

## High Performance Packed Column for HPLC

Shim-pack

# GWS Series

### INSTRUCTION MANUAL

#### ■ Introduction

To maintain and maximize peak performance of Shim-pack GWS series columns, and to ensure the long life and stability of columns, please read the following instructions before use.

#### ■ Operating Precautions

Check if anything is missing or damaged. If there are any signs of damage, notify your local Shimadzu representative at once.

Each of the Shim-pack GWS series columns is delivered with a Column Performance Report. The information supplied in the report include the lot number, column serial number, and chromatographic test conditions. Please keep the report for future reference.

#### ■ Column Performance

Shim-pack GWS series packing materials are subjected to a rigorous array of QC tests, with special emphasis on reagent purity, raw material traceability, consistency in raw materials, and quality of final products. A detailed analysis of all of the physical and chemical properties of these columns, combined with tests for chromatographic selectivity and column packing material efficiency, ensure that each lot of these columns are identical to all previous lots and column-to-column reproducibility is of the highest order.

Shim-pack GWS series columns are shipped with the solvent used for the final QC test of the column, which is Water : Acetonitrile or Water : Methanol.

#### ■ Column Installation

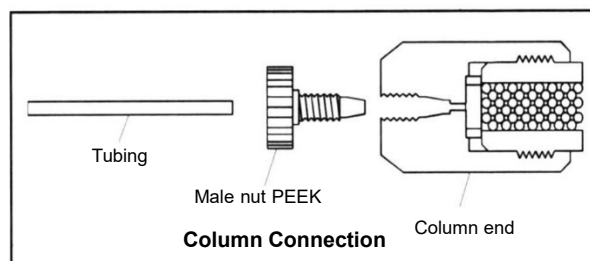
The flow direction of the column is shown on the column (→). When installing the column, ensure that the flow direction matches the mobile phase flow direction.

Use PEEK or SUS tubing with an inner diameter of 0.25 - 0.3 mm and an outer diameter of 1.6 mm.

Use the shortest possible tubing connection from the injector to the column to minimize peak broadening.

The column should be connected with male nuts. Ensure that the fittings are connected properly to avoid creating dead volume between the tubing and the column interface. PEEK male nuts can be ordered by referring to the part number below.

Item name	P/N	Remarks
Male nut, PEEK	228-18565-84	5 pcs



**NOTE** Stains or air in the flow line may deteriorate the column. Before connecting the column, be sure to flow the mobile phase to flush the flow line.

If peaks are tailing more on the early eluting compounds than later eluting compounds, there is a possibility that there is a dead volume. In such case, check that all column connections are properly connected.

Also, make sure to use appropriate internal diameter and length size of tubing at the injector and detector, especially when using semi-micro size columns, to avoid system dead volumes.

#### ■ Sample

Samples should be dissolved in an eluent or solvent weaker than the mobile phase, which helps avoid sample precipitation at column inlet/head and inconsistent retention values.

#### ■ Clogging of column

The most common cause of the increase of column back pressure or split peaks is blockage of the inlet filter by sample particulates, particles created by aging pump seals, or large quantities of lipophilic compounds adsorbing to the head of the column.

- Filtrate the mobile phase using a 0.45 μm membrane filter before using the column.
- Installing "Ghost Trap DS" between the pump and injector can efficiently remove particulates or contaminants in the mobile phase.
- Filtrate the sample using a syringe filter before injecting to the column.
- Installing "Guard Column" can prevent column clogging problems.

Baseline drift and noise can be caused by defective pumping due to air bubbles in eluent or decrease of light intensity when using a UV detector. Note that bubbles can form in the detector flow cell if the eluent is not degassed properly before introduction into the column.

### ■ Column Handling Precautions

Do not drop or bump the columns, to avoid a deterioration of the column performance.

Shim-pack GWS series columns provide optimum lifetime when used with eluents within the pH range of 2.0 to 7.5. Higher pHs lead dissolution of silica gel and lower pHs cause hydrolysis of bonded phase, hence the best lifetimes are obtained at intermediate pH conditions.

To maximize column life operate at pressures below 20 MPa.

Avoid rapid pressure fluctuation.

Column should be disconnected from the system after the pressure gauge indicates "0".

Please note that operating the sample injection valve slowly or using an auto-sampler with slow valve switching speed will also generate a rapid pressure increase at the column inlet, which will cause premature column deterioration.

### ■ Storage of Columns

After using reversed-phase columns with eluent containing buffer or ion-pair reagent, wash the column thoroughly with a salt-free eluent before storing. When storing the column for a long period, replace with 100% organic solvent such as methanol.

Seal the column with the plugs provided and store in a temperature stable place.

### ■ Technical Support

Shim-pack GWS series columns are manufactured, inspected, packaged and shipped under strict standards of quality control. Should you find any defect in performance, please contact your local Shimadzu representative, who will ensure your complete satisfaction.

We regret that we cannot guarantee the lifetime of columns, also that we cannot accept any claim when performance has deteriorated due to noncompliance with the operation procedures elucidated above, or as a result of normal aging.