



# SUPERCritical CO2 FLUID EXTRACTION SYSTEM

## ADVANTAGES

- Best suited extraction process for extracting natural ingredients by keeping delicacy & freshness close to natural.
- High potency of active components.
- CO2 based pure oil extraction method.
- Totally free from heavy metals.
- Totally free from Inorganic salts.
- Choice of polar & non polar component is available during extraction.
- Free from Biological contaminant.
- Safe, eco-friendly & pollution free manufacturing process.
- Eco-friendly & green technology with no residual solvent & effluents.
- Semi-automated PLC based plants with CO2 recycling.

## APPLICATIONS

- Extraction of herbal ingredients from seed/ Leaf /Shoot/Root/Bark of material
- Extraction of spice aroma essence from Red Chili, Parika, Ginger, Nutmeg, and Black paper, Vanilla, cardamom, fennel seed, coriander, Garlic, cinnamon, clove etc.
- Extractions of essential oil & oleoresin from flowers i.e. Rose , Jasmine , Marigold , lavender, Tuberose , Mogara , Champak , Geranium, Chamomile etc... for perfumes & aroma.
- Extraction of aromatic & medicinal oils from Ayurvedic herbs i.e. Ashwagandha , Sawpalmetto , Shatawari , Jatamansi , turmeric , safed mulethi, shilajeet etc.
- Denicotinization from Tobacco.



| PARAMETER                             | LAB & RESEARCH MODELS   |                                   | COMMERCIAL MODELS   |                   |                   |                    |
|---------------------------------------|---|-----------------------------------|---|-------------------|-------------------|--------------------|
|                                       | SCFE 5 ltr model  | SCFE 10 ltr model                 | SCFE 30 ltr model   | SCFE 60 ltr model | SCFE 75 ltr model | SCFE 100 ltr model |
| Extraction Vessels                    | 5 ltr X 1 or<br>2.5 ltr X 2 nos   | 10 ltr X 1 no or<br>5 ltr X 2 nos | 10 ltr X 3 nos  | 20 ltr X 3 nos    | 25 ltr X 3 nos    | 33.3 ltr X 3 nos   |
| Operating Pressure                    | 375 Bar   |                                   | 375 Bar   |                   |                   |                    |
| Hydraulic Test Pressure               | 400 Bar   |                                   | 400 Bar   |                   |                   |                    |
| Operating temperature                 | Max 80 degree   |                                   | Max 80 degree   |                   |                   |                    |
| Seperator Vessel                      | Working volume :- 1000 ml to 5000 ml<br>MOC :- SS 316<br>Design Pressure: 375 bars.<br>Operating Pressure: 350 bars.<br>Design Temperature: 80 C.<br>Pressure Control: through micrometer needle valve/BPR  |                                   | Working volume :- 5 ltr to 15 ltr<br>MOC :- SS 316<br>Design Pressure: 375 bars.<br>Operating Pressure: 350 bars.<br>Design Temperature: 80 C.<br>Pressure Control: through micrometer needle valve/BPR |                   |                   |                    |
| Liquid CO2 Pump                       | Type: reciprocating plunger.<br>No. In the system: 1 or 2 nos as per model selection*<br>No. of plunger :- 1 or 3 as per model selection*<br>Maximum Operating Pressure: 400 bars<br>Discharge Capacity: upto 5kg to 60 kg per hr<br>Drive: Mechanical<br>Material of construction: pump head – Stainless Steel, Plunger/ Diaphragm - sapphire / Stainless Steel. Seals- PTFE.<br>A. The pump is provided with Safety Relieve Valve and Pressure Switch (Auto cut-off in set pressure ) pressure gauge, overpressure protection (Safety Relieve valve ).<br>B. The pump controller has built in feature for reading out the flow rate of the CO2 being pumped |                                   |   |                   |                   |                    |
| Cosolvent Pump                        | NA ( If required it will cost extra)  |                                   | Type: reciprocating plunger.<br>MOC :- SS316/ 304<br>Flow rates :- upto 10 LPM<br>Operating Pressure :- 100 Bar max<br>solvent Tank :- 10 ltr with Level Gauge  |                   |                   |                    |
| Control panel details                 | Type: PLC controller with 7" colour touch screen HMI<br>Pressure Indicator: All Digital and analogue for pressure zones<br>Temperature Indicator: All Digital for heating and cooling zones<br>Pump Flow Control: Thru System software<br>MOC :- ELDON / Rittal make CRCA corrosion free cabinet /body with Epoxy powder coating free standing panel with all electric components   |                                   |   |                   |                   |                    |
| Heating & Cooling Arrangement         | HEATING: JACKETED,<br>• DESIGN PRESSURE JACKET SIDE: 4 BARS   |                                   | For Gentle Heating & precision temperature control<br>A )Hot water generator tank s with hot water circulation<br>B) Refrigeration unit with chilled water circulator                                   |                   |                   |                    |
| Piping & valves                       | The entire piping to be made for high pressure in stainless steel seamless pipes with welded joints & quick connectors of the type of Swagelock or others. The individual equipment to be provided with needle valves for isolation, safety valves & rupture discs. For protection etc. all the piping and valves are to be rated for 1200 bars pressure.<br>A) High Pressure saftey relieve valve<br>B) High Pressure regulator<br>C) High Pressure non return valve   |                                   |   |                   |                   |                    |
| Process parameter indicators /control | Pressure Indicators by digital gauge<br>Temperature indicator : - 20 to 100 deg C<br>Digital Temperature Controllers<br>The control panel is the heart of system operation and control . The Panel shall house the necessary saftey interlock switches ,PID , temperature control and indicators as well as alarm annunciation. The Control system shall be suitablefor automatic operation with manual override and indication / alarm annunciation.   |                                   |   |                   |                   |                    |
| Feed Carbon dioxide                   | 2 nos of 47 ltr CO2 filled cylinder , 30 kg each  |                                   | 4 nos of 47 ltr CO2 filled cylinder , 30 kg each  |                   |                   |                    |
| Spare parts                           | Accessories for Pump :- O ring<br>Extraction Vessel Gas kit<br>High Pressure regulators<br>Valves<br>Electronic spares<br>Heater<br>material loading bags ,<br>tool kit<br>Hose   |                                   |   |                   |                   |                    |
| Optional Accessories *                | All optional accessories having extra cost i.e.<br>1)Vacuum Cleaner<br>2) Grinder or Crusher<br>3)Pump head<br>4) Pump<br>5)Cosolvent Pump<br>6)Gas chromatograph & HPLC<br>7)SS tray or bucket   |                                   |   |                   |                   |                    |

#### List of few extracts from our pilot plant:

|                      |           |                        |       |
|----------------------|-----------|------------------------|-------|
| Clove bud oil        | 19%-20%   | Commiphora Myrrha      | 4%    |
| Sasurea radix (root) | 3%        | Jatamansi Valerina     | 3%    |
| Turmeric oil         | 6%-9.5%   | Curcumin from turmeric | 2%-5% |
| Marigold             | 2%        | Vetevir [ Khas]        | 3%-4% |
| Ginger oil           | 6.5%-9.5% | Sandal wood oil        | 4%-9% |
| Flaxseed Oil         | 1%-3%     |                        |       |



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