ASTG

AirBreather Platform Does it All:

- BevTechCO2
- Carbon Sequestration
- Hydrogen Purity/Impurities
- Alternate CO2 Sources

AirBreather Systems™

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State-of-the-Art Continuous Gas Analysis

AirBreather Systems™ was developed by Analytical Science and Technologies Group, Inc. (ASTG) as a versatile gas purity / impurity monitoring system. A robust, economical, maintenance friendly system, incorporating state-of-the-art technologies and proprietary software to provide fast, accurate, readily accessible CO2 (ISBT standards) and Hydrogen (ISO14687) purity verification.

System Highlights

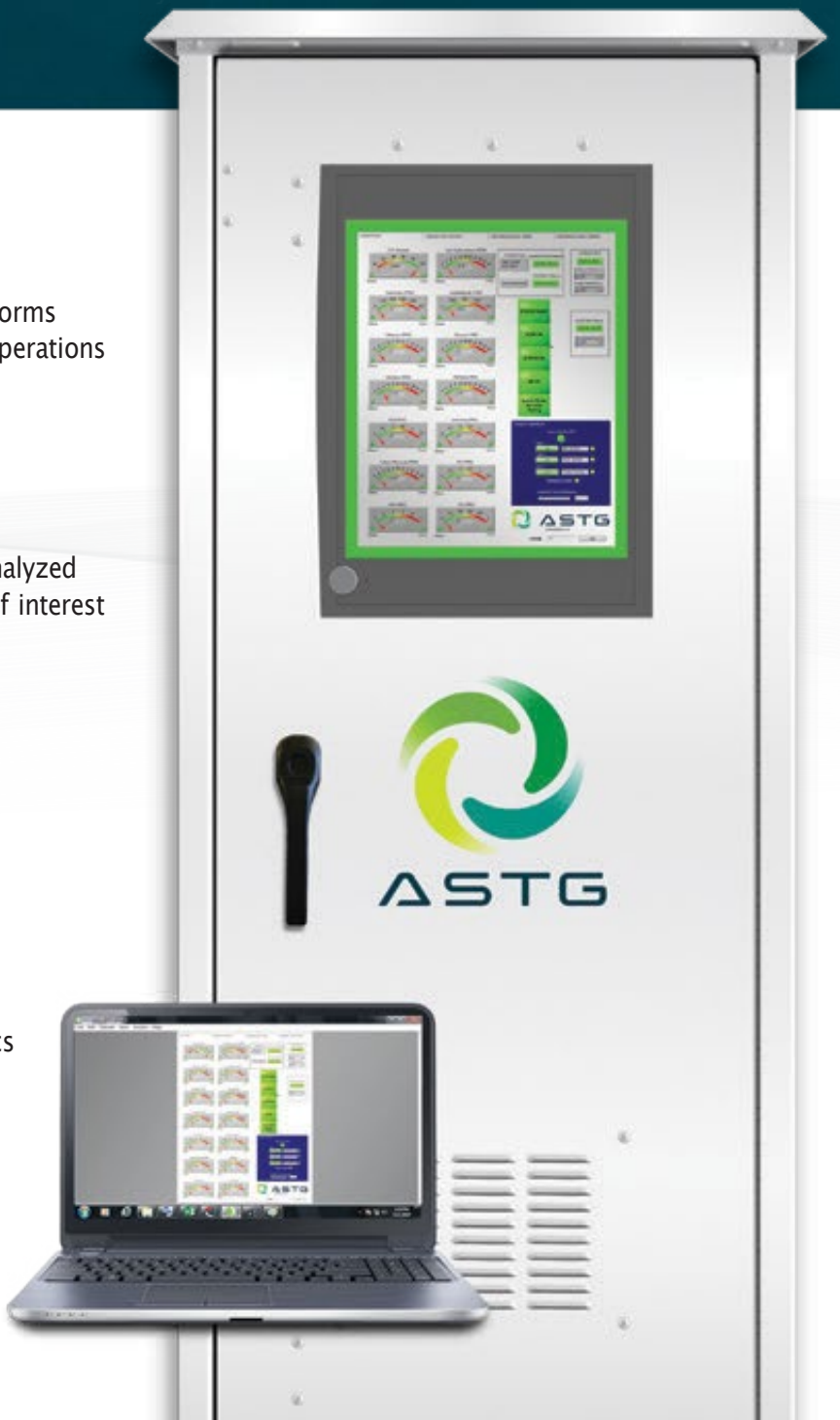
- Fastest analytical system in the market
- Mechanically simple, robust and accurate
- 1 year service intervals
- Compressed air support gas & carrier gases
- Electronic validation & verification
- Seamless integration into ASTG operating platforms for data collection, trailer testing and remote operations
- FDA and FSMA 21 CFR Part 11 module available
- Secure COA™ Certificate of Analysis Module

Analytical Systems Features

- Over 50 targeted impurities simultaneously analyzed with the ability to add additional compounds of interest
- Fully automated computer remote access
- Touch screen for easy set up & control
- View real time, historical or diagnostic data with on board data bases
- Multi-point sampling
- Built In alarm capability for concentration, flow and diagnostics

Integrated Software

- Fully automated computer controlled system allows for remote access of data and diagnostics
- Monitor all critical quality control parameters with visual graphics viewable on dashboard
- Allows for continuous analysis of multiple location



System Components

ABS NM-3

- Solid state mass flow continuous sample system controller
- Sample Safety Tech™ eliminates sample cross-contamination ensuring data reliability
- Reduces sample & analysis time
- Sample capacity up to 40 control points

ABS SPID-1

- Innovative photo ionization technology
- Analyte specific methods available: Benzene (0.5 ppb DL), Toluene (0.5 ppb DL),
  Ethyl Benzene (0.5 ppb DL) and OMP Xylene (0.5 ppb DL)
  Total Sulfur (0.004 ppb DL)
- 100% remote operable, full data support
- 1 year service interval (greater than 1 year PM consumables)
- Validation/Verification

ABS FT-1

- Broad Spectrum Analysis, fast response
- Compressed air for support gas (nitrogen optional)
- 100% remote operable, full data support
- 1 year service interval (greater than 1 year PM consumables)
- Internal Validation/Verification Methanol (0.5 ppm), Sulfur (0.020 ppm)

ABS - MGC

-MicroGC for Permanent gases:

-Extreme Sensitivity and Accuracy (500 ppb DL)

-Response time 45 seconds

Additional System Options:

- Panel HVAC for areas requiring panel cooling or heating
- Up to 40 sample points
- Heated regulators
- Rugged external portable shelters
- Compressed air system for locations without clean dry air systems
- Data governance systems
- Service support options

An advanced integrated system developed for manufacturing and scientific processes that require the monitoring and verification of Hydrogen and CO_2 purity

Food & Beverage Manufacturers

As an ingredient, the compounds found in contaminated carbon dioxide pose significant risk to brand and customer protection. AirBreather is designed to exceed the ISBT[1] Guideline, CGA[2] and EIGA[3] expectations for known hazardous and sensory contaminant quantification. With built in alarms for purity and status conditions, deep data base systems and accuracy, major brand protection can be achieved in a single piece of equipment.

Semiconductor Manufacturers

Ultra-high purity carbon dioxide has become a major process gas in the semiconductor industry, necessitating new analytical technologies for process control and protection. Advanced sensing technologies can identify trace acids, halides, acetates and formates in the carbon dioxide stream. Whether used as a de-masking agent, super-critical cleaning fluid or lithography saturation, AirBreather can protect your process from trace impurities, with unparalleled speed and sensitivity.

Pharma, Biotech and CBD

The use of super-critical carbon dioxide for extraction and hazardous solvent replacement has changed the face of active agent preparation in the pharma, biotech and CBD industry. The current USP[4] compendium has very limited analytical requirements for carbon dioxide and not representative of the risk to the product and customer. Employing AirBreather for continuous analysis of the carbon dioxide stream will mitigate risks associated with contaminated carbon dioxide and off-spec product.

Gas Suppliers

Understanding the commodity nature of carbon dioxide, AirBreather systems help industrial gas suppliers exceed their customer analytical requirements without burdening their manufacturing process with time, cost, and manpower. AirBreather takes laboratory science to a process environment, utilizing simplified interfaces and process control to allow a broad spectrum of user skill bases. Additional options are available for truck and cylinder testing, with limited disruption to the distribution network.

CO_2 Reclamators and Evolving Technologies

AirBreather platforms are a good investment to new industries. The technology employed in the AirBreather can grow with your business as new components of interest are identified and require analysis. Analytes can be added via internet with no disruption to your process.

1 International Society of Beverage Technologists / 2. Compressed Gas Association / 3. European Industrial Gas Association / 4. United States Pharmacopeia

50+ targeted impurities simultaneously analyzed with the ability to add additional compounds of interest:

Some of these additional compounds
Include: H2, N2, He, Ar, O2 & Particulates

- Carbon Dioxide Purity
- Ammonia
- Carbon Monoxide
- Nitric Oxide
- Nitrogen Dioxide
- Methanol
- Phosphine
- Acetaldehyde
- Vinyl Chloride
- Hydrogen Cyanide
- Sulfur Dioxide
- Dimethyl Sulfide
- Carbon Disulfide
- Carbonyl Sulfide
- Total Oxidized Sulfur
- Total Hydrocarbon
- Methane
- Moisture
- Methyl Nitrite
- Ethanol
- Benzene
- Toluene
- Ethyl Benzene
- OMP Xylene
- Halogenated Hydrocarbons
- Refrigerants
- Nitrous Oxide
- Acetylene
- Propane
- Ethane
- Ethylene
- Propylene
- Sulfur Hexafluoride
- HCL
- HCOH
- Formaldehyde
- Phosgene
- R134A
- Dichloroethylene
- Others Upon Request

AirBreather Systems™ is but one of many custom products developed, manufactured and supported by Analytical Science and Technologies Group, Inc. (ASTG) a scientific consulting and laboratory corporation dedicated to providing expert services and products to non-scientific industries and governmental organizations. We provide scientific expertise and technological resource services to several industrial sectors.

- Industrial & Specialty Gases—includes high purity and semiconductor gases.
- Medical & Pharmaceutical—all users of regulated pharmaceutical gas and NFPA compliant facilities.
- Food & Beverage—directly interacts with major finished goods and manufacturers.
- US Government—Registered Small Business Supplier to the US Department of Defense.

Our services are typically called upon for Design & Specification of Advanced Analytical Solutions, Forensic Investigations and Third Party/Amicus Consultation and Crisis Mitigation.

ASTG maintains analytical and manufacturing facilities in Newton, New Jersey and Portland, Oregon. Our ability to cross utilize technologies and techniques allows us the unique ability to develop and validate equipment and processes with quick turnaround. Hands-on experience counts. Knowing exactly what to do at the right time is our value added strength. Our services are rendered both onsite and offsite, meeting our customer's expectations with global response. ASTG is able to respond to our clients' needs with fully operational, portable laboratories and instrumented vans, providing the ultimate real-time / onsite analysis. We are able to move a contingent of analytical equipment to customer sites for short- and long-term studies or provide equipment and training to in-house personnel.

For additional information about Analytical Science and Technologies Group, Inc. please visit www.ASTG.com

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