

HALO COLUMNS FOR LARGE MOLECULE SEPARATIONS

HALO BioClass Columns: Specifications

Bonded Phase	USP Designation	Particle Size(s) (µm)	Pore Size (Å)	Carbon Load (%)	Surface Area (m ² /g)	Low pH/T Limit	High pH/T Limit	Endcapped	
Protein	C4	L26	2.7	1000	0.6	22	2/90 °C	9/40 °C	Yes
	ES-C18	L1	2.7	1000	1.4	22	1/90 °C	8/40 °C	Yes
	Diphenyl	L11	2.7	1000	1.0	22	2/90 °C	9/40 °C	Yes
	C4	L26	3.4	400	0.4	15	2/90 °C	9/40 °C	Yes
	ES-C18	L1	3.4	400	1.0	15	1/90 °C	8/40 °C	Yes
Peptide	ES-C18	L1	2 2.7 5	160	4.0 4.6 4.0	65 90 60	1/90 °C	8/40 °C	No
	ES-CN	L10	2.7 5	160	2.2 1.5	90 60	1/90 °C	8/40 °C	Yes
	Phenyl-Hexyl	L11	2.7	160	4.7	90	2/90 °C	9/40 °C	Yes
Glycan	Proprietary Ligand	L95	2.7	90	3.2	135	2/65 °C	9/40 °C	No

HALO BioClass: Features and Benefits, Target Analytes and Best Applications

Bonded Phase	Features and Benefits	Target Analytes	Best Applications	
1000 Å Protein	C4 (dimethylbutylsilane)	<ul style="list-style-type: none"> Outstanding high temperature stability at low pH Unrestricted access to bonded phase Exceptional mass transfer kinetics Compatible with UHPLC and HPLC Low LC-MS bleed 	Monoclonal antibodies, antibody-drug conjugates, antibody fragments and large proteins with MWs ≤ 500 kDa	High resolution separations of monoclonal antibodies and their variants as well as antibody-drug conjugates
	ES-C18 (diisobutyloctadecylsilane)	<ul style="list-style-type: none"> Even better stability up to 90 °C Can elute very large proteins with good peak shape and recovery Compatible with UHPLC and HPLC Very low LC-MS bleed 	Monoclonal antibodies, antibody-drug conjugates, antibody fragments and large proteins with MWs ≤ 500 kDa	High resolution separations of monoclonal antibodies and their variants as well as antibody-drug conjugates
	Diphenyl (diphenylmethyl)	<ul style="list-style-type: none"> Outstanding temperature stability from 40-90 °C Exceptional low temperature performance without peak area loss Compatible with UHPLC and HPLC Low LC-MS bleed 	Monoclonal antibodies, antibody-drug conjugates, antibody fragments and large proteins with MWs ≤ 500 kDa	High resolution separations of monoclonal antibodies and their variants as well as antibody-drug conjugates
400 Å Protein	C4 (dimethylbutylsilane)	<ul style="list-style-type: none"> Stability up to 90 °C Can elute very large proteins with good peak shape and recovery Compatible with UHPLC and HPLC Low LC-MS bleed 	Monoclonal antibodies, proteins and polypeptides with MWs < 500 kDa	Monoclonal antibodies and mid-to-high molecular weight proteins and polypeptides
	ES-C18 (diisobutyloctadecylsilane)	<ul style="list-style-type: none"> Even better stability up to 90 °C Can elute very large proteins with good peak shape and recovery Compatible with UHPLC and HPLC Very low LC-MS bleed 	Proteins and polypeptides with MWs < 500 kDa	Mid-to-high molecular weight proteins and polypeptides
160 Å Peptide	ES-C18 (diisobutyloctadecylsilane)	<ul style="list-style-type: none"> Fast separations High peak capacity Rugged, reliable performance Use with either UHPLC or HPLC 	Peptides and polypeptides with MWs < 20 kDa	Intermediate molecular weight proteins and polypeptides
	ES-CN (diisopropylcyano-propylsilane)	<ul style="list-style-type: none"> Alternative selectivity to ES-C18 and Phenyl-Hexyl for peptide mapping and proteomic applications 	Peptides and polypeptides with MWs < 20 kDa	Intermediate molecular weight proteins and polypeptides
	Phenyl-Hexyl (dimethylphenyl-hexylsilane)	<ul style="list-style-type: none"> Alternative selectivity to ES-C18 and ES-CN for peptide mapping and proteomic applications 	Peptides and polypeptides with MWs < 20 kDa	Intermediate molecular weight proteins and polypeptides
Glycan	Proprietary hydrophilic ligand	<ul style="list-style-type: none"> Improved retention of acids and zwitterions Very low sensitivity to buffer concentration Able to separate isobaric oligosaccharides with different linkages 	Glycans (MWs < 20 kDa), glycopeptides and polar peptides	Provides orthogonal HILIC selectivity to HALO Peptide ES-C18