

How to get the most out of your new ACE® Excel™ UHPLC column *(avoiding extra column volume and unwanted peak dispersion)*

High resolution UHPLC systems are extremely sensitive to the introduction of **extra column volume** (dead volume), which will adversely affect your chromatography and result in unwanted peak dispersion.

Therefore, when installing any UHPLC column, it is vital to ensure that the high pressure inlet tubing is fitted into the column port to the correct depth to avoid the introduction of any **extra column volume**.

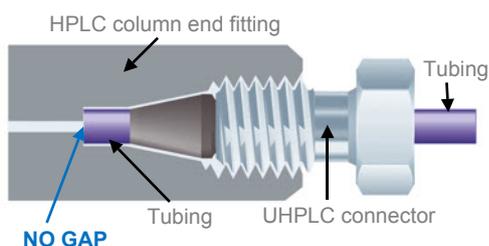


Figure (i). Tubing correctly fitted ⇒ no gap between tubing and column frit = no extra volume introduced.

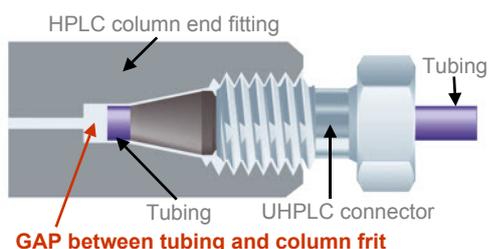


Figure (ii). Tubing incorrectly fitted (or tubing that has experienced slippage due to incorrect tightening) ⇒ gap between tubing and column frit = extra volume introduced.

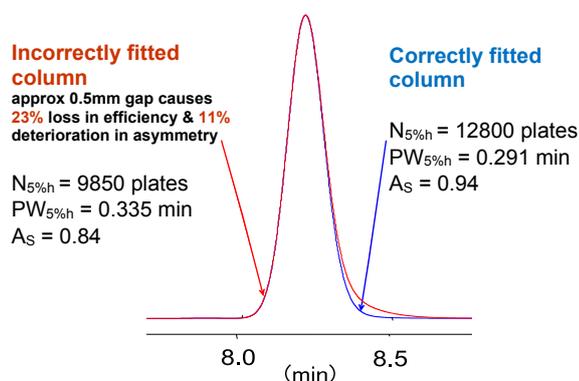


Figure (iii). Chromatogram illustrating the effect of correct and incorrect positioning of the inlet tubing, ferrule and nut.

In this example a ≈ 0.5 mm gap results in a **23% loss in efficiency** and a **11% deterioration in asymmetry**.

How to install your ACE® Excel™ UHPLC column correctly

Your ACE® Excel™ UHPLC column is compatible with virtually all UHPLC fittings and instrumentation. As with all UHPLC columns, correct installation is vital to get the most out of your column.

When you install your new ACE® Excel™ UHPLC column (and every time you change a UHPLC column) a “fresh connection” should always be made between the tubing and the UHPLC connector. Avoid UHPLC connectors that have already been swaged onto the tubing, as these may lead to a gap between the tubing and the column and the introduction of **extra column volume** (dead volume) into the system (as described previously).

For a “fresh connection” every time, we recommend the use of ACE® UHPLC reusable column connectors (Part no. EXL-CC (1/pk) or EXL-CC10 (10/pk)). These fittings are rated for use up to 25,000psi (1,720 bar). They are also suitable for use up to 100°C. Correctly used, these fittings will provide a “fresh connection” for approximately 10 column installations.

The following simple guidelines will help you install your new column correctly.

Installation using ACE® UHPLC reusable column connectors (Part no. EXL-CC)

1. Slide the fitting onto the UHPLC tubing (approximately 5mm ($\frac{1}{4}$ ”) from the end).



2. Insert the assembly into the receiving female port of the column, pushing the tubing in until it ‘bottoms out’.
3. Whilst maintaining pressure on the tubing (to ensure that it continues to ‘bottom out’), finger tighten the fitting into the column until snug.
4. Using the ACE® Torque Wrench (Part no. EXL-TW), tighten the fitting to the correct torque (while continuing to maintain pressure on the tubing).

Instructions for the correct use of the ACE® Torque Wrench are provided with the torque wrench.

A starter kit containing 1 x ACE® Torque Wrench and 4 x ACE® UHPLC reusable column connectors is available (Part no. EXL-CCSK).

ACE® Excel™ UHPLC column connectors reliably provide a “fresh connection” every time.

General awareness of 'good' UHPLC connections

Whenever you are installing an ACE® *Excel™* UHPLC column, we strongly recommend that you ensure that you make a "fresh connection". A previously used / swaged connector may result in a poor column to tubing connection, causing **extra column volume** in the system and unwanted peak dispersion.

When installing an ACE® UHPLC column using other manufacturers' UHPLC connectors, it is also vital that you ensure that the tubing bottoms out in the column port to avoid dead volume (as described previously).

UHPLC column outlet end connections

ACE® UHPLC reusable column connectors (EXL-CC) are suitable for use at both the column inlet and the column outlet, to make good UHPLC connections. Alternatively, at the column outlet end an ACE® reusable PEEK finger-tight column connector (ACE-FT, suitable for use up to 5,000psi, 345 bar) can be used to make a good connection.

To avoid **extra column volume** and unwanted peak dispersion, it is additionally important to make good connections at the outlet end of your UHPLC column. Similar principles as previously described for the inlet end connection should be employed.

The importance of a "fresh connection"

Every time you install any UHPLC column you should always make a "fresh connection." UHPLC connectors that have already been swaged onto tubing do not allow free movement between the tubing and the connector which may result in a gap between the tubing and the column and the introduction of **extra column volume** (dead volume) into the system.

ACE® UHPLC reusable column connectors are ideal for a "fresh connection" every time.

ACE® *Excel™* columns and ACE Guard Cartridges

*Existing integral guard holders for ACE® HPLC Columns are not compatible with ACE® *Excel™* UHPLC columns. Please note that the column end-fittings on ACE® *Excel™* UHPLC columns should not be removed.*

Part Numbers

Description	Part No.
UHPLC column inlet / outlet connectors	
ACE® UHPLC reusable column connectors (1/pk) suitable for use up to 25,000psi (1,720 bar)	EXL-CC
ACE® UHPLC reusable column connectors (10/pk) suitable for use up to 25,000psi (1,720 bar)	EXL-CC10
ACE® UHPLC reusable column connectors starter kit (contains 1 x Part no. EXL-TW and 4 x Part no. EXL-CC)	EXL-CCSK
ACE® Torque Wrench	EXL-TW

Description	Part No.
UHPLC column outlet connectors	
ACE® reusable PEEK finger-tight column connector (1/pk) (suitable for use up to 5,000psi, 345 bar)	ACE-FT
ACE® reusable PEEK finger-tight column connector (10/pk) (suitable for use up to 5,000psi, 345 bar)	ACE-FT10



ACE® products are available through our international distributor network

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ACE® *Excel™* UHPLC columns - high efficiency, ultra robust columns.

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