



Extraction and Fractionation

	Laboratory equipment	Pilot equipment
Vessel capacity	10, 100 and 1000cm ³	2x12 or 2x16 litres
Operating pressure	50 - 600bar	50-700bar
CO ₂ flow	0.3 - 12kg/hour	10-50kg/hour
Temperature	5-120°C	5-80°C
Solvent	Liquid or supercritical CO ₂ with high pressure addition of co-solvents	
Data capture	CO ₂ flow, temperature, pressure and energy capture from all key process parameters	

Extraction and fractionation is the broadest application of liquid or supercritical CO₂ and many commercial processes already exist at large scale. The equipment at Suprex allows trials to be carried out on as little as 5g of material through to intermediate laboratory and pilot scale.

Extraction can be carried out using CO₂ in a liquid or supercritical state and the choice largely depends on the solubility of the molecules to be extracted.

Liquid CO₂ is significantly less polar than supercritical CO₂ and is more applicable to small, non-polar molecules. In the supercritical state, CO₂ is a highly tuneable solvent and the manipulation of temperature and pressure allows selective extraction of a wide range of molecules.

Suprex has expertise across a wide range of applications of the use of CO₂ as a solvent including:

- Flavour and fragrance ingredients
- Waxes for cosmetic and personal care products
- Plant derived pharmaceutical and nutraceutical molecules
- Pigments from plants and algae
- Biosurfactants from fermentation processes

Supercritical CO₂ has low surface tension and viscosity and therefore high mass transfer rates can be achieved, providing ideal conditions for extracting compounds with a high degree of recovery in a short period of time and with easy separation of products.

At Suprex extraction and fractionation is most commonly carried out with solid materials but Suprex has developed a number of novel methods to fractionate complex liquid mixtures that are completely scalable to multi-ton quantities.

Extraction and fractionation is normally carried out in a "closed loop" in which the CO₂ is continuously recycled and the extracts collected by pressure reduction in a series of separators. This is the arrangement of the Suprex pilot plant.

