

for Separation of Proteins, Nucleotides, and other Biomolecules

# YMC-BioPro Ion Exchange Column

## Column Care and Use Instructions

### Introduction

Thank you very much for purchasing YMC high-performance liquid chromatography (HPLC) column for ion exchange chromatography. We are sure you will find that YMC's built-in quality helps solve many of your challenging separation problems.

YMC-BioPro Ion Exchange Column is based on a newly developed hydrophilic polymer bead with a strong-anion exchanger (quaternary ammonium group) or a strong-cation exchanger (sulfopropyl group). A porous-polymer type [YMC-BioPro QA/SP] for high-performance and high-binding capacity and a non-porous-polymer type [YMC-BioPro QA-F/SP-F] for high-throughput and high-resolution analysis are available.

YMC-BioPro Ion Exchange Columns are manufactured under highly controlled conditions and must pass a series of stringent 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 follow these instructions.

### Column Specification

項目	YMC-BioPro QA	YMC-BioPro SP	YMC-BioPro QA-F			YMC-BioPro SP-F		
Matrix	porous hydrophilic polymer beads		Non-porous hydrophilic polymer beads					
Particle size (μm)	5		5					
Pore size (nm)	100		Non-Porous					
Functional group	$-\text{CH}_2\text{N}^+(\text{CH}_3)_3$	$-\text{CH}_2\text{CH}_2\text{CH}_2\text{SO}_3^-$	$-\text{CH}_2\text{N}^+(\text{CH}_3)_3$			$-\text{CH}_2\text{CH}_2\text{CH}_2\text{SO}_3^-$		
Counter ion	Cl <sup>-</sup>	Na <sup>+</sup>	Cl <sup>-</sup>			Na <sup>+</sup>		
Ion exchange capacity (meq/mL-resin)	0.075 ~ 0.100	0.070 ~ 0.095	0.075 ~ 0.110			0.230 ~ 0.290		
Column material	PEEK	PEEK	PEEK	PEEK	PEEK	PEEK	PEEK	PEEK
Column sizes length X I.D. (mm)	50 X 4.6	50 X 4.6	30 X 4.6	50 X 4.6	100 X 4.6	30 X 4.6	50 X 4.6	100 X 4.6
pH range	2 ~ 12	2 ~ 12	2 ~ 12	2 ~ 12	2 ~ 12	2 ~ 12	2 ~ 12	2 ~ 12
Temp. range ( )	4 ~ 60	4 ~ 60	4 ~ 60	4 ~ 60	4 ~ 60	4 ~ 60	4 ~ 60	4 ~ 60
Flow rate (mL/min)	0.5 ~ 0.7	0.5 ~ 0.7	1.0 ~ 1.5	1.0 ~ 1.2	0.2 ~ 0.8	1.0 ~ 1.5	1.0 ~ 1.2	0.2 ~ 0.8
Max. flow rate (mL/min)	0.8	0.8	1.8	1.5	1.0	1.8	1.5	1.0
Max. pressure (MPa)	3.0	3.0	6.0	10.0	12.0	6.0	10.0	12.0
Feature	Excellent resolution and high binding capacity Ideal for analytical and lab.-scale preparative separation		Ultra high-throughput analysis	High-throughput analysis	High-resolution analysis	Ultra high-throughput analysis	High-throughput analysis	High-resolution analysis

### Considerations for column connection and system setting

- The end-fitting of this column is Waters type. When the tubing connection area results in unnecessary extra-column volume, the user may experience a decrease in the number of theoretical plates and/or increase in peak shape distortion. Please make sure of the integrity of fluidic connections to the column.
- As for connecting tubing from the injector to the column and the column to the detector, the internal diameter should be less than 0.15 mm and the length should be shortened as possible to minimize the extra-column volumes.
- When the using YMC-BioPro QA-F/SP-F for ultra-fast separation, please optimize the response of detector (less than 0.5 sec.) and the data-sampling speed of data-processing equipment in order to accept peaks having short band widths.

## Mobile phase and sample solvent

- The solvent enclosed at shipment is mentioned below. It is as the same as the eluent as on the "COLUMN INSPECTION REPORT". When columns are not used for a long time, keep them in a cool place after replacing the below shipping solvent.

### Shipping solvent

YMC-BioPro QA / QA-F	: 20 mM Tris-HCl buffer (pH 8.1)
YMC-BioPro SP / SP-F	: 20 mM sodium phosphate buffer (pH 6.8)

- Solvent should flow in the direction of the arrow as indicated on the column label. Please use the column under the conditions mentioned "Column Specification". The rapid change in pressure or flow may deteriorate the column performance.
- Generally samples are adsorbed on the top of the column with 20~50 mM buffer as first eluent, then eluted with a salt-gradient (0~0.5 M NaCl) or pH-gradient method. After each analysis, we recommend to wash the column with 1 M NaCl to elute any remaining ionically-bonded materials.
- The water-soluble organic-solvent (upper limit: ca. 30%) and protein-denaturants (for example, urea ( 8 M), guanidine hydrochloride ( 6 M), nonionic surfactant, cationic surfactant (for QA / QA-F), anionic surfactant (for SP / SP-F), etc) can be added in the eluent. Before adding them into the eluent, please make sure no salts are precipitated from the buffer.
- Please use the oxidant-free solvents as eluent.
- Adjust the buffer condition of sample to the same as the chosen initial eluent condition. If the buffer concentration or pH of sample solvent is different from the initial eluent conditions, it may lead to decrease in the binding capacity and/or a broadening of the peak of interest.
- In order to prevent exposure of the column to excessive pressures, the eluent and sample should be filtered through a 0.2 ~ 0.5  $\mu$ m membrane filter. We recommend using a precolumn-filter (#XRPRCP02).

## Column cleaning

A change of retention time or peak shape and/or a pressure increase may be caused by the adsorption of fat-soluble substances or precipitated impurities in sample. In this case, please follow these steps to wash the column. If the cleaning procedure does not solve the problem, we recommend you to purchase new column.

First, replace the eluent to initial condition described on "COLUMN INSPECTION REPORT". Secondly inject 4 ~ 5mL of following solvents ((1) ~ (4)) with running the initial solvents. Large scale sample-loop ( 2 mL) is recommended.

### Washing solvent

- 0.2 N NaOH aq / Acetonitrile (80 / 20)
- 1 M Acetic acid aq
- Nonionic surfactant (like 0.02% Brj<sup>TM</sup> 35) in initial eluent
- 6 M guanidine hydrochloride in initial eluent

Please make sure the retention time or the peak shape is recovered after washing by each solvent.