YMC-Triart C18, C8, Phenyl, PFP

(HPLC: 5 µm, 3 µm / UHPLC: 1.9 µm)

Column Care and Use Instructions

1. Introduction

Thank you for purchasing a YMC high-performance/ultra-high-performance liquid chromatography (HPLC/UHPLC) column. YMC-Triart is a multipurpose reversed phase column utilizing hybrid silica gel. The column is designed to work under various analytical conditions and deliver exceptional selectivity and stability.

YMC-Triart columns are manufactured under highly controlled conditions and must pass a series of strict tests before being accepted for shipment (Please refer to the column inspection report). In order to ensure optimal performance and durability of the column, please read these instructions carefully before using this column.

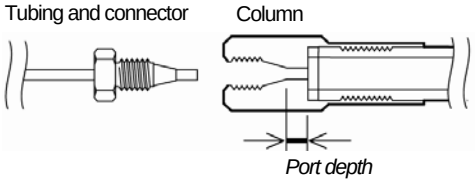
2. Specifications

Packing material	Particle size (µm)	Pore size (nm)	Functional group	End capped	Usable pH range	Usable temperature range	
						Regular use (recommended)	Upper limit
Triart C18	1.9, 3, 5	12	C18	Yes	1～12	20～40°C	pH 1～7 :70°C pH 7～12 :50°C
Triart C8			C8	Yes			
Triart Phenyl			Phenyl	Yes	1～10	20～40°C	50°C
Triart PFP			Pentafluorophenyl	No	1～8	20～40°C	50°C

3. Recommendations for column connections, detector settings and data processing considerations

- The "PT" or "WT" at the end of the product code indicates the style of column endfittings (see below for details).

Consideration of connector and endfittings



The end of the product code	Port depth	Style of endfittings
PT	ca. 2 mm / 0.09 inch	Parker style (UPLC* compatible)
WT	ca. 3 mm / 0.13 inch	Waters style

* UPLC is a registered trademark of Waters Corporation.

- Tubing must have flat ends and must bottom out in the column endfitting. Tubing must be connected to the column correctly to avoid creating a void between column frit and tubing, which can cause a leak and/or result in poor column performance (e.g. peak tailing, loss of theoretical plate number).
- 1.9 µm column for UHPLC gives high operating pressure compared to conventional 5 µm/3 µm columns. Pay attention to the usable maximum pressure of tubing and LC system. Generally, UHPLC system which has 60 MPa (8,700 psi) or higher pressure tolerance is recommended for use with 1.9 µm column. We have a connector with re-adjustable ferrule, which provides flawless sealing at 137 MPa (20,000 psi). Please inquire us for the detail.
- Extra column volume has great impact on band spreading. In order to minimize the influence of band spreading on chromatographic performance, especially when using columns in 2.0 mmI.D. and smaller, LC system should be optimized as follows;
  - The shortest possible length of tubing with narrow inner diameters (tubing less than 0.15 mm, 0.006 inch I.D. is recommended) should be used for connection from the injector to the column and from the column to the detector. Make sure not to have void in connection.
  - Use a detector equipped with low-volume flow cell designed for narrow bore column.
  - Use an injector for narrow bore column and low-volume sample loop.
- A sampling rate and a detector response (time constant) should be optimized to acquire more than 10 data points across a peak. For UHPLC analysis using 1.9 µm columns, we recommend a sampling rate of about 10 points per second or higher and a detector response of 0.1 seconds or faster to detect earliest eluting sharp peak properly.

4. Shipping solvent

100% Acetonitrile. Replace with this solvent for storage. When replacing a mobile phase containing buffer or salts, take extra care to prevent precipitation of salt.

5. Precautions for use

- The correct direction of solvent flow is indicated by an arrow on the column identification label.
- Do not disconnect a column from LC system before the pressure drops to zero.
- Column pressure limit and recommended flow rate is as follows.

Particle size	Pressure limit	Column I.D. and recommended flow rate (Mobile phase condition : acetonitrile/aqueous solution)
5 µm, 3 µm	Column length of 150 mm and less : 20 MPa Column length of 250 mm : 25 MPa Inner diameter of 10 mm and larger : 10 MPa	2.0 mmI.D. : 0.2 mL/min 3.0 mmI.D. : 0.4 mL/min 4.6 mmI.D. : 1.0 mL/min
1.9 µm	100 MPa	2.0 mmI.D. : 0.2 ~ 0.8 mL/min 3.0 mmI.D. : 0.4 ~ 1.6 mL/min

  - ＊ Avoid using a column repeatedly near the pressure limit or abrupt change in pressure to prevent from shortening column life.
  - ＊ Adjust flow rate appropriately as pressure changes depending on column length, temperature, types of organic solvent etc.
- Aqueous or non-aqueous solvents can be used as a mobile phase. Repetitive replacement among solvents with large difference in polarities may result in degradation of column performance. In general, acetonitrile, methanol and tetrahydrofuran (THF) are recommended for regular use (Please also see above recommendation under alkaline mobile phase conditions). When using THF as a mobile phase, mind the solvent resistance of your system or tubing (Especially PEEK parts are not suitable for use with THF).
- Recommendations of pH and temperature for column use are shown in the specifications table in section 2. Also please note the following.
  - ＊ Column lifetime varies depending on conditions of use such as pH, temperature and mobile phase composition. In general, using under higher temperature, higher concentration of buffer salts/additives and/or lower concentration of organic solvents may result in shorter column lifetime.
  - ＊ When using the column under alkaline conditions for a long term, a column should be used with a low concentration (about 1 to 10 mM) of organic buffer, like triethylamine, glycine, etc., at a lower temperature (less than 30°C). The mobile phase containing methanol would give longer column lifetime under alkaline condition compared to other organic solvents.
- Make sure of miscibility among the organic solvents and take care to prevent the precipitation of buffer salts/additives to avoid over-pressuring the column.
- When possible, the sample should be dissolved in a solvent in the same composition as the initial mobile phase. Using the stronger solvent than the initial mobile phase for sample dissolution may result in distortion of peak symmetry and degradation of resolution.
- In order to prevent exposure of the column to excessive pressure, the mobile phase and sample solution should be filtered through a 0.2 µm membrane or smaller to remove particulates.

6. Column cleaning (general method)

[After using mobile phase not containing buffer salts/additives]

- Flush the column with solution containing higher ratio of organic solvent for washing out the compounds that have a great capacity to retain in the column.
- Usable concentration of organic solvent is up to 100%. A cleaning solution containing THF may be effective when removing highly hydrophobic (lipid-soluble) substances adsorbed onto the gel.

[After using mobile phase containing buffer salts/additives]

- Firstly replace with water/organic solution that do not contain buffer salts/additives (A ratio of water to organic solvent should be set at the same proportions as a mobile phase). Then flush the column in accordance with the method mentioned above.
- The mobile phase containing about 50 mM or less buffer salts/additives could be replaced directly with about 60% acetonitrile aqueous solution.

[General proposals]

- Flushing with 100% water after using the column around the pH limit may shorten column lifetime. Flush the column with water/organic solution described above, such as 60 % acetonitrile aqueous solution.
- Once macromolecules like proteins or polysaccharides adsorbed onto the gel, they are hardly removed, even if solvents with high eluting ability are used. In order to avoid contamination of the column by them, conduct sample pretreatment carefully prior to introducing to the column or use a guard column.

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