

# TECHNICAL AUTOMATION SERVICES COMPANY

## ADVANCE TOPICS IN GAS CHROMATOGRAPHY

### THE INSTRUCTOR

Tony Waters has 40 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 these 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.

### The Program

In the advanced gas chromatography class, Tony draws on his fifteen years' experience of designing process gas chromatography 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. 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. 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.

**January 27-28, 2020**

**\$1,695.00 per person**

Breakfast and Lunch provided each day

TASC

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# TASC

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

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# Technical Automation Services Company

## ADVANCED TOPICS IN GAS CHROMATOGRAPHY

### Process Chromatographs

Process Chromatography is now common in nearly all fluid processing plants, and is 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 will both find the discussion interesting and revealing.

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.

### INTRODUCTION TO CHROMATOGRAPHY

- What gas chromatography is
- History and definition of terms
- A brief overview 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 liquid loading
- How to determine the optimum flow rate
- How to improve the resolution of peaks
- How to achieve the fastest analysis

### BACK-FLUSH COLUMN SYSTEM

- The purpose of back-flush
- Typical back-flush valve systems
- How to balance 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

### HEART-CUT SYSTEMS

- Why heart-cut is used in trace analysis
- Heart-cut valve systems
- Evaluating actual chromatograms
- The role of each column in a heart-cut system
- Setting single and multiple cuts
- Understanding peak tails and remnants