



**GERSTEL**

MAKING LABS WORK

# Thermal Desorption System TDS 3



Lowest Detection Limits  
Dependable Operation  
Reliable and Accurate Results



# GERSTEL Thermal Desorption System TDS 3 - Designed for maximum performance

## Thermal Desorption - solvent-free concentration technique

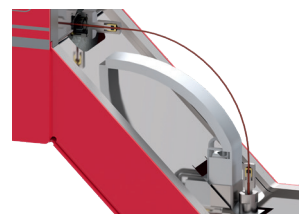
- Volatile and semi-volatile compounds can be sampled from whole air and concentrated using one or more sorbents. Thermal Desorption and transfer to the GC-MS is performed by the TDS 3 resulting in maximum recovery and highly sensitive determination - even of labile analytes.

## Direct Thermal Extraction / Dynamic Headspace

- Determination of volatile and semi-volatile compounds in solids or gels can be performed directly in the TD tube without sample preparation and without the use of solvents.

## Liquid Injection

- The TDS allows liquid injection to be performed in the back inlet of most GCs. Alternatively, the TDS can be removed, and the GC configured for liquid injection in a matter of minutes.



## GERSTEL TDS 3

- Manual thermal desorption system for conventional thermal desorption or direct thermal extraction/dynamic headspace. The TDS offers the following cooling options: LN<sub>2</sub>, LC0<sub>2</sub>, Cryostatic, or Peltier Cooling.

## GERSTEL TDS A2

- Adding a TDS A2 to the TDS 3 or TDS 3C provides automated processing of up to 20 samples using multiple analysis methods.



## GERSTEL TDS 3C

- The GERSTEL TDS 3C has an integrated Peltier cooling or Cryostatic Cooling system eliminating the need for cryogenic cooling.

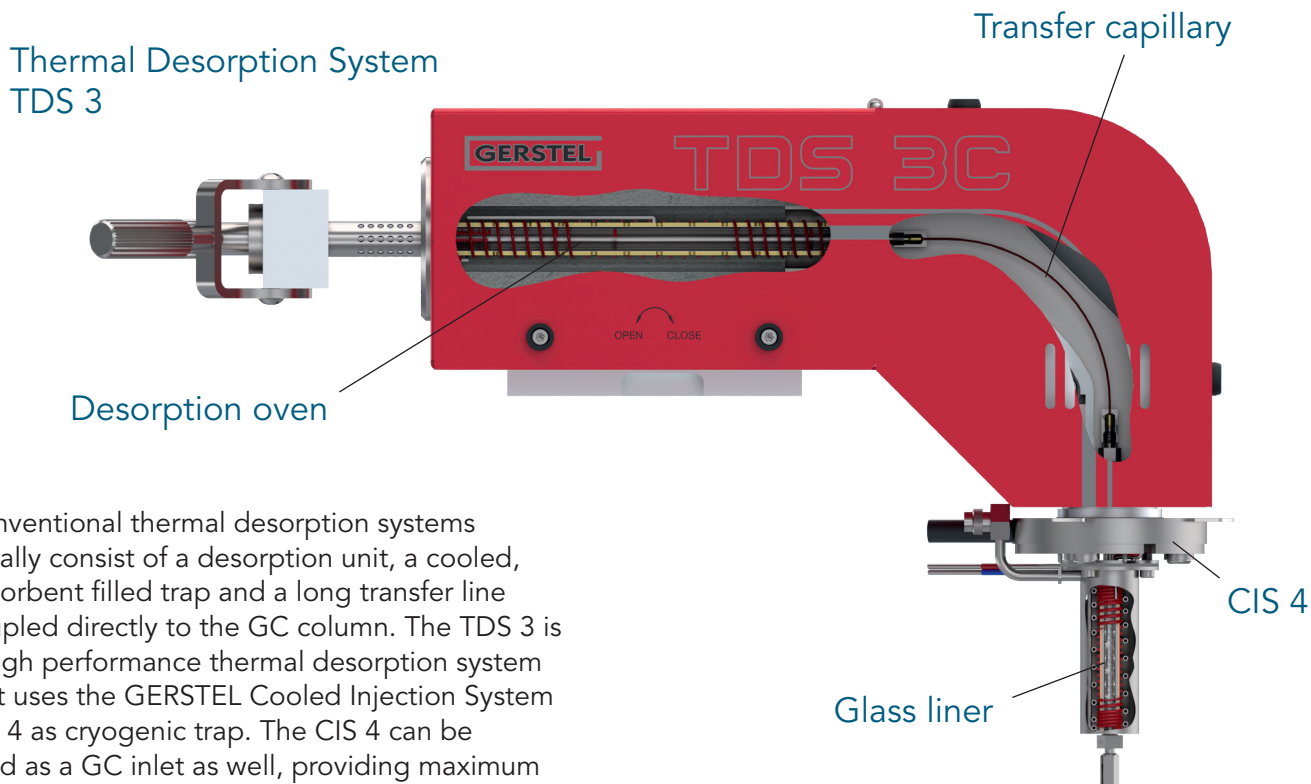
## Advantages and benefits of the GERSTEL TDS

- Mounts on top of the GC-MS → No additional Bench Space needed
- High flow tube desorption with short transfer line to trap → Excellent recovery even of SVOCs
- Splitless, Single-, or Dual Split transfer → Widest possible concentration range covered
- Cooled Injection System CIS trap → Best performance and versatility
- No valves, O-Rings, or membrane filters in flow path → No active sites, excellent analyte recovery
- No transfer line between trap and GC column → Excellent recovery – even of labile analytes
- Multi-level temperature programmed desorption → Highly controlled analyte desorption
- Carrier gas purge before thermal desorption → No analyte degradation
- User performed temperature calibration in the sample position → Simple, reliable Qualification

The TDS 3 is the preferred TD instrument in 1000s of laboratories world-wide due to its excellent analytical performance, reliability and track record for Standardized analytical Methods:

- Method VDA 278 for emissions from materials used in automobiles
- Various automobile manufacturers' material emissions analysis methods
- Volatiles in PET used in bottling plants
- US-EPA TO17, ISO 16017, and ASTM D6196
- ISO 16000 – 6 Indoor air quality

## GERSTEL TDS 3 Overview:



Conventional thermal desorption systems usually consist of a desorption unit, a cooled, adsorbent filled trap and a long transfer line coupled directly to the GC column. The TDS 3 is a high performance thermal desorption system that uses the GERSTEL Cooled Injection System CIS 4 as cryogenic trap. The CIS 4 can be used as a GC inlet as well, providing maximum flexibility. Analytes are focused in the inlet liner, before being transferred onto the analytical column as a narrow band. Using the inlet liner as a trap enables much greater flexibility when trapping analytes while protecting the column from water and contamination.

Prior to desorption in the TDS 3, tubes can be cooled and purged with carrier gas to remove oxygen, water or unwanted solvents. Two temperature ramps enable programmed heating and stepwise desorption of analytes up to 400 °C. Analytes are transferred at high flow through a very short transfer line (15 cm long) from the TDS 3 to the CIS trap. Unlike most other systems, the TDS 3 has no valves, O-rings, membrane filters, or active sites in the flow path. Analyte recovery is excellent – even for high boiling or labile analytes.

The combination of the CIS and the TDS permit a high desorption flow while trapping analytes in the glass inlet liner of the CIS.

Excess gas flows out the split vent. The system is capable of a wide range of sampling modes including true splitless, multi-desorption mode for analyte stacking, and very high split ratios. The dynamic range covers from ultra-trace constituents to major sample components.

When adding the TDS A2, the TDS 3 is upgraded to a fully automated system capable of analyzing up to twenty samples in one batch; for method optimization, each tube can be desorbed using a different method.

### Simple and efficient set-up

The TDS 3 and TDS A2 are easily set up and operated using the GERSTEL MAESTRO software. In combination with Agilent® Technologies GC-MS systems, just one method and one sequence table are required to control the complete system from Thermal Desorption to GC-MS analysis.

## GERSTEL Tube Conditioner TC 2

Conditioning of up to ten GERSTEL thermal desorption tubes or up to 50 GERSTEL Twisters. Conditioning is performed at a user-defined elevated temperature or using temperature programmed heating while purging the tubes with clean inert gas.

### Benefits of off-line tube conditioning:

- The TDS-GC-MS system is kept clean
- Conditioned TDS tubes available at all times
- Extends the useful life of tubes
- Reduced cost per analysis
- Reduced background, better results
- Improved detection limits



## GERSTEL Thermal Extractor TE 2

Sample preparation system for thermal extraction and concentration of analytes from bulk materials or large samples.

### Applications

#### Packaging industry

- Solvents and off-flavors in packaging

#### Flavor and fragrance industry

- Flavors in natural products

#### Accelerated material emissions testing as a complement to environmental chambers:

- Building materials
- Automotive materials
- Toys
- Carpets and flooring

#### Benefits of the GERSTEL TE 2:

- Greater sample capacity
- Lower detection limits
- Keeps TDS-GC-MS system clean

