

F R O S T & S U L L I V A N

2024 ENABLING TECHNOLOGY LEADER

*IN THE GLOBAL
PROCESS SENSORS
INDUSTRY*

F R O S T & S U L L I V A N

BEST
2024 PRACTICES
AWARD

 **Baumer**
Passion for Sensors

Best Practices Criteria for World-Class Performance

Frost & Sullivan applies a rigorous analytical process to evaluate multiple nominees for each award category before determining the final award recipient. The process involves a detailed evaluation of best practices criteria across two dimensions for each nominated company. Baumer excels in many of the criteria in the process sensors industry.

AWARD CRITERIA	
<i>Technology Leverage</i>	<i>Customer Impact</i>
Commitment to Innovation	Price/Performance Value
Commitment to Creativity	Customer Purchase Experience
Stage Gate Efficiency	Customer Ownership Experience
Commercialization Success	Customer Service Experience
Application Diversity	Brand Equity

Commitment to Innovation

Baumer is a global manufacturer of sensors, encoders, measuring instruments, and components for automated image processing machinery and process automation. The company has over 70 years of experience and a global presence in the sensors field, with subsidiaries and sales offices in 19 countries. Baumer’s broad spectrum of sensor offerings, which encompasses pressure, flow, level, analysis and temperature sensors, showcases its commitment to innovation. Recognizing that innovation is linked to customer satisfaction, Baumer continually invests in research and development to improve its products and develop new technologies. These efforts are vital for Baumer to meet its customers’ evolving needs.

Constant research and innovation are the key pillars that have led Baumer to developments in sensor technology. An example of this is the PAD20 analysis sensor, which detects air and gas bubbles in pipe systems to indicate container emptiness and signal the ideal time for exchange. This represents a solution to a major longstanding issue in the dairy industry. With the PAD20 sensor, it is now possible to identify foreign air in quality assurance processes. Another example of innovative sensor design is conductivity sensor CombiLyz AFI4, which stands out by innovative sensor design, fast reaction time and highest accuracy. The CombiLyz conductivity sensor offers optimal prerequisites for the phase separation of food materials, water, and cleaning agents during CIP: It measures the electric conductivity of the flowing medium very precisely and uses this as the basis to deduce the type of medium and its concentration. Thanks to the short reaction time of the temperature compensation, systems receive an exact measured value within only 15 seconds. Customers in the dairy industry report on CIP processes that by using AFI4

consume up to 30 percent less cleaning agent, up to 50 percent less disinfectant, and up to 100.000 liters less water per day.

Customer Ownership Experience

Baumer excels in providing a positive customer ownership experience by complementing its robust products with an extensive service network. While its sensors are renowned for their reliability, accuracy,

“Baumer can modify the mechanical aspects of its sensors to ensure optimal fit and integration within the customer's application. This includes adjusting the sensor's dimensions, mounting options, and connection interfaces. Custom mechanical adaptations enable seamless installation and compatibility with existing equipment or systems, ensuring a satisfactory customer ownership experience.”

**- Krishnan Ramanathan,
Research Director**

and durability, making them suitable for demanding industrial applications, Baumer also provides comprehensive services, including technical support, application consulting, customization options, and after-sales services. The company works closely with customers to understand their specific requirements, providing tailored solutions to meet their evolving needs. Specifically, Baumer can modify the mechanical aspects of its sensors to ensure optimal fit and integration within the customer's application. This includes adjusting the sensor's dimensions, mounting options, and connection interfaces. Custom mechanical adaptations enable seamless installation and compatibility with existing equipment or systems, ensuring a satisfactory customer ownership experience. An example

of this is Arla Foods, which leverages Baumer's hygienic connection from FlexFlow to monitor energy and optimize cooling machines. This collaboration exemplifies Baumer's ability to meet its clients' efficiency requirements, particularly given Arla Foods' active commitment to sustainability, aiming to achieve complete CO2-neutrality for its products by 2050.

Commercialization Success

As a global company, Baumer relies on its extensive networks and resources to guarantee the success of its solutions. Recognizing its competition with large corporations, the company focuses on applications in the food and beverage, pharmaceutical, and other high-value process monitoring industries, including metal and steel, packaging, robotics, and machine tools. A key factor contributing to the company's success across industries is its positioning as a complete sensor solutions partner, prioritizing customer commitment to effectively address challenges. Although a significant portion of the company's revenue is generated in Europe, Asia and the Americas are vital regions too. The company has a strong presence in fast growing Asian regions like India and China and has invested in further expansion.

Application Diversity

Thanks to ongoing investments in research and development and close partnerships with major machines and systems manufacturers, Baumer has been able to innovate and build upon existing solutions, creating competitive advantages for its customers. Baumer's product portfolio covers a wide array of sensor types, including photoelectric, proximity, ultrasonic, capacitive, temperature, and pressure sensors, as well as encoders, industrial cameras and vision sensors. This wide variety has positioned the company as a one-stop shop solutions provider for high-quality process sensors.

Baumer follows a five-stage gate process, using agile methods in the first stage of product development. Prior to launch, products undergo thorough testing in close collaboration with key customers to ensure they meet the tough demands of their respective industries. Recognizing the need to serve customers in emerging energy areas such as hydrogen production and utilization, the company has launched innovative pressure sensors for monitoring and controlling tasks in hydrogen applications. These include tasks related to hydrogen production, storage, and distribution in pipelines. Like its other products, these sensors adhere to strict technical requirements regarding precision and reliability.

Customer Service Experience

As a leading sensor provider, Baumer aims to introduce products that can differentiate its offerings from competitors, ensuring discernible and repeatable benefits over time. For example, the bubble sensor PAD20 is a proven solution in the food industry, helping reduce food waste and plant downtime caused by unwanted gas in the system. This solution saves resources and increases food safety. The PAD20 sensor has significantly increased the efficiency of fruit yogurt production at a large dairy. At Sachsenmilch, a milk

“A key factor contributing to the company’s success across industries is its positioning as a complete sensor solutions partner, prioritizing customer commitment to effectively address challenges.”

**- Krishnan Ramanathan,
Research Director**

products company, Baumer’s sensors are considered a breakthrough, enabling optimal resource deployment and system availability improvement.

Baumer’s sensors are based on a wide range of sensing technologies, including inductive, capacitive, ultrasonic, photoelectric, and magnetic principles. This variety allows users to choose the most appropriate sensor for their specific application. For example, in mobile applications, Baumer’s sensors are used for speed sensing, while the off-highway radar sensor is the preferred choice for distance measurement.

When combined with the company’s servicing capabilities, this makes Baumer a preferred choice for clients.

Brand Equity

Baumer is a trusted provider of sensor solutions, offering an extensive range of products, several customization options, technical support, and industry expertise. The company’s sensors offer high-precision measurement results and provide valuable diagnostic data, streamlining application solutions and improving system availability. Baumer’s products, especially its sensors, undergo rigorous testing and quality control measures to ensure performance and longevity.

Baumer’s focus on technology upgrades is another major contributor to its renowned brand equity. For instance, by implementing IO-Link technology, sensor functions can be easily parameterized, enabling seamless sensor integration. Moreover, this technology enables the transmission of additional information from the sensor to the OT or IT realms, streamlining digitalization.

The company is equally committed to sustainability and operates in an environmentally responsible manner. Baumer strives to minimize its environmental impact by implementing energy-efficient manufacturing processes, optimizing material usage, and adhering to relevant environmental regulations. For instance, the company has opted to use renewable sources at its Innovation Center at the

headquarters in Switzerland for heating and cooling, employing geothermal probes and heat pumps to achieve energy-efficient heating in winter and cooling in summer. This initiative and other sustainability efforts have significantly enhanced Baumer's brand value over time.

Conclusion

Baumer's sensors incorporate advanced features that enhance their effectiveness. These include built-in intelligence, self-diagnostic capabilities, and integration with industrial networks. These features make the company's sensors more flexible and user-friendly and offer valuable data for process optimization. Regarding quality, Baumer's sensors undergo rigorous testing and quality control measures to ensure reliability. Moreover, the company prioritizes promptly addressing inquiries and issues, placing the customer at the center of its operations.

For its strong overall performance, Baumer is recognized with Frost & Sullivan's 2024 Enabling Technology Leadership Award in the global process sensors industry.

What You Need to Know about the Enabling Technology Leadership Recognition

Frost & Sullivan's Enabling Technology Leadership Award recognizes the company that applies its

technology in new ways to improve existing products and services and elevate the customer experience.

Best Practices Award Analysis

For the Enabling Technology Leadership Award, Frost & Sullivan analysts independently evaluated the criteria listed below.

Technology Leverage

Commitment to Innovation: Continuous emerging technology adoption and creation enables new product development and enhances product performance

Commitment to Creativity: Company leverages technology advancements to push the limits of form and function in the pursuit of white space innovation

Stage Gate Efficiency: Technology adoption enhances the stage gate process for launching new products and solutions

Commercialization Success: Company displays a proven track record of taking new technologies to market with a high success rate

Application Diversity: Company develops and/or integrates technology that serves multiple applications and multiple environments

Customer Impact

Price/Performance Value: Products or services provide the best value for the price compared to similar market offerings

Customer Purchase Experience: Quality of the purchase experience assures customers that they are buying the optimal solution for addressing their unique needs and constraints

Customer Ownership Experience: Customers proudly own the company's product or service and have a positive experience throughout the life of the product or service

Customer Service Experience: Customer service is accessible, fast, stress-free, and high quality

Brand Equity: Customers perceive the brand positively and exhibit high brand loyalty

