

ACE Advanced Method Development Kit

- Contains ACE C18, ACE C18-AR and ACE C18-PFP phases
- Ideal starting point for routine method development
- Available from microbore (0.5 mm id) through to analytical (4.6 mm id) dimensions (see p.7)
- Particularly recommended for compounds containing aromatic rings

Phase	Functional Group	Endcapped	Particle Size (µm)	Pore Size (Å)	Surface Area (m ² /g)	Carbon Load (%)	Recommended pH Range	100% Aqueous Compatible	USP Listing
ACE C18	Octadecyl (C18)	Yes	1.7 ^{NEW} , 2, 3, 5, 10	100	300	15.5	2.0-8.0 ^a	No	L1
ACE C18-AR	C18 with integral Phenyl	Yes	1.7 ^{NEW} , 2, 3, 5, 10	100	300	15.5	2.0-8.0 ^a	Yes	L1
ACE C18-PFP	C18 with integral PFP	Yes	1.7 ^{NEW} , 2, 3, 5, 10	100	300	14.3	2.0-8.0 ^a	Yes	L1

^a For optimum column lifetime, a pH range of 2-8 is recommended. To increase column lifetime at higher pH, organic buffers, low buffer concentrations, high % organic solvent and low temperatures must be considered. Further information is contained within "A Guide to HPLC and LC/MS Buffer Selection" by John Dolan – please contact your distributor to request your FREE copy or visit www.ace-hplc.com.

ACE C18	ACE C18-AR	ACE C18-PFP
<p>ACE C18 remains the "go-to" column of choice for HPLC and UHPLC separations. With an excellent reputation for performance, reproducibility and lifetime, ACE C18 provides a rugged, reproducible starting point for method development.</p> <p>Recommended Applications</p> <ul style="list-style-type: none"> • Analytes differing in hydrophobicity • Polar, moderately polar and non-polar analytes • Uncharged acids and bases • Ionized acids or bases using ion-pairing • Ideal starting point for method development 	<p>ACE C18-AR combines the excellent performance and advantages of the ACE C18 phase with the added selectivity of an integral phenyl group.</p> <p>Recommended Applications</p> <ul style="list-style-type: none"> • Analytes with π-bonding and conjugated systems • Analytes with electron delocalization and electron withdrawing groups, such as halogens, nitro groups, ketones, esters and acids • Analytes with different dipole moments • Analytes differing in hydrophobicity • Stereoisomers, steroids, substituted aromatics and sulphur containing compounds • Fully wettable - 100% aqueous buffer compatible • Applications where C18 does not provide adequate separation • Applications where conventional phenyl phases provide insufficient retention, poor stability, or significant bleed. 	<p>ACE C18-PFP brings together the stability, reproducibility and low bleed of the ACE C18 phase with the additional selectivity of an integral pentafluorophenyl (PFP) group.</p> <p>Recommended Applications</p> <ul style="list-style-type: none"> • Analytes with π-bonding • Analytes with electron donating groups, such as phenols, aromatic ethers and amines • Analytes with proton donor groups • Analytes with different dipole moments • Analytes differing in hydrophobicity • Structural isomers, steroids, substituted aromatics and taxanes • Fully wettable - 100% aqueous buffer compatible • Applications where C18 does not provide adequate separation • Applications where conventional PFP phases provide insufficient retention, poor stability or significant bleed.

Additional Information

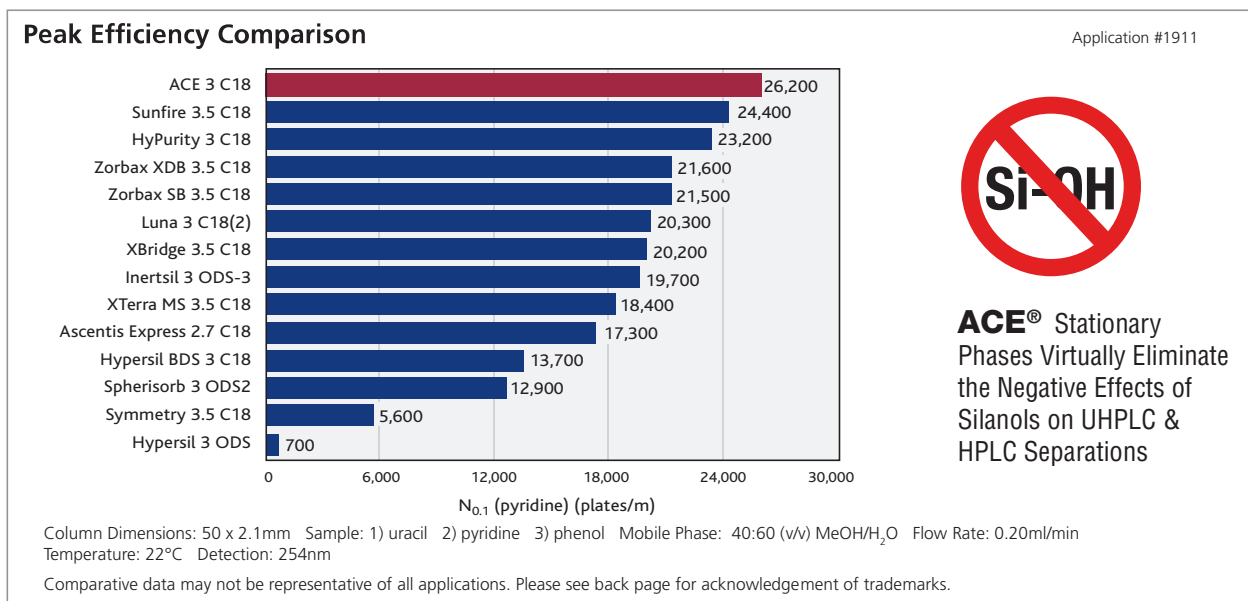
Product bulletins containing further details on the ACE C18, C18-AR and C18-PFP columns contained within the Advanced ACE Method Development Kit are available to download at www.ace-hplc.com. Alternatively, please contact our technical support team via info@ace-hplc.com or contact your local distributor.

Learn More: www.ace-hplc.com



ACE C18 - Comparison of Column Inertness

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

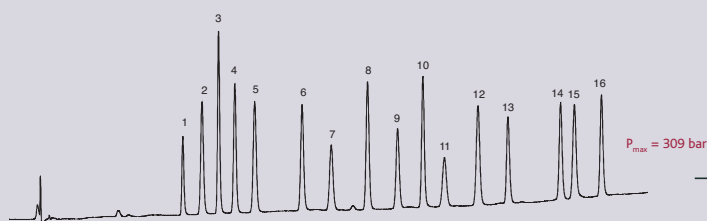


ACE C18 Delivers Excellent Performance

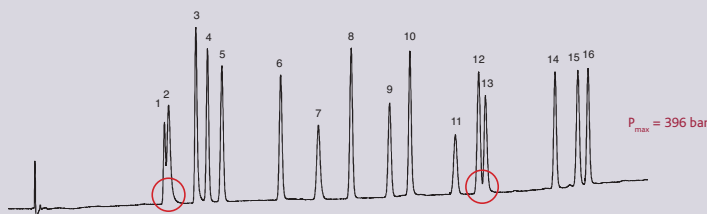
Rapid UHPLC Screening of 16 Pharmaceuticals and Related Compounds

Application # 1503

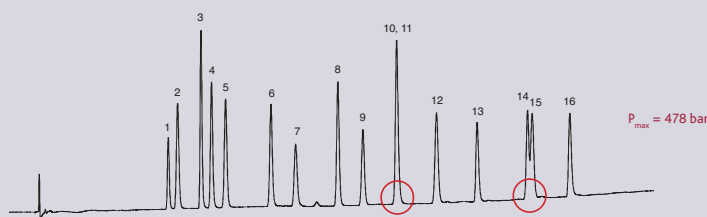
ACE Excel 2 C18
(fully porous ultra-inert silica)



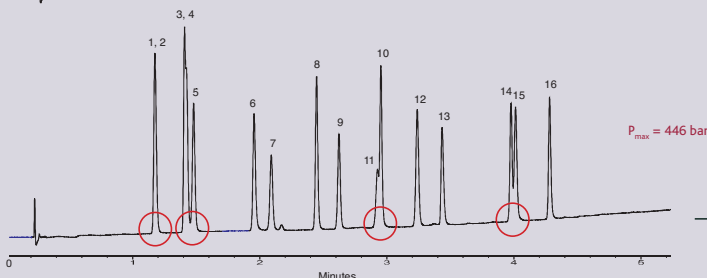
ZORBAX Eclipse 1.8 XDB C18
(fully porous silica)



Waters ACQUITY 1.7 BEH C18
(hybrid particle)



Phenomenex Kinetex 1.7 C18
(core shell particle)



These leading C18 phases provide an essentially hydrophobic-only interaction, and therefore exhibit similar selectivity with only slight differences between brands observed.



To implement a change in selectivity, the use of an alternative bonded phase (eg ACE C18-AR, ACE C18-PFP) that can leverage additional modes of interaction is recommended.

Sample: 1) N-acetylprocainamide 2) 3-hydroxybenzoic acid 3) pindolol 4) methylphenylsulphoxide 5) benzyl alcohol 6) quinoxaline 7) 1,4-dinitrobenzene 8) phenacetin 9) 1,2-dimethoxybenzene 10) furosemide 11) anisole 12) methyl benzoate 13) remacemide 14) nimesulide 15) ethyl benzoate 16) diflunisal
 Mobile Phase: A = 20mM KH₂PO₄, pH 2.7 B = 20mM KH₂PO₄, pH 2.7 in MeOH/H₂O (65:35 v/v) Gradient: 3 – 100% B in 5 minutes
 Column Dimensions: 50 x 2.1mm Flow Rate: 0.60ml/min Temperature: 60°C Detection: 214nm

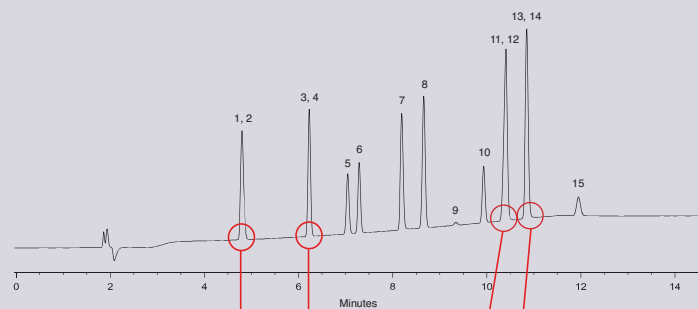
Comparative data may not be representative of all applications. Please see back page for acknowledgement of trademarks.

Leveraging the Unique Selectivity of ACE C18-AR

Improving an Analgesics Separation by Changing Phase

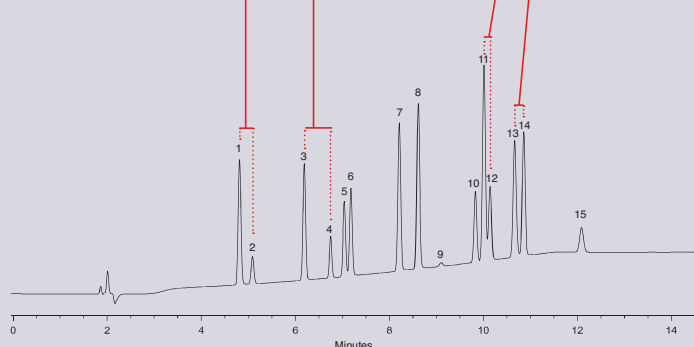
Application #1921

ACE 3 C18



C18 phase provides essentially hydrophobic-only interaction

ACE 3 C18-AR



Multi-mode interaction including π - π and hydrophobic interactions provides complete separation

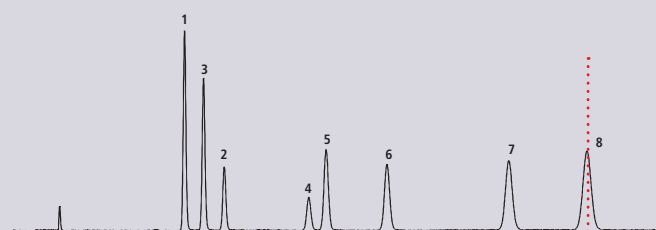
Sample: 1) 4-acetamidophenol 2) 4-aminobenzoic acid 3) 4-hydroxybenzoic acid 4) caffeine 5) 2-acetamidophenol 6) 3-hydroxybenzoic acid 7) salicylamide 8) acetanilide 9) phenol 10) acetylsalicylic acid 11) benzoic acid 12) sorbic acid 13) salicylic acid 14) phenylacetin 15) salicylaldehyde
 Mobile Phase: A = 0.1% v/v formic acid in H₂O B = 0.1% v/v formic acid in MeCN Gradient: 5 - 35% B in 9 minutes, hold at 35% B until 14 minutes
 Column Dimensions: 150 x 4.6mm Flow Rate: 1.00ml/min Temperature: 40°C Detection: 240nm

ACE C18-PFP Provides a Separation that a C18 or PFP Column Alone Cannot Achieve

The Importance of Maintaining Hydrophobicity During Multi-Mode Interactions

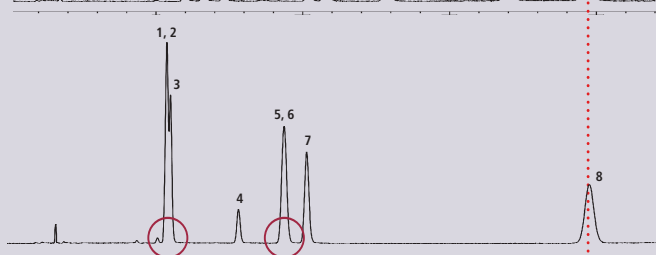
Application #1931

ACE 3 C18-PFP



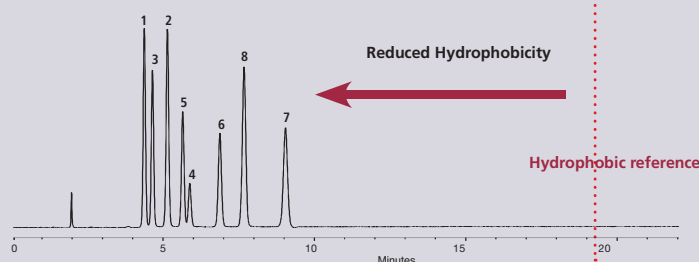
Multi-mode interaction including hydrophobic interaction provides complete separation

ACE 3 C18



C18 phase provides essentially hydrophobic-only interaction

Hypersil GOLD 3 μ m PFP
(example short chain PFP phase)



Significantly reduced hydrophobicity reduces the separation despite other interaction modes

Column Dimensions: 150 x 4.6mm Sample: 1) 1,2,3-trimethoxybenzene 2) 1,2,4-trimethoxybenzene 3) 1,2-dimethoxybenzene 4) 1,4-dimethoxybenzene 5) methoxybenzene 6) 1,3-dimethoxybenzene 7) 1,3,5-trimethoxybenzene 8) neutral molecule (reference)
 Mobile Phase: 50:50 v/v MeOH/H₂O Flow Rate: 1.00ml/min Temperature: 40°C Detection: 254nm

Comparative data may not be representative of all applications. Please see back page for acknowledgement of trademarks.

ACE Advanced Method Development UHPLC/HPLC Column Kits

(Contains 3 columns: ACE C18, ACE C18-AR and ACE C18-PFP of specified dimensions)

(UHPLC/HPLC hardware format with 1000bar/15000psi pressure limit)				
Column Dimensions	1.7µm ^{NEW}	2µm	3µm	5µm
2.1 x 20mm	MDKA-17-0202U	MDKA-2-0202U	MDKA-3-0202U	MDKA-5-0202U
2.1 x 30mm	MDKA-17-0302U	MDKA-2-0302U	MDKA-3-0302U	MDKA-5-0302U
2.1 x 35mm	MDKA-17-3502U	MDKA-2-3502U	MDKA-3-3502U	MDKA-5-3502U
2.1 x 50mm	MDKA-17-0502U	MDKA-2-0502U	MDKA-3-0502U	MDKA-5-0502U
2.1 x 75mm	MDKA-17-7502U	MDKA-2-7502U	MDKA-3-7502U	MDKA-5-7502U
2.1 x 100mm	MDKA-17-1002U	MDKA-2-1002U	MDKA-3-1002U	MDKA-5-1002U
2.1 x 125mm	-	MDKA-2-1202U	MDKA-3-1202U	MDKA-5-1202U
2.1 x 150mm	-	MDKA-2-1502U	MDKA-3-1502U	MDKA-5-1502U
2.1 x 250mm	-	-	MDKA-3-2502U	MDKA-5-2502U
3.0 x 20mm	MDKA-17-0203U	MDKA-2-0203U	MDKA-3-0203U	MDKA-5-0203U
3.0 x 30mm	MDKA-17-0303U	MDKA-2-0303U	MDKA-3-0303U	MDKA-5-0303U
3.0 x 35mm	MDKA-17-3503U	MDKA-2-3503U	MDKA-3-3503U	MDKA-5-3503U
3.0 x 50mm	MDKA-17-0503U	MDKA-2-0503U	MDKA-3-0503U	MDKA-5-0503U
3.0 x 75mm	MDKA-17-7503U	MDKA-2-7503U	MDKA-3-7503U	MDKA-5-7503U
3.0 x 100mm	MDKA-17-1003U	MDKA-2-1003U	MDKA-3-1003U	MDKA-5-1003U
3.0 x 125mm	-	MDKA-2-1203U	MDKA-3-1203U	MDKA-5-1203U
3.0 x 150mm	-	MDKA-2-1503U	MDKA-3-1503U	MDKA-5-1503U
3.0 x 250mm	-	-	MDKA-3-2503U	MDKA-5-2503U
4.6 x 20mm	-	MDKA-2-0246U	MDKA-3-0246U	MDKA-5-0246U
4.6 x 30mm	-	MDKA-2-0346U	MDKA-3-0346U	MDKA-5-0346U
4.6 x 35mm	-	MDKA-2-3546U	MDKA-3-3546U	MDKA-5-3546U
4.6 x 50mm	-	MDKA-2-0546U	MDKA-3-0546U	MDKA-5-0546U
4.6 x 75mm	-	MDKA-2-7546U	MDKA-3-7546U	MDKA-5-7546U
4.6 x 100mm	-	MDKA-2-1046U	MDKA-3-1046U	MDKA-5-1046U
4.6 x 125mm	-	MDKA-2-1246U	MDKA-3-1246U	MDKA-5-1246U
4.6 x 150mm	-	MDKA-2-1546U	MDKA-3-1546U	MDKA-5-1546U
4.6 x 250mm	-	-	MDKA-3-2546U	MDKA-5-2546U

Selectivity Offer:
Each 3 column kit is available for the same price as a single column

ACE Advanced Method Development Microbore HPLC Column Kits

(Contains 3 columns: ACE C18, ACE C18-AR and ACE C18-PFP of specified dimensions)

(HPLC hardware format with 400bar/6000psi recommended pressure limit)						
Column Dimensions	2µm		3µm		5µm	
	1/16" port	1/32" port	1/16" port	1/32" port	1/16" port	1/32" port
0.5 x 30mm	MDKA-2-03005	MDKA-2-03005S	MDKA-3-03005	MDKA-3-03005S	MDKA-5-03005	MDKA-5-03005S
0.5 x 50mm	MDKA-2-05005	MDKA-2-05005S	MDKA-3-05005	MDKA-3-05005S	MDKA-5-05005	MDKA-5-05005S
0.5 x 75mm	MDKA-2-75005	MDKA-2-75005S	MDKA-3-75005	MDKA-3-75005S	MDKA-5-75005	MDKA-5-75005S
0.5 x 100mm	MDKA-2-10005	MDKA-2-10005S	MDKA-3-10005	MDKA-3-10005S	MDKA-5-10005	MDKA-5-10005S
0.5 x 125mm	MDKA-2-12005	MDKA-2-12005S	MDKA-3-12005	MDKA-3-12005S	MDKA-5-12005	MDKA-5-12005S
0.5 x 150mm	MDKA-2-15005	MDKA-2-15005S	MDKA-3-15005	MDKA-3-15005S	MDKA-5-15005	MDKA-5-15005S
0.5 x 250mm	-	-	-	-	MDKA-5-25005	MDKA-5-25005S
1.0 x 30mm	MDKA-2-0301	MDKA-2-0301S	MDKA-3-0301	MDKA-3-0301S	MDKA-5-0301	MDKA-5-0301S
1.0 x 50mm	MDKA-2-0501	MDKA-2-0501S	MDKA-3-0501	MDKA-3-0501S	MDKA-5-0501	MDKA-5-0501S
1.0 x 75mm	MDKA-2-7501	MDKA-2-7501S	MDKA-3-7501	MDKA-3-7501S	MDKA-5-7501	MDKA-5-7501S
1.0 x 100mm	MDKA-2-1001	MDKA-2-1001S	MDKA-3-1001	MDKA-3-1001S	MDKA-5-1001	MDKA-5-1001S
1.0 x 125mm	MDKA-2-1201	MDKA-2-1201S	MDKA-3-1201	MDKA-3-1201S	MDKA-5-1201	MDKA-5-1201S
1.0 x 150mm	MDKA-2-1501	MDKA-2-1501S	MDKA-3-1501	MDKA-3-1501S	MDKA-5-1501	MDKA-5-1501S
1.0 x 250mm	-	-	-	-	MDKA-5-2501	MDKA-5-2501S

Important Note: ACE microbore columns (1.0mm id and 0.5mm id) are available with either standard 1/16" (10-32 thread) connections or 1/32" (6-40 thread) connections. For use with Eksigent micro and nano LC systems, order columns with 1/32" connections and use either ACE 6-40 fittings (part number ACE-MC3210, 10 pack) or Eksigent 6-40 fittings (part number 5019621).

For 1/16" HPLC column connections up to 6000psi, PEEK™ 1/16" fingertight fittings (part number ACE-CC10, 10 pack) are recommended. For 1/32" microbore HPLC column connections up to 6000psi, PEEK™ 1/32" (6-40 thread) fingertight fittings (part number ACE-MC3210, 10 pack) are recommended. For 1/16" UHPLC column connections up to 25000psi, reusable 1/16" fittings (part number EXL-CC10, 10 pack) are recommended. To further extend UHPLC and HPLC column lifetimes, ACE pre-column filters are recommended. For further details please contact your distributor or visit www.ace-hplc.com