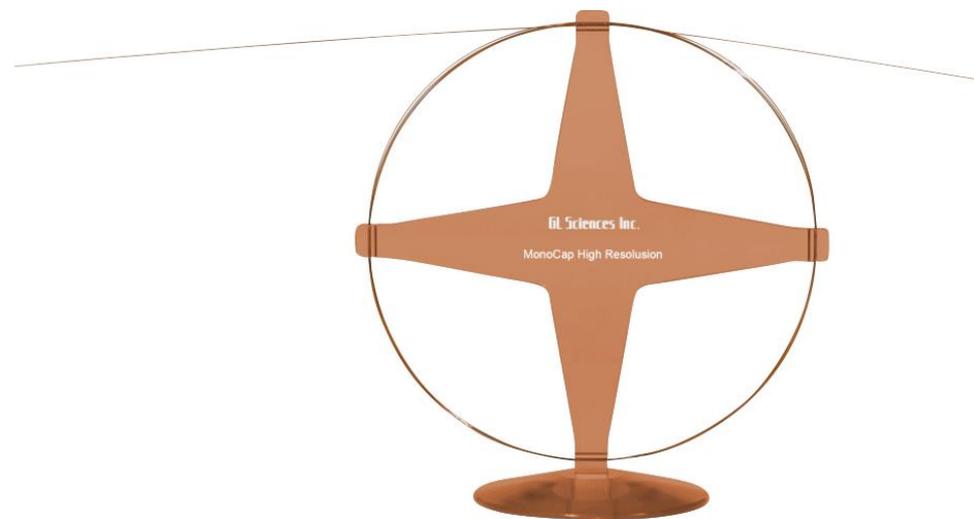


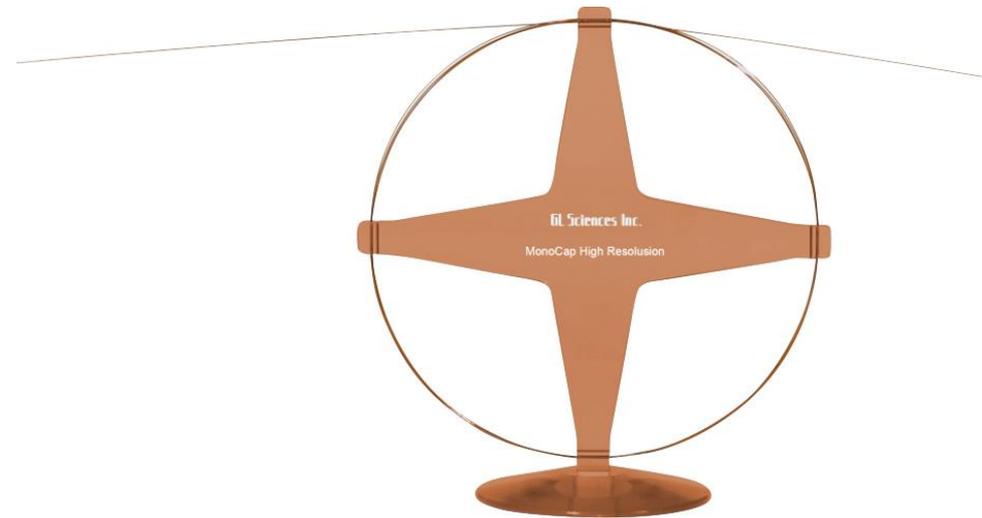
# MonoCap High Resolution 2000 Series



***Optimized for Identification of Peptides /Proteins  
for Proteome Research***

# What is MonoCap HighResolution 2000 ?

MonoCap HighResolution 2000 is a 2 meter length monolithic silica capillary column which is designed for identifying extremely high number of peptides/proteins for proteome research via LC-MS/MS.



# Physical Properties of MonoCap HighResolution 2000

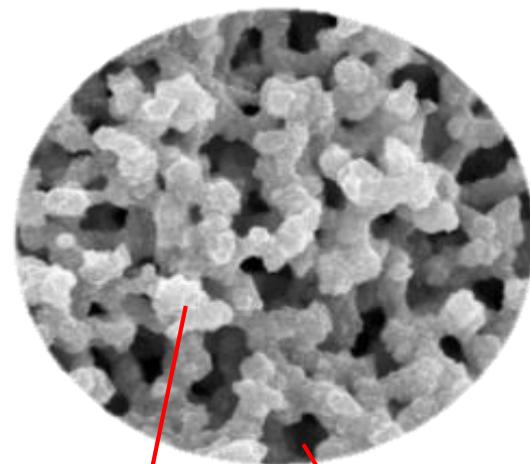
## MonoCap C18 HighResolution 2000

Silica	: High Purity Monolithic Silica Gel
Through-pore Size	: 2 $\mu\text{m}$
Mesopore Size	: 15 nm
Bonded Phase	: Octadecyl Groups
End-capping	: Yes
Internal Diameter	: 0.1 mm I.D.
Length	: 2000 mm
Recommended Flow Rate Ranges	: 0.3 $\mu\text{L}/\text{min}$ ~ 1 $\mu\text{L}/\text{min}$
Maximum Operating Pressure	: 35 MPa, 300 Bar

## MonoCap HILIC-UP HighResolution 2000

Silica	: High Purity Monolithic Silica Gel
Through-pore Size	: 2 $\mu\text{m}$
Mesopore Size	: 12 nm
Bonded Phase	: Ureidopropyl Groups
End-capping	: None
Internal Diameter	: 0.1 mm I.D.
Length	: 2000 mm
Recommended Flow Rate Ranges	: 0.3 $\mu\text{L}/\text{min}$ ~ 1 $\mu\text{L}/\text{min}$
Maximum Operating Pressure	: 35 MPa, 300 Bar
Remarks	: For identification of highly hydrophilic and hydrophobic peptides/proteins

Bimodal Pore Structure of MonoCap



Mesopores

Through-pores

# Why Use MonoCap HighResolution 2000 columns?

<b><u>Facts</u></b>	<b>MonoCap HighResolution 2000 mm columns</b>	Traditional Particle Packed 150 mm columns
Separation Efficiency	<b>Higher</b>	<b>Lower</b>
Number of Identified Peptides	<b>More</b>	<b>Less</b>
Total Operation Time	<b>Shorter</b>	<b>Longer</b>
Operating Pressure	<b>Lower</b>	<b>Higher</b>
Column Lifetime	<b>Longer</b>	<b>Shorter</b>
Total Cost including all the above factors	<b>Less</b>	<b>More</b>

# Ordering Information

## MonoCap™ C18 High Resolution 2000

I.D.(mm)	Length(mm)	Cat.No.
0.1	2000	5020-10015

- \* A column stand is included.
- \* End-fittings are not included.



MonoCap High Resolution 2000

## Connection Kit for MonoCap™ C18 High Resolution



### Connection Kit for MonoCap™ C18 High Resolution 2000

A dedicated connection kit for MonoCap C18 High Resolution 2000.  
Use this connection kit when connecting the column directly to the system.

Description	Contents of Kit	Cat.No.
Connection Kit for MonoCap C18 High Resolution 2000	1/16" PEEK Ferrule, SUS Nut, Sleeve 2 pcs each 1/32" PEEK Ferrule, SUS Nut, Sleeve 2 pcs each	5020-10017

### Zero Dead Volume Union

Connect the tubing from the system to this union and install the column to achieve zero dead volume.



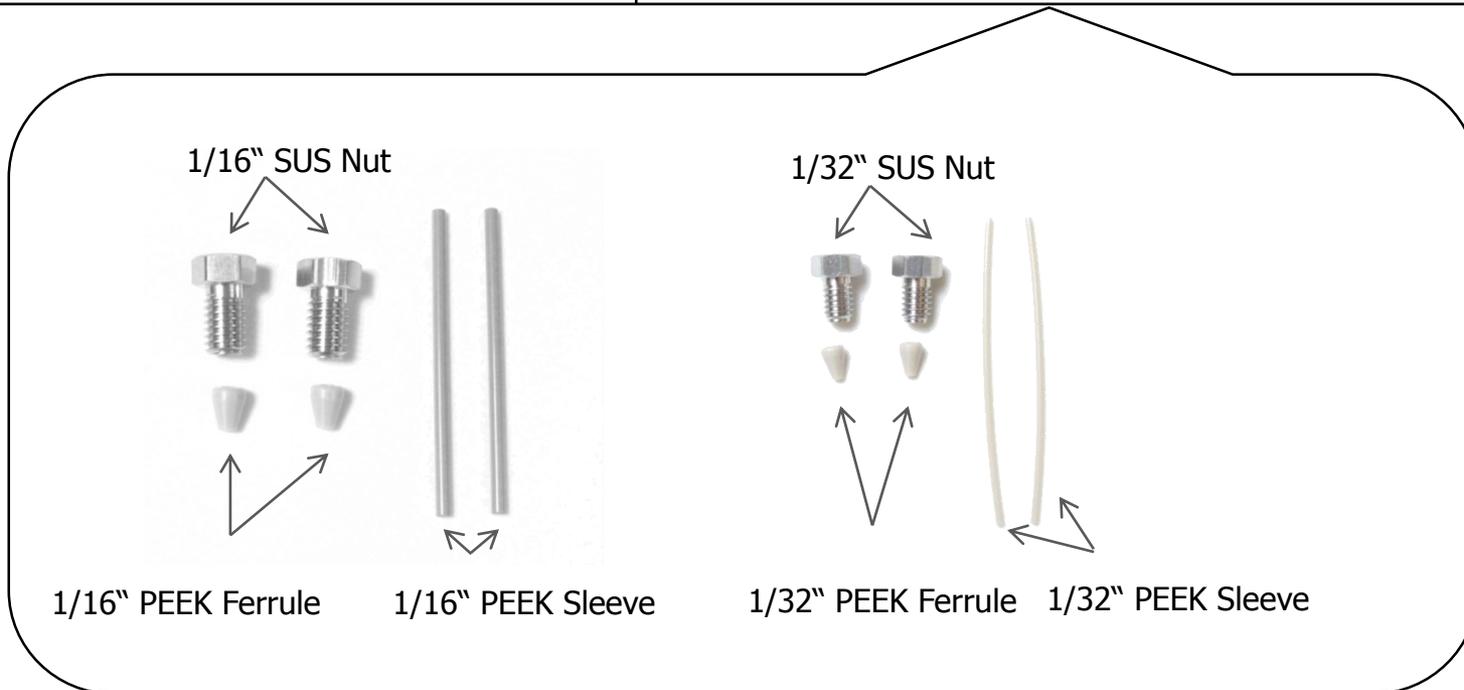
Description	Model	Remarks	Cat.No.
Zero Dead Volume Union	U-435	For 1/16" SUS Tubing	6010-72352

# Column Connection

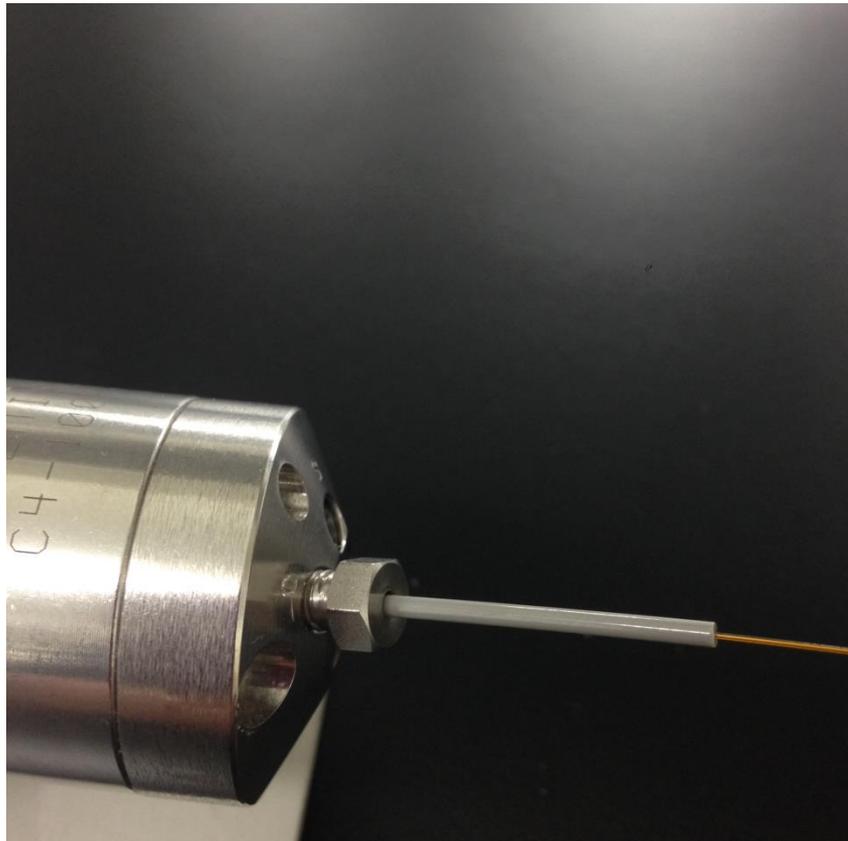
Purchase the following connection kit when directly connecting the column to the injector of a nano-LC instrument.

## MonoCap C18 HighResolution 2000 Connection Kit

Description	Contents	Cat.No.
MonoCap C18 HighResolution 2000 Connection Kit	1/16" PEEK Ferrule, SUS Nut, Sleeve, 2 pcs each. 1/32" PEEK Ferrule, SUS Nut, Sleeve, 2 pcs each.	5020-10017

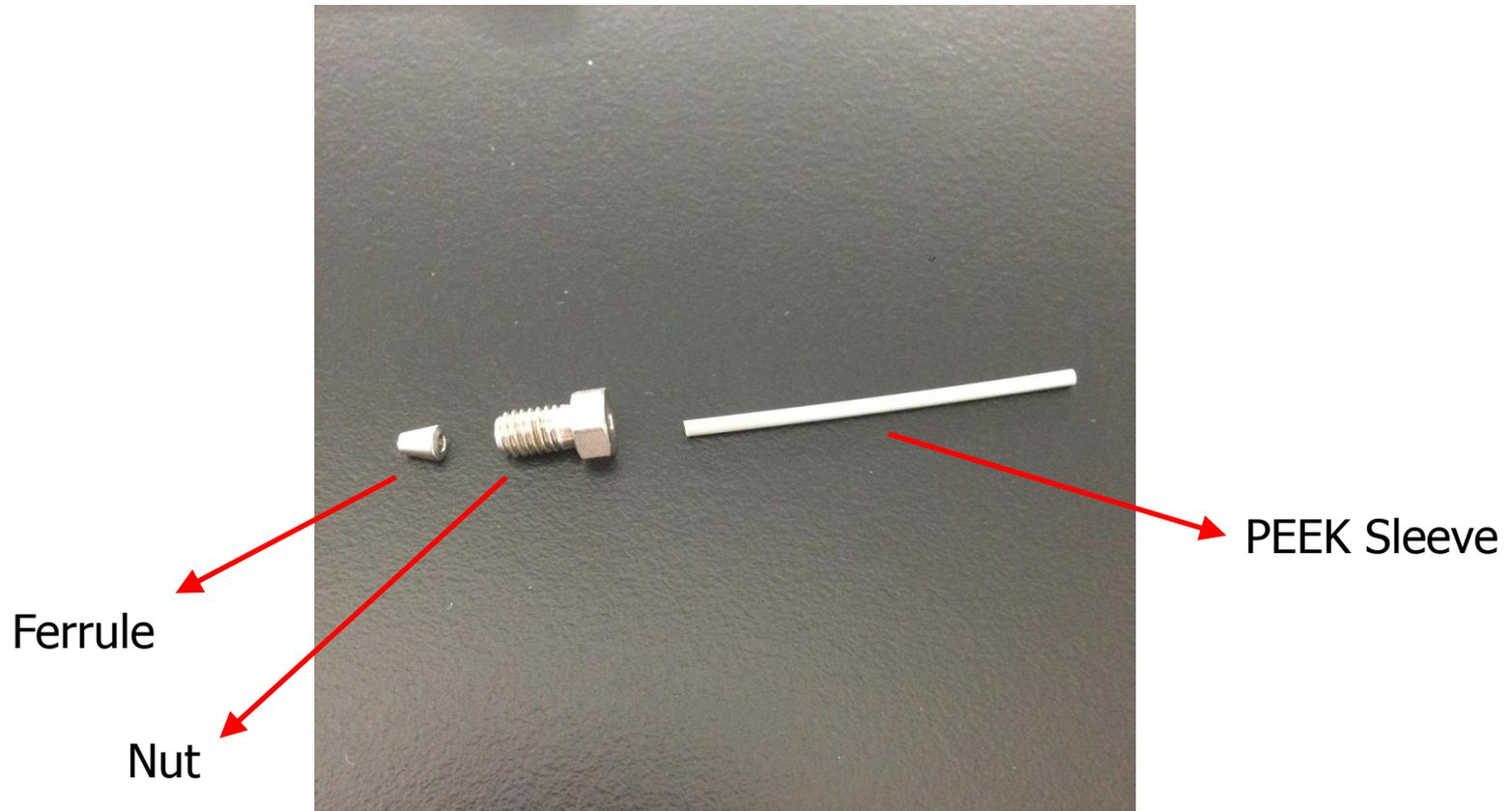


# Example of Column Connection



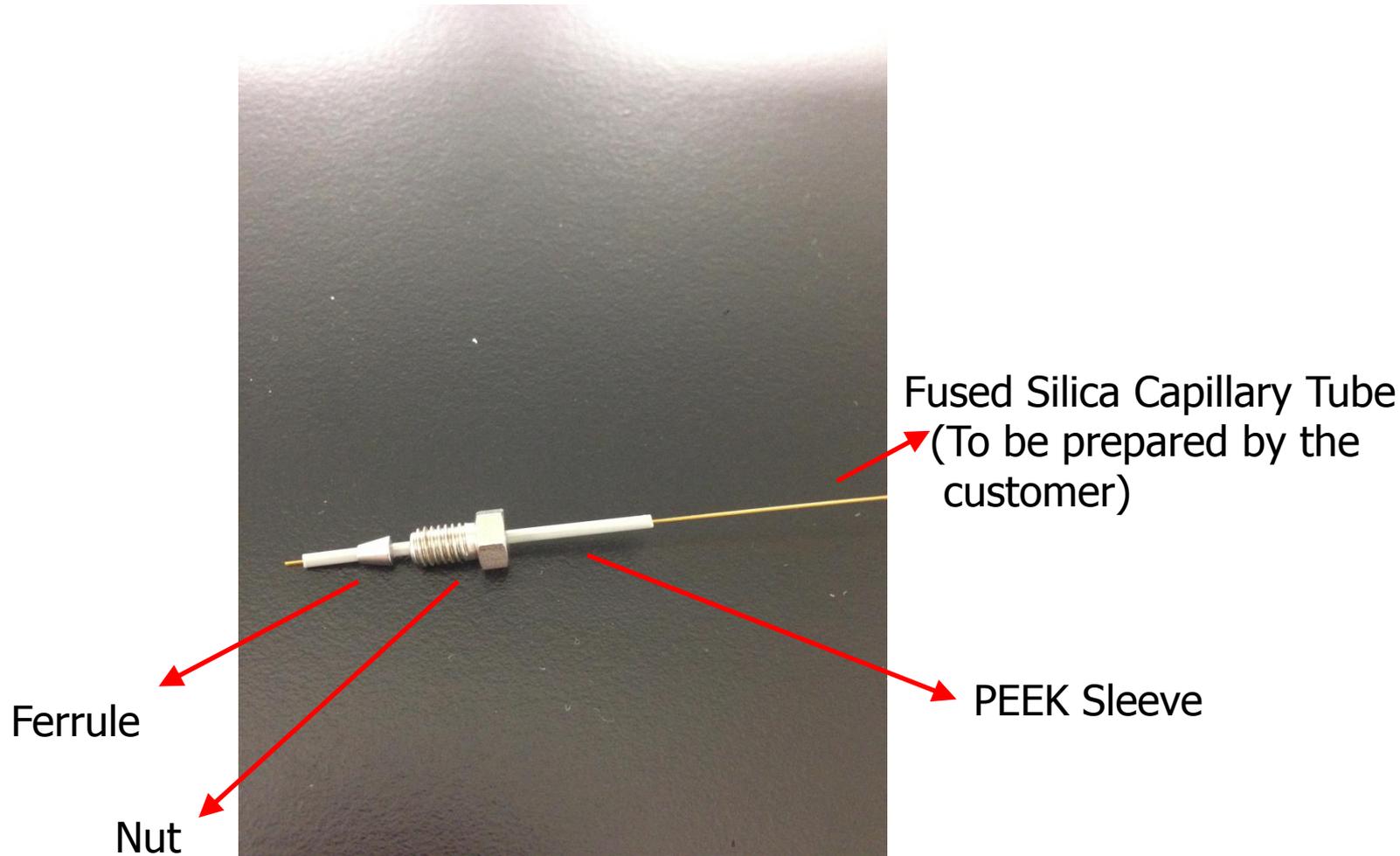
# Installing MonoCap to the appropriate End-fittings

1. Prepare either 1/16" or 1/32" end-fittings and sleeve included in the MonoCap connection kit (Cat# 5020-10017).



# Installing MonoCap to the appropriate End-fittings

2. Insert the sleeve into a nut and ferrule. Then insert a fused silica capillary tube into the sleeve.



# Installing MonoCap to the appropriate End-fittings

3. Insert the pre-assembled fitting into the injection port. First, finger tight the nut. Then, use a \*wrench and make a 1/4 turn two times to tighten the nut to make certain that the ferrule grabs the PEEK sleeve.



Nut

PEEK Sleeve

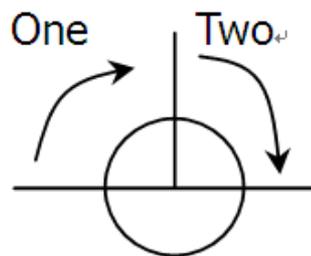
Fused Silica Capillary Tube  
(To be prepared by the customer)

\*Use a 1/4" wrench when using a 1/16" nut.

↵

\*Use a 3/16" wrench when using a 1/32" nut.

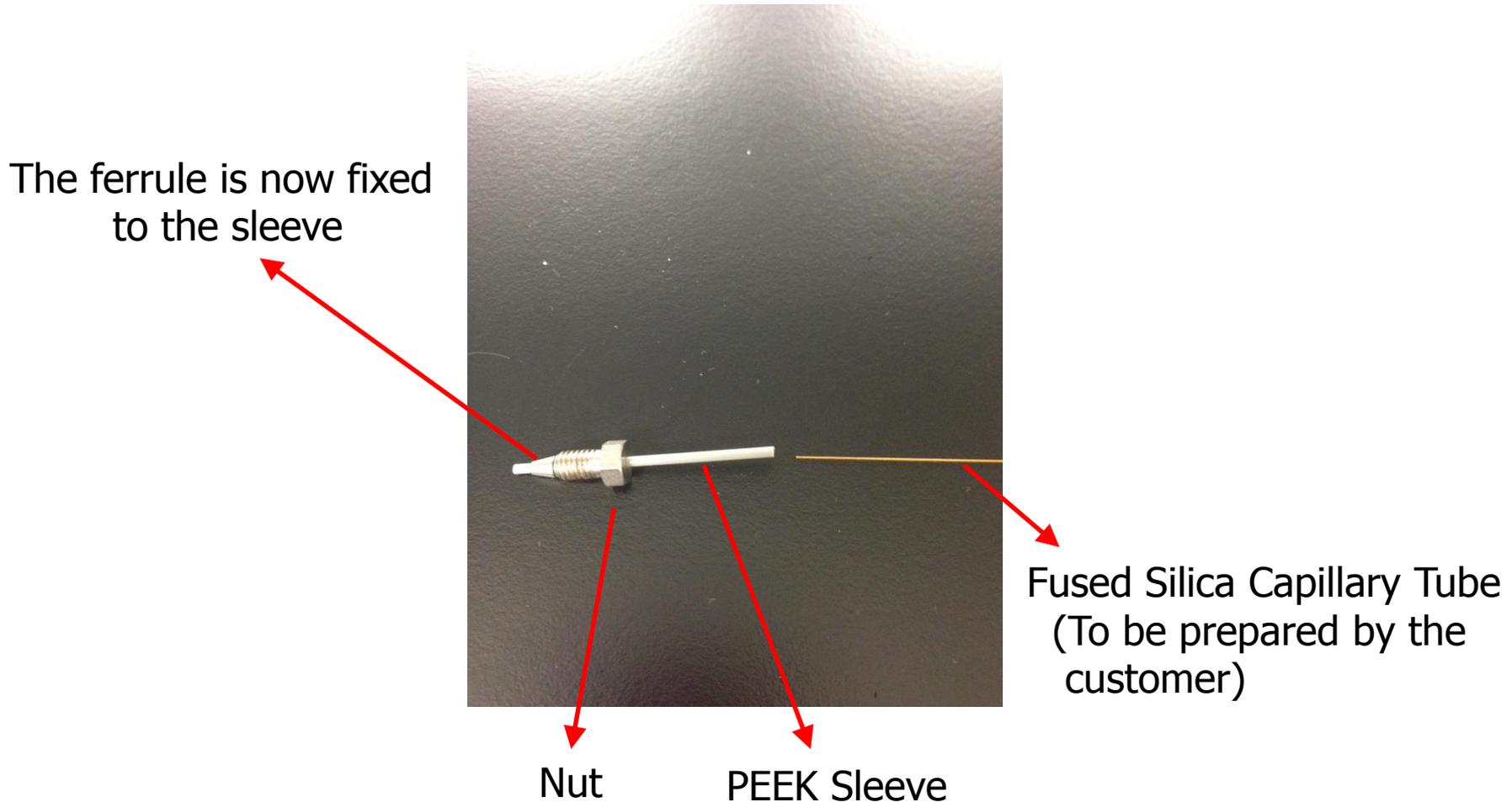
↵



First finger tight the nut.  
Then, make a 1/4 turn two  
times.

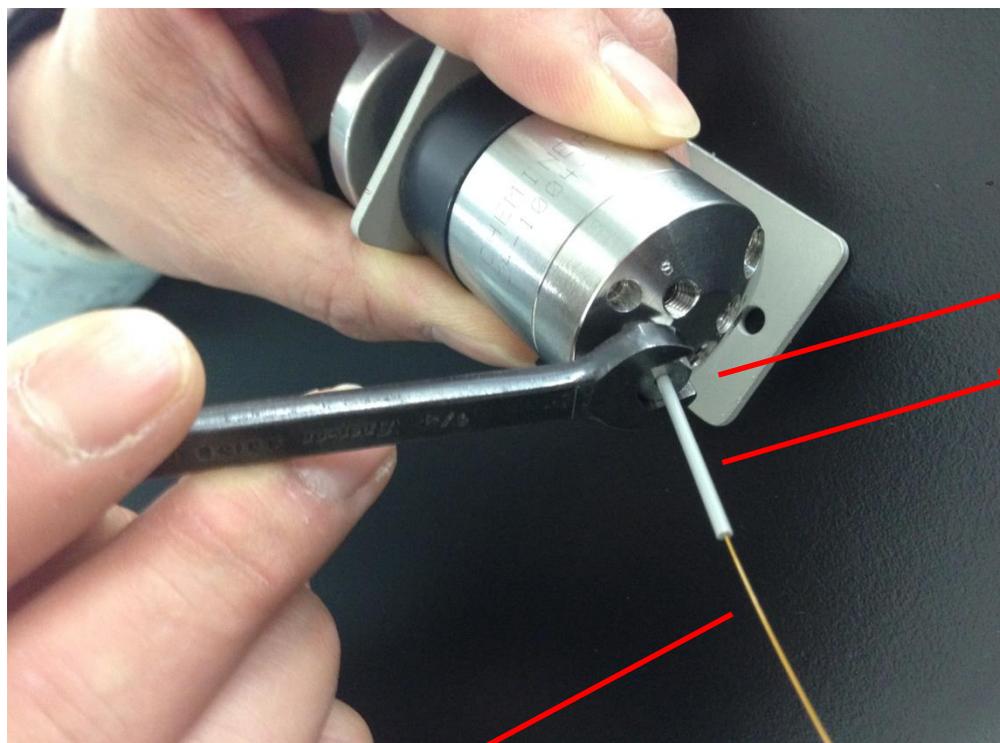
# Installing MonoCap to the appropriate End-fittings

4. Now the ferrule is fixed to the sleeve. Remove the fused silica capillary tube from the sleeve.



# Installing MonoCap to the appropriate End-fittings

5. Insert the MonoCap High Resolution 2000 columns into the sleeve. Then push the sleeve all the way into the port for a zero dead volume connection that the assembly seats firmly. Finally, gently keep pushing the column into the port direction and finger tight the nut. Then, use a \*wrench and make a 1/4 turn two times to tighten the nut.



Nut

PEEK Sleeve

MonoCap C18  
HighResolution 2000

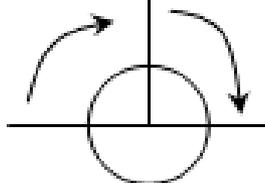
\*Use a 1/4" wrench when using a 1/16" nut. ↵

↵

\*Use a 3/16" wrench when using a 1/32" nut. ↵

↵

One Two ↵

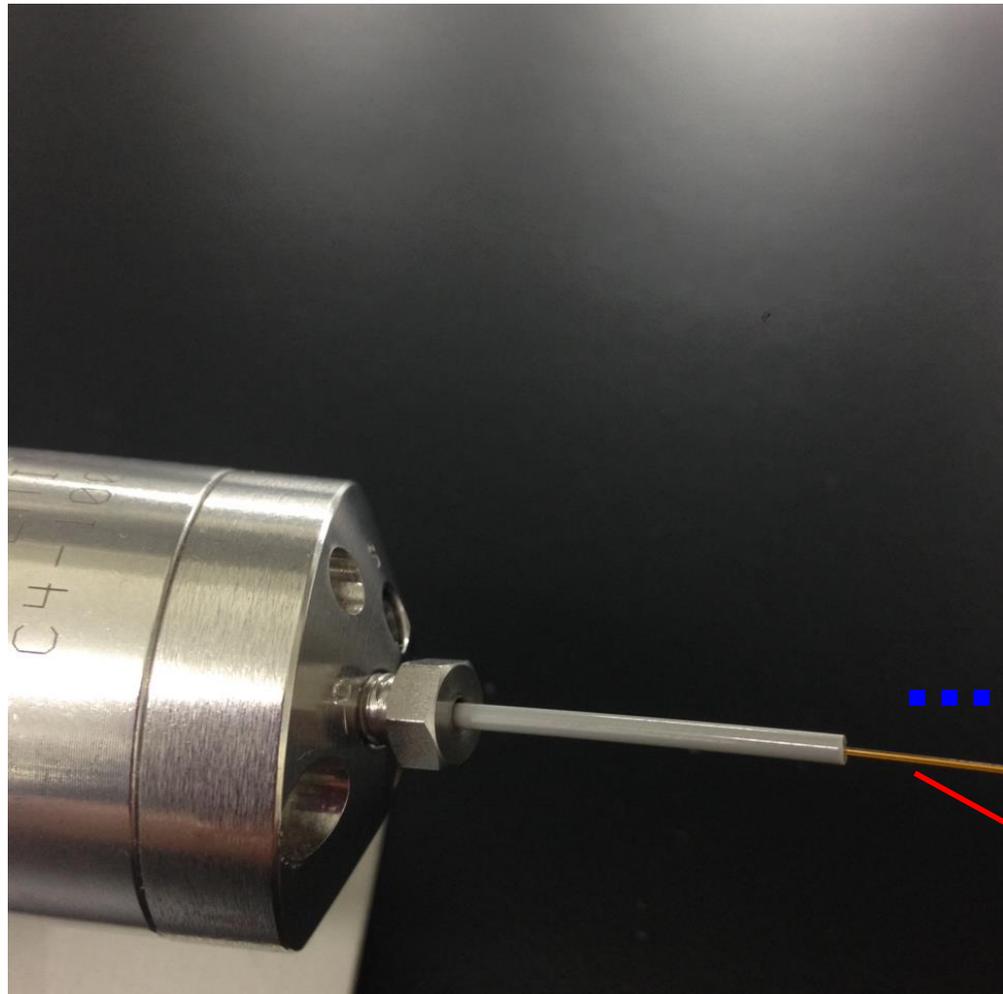


First finger tight the nut. ↵

Then, make a 1/4 turn two ↵  
times. ↵

# Installing MonoCap to the appropriate End-fittings

6. Gently pull the MonoCap C18 column to the direction shown below in blue. Make sure the column is not loose and it is firmly installed.



MonoCap C18  
HighResolution 2000

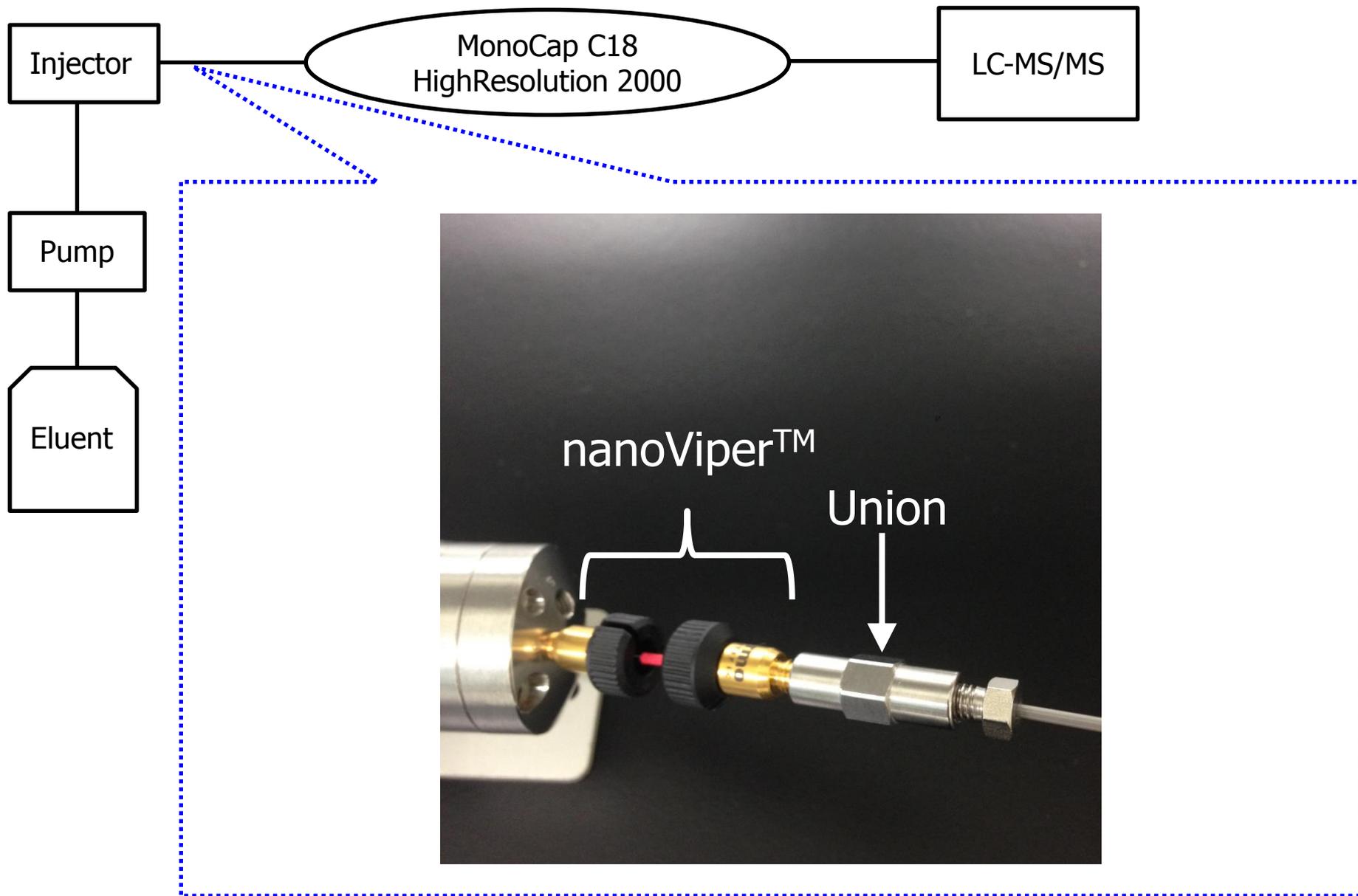
# Column Connection

Purchase the following union when using a tubing that generates any indirect connection to the column.

Description	Model	Remarks	Cat.No.
Zero Dead Volume Union	U-435	For 1/16" SUS Tubing	6010-72352

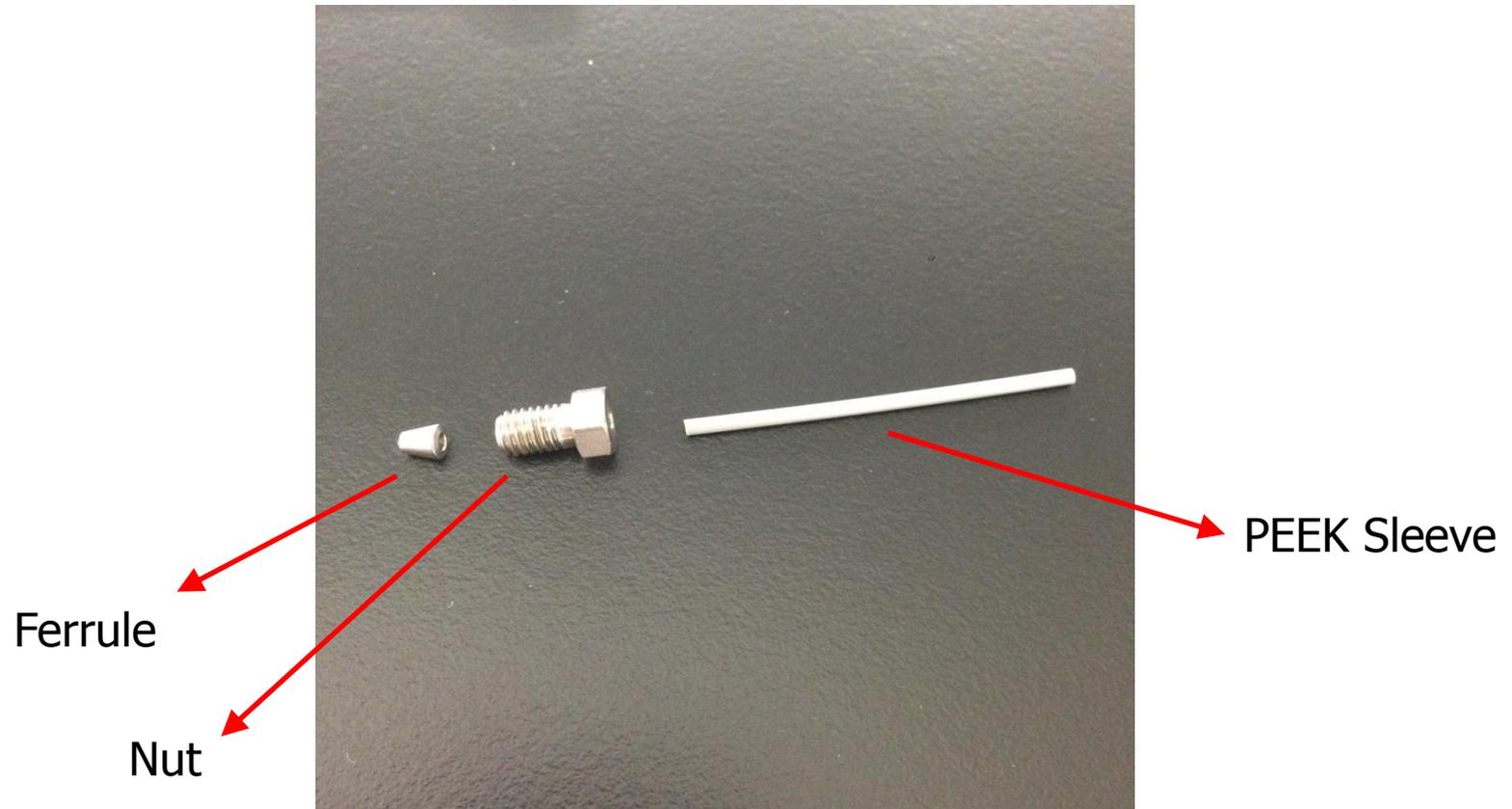


# Example of Column Connection using nanoViper™



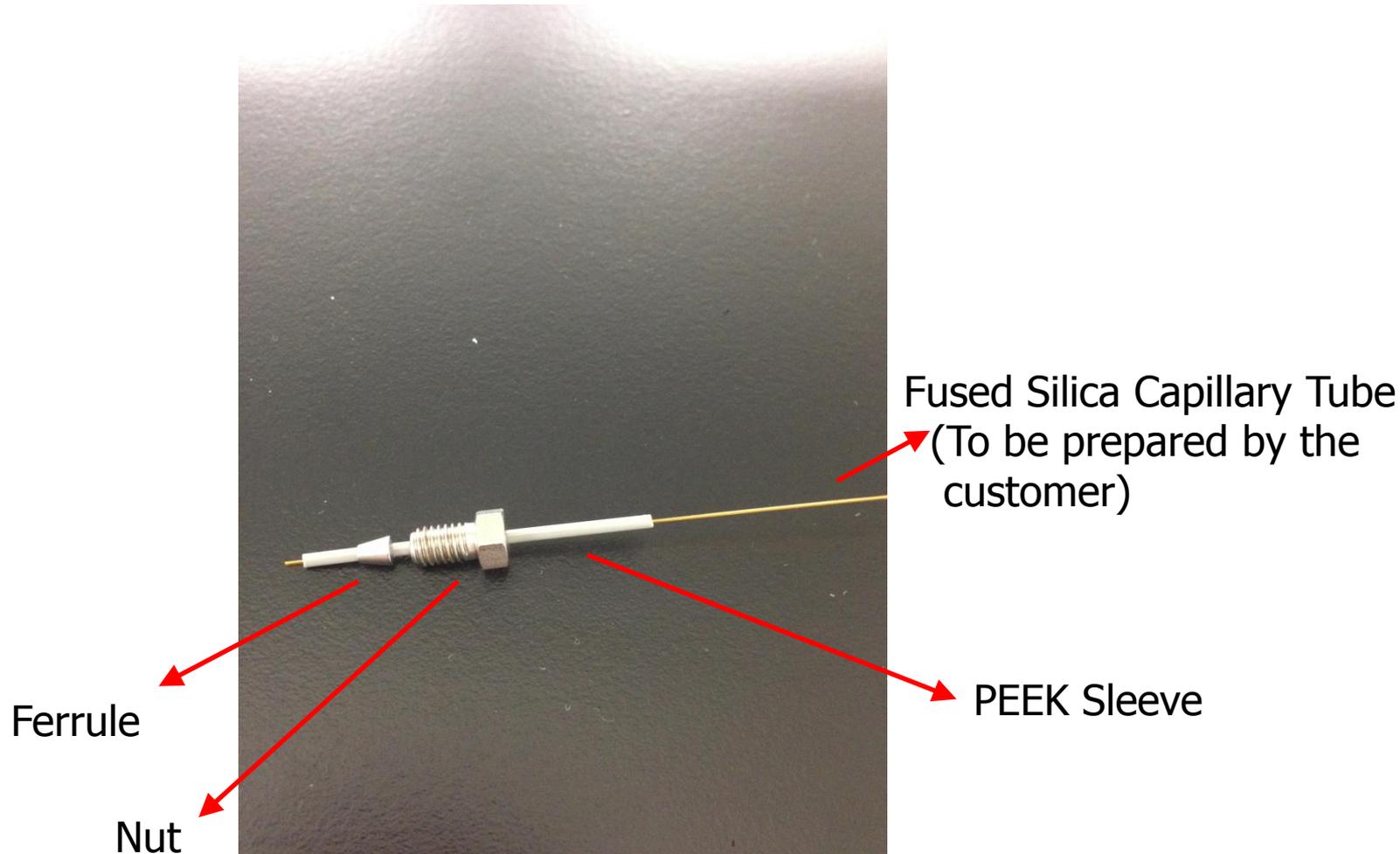
# Installing MonoCap to nanoViper™

1. Prepare 1/16" end-fittings and sleeve included in the MonoCap connection kit (Cat# 5020-10017).



# Installing MonoCap to nanoViper™

2. Insert the sleeve into a nut and ferrule. Then insert a fused silica capillary tube into the sleeve.



# Installing MonoCap to nanoViper™

3. Insert the pre-assembled fitting into the injection port. First, finger tight the nut. Then, use a wrench and make a 1/4 turn two times to tighten the nut to make certain that the ferrule grabs the PEEK sleeve.



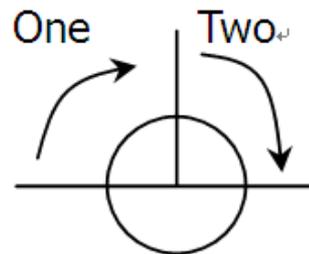
Nut

PEEK Sleeve

Fused Silica Capillary Tube  
(To be prepared by the customer)

\*Use a 1/4" wrench when using a 1/16" nut.

\*Use a 3/16" wrench when using a 1/32" nut.

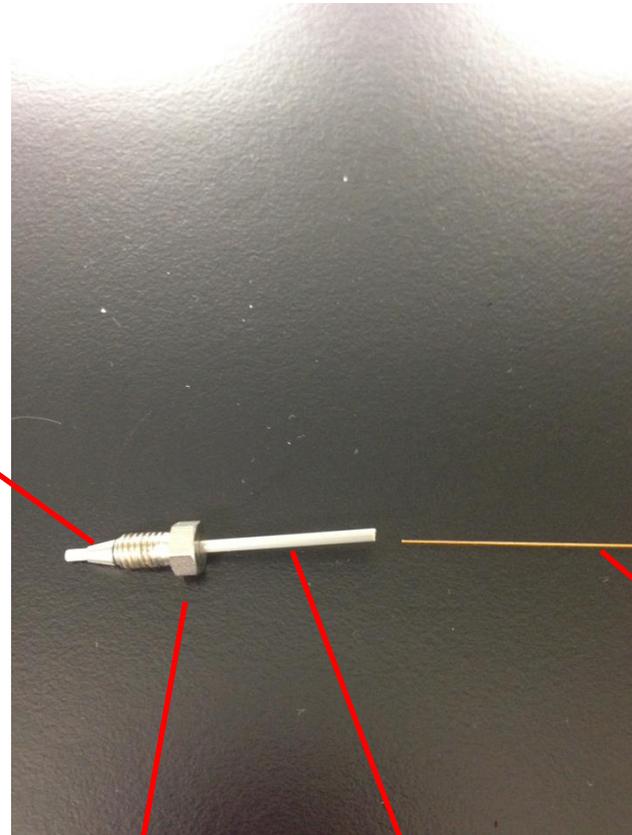


First finger tight the nut.  
Then, make a 1/4 turn two  
times.

# Installing MonoCap to nanoViper™

- Now the ferrule is fixed to the sleeve. Remove the fused silica capillary tube from the sleeve.

The ferrule is now fixed to the sleeve



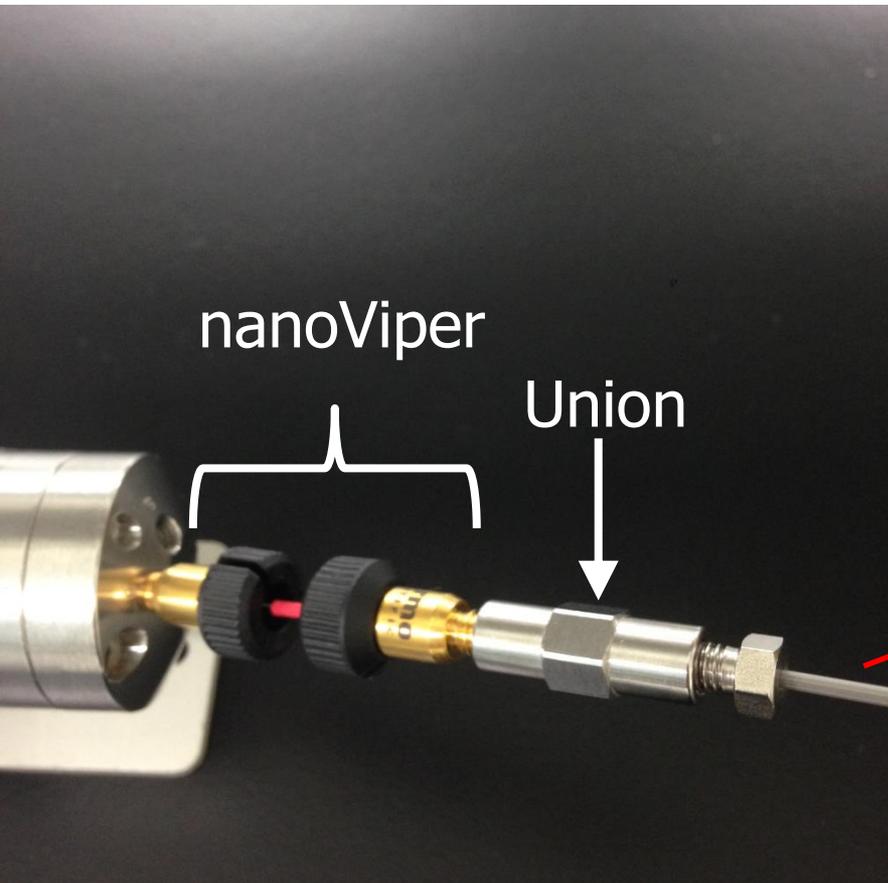
Nut

PEEK Sleeve

Fused Silica Capillary Tube  
(To be prepared by the customer)

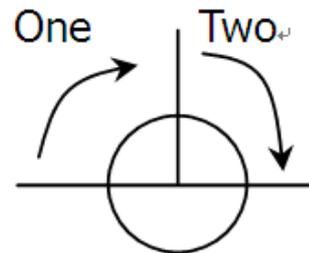
# Installing MonoCap to nanoViper™

5. Connect the MonoCap C18 HighResolution 2000 column into union. Push the sleeve all the way into the union for a zero dead volume connection that the assembly seats firmly. Keep pushing the MonoCap C18 column into the union and finger tight the nut. Then, use a wrench and make a 1/4 turn two times to tighten the nut. Gently pull the MonoCap C18 to confirm if the column is not loose and it is firmly installed.



\*Use a 1/4" wrench when using a 1/16" nut.

\*Use a 3/16" wrench when using a 1/32" nut.

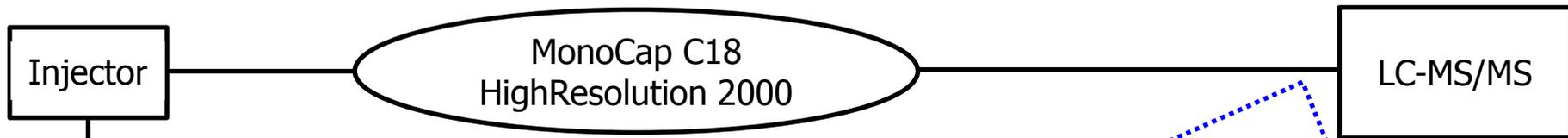


First finger tight the nut.  
Then, make a 1/4 turn two  
times.

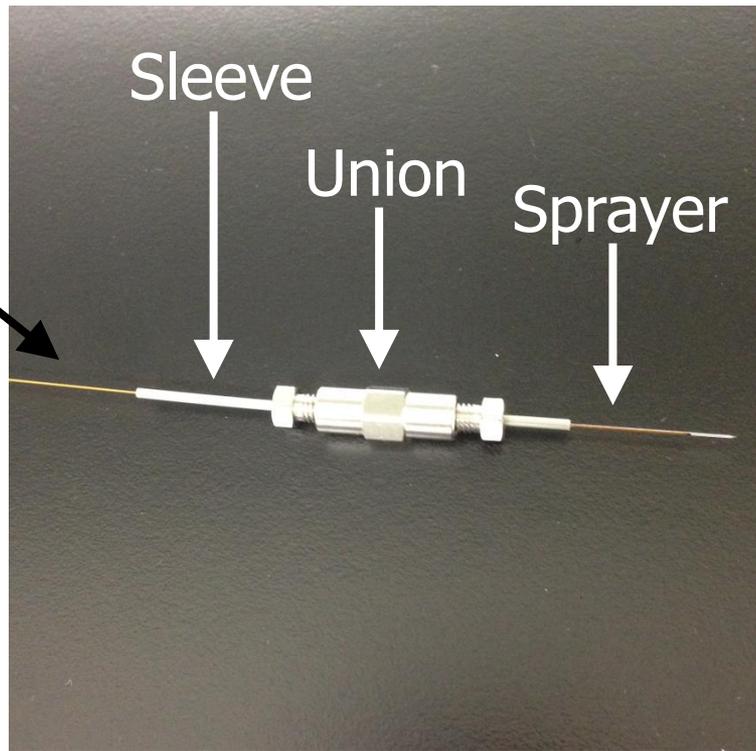
PEEK Sleeve

MonoCap C18  
HighResolution 2000

# Example of Column Connection



MonoCap 18



# Maximizing Performance of MonoCap High Resolution 2000 Series Columns

## Specification

Description	Bonded Phase	Mesopore	End-capping	pH Range	Max. Operating Pressure
MonoCap C18 High Resolution 2000	Octadecyl Groups	15 nm	Yes	2.0-8.0	35 MPa
MonoCap C18 High Resolution Ultra 2000	Octadecyl Groups	11 nm	Yes	2.0-8.0	35 MPa
MonoCap HILIC-UP High Resolution 2000	Ureidopropyl Groups	12 nm	None	2.0-8.0	35 MPa

# Maximizing Performance of MonoCap High Resolution 2000 Series Columns

## 1. Gradient Time Program

Higher efficiency/separation can be achieved by setting the gradient time program longer than three hours.

Longer the gradient time program, higher the efficiency.

# Maximizing Performance of MonoCap High Resolution 2000 Series Columns

## 2. Column Equilibration Time

In order to achieve maximum performance, equilibrate the columns by referring to the following table prior to the analysis.

Product Description	* Equilibration Time
MonoCap C18 High Resolution 2000 MonoCap C18 High Resolution Ultra 2000	1 hour
MonoCap HILIC-UP High Resolution 2000	2 hours

\* When setting the flow rate at 0.5  $\mu\text{L}/\text{min}$ .

# Maximizing Performance of MonoCap High Resolution 2000 Series Columns

## 3. Recommended Flow Rate

Product Description	Recommended Flow Rate Range (nL/min)
MonoCap C18 High Resolution 2000 MonoCap HILIC-UP High Resolution 2000	300~1000
MonoCap C18 High Resolution Ultra 2000	300~600

# Maximizing Performance of MonoCap High Resolution 2000 Series Columns

## 4. Sample Loading Capacity

To maintain and ensure maximum column performance and lifetime, please follow the following table which is the sample loading capacity of each column.

Overload of sample to the column will cause fronting peaks, broad peaks and weak retention of compounds.

Product Description	Injection Volume 1 $\mu$ L (Full Loop Injection) Sample Loading Capacity
MonoCap C18 High Resolution 2000 MonoCap C18 High Resolution Ultra 2000	5 $\mu$ g
MonoCap HILIC-UP High Resolution 2000	1 $\mu$ g

# Maximizing Performance of MonoCap High Resolution 2000 Series Columns

## 5. Column Washing Program

To maximize column lifetime, it is ideal to add a column washing program in the gradient program. The following is an example of adding a washing program in the gradient program.

Product Description	Example of Column Washing Program
MonoCap C18 High Resolution 2000 MonoCap C18 High Resolution Ultra 2000	A)CH <sub>3</sub> CN(0.1 %HCOOH), B)H <sub>2</sub> O(0.1 %HCOOH) A/B = 10/90 – (360 min)- <u>45/55 - (10 min) - 90/10 - (10 min) - 90/10</u> <b>Washing Program</b>
MonoCap HILIC-UP High Resolution 2000	A)10 % CH <sub>3</sub> CN (0.5 % CH <sub>3</sub> COOH) B)95 % CH <sub>3</sub> CN (0.5 % CH <sub>3</sub> COOH) A/B=0/100-(4 hr to 8 hr)- <u>20/80-(10 min)-100/0-(10 min)-100/0</u> <b>Washing Program</b>

# Maximizing Performance of MonoCap High Resolution 2000 Series Columns

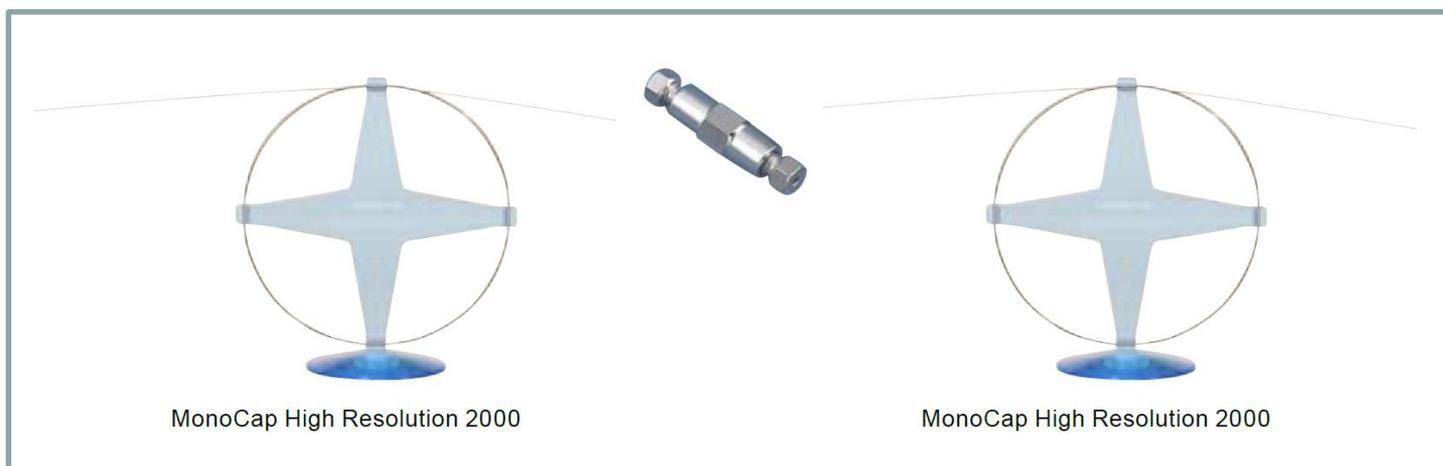
## 6. Sample Diluent

Please prepare the sample in the initial mobile phase conditions or a weaker solvent for the best sensitivity and peak shape.

If the sample is not prepared in the mobile phase, ensure that the sample, solvent and mobile phases are miscible to prevent sample and buffer precipitation.

# Maximizing Performance of MonoCap High Resolution 2000 Series Columns

7. When connecting two columns in series for higher efficiency/separation Use a zero dead volume micro union in between the two columns.



## Zero Dead Volume Union

Connect the tubing from the system to this union and install the column to achieve zero dead volume.



Description	Model	Remarks	Cat.No.
Zero Dead Volume Union	U-435	For 1/16" SUS Tubing	6010-72352

# Maximizing Performance of MonoCap High Resolution 2000 Series Columns

8. When observing an increase of column back pressure or split peaks

This may be caused from column contamination or clogging of the inlet of the column.

- Please filter all solvents through a 0.2  $\mu\text{m}$  membrane filter.
- Desalt/purify the sample with GL Tip SDB (Cat# 7820-11200).

# Related Products

## **Titansphere™ TiO Bulk Material**

Bulk Sorbent Materials for Purification & Enrichment of Phosphopeptides

Description	Volume	Cat.No.
Titansphere TiO 5 µm	500 mg	5020-75000
Titansphere TiO 10 µm	500 mg	5020-75010
* Titansphere Phos-TiO Bulk 10 um	500 mg	5010-21315

\* New material for higher purification efficiency of Phosphopeptides

For more information, please visit

<http://www.glsciences.com/c-product/sample/phosphopeptides/titansphere-tio-bulk-material/>

# Related Products

## **Titansphere™ Phos-TiO Kit**

The most widely used kit in the world for the enrichment of phosphopeptides.

## **Titansphere™ Phos-TiO Kit Part Numbers**

Description	Column Size	Quantity	Cat.No.
Titansphere Phos-TiO Kit	1 mg/10 µL	24 times	5010-21309
		96 times	5010-21310
	3 mg/200 µL	24 times	5010-21311
		96 times	5010-21312

For more information, please visit.

<http://www.glsciences.com/c-product/sample/phosphopeptides/titansphere-phos-tio-kit/>

# Related Products

## **GL-Tip™ SDB and GL-Tip™ GC**

Micropipette used for Desalting of TiO<sub>2</sub>-Enriched Samples Prior to LC/MS

Product	Quantity	Tip Volume	Order Number
GL-Tip™ SDB	96/pkg	200 µL	7820-11200
GL-Tip™ GC	96/pkg	200 µL	7820-11201
GL-Tip™ Adaptor*	1 ea		5010-21514

\*Adaptors are reusable.

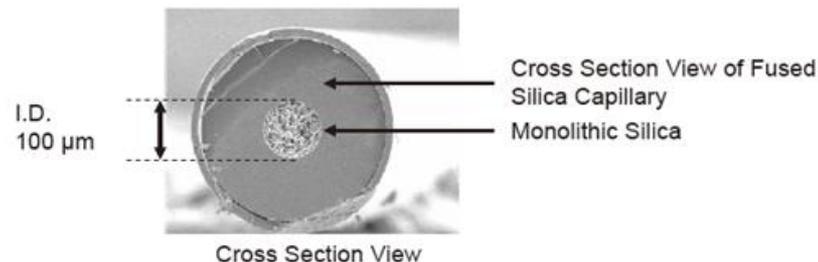
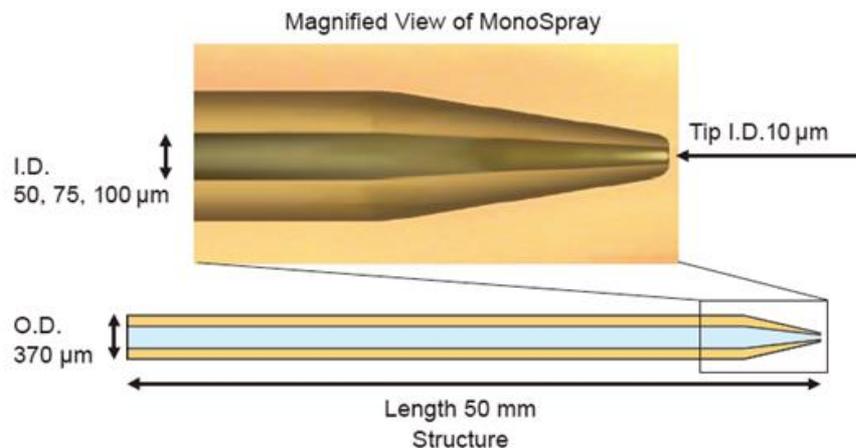
For more information, please visit

<http://www.glsciences.com/c-product/sample/proteins/gl-tip-sdb-and-gl-tip-gc/>

# Related Products

## MonoSpray™

Electrospray emitter for Nano-LC/ESI-MS



## MonoSpray™ FS

Description	Length (mm)	O.D. (μm)	I.D. (μm)	Qty (pcs)	Cat.No.
Mono Spray FS	50	370	50	5	5010-20001
				20	5010-20006
			75	5	5010-20002
				20	5010-20007
			100	5	5010-20003
				20	5010-20008

\* Please inquire for other sizes.

## MonoSpray™ C18

Description	Length (mm)	O.D. (μm)	I.D. (μm)	Qty (pcs)	Cat.No.
Mono Spray C18 Nano	50	370	75	1	5010-20012
				4	5010-20017
			100	1	5010-20013
				4	5010-20018

\* Please inquire for other sizes.