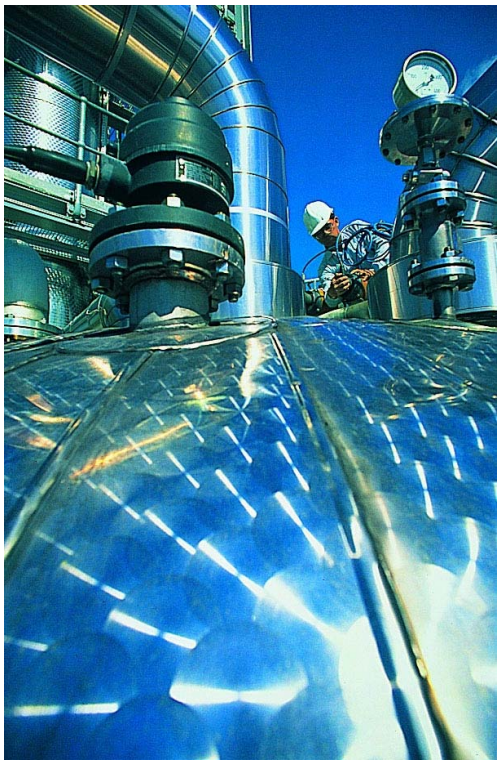
Innovative solutions for

Distillation

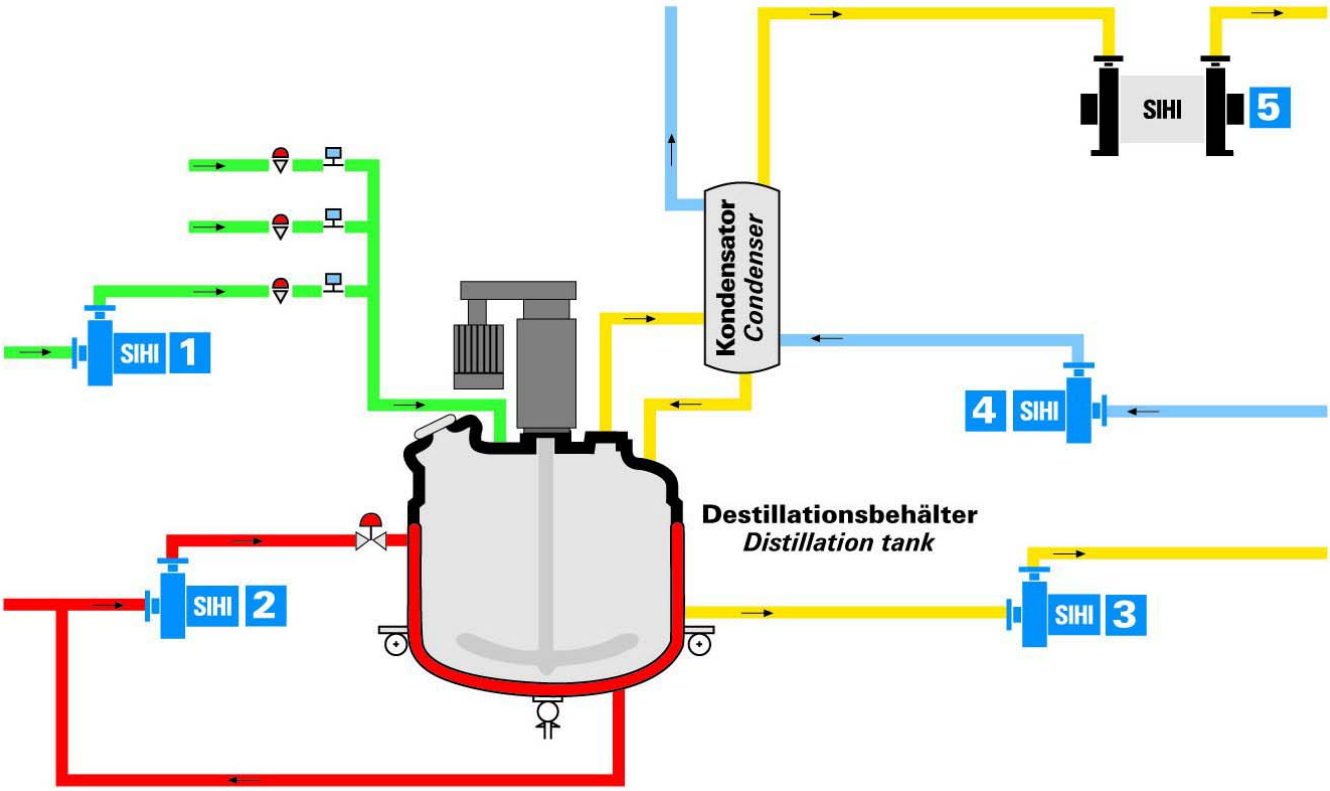
Liquid pumps, vacuum pumps and complete vacuum systems

Process Pumps for Distillation



Distillation is a thermal cutting-off process with the benefit that normally no additional substances such as solvents need to be added.
The distillation heating up process separates the fractions out of the liquid. The fraction with the lowest boiling point will be evaporated first and the evaporated gas can be condensated through a cooling system. At the boiling point the liquid changes from the liquid phase into the gaseous phase and the liquid and gaseous phase are in a thermo-dynamic condition of balance.
At the start of the process, heat is used to increase the temperature of the liquid. More and more energy is needed as the temperature of the liquid comes closer to its boiling point. If the boiling point temperature is reached the liquid temperature will not increase for a considerable time as this heat is only used to evaporate the liquid. This constant temperature is an indicator that the boiling point has been reached.
Due to the fact that the boiling point decreases with pressure mostly all distillation processes operate under vacuum. The reduced pressure lowers the boiling temperature and the energy required to heat this process is thereby reduced.
At a fractional distillation process multiple fractions of a liquid mixture can be separated if the boiling temperature of the fractions differ.

Process Pumps for the Distillation



An overview of the various Process Pumps

1 Feed pumps

The feed pumps transfer the liquid to the distillation tank. The requirements for the different feed pumps vary depending on the distillation volume and the substance properties.

2 Heat transfer pumps

Distillation processes are operated mostly at higher temperatures than ambient temperature. The heating is needed for example, to avoid polymerisation of the distillate.
To supply the heat around the process, circulation pumps are installed in the main pipework. As heat transfer media mostly hot oil is used.

3 Discharge pumps

The discharge pumps transfer the product from the sump to other stages in the process or into tanks where it is stored. Depending on the properties of the product in the sump and the presence of by-products, the requirements for the discharge pumps vary.

4 Cooling water pumps

At the head of the distillation column the product is drawn off and liquefied in a condenser. Recirculation od the cooling media (mostly water) is done by centrifugal pumps. The capacity of the pumps vary depending on the size of the destillation tank and the amount of heat that needs to be dissipated.

5 Vacuum pumps

When handling temperature sensitive media or high boiling liquids the distillation process is usually done under vacuum. Separation therefore can be done at lower temperatures and cracking can be avoided. For this process dry running vacuum pumps or liquid ring vacuum pumps are used. The liquid ring vacuum pumps are mostly running with a closed service liquid circuit.

Innovative Solutions from Sterling SIHI

Process pumps		Pump types	Pump execution		
1	Feed pumps	**Chemical process pumps Type CBS, CBM, CBE, CBT**		Capacity: Shaft sealing: Materials:	max. 2200 m³/h mechanical seal, mag drive nodular iron, stainless steel, special materials on request
2	Heat transfer pumps	**Hot oil pumps Type ZTK, ZTN**		Capacity: Shaft sealing: Materials:	max. 1000 m³/h mechanical seal, mag drive nodular iron, stainless steel
3	Discharge pumps	**Chemical process pumps Type CBS, CBM, CBE, CBT**		Capacity: Shaft sealing: Materials:	max. 2200 m³/h mechanical seal, mag drive nodular iron, stainless steel, special materials on request
		Side channel pumps Type CEH		Capacity: Shaft sealing: Materials:	max. 35 m³/h mechanical seal, mag drive nodular iron, stainless steel
4	Cooling water pumps	**Chemical process pumps Type CBS, CBM, CBE, CBT**		Capacity: Shaft sealing: Materials:	max. 2200 m³/h mechanical seal, mag drive nodular iron, stainless steel, special materials on request
		Industrial pumps Typ ZLN		Capacity: Shaft sealing: Materials:	max. 1800 m³/h mechanical seal grey cast iron, stainless steel
5	Vacuum-pumps	**Liquid ring vacuum pumps Type LPHX/LPH**		Capacity: Shaft sealing: Materials:	max. 10700 m³/h stuffing box, mechanical seal grey cast iron, stainless steel
		Dry running vacuum pumps Type SIHI^{dry}		Capacity: Suction pressure: Materials:	max. 1000 m³/h > 0.001 mbar abs nodular iron / steel

... Liquid pumps, vacuum pumps and complete vacuum systems ... from one source

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