

Care and Use Notes for Lux SFC (Supercritical Fluid Chromatography)

Thank you for purchasing Lux columns for your chiral work. Below are recommended instructions for the care and use of your Lux analytical column under SFC conditions (ID ≤ 4.6 mm).

General Information

Column Description

Column Name	Phase Description
Lux Amylose-1	Amylose tris(3,5-dimethylphenylcarbamate)
Lux Cellulose-1	Cellulose tris(3,5-dimethylphenylcarbamate)
Lux Cellulose-2	Cellulose tris(3-chloro-4-methylphenylcarbamate)
Lux Cellulose-3	Cellulose tris(4-methylbenzoate)
Lux Cellulose-4	Cellulose tris(4-chloro-3-methylphenylcarbamate)
Lux i-Amylose-3	Amylose tris(3-chloro-5-methylphenylcarbamate)
Lux i-Cellulose-5	Cellulose tris(3,5-dichlorophenylcarbamate)
Lux i-Amylose-1	Amylose tris(3,5-dimethylphenylcarbamate)

Shipping Solvent

n-Hexane/2-propanol (9:1, v/v)

Test Certificate

Each column is individually tested before shipment. A test certificate showing the separation parameters for trans-stilbene oxide is enclosed with each column. A test certificate can also be found on our website using column part number and serial number.

Operating Backpressure

The mobile phase flow rate should be set such that the column backpressure stays below 300 bar (4300 psi) for analytical columns and below 241 bar (3500 psi) for Axia packed preparative columns.

Operating Temperatures

With standard co-solvent/modifier (such as alcohol and acetonitrile) the column can be used in the temperature range 0-50°C.

Mobile Phase Restrictions

Coated Lux chiral stationary phases are prepared by coating silica with various polysaccharide derivatives. Therefore, any solvent dissolving the polysaccharide derivative (such as tetrahydrofuran, acetone, chlorinated hydrocarbons, ethyl-acetate, dimethylsulfoxide, dimethylformamide, N-methylformamide, toluene, methylethyl ketone and methyl tert-butyl ether, etc...) must be avoided even in trace amounts (e.g. even as sample solvent). Co-solvent such as methanol (MeOH), ethanol (EtOH), isopropanol (IPA) as well as acetonitrile are compatible and typically used under SFC conditions.

Normal Phase to SFC Conversion

Lux Columns are shipped in Normal Phase solvent and will require solvent switching before running it in SFC mode. Phenomenex recommends flushing your column with ten column volumes of MeOH: EtOH 90:10 followed by your SFC mobile phase for 10 column volumes.

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Have questions or want more details on implementing this method? We would love to help! Visit www.phenomenex.com/Chat to get in touch with one of our Technical Specialists

Column Setup and Use under SFC

Column Setup and Mobile Phase Co-solvent

Install the column in the SFC instrument oven compartment, set SFC instrument backpressure regulator around 80-100 bars and equilibrate the column with a minimum of ten column volumes of the SFC mobile phase prior to use. A good starting choice for SFC mobile phase is CO₂/MeOH or CO₂/EtOH (80:20, v/v) with or without additives. We recommend increasing flow rate gradually to prevent backpressure from going above 300 bar (4300 psi) for analytical column dimensions. For Lux preparative columns in SFC mode, do not exceed 3500 psi back pressure. Recommended flow rates for various dimensions in SFC are presented in the table below.

Column ID	Optimal Flow Rate	Max. Backpressure
4.6 mm	3-6 mL	4300 psi
21.2 mm	65-125 mL	3500 psi
30.0 mm	125- 250 mL	3500 psi
50.0 mm	350-700 mL	3500 psi

Mobile Phase Additives

For some basic or acidic chiral compounds, it may be necessary to use an appropriate mobile phase additive to achieve chiral resolution and to insure proper peak shapes. Ammonia (NH₃OH), diethylamine, ethanalamine, isopropyl amine (IPA) and butyl amine in the concentration range 0.1-0.5 % can be used with basic analytes, while trifluoroacetic acid (TFA) or acetic acid (0.1-0.5%; typically 0.1-0.2 %) can be used with acidic analytes. Mixtures of basic and acidic mobile phase additives are acceptable (for example IPA with TFA). Lux columns will deliver consistent results when operated with mobile phases containing additives at the concentration levels specified above. However, a decrease in column efficiency may occur when a column is used in combination with these additives. Therefore, we advise to dedicate columns to mobile phases containing basic or acidic additives.

Screening Strategies for Successful Separation

See Phenomenex Technote TN-9003 and references cited therein.

Column Care, Maintenance, and Storage

Extending Lifetime and Removal of Contaminants

Phenomenex recommends the use of SecurityGuard™ guard cartridges to extend the lifetime of your column. Ideally, samples must be completely dissolved in the mobile phase modifier and filtered through a syringe filter of approximately 0.45 µm porosity. To remove potential contaminants after extended use of your Lux column, we recommend flushing the column with 100 % methanol or ethanol for for 2-3 hours at the appropriate flow rate. Backflush can also be used to clean the column.

Column Storage

In SFC mode, when shutting down the instrument, the column pressure should be allowed to go to ambient gradually. Rapid depressurization of the column can lead to column and/or system damage. Refer to your SFC instrument manual for depressurization protocol.

Short term Storage

Ideal choice for storage will be as per long term storage. However if the column is supposed to be used within couple of days, you may depressurize the column to atmospheric pressure and add endplugs to both ends.

Longterm storage

Columns used in SFC mode must be flushed with 10 column volume of methanol or ethanol or other co-solvent alcohol that you anticipate to use in SFC method.