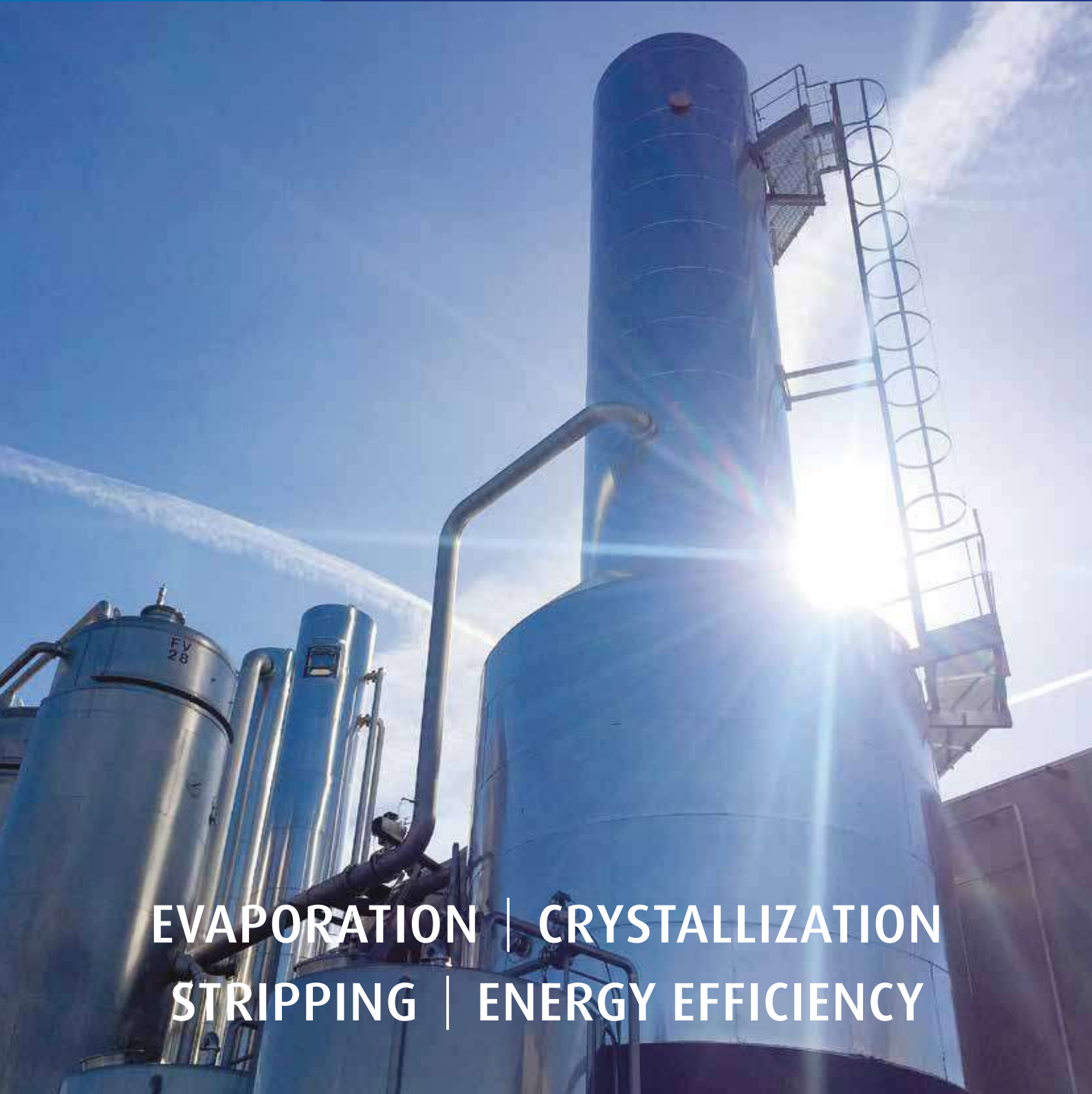




- DESIGN
- ENGINEERING
- TURNKEY
- MAINTENANCE



BY FRANCE EVAPORATION



EVAPORATION | CRYSTALLIZATION
STRIPPING | ENERGY EFFICIENCY

AUDIT | DESIGN | MONITORING

Contract services

FEED project

- Feasibility study
- Assessment in laboratory and/or by pilot testing

Survey of existing units

- Process optimisation
- Energy optimisation
- Making the best use of co-products
- Eco-friendly solutions



Test centre

- Feasibility in laboratory and with pilot
- Assessment of product behaviour
- In-house laboratory analyses
- Evaporation, distillation, FC and IFC® crystallizer pilots

Engineering capabilities

- Turnkey project or supply of the key-process equipment
- Sizing
- Vessels detailed drawing plans, 3D model, isometrics...
- Fabrication follow-up & monitoring
- Site erection and assembly

Automation

Automation can be managed internally, allowing great flexibility until the start-up phase.

Commissioning

FE manages the entire plant start-up with a multi-disciplinary team.

After-sales services

Pumps, valves, instruments, etc. FE offers you the spares you need for the best operability of your plant.

Operation follow-up and monitoring

From the routine visit to operation, including assistance with remote monitoring, FE supports customers with the operation of their plant.

Mobile unit rental

On-site processing and/or industrial scale validation.
100 m³/day unit for evaporation and stripping.

By working with FE, which speciality consists in heat recovery and evaporation processes, client will benefit from the experience built up over 25 years by its team of engineers.

Evaporation

The process of evaporation provides answers to an exceedingly large number of industrial problems linked to the concentration, volume reduction and processing of effluents.



TECHNOLOGIES

- Falling film
- Forced circulation
- Flash cooling
- Mechanical Vapour Recompression (MVR)
- Thermo-compression (TVR)
- Multiple effect

Stripping

Stripping allows to separate volatile compound(s) from a solution. This technology is often used in addition to an evaporation unit to separate a volatile compound from the condensates produced.



Typical application: ammonia

- Possibility of extracting ammonia in liquid form at different concentrations
- DeNOx recycling availability
- Destruction of ammonia by oxidation
- Production of stable liquid fertilizers such as ammonium sulphate, ammonium nitrate, etc.

Crystallization

Size and homogeneity of crystals, energy efficiency, overall cost, robustness: our technical solutions can be adapted to any type of industrial objective within the limits imposed by quality and budget.



TECHNOLOGIES

- IFC® (Indirect Forced Circulation)
- Forced circulation
- DT/DTB
- Oslo
- Agitated reactor

IFC®: a high performance crystallization technology

- Average size of the crystals obtained with IFC® is greater than with Forced Circulation and DTB technologies
- Distribution of the crystal size closer to the D50
- Very reduced production of fines
- Reduced operating cost

New patented crystallizer

TECHNOLOGIES

- Packed column
- Vapour stripping
- MVR stripping®
- Solvent recovery: by condensation or washing

Energy efficiency

FE is specialised in energy optimisation for evaporation, crystallization or stripping plants.

We work on all types of plant, either delivered by FE or not.

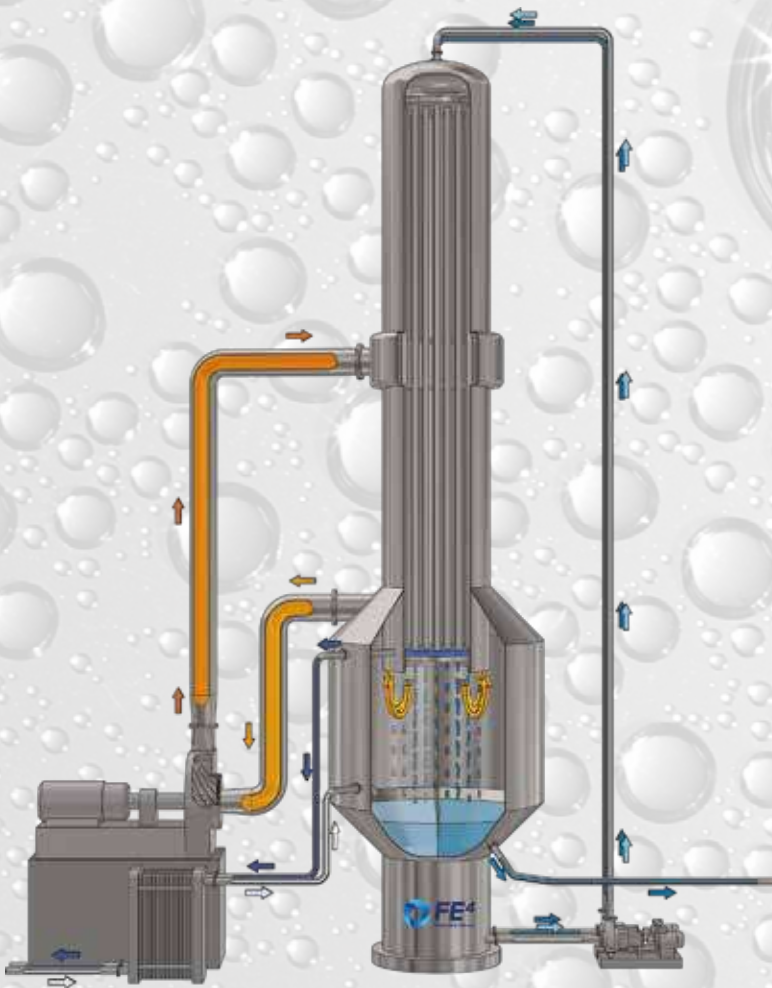


Energy audit can be carried out on any installation

TECHNOLOGIES

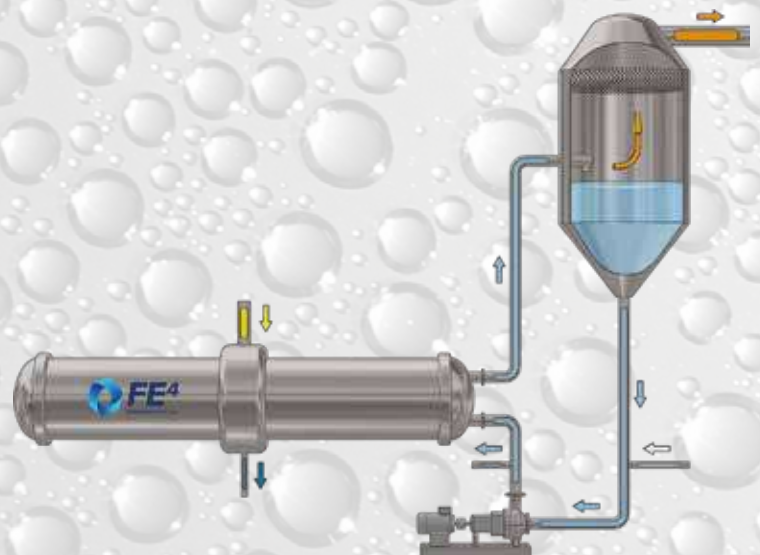
- Mechanical vapour recompression (MVR)
- Multiple effect transformation in MVR
- Heat recovery and re-use (hot water production, etc.)

EVAPORATION



KEY POINTS

- Customised unit
- Wide capacity range: from 10 kg/h to more than 100 t/h
- Adjustable operating pressure and temperature
- Fit-for-purpose material of construction
- Installation according to site restrictions
- Complete range of evaporation technologies



CRYSTALLIZATION



KEY POINTS

- Technology selected to best suit your projects
- Capacity suitable to customer's needs
- Optimised crystal size and distribution
- Fit-for-purpose material of construction
- Complete range of crystallization technologies

STRIPPING



KEY POINTS

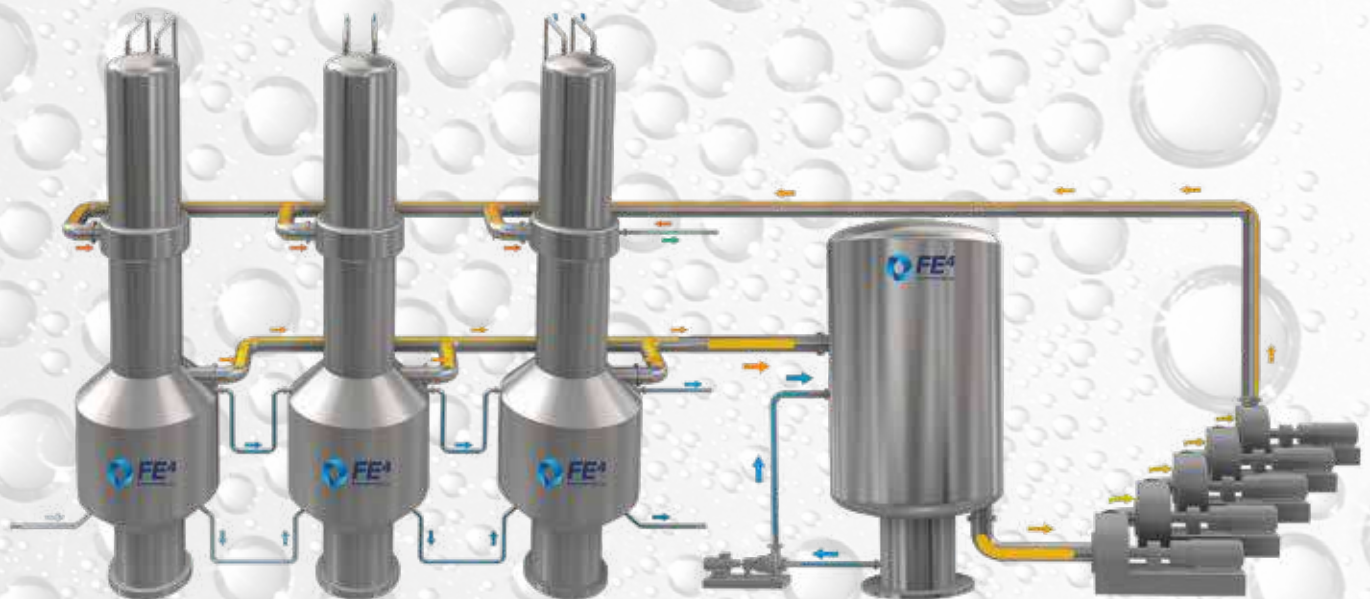
- Quality of processed water
- Concentrated volatile compound on top
- Optimised operating cost
- Combined with an evaporation unit

ENERGY EFFICIENCY



KEY POINTS

- Global heat study and proposal for improvement
- Return on investment modelling
- Reduction in the carbon footprint
- Modification/revamping/debottlenecking of any evaporation, crystallization or distillation unit





Complete expertise in evaporation, crystallization and stripping

Chemistry, biochemistry, thermal and mechanical engineering: FE brings together a complete team of engineers specialised in the processes of evaporation, crystallization and stripping. This ensures to provide a global approach to your projects.

25 years experience

Our teams have been designing, manufacturing, installing and monitoring industrial plants for over 25 years. They have acquired experience in many markets:

- Chemistry
- Agri-business
- Pharmaceuticals and cosmetics
- Mining
- Fertilizers
- Waste water treatment plant
- Treatment of digestates and manure
- Leachate and waste

Global intervention

FE works on all your projects with well-established, precise, complete methodology:

- Installation audit
- Project engineering
- Industrial design
- Test units/Pilot units
- Sourcing
- Monitoring of manufacture
- Erection, assembly and commissioning



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