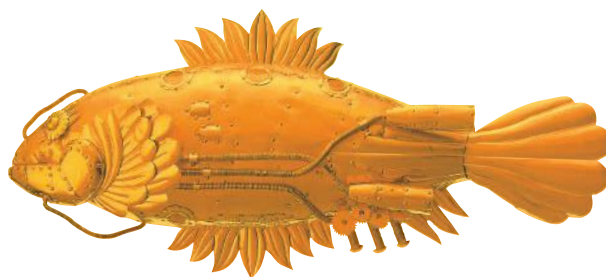


Shodex™



HPLC Columns

MANUAL

Asahipak ODP-40

SHOWA
DENKO
EUROPE

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

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
Phone: +49 (0)89 93 99 62 37
www.shodex.de

Operation Manual Shodex™ Asahipak™ ODP-40 (4D, 4E)

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

1. Introduction

The Shodex Asahipak ODP-40 4D and ODP-40 4E are columns for reversed phase chromatography. These columns are packed with spherical porous polymer having octadecyl (C18), and perform similar to general ODS columns. These columns are compatible with not only water (H₂O) or polar organic solvents, but also the wide pH range between 2 to 13.

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.

3. Specifications

| Product code | Product name | Size (mm) | | Particle size (μm) | Plate number (TP/per column) |
|--------------|--------------|-----------|--------|--------------------|---------------------------------|
| | | ID | Length | | |
| F7621001 | ODP-40 4D | 4.6 | 150 | 4 | >11.000 |
| F7621002 | ODP-40 4E | 4.6 | 250 | | >17.000 |
| F6710022 | ODP-50G 4A | 4.6 | 10 | 5 | (guard column) |

Packing material: Spherical porous particles of polyvinyl alcohol with chemical bonds of C18 groups.

Carbon contents: 17%

Column material: Stainless steel (SUS 316).

Screw type: Unified Thread Standard No. 10-32 UNF.

Shipping solvent: H₂O/CH₃CN = 35/65 vol %

4. Usable conditions

| Product name | Flow rate (mL/min) | | Max. pressure (MPa) | pH range | Temperature range °C |
|--------------|--------------------|-----|---------------------|----------|----------------------|
| | Standard | Max | | | |
| ODP-40 4D | 0.3~0.6 | 0.8 | 13 | 2~13 | 4~60 |
| ODP-40 4E | 0.3~0.6 | 0.8 | 9 | | |
| ODP-50G 4A | 0.3~0.6 | 0.8 | 13 | | |

Apply lower flow rate than standard for solvent replacement.

5. Solvents

- 1) Filtrate the eluent with a membrane filter (0.45µm) to prevent chromatogram noise and column performance deterioration by small particles or unsolved materials.
- 2) It is possible to use pure water, methanol and acetonitrile 100% each, and any proportion of these solvents. Acetonitrile is recommended in case of low resolution of aromatic substances with methanol containing eluent.
- 3) It is possible to use buffer agents like phosphoric salt, acetate salt and Tris-HCL. And neutral salts such as NaCl, KCl, Na₂SO₄ and acids such as trifluoroacetic acid are also usable. Check no precipitation of salts and solvent pH, and filtrate the eluent with a membrane filter (0.45µm).

6. Sample preparation

- 1) Filtrate the sample solution with a disposable filter (0.45µm) to prevent column performance deterioration by small particles or unsolved materials.
- 2) Make sample using eluent as diluted solution. Starting eluent is recommended for making sample for gradient analysis.

7. Column cleaning

Elution characteristics of a column may change considerably after long, repeated usage, due to the accumulation of sample microadsorbents on the packing material surface. In such cases, remove guard column and set analysis column with reverse direction with its flow direction, cleaning the column with 50mL or more of acetonitrile or methanol may be effective for

recovery of column efficiency. Guard column should be cleaned along with the same way. The flow rate should be applied lower than 0.3mL/min.

8. Column inspection

Column inspection method is described in Certificate of Analysis.

9. 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 two weeks or more, replace the in-column solvent with the shipping solvent, and put off from chromatograph and close each end with a stopper, and store it at cool and dark space.
- 6) Contact Shodex website (<http://www.shodex.com/>) or Shodex partners regarding products and analysis applications.

10. Warranty

- 1) Showa Denko K. K. warrants that the Shodex Column, at the time of delivery to the user, will conform to the specification of the attached Certificate of Analysis, if the Shodex Column is used in accordance with the operating manual. The foregoing warranty is exclusive and is in lieu of all other warranties with respect to the Shodex Column, whether written, oral, implied, statutory or otherwise. No warranties by Showa Denko K. K. are implied or otherwise created, including, but not limited to, the warranty of merchantability and fitness for particular purposes.
- 2) Any claim of inconformity to the specification must be notified to Showa Denko K.K. within ten (10) days after delivery to the user. User's exclusive remedy and Showa Denko K.K.'s exclusive liability for such claim are limited to the replacement of the Shodex Column in question. In no event is Showa Denko K.K. liable for any indirect, incidental or consequential

damage arising out of in connection with the Shodex Instrument, whether or not such damage is allegedly based on breach of warranty, negligence or otherwise.

3) No warranty is made in any of the following cases:

- (1) If the Shodex Column is not used in accordance with the operating manual.
- (2) If the Shodex Column is remodeled by anyone other than person or firm designated by Showa Denko K.K.
- (3) If the Shodex Column is resold by the user without giving prior written notice to Showa Denko K.K.
- (4) If the performance of the Shodex Column is not conform to the specification of the attached Certificate of Analysis due to any of the reasons below:
 - a) Computer virus
 - b) Impurities contained in the sample, reagent, gas air or cooling water provided by the user
 - c) Breakdown or malfunction of equipment, apparatus or component used in combination with the Shodex Column
 - d) Force majeure such as fire, earthquake, flood, other natural disaster, rime, riot, act of terrorism, war or radioactive contamination

4) In no event is Showa Denko K.K. liable for (i) the results of analyses or preparations using the Shodex Column or any portion of the same, including, but not limited to, the reliability, accuracy, efficacy and safety of said results, and (ii) the occupational hazard in the use of the Shodex Column, whether or not such use is made in accordance with the attached Conditions for use.

5) The Shodex instrument is for laboratory use only. It must not be used for clinical diagnosis. Showa Denko K.K. is not liable for any use of the Shodex Instrument except laboratory use.