



# SkillPak™ BIO Instruction Manual

## Introduction

SkillPak BIO columns are designed for fast method development and scale-up of Multi-Column Chromatography (MCC) processes, and are pre-packed with TOYOPEARL® or TSKgel® process chromatography media for bioseparations. These columns have been developed to deliver optimal performance on the Octave™ BIO benchtop MCC system, and are also compatible with other FPLC or MCC instruments. SkillPak BIO columns are reproducibly packed using controlled methods and consider the varying compressibility of each resin.

## Product Description

### Hardware Materials

The hardware of SkillPak BIO columns is composed of polymers, mainly polypropylene. The hardware of SkillPak BIO is described in Figure 1 and Table 1, and the materials of construction are listed in Table 2.

Figure 1. Hardware drawing SkillPak BIO

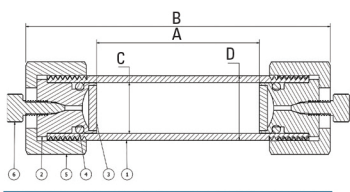
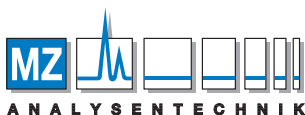


Table 1. Hardware dimensions SkillPak BIO

	SkillPak 1 BIO	SkillPak 5 BIO	SkillPak 10 BIO	SkillPak 25 BIO	SkillPak 100 BIO
A: Bed height	20.0 mm	25.0 mm	51.0 mm	51.0 mm	51.0 mm
B: Overall length	67.6 mm	69.4 mm	95.4 mm	118.2 mm	128.2 mm
C: Inner diameter	8.1 mm	16.0 mm	16.0 mm	25.2 mm	49.6 mm
D: Outer diameter	12.7 mm	20.3 mm	20.3 mm	38.1 mm	63.5 mm

Table 2. Materials of construction

Item	Quantity	Part list	Material
1	1	Main tube	Polypropylene
2	2	Tube adaptor	Polypropylene
3	2	Frit	Ultra-high-molecular-weight polyethylene (UHMWPE)
4	2	O-ring	SkillPak 1, 5, and 10 BIO: Acrylonitrile-butadiene copolymer SkillPak 25 and 100 BIO: Ethylene propylene diene monomer (EPDM) rubber
5	2	Hex cap	Nylon
6	2	Stop plug	Polyoxymethylene (POM)



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## Solvent compatibility

The product contact materials 1, 2, 3, 4, and 6 listed in Table 2 are compatible with the following common solutions:

 **Table 3.** Solvent compatibility for SkillPak BIO hardware

Water	Citric Acid (< 50%)
Acetic Acid (< 60%)	Methanol
Ethanol	Phosphoric Acid (< 95%)
Acetone	Hydrochloric Acid (< 30%)
2% (w/v) Detergents	Sulfuric Acid (< 30%)
8 mol/L Urea (< 33 %)	Sodium Hydroxide (< 3 mol/L)
Isopropyl Alcohol (IPA)	Benzyl Alcohol (at room temperature)

The solvent compatibility for the packed media is listed in the TOYOPEARL and TSKgel documentation.

## Column specifications

 **Table 4.** Specifications of SkillPak BIO columns

	SkillPak 1 BIO	SkillPak 5 BIO	SkillPak 10 BIO	SkillPak 25 BIO	SkillPak 100 BIO
Approx. volume	1 mL	5 mL	10 mL	25 mL	100 mL
Maximum recommended flow rate in 1 mol/L NaCl (mL/min)	2	10	20	50	200
Storage temperature	see labels and Certificate of Analysis				
Frit porosity	10 µm				
Connections	10-32 Standard fitting			1/4-28 Standard fittings with flat-bottom geometry for 1/8" OD or 1/16" OD capillary	
Shipping buffer	20% ethanol for TOYOPEARL and TSKgel resins				
Asymmetry factor (As)	0.8 - 1.4 for TOYOPEARL and TSKgel resins				
Plate count	See resin-related specifications on the Certificate of Analysis				
Estimated shelf life	12 months				
Hardware pressure stability	10 bar				
Resin pressure stability	see resin documentation				

## Instructions for Use

### Installation

SkillPak BIO columns are ready to use upon receipt. Connect the column to the instrument following the recommended flow direction indicated on the column label. Connect the inlet/outlet of the column to the instrument using the connection listed in Table 4. Finger-tight is recommended.

## Equilibration

Before the first sample loading, the column should be equilibrated with at least 10 CVs of the respective loading buffer. See Table 4 for the maximum flow rate. Slowly increase flow until it reaches the desired running flow rate. Do not exceed the maximum flow rate. Please refer to the TOYOPEARL or TSKgel documentation for information about recommended mobile phases.

## Column performance test

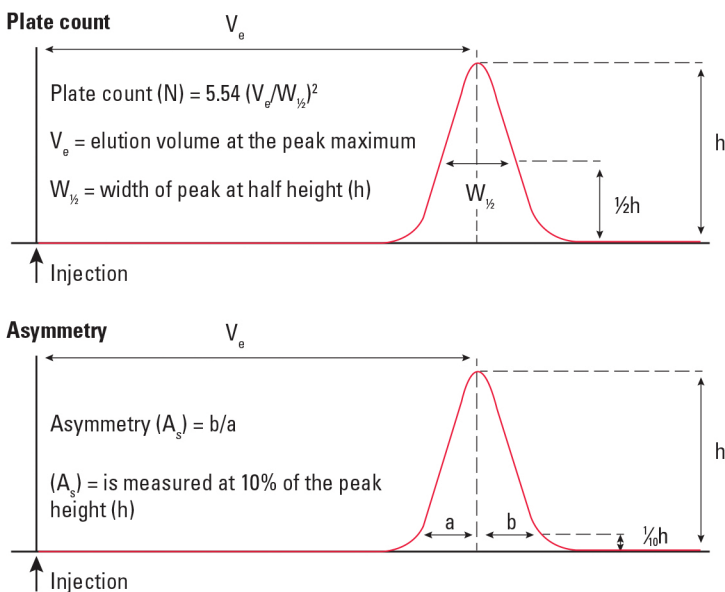
The chromatographic performance of a SkillPak BIO column should be tested initially and at regular intervals throughout use and is determined by the asymmetry factor and plate count, as described in Figure 2. The specifications can be found in the Certificate of Analysis provided with each column.

The evaluation can be carried out as described below:

- Equilibrate column with  $\geq 10$  CV of 1 mol/L NaCl @ 100 cm/h
- Inject 1% CV of 3 mol/L NaCl tracer
- Wash with 2 CV of 1 mol/L NaCl @ 100 cm/h

*Note: the response can be detected using the conductivity meter.*

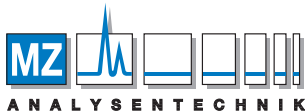
 **Figure 2.** How to determine plate count and asymmetry



## Regeneration and storage conditions

SkillPak BIO columns can be washed/regenerated. The columns can also be returned to the shipping buffer for storage. Please refer to the TOYOPEARL or TSKgel product documentation for information about cleaning and storage solutions. SkillPak BIO columns are reusable as long as the plate counts and asymmetry remain in the desired range, which will largely depend on the care taken, the cleaning performed, and the tolerance of the resin to the applied conditions. The columns are not designed to be repacked.

**Reduce, Recycle**



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Always store the column in its original packaging. It will prolong its lifetime, thus reducing the number of columns you will need.



The box and the foam inserts can be recycled following local regulations. The column can be disposed of as single-use waste according to local regulations.

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