



# Most Powerful. Most Advanced.



*The Hightech SCFN Production Series extractors are the most powerful and most automated supercritical, subcritical and liquid CO<sub>2</sub> systems available in the market.*

## **Semi-Continuous Extraction System**

Our extractors are continuously extracting — you never have to stop the cycle to unload and reload.

## **Intelligent Automation, Remote Control**

A simple dashboard shows you temperature, pressure and flow, and provides quick access to real-time data.

## **Canisters — Easy, Fast, Clean!**

We use a canister for even CO<sub>2</sub> flow through the raw material. No need to clean at the end of each cycle.

## **Recipe-Driven Productivity**

Our extractor recipes automatically control pressure, temperature, flow, timing and collection interval.

# Introducing the SCFN Production Series



*Supercritical Fluid CO<sub>2</sub> Extraction Systems, Distributed Exclusively in North America by Hightech Extracts*

# Performance. Endurance. Control.



- *Fully Automatic*
- *Semi-Continuous*
- *Single- or Dual-Vessel*
- *5-, 10-, 20-, 40- and 100-Liter Models*

## **Safety valves installed on board**

We use pressure safety valves (not uncertified relief valves). Our safety valves are certified and tested individually. Each valve has a label with all the specific safety data clearly displayed, as well as test documents available for your files. No over-pressurization is possible with this feature. The safety valves are made of stainless steel SS 316L. Available up to 10,000 psi. Keeping you safe is our number one priority.

## **Sequential extraction for quality extraction**

First half: Low temperature (113° F) and low pressure (1700 Psi), moderate flow (44 Lb/hr).



## **Semi-continuous extraction system**

With this feature one extractor will be continuously extracting. You will never have to stop the extraction cycle to unload and reload. This unique feature dramatically reduces downtime between two extraction cycles. At the end of the process in the first extraction vessel, CO<sub>2</sub> pressure is equalized automatically in the second extractor. After equalization, the system automatically removes the first extractor from the line and connects the second.

## **Safety is our mission**

High-pressure equipment needs to be well-designed and safe. Our CAD software helps us to find the right sizing and test the final results before going into production. Your safety is our number one priority.

Second half: High temperature (158° F) and high pressure (4800 Psi), high flow (66 Lb/hr).

Automatic first half to second half switch by minutes or CO<sub>2</sub> flow rate set point.

# High Performance, Safety and Reliability



## Standard or fast closing system

Our standard closing system is simple and easy to manage. Eight stud bolts are used to correctly and exactly seat the standard closing. Nuts are tightened by hand, no tool needed. Spring-energized seals are made of PTFE. FDA certification is available.

## Fast closing system

Ours is the easiest to use. A simple 1/6 turn and it's closed, ready to extract. This smart design guarantees safety when closing. The software controls the position of the closing system and releases the hold condition only if the lid is in the final position. Fast and smart.



## Special seals

For the extractor we use spring-energized seals made of PTFE. FDA certification available. These seals are very robust and have a long life. There is no need to change them frequently.

## High-pressure separators

Our separators' working pressure is up to 2500 psi. The system is equipped with two different separators: the first is gravimetric, the second is cyclonic. The heavier fraction collects in the first separator while the lighter fraction collects in the second.



## Top productivity

Our SCFN Production Series Extraction Systems are the most powerful liquid, subcritical and supercritical CO<sub>2</sub> systems available in the market. Our dual-membrane liquid CO<sub>2</sub> electric pumps are the most reliable pumps available, offering maximum uptime with minimal maintenance requirements. Liquid CO<sub>2</sub> pumps are far more powerful than gas booster pumps. One single liter of liquid CO<sub>2</sub> is equivalent to 400 liters of gaseous CO<sub>2</sub>! Our pumps are sized to provide maximum CO<sub>2</sub> pumping rates, while maintaining precise and constant pressure and temperature profiles throughout the extraction process. Finally, our state-of-the-art pumps enable the ability to run three different extraction modes: liquid CO<sub>2</sub> extraction, subcritical CO<sub>2</sub> extraction and supercritical CO<sub>2</sub> extraction.

# High-Quality Components



**Electric Panel**

- Dual membrane liquid CO<sub>2</sub> pump by Lewa, a Nikkiso Group company
- PLC by B&R, powered by Intel i7 core processor
- Electronic inverter by B&R
- 15" touch screen by B&R
- Pressure probe, metal-to-metal by Wika
- Temperature probe by TC-Direct
- CO<sub>2</sub> flow meter by Litermeter
- Liquid CO<sub>2</sub> level probe by HB
- High-pressure manual valve by Autoclave Engineers, a Parker company
- Automatic high-pressure valves by Swagelok and Hamlet
- Fittings by Swagelok
- High-pressure piping by Sandvik
- Extractor, canister and separators made of Stainless Steel
- Electronic Chiller by MTA
- Electronic Heater by Euroklimat or Sella
- No welding on extractor, separators and reservoir, high-pressure side
- All vessel jacketed for water cooling/heating
- Copper tubing for water services
- Electric diverting valve for water services
- Compressed air on/off and proportional pilot valve by Norgren
- Heater connected directly to PLC via serial connection
- Safety valve for each vessel (5 in total)
- Semi-continuous extraction system with automatic extractor selection by automatic valves
- Double safety valves during in cycle unloading/reloading
- Automatic depressurization cycle with programmable time curve
- Automatic venting cycle with actuated valves

# Professional Equipment



## Industrial electric heater

Temperature is very precise (PID controlled) and temperature correction time is very fast. The heater is connected to the PLC to control the water temperature.

## Industrial electric chiller

This air-condensed chiller is robust and able to work easily with external temperature in the air up to 108° F.

## Full recirculating system

CO<sub>2</sub> is fully recirculated along the process. Thanks to a condenser the gaseous CO<sub>2</sub> is liquefied and delivered again to the reservoir. This process provides for very clean CO<sub>2</sub> circulating in the raw material.



## Use the canister, it's smart!

We use a canister in our extractors. Canisters provide a very even CO<sub>2</sub> flow through the raw material, and completely eliminates clogs. No need to clean the extractor at the end of each cycle. Ask for an additional canister. You will further decrease the downtime in between extractions. Just take the canister out of the extractor and insert the new one. Very easy, fast and clean.



## Unique liquid CO<sub>2</sub> level probe

Even if you check the pressure on your reservoir gauge you never know how much liquid CO<sub>2</sub> there is inside. Our unique liquid CO<sub>2</sub> level meter provides information in real time to the PLC in order to maintain the correct level in the reservoir.

When necessary, the automatic CO<sub>2</sub> level control system opens the liquid CO<sub>2</sub> supply valve connected with the external CO<sub>2</sub> cylinder, filling the reservoir up to the programmed level.

## Combinato Liquid Extraction Option

This system is designed to gently extract lipophilic compounds with liquid CO<sub>2</sub> in the range from 32°F to 59°F, from 610 psi to 940 psi. Liquid CO<sub>2</sub> is delivered to a liquid-to-liquid separator, a special oversized version to control the vaporization of the liquid CO<sub>2</sub> without any risk of flooding. A bigger separator is necessary due to the high latent heat of the CO<sub>2</sub>. The liquid separator is configured with the fast cloverleaf closing system for a faster cleaning procedure. Because of the short time available for continuous liquid CO<sub>2</sub> vaporization in the liquid separator, an oversized heater is delivered with the system. A supplementary cold water chiller is used in the liquid extraction process and is delivered with the system.

# Easy to Monitor and Control



## Easy and clear

A simple dashboard clearly indicates temperature ( $^{\circ}\text{F}/^{\circ}\text{C}$ ), pressure (psi/bar) and flow in liters/hr and allows the operator a simplified view of the process. Six software buttons are visible in the lower part of the screen: **Layout** is the general view; **Manual** is the online instruction manual; **Trend** shows the real-time graphs of the extraction process; **Alarm** shows real-time and historical alarms; **Parameters** or **Recipe** accesses the recipes page; and **Setup** is for general configuration options like language (English, Spanish, Italian, German and French) and passwords.



## Process by recipe

The process cycle is managed by recipes. A recipe is an app that automatically controls temperature, pressure, flow and extraction time, and extract collection time interval. These variables dramatically effect the final quality of the extract. These apps are available for download on the SCFN website. If you do not find the recipe you are looking for, simply ask for it. Tailored recipes are available; our engineering team will write a new recipe to do exactly what you need. Load an unlimited number of recipes into the software system. A wizard will help you to change main parameters like pressure, temperature and flow to adapt the original recipe to the new raw material.



## 15" touch-screen monitor PLC

With a wide 15" touch-screen we offer the biggest monitor in this class of extraction systems.

- Automation Panel 15.0" XGA TFT
- 1024 x 768 pixels (5:4)
- Single-touch (analog resistive)
- IP65 protection (front)
- USB and ethernet ports
- Processor: Intel, core i7

## Monitor and control with your smartphone

The wi-fi server installed in the system allows the operator to control the process on a smartphone, tablet or laptop.

# Actual Process Range in Colored Areas

## Supercritical region:

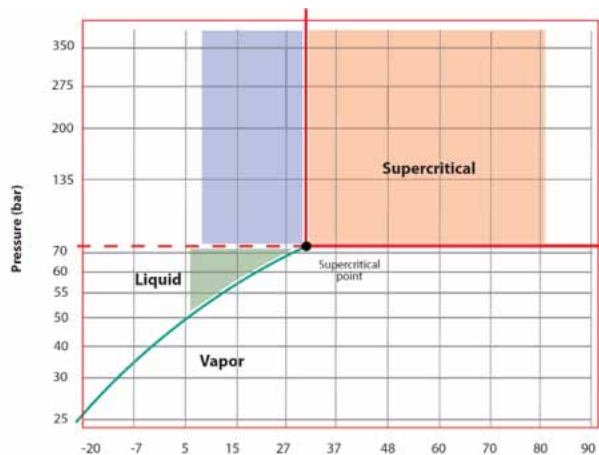
Above 73 bar and above 31°C. In this condition CO<sub>2</sub> has the strongest solubility power. Very fast extraction time. With low pressure (75 bar) and low temperature (32°C) conditions, extract composition is mainly concentrated in lighter oils, few resins and waxes. High-pressure (350 bar) and high-temperature (85°C) conditions allow complete extraction, rich in oils, resins and waxes. Extraction conditions between these two extremes produce very different extract composition.

## Subcritical region:

Above 73 bar and below 31°C. In this condition CO<sub>2</sub> has a low solubility power. Long extraction time. Good for gentle extraction of temperature-sensitive products. Extract composition mainly concentrated in light oils and generally poor in resins, paraffins and waxes.

## Liquid region:

Below 73 bar and below 31°C. In this condition CO<sub>2</sub> has a low solubility power. Long extraction time. Best for extraction of temperature-sensitive products and aroma compounds. Lowest extract concentration in resins, paraffins and waxes.



Industrial Series 1,200 liter SCFE

## Hightech Extracts is a member of the SuperCritical Fluid Network



Hightech Extracts and the SuperCritical Fluid Network are partners, bringing next generation SCF technologies to the North American essential oils and natural products industries. Together, we build systems to your specifications using a modular approach that allows us to maintain predictable results while providing the lowest total cost of ownership in the industry.



# Technical Specifications

SCFN P-5X/PLC	SCFN P-10X/PLC	SCFN P-20X/PLC	SCFN P-40X/PLC	SCFN P-100X/PLC
Single and dual 7-liter extraction vessels with 5-liter canisters	Single and dual 12-liter extraction vessels with 10-liter canisters	Single and dual 24-liter extraction vessels with 20-liter canisters	Single and dual 48-liter extraction vessels with 40-liter canisters	Single and dual 120-liter extraction vessels with 100-liter canisters
Supercritical and subcritical CO <sub>2</sub> extraction				
Pressure up to 5000 psi (350 Bar), with pressure metal-to-metal probe				
Temperature up to 165°F, with fast response thermocouple				
30 kg/hr pump (max pressure)	50 kg/hr pump (max pressure)	100 kg/hr pump (max pressure)	200 kg/hr pump (max pressure)	500 kg/hr pump (max pressure)
Gravity separator 1.5 liters, 2000 psi	Gravity separator 2.5 liters, 2000 psi	Gravity separator 5 liters, 2000 psi	Gravity separator 10 liters, 2000 psi	Gravity separator 25 liters, 2000 psi
Cyclonic separator 1 liter, 2000 psi	Cyclonic separator 1.5 liters, 2000 psi	Cyclonic separator 3 liters, 2000 psi	Cyclonic separator 7 liters, 2000 psi	Cyclonic separator 25 liters, 2000 psi
CO <sub>2</sub> reservoir/phase separator 7 liters, 1000 psi	CO <sub>2</sub> reservoir/phase separator 18 liters, 1000 psi	CO <sub>2</sub> reservoir/phase separator 36 liters, 1000 psi	CO <sub>2</sub> reservoir/phase separator 72 liters, 1000 psi	CO <sub>2</sub> reservoir/phase separator 240 liters, 1000 psi
Dual membrane electric pump; electronic inverter controlling pump motor speed				
Chiller 23°F, 4 kw, air condensed, PID controlled	Chiller 23°F, 17,000 BTU/hr, air condensed, PID controlled	Chiller 23°F, 34,000 BTU/hr, air condensed, PID controlled	Chiller 23°F, 70,000 BTU/hr, air condensed, PID controlled	Chiller 23°F, 170,000 BTU/hr, air condensed, PID controlled
Heater 185°F, 12 kw, PID controlled	Heater 185°F, 40,000 BTU/hr, PID controlled	Heater 185 F, 80,000 BTU/hr, PID controlled	Heater 185°F, 80,000 BTU/hr, PID controlled	Heater 185°F, 205,000 BTU/hr (natural gas), PID controlled
15" touch-screen LCD monitor; PLC powered by Intel i7 core				
Liquid CO <sub>2</sub> level and flow meter; Pressure gauge; Safety valve (certified)				

**Contact us now  
to discuss your needs:**

**1-207-613-5798**  
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Hightech Extracts is an engineering company developing systems for the manufacturing of extract-based products. Our mission: revolutionize the entire extraction process.

The centerpiece of our approach is supercritical fluid extraction, the best way to selectively and cost-effectively extract chemically pure essential oils and natural compounds from botanical materials.

The Hightech advantage: from initial purchase to installation to technical support, we're there to help. We'll work with you through every step of the process — selecting the right extractor, building the feature set you need, creating custom recipes — to help you achieve the lowest possible extraction cost per gram.

