

## What is TD?

Since the early 1980's thermal desorption (TD) has provided the ultimate versatile sample introduction technology for GC / GC-MS. It combines selective concentration enhancement with direct extraction into the carrier gas and efficient transfer / injection all in one fully automated and labour saving package.

## How does TD work?

Many material samples - drugs, foods, textiles, polymers, paints *etc.* can be directly thermally desorbed. Weighed samples are heated in a stream of carrier gas allowing volatiles to be extracted into the gas flow, refocused and injected into the GC-(MS) analyser as a discreet, concentrated band of vapour. With capacity for up to 100 samples, TD provides a labour / cost saving alternative to conventional solvent extraction with reduced risk of error and enhanced sensitivity. It also eliminates the health risks associated with solvent use.

Alternatively, vapours in gas or air can be concentrated on- or off-line onto sorbent tubes before TD-GC-MS analysis. Several hundred litres of air or gas can be sampled and the vapours transferred / injected into the analyzer in as little as 200 µl of carrier gas. As much as a 10<sup>6</sup> enhancement in concentration can be achieved when required.

Features such as stringent leak testing and Secure TD-Q guarantee sample / data integrity and simplify method validation.

Automated TD, with capacity for up to 100 samples, ensures a full weekend of productive operation.

## Will TD work for me?

Thermal desorption is now recognized as the technique of choice for air monitoring. Relevant standard methods include: ISO 16017, ISO 16000, EN 14662 (parts 1 & 4), ASTM D6196, US EPA TO-17, NIOSH 2549. The wide range of TD applications include:



### Environmental air monitoring

- Stack emissions
- Landfill gases
- Factory fence-line monitoring
- Urban air
- Sick building syndrome



### Occupational health & safety

- Personal exposure monitoring (inhalation)
- Biological exposure assessment (breath)



### Materials emissions testing

- Car trim materials
- Construction products
- Consumer goods
- Textiles
- Electronics



### Residual volatiles

- Pharmaceuticals
- Packaging
- Polymer



### Food, flavour & fragrance

- Fragrance profiling
- Off odours / taints



### Defence & forensic

- Civil defence against chemical agents
- Destruction of CW agents
- Drugs, explosives, arson residue, *etc.*

## How do I sample?



### Sorbent tubes for air or gas

- Passive (diffusive) sampling
- Pumped sampling



### On-line monitoring of air or gas

- Continuous air / gas monitoring
- Headspace vapours



### Materials testing

- Micro-Chamber / Thermal Extractor
- FLEC cell and emissions chambers
- Empty tubes for direct desorption / extraction of volatiles



### Alveolar breath

- Bio-VOC breath sampler









### Vapours in soils

- VOC-Mole soil probe

Visit our website for more details and to find out how the Markes TD suite of instruments can help with your application

[www.markes.com](http://www.markes.com)  
or email  
[enquiries@markes.com](mailto:enquiries@markes.com)

## How can thermal desorption benefit me?

-  Versatility: Volatile and reactive compounds measured at ppt to percent levels in air, gas or liquid samples.
-  Automation: TD eliminates manual sample preparation.
-  Greatly enhanced sensitivity compared with other extraction methods.
-  Fully quantitative and readily validated.
-  Referenced in international standard methods.
-  Improves analytical stability for challenging applications & difficult sample matrices.



## Application Areas

Thermal desorption enhances GC-(MS) analysis of trace organics for:



Ambient & workplace air monitoring



Materials testing: residual volatiles and emissions to indoor air



Chemical warfare agents and forensic analysis



Food, flavour & fragrance profiling

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L I M I T E D

## Measuring Trace Organic Compounds in Air and Materials with Thermal Desorption

