	Proprietary	Proprietary	None
Carbon Load	5.7%	6.6%	Unbonded
Ligand Density	2.4 μmol/m ²	2.7 μmol/m ²	N/A
pH Range	2-8	2-8	1-5
Temperature Limits*	Low pH = 45 °C High pH = 45 °C	Low pH = 45 °C High pH = 45 °C	Low pH = 45 °C High pH = 45 °C
Performance Standard	Neutrals QCRM	Neutrals QCRM	HILIC QCRM
Application Standard	Reversed-Phase QCRM	Reversed-Phase QCRM	HILIC QCRM

*Recommended temperature limits when operating at the extremes of the pH range. Higher temperatures may be used when the pH is not near the limits.



Implement the appropriate Waters Quality Control Reference Material (QCRM) into your workflow to benchmark system performance and gain confidence in your results.

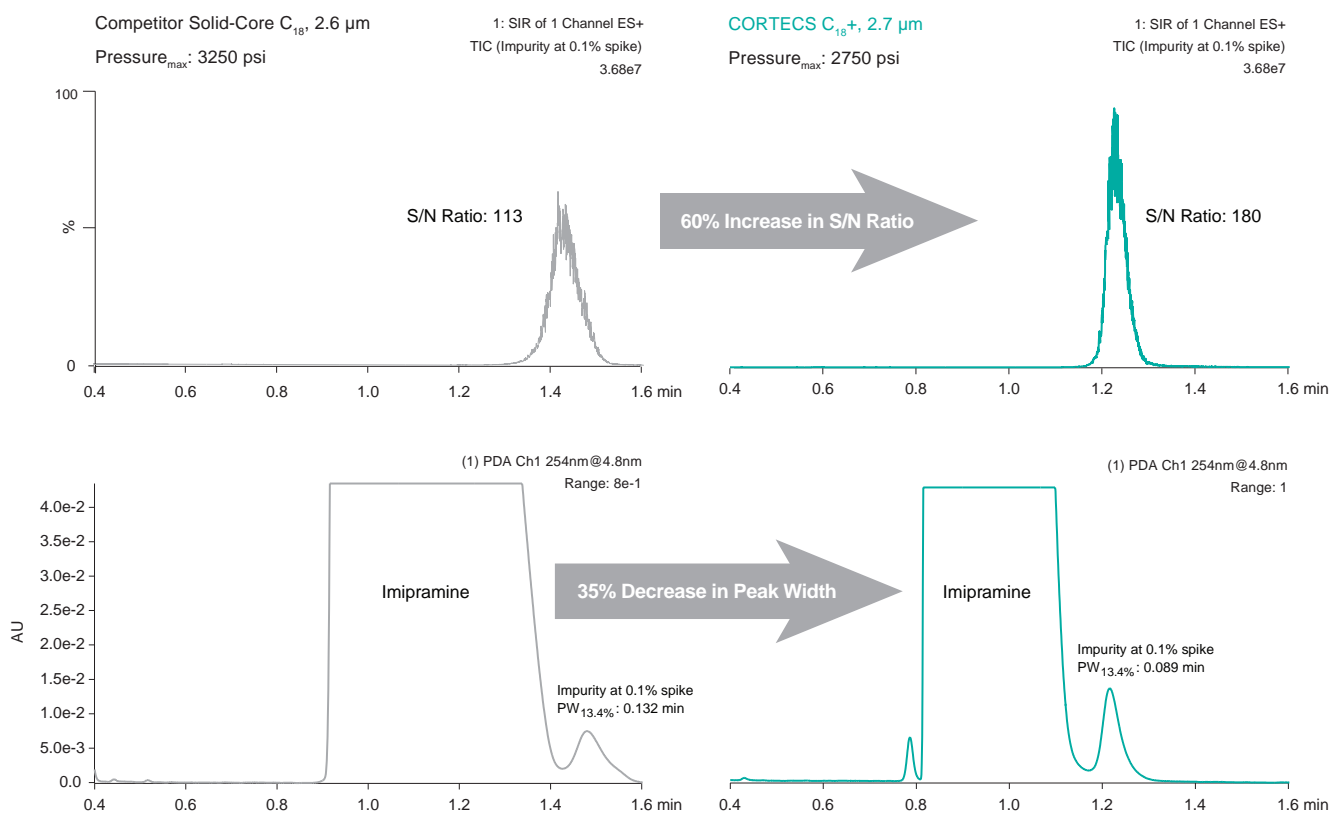
For more information, visit www.waters.com/QCRM

IMPROVED PEAK SHAPE AND INCREASED MS SENSITIVITY FOR BASIC ANALYTES

C₁₈⁺

CORTECS C₁₈⁺ is a general purpose, high-efficiency, reversed-phase column which features a positively charged surface modification. Charged surface technology utilizes a controlled, low-level surface charge for enhanced selectivity and exceptional peak shape for basic compounds when using acidic, low-ionic strength mobile phases such as formic acid. Benefits of CORTECS C₁₈⁺ Columns include unique column selectivity with industry-leading reproducibility, exceptional peak shape and loading capacity without the need for ion-pair reagents, and improved signal-to-noise performance in LC and LC-MS applications.

Superior Peak Shape for Low Level Impurity Analysis



Comparative separations may not be representative in all applications.

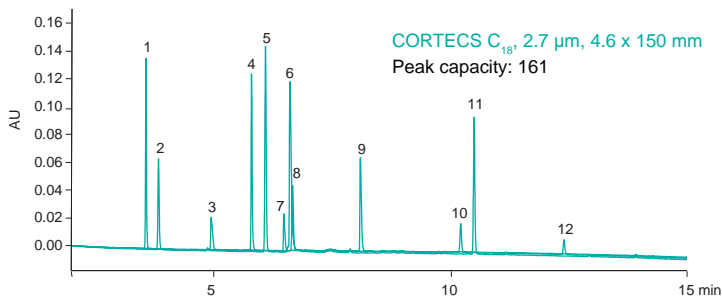
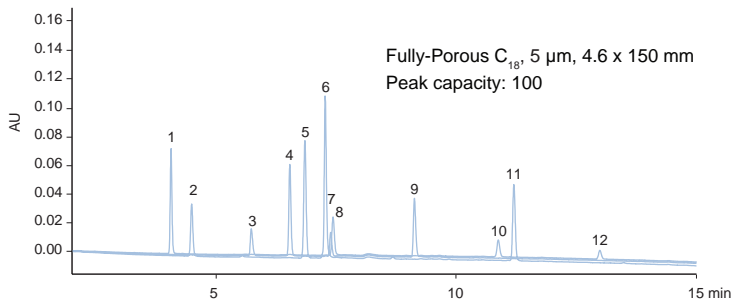
HPLC-UV/MS analysis of the low-ionic basic antidepressant imipramine reveals a low level impurity. Using a CORTECS C₁₈⁺, 2.7 μm Column designed for use with low ionic strength acidic mobile phases results in narrower peaks and improved signal-to-noise. Data conditions— Columns: 3.0 x 50 mm; Mobile phase A: 0.1% formic acid in water; Mobile phase B: 0.1% formic acid in acetonitrile; Gradient: 25 to 35%B in 4.6 minutes; Flow rate: 0.8 mL/min; Column temperature: 30 °C; Detection: UV@254 nm and ESI+ MS; Injection volume: 10 μL; Compounds: imipramine (0.5 mg/mL), impurity at 0.1% spike (0.5 μg/mL).

EXCELLENT RESOLUTION OF ACIDS, BASES, AND NEUTRALS

C₁₈

The C₁₈ ligand is the most popular choice in method development because of its stability and ability to retain a variety of analytes. CORTECS C₁₈ is a traditional C₁₈-bonded phase which exhibits balanced retention of acids, bases, and neutrals at low- and mid-range pH. It provides superb resolution and retention for complex mixtures.

Analysis of Acids, Bases, and Neutrals



Comparative separations may not be representative in all applications.

System: ACQUITY UPLC H-Class System with ACQUITY PDA Detector

Column: CORTECS C₁₈, 2.7 μm, 4.6 x 150 mm (p/n 186007378)

Mobile phase A: 15.4 mM ammonium formate pH 3

Mobile phase B: Acetonitrile

Gradient:	Time (min)	%A	%B	Curve
	Initial	95	5	–
	15.6	5	95	6
	16.6	5	95	6
	16.7	95	5	11
	20.0	95	5	11

Flow rate: 1.0 mL/min

Injection volume: 10 μL

Column temp.: 30 °C

Detection: UV at 254 nm

Sample diluent: 15.4 mM ammonium formate pH 3/acetonitrile (95/5, v/v)

Compounds:

- | | |
|-------------------------------------|----------------------------------|
| 1. Caffeine (10 μg/mL) | 7. Propranolol (20 μg/mL) |
| 2. 2-Nitrobenzoic Acid (5 μg/mL) | 8. 4-Nitrophenol (20 μg/mL) |
| 3. Metoprolol (100 μg/mL) | 9. Amitriptyline (10 μg/mL) |
| 4. Papaverine (2 μg/mL) | 10. Diethylphthalate (25 μg/mL) |
| 5. 2-Chlorobenzoic Acid (125 μg/mL) | 11. Fenopropfen (100 μg/mL) |
| 6. Pyrenesulfonic Acid (19 μg/mL) | 12. Dipropylphthalate (25 μg/mL) |

Analysis of a column characterization mix of acids, bases, and neutrals, using a CORTECS C₁₈, 2.7 μm, 4.6 x 150 mm Column on an ACQUITY UPLC[®] H-Class System. The improved efficiencies of CORTECS 2.7 μm Columns versus fully-porous particle columns produce sharper, narrower peaks resulting in higher peak capacity and increased sensitivity.



SUPERIOR RESOLUTION AND RETENTION OF POLAR ANALYTES

HILIC

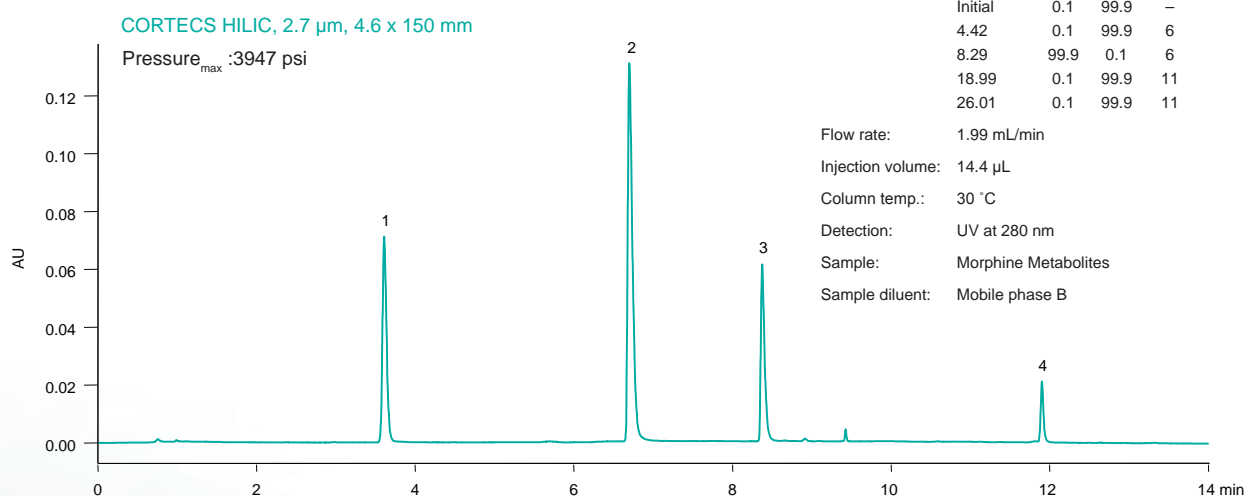
CORTECS HILIC, 2.7 μm Columns are designed specifically for the retention of very polar compounds using hydrophilic-interaction chromatography (HILIC). HILIC is a complementary chromatographic technique to reversed-phase that can provide an orthogonal separation mode for mixtures of ionizable and very polar compounds. The combination of acetonitrile-rich mobile phase and polar, unbonded CORTECS HILIC stationary phase offers additional chromatographic benefits such as increased mass spectrometry response and direct injection of organic extracts from common sample preparation techniques, such as solid-phase extraction (SPE), liquid-liquid extraction (LLE), and protein precipitation (PPT).

Retention of Polar Morphine Metabolites

Compounds:

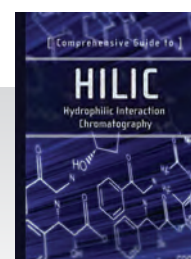
1. 6-Acetylmorphine (0.2 mg/mL)
2. Morphine (0.2 mg/mL)
3. Morphine-N-Oxide (0.1 mg/mL)
4. Morphine-3 β -glucuronide (0.2 mg/mL)

System:	Alliance [®] HPLC with 2998 Photodiode Array Detector		
Column:	CORTECS HILIC, 2.7 μm , 4.6 x 150 mm (p/n 186007393)		
Mobile phase A:	10 mM ammonium formate in 50% acetonitrile/49.875% water/0.125% formic acid		
Mobile phase B:	10 mM ammonium formate in 90% acetonitrile/9.875% water/0.125% formic acid		
Gradient:	Time (min)	%A	%B Curve
	Initial	0.1	99.9 —
	4.42	0.1	99.9 6
	8.29	99.9	0.1 6
	18.99	0.1	99.9 11
	26.01	0.1	99.9 11
Flow rate:	1.99 mL/min		
Injection volume:	14.4 μL		
Column temp.:	30 $^{\circ}\text{C}$		
Detection:	UV at 280 nm		
Sample:	Morphine Metabolites		
Sample diluent:	Mobile phase B		



Using HILIC gradient test conditions and an Alliance HPLC System, a mix of morphine and its polar metabolites were analyzed using a CORTECS HILIC, 2.7 μm , 4.6 x 150 mm Column.

To learn more about Waters Comprehensive Guide to HILIC (Hydrophilic Interaction Chromatography), visit www.waters.com/HILIC



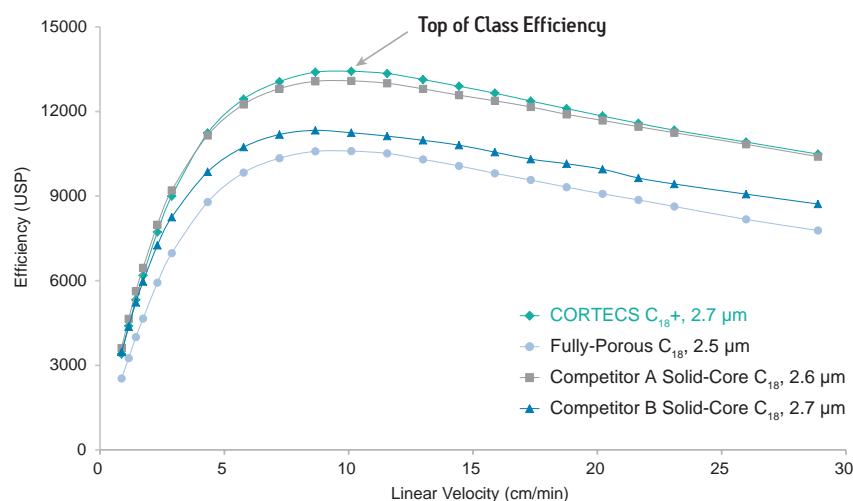
REDUCE BACKPRESSURE WITHOUT SACRIFICING EFFICIENCY

CORTECS 2.7 μm Columns offer the unique advantage of operating at lower backpressure without sacrificing efficiency or resolution. Additionally, CORTECS 2.7 μm Columns are more efficient than columns packed with fully-porous particles of equivalent size.

Advantages of combining lower operating backpressure and high efficiency include:

- Increased resolution using longer columns
- Improved utilization and performance of existing HPLC and UHPLC equipment
- Faster flow rate operation for improved throughput

Efficiency Advantages of CORTECS 2.7 μm Columns

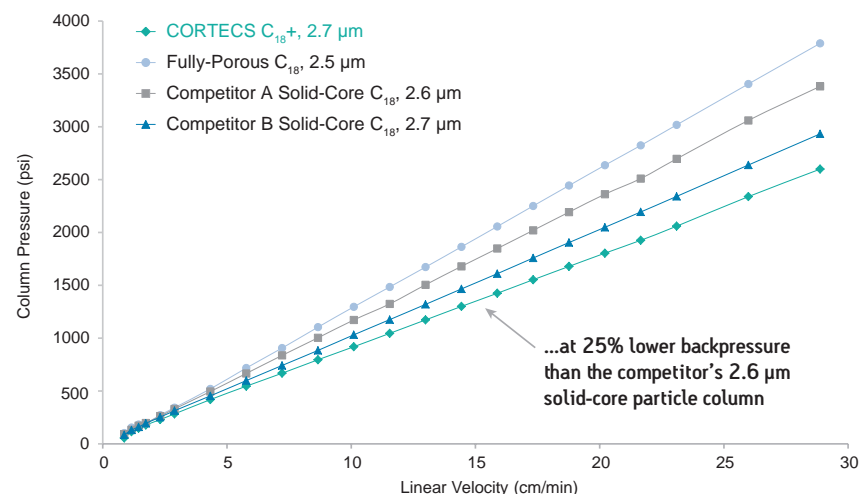


CORTECS 2.7 μm Columns exhibit excellent efficiency compared to similarly-sized, fully-porous and solid-core particle columns. Data conditions—Columns: 2.1 x 50 mm; Mobile phase: water/acetonitrile (25/75, v/v); Column temperature: 30 °C; Detection: UV@254 nm; Injection volume: 0.5 μL ; Compounds: acenaphthene (200 $\mu\text{g}/\text{mL}$), octanophenone (100 $\mu\text{g}/\text{mL}$).

Comparative separations may not be representative in all applications.

Flow Rate (mL/min)	2.1 x 50 mm	3.0 x 50 mm	4.6 x 50 mm	0.17	0.35	0.52	0.69	0.87	1.04
				0.35	0.71	1.06	1.41	1.77	2.12
				0.83	1.66	2.49	3.32	4.15	4.99

Backpressure Advantages of CORTECS 2.7 μm Columns



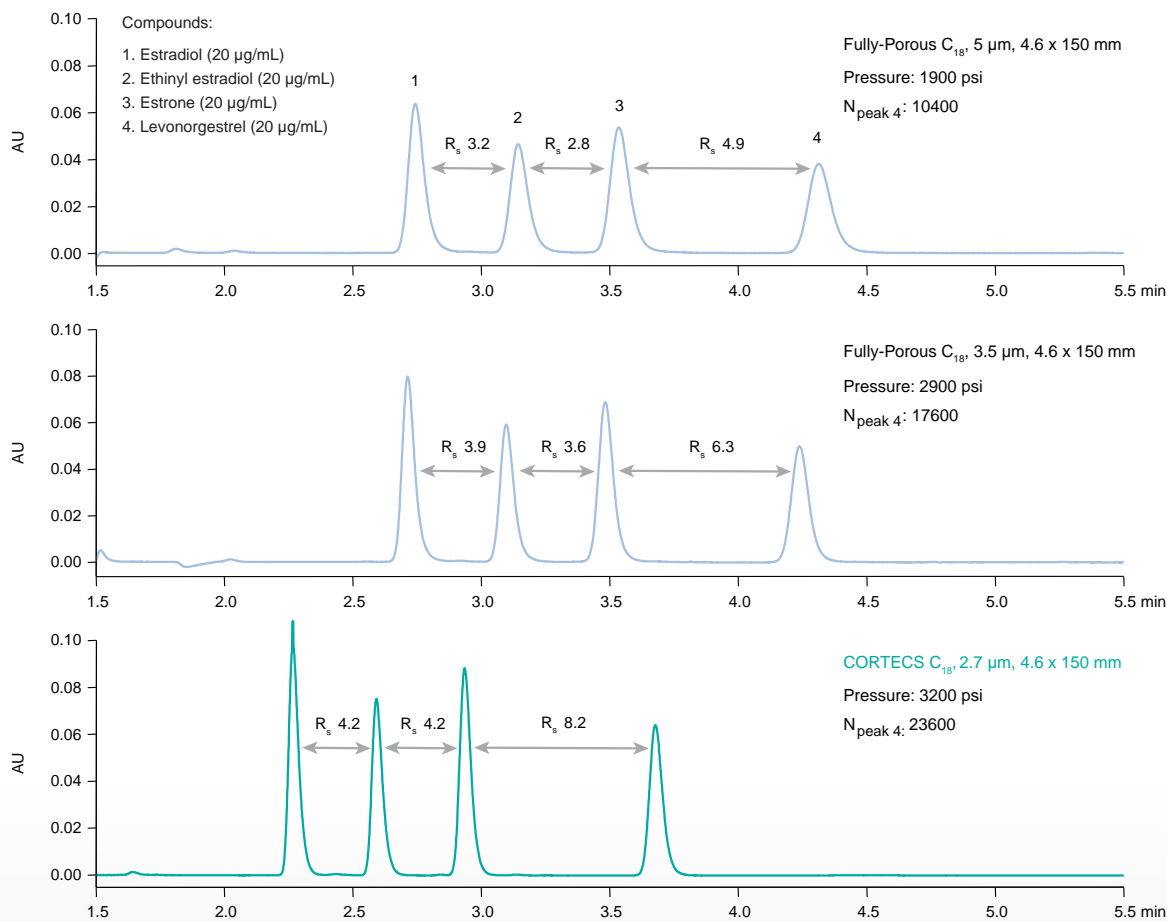
CORTECS 2.7 μm Columns offer a 25% reduction in operating backpressure—without sacrificing efficiency. Data conditions—Columns: 2.1 x 50 mm; Mobile phase: water/acetonitrile (25/75, v/v); Column temperature: 30 °C; Detection: UV@254 nm; Injection volume: 0.5 μL ; Compounds: acenaphthene (200 $\mu\text{g}/\text{mL}$), octanophenone (100 $\mu\text{g}/\text{mL}$).

Comparative separations may not be representative in all applications.

Flow Rate (mL/min)	2.1 x 50 mm	3.0 x 50 mm	4.6 x 50 mm	0.17	0.35	0.52	0.69	0.87	1.04
				0.35	0.71	1.06	1.41	1.77	2.12
				0.83	1.66	2.49	3.32	4.15	4.99

The combination of higher efficiency with lower backpressure culminates in the flexibility to run methods at HPLC- and UHPLC-optimized backpressures, using longer column lengths and higher flow rates to further improve efficiency, resolution, and throughput.

Increased Efficiency and Resolution for Estradiols with CORTECS C₁₈, 2.7 μm Columns



Comparative separations may not be representative in all applications.

Increased efficiency (N) and resolution (R_s) of estradiols can be achieved using a CORTECS C₁₈, 2.7 μm Column at HPLC- and UHPLC-optimized backpressures. Data conditions—Column: CORTECS C₁₈, 2.7 μm, 4.6 x 150 mm (p/n 186007378); Mobile phase: 0.1% formic acid in water/acetonitrile (45/55); Flow rate: 1.0 mL/min; Column temperature: 30 °C; Detection: UV@220 nm; Injection volume: 10 μL.

Waters Column Advisor recommends the most appropriate columns for your specific application requirements.

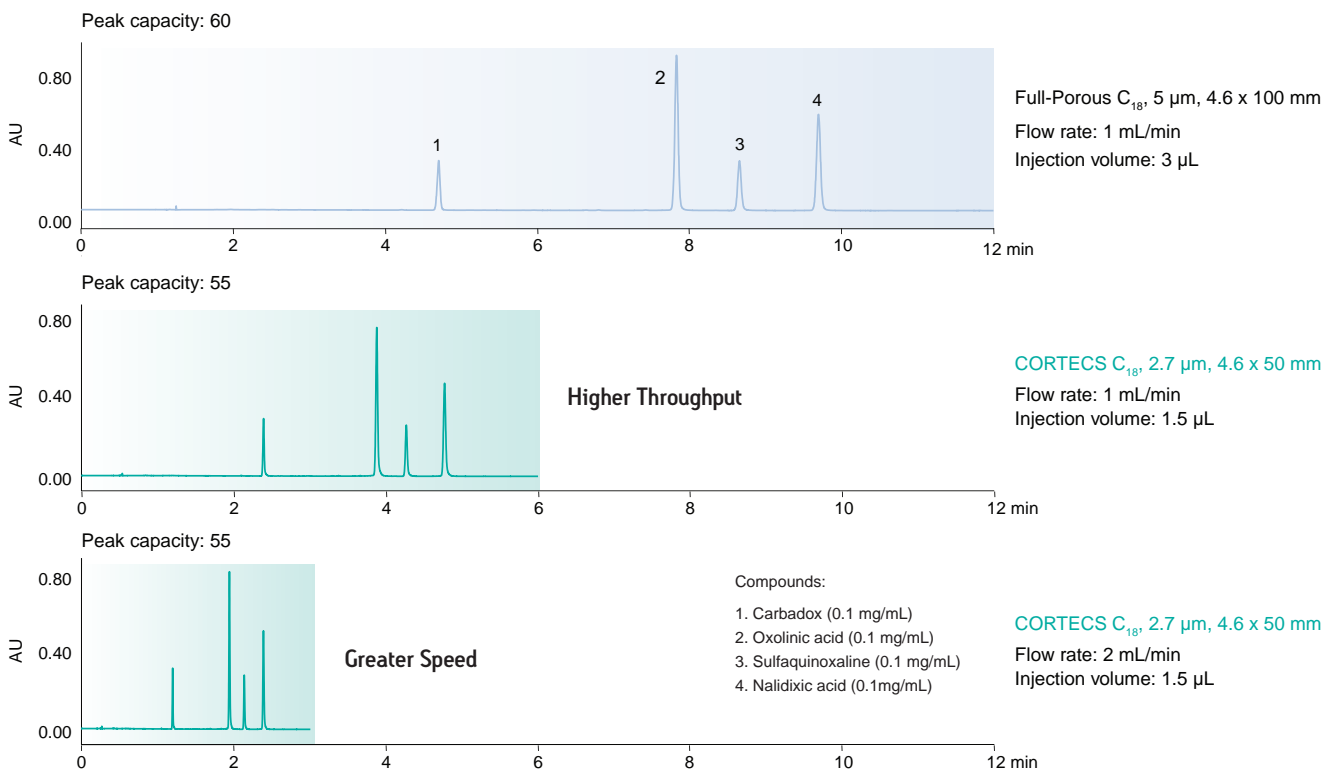
For help with choosing a column, visit www.waters.com/columnadvisor



BOOST YOUR LABORATORY'S PRODUCTIVITY

CORTECS 2.7 μm Columns enable you to achieve faster separations without sacrificing performance. Shorter-length columns can be used to reduce analysis time of the original method and increase the number of samples analyzed. With higher flow rates, gradient times can be further reduced, increasing the speed of analysis.

Increased Throughput and Speed using CORTECS C_{18} , 2.7 μm Columns



Comparative separations may not be representative in all applications.

Throughput was increased 2x by replacing a fully-porous, 5 μm , 100 mm length column with a shorter length CORTECS Column. A further 2x time savings was then achieved by doubling the flow rate without sacrificing peak capacity. Data conditions—Columns: CORTECS C_{18} , 2.7 μm , 4.6 x 50 mm (p/n 186007375); Fully-Porous C_{18} , 5 μm , 4.6 x 100 mm; Mobile phase A: 0.1% formic acid in water; Mobile phase B: 0.1% formic acid in acetonitrile; Gradients: 5 to 50%B in 12, 6, or 3 minutes; Column temperature: 30 $^{\circ}\text{C}$; Detection: UV@254 nm.



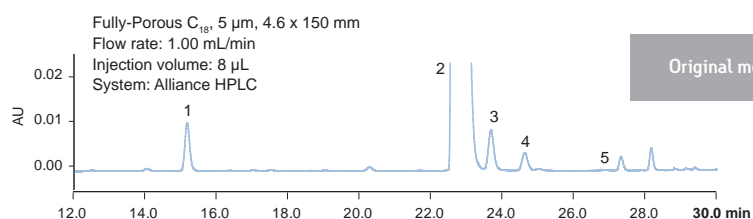
The CORTECS Family of 1.6 μm and 2.7 μm Solid-Core Particle Columns improves the performance of your laboratory's LC systems by increasing resolution while improving sample throughput.



SIMPLE METHOD TRANSFER

In the contemporary world of multi-national and multi-site laboratories whose LC platforms may be sourced from different vendors, Waters recognizes the need for versatility and ease of method transfer. It is essential that robust methods be created quickly and easily while being compatible with a wide range of chromatographic systems. With particle sizes ideal for HPLC, UHPLC, and UPLC® platforms, you can be assured a simple, and seamless transfer with consistent results across different particle sizes and column configurations.

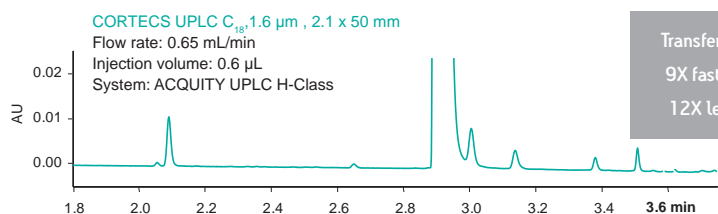
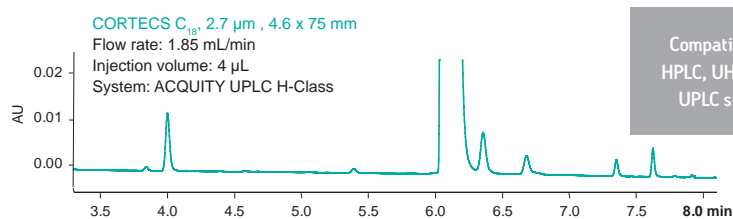
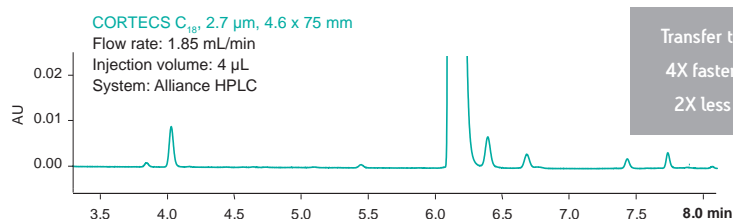
USP Method Transfer of Abacavir with Time and Solvent Savings



Compounds:

1. Descyclopropylabacavir
2. Abacavir
3. 1R,4R Trans abacavir
4. O-(4-Chloro-2,5-diaminopyrimidinyl)-abacavir
5. O-t-Butyl-abacavir

Comparative separations may not be representative in all applications.



Methods developed on 5 µm fully-porous columns can be scaled and transferred to shorter 2.7 µm columns. For further efficiency gains and productivity improvements, sub-2-µm UPLC columns can be used, enabling greater flexibility in method consistency when transitioning between laboratories within an organization or to contract partners. Data conditions—Mobile phase A: 0.1% trifluoroacetic acid in water; Mobile phase B: 85% methanol in water; Geometrically-scaled gradients (i.e., same column volumes per gradient step): Fully-Porous C₁₈, 5 µm, 4.6 x 150 mm column: 5 to 30%B in 23.6 minutes and 30 to 90%B in 14.8 min; CORTECS C₁₈, 2.7 µm, 4.6 x 75 mm column (p/n 186007376): 5 to 30%B in 6.4 minutes and 30 to 90%B in 4.0 minutes; CORTECS C₁₈, 1.6 µm, 2.1 x 50 mm column: 5 to 30%B in 2.5 minutes and 30 to 90%B in 1.6 minutes; Column temperature: 30 °C; Detection: UV@254 nm.

VANGUARD COLUMN PROTECTION

The often complex sample matrices encountered in pharmaceutical, natural product, environmental, and industrial chemical analysis prematurely shorten analytical column lifetime and degrade chromatographic performance.

Waters' VanGuard Column Protection Products help improve analytical column performance by removing particulate and chemical contamination that may be present in the mobile-phase stream.

VanGuard Pre-columns and VanGuard Cartridges are uniquely designed and optimized to protect and prolong analytical column lifetimes without compromising chromatographic performance. Each available CORTECS VanGuard configuration is ideally suited for the physical and chemical protection for CORTECS UPLC and HPLC Columns.

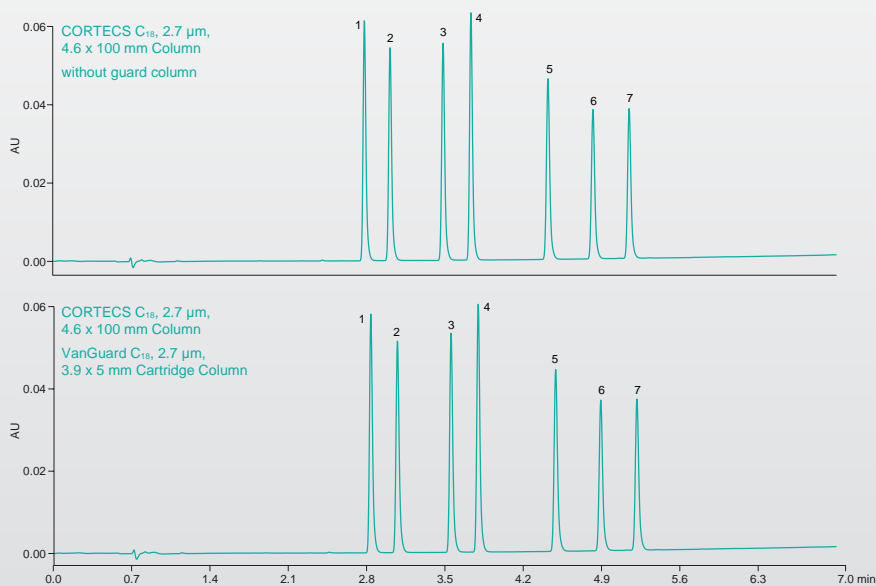
VANGUARD™
COLUMN PROTECTION



KEY FEATURES AND BENEFITS:

Feature	Benefit
First guard column for UPLC and UHPLC applications	Guaranteed compatibility with pressures up to 18,000 psi
Patent-pending, ultra-low volume design	Minimal chromatographic effects
Manufactured using Waters column hardware, particles, and sorbent chemistries	Superior HPLC, UHPLC, and UPLC column protection and performance
Connects directly to Waters HPLC, XP , and UPLC columns	Leaks and connection voids are eliminated

Minimal Chromatographic Effects with VanGuard Cartridges



Peak I.D.	Peak Capacity	
	Without Vanguard Cartridge	With Vanguard Cartridge
1. Sulfathiazole	142	135
2. Sulfamerazine	135	128
3. Sulfamethazine	135	130
4. Sulfamethoxypyridazine	138	132
5. Sulfachloropyridazine	124	119
6. Sulfamethoxazole	122	117
7. Sulfafurazole	122	117

System:	Alliance e2695 with e2489 Detector @254 nm			
Mobile phase A:	0.1 % formic acid in water			
Mobile phase B:	0.1 % formic acid in acetonitrile			
Gradient:	Time (min)	Flow rate (mL/min)	%A	%B
	0.00	1.44	95	5
	7.00	1.44	56.5	43.5
Column temp.:	30 °C			
Concentration:	10 µg/mL			
Injection volume:	5 µL			

Economical VanGuard Cartridge Columns can be used to extend analytical column lifetime without compromise to separation performance.

ORDERING INFORMATION

CORTECS 2.7 μm Columns				
Chemistry	Particle Size	Dimension	Part No. 1 Pack	Part No. 3 Pack
CORTECS C ₁₈ +	2.7 μm	2.1 x 30 mm	186007394	176003289
CORTECS C ₁₈ +	2.7 μm	2.1 x 50 mm	186007395	176003290
CORTECS C ₁₈ +	2.7 μm	2.1 x 75 mm	186007396	176003291
CORTECS C ₁₈ +	2.7 μm	2.1 x 100 mm	186007397	176003292
CORTECS C ₁₈ +	2.7 μm	2.1 x 150 mm	186007398	176003293
CORTECS C ₁₈ +	2.7 μm	3.0 x 30 mm	186007399	176003294
CORTECS C ₁₈ +	2.7 μm	3.0 x 50 mm	186007400	176003295
CORTECS C ₁₈ +	2.7 μm	3.0 x 75 mm	186007401	176003296
CORTECS C ₁₈ +	2.7 μm	3.0 x 100 mm	186007402	176003297
CORTECS C ₁₈ +	2.7 μm	3.0 x 150 mm	186007403	176003298
CORTECS C ₁₈ +	2.7 μm	4.6 x 30 mm	186007404	176003322
CORTECS C ₁₈ +	2.7 μm	4.6 x 50 mm	186007405	176003323
CORTECS C ₁₈ +	2.7 μm	4.6 x 75 mm	186007406	176003324
CORTECS C ₁₈ +	2.7 μm	4.6 x 100 mm	186007407	176003325
CORTECS C ₁₈ +	2.7 μm	4.6 x 150 mm	186007408	176003326
CORTECS C ₁₈	2.7 μm	2.1 x 30 mm	186007364	176003269
CORTECS C ₁₈	2.7 μm	2.1 x 50 mm	186007365	176003270
CORTECS C ₁₈	2.7 μm	2.1 x 75 mm	186007366	176003271
CORTECS C ₁₈	2.7 μm	2.1 x 100 mm	186007367	176003272
CORTECS C ₁₈	2.7 μm	2.1 x 150 mm	186007368	176003273
CORTECS C ₁₈	2.7 μm	3.0 x 30 mm	186007369	176003274
CORTECS C ₁₈	2.7 μm	3.0 x 50 mm	186007370	176003275
CORTECS C ₁₈	2.7 μm	3.0 x 75 mm	186007371	176003276
CORTECS C ₁₈	2.7 μm	3.0 x 100 mm	186007372	176003277
CORTECS C ₁₈	2.7 μm	3.0 x 150 mm	186007373	176003278
CORTECS C ₁₈	2.7 μm	4.6 x 30 mm	186007374	176003312
CORTECS C ₁₈	2.7 μm	4.6 x 50 mm	186007375	176003313
CORTECS C ₁₈	2.7 μm	4.6 x 75 mm	186007376	176003314
CORTECS C ₁₈	2.7 μm	4.6 x 100 mm	186007377	176003315
CORTECS C ₁₈	2.7 μm	4.6 x 150 mm	186007378	176003316
CORTECS HILIC	2.7 μm	2.1 x 30 mm	186007379	176003279
CORTECS HILIC	2.7 μm	2.1 x 50 mm	186007380	176003280
CORTECS HILIC	2.7 μm	2.1 x 75 mm	186007381	176003281
CORTECS HILIC	2.7 μm	2.1 x 100 mm	186007382	176003282
CORTECS HILIC	2.7 μm	2.1 x 150 mm	186007383	176003283
CORTECS HILIC	2.7 μm	3.0 x 30 mm	186007384	176003284
CORTECS HILIC	2.7 μm	3.0 x 50 mm	186007385	176003285
CORTECS HILIC	2.7 μm	3.0 x 75 mm	186007386	176003286
CORTECS HILIC	2.7 μm	3.0 x 100 mm	186007387	176003287
CORTECS HILIC	2.7 μm	3.0 x 150 mm	186007388	176003288
CORTECS HILIC	2.7 μm	4.6 x 30 mm	186007389	176003317
CORTECS HILIC	2.7 μm	4.6 x 50 mm	186007390	176003318
CORTECS HILIC	2.7 μm	4.6 x 75 mm	186007391	176003319
CORTECS HILIC	2.7 μm	4.6 x 100 mm	186007392	176003320
CORTECS HILIC	2.7 μm	4.6 x 150 mm	186007393	176003321

VanGuard Column Protection (Guard Columns)

Chemistry	Particle Size	Part No. ¹	
		2.1 x 5 mm, 3/pk	3.9 x 5 mm, 3/pk
CORTECS C ₁₈ VanGuard Cartridge	2.7 μm	186007682	186007684
CORTECS C ₁₈ + VanGuard Cartridge	2.7 μm	186007685	186007687
CORTECS HILIC VanGuard Cartridge	2.7 μm	186007688	186007690
Universal VanGuard Cartridge Holder	—	186007949	186007949

¹ Recommended for 2.1 mm and 3.0 mm i.d. columns² Recommended for 4.6 mm i.d. columns

CORTECS 2.7 μm Columns Method Validation Kits (MVK)*			
Chemistry	Particle Size	Dimension	Part No.
CORTECS C ₁₈ +	2.7 μm	2.1 x 30 mm	186007439
CORTECS C ₁₈ +	2.7 μm	2.1 x 50 mm	186007440
CORTECS C ₁₈ +	2.7 μm	2.1 x 75 mm	186007441
CORTECS C ₁₈ +	2.7 μm	2.1 x 100 mm	186007442
CORTECS C ₁₈ +	2.7 μm	2.1 x 150 mm	186007443
CORTECS C ₁₈ +	2.7 μm	3.0 x 30 mm	186007444
CORTECS C ₁₈ +	2.7 μm	3.0 x 50 mm	186007445
CORTECS C ₁₈ +	2.7 μm	3.0 x 75 mm	186007446
CORTECS C ₁₈ +	2.7 μm	3.0 x 100 mm	186007447
CORTECS C ₁₈ +	2.7 μm	3.0 x 150 mm	186007448
CORTECS C ₁₈ +	2.7 μm	4.6 x 30 mm	186007449
CORTECS C ₁₈ +	2.7 μm	4.6 x 50 mm	186007450
CORTECS C ₁₈ +	2.7 μm	4.6 x 75 mm	186007451
CORTECS C ₁₈ +	2.7 μm	4.6 x 100 mm	186007452
CORTECS C ₁₈ +	2.7 μm	4.6 x 150 mm	186007453
CORTECS C ₁₈	2.7 μm	2.1 x 30 mm	186007409
CORTECS C ₁₈	2.7 μm	2.1 x 50 mm	186007410
CORTECS C ₁₈	2.7 μm	2.1 x 75 mm	186007411
CORTECS C ₁₈	2.7 μm	2.1 x 100 mm	186007412
CORTECS C ₁₈	2.7 μm	2.1 x 150 mm	186007413
CORTECS C ₁₈	2.7 μm	3.0 x 30 mm	186007414
CORTECS C ₁₈	2.7 μm	3.0 x 50 mm	186007415
CORTECS C ₁₈	2.7 μm	3.0 x 75 mm	186007416
CORTECS C ₁₈	2.7 μm	3.0 x 100 mm	186007417
CORTECS C ₁₈	2.7 μm	3.0 x 150 mm	186007418
CORTECS C ₁₈	2.7 μm	4.6 x 30 mm	186007419
CORTECS C ₁₈	2.7 μm	4.6 x 50 mm	186007420
CORTECS C ₁₈	2.7 μm	4.6 x 75 mm	186007421
CORTECS C ₁₈	2.7 μm	4.6 x 100 mm	186007422
CORTECS C ₁₈	2.7 μm	4.6 x 150 mm	186007423
CORTECS HILIC	2.7 μm	2.1 x 30 mm	186007424
CORTECS HILIC	2.7 μm	2.1 x 50 mm	186007425
CORTECS HILIC	2.7 μm	2.1 x 75 mm	186007426
CORTECS HILIC	2.7 μm	2.1 x 100 mm	186007427
CORTECS HILIC	2.7 μm	2.1 x 150 mm	186007428
CORTECS HILIC	2.7 μm	3.0 x 30 mm	186007429
CORTECS HILIC	2.7 μm	3.0 x 50 mm	186007430
CORTECS HILIC	2.7 μm	3.0 x 75 mm	186007431
CORTECS HILIC	2.7 μm	3.0 x 100 mm	186007432
CORTECS HILIC	2.7 μm	3.0 x 150 mm	186007433
CORTECS HILIC	2.7 μm	4.6 x 30 mm	186007434
CORTECS HILIC	2.7 μm	4.6 x 50 mm	186007435
CORTECS HILIC	2.7 μm	4.6 x 75 mm	186007436
CORTECS HILIC	2.7 μm	4.6 x 100 mm	186007437
CORTECS HILIC	2.7 μm	4.6 x 150 mm	186007438

*Each kit contains three columns from three batches of material.

Quality Control Reference Materials (QCRM)

Description	Part No.
Reversed-Phase QCRM	186006363
Neutrals QCRM	186006360
HILIC QCRM	186007226
QDa QCRM	186007345
LCMS QCRM	186006963

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February 2015 720004675EN Rev C SC-SIG