

CO₂ Capture Plants



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With capture plants from Union Engineering, carbon dioxide can be captured from any gas stream based on the combustion of fossil fuels, including but not limited to coal, heavy fuel oil-fired steam boilers, and natural gas-fired combustion engines.

Moreover, the technology can be used to capture carbon dioxide from non-power generation sources, like lime kilns.

The capture plants from Union Engineering are based on the most well-proven absorption technology currently available on the market, namely high concentrated monoethanolamine (MEA). MEA is a primary amine that reacts readily with carbon dioxide. Since the reaction is purely chemical absorption, it works well with gas streams having low partial CO₂ pressure, as is the case for flue gases.

Once the carbon dioxide is captured in the MEA solution it is transferred to a stripping system. Here it is again released from the MEA solution by increasing the temperature of the

solution to a point where the chemical reaction that took place in the absorber is reversed.

Having started as a gas with a low concentration of carbon dioxide (depending on the type of fuel used the CO₂ will be in the range of 3% to 30%), the gas being released from the stripper is a highly concentrated stream containing roughly 99% pure carbon dioxide. This stream can either be used directly in gaseous form or be further purified and liquefied to meet the strictest requirements for food and beverage grade carbon dioxide in accordance with specifications from regulators like the International Society of Beverage Technologists (ISBT).

Purification column is the final purification step, consisting of a distillation column which enables separation/blow-off of non-condensable gasses, thereby reducing O₂ content in the final product to max. 5 ppm (v/v) and obtaining corresponding CO₂ purity of higher than 99.99% (v/v).

The electrical system for the CO₂ generating plant consists of a combined MCC and control panel. From the control panel, which comprises the latest PLC technology, the plant is operated and monitored, ensuring easy and continuous trouble-free operation.

The plant is started by an automatic start sequence and the operation is fully automatic. The entire process is easily surveyed on the operator panel, showing the status of all drives, readings of all transmitters and alarm warnings, which will also be indicated by audible alarm.

All instruments installed on the skids are wired to junction boxes or remote I/O boxes and tested in our workshop prior to shipment, thus reducing installation and commissioning time on site.

The plants are designed for high efficiency, availability and reliability through components selected for long life and 24/7 operation.