

Instructions for Use

CIM[®] Octa SDVB 0.05 mL Monolithic Column (2 μ m channels)

CIM Convective Interaction Media[®]
BIA-128.9001-2



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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.

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	SDVB (reverse phase; poly(styrene-co-divinylbenzene))
Channel radius	1050 nm (950 nm - 1150 nm)
Support matrix	poly(styrene-co-divinylbenzene)
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 (39.2 °F) to 45 °C (113 °F)
Chemical stability	The PS-DVB monolith is highly stable across the entire pH range. It can tolerate common organic solvents (acetonitrile, methanol, ethanol). Do not expose the column to aqueous media.
Recommended pH	Working range 2–13, cleaning in place 1–14
Storage conditions	2 °C (36 °F) to 25 °C (77 °F); 20 % ethanol
Shelf life	3 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). Apply a suitable intermediary wash step between two incompatible solutions.

5.2. Buffer Selection

For optimal operation and plate lifetime, 10 % (v/v) of organic modifier is recommended in all mobile phases. Exposure to aqueous mobile phases without organic modifier should be kept to a minimum. Consider compatibility between the aqueous (buffering species) and organic (commonly acetonitrile or methanol) portion of the mobile phase, as well as compatibility with the cleaning solution. Outgassing can occur when organic solvents are combined with aqueous mobile phase.

The surface of reverse-phase monoliths is highly hydrophobic, thus excluding water from their surface. To ensure the surface of the stationary phase is suitably "wetted", at least 1 % organic solution should be in the mobile phases used (10 % organic solution recommended in mobile phases).

NOTICE

Rapid transitions from low to high organic content in the mobile phase (or vice versa) should be minimised.

NOTICE

Consider compatibility between sample and mobile phases to avoid precipitation inside the column (e.g. alkaline solutions, such as NaOH).

6. Operating the Column

6.1. Equilibration

The column should be equilibrated before use. The equilibration procedure should avoid step transitions between organic and aqueous mobile phases. The binding mobile phase should be of similar composition to the loading sample, and it is recommended to use a binding mobile phase which contains at least low percent of organic solvent (e.g. 1 % acetonitrile).

1. Starting with a column in storage solution, wash the column with at least 10 CV of binding mobile phase.
2. Run a linear gradient to 100 % elution mobile phase over 10 CV.
3. Hold at 100% elution mobile phase for 20 CV. A reduced flow rate will ensure extended contact time with elution mobile phase (containing organic solvent) and improve equilibration. Alternatively, a static hold in elution buffer can be used (without flow).
4. Run a linear gradient over 10 CV back to the 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)

Sample molecules may bind to the column strongly and 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 procedure should be considered 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.

1. If the column is in the storage solution, proceed directly to step 2. Else, run a linear gradient to 100 % binding mobile phase over 10 CV.
2. Wash the column with 10 CV of 0.5 M NaOH + 15 % ethanol.
3. Wash the column with 10 CV of neutralization solution consisting of 0.85 M sodium acetate + 15 % ethanol, pH 5.5.
4. Wash the column with 10 CV of 20 % ethanol.

To perform another purification run, proceed with column equilibration.

8. Storage

Clean and equilibrate the column before storage. It is recommended to store the column in the designated storage solution both overnight and for long-term storage.

NOTICE

Limit contact with aprotic organic solvents (e.g. acetonitrile, DCM), to the method run (gradient). Short (overnight) and long term storage in the designated storage solution. See table Technical Data.

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.

1. Wash the column with 15 CV storage solution.
2. 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).

Note: Reduce the flow rate when using viscous solvents (such as ethanol) to avoid pressure increase.

Note: Never combine acetonitrile and alkaline solutions (e.g. NaOH). Acetonitrile hydrolyses to ammonia and acetate.

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.

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