



# Technical Automation Services Co.

presents

## Advanced Topics in Gas Chromatography

### The Instructor

Tony Waters has 42 years experience with process gas chromatographs and other analyzers. He has founded three companies to provide specialized analyzer services to the process industries and is an expert in the application of process analyzers in refineries and chemical plants.

Tony developed this and other training courses from his long experience in the field. His presentations are always popular, and have equal appeal with engineers and maintenance technicians. The seminar has been presented in Australia and in many of the countries of Asia, Europe, Middle East, North America and South America.

In the advanced gas chromatography class, Tony draws on his fifteen years experience of designing process gas chromatograph column systems. His extensive analyzer expertise comes from designing hundreds of process analyzer systems and from his varied consulting work at refinery and chemical jobsites on five continents.


Tony Waters and ACE Consulting Engineers provide a variety of training classes and exceptional Engineering Services.



### TASC—Technical Automation Services Corp

We specialize in Analyzer Systems Integration, Technical Services & Support, Training and Environmental Consulting & Testing. Since 1990, we have been providing quality products, personnel and services to our Customers.

TASC and Tony Waters are pleased to present **Advanced Topics In Gas Chromatography** which is scheduled for...

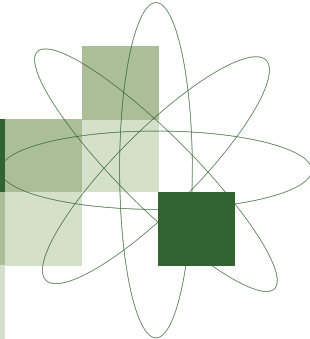


**2012  
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2000 NASA Parkway  
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Tel No. 281-474-3232  
\$895.00 per person**

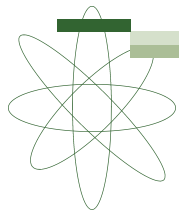
For more information or to register please call or email  
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# Advanced Topics in Gas Chromatography

2012

Process chromatographs are now common in nearly all fluid processing plants, and are often the main focus of analyzer maintenance specialists. The seminar starts with an introduction to the basic tenets of process chromatography. No prior experience of chromatography is required; novice and experienced people with both find the discussion interesting and revealing.

The main focus is on the chromatogram readout; what causes it and how to extract valuable data from the information it contains. The class is challenging and informative.

## Introduction to Chromatography

- what gas chromatography is
- history & definition of terms
- a brief review of the hardware
- Importance of the chromatogram readout

## How GC Columns Work

- how columns are made
- introduction to gas-liquid equilibrium
- what really happens inside a GC column
- understanding the causes of peak shapes
- understanding the cause of separation

## Optimizing Performance

- how to evaluate column performance
- how to set the optimum column temperature
- how to choose the optimum liquid loading
- how to determine the optimum flow rate
- how to improve the resolution of peaks
- how to achieve the fastest analysis

Process GCs almost always use multiple column systems to achieve fast separations and reliable measurements. Since nearly all chromatographic faults appear on the chromatogram, a skilled technician will always use it to diagnose problems. Many class exercises on real chromatograms are used to practice diagnostic techniques for troubleshooting separation problems.

The skills acquired from the class will allow trainees to read clues from chromatograms and more easily diagnose problems with the valves, detectors and column systems

## Backflush Column System:

- the purpose of backflush
- typical backflush valve systems
- how to balance the flow rates
- pressure effects in multiple column systems
- how to optimize the column lengths

## Troubleshooting Baseline Upsets:

- getting a flat baseline
- diagnosing spikes, peaks, bumps and steps
- class exercise to diagnose a complex chromatogram

## Heartcut Systems:

- why heart-cut is used in trace analysis
- heart-cut valve systems
- evaluating actual chromatograms
- the role of each column in a heartcut system
- setting single and multiple cuts
- understanding peak tails and remnants

