

World Record in Short Path Distillation

Case Study

KEY FACTS

- 80 m² heating surface
- 16 m total height
- 70 m³ total volume
- 78 bar design pressure
- 2.6 m inner diameter
- 12,500 individual parts



World's Largest Evaporator

At a customer's request, UIC developed, designed, constructed, and supplied the world's tallest short path evaporator, with 80 m² of heating surface.

The areas of application for large short path evaporators are the polymer, lactic acid, fish oil and edible oil industries. Typical applications of short path evaporators are the separation of pesticides, monomers, mineral oil residues and heavy boilers with a dark color. In plant engineering, many customers are from Asia, especially China, Malaysia and Indonesia, Korea, Europe and the USA. Short path distillation is the method of choice for this challenge because it is performed under vacuum, which lowers the boiling points. This allows gentle distillation at lower temperatures, avoiding the risk of thermal degradation and unwanted by-products.

At UIC, we have been collaborating with our customer from the beginning of the process development. As a result, we conducted several tests in our state-of-the-art laboratories, first on glass laboratory equipment and then on stainless steel pilot plants, to determine the perfect distillation technology and parameters. These efforts, coupled with our customer's production volume, led to the design, construction and delivery of the world's largest short path evaporator. Commissioning took place in September 2024. We have full responsibility for achieving the process and product parameters of the industrial plant based on contractually agreed process guarantees. Upon successful commissioning, our after-sales team will be available to assist our customer with all service and spare parts needs.



Facts & Figures

The most impressive technical and dimensional facts are:

- 80 m² wiped heating surface
- The total length from the outlet nozzle to the top of the motor is 16 m.
- The evaporation process side has a volume of 70 m³.
- The design pressure of the evaporator shell is 78 bar.
- The inside diameter is over 2.6 m.

In total, UIC installed 12,500 individual parts. In addition to the short path evaporator itself, UIC also designed and supplied the following:

- Upstream product treatment process
- Highly sophisticated cold trap system
- To achieve the extremely low operating pressures we installed a robust and high performing vacuum pump system consisting of multiple pump stages.
- The short path evaporator is manufactured to UIC's high quality and is therefore leak-proof despite its immense size to guarantee the process in a high vacuum: the measured leakage rate is so low that, in purely mathematical terms, it would take more than four years for the pressure in the system to rise from vacuum to ambient pressure.

From a transportation standpoint, delivering a plant of such immense dimensions was also a challenge:

- Over 60 tons total weight
- The test assembly took place in advance in the halls of VTA (UIC's parent company) in Niederwinkling, Germany. After subsequent dismantling, five open-top containers with all the additional material (= cold traps, oil booster pumps, scaffolding, ladders, assembly material, degassers, heaters, internal condensers, ...) were stowed there and transported by truck to the port of Hamburg, Germany.
- The short path evaporator itself was transported to the port of Hamburg in a heavy transport accompanied by the police. From there the delivery package was transported by sea freight as special package goods to the final destination harbour.



The experts at UIC and VTA have more than 70 years of experience in providing customized plants of all sizes for every distillation need. With two state-of-the-art technology centers, we support our customers throughout the entire process, from the development of the perfect distillation technology and parameters for the individual requirement through laboratory and pilot plant trials to the planning, design and commissioning of industrial-scale distillation plants and after-sales support.

We can also provide toll distillation services for a wide range of materials and batch sizes.

Let us meet your next distillation challenge together!





UIC GmbH and VTA Verfahrenstechnische Anlagen GmbH & Co. KG

UIC and VTA are the partners for demanding process solutions of high-end thermal separation tasks. The distillation specialists offer small, standardized laboratory units up to tailor-made, skid-mounted industrial size facilities. Testing, engineering and manufacturing is performed in-house at the headquarters in Germany. UIC and VTA offer contract distillation on different toll processing plants. UIC and VTA are offering wiped and short path distillation equipment and process development for various industrial sectors with high boiling and thermal sensitive products.

Technologies

- Thin Film / Wiped Film Distillation
- Short Path Distillation
- Horizontal Thin Film Distillation
- Thin Film Drying
- Fractionation

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