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Supplies

Thermal Desorption Unit TDU 2

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Thermal Desorption Unit TDU 2

The Thermal Desorption Unit (TDU) is a flexible automated solution for thermal desorption and thermal extraction. Several techniques are supported by the TDU:

- Stir Bar Sorptive Extraction (SBSE) using the GERSTEL Twister®
- Dynamic Headspace (DHS) based on standard headspace vials
- Air sampling onto adsorbent tubes combined with thermal desorption
- Thermal extraction of solids placed in fritted TDU liners
- Thermal extraction of liquid placed in µ-vials inside the TDU
- Direct introduction and thermal extraction of liquids and standards
- Hot Injection and Trapping (HIT), multiple HS or SPME injections for significantly improved sensitivity
- Automated Pyrolysis of liquid and solid samples using the PYRO

The TDU 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), up to 196 samples can be analyzed in one automated sequence using one or more methods. The MAESTRO software combined with the Agilent ChemStation controls the complete process from sample introduction through thermal desorption to GC/MS analysis with one method and one sequence table ensuring efficient and error-free operation.

This Supplies catalogue provides a list of certified consumables, accessories and spare parts essential for the smooth operation of your GERSTEL® TDU.
You have the right to demand the highest quality performance from GERSTEL systems and we have compiled this list so that this performance can be maintained throughout the life of your system.
Please use only consumables, accessories and spare parts provided by GERSTEL. All GERSTEL products are made to exact specifications. Use of products not approved by GERSTEL can cause system malfunction or damage and may void system warranty. If you have any questions please do not hesitate to contact GERSTEL. Typically, the most efficient way is to contact your local sales representative.

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Transport adapter for GERSTEL TDU desorption Liner

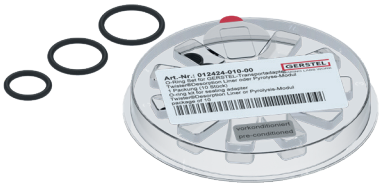
1 Unit	**012423-001-00**
10 Units	**012423-010-00**
100 Units	**012423-100-00**

Transport adapter for liquid injection

10 Units	**013645-010-00**
100 Units	**013645-100-00**

O-ring set

for Transport adapter



10 Units	**012424-010-00**
100 Units	**012424-100-00**

Inner O-ring

for Transport adapter

10 Units	**014846-010-00**
100 Units	**014846-100-00**

Septum for Transport adapter for liquid injection

10 Units	**015608-010-00**
100 Units	**015608-100-00**

Glass inserts

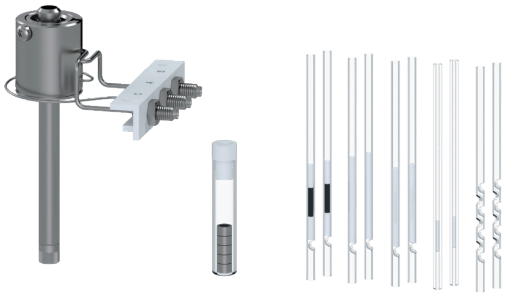
for Twister sample tray

15 Units	**012565-015-00**

Preventive maintenance kit for TDU

consists of:

Injection unit
Glass liner kit (012440-004-00)
GRAPHPACK 3D ferrules; 5 Units



CIS 4	**014100-903-00**

Recommended Kit

consists of:

Glass liner kit (012440-004-00)
GRAPHPACK 3D ferrules; 10 Units
Transport adapter for desorption Liner; 10 Units
O-ring set for Transport adapter; 100 Units
Desorption liner for TDU, empty; 100 Units
Twister, film thickness 0,5 mm, 10 mm long; 10 Units

CIS 4/6	**012713-004-00**

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Desorption Liners for TDU

The following desorption liners are designed for the GERSTEL Twister Desorption Unit (TDU).
Dimensions: OD 6 mm (ID 4 mm), length 60 mm

straight with notch

For desorption of GERSTEL Twister® or for liquid injection of highly contaminated samples, in combination with GERSTEL Microvials

■ 10 Units	**013010-010-00**
■ 100 Units	**013010-100-00**

with glass frit

User packed liners

■ 5 Units	**013742-505-00**

packed with Tenax TA™

For trapping of organic compounds e.g. in air
Maximum temperature: 300 °C

■ 5 Units	**020810-005-00**

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-C_{40}.
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. Suitable for liquid injection, enabling solvent or water to be separated from the analytes.
Maximum temperature: 270 °C.
Minimum temperature -10 °C
(glass transition temperature)

■ 5 Units	**013758-105-00**

Microvials for liquid injection into the TDU

Microvials for the TDU liquid option: for injection of high-boiling or matrix laden samples e.g. oil or food samples into the TDU. The inserts are placed in the empty desorption liners and transferred to the TDU.
(For more information about the TDU and liquid injection, contact your local GERSTEL representative)

■ 20 Units	**014756-500-00**
■ 200 Units	**014756-002-00**
■ 2000 Units	**014756-020-00**

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Desorption Liners for TDU

The following desorption liners are designed for the
GERSTEL Twister Desorption Unit (TDU).
Dimensions: OD 6 mm (ID 4 mm), length 60 mm

packed with Carbopack B and Carboxen-1000 - 40/60 mesh

conditioned, in storage container
Maximum temperature: 330 °C

■ 5 Units **020814-005-00**

packed with Carbopack B, Carbopack X and Carboxen-1000

conditioned, in storage container
Maximum temperature: 330 °C

■ 5 Units **020819-005-00**

packed with Carbopack C & B and Carbosieve SIII

conditioned, in storage container
Maximum temperature: 330 °C

■ 5 Units **020821-005-00**

packed with Tenax GR

conditioned, in storage container
Maximum temperature: 300 °C

■ 5 Units **020823-005-00**

packed with Carbopack B and Carbopack X

conditioned, in storage container
Maximum temperature: 330 °C

■ 5 Units **020825-005-00**

Storage Container

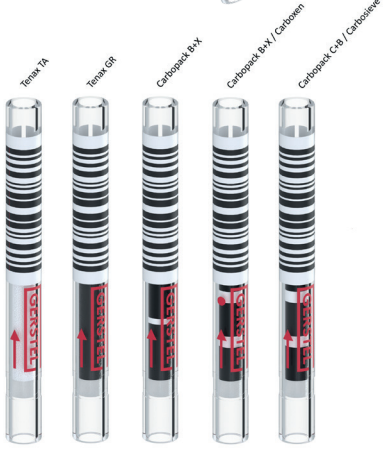
for TDU Desorption Liner

■ 5 Units **020825-005-00**

Desorption Liner - Kit

consists of:
liners packed with Carbopack B, Carbopack X and Carboxen-1000; 1 unit
liners packed with Carbopack C & B and Carbosieve SIII; 1 unit
liners packed with Carbopack B und Carbopack X; 1 unit
liners packed with Tenax TA™; 1 unit
liners packed with Tenax GA™; 1 unit

■ **020830-005-00**



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CIS glass liners for use with the TDU

The glass liners listed in the following are designed for the CIS 4/6 in combination with the GERSTEL TDU 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 adsorbent such as Tenax TA™or Carbotrap B™ or even a sorbent such as PDMS foam can be used.

Tenax TA™
Tenax TA™ is a 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 C_5-C_{28} 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 adsorbent is especially suited for trapping and thermally desorbing compounds in the range from C_5 to C_{20} (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
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
ID 1mm, straight without notch, deactivated

Standard liner for trapping of high to low boilers. Due to the smaller inner diameter the linear gas velocity is increased, resulting in more efficient desorption.
1 package (10 Units)

■ CIS 4/6 **015982-010-00**

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 absorbent 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 (10 Units)

■ CIS 4/6 **015620-005-00**

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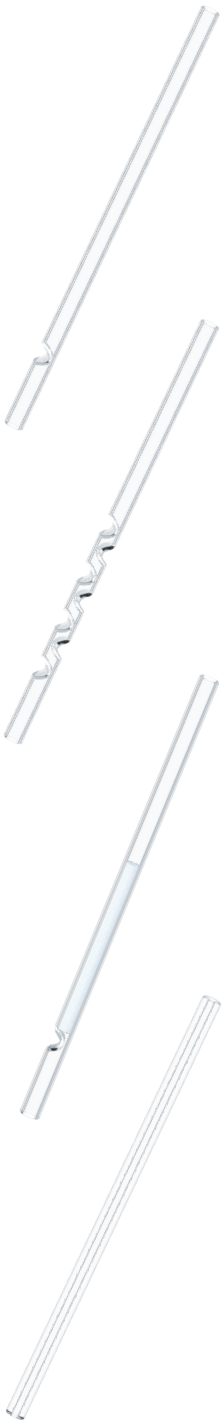

CIS glass liners for use with the TDU

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 compunds.

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 ID

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 analyte trapping (for more information contact your local GERSTEL representative)

- CIS 4/6 **013911-010-00**

Standard liner kit

consists of:

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**

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CIS glass liners for use with the TDU

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 quartz wool

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

consists of:

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**

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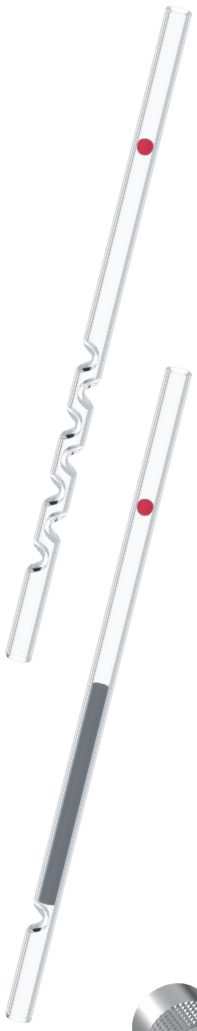

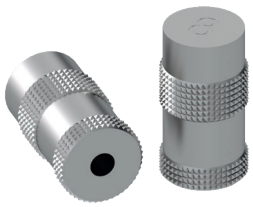

Quartz liners for CIS 6 in combination with TDU

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

■ CIS 4/6 **012781-004-00**

GRAPHPACK® 3D ferrules for glass liners

Standard ferrules

1 package (5 Units)

■ CIS 4/6 **007541-005-00**

1 package (10 Units)

■ CIS 4/6 **007541-010-00**

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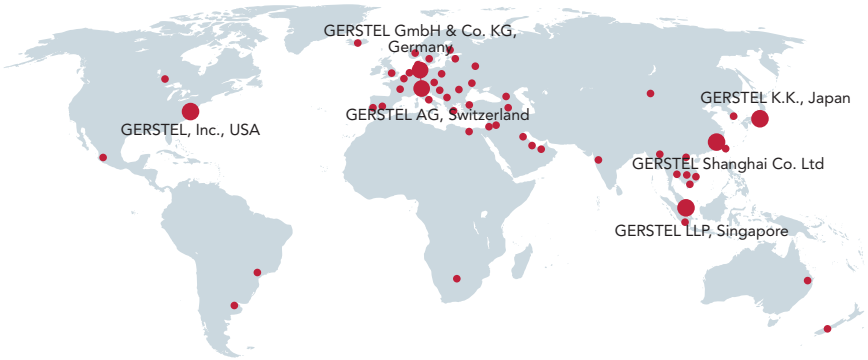

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