

Easy and Painless GC Column Installation with Phenomenex® Cool-Lock™ Nut

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The Cool-Lock Nut is a capillary GC installation tool that eliminates most issues associated with improper column installation. Its unique patent pending design also allows you to change your column quicker, without using Tipp-Ex®, Wite-Out®, or burning your fingers.

Introduction

Accurate GC column installation is critical for a GC system to function properly. Yet errors in this seemingly simple process will cause various problems associated with a GC analysis. The typical column replacement process involves several steps that are not only time-consuming, but can introduce numerous errors (**Table 1**).

To address these issues, Phenomenex has developed the Cool-Lock Nut, a capillary GC installation tool that eliminates most problems associated with column installation. The Cool-Lock Nut is a significant improvement over other commercial GC nuts in many ways. In this technical note, we demonstrate how the Cool-Lock Nut will help you achieve accurate, quick, and easy GC column installation each and every time.

Table 1.

Typical problems associated with GC column installation

Issues	Problems
Slow inlet cool down	<ul style="list-style-type: none"> • Time-consuming • Possible burning of fingers (if not properly cooled, chemists can burn hands when detaching the installation nut)
Improper installation depth	<ul style="list-style-type: none"> • Can cause irreproducibility and inconsistent results

Design Improvements Over Traditional GC Nuts

The Cool-Lock Nut's unique patent pending design helps simplify the column installation process (**Figure 1**). In contrast to a normal capillary installation nut, the Cool-Lock Nut has a knurled installation wheel fused to the body of a typical nut. This allows you to secure the nut in place without having to get close to the injector or detector. Its user friendly design also allows you to tighten the column in place, thus eliminating the need for a wrench. Another unique aspect of the wheel is that it is thermally isolated from the nut allowing it to cool quickly with the oven while the inlet or detector temperature remains elevated. See **Table 2** for a summary of all the benefits the Cool-Lock Nut provides.

Figure 1.
Cool-Lock Nut Unique Design

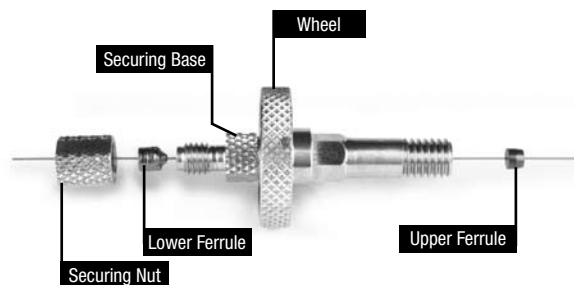


Table 2.

Benefits of the Cool-Lock Nut's Unique Design

Features	Benefits
Wheel	<ul style="list-style-type: none"> • Easier to access nut • Finger tighten capability • Eliminate need for wrench • Thermal isolation helps you avoid burning your fingers • Quicker column change
Securing nut	<ul style="list-style-type: none"> • Secures column in place • Ensures proper installation depth • Eliminate need to use Tipp-Ex or Wite-Out

Cools Down Fast for Rapid Column Installation

The Cool-Lock Nut significantly decreases the time that chromatographers need to wait before they begin changing a column. When the oven temperature is lowered to 30 °C but injector or detector temperatures are not, the Cool-Lock Nut cools quickly. From the onset, the nut starts out at a lower temperature compared to the standard nut (**Figure 2**). Its low thermal mass and thermal isolation allow it to cool down faster, making it comfortable for chromatographers to manually install or remove the nut without waiting for the inlet/detector to cool down. Compared to the 15 minutes required for cool down of the standard installation nut, it only takes 5 minutes for the Cool-Lock Nut to cool down to a temperature comfortable enough to handle without burning your fingers.

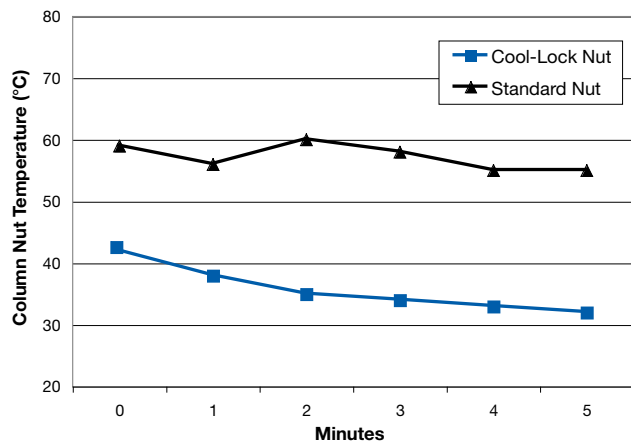
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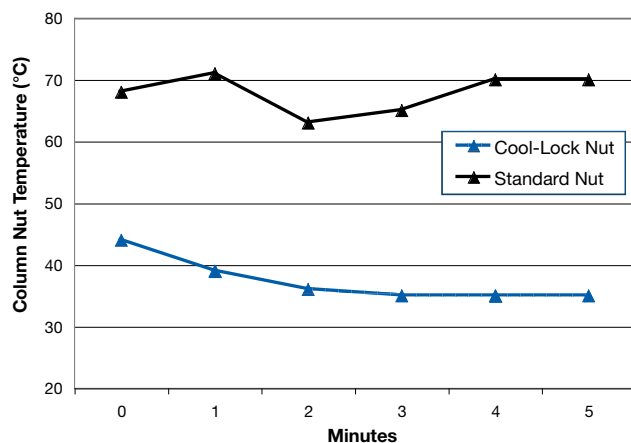
Figure 2.

The Cool-Lock™ Nut cools down faster than a standard nut, regardless of whether the injector is set at (A) 250 °C or (B) 300 °C.

A) Temporal Cool Down Profile of Column Nuts with Injector set at 250 °C



B) Temporal Cool Down Profile of Column Nuts with Injector set at 300 °C



Helps Provide Higher Signal-to-Noise Ratio

Columns that are installed at an improper or inconsistent depth will cause various chromatographic problems, such as poor sensitivity, split or tailing peaks, poor run-to-run response reproducibility, or a noticeable decrease in sensitivity. With the Cool-Lock Nut, the correct installation depth is easily achieved every time, ensuring that you will get the best signal-to-noise ratio possible (Figure 3).

Saves Time

Many GC users have found that the Cool-Lock Nut brings significant improvements to their work.

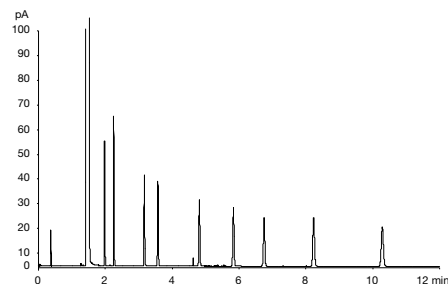
"I have been doing GC work for about 20 years and have seen just about everything when it comes to GC analysis. This Cool-Lock Nut is a welcome tool for those of us cursed with the task of quick column replacement."

"Using the Cool-Lock Nut did speed up the process because we didn't have to wait as long to allow the inlet and detector connections to sufficiently cool down. Time is always critical in a manufacturing environment, so any tools that can help speed tasks up are invaluable."

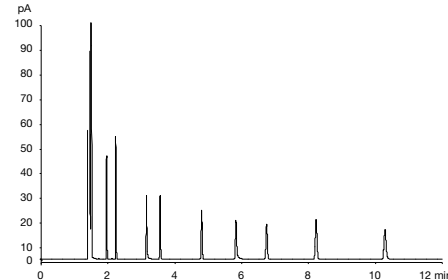
Figure 3.

Improved signal-to-noise ratio using Cool-Lock Nut

A) Correct GC Column Installation

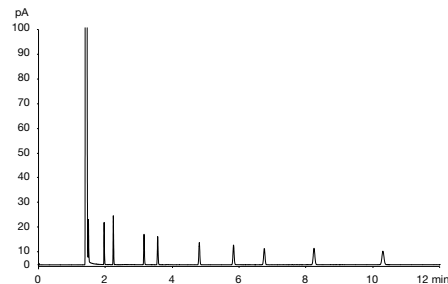


B) Incorrect GC Column Installation at Detector Side



**30 %
Less Signal**

C) Incorrect GC Column Installation at Injector Side



**40 %
Less Signal**

"Because a technician may, in the interest of time, try to manipulate a column connection before it is cooled down, safety is improved because the nuts cool down faster."

"The installation guide also helps as a constant tool with which to measure the depth of the column into the inlet and detector. This is much easier than trying to guess or use a septum to mark the correct spot."

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Ordering Information

Easy Cool-Lock™ Nut Selection

There are two simple steps to selecting the right Cool-Lock Nut for you.

1) Decide on the style of Cool-Lock Nut needed

Short Style (AG0-8319)	Long Style (AG0-8320)
Recommended for use with standard short style ferrules.	Recommended for use with standard long style ferrules.
Also, use for both the inlet and detector configurations on an Agilent® 6890 GC system. (Short ferrules provide a robust seal and typically remain tight over time.)	

2) Determine how many Cool-Lock Nuts are needed per system

Detector	Number of Cool-Lock Nuts Needed
MS	1
FID, ECD, Other	2

Parts for Agilent® HP® GC Systems

Cool-Lock GC Capillary Nut

Part No.	Description	Unit
AG0-8319	Cool-Lock GC Nut For Use With Short-Style Ferrules	ea
AG0-8320	Cool-Lock GC Nut For Use With Long-Style Ferrules	ea

Guaranteed perfect for Agilent 5850, 5890, 6870, 7890 and 6850 GC systems



Cool-Lock Nut Installation Gauge

Part No.	Description	Unit
AG0-8349	Cool-Lock Nut Installation Gauge	ea

Parts for Shimadzu® GC Systems

Cool-Lock GC Capillary Nut

Part No.	Description	Unit
AG0-8419	Cool-Lock GC Nut For Use With Short-Style Ferrules	ea

Guaranteed perfect for Shimadzu QP-2010 and QP 2014 GC systems



Cool-Lock Nut Installation Gauge

Part No.	Description	Unit
AG0-8420	Cool-Lock Nut Installation Gauge	ea

Replacement Ferrule Selection Chart

Column ID (mm)	Ferrule ID (mm)	Agilent Systems				Shimadzu Systems	
		Long Style Nut		Short Style Nut		Top Ferrule	Bottom Ferrule
0.10 to 0.25	0.4	AG0-4698	AG0-4698	AG0-7513	AG0-4698	Use ferrule for standard Shimadzu nut	AG0-4698
0.25 to 0.35	0.5	AG0-4701	AG0-4701	AG0-7513	AG0-4701		AG0-4701
0.45 to 0.53	0.8	AG0-4704	AG0-4704	AG0-8676	AG0-4704		AG0-4704

Replacement Ferrules



Graphite Ferrules, Rated to 450 °C

- High-purity graphite significantly reduces ferrule bleed
- Special construction minimizes “flaking”

Long Ferrules

Part No.	Description	Unit
0.4 mm Ferrule ID		
AG0-4698	Graphite Ferrule 1/16 in. to 0.4 mm	10/pk
AG0-4699	Graphite Ferrule 1/16 in. to 0.4 mm	50/pk
0.5 mm Ferrule ID		
AG0-4701	Graphite Ferrule 1/16 in. to 0.5 mm	10/pk
AG0-4702	Graphite Ferrule 1/16 in. to 0.5 mm	50/pk
0.8 mm Ferrule ID		
AG0-4704	Graphite Ferrule 1/16 in. to 0.8 mm	10/pk
AG0-4705	Graphite Ferrule 1/16 in. to 0.8 mm	50/pk

Short Ferrules

Part No.	Description	Similar to Mfr. No.*	Unit
AG0-7513	Graphite (100 %) Short Ferrules, 1/16 in. to 0.5 mm	072635	10/pk
AG0-8676	Graphite (100 %) Short Ferrules, 1/16 in. to 0.8 mm	072636	10/pk

*Similar but not always an exact equivalent to the original manufacturer's product.

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Cool-Lock Nut is patent pending by Phenomenex.

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