

The Revolution in Gas Chromatography! What took so long?

**3rd Annual micro & Fast Gas Chromatography
Symposium**

Session Leader: Dr. Carl Rechsteiner

**CRrechsteiner Consulting
8:50 AM, October 15, 2015**

The Evolution... since the mid 1950s

The Laboratory GC Path

- Air bath ovens
 - Isothermal with limited column switching
 - PTGC with high thermal mass
 - Suitable for general purpose safety ratings
- Packed columns
- Crude inlets
- Crude electronics

The Process GC Path

- Bell jar & air bath ovens
 - Isothermal only with elaborate column switching schemes
 - Extremely high thermal mass
 - Suitable for hazardous installations
- Packed columns
- Even cruder inlets
- Crude electronics

Time Marches On

The Laboratory GC Path

- Air bath ovens improve
 - PTGC more responsive
 - Expanded column switching capabilities
- Packed & micropacked columns even in glass
- Inlets improved
- Continuous improvement in electronics

The Process GC Path

- Air bath ovens unchanged
 - Column switching networks become very complicated
 - Thermal mass increases! (valve bodies, etc.)
- Column use & inlets essentially unchanged
- Continuous improvement in electronics
- Advanced computer to computer communications

The Upstarts!

- The micro GC came along with limitations
 - Temperature
 - Capacity
 - Inlet
 - Detector
- Still...
 - The advance to fused silica open tubular column technology improved traditional GC
 - ... and enabled micro gas chromatography

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(The Quest for Convergence)

What's UP?

- The advances of micro GC don't seem to find deployment in “traditional” gas chromatographs
 - Low thermal mass
 - Low or zero dead volume
 - NO air bath oven
 - Heating technique
 - Smaller footprint
 - Lower power
 - Faster analysis

Why?

- Does micro & Fast GC technology threaten the “big boys?”
- Has the rapid advancements in spectroscopy distracted the “big boy” development teams?
- Is the technology in light of “Big Boy Life Sciences and Analytical Instrumentation” name changes a sign of relegating gas chromatography to “cash cow” status?

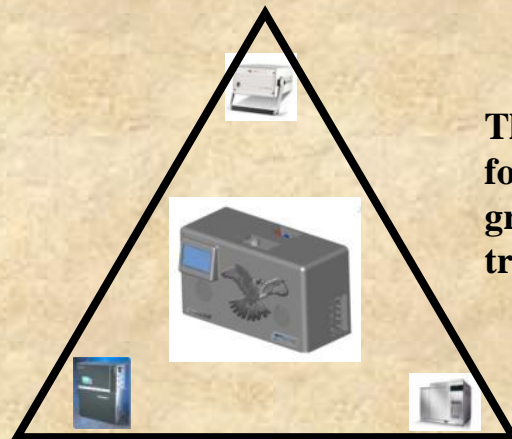
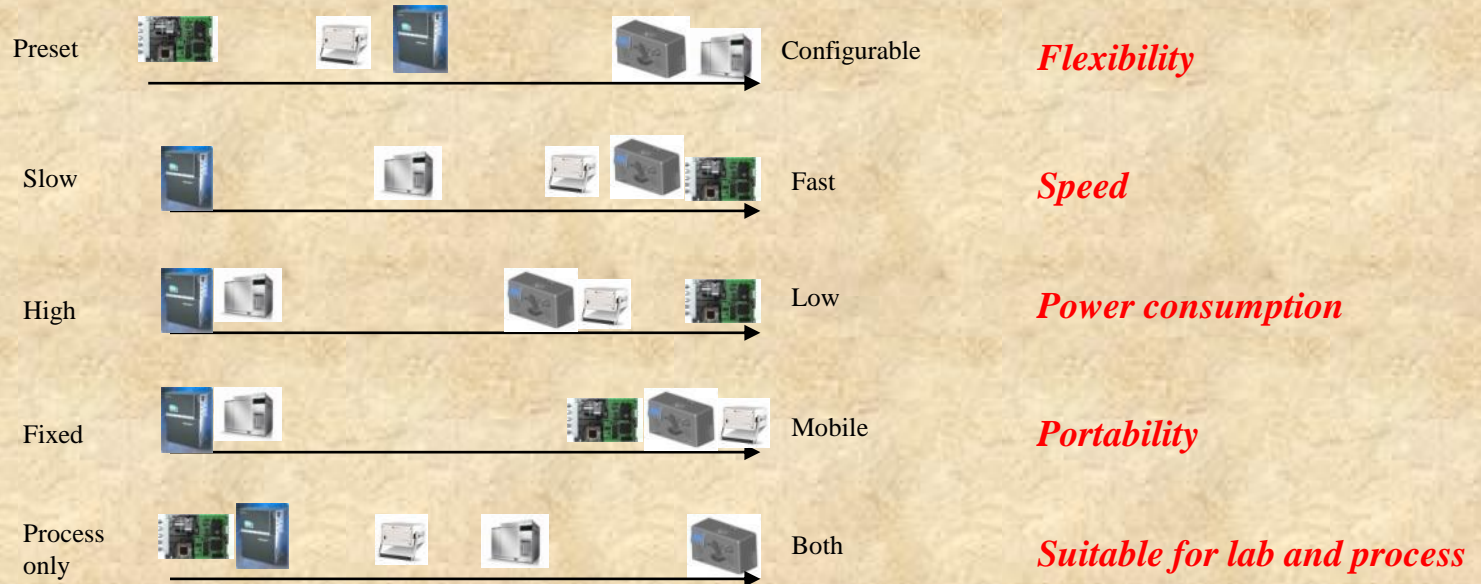
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(Disruptive Technology)

Snapshot of Current Capability Positioning

Speed of Analysis (use to control the process)
Application Coverage (common instrument platform)
Form Factor (size, weight, footprint)
Cost (price, maintenance, periphery)



The applications flexibility combined with a more-compact footprint allows micro and FAST GC to occupy a middle ground and appeal to laboratory, process and the transportable crowd.

The Program:

3rd micro & Fast Gas Chromatography Symposium

- Objectives:
 - Explore the recent advances in gas chromatography
 - Expose the capabilities of modern technology
 - Show examples of real world, commercial deployment
 - Attempt to understand why deployment hasn't accelerated throughout the chromatography community
- AND...
 - To enjoy some camaraderie with our fellow chromatographers
 - And share a beer or two... 😊

The Program

- **9:00 - Historical Review: Fast & micro Gas Chromatography**
 - Dr. Ed Overton, Professor Emeritus, LSU
- **9:30 - Rethinking the Anatomy of Gas Chromatography**
 - Steve Bostic, Marketing Consultant
- **9:50 - The Case for micro & Fast Gas Chromatography: A Market Overview**
 - John Crandall, Falcon Analytical
- **10:10 - Expanding GC Use in Petroleum and Petrochemical Applications**
 - Dr. Carl Rechsteiner, CRechsteiner Consulting
- **10:30 - Recent Advancements in Batch Process Throughput with Fast, Automated Food Grade Fatty Acid Endpoint Analysis**
 - Jonathan A. Blackwell, Lonza, Inc.
- **10:50 - Increasing Throughput AND Easier to Use: Refinery Support Laboratory Experience with micro and Fast Gas Chromatography**
 - Dr. Brian Rohrback, Infometrix, Inc.

The Program

- **11:10 - Data Processing in a Fast GC World**
 - Dr. Brian Rohrback, Infometrix, Inc.
- **11:30 - Recent Advances in Chromatography Data Systems Software: A More Complete Solution including Labs, At-Line, Online and Transportable**
 - George Schreiner, Chromperfect
- **12:10 – Lunch Break**

The Program

- **1:00 - Online Process Control using Modular Fluid Delivery and Fast & Micro Process Gas Chromatography: From the Sample Point to the DCS Connection**
 - John Crandall, Falcon Analytical
- **1:20 - An Online Fast GC for Gasoline Blending: Experience to Date at One Refinery**
 - Dr. Carl Rechsteiner, CRechsteiner Consulting
- **1:40 - An Easy to Use Fast Liquid Chromatographic System using a Novel Sample Manager to Improve Work Flow for the Analysis of Samples Close to a Manufacturing Process.**
 - Charles H. Phoebe, Jr., Waters Associates
- **2:00 - Where Is It Going: micro and Fast Chromatography, a Panel Discussion**
 - Dr. Carl Rechsteiner, CRechsteiner Consulting
- **2:20 - Hospitality**