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Robotic System for Automated Sample Preparation: FREESTYLE

FREESTYLE EVAporation

# The FREESTYLE EVAporation Module

## FREESTYLE

### Precision even in Unobserved Moments

In analytical routine laboratories, the concentration of solutions to a defined end volume is one of the most executed central tasks. But this process is also fraught with enormous potential for error. The solution for a reliable, reproducible evaporation with consistently high recovery rates is automation.

The [FREESTYLE system](#) with EVAporation module concentrates all types of organic solvents around the clock to a precise end volume between 5.0 mL and 0.2 mL, optional with solvent exchange. The end volume can be selected individually for each sample.

The calibration of the EVAporation chamber is done automatically with a simple mouse click in the software. This is especially valuable for certified laboratories.



#### Required for EVAporation:

- the robotic unit FREESTYLE BASIC
- the EVAporation module
- and possibly further modules in combination



#### Integrated in the EVAporation module are:

- Conically shaped EVAporation chamber for fast, low-loss and accurate evaporation
- Sensors for precise process controls
- Membrane pump with intelligent vacuum control
- Closed heating system for heating the evaporating flask
- Condensator for solvent recovery

# Flexibility in all Areas

## Choice of the evaporation principle

- Similar to the rotary evaporator principle with controlled heating of the sample via a closed water cycle and the subsequent application of a vacuum
- Blowing off with nitrogen
- Combination of both principles

## Choice of solvents

- Solvent exchange liquid/liquid
- Solvent exchange to dryness/uptake in a new solvent
- Connection for 3 solvents or upgradeable to 6 or even 15 solvents

## Size choice of initial sample and end volume

- Sample volumes of up to 350 mL can be concentrated in one operation. The sample is sucked up in batches into the smaller high-performance EVApOrator chamber using a vacuum. FREESYLE recognises when the entire sample has reached the vacuum chamber.
- Any volume of between 5.0 mL and 0.2 mL can be defined individually for each sample via software-controlled sensors. Consequently, samples with different end volumes can be mixed within one sample sequence.
- The results are precisely bottled or dispensed in aliquots concentrates, in free-selected glasses (e.g. closed GC vials).

## No cross-contamination

- Rinsing of the EVApOrator chamber during the process, particularly intensive just before reaching the selected end volume.
- Rinsing of the EVApOrator chamber as well as of all parts that are contaminated with the sample after the process.

## Complete transfer of the analytes

Using the double-walled needle and a chosen solvent, all analytes are washed down under pressure from all around the walls of the sample container. The analytes are then transferred to the EVaporation chamber.



*Rinsing of the EVaporation chamber*



*Rinsing of the sample container*

## Combinations

The modules of the FREESTYLE system can be used individually or in combination. The required processing steps are selected in the software and integrated in the method. Hence intermediate steps are eliminated and processing chains within the sample preparation can be easily and reliably automated respectively a complete automation of the process is possible.

### Commonly chosen combinations:

**FREESTYLE BASIC** combined with **GPC-** and **EVAporation** module for clean-up using gel permeation chromatography (i.e. for pesticide residue analysis, PAHs and Dioxins/PCB). Here, e.g. the GPC main fraction can be transferred into the EVAporation chamber online, where it will be concentrated.

**FREESTYLE BASIC** combined with **SPE-** und **EVAporation** module for the automation of SPE processes (i.e. environmental samples). Herewith, SPE eluates are eluted online into the chamber of the EVAporation module and concentrated.

**FREESTYLE BASIC** combines with **SPE-** and/or **GPC module**, **EVAporation-** and **HPLC Direct Injection module** for the direct transfer of the perfectly prepared sample into the HPLC

**FREESTYLE XANA** combined with **EVAporation** module for the

EVaporation after the SPE process for water samples from 1 L up to 10 L and filling of the prepared sample into a GC vial ready for the subsequent analysis.



*Method Set-up EVaporation: The desired processing steps can be integrated with a simple click. The adjustment of parameters is done by moving bars.*



*Combination of SPE- and EVaporation method in a so-called "FLEX"-method. This method can also be saved and recalled at any time.*

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Brochure

[FREESTYLE brochure \( pdf | 3 MB \)](#)

Videos

[Precise concentration of organic solvents: FREESTYLE EVaporation](#)

[User video about automated sample preparation in residue analysis: FREESTYLE GPC/EVaporation](#)

## Application notes

Determination of the hydrocarbon-index (H53-method) ( pdf | 1 MB )

Determination of PAH in particulate matter with SPE/EVAporation ( pdf | 740 KB )

Determination of PAH via GPC/EVAporation ( pdf | 851 KB )

Determination of PAH via GPC/EVAporation and HPLC Direct Injection ( pdf | 1 MB )

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