

OUR DEVELOPMENT & RESEARCH UNIT

More than 30 years of innovation and experience in the field of supercritical fluid extraction technology lead to a professional Research and Development Unit.

We are specialised in scale-up of industrial scale production plant and therefore there was a need to design our own R&D equipment to get real data for the scale-up calculation.

Before adapting new instruments and components in the industrial production plant, they are tested in our R&D centre. By constantly using this R&D unit for our own test and research activities, the design is consequently optimized due to the experience of own operation.

The technology and performance of our R&D Units is unmatched on the market.

THE FUNCTION

Liquid CO₂ from the CO₂ storage is pressurized by means of the CO₂ circulation pump up to the desired extraction pressure and is subsequently heated before being fed into the extractor.

The CO₂ passing the extractor from bottom to top is loaded with soluble substances, which precipitate according to their solubility and adjusted conditions either in separator 1 or 2.

Less soluble substances are collected under supercritical conditions in the first step, while highly soluble substances like essential oils are concentrated in the second step from evaporated CO₂.

The gaseous CO₂ leaving the second separator is condensed and collected in the CO₂ storage vessel before it is recycled.

From the control screen the required operating conditions can be adjusted and are recorded during the extraction process.

DESIGN DESCRIPTION

The whole plant is designed as package-unit - ready to connect - and assembled in a compact steel frame, allowing easy access for service, maintenance and cleaning.

The quick-acting closure system (system NATEX) of the extractor allows easy and fast charging of the basket containing the raw material. The basket is of specific design, preventing carry-over of solid particles and is equipped with a safety device avoiding over-pressure within the basket in case of clogging.

The first separator is equipped with a clamp closure to allow quick opening for product recovery and cleaning.

The individual heating systems enable independent and accurate temperature control of the extraction process.

To prevent corrosion, all parts in contact with CO₂ are fabricated in special stainless steel.

HIGHLIGHTS

Due to the design, which was developed based on our 30 years experience in supercritical fluid extraction and our own research activities; the unit is an advanced professional research unit:

1. Adjustable pressure up to 900 bar.
2. Reproducible tests at most variable conditions are ensured.
3. Optimum size for extract sample production, i.e. for low bulk density material as well as feed with insignificant yields.
4. Fractionated separation.
5. Flexible raw material consumption using baskets of different sizes.
6. Computerized control system and visualization as used in industrial scale
7. Simple and fast recharging of raw material.
8. Only industrially approved components and instruments are used.
9. All pressure indicators and pressure transmitters have no dead volume, which ensures accurate measurements without any product entrapment.
10. Each vessel is equipped with independent controlled temperature circuit
11. Density-independent CO₂-flow control.
12. Mass flow control by frequency changer.
13. Chilling unit either air- or water cooled.
14. Complete unit assembled in a steel frame.
15. Easy access for service and maintenance.
16. Container transport is possible.
17. Testing of the complete assembled unit in presence of the client.
18. Appropriate price/performance ratio.
19. Modifications according to client' s demand are possible.
20. Extendable with co-solvent pump module
21. Extendable with liquid/liquid extraction module

