

BASIC KNOWLEDGE

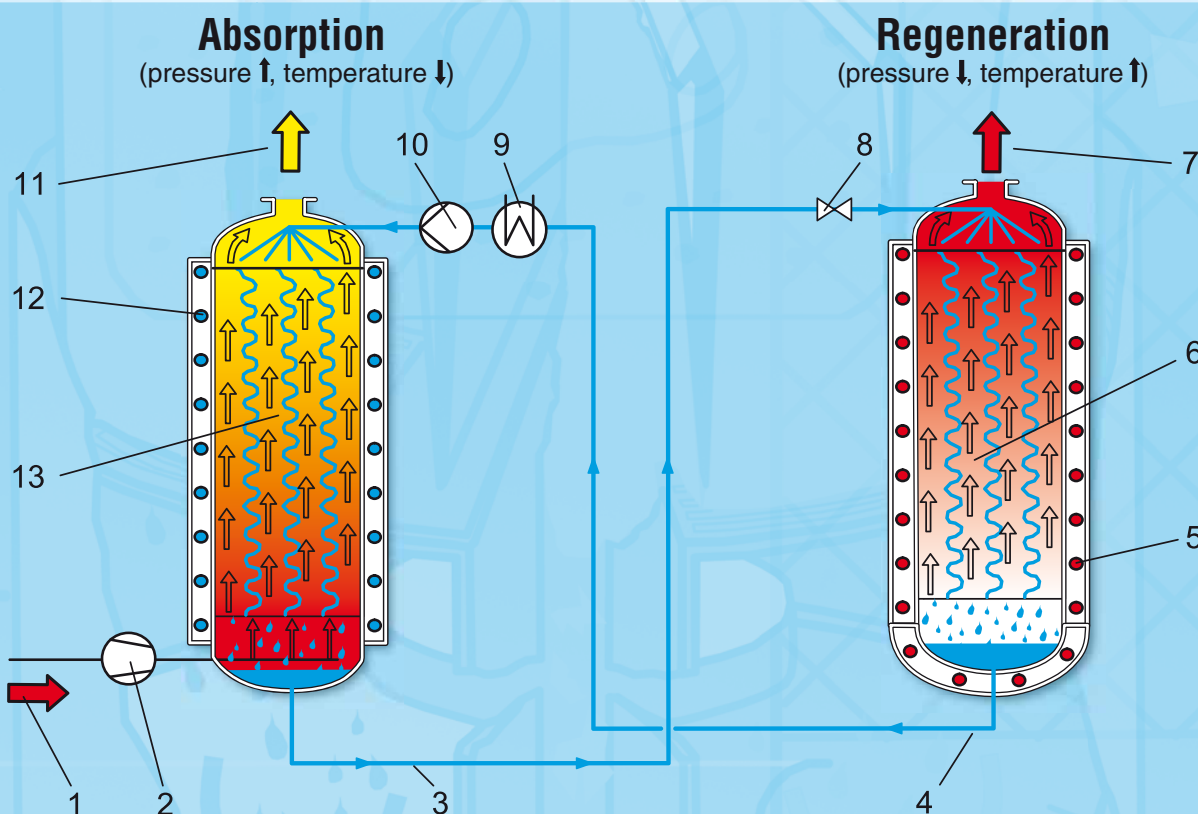
ABSORPTION

Absorption is a separation process that involves removing one or more gaseous components from a gas flow using a washing fluid. Absorption can have different aims:

- The gaseous component to be removed is a product that is wanted.
- The gaseous component to be removed is unwanted. This could be the case when removing contaminants from an exhaust gas flow.

- Production of a liquid; one example would be obtaining hydrochloric acid by absorption of HCl gas in water.

At least three substances are involved in the absorption process: the gaseous component to be removed (absorbate), the carrier gas and the washing fluid (absorbent).



Absorption system: 1 gas flow with component to be removed and carrier gas, 2 compressor, 3 washing fluid, charged with component to be removed, 4 regenerated washing fluid, 5 heating, 6 desorption column, 7 removed gaseous component, 8 expansion valve, 9 cooler, 10 pressure pump, 11 carrier gas, 12 cooling, 13 absorption column

An appropriate washing fluid is used, depending on the gaseous component to be removed. The washing fluid selectively dissolves the gaseous component i.e. the washing fluid primarily absorbs the component(s) to be removed and not the carrier gas. High pressures and low temperatures enhance absorption. Depending on the type of washing fluid, the gas is

either absorbed by physical dissolving (physical absorption) or chemical bonding (chemical absorption).

To remove the gaseous components from the solvent, an absorption stage is normally followed by a desorption stage for regeneration of the washing fluid. Here, high temperatures or low pressures are used to reduce the

solubility of the gases in the washing fluid, thus expelling them. The washing fluid can therefore be recycled for further use.