# Hichrom Limited

Experts in Chromatography

## CHROMATOGRAPHY RANGES ACQUIRED FROM GRACE

Manufactured by Hichrom in the UK

**Vydac | Alltima | Alltima HP | Apex | Apollo | Allsep | Genesis | Prevail**

# HICHROM LIMITED

## Experts in Chromatography

Hichrom aims to supply the highest quality HPLC columns and consumable products to the chromatography industry. The high quality of our service extends not only to the product itself, but our technical consultancy and after-sales service. We aspire to achieve complete customer satisfaction and make a meaningful contribution to the future of the life science and related chemical industries.

Based in the UK and founded in 1978, Hichrom (a VWR company since 2015) is dedicated to supplying the highest quality HPLC/UHPLC columns and other chromatography products to the scientific community. As a global leader in liquid chromatography column manufacturing, we have gained an unrivalled reputation for high quality, competitively priced products, and fast delivery – backed up by expert technical support and after-sales service.

Our extensive worldwide network of distributors supplies Hichrom columns to over 100 countries.

We are excited to combine our considerable manufacturing experience with the technical expertise we have honed through our years of distributing these product ranges. We aim to provide our customers with an unprecedented high quality of service when aiding them with their separations.


### VYDAC®, ALLTIMA®, ALLTIMA® HP, PREVAIL™, APOLLO™, ALLSEP®, APEX™, and GENESIS™ HPLC Column Ranges Acquired by Hichrom Limited

Dear Customer,

Hichrom Limited are pleased to announce we have acquired the worldwide exclusive rights to manufacture Vydac®, Alltima®, Alltima® HP, Prevail™, Apollo™, Allsep®, Apex™, and Genesis™ analytical HPLC column ranges from Grace.

Based in the UK, Hichrom are a leading European manufacturer and distributor of UHPLC and HPLC columns, consumables and media, with manufacturing facilities accredited to both ISO9001 (Quality) and ISO14001 (Environmental) standards.

Hichrom have now commenced manufacture of these columns to the same exacting manufacturing protocols and to identical specifications previously used by Grace/Alltech. Part numbers also remain unaffected by the acquisition.

Under the terms of the acquisition, the complete range of these products are now exclusively available from Hichrom and our global distributor network, and are no longer available directly from Grace.

For further information or assistance, please contact Hichrom directly by one of the following options:

**Phone:** +44 (0) 118 930 3660
**Fax:** +44 (0) 118 932 3484
**Email:** sales@hichrom.co.uk
**Web:** www.hichrom.co.uk

## Hichrom-manufactured columns

### High quality. Assured.

We guarantee that any HPLC/UHPLC columns manufactured by Hichrom will be of the highest quality. All Hichrom manufactured goods are under warranty against defects in material or workmanship. We will promptly replace any such goods unless the defects are attributed to customer misuse.

Hichrom aims to supply the highest quality products in the chromatography industry. Since 1995, Hichrom has been an ISO9001 accredited company. Each column is supplied with documentation enabling a full audit trail to be performed from the point of manufacture to the point of use.

### Reproducible. Reliable.

By purchasing raw materials in as large a batch as possible and checking selectively where appropriate, Hichrom endeavours to minimise batch variation, enabling your chromatography to be reproducible and reliable. We are also happy to supply columns from customer specified batches of packing material.

### Green. Responsible.

We also aim to minimise our impact on the environment. Hichrom was the first chromatography company to become an ISO14001 accredited company in 1996.

### Technical Support Services

Hichrom offers a range of high quality technical support services for free, delivered by our experienced and knowledgeable team, including:

- Column selection guidance
- Column lifetime advice
- Application support – including examples from our extensive applications database
- Method development and optimization strategy
- Batch reservation service

For more information on the services we can offer, please contact technical@hichrom.co.uk and we will be happy to help!

Experts in Chromatography

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For information on any product not mentioned above or for application advice and guidance, please contact our experienced and knowledgeable technical team at **technical@hichrom.co.uk** or **+44 (0)118 930 3660**.

# USP Listings

The following list of USP (United States Pharmacopoeia) column specifications includes the recommended columns contained in this catalogue within each category. Please contact us for advice on column selection by USP specification.

| USP Code | Definition | Columns | |
|---|---|---|---|
| L1 | Octadecylsilane chemically bonded to porous or non-porous silica or ceramic micro-particles, 1.5 to 10 µm in diameter, or a monolithic rod | Alltima C18<br>Alltima C18-LL<br>Alltima HP C18<br>Alltima HP C18-EPS<br>Alltima HP C18-AQ<br>Alltima HP C18-Amide<br>Alltima HP C18-HiLoad<br>Apex ODS<br>Apollo C18<br>Genesis AQ<br>Genesis C18 | Prevail C18<br>Prevail C18-Select<br>Vydac 218TP<br>Vydac 238TP<br>Vydac 201TP<br>Vydac 202TP<br>Vyadc 218MS<br>Vydac 238MS<br>Vydac Denali 238DE<br>Vydac Everest 238EV |
| L3 | Porous silica particles, 1.5 to 10 µm in diameter, or a monolithic silica rod | Alltima Silica<br>Alltima HP Silica<br>Alltima HP HILIC<br>Apex Silica | Apollo Silica<br>Genesis Silica<br>Prevail Silica |
| L7 | Octylsilane chemically bonded to totally or superficially porous silica particles, 1.5 to 10 µm in diameter, or a monolithic silica rod | Alltima C8<br>Alltima HP C8<br>Apollo C8<br>Genesis C8 | Genesis C8EC<br>Prevail C8<br>Vydac 208TP<br>Vydac 208MS |
| L8 | An essentially monomolecular layer of aminopropylsilane chemically bonded to totally porous silica gel support, 1.5 to 10 µm in diameter, or a monolithic silica rod | Alltima Amino<br>Apex II Amino | Prevail Amino |
| L10 | Nitrile groups chemically bonded to porous silica particles, 1.5 to 10 µm in diameter, or a monolithic silica rod | Alltima Cyano<br>Alltima HP Cyano | Genesis Cyano<br>Prevail Cyano |
| L11 | Phenyl groups chemically bonded to porous silica particles, 1.5 to 10 µm in diameter, or a monolithic silica rod | Alltima Phenyl<br>Apollo Phenyl<br>Genesis Phenyl | Prevail Phenyl<br>Vydac 219TP |
| L17 | Strong cation-exchange resin consisting of sulfonated cross-linked styrene-divinylbenzene copolymer in the hydrogen form, 6 to 12 µm in diameter | Organic Acid OA-1000<br>Organic Acid OA-2000 | Organic Acid IOA-1000<br>Organic Acid IOA-2000 |
| L19 | Strong cation-exchange resin consisting of sulfonated cross-linked styrene-divinylbenzene copolymer in the calcium form, 5 – 15 µm in diameter | Carbohydrate Cation | |
| L22 | A cation-exchange resin made of porous polystyrene gel with sulfonic acid groups, 5 – 15 µm in diameter | Anion Exclusion | |
| L23 | An anion-exchange resin made of porous polymethacrylate or polyacrylate gel with quaternary ammonium groups, 7 - 12 µm in diameter | Allsep Anion | |
| L26 | Butyl silane chemically bonded to totally porous or superficially porous silica particles, 1.5 to 10 µm in diameter | Vydac 214TP<br>Vydac 214ATP | Vydac 214MS |

Please contact **technical@hichrom.co.uk** for advice on column selection from EP (European Pharmacopoeia) and JP (Japanese Pharmacopoeia) guidelines, or by application.

# Alltima

The Alltima HPLC column range was developed by Alltech. Hichrom acquired the entire range from Grace. Alltima phases are acid and base-deactivated, giving excellent peak shape for acids, bases, and neutrals in a single run. Polymerically bonded and double-endcapped for long column lifetimes, Alltima columns are great general purpose "workhorse" columns.

## Key Features

- Base deactivated silica
- Stable bonding for long column lifetime
- Symmetrical peak shape

## Alltima Phase Specifications

| Phase | Particle size / µm | Endcapped? | Properties | Applications | USP Code |
|---|---|---|---|---|---|
| C18 | 3, 5, 10 | Yes | Classic reversed-phase retention and selectivity | High quality hydrophobic general purpose C18 | L1 |
| C18-LL | 5 | Yes | Lower carbon load than traditional Alltima C18 | Reversed-phase applications that require a less hydrophobic C18 phase | L1 |
| C8 | 3, 5 | Yes | Lower retention compared to C18 phases | Reversed-phase applications where C18 is too retentive | L7 |
| Amino | 3, 5 | No | General purpose amino suitable for normal or reversed-phase use | Use for carbohydrate analysis or as a weak anion exchanger | L8 |
| Cyano | 3, 5 | Yes | General purpose cyano suitable for normal or reversed-phase use | Rugged normal-phase applications | L10 |
| Phenyl | 3, 5 | Yes | Less hydrophobic than C18 phase | Selective to aromatic compounds | L11 |
| Silica | 3, 5, 10 | - | Highly polar phase | General purpose normal phase applications | L3 |

# Ordering Information

## Analytical Columns

### 3 µm

| Length / mm | 20 | | 50 | | 100 | | |
|---|---|---|---|---|---|---|---|
| i.d. / mm | 2.1 | 4.6 | 2.1 | 4.6 | 1.0 | 2.1 | 4.6 |
| C18 | 43803 | 43851 | 88353 | 81412 | 43853 | 88352 | 81382 |
| C8 | - | - | - | 81413 | - | - | 81392 |
| Amino | - | - | - | 81180 | - | - | 81183 |
| Cyano | - | - | - | 81179 | - | - | 81182 |
| Phenyl | - | - | - | 81178 | - | - | 81181 |
| Silica | - | - | - | 81414 | - | - | 81404 |

| Length / mm | 150 | | | 250 | Guard cartridges (3/pk)[1] |
|---|---|---|---|---|---|
| i.d. / mm | 2.1 | 3.0 | 4.6 | 4.6 | For 2.1 |
| C18 | 43852 | 81143 | 81387 | AL-3C18-25046 | 96681/N |
| C8 | - | - | 81397 | - | - |
| Amino | AL-3NH-150DK[2] | - | 81190 | - | - |
| Cyano | - | - | 81189 | - | - |
| Phenyl | 43813 | - | 81188 | - | - |
| Silica | 43884 | - | 81409 | - | - |

[1]To be used with All-Guard cartridge holder (80101/N) and column coupler for All-Guard cartridges (HI-081). [2]Actual dimensions: 150 x 2.0 mm

### 3 µm – Columns Compatible with Waters Instruments

| Length / mm | 100 | 150 |
|---|---|---|
| i.d. / mm | 4.6 | 4.6 |
| C18 | 81383 | 81388 |
| C8 | 81393 | 81398 |
| Silica | 81405 | 81410 |

### 3 µm – Rocket Columns

Rocket columns are specifically designed for high-throughput and high-speed methods.

| Length / mm | 33 | 53 |
|---|---|---|
| i.d. / mm | 7 | 7 |
| C18 | 50603 | 50605 |
| C8 | – | 50609 |
| Phenyl | – | 43867 |
| Silica | – | 43877 |

**Column:** Alltima C8, 5 µm, 150 x 4.6 mm *(p/n 88072)*
**Dimensions:** 150 x 4.6 mm
**Mobile phase:** A: 0.05 M $K_2HPO_4$, pH 3.3
B: Methanol
C: Acetonitrile

| Time / min | 0 | 2 | 5 |
|---|---|---|---|
| % A | 80 | 80 | 45 |
| % B | 10 | 10 | 30 |
| % C | 10 | 10 | 25 |

**Flow rate:** 2.0 mL $min^{-1}$
**Detector:** UV at 280 nm

1. Aspirin
2. Acetaminophen
3. Naproxen
4. Fenoprofen
5. Ibuprofen
6. Diclofenac

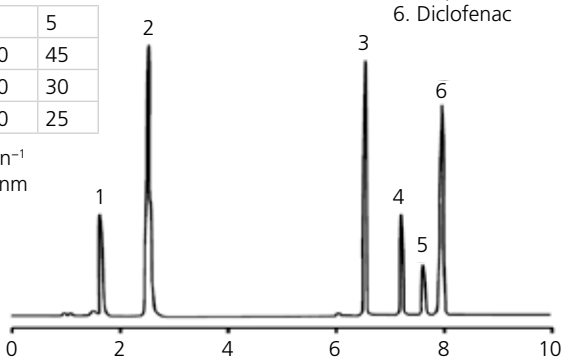



Figure 1. Analgesics

## 5 µm

| Length / mm | 50 | | 100 | | 125 | 150 | | |
|---|---|---|---|---|---|---|---|---|
| i.d. / mm | 2.1 | 4.6 | 3.0 | 4.6 | 4.0 | 2.1 | 3.0 | 4.6 |
| C18 | 88888 | 88889 | – | 88059 | AL-5C18-125DF | 88370 | 81140 | 88052[1] |
| C18-LL | – | – | – | – | – | 88388 | – | 88069 |
| C8 | – | – | AL-5C8-100DT | – | – | 88372 | 81146 | 88072 |
| Amino | – | – | – | – | – | – | – | 88205 |
| Cyano | – | – | – | 88065 | – | – | – | 88180 |
| Phenyl | – | – | – | – | – | – | 81147 | 88087 |
| Silica | – | – | – | – | – | – | – | 88123 |

[1]Also available in PEEK metal-free hardware (88051).

| Length / mm | 250 | | | | 300 | | | Guard cartridges (3/pk)[1] | |
|---|---|---|---|---|---|---|---|---|---|
| i.d. / mm | 2.1 | 3.0 | 4.0 | 4.6 | 3.9 | 4.0 | 4.6 | For 2.1 | For 3.0–4.6 |
| C18 | 88371 | 81142 | AL-5C18-250DF | 88056[2] | AL-5C18-300DE | AL-5C18-300DF | AL-5C18-300D | 96680/N[3] | 96361/N[4] |
| C18-LL | 88389 | – | – | 88099 | – | – | – | 96432/N | 96285/N |
| C8 | – | – | – | 88076 | – | – | – | 96441/N | 96362/N |
| Amino | – | – | AL-5NH-250DF | 88217[5] | – | – | – | – | 96085/N |
| Cyano | – | – | – | 88189 | – | – | – | – | 96084/N |
| Phenyl | – | – | – | 88092 | AL-5PH-300DE | – | – | 96442/N | 96082/N |
| Silica | – | – | AL-5-250DF | 88171 | – | AL-5-300DF | – | 96450/N | 96083/N |

[1] To be used with All-Guard cartridge holder (80101/N) and column coupler for All-Guard cartridges (HI-081). [2] Also available in PEEK metal-free hardware (88055). [3] Also available with 10/pk (5174010/N). [4] Also available with 10/pk (96080SP/N). [5] Also available with reversed-phase solvent (88217RP).

## 5 µm – Columns Compatible with Waters Instruments

| Length / mm | 150 | 250 | Guard cartridges (3/pk)[1] |
|---|---|---|---|
| i.d. / mm | 4.6 | 4.6 | For 3.0-4.6 |
| C18 | 88053 | 88057 | 96361/N |
| C8 | 88073 | 88077 | 96362/N |
| Amino | – | 88218 | 96085/N |
| Cyano | 88182 | 88191 | 96084/N |
| Phenyl | 88088 | 88093 | 96082/N |
| Silica | – | 88172 | 96083/N |

[1]To be used with All-Guard cartridge holder (80101/N) and column coupler for All-Guard cartridges (Waters type column port: HI-881).

## 10 µm

| Length / mm | 150 | 250 | 300 | |
|---|---|---|---|---|
| i.d. / mm | 4.6 | 4.6 | 3.9 | 4.0 |
| C18 | 88302 | 88307 | AL-10C18-300DE | AL-10C18-300DF |
| Silica | – | 88327 | AL-10-300DE | – |

**88308** – Alltima C18, 10 µm, 250 x 4.6 mm (compatible with Waters instruments)

## Method Validation Kits

Alltima C18 method validation kits containing 3 columns from 3 different silica batches are available for you to evaluate the robustness of your method to ensure reproducibility run after run.

**11350** – Alltima C18, 3 µm, 100 x 4.6 mm
**11541** – Alltima C18, 5 µm, 150 x 4.6 mm
**11543** – Alltima C18, 5 µm, 250 x 4.6 mm

**Column:** Alltima C18, 3 µm, 53 x 7 mm Rocket *(p/n: 50605)*
**Mobile phase:** A: 0.1 % Trifluoroacetic Acid in 0.025 M Ammonium Acetate
B: 0.1 % Trifluoroacetic Acid in Acetonitrile

**Gradient:**

| Time / min | 0 | 4 |
|---|---|---|
| % A | 80 | 5 |
| % B | 20 | 95 |

**Flow rate:** 3.5 mL min$^{-1}$
**Detector:** UV at 254 nm

1. Acetazolamide
2. Hydrochlorothiazide
3. Triamterene
4. Hydroflumethiazide
5. Clopamide
6. Trichloromethiazide
7. Indapamide
8. Bumetanide
9. Spironolactone

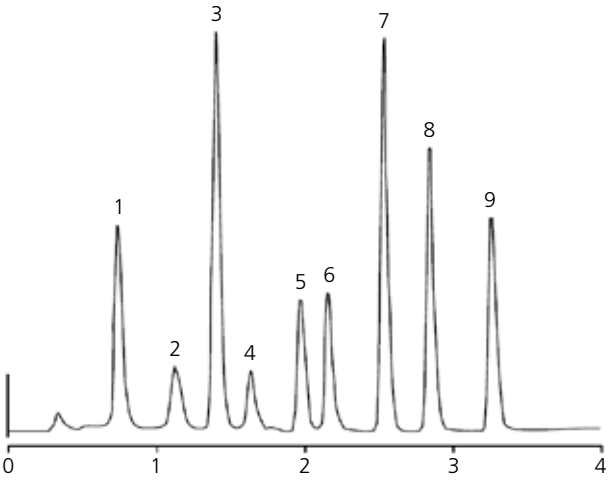



Figure 2. Diuretics – High Throughput

## Semi-preparative and Preparative Columns

## 5 µm

| Length / mm | 150 | | 250 | | Guard cartridges (3/pk)[1] |
|---|---|---|---|---|---|
| i.d. / mm | 10 | 22 | 10 | 22 | For 10–22 |
| C18 | 81102 | 81106 | 88063 | 81105 | AL-5C18-10CP2 |
| C8 | 81109 | – | 88081 | 81110 | – |
| Silica | 81117 | – | 81116 | 81118 | – |

[1]To be used with semi-prep guard holder (C-1000) and column coupler for All-Guard cartridges (HI-081).

## 10 µm

| Length / mm | 250 | | Guard column (33 x 7 mm) |
|---|---|---|---|
| i.d. / mm | 10 | 22 | |
| C18 | 88334 | 88335 | 970203 |
| Silica | 88338 | 88339 | 970204 |

# Alltima HP

The Alltima HP range of HPLC columns was developed by Alltech. Hichrom acquired this range from Grace. Alltima HP columns offer a range of different phase chemistries based on high purity silica. The Alltima HP product family combines the selectivity and performance needed to overcome the most challenging separation needs. The low column bleed makes these columns ideal for microbore applications.

## Key Features

- High purity silica
- Excellent column stability
- Low to no detectable column bleed
- pH stability from 1 to 10
- Multiple selectivity options

## Alltima HP Phase Specifications

| Phase | Particle size / µm | Endcapped? | Properties | Applications | USP code |
|---|---|---|---|---|---|
| C18 | 3, 5 | Yes | Classic reversed-phase retention and selectivity | Routine applications | L1 |
| C18-EPS | 3, 5 | Yes | Greater retention and enhanced peak symmetry for polar compounds. Alternative selectivity to traditional reversed-phase | Reversed-phase applications where C18 is too retentive | L1 |
| C18-HiLoad | 3, 5 | Yes | Highest carbon load for superior retention and loadability | High resolution for complex samples | L1 |
| C18-AQ | 3, 5 | Yes | 100% water wettable | Applications requiring high aqueous mobile phases | L1 |
| C18-Amide | 3, 5 | Yes | Polar-embedded phase with extremely low bleed. Compatible with microbore | Basic compounds in neutral to alkaline pH, MS applications | L1 |
| C8 | 3, 5 | Yes | Lower retention compared to C18 phases | Reversed-phase applications where C18 is too retentive | L7 |
| Cyano | 3, 5 | Yes | Extremely stable, long life and reproducible | Ideal for basic drug analysis | L10 |
| Silica | 3, 5 | No | Highly polar phase | General purpose normal phase applications | L3 |
| HILIC | 3, 5 | – | Hydrophilic Interaction Chromatography uses small amounts of water for increased sensitivity with microbore applications | Very polar analytes that are difficult to retain by reversed-phase | L3 |

# Ordering Information

## Capillary Columns

### 3 µm

| Length / mm | 50 | | 100 | | 150 | |
|---|---|---|---|---|---|---|
| i.d. / mm | 0.15 | 0.3 | 0.15 | 0.3 | 0.15 | 0.3 |
| C18 | 22153 | 22156 | 22154 | 22157 | 22155 | 22158 |
| C18-HiLoad | 22190 | 22193 | 22191 | 22194 | 22192 | 22195 |
| C18-AQ | 22560 | 22563 | 22561 | 22564 | 22562 | 22565 |
| C18-Amide | 22255 | 22258 | 22256 | 22259 | 22257 | 22260 |
| C8 | 22479 | 22482 | 22480 | 22483 | 22481 | 22484 |
| HILIC | 22515 | 22518 | 22516 | 22519 | 22517 | 22520 |

### 5 µm

| Length / mm | 50 | | 100 | | 150 | | 250 |
|---|---|---|---|---|---|---|---|
| i.d. / mm | 0.15 | 0.3 | 0.15 | 0.3 | 0.15 | 0.3 | 0.3 |
| C18 | 22124 | 22128 | 22125 | 22129 | 22126 | 22130 | 22131 |
| C18-HiLoad | 22169 | 22173 | 22170 | 22174 | 22171 | 22175 | 22176 |
| C18-AQ | 22531 | 22535 | 22532 | 22536 | 22533 | 22537 | 22538 |
| C18-Amide | 22236 | 22240 | 22237 | 22241 | 22238 | 22242 | 22243 |
| C8 | 22460 | 22464 | 22461 | 22465 | 22462 | 22466 | 22467 |
| HILIC | 22496 | 22500 | 22497 | 22501 | 22498 | 22502 | 22503 |

## Analytical Columns

### 3 µm

| Length / mm | 20 | | 50 | |
|---|---|---|---|---|
| i.d. / mm | 2.1 | 4.6 | 2.1 | 4.6 |
| C18 | 87674 | 87676 | 87504 | 87826 |
| C18-EPS | 87710 | – | 87508 | 87833 |
| C18-HiLoad | 87692 | 87694 | 87506 | 87827 |
| C18-AQ | – | 87816 | – | 87832 |
| C18-Amide | 87728 | – | 87510 | 87829 |
| C8 | 87746 | – | 87512 | – |
| Cyano | – | – | 87514 | 87825 |
| Silica | – | – | – | 87831 |
| HILIC | – | – | 86461 | – |

| Length / mm | 100 | | | | 150 | | | |
|---|---|---|---|---|---|---|---|---|
| i.d. / mm | 1.0 | 2.1 | 3.0 | 4.6 | 1.0 | 2.1 | 3.0 | 4.6 |
| C18 | 22163 | 87669 | 87629 | 87667 | 22164 | 87670 | 87601 | 87668 |
| C18-EPS | – | 87705 | – | 87703 | – | 87706 | 87604 | 87704 |
| C18-HiLoad | 22230 | 87687 | – | 87685 | 22231 | 87688 | 87610 | 87686 |
| C18-AQ | 22570 | 87809 | – | 87807 | 22571 | 87810 | – | 87808 |
| C18-Amide | 22265 | 87723 | – | 87721 | 22266 | 87724 | 87607 | 87722 |
| C8 | 22490 | 87741 | – | 87739 | 22491 | 87742 | 87613 | 87740 |
| Cyano | – | – | – | – | – | 87760 | 87616 | 87758 |
| Silica | – | – | – | – | – | 87788 | 87619 | 87786 |
| HILIC | 22525 | – | – | – | 22526 | 86463 | – | 86462 |

**AHP-3C18H-250D** – Alltima HP C18-HL, 3 µm, 250 x 4.6 mm

### 5 µm

| Length / mm | 50 | 100 | | 150 | | | | 250 | | | | Guard cartridges (3/pk)[1] | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| i.d. / mm | 4.6 | 1.0 | 2.1 | 1.0 | 2.1 | 3.0 | 4.6 | 1.0 | 2.1 | 3.0 | 4.6 | For 2.1 | For 3.0-4.6 |
| C18 | 87643 | 22137 | 87665 | 22138 | 87681 | 87602 | 87679 | 22139 | 87682 | 87603 | 87680 | 87683/N | 87684/N |
| C18-EPS | – | – | – | – | 87717 | – | 87715 | – | 87718 | 87606 | 87716 | 87719/N | 87623/N |
| C18-HiLoad | – | 22183 | – | 22184 | 87699 | 87611 | 87697 | 22185 | 87700 | 87612 | 87698 | 87701/N | 87624/N |
| C18-AQ | – | 22544 | – | 22545 | 87821 | – | 87819 | 22546 | 87822 | – | 87820 | 87823/N | 87824/N |
| C18-Amide | – | 22249 | – | 22250 | 87735 | 87608 | 87733 | 22251 | 87736 | 87609 | 87734 | 87737/N | 87625/N |
| C8 | – | 22473 | – | 22474 | 87753 | 87614 | 87751 | 22475 | – | 87615 | 87752 | 87755/N | 87756/N |
| Cyano | – | – | – | – | 87781 | – | 87769 | – | – | 87618 | 87780[2] | 87783/N | 87784/N |
| Silica | – | – | – | – | 87799 | 87620 | 87797 | – | 87802 | 87621 | 87798 | 87803/N | 87804/N |
| HILIC | – | 22509 | – | 22510 | 86465 | – | 86464 | 22511 | – | – | 86466 | 86479/N | 86480/N |

[1]To be used with All-Guard cartridge holder (80101/N) and column coupler for All-Guard cartridges (HI-081).

[2]Also available with reversed-phase shipping solvent (87780R)

### 3 µm – Rocket Columns

Rocket columns are specifically designed for high-throughput and high-speed methods.

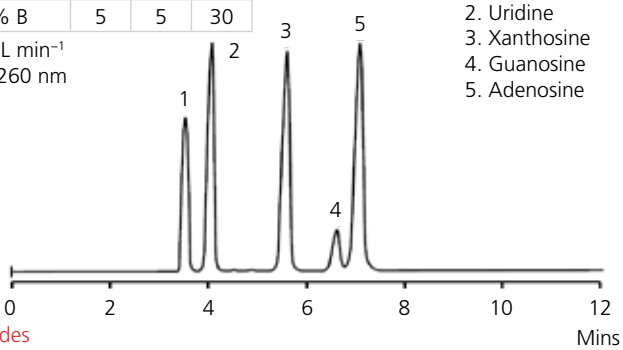
| Length / mm | 33 | 53 |
|---|---|---|
| i.d. / mm | 7 | 7 |
| C18 | 87671 | 87672 |
| C18-EPS | – | 87708 |
| C18-HiLoad | – | 87690 |
| C18-AQ | 87811 | 87812 |
| C8 | – | 87744 |
| Cyano | 87761 | 87762 |
| Silica | 87789 | 87790 |
| HILIC | 86469 | 86470 |

**Column:** Alltima HP C18-EPS, 5 µm, 150 x 4.6 mm *(p/n: 87715)*
**Mobile phase:** A: 0.03 M Potassium Phosphate, pH 3.2
B: Acetonitrile

**Gradient:**

| Time / min | 0 | 2 | 20 |
|---|---|---|---|
| % A | 95 | 95 | 70 |
| % B | 5 | 5 | 30 |

**Flow rate:** 1.0 mL min$^{-1}$
**Detector:** UV at 260 nm




1. Cytidine
2. Uridine
3. Xanthosine
4. Guanosine
5. Adenosine

Figure 3. Nucleosides

# Apex

Apex was originally developed by Jones Chromatography. This range was acquired by Hichrom from Grace. Apex are an economical range of columns manufactured using traditional silica. These columns are recommended for routine analysis and legacy methods.

## Key Features

- Conventional 100 Å pore size spherical silica
- Narrow particle size distribution
- Controlled surface area

## Apex and Apex II Specifications

| Phase | Particle size / µm | Endcapped? | USP code |
|---|---|---|---|
| Apex ODS | 5, 10 | Yes | L1 |
| Apex Silica | 3, 5 | – | L3 |
| Apex II Amino | 3 | No | L8 |

# Ordering Information

## Analytical Columns

### 3 µm

| Length / mm | 150 |
|---|---|
| i.d. / mm | 4.6 |
| Apex Silica | 4M15303 |
| Apex II Amino | 4M15344 |

### 5 µm

| Length / mm | 30 | 50 | 100 | 150 | 250 | Guard cartridges (3/pk)[1] |
|---|---|---|---|---|---|---|
| i.d. / mm | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | For 3.0-4.6 |
| ODS | 4M3310P | 4M5310 | 4M10310 | 4M15310 | 4M25310 | FH1310-2/N |
| Silica | – | – | – | – | 4M25300 | FH1300-2/N |

[1]To be used with All-Guard cartridge holder (80101/N) and column coupler for All-Guard cartridges (HI-081).

### 10 µm

| Length / mm | 50 | 150 |
|---|---|---|
| i.d. / mm | 4.6 | 4.6 |
| ODS | 4M5310 | 4M15311 |

# Apollo

Originally an Alltech brand, Hichrom acquired the Apollo range of HPLC columns from Grace. Apollo HPLC columns are based on high purity, base deactivated silica for powerful separations at an economical price. They are ideal for routine analysis in educational laboratories.

## Key Features

- Easy scale-up from analytical to prep
- Extended pH stability – 1.5 to 10.5

## Apollo Phase Specifications

| Phase | Particle size / µm | Endcapped? | USP code |
|---|---|---|---|
| C18 | 5 | Yes | L1 |
| C8 | 5 | Yes | L7 |
| Phenyl | 5 | Yes | L11 |
| Silica | 5 | – | L3 |

# Ordering Information

## Analytical Columns

### 5 µm

| Length / mm | 150 | | 250 | Guard cartridges (3/pk)[1] |
|---|---|---|---|---|
| i.d. / mm | 3.9 | 4.6 | 4.6 | For 3.0-4.6 |
| C18 | AP-5C18-150DE | 36505 | 36511 | 96454/N |
| C8 | – | 36506 | 36512 | 96463/N |
| Phenyl | – | 36538 | 36544 | 96430/N |
| Silica | – | 36507 | 36513 | 96419/N |

[1] To be used with All-Guard cartridge holder (80101/N) and column coupler for All-Guard cartridges (HI-081).

### 5 µm – Columns Compatible with Waters Instruments

| Length / mm | 150 | 250 | Guard cartridges (3/pk)[1] |
|---|---|---|---|
| i.d. / mm | 4.6 | 4.6 | For 3.0-4.6 |
| C18 | 36515 | 36521 | 96454/N |
| C8 | – | 5126774 | 96463/N |
| Phenyl | 5126788 | – | 96430/N |
| Silica | – | 36523 | 96419/N |

[1]To be used with All-Guard cartridge holder (80101/N) and column coupler for All-Guard cartridges (Waters type column port: HI-881).

## Semi-preparative and Preparative Columns

### 5 µm

| Length / mm | 150 | | | 250 | | Guard column (33 x 7 mm)[1] |
|---|---|---|---|---|---|---|
| i.d. / mm | 7 | 10 | 22 | 10 | 22 | |
| C18 | 36530 | 36531 | 36526 | 36543 | 36537 | 970205 |
| Phenyl | – | 36527 | 36535 | 36532 | 36528 | 970218 |
| Silica | 36542 | – | – | – | 36524 | 970206 |

[1]To be used with column coupler (HI-081).

**For column dimensions not listed here, please contact**
**+44 (0)118 930 3660** or
**technical@hichrom.co.uk**
to discuss your requirements

# Genesis

Genesis HPLC columns were developed by Jones Chromatography. Hichrom acquired this range of columns from Grace. Genesis phases are based on high purity, metal-free, spherical silica. They are suitable for the analysis of a wide range of compounds.

## Key Features

- Good peak shape and reproducibility
- Long column lifetime
- pH stability 1 to 10

## Genesis Phase Specifications

| Phase | Particle size / µm | Endcapped? | Properties | USP code |
|---|---|---|---|---|
| C18 | 3, 4, 5 | Yes | Excellent peak symmetry. Reduced need for mobile phase modifiers. Long column life. | L1 |
| C8 | 4, 5 | No | Suitable for lower pH separations. | L7 |
| C8(EC) | 4 | Yes | Excellent peak symmetry. Reduced need for mobile phase modifiers. Long column life. | L7 |
| AQ | 4 | Yes | Designed for separating hydrophilic and polar compounds. Stable retention times in 100 % aqueous mobile phases. Rapid equilibration. Unique reversed-phase selectivity. | L1 |
| Phenyl | 4, 5 | Yes | Reversed-phase chemistry. Improves the chromatography of polar aromatics, fatty acids, and basic pharmaceuticals. | L11 |
| Cyano | 4 | Yes | Suitable for polar analysis, analytes with double- and/or triple-bonds, and compounds that have too much retention on alkyl phases. | L10 |
| Silica | 4 | – | Highly polar phase for general purpose applications. | L3 |

# Ordering Information

## Analytical Columns

### 3 µm

| Length / mm | 50 | | 100 | | 150 | | 250 | |
|---|---|---|---|---|---|---|---|---|
| i.d. / mm | 3.0 | 4.6 | 4.0 | 4.6 | 2.1 | 4.6 | 3.0 | 4.6 |
| C18 | FL5963E | FM5963E | FH10963E | FM10963E | FK15963E | FM15963E | FL25963E | FM25963E |

### 4 µm

| Length / mm | 30 | | 50 | | | 100 | | | 125 | |
|---|---|---|---|---|---|---|---|---|---|---|
| i.d. / mm | 2.1 | 3.0 | 2.1 | 3.0 | 4.6 | 2.1 | 3.0 | 4.6 | 4.0 | 4.6 |
| C18 | FK3960E | – | FK5960E | FL5960E | FM5960E | FK10960E | FL10960E | FM10960E | GEN-4C18-125DF | GEN-4C18-125D |
| C8 | – | FL3962E | FK5962E | – | – | – | FL10962E | FM10962E | – | – |
| C8(EC) | – | – | FK5964E | – | FM5964 | – | – | FM10964E | – | – |
| AQ | – | – | – | – | FM5951E | – | – | FM10951E | – | – |
| Cyano | – | – | – | – | – | – | – | FM10965E[1] | – | – |

[1]Also available in PEEK, metal-free column hardware (FM10965EP).

| Length / mm | 150 | | 250 | | | Guard cartridges (3/pk)[1] |
|---|---|---|---|---|---|---|
| i.d. / mm | 4.0 | 4.6 | 3.0 | 4.0 | 4.6 | For 3.0-4.6 |
| C18 | FH15960E | FM15960E | FL25960E | FH25960E | FM25960E | 5169650/N |
| C8 | – | FM15962E | – | – | FM25962E | FH1962-2/N |
| C8(EC) | – | FM15964E | – | FH25964E | FM25964E | – |
| AQ | – | FM15951E | – | – | FM25951E | – |
| Cyano | – | FM15965E[2] | – | – | FM25965E | – |
| Phenyl | – | FM15980E | – | – | FM25980E | – |
| Silica | – | – | – | – | FM25961E | FH1961-2/N |

[1]To be used with All-Guard cartridge holder (80101/N) and column coupler for All-Guard cartridges (HI-081).
[2]Also available with reversed-phase shipping solvent (FM15965ER).

### 5 µm

| Length / mm | 125 | 150 | 250 |
|---|---|---|---|
| I.d. / mm | 4.6 | 4.6 | 4.6 |
| C18 | GEN-5C18-125D | GEN-5C18-150D | GEN-5C18-250D |
| C8 | – | – | GEN-5C8-250D |
| Phenyl | – | – | GEN-5PH-250D |


## Semi-preparative and Preparative Columns

### 4 µm

| Length / mm | 150 | 250 |
|---|---|---|
| I.d. / mm | 10 | 10 |
| C18 | – | 8P25960 |
| Silica | 8P15961 | – |

**Column:** Genesis C18, 4 µm, 100 x 4.6 mm *(p/n: FM10960E)*
**Mobile phase:** Acetonitrile:50 mM $KH_2PO_4$, pH 3.0 (40:60)
**Flow rate:** 1.0 mL $min^{-1}$
**Detector:** UV at 254 nm

1. Atenolol
2. Metoprolol
3. Propranolol
4. Diltiazem

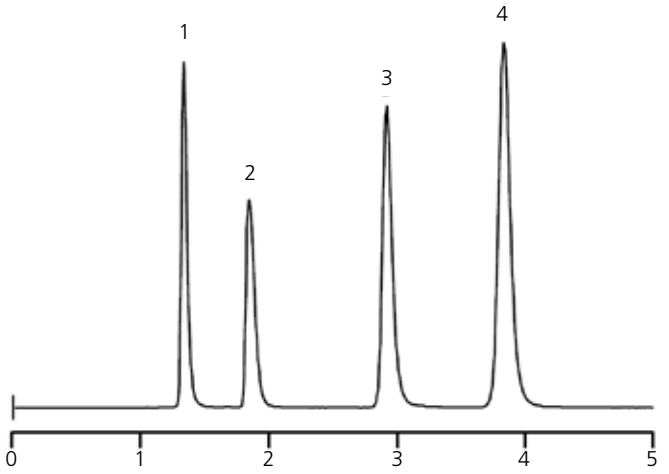



Figure 4. Anti-Anginal Drugs

**Column:** Genesis CN, 4 µm, 150 x 4.6 mm *(p/n: FM15965E)*
**Mobile phase:** Acetonitrile:0.05 % Trichloroacetic Acid in Water, pH 3.0
**Flow rate:** 1.0 mL $min^{-1}$
**Detector:** UV at 254 nm

1. Atazine Desisopropyl
2. Atrazine Desethyl
3. Simazine
4. Propazine

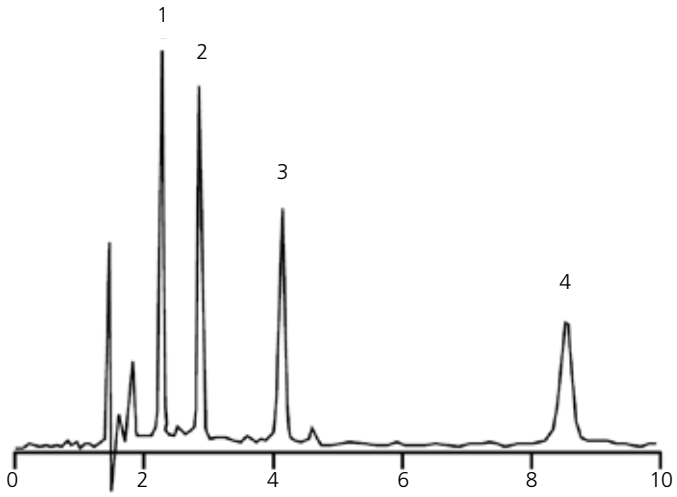



Figure 5. Atrazine Herbicides

# Prevail

The Prevail range of HPLC columns were developed by Alltech. Hichrom acquired this range from Grace. The Prevail range exhibits long lifetimes in both highly aqueous and highly organic mobile phases. The stability of these phases is such that a single column can be switched between highly aqueous, for analysis of highly polar analytes, and highly organic, for strong retention of hydrophobic analytes.

## Key Features

- Stable from highly organic to highly aqueous
- Speciality phases for specific applications
- Excellent sensitivity with microbore and ELSD applications

## Prevail Phase Specifications

| Phase | Particle size / µm | Properties | Applications | USP code |
|---|---|---|---|---|
| C18 | 3, 5 | Stable in highly aqueous to highly organic mobile phases | Flexibility to switch between varied mobile phase conditions to suit a variety of applications. Excellent sensitivity for microbore applications | L1 |
| C18-Select | 3, 5 | Stable in highly aqueous to highly organic mobile phases | Suitable for applications where greater retention than the Prevail C18 is required | L1 |
| C8 | 5 | Stable C8 phase | Use for highly hydrophobic compounds that retain too strongly on C18 | L7 |
| Phenyl | 5 | Lowest hydrophobic capacity | Selective for aromatic compounds in a variety of mobile phase conditions | L11 |
| Cyano | 3, 5 | General purpose cyano suitable for normal or reversed-phase use | Rugged normal phase applications | L10 |
| Amino | 3, 5 | Stable in highly aqueous to highly organic mobile phases | Use for carbohydrates or as a weak anion exchanger | L8 |
| Amide | 5 | Polar embedded phase | Suitable for use with highly aqueous mobile phases | – |
| Silica | 3, 5 | Highly polar phase | General purpose normal phase applications | L3 |
| Organic acid | 3, 5 | Highly efficient silica-based, acid-stable phase | Separates common organic acids with unsurpassed resolution, speed and sensitivity. Lower cost than polymeric columns | – |

## Prevail Organic Acid

Prevail Organic Acid columns are silica-based for maximum efficiency and high resolution. They can separate common organic acids with a combination of speed, sensitivity, and simplicity. A simple acidic phosphate buffer and a Prevail OA column at ambient temperature will separate 11 short chain organic acids in less than 6 minutes. The retention profile can be readily adjusted by changing the mobile phase pH.

## Prevail Carbohydrate ES

The Prevail Carbohydrate ES column was discontinued by Grace prior to the acquisition of the Prevail range by Hichrom.
Please contact our technical team on +44 (0)118 930 3660 or technical@hichrom.co.uk to discuss suitable alternatives for your application.

# Ordering Information

## Analytical Columns

### 3 µm

| Length / mm | 20 | 50 | | 100 | | 150 | | | Guard cartridges (3/pk)[1] |
|---|---|---|---|---|---|---|---|---|---|
| i.d. / mm | 2.1 | 2.1 | 4.6 | 2.1 | 4.6 | 2.1 | 3.0 | 4.6 | For 2.1 |
| C18 | 43827 | 43818 | 43829 | 43871 | 99202 | 99200 | 99322 | 99204 | 96683/N |
| C18-Select | – | 99309 | – | 99312 | 99302 | 99313 | 99315 | 99303 | 96691/N |
| Cyano | – | – | – | – | – | 99243 | – | 99247 | – |
| Amino | – | – | – | – | 99257 | 99255 | – | 99259 | – |
| Silica | – | – | – | 43805 | – | – | 99341 | 99271 | – |
| Organic acid | – | – | – | 88648 | – | – | – | 88655 | – |

[1]To be used with All-Guard cartridge holder (80101/N) and column coupler (HI-081).

**88755** – Prevail Organic Acid, 3 µm, 150 x 4.6 mm (compatible with Waters instruments)

## 3 µm – Rocket Columns

Rocket columns are specifically designed for high-throughput and high-speed methods.

| Length / mm | 33 | 53 |
|---|---|---|
| i.d. / mm | 7 | 7 |
| C18 | 99280 | 99279 |
| C18-Select | 99304 | 99305 |
| Organic Acid | – | 50755 |

**For column dimensions not listed here, please contact**
**+44 (0)118 930 3660** or
**technical@hichrom.co.uk**
to discuss your requirements

## 5 µm

| Length / mm | 50 | 100 | 125 | 150 | | | 250 | | Guard cartridges (3/pk)[1] | |
|---|---|---|---|---|---|---|---|---|---|---|
| i.d. / mm | 4.6 | 4.6 | 4.6 | 2.1 | 3.0 | 4.6 | 3.0 | 4.6 | For 2.1 | For 3.0-4.6 |
| C18 | 43903 | – | PRE-5C18-125D | 99206 | 99320 | 99208 | 99321 | 99210 | 96682/N | 99286/N |
| C18-Select | – | – | – | – | 99316 | 99300 | 99317 | 99301 | 96690/N | 96455/N |
| C8 | – | – | – | 99218 | – | 99224 | 5131428 | 99229 | 99128/N | 99287/N |
| Phenyl | – | – | – | 99237 | 99326 | 99239 | 99327 | 99241 | 99130/N | 99288/N |
| Cyano | – | – | – | – | 99329 | 99251 | – | 99253 | 99131/N | 99353/N |
| Amino | – | – | – | 99261 | – | 99263 | – | 99265 | 99135/N | 99290/N |
| Amide | – | PRE-5AM-100D | – | – | – | 88660 | – | 88665 | – | – |
| Silica | – | – | – | 99273 | 99339 | 99275 | 99340 | 99277 | 99133/N | 99354/N |
| Organic acid | – | – | – | – | – | 88640 | PRE-5OA-250DT | 88645 | – | 96429/N |

[1]To be used with All-Guard cartridge holder (80101/N) and column coupler for All-Guard cartridges (HI-081).

## 5 µm – Columns Compatible with Waters Instruments

| Length / mm | 150 | 250 | Guard cartridges (3/pk)[1] |
|---|---|---|---|
| i.d. / mm | 4.6 | 4.6 | For 3.0-4.6 |
| C18 | 99209 | 99211 | 99286/N |
| Organic Acid | 88740 | 88745 | 96429/N |

[1]To be used with All-Guard cartridge holder (80101/N) and column coupler for All-Guard cartridges (Waters type column port: HI-881).

## Semi-preparative and Preparative Columns

### 5 µm

| Length / mm | 150 | 250 | |
|---|---|---|---|
| i.d. / mm | 22 | 10 | 22 |
| C18 | 99296 | 99294 | 99297 |

# Ion Chromatography

## Allsep Anion

The Allsep Anion column range was developed by Alltech. Hichrom acquired this column range from Grace. Allsep Anion is a methacrylate-based phase with quaternary ammonium functional groups, optimised for use with both suppressed and non-suppressed conductivity detection. Columns are compatible with common IC mobile phases, such as carbonate, bicarbonate, p-hydroxybenzoic acid, phthalic acid, succinic acid, and sodium octane sulfonate.

Allsep Anion is recommended for applications involving inorganic anions, weak and strong acid ions, metal complexes and organic acids. It meets the requirements for the EPA method 300.0 Part A for determination of inorganic ions in water.

### Key Features

- 7 µm polymer-based anion exchange phase
- Suppressed or non-suppressed conductivity detection
- pH range 2–10
- Use with 0–100 % organic modifier
- USP L23

### Ordering Information

#### 7 µm

| Length / mm | 50 | 100 | 150 | | 250 |
|---|---|---|---|---|---|
| i.d. / mm | 4.6 | 4.6 | 2.1 | 4.6 | 2.1 |
| Stainless Steel | 51214 | 51200 | 51210 | 51208 | 51212 |
| PEEK (metal-free) | 51213 | 51207 | – | 51209 | – |

| Length / mm | Guard cartridges (3/pk)[1] | Guard cartridges (3/pk)[1] | Guard cartridge kits[2] | Guard cartridge kits[2] |
|---|---|---|---|---|
| i.d. / mm | For 2.1 | For 3.0–4.6 | For 2.1 | For 3.0–4.6 |
| Stainless Steel | 38110/S | 38108/S | 38111/S | 38109/S |
| PEEK (metal-free) | – | 38108 | – | 38109 |

[1]All-Guard cartridge holder and coupler (80101/N and HI-081) for stainless steel hardware and 80101 for PEEK hardware required.
[2]Includes All-Guard cartridge holder and coupler (80101/N and HI-081) for stainless steel hardware, 80101 for PEEK hardware, and 3 guard cartridges.

## Hichrom Organic Acid

Hichrom Organic Acid columns are ion exclusion columns packed with sulphonated polystyrene-divinylbenzene. The OA-1000 and OA-2000 columns exhibit excellent selectivity for aliphatic and aromatic acids. As with most ion exclusion columns, a column heater in necessary for normal operating procedures.

The IOA-1000 and IOA-2000 columns are suitable for the separation of citric and other acids from glucose and fructose.

### Key Features

- Rapid analysis of organic acids and alcohols
- pH stable polymer resin
- Isocratic 100 % aqueous mobile phases only - no organic solvents
- USP L17

### Ordering Information

| Part number | Phase | Particle size / µm | Column dimensions / mm | Applications |
|---|---|---|---|---|
| 9046 | OA-1000 | 9 | 300 x 6.5 | Inorganic ions, such as fluoride, arsenate, sulphite, alcohols and most organic acids |
| 9048 | OA-2000 | 6.5 | 100 x 6.5 | Organic acids with low pH values, low MW straight chain acids and aromatic acids |
| 9646 | IOA-1000 | 9 | 300 x 7.8 | Acids of the tricarboxylic acid cycle (Krebs cycle) |
| 9648 | IOA-2000 | 8 | 150 x 6.5 | Fast separation of acids and some alcohols |

**28884** – Guard cartridges for Hichrom Organic Acid columns (2/pk).

**28883** – Guard cartridge kit for Hichrom Organic Acid columns, including guard cartridge holder and 2 guard cartridges.

# Hichrom Anion Exclusion

Hichrom Anion Exclusion columns are based on a highly sulphonated polystyrene-divinylbenzene cation-exchange resin. The phase has a particle size of 10 µm and is designed for the separation of organic acids and weakly ionised anions by an anion exclusion mechanism. Typical mobile phases contain dilute mineral acids. Acetonitrile (<10%) may be added as organic modifier to decrease the retention of hydrophobic compounds.

## Key Features

- Separates organic acids and weakly ionised anions
- Polymer-based for broad pH stability
- USP L22

## Ordering Information

### 10 µm

| Length / mm | 100 | 300 |
|---|---|---|
| i.d. / mm | 7.8 | 7.8 |
| Anion Exclusion (stainless steel) | 269068 | 269006 |

# Hichrom Anion/S

Hichrom Anion/S columns are based on 10 µm silica with quaternary ammonium ion-exchange groups. These columns are optimised for non-suppressed conductivity detection and are best suited for routine separations of chloride, bromide, nitrate, and sulphate.

## Key Features

- Silica-based for symmetrical peak shapes
- Separates inorganic and organic anions

## Ordering Information

### 10 µm

| Length / mm | 100 | 250 |
|---|---|---|
| i.d. / mm | 4.6 | 4.6 |
| Stainless Steel | 269013 | 269001 |
| PEEK (metal-free) | 269012 | 269011 |

# Hichrom Carbohydrate Cation

The Hichrom Carbohydrate Cation column consists of a highly efficient sulphonated polystyrene resin supplied in the calcium form. This column provides excellent separations using only water as the mobile phase.

## Key Features

- Sulphonated polystyrene resin ($Ca^{2+}$ form)
- 100% water used as mobile phase
- Column heating required
- USP L19

## Ordering Information

**70057** – Hichrom Carbohydrate Cation, 10 µm, 300 x 6.5 mm

| Length / mm | 300 |
|---|---|
| i.d. / mm | 6.5 |
| Hichrom Carbohydrate Cation | 70057 |

### Hichrom Pre-saturation Columns

All silica HPLC packing materials will gradually dissolve in aqueous solution. This problem is exacerbated when the pH level of the solution is above 7. To avoid silica dissolution, mobile phases should ideally be buffered between pH 3.5–6.5. Where high levels of aqueous solvent or alkaline pH conditions are required, the pre-saturation column (packed with large 40 µm particle diameter silica) saturates the mobile phase with silica to minimise analytical column dissolution problems.

## Ordering Information

**28610** – Hichrom pre-saturation column, 250 x 4.6 mm (1/pk)

**28650** – Hichrom pre-saturation column, 250 x 4.6 mm (4/pk)

# Vydac

Vydac 300 Å columns are a commonly employed range in bioseparations. Following the acquisition of Grace HPLC ranges by Hichrom, Vydac columns continue to be available exclusively from Hichrom in capillary to microbore and analytical to preparative dimensions.

Separate biomolecules from small peptides to large intact proteins with the Vydac family of reversed-phase columns (including Vydac TP, MS, Denali, and Everest) and ion exchange (Vydac 302IC) columns. Reversed-phase columns for a polypeptide separation should be considered on the basis of the polypeptide's hydrophobicity, with molecular weight as a secondary consideration.

## Vydac TP

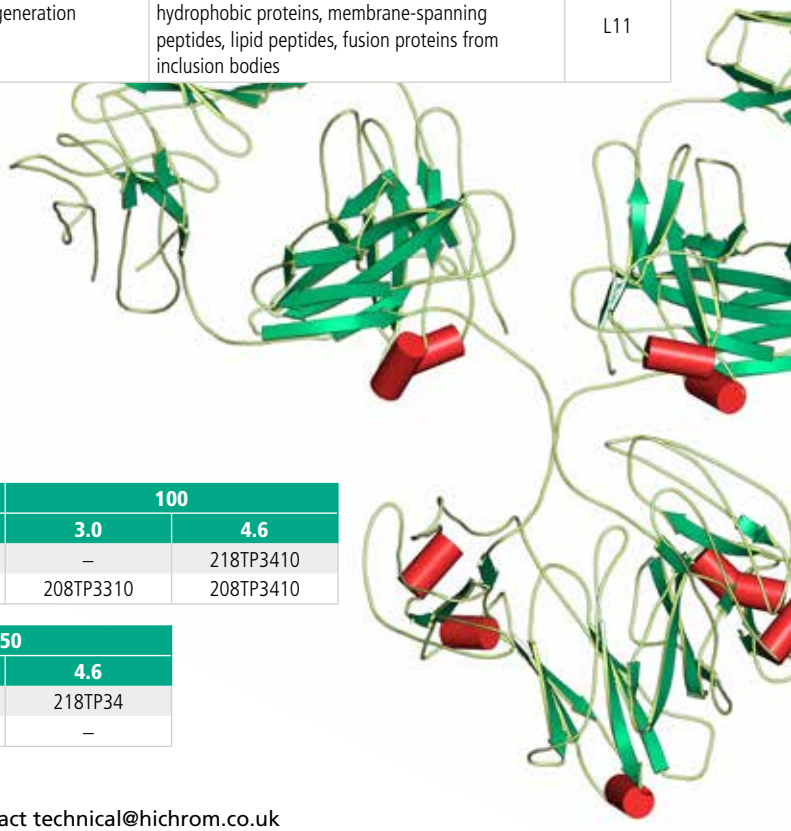
Vydac TP reversed-phase material consists of aliphatic groups bonded to the surface of 300 Å pore diameter silica. The large pores of the TP silica give polypeptide molecules complete access to the interior of the silica pores. Vydac TP silica is the standard that has defined large pore HPLC for polypeptide separations for nearly two decades.

### Key Features

- Long column lifetime and negligible phase leaching
- Reliable protein purifications, scalable from analytical to preparative scale
- Referenced in a large number of patents and publications

### Vydac TP Phase Specifications

| Phase | Functional group | Particle size / µm | Properties | Applications | USP code |
|---|---|---|---|---|---|
| 218TP | C18 | 3, 5, 10 | First generation polymeric C18 phase with unique selectivity | Small polypeptides 4-5 kDa MW, enzymatic digest fragments, natural and synthetic peptides, multi-ring compounds | L1 |
| 238TP | C18 | 5 | First generation monomeric C18 phase | Use for same applications as 218TP, but offers different C18 selectivity | L1 |
| 201TP | C18 | 5, 10 | Non-endcapped C18 phase | Developed for separation of PAHs | L1 |
| 202TP | C18 | 5 | Higher carbon load than 201TP | Developed for separation of PAHs | L1 |
| 208TP | C8 | 3, 5, 10 | Less hydrophobic than C18TP phase | Polypeptides 10-20 kDa MW | L7 |
| 214TP | C4 | 5, 10 | First generation C4 phase | Glycoproteins, haemoglobin variants, histones, insulin variants, membrane proteins | L26 |
| 214ATP | C4 | 5 | C4 phase with lower level of endcapping | Optimised for analysis of human growth hormone | L26 |
| 219TP | Diphenyl | 5, 10 | Lowest capacity first generation diphenyl phase | Polypeptides with aromatic side chains, large hydrophobic proteins, membrane-spanning peptides, lipid peptides, fusion proteins from inclusion bodies | L11 |



## Ordering Information

### Capillary Columns

#### 5 µm

| Length / mm | 150 | |
|---|---|---|
| i.d. / mm | 0.3 | 0.5 |
| 218TP | 218TP5.315 | – |
| 214TP | 214TP5.315 | 214TP5.515 |

### Analytical Columns

#### 3 µm

| Length / mm | 50 | | | 100 | |
|---|---|---|---|---|---|
| i.d. / mm | 2.1 | 3.0 | 4.6 | 3.0 | 4.6 |
| 218TP | 218TP3205 | 218TP3305 | 218TP3405 | – | 218TP3410 |
| 208TP | – | – | 208TP3405 | 208TP3310 | 208TP3410 |

| Length / mm | 150 | | 250 | |
|---|---|---|---|---|
| i.d. / mm | 2.1 | 4.6 | 3.0 | 4.6 |
| 218TP | 218TP3215 | 218TP3415 | – | 218TP34 |
| 208TP | – | – | 208TP33 | – |

| Length / mm | Guard cartridges (2/pk)[1] | | Guard cartridge kits[2] | |
|---|---|---|---|---|
| i.d. / mm | For 2.1 | For 3.0–4.6 | For 2.1 | For 3.0–4.6 |
| 218TP | 218GD32/N | 218GD34/N | 218GK32/N | 218GK34/N |
| 208TP | – | 208GD34/N | – | 208GK34/N |

[1] To be used with All-Guard cartridge holder (80101/N) and column coupler for All-Guard cartridges (HI-081).
[2] Includes holder (80101/N), column coupler (HI-081), and 1 guard cartridge.

## 5 µm

| Length / mm | 30 | 50 | | | |
|---|---|---|---|---|---|
| i.d. / mm | 2.1 | 1.0 | 2.1 | 3.0 | 4.6 |
| 218TP | – | 218TP5105 | 218TP5205 | 218TP5305 | 218TP5405 |
| 238TP | – | 238TP5105 | 238TP5205 | – | 238TP5405 |
| 201TP | 201TP5203 | 201TP5105 | 201TP5205 | – | 201TP5405 |
| 208TP | – | 208TP5105 | 208TP5205 | – | 208TP5405 |
| 214TP | – | 214TP5105 | 214TP5205 | 214TP5305 | 214TP5405 |
| 214ATP | – | – | – | – | 214ATP5405 |
| 219TP | – | 219TP5105 | 219TP5205 | – | 219TP5405 |

| Length / mm | 100 | | | |
|---|---|---|---|---|
| i.d. / mm | 1.0 | 2.1 | 3.0 | 4.6 |
| 218TP | 218TP5110 | 218TP5210 | – | 218TP5410 |
| 238TP | 238TP5110 | – | – | 238TP5410 |
| 201TP | | 201TP5210 | 201TP5310 | 201TP5410 |
| 208TP | 208TP5110 | 208TP5210 | – | 208TP5410 |
| 214TP | 214TP5110 | 214TP5210 | 214TP5310 | 214TP5410 |
| 214ATP | – | 214ATP5210 | – | – |
| 219TP | – | 219TP5210 | – | 219TP5410 |

| Length / mm | 150 | | | |
|---|---|---|---|---|
| i.d. / mm | 1.0 | 2.1 | 3.0 | 4.6 |
| 218TP | 218TP5115 | 218TP5215 | – | 218TP5415 |
| 238TP | 238TP5115 | 238TP5215 | 238TP5315 | 238TP5415 |
| 201TP | 201TP5115 | 201TP5215 | 201TP5315 | 201TP5415 |
| 202TP | – | – | – | 202TP5415 |
| 208TP | 208TP5115 | 208TP5215 | 208TP5315 | 208TP5415 |
| 214TP | 214TP5115 | 214TP5215 | 214TP5315 | 214TP5415 |
| 214ATP | – | 214ATP5215 | – | 214ATP5415 |
| 219TP | 219TP5115 | 219TP5215 | 219TP5315 | 219TP5415 |

| Length / mm | 250 | | | | |
|---|---|---|---|---|---|
| i.d. / mm | 1.0 | 2.1 | 3.0 | 4.0 | 4.6 |
| 218TP | 218TP51 | 218TP52 | 218TP53 | – | 218TP54 |
| 238TP | 238TP51 | 238TP52 | 238TP53 | – | 238TP54 |
| 201TP | 201TP51 | 201TP52 | – | 201TP540 | 201TP54 |
| 202TP | – | – | – | – | 202TP54 |
| 208TP | 208TP51 | 208TP52 | 208TP53 | – | 208TP54 |
| 214TP | 214TP51 | 214TP52 | 214TP53 | – | 214TP54 |
| 214ATP | – | 214ATP52 | – | – | 214ATP54 |
| 219TP | 219TP51 | 219TP52 | 219TP53 | – | 219TP54 |

| Length / mm | Guard cartridges (2/pk)[1] | | | Guard cartridge kits[2] | | |
|---|---|---|---|---|---|---|
| i.d. / mm | For 1.0 | For 2.1 | For 3.0-4.6 | For 1.0 | For 2.1 | For 3.0–4.6 |
| 218TP | 218GD51/N | 218GD52/N | 218GD54/N | 218GK51/N | 218GK52/N | 218GK54/N |
| 238TP | 238GD51/N | 238GD52/N | 238GD54/N | 238GK51/N | 238GK52/N | 238GK54/N |
| 201TP | – | 201GD52/N | 201GD54/N | – | 201GK52/N | 201GK54/N |
| 202TP | – | – | 202GD54/N | – | – | 202GK54/N |
| 208TP | 208GD51/N | 208GD52/N | 208GD54/N | 208GK51/N | 208GK52/N | 208GK54/N |
| 214TP | 214GD51/N | 214GD52/N | 214GD54/N | 214GK51/N | 214GK52/N | 214GK54/N |
| 214ATP | – | – | 214AGD54/N | – | – | 214AGK54/N |
| 219TP | – | 219GD52/N | 219GD54/N | – | 219GK52/N | 219GK54/N |

[1] To be used with All-Guard cartridge holder (80101/N) and column coupler for All-Guard cartridges (HI-081).
[2] Includes holder (80101/N), column coupler (HI-081), and 1 guard cartridge.

## 10 µm

| Length / mm | 50 | 150 | 250 | | | Guard cartridges (2/pk)[1] | Guard cartridge kits[2] |
|---|---|---|---|---|---|---|---|
| i.d. / mm | 4.6 | 4.6 | 1.0 | 2.1 | 4.6 | For 3.0-4.6 | For 3.0-4.6 |
| 218TP | – | 218TP10415 | 218TP101 | 218TP102 | 218TP104 | 218GD104/N | 218GK104/N |
| 201TP | – | 201TP10415 | – | – | 201TP104 | 201GD104/N | 201GK104/N |
| 208TP | 208TP10405 | 208TP10415 | – | – | 208TP104 | 208GD104/N | 208GK104/N |
| 214TP | – | 214TP10415 | 214TP101 | – | 214TP104 | 214GD104/N | 214GK104/N |

[1] To be used with All-Guard cartridge holder (80101/N) and column coupler for All-Guard cartridges (HI-081).
[2] Includes holder (80101/N), column coupler (HI-081), and 1 guard cartridge.

# Vydac TP continued

## 10–15 µm

| Length / mm | 150 | 250 |
|---|---|---|
| i.d. / mm | 4.6 | 4.6 |
| 218TP | 5119751 | 218TP10154 |
| 214TP | – | 214TP10154 |
| 214TP | – | 214TP101015 |

## 15–20 µm

| Length / mm | 50 | 100 | 150 | 250 | Guard cartridges (2/pk)[1] | Guard cartridge kits[2] |
|---|---|---|---|---|---|---|
| i.d. / mm | 4.6 | 4.6 | 4.6 | 4.6 | For 3.0-4.6 | For 3.0-4.6 |
| 218TP | 218TP1520405 | 218TP1520410 | 218TP1520415 | – | – | – |
| 208TP | – | 208TP1520410 | – | – | – | – |
| 214TP | – | – | – | 214TP15204 | 214GD15204/N | 214GK15204/N |

[1]To be used with All-Guard cartridge holder (80101/N) and column coupler for All-Guard cartridges (HI-081).
[2] Includes holder (80101/N), column coupler (HI-081), and 1 guard cartridge.

## 20–30 µm

| Length / mm | 150 |
|---|---|
| i.d. / mm | 4.6 |
| 218TP | 218TP2030415 |

## Semi-preparative and Preparative Columns

## 5 µm

| Length / mm | 100 | | 150 | 250 | Guard cartridges (2/pk)[1] | Guard cartridge kits[2] |
|---|---|---|---|---|---|---|
| i.d. / mm | 10 | 22 | 10 | 10 | For 10–22 | For 10–22 |
| 218TP | 218TP51010 | – | 218TP51015 | 218TP510 | 218GCC510 | 218FSK510 |
| 238TP | – | – | – | 238TP510 | – | – |
| 201TP | – | – | – | 201TP510 | – | – |
| 208TP | 208TP51010 | – | – | 208TP510 | 208GCC510 | 208FSK510 |
| 214TP | 214TP51010 | 214TP52210 | 214TP51015 | 214TP510 | 214GCC510 | 214FSK510 |
| 214ATP | – | – | – | 214ATP510 | – | – |
| 219TP | – | – | – | 219TP510 | 219GCC510 | 219FSK510 |

[1]To be used with semi-prep guard holder (GCH10) and column coupler for All-Guard cartridges (HI-081).
[2]Includes holder (GCH10), column coupler (HI-081), and 1 guard cartridge.

## 10 µm

| Length / mm | 100 | 150 | | 250 | | Guard cartridges (2/pk)[1] |
|---|---|---|---|---|---|---|
| i.d. / mm | 22 | 10 | 22 | 10 | 22 | For 10–22 |
| 218TP | 218TP102210 | 218TP101015 | 218TP102215 | 218TP1010 | 218TP1022 | 218GCC1010 |
| 208TP | – | – | – | 208TP1010 | 208TP1022 | 208GCC1010 |
| 214TP | – | 214TP101015 | 214TP102215 | 214TP1010 | 214TP1022 | 214GCC1010 |
| 219TP | – | – | – | 219TP1010 | 219TP1022 | 219GCC1010 |

[1]To be used with semi-prep guard holder (GCH10) and column coupler for All-Guard cartridges (HI-081).

## 10–15 µm

| Length / mm | 150 | | 250 | | Guard cartridges – 12 µm (2/pk)[1] | Guard cartridge kits – 12 µm[2] |
|---|---|---|---|---|---|---|
| i.d. / mm | 10 | 22 | 10 | 22 | For 10–22 | For 10–22 |
| 218TP | | | 218TP101510 | 218TP101522 | 218GCC1210 | 218FSK1210 |
| 208TP | | | 208TP101510 | 208TP101522 | 208GCC1210 | 208FSK1210 |
| 214TP | 214TP10151015 | 214TP10152215 | 214TP101510 | 214TP101522 | 214GCC1210 | 214FSK1210 |

[1]To be used with All-Guard cartridge holder (80101/N) and column coupler for All-Guard cartridges (HI-081).
[2]Includes holder (80101/N), column coupler (HI-081), and 1 guard cartridge.

## 15–20 µm

| Length / mm | 100 | 150 | 250 | | Guard cartridges (2/pk)[1] |
|---|---|---|---|---|---|
| i.d. / mm | 22 | 22 | 10 | 22 | For 10–22 |
| 218TP | 218TP15202210 | 218TP15202215 | 218TP152010 | 218TP152022 | – |
| 208TP | – | – | – | – | – |
| 214TP | – | – | 214TP152010 | 214TP152022 | 214GCC152010 |

[1]To be used with semi-prep guard holder (GCH10) and column coupler for All-Guard cartridges (HI-081).

# Vydac MS

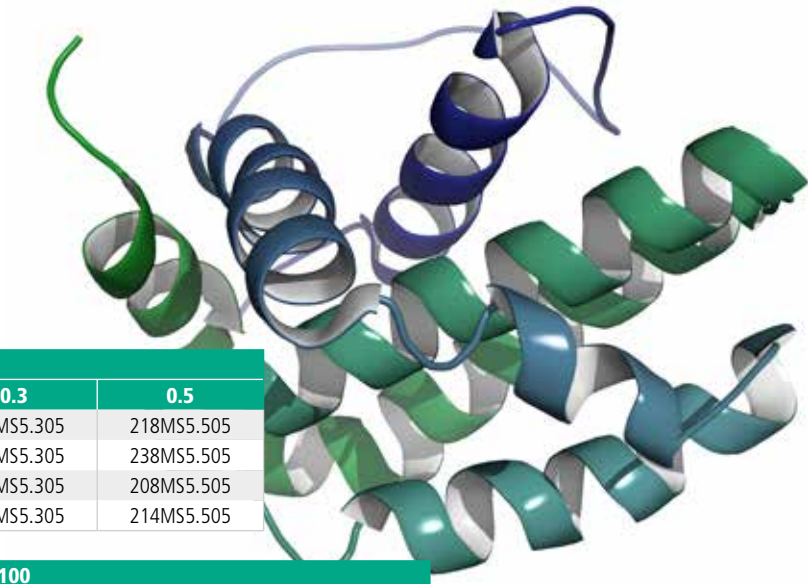
Vydac MS is a further development of the Vydac range for reversed-phase separation of biomolecules. A proprietary surface treatment and bonding process give Vydac MS columns unique selectivity. A variety of reversed-phases makes this product line suitable for the analysis of small peptides to large intact proteins.

## Key Features

- 300 Å pore size spherical silica
- Four reversed-phase chemistries
- Excellent peak shape with little or no TFA
- High protein recoveries make scale-up easy

### Vydac MS Phase Specifications

| Phase | Functional group | Particle size / µm | Properties | Applications | USP code |
|---|---|---|---|---|---|
| 218MS | C18 | 5, 10 | Polymeric bonding, highest hydrophobic interaction and unique geometric selectivity | Use for simple enzymatic digests (<12 proteins) or biomolecules 0–5 kDa MW | L1 |
| 238MS | C18 | 5 | Monomeric bonding offers increased peptide interaction and generally yields higher peak counts | Use for same applications as 218MS, but offers different C18 selectivity | L1 |
| 208MS | C8 | 5, 10 | Lower hydrophobicity is better for larger biomolecules | Ideal for biomolecules 5–10 kDa MW | L7 |
| 214MS | C4 | 5, 10 | Lower capacity than C18 or C8, suitable for hydrophobic proteins or when minimal organic solvent is desired | Ideal for biomolecules >10 kDa MW, intact proteins, antibodies, oligonucleotides, human growth hormone | L26 |



## Ordering Information

### Capillary Columns

### 5 µm

| Length / mm | 50 | | | |
|---|---|---|---|---|
| i.d. / mm | 0.075 | 0.15 | 0.3 | 0.5 |
| 218MS | 218MS5.07505 | 218MS5.1505 | 218MS5.305 | 218MS5.505 |
| 238MS | 238MS5.07505 | 238MS5.1505 | 238MS5.305 | 238MS5.505 |
| 208MS | 208MS5.07505 | 208MS5.1505 | 208MS5.305 | 208MS5.505 |
| 214MS | 214MS5.07505 | 214MS5.1505 | 214MS5.305 | 214MS5.505 |

| Length / mm | 100 | | | | |
|---|---|---|---|---|---|
| i.d. / mm | 0.075 | 0.1 | 0.15 | 0.3 | 0.5 |
| 218MS | 218MS5.07510 | – | 218MS5.1510 | 218MS5.310 | 218MS5.510 |
| 238MS | 238MS5.07510 | – | 238MS5.1510 | 238MS5.310 | 238MS5.510 |
| 208MS | 208MS5.07510 | 208MS5.1010 | 208MS5.1510 | 208MS5.310 | 208MS5.510 |
| 214MS | 214MS5.07510 | – | 214MS5.1510 | 214MS5.310 | 214MS5.510 |

| Length / mm | 150 | | | |
|---|---|---|---|---|
| i.d. / mm | 0.075 | 0.15 | 0.3 | 0.5 |
| 218MS | 218MS5.07515 | 218MS5.1515 | 218MS5.315 | 218MS5.515 |
| 238MS | 238MS5.07515 | 238MS5.1515 | 238MS5.315 | 238MS5.515 |
| 208MS | 208MS5.07515 | 208MS5.1515 | 208MS5.315 | 208MS5.515 |
| 214MS | 214MS5.07515 | 214MS5.1515 | 214MS5.315 | 214MS5.515 |

| Length / mm | 250 | | | |
|---|---|---|---|---|
| i.d. / mm | 0.075 | 0.15 | 0.3 | 0.5 |
| 218MS | 218MS5.07525 | 218MS5.1525 | 218MS5.325 | 218MS5.525 |
| 238MS | 238MS5.07525 | 238MS5.1525 | 238MS5.325 | 238MS5.525 |
| 208MS | 208MS5.07525 | 208MS5.1525 | 208MS5.325 | 208MS5.525 |
| 214MS | 214MS5.07525 | 214MS5.1525 | 214MS5.325 | 214MS5.525 |

## Analytical Columns

### 5 µm

| Length / mm | 20 | | 50 | | |
|---|---|---|---|---|---|
| i.d. / mm | 2.1 | 4.6 | 1.0 | 2.1 | 4.6 |
| 218MS | 218MS5202 | 218MS5402 | 218MS5105 | 218MS5205 | 218MS5405 |
| 238MS | – | – | 238MS5105 | 238MS5205 | – |
| 208MS | – | – | 208MS5105 | 208MS5205 | – |
| 214MS | – | – | 214MS5105 | 214MS5205 | 214MS5405 |

| Length / mm | 100 | | | |
|---|---|---|---|---|
| i.d. / mm | 1.0 | 2.1 | 3.0 | 4.6 |
| 218MS | 218MS5110 | 218MS5210 | 218MS5310 | 218MS5410 |
| 238MS | 238MS5110 | 238MS5210 | – | 238MS5410 |
| 208MS | 208MS5110 | 208MS5210 | – | – |
| 214MS | 214MS5110 | 214MS5210 | 214MS5310 | 214MS5410 |

| Length / mm | 150 | | | | 200 |
|---|---|---|---|---|---|
| i.d. / mm | 1.0 | 2.1 | 3.0 | 4.6 | 1.0 |
| 218MS | 218MS5115 | 218MS5215 | – | 218MS5415 | 218MS5120 |
| 238MS | 238MS5115 | 238MS5215 | – | 238MS5415 | – |
| 208MS | 208MS5115 | 208MS5215 | 208MS5315 | 208MS5415 | – |
| 214MS | 214MS5115 | 214MS5215 | 214MS5315 | 214MS5415 | – |

| Length / mm | 250 | | | |
|---|---|---|---|---|
| i.d. / mm | 1.0 | 2.1 | 3.0 | 4.6 |
| 218MS | 218MS51 | 218MS52 | 218MS53 | 218MS54 |
| 238MS | 238MS51 | 238MS52 | – | 238MS54 |
| 208MS | 208MS51 | 208MS52 | – | 208MS54 |
| 214MS | 214MS51 | 214MS52 | 214MS53 | 214MS54 |

| Length / mm | Guard cartridges (2/pk)[1] | | | Guard cartridge kits[2] | | |
|---|---|---|---|---|---|---|
| i.d. / mm | For 1.0 | For 2.1 | For 3.0-4.6 | For 1.0 | For 2.1 | For 3.0-4.6 |
| 218MS | 218GD51MS/N | 218GD52MS/N | 218GD54MS/N | 218GK51MS/N | 218GK52MS/N | 218GK54MS/N |
| 238MS | 238GD51MS/N | 238GD52MS/N | 238GD54MS/N | 238GK51MS/N | 238GK52MS/N | 238GK54MS/N |
| 208MS | 208GD51MS/N | 208GD52MS/N | 208GD54MS/N | 208GK51MS/N | 208GK52MS/N | 208GK54MS/N |
| 214MS | 214GD51MS/N | 214GD52MS/N | 214GD54MS/N | 214GK51MS/N | 214GK52MS/N | 214GK54MS/N |

[1]To be used with All-Guard cartridge holder (80101/N) and column coupler for All-Guard cartridges (HI-081).
[2]Includes holder (80101/N), column coupler (HI-081), and 1 guard cartridge.

### 10 µm

| Length / mm | 250 | | Guard cartridges (2/pk)[1] | Guard cartridge kits[2] |
|---|---|---|---|---|
| i.d. / mm | 1.0 | 4.6 | For 3.0-4.6 | For 3.0-4.6 |
| 218MS | 218MS101 | 218MS104 | 218GD104MS/N | 218GK104MS/N |
| 208MS | – | 208MS104 | – | – |
| 214MS | – | 214MS104 | – | – |

[1]To be used with All-Guard cartridge holder (80101/N) and column coupler for All-Guard cartridges (HI-081).
[2]Includes holder (80101/N), column coupler (HI-081), and 1 guard cartridge.

### 10–15 µm

| Length / mm | 250 |
|---|---|
| i.d. / mm | 4.6 |
| 214MS | 214MS10154 |

## Semi-preparative and Preparative Columns

### 5 µm

| Length / mm | 250 |
|---|---|
| i.d. / mm | 10 |
| 218MS | 218MS510 |
| 208MS | 208MS510 |
| 214MS | 214MS510 |

### 10 µm

| Length / mm | 150 | 250 | |
|---|---|---|---|
| i.d. / mm | 22 | 10 | 22 |
| 218MS | 218MS102215 | 218MS1010 | 218MS1022 |
| 208MS | 208MS102215 | – | 208MS1022 |
| 214MS | – | 214MS1010 | 214MS1022 |

### 10–15 µm

| Length / mm | 250 | Guard cartridges – 12 µm (2/pk)[1] |
|---|---|---|
| i.d. / mm | 22 | For 22 |
| 214MS | 214MS101522 | 214FSK1210MS |

[1]To be used with semi-prep guard holder (GCH10) and column coupler for All-Guard cartridges (HI-081).

**For column dimensions not listed here, please contact**
**+44 (0)118 930 3660** or
**technical@hichrom.co.uk**
to discuss your requirements

# Vydac Everest

Everest columns (238EV) have unique selectivity and sensitivity, which are the result of bonding technology that improves C18 surface coverage and deactivates residual silanols. Leading 300 Å C18 chemistries have had carbon coverage in the 2.8 to 3.6 µmol $m^{-2}$ range. Everest C18 coverage is in excess of 4 µmol $m^{-2}$ and approximates the theoretical limit based on surface area. The increased shielding of the base silica increases column lifetime and reduces the amount of TFA required to shield the silica.

## Key Features

- Unique selectivity for hydrophilic and hydrophobic peptides
- 300 Å pore size spherical silica
- Excellent sensitivity with little or no TFA in mobile phase
- Ideal for complex enzymatic digests (>12 proteins)

## Ordering Information

### Capillary Columns

#### 5 µm

| Length / mm | 50 | | | 100 | | |
|---|---|---|---|---|---|---|
| i.d. / mm | 0.075 | 0.3 | 0.5 | 0.075 | 0.15 | 0.3 |
| C18 | 238EV5.07505 | 238EV5.305 | 238EV5.505 | 238EV5.07510 | 238EV5.1510 | 238EV5.310 |

| Length / mm | 150 | | | | 250 | |
|---|---|---|---|---|---|---|
| i.d. / mm | 0.075 | 0.15 | 0.3 | 0.5 | 0.15 | 0.3 |
| C18 | 238EV5.07515 | 238EV5.1515 | 238EV5.315 | 238EV5.515 | 238EV5.1525 | 238EV5.325 |

### Analytical Columns

#### 5 µm

| Length / mm | 50 | | 100 | | 150 | | |
|---|---|---|---|---|---|---|---|
| i.d. / mm | 1.0 | 4.6 | 2.1 | 3.0 | 1.0 | 2.1 | 4.6 |
| C18 | 238EV5105 | 238EV5405 | 238EV5210 | 238EV5310 | 238EV5115 | 238EV5215 | 238EV5415 |

| Length / mm | 250 | | | Guard cartridges (2/pk)[1] | | Guard cartridge kits[2] |
|---|---|---|---|---|---|---|
| i.d. / mm | 1.0 | 2.1 | 4.6 | For 2.1 | For 3.0-4.6 | For 3.0-4.6 |
| C18 | 238EV51 | 238EV52 | 238EV54 | 238GD52EV/N | 238GD54EV/N | 238GK54EV/N |

[1]To be used with All-Guard cartridge holder (80101/N) and column coupler for All-Guard cartridges (HI-081).
[2]Includes holder (80101/N), column coupler (HI-081), and 1 guard cartridge.

### Semi-preparative Columns

#### 5 µm

| Length / mm | 250 | Guard cartridges (2/pk)[1] |
|---|---|---|
| i.d. / mm | 10 | For 10-22 |
| C18 | 238EV510 | 238GCC510EV |

#### 10 µm

| Length / mm | 250 |
|---|---|
| i.d. / mm | 22 |
| C18 | 238EV1022 |

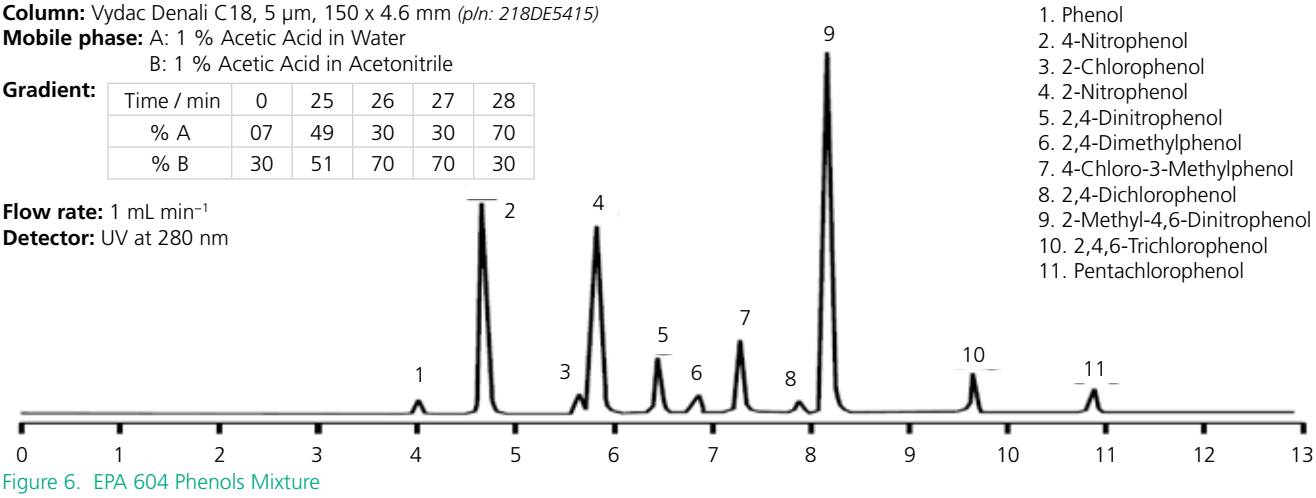
[1]To be used with semi-prep guard holder (GCH10) and column coupler for All-Guard cartridges (HI-081).

**Column:** Vydac Denali C18, 5 µm, 150 x 4.6 mm *(p/n: 218DE5415)*
**Mobile phase:** A: 1 % Acetic Acid in Water
B: 1 % Acetic Acid in Acetonitrile

**Gradient:**

| Time / min | 0 | 25 | 26 | 27 | 28 |
|---|---|---|---|---|---|
| % A | 07 | 49 | 30 | 30 | 70 |
| % B | 30 | 51 | 70 | 70 | 30 |

**Flow rate:** 1 mL $min^{-1}$
**Detector:** UV at 280 nm




1. Phenol
2. 4-Nitrophenol
3. 2-Chlorophenol
4. 2-Nitrophenol
5. 2,4-Dinitrophenol
6. 2,4-Dimethylphenol
7. 4-Chloro-3-Methylphenol
8. 2,4-Dichlorophenol
9. 2-Methyl-4,6-Dinitrophenol
10. 2,4,6-Trichlorophenol
11. Pentachlorophenol

Figure 6. EPA 604 Phenols Mixture

# Vydac Denali

Vydac Denali (238DE) is a 120 Å C18 bonded phase with high carbon coverage, suitable for the analysis of both acidic and basic analytes. It has applications for small molecule analyses of interest to pharmaceutical and environmental laboratories.

## Key Features

- High retentiveness
- LC/MS of small molecules
- Fully scalable from capillary to process

## Ordering Information

### Capillary Columns

#### 5 µm

| Length / mm | 50 | | | |
|---|---|---|---|---|
| i.d. / mm | 0.075 | 0.15 | 0.3 | 0.5 |
| C18 | 238DE5.07505 | 238DE5.1505 | 238DE5.305 | 238DE5.505 |

| Length / mm | 100 | 150 | | | 250 |
|---|---|---|---|---|---|
| i.d. / mm | 0.075 | 0.075 | 0.15 | 0.5 | 0.3 |
| C18 | 238DE5.07510 | 238DE5.07515 | 238DE5.1515 | 238DE5.515 | 238DE5.325 |

### Analytical Columns

#### 5 µm

| Length / mm | 50 | | | | 100 | | | |
|---|---|---|---|---|---|---|---|---|
| i.d. / mm | 1.0 | 2.1 | 3.0 | 4.6 | 1.0 | 2.1 | 3.0 | 4.6 |
| C18 | 238DE5105 | 238DE5205 | 238DE5305 | 238DE5405 | 238DE5110 | 238DE5210 | 238DE5310 | 238DE5410 |

| Length / mm | 150 | | | | 250 | | |
|---|---|---|---|---|---|---|---|
| i.d. / mm | 1.0 | 2.1 | 3.0 | 4.6 | 1.0 | 2.1 | 4.6 |
| C18 | 238DE5115 | 238DE5215 | 238DE5315 | 238DE5415 | 238DE51 | 238DE52 | 238DE54 |

| Length / mm | Guard cartridges (2/pk)[1] | | | Guard cartridge kits[2] | | |
|---|---|---|---|---|---|---|
| i.d. / mm | For 1.0 | For 2.1 | For 3.0-4.6 | For 1.0 | For 2.1 | For 3.0-4.6 |
| C18 | 238GD51DE/N | 238GD52DE/N | 238GD54DE/N | 238GK51DE/N | 238GK52DE/N | 238GK54DE/N |

[1]To be used with All-Guard cartridge holder (80101/N) and column coupler for All-Guard cartridges (HI-081).
[2]Includes holder (80101/N), column coupler (HI-081), and 1 guard cartridge.

#### 10 µm

| Length / mm | 50 | 150 | 250 | | 300 |
|---|---|---|---|---|---|
| i.d. / mm | 4.6 | 4.6 | 4.0 | 4.6 | 4.6 |
| C18 | 238DE10405 | 238DE10415 | DE-10C18-250DF | 238DE104 | DE-10C18-300DF |
| Silica | – | – | – | 5174066 | – |

### Semi-preparative and Preparative Columns

#### 5 µm

| Length / mm | 100 | 150 | | 250 |
|---|---|---|---|---|
| i.d. / mm | 10 | 10 | 22 | 10 |
| C18 | 238DE51010 | 5174053 | 238DE52215 | 238DE510 |
| Silica | – | 5174054 | – | – |

#### 10 µm

| Length / mm | 150 | | 250 | | Guard cartridges (2/pk)[1] |
|---|---|---|---|---|---|
| i.d. / mm | 10 | 22 | 10 | 22 | For 10-22 |
| C18 | 238DE101015 | 238DE102215 | 238DE1010 | 238DE1022 | 238GCC1010DE |
| Silica | – | 5174057 | 5174063 | – | – |

[1]To be used with semi-prep guard holder (GCH10) and column coupler (HI-081).

# Vydac 302IC Anion-Exchange

Vydac 302IC is a low capacity anion-exchange (quaternary amine) material based on a high purity 10 µm large pore size silica.

## Key Features

- Well referenced for non-suppressed ion chromatography applications
- Used with standard HPLC systems for analysis of common ions
- Widely used for environmental analysis

## Ordering Information

### Analytical Columns

#### 10 µm

| Length / mm | 100 | 250 | | Guard cartridges (2/pk)[1] |
|---|---|---|---|---|
| i.d. / mm | 4.6 | 2.1 | 4.6 | For 4.6 |
| 302IC | 302IC4610 | 302IC102 | 302IC4.6 | 302GD4/N |

[1]To be used with All-Guard cartridge holder (80101/N) and column coupler for All-Guard cartridges (HI-081).

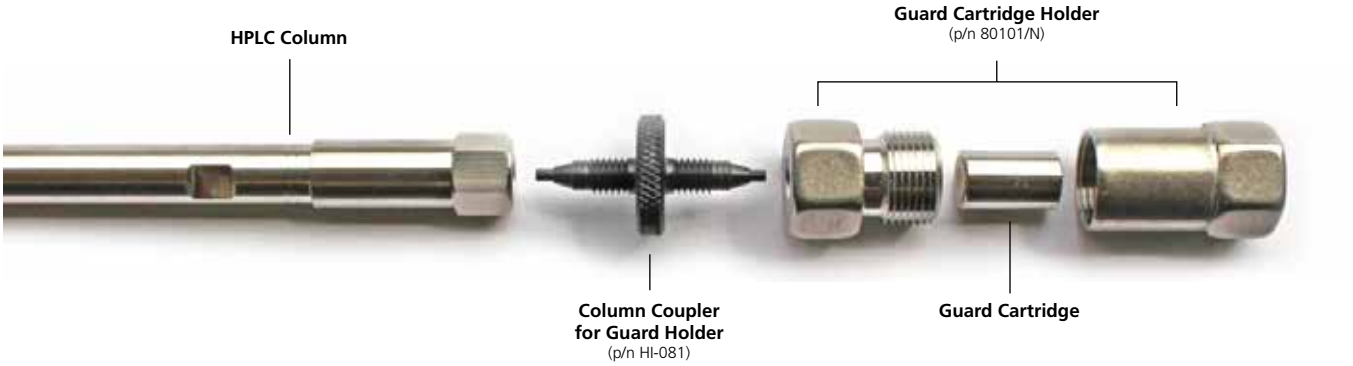
# Guard Cartridge Systems

To support these newly acquired column ranges, Hichrom continues to recommend the use of guard cartridges for analytical column protection and increased column lifetime. The hardware of the Hichrom All-Guard Cartridge System has been improved and all guard cartridges and holders are now supplied in this new hardware, leading to more robust and higher efficiency separations. Chromatographic selectivity will be unaffected by this change.

## Benefits of the hardware improvement include:

- Higher pressure rating
- Low internal swept volume

Please note that the **new Hichrom guard cartridges and holders are not compatible with the old design Alltech guard cartridges and holders.** Guard cartridges and holders supplied in the new improved hardware are denoted by the addition of an 'N' at the end of the old part number.




## Ordering information

**80101/N** – All-Guard cartridge holder

**HI-081** – Column Coupler for All-Guard Cartridge Holder (standard column port)

**HI-881** – Column Coupler for All-Guard Cartridge Holder (Waters type column port only)

**C-1000** – Semi-prep guard holder (for 10-22 mm i.d. columns)

**GCH10** – Vydac semi-prep guard holder (for 10-22 mm i.d. columns)

**HI-226** – Analytical Guard Holder Wrench Set - contains a pair of 9/16" stainless steel wrenches

**HI-050X** – Hichrom PEEK Fingertight Fittings (10/pack) - suitable for connection of HPLC columns and guard holders to all 1/16" tubing types, are compatible with both standard and Waters port designs, and are slip free to >5,000 psi

**Please contact Hichrom for other former Grace brands not featured in this catalogue, including:**

- Adsorbosil
- Adsorbosphere
- Allsphere
- Brava
- Econosil
- Econosphere
- Exsil
- GraceSmart
- Grom Sil
- Grom Sapphire
- Macrosphere
- Platinum
- ProSphere
- VisionHT

This catalogue contains HPLC column ranges acquired by Hichrom from Grace.
For information on any other product ranges within the Hichrom portfolio, please contact

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