

# Distillation tailored to your needs

Customized distillation plants for the petrochemical, chemical and pharmaceutical industries

Your problem: you have to distill. It might be 100 milliliters per day or 100 liters per hour, solvents, flavorings, acids, crude oil fractions or simply water. Distillation experts Iludest/i-Fischer tailor distillation plants precisely to the specific application. PROCESS paid a visit to the “master column builders”.

DR. JÖRG KEMPF

The duo of Iludest and i-Fischer has long been recognized throughout the world when it comes to distillation. It's a success story that dates back to 1990, when the two founders of Iludest, Udo Interwies and Hans Lebahn, started up with thermal processing training equipment for universities, technical colleges and schools of vocational training. They then added another string to their bow in the form of solvent recovery plants for highly purified solvents, which were also quickly snapped up mainly by the chemical industry but also by the pharmaceutical and food industries. Although initially supplying Germany and Switzerland only, global exports started up in 1995 with the first major project in Korea and expanded rapidly in the subsequent years. Today, Iludest is represented by 40 agencies throughout the world, and sales have increased from DM 300,000 in their first year of business to €3.4 million in 2007, currently generated by 26 employees.

Iludest's best “customer” is of course i-Fischer, born in 2001 of the partnership between Iludest, Dr. H. E. Koenen and Intermass Fischer Asia. Set up purely as an engineering and

sales unit, the partner company works exclusively in petrochemicals and supplies semi and fully automatic distillation plants for fractional analysis of crude oils and crude oil products that comply with international ASTM standards D-2892, D-5236 and D-1160, and for which orders are placed with Iludest.

## Versatility is the mother of success

The most important ingredient in the Franconian distillation experts' recipe for success is extreme versatility. For example, all the plants are supplied essentially with customized configurations. While the “hardware”, i.e. columns, sensors, actuators and the necessary units, is supplied from external sources, the entire control system and engineering are tasks performed in-house. “We'll be keeping our expertise to ourselves!” Stefan Opis makes quite clear, who next to Interwies and Lebahn is the third member of the Iludest management team and, alongside Dr. Koenen, Managing Director of i-Fischer. “It allows us to react very quickly and flexibly to customer requirements and is a major difference between us and our competitors.”

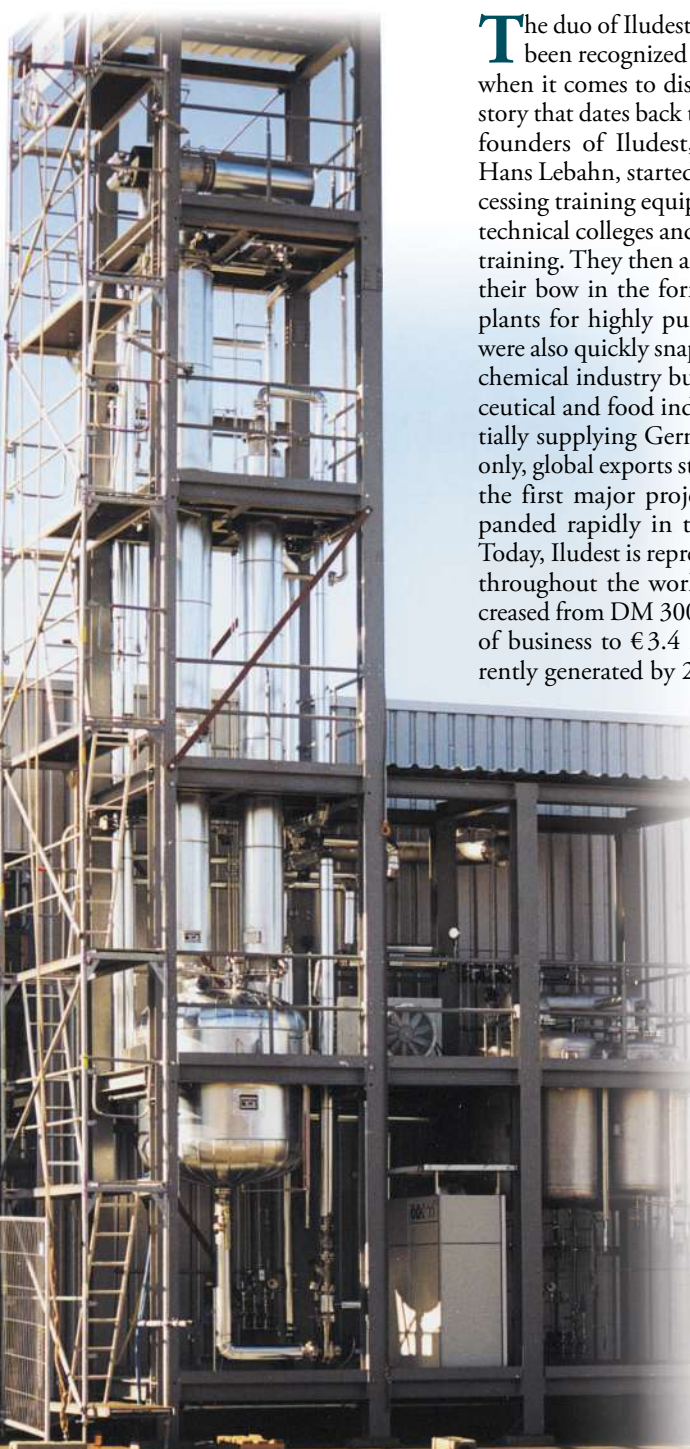
Added to that is another huge competitive advantage: their non-dependence on materials, as the plants are manufactured—depending on application—not just from glass but also from stainless steel and glass-lined steel. The nominal size of a typical column ranges from 10 to 300 mm internal cross section, and the biggest column produced—for a special plant for the distillation of flavorings—achieved a proud 70 cm. Typical throughput rates range from just a few milliliters to 100 l/hr. Hence, there's a customized solution for every user, whether at the experimental stage in the laboratory, the pilot stage in development or in production.

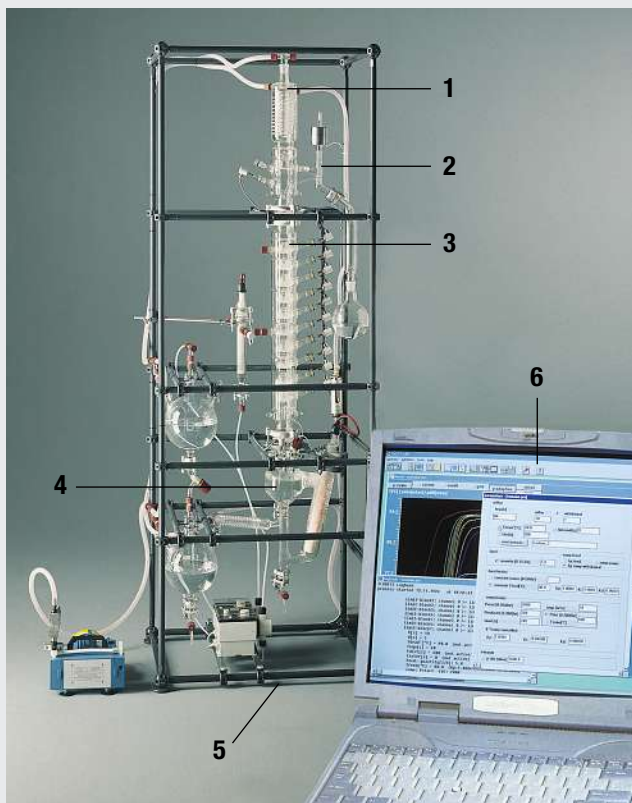
## Special applications

Also included in the Iludest/i-Fischer repertoire are special applications. The latest development is a membrane separator plant for special azeotropic mixtures, a joint project with the GKSS Research Center at

**At Iludest in Waldbüttelbrunn/Germany, all distillation plants are put through a thorough test run using the customer's own samples before being dismantled and re-assembled as a turn-key unit at the customer's premises.**

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### Typical distillation plant layout

1	Condenser	<ul style="list-style-type: none"> <li>• Liebig or Davis condensers for small quantities</li> <li>• Spiral condensers or tube heat exchangers for medium to high throughput rates</li> </ul>
2	Product withdrawal	<ul style="list-style-type: none"> <li>• Distillate withdrawal by ratio or rate control</li> <li>• Sump withdrawal by pump or siphon</li> </ul>
3	Separation column	<ul style="list-style-type: none"> <li>• Vigreux columns for operating pressures of less than 1 mbar</li> <li>• Sieve tray and bubble cap columns for mineral acids, intensely polar and weakly wetting mixtures</li> <li>• Packed columns and columns with structured packing for high separation rates at normal pressure and under vacuum, with packing materials consisting of glass, ceramic, stainless steel or special materials</li> <li>• Column diameters from 15 to 400 mm; throughput rates range from just a few ml to more than 100 l/hr; with or without vacuum jacket</li> </ul>
4	Evaporator	<ul style="list-style-type: none"> <li>• Round-bottomed flask or circulating evaporator</li> <li>• Heated directly by quartz glass or metallic heating rods</li> <li>• Heated indirectly by thermal oil in a jacket or oil bath, by steam or heating jacket</li> <li>• Thin film or short path evaporators for temperature sensitive or high boiling products</li> </ul>
5	Peripherals	<ul style="list-style-type: none"> <li>• Complete with stand, assembly materials, cables and hoses</li> <li>• With vacuum control and metering pumps, thermostats and water coolers, depending on requirements</li> </ul>
6	Measurement and control	<ul style="list-style-type: none"> <li>• By power controller and thermometer, or by a fully automatic computerized control system via keyboard and mouse, with color graphics on screen and printer</li> </ul>

Geesthacht near Hamburg. A further example are the hybrid plants, where a distillation stage is inserted upstream of the membrane separator stage. In this process, the aqueous mixture is first dehydrated using a distillative procedure to achieve the azeotropic point before being prepared via a membrane process to the extreme purity required. i-Fischer also exploits its expertise

in its special petrochemical applications. For example, in these times of raw materials shortages and high prices, the oil exploration currently being undertaken is for oils that have an especially high water content or are particularly heavy which previously would not have been worthwhile. The fractionation of these oils requires particular experience. "Our plants can do

that," stresses Opis, already excited about presenting Iludest/i-Fischer's cumulative expertise atACHEMA on Stand C15/C16 in Hall 6.1. ■

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