Instructions for Use

CIM® Octa OH 0.05 mL Monolithic Column (Hydroxyl) (2 µm channels)

CIM Convective Interaction Media®
BIA-128.8140-2

SARTORIUS

Contents

1. About These Instructions for Use

These instructions are part of the device. They apply to the device product number indicated on the cover page.

2. Safety

⚠WARNING
Denotes a hazard that may result in death or severe injury if it is not avoided.

⚠CAUTION
Denotes a hazard that may result in moderate or minor injury if it is not avoided.

NOTICE
Denotes a hazard that may result in property damage if it is not avoided.

2.1. Intended Use

CIM® Octa Monoliths are miniaturized eight-in-line columns, designed for automatic and parallel chromatographic screening of process development parameters. The columns are used with a robotic liquid handling workstation with a needle. Inside CIM® Octa columns are CIM® monoliths with homogeneous channel size and surface chemistry. The properties of the stationary phase are directly comparable to CIM® preparative chromatographic columns, making CIM® Octa a robust tool in early process development stages.

This high-performance column is primarily intended for fast and efficient purification of proteins, viral particles and other biomolecules under hydrophilic conditions throughout different purification steps. The following information is being provided to ensure proper product care and optimal product performance.

2.2. Safety Note

Follow the guidelines in this Instructions for Use. Improper use may result in malfunction, personal injury, or damage of the product or material. Follow safety instructions, wear gloves, safety glasses, and a lab coat during operation.

3. Technical Data

Column chemistry	OH (hydrophobic; hydroxyl)
Channel radius	1050 nm (950 nm – 1150 nm)
Support matrix	Poly(glycidyl methacrylate -co- ethylene dimethacrylate)

Monolith dimensions	Diameter: 5 mm; length: 2.5 mm; bed volume (CV): 0.05 mL
Column format	Row of eight-in-line columns, material: polypropylene (PP) and polyethylene (HDPE)
Operating parameters	Flow rate between 30-270 cm/h | 2 - 18 CV/min | 100 - 900 µl/min
Maximum pressure	0.8 MPa, 8.0 bar, 116 psi
Operating temperature	4 °C (39 °F) to 40 °C (104 °F)
Chemical stability	All commonly used aqueous buffers, 1 M NaOH, 0.1 M HCl, 8 M urea, 6 M guanidine hydrochloride and 20 % ethanol solution. Avoid oxidising agents. Avoid prolonged exposure to concentrated acids (over 0.5 M) such as hydrochloric, sulphuric or acetic acids.
Recommended pH	Working range 3–13, cleaning in place 1–14
Storage conditions	2 °C (36 °F) to 25 °C (77 °F); 20 % ethanol
Shelf life	5 years

4. Installation

Remove the product from its shipping box or crate and place on a flat surface. Carefully inspect the product for any damage that may have occurred during shipping. Immediately report any such damage to your vendor and the courier. The product is shipped in the designated storage solution at ambient temperature and should be stored upon receiving as stated under Technical Data.

NOTICE
Do not store the product below 0 °C (32 °F).

5. Getting Started

The CIM® Octa columns require a fully automated robotic system and are operated with a needle. CIM® Octa columns are supplied as a row of eight-in-line columns. Each row of columns comes with a holder for easier handling. Each individual column is removable from the holder. Operating parameters can be found under Technical Data. Before use, remove the top and bottom cover seals. Place the columns in the array plate to a tight fit and start the process by removing storage solution.

5.1. General Recommendations

The following are general guidelines to consider when working with chromatography. The guidelines may not apply to specific column chemistry or sample properties.

- Treat loading material appropriately (e.g. pre-treat, filter, concentrate / dilute, etc.). For more details, please refer to the Guideline 'Pre-treatment of complex biological samples before column purification and regeneration procedures for columns with increased back pressure' (biaseparations.com/en/library/guidelines).
- Always use freshly prepared mobile phases, filtered through 0.2 µm filter, compatible with mobile phases.

- Air bubbles will not disturb the stationary phase and can be washed out of the column. However, drying the monolith risks damaging the stationary phase.
- Surfactants can improve recoveries in virus purification. Non-ionic surfactants will not interact with ion exchange chromatography media. Non-UV-absorbing (at working wavelengths) surfactants will improve the baseline signal.
- Ensure all components of the system used are compatible with the working solutions (e.g. sodium hydroxide, organic solvents, high salt concentrations, etc).

NOTICE
Always ensure mobile phases are compatible before mixing them or applying consecutively on the column. Examples of in-compatible buffers are: magnesium ion-containing buffers and sodium hydroxide (forms precipitate), acetonitrile and sodium hydroxide (forms ammonia and acetate), ammonium acetate and sodium hydroxide (potential formation of explosive atmosphere), ethanol and sodium hydroxide (forms ethoxides). Wash the column with water or another compatible solution when using two incompatible solutions consecutively.

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6. Operating the Column

6.1. Equilibration

For robust and consistent operation of the column, equilibration should be performed before starting with sample analysis when the column was stored, regenerated, cleaned in place or sanitised (where applicable). The column should be equilibrated as follows:

1. Flush any storage or cleaning solution out of the column by washing with 10 CV of deionised water.
2. Wash the column with at least 10 CV of binding mobile phase.
3. Wash the column with at least 10 CV of the eluting mobile phase.
4. Wash the column with at least 10 CV of the binding mobile phase or until pH and/or conductivity at the outlet reach the corresponding values of the binding mobile phase.

6.2. Strip | Regeneration

A strip step with water can be used to regenerate the column. A regeneration step can be included into the operating method to improve reproducibility, to detect the resulting peak, or collect the eluted material.

1. Wash the column with at least 20 CV of low ionic strength mobile phase.
2. Re-equilibrate the column with at least 20 CV of binding mobile phase.

7. Cleaning | Maintenance

Cleaning and maintenance of the column may improve its lifetime and increase reproducibility. Sample properties should be taken into account for column cleaning.

7.1. Cleaning in Place (CIP)

In some cases, a simple regeneration of the monolithic column is insufficient. Sample molecules may not completely elute from the column or may even precipitate on the column. This build-up of contaminants on the monolithic column may cause loss of resolution and binding capacity, increased back pressure, or a complete blockage of the column. A specific CIP protocol should be designed for the type of contaminants present in the sample. An example of a general CIP procedure is presented below.

⚠CAUTION
In case of pressure increase during cleaning, adjust flow rate to remain below the maximum pressure allowed over the column.
Perform the following procedure at up to half the maximum operating flow rate. This will ensure sufficient contact time between the monolith and cleaning solution. Optionally, if hydrophobic impurities are expected, wash with 10 CV of deionized water followed by 10 CV of 30 % 2-propanol.

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1. Wash the column with at least 10 CV of deionised water.
2. Wash the column with at least 10 CV of 1 M NaOH.
3. Wash the column with at least 10 CV of deionised water.
4. Wash the column with at least 10 CV of a concentrated buffer (e.g. 0.1 M – 0.5 M buffer) to restore the appropriate pH. Note: Binding buffer may be used for this step. Wash until the pH value at the outlet of the column corresponds to the buffer's pH.

8. Storage

Clean and equilibrate the column before storage. The column can be stored in working buffers overnight.

NOTICE
NaOH-ethanol mixtures at any concentration form ethoxide anions that are highly destructive to biomolecules, and ligands on chromatography media. Neutralise the column environment before introducing ethanol.

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1. Wash the column with 10 CV deionised water.
2. Wash the column with 10 CV of storage solution. **Note:** Reduce the flow rate when using viscous solvents (such as ethanol) to avoid a pressure increase.
3. Seal the column with bottom and upper seal and store at the temperature specified in Technical Data. If there is a possibility of biological contamination from the sample it is recommended to store the column between 2 °C (36 °F) and 8 °C (46 °F).

9. Troubleshooting

Problems arising during the analysis are usually related to the device, sample, mobile phase, or the instrumentation. It is advisable to use an elimination approach to exclude possible causes. Please refer to our troubleshooting guide (biaseparations.com/en/library/guidelines).

10. Decommissioning | Transportation

If there is reason to return the product, complete a Return Form (biaseparations.com/en/terms-conditions) and contact help.bia@sartorius.com.

Contaminated samples used during the process that could cause biological or chemical hazards are potentially hazardous substances. If the product has come into contact with hazardous substances, steps must be taken to ensure proper decontamination and declaration.

Procedure
Decontaminate the product. The operator of the product is responsible for adhering to local government regulations on the proper decontamination and declaration for transport and disposal.

11. Ordering Information

Transferring the workflow to a different scale or format (analytical, screening) is simple with CIM®. Contact your local support to find the appropriate products.

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The information and figures contained in these instructions correspond to the version date specified below.
Sartorius reserves the right to make changes to the technology, features, specifications and design of the equipment without notice.
Masculine or feminine forms are used to facilitate legibility in these instructions and always simultaneously denote the other gender as well.

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