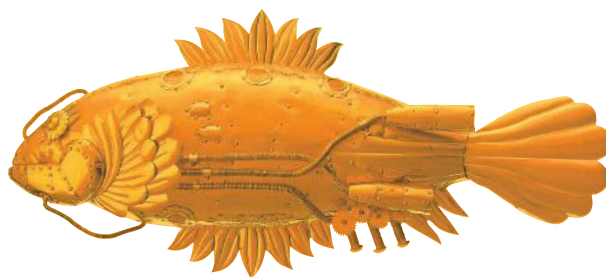


# Shodex™



## HPLC Columns

### MANUAL

### PROTEIN KW 403-4F

**SHOWA**  
**DENKO**  
EUROPE

Columns manufactured by Showa Denko K.K Japan  
Made in Japan

**Shodex HPLC Columns**  
Europe, Middle East, Africa, Russia

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# Operational Manual

## Shodex™ PROTEIN KW403-4F

(Please read this manual carefully before using the column to keep its good performance and life.)

### 1. Introduction

Shodex KW403-4F is a size exclusion chromatography column developed for separation of hydrophilic substances with low molecular weight, such as small proteins and peptides.

### 2. Instructions in handling <Important>

**Caution!** \* Take notice of keeping instructions about the solvents and the reagents used with the column not to occur problems related to losing your health or leaking.

**Attention!** \* Use the column within the regular range of flow rate, pressure and temperature. There is a danger of deteriorating the performance when it is handled beyond the permissible range even for a short time. See the clause "Usable conditions" about the permissible range.

### 3. Specifications

|                               |   |
|-------------------------------|---|
| Column size:                  | 4.6 mm I.D. X 300 mm L.                                       |
| Column material (inside):     | SUS 316.  |
| Packing material:             | Porous silica particle (3 μm) bound with hydrophilic polymer. |
| In-column solvent (initial):  | Water.  |
| Exclusion limit M.W.:         | 150,000 (pullulan).   |
| Number of theoretical plates: | > 35,000 per column.  |

### 4. Usable conditions

|              |  |
|--------------|--|
| Flow rate:   | <0.5 ml/min.<br>*It should be 0.15 ml/min or less for replacing the in column solvent. |
| Pressure:    | <10 MPa per column.  |
| Temperature: | 5~45°C.  |
| pH:          | 3.0~7.5.   |

**Eluent:** An aqueous solution of salt or a buffer solution is usually used.  
<Representative salts> sodium chloride, sodium nitrate, sodium sulfate, potassium sulfate, ammonium sulfate.  
<Representative buffers> phosphate buffer, tris buffer, acetate buffer.  
\*Methanol or acetonitrile can be added up to 100 vol%.

**Attention!**

- 1) Do not remove the end fittings of the column under any circumstances.
- 2) Do not make a strong impact on the column: such as hitting or dropping on the floor.
- 3) Replace the solvent in the chromatograph with the eluent to be used before connecting the column.
- 4) Connect the column so that the flow direction corresponds to the arrow mark on the tag.
- 5) When the column is not used for a month or more, replace the in column solvent with water, close each end with a stopper, and store it at room temperature.
- 6) Adjust total salt concentration of eluent to not more than 0.5M.
- 7) Filtrate the sample with a disposable filter (0.45  $\mu\text{m}$ ) to prevent deterioration by adsorbing insoluble matters.
- 8) When methanol or acetonitrile is added to an aqueous solution of salt or a buffer solution, pay attention not to separate any salt after mixing.