Thermal Desorption Solutions

A complete preparation and analysis package...

from one reliable source

Thermal desorption (TD) represents the ultimate sample introduction technology for gas chromatography. This technique allows you to introduce volatile (VOC) and semi-volatile (SVOC) organic compounds from a wide range of sample matrices, directly into a GC or GC/MS. Versatile, highly sensitive and fully automated, TD has become the preferred methodology for applications in environmental pollutants, material emissions, food, flavors and fragrances.

With the Series 2 UNITY, UltrA, Air Server and CIA 8 products, Markes International has advanced TD instrumentation to an unprecedented level. These products allow for efficient and accurate analysis of samples in standard sorbent tubes, real-time air or in canisters, and are fully compliant with international standards.

TD technology offers significant advantages over solvent extraction:

- Increased sensitivity
- Compatible with solid, liquid, and gaseous samples
- Fully automated
- Greater than 95% recovery

A complete preparation and analysis package... all from one source. Agilent Technologies has partnered with Markes International to add thermal desorption technology to its expanding portfolio of solutions. Think of Agilent as your single source for sales, service and support of TD/GC/MS systems.

Our measure is your success.

Agilent Technologies

The heart of the TD system:
UNITY Series 2

Markes' UNITY 2 provides a single platform for all TD applications. Perfectly suited for increasingly rigorous laboratory demands, the UNITY 2 combines single tube desorption with cryogen-free analyte re-focusing and full compatibility with a variety of autosampler options.

UNITY 2 key features include:

- **Quantitative sample re-collection (SecureTD-Q)** facilitates repeat analysis and overcomes the one shot limitation of conventional TD systems
- **Electrically-cooled**, sorbent trapping to -30° C offers quantitative retention of ultra-volatile components and reduces running costs
- **Patented inert valving** allows compatibility with every TD application from semi-volatiles to reactive compounds
- **Fully compatible with TubeTAG** devices that remain with a specific sample tube throughout its life, recording tube history and facilitating sample tracking between field and laboratory
- **Fully method compliant**, including stringent leak testing without heat or gas flow applied
- **Fully upgradeable** to multi-tube, multi-canister and/or online automation
- **Time-saving overlap mode** allows desorption of a subsequent sample to begin while GC analysis of a previous sample continues

Automation Options

Series 2 UltrA

Multi-functional, mechanically simple TD autosampler with optional reading/writing of electronic tube tags

- Combines with UNITY 2 to offer unattended thermal desorption of up to 100 capped tubes
- Slim design consists of 10 horizontal trays, each containing up to 10 tubes, loaded into the analytical position and sealed into the carrier gas flow path
- Options available for automating quantitative sample re-collection for repeat analysis (SecureTD-Q)
- Incorporates the ambient temperature/no-flow leak test of UNITY 2 as a guarantee of data integrity

Series 2 Air Server and CIA 8

Automated canister analysis and round-the-clock on-line air/gas monitoring

- Connects to any series 2 (UltrA-)UNITY thermal desorption system
- UNITY 2 - Air Server/CIA 8 systems operate **cryogen-free** to reduce costs and maintenance, while offering optimum analytical performance/sensitivity
- Suitable for both automated analysis of canister/bag samples and 24/7 unattended monitoring of on-line air/gas streams
- Delivers controlled flow of whole-air or gas directly into the electrically-cooled focusing trap of the desorber
- Compact design, especially useful for installation in mobile labs

UNITY Series 2

Series 2 UltrA: *10 trays, each accommodating up to 10 capped tubes, shown here with '50:50' option for automating sample re-collection (SecureTD-Q)*

Thermal Desorption

brings versatility and labor-saving benefits to a wide range of applications

Air monitoring by tubes and canisters

Thermal desorption is now recognized as the sample measurement technique of choice for air monitoring, in both the workplace and the environment. By offering superior sensitivity, TD technology has supplanted solvent extraction and charcoal/CS_2 as the preferred methodology.

The trend for thermal desorption to replace other, older, methods for air monitoring is driven by recent advances in instrumentation. For instance, Markes TD products allow for the quantitative re-collection of split flow for repeat analysis. Applications include:

- Atmospheric research
- Ambient/urban air monitoring (TO-15/TO-17)
- Industrial (stack) emissions
- Odor assessment
- Indoor air quality
- Personal exposure monitoring
- Biological exposure assessment (breath testing)
- Soil gas and vapor intrusion assessment

Series 2 UNITY with CIA 8: *Fully compliant with U.S. EPA Method TO-15 for Air Toxics*

Material emissions

Considering the average person's time is spent 65% indoors and 6% in transit, measuring residual volatiles in materials has become increasingly important. Thermal desorption is the technique of choice, because it allows for the removal of organic compounds from solid substances without thermally destroying them.

Offering manual or fully automated (up to 100 samples) operation, the Markes TD systems offer simple direct desorption for measurement of the VOC/SVOC content or profile of small samples of materials. Applications include:

- Paint, pigments, coatings and adhesives
- Building materials
- Toys
- Non-metallic car trim components
- Carpeting

Food, flavor and fragrance

Using GC/MS for flavor and fragrance profiling can be challenging. Typically, profiles are comprised of hundreds of volatile organic compounds – and analytes with the lowest concentration often have the most acute effect on perceived aroma. As a result, solvent extraction and other conventional sample preparation methods are not sufficiently sensitive.

Thermal desorption offers a more reliable solution, because it allows for a wide range of sampling methods, using quantitative, automatic instrumentation. Samples can be re-collected for repeat analysis and validation of recovery. Applications include:

- Fragrance profiling in toiletries and consumer products
- Off-odor and taint analysis
- Aroma profiling
- Residual volatiles
- Characterizing plants and GM crops
- Detecting key olfactory components

The combined benefits of two industry pioneers

Agilent Technologies has a long history of innovation in GC and GC/MS, coupled with a reputation for building rugged instrumentation. In developing strategic business alliances, we seek companies that are similarly forward-thinking. Markes International resoundingly meets our criteria.

Markes International is the world leader in thermal desorption technology, manufacturing products renowned for reliability and performance. Given Agilent's position as the leading global supplier of GC/MS instrumentation, the two companies share obvious synergy. This partnership ensures that customers will get the very best in quality products and support from a *single source*.

An ever-expanding portfolio of solutions from the leader in GC/MS technology

Agilent's partnership with Markes International is another example of our ongoing goal of offering innovative new solutions for maximizing productivity. As the industry benchmark for quality, Agilent's instrumentation helps engineers, scientists, manufacturers, researchers and government agencies achieve more accurate analysis and measurement. Count on Agilent for:

- **Workflow solutions** that let you maintain stringent practices, from sample preparation to analysis
- **GC/MS software** for managing large quantities of data, while preserving the integrity and security of your results. So you can make the most of every run, and every workday
- **Agilent-engineered supplies** that expand your hours of continuous uptime
- **World-class, global service and support** that can reduce lab time, optimize instrument use, and increase productivity

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agilent_inquiries@agilent.com

Europe
info_agilent@agilent.com

Asia Pacific
adinquiry_aplsca@agilent.com

Our catalogue of new applications is ever growing. To learn about the latest, contact your local Agilent Representative or visit us at:
www.agilent.com/chem/ThermalDesorption

Printed in U.S.A., May 5, 2009
5990-3939EN

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