



SFT-110 SFE System



Bench Top SFE for Universities and Industry

- Sample Vessel Volumes from 5 ml to 100 ml
- Operating Pressure up to 10,000 psi (68.9 MPa)
- PID Control of Pressure and Temperature
- Integrated Fluid Preheater and Flow Meter
- Thermoelectrically Cooled Pump Technology
- Various Extract Collection Options
- Optional Co-solvent Addition Modules

◀ *The SFT-110 Supercritical Fluid Extractor*

The SFT-110 Supercritical Fluid Extractor (SFE) is an entry level system which possesses many features typically found in more costly SFE equipment. It may be used for a variety of applications from routine analytical work to basic process development.

The SFT-110 was developed for people who want to investigate the feasibility of applying supercritical fluid techniques to a wide variety of analytical and processing problems. In addition to its numerous industrial uses, the SFT-110 is well suited to the needs of colleges and universities. It is so affordable that it may be incorporated into teaching laboratories. At the same time, it is capable enough to be used for serious research.

The SFT-110 accommodates 5 ml to 100 ml extraction vessels. It may be operated at pressures up to 10,000 psi (68.9 MPa) and at temperatures ranging from ambient to 200°C. The wide range of vessel volumes available makes the SFT-110 well suited to both analytical scale SFE applications and basic process

development work. With a 100 ml vessel, the SFT-110 can extract very low levels of key components from materials and process larger amounts of bulk material than would be possible with smaller, analytical scale SFE equipment. Inside the SFT-110's oven, a preheater ensures that the temperature of the fluid reaching the extraction vessel is controlled precisely. This is essential to obtaining accurate, repeatable results.

The SFT-110 utilizes a high performance, dual piston pump which produces the high pressures required for supercritical fluid work. The system has built-in safety precautions to prevent accidental over-temperature or over-pressure conditions. As an additional safety backup, a rupture disc assembly provides mechanical protection against accidental over pressurization of the system.

Manually operated valves ensure long term, maintenance free operation. An integrated program logic controller monitors and adjusts fluid pressure

inside the extraction vessel to achieve and maintain a desired set point. A PID temperature controller monitors and maintains the precise fluid temperature inside the high pressure vessel.

The SFT-110 utilizes the latest variable restrictor valve (back pressure regulator) technology, providing precise control over the flow rate of the expanding gas. This is essential for obtaining highly reproducible results. Flow rates can range from 0.01 to 24 ml/min (0.008 to 18 grams/min) of liquid CO₂ under typical operating conditions. While carbon dioxide is the most commonly used solvent, the SFT-110, with some modification, allows the user flexibility to work with a variety of supercritical fluids.

Extract collection options include: solid phase extraction (SPE) cartridges, solvent filled vessels, fractional cyclone separators, and EPA sample vials. Optional co-solvent addition modules are available for the SFT-110.

SFT-110 SFE System Specifications

Standard Configuration

Temperature and Pressure Display: Independent LED displays.

Temperature Range: Ambient to 200°C.

Temperature Precision: +/- 0.5°C.

Operating Pressure: 10,000 psi upper pressure limit. Front keypad control, with LED display. "Constant pressure" mode of operation.

Flow Rates: 0.01 – 24.00 ml/min liquid CO₂ (+/- 2% accuracy).

Over Pressure Safeguard: High / Low pressure alarms and rupture disc assembly.

High Pressure Pump: Dual aluminum heads, furon seals and sapphire pistons, integrated thermoelectric cooling, cam-driven pump mechanism with single stepper motor drive, dual ball and seat check valves (ruby ball, sapphire seat), stainless steel fluid path, prime-purge valve, and pressure transducer. The pump's constant pressure mode features a selectable pressure set point. Flow rate auto-adjusts to maintain pressure.

Restrictor Valve: Heated up to 200°C; User selectable set point; Resistant to blockage.

Preheater: Improves temperature consistency of the fluid by heating the fluid before it reaches the main pressure vessel.

Extraction Vessel: Accommodates vessels ranging in size from 5 ml to 100 ml. Vessels come with 5 micron frits and are interchangeable.

Collection Vessel: Externally mounted. Many options available.

Dimensions: Width: 29 cm, Depth: 57 cm, Height: 82 cm.

Weight (with a 100 ml vessel): 28 kg (62 lbs).

Configuration Options

Co-solvent Addition: Doping module or direct, in-line metered addition.

Interchangeable Sample Vessels: 5, 10, 25, 50 and 100 ml (with 5 micron frits).

Sample Baskets: S/S mesh, with lids.

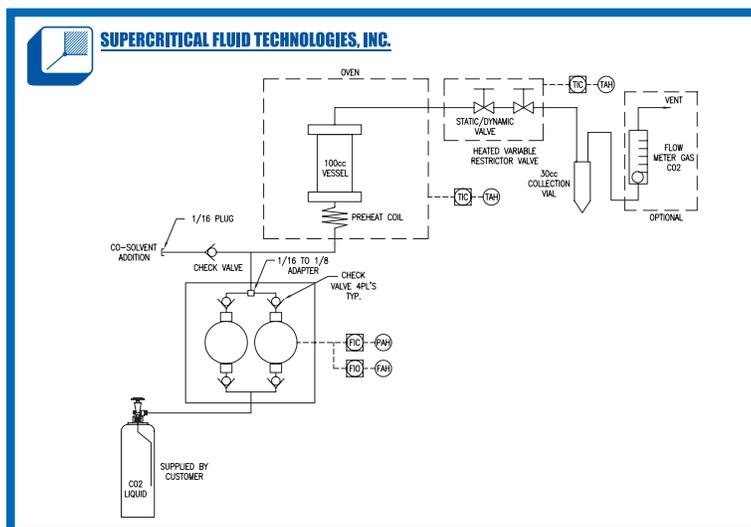
Sample Bags: Nylon mesh, various sizes.

Flow Meter: 0 - 16 SLPM of expanded gas.

System Requirements

Power Requirements: 110/220, 50/60 Hz.

Liquid Gas Supply: Liquid CO₂ cylinder with dip tube.



SFT-110 Flow Diagram ▲

SFT-110 with a 100 ml Vessel ►

