

# Biofuels

Gas Solutions for Improved Productivity



NIPPON  
SANSO

## From R&D to Pilot to Demo to Production, we commit to be with you. . .

In 1927 Nippon Sanso Matheson became the first company to offer a reliable source of high quality scientific gases and equipment. Today, Nippon Sanso Matheson remains an industry leader by delivering total integrated gas solutions. Our vast product profile of gases and gas handling equipment can help your laboratories and bench scale operations, pilot plants and full scale production units with efficient and reliable solutions.

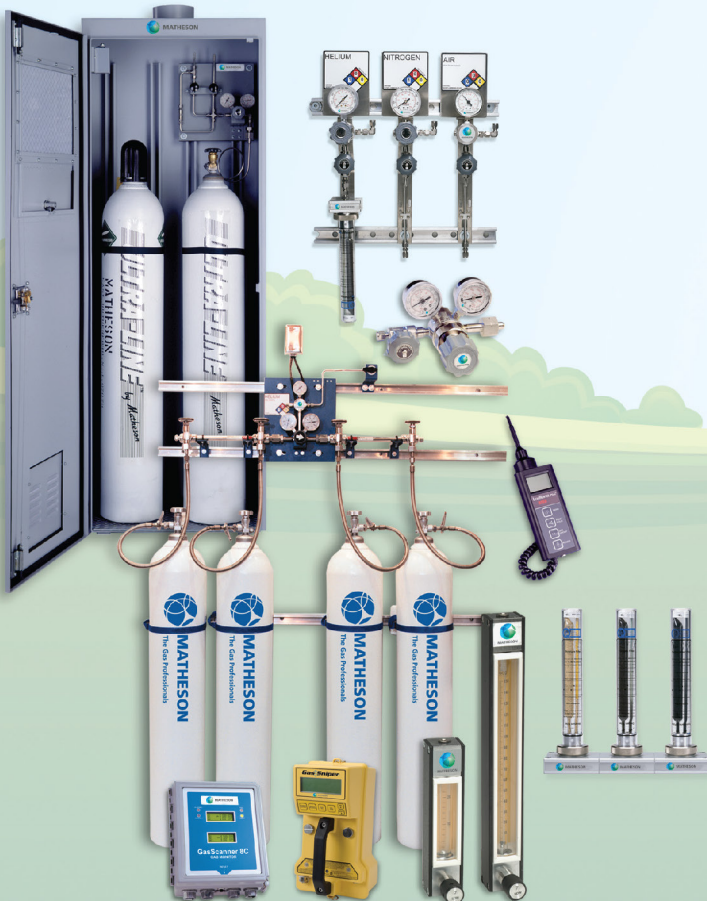
**Cylinder Gases:** Nippon Sanso Matheson supplies pure, ultra-pure, zero gas, and specialty gases for all your requirements: analysis, calibration, process monitoring, spanning, emission control, product certification, and safety. Nippon Sanso Matheson manufactures a full line of high purity hydrocarbon gases and mixtures using the most sophisticated purification technology and state-of-the-art gas and liquid mixture engineering.

**Lab Equipment:** Nippon Sanso Matheson offers the most extensive line of gas handling equipment in the industry to help you manage your gas needs: multi channel flow and pressure monitors, regulators with high pressure and various materials, filters systems, gas purifiers, flow meters and controllers, gas detectors and analyzers, calibration kits, leak detectors, gas safety and all ancillary support equipment.

**Field Services:** We take pride in the high level of service and support that our customers receive after they invest in our gases and equipment. Our services cover field installation, start-up support, routine and preventive maintenance, in and post warranty service, and comprehensive onsite gas and chemical management. We have in-house capabilities for NIST calibration, sophisticated helium leak testing and high pressure testing up to 6000 psig.

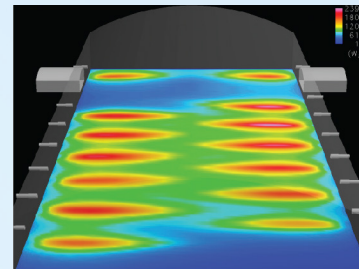
**Bulk Gas Supply:** With sixteen Air Separation Units (ASU's) distributed throughout the United States, Nippon Sanso Matheson is a point-of-origination supplier for atmospheric gases. Nippon Sanso Matheson is positioned to be your key supplier for bulk gases and bulk atmospheric gases. We have an extensive fleet of liquid delivery trucks, storage tanks of various capacities, a bulk logistics center that is fully operational 24/7 to ensure delivery of all your product demand needs, and telemetry systems that provide continuous monitoring of product levels.

**Onsite Production:** We have the technical expertise to meet all of your gas and equipment needs and to provide innovative design and custom solutions. For very large gas requirements, we build air separation or gas production plants at your facilities to supply low cost gases onsite. We manage responsibilities for all design, installation, operation and maintenance. Our plants are designed for your specific flow, purity and pressure requirement to ensure low energy consumption and low total cost of operation.



## You know what you want to do – Nippon Sanso Matheson can help you get it done.

With a successful track record of problem solving in a variety of process and analytical settings, Nippon Sanso Matheson gas application technology experts will get you to the finish line. Faster and more effectively.



### Gasification

Utilize applied combustion knowhow to control gas injection for optimum H<sub>2</sub>/CO ratio; improve operational stability with varying feeds; and increase energy efficiency

### Syngas Treatment

Select and implement processes for removing contaminants such as sulfides, chlorides, NO<sub>x</sub>, particulates etc. - with advanced approaches in gas purification and molecular separation



### Fuel Synthesis

Use field-tested gas application technologies to optimize process productivity for thermochemical, FT synthesis, or microbial fermentation processes

### Hydrotreating/Hydrogenation

Deploy cost-effective hydrogen supply via high pressure tubes or low cost onsite generation; and focus on improved process efficiency and lower gas consumption

### FCC/Pyrolysis

Provide gas focused efficiency improvements in these established industry processes; offer knowhow in catalytic gas processes



### Computational Fluid Dynamics (CFD)

Optimize equipment design and process conditions by analyzing material and energy flows and using computational fluid dynamics tools

### Biotechnology

Use controlled gas atmosphere knowhow to influence reaction rates in wide-ranging biological processes - from bacterial/catalytic fermentation to algae growth

### Product Separation

Evaluate lower cost and more effective multi-component separation technologies as alternatives to typical high energy distillation for the processing of high purity product

### Inerting/Blanketing

Employ efficient protective atmosphere and vapor recovery in reactors and product tanks for lower costs and improved operational safety



# **Nippon Sanso Matheson's Biofuels Mission**

*To contribute to the future of the community and the planet by being the leading gas and equipment supplier and a productive business and technology partner supporting the research and development of sustainable, renewable, cost-effective sources of energy... and to do this from leadership positions in applications technology, quality, and safety.*

## **Nippon Sanso Matheson – A Responsive Partner**

*Biofuel technologies are evolving rapidly – you can benefit from a responsive partner with wide ranging gas applications expertise – one that works to converge rapidly and help you enable the lowest operating costs and highest stability of operation. **Nippon Sanso Matheson** – and our culture of collaborative development – is such a partner..*



**[www.us.nipponsanso.com](http://www.us.nipponsanso.com)**

**1-800-416-2505**

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