



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<sup>®</sup> VMpak-25 Products

<b>Part Numbers:</b>	0020011	2.0 mm ID x 5.0 cm L	TSKgel VMpak-25	<b>7.0 μm</b>
	0020012	2.0 mm ID x 15.0 cm L	TSKgel VMpak-25	<b>7.0 μm</b>

This sheet contains the recommended operating conditions and the specifications for **TSKgel** VMpak-25 columns and guard columns. Installation instructions and column care information are described in a separate Instruction Manual.

#### A. OPERATING CONDITIONS

1. Shipping Solvent: Water
  2. Standard Flow Rate: 0.10 - 0.20 mL/min
  3. Max.Flow Rate: Use at a flow rate (usage flow rate) that does not exceed the maximum pressure drop
- NOTE:** When a buffer with high viscosity is used, the maximum flow rate may have to be reduced so as not to exceed the recommended pressure drop. When changing solvents, use a flow rate equal to 25% of the maximum flow rate.
4. Max. Pressure:
 

2.0 MPa	2.0 mm ID x 5.0 cm L
6.0 MPa	2.0 mm ID x 15.0 cm L
  5. Temperature: 10 – 80 °C Reduce flow rate when operating below 10 °C
  6. pH Range: 2.5 – 12.0
  7. Salt Conc.: ≤ 0.5 mol/L
  8. Organic Conc.: Up to 100%. The solvent change should be made very gradually using a shallow gradient at low flow rate.
  9. Cleaning Solvents: Clean the column in reverse at half the standard flow rate (monitor pressure) with 3 to 5 columns volumes(CV)
    1. High neutral salt concentration buffer (0.5 - 1.0M)
    2. pH 2 - 3 or pH 9 - 12 buffer,
    3. up to 100% organic
    4. Buffer with 6M urea or 0.1% SDS

**Note:** Rinse with 3 to 5 CV of DI water between the cleaning solutions. Choose a cleaning solvent based on sample properties, e.g. use (1) to remove basic polymers, (3) to remove hydrophobic proteins etc
  10. Storage: Store the column in a 0.05% NaN<sub>3</sub> solution or 20% ethanol in DI water when it will not be used the next day. For overnight storage flush the column at low flow rate with the mobile phase. Prevent air from entering the column!
  11. Column Protection: The use of guard columns is recommended to prolong the life of the analytical column. Guard column life depends greatly on sample cleanliness. As a general rule, guard columns should be replaced after every 30-40 sample injections, when the peaks become excessively wide, or when the peaks show splitting.

#### B. SPECIFICATIONS

The performance of **TSKgel** VMpak-25 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):	≥ 1,000	2.0 mm ID x 5.0 cm L
	≥ 3,000	2.0 mm ID x 15.0 cm L
Asymmetry Factor (AF):	0.70 – 1.60	