

Application Guide: Pharmaceutical Drugs (Assay and Impurity profiling) using Avantor® ACE® Generix® Columns

Avantor® ACE® Generix®

HIGH PERFORMANCE, EXCELLENT VALUE HPLC AND UHPLC COLUMNS

High Efficiency 1.8, 3 and 5 µm Particles

- High purity spherical silica
- Ultra-narrow particle size distribution for excellent column efficiency
- C18, C8, Phenyl-Hexyl and SIL phases

Excellent Reproducibility

- Manufactured in the UK in ISO9001 and ISO14001 accredited facilities
- Sharp, highly symmetrical peaks for acidic, basic and neutral analytes
- Every column individually tested and supplied with a test chromatogram
- Excellent column-to-column and batch-to-batch reproducibility

Excellent Column Lifetime

- Highly stable bonded phases for long column lifetimes
- Ultra-robust HPLC and UHPLC column packing technology
- High performance guard system available

Phase Specifications

Bonded Phase*	Particle Size (µm)	Surface Area (m ² /g)	Pore Size (Å)	Carbon Load (%)	Recommended pH Range*	USP Listing
C18(2)	1.8, 3 and 5	350	95	20.3	2.0-8.0	L1
C8(2)	1.8, 3 and 5	350	95	11.9	2.0-8.0	L7
Phenyl-Hexyl	1.8, 3 and 5	350	95	15.2	2.0-8.0	L11
SIL	3 and 5	350	95	-	2.0-8.0	L3

*The full range of Avantor® ACE® HPLC and UHPLC columns is available with 1.7, 2, 3, 5 and 10 µm particle sizes and a wider range of stationary phase options.

*For optimum column lifetime, a pH range of 2-8 is recommended. To increase column lifetime at mid/high pH, organic buffers, low buffer concentrations, high % organic solvent and low temperatures must be considered. Further information is contained within "A Guide to HPLC and LC/MS Buffer Selection" by John Dolan.

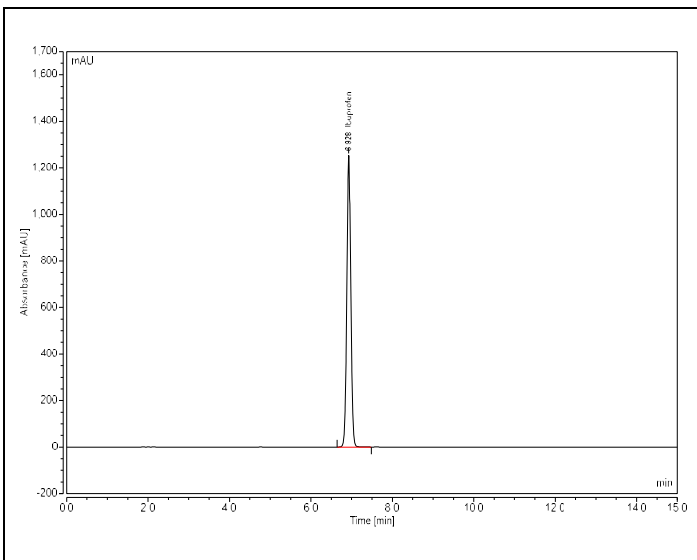
Application Index

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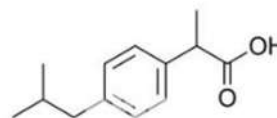
All these methods developed in ACE® Generix® and reproduced with permission from Force Scientific, Vadodara.



Ibuprofen		Application: # C-13288
Column	ACE Generix C18 (2) 5µm 250X4.6	
Injection	10 µL	
Detection	UV 220 nm	
Cell	10 µL	
Flow Rate	1.0 mL/min	
Mobile Phase	Buffer: Acetonitrile (30:70)	
Buffer	0.7 ml of 85 % orthophosphoric acid in 1000 ml Water	
Diluent	Mobile Phase	
Temperature	Ambient	
Autosampler Temp	5°C	
Sample preparation	Weight accurately about 400mg of Ibuprofen into, 100 ml volumetric flask, add 60 ml of acetonitrile, sonicate and make up volume to 100 ml with 0.01M Orthophosphoric acid. Then Transfer 5ml from this solution into 50 ml volumetric flask and dilute to volume with mobile phase	



Ibuprofen

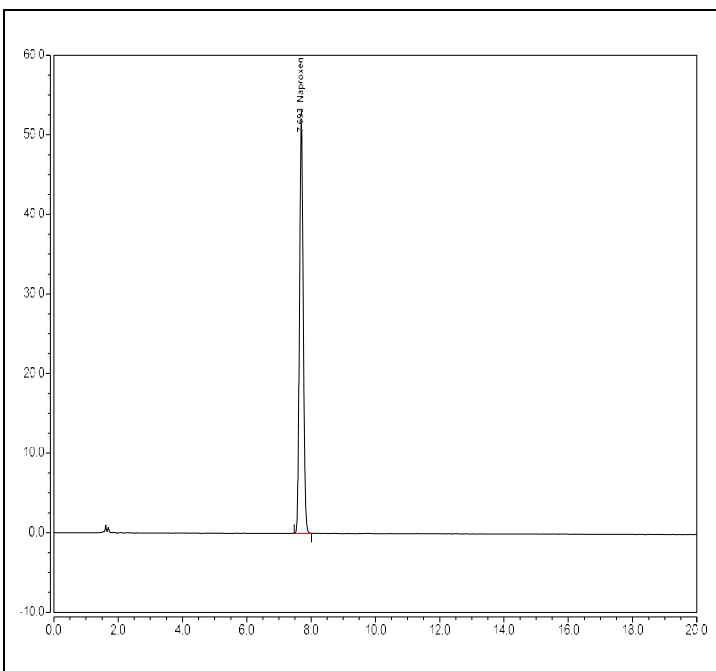


The Avantor ACE 5 Generix (2) 250 x 4.6 mm column is an excellent choice for the quantification of Ibuprofen due to its well-suited properties for handling a broad range of analytes.

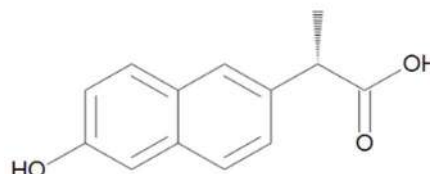
Here's a detailed explanation of the reasons behind its suitability:

1. The ACE 5 Generix (2) column is designed for a wide range of compounds, making it ideal for both simple and complex analytical separations.
2. The C18-like stationary phase ensures consistent retention of non-polar compounds like ibuprofen, as well as other analytes, contributing to its versatility.

Naproxen Sodium		Application: # C-13289
Column	ACE Generix C18 (2) 5µm 250X4.6	
Injection	20 µL	
Detection	UV 254 nm	
Cell	10 µL	
Flow Rate	1.2 mL/min	
Mobile Phase	Acetonitrile, glacial acetic acid and water (50:1:49)	
Diluent	Acetonitrile and water (9:1)	
Temperature	Column oven temp: 25°C	
Autosampler Temperature	10°C	
Sample preparation:	Transfer an amount equivalent to 250 mg of naproxen, to a 100-mL volumetric flask. Add 10 mL of water and sonicate for 10 min. Add 80 mL of acetonitrile and dilute with acetonitrile to volume. Transfer 1.0 mL of the clear supernatant	



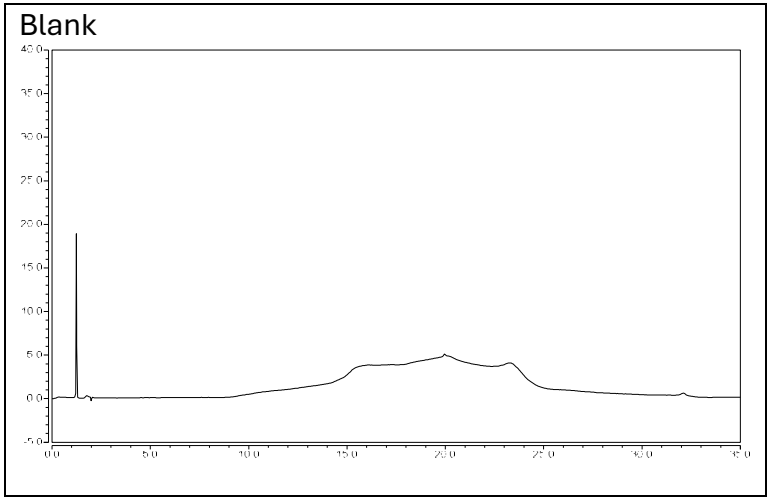
Naproxen Sodium

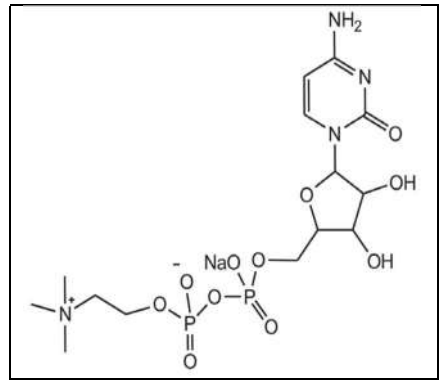


The ACE Generix 5 C18 (2) 250 x 4.6 mm column is an ideal choice for the analysis of Naproxen sodium, a non-steroidal anti-inflammatory drug (NSAID), due to the following reasons:

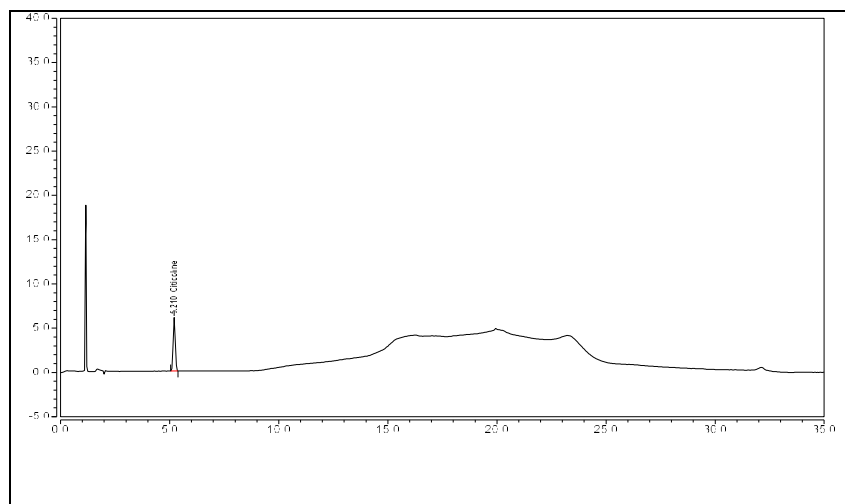
1. Naproxen sodium is a relatively non-polar compound, and the C18 (octadecylsilane) phase is highly hydrophobic, making it suitable for the retention of non-polar molecules.
2. Naproxen sodium analysis often requires separation from its impurities, degradation products, and excipients present in formulations. The ACE Generix C18 (2) column's high efficiency ensures sharp and well-resolved peaks, allowing precise separation of naproxen from these related compounds.
3. The **dual Endcapped chemistry** of the C18 (2) phase minimizes secondary silanol interactions, reducing peak tailing and enhancing the resolution, which is critical in identifying impurities.

Citicoline		Application: # C-13290																					
Column	ACE Generix 5 C18 (2) 250 x 4.6 mm																						
Injection	15 µL																						
Detection	UV 262 nm																						
Cell	10 µL																						
Flow Rate:	1.0 mL/min																						
Mobile Phase	10 mM tetrabutylammonium hydroxide and 15 mM dibasic sodium phosphate anhydrous, adjusted with 20% phosphoric acid to a pH of 6.0																						
Solvent mixture	Water																						
Gradient:	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Time</th> <th>A (%)</th> <th>B (%)</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>100</td> <td>0</td> </tr> <tr> <td>5</td> <td>100</td> <td>0</td> </tr> <tr> <td>15</td> <td>85</td> <td>15</td> </tr> <tr> <td>20</td> <td>85</td> <td>15</td> </tr> <tr> <td>21</td> <td>100</td> <td>0</td> </tr> <tr> <td>35</td> <td>100</td> <td>0</td> </tr> </tbody> </table>		Time	A (%)	B (%)	0	100	0	5	100	0	15	85	15	20	85	15	21	100	0	35	100	0
Time	A (%)	B (%)																					
0	100	0																					
5	100	0																					
15	85	15																					
20	85	15																					
21	100	0																					
35	100	0																					
Temperature:	40 °C																						
Standard solution	2.4 µg/mL of USP Citicoline RS in water																						
Sample solutions	24 µg/mL of Citicoline in water																						

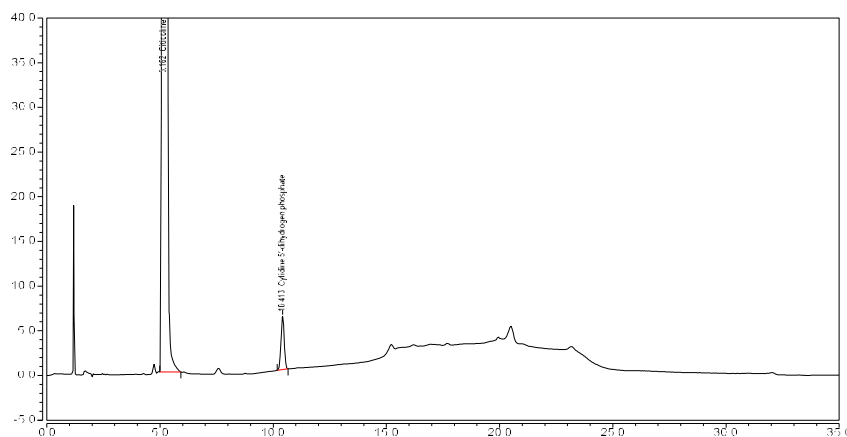




Standard



Sample

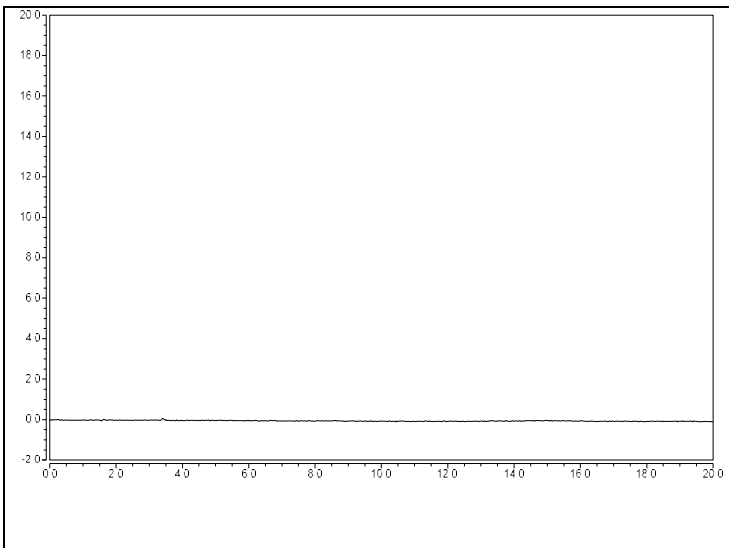


Peak No.	Retention time	Peak Name	Area	Area	Tailing	Resolution	Rel. Ret.Time	S/N
1	5.162	Citicoline	27523638	99.78	1.35	---	1	6739.5
2	10.413	Cytidine 5'-dihydrogen phosphate	59357	0.22	0.99	22.79	2.02	15.7

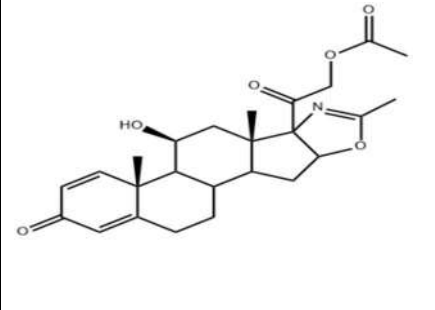
Citicoline, being a water-soluble compound with multiple functional groups, may require a column that provides good retention and resolution of polar compounds. The ACE Generix column likely provides suitable selectivity for such compounds. The 5 μm particle size offers a good balance between column backpressure and resolution. This size is often chosen in related substance tests to achieve sharper peaks and better separation between Citicoline and its impurities.

Deflazacort		Application: # C-13292
Column	ACE Generix 5 C18 (2) 250 x 4.6 mm	
Injection	20 μ L	
Detection	UV 254 nm	
Cell	10 μ L	
Flow Rate	1.0 mL/min	
Mobile Phase	Mix HPLC water and Acetonitrile 60:40 (v/v)	
Solvent mixture	Mobile phase	
Temperature	Ambient	
Test solution	Dissolve 25 mg of sample in 50 ml mobile phase	
Reference solution	Dissolve 2 mg of Deflazacort in 50 ml mobile phase	

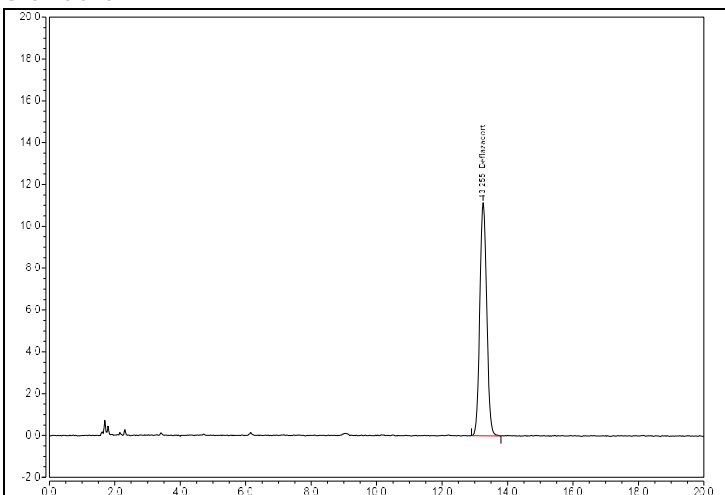
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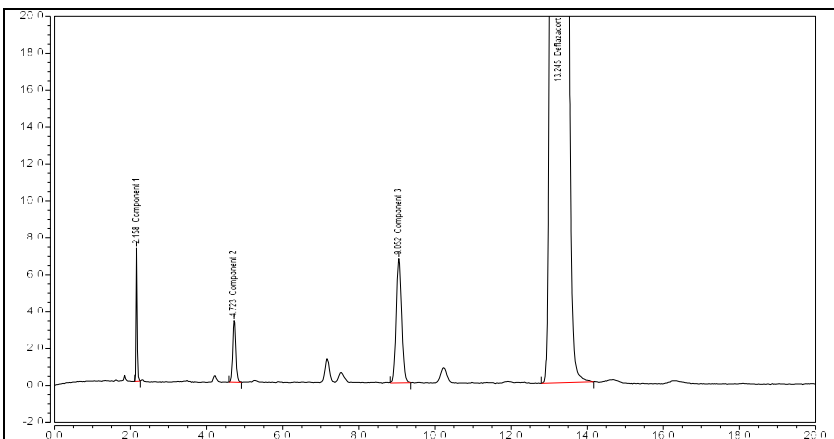
Deflazacort



Standard



Sample



Peak No	Retention Time	Peak Name	Area	Area	Tailing	Resolution	Theoretical
1	2.158	Component 1	15902	0.15	1.2	--	22938
2	4.723	Component 2	18231	0.18	1.11	25.68	17507
3	9.052	Component 3	67582	0.66	1.07	21.38	19086
4	13.245	Deflazacort	10159939	99.01	1.08	13.04	19333

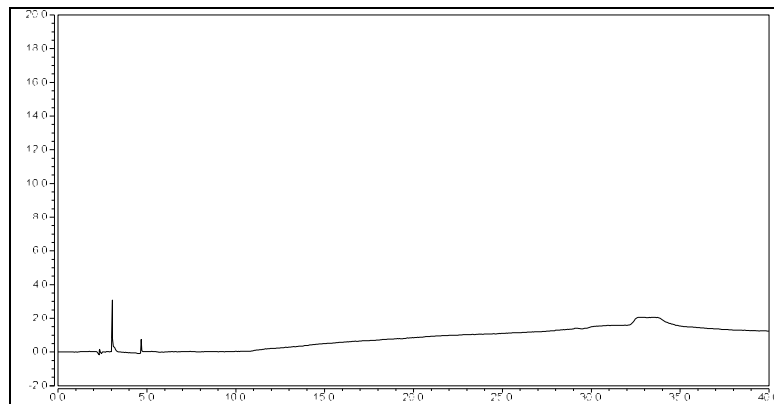
The ACE Generix 5 C18 (2) 250 x 4.6 mm column plays a crucial role in the related substance testing of Deflazacort, a glucocorticoid used for treating conditions such as Duchenne muscular dystrophy. Related substance tests are essential for determining impurities, degradation products, and potential contaminants in pharmaceutical formulations.

Deflazacort is a lipophilic compound with non-polar characteristics. The C18 bonded phase of the ACE Generix column provides optimal hydrophobic interactions, enabling efficient retention of Deflazacort and its related substances. This allows for a clear separation of structurally similar impurities.

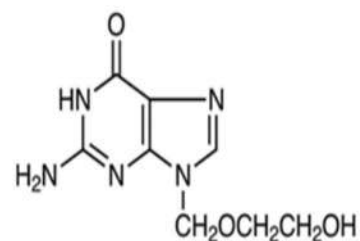
The ACE Generix 5 C18 (2) column is compatible with a wide range of mobile phases, including aqueous-organic mixtures commonly used in pharmaceutical analyses. This flexibility is important for optimizing the separation of polar and non-polar impurities in Deflazacort, while maintaining excellent peak shape and reproducibility.

Aciclovir		Application: # C-13291																					
Column	ACE Generix 5 C18 (2) 250 x 4.6 mm																						
Injection	10 µL																						
Detection	UV @ 254 nm																						
Cell	10 µL																						
Buffer Solution	Phosphate buffer solution pH 2.5. Dissolve 3.48 g of dipotassium hydrogen phosphate. Phosphate buffer solution pH 3.1. Dissolve 3.48 g of dipotassium hydrogen phosphate in 1000 mL of water. Adjust to pH 3.1 with phosphoric acid.																						
Mobile Phase A	Acetonitrile, phosphate buffer solution pH 3.1 (1:99 V/V).																						
Mobile Phase B	Acetonitrile, phosphate buffer solution pH 2.5 (50:50 V/V).																						
Gradient	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Time (min)</th> <th>%A</th> <th>%B</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>100</td> <td>0</td> </tr> <tr> <td>5</td> <td>100</td> <td>0</td> </tr> <tr> <td>27</td> <td>80</td> <td>20</td> </tr> <tr> <td>40</td> <td>80</td> <td>20</td> </tr> <tr> <td>41</td> <td>100</td> <td>0</td> </tr> <tr> <td>50</td> <td>100</td> <td>0</td> </tr> </tbody> </table>		Time (min)	%A	%B	0	100	0	5	100	0	27	80	20	40	80	20	41	100	0	50	100	0
Time (min)	%A	%B																					
0	100	0																					
5	100	0																					
27	80	20																					
40	80	20																					
41	100	0																					
50	100	0																					
Temperature	30° C																						
Sample cooler	10° C																						
Diluent	Dimethyl sulfoxide, water (20:80 V/V).																						
Standard Solution	Dilute 1.0 mL of the test solution to 100.0 mL with the solvent mixture. Further Dilute 1.0 mL of this solution to 10.0 mL with the solvent mixture.																						
Sample Solution	Dissolve 25 mg of the substance to be examined in 5.0 mL of dimethyl sulfoxide and dilute to 25.0 mL with water.																						

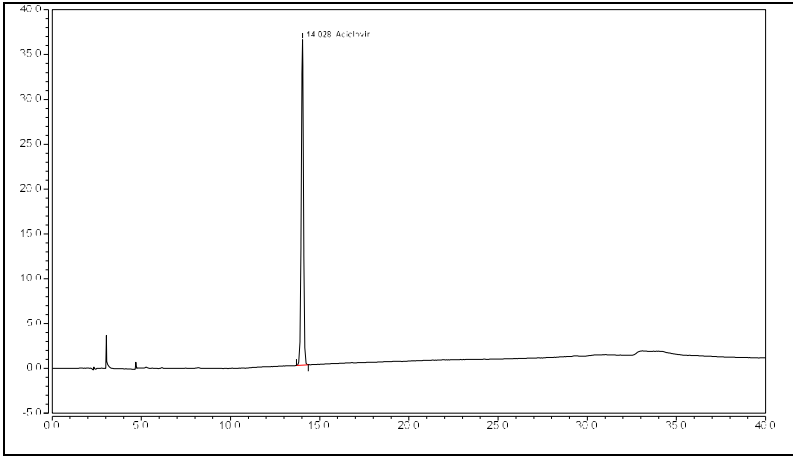
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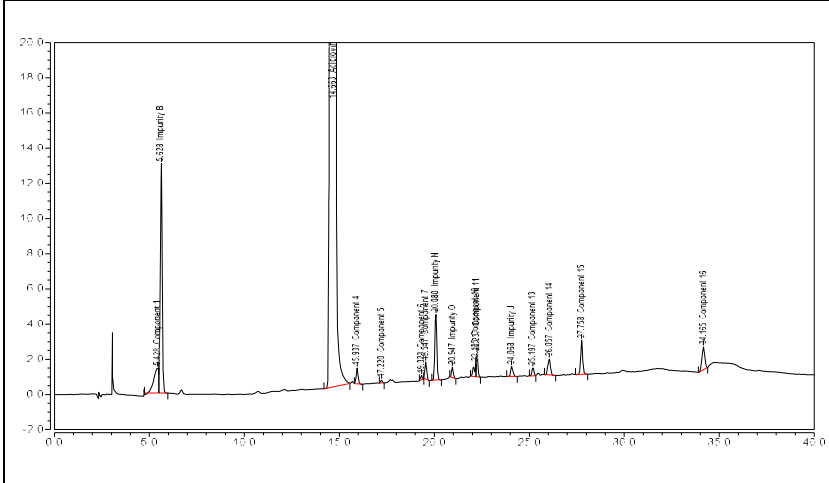
Aciclovir



Standrad



Sample Solution

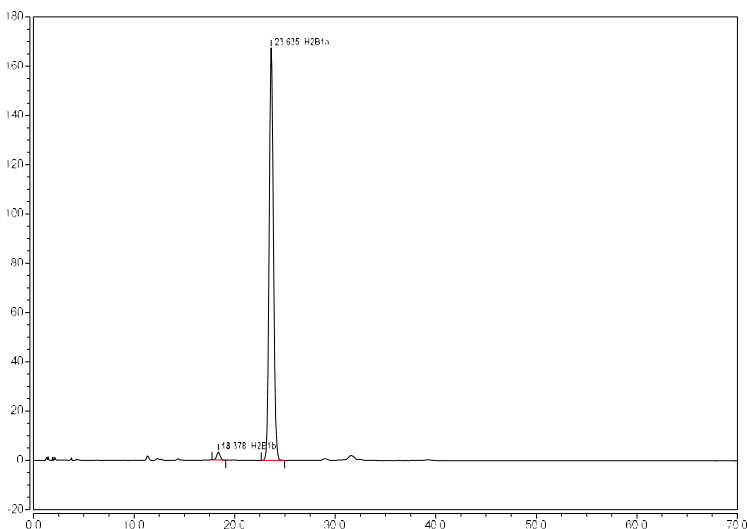


Peak No	Ret. Time	Peak Name	Area	Area	Tailing	Resolution	Theoretical	Rel. Ret. Time.
1	5.428	Component 1	24807	0.08	n.a.	n.a.	187	0.37
2	5.628	Impurity B	92779	0.31	n.a.	0.23	14877	0.38
3	14.663	Aciclovir	29712817	99.27	0.88	44.23	68580	1
4	15.937	Component 4	6193	0.02	1.01	6.22	118462	1.09
5	17.22	Component 5	1073	0	1.03	7.89	241937	1.17
6	19.323	Component 6	1242	0	0.88	15.05	307105	1.32
7	19.547	Component 7	6346	0.02	1.07	1.34	161418	1.33
8	20.08	Impurity N	26246	0.09	1.02	2.79	183899	1.37
9	20.947	Impurity O	3548	0.01	1.05	4.85	243102	1.43
10	22.185	Component 10	4929	0.02	n.a.	n.a.	n.a.	1.51
11	22.237	Component 11	8114	0.03	n.a.	n.a.	230857	1.52
12	24.068	Impurity J	4770	0.02	1.2	8.86	177785	1.64
13	25.197	Component 13	3058	0.01	0.98	5.2	239673	1.72

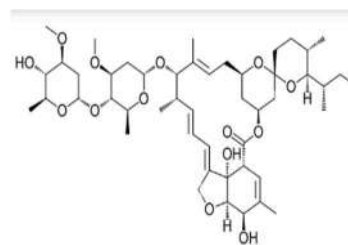
14	26.057	Component 14	8223	0.03	0.92	3.46	127579	1.78
15	27.758	Component 15	13847	0.05	1.03	7.08	346731	1.89
16	34.165	Component 16	13506	0.05	0.99	27.52	243362	2.33

The High-Performance Liquid Chromatography (HPLC) analysis of Aciclovir for the related substance test plays a crucial role in ensuring the quality and purity of the pharmaceutical product. In this study, the ACE Generix 5 C18(2) 250 x 4.6 mm column was utilized due to its optimal performance in separating and detecting impurities. The column's selectivity, efficiency, and reproducibility significantly contributed to accurate and reliable results, enabling the identification of potential impurities in the Aciclovir sample. This method demonstrates the effectiveness of the ACE Generix C18(2) column in supporting the stringent requirements of pharmaceutical quality control.

Ivermectin Tablet		Application: # C-13293
Column	ACE Generix 5 C18 (2) 250 x 4.6 mm	
Injection	10 µL	
Detection	UV @ 245 nm	
Cell	10 µL	
Flow Rate	1.2 mL/min	
Mobile Phase	Mix Acetonitrile, Methanol and water 53:35:12 (v/v/v)	
Temperature	30 °C	
Diluent	Methanol	
Standard Solution	Dissolve 2.5 mg of Ivermectin Working Std in 10 ml volumetric flask. Dissolve in methanol. Dilute up to the mark with methanol.	
Sensitivity Solution	Take 1 ml of the Standard solution and dilute to 100 ml with methanol. Further dilute 1 ml of this solution to 5 ml with methanol.	
Test Solution	Take 5 powdered tablets in 250 ml volumetric flask. Add 25 ml of water. Sonicate for 10 mins. Add 200 ml of methanol and sonicate further for 5 mins. Allow the solution to cool at room temp. Dilute up to the mark with methanol.	

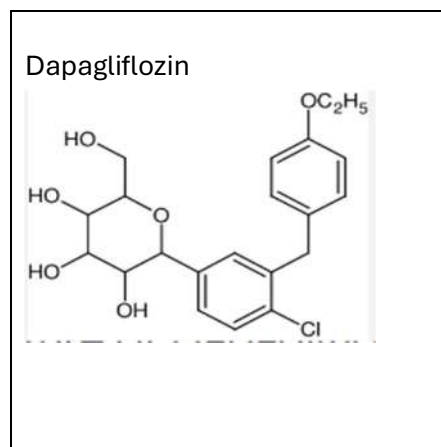
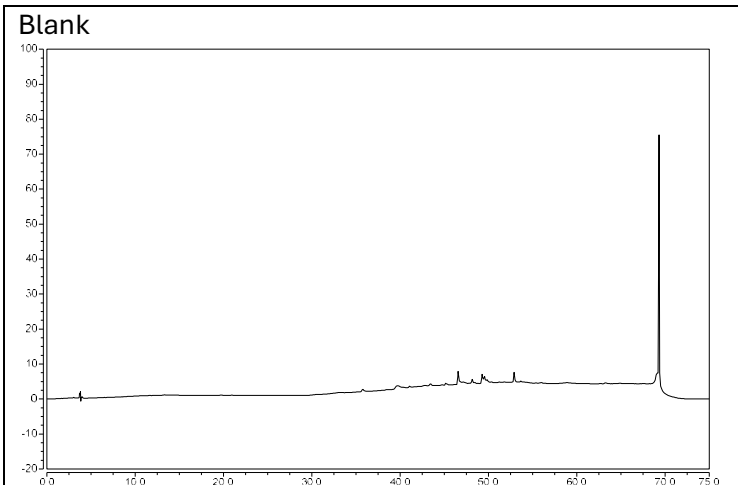


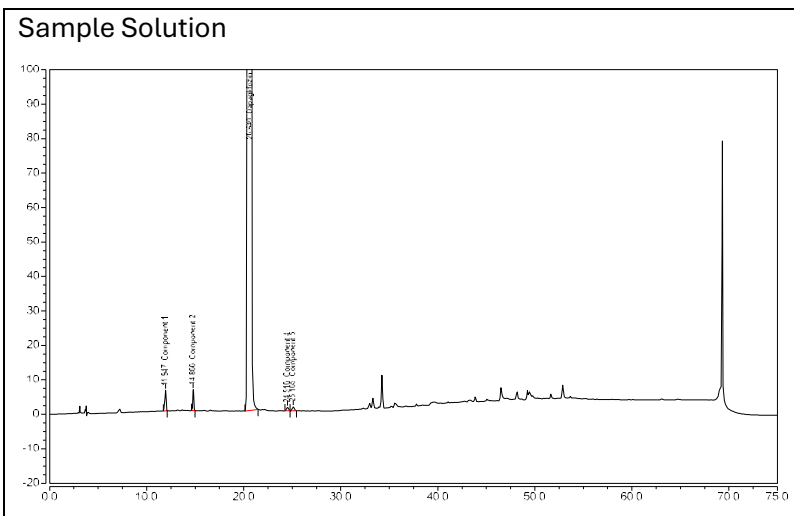
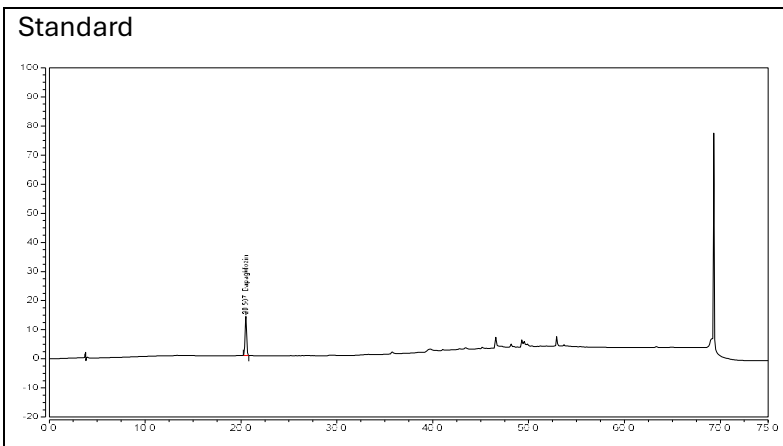
Ivermectin



The assay test for Ivermectin tablets was conducted using High-Performance Liquid Chromatography (HPLC) with an ACE Generix 5 C18(2) 250 x 4.6 mm column. This column was selected for its exceptional performance in achieving precise and accurate quantification of Ivermectin in the tablet formulation. The method employed demonstrated excellent separation efficiency and repeatability, ensuring reliable determination of the active pharmaceutical ingredient (API). The ACE Generix C18(2) column's compatibility with the Ivermectin matrix allowed for a robust assay procedure, making it a suitable choice for routine quality control analysis of Ivermectin tablets.

Dapagliflozin		Application: # C-13294																											
Column	ACE Generix 5 C18 (2) 250 x 4.6 mm																												
Injection	20 µL																												
Detection	UV 225 nm																												
Cell	10 µL																												
Flow Rate	0.8 mL/min																												
Mobile Phase A	Add 1 ml of orthophosphoric acid in 1 L of water. Pass through 0.45-µm or finer porosity membrane filter.																												
Mobile Phase B	Acetonitrile																												
Diluent	Degassed mixture of water and acetonitrile in the ratio of 50:50 v/v																												
Gradient	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Time</th> <th>% A</th> <th>% B</th> </tr> </thead> <tbody> <tr><td>0.01</td><td>80</td><td>20</td></tr> <tr><td>10</td><td>60</td><td>40</td></tr> <tr><td>25</td><td>60</td><td>40</td></tr> <tr><td>35</td><td>40</td><td>60</td></tr> <tr><td>50</td><td>2</td><td>98</td></tr> <tr><td>65</td><td>2</td><td>98</td></tr> <tr><td>67</td><td>80</td><td>20</td></tr> <tr><td>75</td><td>80</td><td>20</td></tr> </tbody> </table>		Time	% A	% B	0.01	80	20	10	60	40	25	60	40	35	40	60	50	2	98	65	2	98	67	80	20	75	80	20
Time	% A	% B																											
0.01	80	20																											
10	60	40																											
25	60	40																											
35	40	60																											
50	2	98																											
65	2	98																											
67	80	20																											
75	80	20																											
Temperature	Ambient temperature for column																												
Sample preparation	Dissolve 4.0 mg of Dapagliflozin sample into 10 ml volumetric flask, add 5 ml diluent and sonicate to dissolve, make up to volume with diluent.																												
Reference solution	0.0006 mg/ml concentration of solution using Dapagliflozin in diluent.																												

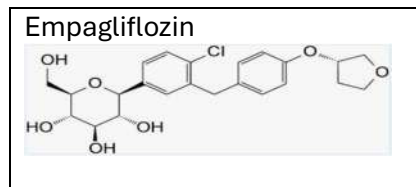
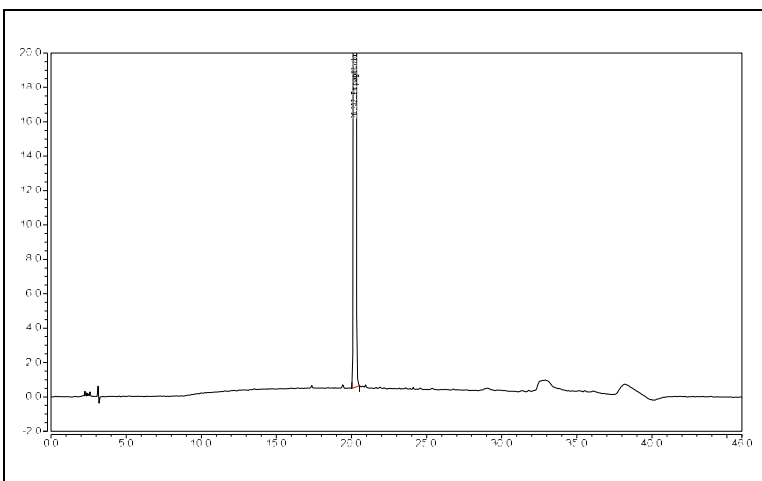




Peak	Ret.Time	Peak Name	Area	Area	Tailing	Resolution	Theoretical Plates	S/N
1	11.947	Component 1	50531	0.1	0.77	n.a.	40970	34.4
2	14.8	Component 2	42760	0.08	0.96	13.5	100505	36
3	20.64	Dapagliflozin	50796258	99.75	0.82	21.32	52256	19094.1
4	24.51	Component 4	15638	0.03	1.07	9.98	56061	6.1
5	25.105	Component 5	18413	0.04	1.01	1.24	33600	6.8

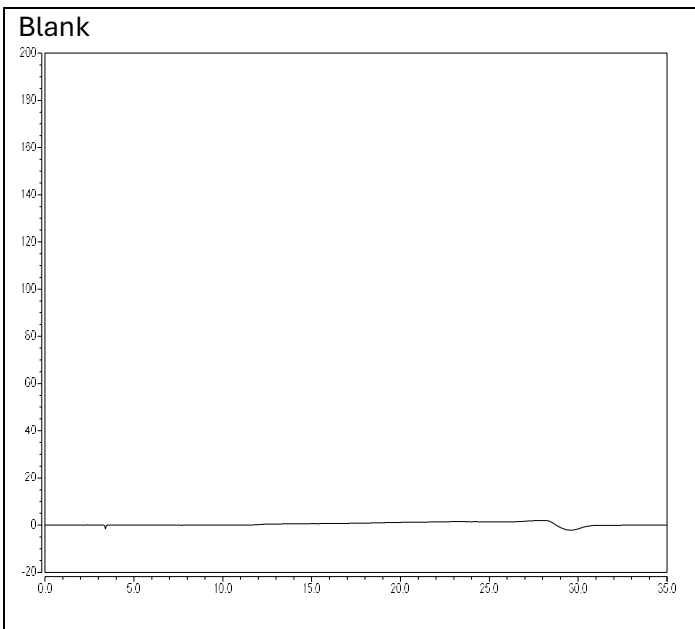
The related substance test for Dapagliflozin was carried out using High-Performance Liquid Chromatography (HPLC) with an ACE Generix 5 C18(2) 250 x 4.6 mm column. This method was selected for its ability to deliver high-resolution separation of impurities from the Dapagliflozin active ingredient. The column's efficiency and selectivity ensured accurate detection and quantification of related substances, adhering to the stringent requirements of pharmaceutical quality control.

Empagliflozin		Application: # C-13295																		
Column	ACE Generix C18 (2) 5µm 250X4.6																			
Injection	20 µL																			
Detection	UV 274 nm																			
Cell	10 µL																			
Data Collection Rate	10 Hz																			
Flow Rate	1.0 mL/min																			
Buffer Solution	Buffer: Dissolve 1.36 g of Potassium dihydrogen phosphate in 1000 mL of HPLC Water. Adjust the pH to 3.0 with dilute phosphoric acid. Filter through 0.2 µm Nylon membrane filter.																			
Mobile Phase A	Buffer																			
Mobile Phase B	Acetonitrile																			
Gradient	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Time</th> <th>%A</th> <th>%B</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>80</td> <td>20</td> </tr> <tr> <td>5</td> <td>80</td> <td>20</td> </tr> <tr> <td>35</td> <td>30</td> <td>70</td> </tr> <tr> <td>36</td> <td>80</td> <td>20</td> </tr> <tr> <td>46</td> <td>80</td> <td>20</td> </tr> </tbody> </table>		Time	%A	%B	0	80	20	5	80	20	35	30	70	36	80	20	46	80	20
Time	%A	%B																		
0	80	20																		
5	80	20																		
35	30	70																		
36	80	20																		
46	80	20																		
Diluent	Mix Buffer and Acetonitrile 80:20 (v/v).																			
Temperature	30°C																			
Test solution	Dissolve 0.1 g of Empagliflozin in 100 mL diluent.																			

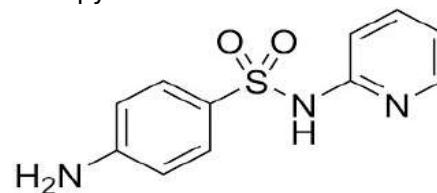


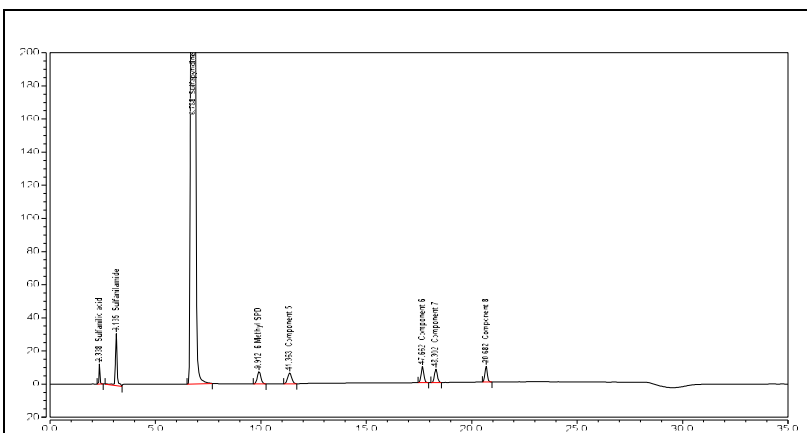
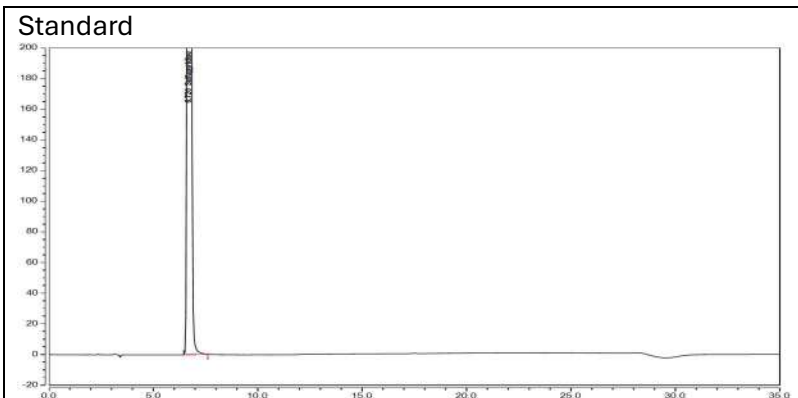
Assay of Empagliflozin using ACE Generix 5 C18 (2) 250 x 4.6 mm Column. The method using the ACE Generix 5 C18 (2) column is suitable for the assay of Empagliflozin, providing consistent and accurate results with well-defined chromatographic separation.

Sulfapyridine		Application: # C-13296
Column	ACE Generix C18 (2) 5µm 250X4.6	
Injection	10 µL	
Detection	UV 265 nm	
Cell	10 µL	
Flow Rate	1 mL/min	
Mobile Phase A	10 ml Acetic acid in 1000 ml Water.	
Mobile Phase B	Methanol	
Diluent	Water: Methanol (77:23)	
Gradient	See Table	
Temperature	30°C	
Autosampler temperature	5°C	
Sample solution	25 mg / 100ml add 1ml 1M HCl and dilute with diluent.	



Sulfapyridine





Peak	Ret.Time	Peak Name	Area	Area	Tailing	Resolution	Theoretical	Rel. Ret.Time. (SPD)
1	2.338	Sulfonic acid	40213	0.21	1.27	--	12744	0.34
2	3.135	Sulfanilamide	166383	0.88	1.62	8	11605	0.46
3	6.788	Sulfapyridine	18384024	96.73	0.98	21.8	15405	1
4	9.912	6 Methyl SPD	88835	0.47	1.08	11.72	15917	1.46
5	11.363	Component 5	89814	0.47	1.05	4.33	16236	1.67
6	17.662	Component 6	84019	0.44	1.07	21.59	97162	2.6
7	18.302	Component 7	76094	0.4	1.06	2.7	87721	2.7
8	20.682	Component 8	76305	0.4	1.09	10.44	156931	3.05

The ACE Generix C18 (2) has been designed to minimize secondary interactions caused by residual silanol groups. This helps reduce peak tailing and improves peak symmetry, which is particularly beneficial in the analysis of polar compounds like Sulfapyridine.

Ordering Information

AVANTOR® ACE® GENERIX® 1.8 µm UHPLC COLUMNS

Columns Dimensions	Particle size	UHPLC/HPLC hardware pressure rated up to 1,000 bar / 15,000 psi		
		C18(2)	C8(2)	Phenyl-Hexyl
2.1 x 50 mm	1.8 µm	GEN-18C182-0502U	GEN-18C82-0502U	GEN-18PHEX-0502U
2.1 x 75 mm	1.8 µm	GEN-18C182-7502U	GEN-18C82-7502U	GEN-18PHEX-7502U
2.1 x 100 mm	1.8 µm	GEN-18C182-1002U	GEN-18C82-1002U	GEN-18PHEX-1002U
3.0 x 50 mm	1.8 µm	GEN-18C182-0503U	GEN-18C82-0503U	GEN-18PHEX-0503U
3.0 x 75 mm	1.8 µm	GEN-18C182-7503U	GEN-18C82-7503U	GEN-18PHEX-7503U
3.0 x 100 mm	1.8 µm	GEN-18C182-1003U	GEN-18C82-1003U	GEN-18PHEX-1003U
Guard cartridges for 2.1-3.0 mm ID UHPLC columns (3/pk)		GEN-C182-GDU	GEN-C82-GDU	GEN-PHEX-GDU
UHPLC guard holder		H0011	H0011	H0011

AVANTOR® ACE® GENERIX® 3 µm HPLC COLUMNS

Columns Dimensions	Particle size	HPLC hardware pressure rated up to 275 bar / 4,000 psi			
		C18(2)	C8(2)	Phenyl-Hexyl	Sil
2.1 x 50 mm	3 µm	GEN-3C182-0502	GEN-3C82-0502	GEN-3PHEX-0502	GEN-3SIL-0502
2.1 x 75 mm	3 µm	GEN-3C182-7502	GEN-3C82-7502	GEN-3PHEX-7502	GEN-3SIL-7502
2.1 x 100 mm	3 µm	GEN-3C182-1002	GEN-3C82-1002	GEN-3PHEX-1002	GEN-3SIL-1002
2.1 x 125 mm	3 µm	GEN-3C182-1202	GEN-3C82-1202	GEN-3PHEX-1202	GEN-3SIL-1202
2.1 x 150 mm	3 µm	GEN-3C182-1502	GEN-3C82-1502	GEN-3PHEX-1502	GEN-3SIL-1502
3.0 x 50 mm	3 µm	GEN-3C182-0503	GEN-3C82-0503	GEN-3PHEX-0503	GEN-3SIL-0503
3.0 x 75 mm	3 µm	GEN-3C182-7503	GEN-3C82-7503	GEN-3PHEX-7503	GEN-3SIL-7503
3.0 x 100 mm	3 µm	GEN-3C182-1003	GEN-3C82-1003	GEN-3PHEX-1003	GEN-3SIL-1003
3.0 x 125 mm	3 µm	GEN-3C182-1203	GEN-3C82-1203	GEN-3PHEX-1203	GEN-3SIL-1203
3.0 x 150 mm	3 µm	GEN-3C182-1503	GEN-3C82-1503	GEN-3PHEX-1503	GEN-3SIL-1503
4.0 x 50 mm	3 µm	GEN-3C182-0504	GEN-3C82-0504	GEN-3PHEX-0504	GEN-3SIL-0504
4.0 x 75 mm	3 µm	GEN-3C182-7504	GEN-3C82-7504	GEN-3PHEX-7504	GEN-3SIL-7504
4.0 x 100 mm	3 µm	GEN-3C182-1004	GEN-3C82-1004	GEN-3PHEX-1004	GEN-3SIL-1004
4.0 x 125 mm	3 µm	GEN-3C182-1204	GEN-3C82-1204	GEN-3PHEX-1204	GEN-3SIL-1204
4.0 x 150 mm	3 µm	GEN-3C182-1504	GEN-3C82-1504	GEN-3PHEX-1504	GEN-3SIL-1504
4.6 x 50 mm	3 µm	GEN-3C182-0546	GEN-3C82-0546	GEN-3PHEX-0546	GEN-3SIL-0546
4.6 x 75 mm	3 µm	GEN-3C182-7546	GEN-3C82-7546	GEN-3PHEX-7546	GEN-3SIL-7546
4.6 x 100 mm	3 µm	GEN-3C182-1046	GEN-3C82-1046	GEN-3PHEX-1046	GEN-3SIL-1046
4.6 x 125 mm	3 µm	GEN-3C182-1246	GEN-3C82-1246	GEN-3PHEX-1246	GEN-3SIL-1246
4.6 x 150 mm	3 µm	GEN-3C182-1546	GEN-3C82-1546	GEN-3PHEX-1546	GEN-3SIL-1546
Guard cartridges for 2.1 mm ID HPLC columns (5/pk)		GEN-C182-GD2	GEN-C82-GD2	GEN-PHEX-GD2	GEN-SIL-GD2
Guard cartridges for 3.0-4.6 mm ID HPLC columns (5/pk)		GEN-C182-GD	GEN-C82-GD	GEN-PHEX-GD	GEN-SIL-GD
HPLC guard holder		H0010	H0010	H0010	H0010

AVANTOR® ACE® GENERIX® 5 µm HPLC COLUMNS

Columns Dimensions	Particle size	HPLC hardware pressure rated up to 275 bar / 4,000 psi			
		C18(2)	C8(2)	Phenyl-Hexyl	Sil
2.1 x 50 mm	5 µm	GEN-5C182-0502	GEN-5C82-0502	GEN-5PHEX-0502	GEN-5SIL-0502
2.1 x 75 mm	5 µm	GEN-5C182-7502	GEN-5C82-7502	GEN-5PHEX-7502	GEN-5SIL-7502
2.1 x 100 mm	5 µm	GEN-5C182-1002	GEN-5C82-1002	GEN-5PHEX-1002	GEN-5SIL-1002
2.1 x 125 mm	5 µm	GEN-5C182-1202	GEN-5C82-1202	GEN-5PHEX-1202	GEN-5SIL-1202
2.1 x 150 mm	5 µm	GEN-5C182-1502	GEN-5C82-1502	GEN-5PHEX-1502	GEN-5SIL-1502
2.1 x 250 mm	5 µm	GEN-5C182-2502	GEN-5C82-2502	GEN-5PHEX-2502	GEN-5SIL-2502
3.0 x 50 mm	5 µm	GEN-5C182-0503	GEN-5C82-0503	GEN-5PHEX-0503	GEN-5SIL-0503
3.0 x 75 mm	5 µm	GEN-5C182-7503	GEN-5C82-7503	GEN-5PHEX-7503	GEN-5SIL-7503
3.0 x 100 mm	5 µm	GEN-5C182-1003	GEN-5C82-1003	GEN-5PHEX-1003	GEN-5SIL-1003
3.0 x 125 mm	5 µm	GEN-5C182-1203	GEN-5C82-1203	GEN-5PHEX-1203	GEN-5SIL-1203
3.0 x 150 mm	5 µm	GEN-5C182-1503	GEN-5C82-1503	GEN-5PHEX-1503	GEN-5SIL-1503
3.0 x 250 mm	5 µm	GEN-5C182-2503	GEN-5C82-2503	GEN-5PHEX-2503	GEN-5SIL-2503
4.0 x 50 mm	5 µm	GEN-5C182-0504	GEN-5C82-0504	GEN-5PHEX-0504	GEN-5SIL-0504
4.0 x 75 mm	5 µm	GEN-5C182-7504	GEN-5C82-7504	GEN-5PHEX-7504	GEN-5SIL-7504
4.0 x 100 mm	5 µm	GEN-5C182-1004	GEN-5C82-1004	GEN-5PHEX-1004	GEN-5SIL-1004
4.0 x 125 mm	5 µm	GEN-5C182-1204	GEN-5C82-1204	GEN-5PHEX-1204	GEN-5SIL-1204
4.0 x 150 mm	5 µm	GEN-5C182-1504	GEN-5C82-1504	GEN-5PHEX-1504	GEN-5SIL-1504
4.0 x 250 mm	5 µm	GEN-5C182-2504	GEN-5C82-2504	GEN-5PHEX-2504	GEN-5SIL-2504
4.6 x 50 mm	5 µm	GEN-5C182-0546	GEN-5C82-0546	GEN-5PHEX-0546	GEN-5SIL-0546
4.6 x 75 mm	5 µm	GEN-5C182-7546	GEN-5C82-7546	GEN-5PHEX-7546	GEN-5SIL-7546
4.6 x 100 mm	5 µm	GEN-5C182-1046	GEN-5C82-1046	GEN-5PHEX-1046	GEN-5SIL-1046
4.6 x 125 mm	5 µm	GEN-5C182-1246	GEN-5C82-1246	GEN-5PHEX-1246	GEN-5SIL-1246
4.6 x 150 mm	5 µm	GEN-5C182-1546	GEN-5C82-1546	GEN-5PHEX-1546	GEN-5SIL-1546
4.6 x 250 mm	5 µm	GEN-5C182-2546	GEN-5C82-2546	GEN-5PHEX-2546	GEN-5SIL-2546
Guard cartridges for 2.1 mm ID HPLC columns (5/pk)		GEN-C182-GD2	GEN-C82-GD2	GEN-PHEX-GD2	GEN-SIL-GD2
Guard cartridges for 3.0-4.6 mm ID HPLC columns (5/pk)		GEN-C182-GD	GEN-C82-GD	GEN-PHEX-GD	GEN-SIL-GD
HPLC guard holder		H0010	H0010	H0010	H0010

AVANTOR® ACE® GENERIX® HPLC COLUMN MULTIPACKS

Three column multipacks provide further cost savings

Column Dimensions	Particle size	HPLC hardware pressure rated up to 275 bar / 4,000 psi			
		C18(2)	C8(2)	Phenyl-Hexyl	Sil
2.1 x 50 mm (3/pk)	3 µm	GEN-3C182-0502/3PK	GEN-3C82-0502/3PK	GEN-3PHEX-0502/3PK	GEN-3SIL-0502/3PK
4.6 x 100 mm (3/pk)	3 µm	GEN-3C182-1046/3PK	GEN-3C82-1046/3PK	GEN-3PHEX-1046/3PK	GEN-3SIL-1046/3PK
4.6 x 150 mm (3/pk)	3 µm	GEN-3C182-1546/3PK	GEN-3C82-1546/3PK	GEN-3PHEX-1546/3PK	GEN-3SIL-1546/3PK
2.1 x 50 mm (3/pk)	5 µm	GEN-5C182-0502/3PK	GEN-5C82-0502/3PK	GEN-5PHEX-0502/3PK	GEN-5SIL-0502/3PK
4.6 x 150 mm (3/pk)	5 µm	GEN-5C182-1546/3PK	GEN-5C82-1546/3PK	GEN-5PHEX-1546/3PK	GEN-5SIL-1546/3PK
4.6 x 250 mm (3/pk)	5 µm	GEN-5C182-2546/3PK	GEN-5C82-2546/3PK	GEN-5PHEX-2546/3PK	GEN-5SIL-2546/3PK

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Avantor® is a leading global provider of mission critical products and services to customers in the biopharma, healthcare, education & government, and advanced technologies & applied materials industries. We operate in more than 30 countries and deliver an extensive portfolio of products and services.

