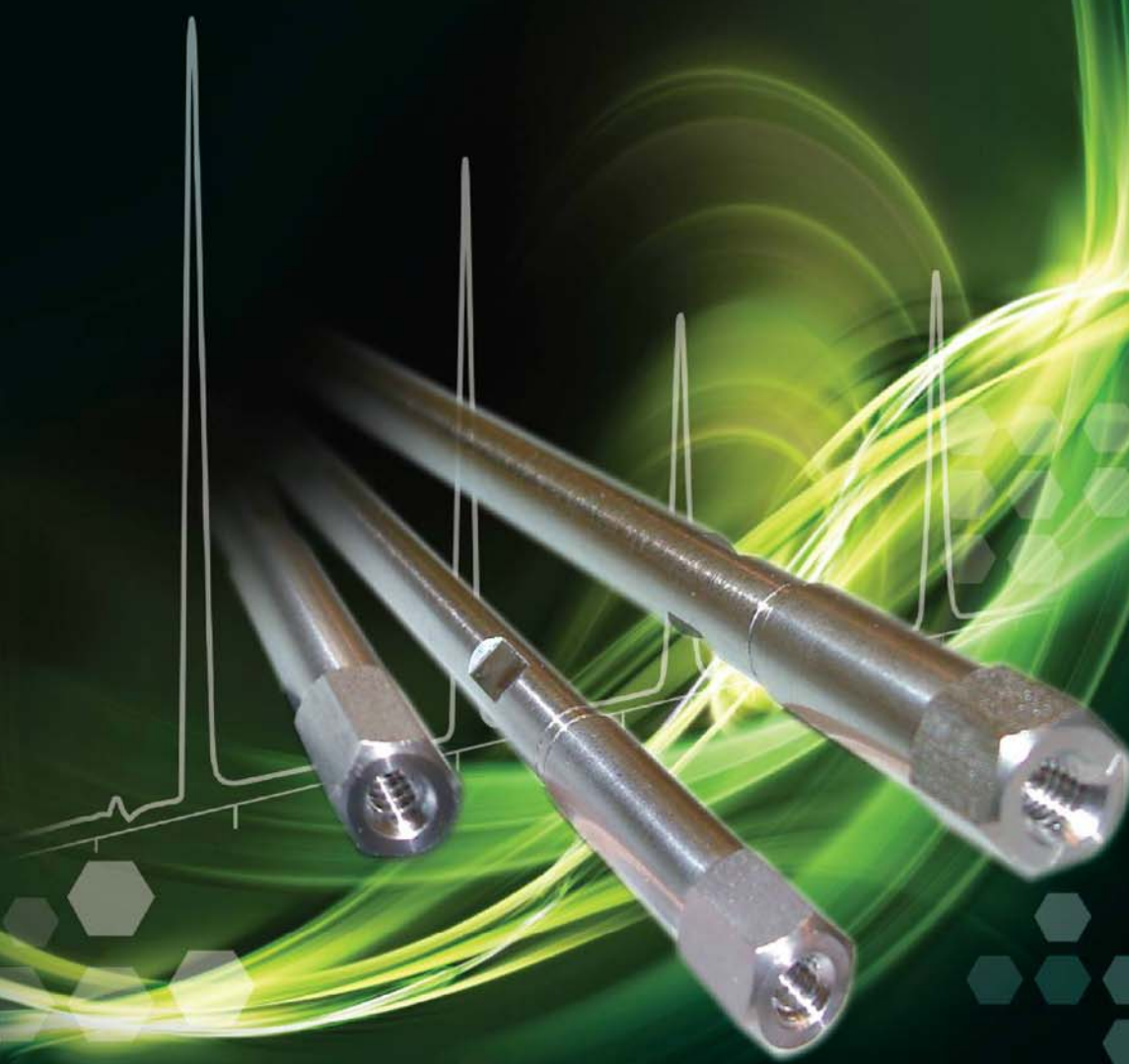


ACE[®]

HPLC and UHPLC Columns

Independent Column Comparisons

- 
- UHPLC and HPLC columns
 - Porous and solid-core particles
 - Asymmetry and efficiency comparisons
 - Independently tested for impartial results

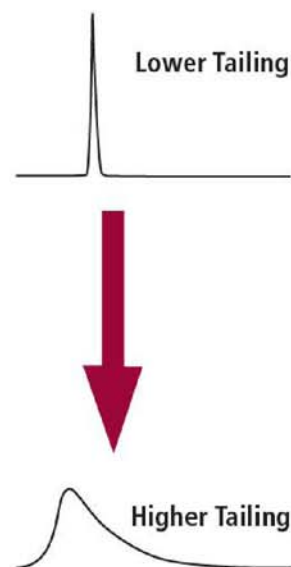
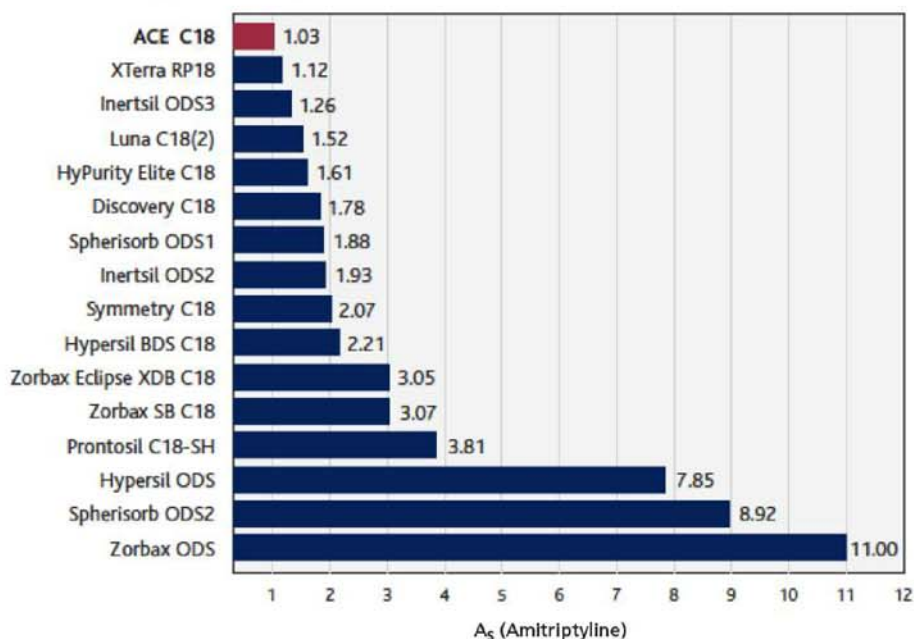
Comparison of Leading 5µm C18 Columns

- Data obtained from the National Institute of Standards and Technology (NIST), USA

- Leading 5µm C18 column brands
- Basic molecule testing
- Peak asymmetry investigation

"Elution of organic bases (eg amitriptyline) with severe peak tailing is often associated with high silanol activity; however, the elution of such compounds with symmetrical peak shape is considered indicative of column deactivation."

Peak Asymmetry Comparison



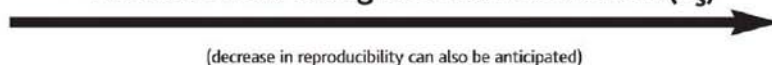
Column Dimensions: 150 x 4.6mm, 5µm Mobile Phase: 80:20 MeOH/5mM potassium phosphate buffer (pH 7.0) Flow Rate: 2.0ml/min Temperature: 24°C

The above data was obtained from the National Institute of Standards and Technology (NIST), Certificate of Analysis for Standard Reference Material 870 - "Column Performance Test Mixture for Liquid Chromatography" at the NIST internet site <http://ois.nist.gov/srmcatalog/certificates/870.pdf> in September 2002.

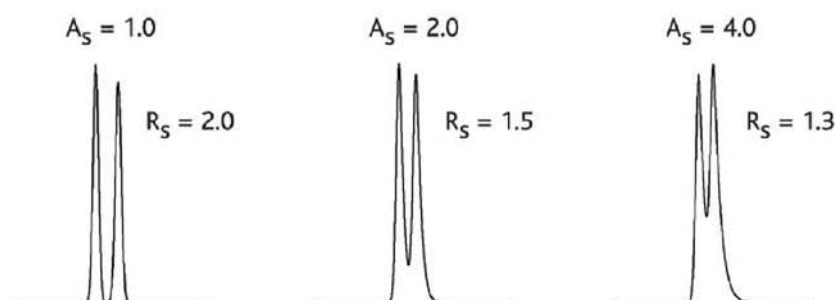
The NIST test mixture, which is designed to characterize general aspects of HPLC was revised in December 2002. Comparative data may not be representative of all applications.

Importance of Peak Asymmetry (A_s)

- Increased Peak Tailing Decreases Resolution (R_s)



(decrease in reproducibility can also be anticipated)



ACE® Stationary Phases Virtually Eliminate the Negative Effects of Silanols on UHPLC & HPLC Separations

"Independent Testing Shows ACE HPLC Columns Deliver Outstanding Peak Shape"

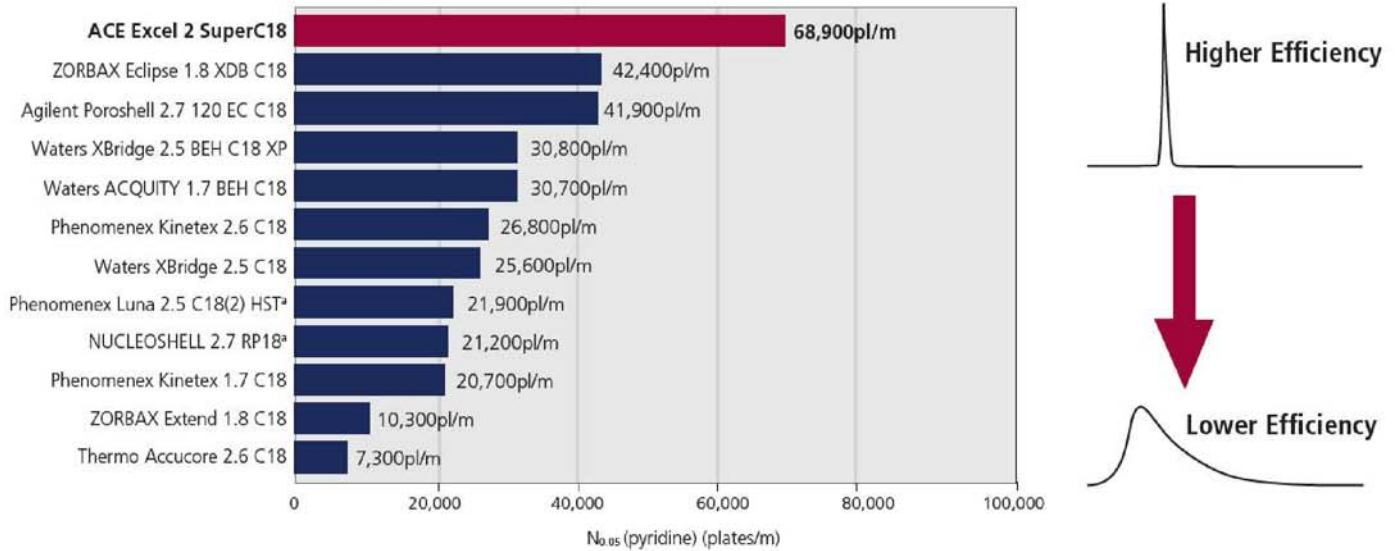
Comparison of Column Inertness at Intermediate pH

- Reproduced with kind permission of The Open University, UK

- Leading column brands in 50 x 2.1mm LC/MS compatible dimensions at pH 5.8
- Silica, Hybrid and Superficially Porous particle technologies compared
- Comparison of column efficiency for pyridine – a basic molecule
- Efficiency measured at 5% peak height to account for peak tailing effects

Peak Efficiency Comparison

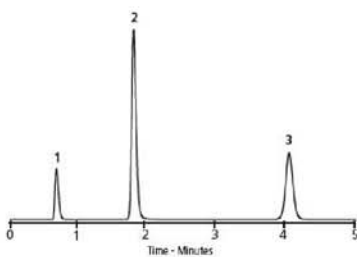
Application # 1513



Column Dimensions: 50 x 2.1mm (#50 x 2.0mm) Sample: 1) uracil 2) pyridine 3) phenol Mobile Phase: 30:70 MeOH/10mM NH₄OAc in H₂O (pH 5.8)
Flow Rate: 0.20ml/min Temperature: 22°C Wavelength: 254nm Comparative data may not be representative of all applications.

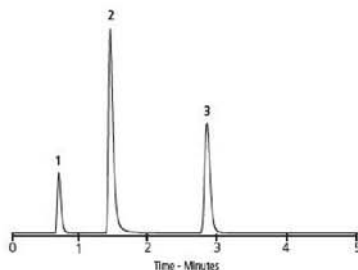
ACE Excel 2 SuperC18

(fully porous ultra-inert silica)
 $N_{0.05}$ (pyr) = 68,900pl/m



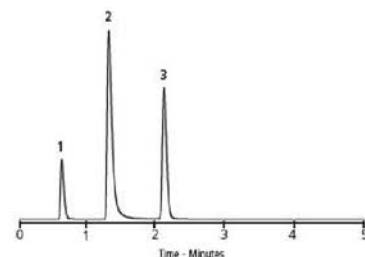
Waters ACQUITY 1.7 BEH C18

(hybrid particle)
 $N_{0.05}$ (pyr) = 30,700pl/m



Phenomenex Kinetex 1.7 C18

(core-shell particle)
 $N_{0.05}$ (pyr) = 20,700pl/m



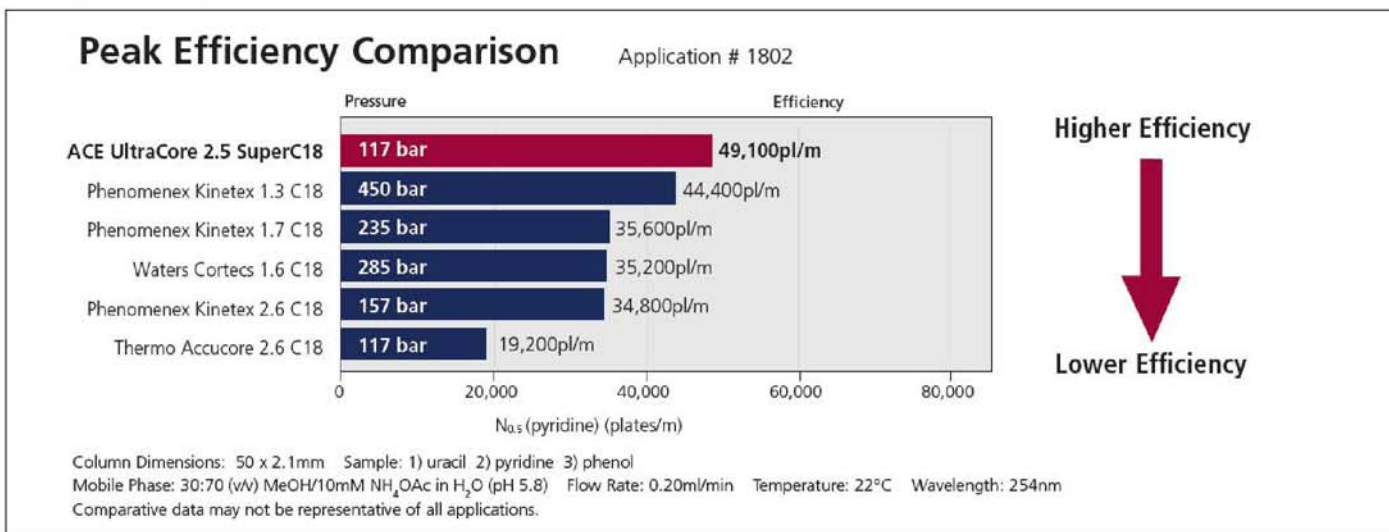
**“Independent Testing Shows ACE UHPLC Columns
Deliver Outstanding Efficiency”**

Independent Testing Comparison #3: Solid-Core Particles

ACE UltraCore SuperC18 Provides Exceptional Efficiency

- Reproduced with kind permission of The Open University, UK.

- Leading column brands from major manufacturers investigated
- Comparison of column efficiency for pyridine – a basic molecule

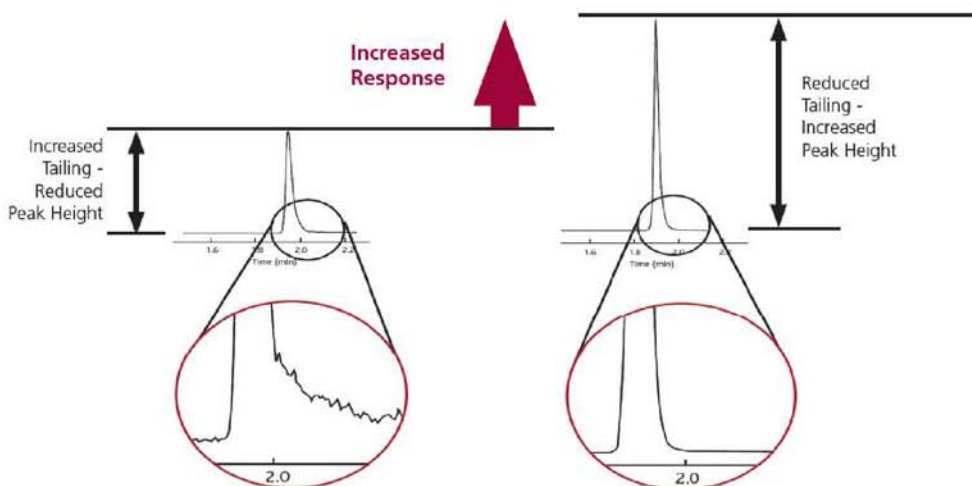


“Independent Testing Shows ACE Solid-Core Columns Deliver Outstanding Performance”

Reduce Peak Tailing Improve MS Signal Response

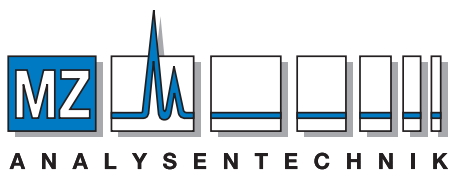
AUTHORIZED DISTRIBUTOR
MZ-Analysentechnik GmbH, Wöhlerstraße 2-6 • D-55120 Mainz
Tel +49 6131 68 66 19, Fax +49 6131 68 66 20
e-mail: info@mz-at.de, www.mz-at.de

- Improved efficiency and peak shape has a direct effect upon signal response



Improve your MS signal response by selecting high efficiency, low tailing ACE UHPLC and HPLC Columns

ACE® UHPLC and HPLC columns are available through our international distributor network:



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