

Thin Film / Short Path Technology



Distillation at the highest level

GIG Karasek Rotation Evaporator & Plant Construction

GIG Karasek has established as an expert in separation technology, in particular in the field of distillation. Besides conventional evaporator types such as Falling Film Evaporators, we convince our customers with design and construction of gentle rotary evaporators to solve particularly complex distillation challenges.

Tailor-made expertise makes the difference

The focus of our services is the development of individual systems, perfectly adapted to the conditions and customer requirements. This is the only way to secure the basic advantages of efficient distillation in production: depending on the customer to recover valuable materials, reduce energy costs and fulfill environmental requirements as efficiently as possible - or an intelligent combination of these priority objectives of modern industry. Years of experience, a special apparatus technology and clear structures are our advantages as an international renowned expert.

Complex tasks require special process solutions:

GIG Karasek has devoted his concentrated expertise from process engineering and equipment development of highly specific Thin Film Evaporators and established them as an ideal solution for demanding applications in thermal separation technology.



Fields of application

Temperature Range:

-196°C to 400°C

Vacuum:

≥ 0,001 mbara

Feedamounts:

10 kg/h to 2.500 kg/h (for one-piece package unit) to 10.000 kg/h (for multi-part skids, depending on application)

Viscosities:

up to 10 Pa.s (in special cases up to 1000 Pa.s at 20°C operating temperature)

Performance:

ATEX, GMP, API

Materials:

Carbon steel, Hastelloy, Titanium, Stainless steel (1.4301, 1.4404, 1.4562, 1.4539)
Available in multi-part units

Applications

GIG Karasek has no conceptual and procedural limits with its extensive portfolio. With international experience from projects of various sizes we are able to develop suitable systems for new, unconventional areas of use, or to optimize existing solutions.

Our Portfolio

Equipment is made in our own workshops and subject to strictest quality guidelines and regular controls and inspections.

- Thin Film Evaporator
- Short Path Evaporator
- Falling Film Evaporator
- Horizontal & Vertical Thin Film Dryer
- Forced Circulation Evaporator
- Columns
- Package Units

Package Units

We create perfect systems and constructions depending on your requirements - competent, reliable, goal-oriented, cost-conscious, cooperative and proactive. Choose a partner who justifies your confidence. A project engineer will accompany you from consulting and planning to implementation of package units and unit parts as well as commissioning. Or, if desired, even with engineering services and optimization measures. Independently of the scope of services our goal is to upgrade your production with customized GIG Karasek solutions in terms of productivity improvement and process optimization. No challenge is too big for us: Complex tasks encourage us to become even better.



Thin Film Evaporator

Special solutions for demanding tasks

The Thin Film Evaporator made of high quality materials provides the highest performance and allows even to separate sensitive products in small quantities.

Depending on the manufacturing and product requirements, we develop for each of our clients tailor-made distillation modules. Their heartpiece - individually selected evaporators with perfectly matching rotor types.

Function

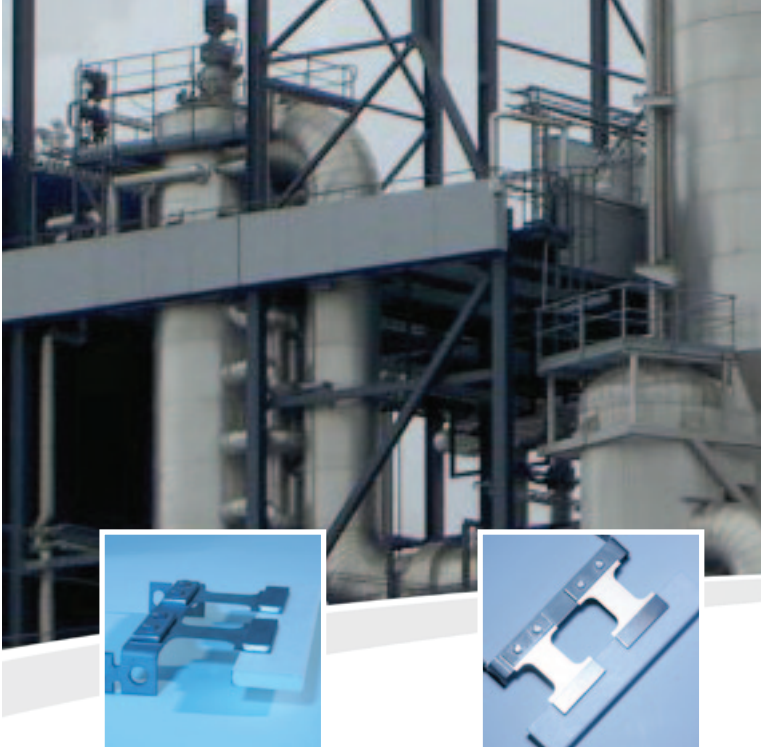
The thin film evaporator consists of a cylindrical, mechanically precisely machined heating surface with external heating and an internal rotor. The mixture of substances is distributed around the circumference via a rotating distributor system located on the apparatus head and flows downwards on an evaporator wall heated from the outside with steam or thermal oil. A uniform distribution and a liquid film are mechanically generated by means of wiper elements.

Vortexes with highly turbulent heat transfer zones form on the wiper blades, which, in addition to the good heat transfer achieved, also ensure constant renewal of the product coming into contact with the heating surface.

The result is a gentle evaporation process, which ensures the product quality through the shortest possible contact with the heating surface and thus under minimal thermal pressure.

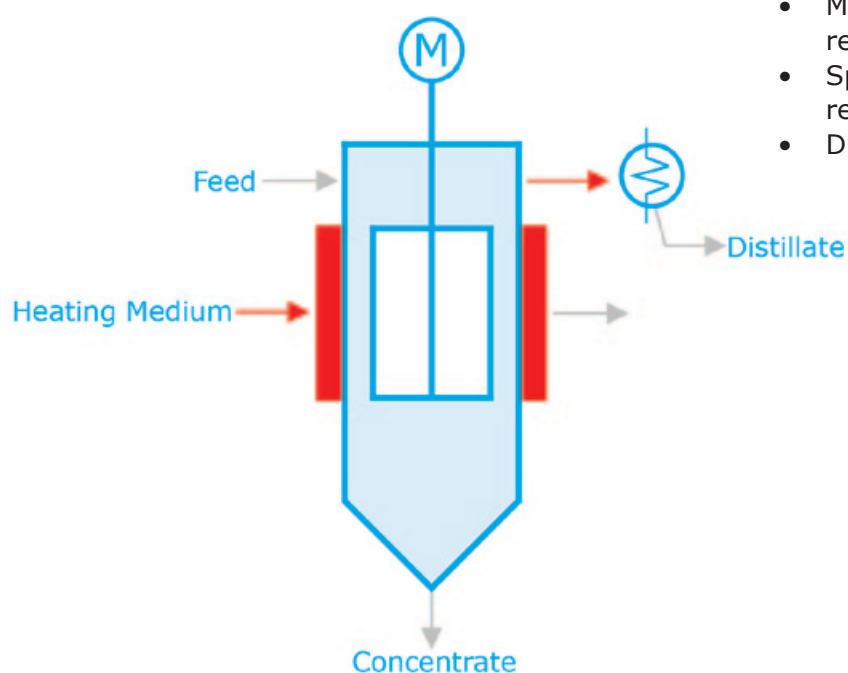
For each task the matching rotor type

We have a variety of different types of rotors and wipers. Through individual consultation, we will find the perfect solution for your application.



Advantages

- Individual selection and adjustment of the perfect rotor type
- High evaporation rates
- Short residence time of the product
- Gentle evaporation
- Good heat transfer even with highly viscous or heavily polluted media
- No additional lubrication required
- Reduced maintenance
- Shorter downtime and assembly time for maintenance / inspection
- No corrosion by using suitable materials



Applications

Our Thin Film Evaporators can be used both, for concentration and for purification of solvents. Exactly tailored to your needs, our equipment is particularly suitable for the following performance areas:

- Concentration of temperature-sensitive products
- Concentration of viscous media
- Concentration of structure viscous media
- Distillation off low boilers from solvents
- Purification by distillation of products from value-boiling components
- Mass transfer through the constantly renewed thin film
- Special applications such as e.g.: reboiler for rectification
- Drying



Thin Film Dryer

*Reliable solutions for
solidsloaded liquids
up to pourable products*

Also in the field of drying GIG Karasek provides a wide range of conventional dryer technologies. Get these systems in heat-sensitive products to their limits, the successful Thin Film Evaporator principle ensures gentle processes. Based on their wealth of experience and knowledge of the separation technology, our experts realize powerful vertical and horizontal Thin Film Dryer, convincing both economically and process technology. For individual results, tailored and at market not available, our technical center provides the ideal R&D environment to cover incoming tests etc.

Function

The product is distributed continuously over the entire circumference of the heating wall. Using special wiper elements the wall contact is renewed constantly and the product stream simultaneously transported. The blades do not touch the heating jacket, but prevented crusting or clogging of the heating surface by massively built, arranged with defined gap wiper elements. These wiper design allows liquid feedstock through to powdered dry up. The various units can be used both individually and in combination, and the operator can thus benefit from the advantages of different types of evaporators.

Rotor types and applications - individual and diverse

Through individual analysis, we find the right type of rotor or wiper for your application.



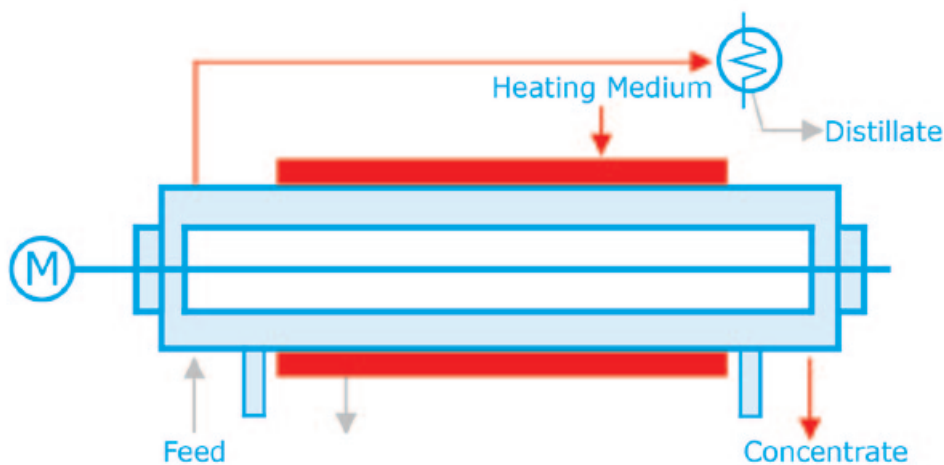
Advantages

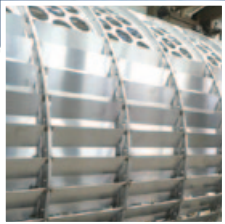
- Minimal product loss
- Product protection and purity
- Gentle evaporation due to short residence and permanent product circulation
- No deposits on the heating surfaces due to mechanical cleaning
- Reduced maintenance through clever design in the bearing and mechanical seal area

Applications

The Thin Film Dryer is mainly used in the chemical, pharmaceutical and in the foodstuffs industry. Products such as:

- Chemical products (preproducts and intermediates)
- Sludges (process sludge, industrial sludge and municipal sludge)
- Suspensions
- Pastes
- Moisture solids
- Saline solutions
- Products of fatty acid industry





Short Path Evaporator

Powerpackage for universal fields of application

The GIG Karasek Short Path Evaporator offers a particularly wide range of services in gentle evaporation technology for delicate fabrics. The spectrum of this special apparatus reaches from high evaporation rates to fine vacuum distillation at pressures up to 0.001 mbar.

Function

The short path evaporator works on the same powerful principle as the thin film evaporator. The mixture of substances is distributed around the circumference via a rotating distributor system located on the apparatus head and flows downwards on an evaporator wall heated from the outside with steam or thermal oil. A uniform distribution and a liquid film are mechanically generated by means of wiper elements.

Vortexes with highly turbulent heat transfer zones form on the wiper blades, which, in addition to the good heat transfer achieved, also ensure constant renewal of the product coming into contact with the heating surface.

The key difference is that the short-path evaporator also has an integrated condenser. This minimizes the path of the vapors to the condenser.

Individual rotor types for different tasks

GIG Karasek has a variety of different rotor and wiper blades. There is the right solution for every challenge.



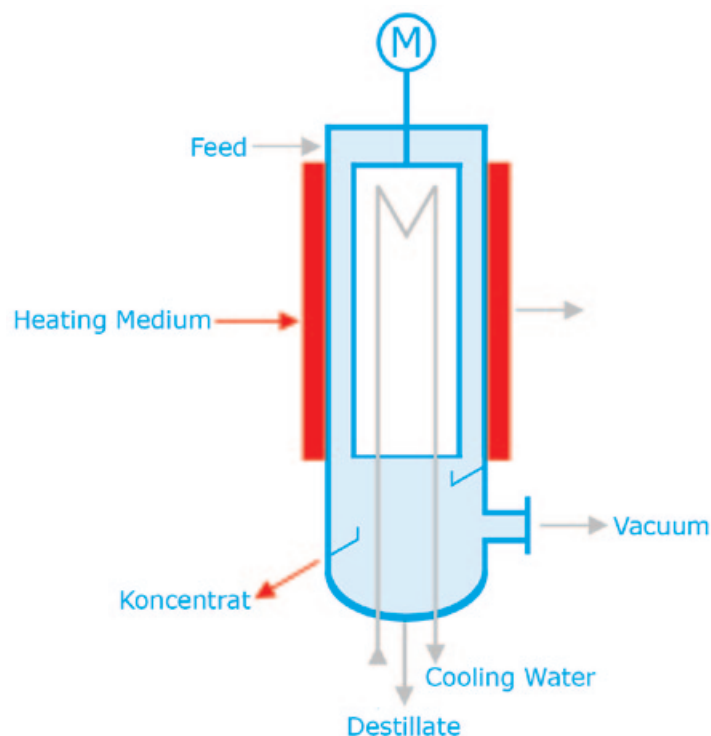
Advantages

- Low pressure loss despite high steam rate
- Gentle evaporation and therefore suitable for the purification by distillation of many substances that would conventionally not be separated by thermal processes
- High boiler does not reach the condensor through efficient droplet separator
- Through special devices it is possible to draw several distillate fractions and thus to obtain more varied product qualities

Applications

Short Path Evaporators are used mainly for distilling low-viscosity products:

- Separating extracts
- Extraction of fatty acids, derivatives or sparingly volatile aroma and flavor materials
- Distilling of vitamins





Research & Development

Customer-oriented R&D for the separation technology of the future

Expertise and know-how provide the basis of our services. Our Technical Center provides the technological lead for long term performance systems. On the basis of intensive trials, simulations and the development of new approaches, we generate the necessary input for your customized solution. In our Technical Center the entire evaporation process can be carried out by the thin solution through to the bone-dry residue.

Advice and support from the beginning

Experimental projects with GIG Karasek start already early, to accompany and advise you from the beginning:

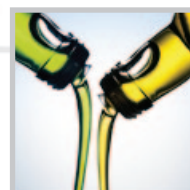
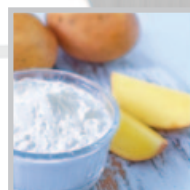
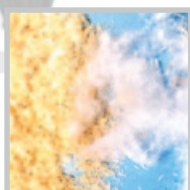
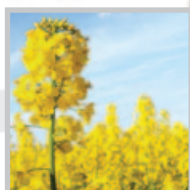
Before the test, careful planning and the simulation of the concentration or distillation process in pilot scale takes place in cooperation with the customer. The necessary for the scale-up process data are determined here. Because of many years of experience and methods operations can be carried out in excess of the scale-up factor 2000.

High quality test infrastructure for individual tests

- Pre - Experiments in the laboratory
- Experiment accompanied by process engineer
- Pilot-scale trials
- Determination of the optimal process parameters and performance limits
- Plant optimization
- Preparation of product samples, small quantities, sample quantities
- Test report
- Design of large systems (scale-up)

GIG KARASEK

A Member of Dr. Aichhorn Group



Performance & Services

- Project Management
- Project Controlling
- Engineering (*Basic, Detail*)
- Manufacturing & Procurement
- Assembly & Supervision
- Commissioning & Training
- Turn-Key-Projects (EPC, EPS, EPCM...etc.)
- After Sales & Services

Optimization & Modernization

- Revamping
- Retrofitting
- Debottlenecking

Technical Center

- Laboratory Tests
- Pilot Tests
- Scale-Up
- Contract Distillation

Consulting & Studies

- Debottlenecking
- Inventory survey incl. simulation models
- Development of expansion concepts
- Cleaning concepts
- Evaluation of savings potential

Technologies

Evaporation Technology

- Evaporator Types:
 - Plate Fallingfilm Evaporator*
 - Tube Fallingfilm Evaporator*
 - Forced Circulation Evaporator*
- Multistage Evaporation Plants
- MVR - Mechanical Vapor Recompression
- TVR - Thermal Vapor Recompression

Thinfilm-/Shortpath Technology

- Evaporator Types:
 - Thin Film Evaporator*
 - Short Path Evaporator*
 - High Viscosity Evaporator*
- Thin Film Dryer:
 - horizontal*
 - vertical*
- Miniplant

Rectification / Distillation

Branches & Industries

- | | |
|------------------------------------|-----------------------|
| • Inorganic Chemistry | • Organic Chemistry |
| • Biodiesel &
alternative Fuels | • Petrochemicals |
| • Fiber Industry | • Pharmaceuticals |
| • Food Industry | • Polymers & Plastics |
| • Oleochemistry | • Recycling |
| | • Pulp Industry |

We look forward to informing you about your possible applications



Where traditional methods reach their limits, the GIG Karasek Thin Film- / Short Path Technology is used:

For very temperature sensitive products our proven experts develop solutions to specific problems, tailored to your requirements and in this individual form. High efficiency and personal all-round service make GIG Karasek a reliable partner for your special challenges.



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