

FLOXAL™ Nitrogen

AMSA™ EOR Nitrogen Generation for
Enhanced Oil Recovery



AMSA™ EOR Supply System

An Air Liquide AMSA™ EOR system is a compact, fully integrated system that provides a continuous supply of nitrogen (N₂) as demand changes. It is a reliable, low-cost N₂ supply solution when cryogenic purity is not required.

AMSA™ EOR BENEFITS

- ✓ Standard sizes cover a broad range of flow rates and purities
- ✓ Reliable N₂ supply of consistent quality
- ✓ Investment, installation, operation and maintenance by Air Liquide
- ✓ Customized system design ensures the lowest cost
- ✓ Modular design provides upgrade flexibility if demand increases
- ✓ Load following of N₂ demand minimizes energy costs
- ✓ Telemonitored performance tracking supported by a network of alarm response centers and qualified service technicians
- ✓ Optional *iDATA*™ service provides real time operating data via the Internet



Depending on purity, the range of flow rates available are as specified below.

PURITY	FLOW RANGE (SCFH)
99.9%	1,000 - 35,000
99.5%	1,500 - 50,000
99.0%	2,500 - 70,000
98.0%	3,500 - 90,000
97.0%	4,500 - 105,000
95.0%	5,500 - 125,000

Standard supply pressures of up to 150 psig with optional configurations available for higher pressure requirements.

THE AMSA™ EOR SYSTEM COMPONENTS INCLUDE

- ✓ Properly sized AMSA™ EOR N₂ generator
- ✓ Air-cooled rotary screw compressor(s)
- ✓ Air pre-treatment equipment such as dryer(s) and filters
- ✓ Product analyzer(s) and a PLC control system
- ✓ Teleflo™ system to remotely monitor the AMSA™ EOR supply system
- ✓ Control room and spare parts storage
- ✓ Liquid N₂ system to back up and supplement the AMSA™ EOR generator is available if needed

AMSA™ EOR Technology

AMSA™ EOR N₂ production is a clean air separation operation that requires only ambient air and electricity. This process uses selective permeation technology to separate N₂ from the air. It is the most economical mode of supply for a wide range of flow rates.



NITROGEN FLOODLINE FOR EOR

If reservoir gas or carbon dioxide is not available, N₂ injection provides a non-corrosive alternative to recovery.

Gaseous N₂ produced by an AMSA™ EOR is a cost-efficient, reliable solution for the following tertiary Enhanced Oil Recovery applications.

- ✓ Pressure maintenance
- ✓ Immiscible displacement
- ✓ Miscible displacement
- ✓ Gas-assisted gravity drainage



THE AMSA™ EOR N₂ SEPARATION PROCESS

Ambient air is compressed and filtered and then enters the membrane module which contains thousands of polymeric hollow membrane fibers. The selectivity of the membrane allows oxygen to pass through the wall of the membrane fiber and be vented to the atmosphere. Nitrogen remains inside the fiber and exits the membrane module and is delivered to the customer. The N₂ produced is dry (dewpoint < - 80°F) with residual O₂ of 0.5 - 5 percent based on the customer's requirement.

Air Liquide will help you minimize your N₂ costs with an optimally designed AMSA™ EOR supply system to meet your unique N₂ injection requirements.

Our proven track record operating on-site N₂ supply systems assures you of the highest level of quality and reliability.

Contact us today at 1-800-338-7028 and allow us to evaluate your N₂ needs and provide our recommendations.

YOUR AMSA™ EOR SOLUTION IS ONLY THREE STEPS AWAY.

1. **Meet with an Air Liquide representative** to establish the N₂ supply requirements for your injection project, including flow rate, flow profile, purity and pressure.
2. **Allow Air Liquide to design the optimal solution** tailored to your unique needs.
3. **Evaluate Air Liquide's proposed solution** and commercial offer and negotiate a supply agreement.

Contact

Call **1-800-338-7028** to speak with our On-site Administrator about an Air Liquide AMSA™ EOR supply solution.
<http://bit.ly/NitrogenSupplySolutions>



www.us.airliquide.com

World leader in gases, technologies and services for Industry and Health, Air Liquide is present in **80 countries** with close to **50,000 employees** and serves more than 2 million customers and patients. Oxygen, nitrogen and hydrogen have been at the core of the company's activities since its creation in 1902. Air Liquide's ambition is to be the leader in its industry, delivering long-term performance and acting responsibly. 14AIR1445

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