

# Laboratory Instrumentation Pilot Plants Small Production Systems using Supercritical Fluid Technology

## It Is Easy Being Green...

Carbon dioxide is one of the most commonly used supercritical fluids. CO<sub>2</sub> is:

- Safe
- Inexpensive
- Readily available
- An ideal substitute for many hazardous and toxic solvents

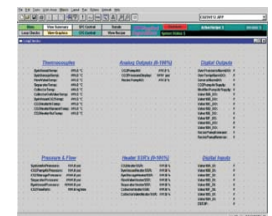
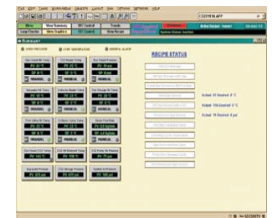
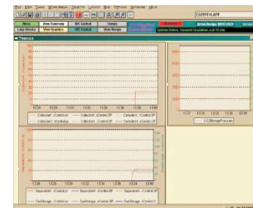
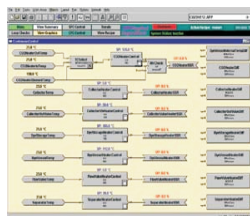
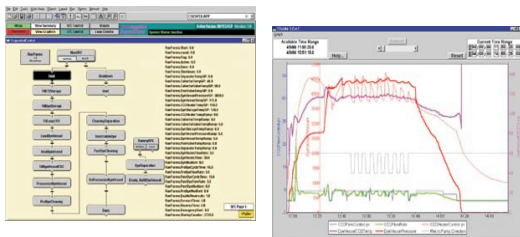
CO<sub>2</sub> is not produced in the SCF process. Existing CO<sub>2</sub> is merely used. There is NO addition to any greenhouse effect.

### A few examples include:

- Extracting herbs, spices and fragrances
- Extraction of pharmaceuticals / nutraceuticals
- Extracting nicotine and caffeine
- Extraction from foods
- Dyeing textiles
- Cleaning medical implants
- Making nanoparticles
- Drying aerogels
- Cleaning wafers
- Developing photoresists
- Extraction from polymers
- Impregnation of biopolymers

*State-of-the-art  
engineering and design,  
systems control,  
precision manufacturing,  
low maintenance  
operation.*

Our support doesn't stop with the delivery of a system, we can help you bring your development ideas to full scale production.



Welcome to Applied Separations Supercritical Fluid Systems

Supercritical Fluid (SCF) technology works with today's innovative, easy-to-use systems from Applied Separations, your idea will be tomorrow's green process! No petroleum solvents and no toxic residue.

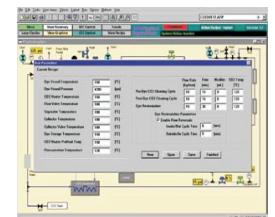
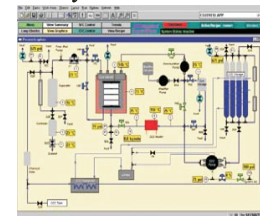
We have built thousands of SCF systems. Get the benefit of our experience. You have the ideas, we have the SCF systems - from conception to production. From laboratory systems to pilot plants to large scale production facilities.

Applications and process support? We have been involved in hundreds of uses for supercritical fluids. Discuss your ideas with us. We'll evaluate your samples for free.

## Manual or Automation and Computer Control

Each of the Pilot Plant Supercritical Fluid systems can be operated manually or completely automated and PC controlled, with concise and clear presentations. Applied Separations has developed software that controls system components and provides the user with maximum information specific for SCF applications.

- ◆ Graphical presentation of the entire system
- ◆ Applications screens
- ◆ Summary screens
- ◆ Loop checks
- ◆ User prompting displays
- ◆ Combinational function displays
- ◆ Sequential function displays
- ◆ Real time data logging
- ◆ Data extraction and graphing



C-114, Synthofine Indl. Estate Off. Aarey Road, Goregaon (E), Mumbai - 400 063.  
Tel : (+91) 22 29275834 / 35, • Fax : (+91) 22 2927551  
email : crescent@cspl.in • www.cspl.in



- Supercritical Fluid Technology
- Solid Phase Extraction
- Pressurized Solvent Extraction

930 Hamilton Street • Allentown, PA 18101  
610.770.0900 • 610.740.5520 (fax)  
[www.appliedseparations.com](http://www.appliedseparations.com)

# Spe-ed SFE-2

## 2-Vessel Simultaneous Oven-based Extraction System

#7070 120 Vac, 60 Hz

#7071 240 Vac, 50 Hz

The *Spe-ed SFE-2* is the original SFE in our series of instruments for supercritical fluid extraction. Built in conjunction with the USDA<sup>1</sup>, this system was designed to meet the rigorous needs of day-to-day use in the research lab. It is simple to operate, fast and affordable, with unique features not found in other SFE systems.

### The system features:

- temperatures to 240°C
- pressure up to 10,000 psi (680 BAR)
- pump flow rates up to 400mL/min\*
- independent control of flow rates to each vessel
- fully-adjustable, non-clogging, variable restrictors
- parallel processing capabilities of 1 or 2 vessels from 0.5mL to 1.0L
- collection into SPE cartridges or standard glassware
- in-line trapping capabilities (Lit#S01)
- modifier addition capability
- multiple flow path capability
- extract directly from liquid samples

# Spe-ed SFE-4

## 4-Vessel Simultaneous Oven-based Extraction System

#7072 120 Vac, 60 Hz

#7073 240 Vac, 50 Hz

Designed for every day use in the research lab, the *Spe-ed SFE-4* is easy to use, cost-effective, and durable. The *Spe-ed SFE-4* has all the advantages of the *Spe-ed SFE-2* while expanding parallel processing capabilities up to four extractor vessels. This system doubles the processing capability of the *Spe-ed SFE-2*.

### The system features:

- temperatures to 240°C
- pressure up to 10,000 psi (680 BAR)
- pump flow rates up to 400mL/min\*
- independent control of flow rates to each vessel
- fully-adjustable, non-clogging, variable restrictors
- parallel processing capabilities of up to 4 vessels from 0.5mL to 1.0L
- collection into SPE cartridges or standard glassware
- in-line trapping capabilities (Lit#S01)
- modifier addition capabilities
- multiple flow path capability
- extract directly from liquid samples

## Accessories

### 7109 Spe-ed SFE System Operations Kit for Spe-ed SFE-2 (Model # 7070, 7071)

Includes all additional tubing, fittings and accessories necessary to connect the *Spe-ed SFE* and run extraction.

- 7113 Flexible hose assembly
- 7115 Air supply line and fittings (5')
- 7711 SFE purge syringe assembly for extraction vessel discharge line
- 7951 Tygon tubing (10')
- 7914 SPE-Hose adapter
- 7713 SS Discharge tube for solvent collection
- 7733 Collection tube vent assembly
- 7913 Barb fitting for flowmeter input line

### 7149 Spe-ed SFE System Operations Kit for Spe-ed SFE-4 (Model # 7072, 7073)

This kit contains components similar to those listed in kit #7109, but in quantities appropriate to the *Spe-ed SFE-4*.

### 7702 Maintenance / Replacement Parts Kit for Spe-ed SFE-2

Includes :

- 7734, 7740\*\*Vessel connectors (2) with 10" tubing
- 7741 Sealing ferrules (2) for vessel connectors
- 7750 Wrench set (5/16", 1/2", 5/8", 9/16")
- 7130 Rupture disc
- 7819, 7742\*\*Three-way valve ferrules (3)
- 7743 Micro-metering valve ferrules (3)
- 7751, 7744\*\*Micro-metering valve rebuilding kit
- 7745 SS Oven -Pump CO<sub>2</sub> line (3')
- 7122 Teflon washer CGA nut
- 7768 Thermocouple probe

### 7402 Maintenance / Replacement Parts Kit for Spe-edSFE-4

This kit contains components similar to those listed in kit #7702, but in quantities appropriate to the *Spe-ed SFE-4*.

## SFE Extractor Vessels

Whatever your SFE extraction needs, we have the extractor vessel for the job. With the unique large oven capacity of the *Spe-ed SFE* systems, we have vessels for multiple processing or large sample processing needs. Vessels range from 5mL to 1 liter for laboratory SFE systems, and to 1000s of liters in production size systems. All our stainless steel vessels are rated for 10,000 psi. Endcaps and frits are included

Also available are an assortment of laboratory SFE vessel accessories:

- oven brackets and supports
- metal frits
- in-line cartridges
- filling funnels
- vessel wrenches
- seals
- polypropylene frits
- tamping rods
- teflon frits
- liquid sample extraction kit



### Full Range of Extractor Vessels

