Product Specifications

Phase	Functional Group	Particle Size (µm)	Pore Size (Å)	Surface Area (m^2/g)	Carbon Load (%)	Maximum pH Range
Avantor® ACE® Excel® Oligo	Proprietary encapsulated	1.7, 3	90	400	14.8	1.5-11.5

BUFFER RECOMMENDATIONS FOR AVANTOR® ACE® EXCEL® OLIGO

Buffer Selection

Avantor® ACE® Excel® Oligo columns have been designed for use with LC-MS compatible mobile phases across an extended pH range (pH 1.5 – pH 11.5). Manufactured using proprietary Encapsulated Bonding Technology (EBT™), this technology dramatically increases the ligand coverage of the silica surface and improves stability, inertness and chromatographic performance. The use of LC-MS compatible (volatile) buffers as detailed in Table 1 are recommended to maximise column lifetime. Working at the extremes of pH, temperature and/or pressure will result in shorter column lifetimes.

Use of non LC-MS Compatible Buffers:

Whilst the use of the above LC-MS compatible (volatile) buffers are recommended, Avantor® ACE® Excel® Oligo columns may also be used with a variety of non LC-MS compatible, non-volatile buffers, commonly used within analytical methods. However, under alkaline conditions (>pH 7), such buffers are recognised to accelerate column degradation compared to LC-MS compatible buffers – the use of buffers detailed within Table 1 is consequently recommended to ensure maximum column lifetime at elevated pH. Further details are contained within the FREE booklet *'A Guide to HPLC and LC-MS Buffer Selection'* by leading chromatography expert John Dolan.

Temperature:

The columns may be used at temperatures up to 100 °C. However, any temperature above ambient will reduce column lifetime. As a general rule, for acidic mobile phases (<pH 7), maintaining a temperature <60 °C will help maximise column lifetime, whereas for alkaline mobile phases (>pH 7), maintaining a temperature <40 °C is recommended.

For further guidance on maximising column lifetime or to assist with developing your evaluation conditions, please contact our Technical Support Department at chromsupport@avantorsciences.com

Table 1: Use of LC-MS Compatible Buffers for Maximum Column Lifetime

Buffer/Additive	pK_a	Buffer range[1]	LC-MS Compatible	Comments
Trifluoroacetic acid (TFA)	0.2		Yes	Use in 0.02% – 0.2% range. Ion pair additive. May preferentially ionise and suppress MS signal.
Formic acid	3.8		Yes	Use with ammonium formate salt for maximum buffering capacity. Use in 0.05% - 0.5% range.
Ammonium formate	3.8	2.8 – 4.8	Yes	Typically use 10-25 mM. Note: both sodium and potassium salts are non-volatile.
Acetic acid	4.8		Yes	Use with ammonium acetate salt for maximum buffering capacity. Use in 0.05% - 0.5% range.
Ammonium acetate	4.8	3.8 – 5.8	Yes	Typically use 10-25 mM. Note: both sodium and potassium salts are non-volatile.
Ammonium formate	9.2	8.2 – 10.2	Yes	Typically use 10-25 mM.
Ammonium acetate	9.2	8.2 – 10.2	Yes	Typically use 10-25 mM.
Ammonium hydroxide	9.3	8.3 – 10.3	Yes	Typically use 10-25 mM.

[1] A buffer is most effective when used within ± 1 pH unit of its *p*Ka but may provide adequate buffering ± 2 pH units from the *p*Ka.