GC-MS interface

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Interface between GC and MS

❖ Interface connects gas chromatograph with a mass spectrometer.

❖ After the separation in the GC column, analyte species have to be transported to the mass spectrometer to be ionized, mass filtered and detected.

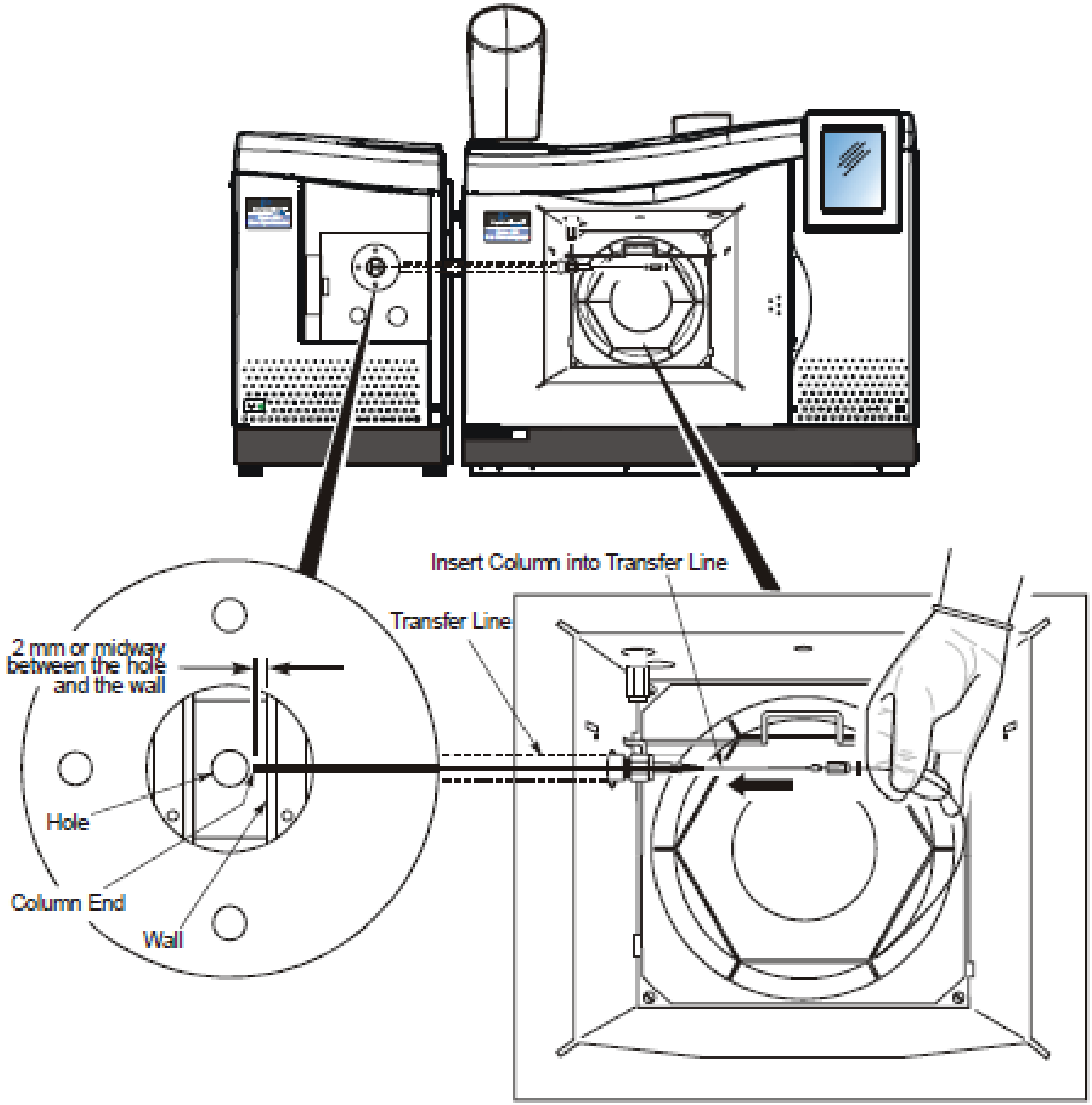
❖Analytes should not condense in the interface. All interface designs contain a heat source or are lagged with a heating jacket.

❖ Analytes must not decompose before entering the mass spectrometer ion source.

❖ The gas load (dictated by the mobile phase gas flow rate) entering the ion source must be within the pumping capacity of the mass spectrometer.

❖ GC-MS applications where the flow rates to the MS detector do not exceed 2 mL/min can usually be achieved by using direct interfaces.

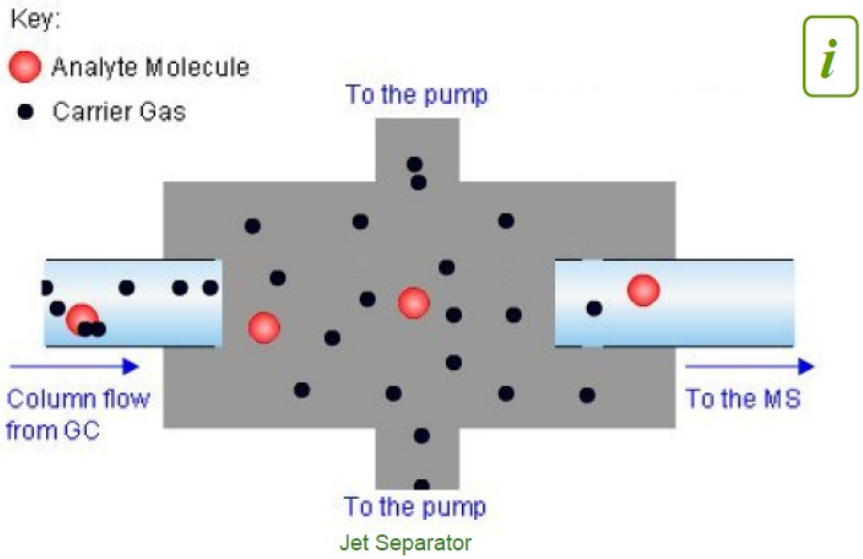
❖ Higher flow rates will require the use of vapor concentrator devices or jet separator interfaces.

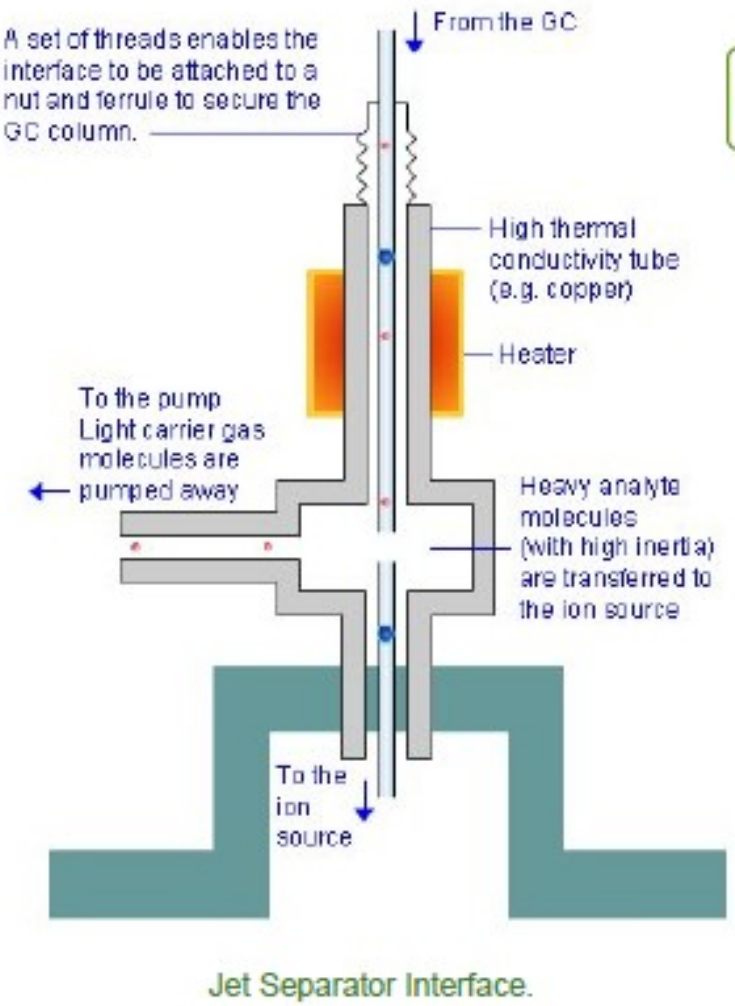

Insert Column into Transfer Line
Transfer Line
2 mm or midway between the hole and the wall
Hole
Column End
Wall

Jet separator

d for packed columns with gas flow > 2mL/min

e volatile species may lost to vacuum

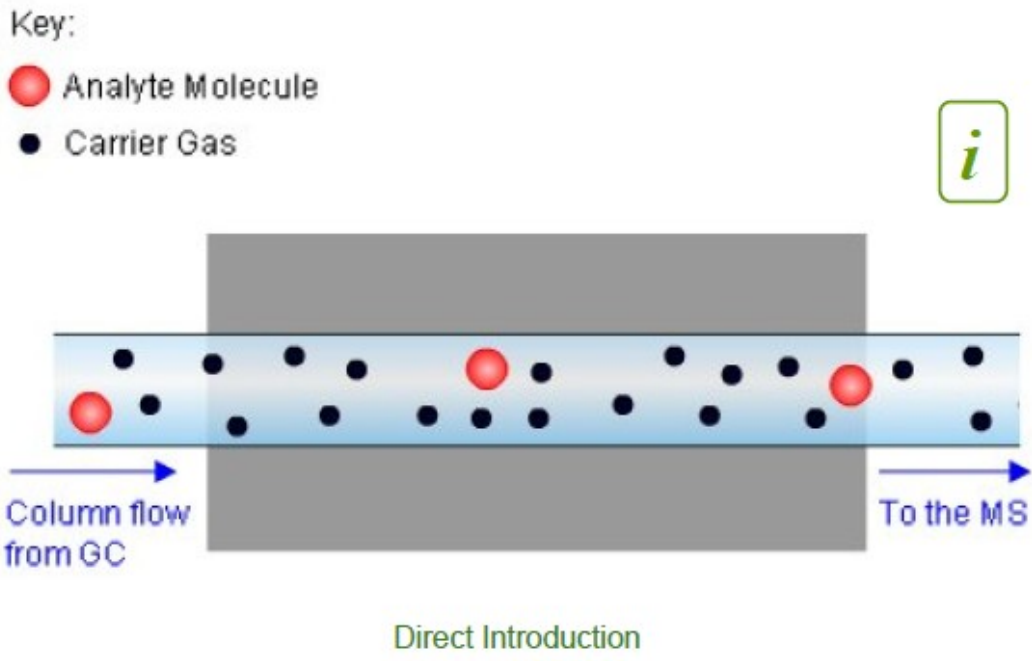




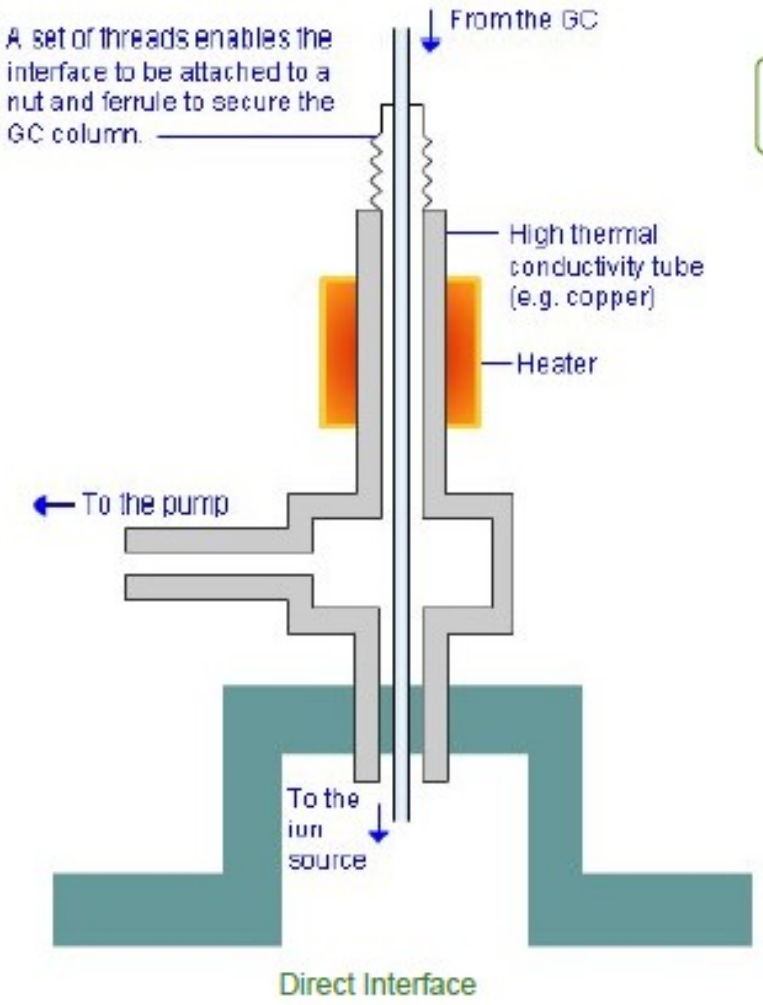
Direct introduction

st commonly used design for capillary GC
Typical flow rates:2 mL/min

Column is inserted directly into the MS ionisation chamber

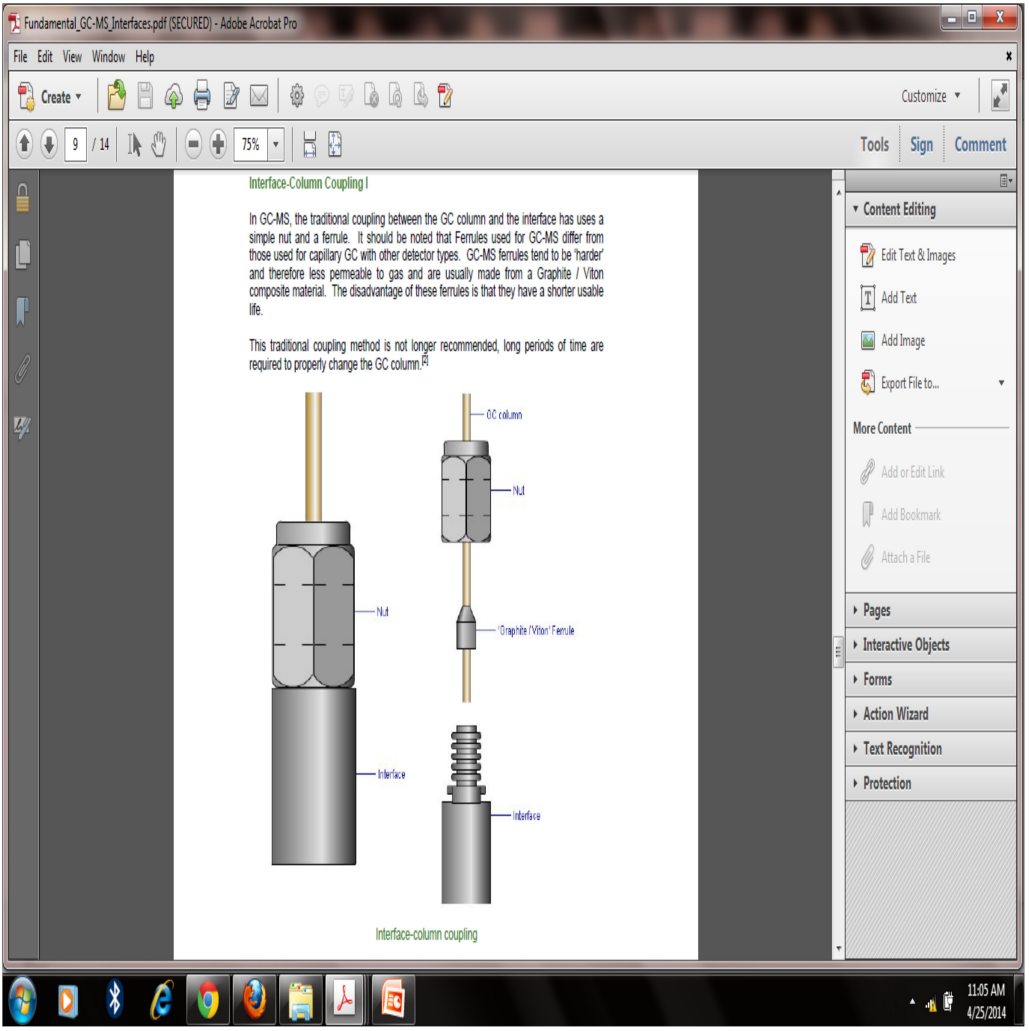


Direct Introduction



Direct Interface

Interface-column coupling I



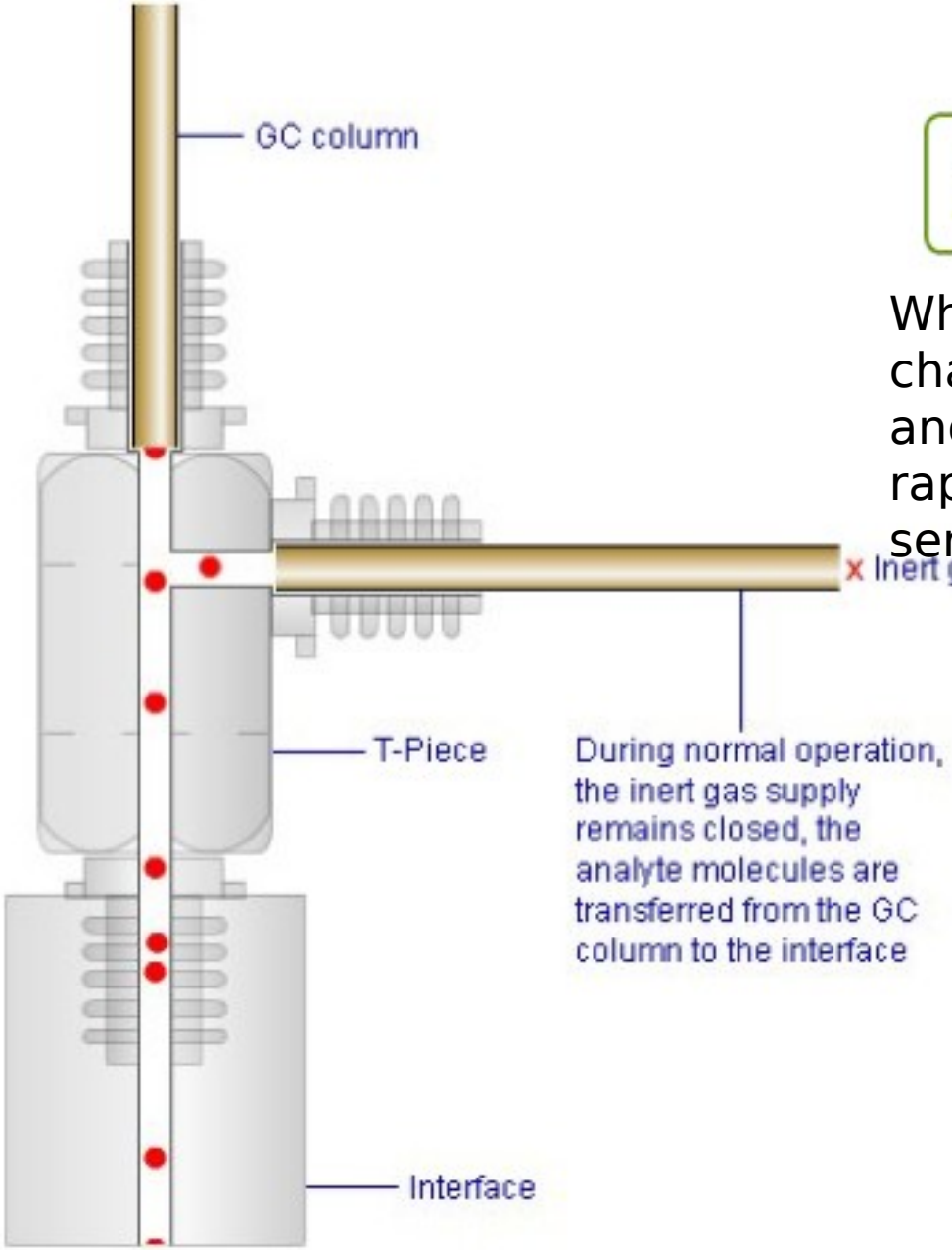
Traditional method

GC-MS ferrules tend to be harder and less permeable to gases

Usually made up of graphite/Vesel

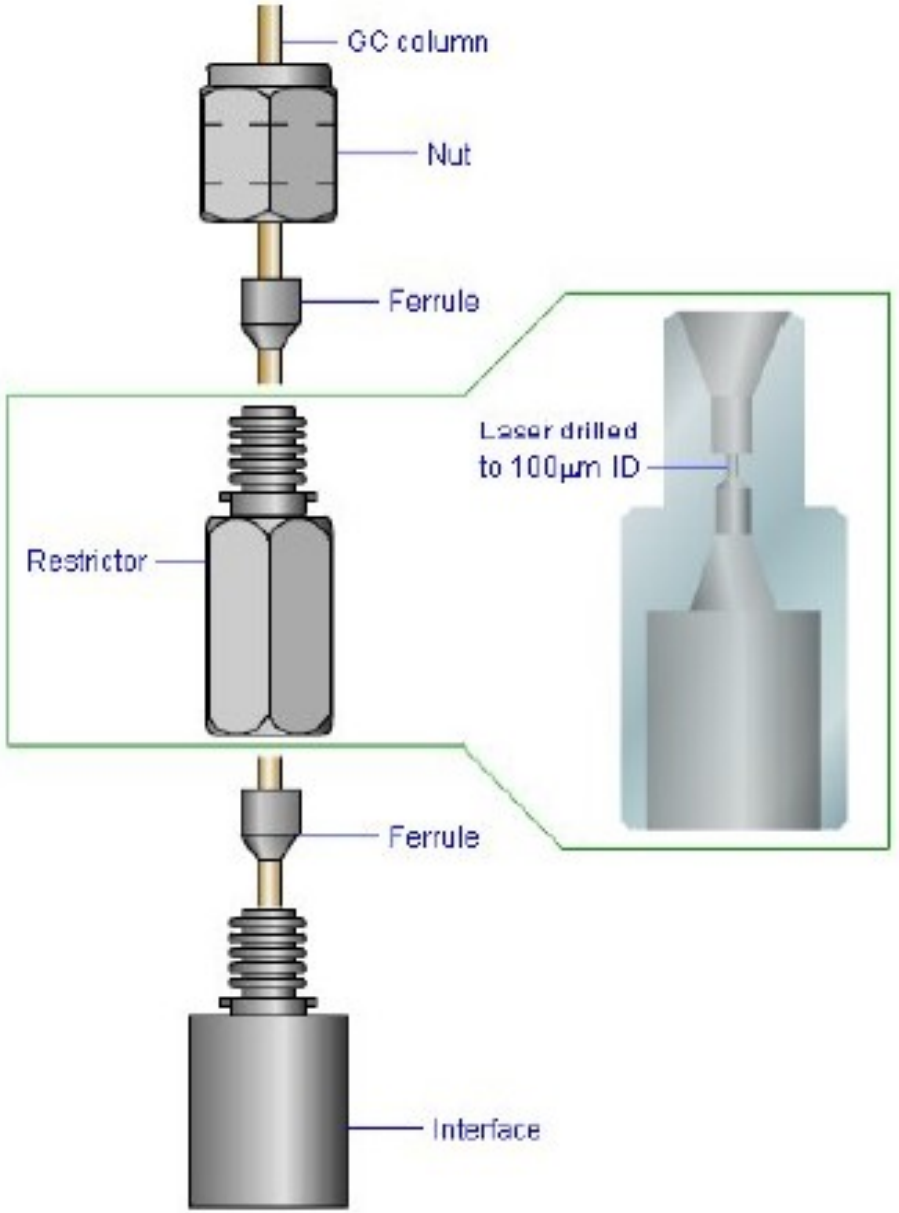
This method is no longer recommended as longer periods of time are required to properly change the GC column

Interface-column coupling II



When the column is removed for changing, the inert gas is pressurized and forms an effective barrier to the rapid intake of air and moisture thus serving to retain the vacuum.

Interface-column coupling III-Use of restrictors



When a restriction connector is installed, pressure drop across the 100 um transfer linea mkes it necessary to increase the head pressure to o btain retention times equal to those obtained without connector.

THANK YOU