



**Infinity
Supercritical LLC**

Technology of Botanical Extraction by Infinity Supercritical

Structured Data

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    "description":"Company Name: Infinity Supercritical LLC
    Industries Served: Botanical oil extraction and cosmetics
    Botanical Oil Extraction Uses: Hemp, lavender, algae, Flax, Oregano, Caffeine, flower, Black Seed,
    Machine Features: Silent operation, Compact, Fast return on investment, electrostatic precipitation collection of oil.
    Other Technologies: Hydrodynamic cavitation plant oil extraction using water. Oil extraction using vegetable oil. PPE sterilization,
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Producing Alcohol from Liquid CO2

Infinity has already built lots of closed-loop supercritical CO2 systems, and experimented with CO2 cavitation to make a one-moving-part liquid CO2 pump.

Infinity currently sells a cart-mounted portable on-demand supercritical CO2 phase change system for \$150,000 which can be used for the experiments listed below, along with many others. It is a cart which was designed to fit through any standard door, hallway, or elevator and has heavy duty casters for mobility.

We are currently looking for funding to develop the following:

1. On-Demand CO2 to Alcohol: Using our closed-loop liquid CO2 phase change system, adding Nafion in the process to make alcohol. Inputs: Liquid CO2, water, and electricity. About 3-4 kW to make a liter of alcohol (from lab experiments).
2. CO2 to Alcohol with In-Situ Power Generation: Using our closed-loop supercritical CO2 phase change system, produce the power via miniature CO2 turbine generator or static electricity generator (SEG) to power the conversion via Nafion.
3. Spin-To-Liquid (STL): A novel one-step approach to producing alcohol from liquid CO2 using a cavitation device with Nafion. This is a one-moving-part device employing sonochemistry with inputs of water and liquid CO2. Electricity is produced in-situ. Shaft rotation is required to spin the device (this can be done via a electric motor, pressure expanding turbine, or other shaft rotation such as a wind turbine).

You can further our efforts by buying our \$150,000 systems (which we build - and have four in stock) or by considering an investment to fund our development.

Teaser: Why was Nikola Tesla so fascinated with static electricity and spinning discs ? Our guess is that he had already found the worlds best battery - water. The Tesla turbine (while a fascinating pump) was actually a static electricity generator originally designed to charge water. All of his Colorado Springs experiments revolved around static electricity. Power generation and (wireless) transportation was via static electricity.



Infinity Supercritical Technology

Infinity deploys some of the most cutting-edge technology on their machine and system design.

Infinity uses First Principle design philosophy.

The Concept: First principles. Instead of forwarding current form (imitating current design), forward function as the initiator. Use information from different disciplines to make current innovation. Most people are so focused on form, that they overlook the function. As Elon Musk says, people often live life by analogy.

First principles involves boiling down problems to basic elements and then coming up with unique solutions. Be wary of ideas that you inherit, since they are already laden with problems and barriers. Old ideas set a boundary around creativity. That distinction is the difference between continuous improvement and first principles. First principles means that you abandon allegiance around first forms, and put the function front and center. What are you trying to accomplish? What is the functional outcome of what you are trying to achieve? Optimize function and ignore the form. This is how you learn to think for yourself.



Larger Diameter Interconnection Tubing That Doesn't Clog Like Waters Machines

We use 1/4 and 1/2 inch diameter stainless steel tubing in our extraction systems. Using larger diameter tubing resists clogging. Some of the most popular extraction systems use a small diameter 1/8 and 1/16 inch tubing which clogs constantly.

The larger diameter tubing we use has other benefits, including higher flow rate of the CO₂, which results in less cycle time.

Larger diameter tubing also results in less cleaning and maintenance (it's also easier to clean). The benefit of using larger diameter tubing allows the use of a larger CO₂ pump, which decreases processing cycle time. Less time processing time = more profits.

We focus on proper CO₂ distribution, not massive flow rate. More efficient delivery = better extracts.



Electrostatic Precipitation Collection

Infinity Supercritical is the first to use new patent-pending electrostatic precipitation system for separation and collection of the oil. Oil is charged and adheres to the collection vessel.

10/10/2021



Solid State Heating

Infinity uses solid state thermoelectric heating to regulate temperature within the extraction systems. We also use Supercritical CO2 flat plate heat exchangers for our larger models which allow you to use cool tap water, outside air, or chiller cooling, as a supplement to our thermoelectric technology, which gives you the option of using less energy to run the system.



Quiet Pump Technology

Our systems do not use noisy and heat generating air or CO₂ compression systems. Other systems require a separate air compressor to run, and a chiller to cool down the compressor.

Our systems use phase change dynamics, which use solid state thermoelectric devices to bring CO₂ to supercritical. This results in energy cost savings, and less operator (noise) fatigue. Our systems run silent.

10/10/2021



Sight Glass to View Supercritical CO₂ in Action

Our systems use high pressure stainless steel sight glass viewports which allow you to see the CO₂ in liquid or gas phase.

10/10/2021



Botanical Basket

We offer a quick-change basket option for our customers, which allows the input and removal of botanicals from the extraction vessel in less than a minute.

Some systems include a 40 micron basket to hold botanicals.

We have run tests using baskets, and without baskets, with the same extraction and cycle time results. There is no difference.

10/10/2021



IPM Integrated Pump Management

Since the CO₂ pump is the heart of any extraction system, we focus on the pressure provided by the pump.

That focus has resulted in a system called Integrated Pump Management, which gives the pump drive real-time feedback on system pressure, and adjusts the pump output pressure accordingly. Set the pressure, and it maintains pressure.

10/10/2021



FLIR

Infinity Supercritical uses Forward Looking Infrared Imaging to sense temperatures and flow rates in the extraction systems. This gives the processor valuable data which can be used to hone in on desired extraction techniques.



CO2 Flow Bar

While almost every CO2 extraction system enters in one end, and exits the other, our new concept delivers CO2 in a uniform distributed manner throughout the entire extraction vessel from the inside to the outside of the botanical extraction vessel.

Infinity is the first in the industry to deploy the very successful concept.

Others try to reverse flow, and other time consuming techniques which only slow down the cycle time.

That is why Infinity has one of the fastest and most complete supercritical CO2 extraction systems in the market.

10/10/2021



Reduced Cycle Time

The initial challenge that was given to us by John Baker at Fogponics was to develop a CO2 extraction system that can rival fast one hour hydrocarbon (BHO) extractions.

Using beer hops as our botanicals to test, we have tested a 6-12 percent extraction in 30 minutes, 9-18 percent in one hour, and 18 percent or more in 3 hours or less.

Note that hops has 15-25 percent oil content. Quality in = quality out.

Your results may vary, depending on experience.

10/10/2021



Fast Extraction Technology

Infinity Supercritical is the first in the industry to experiment and develop the 30/30 (30 minutes start extraction, remove botanicals, and finish with 30 minutes extraction) and 45/45 schedule, for fast extraction which rivals BHO, but provides a cleaner result.

This translates into more profit for the operator, and faster turnarounds.

Our FlowBar and Basket system allow fast cycle and minimal downtime between runs. Depending on which machine you are running, our system may be able to run 2-4 times the amount of botanicals in the same amount of time.



Panel Flow

The panel flow shows details of the system and closed-loop supercritical CO₂ operation.

This panel which is on every 10L system gives the operator a quick heads-up display on system flow.



Eco Extraction

All of our extraction systems are energy efficient, and are designed to have a low environmental footprint. The Spinning Disc Reactor system is the first large scale industrial Eco Extraction system available in the botanicals industry.

Adhering to NIH principles of Green Extraction:

Principle 1: Innovation by selection of varieties and use of renewable plant resources.

Principle 2: Use of alternative solvents and principally water or agro-solvents.

Principle 3: Reduce energy consumption by energy recovery and using innovative technologies.

Principle 4: Production of co-products instead of waste to include the bio-and agro-refining industry.

Principle 5: Reduce unit operations and favor safe, robust and controlled processes.

Principle 6: Aim for a non denatured and biodegradable extract without contaminants.









