



Leaders In Sample Introduction Technology

Dynatherm Thermal Desorption Systems

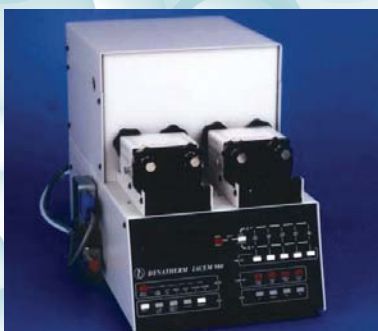


A complete suite of sample collection and concentration systems



FAST

RELIABLE



FLEXIBLE



UPGRADEABLE

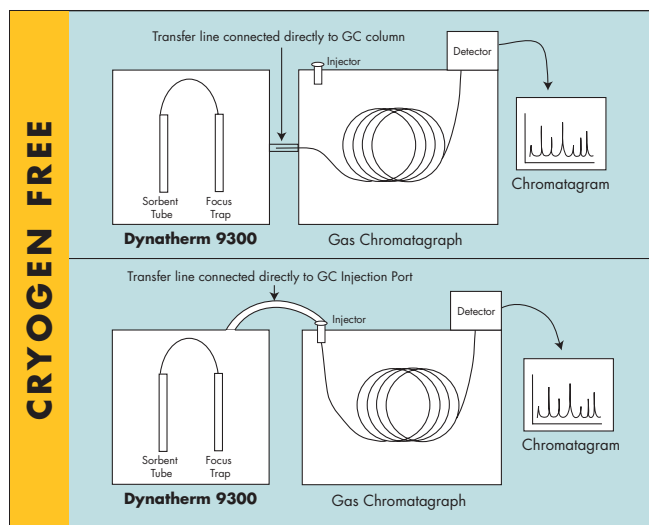
CDS Analytical is the premier designer and manufacturer of laboratory instruments for sample introduction to GC for analysis. For over 35 years our focus has been on conceiving, designing, manufacturing, and supporting leading edge instrumentation.

Today we offer a complete suite of diverse front-end GC equipment for pyrolysis, purge and trap, headspace, and thermal desorption. These robust, field-tested products provide the entire range of sample introduction techniques, and matrix handling capabilities utilizing different; gas flows, temperatures, heating rates, and multiple step capabilities required by today's most demanding analytical laboratories.

Dynatherm thermal desorption systems are the name brand in the chemical weapons industry, known and respected for flexibility and reliability. Time and again, organizations like the U.S. Department of Defense, State DOH Labs, mobile labs and major universities have relied on them in situations where there simply is no margin for error.

Our new Series 9300 thermal desorbers include: a single tube desorber, a near real-time sampling system, a continuous sampler and near-real time desorber, and the only autosampler able to handle any standard size thermal desorption tubes.

In years to come CDS Analytical will continue to support customers by developing the next generation of sample introduction instrumentation.



Thermal Desorption

Thermal desorption is a two-step technique. First, samples are collected and concentrated. Next, they are transferred to a detector for analysis.

Dynatherm instruments capture relevant compounds on adsorbent material packed in glass cartridges. Then they introduce the collected chemicals into a gas chromatograph, where the components are separated, identified, and measured.

Thermal desorption uses heat, not solvent extraction, to release organic compounds. This eliminates long extraction waits and chromatogram solvent peaks.

Two sorbent traps work in tandem: a high-capacity trap retains desired compounds from large sampling volumes; a capillary-bore focusing trap injects samples onto the capillary column in a narrow-band plug.

Transferring analytes to the focus trap improves injection efficiency without the need for cryogenics. This is because the sampling process may have required liters of flow to collect mass sufficient to meet the analytical needs. The method also minimizes water interference because carrier gas evaporates water vapor from the absorbent tube and vents it from the unit – with no sample loss.

Dynatherm instruments are perfect for a mobile laboratory. Samples can be collected using a battery-powered unit for remote air sampling and brought to the lab, or collected directly onto the unit utilizing a heated sampling line.

Applications

What We Can Measure

Air, solids and even liquids for:

- Any C3 up to n-C33; 5 ring PAH's maximum
- Halogenated C1-C33 compounds
- High moisture samples are OK
- Levels from ppt (parts per trillion) to %

Military and Homeland Security

Analysis of:

- Chemical agents
- TICS
- TIMS
- WMD

Environmental

- TO-1, TO-2 Using old Tekmar tubes or any other size tube.
- VOST – Volatile organic sampling train
- IH – Industrial hygiene samples
- ASTM method D6196
- MDHS method 72
- NIOSH method 2459

Indoor Air Quality

Product Emissions:

- Carpets
- Upholstery
- Vehicle trim and interior
- Textiles
- Construction and building materials

Food, Flavors and Fragrances

- Aroma compounds collected from headspace
- Analysis of flavor compounds using solid thermal desorption, SPE or SBSE
- Pharmaceutical powders and ointments



ACEM 9300/9305 Thermal Desorption System

System Application

- 9300 – Single tube thermal desorber
- 9305 – Near real-time sampling and thermal desorption
- 9320 – Thermal desorber for the Inficon HAPSITE GC/MS

Current Users

- U.S. Army
- Chemical weapons monitoring and destruction facilities
- State mobile laboratories
- Universities
- Research and development laboratories
- QA/QC laboratories

Functional Profile

This flexible and reliable instrument is the next iteration of the familiar ACEM 900 which has proven itself repeatedly in Defense Department depots storing and destroying chemical agents.

The 9300 Thermal Desorption system is typically attached to a GC or GC/MS to provide extreme sensitivity by concentrating air samples for minutes to hours. The 9305 provides near real-time sampling capabilities utilizing a heated sampling line, mass flow controller and vacuum pump.

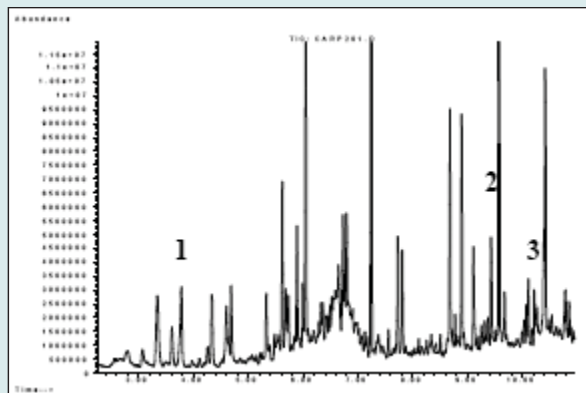
Other applications include characterizing source emissions, quantifying increasingly lower levels of contamination during site remediation projects, and identifying health hazards in the work place or to emergency response crews in the event of a chemical spill or terrorist activity.

Using high capacity sampling tubes, the 9300 Thermal Desorption System captures and desorbs target analytes to the GC and GC/MS. The analytes are focused on a precision bore focus trap, resulting in a narrow band injection without splitting, sub-ambient cooling, or cryofocusing.

This two stage trapping and desorption process provides the most efficient capture and release of airborne contaminants possible within a field-operable system.

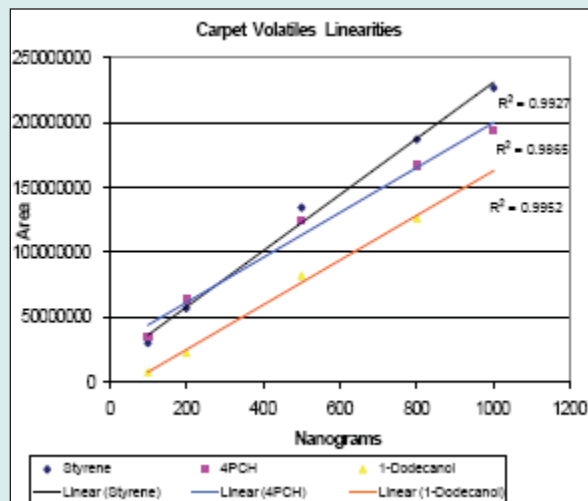
Built-In Flexibility

Building on the success of the 900 series Automated Concentrator for Environmental Matrices (ACEM), the 9300 series offers multiple configurations of the basic thermal desorber to provide maximum flexibility. All versions include sorbent tube chambers that accept 6, 8 or 10 mm OD tubes, concentrate the analytes of interest on the capillary bore focus trap and connect to the GC by direct connection to the GC column, or by connecting through the injection port.



Carpet Volatiles

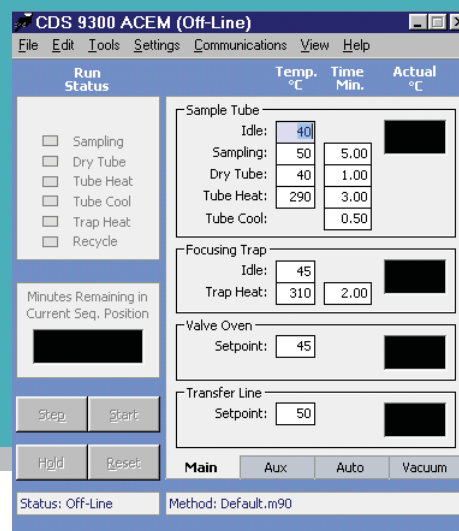
1=Styrene, 2=4-PCH, 3=Dodecanol



Carpet Volatiles Linearity with TDA

9300/9305/IACEM 980

Product Specifications



All models feature totally redesigned electronic control with handheld plug-in user interface and direct communication interface for PC control. The flexible transfer line, reinforced with a Silcosteel™ liner, provides direct connection to GC column for maximum sensitivity.

Other features include:

Dynamic Range	C3-C33+, including volatiles, semi-volatiles, polar and non-polar compounds
Heated Zones Valve compartment Transfer Lines Sample Tube Desorb Sample Tube Idle Focus Trap Desorb Focus Trap Idle	<div> 9300 Series ambient to 300°C ambient to 400°C ambient to 400°C ambient to 400°C ambient to 400°C ambient to 400°C </div> <div> IACEM 980 ambient to 225°C ambient to 260°C ambient to 350°C ambient to 99°C ambient to 400°C ambient to 99°C </div>
Heating Rates	Sample tube 1000°C/min. typ. Focusing trap 900°C/min typ.
Timed Events	External sampling (IACEM 980/9305), dry purge, tube heat, tube cool, trap heat and system recycle.
Sorbent Tube Requirements	6 mm OD (standard), 4.5" long. 10 mm OD fast flow tubes (6 mm ends). Optional 8 mm tubes, with fittings modified.
Power	115VAC (110 to 125), 50/60 Hz. 220 VAC Optional.
GC Interface	GC wait for ready, remote start, multiple methods and sequence interrupt.
Computer Control	<ul style="list-style-type: none"> • Ability to run different tubes with different methods, or same tube multiple times • Save and recall methods • Log file of: analyst, date/time of injection, method, start temperatures, and leak check verification, (internal standard verification) • Preset maximums for identified tubes and traps
Maintenance Counters	On all valves
Dimensions	9300 series – 10.5" H x 9.25" W x 12.5" D 25 lbs. IACEM 980 – 13.5" H x 12" W x 20" D 42 lbs.

IACEM 980

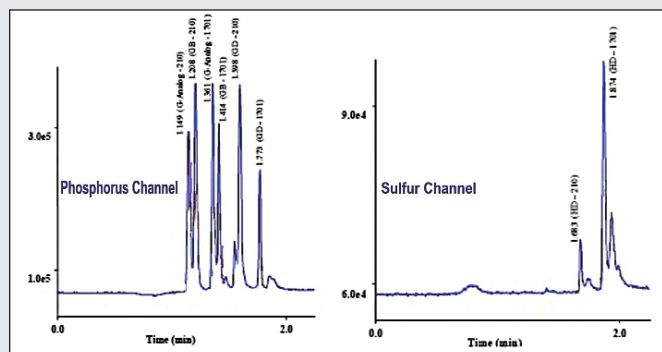


Continuous (24/7) Sampling and Thermal Desorption System

Developed in response to increasingly strict airborne exposure level guidelines, the IACEM 980 enables superior workplace monitoring of chemical analytes. The precision air sampler collects organic compounds and concentrates them onto solid sorbent cartridges. Analytes are then transferred to a gas chromatograph (GC) for separation, identification, and measurement.

Dual collection tubes operate in alternate cycles for continuous sample concentration throughout the survey period. Each tube is linked with a focusing trap, enabling efficient chromatographic separation of analytes from interferences. Focusing traps may be connected to capillary columns of dissimilar phases.

By blending parallel systems into an integrated unit, the IACEM delivers the ultimate in flexibility and sensitivity through increased sample collection efficiency and state-of-the-art GC/method Set-up.



Simultaneous Detection of Chemical Agents

Advanced Features

Flexibility

May be used as a single tube desorber or a near real-time sampler or a continuous sampler. May be used with GCs containing one, two, or four columns in combination with one, two or three detectors. *Operates effectively with all new GCs and easily retrofits onto older GC models.*

Speed

New analytical results are available as often as every four minutes – making for near real-time (NRT) performance. Cycle duration determined by GC's oven program and cool-down time.

Selectivity

Configuring with multiple, dissimilar columns or different detectors accomplishes same-cycle confirmation, *greatly reducing false positives.*

Continuous

Two sub-systems, 180 degrees out of phase, employ a push-pull design that enables the instrument to collect one sample while analyzing another. This continuous process provides *maximum personnel protection.*

Sensitivity

Patented, time-tested construction and focusing techniques allow detection to 0.2 TWA (sub-part-per-trillion) levels. High sampling flow rates (>1.0 liters per minute) permit the collection of analyte quantities necessary for accurate and reproducible GC detection and quantification.

Higher Temperature Sampling Capability (Option)

The 980 DVX was developed as an option adding a third heated valve to accommodate higher sample inlet temperatures required for direct collection and analysis of higher boiling compounds such as VX and PAHs.

TDA – 9300 - Thermal Desorption Autosampler

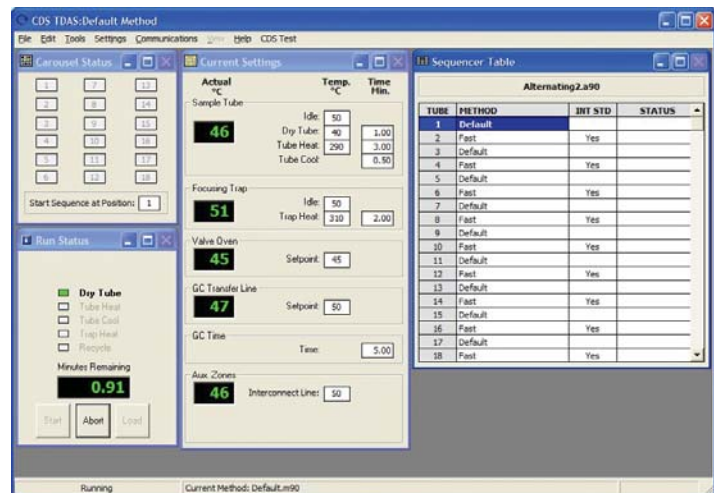


The new Dynatherm TDA 9300 is adaptable; it can be equipped with sample tubes of various sizes, thereby optimizing the process for different applications.

The presence of independently controlled tubes enables you to perform analyses with a variety of sorbent materials using different desorption times and temperatures.

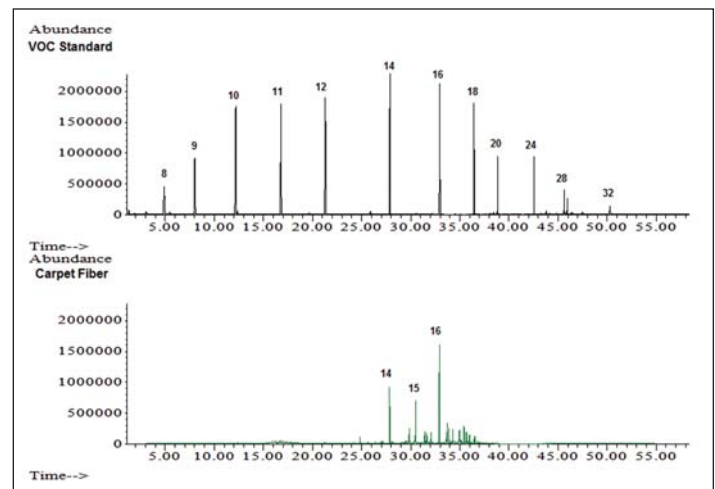
This autosampler is perfect for replacing old Tekmar 6016 units and Nutech VOST units, automating chemical agent monitoring, and implementing product emissions testing in an R&D lab. It enhances your lab's analytical flexibility by being able to run numerous types of tubes on one instrument.

- 18-tube autosampler
- Can desorb any size standard thermal desorption tube
- Automatic leak checking
- Computer control
- Ability to desorb same tube at multiple temperatures
- No special end caps required
- Cryogen-free focusing



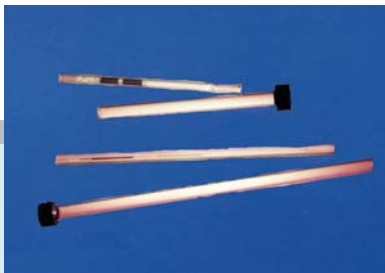
The unit requires:

- ACEM 9300
Connected through GC injection port or direct to the analytical column
- Computer running Windows 98 or higher
- Any standard size desorption tubes from 3" to 7.5" long, with ODs of 3 mm to 16 mm (8 mm ends)



Automobile Interior Emissions Using VOC Portion of VDA 278 (8-32 straight chain alkanes by carbon number)

Accessories



Sorbent Tubes and Focus Traps



Single Tube Conditioner



6-Tube Conditioner



AirPro Surveyor

Sorbent Tubes and Focus Traps

The design of the sorbent tubes and focus traps used for sample collection and thermal desorption in Dynatherm systems is a major factor contributing to the overall performance of the equipment. Dynatherm sorbent tubes are precisely engineered to snugly fit into Vespel® Graphite ferrules, offering a balance between elasticity (seal in a pressurized environment) and durability (resist deforming under pressure). The 1 mm tube wall thickness is rugged and robust.

- Standard Sorbent Tubes: 6 mm OD, 4.5" long
- Fast Flow Tubes: 10 mm OD, 4.5" long with 6 mm ends.
- Focus Traps: 6 mm OD, 4.5" long with 0.9 mm – 0.5 mm ID.

For a complete list of tubes and packings visit our website
www.cdsanalytical.com/products/tubes.htm

Tube Conditioners

Dynatherm offers two conditioners to restore tubes to their original purity, a single-tube model and a six-tube model. The six-tube model is sensor-controlled to 1°C and features individualized temperature and flow control for each tube.

Heaters and fittings can be mixed and matched to accommodate tubes with varying outer diameters and lengths. They can then be conditioned simultaneously on the Model 9600 Six-Tube Conditioner.

The 9600 comes with a handheld controller, which stores up to 20 methods, and optional DCI software, letting the user program each tube chamber in 1°C increments and condition in 0.1 minute increments.

Both models offer an injection port option that lets users spike tubes with an internal standard.

Remote Sampling Accessories

The AirPro Surveyor is a compact, portable two-tube air sampler. It is an excellent tool for rapid, short-term task sampling, survey work, or long-duration ambient air assessment for fence-line monitoring at remote locations. The Surveyor is engineered to handle backpressure, compensating for varying restrictions of polymer adsorbents to provide accurate flow volume over short or extended sampling periods.

Peripherals

- Sorbent packed tubes and traps
- Dust filters
- Vespel ferrules, O-rings
- Transfer Lines
- Simulant Mixes
- Heater Sleeves



CDS maintains a global network of trained representatives ready to assist you. For a complete listing of authorized dealers, visit **www.cdsanalytical.com** and select "International Sales."

Our instruments feature universal compatibility with all GC and GC/MS systems.

At CDS, we take responsibility for our instruments throughout their entire lifetime by supporting them with upgrades, parts, and services. We are always on call to answer questions and resolve issues.

All CDS Analytical instruments are backed by a one-year warranty; we also offer the option of extended warranties. Customers have the opportunity to lock in comprehensive maintenance and service contracts for any CDS instrument.

