TOSOH BIOSCIENCE

Im Leuschnerpark 4, 64347 Griesheim, Germany
Tel: +49 6155-7043700 Fax: +49 6155-8357900
E-Mail: info.tbg@tosoh.com
Web: www.tosohbioscience.de

3604 Horizon Drive, Suite 100, King of Prussia, PA 19406, USA
Tel: +1 800-366-4875 Fax: +1 610-272-3028
E-Mail: info.tbl@tosoh.com
Web: www.tosohbioscience.com

OPERATING CONDITIONS and SPECIFICATIONS

TSKgel® GMHXL-HT Products

Part Numbers: 0007112 7.8 mm ID x 30.0 cm L GMHXL-HT **13 µm**

This sheet contains the recommended operating conditions and the specifications for **TSKgel** GMH-HT columns. GMH-HT columns are mixed-bed columns. They are prepared by combining packings of various pore sizes to obtain a column that has a linear calibration curve that spans a very wide molecular weight range. GMH-HT columns are used exclusively for high temperature Gel Permeation Chromotography with o-dichlorobenzene mobile phase. Installation instructions and column care information are described in a separate Instruction Manual.

A. OPERATING CONDITIONS

1.	Shipping Solvent:	o-dichlorobenzene (ODCB)		
2.	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.	
3.	Standard Flow Rate:	0.5 - 1.0	mL/min	
4.	Max. Pressure:	1.5	MPa	7.8 mm ID x 30.0 cm L
5.	Multiple Columms:		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.	
6.	Solvents.:		Turn this page over for a list of solvents that are compatible with this H-type column. GMH-HT columns are only available packed in o-dichlorobenzene (ODCB), although other H-type columns are available packed in ODCB.	
7.	Temperature.:	140°C	There is limited evidence that HT columns may be operated at temperatures as high as 220°C in 1-chloronaphthalene.	
8.	Sample Size:	0.001 - 0.5 mg 0.500 - 5.0 mg	7.8 mm ID x 30.0 cm L (analytical) 7.8 mm ID x 30.0 cm L (semi-prepl)	
9.	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!	
10.	Column Protection:		Unfortunately, guard columns are not yet available for the HT column; it is therefore even more important to filter the mobile phase and the sample.	

B. SPECIFICATIONS

The performance of **TSKgel** GMH-HT 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):	≥	5,500	7.8 mm ID x 30.0 cm L

Note our technical hotline tel +49 6155 70437-36
and e-mail, techsupport.tbg@tosoh.com

C. SOLVENT COMPATIBILITY for HXLCOLUMNS

Standard H-type columns are packed (and shipped) in tetrahydrofuran, with the exception of GMH-HT columns which are only shipped in o-dichlorobenzene. H-type columns are also available *per special order* packed in acetone, chloroform, dimethylformamide, or o-dichlorobenzene.
The table below lists the solvents that may used to replace the original shipping solvent.

Note: **Only one solvent substitution can be made.**

SHIPPING SOLVENT	**CAN BE REPLACED BY**
Tetrahydrofuran	benzene, chloroform, toluene, xylene, dichloromethane, dichloroethane
NOTE:	THF in G1000HXL columns cannot be substituted with dichloromethane or dichloroethane.
Acetone	carbon tetrachloride, o-chlorophenol/chloroform, m-cresol/chloroform, o-dichlorobenzene, dimethylformamide (DMF), dimethylsulfoxide (DMSO), dioxane, ethylacetate, FC-113, hexane, hexafluoroisopropanol/chloroform, methylethylketone, N-methylpyrrolidine, methanol/chloroform (up to 60% MeOH), pyridine, quinoline.
Chloroform	m-cresol/chloroform, hexafluoroisopropanol/chloroform, 0 to 20% methanol in chloroform.
Dimethylformamide	dimethylsulfoxide, dioxane, tetrahydrofuran, toluene,
o-dichlorobenzene	1-chloronaphthalene, trichlorobenzene

Important:

1. Carbon tetrachloride can corrode stainless steel parts in an HPLC system and in the column.
2. Methanol cannot be used with H-Type columns; use PW columns with this solvent.

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 7.8 mm ID columns.
   Use half the normal flow rate for (semi-) prep columns.

Note our technical hotline tel +49 6155 70437-36
and e-mail, techsupport.tbg@tosoh.com