thermoscientific

Revolutionary solvent evaporation complete laboratory workflow

Thermo Scientific Rocket Synergy 2 Evaporator

ThermoFisher SCIENTIFIC

Sample evaporation with walk-away capability to produce uncompromised results

The Thermo Scientific Rocket Synergy 2 Evaporator is for laboratories seeking to spend minimal time and effort to concentrate or dry large-volume samples for chromatographic analysis.

Concentrates or dries up to 18 ASE vials or 6 large-volume flasks unattended.
Developed as a result of users' demands for an evaporator that could quickly process large-volume samples in parallel without supervision, the Thermo Scientific™ Rocket™ Synergy 2 Evaporator can concentrate or dry 18 ASE vials or up to 6 large-volume 450 mL flasks.

This enables the user to focus on other tasks, confident that the Rocket Synergy 2 Evaporator will achieve reproducible evaporation with excellent recovery rates.

- **Five times faster than conventional sample evaporators**
- **Substantially greater productivity than rotary evaporators**
- **True walk away capability with no supervision required**
- **Eliminate manual sample transfer steps between cleanup and analysis**
- **Genevac AutoStop feature for end point detection**
- **Powerful centrifuge that eliminates solvent bumping**

The Rocket Synergy 2 Evaporator is equipped with the advanced performance features that our users expect, such as automated end point detection, effective bumping protection, accurate temperature regulation, and easy-to-use controls.

A two-stage cold trap is built into the Rocket Synergy 2 Evaporator, providing high levels of solvent recovery, even with volatile organic solvents. The cold trap auto-drains is under the control of the evaporator to ensure that high solvent recovery is maintained, no matter what mix of solvents are being used.

The Rocket Synergy 2 Evaporator has proven to yield fast, unattended operation that significantly improves laboratory productivity.

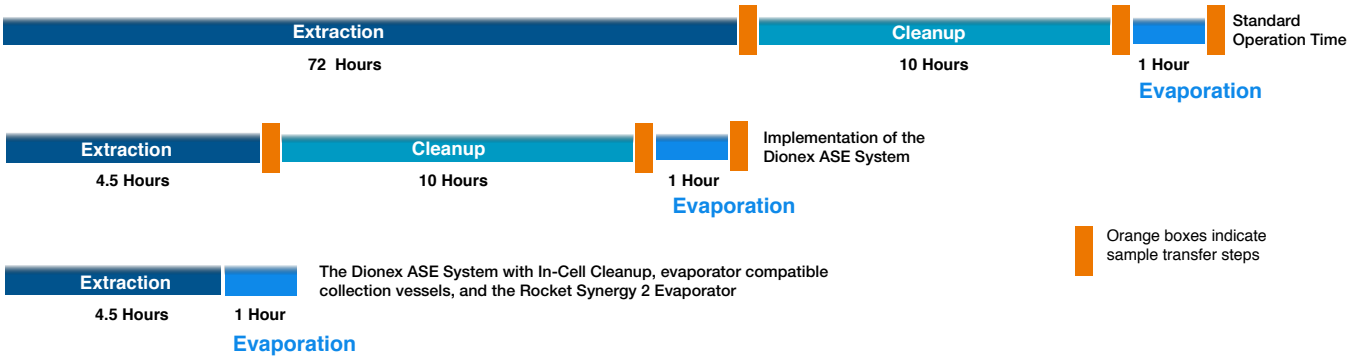
Why compromise analytical results with cumbersome and ineffective sample evaporation procedures?

Innovative sample preparation solutions to optimize laboratory workflow

Sample preparation is the most vital part of the laboratory workflow. Since greater than 60% of all errors occur during this phase, it is often considered the most frustrating and cumbersome component of the workflow. While analytical technology has evolved remarkably over the last 20 years, most sample preparation still relies on antiquated manual techniques that can produce low analyte recovery with highly variable reproducibility. A traditional sample preparation workflow consists of extraction, cleanup, and evaporation, all of which use manual sample transfer steps through the transition. Techniques such as Soxhlet, gel permeation chromatography, and nitrogen blowdown evaporation oftenproduce total sample prep workflow times in excess of 60 hours per batch. In 1995, the Thermo Scientific™ Dionex™ ASE™ Accelerated Solvent Extractor system was introduced and substantially reduced the time but did not address clean up or evaporation. More recently, we introduced the Dionex ASE system with In-Cell Cleanup and Rocket Synergy 2 Evaporator to address the entire sample preparation workflow and reduce the total time to six hours per sample batch.

The combination of the Dionex ASE system with In-Cell Cleanup and the Rocket Synergy 2 Evaporator provides a total sample preparation solution for the analytical laboratory. The combination of these two techniques entirely eliminates both the cleanup step and manual sample transfer. The effect of this combination on laboratory productivity is profound and ensures highly accurate and reproducible sample preparation.

Sample Preparation Productivity *



*average processing times for 18 samples

Dionex ASE 350 Accelerated Solvent Extractor System

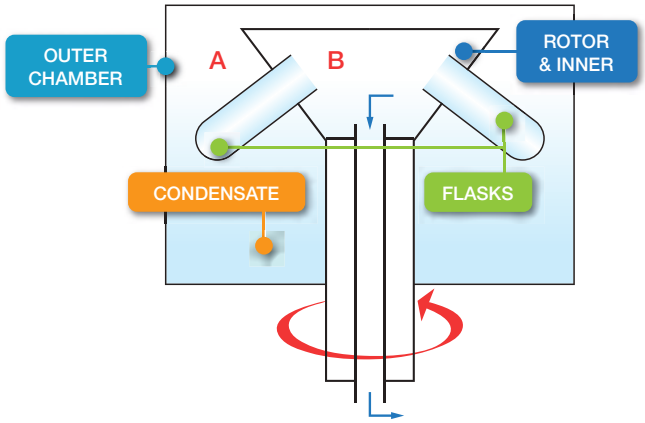
Rocket Synergy 2 Evaporator

Thermo Scientific™ TRACE™ 1300 Series GC

Inside the Rocket Synergy 2 Evaporator

The Rocket Synergy 2 Evaporator uses a new technology that works as follows:

Samples are loaded into the rotor, spun, and placed under vacuum (point B). The centrifugal force generated by spinning the centrifuge rotor creates a pressure gradient within the solvent contained in the vials. The samples boil from the top down, helping to prevent any bumping. Dri-Pure technology prevents any bumping and cross contamination.



To achieve fast evaporation and precise temperature control, a low temperature, and low pressure steam is used to heat the samples indirectly. The steam condenses on the flasks/tubes, which are cold due to the solvent(s) boiling inside them. Condensate is thrown off the spinning flask, where it is recycled and boiled again to make more steam.

Steam temperature is controlled in two ways: 1) The pressure in the outer chamber (at point A) is set to boil water at the desired temperature, while 2) The temperature of the outer chamber is precisely controlled at or below the set temperature.

To ensure that steam does not enter the samples, each tube or flask slides effortlessly into the rotor, and the action of spinning the rotor firmly clamps it in place.

Controls

The controls of the Rocket Synergy 2 Evaporator are easy to use: highlight the desired evaporation or concentration method using the right hand knob, and start. The left hand knob activates the (optional) on-board strobe. Rotating the strobe knob adjusts the strobe frequency and allows each of the six positions to be viewed separately in real time.

The software controlling the evaporation process can be optimized for each customer application and new methods created to enhance performance, usually in partnership with your local Thermo Fisher Scientific representative. New methods are supplied by email and uploaded using a USB key. Data is downloaded in the same way.


Method Select
01: Low Boiling Point
02: LowBPMixture_Rev5
03: Aqueous Run
04: Medium Boiling Point
05: Medium & Low BP Mix
06: HPLC Fractions
to Start, to View


Built-in solvent-resistant vacuum pump
Robust stainless steel condenser
Easy to use controls
Six-positions rotor
Steam chamber
Automatic cold trap drain
Real-time strobe viewing window
USB upload/download of methods and data

Choice of formats for the best results

The Rocket Synergy 2 Evaporator can be used either to dry samples completely, or to concentrate them to a small volume. To help achieve the best results in the desired sample format, there are several options, described below:

1 Puck for ASE Vials
The Rocket Synergy 2 Evaporator accommodates the direct transfer of up to 18 ASE vials. Each 60 mL vial can be directly transferred from the Dionex ASE system and loaded into the Puck for evaporation.

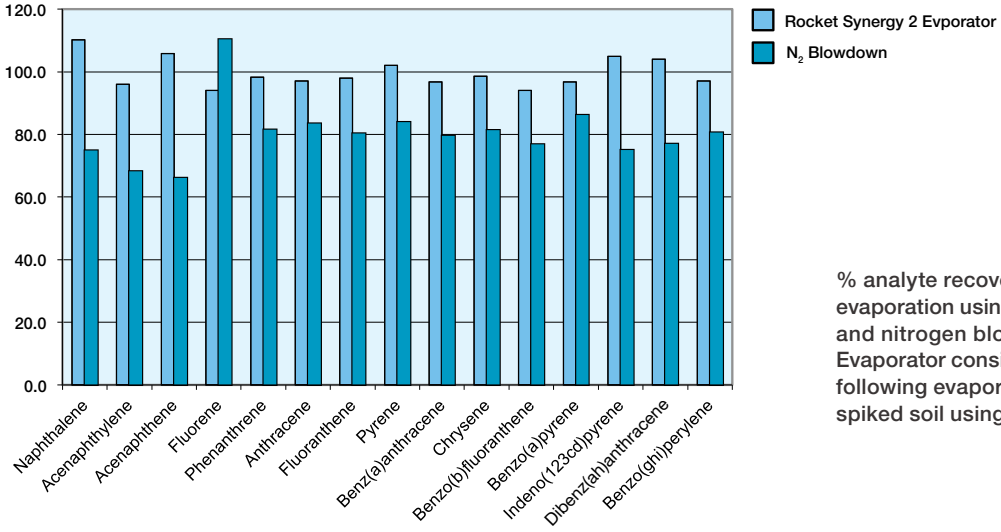
2 Flip-Flop System
Extracts are collected in the Dionex ASE system using a double-ended 60 mL vial. An adaptor with a GC autosampler vial is then fitted. The 60 mL vial is flipped over and placed into the Puck in the Rocket Synergy 2 Evaporator and the cap is removed. The samples are concentrated directly into the GC vial.

3 Thermo Scientific™ Rocket™ Evaporator SampleGenie™ for GC Vials
Allows concentration of the sample directly into a GC autosampler vial. The vial is insulated so that only the solvent in the flask evaporates, leaving a small volume in the vial.

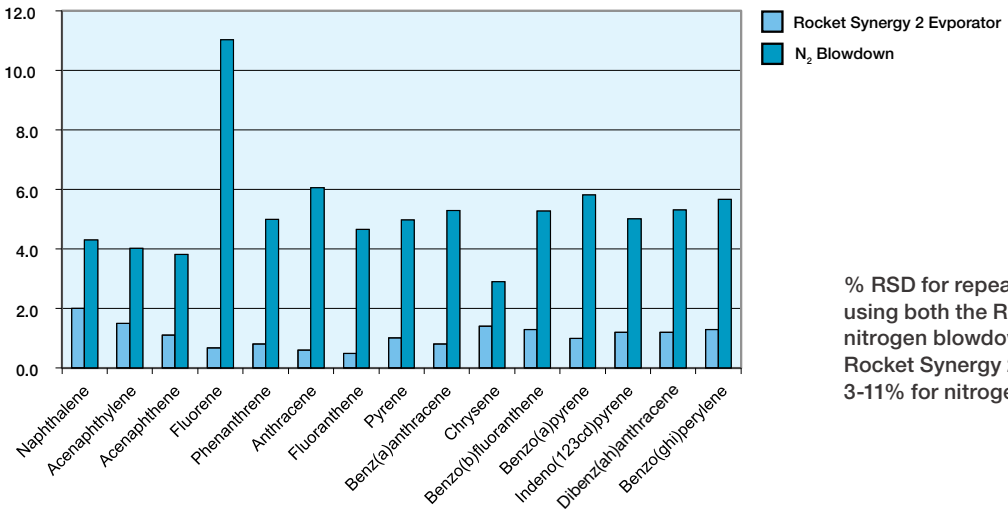
4 SampleGenie 4 Flasks
Allows concentration of sample into a 20 mL scintillation vial or a 4 Dram vial. Accommodates vials from 12 mm to 28 mm in diameter and up to place 70 mm on the same line.

5 Evaporation Flasks
450 mL flasks that are used for drying or concentrating samples.

Uncompromised analyte recovery excellent reproducibility



% analyte recovery for common PAHs following evaporation using both the Rocket Synergy 2 Evaporator and nitrogen blowdow (n = 6) . The Rocket Synergy 2 Evaporator consistently generated higher % recoveries following evaporation. Extractions were performed from spiked soil using the Dionex ASE 350 system.



% RSD for repeat evaporations of PAH samples using both the Rocket Synergy 2 Evaporator and nitrogen blowdown. % RSD ranged from 1-2% for Rocket Synergy 2 Evaporator samples (n=6) and from 3-11% for nitrogen blowdown samples (n=6).

Evaporation Times*

	100 mL	250 mL	450 mL
DCM (dichloromethane)	10 min	20 min	35 min
Methanol	20 min	45 min	1.5 h
DMF	30 min	1 h	2 h
Water	35 min	1.5 h	2 h
Water/ACN (1:1)	1 h	1.5 h	3 h

The Rocket Synergy 2 Evaporator efficiently evaporates solvents commonly used with the Dionex ASE system. Through use of the ASE Pucks, up to 18 samples can be simultaneously evaporated to improve productivity.

*Times are given for complete dryness for 6 flasks simultaneously evaporated.

Solvent Recovery

Solvent	Recovery
DCM	80%
DMF	99%
Ethanol	99%
Methanol	98%
Water	99%
Water/acetonitrile	98%

The Rocket Synergy 2 Evaporator is eco-friendly green technology. Vapors from solvents commonly used with the Dionex ASE system are condensed and trapped for appropriate disposal.

Total workflow solutions
from Thermo Fisher Scientific

Dionex ASE 150/350 Systems

Automated accelerated solvent extractor systems. Enables extraction of solid and semisolid samples using common solvents at elevated temperatures and pressures.

Rocket Synergy 2 Evaporator

A revolutionary solvent evaporator that concentrates or dries up to 18 ASE tubes or 6 large-volume flasks unattended.

Thermo Scientific™ Dionex™ AutoTrace™ 280 Solid-Phase Extraction (SPE) Instrument

Automated SPE instrument that extracts large-volume samples (20 mL-4 L) for the isolation of trace organics in aqueous matrices. Produces analyte recoveries that are superior to manual liquid-liquid extraction techniques using less time and solvent.

Thermo Scientific™ TRACE™ 1300 Series GC Systems

The first and only gas chromatograph featuring user-exchangeable miniaturized, instant connect injectors and detectors that eliminate maintenance downtime and enable the user to quickly tailor instrument capability to specific applications and daily workload.

Thermo Scientific™ TSQ™ 9000 Evo Triple Quadrupole GC-MS/MS System

A reliable, easy-to-use system that enables faster, more precise, error-free analyses, saving time and reducing laboratory costs. It enables more precise routine analyses and offers unstoppable productivity with uncompromised MS/MS simplicity.

Thermo Scientific™ Vanquish™ and UltiMate™ 3000 LC Systems

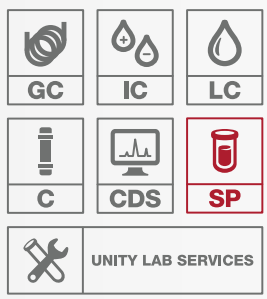
Thermo Scientific Vanquish UHPLC systems are the most advanced UHPLC instruments available: designed from the ground up to improve performance and repeatability with no trade-offs in quality, robustness, or ease-of-use. The UltiMate 3000 HPLC series provides excellent chromatographic performance while maintaining easy-to-use, reliable operation.

Thermo Scientific™ Dionex™ Chromeleon™ Chromatography Data System Software

One scalable software platform for LC, GC, IC and MS that provides Operational Simplicity™ by streamlining your entire analysis process – ultimately boosting your lab's overall productivity and increasing the quality of your analytical results.

The collective power of chromatography
Lead your lab with SP

Maximizing your chromatography productivity and achieving reproducible results requires optimizing the whole workflow from sample to knowledge. By choosing the right tools, from your sample preparation (manual or automated) to the highest selectivity column chemistry and cleanest vials, you maintain sample integrity and achieve the highest instrument efficiency and reduce the need for costly reanalysis. With the largest portfolio of sample handling; vials, plates and closures, column chemistries in a broad range of dimensions and sample preparation, we remain a steadfast and committed partner in your endeavor to improve the world around us.



Find out more at **thermofisher.com/chromatography**

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