

Introducing Intuvo 9000 GC System

- A completely re-imagined integrated system of GC consumables, MS services and software
- New paradigm streamlining the way GC is done
- Better Business Outcome



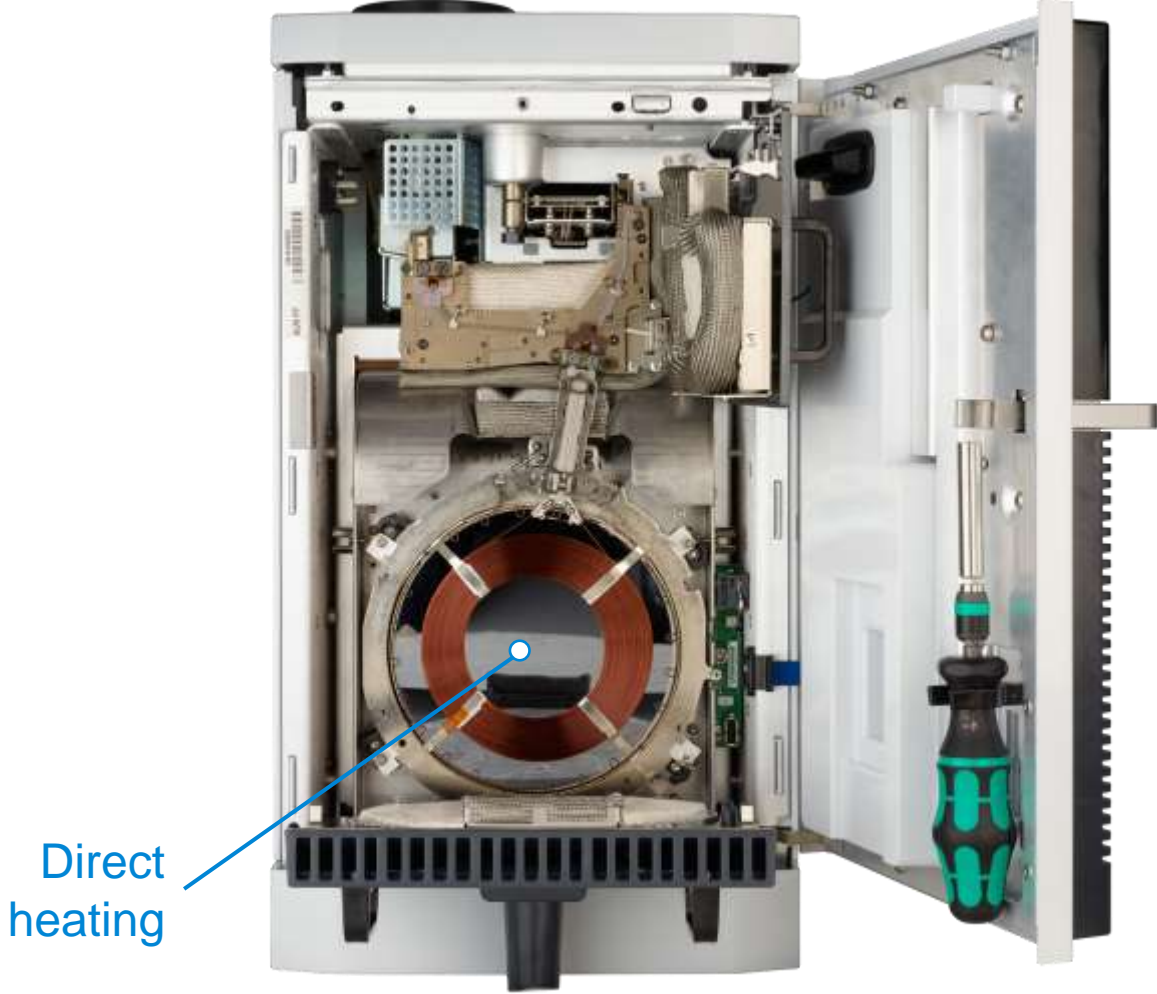
Innovating a New Path to GC Productivity

- Easier
- Faster
- Smaller
- Smarter
- Greener



Innovating a New Path to GC Productivity

A whole new way to GC



Innovating a New Path to GC Productivity

A whole new way to GC



No-trim column

Direct heating



Innovating a New Path to GC Productivity

A whole new way to GC

Ferrule-free click-and-run connections

No-trim column

Direct heating



Innovating a New Path to GC Productivity

A whole new way to GC



Disposable Guard chip

Ferrule-free click-and-run connections



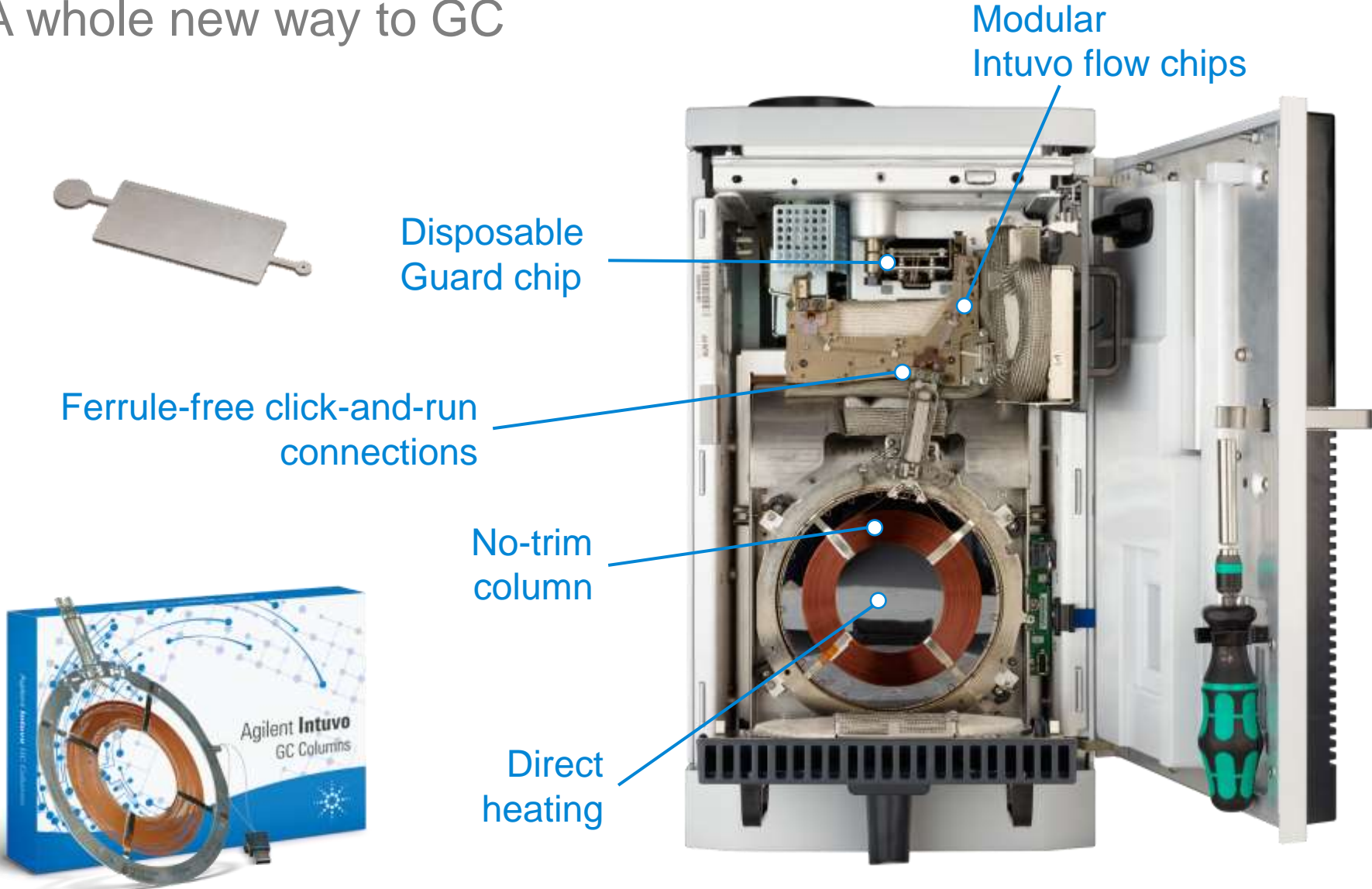
No-trim column

Direct heating



Innovating a New Path to GC Productivity

A whole new way to GC



Flexible Compatible Design

Configurable to any application

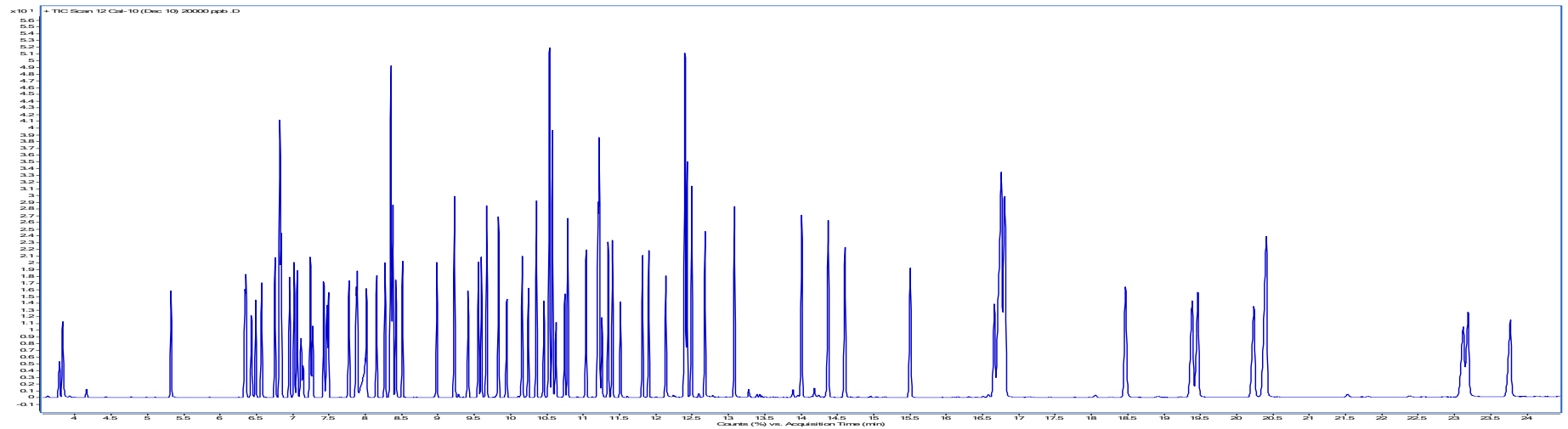
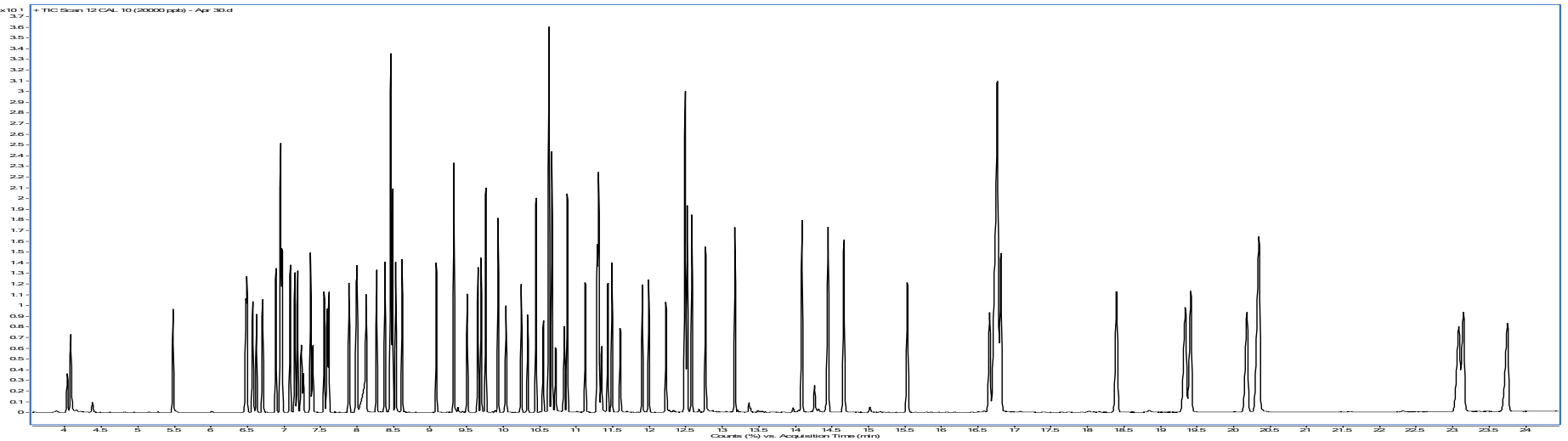


- SSL, MMI, GSV, LSV inlets
- FID, TCD, ECD, NPD, FPD, NCD, SCD detectors
- SQ and TQ mass spectrometers
- Headspace, thermal desorption, purge and trap samplers
- 16-, 50-, 150-position auto-injectors and trays

Seamless Method Migration to Intuvo

Preserving method and SOP investments

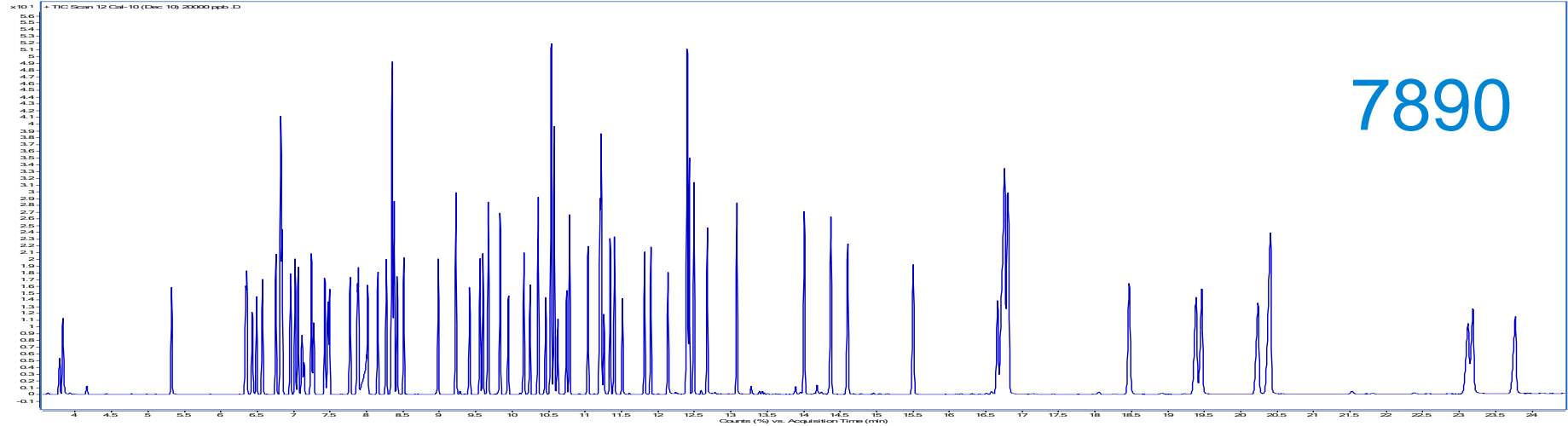
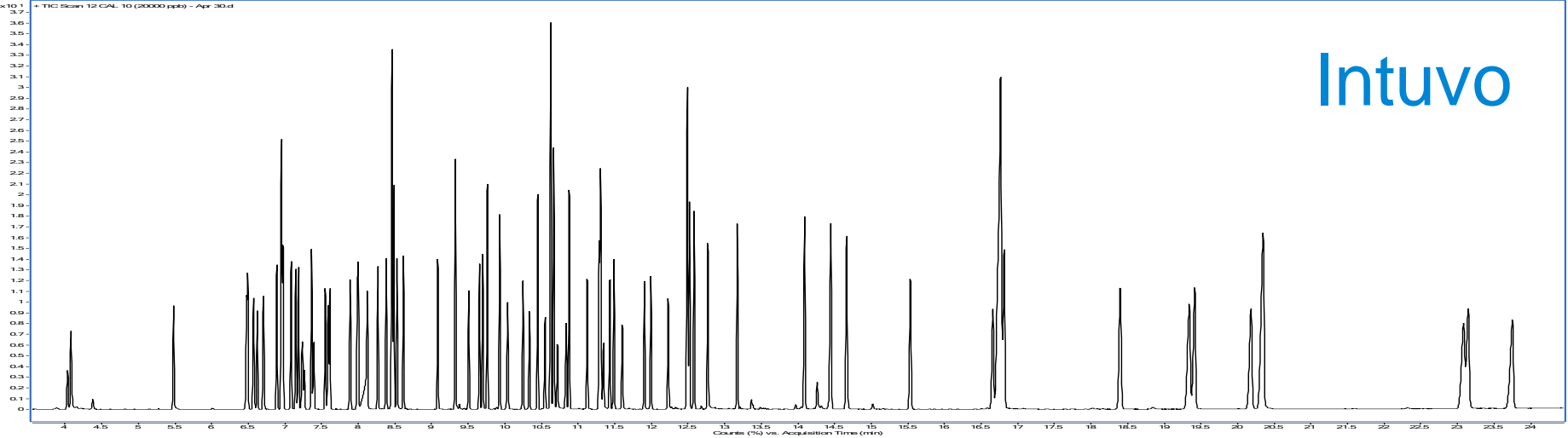
83 SVOC by US EPA 8270



Seamless Method Migration to Intuvo

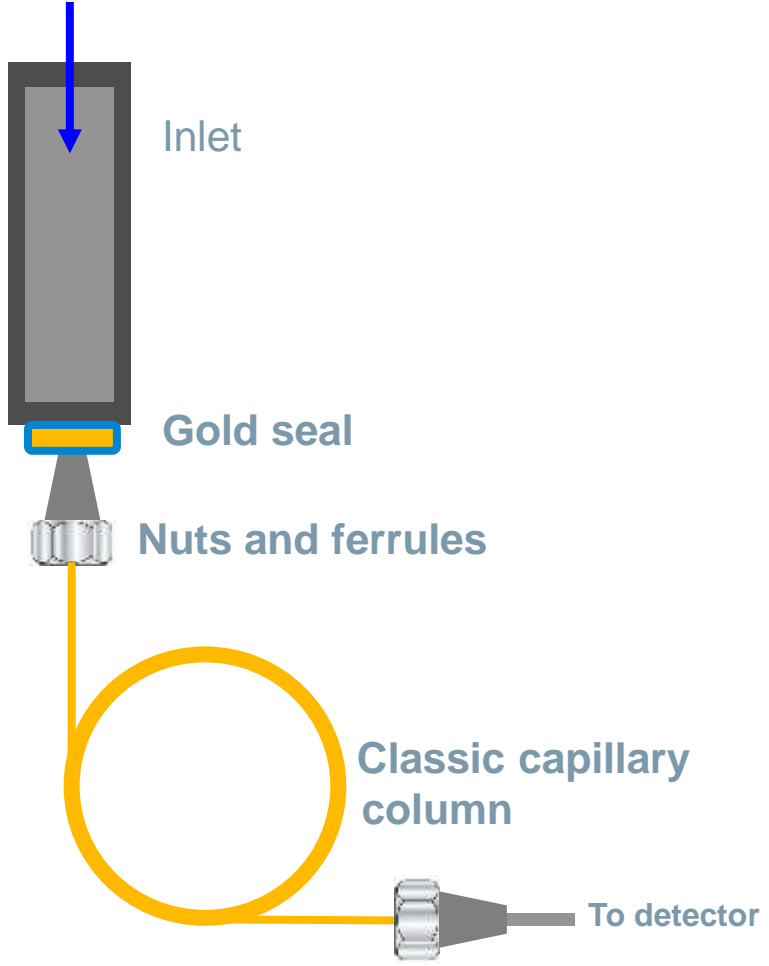
No business disruption

83 SVOC by US EPA 8270



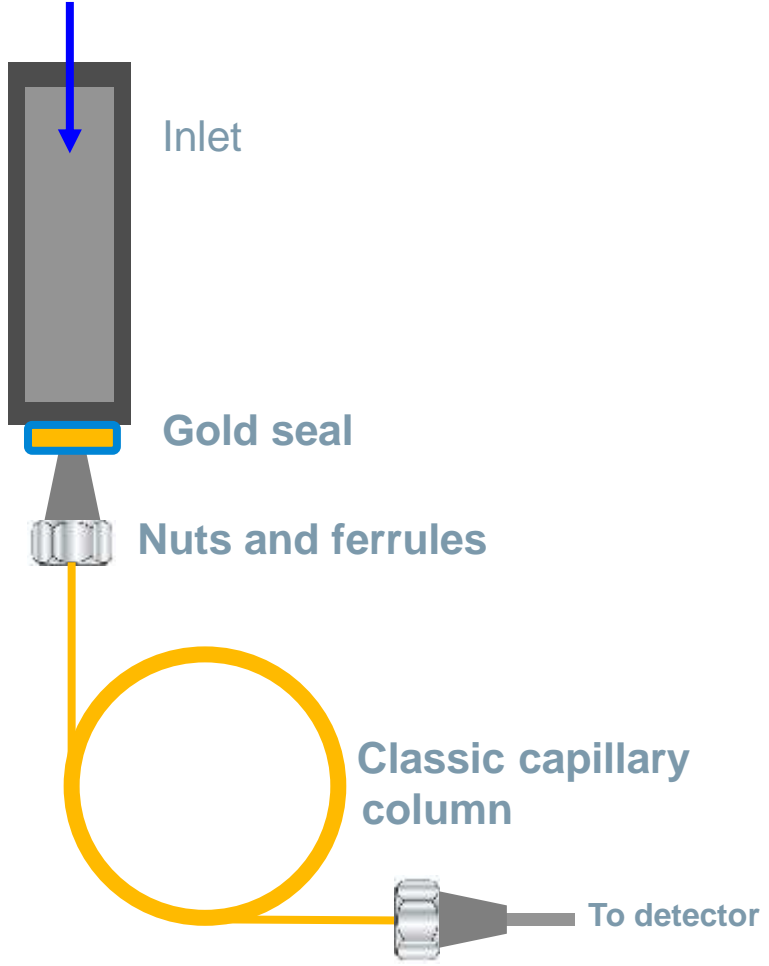
Innovating the GC Flow Path

Conventional flow path

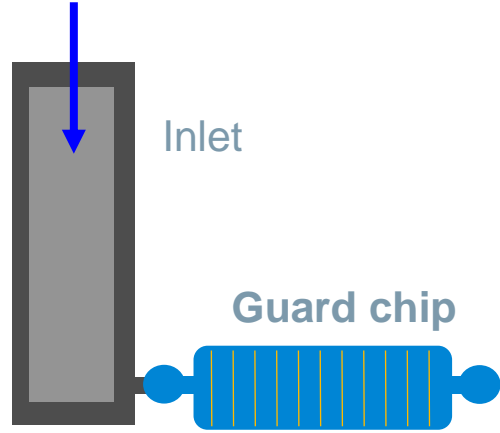


Innovating the GC Flow Path

**Conventional
flow path**

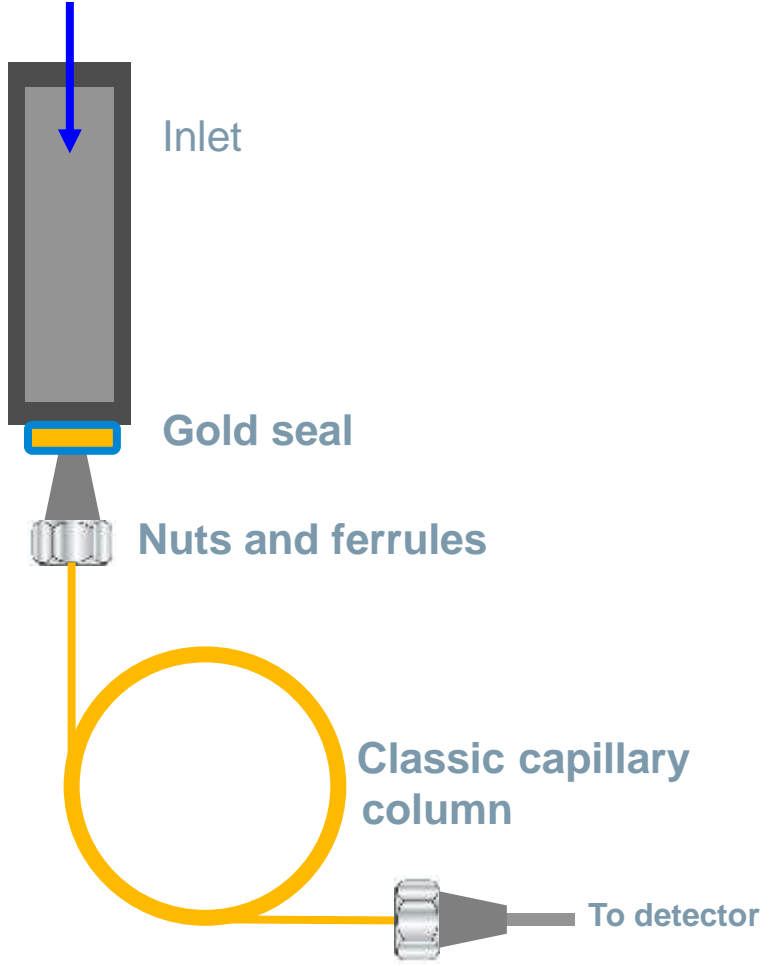


**Intuvo
flow path**

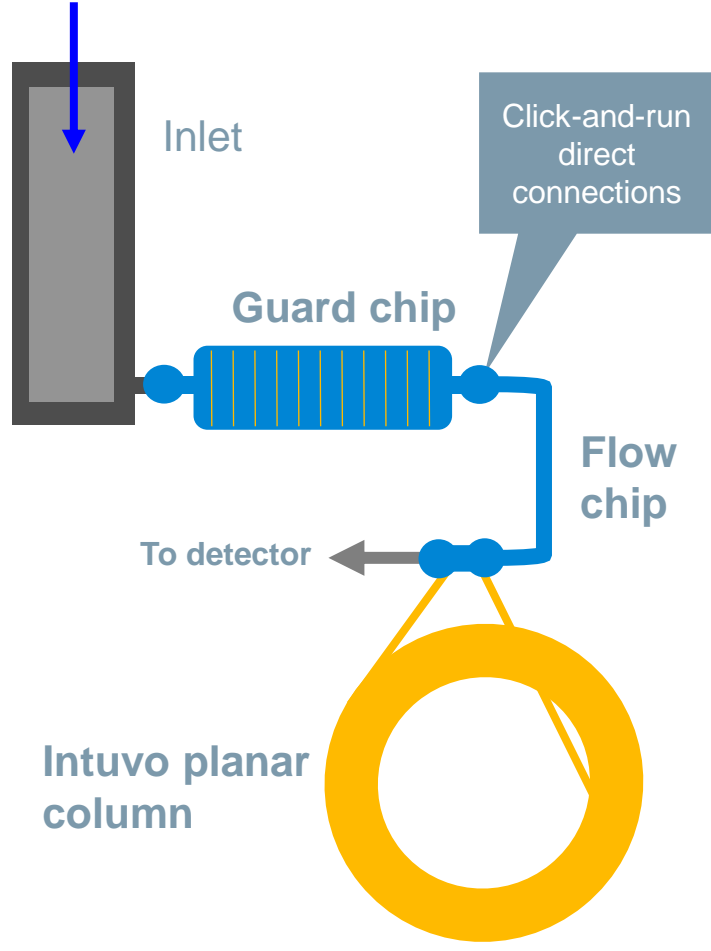


Innovating the GC Flow Path

Conventional flow path

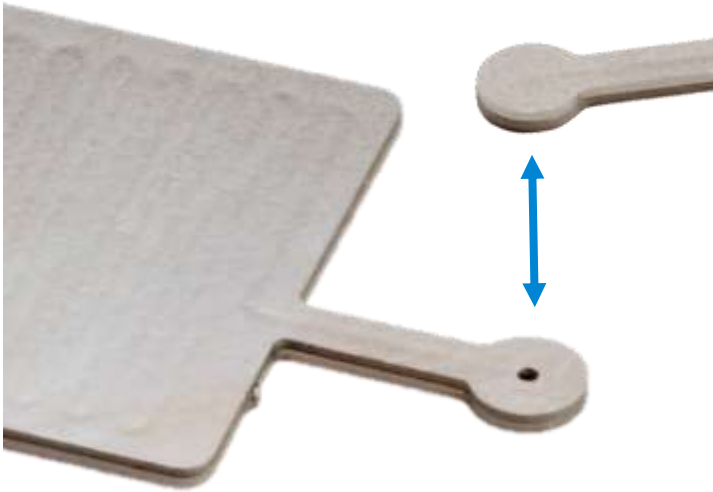


Intuvo flow path



Click-and-Run Direct Connections

Eliminating connection uncertainty

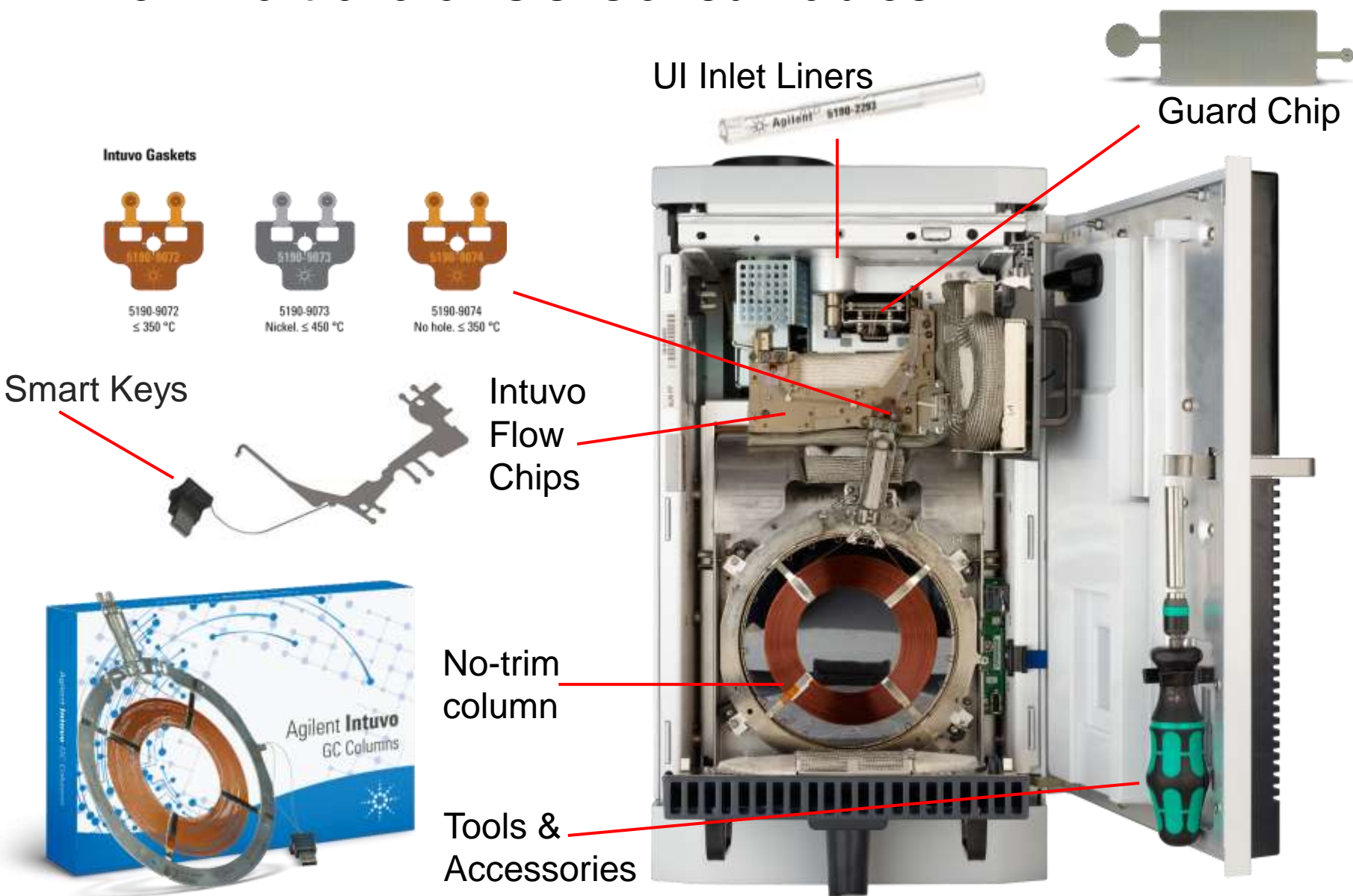


- No more ferrules
- Direct face seal connections
- Audible and tactile click lets you know connection is made



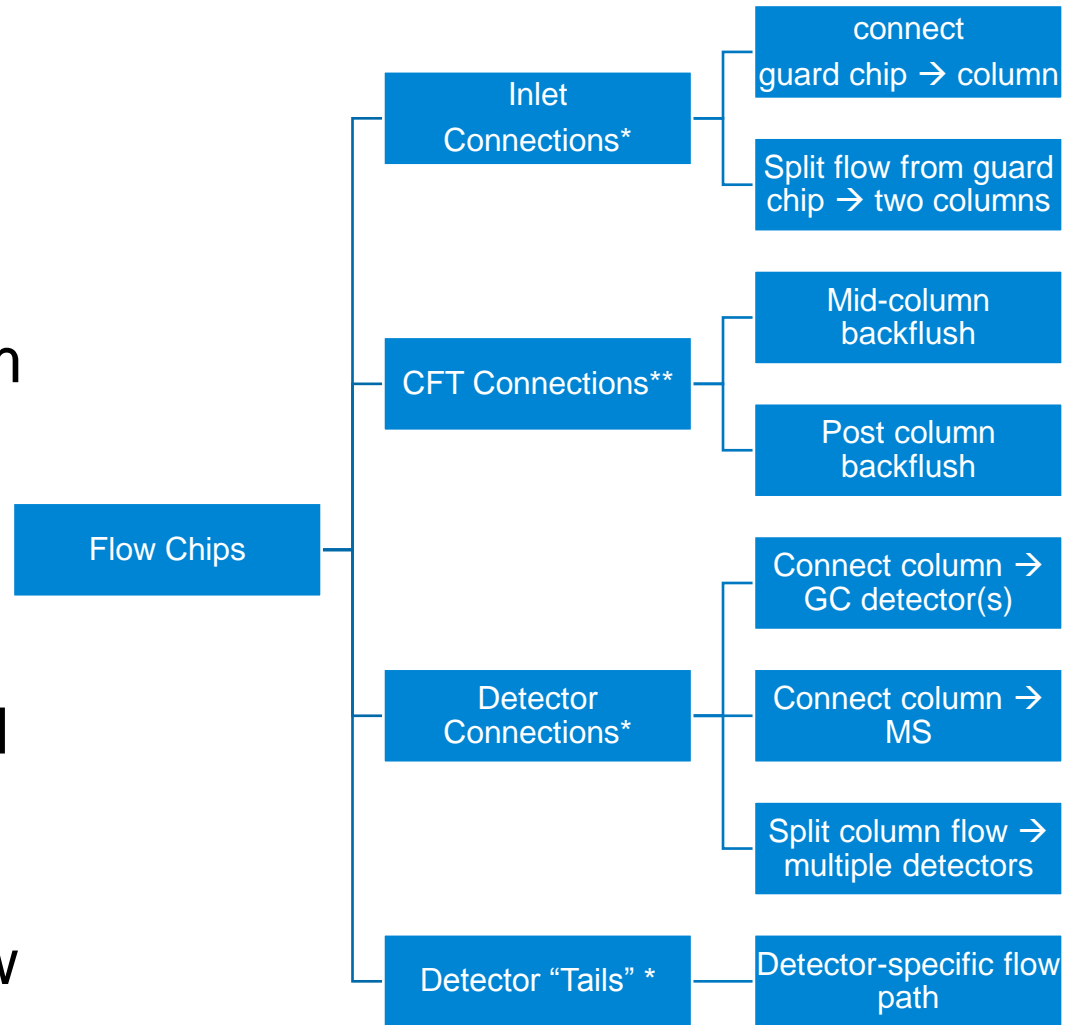
- Easier to train
- Less unplanned downtime
- Fewer batch reruns and precious samples lost

A New Portfolio of GC Consumables



Intuvo Flow Chips

- Modular microfluidic chips
- Configures flow path from inlet to detector
- Provides ferrule-free connections
- Volumes, restrictions and flow rates are known precisely eliminating the need for complicated flow calculators

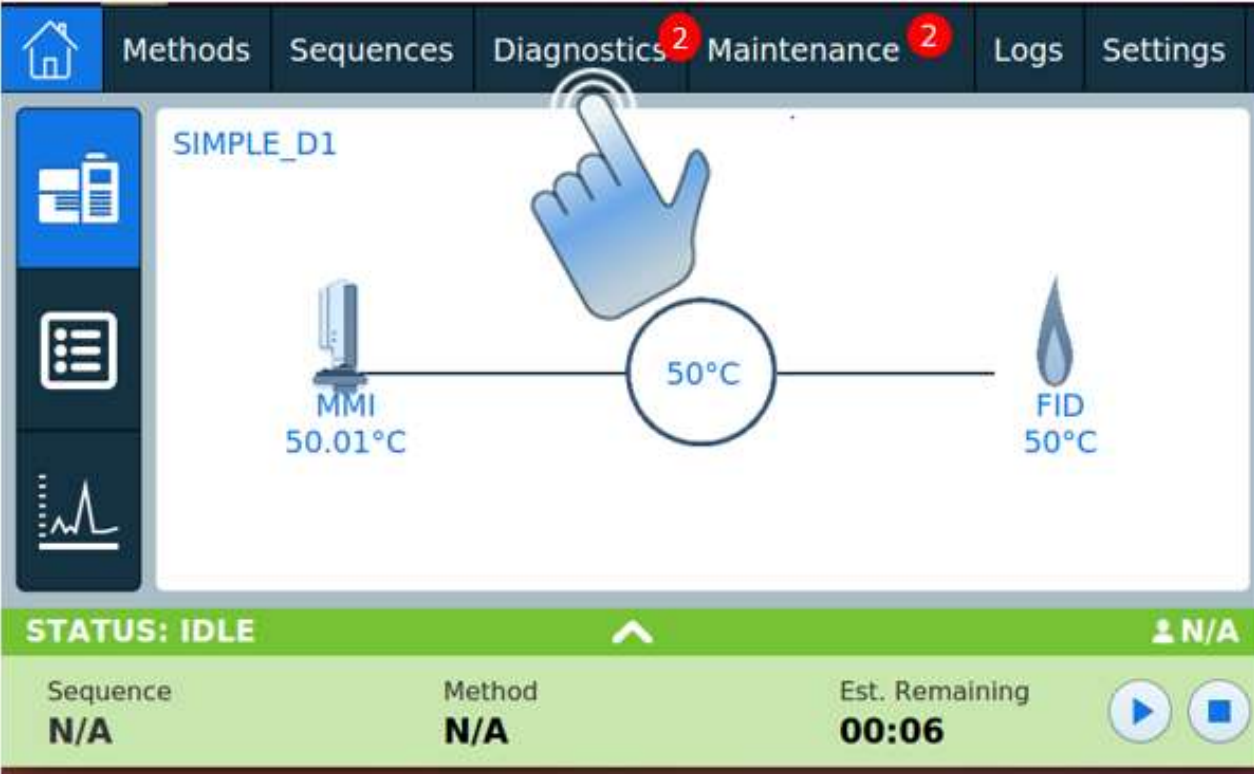


*- minimum requirement

** - optional accessory

Autonomous Leak Checking

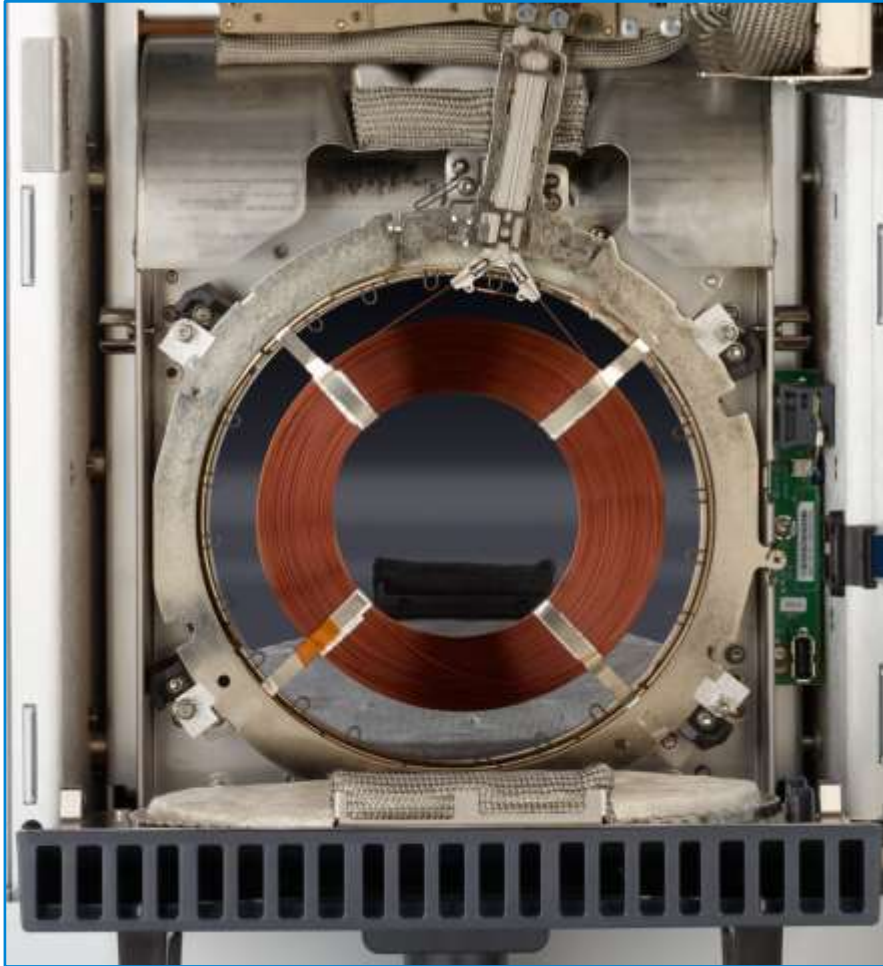
Avoiding unplanned downtime



Microfluidic-enabled 6th generation EPC modules allow hands-free leak checking to confirm and document leak-free operation autonomously.

Fast Direct Heating and Cooling

Every single minute counts

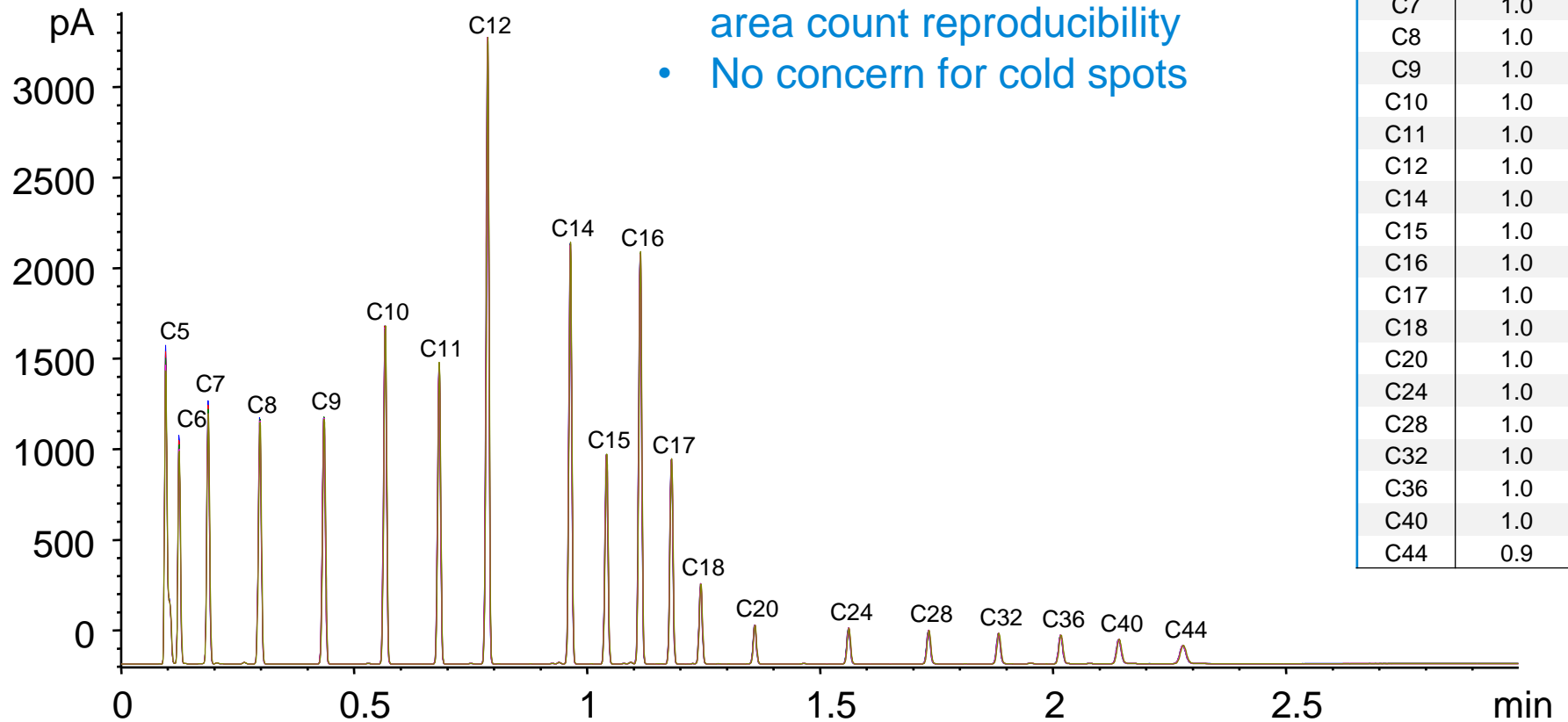


- Fast, efficient heating
- Ballistic cooling
- Smaller footprint

“We are the police – we need answers fast. Even 1 minute faster cool-down would be valuable...”

Ultra Fast GC

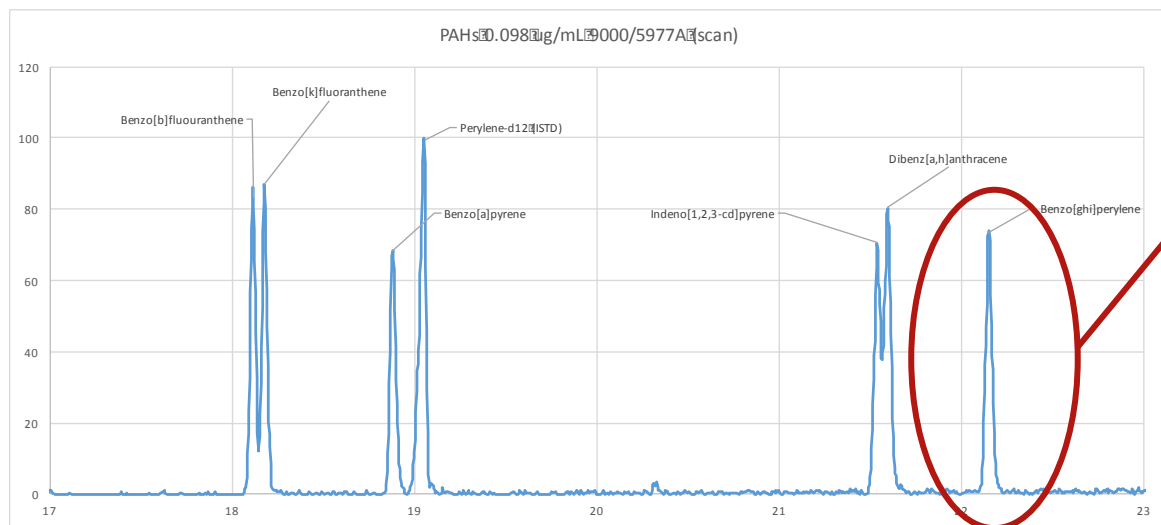
It's All About How Well You GC Fast



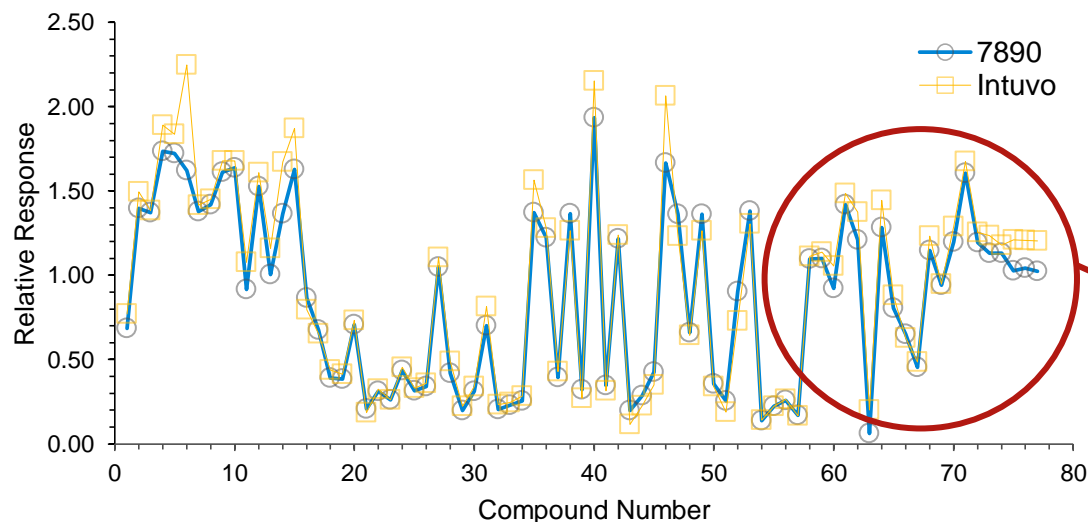
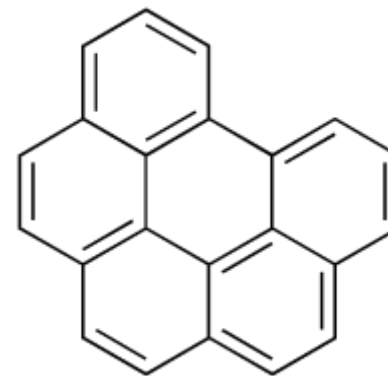
- Excellent retention time and area count reproducibility
- No concern for cold spots

5 replicate overlay of ASTM D7798 SimDist standard mix

Efficient, Even Direct Heating



Even high molecular weight compounds such as Benzo(ghi)perylene (mol wt 276 amu) have excellent peak shape



High molecular weight PAH compounds also have largely identical response factors

Optimizing Lab Space

Supporting lean laboratory thinking



Less than half:

- Power consumption
- Heat output into laboratory
- Laboratory bench footprint

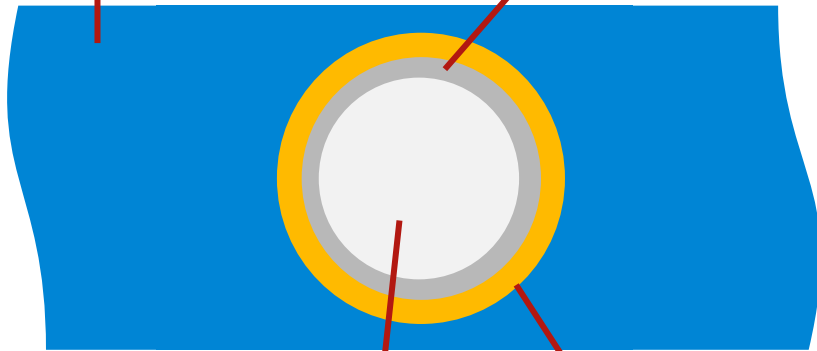
- Lower operating costs
- Higher efficiency
- Greener

Modular Intuvo Flow Chips

High purity inert silica flow path

Thermally conductive
proprietary alloy

Intuvo ultra inert
treatment



Intuvo Flow Chip
cross section

Carrier
gas

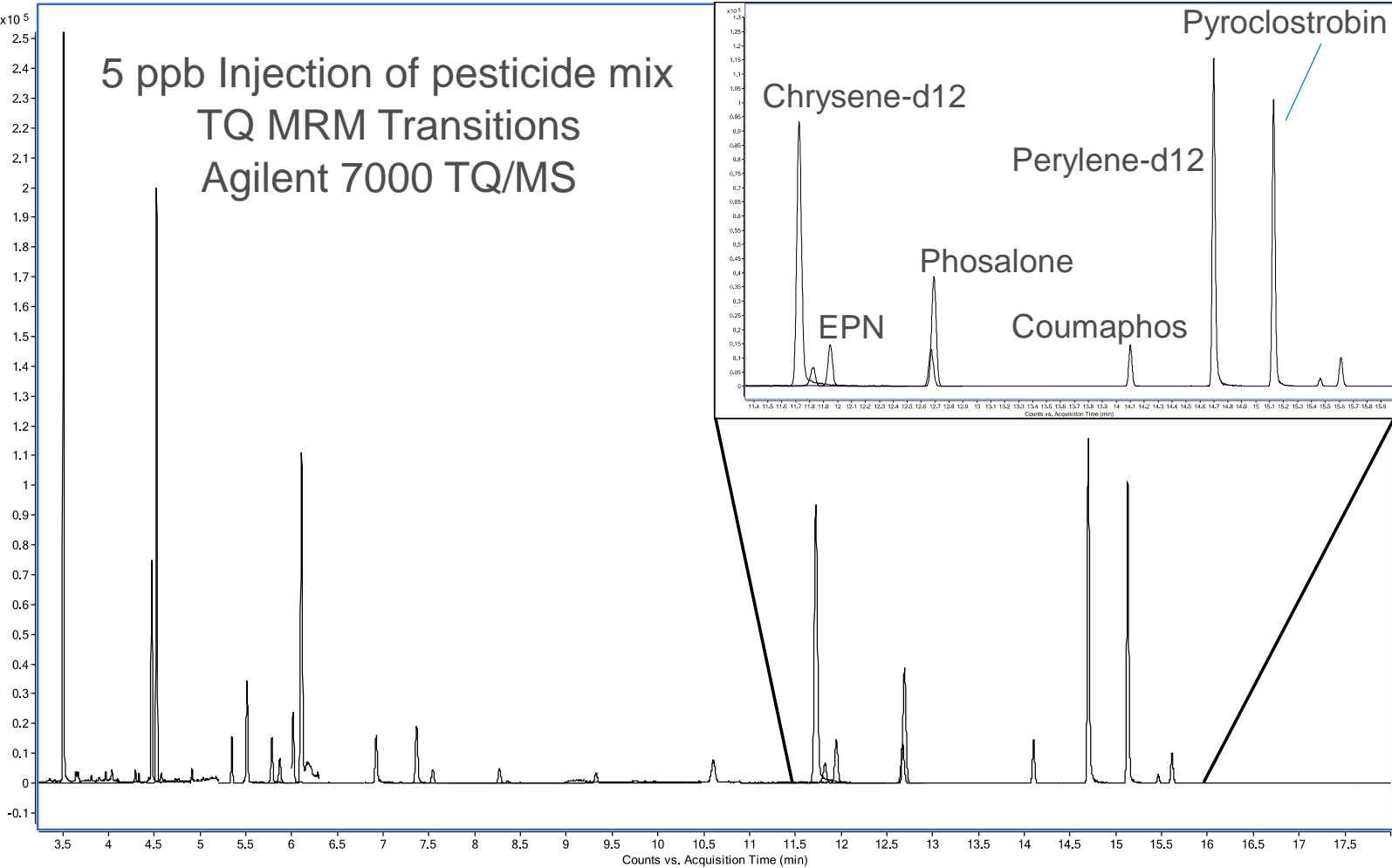
High purity
silica channel

- Inert
- Modular, configurable
- Click-and-run connections



Intuvo Inert Flow Path

Optimized for active compounds



Intuvo Guard Chip and No-trim Columns

Running more, maintaining less

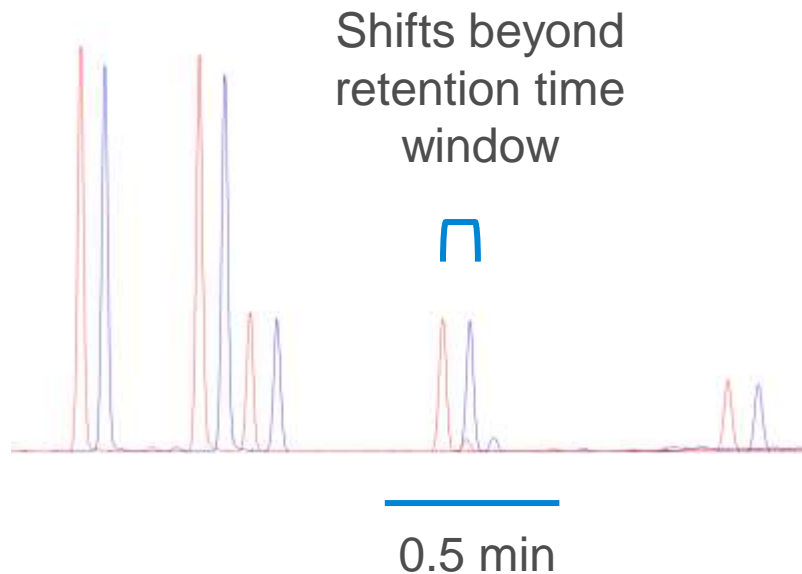


- Simple disposable design
- No column trimming
- Retention time reproducibility
- Less maintenance time
- Less recalibration and requalification
- Less unplanned downtime

Intuvo Guard Chip and No-trim Columns

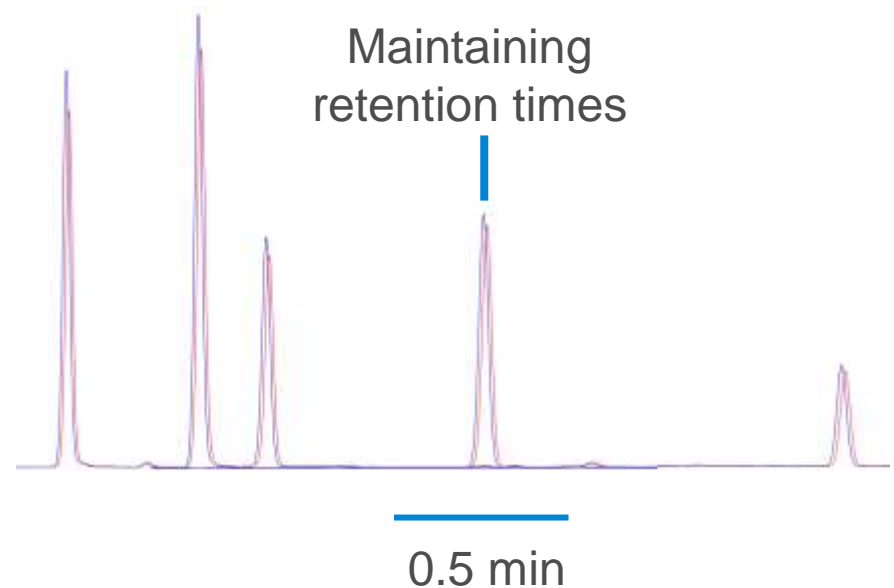
No retention time shifts after maintenance

Conventional Column



Pesticide mix injected before and after 300 mm column trim

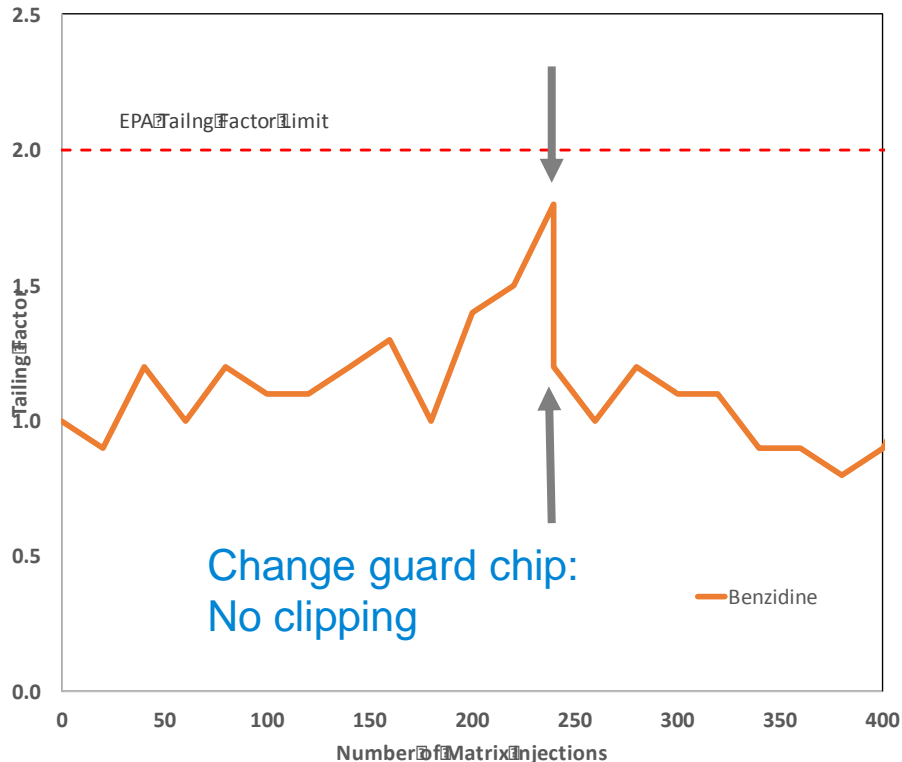
Intuvo Column



Pesticide mix injected before and after guard chip change

Intuvo Guard Chip

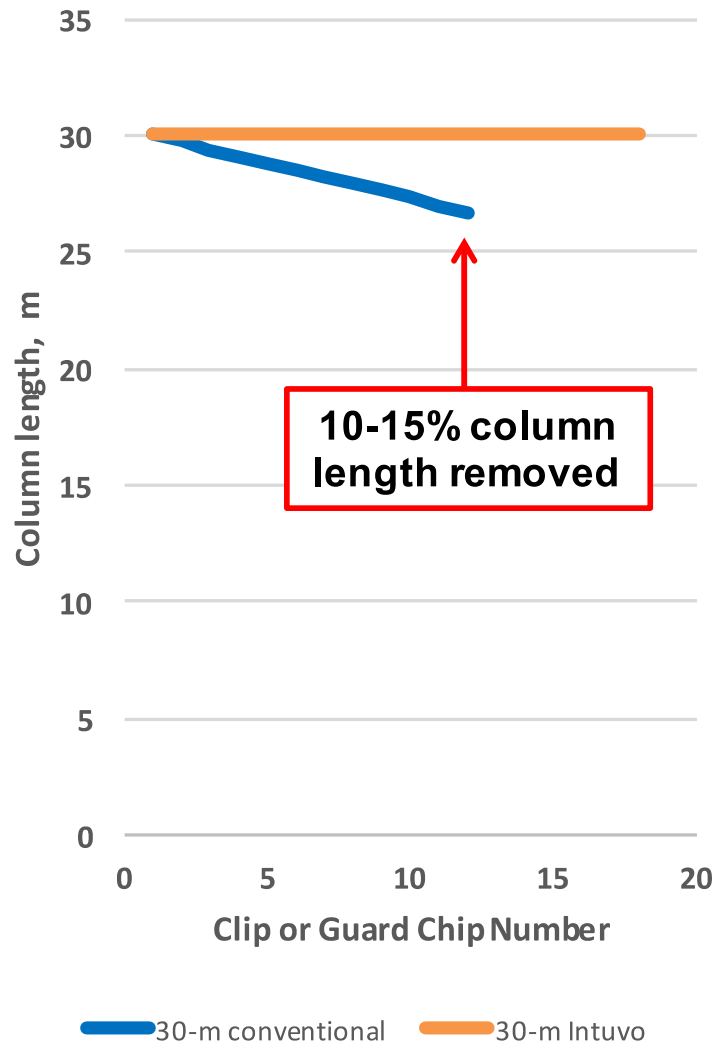
Protect, don't repair



- US EPA 8270D SVOC in soil
- Tailing factor slowly increases during 240 soil extract injections
- Guard chip replacement restores analytical performance and extends column life

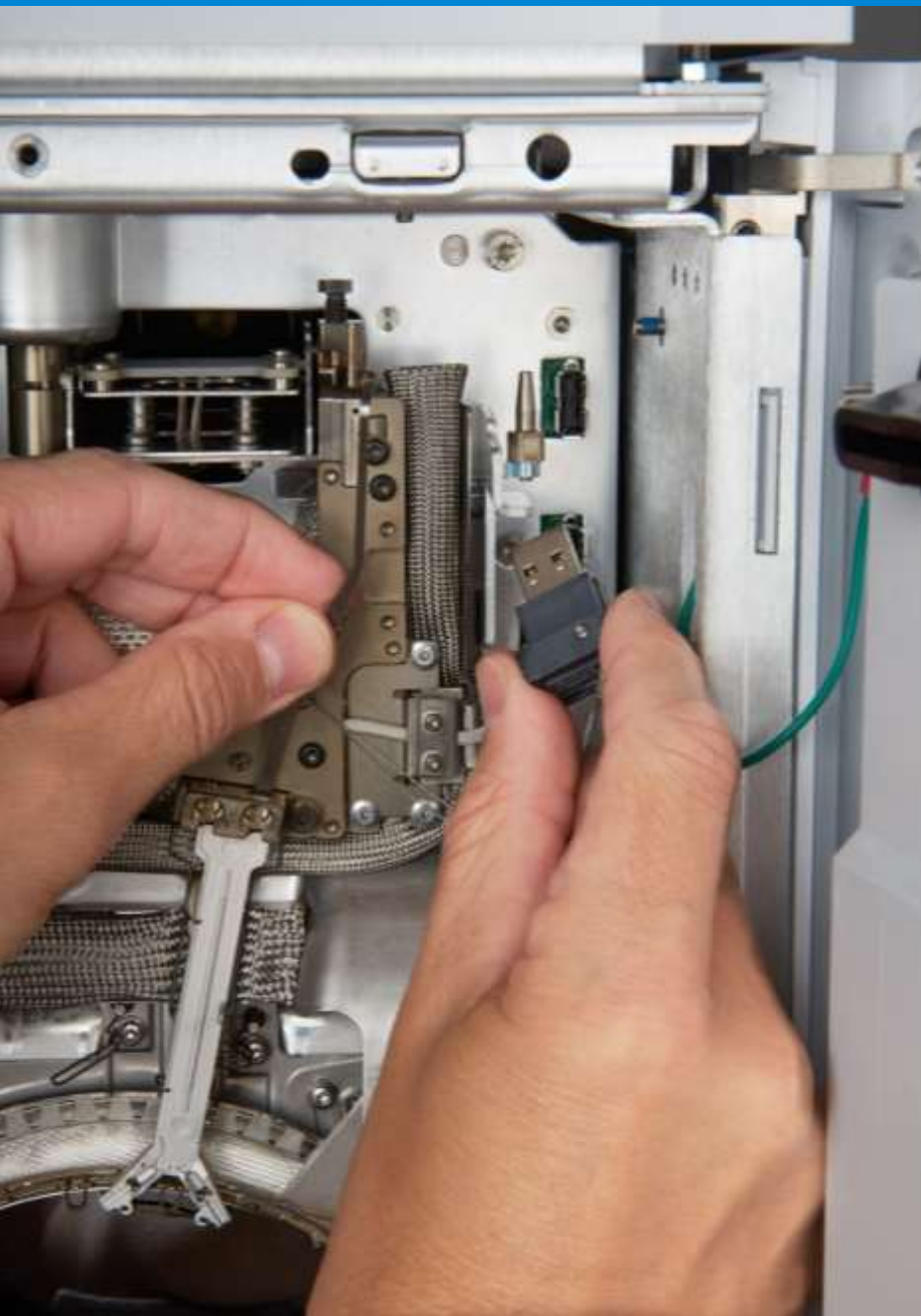


Intuvo Columns Maintain Integrity



Example

- US EPA 8270D SVOC in soil
- 30-m columns
- Conventional column clipped 0.3-m every second day:
Lasted 4 weeks
- Intuvo guard chip replaced every second day:
Lasted 6 weeks
- No trimming, fewer column replacements, fewer recalibrations:
3x less maintenance



Intuvo Smart Keys

Self aware

- Flow Chips and Columns
- Smart: Informs how Intuvo is configured
- Easy: Sets method context and parameter defaults – no complex calculators needed

Accessing the Power of Innovation

Transforming the user experience



New mobilized generation

- Expectations of remote mobile connection
- Technology accessed through interactive graphic SW and apps

Make technology accessible

- Interface meeting today's expectations

Intuvo Graphical User Interface

- System status



Intuvo Graphical User Interface

- System status
- Real-time chromatograms



Intuvo Graphical User Interface

- System status
- Real-time chromatograms
- Step-by-step user maintenance and troubleshooting



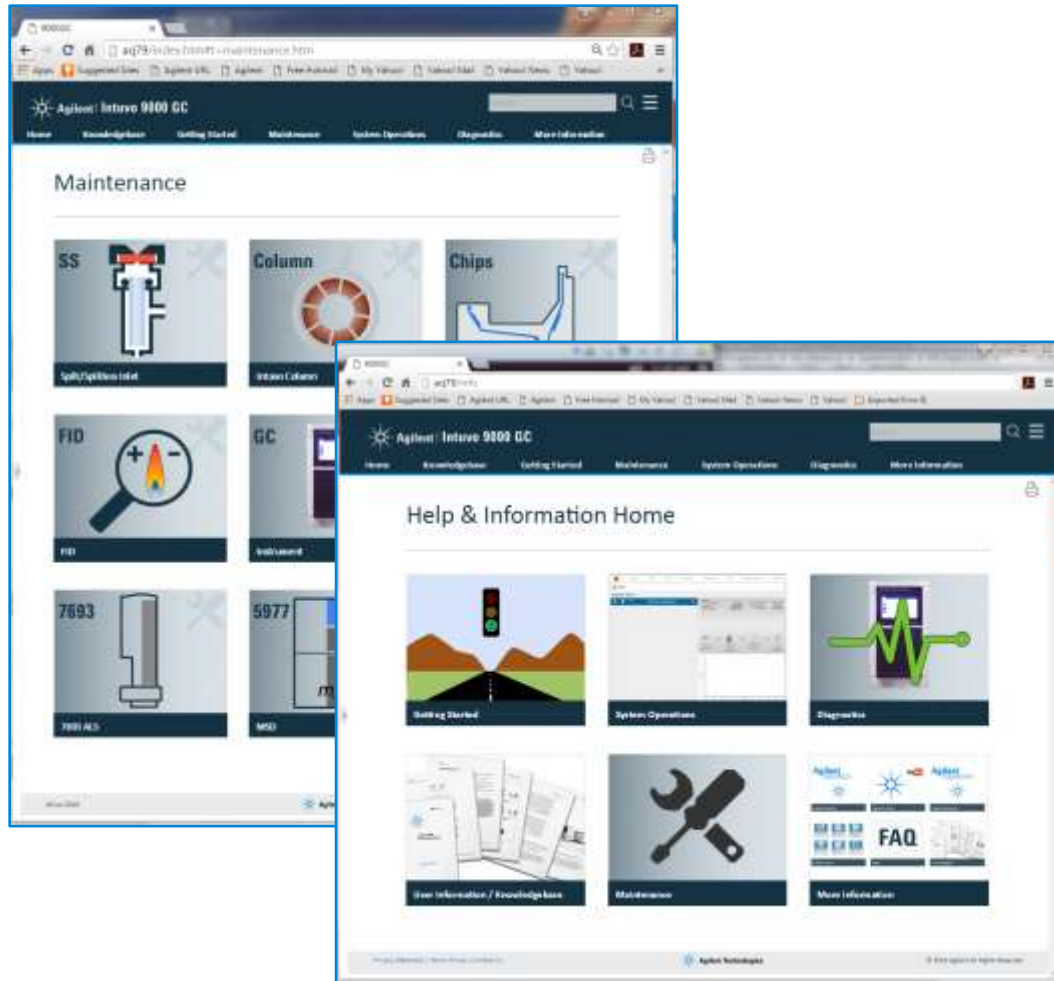
Intuvo Graphical User Interface

- System status
- Real-time chromatograms
- Step-by-step user maintenance and troubleshooting
- Finding parts fast



Internet of Things

A full suite of customer support



- Intuvo serves up a web homepage
- User help for Maintenance, troubleshooting and diagnostics
- Accessible through any approved PC or mobile device securely on internal network

Keep Connected

Tablet or phone connectivity

Check instrument and batch status remotely

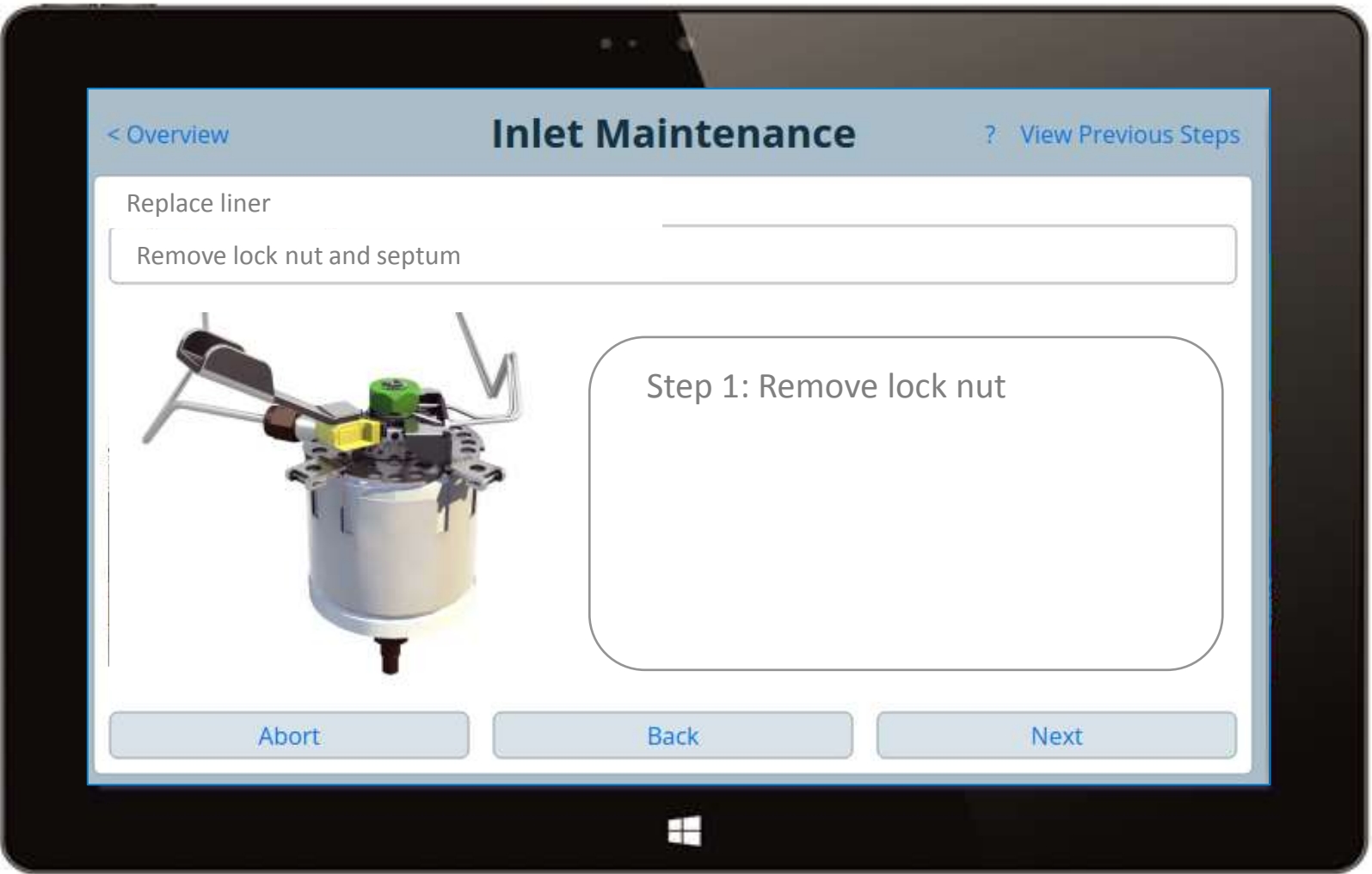
Confirm laboratory operations while out of the laboratory

Connect to any instrument with a single mobile device

Go Mobile

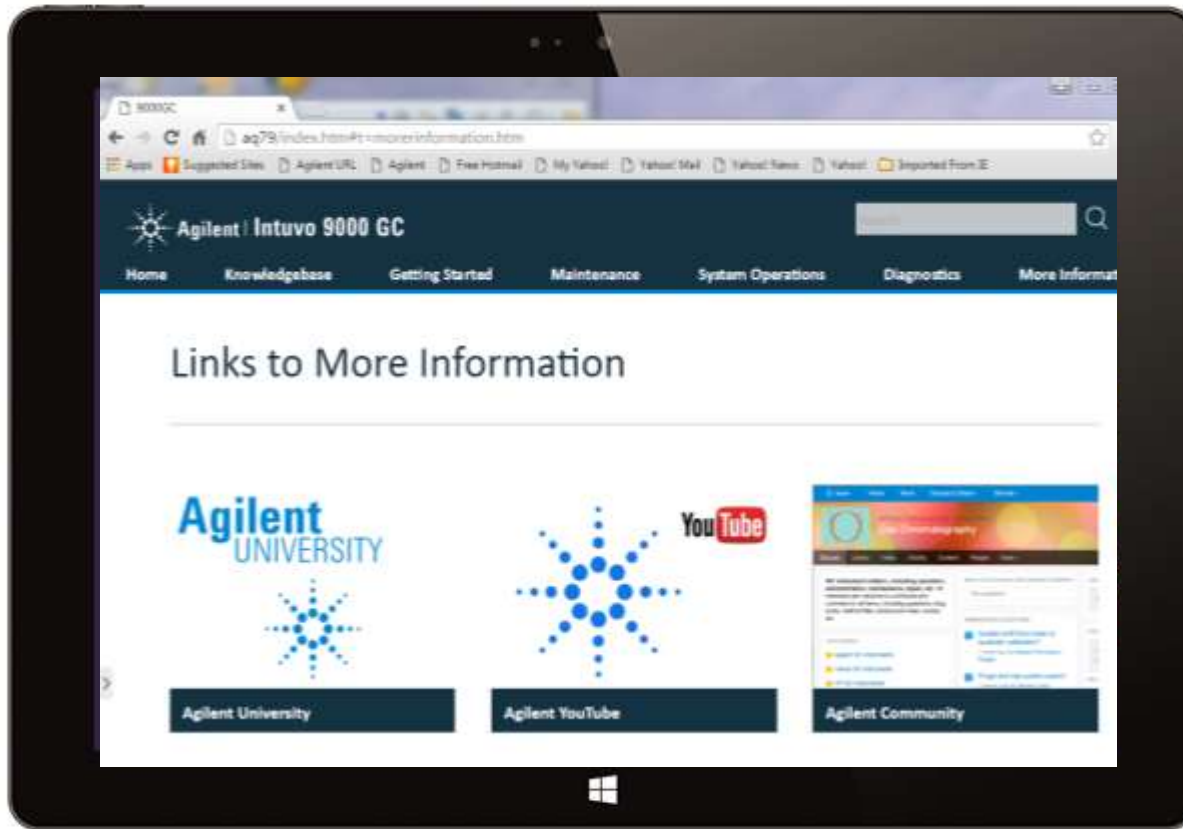
Intuvo Graphical User Interface

Interactive maintenance



A Gateway of Information at Your Fingertips

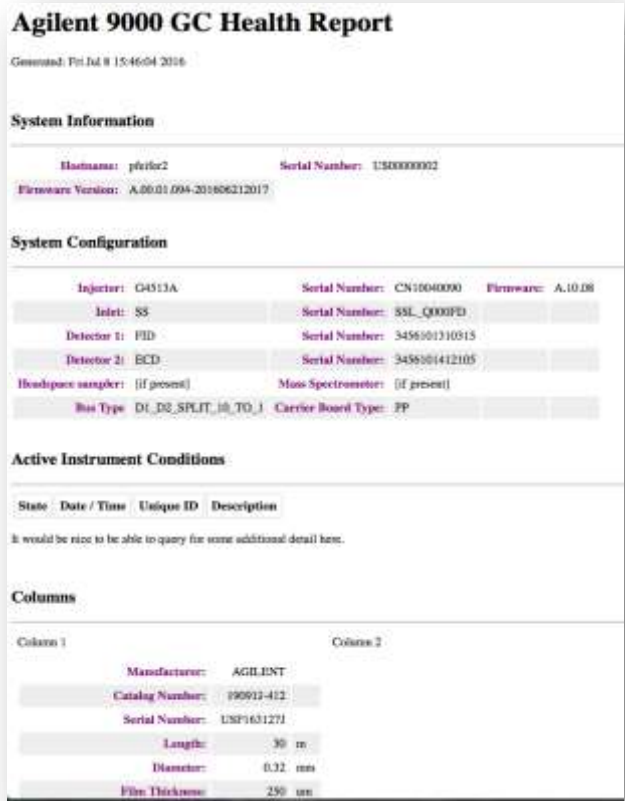
Whenever and wherever you are



- On-line resources
- Agilent University
- YouTube
- Agilent.com
- Agilent GC community

Agilent CrossLab Services for Intuvo

A streamlined service experience



Agilent 9000 GC Health Report
Generated: Fri Jul 8 15:46:04 2016

System Information

Hostname:	pferic2	Serial Number:	150000002
Firmware Version:	A.00.01.004-201606212017		

System Configuration

Injector:	G4513A	Serial Number:	CN10040000	Firmware:	A.10.08
Inlet:	SS	Serial Number:	SSL_Q000FD		
Detector 1:	FID	Serial Number:	3456101310515		
Detector 2:	ECD	Serial Number:	3456101412105		
Headspace sampler:	[if present]	Mass Spectrometer:	[if present]		
Bus Type:	DI_DS_SPLIT_IN_TO_1	Carrier Board Type:	FP		

Active Instrument Conditions

State	Date / Time	Unique ID	Description
-------	-------------	-----------	-------------

It would be nice to be able to query for some additional detail here.

Columns

Column 1	Column 2
Manufacturer:	AGILENT
Catalog Number:	990913-412
Serial Number:	USP1631271
Length:	30 m
Diameter:	0.32 mm
Film Thickness:	250 nm

Intuvo 9000 GC Health Report

Installation and familiarization

Compliance services

Education

An Ideal Partner for Mass Spectrometry

- Guard chip protection of column and MS ion source
- Retention time stability after changing guard chip
- Easy and reliable backflush
- Leak-free click-and-run connections
- Fast direct heating and cooling



Intuvo 9000 GC System

Appealing to all stakeholders



Operator and Scientist

- Simpler operation, less training, fewer mistakes
- Innovative enabling technology: Future of GC



Lab Manager

- Less unplanned downtime and disruption
- Delivering results with confidence



Business Executive

- A better financial return on innovation
- Improved operations and business continuity

**DREAM
BIGGER**

