

# Zacks Small-Cap Research (NOTE)

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## Ainos Inc

(AIMD-NASDAQ)

### Ainos (AIMD): Building an AI Platform for Environmental Intelligence

#### Research Note

Ainos, Inc. (AIMD) is an emerging artificial-intelligence company establishing scent as a new category of machine-readable data. The company's primary technology platform, known as AI Nose, is designed to detect airborne chemical compounds, convert the resulting sensor signals into digital scent profiles and use artificial intelligence to interpret what those profiles may indicate. Ainos is currently applying the platform in semiconductor manufacturing, robotics, healthcare infrastructure, hygiene monitoring and exploratory medical diagnostics.

The investment opportunity rests on the possibility that digital olfaction (Ainos calls it Smell AI) could become an additional sensing layer for intelligent machines. Cameras allow computers to see, microphones allow them to hear, and conventional sensors measure variables such as temperature, pressure and motion. Ainos is seeking to provide machines with a digital sense of smell that can, among other use-cases, identify chemical changes that are invisible to cameras and may occur before a problem can be detected through other means.

#### How the AI Nose Technology Works

The air contains complex chemical signatures that provide information about the surrounding environment. Ainos's AI Nose uses arrays of microelectromechanical-system, or MEMS, gas sensors to detect these airborne compounds. Different sensors respond differently when exposed to a chemical mixture, producing a pattern of electrical signals that represents the overall scent environment. Based on around 13 years of development, originated from medical use-cases, the platform then uses proprietary AI algorithms to profile those sensor responses into what Ainos calls a "Smell ID." A Smell ID is essentially a machine-readable digital fingerprint of a scent. Rather than depending solely on the identification of one chemical, the system analyzes patterns across multiple sensor readings and changes over time. This enables the platform to categorize complex odor mixtures and identify abnormal conditions.

Ainos says its full-stack platform combines MEMS sensor arrays with proprietary algorithms intended to support parts-per-billion sensitivity under appropriate operating conditions. The hardware can be incorporated into fixed environmental monitors, portable devices or robotic systems and the captured data can be fed into user's own software systems when needed.

This approach is important because many industrial and biological conditions do not produce one simple chemical marker. A contamination event, equipment problems or medical condition may instead create a combination of scent signals. AI is well suited to analyzing these multidimensional patterns and comparing them with previously collected examples.

## The Artificial Intelligence Platform for Environmental Intelligence

The AI and the Smell ID data component could ultimately be more valuable than the physical hardware. Each deployed AI Nose unit can generate additional scent data from real-world environments. Those readings can be labeled according to the surrounding condition, such as normal air, chemical contamination, gas leakage, hygiene events or particular breath patterns. The AI can then learn which sensor patterns correspond to each condition.

Ainos recently announced that since December 2025, AI Nose have accumulated approximately 613 million industrial scent data points, primarily from semiconductor factories. This growing dataset could support continued improvement of the company's scent-pattern recognition capabilities, model development and the expansion of its Smell Intelligence Network across different applications. As the amount and diversity of data increase, the model will become better at separating meaningful signals from background odors, humidity, temperature changes and other environmental noise. This creates a data-driven feedback loop: more deployments produce more scent data, more scent data improves the models, and improved models make the system more useful to new customers.

Ainos is developing what it calls a Smell Language Model, or SLM, intended to recognize and interpret scent patterns across different applications. The company has also established ScentAI as a wholly owned software-focused subsidiary dedicated to advancing its smell-language-model technology. The platform concept offers several advantages. A customer may initially install AI Nose to identify a limited set of smell profiles or detect a specific contamination event. Over time, software updates and additional training data could allow the same hardware to recognize more conditions. Ainos could therefore expand the value of installed units without necessarily replacing the sensing equipment. Shared data could further strengthen the platform. A scent pattern discovered at one semiconductor facility, hospital or care center could potentially improve the model used at other locations. This network effect becomes an important competitive advantage because a large, proprietary scent database would be difficult for a new entrant to reproduce quickly.

### Semiconductor Manufacturing

Semiconductor production is currently the most commercially advanced application for AI Nose. Chip-manufacturing facilities use many chemicals and require highly controlled production environments. Trace contamination can damage wafers, reduce yields, create employee-safety concerns or force production interruptions.

Traditional monitoring systems are generally designed to detect specified gases or contaminants. AI Nose is intended to provide a complementary layer that recognizes broader scent patterns and detects chemical anomalies in real time. It does not need to replace existing safety and contamination controls to provide value. It can be layered onto current systems to provide an earlier or more flexible warning signal. It is also designed to allow automated, continuous sensing and learning.

Ainos is advancing AI Nose deployment in two parts of semiconductor supply chain: the backend process, and the front-end process. In testing conducted in Japanese semiconductor facilities, Ainos reported that AI Nose identified 22 VOCs with approximately 79% to 80% accuracy. Ainos subsequently entered into a partnership with ASE Technology Holding to apply scent digitization in semiconductor manufacturing. The company is executing the first phase of a planned deployment of 1,400 AI Nose systems for this back-end semiconductor customer. Ainos valued that phase at approximately \$2.1 million under a three-year subscription framework and targeted completion during the second quarter of 2026. It also announced plans to install approximately 200 systems at targeted front-end wafer-fabrication facilities for technical validation. Those front-end installations remain subject to customer testing, review and formal commercial approval.

These programs could provide Ainos with additional real-world data that may help refine its Smell ID library and improve the platform's ability to recognize chemical patterns in semiconductor environments.

The semiconductor market is attractive because preventing even a small number of contamination events or production interruptions could generate savings that materially exceed the cost of the monitoring system. The need for continuous monitoring is therefore high, which explains why Ainos has gathered nearly 613 million scent data points mainly from semiconductor factories within 8 months. Successful validation would also provide Ainos with an important reference customer in an industry where product qualification and reliability standards are demanding.

## **Robotics and Physical AI**

A second major opportunity is the integration of digital scent into robots. Most robots currently depend on cameras, microphones, proximity sensors and navigation systems. Those technologies cannot directly recognize many chemical hazards, including gas leaks, solvent vapors, smoke precursors or certain biological odors.

A scent-enabled robot could patrol an industrial facility, warehouse, hospital or public area and investigate changing chemical conditions without exposing a person to the initial risk. The robot could move toward the source of an odor, compare readings across several locations and transmit the information to a centralized operating system.

In February 2026, Ainos announced a collaboration Taiwan-based Mirle Automation. The Mirle relationship is focused on integrating AI Nose into mobile and quadruped robots for real-world applications. Chemical leaks and environmental changes may not be reliably detected by vision or sound alone, making scent a potentially valuable additional input for robotic perception. Because industrial applications are expected to be a key driver to demand for robots, the Ainos-Mirle partnership seems to fit with Ainos's industrial strategy.

Robotics could expand the addressable market considerably because Ainos would not need to manufacture complete robots. Instead, it could seek to become a sensor and software provider to multiple robotics manufacturers. This type of embedded-platform strategy could support hardware revenue, software licensing, subscription fees and ongoing model-development relationships.

## **Healthcare and Hygiene Monitoring**

Ainos originally developed much of its scent technology with medical and point-of-care applications in mind. Human breath, bodily fluids and biological waste contain VOCs that change according to metabolism, infection, diet and disease. AI Nose is intended to capture those patterns without requiring invasive sample collection.

The company has tested the platform for hygiene and excretion monitoring in long-term-care settings. In May 2025, Ainos reported approximately 85% accuracy in detecting excretion-odor data, an improvement from 80%, based on 2,119 valid data entries collected from participant instances in Japan and Taiwan. The potential use is to help caregivers identify hygiene events more quickly, reduce manual checking and improve care for patients who cannot easily communicate their needs.

The technology could be integrated into beds, rooms, portable monitors or care robots. For hospitals and nursing facilities, automated odor monitoring could improve staff productivity while providing more timely patient care. It may also provide objective data for monitoring room conditions and cleaning effectiveness.

Ainos has additionally expanded into environmental sensing within healthcare facilities. Hospital environments contain potentially useful odor information related to sanitation, infection risk, waste handling and air quality. Continuous sensing could alert staff to changes earlier than periodic manual inspection.

## Digital Breath Intelligence

In June 2026, Ainos announced a research program with National Taiwan University to study whether VOC patterns in exhaled breath can help emergency physicians evaluate patients experiencing shortness of breath. The project is designed to determine whether breath patterns can be converted into patient-level Smell IDs that support faster emergency-department assessment.

A rapid, non-invasive breath test could eventually complement blood tests, imaging and physical examinations. Rather than attempting to replace established diagnostics, Ainos could initially position the technology as a screening tool that helps determine which patients require additional testing. Healthcare applications could also generate especially valuable datasets. If researchers can associate breath profiles with specific medical conditions and clinical outcomes, those datasets could support increasingly specialized AI models. Medical applications would carry longer development timelines and greater regulatory risk than industrial applications, but they could also command higher value if clinically validated.

### Platform Expansion and Potential Business Model.

Ainos's commercial model appears capable of evolving beyond one-time hardware sales. The semiconductor deployment announced by the company uses a three-year subscription framework, suggesting that recurring revenue could become an important part of the business.

Potential revenue sources include system-unit sales, installation, monitoring subscriptions, software licenses, AI-model updates, data-analysis services and customized model development. Industry-specific Smell IDs could also be developed for semiconductor chemicals, hospital environments, industrial gases, food spoilage, agricultural conditions and other applications.

The common platform architecture is central to the investment thesis. The MEMS sensors capture the raw data, while the software determines what the data means. Once Ainos has established the core hardware, cloud infrastructure and AI-model framework, it may be able to enter new markets by collecting application-specific training data rather than designing an entirely new product from the ground up. Artificial intelligence plays a critical role in this architecture. Machine learning algorithms are trained using thousands—or even millions—of known scent samples. During training, the AI learns to associate specific sensor response patterns with known odors, contaminants, diseases, manufacturing conditions, or environmental events. Ainos's recent accumulation of approximately 613 million industrial scent data points, primarily from semiconductor factories, illustrates the growing scale of real-world data available to support this model-development process. As additional data is collected, the algorithms continuously improve their accuracy, enabling the system to recognize increasingly subtle differences and previously unseen patterns.

One of AI's greatest strengths is its ability to digitize complex mixtures of chemicals that would be difficult for traditional analytical methods to classify effectively. Instead of looking for a single compound, AI evaluates the overall pattern across the sensor array, similar to how facial recognition software analyzes numerous features simultaneously rather than focusing on one characteristic.

The value of AI smell technology increases substantially when data from multiple sensors is connected through cloud computing. Rather than each sensor operating independently, information from thousands of deployed devices can be aggregated into centralized databases. AI systems can then compare local readings against millions of previous observations from different facilities, geographic regions, climates, and operating conditions.

This shared intelligence creates a network effect, which Ainos refers to as the smell intelligence network. For example, if one manufacturing facility detects the earliest chemical signature associated with equipment failure, that information can be incorporated into the AI model and immediately benefit every

other connected facility using the same platform. The system effectively learns collectively, allowing improvements discovered in one location to enhance detection accuracy everywhere else. This creates the possibility of operating leverage. Early deployments require significant research, customization and customer support, but mature models could potentially be distributed across many units and customers at relatively low incremental software cost.

## Financial Position

Like many emerging artificial intelligence companies commercializing a new platform technology, Ainos remains in the investment phase of its corporate development. The company is prioritizing the expansion of its AI Nose platform, building commercial partnerships, growing its proprietary scent database and establishing recurring revenue opportunities before focusing on profitability. While this strategy requires continued investment, there are several encouraging developments in the company's financial position. Perhaps the most notable improvement has been Ainos' strengthened liquidity during the first quarter of 2026. Cash and cash equivalents increased to approximately \$2.8 million as of March 31, 2026, compared with about \$417,000 at year-end 2025, providing the company with a stronger operating runway as it advances commercial deployments and product development.

Equally important, Ainos appears to be transitioning from a pure research organization toward an early commercial enterprise. While revenue remains modest, virtually all of the company's recent revenue has come from its AI Nose platform, demonstrating that the technology has begun generating commercial interest rather than remaining solely in the laboratory. Management's emphasis has shifted from proving the concept to validating real-world applications in semiconductor manufacturing, robotics and healthcare, where successful deployments could support recurring subscription and software revenue over time.

The semiconductor business model is particularly attractive from a financial perspective. Rather than relying exclusively on one-time hardware sales, the company has structured early customer agreements around multi-year subscription arrangements that combine sensing hardware, AI software and ongoing monitoring services. If additional customers adopt this model, recurring revenue could become an increasingly important contributor to future financial performance while improving revenue visibility. Ainos has also been disciplined in leveraging strategic partnerships to accelerate commercialization. Collaborations with leading companies in semiconductor manufacturing, industrial automation and robotics allow the company to validate its technology alongside established industry participants rather than attempting to build every distribution channel independently. This partnership strategy has the potential to reduce commercialization risk while expanding market access more efficiently than pursuing each vertical alone.

One of the company's most valuable assets may not yet be fully reflected on its balance sheet. Every deployed AI Nose system generates proprietary scent data that can be incorporated into the company's Smell Language Model. As this database expands across semiconductor fabs, healthcare facilities, industrial environments and robotics applications, Ainos could be building a proprietary artificial intelligence asset that becomes increasingly valuable with scale. Similar to other AI companies, the long-term value may reside less in the physical hardware than in the continuously improving data and algorithms that power the platform.

The company nevertheless remains in an early commercialization stage and continues to report operating losses as it invests in research, product development and market expansion. Additional financing may be required before the business reaches sustainable positive cash flow, and investors should recognize that future capital raises could result in shareholder dilution. These risks are common among emerging technology companies developing new platform technologies and should be weighed against the significant size of the potential markets Ainos is pursuing.

The improvement in liquidity, transition toward commercial deployments, emergence of subscription-based revenue opportunities and expansion of strategic partnerships suggest the company is

progressing beyond pure research and into the early stages of commercial execution. If management successfully converts current pilot programs into larger commercial contracts, operating leverage could improve meaningfully as software, data analytics and recurring service revenue begin to represent a larger portion of the business.

## **Investment Outlook**

Ainos offers investors exposure to an unusual emerging technology category: the digitization of scent as a data source for artificial intelligence. The company has progressed beyond a purely conceptual platform and is now pursuing meaningful deployments in semiconductor facilities, partnerships with robotics companies, hygiene-monitoring applications and medical research programs.

The strongest near-term investment case comes from semiconductor manufacturing. The industry has a clear economic reason to detect contamination early, and Ainos has reported real-world VOC testing, a paid subscription arrangement and a defined deployment program. Robotics provides a second scalable channel that could allow the technology to reach industrial customers through established automation platforms.

Healthcare offers greater long-term upside but should currently be considered an option rather than the foundation of the valuation. Hygiene monitoring is further advanced than diagnostic breath analysis, while the emergency-medicine program provides evidence that the platform may eventually extend into patient-level clinical applications.

The most compelling aspect of Ainos may be the potential interaction among hardware, data and artificial intelligence. Every deployment can create new information. That information can train the Smell Language Model, and an improved model can increase the usefulness of the entire installed base. If Ainos can establish a large proprietary library of Smell IDs, the company could develop a defensible data asset in addition to selling physical sensors.

Ainos remains an early-stage micro-cap company with financing, execution and dilution risks. However, it is addressing an area of artificial intelligence that remains relatively undeveloped compared with computer vision and voice recognition. Successful execution in semiconductor manufacturing should validate the technology, generate recurring revenue and provide the data needed to expand into robotics, healthcare and additional industrial markets. For investors comfortable with risk, Ainos represents an opportunity to get involved in the emergence of scent as a new digital and AI-enabled information layer at relatively early stage.

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