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OPERATING CONDITIONS and SPECIFICATIONS

TSKgel® MultiporeHXL-M Products

Part Numbers:	0018403	7.8 mm ID x 30.0 cm L	Multipore HXL-M	5 µm
	0018404		Guardcolumn Multipore Hxl	5 µm

This sheet contains the recommended operating conditions and the specifications for **TSKgel** Multipore HXL-M columns and guard columns. The Multipore HXL-M column has different size pores within the same bead. H-type columns are used exclusively for Gel Permeation Chromatography. Installation instructions and column care information are described in a separate Instruction Manual.

A. OPERATING CONDITIONS

- Shipping Solvent: Tetrahydrofuran (THF)
- Max.Flow Rate: 1.2 mL/min
NOTE: When a buffer with high viscosity is used, the maximum flow rate may have to be reduced so as not to exceed the maximum pressure drop. When changing solvents, use a flow rate equal to 25% of the maximum flow rate.
- Standard Flow Rate: 0.5 - 1.0 mL/min
- Max. Pressure: 3.5 MPa
- Multiple Columns: Columns of the same or different pore size are often connected in series to improve resolution and/or to expand the linear portion of the calibration curve. Connect the columns in order of decreasing pore size to avoid overloading from the high MW components. Connect analytical columns using short pieces of 1/16" x 0.01" ID stainless steel tubing.
- Solvents.: Turn this page over for a list of solvents that are compatible with this H-type column. Most H-type columns are supplied in THF because of its high dissolving power for polymers and oligomers. Besides THF, H-type columns are also available packed in acetone, chloroform, dimethylformamide and o-dichlorobenzene (ODCB).
- Temperature.: Multipore columns should be used above room temperature and up to a maximum of 60°C.
- Sample Size: 0.001 - 0.5mg
- Storage: The column can be left overnight in solvent in the LC system. When it will not be used for longer periods of time, remove the column from the equipment, seal the ends with the provided protective screws, and store it at laboratory temperature. At all times, prevent air from entering the column!
- Column Protection: The use of guard columns is recommended to prolong the life of the analytical column. Guard columns are not for analysis, they do not improve resolution when connected to the main column. They are also not a substitute for filtering the mobile phase and the sample. A guard column does reduce pump pulsation, and further protects the main column by collecting highly adsorptive components and insoluble substances. Guard column life depends greatly on sample cleanliness. As a general rule, guard columns should be replaced when the peaks become excessively wide, or when the peaks show splitting.

B. SPECIFICATIONS

The performance of **TSKgel** Multipore H_{XL}-M columns is tested under the conditions described in the Data sheet

All columns have passed the following quality control specifications:

Number of Theoretical Plates (N): $\geq 16,000$

Asymmetry Factor (AF): 0.7 – 1.6

C. SOLVENT COMPATIBILITY for H_{XL} COLUMNS

Note: Only one solvent substitution can be made.

SHIPPING SOLVENT:

CAN BE REPLACED BY:

Tetrahydrofuran¹ benzene, chloroform, toluene, xylene, dichloromethane, dichloroethane

Acetone carbon tetrachloride², o-dichlorobenzene, dimethylformamide, dimethylsulfoxide, dioxane, ethylacetate, FC-113, hexane, hexafluoroisopropanol / chloroform, methylethylketone, N-methylpyrrolidine, pyridine, quinoline, cyclohexane, dodecane

Chloroform⁴ m-cresol / chloroform, up to 10% hexafluoroisopropanol / chloroform

Dimethylformamide dimethylsulfoxide, dioxane, tetrahydrofuran, toluene

o-dichlorobenzene 1-chloronaphthalene, trichlorobenzene

Important:

1. All TSK-GEL H_{XL}, and GMH analytical columns are shipped containing tetrahydrofuran (THF), except GMH-HT columns, which contain **only** o-dichlorobenzene. THF in G1000HXL, columns **cannot** be replaced with dichloromethane or dichloroethane.
2. Prolonged exposure to carbon tetrachloride can corrode the stainless steel parts of a column and an HPLC system
3. 100% methanol cannot be used with H type columns; use this solvent with TSKgel **Alpha type** or SW type columns

How to Change Solvents:

1. Use a linear gradient at a rate of change of 2% per minute.
2. Use a flow rate of ≤ 0.5 mL/min for 7.5 and 7.8mm ID columns.
3. Use half the normal flow rate for (semi-) prep columns.