a selection of
HPLC Material Sorbent Characteristics

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Phenomenex Sorbents

Packing Material	Particle Shape/Size (µm)	Pore Size (Å)	Pore Volume (mL/g)	Surface Area (m^2/g)	Carbon Load %	Calculated* Bonded Phase Coverage (µmole/m^2)	End Capping	pH Range	USP Packing
Aeris WIDEPORE XB-C18	Core-Shell 3.6	—	—	25	—	—	Yes	1.5-9	L1
Aeris WIDEPORE XB-C8	Core-Shell 3.6	—	—	25	—	—	Yes	1.5-9	L7
Aeris WIDEPORE C4	Core-Shell 3.6	—	—	25	—	—	Yes	1.5-9	L26
Aeris PEPTIDE XB-C18	Core-Shell 1.7, 3.6	100	—	200	10†	—	Yes	1.5-9	L1
Aqua C18	Spher. 3, 5, 10, 15	125	1.05	320	15	—	Proprietary	2.5-7.5	L1
Aqua C18	Spher. 5, 10, 15	200	1.15	215	11	—	Proprietary	2.5-7.5	L1
Bondclone Silica	Irreg. 10	148	1.1	300	0	0	No	—	L3
Bondclone C18	Irreg. 10	148	1.1	300	10, Monomeric	1.61	Yes	2.5-7.5	L1
Clarity Oligo-RP	Spher. 3, 5, 10	110	—	375	14	—	Yes	1-12	—
Clarity Oligo-WAX	Spher. 10	360	—	150	—	0.8 meq/g	Yes	1-11	L8
Clarity Oligo-MS	Core-shell 1.7, 2.6	100	—	200	12	—	Yes	1.5-10	L1
Columbus C8	Spher. 5	110	—	375	13	—	Double	2.5-7.5	L7
Columbus C18	Spher. 5	110	—	375	19	—	Double	2.5-7.5	L1
Gemini C18	Spher. 3, 5, 10	110	—	375	14	—	Yes	1.0-12.0	L1
Gemini C6-Phenyl	Spher. 3, 5	110	—	375	12	—	Yes	1.0-12.0	L11
Gemini-NX C18	Spher. 3, 5, 10	110	—	375	14	—	Yes	1.0-12.0	L1
HyperClone BDS C8	Spher. 3, 5	130	0.6	155	7	—	Yes	2.0-7.5	L7
HyperClone BDS C18	Spher. 3, 5	130	0.6	155	11	—	Yes	2.0-7.5	L1
HyperClone MOS (C8)	Spher. 3, 5	120	0.6	155	6.5	—	Yes	2.0-7.5	L7
HyperClone ODS (C18)	Spher. 3, 5	120	0.6	155	10	—	Yes	2.0-7.5	L1
HyperClone CN (CPS)	Spher. 3, 5	120	0.6	155	4	—	No	2.0-7.5	L10
IB-Sil C18	Spher. 3, 5, 10	125	0.75	165	11, Monomeric	3.27	Yes	2.5-7.5	L1
IB-Sil C8	Spher. 3, 5, 10	125	0.75	165	7.5, Monomeric	4.29	Yes	2.5-7.5	L7
IB-Sil CN	Spher. 3, 5, 10	125	0.75	165	4.5, Monomeric	4.15	No	2.5-7.5	L10
Jupiter C4	Spher. 5, 10, 15	300	—	170	5.0	6.30	Yes	1.5-10	L26
Jupiter C5	Spher. 5, 10, 15	300	—	170	5.5	5.30	Yes	1.5-10	—
Jupiter C18	Spher. 5, 10, 15	300	—	170	13.34	5.50	Yes	1.5-10	L1
Jupiter Proteo	Spher. 4, 10	90	—	475	15	—	Yes	1.5-10.0	—
Kinetex C18	Core-shell 1.3, 1.7, 2.6, 5	100	—	200	12†	—	Yes	1.5-8.5Δ	L1
Kinetex XB-C18	Core-shell 1.7, 2.6, 5	100	—	200	10†	—	Yes	1.5-8.5Δ	L1
Kinetex PFP	Core-shell 1.7, 2.6, 5	100	—	200	9†	—	Yes	1.5-8.5Δ	L43
Kinetex C8	Core-shell 1.7, 2.6	100	—	200	8†	—	Yes	1.5-8.5Δ	L7
Kinetex HILIC	Core-shell 1.7, 2.6	100	—	200	0	—	No	2.0-7.5	L3
Kinetex Phenyl-Hexyl	Core-shell 1.7, 2.6, 5	100	—	200	11†	—	Yes	1.5-8.5Δ	L11
Luna PFP(2)	Spher. 3, 5	100	1.0	400	11.5	2.20	Yes	1.5-9.0‡	L43
Luna Phenyl-Hexyl	Spher. 3, 5, 10, 15	100	1.0	400	17.5	4.00	Yes	1.5-9.0‡	L11
Luna Silica(2)	Spher. 3, 5, 10, 15	100	1.0	400	0	—	No	2.0-7.5	L3
Luna C5	Spher. 5, 10	100	1.0	440	12.5	7.85	Yes	1.5-9.0‡	—
Luna C8	Spher. 5, 10	100	1.0	440	14.75	5.50	Yes	1.5-9.0‡	L7
Luna C8(2)	Spher. 3, 5, 10, 15	100	1.0	400	13.5	5.50	Yes	1.5-9.0‡	L7
Luna C18	Spher. 5, 10	100	1.0	440	19	3.00	Yes	1.5-9.0‡	L1
Luna C18(2)-HST	Spher. 2.5	100	1.0	400	17.5	3.00	Yes	1.5-9.0‡	L1
Luna C18(2)	Spher. 3, 5, 10, 15	100	1.0	400	17.5	3.00	Yes	1.5-9.0‡	L1
Luna CN	Spher. 3,5,10	100	1.0	400	7.0	3.80	Yes	1.5-7.0	L10
Luna HILIC	Spher. 3, 5	200	—	200	5.7	4.30	No	1.5-8.0	L20
Luna NH_2	Spher. 3,5,10	100	1.0	400	9.5	5.80	No	1.5-11.0	L8
Luna SCX	Spher. 5,10	100	—	400	0.55 % Sulfur Load	—	No	2.0-7.0	—
Maxsil Silica	Irreg. 5, 10	65	0.7	500	0	0	No	—	L3
Maxsil C8	Irreg. 5, 10	65	0.7	500	6.5, Monomeric	1.20	No	2.5-7.5	L7
Maxsil C18	Irreg. 5, 10	65	0.7	500	12.5, Monomeric	1.25	Yes	2.5-7.5	L1
Onyx C18	C18 Bonded Rod**	130*	1.0	300	18	3.6	Yes	2.0-7.5	L1
PhenoSphere Si	Spher. 3, 5, 10	80	0.5	220	0	0	No	—	L3
PhenoSphere C1	Spher. 3, 5, 10	80	0.5	220	4, Monomeric	1.08	No	2.5-7.5	L13
PhenoSphere C6	Spher. 3, 5, 10	80	0.5	220	6, Monomeric	2.27	Yes	2.5-7.5	L15
PhenoSphere C8	Spher. 3, 5, 10	80	0.5	220	6, Monomeric	3.54	Yes	2.5-7.5	L7
PhenoSphere ODS (1)	Spher. 3, 5, 10	80	0.5	220	7, Monomeric	1.74	Partial	2.5-7.5	L1
PhenoSphere ODS (2)	Spher. 3, 5, 10	80	0.5	220	12, Monomeric	2.50	Yes	2.5-7.5	L1
PhenoSphere CN	Spher. 3, 5, 10	80	0.5	220	4, Monomeric	2.82	Partial	2.5-7.5	L10
PhenoSphere Phenyl	Spher. 3, 5, 10	80	0.5	220	3.5, Monomeric	1.10	Partial	2.5-7.5	L11
PhenoSphere SCX	Spher. 5, 10	80	0.5	220	6, Monomeric	0.4 meq/g	No	2.5-7.5	—
PhenoSphere SAX	Spher. 5, 10	80	0.5	220	4, Monomeric	0.6 meq/g	No	2.5-7.5	L14
PhenoSphere CN (2)	Spher. 3, 5, 10	80	0.5	220	3.5, Monomeric	2.50	Partial	2.5-7.5	L10
PhenoSphere-*NEXT* Silica	Spher. 3, 5	120	—	380	—	—	No	—	L3

† Effective Carbon Load. ** Mesopore size listed. Macropore size is 2 µm. Δ pH range is 1.5-10 under isocratic conditions. pH range is 1.5-8.5 under gradient conditions. ‡ pH range is 1.5-10 under isocratic conditions. pH range is 1.5-9.0 under gradient conditions.

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Phenomenex Sorbents *(cont'd)*

Packing Material	Particle Shape/Size (µm)	Pore Size (Å)	Pore Volume (mL/g)	Surface Area (m^2/g)	Carbon Load %	Calculated* Bonded Phase Coverage (µmole/m^2)	End Capping	pH Range	USP Packing
PhenoSphere-*NEXT* C8	Spher. 3, 5	120	—	380	10	—	Yes	2.5-7.5	L7
PhenoSphere-*NEXT* C18	Spher. 3, 5	120	—	380	14	—	Yes	2.5-7.5	L1
PhenoSphere-*NEXT* CN	Spher. 3, 5	120	—	380	8	—	Yes	2.5-7.5	L10
PhenoSphere-*NEXT* Phenyl	Spher. 5	120	—	380	11	—	Yes	2.5-7.5	L11
PolymerX RP-1	Spher. 3, 5, 7, 10, 15	100	—	410	0	N/A	No	0-14	L21
Prodigy ODS(2)	Spher. 5	150	1.1	310	18.5, Monomeric	3.50	Yes	2.0-9.0	L1
Prodigy C8	Spher. 5	150	1.1	310	12.6, Monomeric	5.00	Yes	2.0-9.0	L7
Prodigy ODS (3)	Spher. 3, 5, 10	100	1.0	450	15.5, Monomeric	—	Yes	2.0-9.0	L1
Prodigy Phenyl (PH-3)	Spher. 5	100	—	450	10.0, Polymeric	—	No	2.0-9.0	L11
SphereClone Silica	Spher. 3, 5, 10	80	—	200	-	—	No	—	L3
SphereClone C6	Spher. 3, 5, 10	80	—	200	6	—	Yes	2.5-7.5	L15
SphereClone C8	Spher. 3, 5, 10	80	—	200	6	—	Yes	2.5-7.5	L7
SphereClone ODS (1)	Spher. 3, 5, 10	80	—	200	7	—	Partial	2.5-7.5	L1
SphereClone ODS (2)	Spher. 3, 5, 10	80	—	200	12	—	Yes	2.5-7.5	L1
SphereClone NH_2	Spher. 3, 5, 10	80	—	200	2	—	No	2.5-7.5	L8
SphereClone SAX	Spher. 3, 5, 10	80	—	200	—	—	No	2.5-7.5	—
Synergi Fusion-RP	Spher. 2.5	100	—	400	12	—	Yes	1.5-9.0‡	L1
Synergi Max-RP	Spher. 2.5	100	—	400	17	—	Yes	1.5-9.0‡	—
Synergi Hydro-RP	Spher. 2.5	100	—	400	19	—	Proprietary	1.5-7.5	L1
Synergi Polar-RP	Spher. 2.5	100	—	400	11	—	Proprietary	1.5-7.0	—
Synergi Fusion-RP	Spher. 4, 10	80	1.05	475	12	—	Yes	1.5-9.0‡	L1
Synergi Max-RP	Spher. 4, 10	80	1.05	475	17	3.21	Yes	1.5-9.0‡	—
Synergi Hydro-RP	Spher. 4, 10	80	1.05	475	19	2.45	Proprietary	1.5-7.5	L1
Synergi Polar-RP	Spher. 4, 10	80	1.05	475	11	3.15	Proprietary	1.5-7.0	L11
Ultracarb C8	Spher. 5	60	0.80	550	14, Monomeric	2.71	Yes	2.5-7.5	L7
Ultracarb ODS (20)	Spher. 3, 5, 7	90	0.75	370	22, Monomeric	3.53	Yes	2.5-7.5	L1
Ultracarb ODS (30)	Spher. 5, 7	60	0.80	550	31, Monomeric	4.06	Yes	2.5-9.0	L1

*As per Sander, L.C., and Wise, S.A., Anal. Chem. 1984, 56, 504-510,

where $N(\mu mol/m^2) = \frac{10^6 P_c}{1200 n_c - P_c(M-1)} \bullet \frac{1}{S}$

and P_c = percent carbon of bonded phase, n_c is the number of carbon atoms in the bonded silane molecule,
M is the molecular weight of the bonded silane molecule, and S is the specific surface area of the bonded silica in m^2/g.
NOTE: Phenomenex has not verified above values experimentally, and does not guarantee their accuracy. Above specifications subject to change without prior notice.

‡ pH range is 1.5-10 under isocratic conditions. pH range is 1.5-9.0 under gradient conditions.

Non-Aqueous SEC/GPC Materials

Packing Material	Particle Shape/Size (µm)	Pore Size** (Å)	Exclusion Limit***
Phenogel 50 Å	Spher. 5, 10	50	3×10^3
Phenogel 100 Å	Spher. 5, 10	100	6×10^3
Phenogel 500 Å	Spher. 5, 10	500	1×10^4
Phenogel 10^3 Å	Spher. 5, 10	10^3	7×10^4
Phenogel 10^4 Å	Spher. 5, 10	10^4	5×10^5
Phenogel 10^5 Å	Spher. 5, 10	10^5	1×10^6
Phenogel 10^6 Å	Spher. 5, 10	10^6	1×10^7
Phenogel Linear	Spher. 5, 10	Mixed	1×10^7
Phenogel MXL	Spher. 5, 10	Mixed	1×10^5
Phenogel MXM	Spher. 5, 10	Mixed	5×10^5
Phenogel MXH	Spher. 5, 10	Mixed	1×10^7
EnviroSep-ABC	Spher. 20	N/A	5×10^3

Aqueous SEC/GFC Materials

Packing Material	Particle Shape/Size (µm)	Pore Size** (Å)	Exclusion Limit***
Yarra SEC 2000	Spher. 3	145	3×10^5
Yarra SEC 3000	Spher. 3	290	7×10^5
Yarra SEC 4000	Spher. 3	500	1×10^6
BioSep-SEC-S 2000	Spher. 5	145	3×10^5
BioSep-SEC-S 3000	Spher. 5	290	7×10^5
BioSep-SEC-S 4000	Spher. 5	500	1×10^6
PolySep-GFC-P 1000	Spher.	N/A	2×10^3 (PEG)
PolySep-GFC-P 2000	Spher.	N/A	9×10^3 (PEG)
PolySep-GFC-P 3000	Spher.	N/A	50×10^3 (PEG)
PolySep-GFC-P 4000	Spher.	N/A	20×10^4 (PEG)
PolySep-GFC-P 5000	Spher.	N/A	20×10^5 (PEG)
PolySep-GFC-P 6000	Spher.	N/A	10×10^6 (PEG)
PolySep-GFC-P Linear	Spher.	N/A	10×10^7 (PEG)

**Pore Size is expressed in Angstroms (10^{-10} meters). This is actually a convention used by manufacturers to indicate the approximate molecular weight of compounds that can be separated on a given SEC packing; these values do not indicate the actual size (diameter) of the pores on the surface of the particle.

***Exclusion Limit is expressed in Daltons (the molecular weight) of the specified compound excluded from the pores of the base material. Practically speaking however, the exclusion limit is more accurately a reflection of the hydrodynamic volume occupied by the solvated compound.

For material sorbent characteristics of other HPLC columns manufactured and sold by Phonemenex, please visit the Web link **http://www.phenomenex.com/chromtips**