

Case Study IV: 50% Productivity Improvement for EPA Method 8260 without Changing Method Parameters

Technical Note 006

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Abstract

GC-MS productivity was increased 13% without changing any of the method parameters. Gains were realized immediately simply by improving the oven ventilation during the cool-down step with the GC Chaser. Time savings were realized immediately upon installation. **The method did not have to be re-validated because none of the separation conditions were altered.**

Introduction

GC test methods and equipment play an integral part of nearly every field of chemical testing. A scientist might view GC as a very mature field because both theory and practice are well understood. On the other hand, a lab manager views his fleet of GCs as a financial resource because test results and sample analysis generate revenue. As a result managers are always on the lookout for faster and more cost-effective ways to streamline operations and maximize the earning potential of their equipment. This is especially true for expensive systems such as GC-MS. Fast GCs, new methods, techniques and accessories that can achieve higher sample throughputs are important tools for attaining higher profitability.

Fast GC Accessories

Thermal agility describes the ability of an oven to heat up and cool down fast. Both steps comprise the complete cycle time and together they determine sample throughput. Lab managers recognize that cost effective fast GC accessories provide an attractive alternative to buying new equipment because they require little or no bench space and do not eat up extra costs for consumables and support equipment.

Zip Scientific manufactures the GC Chaser, a GC accessory design to reduce the cool-down time between runs. Shown in Figure 1, the GC Chaser is pneumatically connected to the intake vent of the GC oven via a flexible aluminum duct. Oven activity is monitored by placing a current transducer on one of the oven heater

wires. The GC Chaser automatically activates a centrifugal fan at the end of the temperature program. The oven ventilation is dramatically improved resulting in significant time savings and higher sampler throughput.

Case Study

Alpha Laboratories, Westborough MA (www.alphalabs.com) is a U.S. leader in environmental testing. They have three separate environmental testing facilities in the northeastern United States. The Alpha Labs facility in Westborough MA was selected as the test site for this case study. Scott Enright is the lab manager; he uses the GC Chaser to increase the sample throughput by fast oven cool-down. Table I summarizes the data demonstrating the productivity gains achieved with these two fast GC accessories.

Figure 1 shows two ENCON purge and trap systems connected to one Agilent GC-MS. Normally the 11 min purge step is the slowest step in the cycle therefore, there is no benefit to cooling the oven down fast. However, with two ENCON systems taking turns feeding the GC the oven cool-down step limits the sample throughput.



Figure 1. P&T with GC-MS Equipment for EPA Method 8260 at Alpha Labs

The GC Chaser can be seen in the lower right corner of Figure 1. It was placed on the floor behind the bench and connected to the GC

Zip Scientific Fast GC
Good People, Top-notch Products and Excellent Service

by maximizing the potential of the single GC. The offers an attractive option to lab managers for streamlining operations, reducing costs and maximizing profits.

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For this specific case study, Figure 1 shows the GC sitting on an open bench with adequate ventilation. Therefore, these results suggest a conservative estimate of the time savings. The benefits would be greater for situations exhibiting poorer ventilation.

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Figure 2. Method 8260 Chromatogram

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