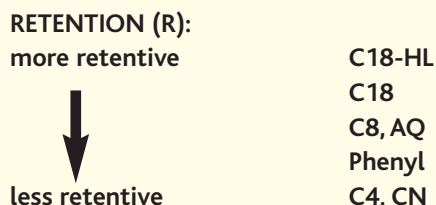


## Choosing the Bonded Phase that's Best for Your Application

As a general rule, retention increases with chain length of the bonded phase, that is:



We recommend starting most method development projects with C18 or C8, knowing that if more retention and hence more resolution is needed, your next choice is C18-HL (Hi-Load). Starting with C8 offers the benefit of shorter analysis times and/or lower organic solvent use. The elution order for most compounds will be the same on the aliphatic (C18, C8, C4) phases. If a different elution order is required for compound verification or to resolve matrix components, changing to a phenyl or CN phase is far simpler than trying to change selectivity by mobile phase changes. In many cases, the ACE CN and ACE Phenyl phases will offer a significant difference in selectivity from the aliphatic phases. ACE AQ (see p.10) is particularly recommended for applications requiring high aqueous content mobile phases. Improved resistance to phase collapse is seen compared to standard C18 phases.

### Need even more resolution?

- Choose 3 micron ACE columns

With today's increased pace of drug discovery, fast and efficient methods are the rule. Short, narrow-bore columns are replacing the conventional 250 x 4.6mm versions. ACE HPLC columns are available in both 3µm and 5µm particle sizes. Although 5µm particles are sufficient for most applications, greater efficiency can be obtained by using smaller particles. This increased efficiency enables the use of shorter (<150mm) column lengths, resulting in decreased analysis times. Due to the excellent flow characteristics of ACE silica, you will not experience the high back pressures often encountered with other columns.

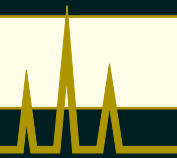
ACE LC/MS and rapid analysis columns are highlighted on pages 28-31.

### Narrow-bore? Rapid analysis? LC/MS? Preparative? - No problem!

ACE bonded phases are available in 3µm, 5µm, 10µm and 15µm particle sizes, so regardless of your application, you can scale up or scale down and be assured of the same selectivity. For fast, high resolution preparative chromatography, a range of pre-packed ACE preparative and combinatorial chemistry columns are highlighted on pages 32-34.

## Application Summary

PHASE	DESCRIPTION	APPLICATION
C18	Optimised for maximum efficiency, superior peak shape and resolution. Utilises the same ultra high purity silica as all ACE phases.	A C18 phase for most HPLC applications. Available in a range of particle sizes, from LC/MS and microbore applications through to preparative scale separations.
C8	Increased bonding density compared to ACE C18. Similarly optimised for maximum efficiency, superior peak shape and resolution.	Recommended starting point for method development. Also suited to high aqueous conditions and for rapid analysis applications.
C4	Combines lower hydrophobicity with excellent chromatographic performance. Improved hydrolytic stability compared to conventional C4 phases.	Use for rapid analysis optimisation, when less retention than C8 or C18 is required. Also suitable for analysis of small proteins.
CN	Suitable for use in both normal - and reversed-phase modes. Greatly improved performance, stability and reproducibility compared to conventional CN phases.	Use to increase retention of polar compounds. Ideal for gradients and rapid screening applications due to fast equilibration capabilities.
Ph	Hydrophobicity between C4 and C8 phases, with increased polar selectivity. Improved performance, stability and reproducibility compared to conventional phenyl phases.	Offers alternative selectivity for aromatic, amine or polar compounds.
AQ	A unique C18 bonded phase with integral polar functionality. Resistant to phase collapse even with 100% aqueous mobile phase.	Recommended for applications where 100% aqueous mobile phases are required. Ideal for fast gradients due to rapid re-equilibration properties.
C18-HL	High surface area, high carbon load phase, leading to increased retention and loading compared to ACE C18.	Suitable for LC/MS due to increased retention characteristics. Availability of particle sizes up to 15µm ensures easy scale-up for preparative and process scale applications.



## ACE C18-HL (Hi-Load)

- High surface area, high carbon load phase
- Increased loading and retention
- Optimised for preparative and process scale applications
- 3µm, 5µm, 10µm and 15µm particle sizes
- Exceptional chemical stability
- Excellent peak shape with acidic, basic and neutral molecules

PHASE	FUNCTIONAL GROUP	ENDCAPPED	PARTICLE SIZE (µm)	PORE SIZE (Å)	SURFACE AREA (m <sup>2</sup> /g)	CARBON LOAD (%)
C18-HL	Octadecyl	Yes	3, 5, 10, 15	90	400	20.0



## LC/MS to Preparative Scale Applications

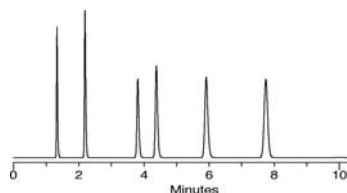
The increased retention characteristics of ACE C18-HL (see Figure 11a) make it an ideal selection for LC/MS applications. Retention can be maintained whilst reducing the aqueous content of the mobile phase, thus increasing sensitivity.

For preparative applications, the higher surface area leads to increased loading capacity. Available in 3µm, 5µm, 10µm and 15µm particle sizes and a wide range of column dimensions (see pages 14-17), ACE C18-HL columns show reproducible scale up from LC/MS to preparative scale dimensions.

100Å

Figure 11a. Reproducible Scale-Up with ACE C18-HL Columns

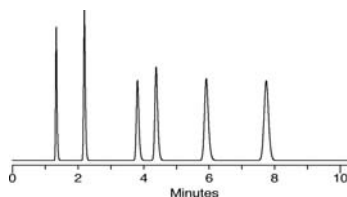
ACE 3 C18-HL



LC/MS

150 x 2.1mm i.d.  
0.21ml/min

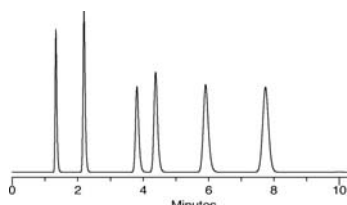
ACE 5 C18-HL



Analytical

150 x 4.6mm i.d.  
1.00ml/min

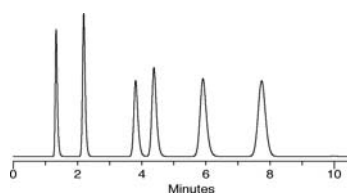
ACE 10 C18-HL



Semi-Preparative

150 x 10mm i.d.  
4.7ml/min

ACE 15 C18-HL



Preparative

150 x 30.0mm i.d.  
42.5ml/min

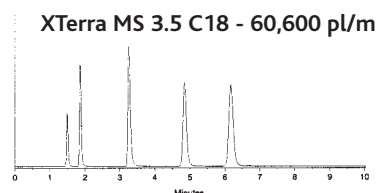
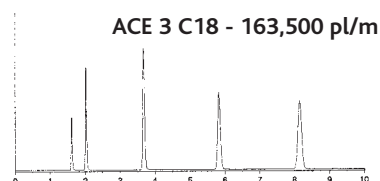
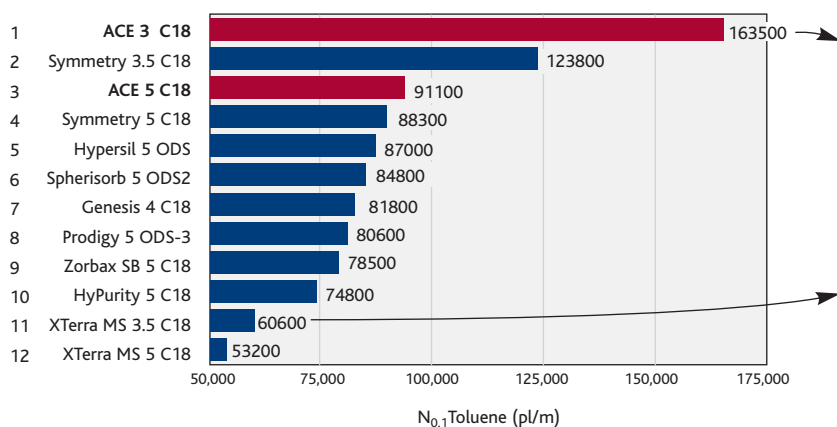
Sample: 1) Uracil 2) 4-Hydroxybenzoic acid 3) Acetylsalicylic acid 4) Benzoic acid 5) 2-Hydroxybenzoic acid 6) Ethyl paraben  
Mobile Phase: 35:65 MeCN/0.1% TFA in H<sub>2</sub>O, Temperature: 22°C, Wavelength: 254nm

## Comparison of Leading 100Å 3µm and 5µm C18 Columns

- Independently tested at the University of Aberdeen, UK

- Leading 3µm and 5µm C18 column brands - 150 x 4.6mm i.d.
- Acidic, basic and neutral molecule tests
- Peak efficiency and asymmetry comparison

### Neutral Molecules



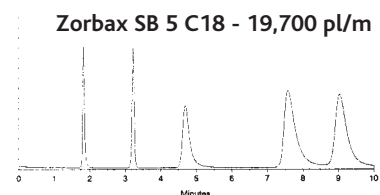
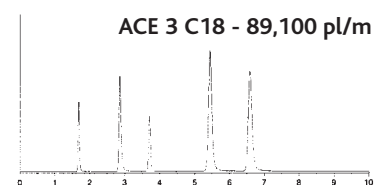
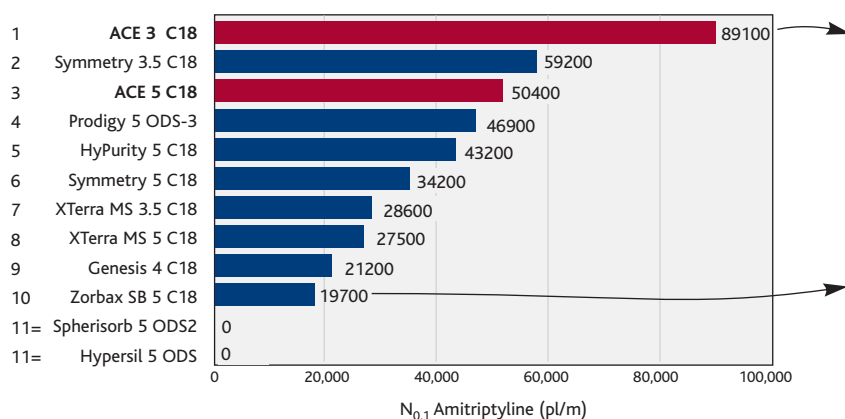
Independently Tested at The University of Aberdeen, UK

#### Summary:

Column efficiencies were seen to differ greatly. The use of high efficiency columns is recommended to reduce analysis time. Column length can be reduced without loss of resolution.

Column Dimensions: 150 x 4.6mm id  
 Sample: 1) Uracil 2) Dimethyl phthalate  
 3) Toluene 4) Biphenyl  
 5) Phenanthrene  
 Mobile Phase: 80:20 MeOH/H<sub>2</sub>O  
 Flow Rate: 1.0 ml/min  
 Temperature: 22°C

### Basic Molecules

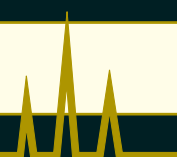


Independently Tested at The University of Aberdeen, UK

#### Summary:

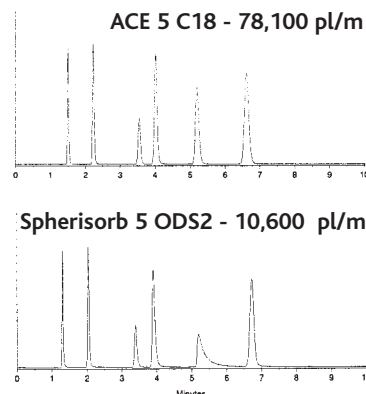
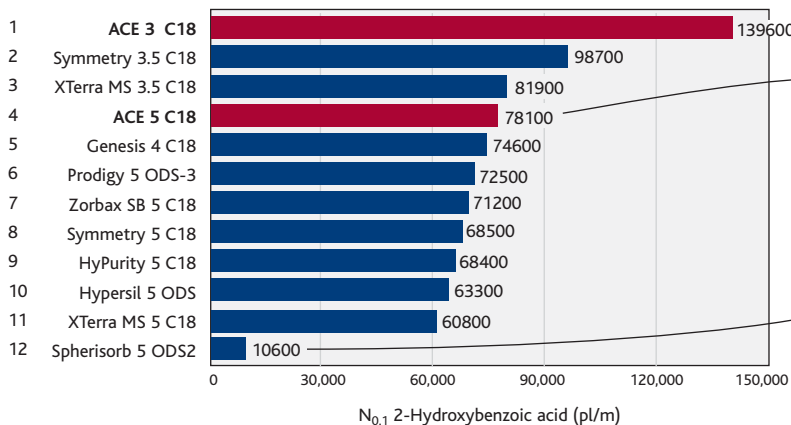
C18 bonded columns show significant differences in chromatography for basic compounds. These variations are generally caused by undesirable secondary silanol interactions with the silica surface. Increasing silanol activity results in a deterioration of chromatographic performance. Highly inert "base deactivated" C18 columns with very low levels of silanol activity all exhibit similar selectivity, with differences limited to efficiency and peak shape.

Column Dimensions: 150 x 4.6mm id  
 Sample: 1) Norephedrine  
 2) Nortriptyline 3) Toluene  
 4) Imipramine 5) Amitriptyline  
 Mobile Phase: 80:20 MeOH/25mM KH<sub>2</sub>PO<sub>4</sub> (pH 6)  
 Flow Rate: 1.0 ml/min  
 Temperature: 22°C



100Å

## Acidic Molecules



Independently Tested at The University of Aberdeen, UK

### Summary:

Testing with acidic molecules shows similar trends to those seen with basic molecules. Smaller particle size, highly inert "base deactivated" phases are again seen to offer improved separations.

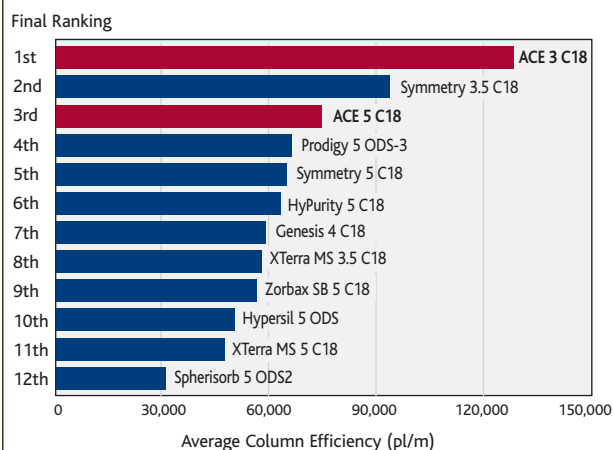
Column Dimensions: 150 x 4.6mm id  
 Sample: 1) Uracil 2) 4-Hydroxybenzoic acid  
 3) Acetylsalicylic acid 4) Benzoic acid  
 5) 2-Hydroxybenzoic acid 6) Ethyl paraben  
 Mobile Phase: 35:65 MeCN/0.1% TFA in H<sub>2</sub>O  
 Flow Rate: 1.0 ml/min  
 Temperature: 22°C

## Final Ranking

The results from all three tests have been analysed and compared. As an aid to column comparison, a final ranking has been determined by averaging the column performance on each test (see Table below). This average ranking of column performance is illustrated by Figure 13.

COLUMN TYPE	COLUMN EFFICIENCY (pl/m)			
	NEUTRAL	BASIC	ACIDIC	AVERAGE
ACE 3 C18	163,500	89,100	139,600	130,700
Symmetry 3.5 C18	123,800	59,200	98,700	93,900
ACE 5 C18	91,100	50,400	78,100	73,200
Prodigy 5 ODS-3	80,600	46,900	72,500	66,700
Symmetry 5 C18	88,300	34,200	68,500	63,700
HyPurity 5 C18	74,800	43,200	68,400	62,100
Genesis 4 C18	81,800	21,200	74,600	59,200
XTerra MS 3.5 C18	60,600	28,600	81,900	57,000
Zorbax SB 5 C18	78,500	19,700	71,200	56,500
Hypersil 5 ODS	87,000	0	63,300	50,100
XTerra MS 5 C18	53,200	27,500	60,800	47,200
Spherisorb 5 ODS2	84,800	0	10,600	31,800

Figure 13 - Final Ranking



## Conclusion:

Significant differences in efficiency, peak shape and selectivity are seen with C18 bonded columns when evaluating acidic and basic compounds. These variations are caused by undesirable secondary silanol interactions.

The selection of a high efficiency base deactivated phase with very low silanol activity will prove highly beneficial for the majority of analyses.

ACE C18 materials were the highest performing 3µm and 5µm phases respectively. Superior column efficiency and peak shape are combined to provide excellent separations with acidic, basic and neutral molecules.



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

# ACE 100Å HPLC Columns - Part Numbers

## ACE 3µm Columns

### ACE 3µm C18

COLUMN DIAMETER	COLUMN LENGTH									GUARD CARTRIDGE
	20 mm	30 mm	35 mm	50 mm	75 mm	100 mm	125 mm	150 mm	250 mm	
1.0mm	ACE-111-0201	ACE-111-0301	ACE-111-3501	ACE-111-0501	ACE-111-7501	ACE-111-1001	ACE-111-1201	ACE-111-1501	-	ACE-111-0101GD <sup>1</sup>
2.1mm	ACE-111-0202	ACE-111-0302	ACE-111-3502	ACE-111-0502	ACE-111-7502	ACE-111-1002	ACE-111-1202	ACE-111-1502	-	ACE-111-0102GD <sup>1</sup>
3.0mm	ACE-111-0203	ACE-111-0303	ACE-111-3503	ACE-111-0503	ACE-111-7503	ACE-111-1003	ACE-111-1203	ACE-111-1503	-	ACE-111-0103GD <sup>2</sup>
4.0mm	-	-	ACE-111-3504	ACE-111-0504	ACE-111-7504	ACE-111-1004	ACE-111-1204	ACE-111-1504	-	ACE-111-0103GD <sup>2</sup>
4.6mm	ACE-111-0246	ACE-111-0346	ACE-111-3546	ACE-111-0546	ACE-111-7546	ACE-111-1046	ACE-111-1246	ACE-111-1546	-	ACE-111-0103GD <sup>2</sup>

### ACE 3µm C8

COLUMN DIAMETER	COLUMN LENGTH									GUARD CARTRIDGE
	20 mm	30 mm	35 mm	50 mm	75 mm	100 mm	125 mm	150 mm	250 mm	
1.0mm	ACE-112-0201	ACE-112-0301	ACE-112-3501	ACE-112-0501	ACE-112-7501	ACE-112-1001	ACE-112-1201	ACE-112-1501	-	ACE-112-0101GD <sup>1</sup>
2.1mm	ACE-112-0202	ACE-112-0302	ACE-112-3502	ACE-112-0502	ACE-112-7502	ACE-112-1002	ACE-112-1202	ACE-112-1502	-	ACE-112-0102GD <sup>1</sup>
3.0mm	ACE-112-0203	ACE-112-0303	ACE-112-3503	ACE-112-0503	ACE-112-7503	ACE-112-1003	ACE-112-1203	ACE-112-1503	-	ACE-112-0103GD <sup>2</sup>
4.0mm	-	-	ACE-112-3504	ACE-112-0504	ACE-112-7504	ACE-112-1004	ACE-112-1204	ACE-112-1504	-	ACE-112-0103GD <sup>2</sup>
4.6mm	ACE-112-0246	ACE-112-0346	ACE-112-3546	ACE-112-0546	ACE-112-7546	ACE-112-1046	ACE-112-1246	ACE-112-1546	-	ACE-112-0103GD <sup>2</sup>

### ACE 3µm C4

COLUMN DIAMETER	COLUMN LENGTH									GUARD CARTRIDGE
	20 mm	30 mm	35 mm	50 mm	75 mm	100 mm	125 mm	150 mm	250 mm	
1.0mm	ACE-113-0201	ACE-113-0301	ACE-113-3501	ACE-113-0501	ACE-113-7501	ACE-113-1001	ACE-113-1201	ACE-113-1501	-	ACE-113-0101GD <sup>1</sup>
2.1mm	ACE-113-0202	ACE-113-0302	ACE-113-3502	ACE-113-0502	ACE-113-7502	ACE-113-1002	ACE-113-1202	ACE-113-1502	-	ACE-113-0102GD <sup>1</sup>
3.0mm	ACE-113-0203	ACE-113-0303	ACE-113-3503	ACE-113-0503	ACE-113-7503	ACE-113-1003	ACE-113-1203	ACE-113-1503	-	ACE-113-0103GD <sup>2</sup>
4.0mm	-	-	ACE-113-3504	ACE-113-0504	ACE-113-7504	ACE-113-1004	ACE-113-1204	ACE-113-1504	-	ACE-113-0103GD <sup>2</sup>
4.6mm	ACE-113-0246	ACE-113-0346	ACE-113-3546	ACE-113-0546	ACE-113-7546	ACE-113-1046	ACE-113-1246	ACE-113-1546	-	ACE-113-0103GD <sup>2</sup>

### ACE 3µm CN

COLUMN DIAMETER	COLUMN LENGTH									GUARD CARTRIDGE
	20 mm	30 mm	35 mm	50 mm	75 mm	100 mm	125 mm	150 mm	250 mm	
1.0mm	ACE-114-0201	ACE-114-0301	ACE-114-3501	ACE-114-0501	ACE-114-7501	ACE-114-1001	ACE-114-1201	ACE-114-1501	-	ACE-114-0101GD <sup>1</sup>
2.1mm	ACE-114-0202	ACE-114-0302	ACE-114-3502	ACE-114-0502	ACE-114-7502	ACE-114-1002	ACE-114-1202	ACE-114-1502	-	ACE-114-0102GD <sup>1</sup>
3.0mm	ACE-114-0203	ACE-114-0303	ACE-114-3503	ACE-114-0503	ACE-114-7503	ACE-114-1003	ACE-114-1203	ACE-114-1503	-	ACE-114-0103GD <sup>2</sup>
4.0mm	-	-	ACE-114-3504	ACE-114-0504	ACE-114-7504	ACE-114-1004	ACE-114-1204	ACE-114-1504	-	ACE-114-0103GD <sup>2</sup>
4.6mm	ACE-114-0246	ACE-114-0346	ACE-114-3546	ACE-114-0546	ACE-114-7546	ACE-114-1046	ACE-114-1246	ACE-114-1546	-	ACE-114-0103GD <sup>2</sup>

### ACE 3µm Phenyl

COLUMN DIAMETER	COLUMN LENGTH									GUARD CARTRIDGE
	20 mm	30 mm	35 mm	50 mm	75 mm	100 mm	125 mm	150 mm	250 mm	
1.0mm	ACE-115-0201	ACE-115-0301	ACE-115-3501	ACE-115-0501	ACE-115-7501	ACE-115-1001	ACE-115-1201	ACE-115-1501	-	ACE-115-0101GD <sup>1</sup>
2.1mm	ACE-115-0202	ACE-115-0302	ACE-115-3502	ACE-115-0502	ACE-115-7502	ACE-115-1002	ACE-115-1202	ACE-115-1502	-	ACE-115-0102GD <sup>1</sup>
3.0mm	ACE-115-0203	ACE-115-0303	ACE-115-3503	ACE-115-0503	ACE-115-7503	ACE-115-1003	ACE-115-1203	ACE-115-1503	-	ACE-115-0103GD <sup>2</sup>
4.0mm	-	-	ACE-115-3504	ACE-115-0504	ACE-115-7504	ACE-115-1004	ACE-115-1204	ACE-115-1504	-	ACE-115-0103GD <sup>2</sup>
4.6mm	ACE-115-0246	ACE-115-0346	ACE-115-3546	ACE-115-0546	ACE-115-7546	ACE-115-1046	ACE-115-1246	ACE-115-1546	-	ACE-115-0103GD <sup>2</sup>

### ACE 3µm AQ

COLUMN DIAMETER	COLUMN LENGTH									GUARD CARTRIDGE
	20 mm	30 mm	35 mm	50 mm	75 mm	100 mm	125 mm	150 mm	250 mm	
1.0mm	ACE-116-0201	ACE-116-0301	ACE-116-3501	ACE-116-0501	ACE-116-7501	ACE-116-1001	ACE-116-1201	ACE-116-1501	-	ACE-116-0101GD <sup>1</sup>
2.1mm	ACE-116-0202	ACE-116-0302	ACE-116-3502	ACE-116-0502	ACE-116-7502	ACE-116-1002	ACE-116-1202	ACE-116-1502	-	ACE-116-0102GD <sup>1</sup>
3.0mm	ACE-116-0203	ACE-116-0303	ACE-116-3503	ACE-116-0503	ACE-116-7503	ACE-116-1003	ACE-116-1203	ACE-116-1503	-	ACE-116-0103GD <sup>2</sup>
4.0mm	-	-	ACE-116-3504	ACE-116-0504	ACE-116-7504	ACE-116-1004	ACE-116-1204	ACE-116-1504	-	ACE-116-0103GD <sup>2</sup>
4.6mm	ACE-116-0246	ACE-116-0346	ACE-116-3546	ACE-116-0546	ACE-116-7546	ACE-116-1046	ACE-116-1246	ACE-116-1546	-	ACE-116-0103GD <sup>2</sup>

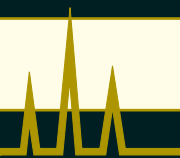
### ACE 3µm C18-HL

COLUMN DIAMETER	COLUMN LENGTH									GUARD CARTRIDGE
	20 mm	30 mm	35 mm	50 mm	75 mm	100 mm	125 mm	150 mm	250 mm	
1.0mm	ACE-311-0201	ACE-311-0301	ACE-311-3501	ACE-311-0501	ACE-311-7501	ACE-311-1001	ACE-311-1201	ACE-311-1501	-	ACE-311-0101GD <sup>1</sup>
2.1mm	ACE-311-0202	ACE-311-0302	ACE-311-3502	ACE-311-0502	ACE-311-7502	ACE-311-1002	ACE-311-1202	ACE-311-1502	-	ACE-311-0102GD <sup>1</sup>
3.0mm	ACE-311-0203	ACE-311-0303	ACE-311-3503	ACE-311-0503	ACE-311-7503	ACE-311-1003	ACE-311-1203	ACE-311-1503	-	ACE-311-0103GD <sup>2</sup>
4.0mm	-	-	ACE-311-3504	ACE-311-0504	ACE-311-7504	ACE-311-1004	ACE-311-1204	ACE-311-1504	-	ACE-311-0103GD <sup>2</sup>
4.6mm	ACE-311-0246	ACE-311-0346	ACE-311-3546	ACE-311-0546	ACE-311-7546	ACE-311-1046	ACE-311-1246	ACE-311-1546	-	ACE-311-0103GD <sup>2</sup>

<sup>1</sup> 5 pack - use with integral microbore cartridge holder H0004

<sup>2</sup> 5 pack - use with integral analytical cartridge holder H0005

# ACE 100Å HPLC Columns - Part Numbers



## ACE 5µm Columns

### ACE 5µm C18

COLUMN DIAMETER	COLUMN LENGTH									GUARD CARTRIDGE
	20 mm	30 mm	35 mm	50 mm	75 mm	100 mm	125 mm	150 mm	250 mm	
1.0mm	ACE-121-0201	ACE-121-0301	ACE-121-3501	ACE-121-0501	ACE-121-7501	ACE-121-1001	ACE-121-1201	ACE-121-1501	ACE-121-2501	ACE-121-0101GD <sup>1</sup>
2.1mm	ACE-121-0202	ACE-121-0302	ACE-121-3502	ACE-121-0502	ACE-121-7502	ACE-121-1002	ACE-121-1202	ACE-121-1502	ACE-121-2502	ACE-121-0102GD <sup>1</sup>
3.0mm	ACE-121-0203	ACE-121-0303	ACE-121-3503	ACE-121-0503	ACE-121-7503	ACE-121-1003	ACE-121-1203	ACE-121-1503	ACE-121-2503	ACE-121-0103GD <sup>2</sup>
4.0mm	-	-	ACE-121-3504	ACE-121-0504	ACE-121-7504	ACE-121-1004	ACE-121-1204	ACE-121-1504	ACE-121-2504	ACE-121-0103GD <sup>2</sup>
4.6mm	ACE-121-0246	ACE-121-0346	ACE-121-3546	ACE-121-0546	ACE-121-7546	ACE-121-1046	ACE-121-1246	ACE-121-1546	ACE-121-2546	ACE-121-0103GD <sup>2</sup>
7.75mm	-	-	-	ACE-121-0508	ACE-121-7508	ACE-121-1008	ACE-121-1208	ACE-121-1508	ACE-121-2508	ACE-121-0110GD <sup>3</sup>
10.0mm	-	-	-	ACE-121-0510	ACE-121-7510	ACE-121-1010	ACE-121-1210	ACE-121-1510	ACE-121-2510	ACE-121-0110GD <sup>3</sup>
21.2mm	-	-	-	ACE-121-0520	ACE-121-7520	ACE-121-1020	ACE-121-1220	ACE-121-1520	ACE-121-2520	ACE-121-0110GD <sup>3</sup>
30.0mm	-	-	-	ACE-121-0530	ACE-121-7530	ACE-121-1030	ACE-121-1230	ACE-121-1530	ACE-121-2530	ACE-121-0220GD <sup>4</sup>

### ACE 5µm C8

COLUMN DIAMETER	COLUMN LENGTH									GUARD CARTRIDGE
	20 mm	30 mm	35 mm	50 mm	75 mm	100 mm	125 mm	150 mm	250 mm	
1.0mm	ACE-122-0201	ACE-122-0301	ACE-122-3501	ACE-122-0501	ACE-122-7501	ACE-122-1001	ACE-122-1201	ACE-122-1501	ACE-122-2501	ACE-122-0101GD <sup>1</sup>
2.1mm	ACE-122-0202	ACE-122-0302	ACE-122-3502	ACE-122-0502	ACE-122-7502	ACE-122-1002	ACE-122-1202	ACE-122-1502	ACE-122-2502	ACE-122-0102GD <sup>1</sup>
3.0mm	ACE-122-0203	ACE-122-0303	ACE-122-3503	ACE-122-0503	ACE-122-7503	ACE-122-1003	ACE-122-1203	ACE-122-1503	ACE-122-2503	ACE-122-0103GD <sup>2</sup>
4.0mm	-	-	ACE-122-3504	ACE-122-0504	ACE-122-7504	ACE-122-1004	ACE-122-1204	ACE-122-1504	ACE-122-2504	ACE-122-0103GD <sup>2</sup>
4.6mm	ACE-122-0246	ACE-122-0346	ACE-122-3546	ACE-122-0546	ACE-122-7546	ACE-122-1046	ACE-122-1246	ACE-122-1546	ACE-122-2546	ACE-122-0103GD <sup>2</sup>
7.75mm	-	-	-	ACE-122-0508	ACE-122-7508	ACE-122-1008	ACE-122-1208	ACE-122-1508	ACE-122-2508	ACE-122-0110GD <sup>3</sup>
10.0mm	-	-	-	ACE-122-0510	ACE-122-7510	ACE-122-1010	ACE-122-1210	ACE-122-1510	ACE-122-2510	ACE-122-0110GD <sup>3</sup>
21.2mm	-	-	-	ACE-122-0520	ACE-122-7520	ACE-122-1020	ACE-122-1220	ACE-122-1520	ACE-122-2520	ACE-122-0110GD <sup>3</sup>
30.0mm	-	-	-	ACE-122-0530	ACE-122-7530	ACE-122-1030	ACE-122-1230	ACE-122-1530	ACE-122-2530	ACE-122-0220GD <sup>4</sup>

### ACE 5µm C4

COLUMN DIAMETER	COLUMN LENGTH									GUARD CARTRIDGE
	20 mm	30 mm	35 mm	50 mm	75 mm	100 mm	125 mm	150 mm	250 mm	
1.0mm	ACE-123-0201	ACE-123-0301	ACE-123-3501	ACE-123-0501	ACE-123-7501	ACE-123-1001	ACE-123-1201	ACE-123-1501	ACE-123-2501	ACE-123-0101GD <sup>1</sup>
2.1mm	ACE-123-0202	ACE-123-0302	ACE-123-3502	ACE-123-0502	ACE-123-7502	ACE-123-1002	ACE-123-1202	ACE-123-1502	ACE-123-2502	ACE-123-0102GD <sup>1</sup>
3.0mm	ACE-123-0203	ACE-123-0303	ACE-123-3503	ACE-123-0503	ACE-123-7503	ACE-123-1003	ACE-123-1203	ACE-123-1503	ACE-123-2503	ACE-123-0103GD <sup>2</sup>
4.0mm	-	-	ACE-123-3504	ACE-123-0504	ACE-123-7504	ACE-123-1004	ACE-123-1204	ACE-123-1504	ACE-123-2504	ACE-123-0103GD <sup>2</sup>
4.6mm	ACE-123-0246	ACE-123-0346	ACE-123-3546	ACE-123-0546	ACE-123-7546	ACE-123-1046	ACE-123-1246	ACE-123-1546	ACE-123-2546	ACE-123-0103GD <sup>2</sup>
7.75mm	-	-	-	ACE-123-0508	ACE-123-7508	ACE-123-1008	ACE-123-1208	ACE-123-1508	ACE-123-2508	ACE-123-0110GD <sup>3</sup>
10.0mm	-	-	-	ACE-123-0510	ACE-123-7510	ACE-123-1010	ACE-123-1210	ACE-123-1510	ACE-123-2510	ACE-123-0110GD <sup>3</sup>
21.2mm	-	-	-	ACE-123-0520	ACE-123-7520	ACE-123-1020	ACE-123-1220	ACE-123-1520	ACE-123-2520	ACE-123-0110GD <sup>3</sup>
30.0mm	-	-	-	ACE-123-0530	ACE-123-7530	ACE-123-1030	ACE-123-1230	ACE-123-1530	ACE-123-2530	ACE-123-0220GD <sup>4</sup>

### ACE 5µm CN

COLUMN DIAMETER	COLUMN LENGTH									GUARD CARTRIDGE
	20 mm	30 mm	35 mm	50 mm	75 mm	100 mm	125 mm	150 mm	250 mm	
1.0mm	ACE-124-0201	ACE-124-0301	ACE-124-3501	ACE-124-0501	ACE-124-7501	ACE-124-1001	ACE-124-1201	ACE-124-1501	ACE-124-2501	ACE-124-0101GD <sup>1</sup>
2.1mm	ACE-124-0202	ACE-124-0302	ACE-124-3502	ACE-124-0502	ACE-124-7502	ACE-124-1002	ACE-124-1202	ACE-124-1502	ACE-124-2502	ACE-124-0102GD <sup>1</sup>
3.0mm	ACE-124-0203	ACE-124-0303	ACE-124-3503	ACE-124-0503	ACE-124-7503	ACE-124-1003	ACE-124-1203	ACE-124-1503	ACE-124-2503	ACE-124-0103GD <sup>2</sup>
4.0mm	-	-	ACE-124-3504	ACE-124-0504	ACE-124-7504	ACE-124-1004	ACE-124-1204	ACE-124-1504	ACE-124-2504	ACE-124-0103GD <sup>2</sup>
4.6mm	ACE-124-0246	ACE-124-0346	ACE-124-3546	ACE-124-0546	ACE-124-7546	ACE-124-1046	ACE-124-1246	ACE-124-1546	ACE-124-2546	ACE-124-0103GD <sup>2</sup>
7.75mm	-	-	-	ACE-124-0508	ACE-124-7508	ACE-124-1008	ACE-124-1208	ACE-124-1508	ACE-124-2508	ACE-124-0110GD <sup>3</sup>
10.0mm	-	-	-	ACE-124-0510	ACE-124-7510	ACE-124-1010	ACE-124-1210	ACE-124-1510	ACE-124-2510	ACE-124-0110GD <sup>3</sup>
21.2mm	-	-	-	ACE-124-0520	ACE-124-7520	ACE-124-1020	ACE-124-1220	ACE-124-1520	ACE-124-2520	ACE-124-0110GD <sup>3</sup>
30.0mm	-	-	-	ACE-124-0530	ACE-124-7530	ACE-124-1030	ACE-124-1230	ACE-124-1530	ACE-124-2530	ACE-124-0220GD <sup>4</sup>

### ACE 5µm Phenyl

COLUMN DIAMETER	COLUMN LENGTH									GUARD CARTRIDGE
	20 mm	30 mm	35 mm	50 mm	75 mm	100 mm	125 mm	150 mm	250 mm	
1.0mm	ACE-125-0201	ACE-125-0301	ACE-125-3501	ACE-125-0501	ACE-125-7501	ACE-125-1001	ACE-125-1201	ACE-125-1501	ACE-125-2501	ACE-125-0101GD <sup>1</sup>
2.1mm	ACE-125-0202	ACE-125-0302	ACE-125-3502	ACE-125-0502	ACE-125-7502	ACE-125-1002	ACE-125-1202	ACE-125-1502	ACE-125-2502	ACE-125-0102GD <sup>1</sup>
3.0mm	ACE-125-0203	ACE-125-0303	ACE-125-3503	ACE-125-0503	ACE-125-7503	ACE-125-1003	ACE-125-1203	ACE-125-1503	ACE-125-2503	ACE-125-0103GD <sup>2</sup>
4.0mm	-	-	ACE-125-3504	ACE-125-0504	ACE-125-7504	ACE-125-1004	ACE-125-1204	ACE-125-1504	ACE-125-2504	ACE-125-0103GD <sup>2</sup>
4.6mm	ACE-125-0246	ACE-125-0346	ACE-125-3546	ACE-125-0546	ACE-125-7546	ACE-125-1046	ACE-125-1246	ACE-125-1546	ACE-125-2546	ACE-125-0103GD <sup>2</sup>
7.75mm	-	-	-	ACE-125-0508	ACE-125-7508	ACE-125-1008	ACE-125-1208	ACE-125-1508	ACE-125-2508	ACE-125-0110GD <sup>3</sup>
10.0mm	-	-	-	ACE-125-0510	ACE-125-7510	ACE-125-1010	ACE-125-1210	ACE-125-1510	ACE-125-2510	ACE-125-0110GD <sup>3</sup>
21.2mm	-	-	-	ACE-125-0520	ACE-125-7520	ACE-125-1020	ACE-125-1220	ACE-125-1520	ACE-125-2520	ACE-125-0110GD <sup>3</sup>
30.0mm	-	-	-	ACE-125-0530	ACE-125-7530	ACE-125-1030	ACE-125-1230	ACE-125-1530	ACE-125-2530	ACE-125-0220GD <sup>4</sup>

<sup>1</sup> 5 pack - use with integral microbore cartridge holder H0004

<sup>2</sup> 5 pack - use with integral analytical cartridge holder H0005

<sup>3</sup> 3 pack - use with semi-prep cartridge holder H0002 and column coupler C0001

<sup>4</sup> 1 pack - use with prep cartridge holder H0006 and column coupler C0002

## ACE 5µm Columns - continued

### ACE 5µm AQ

COLUMN DIAMETER	COLUMN LENGTH									GUARD CARTRIDGE
	20 mm	30 mm	35 mm	50 mm	75 mm	100 mm	125 mm	150 mm	250 mm	
1.0mm	ACE-126-0201	ACE-126-0301	ACE-126-3501	ACE-126-0501	ACE-126-7501	ACE-126-1001	ACE-126-1201	ACE-126-1501	ACE-126-2501	ACE-126-0101GD <sup>1</sup>
2.1mm	ACE-126-0202	ACE-126-0302	ACE-126-3502	ACE-126-0502	ACE-126-7502	ACE-126-1002	ACE-126-1202	ACE-126-1502	ACE-126-2502	ACE-126-0102GD <sup>1</sup>
3.0mm	ACE-126-0203	ACE-126-0303	ACE-126-3503	ACE-126-0503	ACE-126-7503	ACE-126-1003	ACE-126-1203	ACE-126-1503	ACE-126-2503	ACE-126-0103GD <sup>2</sup>
4.0mm	-	-	ACE-126-3504	ACE-126-0504	ACE-126-7504	ACE-126-1004	ACE-126-1204	ACE-126-1504	ACE-126-2504	ACE-126-0103GD <sup>2</sup>
4.6mm	ACE-126-0246	ACE-126-0346	ACE-126-3546	ACE-126-0546	ACE-126-7546	ACE-126-1046	ACE-126-1246	ACE-126-1546	ACE-126-2546	ACE-126-0103GD <sup>2</sup>
7.75mm	-	-	-	ACE-126-0508	ACE-126-7508	ACE-126-1008	ACE-126-1208	ACE-126-1508	ACE-126-2508	ACE-126-0110GD <sup>3</sup>
10.0mm	-	-	-	ACE-126-0510	ACE-126-7510	ACE-126-1010	ACE-126-1210	ACE-126-1510	ACE-126-2510	ACE-126-0110GD <sup>3</sup>
21.2mm	-	-	-	ACE-126-0520	ACE-126-7520	ACE-126-1020	ACE-126-1220	ACE-126-1520	ACE-126-2520	ACE-126-0110GD <sup>3</sup>
30.0mm	-	-	-	ACE-126-0530	ACE-126-7530	ACE-126-1030	ACE-126-1230	ACE-126-1530	ACE-126-2530	ACE-126-0220GD <sup>4</sup>

### ACE 5µm C18-HL

COLUMN DIAMETER	COLUMN LENGTH									GUARD CARTRIDGE
	20 mm	30 mm	35 mm	50 mm	75 mm	100 mm	125 mm	150 mm	250 mm	
1.0mm	ACE-321-0201	ACE-321-0301	ACE-321-3501	ACE-321-0501	ACE-321-7501	ACE-321-1001	ACE-321-1201	ACE-321-1501	ACE-321-2501	ACE-321-0101GD <sup>1</sup>
2.1mm	ACE-321-0202	ACE-321-0302	ACE-321-3502	ACE-321-0502	ACE-321-7502	ACE-321-1002	ACE-321-1202	ACE-321-1502	ACE-321-2502	ACE-321-0102GD <sup>1</sup>
3.0mm	ACE-321-0203	ACE-321-0303	ACE-321-3503	ACE-321-0503	ACE-321-7503	ACE-321-1003	ACE-321-1203	ACE-321-1503	ACE-321-2503	ACE-321-0103GD <sup>2</sup>
4.0mm	-	-	ACE-321-3504	ACE-321-0504	ACE-321-7504	ACE-321-1004	ACE-321-1204	ACE-321-1504	ACE-321-2504	ACE-321-0103GD <sup>2</sup>
4.6mm	ACE-321-0246	ACE-321-0346	ACE-321-3546	ACE-321-0546	ACE-321-7546	ACE-321-1046	ACE-321-1246	ACE-321-1546	ACE-321-2546	ACE-321-0103GD <sup>2</sup>
7.75mm	-	-	-	ACE-321-0508	ACE-321-7508	ACE-321-1008	ACE-321-1208	ACE-321-1508	ACE-321-2508	ACE-321-0110GD <sup>3</sup>
10.0mm	-	-	-	ACE-321-0510	ACE-321-7510	ACE-321-1010	ACE-321-1210	ACE-321-1510	ACE-321-2510	ACE-321-0110GD <sup>3</sup>
21.2mm	-	-	-	ACE-321-0520	ACE-321-7520	ACE-321-1020	ACE-321-1220	ACE-321-1520	ACE-321-2520	ACE-321-0110GD <sup>3</sup>
30.0mm	-	-	-	ACE-321-0530	ACE-321-7530	ACE-321-1030	ACE-321-1230	ACE-321-1530	ACE-321-2530	ACE-321-0220GD <sup>4</sup>

## ACE 10µm Columns

### ACE 10µm C18

COLUMN DIAMETER	COLUMN LENGTH									GUARD CARTRIDGE
	20 mm	30 mm	35 mm	50 mm	75 mm	100 mm	125 mm	150 mm	250 mm	
4.6mm	ACE-131-0246	ACE-131-0346	ACE-131-3546	ACE-131-0546	ACE-131-7546	ACE-131-1046	ACE-131-1246	ACE-131-1546	ACE-131-2546	ACE-131-0103GD <sup>2</sup>
7.75mm	-	-	-	ACE-131-0508	ACE-131-7508	ACE-131-1008	ACE-131-1208	ACE-131-1508	ACE-131-2508	ACE-131-0110GD <sup>3</sup>
10.0mm	-	-	-	ACE-131-0510	ACE-131-7510	ACE-131-1010	ACE-131-1210	ACE-131-1510	ACE-131-2510	ACE-131-0110GD <sup>3</sup>
21.2mm	-	-	-	ACE-131-0520	ACE-131-7520	ACE-131-1020	ACE-131-1220	ACE-131-1520	ACE-131-2520	ACE-131-0110GD <sup>3</sup>
30.0mm	-	-	-	ACE-131-0530	ACE-131-7530	ACE-131-1030	ACE-131-1230	ACE-131-1530	ACE-131-2530	ACE-131-0220GD <sup>4</sup>
50.0mm	-	-	-	enquire	enquire	enquire	enquire	enquire	enquire	enquire

### ACE 10µm C8

COLUMN DIAMETER	COLUMN LENGTH									GUARD CARTRIDGE
	20 mm	30 mm	35 mm	50 mm	75 mm	100 mm	125 mm	150 mm	250 mm	
4.6mm	ACE-132-0246	ACE-132-0346	ACE-132-3546	ACE-132-0546	ACE-132-7546	ACE-132-1046	ACE-132-1246	ACE-132-1546	ACE-132-2546	ACE-132-0103GD <sup>2</sup>
7.75mm	-	-	-	ACE-132-0508	ACE-132-7508	ACE-132-1008	ACE-132-1208	ACE-132-1508	ACE-132-2508	ACE-132-0110GD <sup>3</sup>
10.0mm	-	-	-	ACE-132-0510	ACE-132-7510	ACE-132-1010	ACE-132-1210	ACE-132-1510	ACE-132-2510	ACE-132-0110GD <sup>3</sup>
21.2mm	-	-	-	ACE-132-0520	ACE-132-7520	ACE-132-1020	ACE-132-1220	ACE-132-1520	ACE-132-2520	ACE-132-0110GD <sup>3</sup>
30.0mm	-	-	-	ACE-132-0530	ACE-132-7530	ACE-132-1030	ACE-132-1230	ACE-132-1530	ACE-132-2530	ACE-132-0220GD <sup>4</sup>
50.0mm	-	-	-	enquire	enquire	enquire	enquire	enquire	enquire	enquire

### ACE 10µm C4

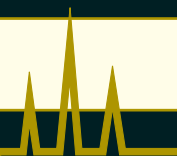
COLUMN DIAMETER	COLUMN LENGTH									GUARD CARTRIDGE
	20 mm	30 mm	35 mm	50 mm	75 mm	100 mm	125 mm	150 mm	250 mm	
4.6mm	ACE-133-0246	ACE-133-0346	ACE-133-3546	ACE-133-0546	ACE-133-7546	ACE-133-1046	ACE-133-1246	ACE-133-1546	ACE-133-2546	ACE-133-0103GD <sup>2</sup>
7.75mm	-	-	-	ACE-133-0508	ACE-133-7508	ACE-133-1008	ACE-133-1208	ACE-133-1508	ACE-133-2508	ACE-133-0110GD <sup>3</sup>
10.0mm	-	-	-	ACE-133-0510	ACE-133-7510	ACE-133-1010	ACE-133-1210	ACE-133-1510	ACE-133-2510	ACE-133-0110GD <sup>3</sup>
21.2mm	-	-	-	ACE-133-0520	ACE-133-7520	ACE-133-1020	ACE-133-1220	ACE-133-1520	ACE-133-2520	ACE-133-0110GD <sup>3</sup>
30.0mm	-	-	-	ACE-133-0530	ACE-133-7530	ACE-133-1030	ACE-133-1230	ACE-133-1530	ACE-133-2530	ACE-133-0220GD <sup>4</sup>
50.0mm	-	-	-	enquire	enquire	enquire	enquire	enquire	enquire	enquire

<sup>1</sup> 5 pack - use with integral microbore cartridge holder H0004

<sup>2</sup> 5 pack - use with integral analytical cartridge holder H0005

<sup>3</sup> 3 pack - use with semi-prep cartridge holder H0002 and column coupler C0001

<sup>4</sup> 1 pack - use with prep cartridge holder H0006 and column coupler C0002



## ACE 10µm Columns - continued

### ACE 10µm CN

COLUMN DIAMETER	COLUMN LENGTH									GUARD CARTRIDGE
	20 mm	30 mm	35 mm	50 mm	75 mm	100 mm	125 mm	150 mm	250 mm	
4.6mm	ACE-134-0246	ACE-134-0346	ACE-134-3546	ACE-134-0546	ACE-134-7546	ACE-134-1046	ACE-134-1246	ACE-134-1546	ACE-134-2546	ACE-134-0103GD <sup>2</sup>
7.75mm	-	-	-	ACE-134-0508	ACE-134-7508	ACE-134-1008	ACE-134-1208	ACE-134-1508	ACE-134-2508	ACE-134-0110GD <sup>3</sup>
10.0mm	-	-	-	ACE-134-0510	ACE-134-7510	ACE-134-1010	ACE-134-1210	ACE-134-1510	ACE-134-2510	ACE-134-0110GD <sup>3</sup>
21.2mm	-	-	-	ACE-134-0520	ACE-134-7520	ACE-134-1020	ACE-134-1220	ACE-134-1520	ACE-134-2520	ACE-134-0110GD <sup>3</sup>
30.0mm	-	-	-	ACE-134-0530	ACE-134-7530	ACE-134-1030	ACE-134-1230	ACE-134-1530	ACE-134-2530	ACE-134-0220GD <sup>4</sup>
50.0mm	-	-	-	enquire	enquire	enquire	enquire	enquire	enquire	enquire

### ACE 10µm Phenyl

COLUMN DIAMETER	COLUMN LENGTH									GUARD CARTRIDGE
	20 mm	30 mm	35 mm	50 mm	75 mm	100 mm	125 mm	150 mm	250 mm	
4.6mm	ACE-135-0246	ACE-135-0346	ACE-135-3546	ACE-135-0546	ACE-135-7546	ACE-135-1046	ACE-135-1246	ACE-135-1546	ACE-135-2546	ACE-135-0103GD <sup>2</sup>
7.75mm	-	-	-	ACE-135-0508	ACE-135-7508	ACE-135-1008	ACE-135-1208	ACE-135-1508	ACE-135-2508	ACE-135-0110GD <sup>3</sup>
10.0mm	-	-	-	ACE-135-0510	ACE-135-7510	ACE-135-1010	ACE-135-1210	ACE-135-1510	ACE-135-2510	ACE-135-0110GD <sup>3</sup>
21.2mm	-	-	-	ACE-135-0520	ACE-135-7520	ACE-135-1020	ACE-135-1220	ACE-135-1520	ACE-135-2520	ACE-135-0110GD <sup>3</sup>
30.0mm	-	-	-	ACE-135-0530	ACE-135-7530	ACE-135-1030	ACE-135-1230	ACE-135-1530	ACE-135-2530	ACE-135-0220GD <sup>4</sup>
50.0mm	-	-	-	enquire	enquire	enquire	enquire	enquire	enquire	enquire

### ACE 10µm AQ

COLUMN DIAMETER	COLUMN LENGTH									GUARD CARTRIDGE
	20 mm	30 mm	35 mm	50 mm	75 mm	100 mm	125 mm	150 mm	250 mm	
4.6mm	ACE-136-0246	ACE-136-0346	ACE-136-3546	ACE-136-0546	ACE-136-7546	ACE-136-1046	ACE-136-1246	ACE-136-1546	ACE-136-2546	ACE-136-0103GD <sup>2</sup>
7.75mm	-	-	-	ACE-136-0508	ACE-136-7508	ACE-136-1008	ACE-136-1208	ACE-136-1508	ACE-136-2508	ACE-136-0110GD <sup>3</sup>
10.0mm	-	-	-	ACE-136-0510	ACE-136-7510	ACE-136-1010	ACE-136-1210	ACE-136-1510	ACE-136-2510	ACE-136-0110GD <sup>3</sup>
21.2mm	-	-	-	ACE-136-0520	ACE-136-7520	ACE-136-1020	ACE-136-1220	ACE-136-1520	ACE-136-2520	ACE-136-0110GD <sup>3</sup>
30.0mm	-	-	-	ACE-136-0530	ACE-136-7530	ACE-136-1030	ACE-136-1230	ACE-136-1530	ACE-136-2530	ACE-136-0220GD <sup>4</sup>
50.0mm	-	-	-	enquire	enquire	enquire	enquire	enquire	enquire	enquire

### ACE 10µm C18-HL

COLUMN DIAMETER	COLUMN LENGTH									GUARD CARTRIDGE
	20 mm	30 mm	35 mm	50 mm	75 mm	100 mm	125 mm	150 mm	250 mm	
4.6mm	ACE-331-0246	ACE-331-0346	ACE-331-3546	ACE-331-0546	ACE-331-7546	ACE-331-1046	ACE-331-1246	ACE-331-1546	ACE-331-2546	ACE-331-0103GD <sup>2</sup>
7.75mm	-	-	-	ACE-331-0508	ACE-331-7508	ACE-331-1008	ACE-331-1208	ACE-331-1508	ACE-331-2508	ACE-331-0110GD <sup>3</sup>
10.0mm	-	-	-	ACE-331-0510	ACE-331-7510	ACE-331-1010	ACE-331-1210	ACE-331-1510	ACE-331-2510	ACE-331-0110GD <sup>3</sup>
21.2mm	-	-	-	ACE-331-0520	ACE-331-7520	ACE-331-1020	ACE-331-1220	ACE-331-1520	ACE-331-2520	ACE-331-0110GD <sup>3</sup>
30.0mm	-	-	-	ACE-331-0530	ACE-331-7530	ACE-331-1030	ACE-331-1230	ACE-331-1530	ACE-331-2530	ACE-331-0220GD <sup>4</sup>
50.0mm	-	-	-	enquire	enquire	enquire	enquire	enquire	enquire	enquire

## ACE 15µm Columns

### ACE 15µm C18-HL

COLUMN DIAMETER	COLUMN LENGTH									GUARD CARTRIDGE
	20 mm	30 mm	35 mm	50 mm	75 mm	100 mm	125 mm	150 mm	250 mm	
4.6mm	ACE-341-0246	ACE-341-0346	ACE-341-3546	ACE-341-0546	ACE-341-7546	ACE-341-1046	ACE-341-1246	ACE-341-1546	ACE-341-2546	ACE-341-0103GD <sup>2</sup>
7.75mm	-	-	-	ACE-341-0508	ACE-341-7508	ACE-341-1008	ACE-341-1208	ACE-341-1508	ACE-341-2508	ACE-341-0110GD <sup>3</sup>
10.0mm	-	-	-	ACE-341-0510	ACE-341-7510	ACE-341-1010	ACE-341-1210	ACE-341-1510	ACE-341-2510	ACE-341-0110GD <sup>3</sup>
21.2mm	-	-	-	ACE-341-0520	ACE-341-7520	ACE-341-1020	ACE-341-1220	ACE-341-1520	ACE-341-2520	ACE-341-0110GD <sup>3</sup>
30.0mm	-	-	-	ACE-341-0530	ACE-341-7530	ACE-341-1030	ACE-341-1230	ACE-341-1530	ACE-341-2530	ACE-341-0220GD <sup>4</sup>
50.0mm	-	-	-	enquire	enquire	enquire	enquire	enquire	enquire	enquire

<sup>2</sup> 5 pack - use with integral analytical cartridge holder H0005

<sup>3</sup> 3 pack - use with semi-prep cartridge holder H0002 and column coupler C0001

<sup>4</sup> 1 pack - use with prep cartridge holder H0006 and column coupler C0002

## ACE 300Å Columns for Biotechnology

- 300Å ultra high purity silica
- Ultimate protein and peptide application column
- C18, C8, C4, CN and Phenyl chemistries
- 3µm, 5µm and 10µm particle sizes
- Unmatched reproducibility
- Exceptional chemical stability

Excellent peak shape and reproducibility have established ACE HPLC columns as the finest available. This quality is now available for protein chemists desiring the utmost in performance and reproducibility for the separation of peptides, proteins and other high molecular weight biomolecules.

ACE 300Å columns are available in an extensive range of dimensions and particle sizes for use in micro-scale separations, LC/MS analyses, high speed preparative analyses up to process scale.

PHASE	FUNCTIONAL GROUP	ENDCAPPED	PARTICLE SIZE (µm)	PORE SIZE (Å)	SURFACE AREA (m <sup>2</sup> /g)	CARBON LOAD (%)
C18-300	Octadecyl	Yes	3, 5, 10	300	100	9.0
C8-300	Octyl	Yes	3, 5, 10	300	100	5.0
C4-300	Butyl	Yes	3, 5, 10	300	100	2.6
CN-300	Cyano	Yes	3, 5, 10	300	100	2.6
Ph-300	Phenyl	Yes	3, 5, 10	300	100	5.3

## ACE 300Å Columns for Peptide and Protein Analyses

Chromatographers prefer inert stationary phases for the reversed-phase HPLC of ionic compounds because they minimize the negative effect of silanols on the separation. This results in improved peak shape and reproducibility when separating compounds that contain polar functional groups, especially amines.

A new generation of ultra-inert stationary phases, with extremely low silanol activity, has made it possible to achieve even better peak shape and reproducibility when separating these types of compounds.

Scientists working with small molecules have been rapidly adopting this new technology and the recent introduction of wide-pore (300Å) ultra-inert phases makes the benefits of this technology available to those wanting to separate peptides and proteins by reversed-phase HPLC (see Figures 18a and 18b).

Figure 18a. Proteins

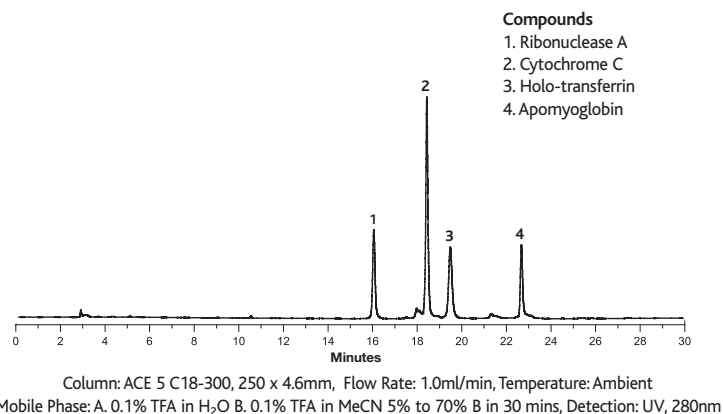
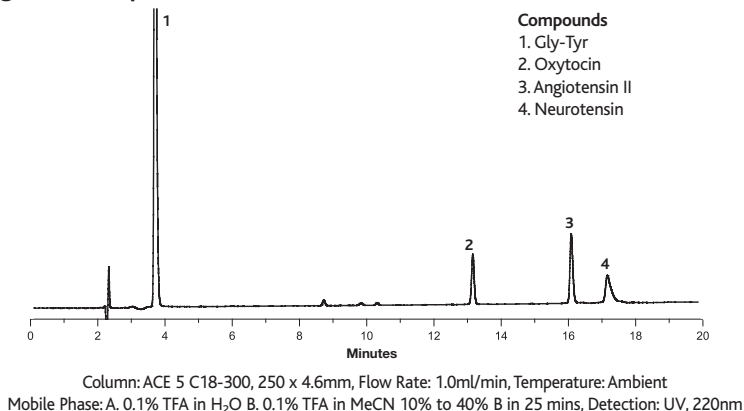
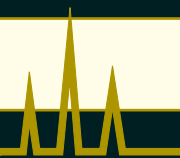


Figure 18b. Peptides





## Comparison of Leading 300Å 5µm C18 Columns

- Leading 300Å 5µm, C18 Column Brands
- Neutral molecule test for packing integrity
- 2 basic molecule tests for silica inertness
- Peak efficiency and asymmetry comparison

In order to demonstrate the benefits of ultra-inert phases in biomolecule analysis, several commercially available 300Å pore size reversed-phase columns were tested using three different samples: neutral molecules to measure efficiency, pyridine/phenol to measure silanol activity and antidepressants to measure both silanol activity and

metal content. These are the same test procedures typically used to evaluate standard pore size columns (eg 100Å) used for the analysis of small molecules in the chemical and pharmaceutical industries. Columns were ranked by efficiency, N, measured at 10% peak height. In addition to measuring overall efficiency, this value also takes into consideration peak tailing usually caused by silanol interactions. The table below summarises the performance of various columns as determined by each test along with an overall ranking based on a combination of all three tests.

## Results

Efficiency Measurements (N) For Leading 300Å (5µm, C18, 250 x 4.6mm) HPLC Columns

	TEST I	TEST II	TEST III	AVERAGE	
ACE C18-300	23,400	14,400	14,000	17,300	Test I: neutral molecule - toluene 80:20 MeOH/H <sub>2</sub> O, 1.0ml/min
Jupiter C18	19,700	12,400	12,400	14,800	Test II: basic molecule 1- pyridine 60:40 MeOH/H <sub>2</sub> O, 1.0ml/min
Zorbax 300SB-C18	18,900	14,400	6,600	13,300	Test III: basic molecule 2 - amitriptyline 80:20 MeOH/25mM KH <sub>2</sub> PO <sub>4</sub> (pH 6.0), 1.0ml/min
Symmetry 300 C18	17,500	9,000	6,700	11,000	
Nucleosil 300 C18	20,300	6,700	400	9,100	
Vydac Everest C18	20,000	5,900	800	8,900	
Vydac 218MS	14,600	1,300	1,400	5,800	
Vydac 218TP	14,200	1,700	800	5,600	

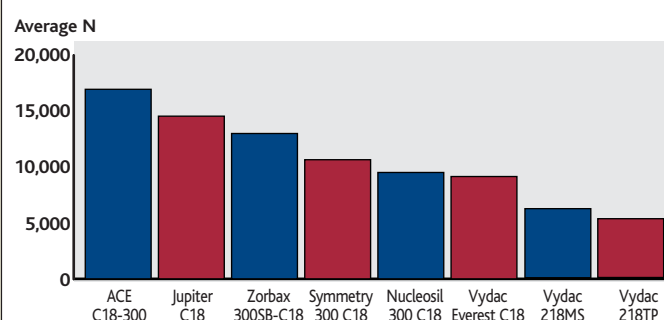
Column efficiency, as measured in Test I, is a reflection of how well a column is packed, as well as particle size and particle size distribution. Although many columns performed similarly in this test, those with lower plate counts reflect poorer physical characteristics of the silica particle. In Test II, efficiencies for pyridine are a good measure of active silanols on the silica surface. Active silanols account for most peak tailing and adsorptive losses of proteins. Since silanol activity is very hard to control in silica manufacture, columns exhibiting

low silanol activity are most likely to give consistent results column-to-column and batch-to-batch. In addition, polar and basic compounds will have better peak shapes and hence greater sensitivity on columns with low silanol activity. Since most biomolecules are polar and many are basic, columns with low silanol activity are desirable. In Test III, N values for tricyclic antidepressants measure metal content in addition to active silanol activity. Amitriptyline, chromatographed at neutral pH, is a standard test for measuring silica quality.

## Conclusion

The overall ranking of the 300Å columns shown in Figure 19 reflects their performance based on how well they are packed and also the silanol and metal activity of the stationary phase. Chromatographers with experience in HPLC of basic pharmaceuticals know that columns giving good results on these tests will perform best for their samples. The benefits obtained from ultra-inert stationary phases are also important in wide-pore columns designed for the analysis of biomolecules.

Figure 19. 300Å (C18) Columns Ranked by Average Efficiency



By averaging N values obtained by each column in Tests I, II and III, columns can be ranked by overall quality, reflecting packing integrity and inertness.

## ACE 3µm Columns

### ACE 3µm C18-300

COLUMN DIAMETER	COLUMN LENGTH									GUARD CARTRIDGE
	20 mm	30 mm	35 mm	50 mm	75 mm	100 mm	125 mm	150 mm	250 mm	
1.0mm	ACE-211-0201	ACE-211-0301	ACE-211-3501	ACE-211-0501	ACE-211-7501	ACE-211-1001	ACE-211-1201	ACE-211-1501	-	ACE-211-0101GD <sup>1</sup>
2.1mm	ACE-211-0202	ACE-211-0302	ACE-211-3502	ACE-211-0502	ACE-211-7502	ACE-211-1002	ACE-211-1202	ACE-211-1502	-	ACE-211-0102GD <sup>1</sup>
3.0mm	ACE-211-0203	ACE-211-0303	ACE-211-3503	ACE-211-0503	ACE-211-7503	ACE-211-1003	ACE-211-1203	ACE-211-1503	-	ACE-211-0103GD <sup>2</sup>
4.0mm	-	-	ACE-211-3504	ACE-211-0504	ACE-211-7504	ACE-211-1004	ACE-211-1204	ACE-211-1504	-	ACE-211-0103GD <sup>2</sup>
4.6mm	ACE-211-0246	ACE-211-0346	ACE-211-3546	ACE-211-0546	ACE-211-7546	ACE-211-1046	ACE-211-1246	ACE-211-1546	-	ACE-211-0103GD <sup>2</sup>

### ACE 3µm C8-300

COLUMN DIAMETER	COLUMN LENGTH									GUARD CARTRIDGE
	20 mm	30 mm	35 mm	50 mm	75 mm	100 mm	125 mm	150 mm	250 mm	
1.0mm	ACE-212-0201	ACE-212-0301	ACE-212-3501	ACE-212-0501	ACE-212-7501	ACE-212-1001	ACE-212-1201	ACE-212-1501	-	ACE-212-0101GD <sup>1</sup>
2.1mm	ACE-212-0202	ACE-212-0302	ACE-212-3502	ACE-212-0502	ACE-212-7502	ACE-212-1002	ACE-212-1202	ACE-212-1502	-	ACE-212-0102GD <sup>1</sup>
3.0mm	ACE-212-0203	ACE-212-0303	ACE-212-3503	ACE-212-0503	ACE-212-7503	ACE-212-1003	ACE-212-1203	ACE-212-1503	-	ACE-212-0103GD <sup>2</sup>
4.0mm	-	-	ACE-212-3504	ACE-212-0504	ACE-212-7504	ACE-212-1004	ACE-212-1204	ACE-212-1504	-	ACE-212-0103GD <sup>2</sup>
4.6mm	ACE-212-0246	ACE-212-0346	ACE-212-3546	ACE-212-0546	ACE-212-7546	ACE-212-1046	ACE-212-1246	ACE-212-1546	-	ACE-212-0103GD <sup>2</sup>

### ACE 3µm C4-300

COLUMN DIAMETER	COLUMN LENGTH									GUARD CARTRIDGE
	20 mm	30 mm	35 mm	50 mm	75 mm	100 mm	125 mm	150 mm	250 mm	
1.0mm	ACE-213-0201	ACE-213-0301	ACE-213-3501	ACE-213-0501	ACE-213-7501	ACE-213-1001	ACE-213-1201	ACE-213-1501	-	ACE-213-0101GD <sup>1</sup>
2.1mm	ACE-213-0202	ACE-213-0302	ACE-213-3502	ACE-213-0502	ACE-213-7502	ACE-213-1002	ACE-213-1202	ACE-213-1502	-	ACE-213-0102GD <sup>1</sup>
3.0mm	ACE-213-0203	ACE-213-0303	ACE-213-3503	ACE-213-0503	ACE-213-7503	ACE-213-1003	ACE-213-1203	ACE-213-1503	-	ACE-213-0103GD <sup>2</sup>
4.0mm	-	-	ACE-213-3504	ACE-213-0504	ACE-213-7504	ACE-213-1004	ACE-213-1204	ACE-213-1504	-	ACE-213-0103GD <sup>2</sup>
4.6mm	ACE-213-0246	ACE-213-0346	ACE-213-3546	ACE-213-0546	ACE-213-7546	ACE-213-1046	ACE-213-1246	ACE-213-1546	-	ACE-213-0103GD <sup>2</sup>

### ACE 3µm CN-300

COLUMN DIAMETER	COLUMN LENGTH									GUARD CARTRIDGE
	20 mm	30 mm	35 mm	50 mm	75 mm	100 mm	125 mm	150 mm	250 mm	
1.0mm	ACE-214-0201	ACE-214-0301	ACE-214-3501	ACE-214-0501	ACE-214-7501	ACE-214-1001	ACE-214-1201	ACE-214-1501	-	ACE-214-0101GD <sup>1</sup>
2.1mm	ACE-214-0202	ACE-214-0302	ACE-214-3502	ACE-214-0502	ACE-214-7502	ACE-214-1002	ACE-214-1202	ACE-214-1502	-	ACE-214-0102GD <sup>1</sup>
3.0mm	ACE-214-0203	ACE-214-0303	ACE-214-3503	ACE-214-0503	ACE-214-7503	ACE-214-1003	ACE-214-1203	ACE-214-1503	-	ACE-214-0103GD <sup>2</sup>
4.0mm	-	-	ACE-214-3504	ACE-214-0504	ACE-214-7504	ACE-214-1004	ACE-214-1204	ACE-214-1504	-	ACE-214-0103GD <sup>2</sup>
4.6mm	ACE-214-0246	ACE-214-0346	ACE-214-3546	ACE-214-0546	ACE-214-7546	ACE-214-1046	ACE-214-1246	ACE-214-1546	-	ACE-214-0103GD <sup>2</sup>

### ACE 3µm Phenyl-300

COLUMN DIAMETER	COLUMN LENGTH									GUARD CARTRIDGE
	20 mm	30 mm	35 mm	50 mm	75 mm	100 mm	125 mm	150 mm	250 mm	
1.0mm	ACE-215-0201	ACE-215-0301	ACE-215-3501	ACE-215-0501	ACE-215-7501	ACE-215-1001	ACE-215-1201	ACE-215-1501	-	ACE-215-0101GD <sup>1</sup>
2.1mm	ACE-215-0202	ACE-215-0302	ACE-215-3502	ACE-215-0502	ACE-215-7502	ACE-215-1002	ACE-215-1202	ACE-215-1502	-	ACE-215-0102GD <sup>1</sup>
3.0mm	ACE-215-0203	ACE-215-0303	ACE-215-3503	ACE-215-0503	ACE-215-7503	ACE-215-1003	ACE-215-1203	ACE-215-1503	-	ACE-215-0103GD <sup>2</sup>
4.0mm	-	-	ACE-215-3504	ACE-215-0504	ACE-215-7504	ACE-215-1004	ACE-215-1204	ACE-215-1504	-	ACE-215-0103GD <sup>2</sup>
4.6mm	ACE-215-0246	ACE-215-0346	ACE-215-3546	ACE-215-0546	ACE-215-7546	ACE-215-1046	ACE-215-1246	ACE-215-1546	-	ACE-215-0103GD <sup>2</sup>

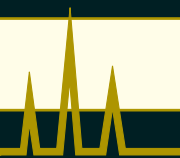
<sup>1</sup> 5 pack - use with integral microbore cartridge holder H0004

<sup>2</sup> 5 pack - use with integral analytical cartridge holder H0005

**ACE** performance guarantee ✓

If ACE does not outperform your existing column (of equivalent phase, particle size and dimensions), send in your comparative data within 60 days and keep the ACE column FREE OF CHARGE.

# ACE 300Å HPLC Columns - Part Numbers



## ACE 5µm Columns

### ACE 5µm C18-300

COLUMN DIAMETER	COLUMN LENGTH									GUARD CARTRIDGE
	20 mm	30 mm	35 mm	50 mm	75 mm	100 mm	125 mm	150 mm	250 mm	
1.0mm	ACE-221-0201	ACE-221-0301	ACE-221-3501	ACE-221-0501	ACE-221-7501	ACE-221-1001	ACE-221-1201	ACE-221-1501	ACE-221-2501	ACE-221-0101GD <sup>1</sup>
2.1mm	ACE-221-0202	ACE-221-0302	ACE-221-3502	ACE-221-0502	ACE-221-7502	ACE-221-1002	ACE-221-1202	ACE-221-1502	ACE-221-2502	ACE-221-0102GD <sup>1</sup>
3.0mm	ACE-221-0203	ACE-221-0303	ACE-221-3503	ACE-221-0503	ACE-221-7503	ACE-221-1003	ACE-221-1203	ACE-221-1503	ACE-221-2503	ACE-221-0103GD <sup>2</sup>
4.0mm	-	-	ACE-221-3504	ACE-221-0504	ACE-221-7504	ACE-221-1004	ACE-221-1204	ACE-221-1504	ACE-221-2504	ACE-221-0103GD <sup>2</sup>
4.6mm	ACE-221-0246	ACE-221-0346	ACE-221-3546	ACE-221-0546	ACE-221-7546	ACE-221-1046	ACE-221-1246	ACE-221-1546	ACE-221-2546	ACE-221-0103GD <sup>2</sup>
7.75mm	-	-	-	ACE-221-0508	ACE-221-7508	ACE-221-1008	ACE-221-1208	ACE-221-1508	ACE-221-2508	ACE-221-0110GD <sup>3</sup>
10.0mm	-	-	-	ACE-221-0510	ACE-221-7510	ACE-221-1010	ACE-221-1210	ACE-221-1510	ACE-221-2510	ACE-221-0110GD <sup>3</sup>
21.2mm	-	-	-	ACE-221-0520	ACE-221-7520	ACE-221-1020	ACE-221-1220	ACE-221-1520	ACE-221-2520	ACE-221-0110GD <sup>3</sup>
30.0mm	-	-	-	enquire	enquire	enquire	enquire	enquire	enquire	enquire

### ACE 5µm C8-300

COLUMN DIAMETER	COLUMN LENGTH									GUARD CARTRIDGE
	20 mm	30 mm	35 mm	50 mm	75 mm	100 mm	125 mm	150 mm	250 mm	
1.0mm	ACE-222-0201	ACE-222-0301	ACE-222-3501	ACE-222-0501	ACE-222-7501	ACE-222-1001	ACE-222-1201	ACE-222-1501	ACE-222-2501	ACE-222-0101GD <sup>1</sup>
2.1mm	ACE-222-0202	ACE-222-0302	ACE-222-3502	ACE-222-0502	ACE-222-7502	ACE-222-1002	ACE-222-1202	ACE-222-1502	ACE-222-2502	ACE-222-0102GD <sup>1</sup>
3.0mm	ACE-222-0203	ACE-222-0303	ACE-222-3503	ACE-222-0503	ACE-222-7503	ACE-222-1003	ACE-222-1203	ACE-222-1503	ACE-222-2503	ACE-222-0103GD <sup>2</sup>
4.0mm	-	-	ACE-222-3504	ACE-222-0504	ACE-222-7504	ACE-222-1004	ACE-222-1204	ACE-222-1504	ACE-222-2504	ACE-222-0103GD <sup>2</sup>
4.6mm	ACE-222-0246	ACE-222-0346	ACE-222-3546	ACE-222-0546	ACE-222-7546	ACE-222-1046	ACE-222-1246	ACE-222-1546	ACE-222-2546	ACE-222-0103GD <sup>2</sup>
7.75mm	-	-	-	ACE-222-0508	ACE-222-7508	ACE-222-1008	ACE-222-1208	ACE-222-1508	ACE-222-2508	ACE-222-0110GD <sup>3</sup>
10.0mm	-	-	-	ACE-222-0510	ACE-222-7510	ACE-222-1010	ACE-222-1210	ACE-222-1510	ACE-222-2510	ACE-222-0110GD <sup>3</sup>
21.2mm	-	-	-	ACE-222-0520	ACE-222-7520	ACE-222-1020	ACE-222-1220	ACE-222-1520	ACE-222-2520	ACE-222-0110GD <sup>3</sup>
30.0mm	-	-	-	enquire	enquire	enquire	enquire	enquire	enquire	enquire

### ACE 5µm C4-300

COLUMN DIAMETER	COLUMN LENGTH									GUARD CARTRIDGE
	20 mm	30 mm	35 mm	50 mm	75 mm	100 mm	125 mm	150 mm	250 mm	
1.0mm	ACE-223-0201	ACE-223-0301	ACE-223-3501	ACE-223-0501	ACE-223-7501	ACE-223-1001	ACE-223-1201	ACE-223-1501	ACE-223-2501	ACE-223-0101GD <sup>1</sup>
2.1mm	ACE-223-0202	ACE-223-0302	ACE-223-3502	ACE-223-0502	ACE-223-7502	ACE-223-1002	ACE-223-1202	ACE-223-1502	ACE-223-2502	ACE-223-0102GD <sup>1</sup>
3.0mm	ACE-223-0203	ACE-223-0303	ACE-223-3503	ACE-223-0503	ACE-223-7503	ACE-223-1003	ACE-223-1203	ACE-223-1503	ACE-223-2503	ACE-223-0103GD <sup>2</sup>
4.0mm	-	-	ACE-223-3504	ACE-223-0504	ACE-223-7504	ACE-223-1004	ACE-223-1204	ACE-223-1504	ACE-223-2504	ACE-223-0103GD <sup>2</sup>
4.6mm	ACE-223-0246	ACE-223-0346	ACE-223-3546	ACE-223-0546	ACE-223-7546	ACE-223-1046	ACE-223-1246	ACE-223-1546	ACE-223-2546	ACE-223-0103GD <sup>2</sup>
7.75mm	-	-	-	ACE-223-0508	ACE-223-7508	ACE-223-1008	ACE-223-1208	ACE-223-1508	ACE-223-2508	ACE-223-0110GD <sup>3</sup>
10.0mm	-	-	-	ACE-223-0510	ACE-223-7510	ACE-223-1010	ACE-223-1210	ACE-223-1510	ACE-223-2510	ACE-223-0110GD <sup>3</sup>
21.2mm	-	-	-	ACE-223-0520	ACE-223-7520	ACE-223-1020	ACE-223-1220	ACE-223-1520	ACE-223-2520	ACE-223-0110GD <sup>3</sup>
30.0mm	-	-	-	enquire	enquire	enquire	enquire	enquire	enquire	enquire

### ACE 5µm CN-300

COLUMN DIAMETER	COLUMN LENGTH									GUARD CARTRIDGE
	20 mm	30 mm	35 mm	50 mm	75 mm	100 mm	125 mm	150 mm	250 mm	
1.0mm	ACE-224-0201	ACE-224-0301	ACE-224-3501	ACE-224-0501	ACE-224-7501	ACE-224-1001	ACE-224-1201	ACE-224-1501	ACE-224-2501	ACE-224-0101GD <sup>1</sup>
2.1mm	ACE-224-0202	ACE-224-0302	ACE-224-3502	ACE-224-0502	ACE-224-7502	ACE-224-1002	ACE-224-1202	ACE-224-1502	ACE-224-2502	ACE-224-0102GD <sup>1</sup>
3.0mm	ACE-224-0203	ACE-224-0303	ACE-224-3503	ACE-224-0503	ACE-224-7503	ACE-224-1003	ACE-224-1203	ACE-224-1503	ACE-224-2503	ACE-224-0103GD <sup>2</sup>
4.0mm	-	-	ACE-224-3504	ACE-224-0504	ACE-224-7504	ACE-224-1004	ACE-224-1204	ACE-224-1504	ACE-224-2504	ACE-224-0103GD <sup>2</sup>
4.6mm	ACE-224-0246	ACE-224-0346	ACE-224-3546	ACE-224-0546	ACE-224-7546	ACE-224-1046	ACE-224-1246	ACE-224-1546	ACE-224-2546	ACE-224-0103GD <sup>2</sup>
7.75mm	-	-	-	ACE-224-0508	ACE-224-7508	ACE-224-1008	ACE-224-1208	ACE-224-1508	ACE-224-2508	ACE-224-0110GD <sup>3</sup>
10.0mm	-	-	-	ACE-224-0510	ACE-224-7510	ACE-224-1010	ACE-224-1210	ACE-224-1510	ACE-224-2510	ACE-224-0110GD <sup>3</sup>
21.2mm	-	-	-	ACE-224-0520	ACE-224-7520	ACE-224-1020	ACE-224-1220	ACE-224-1520	ACE-224-2520	ACE-224-0110GD <sup>3</sup>
30.0mm	-	-	-	enquire	enquire	enquire	enquire	enquire	enquire	enquire

### ACE 5µm Phenyl-300

COLUMN DIAMETER	COLUMN LENGTH									GUARD CARTRIDGE
	20 mm	30 mm	35 mm	50 mm	75 mm	100 mm	125 mm	150 mm	250 mm	
1.0mm	ACE-225-0201	ACE-225-0301	ACE-225-3501	ACE-225-0501	ACE-225-7501	ACE-225-1001	ACE-225-1201	ACE-225-1501	ACE-225-2501	ACE-225-0101GD <sup>1</sup>
2.1mm	ACE-225-0202	ACE-225-0302	ACE-225-3502	ACE-225-0502	ACE-225-7502	ACE-225-1002	ACE-225-1202	ACE-225-1502	ACE-225-2502	ACE-225-0102GD <sup>1</sup>
3.0mm	ACE-225-0203	ACE-225-0303	ACE-225-3503	ACE-225-0503	ACE-225-7503	ACE-225-1003	ACE-225-1203	ACE-225-1503	ACE-225-2503	ACE-225-0103GD <sup>2</sup>
4.0mm	-	-	ACE-225-3504	ACE-225-0504	ACE-225-7504	ACE-225-1004	ACE-225-1204	ACE-225-1504	ACE-225-2504	ACE-225-0103GD <sup>2</sup>
4.6mm	ACE-225-0246	ACE-225-0346	ACE-225-3546	ACE-225-0546	ACE-225-7546	ACE-225-1046	ACE-225-1246	ACE-225-1546	ACE-225-2546	ACE-225-0103GD <sup>2</sup>
7.75mm	-	-	-	ACE-225-0508	ACE-225-7508	ACE-225-1008	ACE-225-1208	ACE-225-1508	ACE-225-2508	ACE-225-0110GD <sup>3</sup>
10.0mm	-	-	-	ACE-225-0510	ACE-225-7510	ACE-225-1010	ACE-225-1210	ACE-225-1510	ACE-225-2510	ACE-225-0110GD <sup>3</sup>
21.2mm	-	-	-	ACE-225-0520	ACE-225-7520	ACE-225-1020	ACE-225-1220	ACE-225-1520	ACE-225-2520	ACE-225-0110GD <sup>3</sup>
30.0mm	-	-	-	enquire	enquire	enquire	enquire	enquire	enquire	enquire

<sup>1</sup> 5 pack - use with integral microbore cartridge holder H0004

<sup>2</sup> 5 pack - use with integral analytical cartridge holder H0005

<sup>3</sup> 3 pack - use with semi-prep cartridge holder H0002 and column coupler C0001

300Å

## ACE 300Å HPLC Columns - continued

### ACE 10µm C18-300

COLUMN DIAMETER	COLUMN LENGTH									GUARD CARTRIDGE
	20 mm	30 mm	35 mm	50 mm	75 mm	100 mm	125 mm	150 mm	250 mm	
4.6mm	ACE-231-0246	ACE-231-0346	ACE-231-3546	ACE-231-0546	ACE-231-7546	ACE-231-1046	ACE-231-1246	ACE-231-1546	ACE-231-2546	ACE-231-0103GD <sup>2</sup>
7.75mm	-	-	-	ACE-231-0508	ACE-231-7508	ACE-231-1008	ACE-231-1208	ACE-231-1508	ACE-231-2508	ACE-231-0110GD <sup>3</sup>
10.0mm	-	-	-	ACE-231-0510	ACE-231-7510	ACE-231-1010	ACE-231-1210	ACE-231-1510	ACE-231-2510	ACE-231-0110GD <sup>3</sup>
21.2mm	-	-	-	ACE-231-0520	ACE-231-7520	ACE-231-1020	ACE-231-1220	ACE-231-1520	ACE-231-2520	ACE-231-0110GD <sup>3</sup>
30.0mm	-	-	-	enquire	enquire	enquire	enquire	enquire	enquire	enquire

### ACE 10µm C8-300

COLUMN DIAMETER	COLUMN LENGTH									GUARD CARTRIDGE
	20 mm	30 mm	35 mm	50 mm	75 mm	100 mm	125 mm	150 mm	250 mm	
4.6mm	ACE-232-0246	ACE-232-0346	ACE-232-3546	ACE-232-0546	ACE-232-7546	ACE-232-1046	ACE-232-1246	ACE-232-1546	ACE-232-2546	ACE-232-0103GD <sup>2</sup>
7.75mm	-	-	-	ACE-232-0508	ACE-232-7508	ACE-232-1008	ACE-232-1208	ACE-232-1508	ACE-232-2508	ACE-232-0110GD <sup>3</sup>
10.0mm	-	-	-	ACE-232-0510	ACE-232-7510	ACE-232-1010	ACE-232-1210	ACE-232-1510	ACE-232-2510	ACE-232-0110GD <sup>3</sup>
21.2mm	-	-	-	ACE-232-0520	ACE-232-7520	ACE-232-1020	ACE-232-1220	ACE-232-1520	ACE-232-2520	ACE-232-0110GD <sup>3</sup>
30.0mm	-	-	-	enquire	enquire	enquire	enquire	enquire	enquire	enquire

### ACE 10µm C4-300

COLUMN DIAMETER	COLUMN LENGTH									GUARD CARTRIDGE
	20 mm	30 mm	35 mm	50 mm	75 mm	100 mm	125 mm	150 mm	250 mm	
4.6mm	ACE-233-0246	ACE-233-0346	ACE-233-3546	ACE-233-0546	ACE-233-7546	ACE-233-1046	ACE-233-1246	ACE-233-1546	ACE-233-2546	ACE-233-0103GD <sup>2</sup>
7.75mm	-	-	-	ACE-233-0508	ACE-233-7508	ACE-233-1008	ACE-233-1208	ACE-233-1508	ACE-233-2508	ACE-233-0110GD <sup>3</sup>
10.0mm	-	-	-	ACE-233-0510	ACE-233-7510	ACE-233-1010	ACE-233-1210	ACE-233-1510	ACE-233-2510	ACE-233-0110GD <sup>3</sup>
21.2mm	-	-	-	ACE-233-0520	ACE-233-7520	ACE-233-1020	ACE-233-1220	ACE-233-1520	ACE-233-2520	ACE-233-0110GD <sup>3</sup>
30.0mm	-	-	-	enquire	enquire	enquire	enquire	enquire	enquire	enquire

### ACE 10µm CN-300

COLUMN DIAMETER	COLUMN LENGTH									GUARD CARTRIDGE
	20 mm	30 mm	35 mm	50 mm	75 mm	100 mm	125 mm	150 mm	250 mm	
4.6mm	ACE-234-0246	ACE-234-0346	ACE-234-3546	ACE-234-0546	ACE-234-7546	ACE-234-1046	ACE-234-1246	ACE-234-1546	ACE-234-2546	ACE-234-0103GD <sup>2</sup>
7.75mm	-	-	-	ACE-234-0508	ACE-234-7508	ACE-234-1008	ACE-234-1208	ACE-234-1508	ACE-234-2508	ACE-234-0110GD <sup>3</sup>
10.0mm	-	-	-	ACE-234-0510	ACE-234-7510	ACE-234-1010	ACE-234-1210	ACE-234-1510	ACE-234-2510	ACE-234-0110GD <sup>3</sup>
21.2mm	-	-	-	ACE-234-0520	ACE-234-7520	ACE-234-1020	ACE-234-1220	ACE-234-1520	ACE-234-2520	ACE-234-0110GD <sup>3</sup>
30.0mm	-	-	-	enquire	enquire	enquire	enquire	enquire	enquire	enquire

### ACE 10µm Phenyl-300

COLUMN DIAMETER	COLUMN LENGTH									GUARD CARTRIDGE
	20 mm	30 mm	35 mm	50 mm	75 mm	100 mm	125 mm	150 mm	250 mm	
4.6mm	ACE-235-0246	ACE-235-0346	ACE-235-3546	ACE-235-0546	ACE-235-7546	ACE-235-1046	ACE-235-1246	ACE-235-1546	ACE-235-2546	ACE-235-0103GD <sup>2</sup>
7.75mm	-	-	-	ACE-235-0508	ACE-235-7508	ACE-235-1008	ACE-235-1208	ACE-235-1508	ACE-235-2508	ACE-235-0110GD <sup>3</sup>
10.0mm	-	-	-	ACE-235-0510	ACE-235-7510	ACE-235-1010	ACE-235-1210	ACE-235-1510	ACE-235-2510	ACE-235-0110GD <sup>3</sup>
21.2mm	-	-	-	ACE-235-0520	ACE-235-7520	ACE-235-1020	ACE-235-1220	ACE-235-1520	ACE-235-2520	ACE-235-0110GD <sup>3</sup>
30.0mm	-	-	-	enquire	enquire	enquire	enquire	enquire	enquire	enquire

<sup>2</sup> 5 pack - use with integral analytical cartridge holder H0005

<sup>3</sup> 3 pack - use with semi-prep cartridge holder H0002 and column coupler C0001

**ACE** performance guarantee 

If ACE does not outperform your existing column (of equivalent phase, particle size and dimensions), send in your comparative data within 60 days and keep the ACE column FREE OF CHARGE.



## Column Ordering Information

Part numbers for ACE 100Å columns are listed on pages 14-17.

Part numbers for ACE 300Å columns are listed on pages 24-26.

For ACE Capillary and Nano columns (page 27), ACE Validation Kits (page 38) and ACE Combinatorial Chemistry Kits (page 38), replace "X" with the required material code from the following tables:

### ACE 100Å Materials:

PARTICLE SIZE	PHASE REQUIRED						
	C18	C8	C4	CN	PHENYL	AQ	C18-HL
3µm	ACE-111	ACE-112	ACE-113	ACE-114	ACE-115	ACE-116	ACE-311
5µm	ACE-121	ACE-122	ACE-123	ACE-124	ACE-125	ACE-126	ACE-321
10µm	ACE-131	ACE-132	ACE-133	ACE-134	ACE-135	ACE-136	ACE-331
15µm	-	-	-	-	-	-	ACE-341

Example: 250 x 4.6mm i.d. ACE 5 C18 Method Validation Kit - Part Number = ACE-121-2546-MVK

### ACE 300Å Materials:

PARTICLE SIZE	PHASE REQUIRED				
	C18-300	C8-300	C4-300	CN-300	PHENYL-300
3µm	ACE-211	ACE-212	ACE-213	ACE-214	ACE-215
5µm	ACE-221	ACE-222	ACE-223	ACE-224	ACE-225
10µm	ACE-231	ACE-232	ACE-233	ACE-234	ACE-235

Example: 100 x 0.3mm i.d. ACE 3 C18-300 Capillary Column - Part Number = ACE-211-10003

Please contact your distributor for part numbers of custom packed columns (page 38) and additional ordering assistance.

For complete 52 page Catalogue, Price & Delivery in  
Australia & New Zealand contact [info@winlab.com.au](mailto:info@winlab.com.au)

or call 61 7 3205 5233

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