



GERSTEL
MAKING LABS WORK

AutoTwister

GERSTEL
Twister[®]
THE ORIGINAL



GERSTEL Twister®



The GERSTEL Twister® enables efficient extraction of organic compounds from aqueous matrices based on Stir Bar Sorptive Extraction (SBSE). SBSE is a solvent-free extraction technique, which is significantly faster than most conventional extraction techniques. SBSE is up to 1000 x more sensitive than SPME since the stir bar has significantly more sorbent volume and since it can extract and concentrate analytes from a much larger sample volume due to the efficient stirring. The Twister® may look like a conventional magnetic stirring rod, but while it stirs samples, such as water, body fluids or beverages it absorbs and concentrates organic compounds into its sorbent coating. A large number of samples can be extracted simultaneously using multi-position stir plates resulting in high productivity and throughput. Labor- and resource-intensive sample preparation steps are eliminated. Analytes are typically desorbed from the Twister using thermal desorption. Liquid desorption using a solvent can be performed whenever the analytes are very high-boiling, thermally labile, or when they must be determined by HPLC.

Twister/SBSE Benefits:

- Up to 1000 times more sensitive than SPME
- Quantitative, with large linear range
- A large number of samples can be extracted simultaneously for highest productivity
- Requires minimal time and labor
- Thermal desorption and GC/MS analysis are performed in one automated system

Twister® Application Fields

- Food and beverages
- Flavor and Fragrance
- Environmental analysis of water (EU-WFD) or waste water
- Extractables and leachables from pharmaceutical packaging

GERSTEL Twicester®

The GERSTEL Twicester® offers a simple possibility to position one or more Twisters magnetically on the inner wall of a sample vial for more efficient sample extraction. The method, referred to as Multi-Stir Bar Sorptive Extraction (™SBSE), was developed in a cooperation between GERSTEL K.K., Tokyo, Japan, and the Research Institute for Chromatography (RIC) of Professor Pat Sandra in Kortrijk, Belgium.

GERSTEL Flex-Twister

The Flex Twister was developed specifically for Solvent Assisted Stir Bar Sorptive Extraction (SA-SBSE), a novel extraction technique that relies on Flex Twisters that have been swollen with a user defined solvent.

The solvent is added to the Flex Twisters before the extraction step leading to a modification of the sorbent phase properties and thereby, depending on the solvent used, to significantly improved extraction recovery for polar compounds with log Kow values between 1.0 and 2.0. Compared with standard SBSE, the SA-SBSE phase volume is increased significantly leading to improved recovery even of non-polar compounds as an added bonus.



GERSTEL ^{Auto}Twister

Introducing ^{Auto}Twister

Fully automated SBSE / Twister® workflow for solvent free „green“ extraction seamless automation: Achieve full automation of your Twister® workflow from sample to analysis report, eliminating manual steps and increasing efficiency.

Simplest possible process:

1. Add your sample to a vial, seal it with a screw cap, and place it in the MultiPurpose Sampler MPS tray.
2. The vial is transferred to the quickMIX module for high-energy agitation and analyte extraction.
3. The MPS inserts the designated ^{Auto}Twister rod into the sample.
4. Matrix residue is rinsed from the ^{Auto}Twister rod in the dedicated Wash & Dry station.
5. The ^{Auto}Twister rod is quickly dried through high speed rotation in clean and loss-free atmosphere in the drying station.
6. The MPS transfers the ^{Auto}Twister Rod to the TDU 2 for thermal desorption and GC-MS analysis.

Approved performance that meets analysis requirements for:

- Common beverages such as tea, beer, spirits, milk, and others
- EU Water Framework Directive Standard Method DIN 27108
- DIN 27108 (SPME method)

Test the ^{Auto}Twister performance with our Proof of Performance!

The results speak for themselves, ^{Auto}Twister has demonstrated:

- Superior sensitivity
- Excellent analyte recovery
- Clean blanks after each run
- Reduced background for improved Limits of Quantitation

Enhanced Features:

- quickMIX 2 is available with cooling and heating for accurate temperature control during extraction
- The GERSTEL Wash & Dry station improves overall efficiency and sustainability, eliminating potential analyte loss from purge gas drying and minimizing water usage.

Experience fully automated SBSE / Twister® workflows with the GERSTEL ^{Auto}Twister. Contact GERSTEL today to learn more about upgrading your laboratory!



The GERSTEL Wash & Dry station



Twister Desorption in the TDU

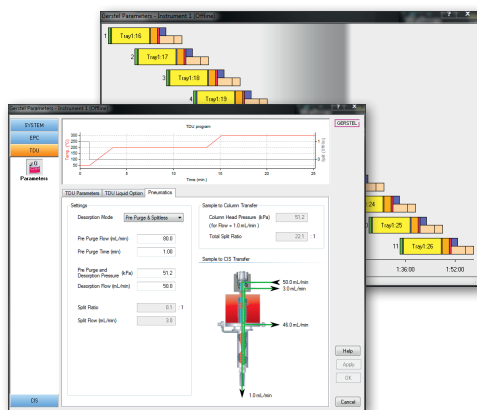
The Thermal Desorption Unit (TDU 2) is perfectly suited for desorption of the GERSTEL Twister® and sorbent-packed tubes – as well as for thermal extraction of liquids and solids. The TDU fits on top of any modern GC-MS without need for additional bench space. The TDU 2 incorporates the latest advances in thermal desorption technology based on a "Liner-in-Liner" concept without valves or transfer lines. The TDU 2 is connected directly to the GERSTEL Cooled Injection System (CIS), PTV type inlet that serves as cryo-focusing trap. Active sites are eliminated, reducing the risk of analyte loss, discrimination, and memory effects to an absolute minimum. The TDU 2 can be operated in split or true splitless mode. It covers a wide range of concentrations while protecting both GC column and MS from water and contamination and achieving extremely low detection limits. For extreme sensitivity, multi-desorption mode can be selected by mouse-click in MAESTRO.

TwisterBackExtraction TBE

Twister® Back Extraction as MPS option. The combination of Twister technology (SBSE; Stir Bar Sorptive Extraction) with solvent elution and subsequent chromatographic determination is a powerful and reproducible process for the determination of high boiling and thermally labile organic analytes from aqueous samples; e.g. PAH, pesticides, herbicides or phenols. The process was developed by UFZ Leipzig-Halle GmbH in close cooperation with GERSTEL.

Twister Back Extraction TBE offers:

- Extraction, enrichment and analysis of high boiling or thermally labile compounds
- Combination of Stir Bar Sorptive Extraction (SBSE) and LC or LC/MS analysis



Tube Conditioner TC

To fully benefit from the high sensitivity offered by thermal desorption and for best possible quality of analysis, clean and well-conditioned TD tubes and Twisters are needed. The Tube Conditioner (TC 2) is separate from the GC-MS system, eliminating the risk of contamination during conditioning and freeing the GC-MS for analytical tasks with maximum productivity. TD tubes are held at a user-specified fixed temperature or undergo a specified temperature program cycle while being purged with inert gas to remove contaminants. Up to 10 tubes with 50 Twisters are conditioned in one batch, with independent gas flow regulation, enabling the conditioning of one to ten tubes without adjusting flows.

