HPLC Packings for USP Compendial Methods

The official pharmaceutical analysis monographs in the United States Pharmacopeia (USP) detail the methods used by pharmaceutical manufacturers for quality control of bulk drug substances and dosage form preparations. Each method specifies a particular high performance liquid chromatography (HPLC) or gas chromatography (GC) column or column type and the conditions under which the analysis is performed. This poster lists the USP Codes for the HPLC phases used in these methods, descriptions of the columns, and information about our products that conform to these descriptions.

USP Code[1]	Description	Available Columns [2] [3]				
		Particles				Monolithic
		Fused-Core® Silica Particles	Fully Porous Silica Particles		Non-Silica Particles	Silica Based
		Type B Silica[4]	Type B Silica[4]	Type A Silica[5]		Type B Silica[4]
L1	Octadecyl silane chemically bonded to porous or non-porous silica or ceramic micro-particles, 1.5 to 10 µm in diameter, or a monolithic rod.	Ascentis® Express C18 Ascentis® Express AQ C18 Ascentis® Express ES C18 Ascentis® Express PAH Ascentis® Express PFAS BIOshell™ IgG C18 BIOshell™ Peptide C18	Purospher® STAR RP-18e Purospher® RP-18 Purospher® RP-18e Pore C18 Discovery® HS C18 Discovery® C18 Ascentis® C18 Discovery® BIO Wide	LiChrosorb® RP-18 LiChrospher® RP-18e LiChrospher® RP-18 LiChrospher® PAH SUPELCOSIL™ LC-18 SUPELCOSIL™ LC-18-DB SUPELCOSIL™ LC-PAH SUPELCOSIL™ LC-18-S SUPELCOSIL™ LC-18-T Superspher® RP-18e Superspher® RP-18	—	Chromolith® HighResolution RP-18e Chromolith® Performance RP-18e Chromolith® Prep RP-18e Chromolith® SemiPrep RP-18e Chromolith® CapRod® RP-18e Chromolith® CapRod® HighResolution RP-18e Chromolith® WP 300 RP-18
L3	Porous silica particles, 1.5 to 10 µm in diameter, or a monolithic silica rod.	Ascentis® Express HILIC	Ascentis® Si Purospher® STAR Si	LiChrosorb® Si 60 LiChrospher® Si 60 SUPELCOSIL™ LC-Si SUPELCOSIL™ LC-3Si Superspher® Si 60	—	Chromolith® Performance Si Chromolith® Prep Si Chromolith® SemiPrep Si
L7	Octylsilane chemically bonded to totally or supericially porous silica particles, 1.5 to 10 µm in diameter, or a monolithic silica rod.	Ascentis® Express C8	Purospher® STAR RP-8e Ascentis® C8 Discovery® C8 Discovery® BIO Wide Pore C8	LiChrosorb® RP-8 LiChrospher® RP-8e LiChrospher® RP-Select B SUPELCOSIL™ LC-8 SUPELCOSIL™ LC-8-DB Superspher® RP-8e Superspher® RP-8 Superspher® RP-Select B	—	Chromolith® CapRod® RP-8e Chromolith® HighResolution RP-8e Chromolith® Performance RP-8e Chromolith® WP 300 RP-8
L8	An essentially monomolecular layer of aminopropylsilane chemically bonded to totally porous silica gel support, 1.5 to 10 µm in diameter, or a monolithic silica rod.	—	Purospher® STAR NH_2	LiChrospher® NH_2 SUPELCOSIL™ LC-NH_2	—	Chromolith® NH_2
L9	Irregular or spherical, totally porous silica gel having a chemically bonded, strongly acidic cation-exchange coating, 3 to 10 µm in diameter.	—	TSKgel® SP-2SW	SUPELCOSIL™ LC-SCX	—	
L10	Nitrile groups chemically bonded to porous silica particles, 1.5 to 10 µm in diameter, or a monolithic silica rod.	Ascentis® Express ES-Cyano BIOshell™ Peptide CN	Ascentis® ES Cyano Discovery® Cyano	LiChrospher® CN SUPELCOSIL™ LC-CN	—	Chromolith® CN
L11	Phenyl groups chemically bonded to porous silica particles, 1.5 to 10 µm in diameter, or a monolithic silica rod.	Ascentis® Express Phenyl-Hexyl BIOshell™ IgG Diphenyl	Ascentis® Phenyl Purospher® STAR Phenyl	SUPELCOSIL™ LC-DP Diphenyl	—	—
L13	Trimethylsilane chemically bonded to porous silica particles, 3 to 10 µm in diameter.	—	TSKgel® TMS-250	SUPELCOSIL™ LC-1	—	—
L14	Silica gel having a chemicallly bonded strongly basic quaternary ammonium anion-exchange coating, 5 to 10 µm in diameter.	—	TSKgel® QAE-2SW	SUPELCOSIL™ SAX1	—	—
L17	Strong cation-exchange resin consisting of sulfonated cross-linked styrene-divinylbenzene copolymer in the hydrogen form, 6 to 12 µm in diameter.	—	—	—	Proteomix® WCX-NP10 SUPELCOGEL™ C-610H SUPELCOGEL™ H	—
L19	Strong cation-exchange resin consisting of sulfonated cross-linked styrene-divinylbenzene copolymer in the calcium form, 5 to 15 µm in diameter.	—	—	—	Proteomix® SCX-NP5 Proteomix® SCX-NP10 SUPELCOGEL™ Ca	—
L20	Dihydroxypropane groups chemically bonded to porous silica or hybrid particles, 1.5 to 10 µm in diameter, or a monolithic silica rod.	—	TSKgel® QC-PAK GFC TSKgel® SuperSW TSKgel® SW TSKgel® SW_{XL}	LiChrosorb® Diol LiChrospher® Diol SUPELCOSIL™ LC-Diol	—	Chromolith® Diol
L21	A rigid, spherical styrene-divinylbenzene copolymer, 3 to 30 µm in diameter.	—	—	—	Hamilton® PRP-1 Hamilton® PRP-3 TSKgel® SuperH TSKgel® SuperHZ TSKgel® H_{HR} TSKgel® H_{XL}	—
L22	A cation-exchange resin made of porous polystyrene gel with sulfonic acid groups, 5 to 15 µm in diameter.	—	—	—	Hamilton® PRP-X200 Hamilton® PRP-X300 SUPELCOGEL™ H	—
L23	An anion-exchange resin made of porous polymethacrylate or polyacrylate gel with quaternary ammonium groups, 7 to 12 µm in size.	—	—	—	—	—
L25	Packing having the capacity to separate compounds with a molecular weight range from 100 – 5000 (as determined by polyethylene oxide), applied to neutral, anionic, and cationic water-soluble polymers.	—	—	—	TSKgel® G2500PWXL TSKgel® G2500PW TSKgel® G2000PW TSKgel® G1000PW	—
L26	Butyl silane chemically bonded to totally porous or supericially porous silica particles, 1.5 to 10 µm in diameter.	BIOshell™ Protein C4 BIOshell™ IgG C4	—	—	—	Chromolith® WP 300 RP-4
L27	Porous silica particles, 30 to 50 µm in diameter.	—	—	Pelliguard™ LC-Si Supelclean™ LC-Si	—	—
L29	Gamma alumina, reverse-phase, low carbon percentage by weight, alumina-based polybutadiene spherical particles, 5 µm in diameter with a pore volume of 80 Å units.	—	—	—	—	—
L32	A chiral ligand-exchange resin packing - L-proline copper complex covalently bonded to irregularly shaped silica particles, 5 to 10 µm in diameter.	—	Astec® CLC-D Astec® CLC-L	—	—	—
L33	Packing having the capacity to separate dextrans by molecular size over a range of 4,000 to 500,000 Da. It is spherical, silica-based, and processed to provide pH stability.	—	TSKgel® $G2000SW_{XL}$ TSKgel® $G4000SW_{XL}$	—	—	—
L34	Strong cation-exchange resin consisting of sulfonated cross-linked styrene-divinylbenzene copolymer in the lead form, 7 to 9 µm in diameter.	—	—	—	SUPELCOGEL™ Pb	—
L37	Packing having the capacity to separate proteins by molecular size over a range of 2,000 to 40,000 Da. It is a polymethacrylate gel.	—	—	—	TSKgel® $G3000PW_{XL}$ TSKgel® G3000PW	—
L38	A methacrylate-based size-exclusion packing for water-soluble samples.	—	—	—	TSKgel® SuperAW TSKgel® PW TSKgel® PW_{XL} TSKgel® PW_{XL}-CL	—
L39	A hydrophilic polyhydroxymethacrylate gel of totally porous spherical resin.	—	—	—	TSKgel® SuperAW TSKgel® PW TSKgel® PW_{XL} TSKgel® PW_{XL}-CL	—
L40	Cellulose tris-3,5-dimethylphenylcar bamate coated porous silica particles, 3 to 20 µm in diameter.	—	Astec® Cellulose® DMP	—	—	—
L41	Immobilized α1-acid glycoprotein on spherical silica particles, 5 µm in diameter.	—	CHIRALPAK® AGP	—	—	—
L43	Pentaluorophenyl groups chemically bonded to silica particles by a propyl spacer, 1.5 to 10 µm in diameter.	Ascentis® Express F5	Discovery® HS F5	—	—	—
L45	Beta cyclodextrin, R,S-hydroxypropyl ether derivative, bonded to porous silica particles, 3 to 10 µm in diameter.	—	Astec® CYCLOBOND® I 2000 Series	ChiraDex® ChiraDex® HR	—	—
L49	A reversed-phase packing made by coating a thin layer of polybutadiene on to spherical porous zirconia particles, 3 to 10 µm in diameter.	—	—	—	—	—
L52	A strong cation exchange resin made of porous silica with sulfopropyl or sulfoethyl groups, 1 to 10 µm in diameter.	—	—	SUPELCOSIL™ LC-SCX	—	—
L59	Packing for the size-exclusion separations of proteins (separation by molecular weight) over the range of 5 to 7,000 kDa. The packing is spherical 1.5 to 10 µm, silica or hybrid packing with a hydrophilic coating.	—	SRT® SEC Series TSKgel® SuperSW TSKgel® SW TSKgel® SW_{XL}	—	—	—
L60	Spherical, porous silica gel, 10 µm or less in diameter, the surface of which has been covalently modiied with alkyl amide groups and endcapped.	Ascentis® Express RP-Amide	Ascentis® RP-Amide Discovery® RP-AmideC16	SUPELCOSIL™ ABZ+Plus SUPELCOSIL™ LC-ABZ	—	—
L62	C30 silane bonded phase on a fully porous spherical silica 3 to 15 µm in diameter.	Ascentis® Express C30	—	—	—	—
L63	Glycopeptide teicoplanin linked through multiple covalent bonds to a 100 Å units spherical silica.	—	Astec® CHIROBIOTIC® T Astec® CHIROBIOTIC® T2 Astec® CHIROBIOTIC® TAG	—	—	—
L67	Porous vinyl alcohol copolymer with a C18 alkyl group attached to the hydroxyl group of the polymer, 2 to 10 µm in diameter.	—	—	—	apHera™ C18	—
L68	Spherical, porous silica, 10 µm or less in diameter, the surface of which has been covalently modiied with alkyl amide groups and not endcapped.	—	—	SUPLEX™ pKb-100	—	—
L82	Polyamine chemically bonded to cross-linked polyvinyl alcohol polymer, 4 to 5 µm in diameter.	—	—	—	apHera™ NH_2	—
L86	A 5 µm fused core particle with a highly polar ligand possessing 5 hydroxyl groups tethered to the silica gel outer layer.	Ascentis® Express OH5 BIOshell™ Glycan	—	—	—	—
L88	Glycopeptide vancomycin linked through multiple covalent bonds to 100 Ånsgtroms spherical silica.	—	Astec® CHIROBIOTIC® V Astec® CHIROBIOTIC® V2	—	—	—
L109	Spherical particles of porous graphitic carbon, 1.5 to 30 µm in diameter.	—	—	—	Supel™ Carbon LC	—
L114	Sulfobetaine graft-polymerized to totally or supericially porous silica, 1.5 to 10 µm in diameter, or a monolithic rod. Packing having densely bonded zwitterionic groups with 1:1 charge balance.	—	SeQuant® ZIC®-HILIC	—	—	—
L122	Sulfobetaine graft-polymerized to totally or superficially porous hydrophilic polymer particles, 1.0 to 10 µm in diameter, or a monolithic rod. Packing having densely bonded zwitterionic groups with 1:1 charge balance.	—	—	—	SeQuant® ZIC®-pHILIC	—

Footnotes:

[1] United States Pharmacopeia 40, National Formulary 35, (November 1, 2016). Request from Unites States Pharmacopeial Convention, Inc.,12601 Twinbrook Parkway, Rockville, MD USA 20852 (tel. 800-227-8772).
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[2] Indicates availability of material(s) matching the description. We are not necessarily the manufacturer of the material.

[3] Purple text indicates our recommendation(s).

[4] Type B silica is obtained from a synthetic source, and is virtually free of metal contant.

[5] Type A silica is obtained from a natural source, so may contain varying degrees of metal content.

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