



Leaders In Sample Introduction Technology

The CDS 8000 Sample Concentrator



One Instrument...
many techniques

THERMAL DESORPTION

LIQUID PURGE & TRAP

DYNAMIC HEADSPACE

PYROLYSIS

The CDS Model 8000 Sample Concentrator is a universal sample introduction system for collecting and/or concentrating volatile organic compounds from a variety of matrices. Having an assortment of vessels and options to choose from, the 8000 can purge volatiles from liquids, concentrate organics from headspace above solid or liquid samples, thermally desorb air samples from sorbent tubes, and deconstruct solid materials by dynamic headspace and pyrolysis. Sampling can be performed in either an inert or reactive gas atmosphere. CDS was the first company to introduce a microprocessor based purge and trap system and the first to incorporate a split cabinet design allowing pneumatics and electronics to be separated easily for service. Today, the 8000 is built for maximum flexibility. Its design permits rapid interchange of modules without disturbing the GC connection. The Model 8000 has already proven its value in many industries: food and flavors, pharmaceuticals, environmental, paper, paints, coating, medical devices, automotive and more...

Let our team of scientists help you with your analytical challenges



Product Features:

- Detection limits to sub-ppb
- Standard thermal desorption chamber
- All Silcosteel® sample path for inert sample transfer
- Programming through front keypad or optional software
- Exclusive reactant gas option lets you purge in air, oxygen or another gas and sweep to the GC in a different carrier
- Manual mode for total control of heating rates and diagnostics
- Optional cryogenic trapping or GC-mounted cryofocusing
- 350°C valve oven temperature limit reduces carryover and permits analysis of semi-volatiles
- Isolation of water elimination trap during desorb phase prevents moisture from entering GC
- Built-in injection ports allow user to spike direct to trap or to GC. This aids in troubleshooting

Product Specifications:

Programmable times: 0–999.9 minutes **with step-to feature and hold key**

Trap: 0.3 cm OD x 28.5 cm length with choice of adsorbents

Pyrex® 1/4 inch desorption tubes:

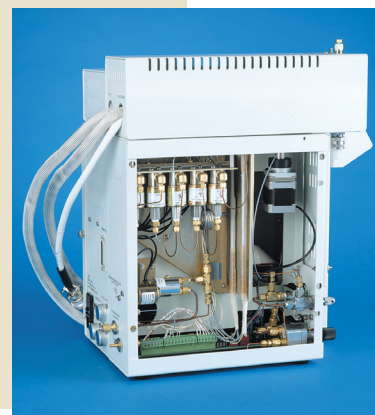
available with an assortment of sorbent packings

Transfer line: 1.5 m stainless steel-clad fused silica, in a flexible heated jacket (other lengths available by special order)

Maximum Operating Temperatures:

Valve Oven	350°C
Vessel	350°C
Transfer Line	350°C
Wet Trap	350°C
Adsorbent Trap	350°C
Cryofocuser	350°C

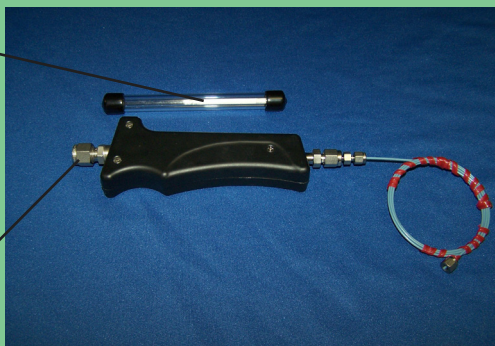
Overall Dimensions 8000:
25 cm W x 44 cm H x 46 cm D



Thermal Desorption Chamber

Packed Thermal Desorption Tube

Thermal desorption tube loads in handle and inserts into thermal desorption chamber



Thermal Desorption

Thermal desorption encompasses two primary functions; sample collection/concentration, and transfer to a detector.

The use of adsorbents and large sample volumes to collect vapor phase compounds, (such as pollutants in air or residual components from solids), facilitates accurate analysis even when contaminant levels are very low.

Organics are concentrated on sorbent media while the sample matrix, air or water, is discarded. In much the same way as a vacuum cleaner filters dust from air as it sweeps over a surface, CDS instruments capture compounds of interest on adsorbent material packed in glass or stainless steel cartridges. Collected chemical compounds are then introduced into another analytical instrument, typically a gas chromatograph, where they are separated, measured, and identified.

Thermal desorption uses heat, (instead of solvent extraction), to release organic compounds from the adsorbent and transfer the entire collected sample to a gas chromatograph for analysis. This eliminates extraction time, a solvent peak in the chromatogram (which can mask compounds of interest) and waste solvent disposal.

Analytical trap heats to 350°C in less than 25 seconds for quick transfer of analytes

Uses 1/4" packed sorbent tubes

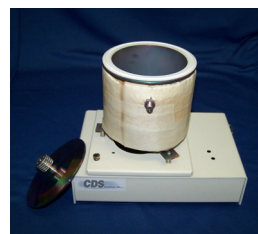
Dynamic Headspace

Only CDS offers a true dynamic headspace system using a constant stream of carrier gas or reactant gas to envelop the sample without saturating the headspace. The result: greater sensitivity.

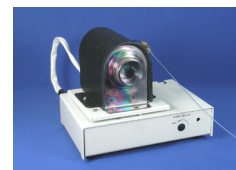
No sample preparation is necessary, simply place sample into the vessel. Several vessels are offered, each with a different size to reduce dead volume around your sample.

Vessels are connected to the 8000 with a heated transfer line. A configurable platform, with built-in fan for quick cooling, accommodates additional vessels as needed.

Dynamic Headspace vessels are programmable to 350°C



800 ml vessel
(95mm X 115mm)



140-ml bulk vessel
(38mm x 120mm)



test tube desorber
(20mm x 150mm)



Model 8000 shown with 800 ml
bulk vessel (95mm x 115mm)

Platform Dimensions:
24 cm W x 7cm H x 20 cm D

Model 8400 Autosampler

The Model 8400 is a four-position autosampler for dynamic headspace. The instrument runs in multi-vessel mode, where each vessel is assigned its own time and temperature parameters.

Pushing the start key automatically activates a synchronized GC cycle time, so samples that follow do not lay on the trap for a prolonged period. Bake cycles can be delayed. Options include cryofocusing at the GC injection port and reactant gas.

Vessel Dimensions: 38mm x 140mm (4 each)
8400 Dimensions: 46cm H x 32cm D x 21 cm W



Model 8000 with CDS Pyroprobe@5000

Pyrolysis

The pyrolysis module enables qualitative and quantitative compound profiling of semi and non-volatiles. The 8000 is designed to allow simple integration with a CDS pyrolysis instrument.

The interface is built directly into the 8000 for simplicity and effectiveness. The sample carrier (inert or reactant) is introduced through the desorber. Use the timed event feature to fire the probe.

Applications include polymer identification, oxidation studies, simulated TGA-GC, combustion analysis, kinetic studies and pyrolysis at slow, programmed rates.

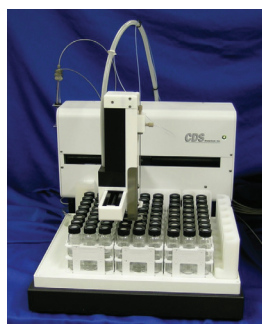
Liquid Purge & Trap

The liquid purge & trap option expands the possibilities for the 8000. Applications for this module include water, beer, wine, fruit juice, soy sauce and other liquids.

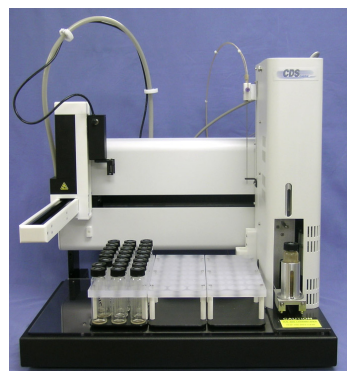
For enhanced analysis, CDS offers its patented **Foam Sensor**. The first in the industry is now the industry's standard. It prevents system contamination by automatically shutting-off purge gas if the sample foams.

An available sparge heater allows the user to sample at temperatures up to 85°C. Sparge vessels are available fritted or non-fritted, in 5 ml and 25 ml volumes.

Optional autosamplers are available for analyzing waters and soils (Model 7400) and waters only (Model 7300).



Model 7300



Model 7400



Thermal Desorption – TO-17 Analysis

TO-17 is the EPA method for the determination of VOC's in ambient air by pulling a known volume of air through a tube packed with a variety of sorbent materials. The sorbent tube is then thermally desorbed and analyzed using gas chromatography and mass spectrometry. The list of compounds includes the gases (dichlorofluoromethane, vinyl chloride), heavier alkyl halides (chloroform, trichloroethylene), as well as the aromatics (benzene through trichlorobenzene). Figure 1 shows the overlay of a calibration from 5 ppbv to 100 ppbv of the TO17 standard.

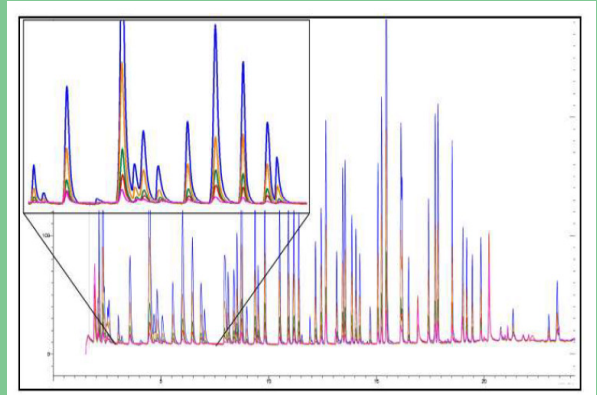


Figure 1. TO-17 standard (65 components), 5 ppbv through 100 ppbv.

Purge & Trap – EPA Method 524

The analysis of water for volatile organic contaminants using the purge and trap technique has been an established method for decades. Trace level organic compounds are purged from the water using a stream of inert gas, trapped using a sorbent trap, and then transferred to the gas chromatograph for identification. The resulting chromatogram contains compounds ranging from light gases like vinyl chloride to naphthalene and trichlorobenzene. Figure 2 shows a purge and trap analysis of EPA method 524 volatiles at the 20 PPB level.

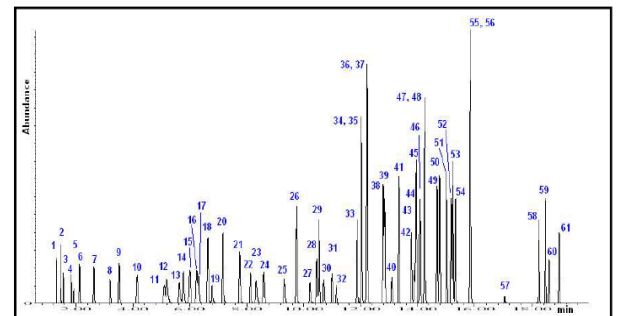


Figure 2. Volatiles at 20 PPB concentration purged from water.

Dynamic Headspace Sampling of a Printed Circuit Board

The volatile materials released from electronic components such as printed circuit boards may be analyzed by dynamic headspace. The sample material is warmed to a pre-determined temperature and purged to a sorbent trap to collect and concentrate the volatilized analytes. Figure 3 shows the volatiles collected from a small circuit board.

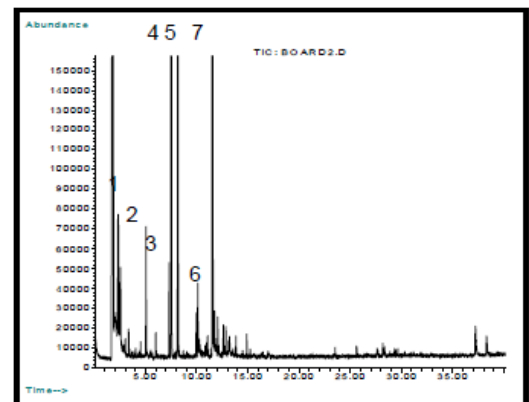


Figure 3. PCB with components attached, volatiles include acetone, xylene, tetrachloroethylene xylenes, benzaldelyde, and dichlorobenzenes.

Pyrolysis of Tobacco in Air

When tobacco burns some of the released compounds are pyrolysis products. These products may be studied analytically by pyrolyzing the tobacco in air, collecting the pyrolysate onto a sorbent trap and then desorbing the trap to the GC/MS. As seen in figure 4, the largest peak is nicotine, which is not a pyrolysis product, but is simply volatilized from the tobacco by heating. Some of the compounds are pyrolysis products of the cellulose, such as levoglucosan and furans.

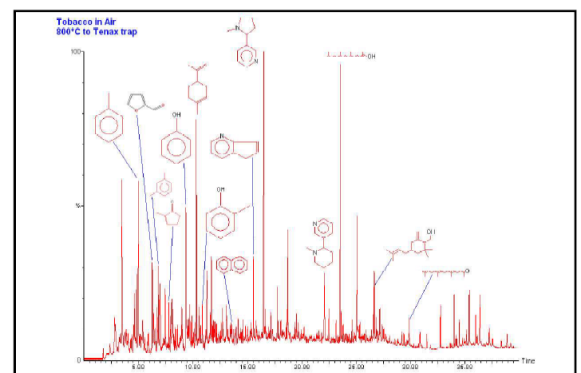
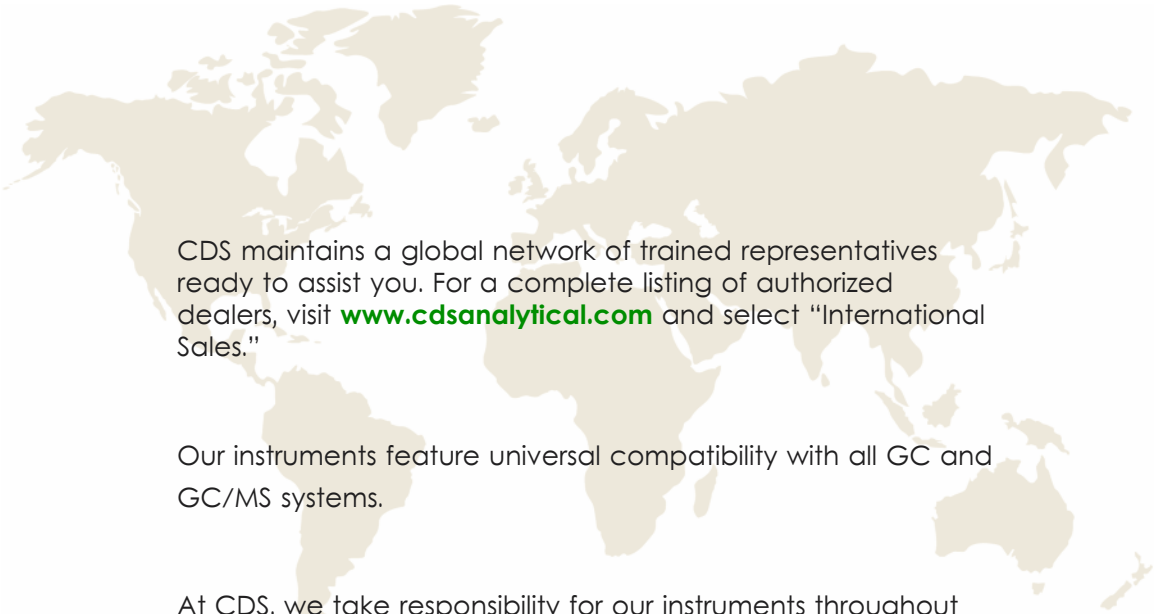


Figure 4. Tobacco in Air



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.



Worldwide Headquarters
465 Limestone Road
P.O. Box 277
Oxford, PA 19363-0277 USA
Toll Free 800-541-6593
610-932-3636
Fax 610-932-4158
www.cdsanalytical.com