

Your local **gas generation** partner



Thermo

Who are Peak?

Peak Scientific established 1992 in **SCOTLAND**

450 employees worldwide 16 locations



Largest specialised gas generator manufacturer in world



Laboratory Gas Solutions



Our generators are utilised in laboratories across the globe for important applications, improving workflow and productivity in analysis, research and discovery in all of the following fields:

Thermo



LC-MS

Thermo



GC/GC-MS

Thermo



FT-IR

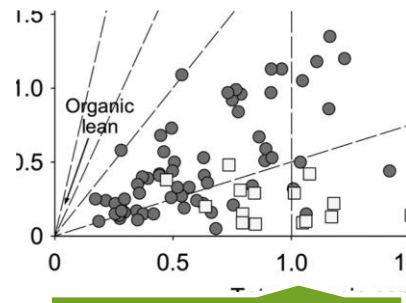
Thermo



**Hydrocarbon
Analyser**



**Sample
Preparation**



TOC



Glovebox



**Purge &
Calibration**

CAD, AA, ICP, TGA, DSC, ELSD, NMR, AA, Evaporation, Drying.... and more

Decade of Transformation



2007

<70 employees and £5m revenues

All UK based, no overseas offices

Limited field service capability

Small engineering team / manufacturing capacity

Local Markets



**British Standards
Institute**



**European
Conformity**



**Federal Communications
Commission**



**Safe
contractor**



**Queens Award
International Trade**

2017

>400 employees and continual growth

16 overseas offices, direct in +20 countries

100 dedicated service personnel globally

+40 R&D / product engineering staff, s QC / ISO 9001

Global Market Share

Changing Perceptions

Peak Scientific has transformed over recent years, maintaining the core philosophy of what makes us the company we are.

Training & Support / Manufacturing Excellence

Bespoke training for partners / **ACM2**, empower Engineers with knowledge to install and maintain Peak generators

100+ certified Peak service professionals globally delivering world-class service, plus trained Distributors

Renowned service / spare parts / technical support infrastructure, enables rapid customer service / tech support / advice; online & telephone

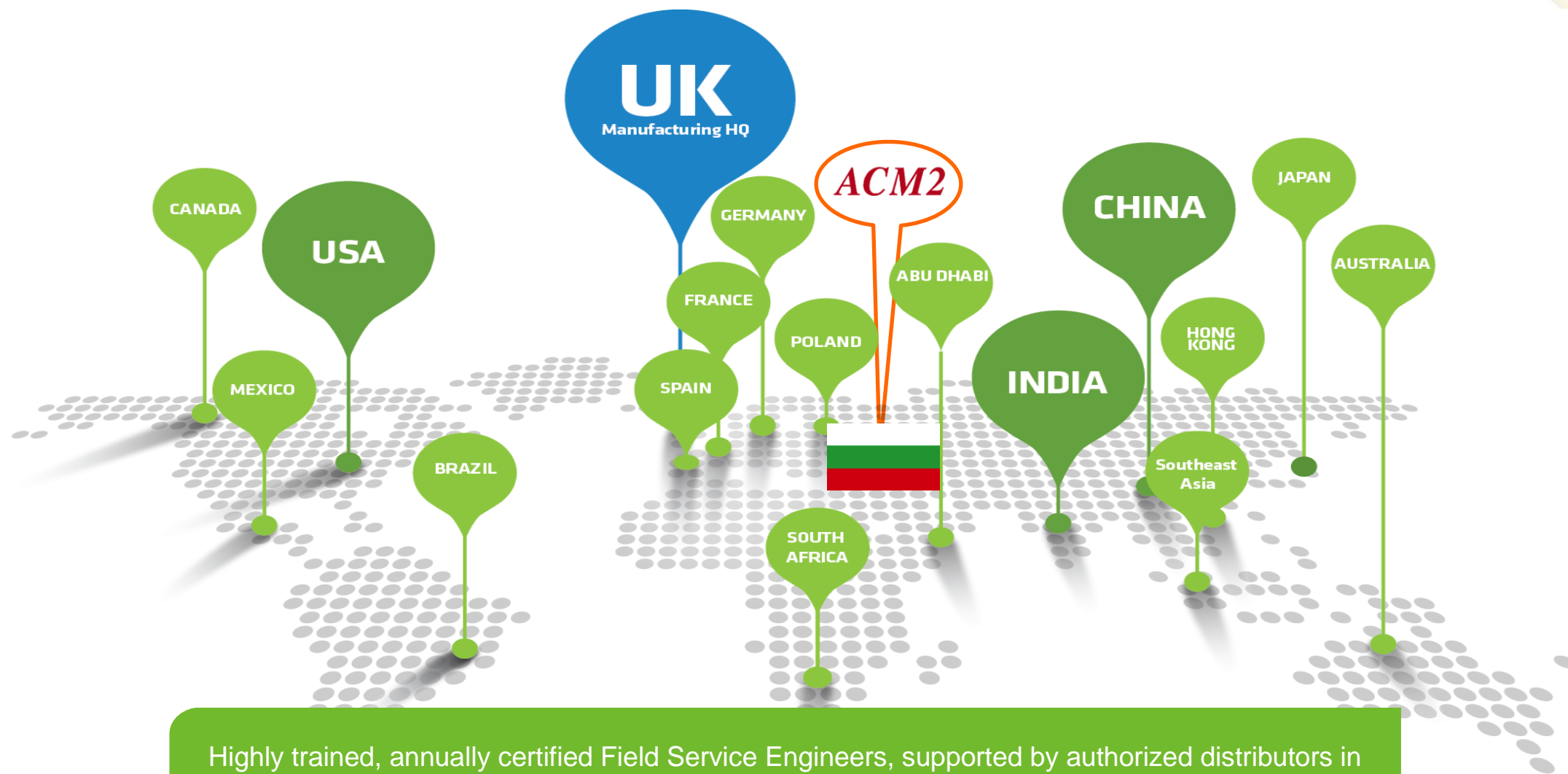
R&D / Manufacturing in Scotland at **ISO 9001** accredited HQ. Continual investment in R&D – innovation central to our business

All relevant certification and approval **ISO, CSA, CE.....**
Modern manufacturing methodology with policy of continual improvement

PEAK Protected



Global Scale, Local Partner



Highly trained, annually certified Field Service Engineers, supported by authorized distributors in 70 countries, **including Bulgaria**. Allows industry-leading, rapid response on-site service

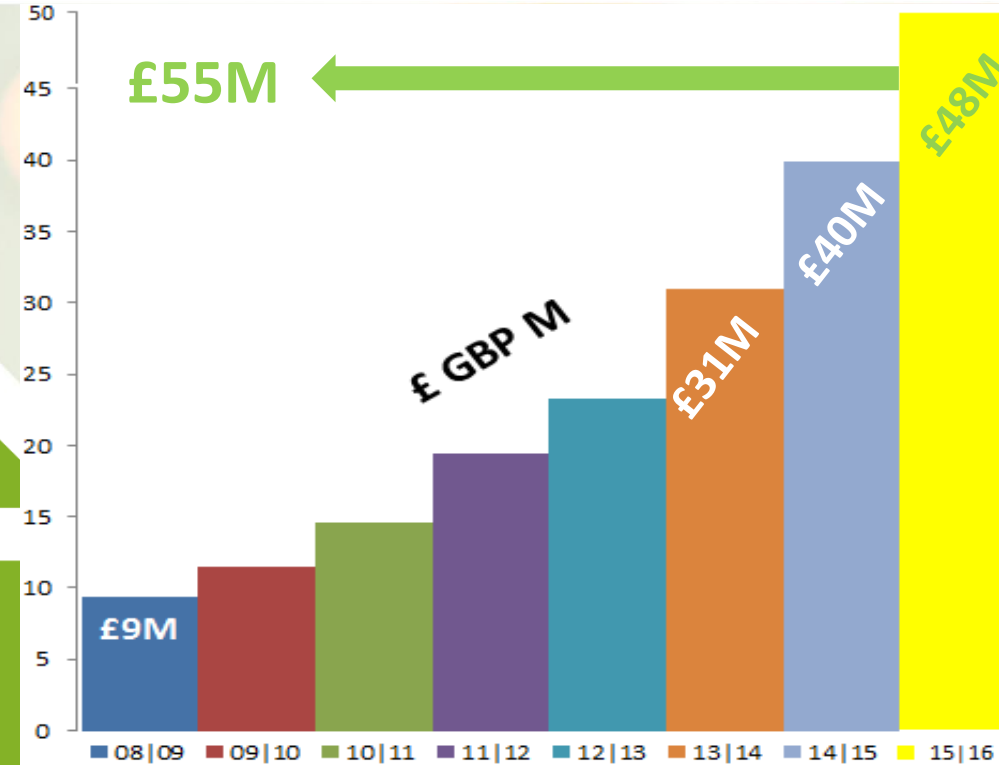
History / Growth / Future

Your local **gas generation** partner

2010 – 70 Employees

2017 – 450 employees

2020 – 500+ employees → £100M



THE SUNDAYTIMES

International Track 200 

Britain's private companies with the fastest-growing international sales

The Future

Your local **gas generation** partner

Mass Spectrometry
Gas Chromatography ↑



Sample Evaporation Total Organic Carbon (TOC)
Fourier Transform - Infrared Spectroscopy (FT-IR)
Inductively Coupled Plasma (ICP) Atomic Absorption (AA)
Nuclear Magnetic Resonance (NMR) Atmospheric Packaging (MAP)



Laser Cutting

Wine Making & Bottling

Electronic Component Assembly

Gas Assisted Injection Moulding

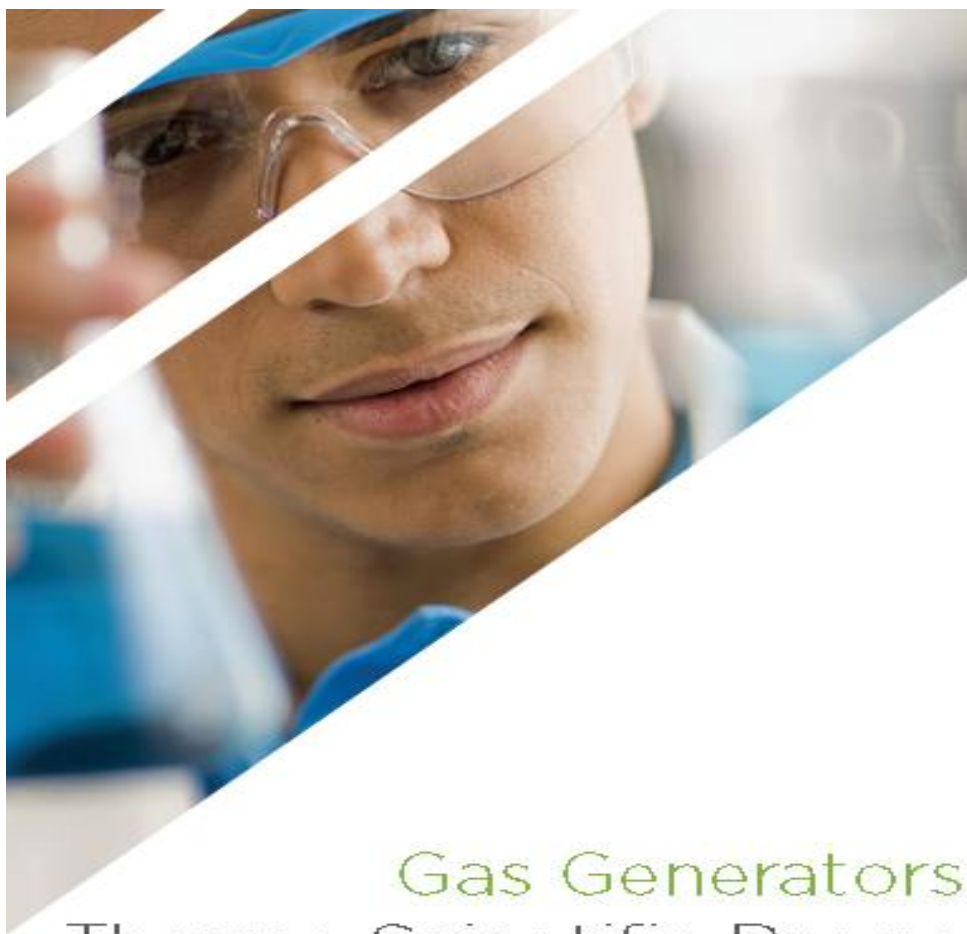
Modified Atmosphere Packaging (MAP)

Your local **gas generation** partner

i-Flow nitrogen
solutions for Wine
Production and Bottling



Edinburgh / Newcastle University
Chemistry / Med Toxicology



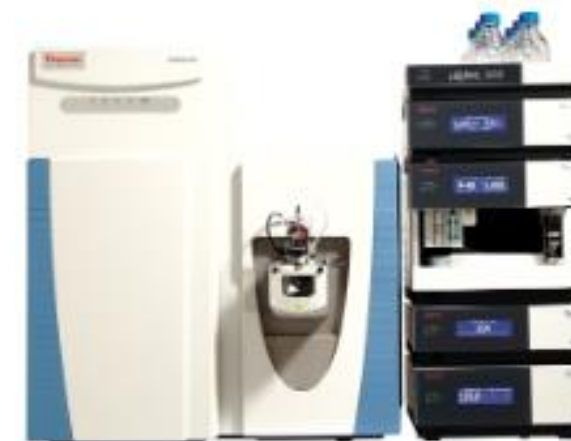
Gas Generators Thermo Scientific Range

Product Application Matrix

		PEAK Solution	
		Single Instrument	Two Instruments
Thermo Scientific™ MSQ+™ MS Nitrogen up to 15l/min @ 100psi	No compressor	Infinity NM18L	Infinity NM45L
	Built in compressor	Genius N418LA	Genius 3020
Thermo Scientific™ LTQ™ MS or LTQ ORBITRAP™ MS Nitrogen up to 21l/min @ 100psi	No compressor	Infinity NM32L	Infinity 5010
	Built in compressor	Genius NM32LA	Genius 3020
Thermo Scientific™ ORBITRAP FUSION™ MS Nitrogen up to 21l/min @ 100psi	No compressor	Infinity NM32L	Infinity 5010
	Built in compressor	Genius NM32LA	Genius 3020
Thermo Scientific™ LCQ™ MS Nitrogen up to 30l/min @ 100psi	No compressor	Infinity NM32L	Infinity 5010
	Built in compressor	Genius NM32LA	Genius 3020
Thermo Scientific™ TSQ™ Series MS Nitrogen up to 21l/min @ 100psi	No compressor	Infinity NM32L	Infinity 5010
	Built in compressor	Genius NM32LA	Genius 3020
Thermo Scientific™ TSQ™ Quantiva MS Nitrogen up to 21l/min @ 100psi	No compressor	Infinity NM32L	Infinity 5010
	Built in compressor	Genius NM32LA	Genius 3020

Thermo Instrument Compatibility

Thermo



ACM2

Thermo

Thermo LTQ Series LTQ XL/LTQ Orbitrap Velos	Nitrogen up to 21 L/min 100 psi	Infinity NM32L Genius NM32LA Genius 1050 Genius NM-3G
Thermo Finnigan TSQ Quantum TSQ Quantum Ultra TSQ Quantum Discovery	Nitrogen up to 21 L/min at 100 psi	Infinity NM32L Genius NM32LA Genius 1050 Genius NM-3G
Thermo Exactive	Nitrogen up to 30 L/min at 100 psi +- 10 psi	NM32L NM32LA NM-3G
Thermo Q- Exactive Thermo Q- Exactive Plus	Nitrogen up to 30 L/min at <u>116 psi</u>	Genius 1022
Thermo LXQ Linear	<u>Nitrogen up to 15 L/min, up to 100psi</u>	Infinity NM32L Genius NM32LA Genius 1050 Genius NM-3G

Genius Series - LCMS

Compressor Based
XX 'in-house' air

- LCMS grade Nitrogen laboratory gas generators
- 18-64 L/min
- **Integrated compressors**
- Simple Installation - Plug and play system
- Quiet – insulated compressor compartment <54dB
- Economical – most cost effective solution for LCMS
- Convenient – Gas On Demand

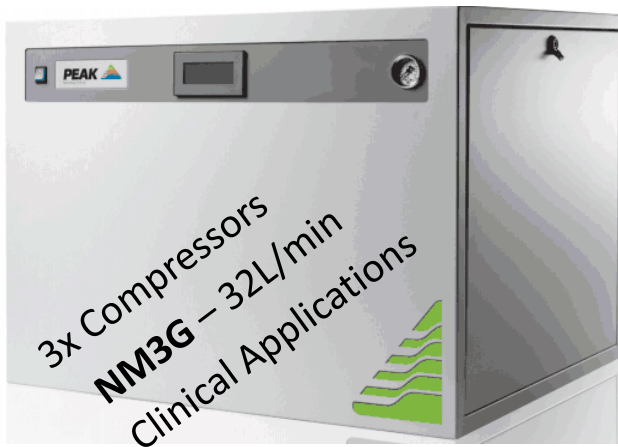


Genius Series Thermo Options

Thermo



Genius 1022 → Q Exactive
32L/min; 116 psi



2 x LCMS
plus.....

ACM2

Compressor Based
XX 'in-house' air



Genius 3022 → Q Exactive
2x32L/min; 116 psi



Infinity / XE Series - LCMS

Compressor – less
✓✓ 'in-house' air

- 11-432 L/min
- Variable N₂ purities - 95-99.5%*
- One generator for multiple applications → → → LCMS / CAD / Sample Evaporation / ELSD
- Silent in operation
- Purity safeguard, with warning & failsafe auto-shutdown
- Energy efficient eco-mode, ensuring low running costs
- 30% smaller than previous Infinity 50 Series
- **Sample Evaporation/Concentration – prepare for analysis**

Air Caution!

Ensure sufficient capacity to supply correct flow and pressure to Generator

Ensure supply will not contaminate Generator or LCMS / GC System

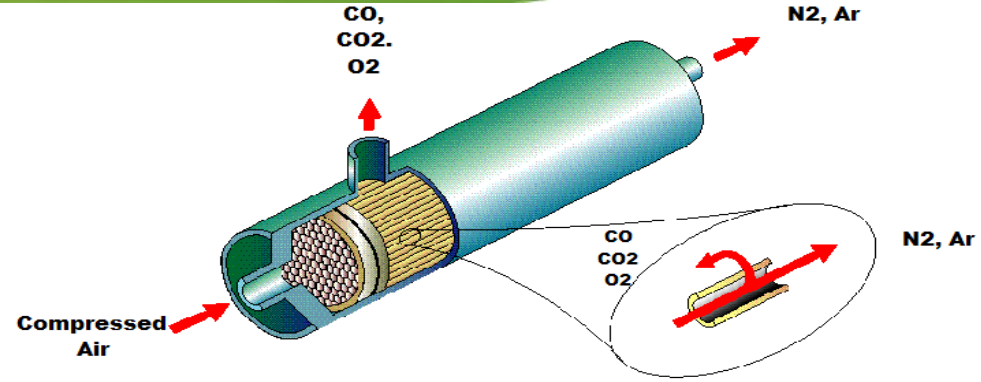
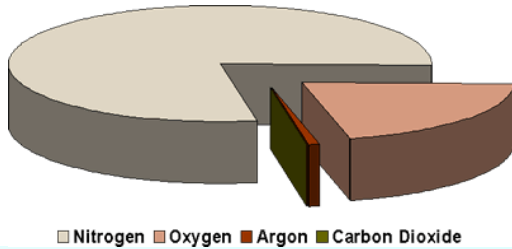
..... **Clean, Dry, Oil-free**



Nitrogen Production Processes

Membrane Separation

Compressed Air passed through membrane
Membrane filters CO, CO², and O²
Larger Nitrogen passes through membrane

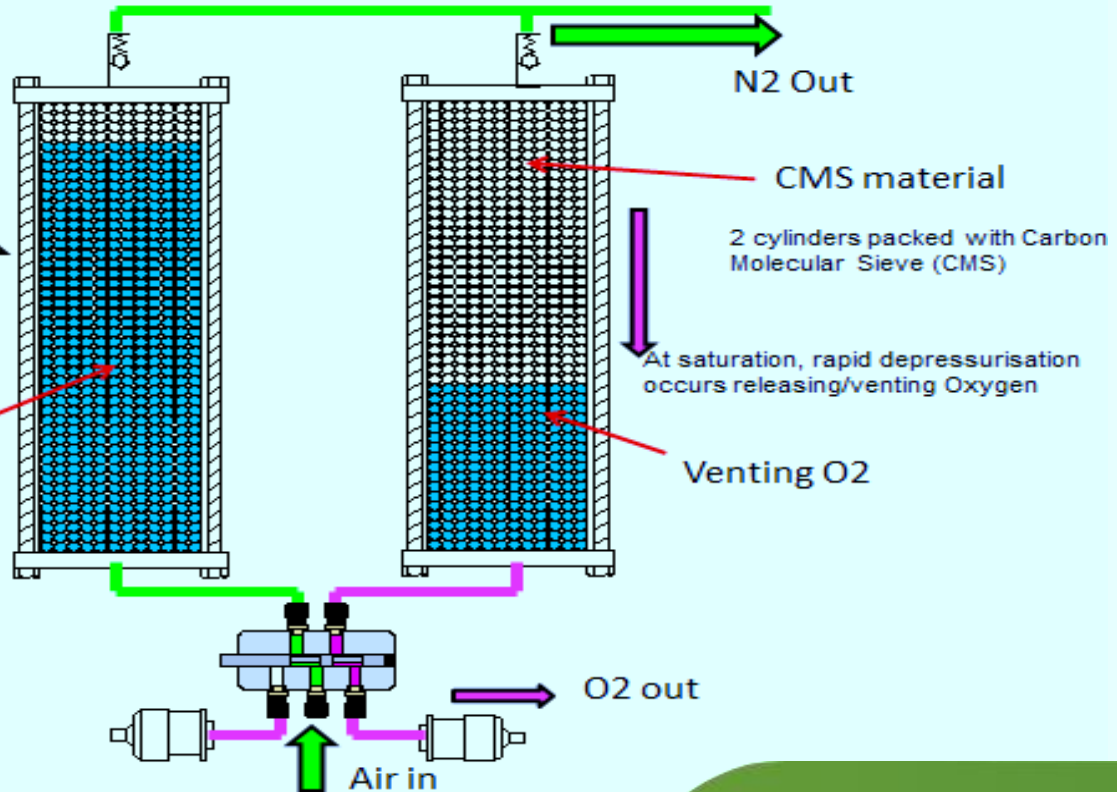


Pressure Swing Adsorption Carbon Molecular Sieve

Air compressed through CMS

Oxygen adsorbed
Larger Nitrogen → Purity

Trapped O₂



Gas generators

Gas Chromatography

Helium Crisis – What Helium Crisis?
Alternatives – Carrier Gas, Safer Flame Gas

Thermo

ACM2

GC Helium Crisis..... Availability/Cost

GC systems use Helium as Carrier Gas

Qatar ceases helium production; 25% supply

Helium availability issues ; depleted reserves

Prices high ; continue to rise

Calls for international body to oversee/regulate helium use; limit to critical /medical use

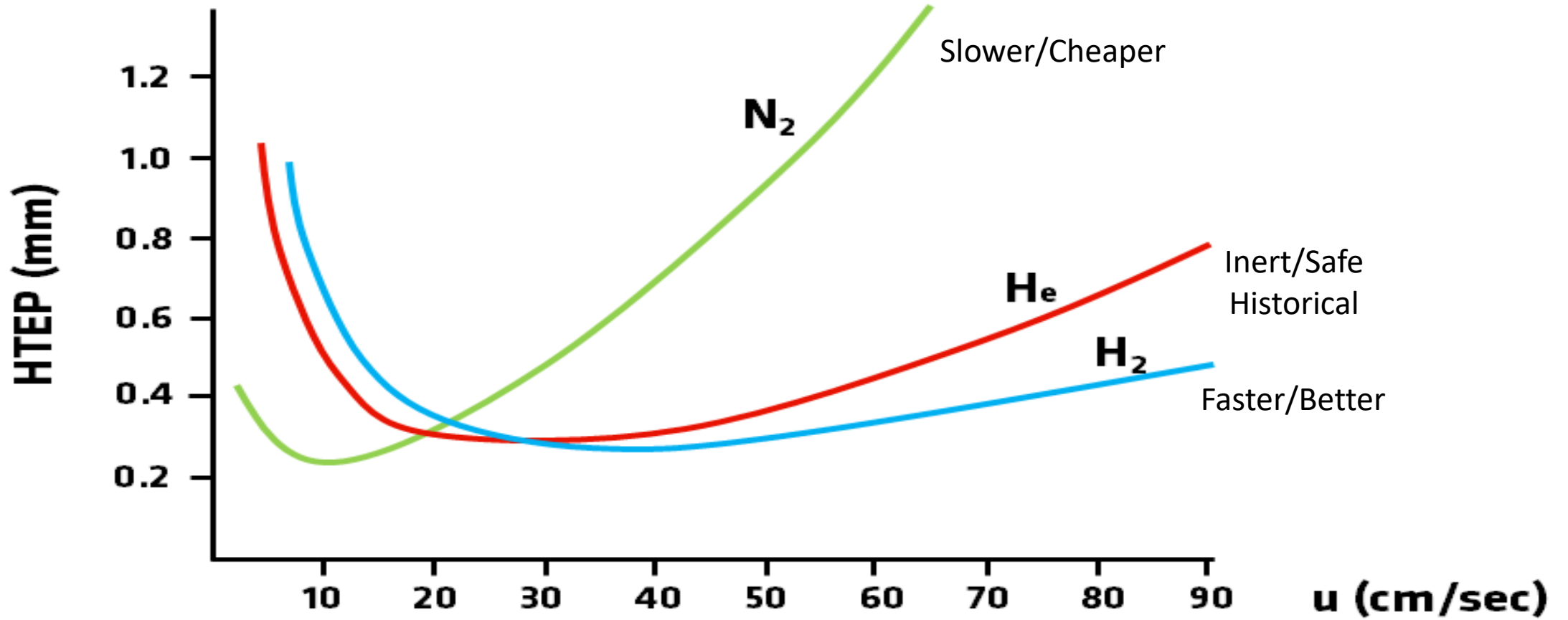
Creates uncertainty for the GC scientist

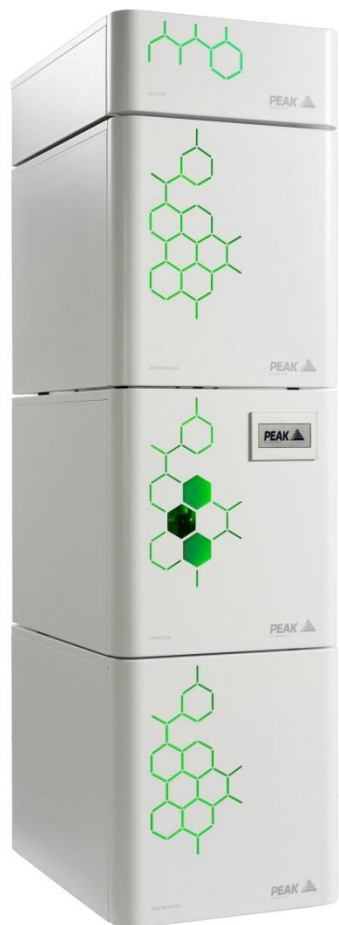
GC Manufacturers adopting/advising alternative gases



Alternatives to Helium - GC

Carrier Gas





Flame Support

← Precision Zero Air - hydrocarbon <0.05ppm

Catalyst Chamber

Make-Up / Carrier

← Precision Nitrogen – 99.9995%

Precision Nitrogen Trace - 99.9995%; hydrocarbon <0.05ppm

Molecular Sieve / Catalyst Chamber

Flame / Carrier

← Precision Hydrogen – 99.9995%

Precision Hydrogen Trace – 99.9999%

Water Electrolysis

← Precision Air Compressor - support Nitrogen & Zero Air Units

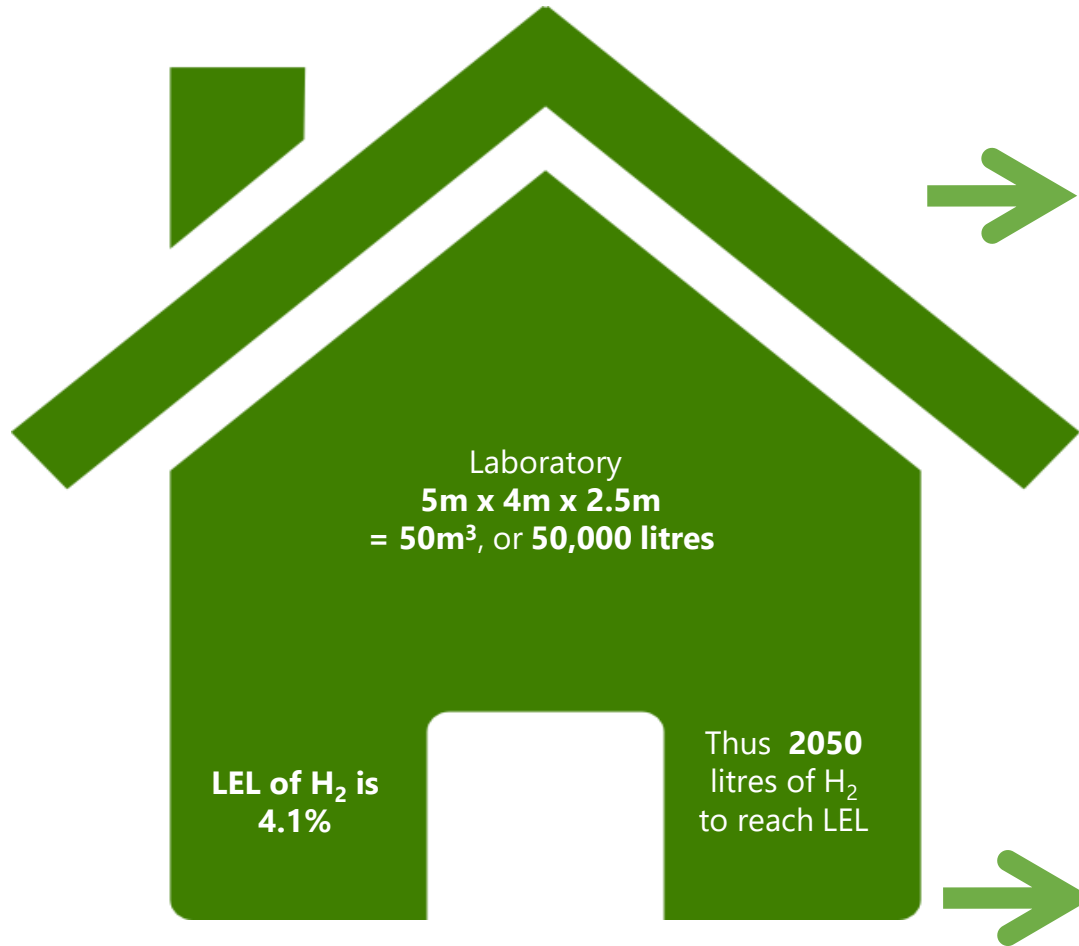


Thermo

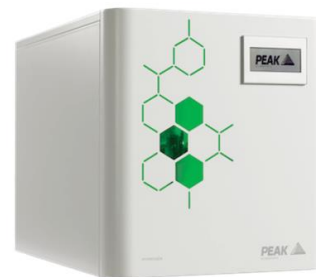
Hydrocarbon Analyser



Safety of Precision Hydrogen → Lower Explosive Level



50L cylinder contains
around **9000 litres** of
hydrogen
Therefore releasing **25%**
would reach LEL



Precision **500cc** → **3 days**
Precision **100cc** → **12 days**
to reach LEL (assumes no
loss of hydrogen)



Precision Hydrogen

Hydrogen on demand ...
< 400 cc stored gas

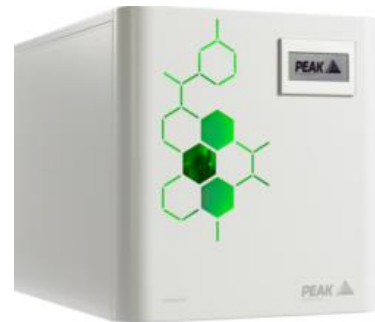
Internal leak detection

Automatic safety shutdown ...
Precision will not operate for
20 mins + 1 sec at max output
To achieve 4% in small lab →
24 hours/12 days

No need to
plan/purchase/deliver/move
heavy cylinders



FID Flame Support



Guaranteed Purity
No Monitoring



Final 20% Impure
Requires Monitoring

Hydrogen Cylinder

Always present
4-9,000L

No leak detection

No automatic shutdown

4% → 1 cylinder



PSPrecision Hydrogen Detector

Easy installation - Simply connect to GC and Hydrogen Generator

Compatible - Suitable for all GC models

Laboratory Costs - May reduce lab insurance cost

Audio Alarm at critical level of hydrogen in GC oven

Automatic shut down



(W) 6.3 x (D) 16.2 x (H) 20cm

Precision Hydrogen... Benefits

Hydrogen Carrier Gas

Improved Analysis Results: Allows lower detection limits

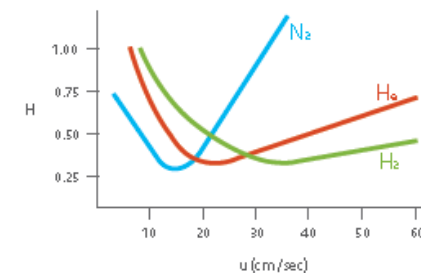
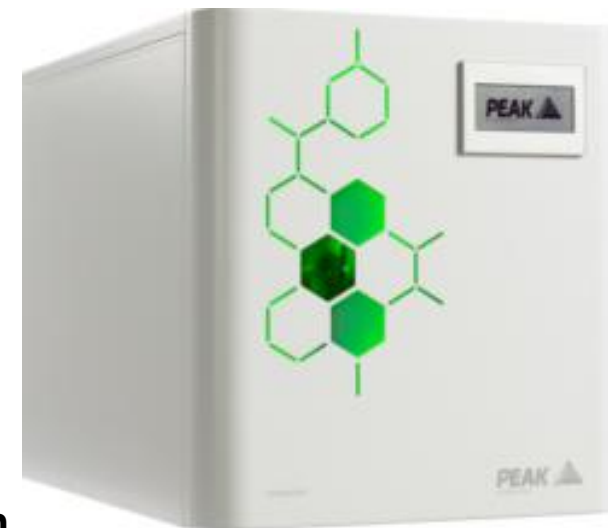
Increased speed: Increasing linear velocity of carrier gas allows shorter run times, **increasing throughput (<35%)**

Hydrogen out performs Helium at higher velocities **without sacrificing resolution**

Lower temperature separations: Lower elution temperatures of analytes → reduce maximum GC oven temperature → **extend column life**

Cost Effective: Use **shorter, narrower bore columns**, improve detection of samples in less time without need to work at high inlet pressures.

Hydrogen is **less expensive** alternative to Helium



Precision Hydrogen Trace – 99.9999%

Thermo Corona Veo (Charged Aerosol Detector)

Thermo

Corona Nitrogen 1010

Developed in conjunction with Thermo

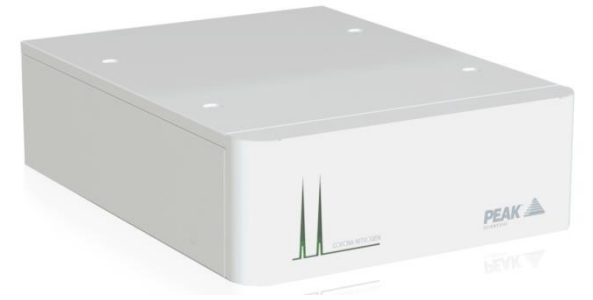
Specifically designed for Thermo Corona Veo CAD

5L Nitrogen / min, <2% Oxygen

Minimal Maintenance - 1 filter change per annum

Optional Corona Air Compressor

**Min Air Inlet Flow 30 L/min



ACM2

SOLARIS – CAD / ELSD / Compact MS



SOLARIS → 10L/min N₂.... 95%-99.5%.... 1-2 CAD / ELSD

- Typically require purity of 98% or more and between 50-100 psi
- Typically require flow rates between 0.9L/min and 4 L/min
- Optional Compressor

- Advion / Microsaic – compact MS

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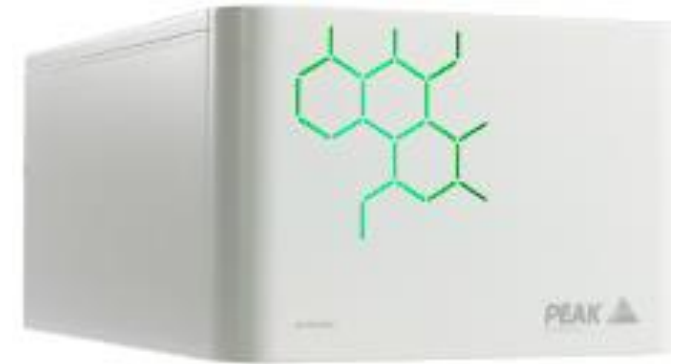
Precision Headspace Autosampler

Precision Nitrogen 250

250ml/min; 99.9995%; < 100psi

Analyse compounds that diffuse from sample → headspace

Analysis of volatile / semi-volatile organics



Precision Combinations / Benefits

Eliminate inconvenience of gas cylinders:

No supply issues

Various flow rates

Less safety concerns

No periodic replacements

No monitoring cylinder pressure

No contamination risk with each cylinder change

Minimal maintenance

Long term cost stability



Zero Air + Nitrogen + Hydrogen Trace

Cylinders

...

Precision



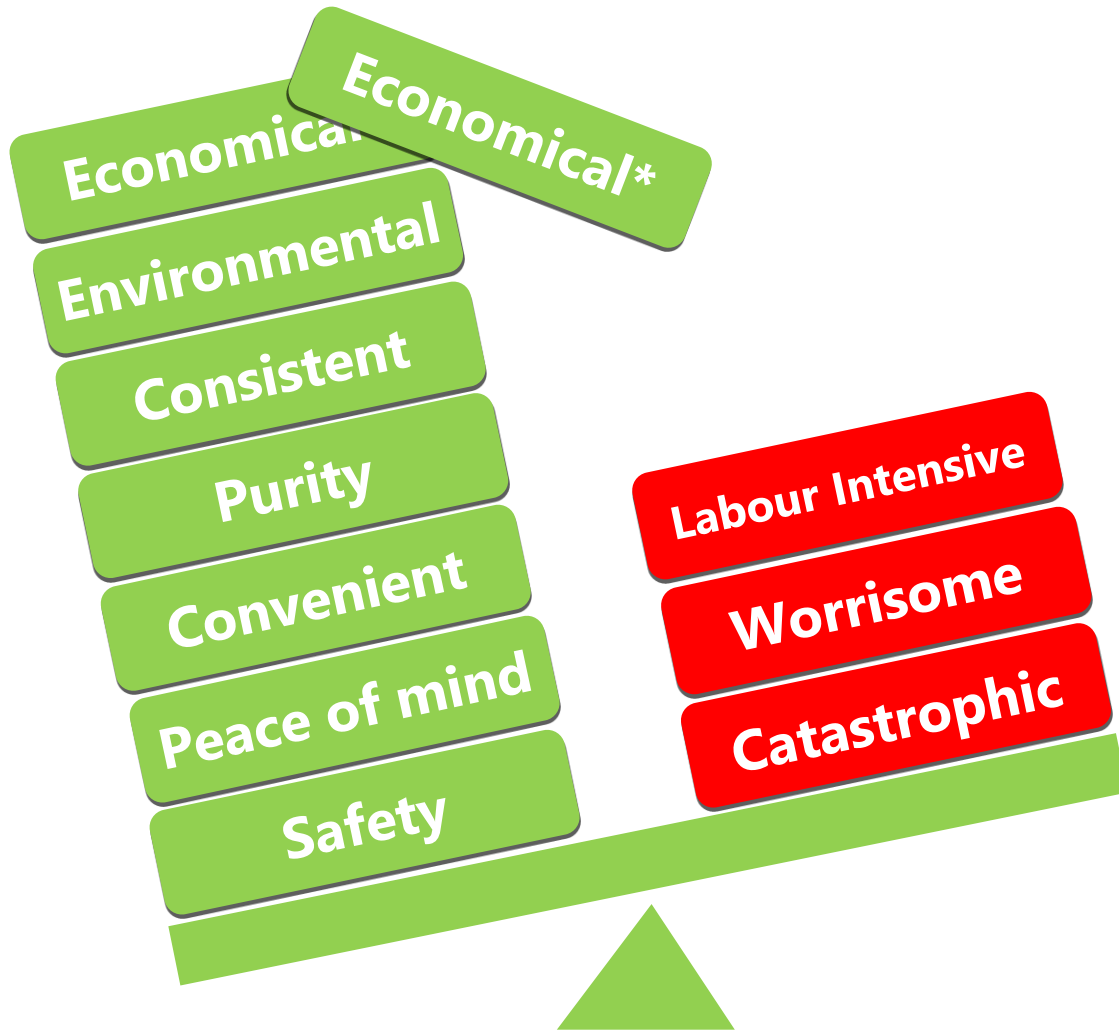
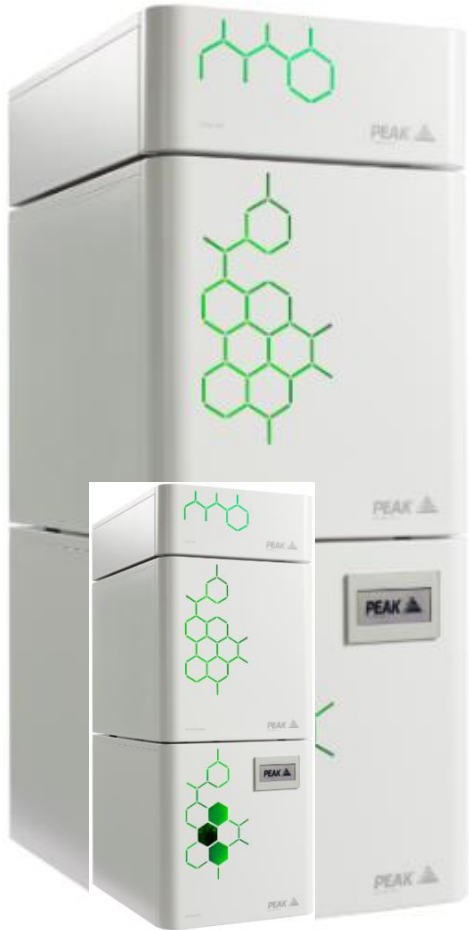
Bannockburn
Chicago



Remember



Precision Hydrogen



Gas Cylinder



Other Applications

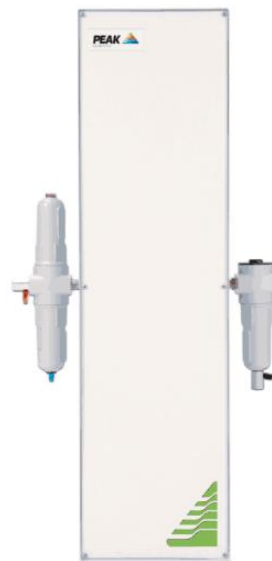


TOC

DSC, TGA, TOD, TMA, DMA
Differential Scanning Calorimeter
Thermogravimetric Analysis
Total Oxygen Demand
Thermomechanical Analysis
Differential Mobility Analyzer



Calibration



FT - IR



ICP



AA / Air Dryer / NMR



Evaporation

Your local **gas generation** partner

Tommy Harley

Office: +44 (0) 141 812 8100
Mobile: +44 (0) 7876 861 288
Email: tharley@peakscientific.com

Fountain Crescent, Inchinnan Business Park, Inchinnan. PA4 9RE



Scotland

Благодаря

- ICP – Inductively Coupled Plasma
- UV Flow

- 2L - 5L/min; 99.9995%
- Convenient – Gas On Demand
- With/Without internal compressor

- Also suitable for DSC, TGA, TOD, TMA, DMA, GC
Differential Scanning Calorimeter
Thermogravimetric Analysis
Total Oxygen Demand
Thermomechanical Analysis
Differential Mobility Analyzer



Infinity 90 Series

- Sample Evaporation/Concentration – prepare samples for analysis
- 34-1120L/min

- Quiet – Silent in operation
- Convenient – Gas On Demand
- Simply connect to existing air supply

- For Turbovap, Sample Evaporators and other Sample Concentrators



Generators for TOC Applications

- Clean, dry, carbon dioxide free air
- Quiet – Silent in operation
- Convenient – Gas On Demand
- Simply connect to existing air supply
- Waste water or natural water application



Calibration Gas Generators

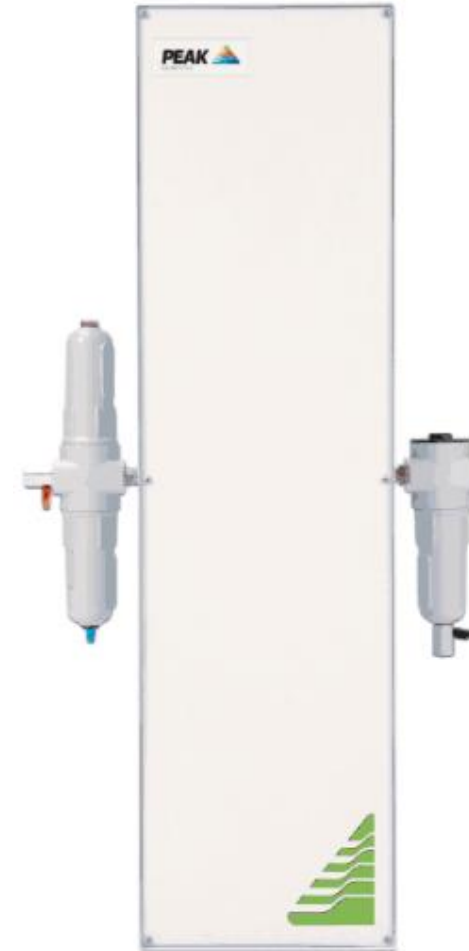
- Purest source of calibration gas for CO₂ Analyzer, emissions monitoring
- Quiet – Silent in operation
- Convenient – Gas On Demand
- Simply connect to existing air supply

- Ensures cleanest starting point for emissions measurement, monitoring and analysis



FT- IR Gas Generators

- Clean, dry carbon dioxide free air
 - Suitable for most FT-IR Spectrometers,
 - Quiet – Silent in operation
 - Convenient – Gas On Demand
 - Simply connect to existing air supply
-
- Improve signal to noise ratio, offers cleaner backgrounds
 - Provide more accurate analysis



Atomic Absorption / NMR / Air Dryers

- Clean, dry instrument grade air
NB Nitrogen, Zero Air can also be used
- Quiet – Silent in operation
- Convenient – Gas On Demand
- Simply connect to existing air supply
- Prevent moisture contamination in many applications



GC

NMR

Rheometry

CO₂ Analysis

IVF Incubators

Atomic Absorption

Animal Euthanasia

Packaging/Preservation

TOD-Total Oxygen Demand

ICP-inductively coupled plasma -MS

Sample Evaporation
Sample Concentration

TOC
FT-IR

MASS SPEC

Peak Distributor Support



- **Train & certify local Distributor Engineers**
- **Desk-bound Service Engineers – immediate support to local ‘in-field’ engineers**
support@peakscientific.com
- **Desk-bound Spares Team – immediate support / advice on parts requests**
spares@peakscientific.com
- **Huge stock of Service Kits / Parts – same day despatch possible**
- **IQ/OQ options – calibrated kit plus individual documentation**
- **Elite Service Kits – enhanced service / performance / reliability**

Item	P/N	Description	Qty
1	00-4424	Filter Element 0.01 Micron	2
2	00-4425	Filter Element For RAC (RAC)	1
3	02-4640	Filtr Element repl Inlet 3/8" NPT 02-4639	1
4	02-5494	Valve Sol 3/2 Universal 24v DC	1
5	02-5504	Valve Sol 2/2 24v DC 2.5 Orifice	2
6	04-4534	Relay Plug-In 5 Pin 10A	3
7	06-5529	2750 Compressor Service Kit	1
8	08-8141	Compressor Assembly	1



[PEAK Protected]

Thank you



Our Vision:

To exceed the expectation of our Customers, Colleagues and Suppliers

Our Values:

- **Respect** customer, supplier, colleague
- **Restless** constantly striving to improve
- **Freedom with responsibility**
- **Fun & passion** in everything we do

