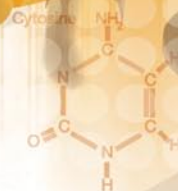


strength in technology

FortisTM HPLC Columns



Fortis Philosophy

Here at Fortis Technologies we take pride in understanding the needs of our customers, levels of technical service are of the highest standard and all of our products are developed in close consultation with customers to ensure that their needs are met. We believe in making method development as simple as possible, so our innovative phase chemistries offer the ability for resolution, efficiency, speed and sensitivity; all of the variables that are needed in today's high speed evolving world.

If you have any questions please feel free to contact me on : info@fortis-technologies.com

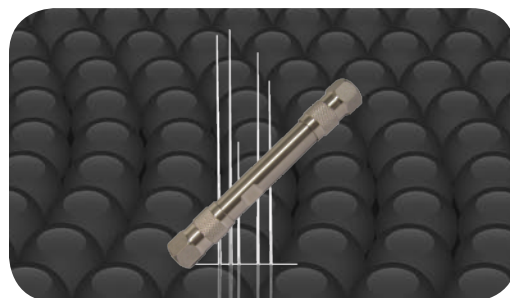
Mark Woodruff
Director

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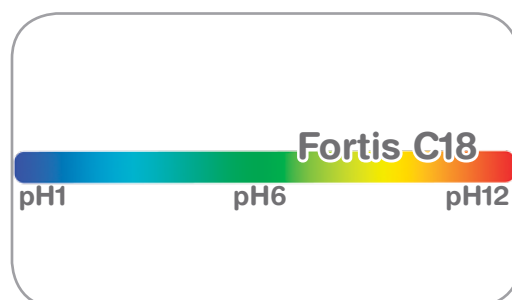
2.1 μm Fortis™

- Ideal for Ultra High Pressure LC (UHPLC)
- Available C18, Di-phenyl, C8, Cyano
- Operate to 15,000psi
- Fully Scalable analytical to prep



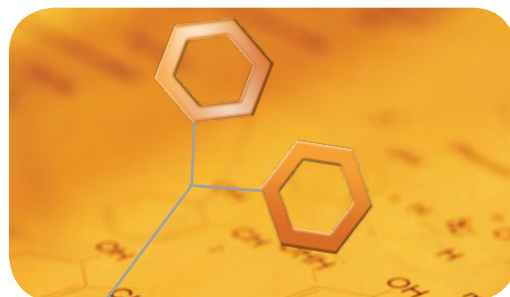
Fortis C18™

- Superior Peak Shapes
- Low, Mid and High pH 1-12
- Based upon Ultra Pure Silica
- Fully Scalable



Fortis Phenyl™

- Unique di-phenyl selectivity
- Separate Positional Isomers
- Aromatic retention and selectivity
- Enhanced Polar Retention

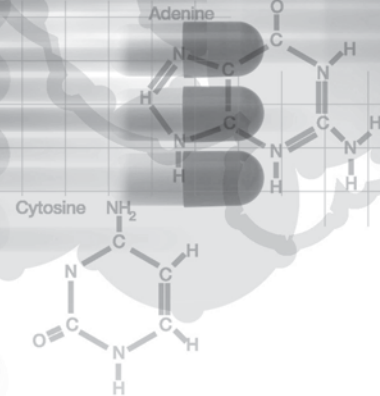


2.1µm Fortis C18(2)TM

- High Efficiency
- Robust Particles
- Operate to 15,000psi
- Fully Scalable to analytical and prep size

Fortis 2.1µm particles are designed to provide characteristics, which will aid in increased productivity within ultra high pressure chromatography (UHPLC). Designed to be robust, reproducible and fully scalable.

Fortis 2.1µm particles will operate both on traditional LC systems, providing increased efficiency, and also on the latest UHPLC systems.



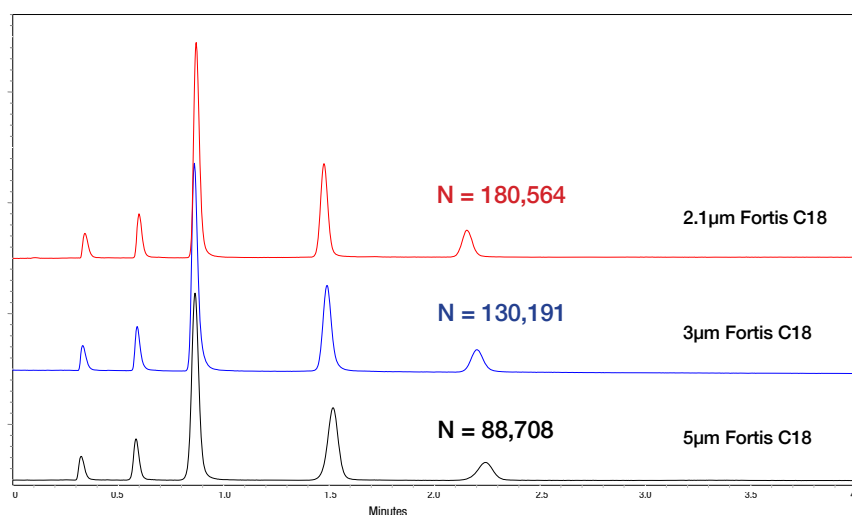
Increased Efficiency

2.1µm Fortis C18 provides increased efficiency over 3µm and 5µm particles. This gives the opportunity to increase resolution or speed of analysis.

A wider linear flow range means that more resolution and peak capacity can be achieved for a given separation.

By staying above 2µm particle size, Fortis 2.1µm C18 ensures pressure is reduced whilst no loss in efficiency is seen.

- Lower back pressure
- Higher Efficiency
- Greater Resolution
- Increased Sensitivity

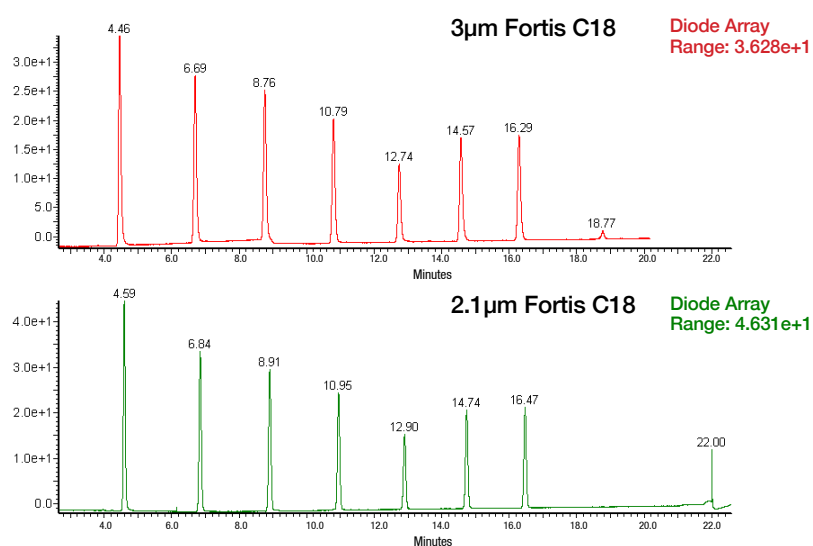


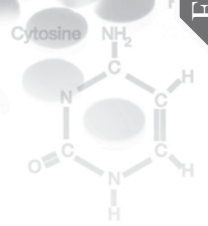
- All columns 50x2.1mm

Scalability and Sensitivity

Critically important to the analyst is the ability to have a fully scalable separation. Fortis C18 can be scaled from 2.1µm all the way through analytical 3 and 5µm particles to prep size without any change in retention profile.

By moving from a 3µm particle size to 2.1µm Fortis C18 sensitivity can be increased. In this example peak height goes up by over 27%





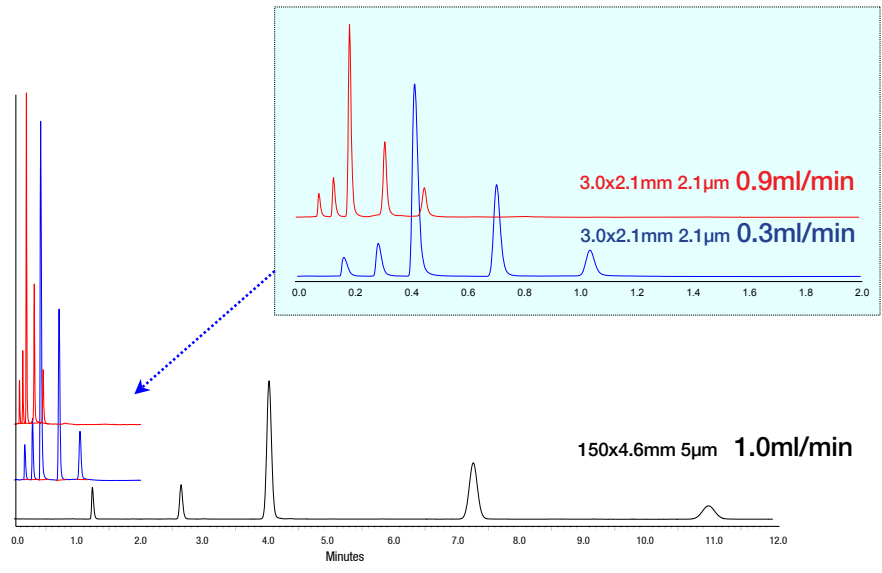
Method Development

Increase Speed

Greater speed can be achieved by moving to smaller particles, whilst still obtaining full baseline resolution.

2.1µm Fortis C18 will operate at higher linear flow rates whilst providing lower backpressure than sub 2µm particles.

To move to smaller particles and smaller columns, without affecting selectivity, use the scaling equations to optimise your UHPLC parameters: e-mail us for the spreadsheet, technicalsupport@fortis-technologies.com

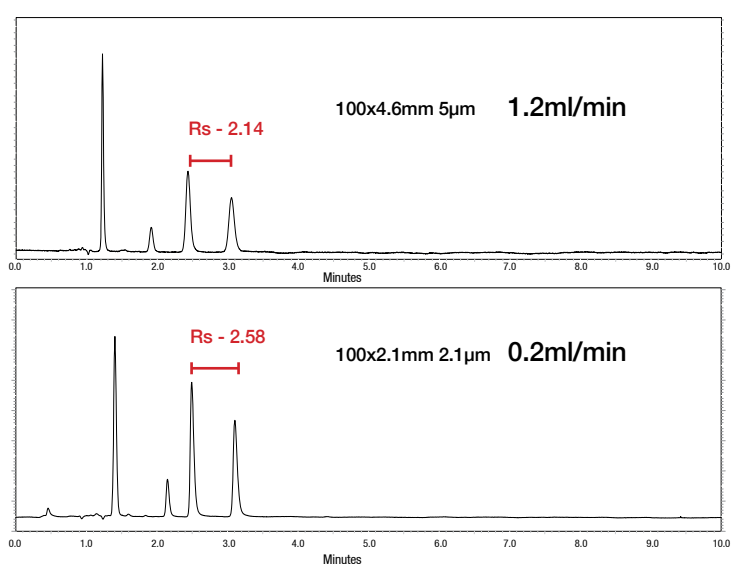


Increase Resolution

Greater resolution can be achieved by maintaining the column length and diameter but moving to a smaller particle size.

2.1µm Fortis C18 will provide very high efficiency and therefore peak capacity and resolution if used with longer column lengths. Columns can be coupled in series to provide extreme resolution capability

1. Cefadroxil
2. Cefachlor
3. Cefalexin
4. Cefradine



| 2.1µm Fortis C18 (2) | | Column Length | | | |
|----------------------|-----|---------------|------------|------------|------------|
| | | 30 | 50 | 100 | 150 |
| Column Diameter | 2.1 | F28-020202 | F28-020302 | F28-020502 | F28-020702 |
| | 3.0 | F28-030202 | F28-030302 | F28-030502 | - |
| | 4.6 | F28-050202 | F28-050302 | - | - |

2.1µm Fortis Phenyl™

- High Efficiency and Alternative Selectivity
- Unique di-phenyl Chemistry
- Operate to 15,000psi
- Fully Scalable to analytical and prep size

Providing an alternate selectivity to traditional C18 and C8 chemistries, Fortis Phenyl's unique di-phenyl structure allows ease of separation. Now the high efficiency of small particles can be combined with selectivity to ensure that resolution is optimised in ultra high pressure chromatography (UHPLC).

Fortis 2.1µm particles will operate both on traditional LC systems, providing increased efficiency, and also on the latest UHPLC systems.

Alternative Selectivity - High Efficiency

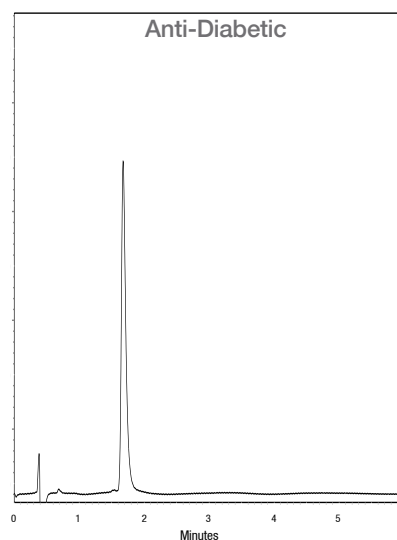
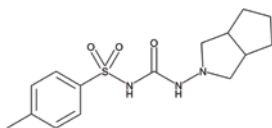
Particularly adept at separating closely related species Fortis Phenyl is also able to provide retention and separation of many species type whether polar or non-polar.

Where alternate selectivity is required from C18 and C8 then Fortis Phenyl is the key choice.

- Higher Efficiencies
- Greater Reproducibility
- Resolution enhanced

Column: Fortis Phenyl 50x2.1mm 2.1µ
p/n: F2PH-020302
Mobile Phase: 80:20 H₂O : ACN + 0.1% Formic acid
Flow: 0.8ml/min
Temp: 25°C
Wavelength: 254nm

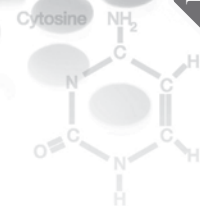
1. Gliclazide



To learn more about the unique structure and separating power of Fortis Phenyl turn to page 15.

| 2.1µm Fortis Phenyl(2) | | Column Length | | | |
|------------------------|-----|---------------|-------------|-------------|-------------|
| | | 30 | 50 | 100 | 150 |
| | 2.1 | F2PH-020202 | F2PH-020302 | F2PH-020502 | F2PH-020702 |
| Column Diameter | 3.0 | F2PH-030202 | F2PH-030302 | F2PH-030502 | - |
| | 4.6 | F2PH-050202 | F2PH-050302 | - | - |





2.1µm Fortis C8™

- High Efficiency
- Robust Particles
- Operate to 15,000psi
- Fully Scalable to analytical and prep size

Fortis C8 2.1µm particles will provide an advantage where the hydrophobicity of a C18 is not required. C8 is also often used as the first choice in method development.

Fortis C8 2.1µm particles are designed to provide characteristics which will aid in increased productivity within ultra high pressure chromatography (UHPLC). Designed to be robust, reproducible and fully scalable.

Hydrophobicity - High Efficiency

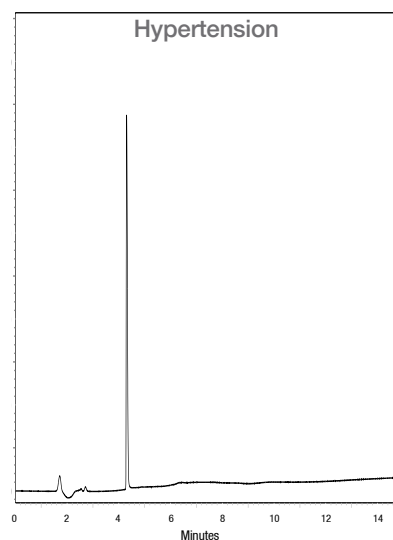
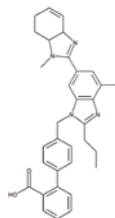
Whatever the compound functionality Fortis C8 provides excellent performance. The high bonding density of C8 ligands can also provide resolving power different to that of C18 ligands.

Hydrophobicity is reduced from that of a C18 ligand, allowing steroids and other lipophilic species to be analysed more quickly.

- Higher Efficiencies
- Greater Reproducibility
- Reduced hydrophobicity over C18

Column: Fortis C8 50x2.1mm 2.1µ
p/n: F208-020302
Mobile Phase: A - H₂O + 0.1% Formic acid
 B - ACN + 0.1% Formic acid
Gradient: 10 - 90% in 15min
Flow: 0.4ml/min
Temp: 20°C
Wavelength: 254nm

1. Telmisartan



| 2.1µm Fortis C8(2) | | Column Length | | | |
|--------------------|-----|---------------|-------------|-------------|-------------|
| | | 30 | 50 | 100 | 150 |
| | 2.1 | F208-020202 | F208-020302 | F208-020502 | F208-020702 |
| Column Diameter | 3.0 | F208-030202 | F208-030302 | F208-030502 | - |
| | 4.6 | F208-050202 | F208-050302 | - | - |

2.1µm Fortis Cyano™

- High Efficiency
- Robust Particles
- Operate to 15,000psi
- Fully Scalable to analytical and prep size

Fortis Cyano 2.1µm particles are designed to provide alternative selectivity. Along with the other functionalities available on the Fortis 2.1µm particles this provides selectivity as well as increased efficiency for UHPLC analysis. Designed to be robust, reproducible and fully scalable, Fortis Cyano can be operated in normal phase as well reverse phase conditions.

Alternative Selectivity - High Efficiency

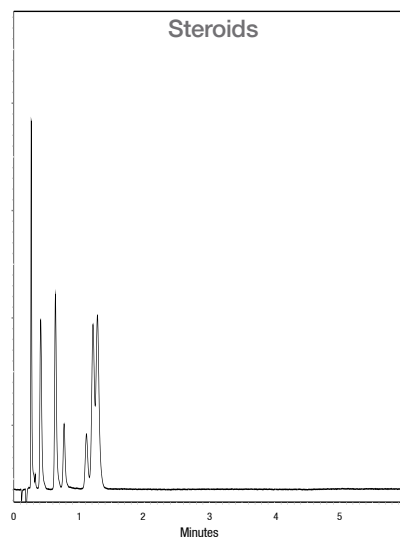
Fortis Cyano works for all types of compounds either in normal phase or reversed phase solvents. Peak shapes and efficiency will be of the highest order.

Normal phase conditions will allow the retention of very polar analytes.

- Higher Efficiencies
- Greater Reproducibility
- Resolution enhanced

Column: Fortis Cyano 50x2.1mm 2.1µ
p/n: F2CN-020302
Mobile Phase: Heptane : THF : MeOH 90:5:5
Flow: 1ml/min
Temp: 25°C
Wavelength: 254nm

1. Progesterone
2. 17αHydroxyprogesterone
3. 11αHydroxyprogesterone
4. Hydroxy-21-acetate
5. Cortisone
6. Prednisone
7. Prednisolone

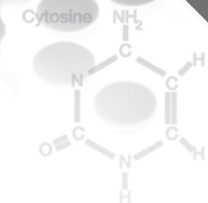


To learn more about the separating power of Fortis Cyano turn to page 19.

| 2.1µm Fortis Cyano(2) | | Column Length | | | |
|-----------------------|-----|---------------|-------------|-------------|-------------|
| | | 30 | 50 | 100 | 150 |
| | 2.1 | F2CN-020202 | F2CN-020302 | F2CN-020502 | F2CN-020702 |
| Column Diameter | 3.0 | F2CN-030202 | F2CN-030302 | F2CN-030502 | - |
| | 4.6 | F2CN-050202 | F2CN-050302 | - | - |



Fortis Cyano page 19



2.5µm Fortis C18™

- Over 20% more efficiency than 3µm
- Lower backpressure than UHPLC columns
- Operate in 400bar or 1000bar systems
- Fully Scalable to analytical and prep size

Fortis 2.5µm particles are designed to be the next step in improving both resolution and speed. Allowing the analyst to move towards ultra high pressure chromatography (UHPLC) whilst still operating on traditional 400bar LC systems. Combined with the companies innovative PACE™ column design, 2.5µm particles offer speed and efficiency without compromising loadability and scalability. The optimised C18 bonding maintains the phases ability to be stable from pH 1-12.

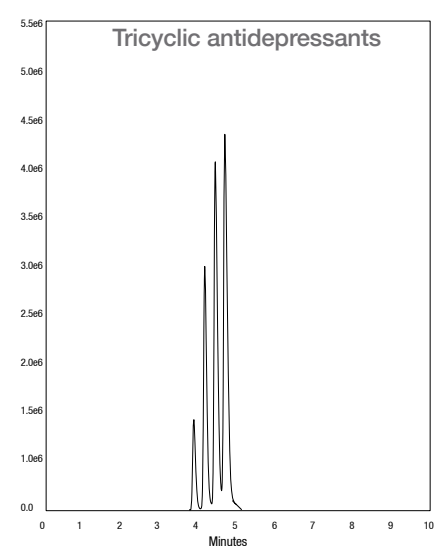
Optimised Resolution

Resolution of closely related species can be achieved by the use of 2.5µm particles and the optimised peak shapes afforded by Fortis C18 stationary phase. Basic, Acidic and Neutral analyte performance is first class across the pH spectrum.

- Higher Efficiencies
- Greater Reproducibility
- Resolution enhanced

Column: Fortis C18 100x4.6mm 2.5µ
p/n: F18-050502
Mobile Phase: A - H₂O + 0.1% Formic acid
 B - ACN + 0.1% Formic acid
Gradient: 25 - 40% in 10min
Flow: 1ml/min
Temp: 20°C
Wavelength: 254nm

1. Protriptyline
2. Nortriptyline
3. Amitriptyline
4. Trimipramine

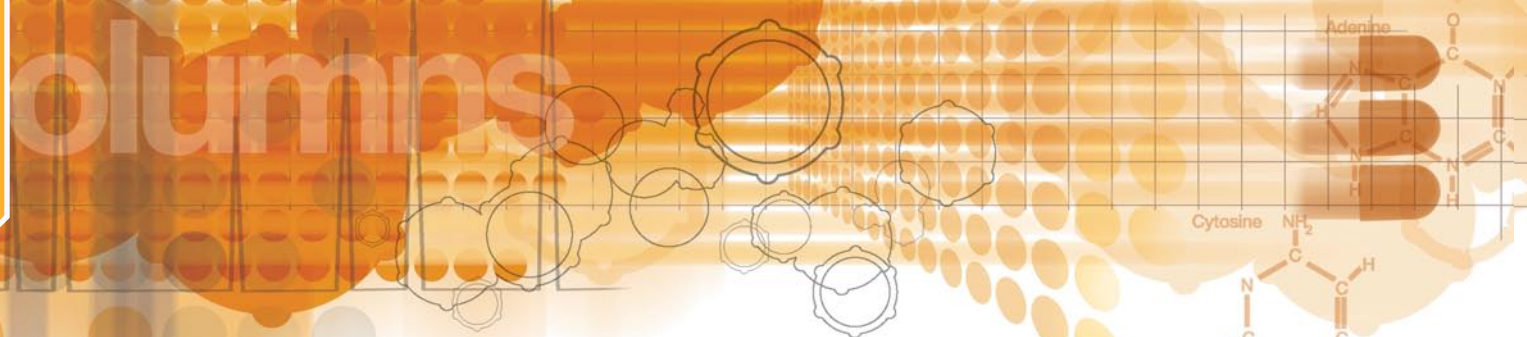


To learn more about the stability and peak shapes of Fortis C18 turn to page 11.

| 2.5µm Fortis C18 | | Column Length | | | |
|------------------|-----|---------------|------------|------------|------------|
| | | 30 | 50 | 100 | 150 |
| | 2.1 | F18-020202 | F18-020302 | F18-020502 | F18-020702 |
| Column Diameter | 3.0 | F18-030202 | F18-030302 | F18-030502 | F18-030702 |
| | 4.6 | F18-050202 | F18-050302 | F18-050502 | F18-050702 |



Fortis C18 page 11

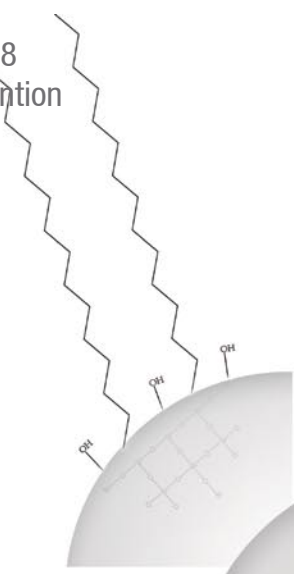


Fortis Method Development Options

- Choice of Stationary phase functionality
- Based on Ultra pure silica
- Reversed Phase (RP) and Normal Phase (NP) options

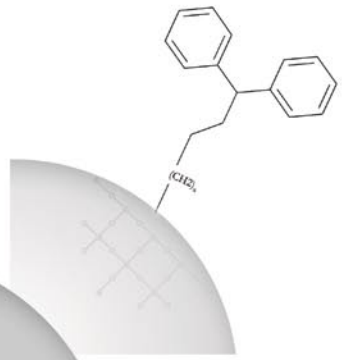
Fortis H2o™

- Polar endcapped C18
- Increased polar retention
- *Organic acids*
- *Catecholamines*



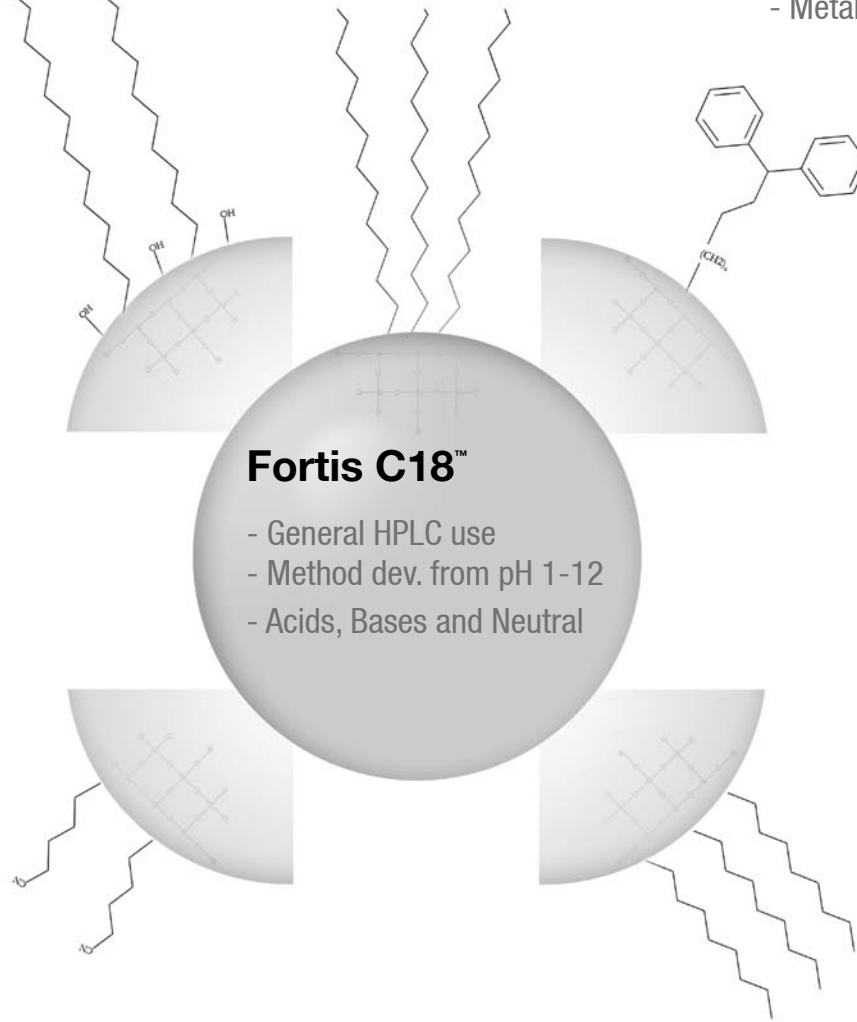
Fortis Phenyl™

- Unique di-phenyl structure
- Separate Positional Isomers
- Metabolite profiling



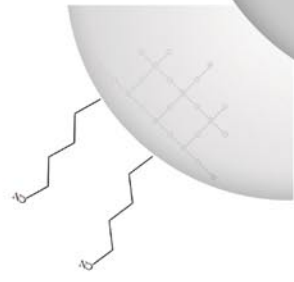
Fortis C18™

- General HPLC use
- Method dev. from pH 1-12
- Acids, Bases and Neutral



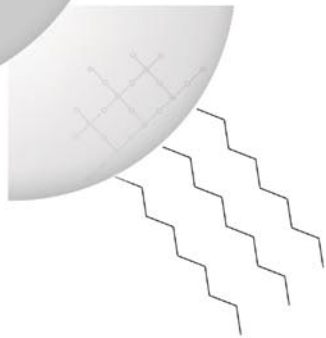
Fortis Cyano™

- Cyano functionality
- RP or NP use
- *Explosives*
- *Pesticides*



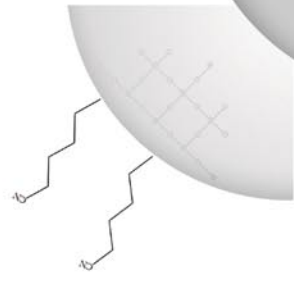
Fortis HILIC™

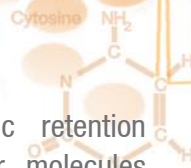
- High Polar Retention
- Highly Pure Silica
- *Carboxylic acids*
- *Nucleotides*



Fortis C8™

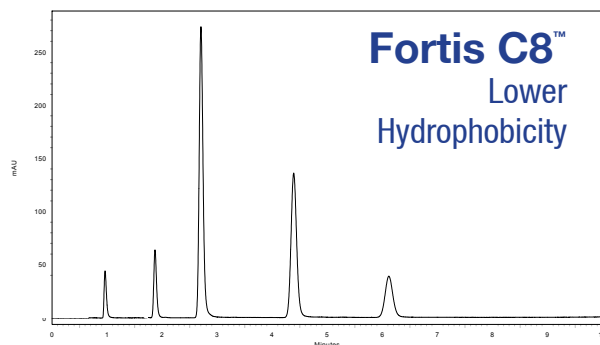
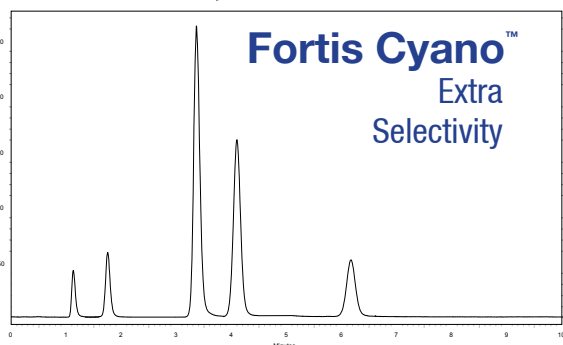
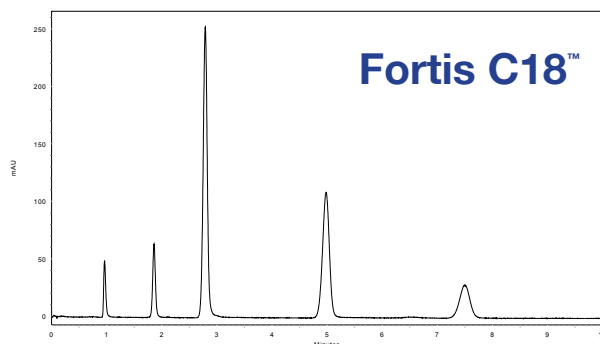
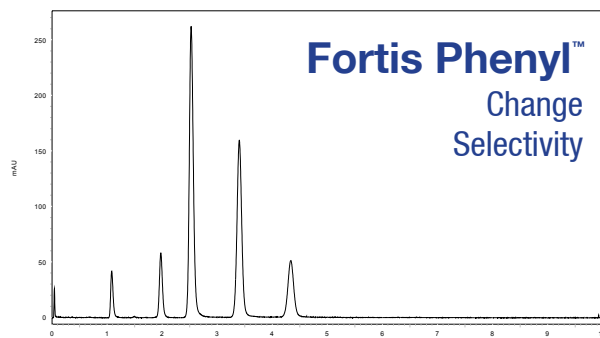
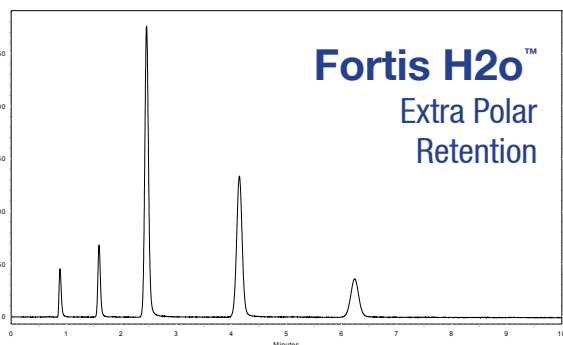
- Reduced Hydrophobicity
- *Lipids*
- *Steroids*





Getting Started :

Method development typically starts with a C18 or C8 column, both provide Hydrophobic retention with good peak shapes for neutral, acidic and basic analytes. Generally if retention of polar molecules is also needed then a polar endcapped stationary phase such as Fortis H2o is a good starting choice. If selectivity is insufficient then Phenyl or Cyano stationary phases are a good alternative, they will change selectivity and even elution order since they work on dipole characteristics as opposed to just hydrophobicity. Fortis Cyano is good in normal phase (NP) conditions for polar analytes with COOH, NH₂, NHR₂ or NR₂ groups. If small polar molecules still do not retain then HILIC chromatography is a suitable alternative.



Acidic, Neutral & basic analytes

- Fortis C18
- Fortis C8
- Fortis Phenyl

Polar acidic molecules

- Fortis H2o
- Fortis HILIC
- Fortis Cyano in NP mode

Polar basic molecules

- Fortis C18 operated at high pH
- Fortis Phenyl
- Fortis H2o

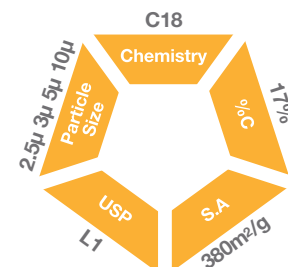
Alternate Selectivity

- Fortis Phenyl
- Fortis Cyano

Fortis C18™

- Superior Peak Shapes
- pH Range 1-12
- Based on Ultra Pure Silica
- Fully Scalable

Fortis C18 is a pure silica based stationary phase with unique high and low pH performance. Whether carrying out simple compound screens or complex metabolite identification Fortis C18 will provide the best in peak shape, resolution and extended pH range for method development flexibility.



Optimised Peak Shape

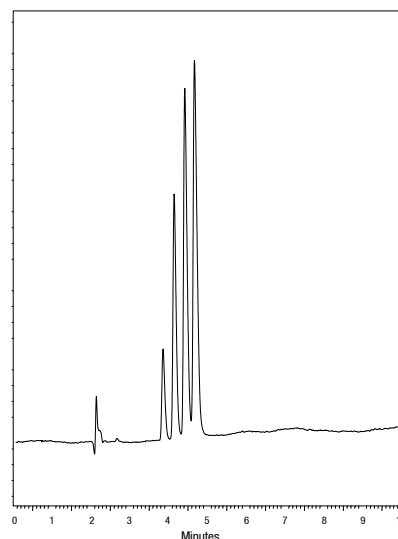
Whatever the compound functionality the optimised hydrophobic bonding of Fortis C18 leads to peak symmetries being near perfect whatever the analyte type.

Basic, Acidic and Neutral analyte performance is first class across the pH spectrum.

- Superior Peak Shapes
- Higher Efficiencies
- Greater Reproducibility

Column: Fortis C18 100x4.6mm 3µ
p/n: F18-050503
Mobile Phase: A - H₂O + 0.1% Formic acid
 B - ACN + 0.1% Formic acid
Gradient: 25 - 40% in 10min
Flow: 1ml/min
Temp: 20°C
Wavelength: 254nm

1. Protriptyline
2. Nortriptyline
3. Amitriptyline
4. Trimipramine

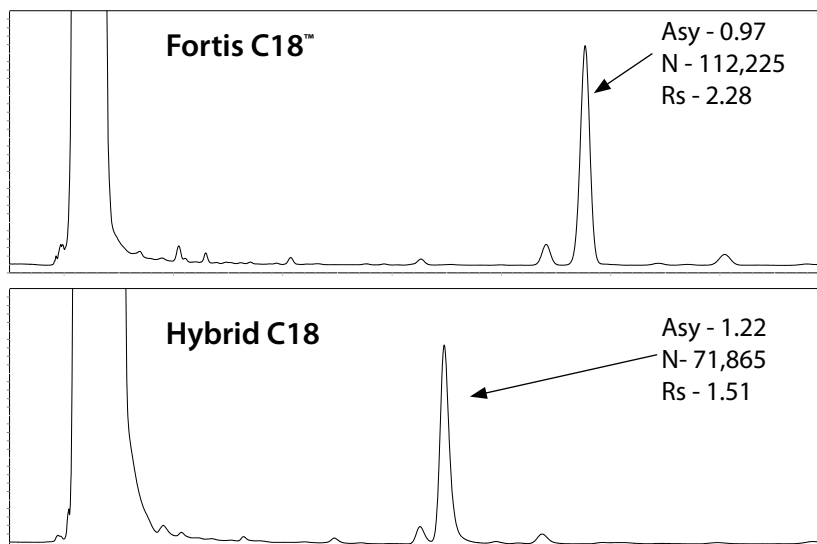


Extreme pH range

Fortis C18 has the ability to not only operate at low pH like other silica based phases, but also to operate at high pH to aid with basic analyte retention and performance.

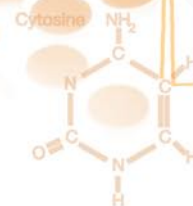
The ability to quickly equilibrate from formic acid or TFA into ammonia or bicarbonate aids in method development. Mass transfer, loadability and precision of a silica matrix are all maintained.

- Higher Efficiency than Hybrids
- Greater Reproducibility
- Retain polar basic analytes



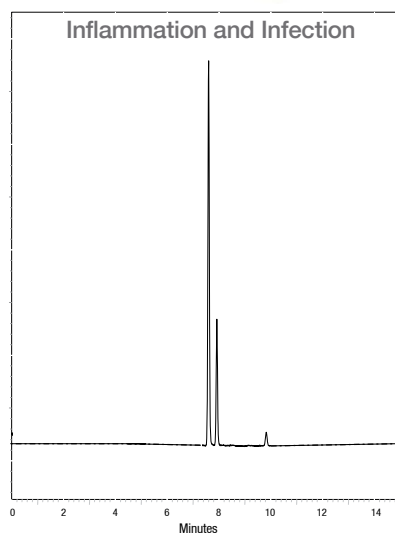
Columns: 150x4.6mm 3µ Mobile Phase: 50:50 0.1% NH₃ : MeCN Flow: 1.0ml/min Temp: 25°C Wavelength: 230nm

Extended pH Range



Column: Fortis C18 100x4.6mm 3µ
p/n: F18-050503
Mobile Phase: A - H₂O + 0.1% Formic acid
 B - ACN + 0.1% Formic acid
Gradient: 10 - 50% in 10min
Flow: 1ml/min
Temp: 20°C
Wavelength: 254nm

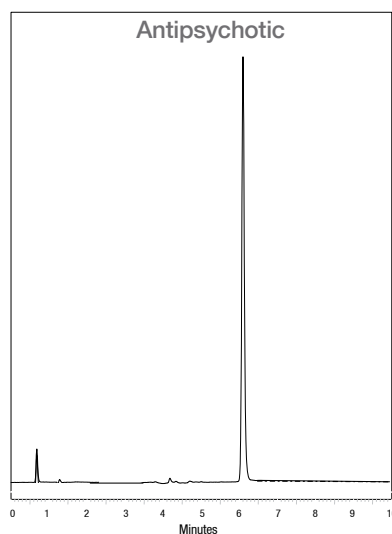
1. Dexamethasone
2. Neomycin Sulphate
3. Acetic acid



pH 1

Column: Fortis C18 50x4.6mm 5µ
p/n: F18-050305
Mobile Phase: A - 50mM NH₄OAc
 B - ACN
Gradient: 10 - 40% in 10min
Flow: 1ml/min
Temp: 20°C
Wavelength: 254nm

1. Quetiapine

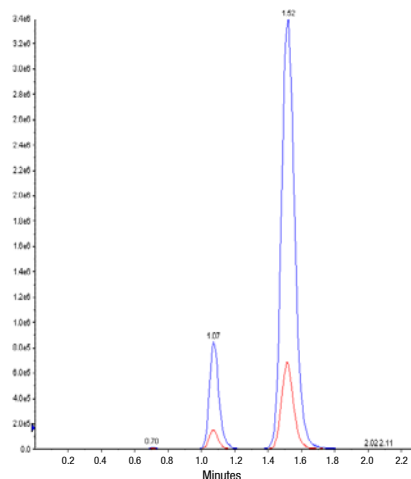


pH 6

Column: Fortis C18 50x3.0mm 3µ
p/n: F18-030303
Mobile Phase: 30:70 H₂O + 10mM ammonium bicarbonate : MeOH
Flow: 0.4ml/min
Temp: 25°C
Wavelength: MS Detection

Raloxifene Glucuronides

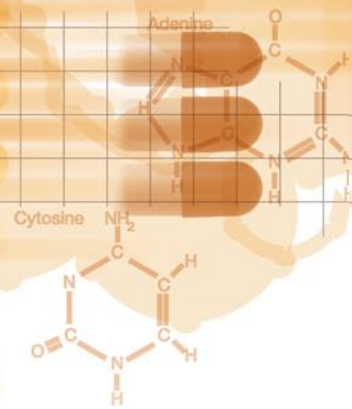
Selective Estrogen Modulator



pH 12

Data Courtesy of : Pharmaceutical company, USA

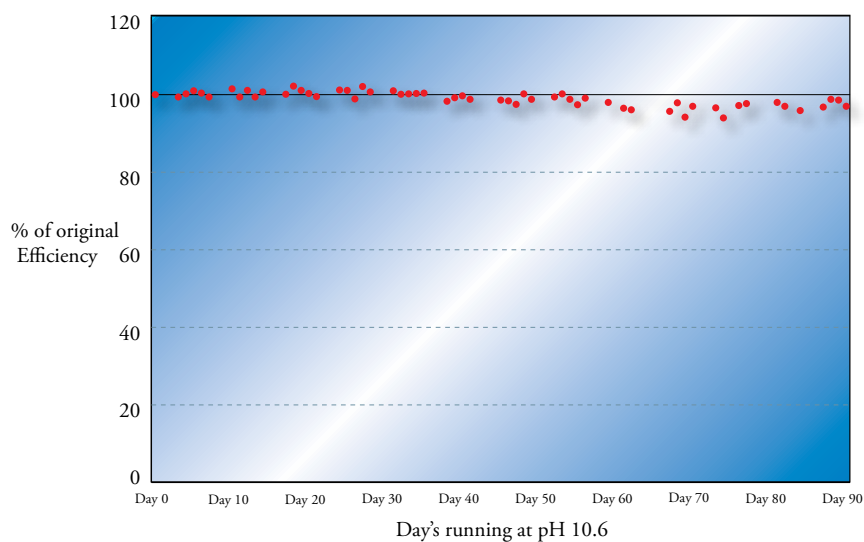
Fortis C18™



High pH Stability

The unique bonding of Fortis C18 enables stability at extremes of pH to be maintained.

Run continuously in 0.1% ammonia Fortis C18 shows no deterioration in efficiency over a 90 day period.



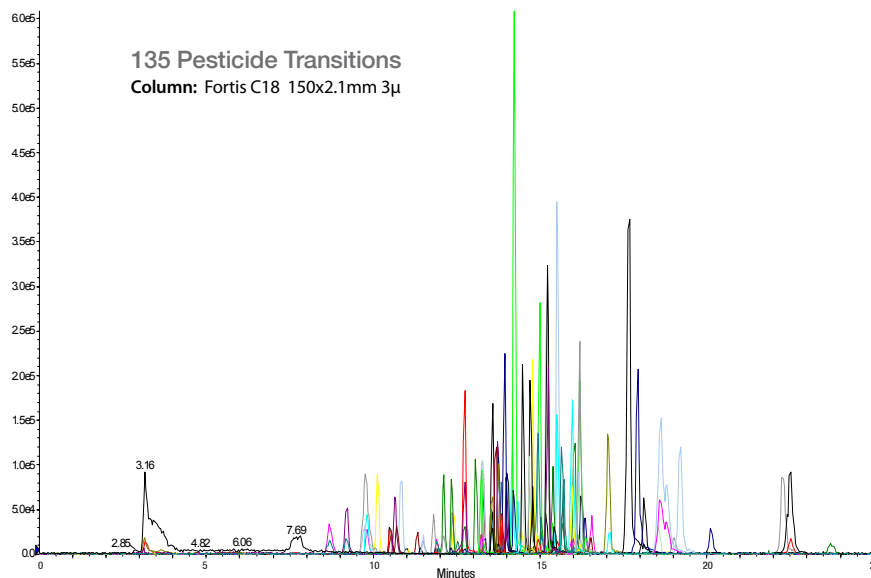
Optimised Resolution

Only by optimising all factors of stationary phase design can the analyst be assured of the best possible chromatography.

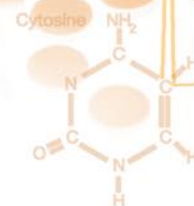
Fortis C18's unique bonded character ensures that not only is reproducibility and robustness assured, but also that resolution is of the highest level. Only by obtaining sharp peak shapes for many analyte types can this sort of resolution be achieved.

Analysed here are 135 transitions of pesticide residues. Good LC resolution leads to excellent sensitivity in MS detection.

Data Courtesy of : Central Science Laboratories, UK



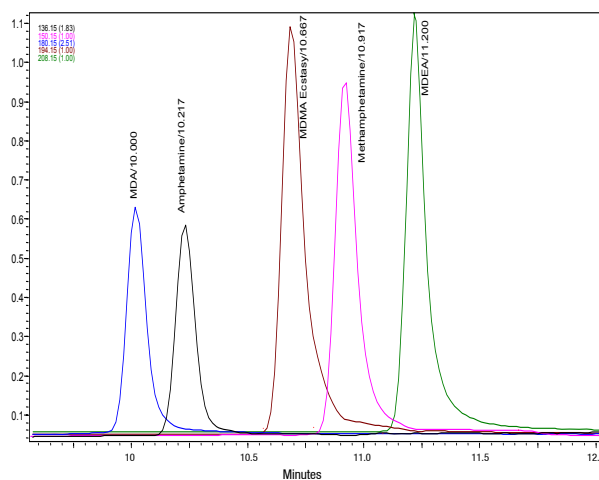
Fortis C18™



Drugs of Abuse

Column: Fortis C18 150x3.0mm 3µ
p/n: F18-030703
Mobile Phase: A - H₂O + 0.1% ammonia
 B - MeOH + 0.1% ammonia
Gradient:
Flow: 0.4ml/min
Temp: 20°C
Wavelength: MS Detection

1. MDA (3,4-Methylenedioxyamphetamine)
2. Amphetamine
3. MDMA (Ecstasy)
4. Methamphetamine
5. MDEA (3,4-Methylenedioxy-N-ethylamphetamine)



Data Courtesy of : Forensic Laboratory, UK

Hydrophobicity

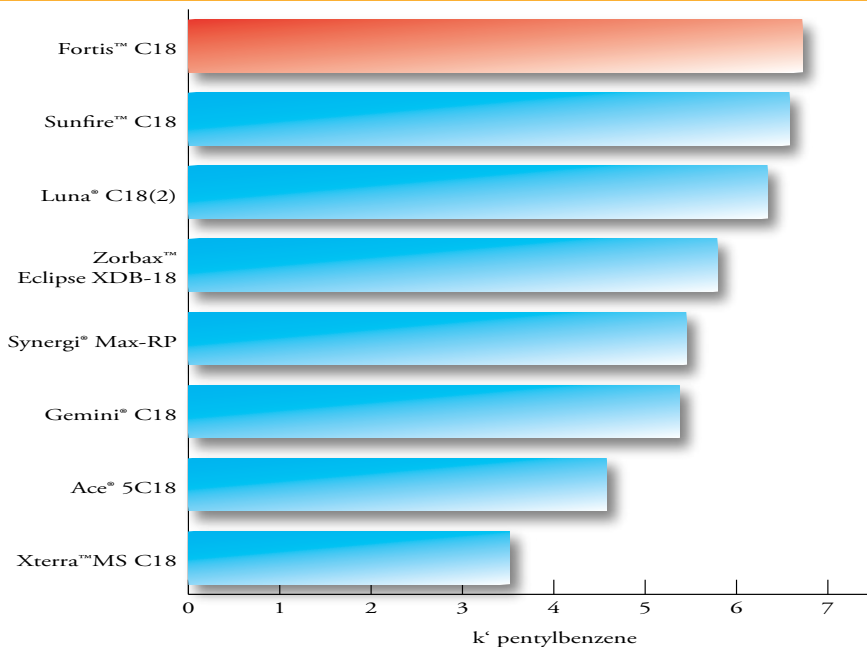
Fortis C18 high surface area combined with the optimised C18 ligand bonding provides high retention for compounds.

This is advantageous in a number of ways:

- Higher retention of analytes, more organic modifier can be used to elute, therefore greater MS sensitivity.

- Higher retention of analytes, more organic leads to shorter 'dry-down' in fraction collection.

- Higher retention of analytes, more chance of resolution



| Fortis C18 | Column Length | | | |
|-----------------|---------------|------------|------------|------------|
| | 50 | 100 | 150 | 250 |
| 2.1 | F18-0203xx | F18-0205xx | F18-0207xx | - |
| Column Diameter | 3.0 | F18-0303xx | F18-0305xx | F18-0307xx |
| | 4.6 | F18-0503xx | F18-0505xx | F18-0507xx |
| | | | | F18-0509xx |

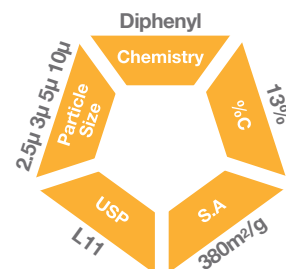
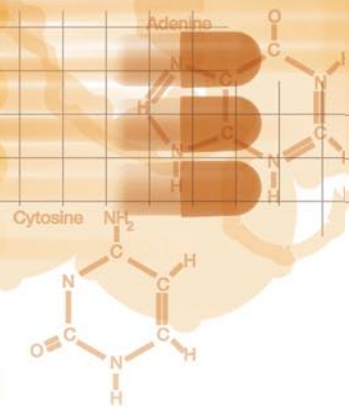
| Fortis C18 Guards | Length | |
|-------------------|--------|-------------|
| | 2.1 | 4.6 |
| Column Diameter | 10 | F18-0200xxG |
| | | F18-0500xxG |

Replace xx - 02 for 2.5µm - 03 for 3µm - 05 for 5µm - 10 for 10µm

Fortis Phenyl™

- Unique Selectivity
- Separate Positional Isomers
- No "MS bleed", stable hydrophobic ligand
- Enhanced Polar Retention

Fortis Phenyl is designed to provide characteristics which will enhance selectivity. It provides the analyst with extra retention of compounds containing aromatic functionality. Extra selectivity and retention can be found for polar substrates, along with metabolite profiling.

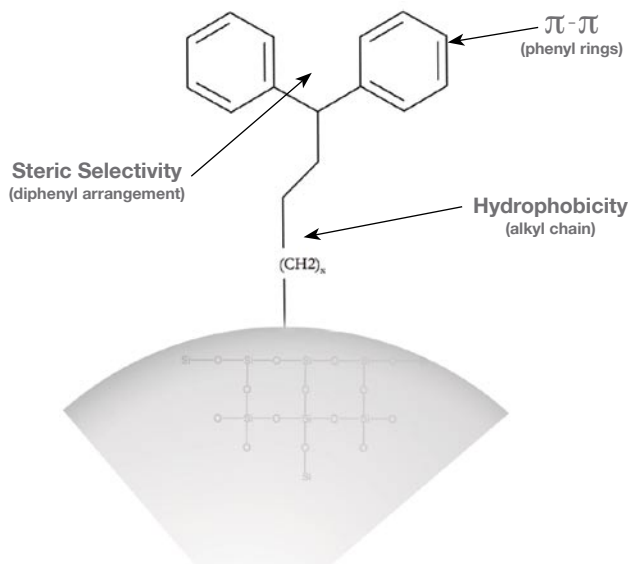


Unique Functionality

Fortis Phenyl is based upon a unique di-phenyl functionality. Three controlled mechanisms of interaction can occur.

This allows for unique resolution of closely related species, and metabolites. No complex mobile phases are necessary simplifying method development.

- π - π High Selectivity
- Resolution enhanced
- Sharp Peak Shapes
- Highly Stable phenyl ligand



Separate Positional Isomers

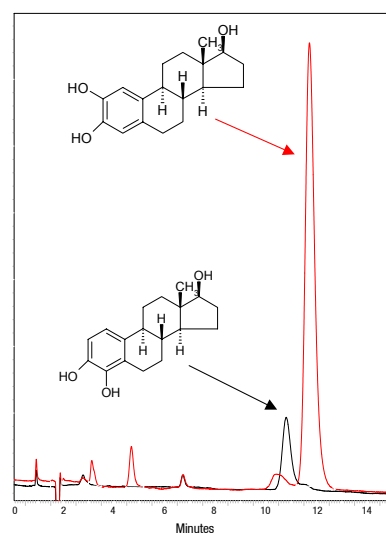
Selectivity of compounds normally difficult to resolve on a hydrophobic alkyl chain stationary phase is simplified by the π - π interactions provided by the phenyl functionality.

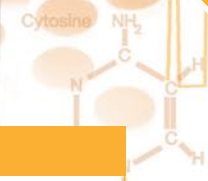
In this application two hydroxyestradiol steroids exhibit resolution from each other, which is not achievable on alkyl chain phases. No complex mobile phases are necessary.

- High Selectivity
- Resolution enhanced
- Sharp Peak Shapes

Column: Fortis Phenyl 150x4.6mm 5µ
p/n: FPH-050705
Mobile Phase: 40:60 H₂O : MeOH
Flow: 1ml/min
Temp: 20°C
Wavelength: 210nm

1. 4-Hydroxyestradiol (mw=288.38)
2. 2-Hydroxyestradiol (mw=288.38)





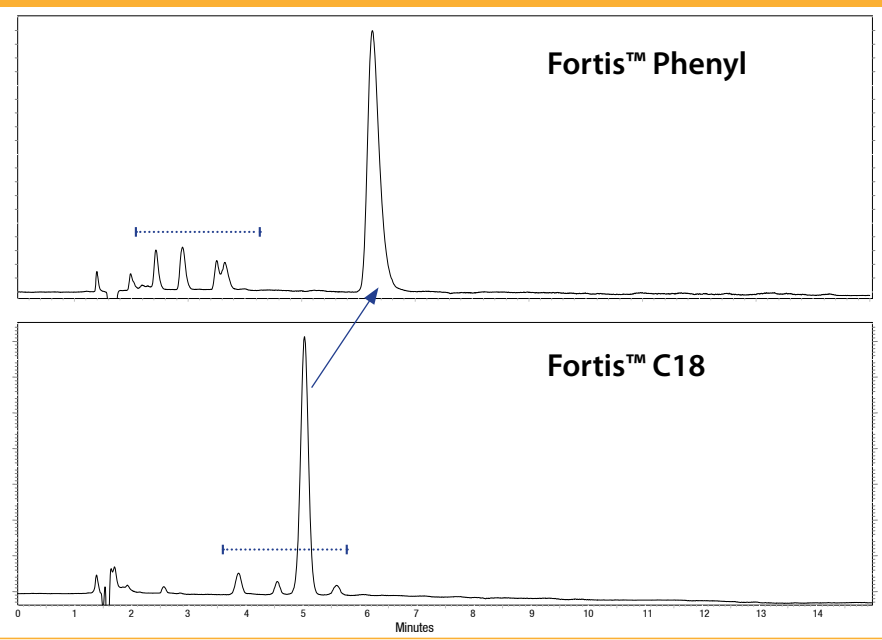
Di-phenyl vs C18

Selectivity of the Fortis di-phenyl is radically different to that of a C18 stationary phase.

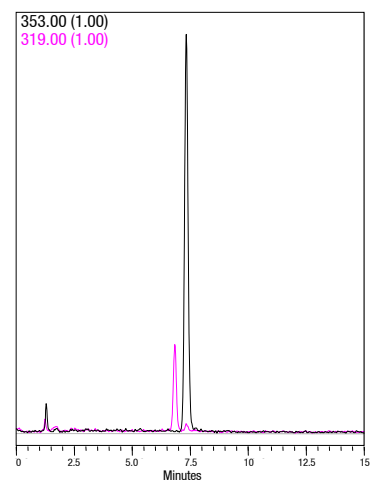
In this pharmaceutical mixture we can see an increase in retention of the parent drug, whilst the degradants are all eluted quickly, removing them from co-elution with the parent.

Selectivity such as this can be extremely useful, combined with the ability to separate closely related species such as metabolites and positional isomers.

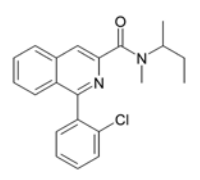
Data Courtesy of : Major Pharmaceutical company, USA



PET Tracer - PK11195



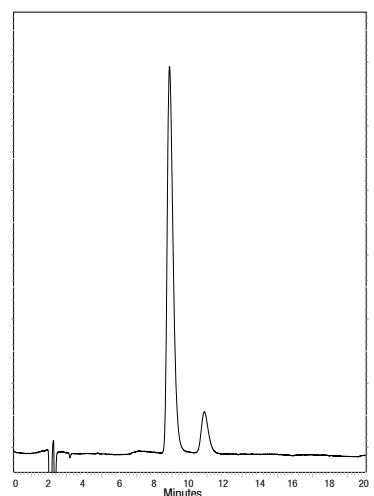
1. Dechlorinated PK11195
2. PK11195



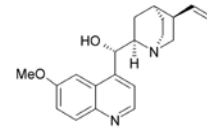
Column: Fortis Phenyl 150x4.6mm 5µ
p/n: FPH-050705
Mobile Phase: 40 : 60 H₂O : ACN
Flow: 1ml/min
Temp: 25°C
Wavelength: MS Detection

Data Courtesy of : Wolfson Molecular Imaging Centre

Antiarrhythmic



1. Quinidine
2. Dihydroquinidine



Column: Fortis Phenyl 150x4.6mm 5µ
p/n: FPH-050705
Mobile Phase: 70 : 30 H₂O + 0.1% formic acid MeOH
Flow: 1ml/min
Temp: 25°C
Wavelength: 235nm

| Fortis Phenyl | Column Length | | | |
|---------------|---------------|------------|------------|------------|
| | 50 | 100 | 150 | 250 |
| 2.1 | FPH-0203xx | FPH-0205xx | FPH-0207xx | - |
| 3.0 | FPH-0303xx | FPH-0305xx | FPH-0307xx | - |
| 4.6 | FPH-0503xx | FPH-0505xx | FPH-0507xx | FPH-0509xx |

| Fortis Phenyl Guards | | Length |
|----------------------|-----|-------------|
| | | 10 |
| Column Diameter | 2.1 | FPH-0200xxG |
| | 4.6 | FPH-0500xxG |

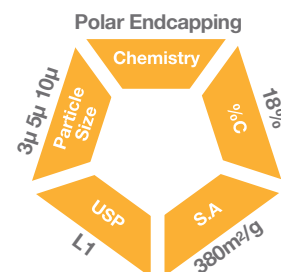
Replace xx - 02 for 2.5µm - 03 for 3µm - 05 for 5µm - 10 for 10µm



Fortis H2o™

- Retention of Polars
- Enhanced Resolution
- 100% Aqueous Compatible
- Fully Scalable

Fortis H2o is designed to aid in the separation and retention of polar analytes. Complex mobile phase systems can be bypassed if sufficient retention can be provided by the stationary phase chemistry. Fortis H2o is designed to supply additional interaction with polar molecules which allows their successful retention.



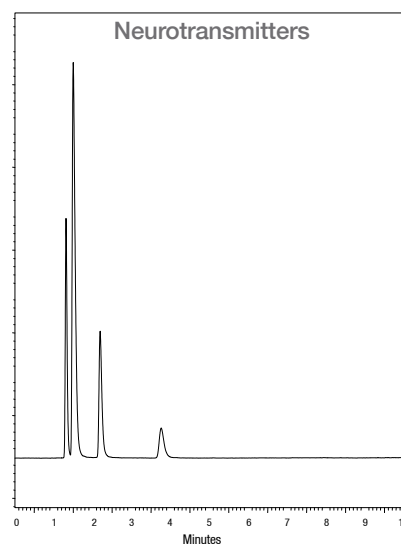
Retention of Polar analytes

Fortis H2o is optimised not only to help retain and resolve polar analytes, but also to be complimentary in resolution to Fortis C18.

- Hydrophilic as well as Hydrophobic interaction's
- Alternative Selectivity
- No MS bleed

Column : Fortis H2o 150x4.6mm 5µ
p/n : FHO-050705
Mobile Phase: H₂O + 0.1% Formic acid
Flow : 0.8ml/min
Temp : 20°C
Wavelength: 270nm

1. Dopamine
2. Serotonin
3. DOPAC
4. 5-HIAA

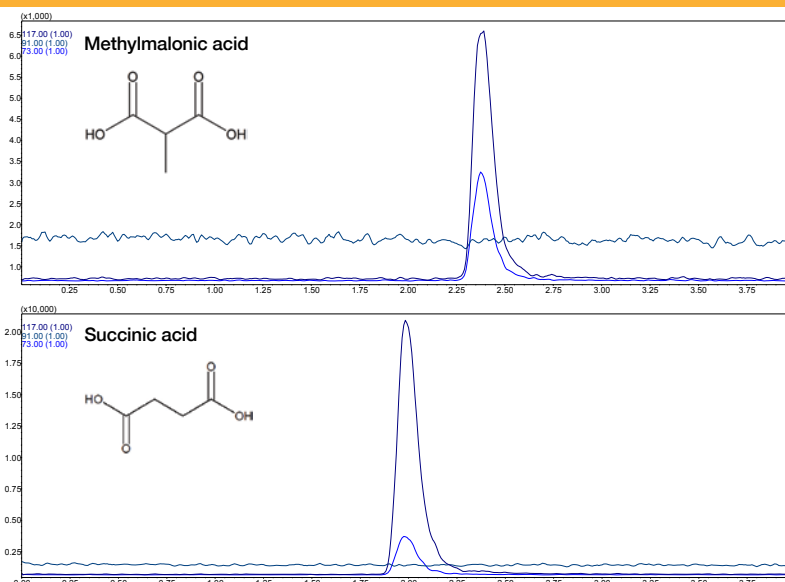


Alternative Selectivity - Organic acids

Fortis H2o's unique bonded character ensures that not only is reproducibility and robustness assured, but also that resolution is of the highest level.

Column: Fortis H2o 150x2.1mm 3µ
p/n: FHO-020703
Mobile Phase: 5mM Ammonium Formate + 0.5% Formic acid

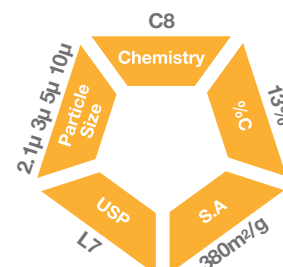
Flow: 0.4ml/min
Temp: 60°C
Wavelength: MS Detection



Fortis C8™

- Reduced Hydrophobicity over C18
- Excellent Peak Shapes
- Fully Scalable

Fortis C8 is designed to provide characteristics similar to Fortis C18 but specifically for situations where less hydrophobicity is required. The same gains in peak shape, efficiency, resolution and scalability are available providing increased productivity to the analyst.



Optimised Peak Shape

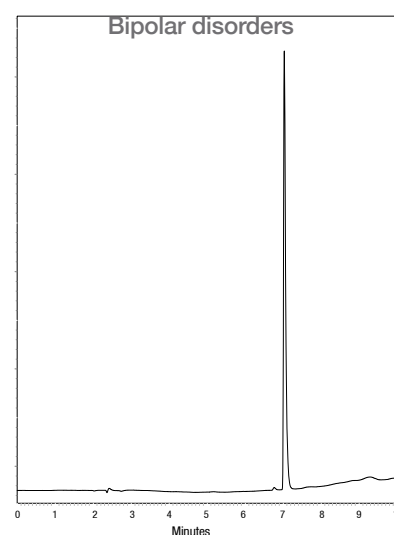
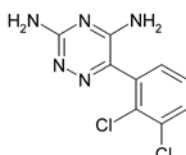
Fortis C8 is optimised to provide the best possible peak shapes and efficiency.

Basic, Acidic and Neutral analyte performance is first class.

- Higher Efficiencies
- Greater Reproducibility
- Symmetrical peak shapes
- Lower Hydrophobicity

Column: Fortis C8 150x4.6mm 5µ
p/n: F08-050705
Mobile Phase: A - H₂O + 0.1% Formic acid
 B - MeOH + 0.1% Formic acid
Gradient: 10 - 90% in 10min
Flow: 1ml/min
Temp: 25°C
Wavelength: 254nm

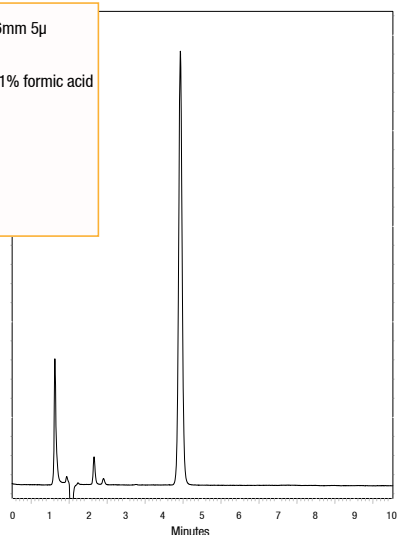
1. Lamotrigine



Anticonvulsant

Column: Fortis C8 150x4.6mm 5µ
p/n: F08-050705
Mobile Phase: 40 : 60 H₂O + 0.1% formic acid
 ACN
Flow: 1ml/min
Temp: 25°C
Wavelength: 220nm

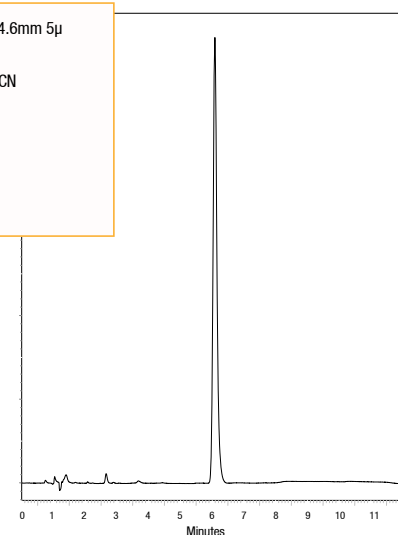
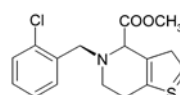
1. Valproate Semisodium



Antiplatelet

Column: Fortis C8 150x4.6mm 5µ
p/n: F08-050705
Mobile Phase: 25 : 75 H₂O : ACN
Flow: 1ml/min
Temp: 25°C
Wavelength: 254nm

1. Clopidogrel

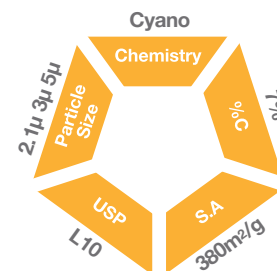


Fortis Cyano™

- Retention of Polars
- Alternative Selectivity
- Normal Phase or Reverse Phase system
- Rapid Equilibration

Fortis Cyano allows the use of aqueous reversed phase conditions to provide less retention for compounds too heavily retained on C18 functionality. However, it can also be used in normal phase solvent systems to retain and separate polar analyte species.

Cyano columns are particularly useful for polar species, Fortis Cyano is now also available in 2.1µm particle size for UHPLC work.



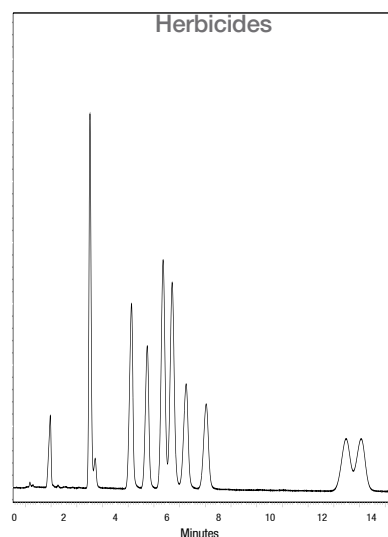
Herbicides

Fortis Cyano is optimised not only to help retain and resolve polar analytes, but also to be complimentary in resolution to other Fortis phases.

- Normal phase as well as Reversed phase use
- Alternative Selectivity
- Rapid Equilibration

Column : Fortis Cyano 50x2.1mm 3µ
p/n : FCN-020303
Mobile Phase: 80:20 H₂O : ACN + 0.2% Acetic acid
Flow : 0.2ml/min
Temp : 20°C
Wavelength: 280nm

1. Banvel
2. Int Std
3. 2,4-D
4. MCPA
5. PCOC
6. 2,4-DCP
7. 2,4-DP
8. CMPP
9. 2,4-DB
10. MCPB



To see more applications on Fortis Cyano turn to page 26. To learn more about Fortis Cyano 2.1µm see page 7.

| Fortis Cyano | Column Length | | | |
|--------------|---------------|------------|------------|------------|
| | 50 | 100 | 150 | 250 |
| 2.1 | FCN-0203xx | FCN-0205xx | FCN-0207xx | - |
| 3.0 | FCN-0303xx | FCN-0305xx | FCN-0307xx | - |
| 4.6 | FCN-0503xx | FCN-0505xx | FCN-0507xx | F18-0509xx |

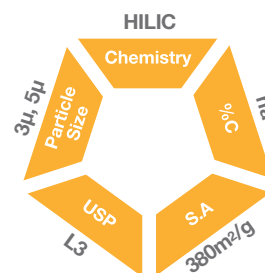
Replace xx - 02 for 2.1µm - 03 for 3µm - 05 for 5µm

| Fortis Cyano Guards | Length | |
|---------------------|-------------|-------------|
| | 2.1 | 4.6 |
| Column Diameter | FCN-0200xxG | FCN-0500xxG |

Fortis HILIC™

- Retention of Polars
- Increased MS sensitivity
- Alternate selectivity
- Reduced extraction (SPE) and dry down times.

Fortis HILIC (Hydrophilic Interaction Chromatography) is designed to aid in the separation and retention of very polar analytes. Extended retention is afforded by the partitioning, ion-exchange and hydrogen bonding that can occur on a HILIC stationary phase. Fortis HILIC can increase sensitivity in MS analysis and provide alternate selectivity to that achieved with reversed phase C18.



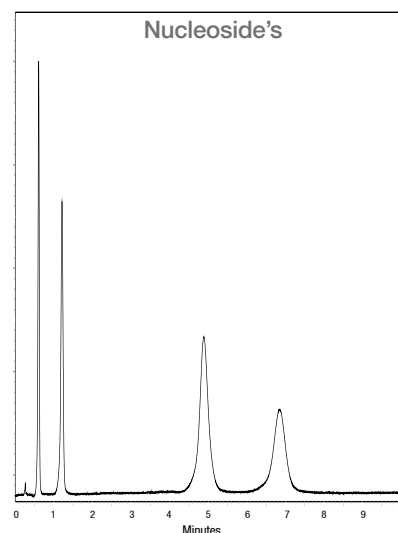
Nucleosides

Fortis HILIC is optimised to help retain and resolve polar analytes. By use of high concentrations of organic solvent polar analytes partition with the stationary phase.

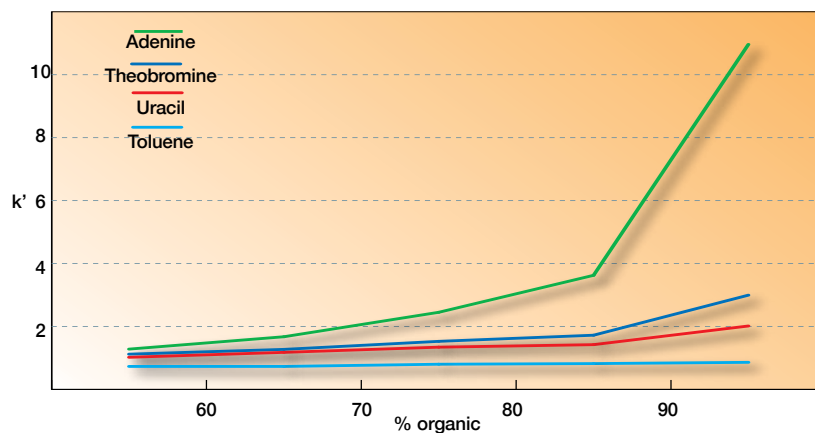
- Polar Retention
- Alternative Selectivity
- Rapid Equilibration

Column : Fortis HILIC 50x4.6mm 5µ
p/n : FHI-050305
Mobile Phase: 95:5 ACN : 100mM NH₃OAc
Flow : 1ml/min
Temp : 20°C
Wavelength: 254nm

1. Uracil
2. Uridine
3. Cytosine
4. Guanosine



Hydrophilic Interaction Chromatography (HILIC) works in a similar way to normal phase chromatography. A polar surface combined with a non-polar mobile phase, typically ACN, allows for partition of the polar analytes and hence retention and separation. Water is used in low concentration as the strong solvent in order to elute the compounds.



| Fortis HILIC | Column Length | | | |
|-----------------|---------------|------------|------------|------------|
| | 50 | 100 | 150 | 250 |
| | FHI-0203xx | FHI-0205xx | FHI-0207xx | - |
| Column Diameter | 3.0 | FHI-0303xx | FHI-0305xx | FHI-0307xx |
| | 4.6 | FHI-0503xx | FHI-0505xx | FHI-0507xx |
| | | | | FHI-0509xx |

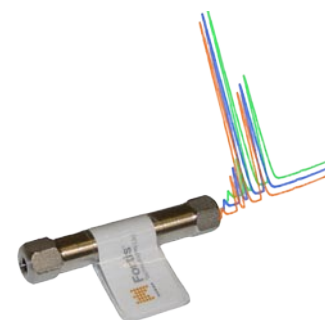
| Fortis HILIC Guards | Length | |
|---------------------|-------------|-------------|
| | 2.1 | 4.6 |
| Column Diameter | FHI-0200xxG | FHI-0500xxG |

Replace xx - 03 for 3µm - 05 for 5µm - 10 for 10µm

Fortis Pace™

- LC-MS Optimised Hardware
- 20mm and 30mm lengths
- High Throughput
- High Efficiency and Resolution

Fortis Pace™ columns are designed with High Throughput Screening (HTS) applications in mind. Optimised for use in LC-MS to provide greatest sensitivity by achieving sharp peak shapes combined with excellent resolution and retention. Any Fortis stationary phase can be supplied in this hardware.



Optimised Hardware

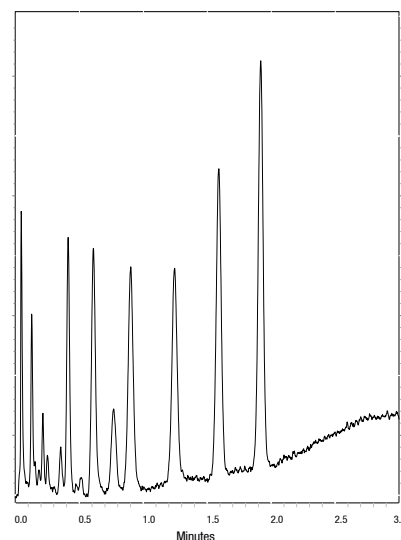
Fortis Pace column hardware is specifically designed for HTS, whether isocratic or by ballistic gradients.

Optimised packing density in this low volume hardware leads to ultra sharp peak shapes combined with maximum efficiency.

- Reduced peak widths
- Higher Efficiency
- Resolution enhanced

Column: Fortis Pace C18 30x2.1mm 5µ
p/n: F18-020205
Mobile Phase: A - H₂O + 0.1% Formic acid
 B - ACN + 0.1% Formic acid
Gradient: 60 - 90% in 2min
Flow: 1ml/min
Temp: 25°C
Wavelength: 254nm

1. Alkyl Benzenes



Complimentary Stationary Phases

Fortis stationary phases have been proven to exhibit excellent peak shapes and efficiency, packed in Pace hardware allows speed and resolution to be achieved without the need for UHPLC systems.

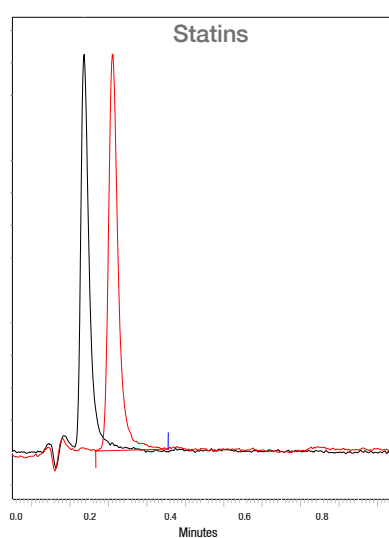
Providing highly retentive and selective phases allows strong retention properties, enabling high concentrations of organic modifier to be utilised optimising the MS ionisation process.

Gains are also made in:

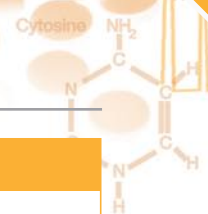
- Reduced analysis time
- Increased productivity
- Lower solvent consumption

Column: Fortis Pace C18 30x2.1mm 5µ
p/n: F18-020205
Mobile Phase: 75:25 H₂O:ACN + 0.1% Formic acid
Flow: 0.4ml/min
Temp: 25°C
Wavelength: 254nm

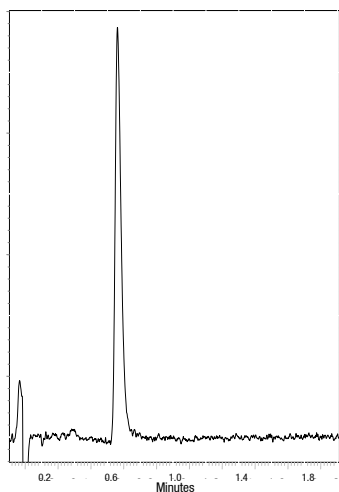
1. Rosuvastatin
 2. Atorvastatin



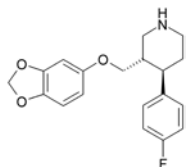
Applications



SSRI Antidepressant

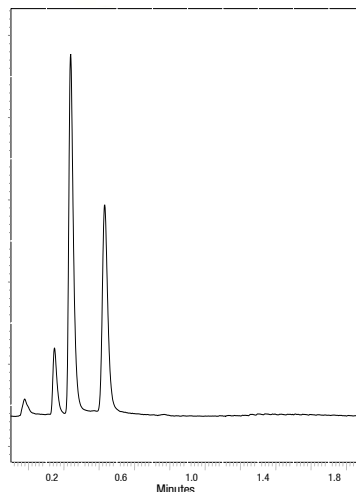


1. Paroxetine

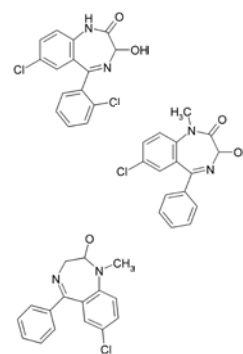


Column: Fortis Pace H2o 30x2.1mm 3µ
p/n: FHO-020203
Mobile Phase: 70:30 H₂O : ACN + 0.1% Formic acid
Flow: 0.6ml/min
Temp: 25°C
Wavelength: 200nm

Benzodiazepines

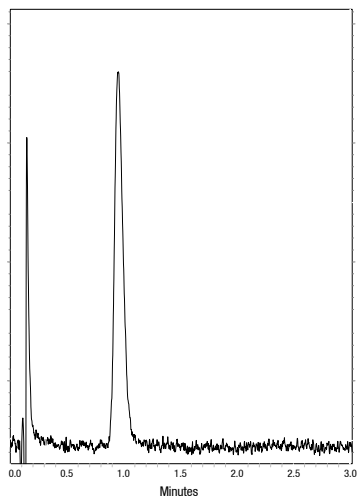


1. Lorazepam
 2. Temazepam
 3. Diazepam

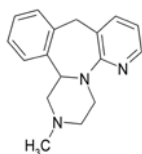


Column: Fortis Pace H2o 30x2.1mm 3µ
p/n: FHO-020203
Mobile Phase: 50:50 ACN : H₂O
Flow: 0.7ml/min
Temp: 25°C
Wavelength: 220nm

Antidepressant

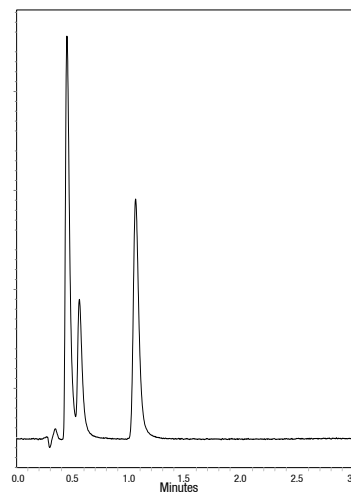


1. Mirtazapine

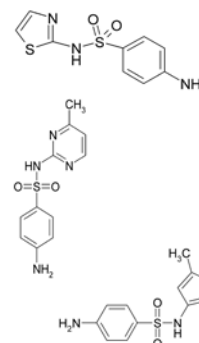


Column: Fortis Pace C18 30x2.1mm 5µ
p/n: F18-020205
Mobile Phase: 80:20 H₂O : MeOH + 0.1% Formic acid
Flow: 0.7ml/min
Temp: 25°C
Wavelength: 254nm

Sulfa Drugs



1. Sulfathiazole
 2. Sulfamerazine
 3. Sulfamethoxazole



Column: Fortis Pace H2o 30x2.1mm 3µ
p/n: FHO-020203
Mobile Phase: 70:30 H₂O : ACN + 0.1% Formic acid
Flow: 0.2ml/min
Temp: 25°C
Wavelength: 254nm

| Fortis Pace 3µ | Column Length | |
|-----------------|---------------|------------|
| | 20 | 30 |
| | 2.1 | Fxx-020103 |
| | | Fxx-020203 |
| Column Diameter | 3.0 | - |
| | | Fxx-030203 |
| | 4.6 | - |
| | | Fxx-050203 |

| Fortis Pace 5µ | Column Length | |
|-----------------|---------------|------------|
| | 20 | 30 |
| | 2.1 | Fxx-020105 |
| | | Fxx-020205 |
| Column Diameter | 3.0 | - |
| | | Fxx-030205 |
| | 4.6 | - |
| | | Fxx-050205 |

Replace xx with: 18 for Fortis C18; OH for Fortis H2o; PH for Fortis Phenyl; 08 for Fortis C8; CN for Fortis Cyano;

Fortis Prep™

- 5µm and 10µm particles
- High Loadability
- Optimised Packing Efficiency
- Narrow peak profile, High Efficiency and Resolution

Fortis Prep columns are designed for high sample loading, high throughput applications. The optimised packed bed (OPB) process ensures excellent peak shapes and efficiency, whilst the lifetime of the column is increased.



Columns & Bulk

Fortis Prep columns come in sizes from 30mm to 250mm in length and from 10mm in diameter all the way up to 50mm (2" i.d.).

Pre-packed columns are advised for < 2" i.d. after this Bulk material can be supplied for those wishing to pack DAC (Dynamic Axial Compression) columns.

If preparative columns are packed with the identical media to their analytical counterpart then the ability to scale up with the theoretical calculations will be accurate.

- 10mm, 21.2mm, 30mm and 50mm i.d.
- 5µm and 10µm particles
- 100g to multi Kg bulk available

Contact us for more information on availability of prep options/bulk packings, or to discuss your application and the ability to scale up. Our technical experts will be happy to discuss your needs with you.



Filter & Guard Options

- Guard system for all 3µm, 5µm and 10µm phases
- Low volume in-line filters for LC and UHPLC
- Maintain chromatographic integrity

Fortis Guards and filters are designed to ensure that erroneous materials do not find their way onto the more important and expensive analytical column. Guards are available in sizes to match all analytical and preparative column dimensions. Filters are particularly suitable for short fast LC/MS (Pace™) columns and UHPLC columns.



- Guard system for all 3µm, 5µm and 10µm phases
- Quick replacement cartridges
- Highly Cost Effective



- Preparative guard system 10mm & 21.2mm
- Quick replacement cartridges
- Highly Cost Effective



- Filter for all LC columns
- Low volume in-line filters
- Change over time - seconds not minutes

Fortis in-line filters are fingertight direct connect design, fitting in between the column and the conventional peek fitting to filter out particulate matter, it contains low dead volume and pressure. In-line filters are ideal for very short fast columns such as Fortis Pace™ LC/MS columns where extra packed bed from a guard would be detrimental.

In-line filters are also available in UHPLC format, capable of withstanding the elevated pressures involved.

| 3µm Fortis C18 Cartridges | |
|---------------------------|----------------------------------|
| F18-040003G/2 | 10x4mm Fortis C18 3µm Guard pk 2 |
| F18-040003G/4 | 10x4mm Fortis C18 3µm Guard pk 4 |
| F18-020003G/2 | 10x2mm Fortis C18 3µm Guard pk 2 |
| F18-020003G/4 | 10x2mm Fortis C18 3µm Guard pk 4 |

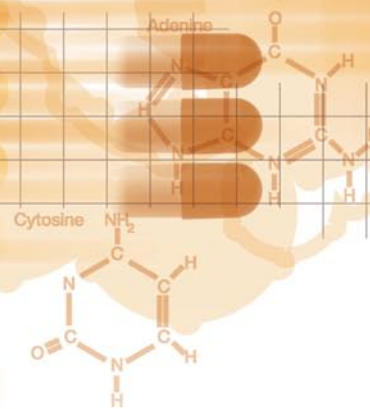
| 5µm Fortis C18 Cartridges | |
|---------------------------|----------------------------------|
| F18-040005G/2 | 10x4mm Fortis C18 5µm Guard pk 2 |
| F18-040005G/4 | 10x4mm Fortis C18 5µm Guard pk 4 |
| F18-020005G/2 | 10x2mm Fortis C18 5µm Guard pk 2 |
| F18-020005G/4 | 10x2mm Fortis C18 5µm Guard pk 4 |

| In-line Filters | |
|-----------------|---------------------------|
| 2-SAV5 | 2µm In-line filter pk 5 |
| 2-SAV10 | 2µm In-line filter pk 10 |
| UHPSAV2 | UHPLC In-line filter pk 2 |
| UHPSAV4 | UHPLC In-line filter pk 4 |

QC Reproducibility

- Robust column bondings
- Assured Peak shapes
- 20% lower asymmetry specification
- 10% Higher Efficiency

Fortis HPLC columns are tested using the industries most rigorous QC test, utilising basic analyte probes as well as neutral efficiency markers ensures that the column reproducibility is first class. Fortis columns are also subject to a 20% lower peak shape specification than other manufacturers columns.



QC Test

Fortis stationary phases have been proven to exhibit excellent peak shapes and efficiency for the full range of analyte species.

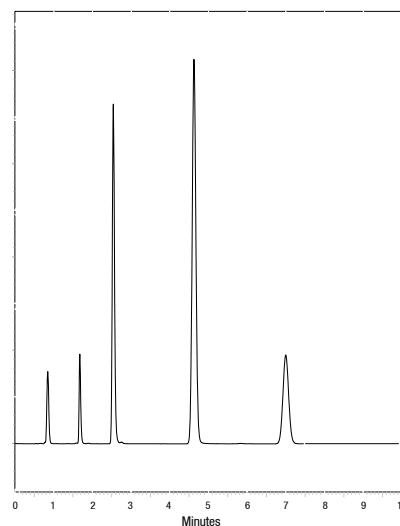
By employing a QC mix that accurately probes silanol activity (the measure of good peak shape) the analyst can be assured of quality time and time again.

Gains are also made in:

- Sample carry over
- Increased Resolution
- Increased Sensitivity

Column: Fortis C18 100x4.6mm 5 μ
p/n: F18-050505
Mobile Phase: 60:40 ACN:H₂O
Flow: 1.0ml/min
Temp: 25°C
Wavelength: 254nm

1. Uracil
2. Phenol
3. 4-Ethylaniline
4. N,N-Dimethylaniline
5. Napthalene

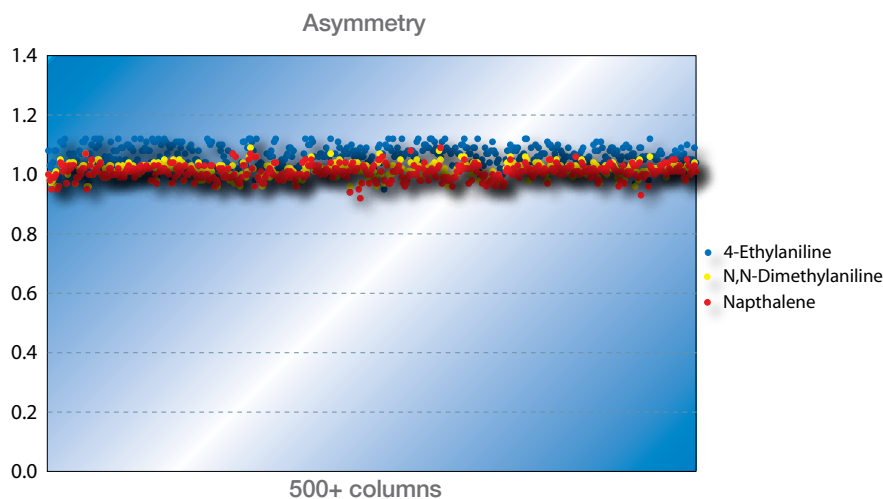


Column Asymmetry Reproducibility

Fortis columns are subject to tight specification using basic analytes in an unbuffered mobile phase system.

If there were residual uncovered hydroxyl groups present then these basic probes would highlight this fact.

Fortis Technologies unique bondings combined with the ultra pure silica matrix ensure that the peak shapes achieved are first class.



Applications



Casein Tryptic Digest

Column: 2.1µm Fortis C18(2) 100x2.1mm

p/n: F28-020502

Mobile Phase: A - H₂O + 0.1% Formic acid
B - ACN + 0.1% Formic acid

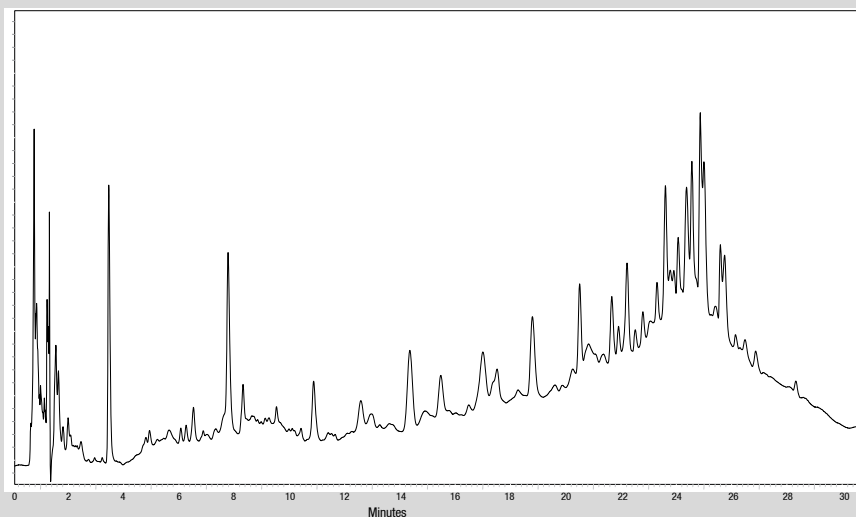
Gradient: 0min 5% B
5min 5% B
30min 20% B
35min 50% B

Flow: 0.25 ml/min

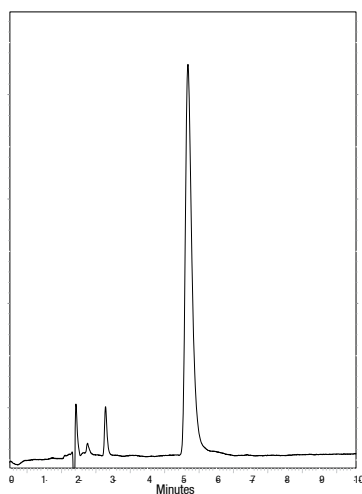
Temp: 35°C

Wavelength: 200nm

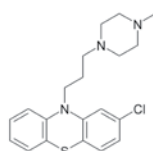
1. Casein



Antipsychotic



1. Prochlorperazine Maleate



Column: Fortis Phenyl 150x4.6mm 5µ

p/n: FPH-050705

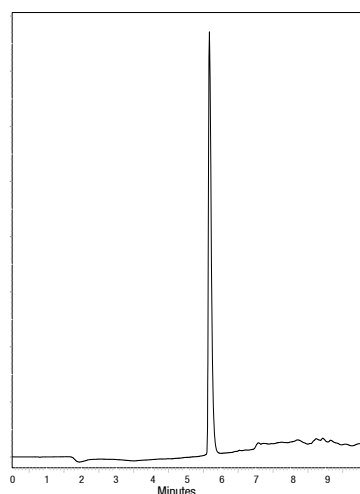
Mobile Phase: 35:65 H₂O + 0.1% Formic acid
: MeOH

Flow: 1ml/min

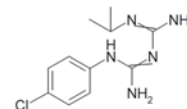
Temp: 25°C

Wavelength: 254nm

Antimalarial



1. Proguanil



Column: Fortis Phenyl 50x4.6mm 5µ

p/n: FPH-050305

Mobile Phase: A: H₂O + 0.1% formic acid
B: MeOH + 0.1% formic acid

Gradient: 10 - 90% in 10mins

Flow: 1ml/min

Temp: 25°C

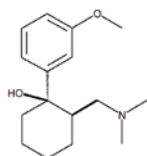
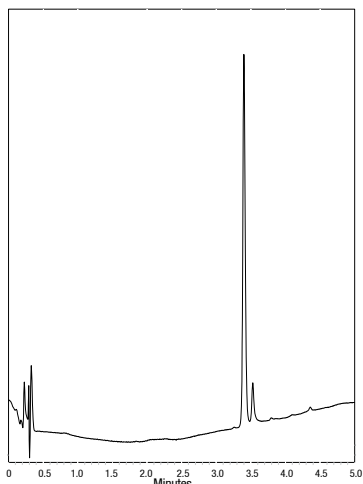
Wavelength: 254nm

Applications



Opioid analgesic

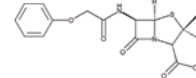
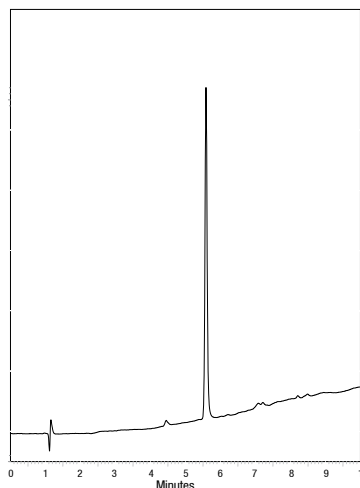
1. Tramadol



Column: Fortis C18 50x2.1mm 5µ
p/n: F18-020305
Mobile Phase: A: H₂O + 0.1% NH₃
 B: ACN + 0.1% NH₃
Gradient: 10 - 100% in 5mins
Flow: 0.2ml/min
Temp: Ambient
Wavelength: 220nm

Antibiotic

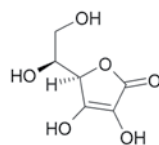
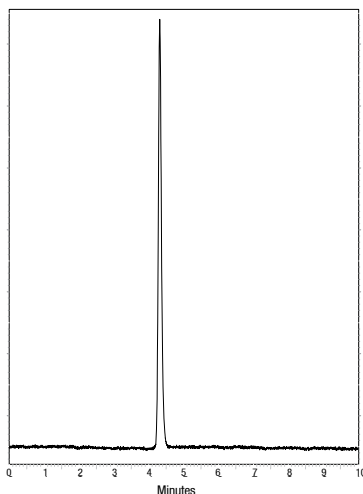
1. Phenoxymethylpenicillin



Column: Fortis C18 50x4.6mm 5µ
p/n: F18-050305
Mobile Phase: A: H₂O + 0.1% formic acid
 B: ACN + 0.1% formic acid
Gradient: 10 - 100% in 10mins
Flow: 1ml/min
Temp: 25°C
Wavelength: 254nm

Vitamin

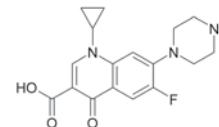
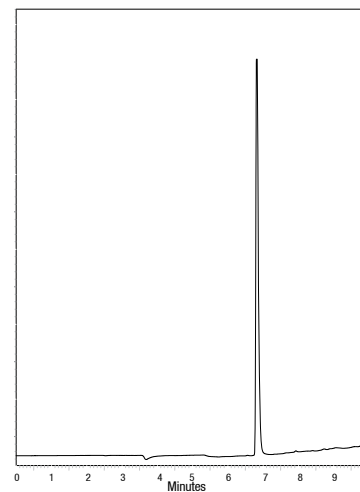
1. Vitamin C



Column: Fortis Phenyl 150x4.6mm 5µ
p/n: FPH-050705
Mobile Phase: 100% H₂O + 0.1% Formic acid
Flow: 0.8ml/min
Temp: 25°C
Wavelength: 254nm

Antibiotic

1. Ciprofloxacin

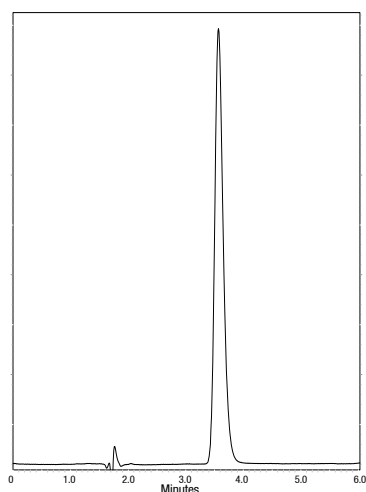


Column: Fortis Phenyl 150x4.6mm 5µ
p/n: FPH-050705
Mobile Phase: A: H₂O + 0.1% formic acid
 B: MeOH + 0.1% formic acid
Gradient: 10 - 90% in 10mins
Flow: 1ml/min
Temp: 25°C
Wavelength: 254nm

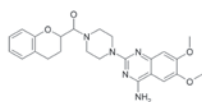
Applications



Adrenergic alpha-antagonist

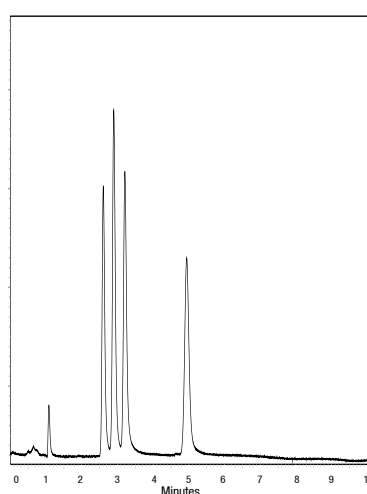


1. Doxazosin



Column: Fortis Phenyl 150x4.6mm 5µ
p/n: FPH-050705
Mobile Phase: 30:60 H₂O + 0.1% Formic acid : MeOH
Flow: 1ml/min
Temp: 25°C
Wavelength: 254nm

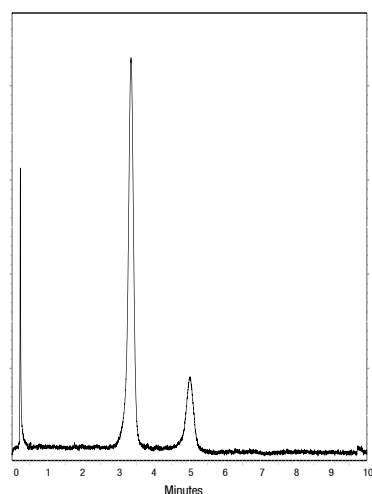
Explosives



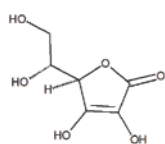
1. 4-Nitroaniline
 2. 2-Nitroaniline
 3. Nitrobenzene
 4. 2,6-Dinitrotoluene

Column: Fortis Cyano 50x2.1mm 3µ
p/n: FCN-020303
Mobile Phase: A: 80:20 H₂O : MeOH
 B: ACN
 90 : 10 Isocratic
Flow: 0.2ml/min
Temp: Ambient
Wavelength: 254nm

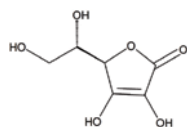
Stereoisomers



1. Isoascorbic acid

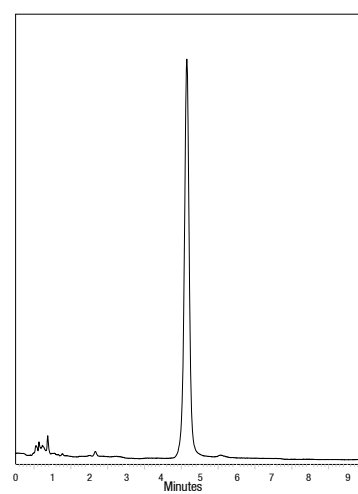


2. Ascorbic acid

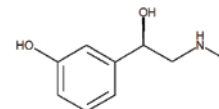


Column: Fortis HILIC 50x4.6mm 5µ
p/n: FHI-050305
Mobile Phase: 90 : 10 ACN : NH₃OAc
Flow: 1ml/min
Temp: 25°C
Wavelength: 254nm

Decongestant



1. Phenylephrine

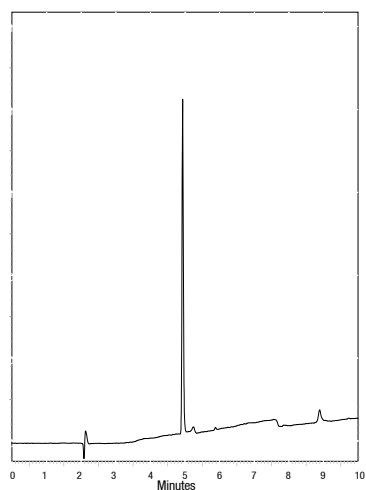


Column: Fortis C18 100x4.6mm 3µ
p/n: F18-050503
Mobile Phase: 90 : 10 H₂O : MeOH + 0.1% NH₃
Flow: 1.2ml/min
Temp: 25°C
Wavelength: 210nm

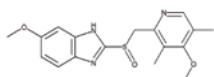
Applications



Proton Pump Inhibitor

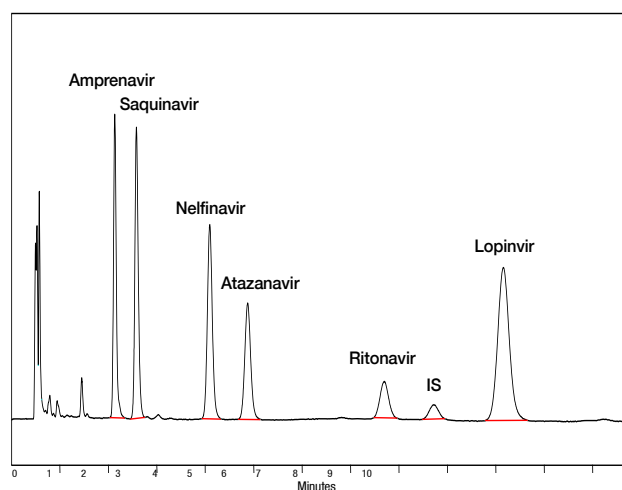


1. Omeprazole



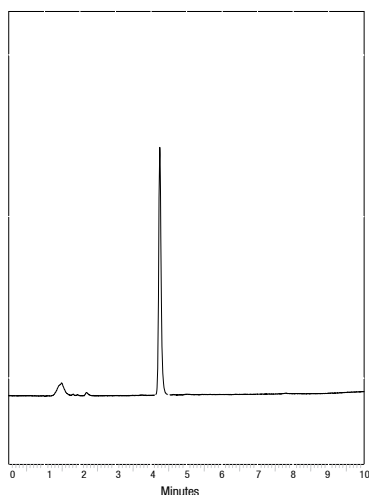
Column: Fortis C18 100x4.6mm 3μ
p/n: F18-050503
Mobile Phase: A: H₂O + 0.1% Formic acid
 B: ACN + 0.1% Formic acid
Gradient: 10 - 100% in 10mins
Flow: 1.0ml/min
Temp: 25°C
Wavelength: 254nm

Antiretroviral - HIV

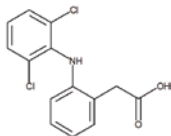


Column: Fortis C18 150x4.6mm 5μ
p/n: F18-050705
Mobile Phase: A: H₂O + Buffer
 B: MeOH + ACN
Flow: 1.0ml/min
Temp: 25°C
Wavelength: 215nm

Non Steroid Anti-Inflammatory

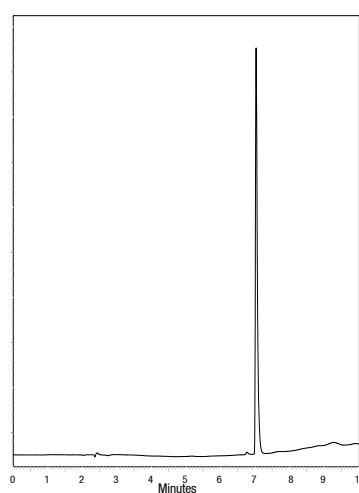


1. Diclofenac Sodium

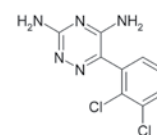


Column: Fortis C18 100x4.6mm 5μ
p/n: F18-050505
Mobile Phase: A: H₂O + 0.1% Formic acid
 B: ACN + 0.1% Formic acid
Gradient: 50 - 100% in 10mins
Flow: 1.0ml/min
Temp: Ambient
Wavelength: 254nm

Anticonvulsant



1. Lamotrigine



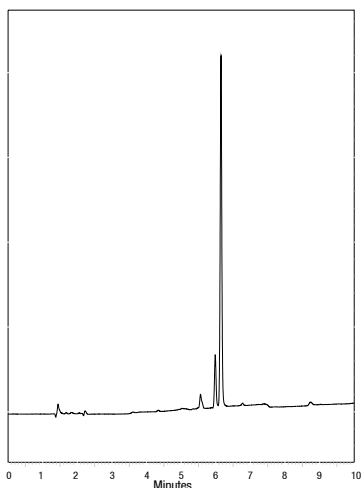
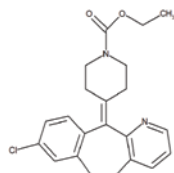
Column: Fortis C8 150x4.6mm 5μ
p/n: F08-050705
Mobile Phase: A: H₂O + 0.1% formic acid
 B: MeOH + 0.1% formic acid
Gradient: 10 - 90% in 10mins
Flow: 1.0ml/min
Temp: 25°C
Wavelength: 254nm

Applications



Antihistamine

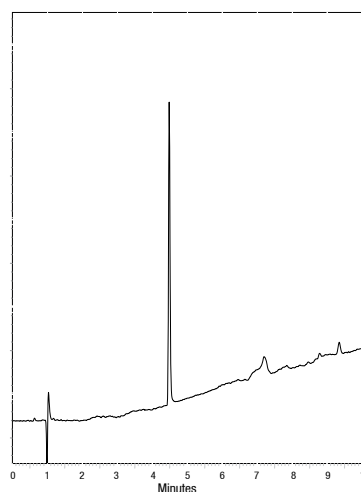
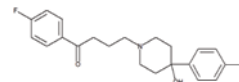
1. Loratadine



Column: Fortis C18 100x4.6mm 5µ
p/n: F18-050505
Mobile Phase: A: H₂O + 0.1% Formic acid
 B: ACN + 0.1% Formic acid
Gradient: 10 - 100% in 10mins
Flow: 1.0ml/min
Temp: 22°C
Wavelength: 254nm

Antipsychotic

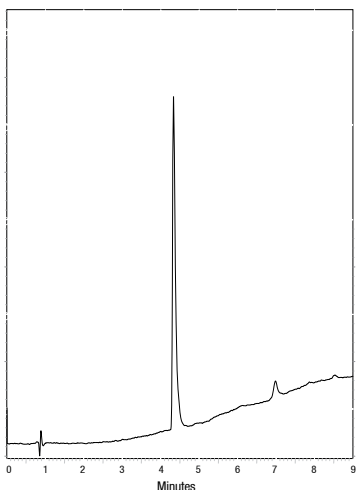
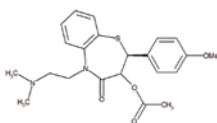
1. Haloperidol



Column: Fortis C18 50x4.6mm 5µ
p/n: F18-050305
Mobile Phase: A: H₂O + 0.1% formic acid
 B: ACN + 0.1% formic acid
Gradient: 10 - 100% in 5mins
Flow: 1.0ml/min
Temp: 25°C
Wavelength: 254nm

Hypertension

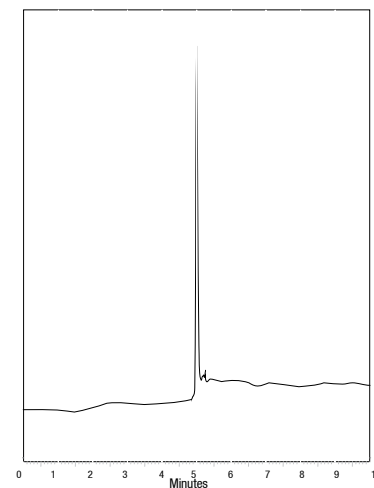
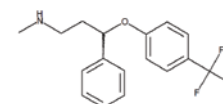
1. Diltiazem



Column: Fortis H2o 50x4.6mm 5µ
p/n: FHO-050305
Mobile Phase: A: H₂O + 0.1% formic acid
 B: ACN + 0.1% formic acid
Gradient: 10 - 100% in 10mins
Flow: 1.0ml/min
Temp: 25°C
Wavelength: 254nm

Antidepressant

1. Fluoxetine



Column: Fortis C18 50x4.6mm 3µ
p/n: F18-050303
Mobile Phase: A: H₂O + 0.1% formic acid
 B: ACN + 0.1% formic acid
Gradient: 10 - 100% in 10mins
Flow: 1.0ml/min
Temp: 20°C
Wavelength: 254nm

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For more information VISIT :
www.fortis-technologies.com

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