

GEA spray drying evaporation

The world class thermal solution for achieving zero liquid discharge (ZLD).



The effluent drying process ensures zero liquid discharge.

Process optimization concept

Scarce water resources, increasing environmental awareness and global recognition of the need to deal with wastewater from industrial process in a sustainable way, have led to the implementation of stringent regulations for the discharge of wastewater streams. Therefore, the utilization of zero liquid discharge (ZLD) solutions can play a vital role in preserving our water resources and protecting the environment. GEA is, among others, a single-source supplier of cost effective, energy efficient and reliable wastewater evaporator

systems, based on using spray drying evaporation.

GEA salt drying process

Drying of salt-containing effluents from various industrial processes, including wastewater streams from wet type FGD (flue-gas desulfurization), is efficiently enabled using the well-proven GEA spray drying technology and proprietary equipment. The heat of the flue gas from the industrial process is used to evaporate the water in the effluent, leaving a dry powder to be collected in a downstream filter with no liquid effluent at all.

Mature technology

Spray drying is a mature technology that was developed over a century ago. GEA has successfully delivered installations worldwide across many different spray drying applications in the power, waste to energy, sinter & metallurgical and glass industries — to name some.



Process

The GEA spray drying evaporation process is highly efficient yet very simple, as it basically consists of the spray dryer evaporator module and a down-stream filter to collect the dried salts. Commonly, these are captured in the main dust collector where they are mixed with the fly ash from the process.

If needed, the dried salts can be separated in a dedicated dust collector, installed after the spray dryer evaporator. This option requires a booster fan if the gas leaving the spray dryer evaporator is to be returned to the main flue gas duct.



Mature and well-proven technology.

Unmatched rotary GEA Niro® F atomizer series:

- Excellent performance with outstanding distribution of droplets' size.
- High availability thanks to the plug and play concept and robust mechanical design.
- Small droplets ensure optimum drying conditions.

Very flexible process:

- The heat source for effluent evaporation can be hot flue gas or pre-heated combustion air.
- Dried salts can be collected either in a particular filter or in the main dust collector.
- Can be adapted for large variations of hot gas temperatures and ash load.
- Full ranges of atomizer sizes for different effluent capacities.

System simplicity:

- Carbon steel construction for the chamber.
- The gas disperser and the chamber can be supplied with a high degree of local production.











For your continued success.

Some selected references

Jiangsu, China, coal fired power plant:

- Plant size 2x600MW
- Gas flow 2x50,000 Nm³/h

Midwest Utility, USA, coal fired power plant:

- Plant size 1x273 MW
- Gas flow 1x200,000 Nm³/h

Hunan, China, coal fired power plant:

- Plant size 2x1,000MW
- Gas flow 2x23,000Nm³/h

15+ salt drying systems in Europe.

Potential benefits

- Elimination of wet FGD wastewater discharge.
- High reliability and limited operator attention required due to the process' simplicity.
- Designed for improved material handling.
- Integration with other upstream processes.

Applications for spray drying technology

GEA's spray drying evaporation solution is widely regarded as one of the effective and economical methods for obtaining zero liquid discharge.

The solution can be used for the evaporation of various effluent streams, for example, from wet flue gas desulfurization (WFGD) plants in power stations or wet flue gas cleaning (WFGC) plants in waste incinerators and similar.

Please contact GEA for an evaluation of the possibilities in your specific plant.



Projects in capable hands.

Building partnerships

- GEA spray drying absorption (SDA) technology available through meticulously selected local partners.
- Alliance-based market approach helps keep expenses low, while the quality of the technology and services remains high.
- Network of highly competent local partners with extensive experience in local supply chain, technical execution and project management experience.
- All partners enjoy a proven track record in demonstrating robust process and procedures to ensure projects remain on schedule and within budget.

The best of both worlds

- GEA's SDA/spray drying evaporation solutions are widely regarded among the most effective and economical methods of flue gas cleaning and zero liquid discharge.
- The process is available worldwide through our global network of selected partners.
- By combining our technical proficiency with our partners' operational skills GEA provides the best of both worlds for the best customer experience.
- This market approach allows GEA to focus on its strenghts: process know-how and atomizer design. While local partners retain overall responsibility for the project, providing local insight, relationships and resources.

Become a GEA SDA/spray drying evaporation partner

- Potential partners have the opportunity of enhancing their business with a world class technology solution.
- End to end technology and engineering support from Denmark, from sale to project hand over.
- Technology licensing and many years of experience with partners.
- Built on trust and cooperation on a long-term basis.



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