

Supplies

Thermal Desorber TD 3.5⁺







Thermal Desorber TD 3.5⁺

The Thermal Desorber TD 3.5⁺ is a flexible automated solution for thermal desorption and thermal extraction. The TD 3.5⁺ fits on top of any modern GC without the need for additional bench space and it is perfectly suited for the analysis of materials and for thermal desorption of sorbent tubes used to sample whole air. The TD 3.5⁺ handles standard 3.5" tubes, as prescribed in several standard methods, in addition to GERSTEL plus tubes, which hold up to 30 % more sorbent for enhanced break-through volume, improved recovery as well as improved limits of detection.

The TD 3.5⁺ incorporates the latest advances in thermal desorption technology. During desorption, tubes are heated over the entire length of the sorbent bed, as well as the sampling end for best possible recovery. Intelligently designed and based on a "Liner-in-Liner" concept, the TD 3.5⁺ has no valves or transfer lines. The TD 3.5⁺ is connected directly to the GERSTEL Cooled Injection System (CIS), which serves both as a cryo-focusing trap and as a temperature programmable GC inlet. Active sites are eliminated, reducing the risk of analyte loss, discrimination and memory effects to an absolute minimum.

The TD 3.5⁺ can be operated in single split, dual split or true splitless mode enabling it to cover the widest range of concentrations, to protect the column from water and contamination and to achieve the lowest possible limits of detection. The TD 3.5⁺ low-flow split pneumatics provide improved flexibility and performance. For extreme sensitivity, the multi-desorption mode can be selected in MAESTRO.

Techniques supported by TD 3.5⁺:

- Thermal desorption of sorbent tubes used for air sampling
- GERSTEL plus tubes
- Dynamic Headspace (DHS 3.5+) based on standard headspace vials
- DHS 3.5+ Large based on sample containers up to 1 L volume
- Thermal extraction of solid samples placed in fritted TD tubes
- Stir Bar Sorptive Extraction (SBSE) using the GERSTEL Twister
- Thermal extraction of liquids placed in µ-vials inside the TD tube

The TD 3.5⁺ supports manual operation and it can be removed in seconds to enable direct liquid sample introduction into the GERSTEL Cooled Injection System (CIS), a PTV-type universal GC inlet.

When configured with the GERSTEL MultiPurpose Sampler (MPS robotic), up to 40 samples are stored per TD 3.5⁺ tray in individually sealed sample positions. The system can easily be scaled up by using up to three TD 3.5⁺ trays per tray holder. The number of tray holders depends on size and configuration of the MPS robotic.



Transport adapter for GERSTEL TD 3.5+

■ 10 Units	021005-010-00
■ 100 Units	021005-100-00



Transport adapter liquid injection for GERSTEL TD 3.5+

■ 10 Units	020960-010-00
■ 100 Units	020960-100-00



O-ring set

für Transportadapter

■ 10 Units	021052-010-00
■ 100 Units	021052-100-00



Inner O-ring

für Transportadapter

■ 10 Units	020966-010-00
■ 100 Units	020966-100-00

Septum for Transport adapter for liquid injection

■ 10 Units	015608-010-00
■ 100 Units	015608-100-00

Glass inserts

für Twister Proben tray

■ 40 Units	012565-640-00
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Preventive maintenance kit for TD 3.5+

consists of:

Injection unit

Glass liner kit (012440-004-00)

GRAPHPACK 3D ferrules; 5 Units

■ CIS 4	014100-926-00
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Recommended kit for TD 3.5+

consists of:

Glass liner kit (012440-004-00)

GRAPHPACK 3D ferrules; 2 Units

Transport adapter for desorption Liner; 2 Units

Desorption liner for TD 3.5+, empty; 5 Units

■ KAS 4	012753-535-00
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TD 3.5⁺ Desorption tubes

The following desorption tubes are designed for the GERSTEL Thermal Desorber TD 3.5+. Dimensions OD 1/4" (6.35mm), ID 4.95mm; length 3.5" (88.9mm)

packed with Tenax[®] TA

stainless steel with bar code,
filled with 200mg of Tenax-TA 60/80mesh, in storage container
Maximum temperature: 300 °C

■ 10 Units

020586-010-00

packed with Tenax[®] TA

stainless steel with bar code,
filled with 260mg of Tenax-TA 60/80mesh, in storage container
Maximum temperature: 300 °C / 300 °C

■ 10 Units

020602-010-00

packed with Tenax[®] GR

stainless steel with bar code,
filled with 200mg of Tenax-GR 60/80mesh, in storage container
Maximum temperature: 300 °C

■ 10 Units

020603-010-00

packed with Carbotrap[®] 300

stainless steel with bar code,
filled with Carbopack-C 40/60 mesh, Carbopack-B 40/60 mesh
and Carbosieve-SIII 60/80 mesh in storage container
Maximum temperature: 330 °C

■ 10 Units

020604-010-00

packed with Carbopack[™] B and Carbopack[™] X

stainless steel with bar code,
filled with Carbopack-B 40/60 mesh and Carbopack-X 40/60mesh
in storage container
Maximum temperature: 330 °C

■ 10 SUnits

020605-010-00

with glass frit

Glass with bar code,
User packed liners

■ 5 Units

020801-005-00

Microvials for TDU / TD 3.5⁺

For injection of high-boiling or matrix laden samples e.g. oil or food
samples into the Microvial. The inserts are placed in the empty TD 3.5+
desorption tubes.

■ 20 Units

014756-500-00

■ 200 Units

014756-002-00

■ 2000 Units

014756-020-00





CIS glass liners for use with the TDU/TD 3.5⁺

The glass liners listed in the following are designed for CIS 4/6 in combination with the GERSTEL TDU/TD 3.5+ only. Unless specified separately, the dimensions are:

CIS 4/6 OD 3 mm (ID 2 mm); length 78 mm.

For all liners for any particular CIS type inlet, the same GERSTEL-Graphpack® ferrules can be used.

Important Information:

With exception of the Siltek™ coated liners, the deactivation is only stable at temperatures up to 275 °C. Higher temperatures can be used, but this will create more active sites inside the liner.

GERSTEL Headspace:

For standard Headspace Split injection, we recommend a deactivated baffled liner. For splitless introduction, it can be necessary to refocus the analytes in the liner. In this case, depending on the application, a liner packed with an sorbent such as Tenax® TA or Carbotrap™ B or even a sorbent such as PDMS foam can be used

Tenax TA™

Tenax TA™ is a porous material based on 2,6-diphenylene oxide polymer, with a specific surface area of 35 m²/g. The material has low affinity for water and methanol and adsorbs compounds in the C₅-C₂₈ range. The particle size is 60/80 MESH

Carbotrap B™

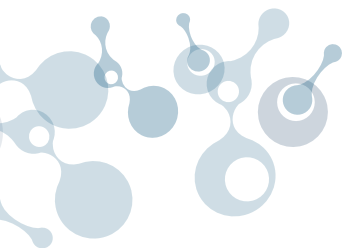
Carbotrap B™ has a particle size of 20/40 MESH. It has a specific surface area of 100 m²/g. This sorbent is especially suited for trapping and thermally desorbing compounds in the range from C₅ to C₂₀ (depending on the size and structure of the molecule).

PDMS

The GERSTEL PDMS foam has an open porous structure. The non polar material is very well suited for focusing and thermally desorbing non polar analytes (a distribution equilibrium occurs between the PDMS foam and the vapor phase). Maximum temperature: 300 °C. Minimum temperature: glass transition temperature -10 °C.

Maximum temperatures:

Liner type	maximum temperature
Deactivated liner	275 °C
Siltek™ coating	350 °C
Not deactivated	450 °C
Packed with Carbotrap B™	400 °C
Packed with Tenax TA™	350 °C
PDMS foam	300 °C



CIS glass liners for use with the TDU/TD 3.5+ deactivated

straight with notch deactivated

For initial system evaluation. Used for custom-packed liners.

Maximum temperature: 275 °C

1 package (10 Units)

■ CIS 4/6

013775-010-00

baffled deactivated

Suitable for very labile and for high boiling compounds.

(Warning: Breakthrough of analytes is possible.)

Maximum temperature: 275 °C

1 package (10 Units)

■ CIS 4/6

012436-010-00

with silanized glass wool 2mm, deactivated

For special uses: For trapping of low boilers. At 2 mm ID (CIS 4), a lower linear gas velocity is achieved, enabling trapping of low boilers even if no sorbent material can be used.

1 package (10 Units)

■ CIS 4/6

012742-010-00

with glass beads deactivated

improved cryofocusing across a wide boiling range and improved splitless transfer to the column due to the optimized flow restriction.

1 package (5 Units)

■ CIS 4/6

015620-005-00

with silanized glass wool Topaz coated

1 package (5 Units)

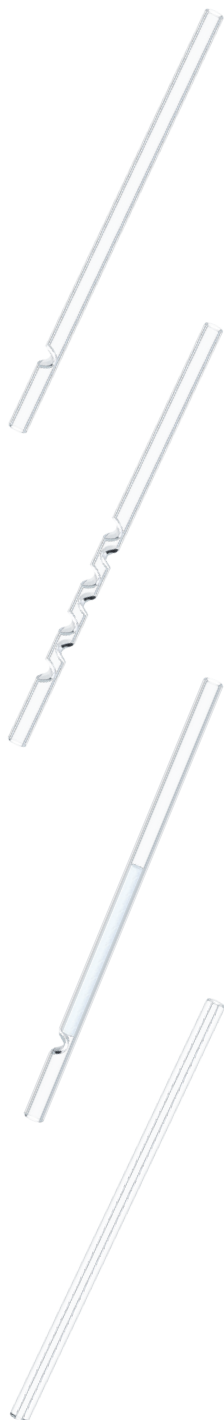
■ CIS 4/6

019867-005-00





CIS glass liners for use with the TDU/TD 3.5+



straight with notch

Special use liner e.g. for custom-packing

1 package (10 Units)

■ CIS 4/6

013885-010-00

1 package (100 Units)

■ CIS 4/6

013885-100-00

baffled

Used for high boiling and stable compounds.

1 package (10 Units)

■ CIS 4/6

013884-010-00

1 package (100 Units)

■ CIS 4/6

013884-100-00

with silanized glass wool 1mm

Especially useful for focusing of semi-volatiles due to small amount of packing material combined with high linear gas velocity for efficient transfer von analytes to the column.

1 package (10 Units)

■ CIS 4/6

013409-010-00

straight without notch

For special uses e.g. in combination with TDU/TD 3.5+ analyte trapping (for more information contact your local GERSTEL representative).

1 package (10 Units)

■ CIS 4/6

013911-010-00

Standard liner kit included glass liners:

Empty (baffled) deactivated, 2 units

Packed with silanized glass wool deactivated, 2 units

1 mm/2 mm ID, packed with silanized glass wool deactivated, 2 units

Packed with Tenax™, 2 units

Packed with Carbotrap B™, 2 units

■ CIS 4/6

012440-004-00



CIS glass liners for use with the TDU/TD 3.5⁺

packed with Tenax TA™

Low affinity to methanol and water (optimal water purging at 40 °C). For trapping from C₅ to high boilers.

1 package (10 Units)

■ CIS 4/6

012438-010-00

packed with Carbotrap B™

For trapping of low boilers.

1 package (10 Units)

■ CIS 4/6

012439-010-00

packed with Quarzwolle

More inert than glass wool. For trapping of difficult compounds (acidic, alkaline, etc.).

1 package (10 Units)

■ CIS 4/6

012437-010-00

packed with PDMS foam

Polydimethylsiloxane (PDMS) is an open porous foam packing, used for analyte trapping. PDMS strongly retains non polar analytes and can be used for analytes as high boiling as n-C40. Ideal mid-range sorbent, useful when glass wool retains too little and

Tenax® TA is too strong. Allows trapping at moderate temperatures, reducing the need for cryogenic cooling compared to glass wool. Maximum temperature: 300 °C. Minimum temperature -10 °C (glass transition temperature). At lower temperatures the analytes will just freeze out at the surface. The PDMS foam liner is much more inert than a glass wool liner. 5 mm packing length retains semi volatiles. 10 mm retains intermediate volatiles. 30 mm retains very volatile organic compounds.

packed with PDMS foam, 5 mm

1 package (10 Units)

■ CIS 4/6

014597-110-00

packed with PDMS foam, 10 mm

1 package (10 Units)

■ CIS 4/6

014597-110-00

packed with PDMS foam, 30 mm

1 package (10 Units)

■ CIS 4/6

014600-105-00

PDMS glass liner kit

included glass liners:

Packed with PDMS foam, 5 mm length, 2 units

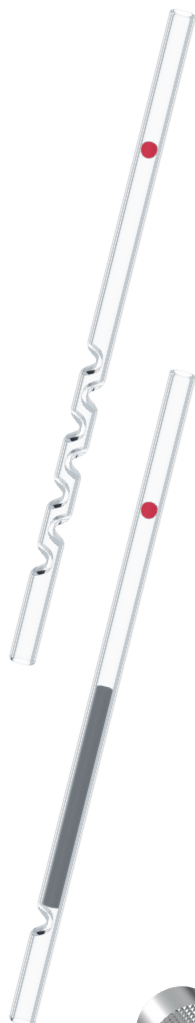
Packed with PDMS foam, 10 mm length, 2 units

Packed with PDMS foam, 30 mm length, 2 units

■ CIS 4/6

014602-104-00





Quartz liners for CIS 6 in combination with TDU/TD 3.5+

Quartz liners can be used at temperatures up to 650 °C and are marked with a red dot.

baffled

For cold split injections, baffles create good mixing of sample and carrier gas. For liquid injections of moderate/high boilers and for labile compounds. Suitable for high temperature usage (up to 650 °C) with a CIS 6.

1 package (5 Units)

■ CIS 6

016070-005-00

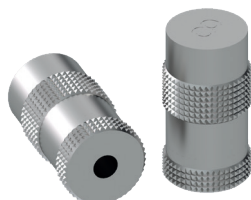
packed with quartz wool

Suitable for large volume injections into the PTV. The large surface area helps retain analytes while the solvent evaporates. The packing can be used as a filter for particulates. More inert than glass wool. For liquid injections of difficult compounds (acidic, alkaline etc.). Suitable for high temperature usage (up to 650 °C) with a CIS 6

1 package (5 Units)

■ CIS 6

016072-005-00



GRAPHPACK® 3D mounting tool for glass liners

The mounting tool is designed for use only with glass liners used in combination with a TDU/TD 3.5+

■ CIS 4/6

012781-004-00



GRAPHPACK® 3D ferrules for glass liners

Standard ferrules

1 package (5 Units)

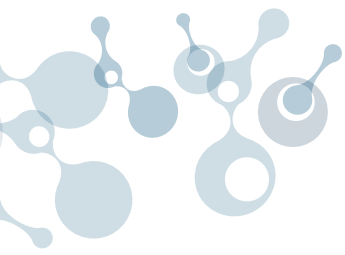
■ KAS 4/6

007541-005-00

1 package (10 Units)

■ KAS 4/6

007541-010-00





S00135-711-02



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