

EVAPORATION AND SPRAY DRYING TECHNOLOGY

CUSTOM SOLUTIONS FOR INDUSTRIAL PROCESSES

Lübberts



Lübbers is a family-owned company for the design and manufacturing of hygienic stainless steel equipment with locations in Germany and the Netherlands. We specialize in evaporation and spray drying technologies for industrial plants in the food and dairy, pharmaceutical and chemical processing sectors. Based upon more than a century of experience in food processing, we deliver a high quality of manufacture and outstanding expertise in process engineering.

TRADITION OF EXCELLENCE - FROM THE HEART OF GERMANY

Lübbers industrial process solutions focus on quality, flexibility and customer's choice. We have developed an excellent name for approaching each customer's needs individually. Leading international companies worldwide have come to rely on Lübbers as a strong, long-term partner in their continual growth and improvement.

Our range of equipment comprises of modern, cost-effective and energy efficient evaporation and spray drying plants or their individual components, which allow the processing of a multitude of raw materials and products.

We provide a full spectrum of equipment and services, enabling our clients to produce at the highest quality while complying with the strict health, hygiene and safety rules. Our customers can decide whether to conduct installation by themselves, or whether to have a fully operational plant handed over to them by Lübbers. Besides, we provide engineering packages, process optimization, and comprehensive technical support.

DELIVERY SCOPE

- ✓ Individual components
- ✓ Process lines
- ✓ Revamps / upgrades
- ✓ Installation and commissioning
- ✓ Technical support
- ✓ Process optimization

PRODUCT AREAS

- ✓ Fluids
- ✓ Concentrates
- ✓ High-viscous pumpable materials
- ✓ Moist powders
- ✓ Wet cakes
- ✓ Fibrous materials

INDUSTRIES

- ✓ Food industry
- ✓ Pharmaceutical industry
- ✓ Chemical industry



A photograph of an industrial facility featuring large, vertical stainless steel tanks and a complex network of pipes and walkways. A blue semi-transparent banner is overlaid on the left side of the image, containing the text 'DELIVERY PROGRAM'.

DELIVERY PROGRAM

EVAPORATION

Lübbers supplies falling film evaporators with thermal, mechanical and hybrid vapor recompression. Our expert team develops custom-made designs, taking into consideration the specific product requirements, as well as further operational and economic factors, which are significant to our clients. The equipment is manufactured at our production site in Bad Langensalza, Germany, which gives us more flexibility on fast track projects.

SPRAY DRYING

We are acclaimed experts in spray drying and filtration technology, delivering a wide range of single- and multistage drying systems, as well as engineering services. Our highlights include award-winning, patented CIP-able baghouse filters, indirect gas air heaters with extreme heat capacities, and rotary atomizers with internal water-cooled motors, among others. All our components are engineered individually and manufactured at our production site in Bad Langensalza, in Germany.

CLEANING IN PLACE (CIP)

Lübbers plants are distinguished by sanitary designs of the highest standard and are equipped with modern and fully automated cleaning-in-place systems. We also specialize in retrofitting of existing plants for process and hygiene optimization. Lübbers CIP facilities ensure minimal interruption of production cycles, and the efficient positioning of cleaning nozzles prevents sedimentation of impurities. Lübbers spray drying designs allow wet cleaning of all parts, including baghouse filters.

HEAT RECOVERY SYSTEMS

We supply hygienic and custom-designed heat recuperation systems and integrate various heating and cooling solutions in both new and existing evaporation and spray drying facilities, to ensure process and capacity optimization. For spray drying systems, an increase total efficiency of up to 20 per cent can be reached. Our heat recuperation systems are integrated in the CIP system of the whole plant, and the process heat can be reused for warming up of different units.

EVAPORATION

PRODUCT FLOW UP TO 75 T/H (83 STPH)
TUBE LENGTH UP TO 25 M (83 Ft)
TVR / MVR / HYBRID SYSTEMS
SINGLE & MULTIPLE EFFECTS

Falling Film Evaporation

Our guiding principle is to make the most efficient and cost-effective design. Falling film evaporation is counted among the most progressive evaporation technologies today. It ensures short residence time and gentle treatment of product, which is especially important in dairy industry. In order to provide our customers with the best solutions, we implement a variety of individual designs..

Thermal Vapor Recompression (TVR)

By implementing process lines with TVR technology, our customers are able to achieve increased operation efficiency, equal to the output of a multi-effect evaporator. A steam injector, due to its simplicity and absence of moving parts, is a reliable and economical design element. At the same time, steam consumption is kept as low as possible by reusing product vapour.

Mechanical Vapor Recompression (MVR)

The MVR technology is particularly advantageous for delicate products. Gentle evaporation is achieved by means of low temperature differences and short residence times of the product. The energy consumption is notably low. MVR systems are highly accessible due to the simplicity of the process, their excellent partial load behavior and low operating costs.

Evaporation Delivery Scope

- ✓ Reception

✓ Homogenization

✓ Pasteurization

✓ Skimming

✓ Filtration
- ✓ Standardization

✓ Concentration

✓ Parallel CIP

✓ Storage tanks

✓ Process tanks
- ✓ Pumps

✓ Fans / high-pressure ventilators

✓ Piping

✓ Instrumentation

✓ Spare parts

Components	Properties	Advantages
Separators	Cyclone	Efficient separation of vapor / liquid
	Wrap-around (integrated type)	
Product Heaters	Spiral tube heaters Straight tube heaters	Less fouling Protein denaturation reduced to a minimum
	Direct steam injection (DSI) Direct contact heating (DCH)	Fast heating Longer operation times without cleaning Lethal to thermophilic and/or mesophilic microorganisms Surplus vapour as heating medium can be used
Condensers	Indirect spiral-wound tube Straight tube Direct mix	Optimal de-aeration design Heat recovery if possible
Flash Coolers	Natural / Forced / Hybrid Multi stage	Required for whey and sweetened condensed milk concentrate Energy recovery possible

SPRAY DRYING

- CIP-ABLE BAGHOUSE FILTERS
- GAS AIR HEATING UP TO 450°C (840°F)
- HEAT RECUPERATION
- DEHUMIDIFICATION KNOW-HOW

Lübbers Powder Technology

The greatest advantage of the spray drying process is that it allows extremely gentle product treatment, which makes it suitable for a wide variety of industrial applications. Our designs are individual, flexible and efficient. The characteristics of powder produced by Lübbers systems are set up in accordance with our customers’ individual requirements.

Components	Capacities	Designs	Advantages
Supply air handling	Up to 200.000 m³/h (7.000.000 ft3/h)	Primary and secondary air handling Modular / fully welded Temperature control / Defrosting / (De-) humidification Multiple stage filtration up to EU13 (HEPA)	Adjustable air quantities, conditions and temperatures Clean and correctly conditioned process air Avoidance of free water
Air Heaters	Process air up to 250 °C (480° F) Process range up to 100.000 kg/h (220.000 pph)	Direct / Indirect Gas / steam Vertical / horizontal installation Special designs up to 450 °C (840° F)	Varying air quantities and temperatures High total efficiency (up to 92%) Hot air generation without cross-contamination With flue gas cooling up to 99% efficiency
Atomization systems	Up to 15.000 kg/h (33.000 pph)	Nozzle atomizers Rotary atomizers with internal water-cooled synchronous / asynchronous motor with oil-free execution Design as removable units for cleaning Exchange between rotary and nozzle atomization	Flexible production processes & powder characteristics High powder quality High operating efficiency Suitable for baby food and temperature-sensitive products
Drying Chambers	Up to 8.500 kg/h (19.000 pph) of powder	Single- and multistage drying (internal fluid beds) Hot Room installation or insulation From ring to surface air distributors Pneumatic sealed door systems CIP Explosion and fire safety system	Strong quality materials Wide range of drying conditions (50...500°C / 300...900 °F)
External Fluid Beds	Area size up to 20 m² (215 ft2)	Vibrating fluid beds Multiple sections for powder conditioning and cooling Vibrating sifters for subsequent installation CIP Explosion and fire safety system	Optimized powder adjustments to final product Long lifetime
Cyclones	Up to 50.000 m³/h (1.800.000 ft3/h) per unit	Single cyclones / cyclone batteries Fine powder return CIP Fire safety system	Low pressure drop Very high separation rate >99% Powder separation down to 5 µm (197 µin)
Baghouse filters	Filter areas up to 1.000 m² (11.000 ft2)	Optimal exhaust air distribution Internal air pressure dedusting system CIP Explosion and fire safety system	Patented award-winning Lübbers filter technology Very low pressurized air consumption No consumables in purging system Long lifetime of filter bags

Delivery Scope

- ✓ Reception
- ✓ Concentrate lines
- ✓ Atomization
- ✓ Primary and secondary air handling
- ✓ Dehumidification
- ✓ Spray towers
- ✓ Powder after-treatment
- ✓ Exhaust air treatment
- ✓ Heat recovery
- ✓ Powder recovery
- ✓ CIP
- ✓ Storage tanks
- ✓ Process tanks
- ✓ Pumps
- ✓ Fans
- ✓ Piping
- ✓ Instrumentation
- ✓ Spare parts

SCOPE OF SERVICES

Automation

- ✓ Hardware: Cupboard field boxes
- ✓ Software: Allen-Bradley
- Honeywell
- ProLeiT
- Rockwell
- Siemens

Installation

- ✓ Installation supervision
- ✓ Complete mechanical and electrical installation
- ✓ Occupational safety (SCC certification)

Commissioning

- ✓ I/O Check
- ✓ Testing
- ✓ Validation

Quality

Lübbers equipment meets the strictest requirements of the regulatory bodies worldwide with regard to quality, safety and environmental protection, such as the European and German rules and regulations regarding safety of work and environment, the machine directive, directive 93/43/EEC on the hygiene of foodstuffs and 92/46/EEC on the health rules for raw milk, heat-treated milk and milk-based products. Our equipment conforms to the FDA and 3A SSI standards and has received EAC certification. As a longstanding member of the European Hygienic Engineering & Design Group (EHEDG) we guarantee advanced hygienic engineering knowledge and its implementation in our equipment. Our flexible approach always allows us to respond to specific local regulations to the full satisfaction of our customers.

Safety

Lübbers plants are equipped with state-of-the art safety technology. To minimize risks and ensure highest levels of safety we supply sophisticated detection, prevention, and protection systems, also within the scope of our retrofit projects. All relevant components have ATEX certification.

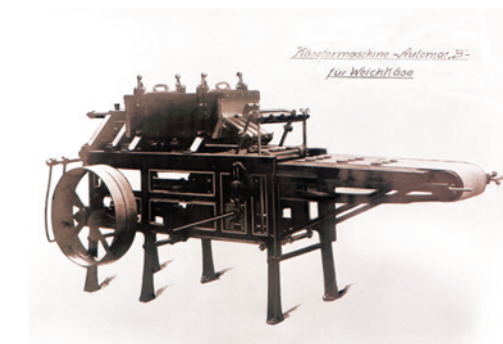
- ✓ CO-detection
- ✓ Fire extinguishing systems with temperature sensors
- ✓ Explosion venting of drying chambers

- ✓ Explosion suppression of external fluid beds and process filters
- ✓ Explosion decoupling
- ✓ Overpressure safety measures
- ✓ High temperature safety

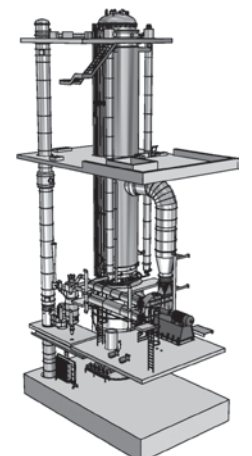


Company History

- 1909 Founding of "Lübbers Käsereimaschinen", a factory for the production of cheese-making machinery, by Alfred Lübbers in Bad Langensalza
- 1925 Lübbers becomes a market segment leader in Germany with its advanced machinery for sour milk cheese industry
- 1959 Exclusive producer of high quality cheese machines with 24 employees and exports throughout Europe under the leadership of the founder's son, Manfred Lübbers
- 1972 Forced nationalization of the company with severe state intervention. The company's activities are restricted to East German market. The focus of production lies on curd kneading machines, stainless steel refiners and packaging machines.
- 1991 Re-privatization of the company and a fresh start: Lübbers introduces a packaging machine with electronic synchronization for the first time on the German market.
- 1992 Incorporation of Lübbers Anlagen- und Umwelttechnik GmbH under the leadership of the founder's grandson, Matthias Lübbers. An expansion of the company's range: Lübbers builds a new wastewater treatment plant in its home town Bad Langensalza and participates in various projects for the manufacture and installation of evaporation and spray drying plants. A new company building and a spacious production location are built.
- 1999 Lübbers becomes an independent supplier of advanced evaporation and spray drying plants with a growing number of projects in Germany and abroad. Design and manufacture of complex spray drying and evaporation systems with outstanding capacities. A new patented CIP-able baghouse filter technology with individual cleaning capacity for the filter bags is introduced
- Since 2000 Development of own designs for key spray drying components, manufactured completely in-house, such as: fully welded air handling units, indirect gas fired air heaters, nozzle atomization systems, heat recovery and dehumidification units.
- 2011 Business expansion to CIS states with a Russian-speaking sales representative in Moscow
- 2013 Acquisition of the engineering office STS in the Netherlands and its integration into Lübbers Friesland B. V. in Ochten, specializing in evaporation technology in the food industry. Development of own key components in evaporation technology, manufactured in Bad Langensalza.
- 2014 Cooperation with GLM Hydro in the areas of evaporation, crystallization and spray drying on the US market.



Cheese forming machine "Automat B",
Leipzig Exhibition, 1910



Evaporator MVR & TVR
for whey concentration, 2012

A world map with a light blue background. Red location pins are placed in North America (USA), Europe (Germany and Netherlands), and Russia. A dark blue rectangular box is overlaid on the left side of the map, containing the word 'CONTACT' in white capital letters.

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