

# 14

## Sample Pretreatment, Accessories

Sample pretreatment .....	136
Column protection .....	137
Tubing parts .....	138-139
Guard cartridge .....	140-141
Empty columns and other parts .....	142-143

## Sample pretreatment, Accessories

### Material properties of products

#### Stainless (SUS-316)

A general-purpose material for general HPLC products. Contains Ni, Cr, Mo, etc, as well as Fe, and is highly resistant to corrosion.

#### PEEK (polyetheretherketone)

A super engineering plastic developed as an alternative to metals. A polymer containing ketones and ether bonds, it is highly resistant to pressure, chemicals, heat, and fatigue. Used as an alternative to stainless for a metal-free tubing system.

#### Teflon (polytetrafluoroethylene, PTFE)

A polymer of tetrafluoroethylene. Highly resistant to chemicals but not so resistant to pressure as PEEK. Generally used for low pressure tubing systems. (Teflon is a trademark of DuPont.)

#### Polyacetal

An engineering plastic. A polymer in which aldehyde compounds are polymerized, with excellent chemical resistance and excellent machinability.

#### Polypropylene

A polymer of propylene. Excellent chemical and heat resistance. Often used for containers since processing, such as injection molding, is easy.

### Sample pretreatment

Sample pretreatment cartridge

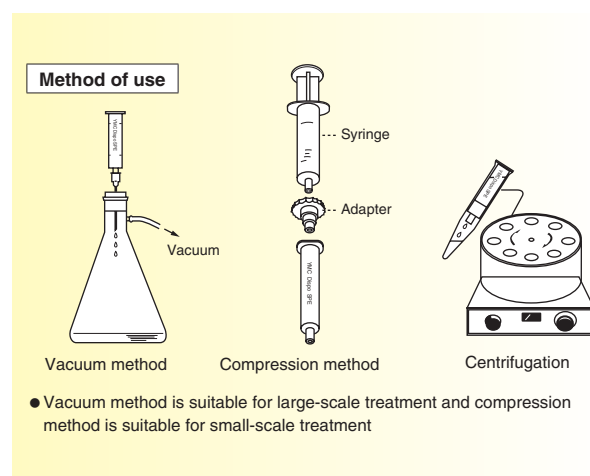
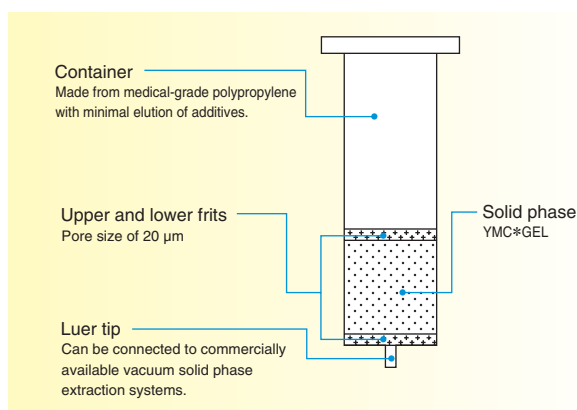
#### [YMC Dispo SPE]

- Disposable type cartridge made from polypropylene
- Utilizes packing material designed for HPLC columns, manufactured under strict quality controls
- Excellent cartridge-to-cartridge reproducibility
- High recovery of samples

#### Excellent recovery

Sample	YMC Dispo SPE	Cartridge, Company A	Cartridge, Company B
Basic sample (Propranolol hydrochloride)	89(99)%	59(73)%	66(89)%
Acidic sample (Thioctic acid)	91(100)%	92(89)%	87(88)%

\*Figures inside parentheses represent recoveries obtained when buffer was used.



#### YMC Dispo SPE C18

Product No.	Specification
XQSPEC18101	C18 100 mg/1 mL 100/pack
XQSPEC18203	C18 200 mg/3 mL 50/pack
XQSPEC18503	C18 500 mg/3 mL 50/pack
XQSPEC18A06	C18 1000 mg/6 mL 30/pack

#### YMC Dispo SPE SIL

Product No.	Specification
XQSPESIL503	SIL 500 mg/3 mL 50/pack
XQSPESILA06	SIL 1000 mg/6 mL 30/pack

## Column protection

### [Stainless steel precolumn filter]

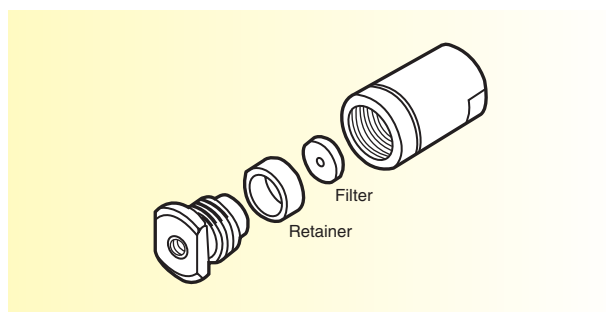
- **Filter construction with minimal dead volume**

Effective diameter of the filter is extremely small about 1.6 mm.

Sample diffusion that occurs in passage is minimized.

#### Stainless steel precolumn filter

Product No.	Specification
XRPRCS03	For tubing system with 1/16" outer diameter, 1 filter included
XRPRCS35	Spare filter 0.5 µm, 5/pack



### [PEEK precolumn filter]

- **Metal free**

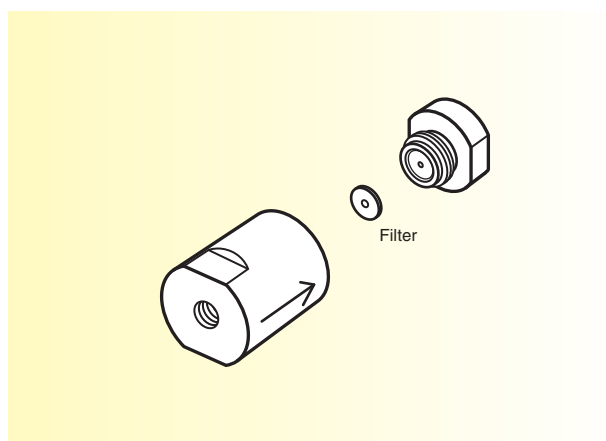
The material of the wetted part of the holder is PEEK and the packing is PCTFE. The packaging that of the filter is a mixture of PEEK and Teflon. PEEK precolumn filters are suitable for use in HPLC systems requiring a metal-free environment.

- **High-pressure resistance**

PEEK precolumn filters are resistant to ca. 35 MPa.

#### PEEK precolumn filter

Product No.	Specification
XRPRCP02	For tubing systems with 1/16" outer diameter, 1 filter included
XRPRCP25	Spare filter 2 µm, 5/pack



### [Handy connector 1]

- **A ferrule integrated into a connector**

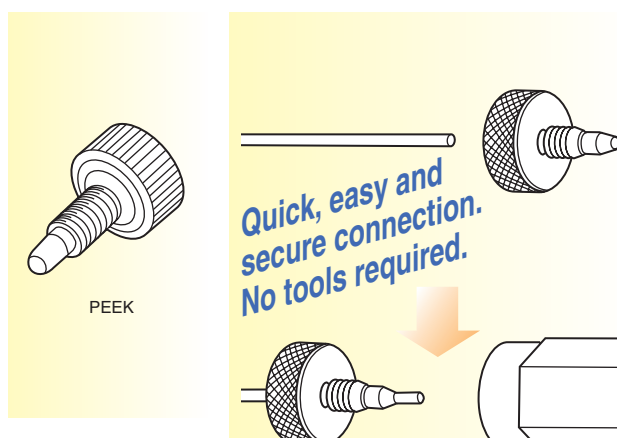
Handy connector 1 resists pressure to ca. 21 MPa. Handy connector 1 is suitable for tubing systems of relatively low pressure. Connection to a tubing system is easy because a ferrule is integrated into the connector.

- **Metal free**

The whole connector is made from PEEK. Handy connector 1 is suitable for metal-free tubing systems using PEEK tubes.

#### Handy connector 1

Product No.	Specification
XRP0203	For tubing system of 1/16" outer diameter, 10/pack



### [Handy connector 2]

- **High pressure resistance and made from stainless steel**

Handy connector 2 resists pressure to ca. 42 MPa. Handy connector 2 is suitable for connection to the injection side of a column, to which high pressure is applied.

It is also useful for connection of a guard column or a precolumn filter.

- **Metal free**

The ferrule at the wetted part of the connector is made from PEEK. Handy connector 2 is suitable for metal-free tubing systems using PEEK tubes.

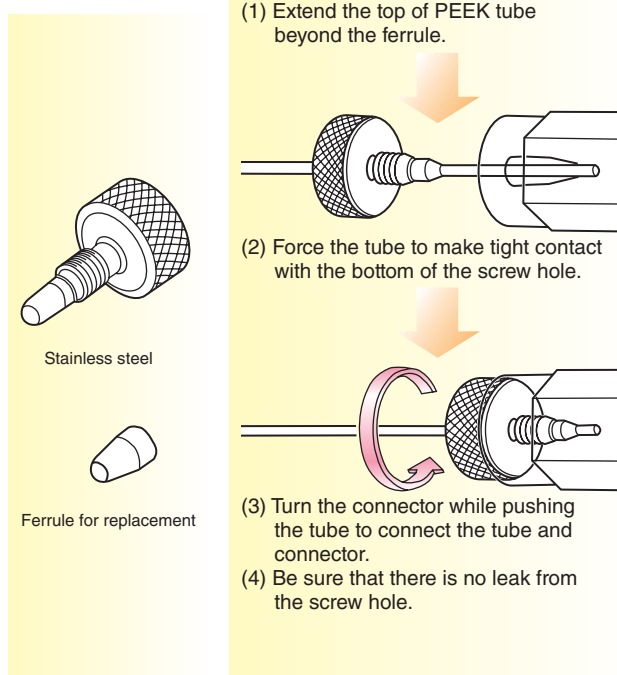
- **Ferrule is replaceable**

Only the ferrule needs to be replaced when it deteriorates, as opposed to the entire connector.

#### Handy connector 2

Product No.	Specification
XRP0204	For tubing system of 1/16" outer diameter, 2/pack
XRP0205	Spare PEEK ferrule, 10/pack

- Be aware that Handy connector 2 cannot be connected to "Old Shimadzu type", "Old JASCO type", or "Old Hitachi type" tubes.

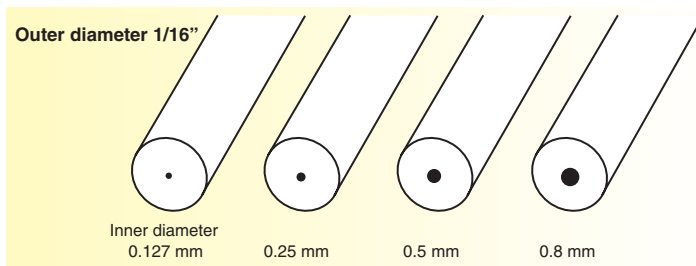


**Tubing parts**

**[PEEK tubing]**

● **Easy to use**

PEEK tubing is made from a material that is flexible and easy to use. It is easily cut using a commercially available cutting knife. A PEEK tube with an inner diameter of 0.127 mm is useable at up to 40 MPa. PEEK tubes are practical general tubing as alternatives to stainless steel tubing. They are suitable for metal-free tubing systems. A Handy connector is suitable for connection of PEEK tubing to a column.

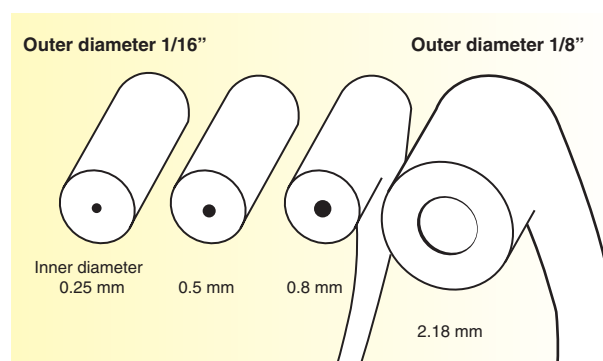
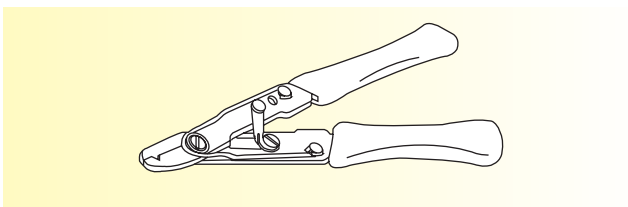


**[Stainless steel tubing]**

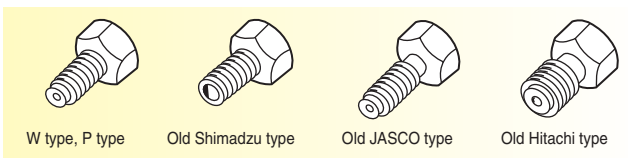
● **Stainless steel male nut and ferrule are used for connection**

**[Tube cutter]**

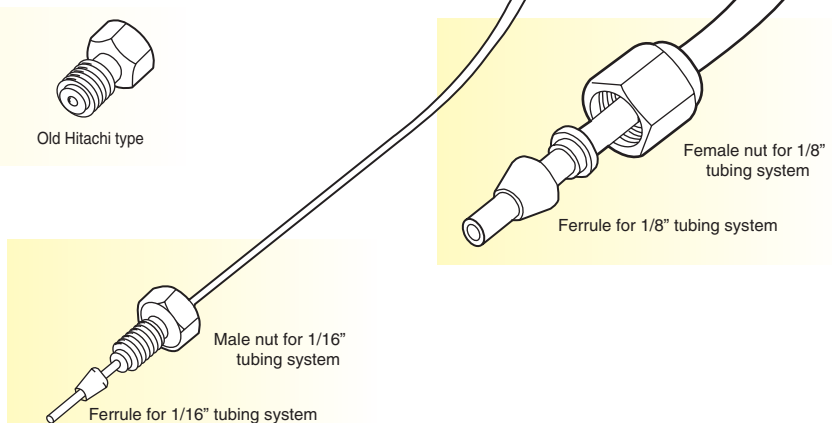
● **For cutting 1/16" stainless tubing (simple type)**



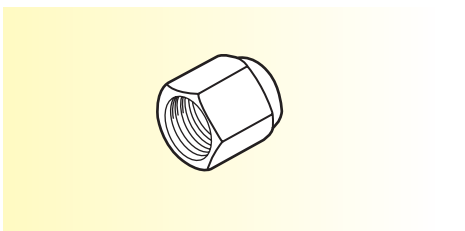
**[Male nut for 1/16" tubing system] (stainless steel)**



**[Ferrule for 1/16" tubing system] (stainless steel)**

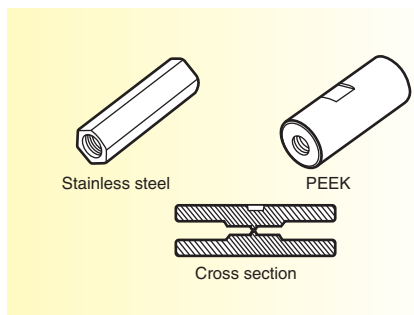


**[Female nut for 1/8" tubing system] (cap nut) (stainless steel)**



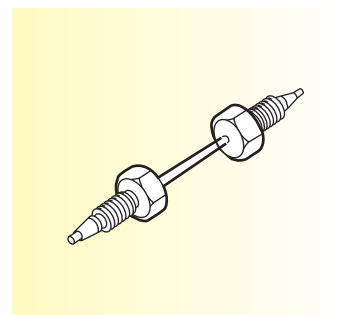
**[Union for 1/16" tubing system]**

Unions for 1/16" tubing system come in two types, made from either stainless steel or PEEK. They are convenient to use it with a Handy connector. Connector type is "W type".

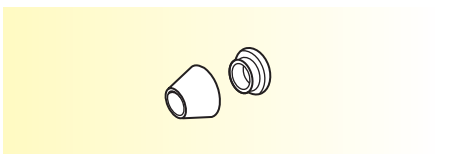


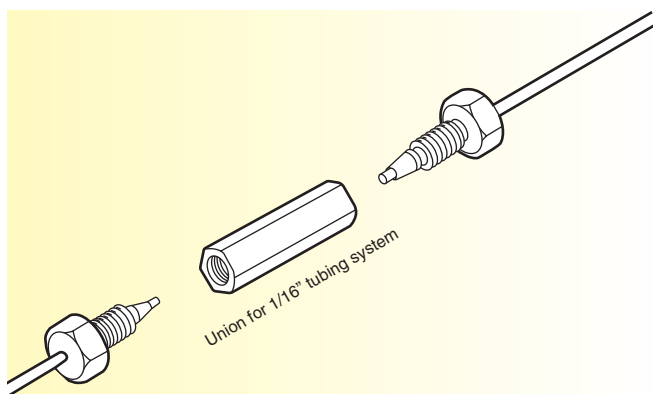
**[Column coupler]**

Column couplers are used for column-to-column connections. Various tube inner diameters and column connection types are available.



**[Ferrule for 1/8" tubing system] (stainless steel, double ring)**

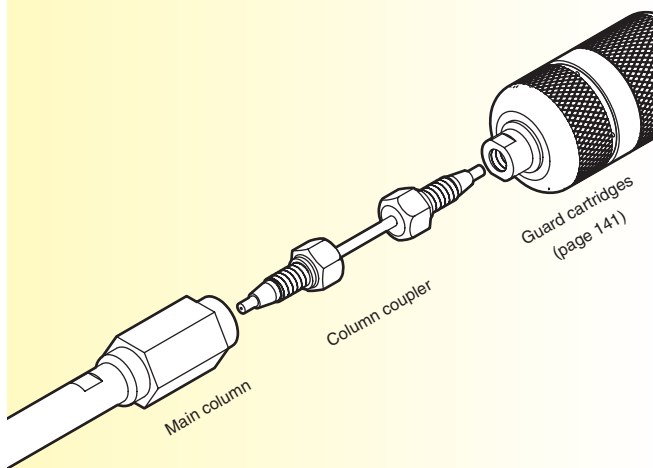




Union for 1/16" tubing system

#### Notes for successful tubing

The shapes of separation peaks are affected not only by column performance, but by the tubing system as well. Some effort is needed to minimize the dead volume in a tubing system among the injector column and detector, in order to prevent poor peak shape. Using a tube with a small inner diameter (0.127 mm) is one solution. When a tube is connected to a union or a column, it is important to give due consideration to make the top of the tube contact flush with the bottom of the screw hole and to avoid leakage or creation of a cavity.



Main column

Column coupler

Guard cartridges  
(page 141)

## PEEK tubing

Product No.	Specification
XRPT01	1/16" outer diameter, 0.127 mm inner diameter, 3 m length
XRPT02	1/16" outer diameter, 0.25 mm inner diameter, 3 m length
XRPT05	1/16" outer diameter, 0.5 mm inner diameter, 3 m length
XRPT08	1/16" outer diameter, 0.8 mm inner diameter, 3 m length

## Stainless steel tubing

Product No.	Specification
XRST02	1/16" outer diameter, 0.25 mm inner diameter, 2 m length
XRST05	1/16" outer diameter, 0.5 mm inner diameter, 2 m length
XRST08	1/16" outer diameter, 0.8 mm inner diameter, 2 m length
XRST20	1/8" outer diameter, 2.18 mm inner diameter, 5 m length

## Tube cutter

Product No.	Specification
XRP1909	For cutting 1/16" stainless tubing

## Male nut for 1/16" tubing system (stainless steel)

Product No.	Specification
XRONW	1/16" W type, P type, 5/pack
XRONS	1/16" Old Shimadzu type, 5/pack
XRONJ	1/16" Old JASCO type, 5/pack
XRONH	1/16" Old Hitachi type, 5/pack

## Ferrule for 1/16" tubing system (stainless steel)

Product No.	Specification
XRONFA	1/16" one ring ferrule, 5/pack

## Female nut for 1/8" tubing system (cap nut)(stainless steel)

Product No.	Specification
XRON8	1/8" female nut, 5/pack

## Ferrule for 1/8" tubing system (stainless steel)

Product No.	Specification
XRTWFA	Front ferrule, back ferrule, 5/pack each

## Union for 1/16" tubing system

Product No.	Specification
XRUNW	1/16" tubing system (stainless steel)
XRUN16P	1/16" tubing system (PEEK)

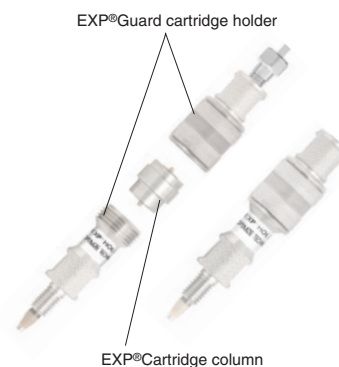
## Column coupler

Product No.	Specification
XRCP1602	1/16" outer diameter, 0.25 mm inner diameter
XRCP1605	1/16" outer diameter, 0.5 mm inner diameter
XRCP1620	1/16" outer diameter, 0.8 mm inner diameter

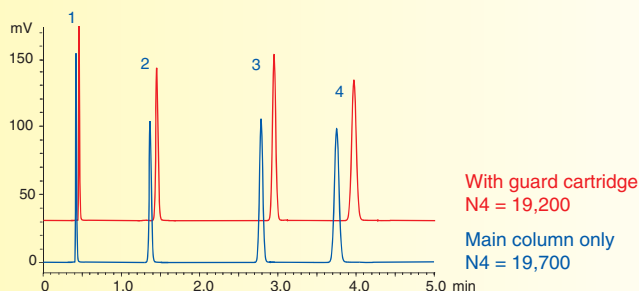
(Stainless tube 50 mm×1, male nut×2, ferrule×2)

### Guard cartridge columns for UHPLC

- High pressure resistance up to 100 MPa (15000 psi)
- Low-volume, low-dispersion cartridges minimize the impact on separation
- Zero-dead-volume direct connection to column
- Hand-tight guard replacement (No tools required)



#### Low-volume, low-dispersion cartridges minimize the impact on separation



Column	: YMC-Triart C18 1.9 $\mu$ m 100 X 2.0 mm.I.D.
Eluent	: acetonitrile/water (60/40)
Flow rate	: 0.4 mL/min
Temperature	: 25°C
Detection	: UV at 270 nm
Injection	: 1 $\mu$ L
Sample	: 1. Uracil 2. Methyl benzoate 3. Naphthalene 4. Butyl benzoate

EXP® guard cartridge column with low-volume and low-dispersion column minimize the impact on separation. EXP® guard cartridge column provides less than 3% decrease in theoretical plate count.

### EXP®Cartridge Column (Pressure limit: 100 MPa, 3/pack)

Particle size ( $\mu$ m)	Column size inner diameter X length (mm)	Product number					
		Triart C18	Triart C18 ExRS	Triart C8	Triart Phenyl	Triart PFP	Triart Bio C4
1.9	2.1 X 5	TA12SP9-E5Q1CC	TAR08SP9-E5Q1CC	TO12SP9-E5Q1CC	TPH12SP9-E5Q1CC	TPF12SP9-E5Q1CC	TB30SP9-E5Q1CC
	3.0 X 5	TA12SP9-E503CC	TAR08SP9-E503CC	TO12SP9-E503CC	TPH12SP9-E503CC	TPF12SP9-E503CC	TB30SP9-E503CC

A cartridge holder will need to be purchased separately before using this product for the first time.

### EXP®Guard Cartridge Holder (Adjustable ferrule, Pressure limit: 137 MPa)

EXP®direct connect holder (for both 2.1 mm and 3.0 mm inner diameter, 2 titanium hybrid ferrule and 1 nut included)	XPCHUHP
--	---------

### Fitting for Connecting System and Main Column/Guard Cartridge (Adjustable ferrule, Pressure limit: 137 MPa)

Hand-tight EXP® fitting (Hand-tight nut and titanium hybrid ferrule included)	XRHTF-01
---	----------



### Replacement Ferrule

Titanium hybrid ferrule (5/pack)	XRHTF-05
----------------------------------	----------

\*EXP® is a registered trademark of Optimize Technologies, Inc.

## YMC guard cartridges

### ● Wide variety of packing materials

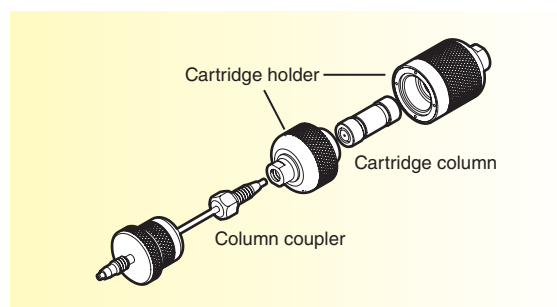
The packing materials with various bonded phases identical to those available for analytical columns is packed under high pressure.

### ● Disposable

The cartridge holder can be used repeatedly. Only the cartridge column needs replacement when worn out.

### ● Easy cartridge replacement

The main body of the YMC guard cartridge is composed of a cartridge holder and a cartridge column. The cartridge column is threaded for easy replacement.



## Cartridge Column

Column size inner diameter X length (mm)	Product number*	
	1/pack	5/pack
2.1 X 10	<input type="text"/> -01Q1GC-1	<input type="text"/> -01Q1GC
3.0 X 10	<input type="text"/> -0103GC-1	<input type="text"/> -0103GC
4.0 X 10	<input type="text"/> -0104GC-1	<input type="text"/> -0104GC
2.1 X 20	<input type="text"/> -02Q1GC-1	<input type="text"/> -02Q1GC
3.0 X 20	<input type="text"/> -0203GC-1	<input type="text"/> -0203GC
4.0 X 20	<input type="text"/> -0204GC-1	<input type="text"/> -0204GC

A cartridge holder will need to be purchased separately before using this product for the first time.

## Cartridge Holder Set

cartridge holder set (10 mm length)	XPGCH-Q1
cartridge holder set (20 mm length)	XPGCH-Q2

Cartridge holder set includes a cartridge holder (1 set), and a column coupler.

## Guard cartridge columns for semi-preparative

### ● Pressure resistance up to 30 MPa (4350 psi)

### ● Ideal for protecting semi-preparative column

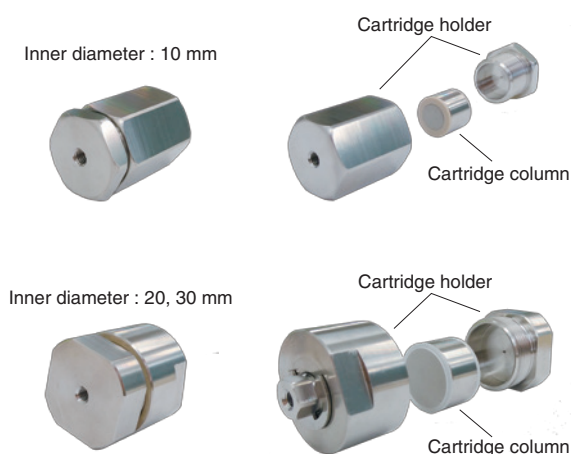
## Cartridge Column (2/pack)

Column size inner diameter X length (mm)	Product number*
10 X 10	<input type="text"/> -0110CC
20 X 10	<input type="text"/> -0120CCN
30 X 10	<input type="text"/> -0130CCN

A cartridge holder will need to be purchased separately before using this product for the first time.

## Cartridge Holder

cartridge holder (inner diameter : 10 mm)	XPCHSPW1
cartridge holder (inner diameter : 20 mm)	XPGHFSP20ID
cartridge holder (inner diameter : 30 mm)	XPGHFSP30ID



\* Refer to the page of each product for product number.  
Example : Triart C18, 120 Å, 5 µm ⇒ TA12S05

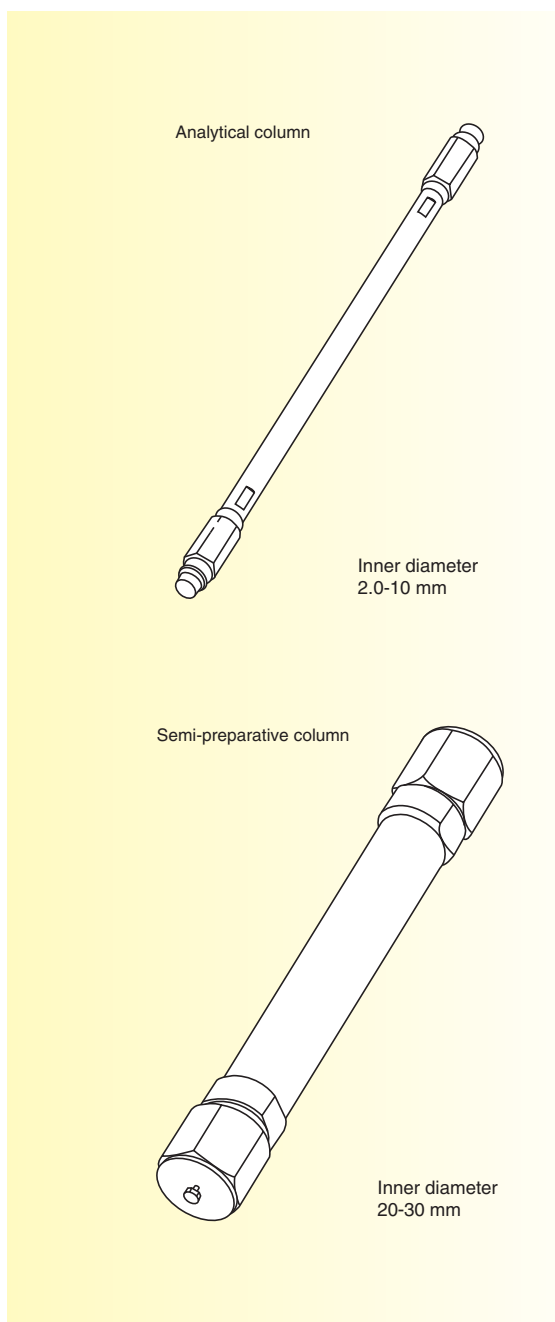
## Empty columns and other parts

### [YMC original empty columns (for analysis or semi-preparative isolation) ]

A stainless steel tube with a screw and an endfitting are directly connected (screw type). Since YMC original empty columns use no ferrule, there is no danger of endfitting dislocation when the column is packed and used under high pressure.

#### YMC original empty columns

Product No.	Column size length X inner diameter (mm)	
XC0502WT	50	2.0
XC1502WT	150	
XC2502WT	250	
XC0346WT	30	4.6
XC0546WT	50	
XC1046WT	100	
XC1546WT	150	
XC2546WT	250	
XC3046WT	300	6.0
XC0506WT	50	
XC1006WT	100	
XC1506WT	150	
XC2506WT	250	
XC3006WT	300	8.0
XC5006WT	500	
XC0308WT	30	
XC3008WT	300	
XC5008WT	500	
XC0310WT	30	10.0
XC0510WT	50	
XC1010WT	100	
XC1510WT	150	
XC2510WT	250	
XC3010WT	300	
XC5010WT	500	
XC0520WT	50	20.0
XC1520WT	150	
XC2520WT	250	
XC3020WT	300	
XC5020WT	500	
XCA020WT	1000	30.0
XCL530WT	75	
XC2530WT	250	
XC3030WT	300	
XC5030WT	500	
XCA030WT	1000	





## [Flange type empty column (for preparative isolation)]

A stainless steel tube with a flange and a cap are tightly connected using a bolt. The inner diameter is 50 mm or more.

### Flange type empty column

#### 50 mm inner diameter

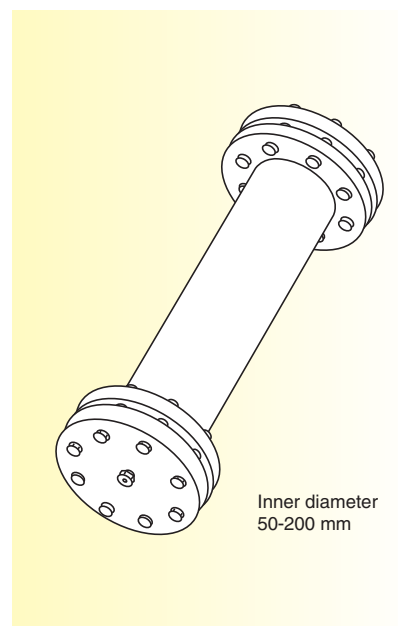
Product No.	Column size length X inner diameter (mm)	Pressure limit (MPa)
XC0551■R	50	7
XC1051■R	100	
XC2551■R	250	
XC3051■R	300	
XC5051■R	500	
XCA051■R	1000	
XC0552■R	50	14
XC1052■R	100	
XC2552■R	250	
XC3052■R	300	
XC5052■R	500	
XCA052■R	1000	

Designate a frit pore size depending on particle size.  
We recommend 2 µm for particle size below 10 µm,  
5 µm for particle size above 15 µm.

#### 70 mm inner diameter

Product No.	Column size length X inner diameter (mm)	Pressure limit (MPa)
XC1071■R	100	7
XC2571■R	250	
XC3071■R	300	
XC5071■R	500	
XCA071■R	1000	
XC1072■R	100	14
XC2572■R	250	
XC3072■R	300	
XC5072■R	500	
XCA072■R	1000	

Designate a frit pore size depending on particle size.  
We recommend 2 µm for particle size below 10 µm,  
5 µm for particle size above 15 µm.



#### 100 mm inner diameter

Product No.	Column size length X inner diameter (mm)	Pressure limit (MPa)
XC10A1■R	100	7
XC30A1■R	300	
XC50A1■R	500	
XCA0A1■R	1000	
XC10A2■R	100	14
XC30A2■R	300	
XC50A2■R	500	
XCA0A2■R	1000	

#### 150 mm inner diameter

Product No.	Column size length X inner diameter (mm)	Pressure limit (MPa)
XC20B1■R	200	7
XC30B1■R	300	
XC50B1■R	500	
XCA0B1■R	1000	
XC20B2■R	200	14
XC30B2■R	300	
XC50B2■R	500	
XCA0B2■R	1000	

#### 200 mm inner diameter

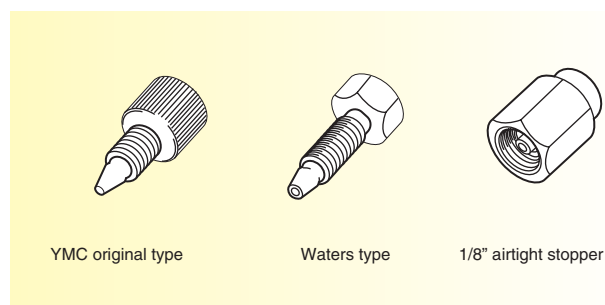
Product No.	Column size length X inner diameter (mm)	Pressure limit (MPa)
XC20C1■R	200	7
XC50C1■R	500	
XCA0C1■R	1000	
XC20C2■R	200	14
XC50C2■R	500	
XCA0C2■R	1000	

\*■Connection type: Select your desired connection type.

- A : 1/16" male nut
- D : 1/8" female nut
- E : 1/4" female nut

## [Airtight stopper]

Airtight stoppers are used to prevent column contents from drying.  
Please use a stopper appropriate for each column connection type.



### 1/16" airtight stopper

Product No.	Specification
XPMSY	YMC original type (PEEK), 5/pack
XPMSW	Waters type (stainless), 5/pack

### 1/8" airtight stopper

Product No.	Specification
XPMS8	Female nut, 2/pack