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*la ingeniería en
analítica instrumental.
un nuevo concepto*

Unity™ Thermal Desorber

Markes International (MI™) manufacture a suite of state-of-the-art thermal desorption (TD) systems based on the field-proven technology platform of our single tube thermal desorber - UNITY. UNITY offers long-term reliability plus the precision and analytical performance required by both routine and challenging applications. It incorporates all of the sample protection features required for compliance with key international standard methods plus SecureTD™ - a unique repeat analysis capability.

Markes International thermal desorption systems are compatible with industry standard sorbent tubes (¼-inch O.D. x 3½-inch long) in glass, stainless and coated steel, as well as canisters, bags and on-line air or process streams. They will connect to any GC/GCMS system and do not require a standard GC inlet.

Key features of UNITY and all associated automated systems include:



Electrically-cooled focusing trap - no liquid cryogen

- **Efficient retention**

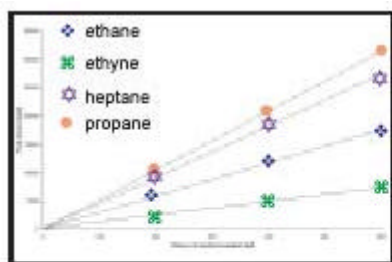
UNITY's electrically cooled focusing trap retains even ultra volatile components without the use of liquid cryogen. Two, three or even four sorbents can be packed in series for quantitative retention and efficient desorption of wide boiling range samples.

- **Rapid trap heating for efficient desorption**

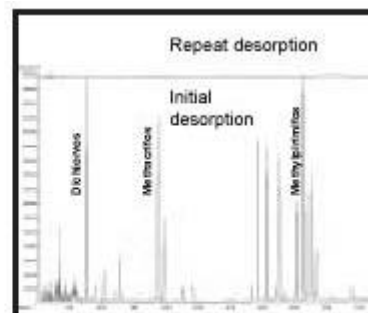
Trap heating rates in excess of 60°C / sec result in uncompromised high-resolution capillary chromatography - even under splitless conditions.

- **Easily changed**

The trap is easy to change with a unique combination of oring seals and flexible connections.



Retention of ultra-volatile compounds including acetylene (ethyne) from several hundred millilitres of air.



No carryover confirms complete desorption of high boiling pesticides.



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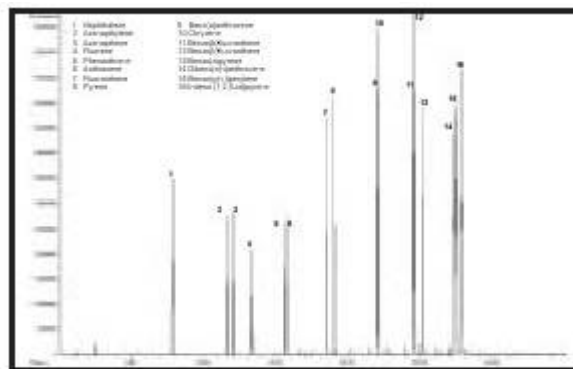
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Short, inert flow path and valve

Constructed entirely of inert materials the short, narrow-bore flow path is efficiently and uniformly heated to prevent band dispersion and eliminate carry-over. It ensures compatibility with "sticky" compounds such as dioctyl phthalate, semi-volatiles and reactive compounds such as amines, mercaptans (thiols) and phosphorous pesticides.



Recovery of up to 6-ring PAHs

From splitless to double split

- **Splitless operation for optimum detection**

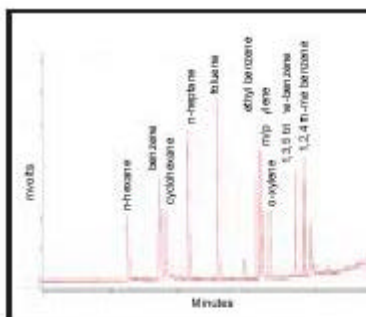
The desorption of UNITY's cold trap is so efficient that it is capable of splitless operation with high-resolution capillary chromatography. This facilitates trace-level monitoring.

- **Single/Double split operation**

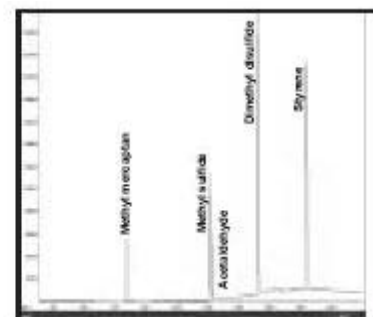
UNITY also supports single and double split capability for high concentration industrial monitoring and the analysis of % level volatiles in materials.

- **Optional electronic mass flow control (MFC) of split flows**

UNITY can be configured with an electronic MFC module which enables split flows to be set and controlled through the Windows® based control software.



Splitless analysis of volatile hydrocarbons in air for optimum sensitivity.



Analysis of labile compounds.

Versatility

With its inert flow path, multiple split options and wide temperature range, the inherent flexibility of UNITY is further enhanced by operational versatility. Standard systems feature:

- repeat desorption of single samples at multiple temperatures
- a dedicated tube conditioning mode
- the option of purging at elevated temperatures before desorption
- direct sampling of headspace vapours from sealed containers (jars, headspace vials, etc.) directly into the focusing trap



Software selection of the desorption mode using drop down menu.





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UNITY & SecureTD™ - For Complete Confidence

Compliance

Markes systems have been designed to satisfy the stringent performance and sample protection requirements of key thermal desorption standard methods such as US EPA TO- 17, ASTM D-6196-97, ISO 16017, NIOSH 2549 and the UK HSE Methods for Determination of Hazardous Substances.

SecureTD - complete confidence

All Mi systems feature SecureTD, a unique recollection facility for the repeat analysis or archiving of critical samples. This provides ultimate confidence in analysis.

SecureTD allows a quantitative portion of each sample to be collected on a clean backup tube regardless of whether the original sample was in a tube or gas / air container. The quantitative performance of SecureTD has been demonstrated for both routine and challenging applications.

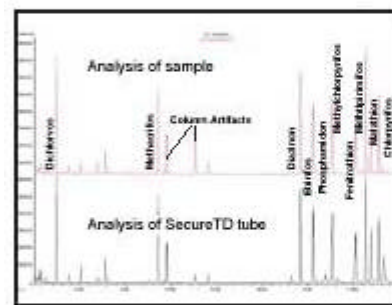
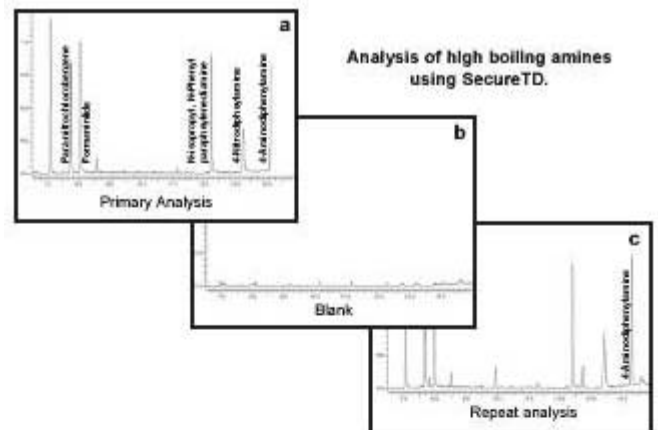
Chromatograms (a) to (c) show the analysis of a series of amines - data acquisition during the initial run ends prematurely, half way through the 4- Aminodiphenylamine (4A) peak. The subsequent blank chromatogram shows no system carry-over. Analysis of the SecureTD tube allows the quantitation of 4A despite the failure of run 1.

Secure TD - TD method validation

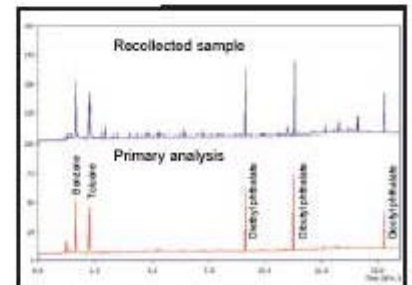
Desorption of a recollected sample should produce an exact match to the original chromatogram, but at a lower peak area - proportional to the split ratio used. By producing a replicate chromatogram or series of chromatograms from recollected samples, SecureTD can be used to demonstrate lack of bias & quantitative performance. It is thus a convenient tool for method validation.

Sample protection

Markes International TD systems feature stringent and automatic leak testing of every tube before desorption. Failed tubes are retained intact for operator attention. Tubes are also purged with carrier gas to eliminate air, prior to desorption. This prevents sorbent and / or sample oxidation. Fully interlinked ready / start signals ensure that desorption only occurs when the GC/GCMS is ready for analysis.



Semi-volatile phosphorous pesticides. Repeat analysis confirms results and validates method.



Analysis of recollected phthalate sample demonstrates quantitative SecureTD performance for high boiling compounds.

