

# TSKgel<sup>®</sup> Butyl-NPR Products

**Columns:** 14947, 4.6 mm ID x 3.5 cm, 2.5  $\mu$ m, nonporous  
42168, 4.6 mm ID x 10 cm, 2.5  $\mu$ m, nonporous

This sheet contains the recommended operating conditions and the specifications for the TSKgel Butyl-NPR column. Installation instructions and column care information are described in a separate Instruction Manual.

## A. OPERATING CONDITIONS

1. Shipping Solvent: Distilled Water  
1.2 mL/min: (P/N 14947)  
1.0 mL/min: (P/N 42168)
2. Max. Flow Rate: 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.
3. Max. Pressure: 20 MPa
4. pH Range: 2 - 12 (pH above 12 or below 2 can only be used for a short time)
5. Salt Conc.: < 4 mol/L
6. Organic Conc.:  $\leq$  50% (salt precipitation should be avoided when adding salts to the mobile phase containing organic solvents)
7. Temperature: 10 - 60  $^{\circ}$ C
8. Column Washing and Regeneration: Repeated 100 - 250  $\mu$ l injections of 0.1 - 0.2 mol/L NaOH are recommended for cleaning or regenerating the column. When this procedure is not effective, we recommend repeated injections of 100 - 250  $\mu$ l of 20% aq. acetic acid.

**NOTE:** The above cleaning step using 0.1 - 0.2 mol/L NaOH is best performed after each day of column use.

9. Storage: Store the column in shipping solvent at the end of each day of use.
10. Column Protection: No guard column is available for the TSKgel Butyl-NPR column. Be sure to use a filter after the injector with 0.5 micron pores to avoid frequent plugging of the one micron pore size NPR column frit. We also recommend a pre-injector membrane filter to prevent particles from pump seal wear to reach the column.

**NOTE:** Use high quality reagents, water and solvents for preparing buffers. Fouling of the resin, leading to a loss in retention and/or efficiency, occurs faster due to the small surface area of non-porous resin particles.

## B. SPECIFICATIONS

The performance of TSKgel Butyl-NPR columns is tested under the conditions described in the Data Sheet. All columns have passed the following quality control specifications:

1. Resolution (Rs):  $\geq$  3.0 (4.6 mm ID x 3.5 cm)  
 $R_s = 2(V_2 - V_1)/1.7(W_2 + W_1)$  in which,  
 $V_1$  = elution volume lysozyme  
 $V_2$  = elution volume ovalbumin  
 $W_1, W_2$  = widths of peaks 1 and 2 at half height
2. Number of Theoretical Plates (N):  $\geq$  4,000 (4.6 mm ID x 10 cm)
3. Asymmetry Factor (AF): 1.0 - 3.0 (4.6 mm ID x 10 cm)