Sample preparation

Thermo Scientific EXTREVA ASE Accelerated Solvent Extractor

Benefits

- Experience walkaway, sample-to-vial extraction and concentration in one seamless operation, without user interaction between processes
- Extract and concentrate four samples in parallel
- Reduce the required hands-on time for sample preparation. Additionally, reduce the amount of solvent used for extraction
- Enable sample preparation method and parameter tracking with 2D barcode reading
- Reduced PFAS components for cleaner results: The EXTREVA ASE system minimizes PFAS background for accurate and reliable sample analysis

Keywords
EXTREVA ASE, solids, semi-solids, food safety, environmental, reduced PFAS, Accelerated Solvent Extractor, sample preparation, IC, ion chromatography

The Thermo Scientific™ EXTREVA™ ASE™ Accelerated Solvent Extractor is a fully automated platform designed to streamline the chromatographic sample preparation process. Improved throughput and efficiency, high analyte recovery, improved data, error reduction, and a reduced cost per sample are paramount for the modern analytical laboratory.

Extraction and concentration

Accelerated solvent extraction is a technique for extracting organic compounds from solid and semi-solid samples with liquid solvents. The newly patented gas-assisted solvent delivery uses a combination of nitrogen gas and organic/aqueous solvents at elevated temperatures and pressure to increase the efficiency of the extraction process and reduce the solvent consumption. The extracts are collected in proprietary glass assemblies, which are specially designed to allow direct concentration in either gas or liquid chromatography vials without any additional manual intervention.

System highlights

- Meets US EPA Method 1633A requirements: Ensures accurate and reliable PFAS extractions and analyses
- Reduced PFAS components for cleaner, more accurate results
- From sample to vial in one fully automated workflow without the need for user interaction
- Parallel and serial extraction by using up to six solvents allow for maximum flexibility in the daily schedule

- Optimization of the extraction time and solvent consumption with the newly patented gas-assisted solvent delivery
- Collection of the extracts in vials and bottles for evaporation to dryness or in easy-to-use assemblies for direct concentration into gas or liquid chromatography vials
- Completely unattended extraction and evaporation of up to 16 samples in one analytical batch
- Easy-to-fill stainless steel cells (1, 5, 10, 22, 34, 66, and 100 mL). Fully compatible with Dionex ASE 150/350 extraction cells
- Sample tracking through a 2D barcode reader
- Fast sequence start with QUIKRUN™ feature
- Concentration with fully automated end point detection through artificial intelligence machine vision
- High and eco-friendly solvent recovery through condensation in a CFC-free Refrigerated Vapor Trap
- Sensors for temperature, pressure, vapor, and liquid leaks allow for a safe working environment
- No need for a dedicated fume hood
- Local control through a dedicated user interface

System installation

Prior to scheduling installation of your EXTREVA ASE system, the following items must be available on site:

1. Nitrogen tank or house nitrogen (99.99% standard grade, 350 psi/25 bar minimum delivery output)
2. Nitrogen regulator, capable of 350 psi/25 bar
3. Optional: air tank or house air (99.99% standard grade, 150 psi/10 bar minimum delivery output)
4. Optional: air regulator, capable of 150 psi/10 bar
5. 4 liters HPLC grade Ethanol (Fisher catalog number AC611050040)
6. 3 Kg Ottawa Sand Standard (Fisher catalog number S23-3)
7. Lab bench capable of supporting the EXTREVA ASE system (see height and weight dimensions)

   Caution:

   - *Lift the module only from the bottom or side surfaces. For safety, lifting handles are available.*
   - *Equipment exceeds 100 lbs. (45 kg). Multi-person lift is required!*
8. A minimum lab bench width of 32 in. (80 cm) and length of 47 in. (120 cm) (standalone unit) or 80 in. (200 cm) (remote control via computer)
9. A minimum horizontal clearance of 20 in. (50 cm) behind the instrument for optimal air circulation and for the installed gas and venting lines
10. One or two ceiling exhaust systems with a pipe diameter of 3.9 in. (100 mm) and a minimum total flow rate of 300 m^3/hour. In case only one ceiling exhaust system is available, a suitable Y joint pipe is highly recommended.
11. Electrical:

    - 220–240 V AC single phase, 10 A, 50/60 Hz, with earth ground for the instrument
    - 220–240 V AC single phase, 10 A, 50/60 Hz, with earth ground for the vacuum pump, refrigerated vapor trap and computer

    or

    - 100–120 V AC single phase, 20 A, 50/60 Hz, with earth ground for instrument
    - 100–120 V AC single phase, 20 A, 50/60 Hz, with earth ground for the vacuum pump, refrigerated vapor trap, and computer
12. Optional: A reserved space of 47 × 32 in. (120 × 80 cm) next to a fixed bench when wheeled cart is ordered

At the time of your installation, the Field Service Engineer will:

1. Make all hardware connections between the EXTREVA ASE system and gas supply
2. Make all the hardware connections between the EXTREVA ASE system and the peripherals (solvent trap and vacuum pump—only if the evaporation feature is present)
3. Make all tubing connections for solvent, waste, and exhaust lines in the EXTREVA ASE system
4. Check the calibration of the robotic arm, test the cell tray and the auto seal alignment
5. Test the EXTREVA ASE system for proper operation
6. Provide training for up to two end users on routine operations of the EXTREVA ASE system

System specifications

EXTREVA ASE system	
Extraction mode	• Parallel (up to four channels) • Sequential
Extraction cell tray	• 16 positions, four groups of four extraction cells on 2 trays • Additional position for prime and rinse
Collection vial tray	• 16 position tray for 60 and 250 mL collection vessels or 60, 100, 250 evaporation assemblies for either direct and unattended concentration into a GC/LC vial • Four waste positions
Extraction	• Extraction temperature: ambient or from 40 to 200 °C • Extraction pressure: 180-350 psi • Extraction time: 2–300 min • Extraction cells: stainless steel 1, 5, 10, 22, 34, 66, and 100 mL. Fully compatible with extraction cells from Thermo Scientific™ Dionex™ ASE™ 150 and 350 Accelerated Solvent Extractor systems • Solvent flowrate per channel: 0.1–8 mL/min (parallel), 0.1–20 mL/min (sequential) • Nitrogen gas flowrate per channel: 0–40 mL/min • Purge time per channel: 15–600 sec
Evaporation	• Up to four channels simultaneously (standalone or workflow mode) • Concentration to dryness or to fixed volume (0.3–1.4 mL ± 0.1 mL) through a combination of heating, vacuum[1] and nitrogen blow down • High and eco-friendly solvent recovery through condensation in a CFC-free Refrigerated Vapor Trap[2] • Evaporation temperature: 40–100 °C • Nitrogen flow rate: 0–200 mL/min • Vial pre-rinse: 0.5–40 mL (with option of disable) • Vial rinse (spray): 0.5–4 mL
Extraction fluids	• Compatible with a wide range of organic and aqueous solvents • Not compatible with acids and bases
Control	Local control through the user interface (10.1 in., 1280 RGB × 800 P multi-touch screen)
Language	• English • Simplified Chinese
Dimensions (d × w × h)	25.6 × 39.4 × 34.8 in. (65.2 × 100 × 88.6 cm)
Weight	• Extraction only: 341.7 lb (155 kg) • Extraction and evaporation: 372.6 lb (169 kg)
Power supply requirements	• Voltage: 100–120 or 220–240 VAC • Frequency: 50/60 Hz • Consumption: 2200 VA max
Pneumatic requirements	• Nitrogen at 400 ± 50 psi • Air at 150–450 psi

Ordering information

To order in the U.S., please call +1-800-346-6390, or contact your nearest Thermo Fisher Scientific office. Outside the U.S., order through your local Thermo Fisher Scientific office or distributor. Refer to the following part numbers:

Description	Part number
EXTREVA ASE system (extraction only)	B51004594
EXTREVA ASE system (extraction + evaporation)	B51004598
Evaporation upgrade kit[3]	22184-60102
EXTREVA ASE PFAS Analysis Upgrade Kit	B51004603
Welch Vacuum Pump[4], 115 V/60 Hz	22184-60103
Welch Vacuum Pump[4], 230 V/50 Hz	22184-60104
Welch Vacuum Pump[4], 230 V/50 Hz (for China only)	22184-60108
Welch Vacuum Pump[4], 100 V/60 Hz	22184-60105
Thermo Scientific™ Savant™ SpeedVac™ Refrigerated Vapor Trap[4], 115 V/60 Hz	22184-60109
Thermo Scientific™ Savant™ SpeedVac Refrigerated Vapor Trap[4], 230 V/50 Hz	22184-60110

[1]For more information on the Welch 2028 Series Vacuum Pump please visit the following link: https://www.welchvacuum.com

[2]For more information on the Savant SpeedVac Refrigerated Vapor Trap Series please visit the following link: https://www.thermofisher.com/order/catalog/product/RVT450-115

[3]Only required for the upgrade to the extraction + evaporation version of the EXTREVA ASE system

[4]Only required for the extraction + evaporation version of the EXTREVA ASE system

Learn more at **thermofisher.com/extreva**