



# Tube Standard Preparation System TSPS

*System for the Preparation of Thermal Desorption Standards*



Three good reasons  
for choosing  
a GERSTEL TSPS:

▶ **Production of solvent-free standards**

▶ **Simple to use  
no tools needed**

▶ **High throughput  
of six tubes**

▶ ***No solvent interferences***

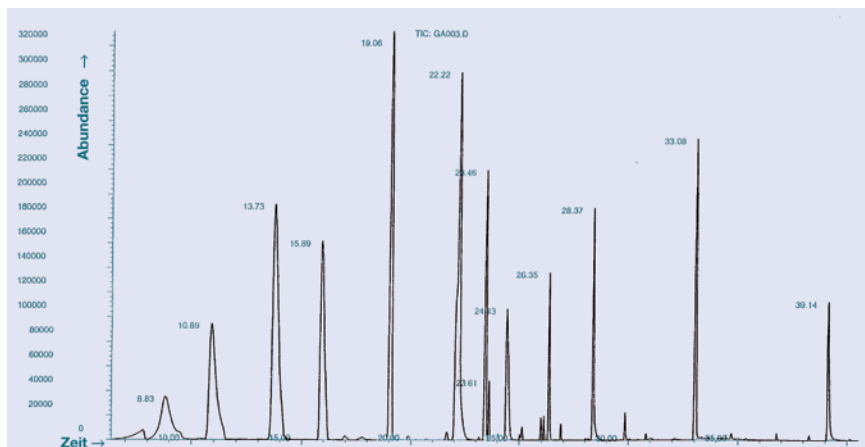
▶ ***Simple, quick connections,***

▶ ***Simultaneous preparation***



**GERSTEL**

## GERSTEL Tube Standard Preparation System TSPS



Chromatogram obtained from a 500 ng/µl. standard

The GERSTEL TSPS is designed for the preparation of solvent-free thermal desorption standards for use in air and industrial hygiene analysis. It provides an excellent alternative to commonly used "one-at-a-time" classic methods. The TSPS is simple in design, speeds up routine laboratory procedures and can be easily used by staff with any level of technical training.

The TSPS can be equipped with up to six GERSTEL thermal desorption tubes that are easily attached using a specially designed connection system. Methanol based standard solutions are injected through septumless sampling heads that are located directly above Tenax packed tubes. The septumless sampling heads have the advantage of providing leak free injections and independent gas flow to each tube. Since Tenax does not retain methanol, this provides a convenient means of depositing the standard compounds in the tube while completely eliminating the solution solvent. Multi-point calibration curves are then generated by thermally desorbing the calibration tubes prepared using the TSPS.

Compounds	Boiling point in °C at 101.3 kPa	Vapour pressure in kPa at 298 K	Desorption temperature in °C	Detection limit in ng	Standard deviation in ng from 14 replicates for mass = 10 ng absolute
Tetrahydrofuran	66	2.00		4.8	2.7
Benzene	80	1.01	120	5.0	2.9
Trichlorethene	87	0.27	120	5.1	2.9
Methylcyclohexane	101			5.0	3.2
n-Butanol	118	0.067	120	5.2	2.7
n-Butylacetate	126	0.10	95	5.0	2.2
2-Ethoxyethanol	136	0.051	130	3.2	2.7
Cyclohexanone	155	0.045	150	3.4	2.6
Limonene	170		200	4.6	2.4
Nonanol	191		220	4.2	2.9
Hexane acid	202			4.3	3.1
n-Hexadecane	287			5.2	2.6

Compound list by boiling point.

Concentration in ng absolute	Corresponds to a relative concentration in µg/m³ at an air sampling volum of		
	0.1 l	1.0 l	12 l
10	100	10	1
2.000	20.000	2.000	200

Relative concentrations in µg/m³ corresponding to the absolute concentration in the standard solution.

The TSPS has been thoroughly evaluated at the Institute for Medical Microbiology and Hygiene of the University of Lübeck, Germany. A detailed study of the system is included in the paper by R. Keller, *Development of a Calibration Method for Thermal Desorption*, which we will be happy to send you on request.



### Technical Data

<b>Diameter</b>	220 mm
<b>Height</b>	300 mm
<b>Weight</b>	3.6 kg



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