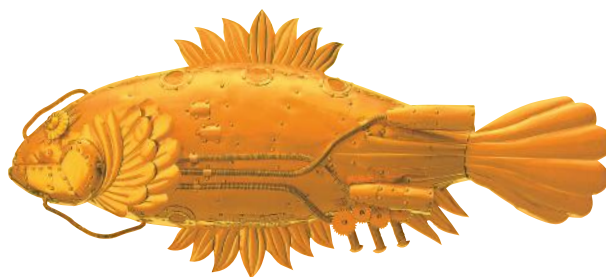


# Shodex™



## HPLC Columns

### MANUAL

### MSpak GF-4A

**SHOWA**  
**DENKO**  
EUROPE

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

For technical support please use  
contact details shown below:

**SHOWA DENKO EUROPE GmbH**  
Shodex Business  
Konrad-Zuse-Platz 3  
81829 Munich, Germany

E-mail: [support@shodex.de](mailto:support@shodex.de)  
Phone: +49 (0)89 93 99 62 37  
[www.shodex.de](http://www.shodex.de)

# Operation Manual

## Shodex™ MSpak™ GF-4A

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

### 1. Introduction

Shodex MSpak GF-4A is a multi-mode column. It can be used for size exclusion chromatography and reverse phase chromatography. Because the adsorption of the protein is a little, it can be used also for the medicine concentrate in the sample including the protein.

### 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. × 10 mm L.
Column material (inside):	Stainless steel type 316
Packing material:	Polyvinyl alcohol polymer
In-column solvent (initial):	water

### 4. Usable conditions

Flow rate:	≦1.0 mL/min.
Pressure:	≦1.0 MPa per column
Temperature:	4~60 °C
pH:	2.0~9.0
Eluent:	Solution and various buffering solutions can be used. Please use a total salt level by 0.5M or less. The organic solvent can be used within the range of 0 - 100%. The kind of the organic solvent that can be used is as follows. Methanol, ethanol, acetonitrile, acetone, ethyl acetate, DMF, chloroform and THF.

### 5. Directions

Please use eluent after it degas enough.

Please use it in the density of the organic solvent that denatures the protein and doesn't coagulate when the protein is contained in the sample.

Please make to 0.2mL/min or less, and substitute the solvent of the entire system enough for set flowing quantity when the column solvent is substituted.

**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) Filtrate the sample with a disposable filter (0.45 $\mu$ m) to prevent deterioration by adsorbing insoluble matters.
- 7) 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.