

Chromatography Solutions

Avantor® Chromatography Range

Vydac for the separation of biomolecules and polypeptides.



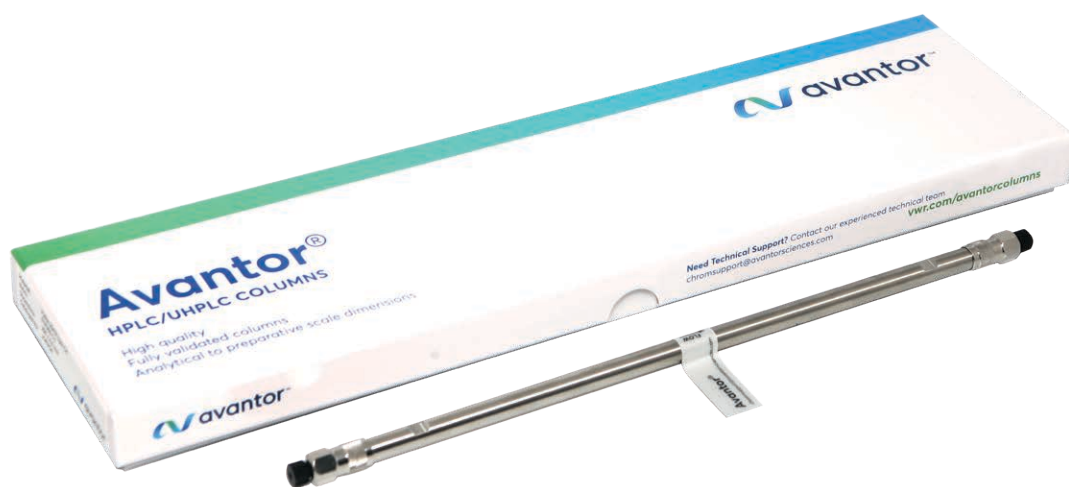
Introduction

Avantor® manufactures a range of cutting edge HPLC chromatography products from its ISO 9001/ISO 14001 production facility.

Offering 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, method development and optimization strategy.

Avantor 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 in the UK since 1978, 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.

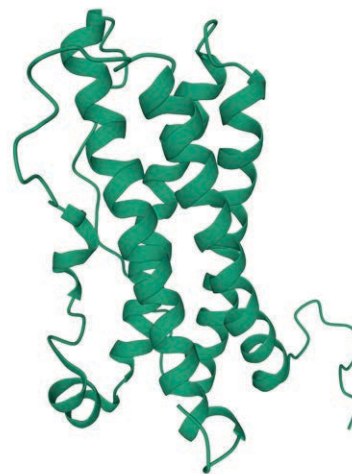
Hichrom Limited announced the acquisition of the global exclusive rights to manufacture Vydac® column ranges in 2016. Now part of the Avantor® family, we continue to manufacture these columns using the same protocols.



Vydac

for biomolecules and polypeptide separations

Vydac 300 Å columns are a commonly employed range in bioseparations. Vydac columns are fully scalable from 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 HPLC COLUMN SPECIFICATIONS

Phase	USP listing	Functional group	Endcapped	Particle Size (µm)	Surface Area (m ² /g)	Pore size (Å)	Carbon load (%)	Bonding type	pH
Vydac TP									
218TP	L1	Octadecyl	Yes	3, 5, 10, 10-15, 15-20	60 - 110	300	8	Polymeric	2 - 7
238TP	L1	Octadecyl	No	5	60 - 110	300	4	Monomeric	2 - 7
201TP	L1	Octadecyl	No	5, 10	70 - 90	300	8	Polymeric	2 - 7
202TP	L1	Octadecyl	No	5	60 - 90	300	9	Polymeric	2 - 7
208TP	L7	Octyl	Yes	5, 10, 10-15	60 - 110	300	5	Polymeric	2 - 7
214TP	L26	Butyl	Yes	5, 10, 10-15, 15-20	60 - 110	300	3	Polymeric	2 - 7
214ATP	L26	Butyl	Yes	5	60 - 110	300	3	Polymeric	2 - 7
219TP	L11	Diphenyl	Yes	5, 10	60 - 110	300	4	Polymeric	2 - 7
Vydac MS									
218MS	L1	Octadecyl	Yes	5	200	190	12	Monomeric	2 - 7
238MS	L1	Octadecyl	Yes	5	200	190	4	Monomeric	2 - 7
208MS	L1	Octadecyl	Yes	5	450	100	24	Monomeric	2 - 7
214MS	L1	Octadecyl	Yes	5, 10, 10-15	450	100	20	Monomeric	2 - 7
Vydac Denali									
238DE	L1	Octadecyl	Yes	5, 10	70 - 110	120	6	Monomeric	2 - 7
Vydac Everest									
238EV	L1	Octadecyl	Yes	5	70 - 110	300	6	Monomeric	2 - 7
Vydac IC									
302IC	-	Quaternary amine	-	10	-	> 100	-	-	2 - 6.5

Please contact chromsupport@avantorsciences.com for advice on column selection for EP (European Pharmacopoeia) and JP (Japanese Pharmacopoeia) guidelines, or by application.

Vydac TP

for biomolecules and polypeptide separations

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	Particle size (µm)	Functional group	Properties	Applications	USP code
218TP	3, 5, 10	C18	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	5	C18	First generation monomeric C18 phase	Use for same applications as 218TP, but offers different C18 selectivity	L1
201TP	5, 10	C18	Non-encapped C18 phase	Developed for separation of PAHs	L1
202TP	5	C18	Higher carbon load than 201TP	Developed for separation of PAHs	L1
208TP	5, 10	C8	Less hydrophobic than C18TP phase	Polypeptides 10-20 kDa MW	L7
214TP	5, 10	C4	First generation C4 phase	Glycoproteins, haemoglobin variants, histones, insulin variants, membrane proteins	L26
214ATP	5	C4	C4 phase with lower level of endcapping	Optimised for analysis of human growth hormone	L26
219TP	5, 10	Diphenyl	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

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ANALYTICAL COLUMNS - 3 µm

Length (mm)	50	100
i.d. (mm)	4.6	4.6
218TP	218TP3405	218TP3410

Length (mm)	150		250	
i.d. (mm)	2.1	4.6	3.0	4.6
218TP	218TP3215	218TP3415	–	218TP34

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

¹ To be used with All-Guard cartridge holder (80101/N) and column coupler for All-Guard cartridges (HI-081 and HI-1212).
² Includes holder (80101/N), column coupler (HI-081), and 1 guard cartridge.



ORDERING INFORMATION

ANALYTICAL COLUMNS - 5 µm

Length (mm)	30				
i.d. (mm)	2.1	1.0	2.1	3.0	4.6
218TP	-	218TP5105	-	218TP5305	218TP5405
238TP	-	-	-	-	-
201TP	201TP5203	-	-	-	-
208TP	-	-	-	-	-
214TP	-	-	-	-	214TP5405
214ATP	-	-	-	-	214ATP5405
219TP	-	-	-	-	-

Length (mm)	100		
i.d. (mm)	1.0	2.1	4.6
218TP	218TP5110	218TP5210	218TP5410
238TP	-	-	-
201TP	-	-	201TP5410
208TP	-	208TP5210	-
214TP	-	214TP5210	214TP5410
214ATP	-	-	-
219TP	-	219TP5210	-

Length (mm)	150			
i.d. (mm)	1.0	2.1	3.0	4.6
218TP	218TP5115	218TP5215	-	218TP5415
201TP	-	201TP5215	201TP5315	-
202TP	-	-	-	-
208TP	-	208TP5215	-	208TP5415
214TP	214TP5115	214TP5215	214TP5315	214TP5415
214ATP	-	-	-	214ATP5415
219TP	-	-	-	219TP5415

Length (mm)	250			
i.d. (mm)	1.0	2.1	3.0	4.6
218TP	-	218TP52	218TP53	218TP54
238TP	-	-	238TP53	238TP54
201TP	-	201TP52	-	201TP54
202TP	-	-	-	202TP54
208TP	-	208TP52	-	208TP54
214TP	214TP51	214TP52	214TP53	214TP54
214ATP	-	-	-	214ATP54
219TP	-	-	-	219TP54

Length (mm)	Guard cartridges (2/pk) ¹			Guard cartridge kits ²		
	For 1.0	For 2.1	For 3.0-4.6	For 1.0	For 2.1	For 3.0-4.6
218TP	-	218GD52/N	218GD54/N	218GK51/N	218GK52/N	218GK54/N
238TP	-	-	-	238GK51/N	238GK52/N	238GK54/N
201TP	-	201GD52/N	201GD54/N	-	201GK52/N	201GK54/N
202TP	-	-	-	-	-	-
208TP	-	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	-	-	-
219TP	-	219GD52/N	-	-	219GK52/N	-

¹ To be used with All-Guard cartridge holder (80101/N) and column coupler for All-Guard cartridges (HI-081 and HI-1212).
² Includes holder (80101/N), column coupler (HI-081), and 1 guard cartridge.

ANALYTICAL COLUMNS - 10 µm

Length (mm)	150	250	Guard cartridges (2/pk) ¹	Guard cartridge kits ²
i.d. (mm)	4.6	4.6	For 3.0-4.6	For 3.0-4.6
218TP	-	218TP104	218GD104/N	218GK104/N
201TP	-	201TP104	201GD104/N	201GK104/N
208TP	-	208TP104	208GD104/N	208GK104/N
214TP	214TP10415	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 and HI-1212).
² Includes holder (80101/N), column coupler (HI-081), and 1 guard cartridge.

ANALYTICAL COLUMNS - 10-15 µm

Length (mm)	150
i.d. (mm)	4.6
218TP	5119751
214TP	-

CONDITIONS

Column: Vydac 201TP C18 (p/n 201TP5415)
Particle size: 5 µm
Dimensions: 150x4.6 mm
Mobile phase: A: H₂O - B: Acetonitrile
Gradient: Time / min 0 30
 % B 50 100
Flow rate: 1.0 mL min⁻¹

- 1 Naphthalene
- 2 Acenaphthylene*
- 3 Acenaphthene
- 4 Fluorene
- 5 Phenanthrene
- 6 Anthracene
- 7 Fluoranthene
- 8 Pyrene
- 9 Benzo[a]anthracene
- 10 Chrysene
- 11 Benzo[b]fluoranthene
- 12 Benzo[k]fluoranthene
- 13 Benzo[a]pyrene
- 14 Dibenz[a,h]anthracene
- 15 Benzo[g,h,i]perylene
- 16 Indeno[1,2,3-c,d]pyrene

100 ng/mL (100 pg on column) of each analyte.

*Not detected with fluorescence

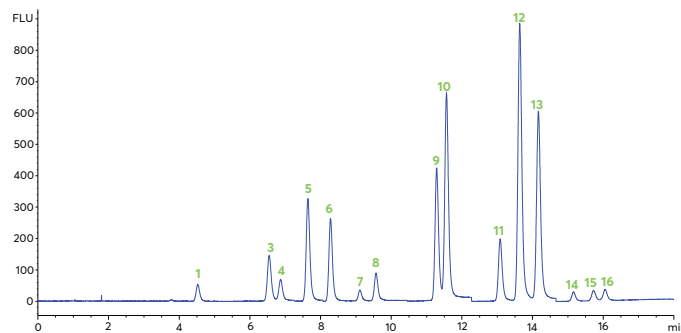


FIGURE 8: Fluorescence Detection. Beyond the EPA 16 Priority-Pollutant PAHs.

SEMI-PREPARATIVE AND PREPARATIVE COLUMNS - 5 µm

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

¹ To be used with semi-prep guard holder (GCH10) and column coupler for All-Guard cartridges (HI-081 and HI-1212).
² Includes holder (GCH10), column coupler (HI-081), and 1 guard cartridge.

SEMI-PREPARATIVE AND PREPARATIVE COLUMNS - 10 µm

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

¹ To be used with semi-prep guard holder (GCH10) and column coupler for All-Guard cartridges (HI-081 and HI-1212).

SEMI-PREPARATIVE AND PREPARATIVE COLUMNS - 10-15 µm

Length (mm)	150	250		Guard cartridges – 12 µm (2/pk) ¹	Guard cartridge kits – 12 µm ²
i.d. (mm)	22	10	22	For 10–22	For 10–22
218TP	–	218TP101510	218TP101522	–	218FSK1210
208TP	–	208TP101510	–	208GCC1210	208FSK1210
214TP	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 and HI-1212).
² Includes holder (80101/N), column coupler (HI-081), and 1 guard cartridge.

SEMI-PREPARATIVE AND PREPARATIVE COLUMNS - 15-20 µm

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

¹ To be used with semi-prep guard holder (GCH10) and column coupler for All-Guard cartridges (HI-081 and HI-1212).

Vydac MS

for the analysis of small peptides to large proteins

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)	100	
i.d. (mm)	0.3	
218MS	218MS5.310	
238MS	238MS5.310	
208MS	-	
214MS	-	

Length (mm)	150	
i.d. (mm)	0.075	0.3
218MS	-	-
238MS	-	-
208MS	-	-
214MS	214MS5.07515	214MS5.315

Length (mm)	250	
i.d. (mm)	0.3	
218MS	-	
238MS	-	
208MS	-	
214MS	214MS5.325	

ANALYTICAL COLUMNS - 5 µm

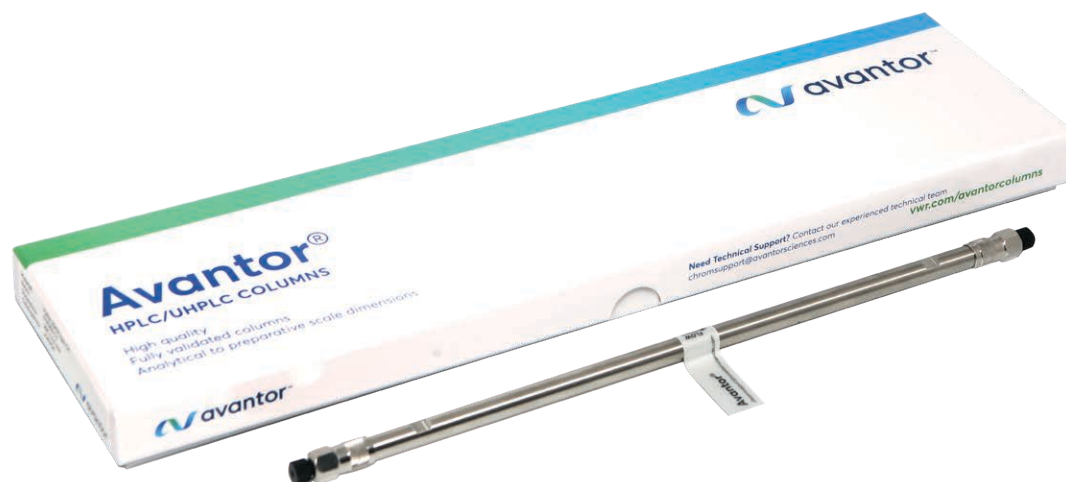
Length (mm)	50	
i.d. (mm)	2.1	4.6
218MS	218MS5205	-
238MS	-	-
208MS	-	-
214MS	214MS5205	214MS5405

Length (mm)	100	
i.d. (mm)	2.1	
218MS	-	
238MS	-	
208MS	208MS5210	
214MS	-	

Length (mm)	100	
i.d. (mm)	2.1	4.6
218MS	218MS5215	218MS5415
238MS	-	-
208MS	-	208MS5415
214MS	214MS5215	214MS5415

Length (mm)	250		
i.d. (mm)	1.0	2.1	4.6
218MS	218MS51	-	218MS54
238MS	-	-	-
208MS	-	208MS52	208MS54
214MS	-	214MS52	214MS54





ANALYTICAL COLUMNS - 5 µm

Length (mm)	Guard cartridges (2/pk) ¹		Guard cartridges kits ²	
	For 2.1	For 3.0-4.6	For 2.1	For 3.0-4.6
218MS	-	218GD54MS/N	-	218GK54MS/N
238MS	-	-	-	-
208MS	-	-	-	208GK54MS/N
214MS	214GD52MS/N	214GD54MS/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 and HI-1212).
² Includes holder (80101/N), column coupler (HI-081), and 1 guard cartridge.

SEMI-PREPARATIVE AND PREPARATIVE COLUMNS - 5 µm

Length (mm)	250
i.d. (mm)	10
218MS	218MS510

SEMI-PREPARATIVE AND PREPARATIVE COLUMNS - 10 µm

Length (mm)	250
i.d. (mm)	22
214MS	214MS1022

Vydac Everest

for high resolution of complex samples

Vydac 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 $\mu\text{mol m}^{-2}$ range. Everest C18 coverage is in excess of 4 $\mu\text{mol m}^{-2}$ 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)	150
i.d. (mm)	0.075
C18	238EV5.07515

ANALYTICAL COLUMNS - 5 μm

Length (mm)	150
i.d. (mm)	2.1
C18	238EV5215

Length (mm)	Guard cartridges (2/pk) ¹
i.d. (mm)	For 2.1
C18	238GD52EV/N

¹ To be used with All-Guard cartridge holder (80101/N) and column coupler for All-Guard cartridges (HI-081 and HI1212).
² Includes holder (80101/N), column coupler (HI-081), and 1 guard cartridge.

SEMI-PREPARATIVE COLUMNS - 5 μm

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

¹ To be used with semi-prep guard holder (GCH10) and column coupler for All-Guard cartridges (HI-081 and HI-1212).

SEMI-PREPARATIVE COLUMNS - 10 μm

Length (mm)	250
i.d. (mm)	22
C18	238EV1022

Vydac Denali

for small molecule analyses

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

ANALYTICAL COLUMNS - 5 µm

Length (mm)	100	
i.d. (mm)	4.6	
C18	238DE5410	

Length (mm)	150	250
i.d. (mm)	4.6	4.6
C18	238DE5415	238DE54

Length (mm)	Guard cartridges (2/pkg) ¹	
i.d. (mm)	For 3.0-4.6	
C18	238GD54DE/N	

¹ To be used with All-Guard cartridge holder (80101/N) and column coupler for All-Guard cartridges (HI-081 and HI-1212).
² Includes holder (80101/N), column coupler (HI-081), and 1 guard cartridge.

SEMI-PREPARATIVE AND PREPARATIVE COLUMNS - 5 µm

Length (mm)	150	
i.d. (mm)	22	
C18	238DE52215	
Silica	-	

SEMI-PREPARATIVE AND PREPARATIVE COLUMNS - 10 µm

Length (mm)	250	
i.d. (mm)	22	
C18	238DE1022	
Silica	-	

¹ To be used with semi-prep guard holder (GCH10) and column coupler (HI-081 and HI-1212).

CONDITIONS

Column: Vydac Denali, C18, 5 µm, 150 x 4.6 mm (p/n: 238DE5415)

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

Detector: UV at 280 nm

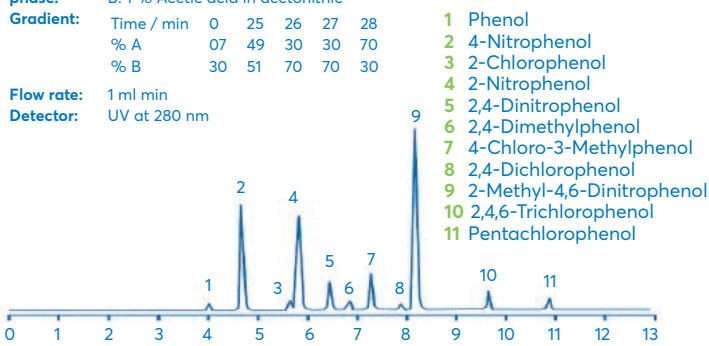


FIGURE 10: EPA 604 Phenols Mixture.

Vydac 302IC Anion-Exchange

for environmental analyses

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

Key Features

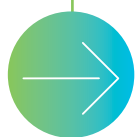
- Well referenced for non-suppressed ion chromatography applications
- Used with standard HPLC systems for analysis of common ions
- Widely used for environmental analysis

ORDERING INFORMATION

ANALYTICAL COLUMNS - 10 µm

Length (mm)	250	Guard cartridges (2/pk) ¹
i.d. (mm)	4.6	For 4.6
302IC	302IC4.6	302GD4/N

¹ To be used with All-Guard cartridge holder (80101/N) and column coupler for All-Guard cartridges (HI-081 and HI-1212).



For additional dimensions please contact
chromsupport@avantorsciences.com

For more info, please contact our Chromatography Technical support team at: chromsupport@avantorsciences.com