

Processes with supercritical fluids in the pharmaceutical- cosmetics- and food industry

In the life science sectors there is an increasing trend away from the classic organic solvent chemistry to new processes due to economic and ecological reasons. These work with fluids in supercritical condition. The advantage of these processes lays in the use of solvents, above all carbon dioxide, which do not burden the environment and the product.



LEWA diaphragm pump for liquid CO₂, with cooling device

There are very specific demands on the metering and process diaphragm pumps for these applications. Due to many years of experience with these processes all requirements are fulfilled by LEWA metering pumps and LEWA process diaphragm pumps:

- Hermetically tight
- High operational safety
- 20 years of experience in the design of high pressure pumps and their periphery for liquid gases (calculation programmes)
- Suitable for non-lubricating fluids with low viscosity
- Constant flow even when the pressure slightly fluctuates
- Low wear, almost no particle contamination due to few moving pump head parts
- Easy to clean, dairy version available
- Materials compliant to FDA

- Variety of hook-up connections
- Cooling equipment
- Special valves, if required
- Optimum pump head material, e.g. Hastelloy for highly corrosive fluids
- Design for installation in hazardous areas
- For pharmaceutical applications hygienic design is possible (Ra < 0,5 µm electro-polished, ASME BPPE, EHEDG)
- Suitable for installation in GMP-areas and clean rooms
- Documentation for qualification / validation

LEWA metering pumps and process diaphragm pumps are already used successfully in the following processes:

- Extraction processes with supercritical CO₂ (Supercritical Fluid Extraction SFE)
- **Supercritical Fluid Chromatography (SFC)**
- **Supercritical Fluid Fractionation (SFF)**
- **Supercritical Fluid Reactions (SFR)**
- Formation of particles (e. g. **Rapid Expansion of Supercritical Solutions RESS**)
- Cleaning processes
- Impregnation
- Inactivation, cell disruption



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