

Quick Connect Fitting

Quick Turn Fitting



How to

- use
- repair
- troubleshoot poor fitting connections

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Quick Connect Fitting

Where can it be used?



Being specially designed as a ,high end' fitting for column connections it is not limited to Agilent columns alone and can be used with many other column brands.

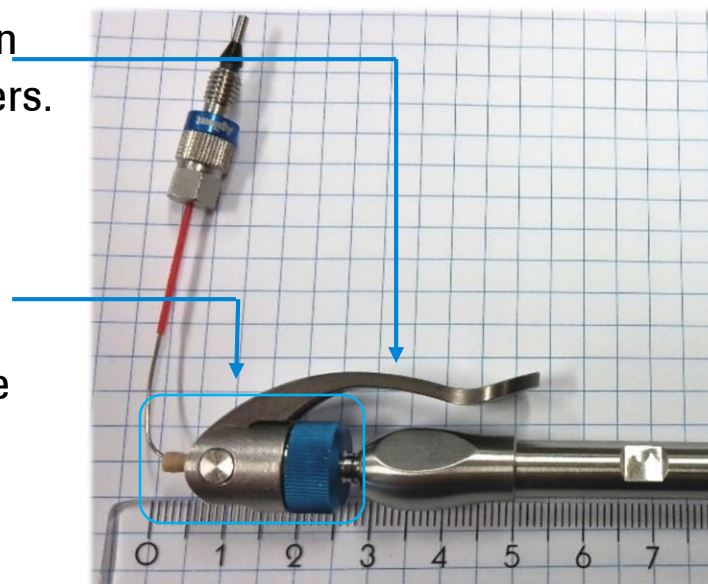
(tested also with Waters, Phenomenex and Supelco columns)

Detailed information can be found in the application note:

[Agilent A-Line UHPLC Fittings \(5991-5525EN\)](#)

Limiting factors

- The lever limits the type of connection partners it can get used with to columns or likely parts as inline filters.
- Limited space can prevent the usage of the Quick Connect fitting as it results in additional 3cm overall column length when installed.
- Incompatibilities in port geometry as described in the ,Troubleshooting' section



Quick Connect Fitting & Quick Turn Fitting

Known issues due to limited space

- Agilent 1120/1220 System (with column oven):
 - When using 250mm & 300mm columns
- Waters H-class Aquity System
 - Max. length (incl. filter, guard column and fitting):
 - CH-A: max. 150 mm
 - CH-30A: max. 300mm
 - CM-A: max. 150mm (with 2 columns)
max. 50mm (with 4 columns)

minimum additional required length:

Quick Connect Fitting: 3cm (1.2 inch)

Quick Turn Fitting: 2cm (0.8inch)

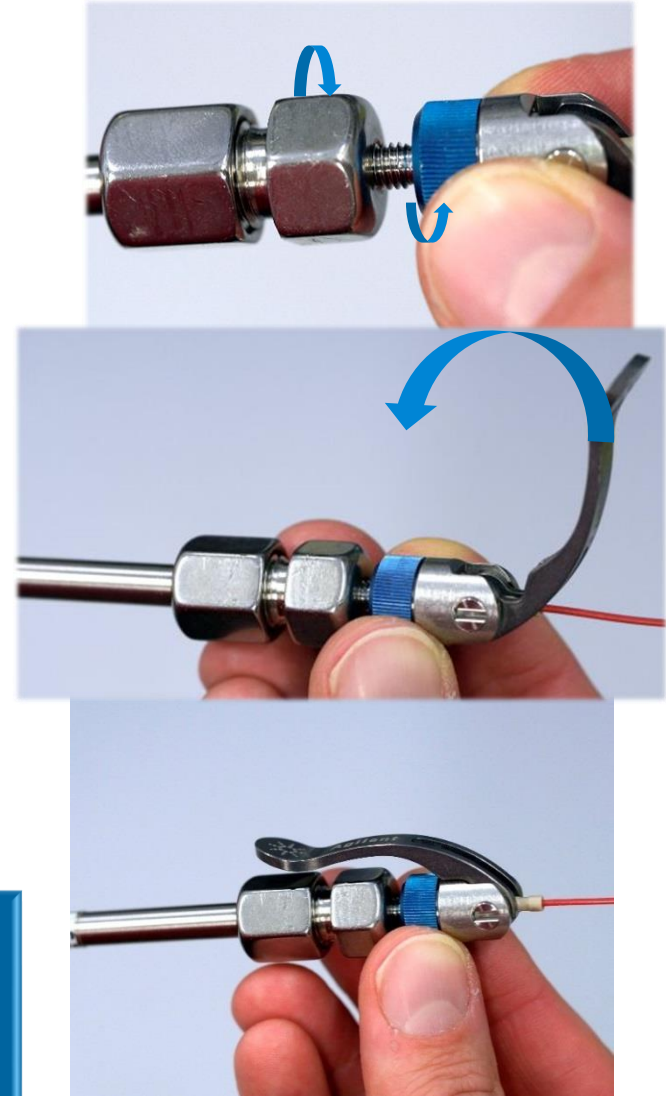


Quick Connect Fitting

How to use

1. Screw the fitting (blue wheel) with lever in ,open' position onto the column – or the column onto the fitting.
2. Stop when finger-tight and turn the lever.
3. Finished ... in seconds

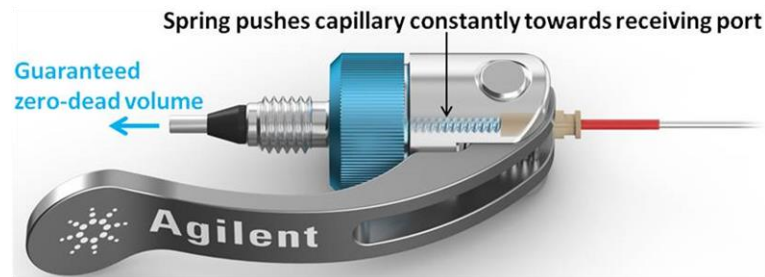
Important
finger-tight does not mean as far as your fingers can go
→ Stop as soon as you can feel the first resistance
Excessive force will damage the fitting!



Quick Connect Fitting

Component overview

It is important to only use capillaries specially dedicated for the Quick Connect Fitting to assure a proper functioning. (a list of part numbers can be found in the ,Repair' section)

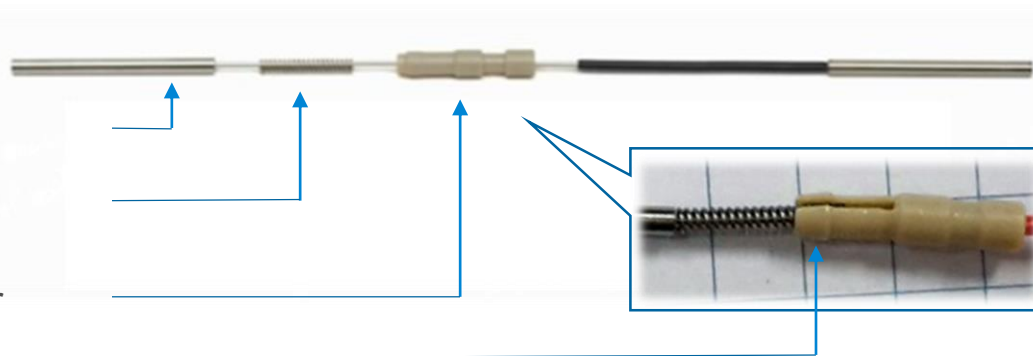


Socket

Spring

PEEK – Adapter

Retaining clamp



The Spring constantly pushes the capillary towards the receiving port and guarantees a zero dead volume connection.

The PEEK adapter fixes the capillary to the fitting body.

Quick Turn Fitting

Where to use



The Quick Turn Fitting it is not a dedicated column connector fitting and its design allows it to be connected into different receiving ports.

As its maximum ,finger-tight' level is strongly user-dependent, a wrench can be used for tightening it up to 1300bar.

The receiving port must accept 10-32 male threaded fittings and must be intended for use with Swagelok ferrules.

Limiting factors

- Limited space: The Quick Turn Fitting adds 2cm in length to the connection
- Incompatibilities in port geometry as described in the ,Troubleshooting' section

How to repair the Quick Connect and Quick Turn Fittings

Required parts and tools

- Plier
(e.g. Agilent #8710-0004)
- Standalone capillary (see following pages)
- Ferrule (p/n 5043-0924)

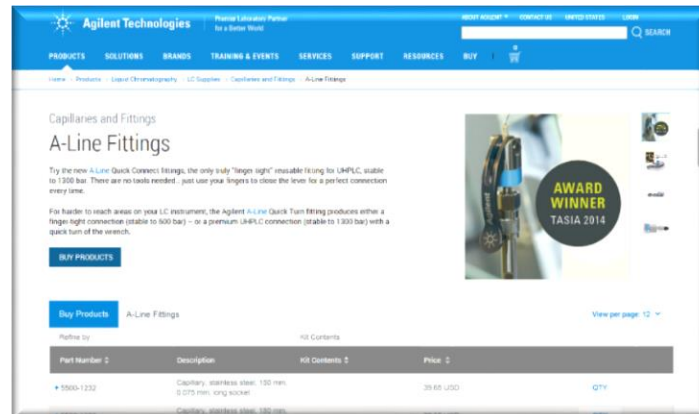
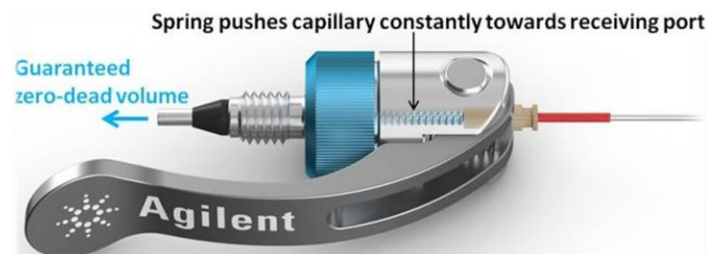


Capillary for Quick Connect Fitting



List of standalone A-Line (Quick Connect) Capillaries

5500-1170	A-Line Capillary ST 0.12mmx280mm
5500-1171	A-Line Capillary ST 0.12mmx220mm
5500-1172	A-Line Capillary ST 0.12mmx150mm
5500-1173	A-Line Capillary ST 0.12mmx105mm
5500-1174	A-Line Capillary ST 0.075mmx105mm
5500-1175	A-Line Capillary ST 0.075mm x 150mm
5500-1176	A-Line Capillary ST 0.075mm x 220mm
5500-1177	A-Line Capillary ST 0.075mm x 250mm
5500-1178	A-Line Capillary ST 0.075mm x 280mm
5500-1179	A-Line Capillary ST 0.12mm x 400mm
5500-1180	A-Line Capillary ST 0.12mm x 500mm
5500-1181	A-Line Capillary ST 0.17mm x 105mm
5500-1182	A-Line Capillary ST 0.17mm x 150mm
5500-1183	A-Line Capillary ST 0.17mm x 220mm
5500-1230	A-Line Capillary ST 0.17mm x 280mm
5500-1231	A-Line Capillary ST 0.17mm x 500mm
5500-1247	A-Line Capillary ST 0.12x120
5500-1248	A-Line Capillary ST 0.17x120
5500-1258	A-Line capillary ST 0.25mm x 105mm with a female connection
5500-1259	A-Line capillary ST 0.25mm x 150mm
5500-1260	A-Line capillary ST 0.25mm x 400mm
5500-1289	A-Line Capillary ST 0.12x150 M4
5500-1291	A-Line Capillary ST 0.17x150 M4



Search for Quick Connect and Quick Turn fittings on agilent.com for latest product information and parts lists

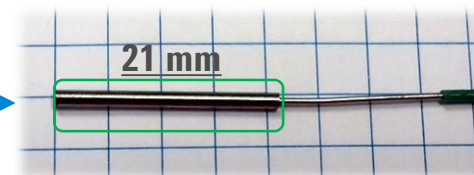
List of recommended capillaries for the Quick Turn

5500-1188	Capillary ST 0.12mm x 105mm long socket
5500-1189	Capillary ST 0.12mm x 150mm long socket
5500-1190	Capillary ST 0.12mm x 200mm long socket
5500-1191	Capillary ST 0.12mm x 280mm long socket
5500-1192	Capillary ST 0.12mm x 500mm long socket
5500-1193	Capillary ST 0.17mm x 105mm long socket
5500-1194	Capillary ST 0.17mm x 150mm long socket
5500-1195	Capillary ST 0.17mm x 200mm long socket
5500-1196	Capillary ST 0.17mm x 280mm long socket
5500-1197	Capillary ST 0.17mm x 500mm long socket
5500-1198	Capillary ST 0.075mm x 105mm long socket
5500-1200	Capillary ST 0.12mm x 130mm long socket M4
5500-1205	Capillary ST 0.075mm x 500mm long socket
5500-1206	Capillary ST 0.075mm x 250mm long socket
5500-1232	Capillary ST 0.075mm x 150mm long Socket
5500-1233	Capillary ST 0.12mm x 180mm long Socket
5500-1234	Capillary ST 0.17mm x 180mm long Socket
5500-1235	Capillary ST 0.17mm x 380mm long Socket
5500-1236	Capillary ST 0.17mm x 400mm long Socket
5500-1237	Capillary ST 0.17mm x 700mm long Socket
5500-1243	Capillary SST 0.12x50mm long Socket
5500-1249	Capillary ST 0,12x120 SL/SL long Socket
5500-1250	Capillary ST 0,17x120 SL/SL long Socket
5500-1251	Capillary ST 0,12x400 SL/SL long Socket
5500-1252	Capillary ST 0,17x400 SL/SL long Socket
5500-1261	Capillary ST 0.25mm x 105mm long socket with a female connection
5500-1262	Capillary ST 0.25mm x 150mm long socket
5500-1263	Capillary ST 0.25mm x 400mm long socket
5500-1288	Capillary ST 0.12x150 long socket M4
5500-1290	Capillary ST 0.17x150 long socket M4



Use the right capillaries:

Quick turn compatible capillaries are equipped with a so called 'long socket'. Other capillaries are usually equipped with shorter and softer sockets. Using those capillaries with the Quick Turn Fitting will cause it to stuck (too soft) or not to function at all (too short) as the fitting's chuck tightens up behind the socket.

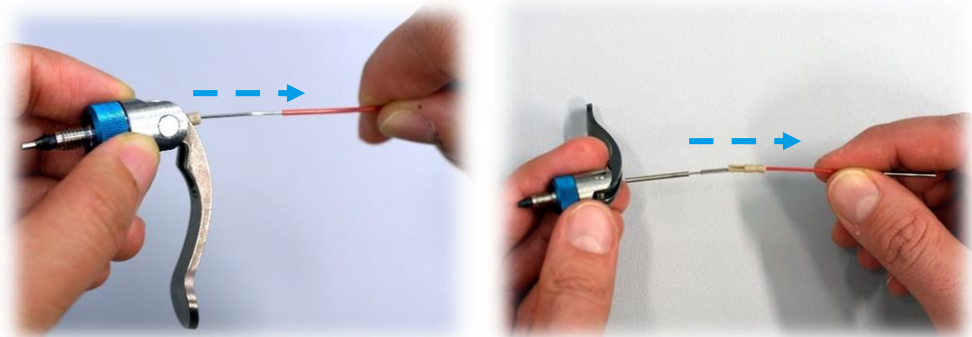


How to remove the capillary

On both fittings the capillary simply can be pulled-out of the fitting.

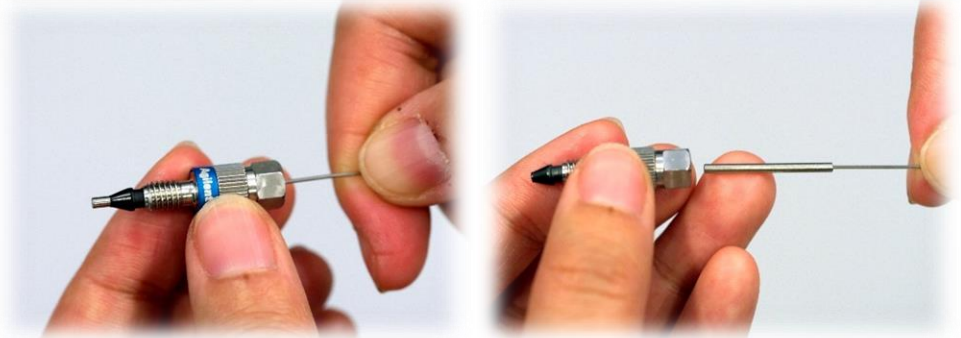
Quick Connect Fitting:

- open the lever
- pull the capillary out of the fitting



Quick Turn Fitting:

- pull out the capillary



In case it should be impossible to separate the two parts it has to be expected that the fitting is defect due to excessive force being applied while connecting it.

How to install the capillary

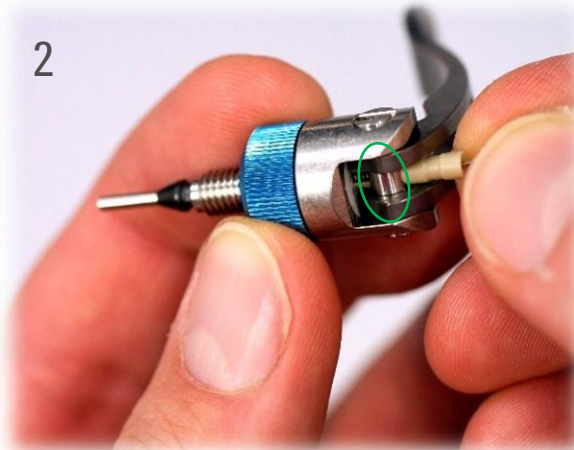
Installing the capillary is very similar on both fittings as it simply needs to get pushed in. But be aware about some specials for each fitting.

Quick Connect Fitting (lever in 'open' position):

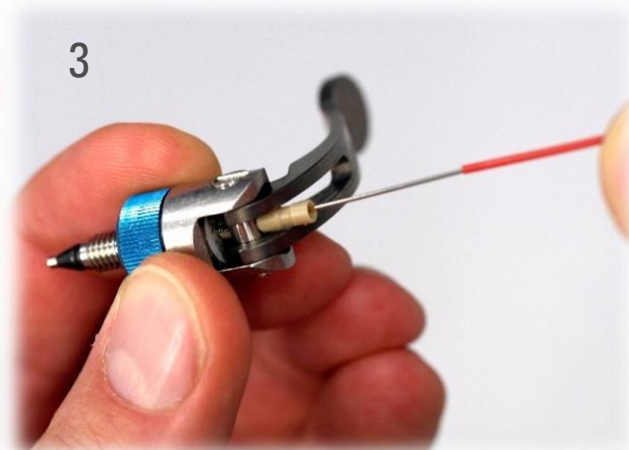
Hold the fitting in one hand and the PEEK adapter with the other hand and push the capillary into the rear of the fitting.



1
Grab the rear end of the PEEK adapter



2
Push until the PEEK adapter hooks into the lever's bolt

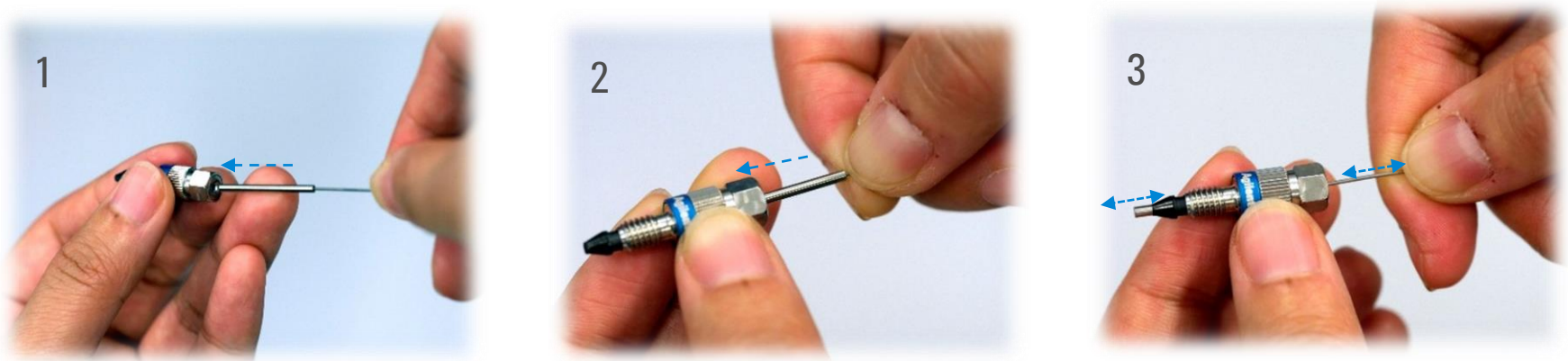


3
Carefully pull on the capillary to verify it is correctly installed - the PEEK adapter keeps the capillary attached to the fitting.

How to install the capillary

Quick Turn Fitting

1. Hold the fitting in one hand and slide it onto the capillary.
2. During this procedure the capillary needs to be pushed through the internal clamping ring and therefore a certain force is required at this point. Continue to push the capillary until its front end is visible. (approx. 1cm w.o. ferrule, 3mm with ferrule).
3. Pull carefully on the capillary to verify you can feel the spring-load function.



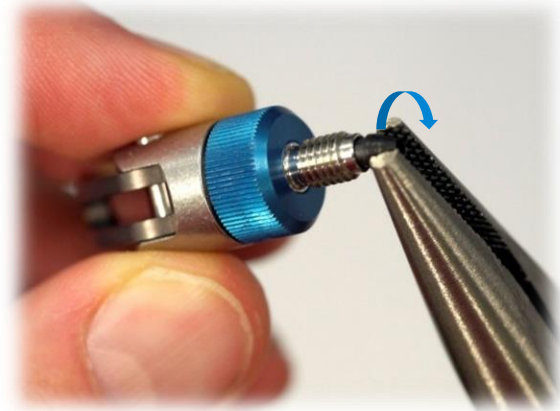
Both procedures for installing the capillary have been shown with the ferrule still in place. Difficulties can occur during this procedure if the ferrule is squeezed.

→ Check the ferrule first for defects and replace it if necessary. (see next page)

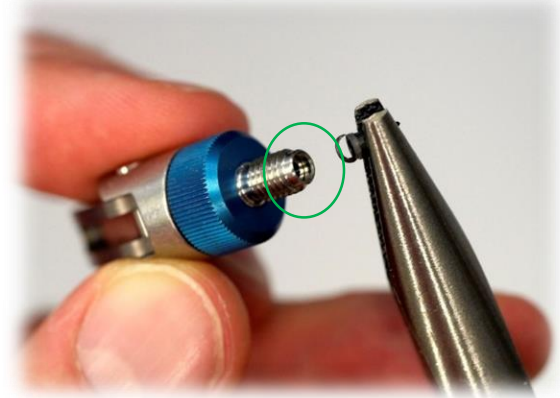
How to remove the ferrule

Removing the ferrule requires the same procedure for the Quick Connect and for the Quick Turn Fitting.

1. De-install the capillary first and use a plier to twist-off the ferrule



2. Check the fitting for any remainings and remove them if necessary with a tweezer before installing the new ferrule.

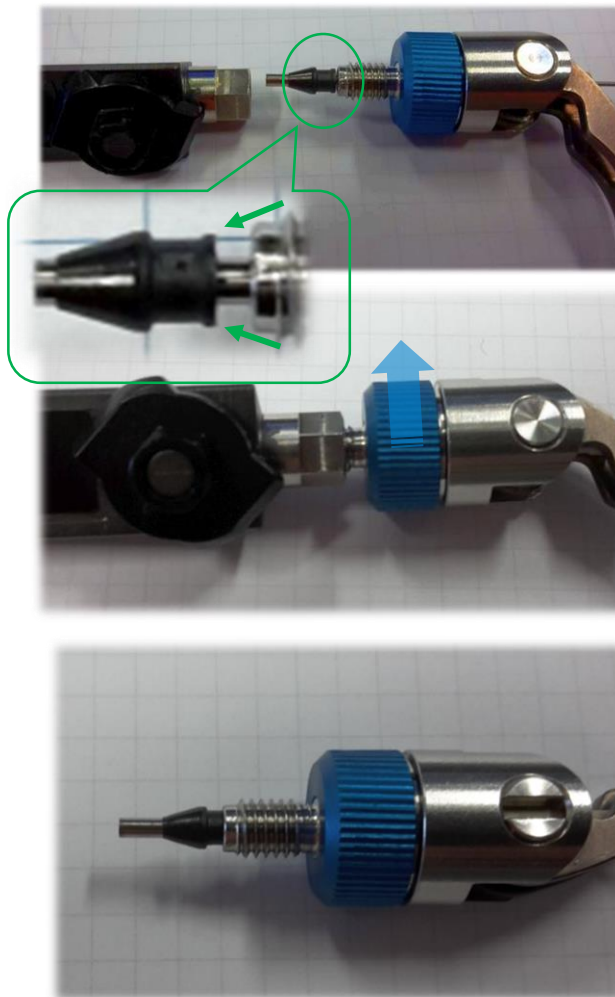


How to install the ferrule

This procedure is applicable for the **Quick Connect** and the **Quick Turn Fitting**. A capillary needs to be already installed.

1. Slide the ferrule over the tip of the capillary.
2. Screw the fitting into a suitable counterpart until it is just finger tight.

While screwing the fitting into the counterpart you will feel a slight increase in resistance. At this point the small retention ring of the ferrule is pushed into the fitting. Just continue and directly when the resistance is passed the ferrule is installed.



Bad connections

The following pages share some insights about bad connections:

- visible effects
- root causes
- how are the Quick Connect and Quick Turn Fitting affected?
- troubleshooting information

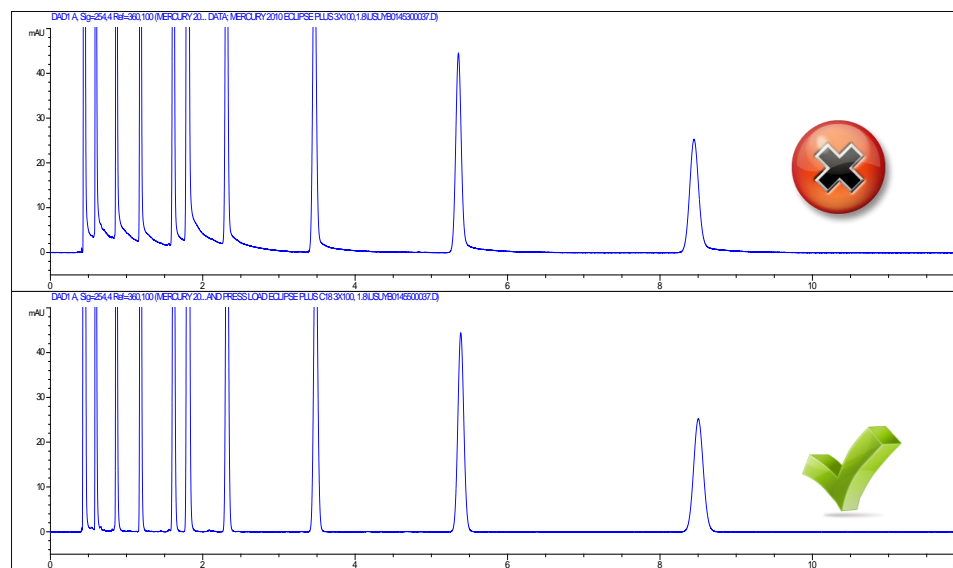
Visible effects of a bad connection:

Leaks

- low system pressure
- visible solvent leaks

Bad chromatography

- Retention time shift
- Bad peak shape



Peak tailing due to extra volume

Bad connections

Root causes can be categorized as being **technical** and/or **operational**.

Both are usually closely linked as they always can be result and cause to each other.

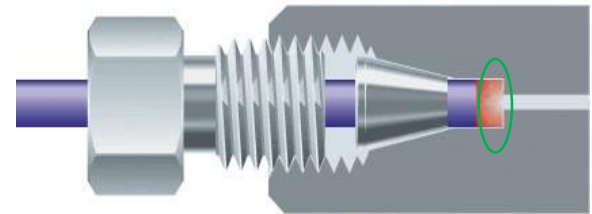
Additional Volume

possible causes

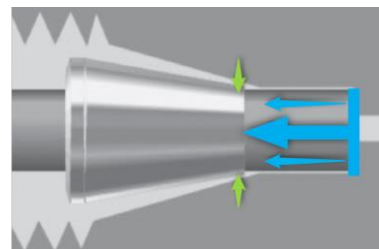
- (pre-) swage distance (stem length) too short on non-adjustable fittings
- Tubing slippage - system pressure larger than fitting's holding power
- Fitting screw (thread) too short

possible effects

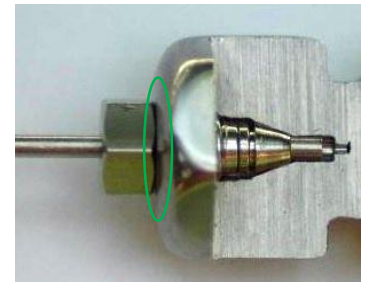
- retention time shift
- bad peak shape (e.g. tailing)



Additional volume due to short stem length



Tubing slippage



Fitting screw too short

Leaks

potential causes

- Defect ferrule (normal wear, excessive force)
- Fitting screw too long (ferrule cannot seal sufficiently)
- Incompatibility between fitting and receiving port (stem length, thread, port geometry)
- Receiving port (counterpart) damaged

potential effects

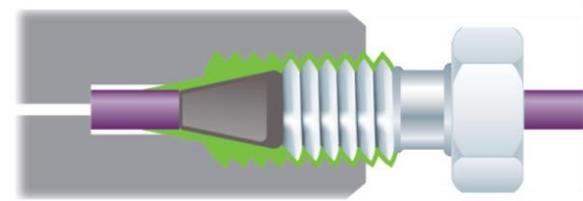
- retention time shift
- bad peak shape (e.g. tailing)
- solvent spill



Bad PEEK ferrule



squeezed stainless steel ferrule



Stem length too long

Incompatibilities in the geometry between fitting and receiving port (e.g. long stem length) can lead to excessive force being applied to make the connection tight.

Applying too much force not only damages the fitting as it will also constantly damage the receiving port step by step, requiring more and more force being applied to receive a tight connection.

Troubleshooting

For a successful troubleshooting it is important to trace down the problem for the real root cause in order to prevent a recurrence and continuously damaging of the fitting and the responding counterpart as well.

Example for the connection of problems and root causes

<u>Problem:</u> Squeezed ferrule	<u>Effect:</u> Capillary with steel fitting stuck in receiving port	<u>Cause:</u> Overtightening <u>Technical Root Cause:</u> <u>Cause:</u> Stem length too long	Operational Root Cause: <ul style="list-style-type: none">• bad installation process by operator (non-swaged capillaries)or• Capillary with wrong stem length (pre-swaged capillary)
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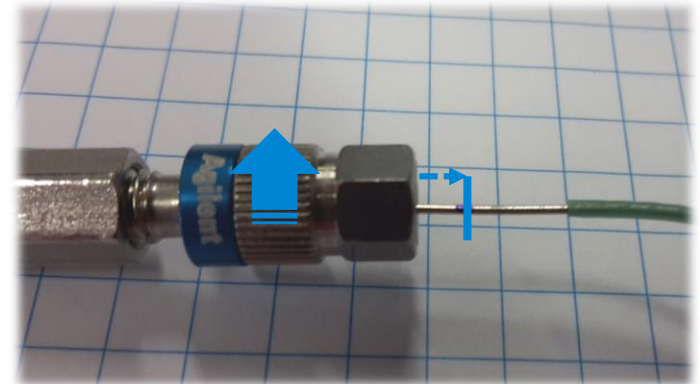
The spring function on the Quick Connect and Quick turn Fitting automatically adjusts the stem length and prevents dead volume due to improper installation. Nevertheless this problem can still occur on both fittings due to:

- Tubing slippage (fitting insufficiently tightened or incompatibility to receiving port)
- Re-tightening the fittings without completely taking them off first will prevent the spring to re-adjust the stem length in case of a slipped tubing
- Receiving port depth too deep or thread too long

Checking for the stem length

If in doubt that the stem length of the Quick Connect or Quick Turn Fitting is long enough the below described procedure can be used for a check.

1. Insert the fitting into the counterpart and turn until the thread starts to engage.
2. Use a marker and mark the capillary at the point where it enters the fitting.
3. As soon as capillary tip has contact to the bottom of the port the fitting moves forward along the capillary increasing the distance between the mark and the fitting end.



Issues observed with the Quick Connect and Quick Turn Fitting

Fitting stuck on capillary:

If excessive amount of force being used for tightening the fittings internal parts can be damaged and the fitting will be swaged onto the capillary.

Be careful with the applied force to tighten the fittings.

Corrosion:

Under normal conditions the PEEK ferrule is the only wetted part of the fitting.

Nevertheless in case of a small leak on the fitting itself or elsewhere it may happen that internal parts get into contact with solvent.

These internal parts are made of high quality stainless steel similiar to the material used in the flow path of the LC instruments.

This stainless steel may show signs of corrosion if being exposed to solutions containing chlorides especially at high temperatures and over a certain time period.

In case of corrosion therefore it is recommended to follow a detailed troubleshooting on leaks, check for damaged ferrules and also damages on the receiving port.