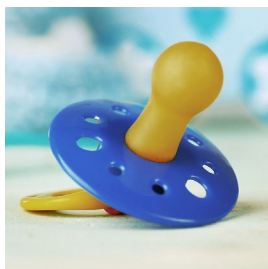


# Micro-Chamber/Thermal Extractor

**Fast and flexible sampling of chemicals and odours released from materials and foods**



# Micro-Chamber/Thermal Extractor™

**The Micro-Chamber/Thermal Extractor (μ-CTE™) is a compact, stand-alone unit for the rapid, method-compliant sampling of chemical vapours released from a wide variety of products, foods and materials.**

With its simple operation and ability to simultaneously collect volatile and semi-volatile organic compounds (VOCs and SVOCs) from up to four samples, the μ-CTE is a powerful tool for increasing laboratory productivity.

It is also versatile – accommodating many types of solid and liquid sample, and allowing vapour collection using sorbent tubes, DNPH cartridges and on-line systems.

The μ-CTE is widely used by industry and test laboratories for determining representative emission or odour profiles, identifying emission sources, and simulating ageing or formulation processes.



“ The Micro-Chamber/Thermal Extractor is easy to use, with fast results ”

**Murielle Etienne**  
Bostik, France

# Convenient sampling of chemical vapours

The  $\mu$ -CTE streamlines the whole process of sampling organic vapours from everyday materials, thanks to the minimised need for sample preparation and simple operation.

## 1 Load the material



The sample is placed inside one of the chambers. Up to four samples can be accommodated.

## 2 Set the conditions



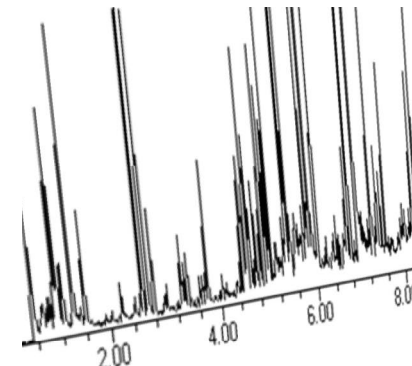
Each chamber lid is closed, a flow of gas (air or nitrogen) is applied, and the temperature selected – from ambient up to 250°C.

## 3 Collect the volatiles



A sampling tube is attached to the outlet of each chamber, and vapours from the sample are swept onto it. The sorbent packing can be optimised for the analytes of interest.

## 4 Analyse the sample



Analysis of sorbent tubes for VOCs and SVOCs uses thermal desorption (TD) with GC or GC-MS. Analysis of DNPH cartridges for formaldehyde is carried out by HPLC.

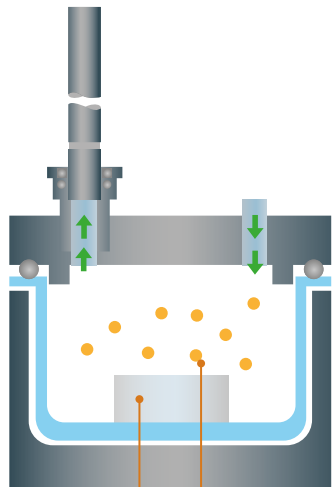
### The $\mu$ -CTE can be used for:

- Quality-control of chemical emissions from products and materials.
- Screening of products before long-term certification tests.
- Checking raw materials.
- Comparing products to those of competitors.
- Monitoring odour and emission profiles.
- Product troubleshooting and R&D.
- Kinetic studies such as shelf-life tests, or monitoring fragrance profiles as they change over time.
- Permeation tests.

# Perfect for a range of sample types

With three modes of operation, the  $\mu$ -CTE can be used for a variety of investigations.

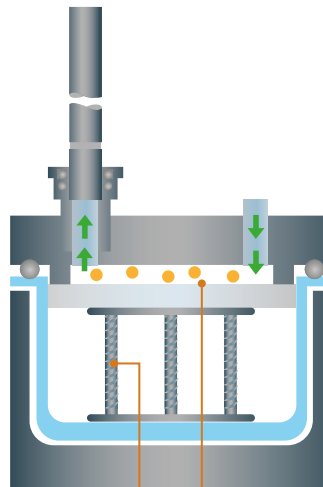
**Bulk emissions testing** is valuable for profiling odours and emissions, and for testing of raw materials and foods.



Samples are placed straight into the chambers.

Vapours swept from the entire sample are collected.

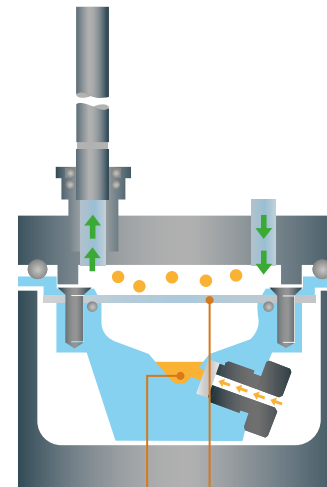
**Surface emissions testing:** This approach is suitable for determining area-specific emission rates from flat samples.



Sprung spacers raise planar samples to the top of the chamber.

A seal forms when the lid is closed, so only vapours released from the sample's surface are collected.

**Permeation testing:** A permeation accessory allows measurement of volatiles permeating through a thin layer of material.



Liquid samples are injected through a septum into the well under a sealed sample of test material.

Vapours diffuse through the test material into the chamber.

## Other options include:

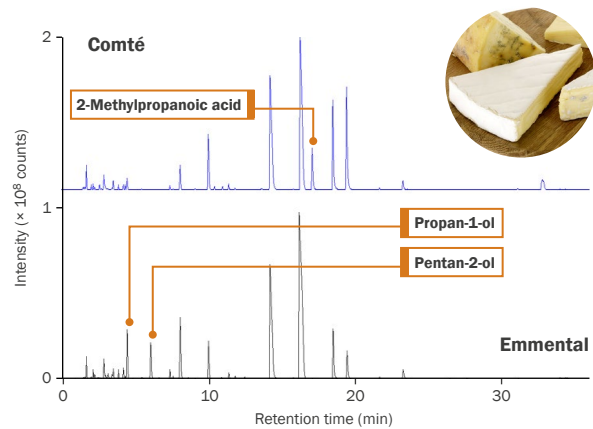
- **A Humidifier Accessory** supplies the  $\mu$ -CTE with 50% humidified air. This allows closer simulation of conditions used in reference emission tests, and can enhance the recovery of some less-volatile polar compounds.
- **Toggle valves** allow the gas flow to unused chambers to be turned off, reducing gas consumption.
- **A Chamber Calibration Tool** enables the performance and reproducibility of the individual sampling chambers to be compared, both on one system and between systems.
- **An SPF Sample Cutter** makes it easy to cut out cylindrical samples of spray polyurethane foam or other soft materials.

# Comprehensive odour profiling...

## ...of foods and consumer products

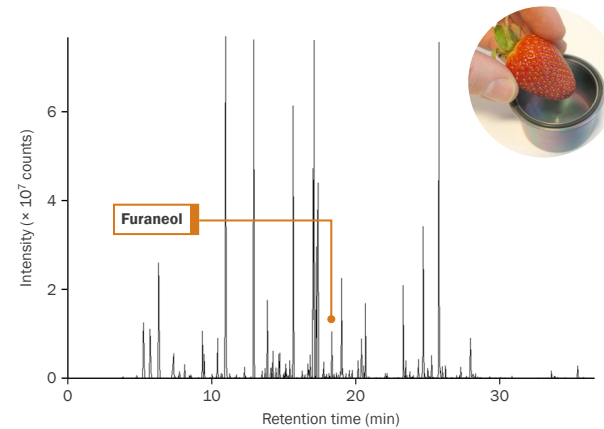
Sampling of headspace volatiles is well-established in the food and fragrance industries, and the  $\mu$ -CTE uses this principle to odour-profile a wide range of sample types.

### Aroma-profiling cheese



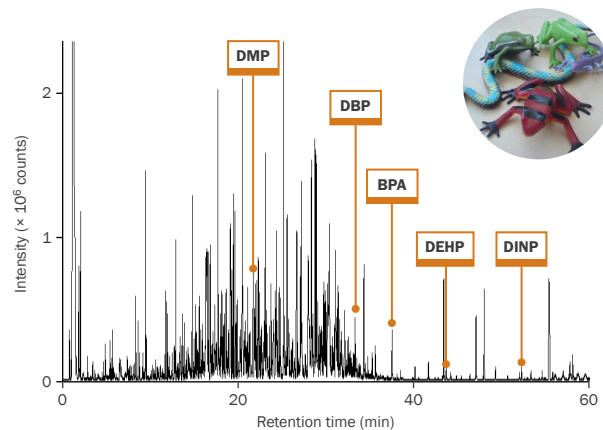
Key differences between the aroma profiles of food products are rapidly identified using the  $\mu$ -CTE, as illustrated here by this comparison of vapours released from different **cheeses**.

### Identifying key aroma compounds



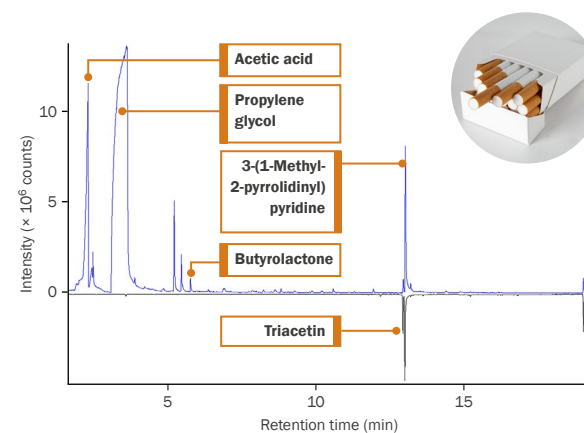
The  $\mu$ -CTE is perfect for identifying target species in complex aroma profiles such as **strawberry** headspace. Furaneol was of interest in this case, with its desirable 'burnt sugar' aroma and sub-ppb odour threshold.

### Assessing VOCs from consumer products



The  $\mu$ -CTE is ideal for quickly assessing emission profiles from products – such as the **plastic toy** examined here. Chemicals identified included endocrine disruptors such as phthalates and bisphenol A.

### Comparing the odour profiles of related products



Key differences between 'rolling' **tobacco** (top) and manufactured cigarette tobacco (bottom) are easily seen in this side-by-side comparison carried out using the  $\mu$ -CTE.

# Rapid emissions screening...

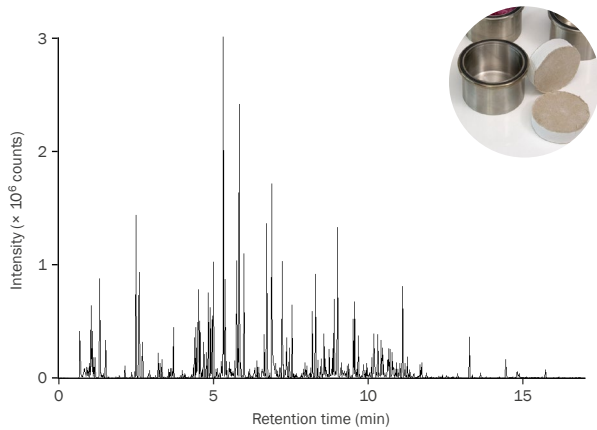
## ...of materials that affect indoor and in-vehicle air quality

The  $\mu$ -CTE is ideally suited to the quick screening of emissions from materials used indoors or in vehicles – aiding compliance with regulatory requirements and facilitating product development.

**Predict results of reference tests**

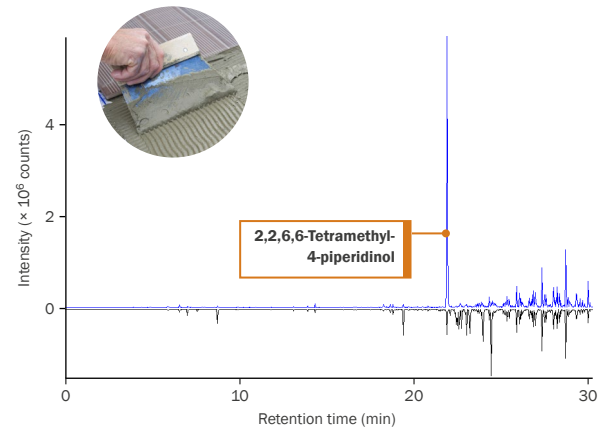
Results from the  $\mu$ -CTE can be correlated with long-term (e.g. 28-day) reference tests – allowing you to predict whether your product will pass or fail.

### Screening construction materials



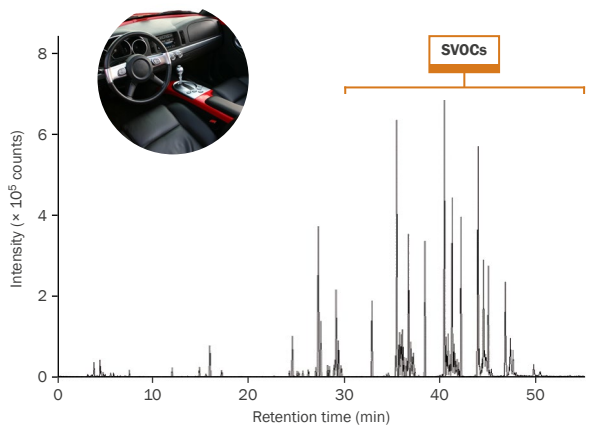
The  $\mu$ -CTE is ideal for screening emissions from products such as flooring and **plasterboard**, for routine factory production control under the Construction Products Regulation (see prEN 16516).

### Comparing products across a range



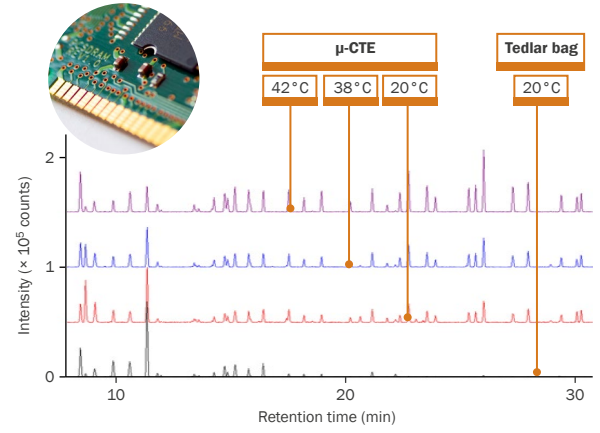
Emission profiles of similar products like these two brands of **grab-adhesive** are readily compared using the  $\mu$ -CTE – aiding product development and compliance with standard methodology such as ASTM D7706-11.

### Complying with standard methods



New regulations and voluntary controls limit the chemicals released from **car trim**, and the  $\mu$ -CTE is an ideal tool for assessing vapour profiles from these materials – see ISO 12219-3.

### Assessing different test methodologies



Quick investigations of how emission profiles vary under different conditions are easily conducted using the  $\mu$ -CTE. This example shows the detection of residual solvents in **printed circuit boards**.



# Compliant with key standard methods

Due to its outstanding productivity and exceptional repeatability and reproducibility, use of the  $\mu$ -CTE is now described in a number of key international standard methods.

## It is required for compliance with:

- **ISO 12219-3:** Interior air of road vehicles – Part 3: Screening method for the determination of the emissions of volatile organic compounds from vehicle interior parts and materials – Micro-scale chamber method.
- **ASTM D7706-11:** Standard practice for rapid screening of VOC emissions from products using micro-scale chambers.
- **VDI 2083-17:** Reinraumtechnik – Reinraum- und reinheitstauglichkeit von werkstoffen [*Cleanrooms – Cleanroom cleanliness and suitability of materials*].
- **GUT Test:** Test system for VOC emissions from carpets (Gemeinschaft umweltfreundlicher Teppichboden).
- **ASTM D7859:** Standard practice for spraying, sampling, packaging, and test specimen preparation of spray polyurethane foam (SPF) insulation for testing of emissions using environmental chambers.
- **ASTM D8142:** Standard test method for determining chemical emissions from spray polyurethane foam (SPF) insulation using micro-scale environmental test chambers.
- **General Motors GMW17082:** Determination of volatile and semi-volatile organic compounds from vehicle automotive materials using a micro-scale chamber.
- **IKEA Test Instruction IOS-TI-0219:** Micro chamber sampling for screening of volatile organic compounds emitted from materials and products.
- **ISO 16000-25:** Determination of the emission of semi-volatile organic compounds by building products – Microchamber method. (Models M-CTE250, M-CTE250I and M-CTE250TI only).

## It is also cited as a secondary screening method in:

- **prEN 16402:** Paint and varnishes – Assessment of emissions of substances from coatings into indoor air – Sampling, conditioning and testing.
- **prEN 16516:** Construction products – Assessment of release of dangerous substances.

## Specifications

### $\mu$ -CTE-250

Maximum temperature:	From ambient to 250 °C
Number of chambers:	4
Volume of each chamber:	114 mL
Flow ranges (air or gas):	50–500 mL/min (high) 10–70 mL/min (low)



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