Greenlane™

Cascade MS

Membrane Separation

Upgrading of biogas from anaerobic digesters, with high methane recovery.

Manure and other agricultural residues are an excellent renewable energy source. Under anaerobic conditions, these valuable waste resources generate biogas. Biogas upgrading systems cleanse the impurities in biogas and separate the carbon dioxide from the methane, turning agricultural waste into clean, high-purity low carbon fuel: biomethane, or renewable natural gas (RNG).

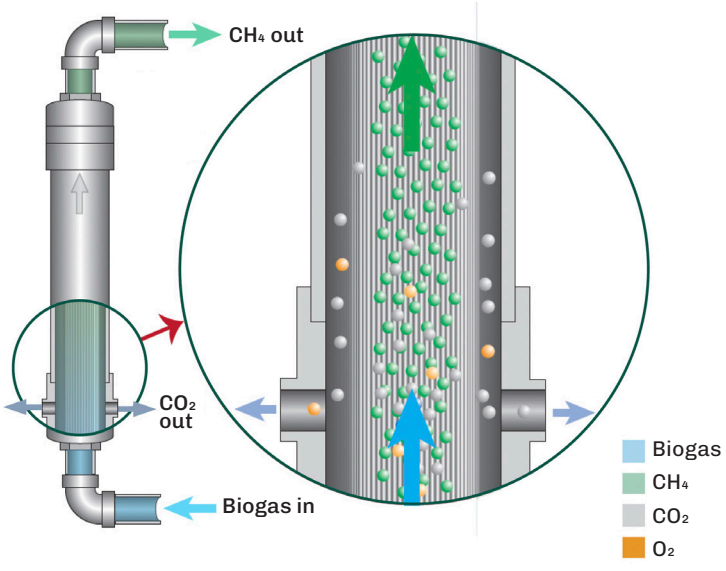
Cascade MS important benefits

- **Creates new economic opportunities while reducing operational costs:** Building sector resilience in the face of commodity-price fluctuations by helping turn the cost of waste management into new revenue streams.

- **Reduces environmental impact of farming:** Helping farmers lower greenhouse gas emissions and enabling sustainable agricultural practices.

Types of Feedstock:

Dairy manure, swine manure, chicken litter, agricultural residues



How Cascade MS works

1. biogas is pretreated, compressed, filtered, and conditioned for upgrading

2. pretreated gas flows through multiple stages of membrane cartridges that remove carbon dioxide and some oxygen, resulting in high purity methane product gas

3. some of the processed gas is recycled back to the compressor inlet to maximize methane recovery

4. this entire process results in a continuous stream of high value renewable natural gas

Why membrane technology for biogas upgrading?

- delivers high methane recovery
- integrates with Cascade H_2S for cost effective removal of high H_2S in the biogas along with efficient RNG production
- cost optimized open frame layout for warm climates. Containerized systems for cold climates

Typical gas processing capability for RNG

Parameter	Raw Gas Quality	Product Gas Quality	Cascade MS
Methane (CH_4)	50-65%	Exceeds pipeline quality require-ments	Up to 99.5% guaranteed methane recovery
Carbon Dioxide (CO_2)	35-50%		
Nitrogen (N_2)	0~1.5%		
Oxygen (O_2)	0~0.4%		

Gas must be free of H2S, VOCs and siloxanes

Cascade MS Flow Range

	Flow (Nm^3/h)	Flow (scfm)
Cascade MS	1,500-2,500*	930-1,550*

**Higher flow rates can be accommodated with multiple units*

The Greenlane Advantage

Solving the industry's most challenging problems for over 35 years with more than 355 systems supplied into 28 countries.

- 24/7/365 expert technical support
- Remote monitoring and management
- Priority spare parts incl. warehousing/logistics
- Proprietary software and equipment upgrades
- Commissioning, training & performance optimization
- Service contract options

Contact us

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