kern s&d

Evaporation and Crystallisation

PLANTS

Engineering at service *of sustainability*

Evaporation and Crystallisation

PLANTS

KERN SD

develops tailor-made evaporation and crystallisation plants ¨in situ¨ to meet customers' technical and economical needs.

KERN SD plants are fully customizable in terms of production.

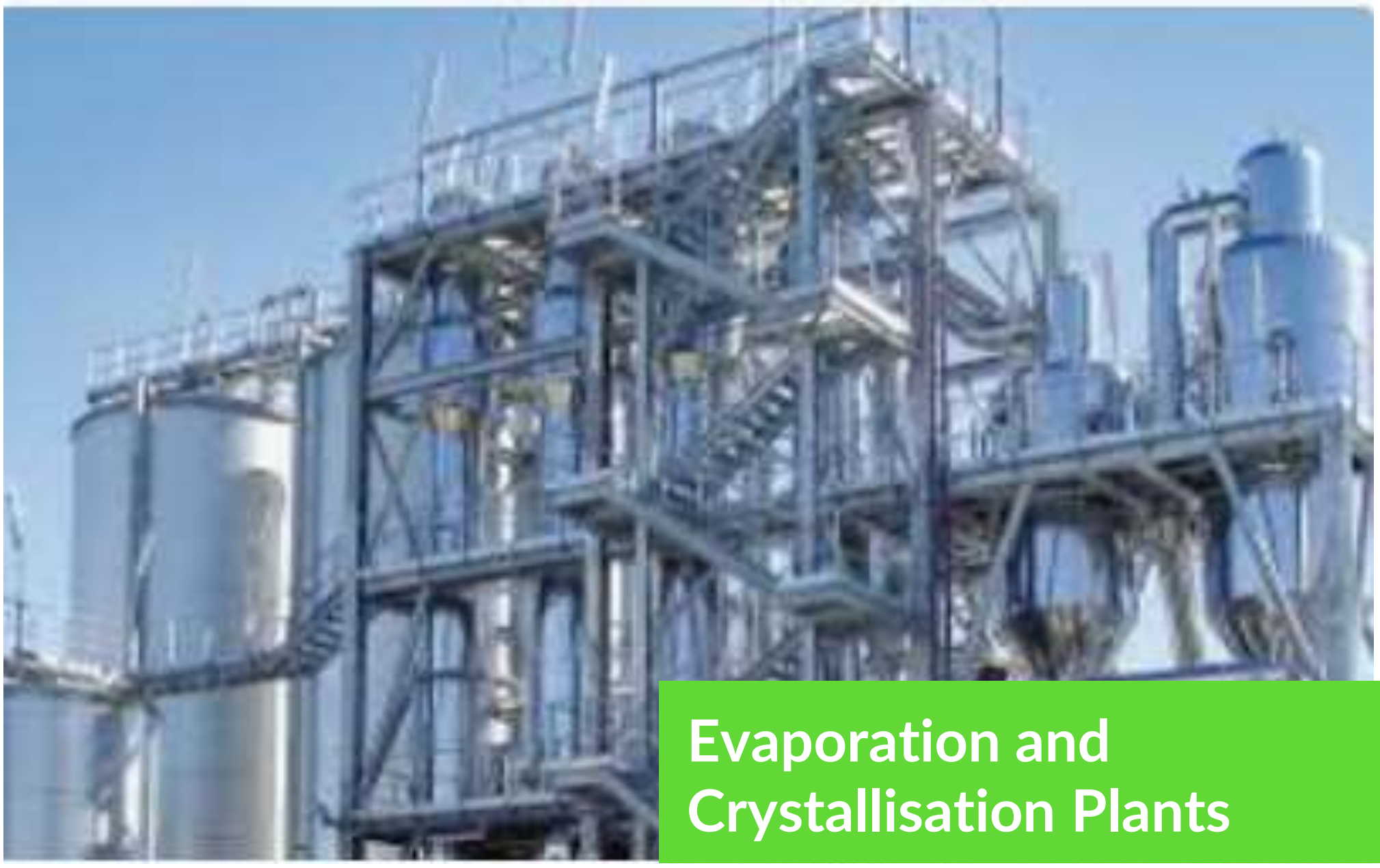
- KERN SD has **extensive experience** in the **design and construction of evaporation and crystallisation plants,** enabling it to meet customer specifications in terms of density, purity, particle size and operating time, while minimising investment and operating costs.

- **Evaporation systems**, which in most cases operate under vacuum or atmospheric conditions, use and optimally combine the following technologies depending on the characteristics of the working liquid:
  - Falling Film Evaporators (FFE)
  - Forced Circulation Evaporators (FCE)
  - Thin film/clean film evaporators (TFE)
  - Short Path Evaporators (SPE)

- **Solution crystallisation** is well suited for most applications and especially for large capacities. The use of different types of crystallisers and energy efficient configurations allows the desired particle size to be achieved.

  There are three basic types of crystallisers for crystallisation of solutions: forced circulation (FC), diffuser tube plate (DTB) and fluidised bed (Oslo), and they can be used alone or in combination for:
  - Evaporative crystallisation
  - Crystallisation by vacuum quenching
  - Crystallisation by surface cooling
  - Reaction crystallisation

The selection of the right equipment for the process and the design of the crystallisation operation are influenced by multiple product and process specific parameters.



Evaporation and Crystallisation Plants

PLANT FEATURES

Output	Tailored to customer needs
Flexibility	30-100%
Materials	Built with high quality materials
Monitoring	Fully automated and monitored plants

- ☐ **ON-SITE PRODUCTION**
- ☐ **FIXED PLANTS**
- ☐ **MODULAR AND SCALABLE**
- ☐ **AUTOMATIC CONTROL**
- ☐ **SAFE OPERATION**
- ☐ **ECONOMIC SAVINGS** (low operating and maintenance costs)
- ☐ **HIGH ENERGY EFFICIENCY**
- ☐ **SIGNIFICANT REDUCTION** of associated storage, handling and road transport risks
- ☐ **HIGH PURITY PRODUCT**
- ☐ **NO ENVIRONMENTAL IMPACT**

Evaporation and Crystallisation

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Evaporation and crystallisation plants are needed when water or other solvents have to be removed from a process, when concentration has to be increased or volume reduced, when high value pure crystals have to be produced, or when impurities and by-products have to be precipitated and removed.

MAIN USES OF EVAPORATION AND CRYSTALLISATION PLANTS

- Zero discharge of wastewater with high salt content
- Chemical industry
- Pesticide industry
- Lithium industry
- Wastewater treatment from recycling of waste batteries
- Printing and dyeing industry
- Waste leachate treatment
- Pharmaceutical industry
- Metallurgical industry
- Fermentation industry