ADVANCED AMINE TECHNOLOGY

CO_2 capture technology for low-CO_2 concentration sources

Commercializing your CO_2

By adopting a strategy of capturing and selling carbon dioxide (CO_2) generated from flue gas sources, plants can effectively enhance their bottom line while reducing their carbon footprint, positively impacting the environment.

Choosing the right technology

Pentair Advanced Amine Technology with live industry-tested solvents enables businesses to capture and extract value from their CO_2 by-product.

By capturing CO_2 from flue gas sources such as steam boilers, natural gas-fired combustion engines, and non-power generation sources, you can produce high-quality CO_2 that meets food-grade standards. The purified liquid CO_2 has a purity rate exceeding 99.999% and can be used for example, to carbonate beverages and enable soft drink producers to become CO_2 self-sufficient or sold as a commercial opportunity.

BENEFITS

- Durable plant design can withstand high oxygen (O_2) concentrations of up to 15% in the flue gas.
- Ability to extract CO_2 from numerous flue gas sources with high O_2 concentrations. References range from gas turbines to lime kilns, ranging from 3-25% of CO_2 concentrations.
- More efficiencies in CO_2 absorption capability due to higher amine concentration.
- Benefit from a lower OPEX in the CO_2 extraction process due to reduced heat consumption.
- Patented design can (in some cases[1]) eliminate the need for heat sources such as steam.
- Flexibility with non-licensed amine – available worldwide.
- Rely on 90 years of expertise with 350+ Pentair Amine systems commissioned worldwide.
- Engineered to order plant ensures optimal customer-specified design for a specific gas source.

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FEATURES

- Pentair patented component, NOxFlash, and highly concentrated amine (monoethanolamine - MEA) allow for high oxygen, O_2, concentrations in the flue gas.
- Patented design Pentair flue gas heated reboiler efficiently utilizes heat from flue gas, eliminating the need for steam.
- NOxFlash efficiently removes nitrogen dioxide, NO_2, resulting in a high purity CO_2 and reducing degradation of amine.
- Pentair Amine Systems are designed to produce food-grade quality CO_2, as per ISBT and EIGA specifications.

Pentair Advanced Amine CO_2 Capture explained:
Pentair Advanced Amine CO_2 Capture Plant relies on absorption technology, which employs concentrated monoethanolamine (MEA) to react with the carbon dioxide (CO_2) and extract it from the gas stream.

After capturing the CO_2 in the MEA solution, it is transferred to the stripping (de absorber) unit. In this unit, the solution's temperature is raised to reverse the chemical reaction that occurred during absorption, thereby releasing the CO_2 from the MEA solution.

The gas being released from the stripper is a highly concentrated stream containing roughly 99% pure CO_2. This concentrated stream can be used in its gaseous form or further purified and liquefied to meet the standards for food and beverage-grade CO_2 specified by regulators.

Purification is the final step, consisting of a compression, drying, and liquefaction process, increasing the purity to food-grade and Northern Lights specification[2] (99.999% (v/v)).

A partner you can rely on:

- **350+** Amine Plants
- **2000+** CO_2 Recovery Plants
- **90** Years of CO_2 Expertise
- In 2022 alone, we supplied our customers with CO_2 recovery solutions that had the capacity to recover **7.61 million** metric tonnes of CO_2 annually and supported our beverage customers with the capacity to replace **3 million** metric tonnes of CO_2, otherwise coming from less sustainable sources.

[1] If hot flue gas is available
[2] Quality specification for liquified CO_2, Northern Lights JV, Accessed 06.09.2023, https://norlights.com/wp-content/uploads/2021/12/Quality-specification-for-liquified-C02.pdf

PENTAIR

UNION ENGINEERING A/S
Snaremosevej 27
7000 Fredericia
Denmark

Phone: +45 76 20 77 00
carboncapture.pentair.com

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