

FROST & SULLIVAN  
BEST PRACTICES



2026

GLOBAL LASER RADAR  
IN BIW INSPECTION

**PRODUCT LEADERSHIP**



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## Best Practices Criteria for World-class Performance

Frost & Sullivan applies a rigorous analytical process to evaluate multiple nominees for each recognition category before determining the final recognition recipient. The process involves a detailed evaluation of best practices criteria across two dimensions for each nominated company. Nikon excels in many of the criteria in the laser radar in BIW inspection space.

RECOGNITION CRITERIA	
<i>Business Impact</i>	<i>Product Portfolio Attributes</i>
Financial Performance	Match to Needs
Customer Acquisition	Reliability and Quality
Operational Efficiency	Product/Service Value
Growth Potential	Positioning
Human Capital	Design

## EV Acceleration and Industry 4.0 Adoption Sustain Steady BIW Inspection Market Expansion

Frost & Sullivan’s observes that the global Body-in-White (BIW) inspection market is entering a more mature phase of its growth cycle, with demand increasingly shaped by fundamental shifts driven by electrification, digitalization, and the need for flexible production strategies.

Among the most influential growth drivers remains the continued acceleration of electric vehicle (EV) production. New EV registrations expanded sharply across Europe and Asia in recent years, supported by strong government subsidies in China, the United States, and Korea. As EV adoption accelerates, original equipment manufacturers (OEM) place greater emphasis on BIW structural integrity to ensure passenger and battery safety, further elevating the importance of high-precision dimensional inspection. In parallel, the industry’s growing focus on 100% in-line quality control and zero-defect manufacturing is reshaping metrology architectures. Traditional offline coordinate measuring machines (CMM)-based inspection struggles to keep pace with shrinking lead times, mass personalization, and closed-loop manufacturing enabled by Industry 4.0. As a result, in-line, automated inspection solutions increasingly replace legacy approaches.

Lightweighting initiatives further support market expansion. As OEMs turn to advanced materials, alloys, and composites to offset EV battery weight and meet carbon reduction targets, dimensional validation at the BIW level becomes mission-critical. At the same time, OEMs’ platform strategies, which enable

multiple vehicle models to run on shared lines, drive demand for automated, flexible inspection solutions tightly integrated with robotics and data analytics.

However, the market continues to face structural restraints. Slow replacement cycles, with BIW metrology systems often lasting 15 to 18 years, limit near-term equipment turnover. Pricing pressure persists due to limited product differentiation within mature segments. In addition, lingering macroeconomic disruptions, including supply chain instability and geopolitical tensions, still affect investment timing in select regions.

Despite these constraints, Frost & Sullivan anticipates steady, structurally supported growth led by EV platforms, digital manufacturing roadmaps, and the industry's accelerating shift toward in-line, absolute, data-driven dimensional control.

### A Trailblazer's Path

Nikon Metrology, LLC (Nikon) serves as the industrial metrology and inspection solutions arm of Nikon Corporation, bringing together more than a century of optical engineering heritage with advanced digital

*"While competitors enter the market and promote similar long-range, non-contact measurement concepts, Nikon retains a clear leadership position through its depth of production deployment, application maturity, and established installed base. As a result, the company occupies a reference position in absolute in-line BIW metrology."*

**- Shruti Bapusaheb Yewale**  
**Senior Research Analyst**

manufacturing technologies. Through its global operations, Nikon delivers a comprehensive portfolio that spans X-ray and computed tomography inspection, industrial microscopy, optical and video measurement systems, and large-volume non-contact laser radar solutions. The company supports manufacturers across automotive, aerospace, electronics, and general industrial markets, enabling high-precision quality assurance from micro-scale components to full-vehicle structures. Its globally distributed sales, service, and applications engineering teams ensure consistent execution and localized support across major manufacturing regions.

Within the automotive BIW inspection market, Nikon has established a strong leadership position through its advanced laser radar platforms designed for high-speed, in-line, absolute dimensional measurement. These systems allow OEMs to transition from offline, sample-based inspection to real-time, 100% process control in high-mix, multi-model production environments.<sup>1</sup> By combining production-grade robustness with metrology-grade accuracy, the company enables manufacturers to improve dimensional stability, reduce scrap and rework, and support increasingly flexible vehicle platforms. Frost & Sullivan believes Nikon is uniquely prepared to continue transforming the BIW inspection market and sustaining leadership for years to come.

### Defining the Shift from Offline Inspection to Absolute In-Line Process Control

Nikon aligns its laser radar portfolio with a core shift in automotive manufacturing requirements: moving from offline, sample-based dimensional checks to absolute, in-line, 100% inspection that supports real-time process control. OEMs increasingly require CMM-grade accuracy directly in the production line to

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<sup>1</sup> Interview with Frost & Sullivan, November 2025

detect deviations earlier in the build process, particularly before paint and trim, where rework and scrap costs escalate sharply. The company's laser radar architecture directly addresses this requirement by enabling non-contact, automated, absolute measurement at full production speed.

From a market positioning standpoint, Nikon established early leadership by transitioning laser radar from aerospace into automotive BIW inspection through direct OEM collaboration. This early involvement allowed the company to shape the technical direction and application standards of the segment. While competitors enter the market and promote similar long-range, non-contact measurement concepts, Nikon retains a clear leadership position through its depth of production deployment, application maturity, and established installed base. As a result, the company occupies a reference position in absolute in-line BIW metrology.

### **Delivering CMM-Grade Accuracy at Production Speed through Advanced Laser Radar Engineering**

Nikon's APDIS laser radar systems deliver CMM-equivalent accuracy at substantially higher inspection speeds, enabling simultaneous gains in precision and productivity. The architecture uses heterodyne interferometry to measure surfaces directly without requiring physical contact, reflective targets, or surface preparation. This capability allows the system to capture high-fidelity dimensional data across large vehicle structures with consistent repeatability.

The platform supports shop-floor deployment and operates reliably under typical production environmental conditions, eliminating the need for dedicated metrology rooms. Long measurement stand-off distances enhance operational safety and simplify system integration. APDIS also supports robot-independent accuracy by automatically realigning to the part using fixture references, reducing dependence on robot repeatability and simplifying programming.

From a reliability perspective, Nikon demonstrates strong lifecycle performance. Many of the company's systems remain operational for 10 to 15 years, supported by structured calibration, maintenance, and regional service infrastructure. OEMs often keep earlier-generation systems on legacy lines while deploying newer platforms on new lines, showing their confidence in long-term system stability and consistent performance.

Nikon Metrology has strengthened its leadership in Body-in-White (BiW) metrology with the launch of the APDIS MV5X, a compact next-generation laser radar system for automated non-contact inspection. The MV5X delivers up to six times faster scanning than previous models while maintaining high accuracy, enabling efficient inline quality control in automotive manufacturing. Weighing less than 12 kg, the system can be deployed as a portable unit or integrated with robots and AGVs for smart factory applications, reinforcing Nikon Metrology's position in intelligent manufacturing and digital quality assurance.

Frost & Sullivan applauds Nikon's approach, which delivers reliable, long-lasting systems that preserve customer investment while enabling a smooth transition to future generations of in-line metrology.

### **Transforming Inspection from a Cost Center into a throughput and Yield Accelerator**

Nikon's laser radar systems typically require a higher initial investment than conventional CMM or in-line solutions. However, the platform delivers superior economic value through multiplicative throughput gains, reduced facility modification costs, and lower inspection-related bottlenecks. The ability to perform

high-speed, in-line inspection eliminates the need for part transport to offline CMM rooms and avoids the construction, excavation, and environmental control costs associated with traditional dimensional labs.

By enabling faster inspection cycles and reducing scrap and rework through earlier defect detection, Nikon improves overall equipment effectiveness and lowers the expense associated with each inspected unit. When evaluated on a total-ownership basis, the company's laser radar systems remain highly competitive with CMM and optical dimensional scanning alternatives while delivering significantly higher output per dollar invested

Backed by the scale and financial strength of Nikon Corporation, Nikon operates from a \$4.7 billion global revenue base. This financing allows the company to continue investing steadily in next-generation in-line

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**- Silvana Rulet**  
**Best Practices Research Analyst**

metrology, sustaining long-term platform development even during periods of macroeconomic constraint.

### **Scaling Global Adoption through Integration-Led Deployment and Application-Driven Support**

Nikon executes through a globally distributed commercial and service model that integrates regional sales teams, system integration partners, and locally deployed service, calibration, and support personnel. This structure allows it to deploy, support, and scale laser radar systems across major automotive manufacturing regions with consistent execution quality.

The company maintains direct engagement between engineering teams and end users, ensuring that software updates, feature enhancements, and integration refinements reflect real production requirements rather than laboratory assumptions. This closed feedback loop strengthens application reliability, shortens commissioning timelines, and improves long-term system utilization.

Nikon's execution model supports strong customer retention. OEMs frequently expand deployments across multiple production lines and facilities, while peer references within the automotive community reinforce market credibility and accelerate follow-on adoption.

### **Building a Durable Platform for the Next Generation of Flexible, Data-Driven Manufacturing**

Nikon's laser radar strategy aligns with the industry's transition from inspection for defect identification to inspection as a closed-loop process control mechanism. As OEMs pursue greater platform sharing, vehicle customization, and flexible manufacturing, absolute in-line dimensional measurement becomes a foundational requirement. The company's platform directly supports this evolution.

Adoption remains strongest in North America and China, while Europe represents a significant medium-term opportunity as risk aversion declines and next-generation in-line metrology becomes more established. Nikon's expanding global installed base continues to reduce perceived adoption risk and supports sustained market penetration.

Internally, Nikon benefits from over a decade of dedicated automotive laser radar deployment experience. Engineering teams operate in proximity to customer operations and continuously refine system performance based on field learning. This application-driven development culture strengthens the company's ability to scale leadership without compromising execution discipline.

## Conclusion

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Nikon Metrology, LLC (Nikon) converts its absolute in-line laser radar capability into consistent, measurable improvements in manufacturing precision, throughput, and process stability for automotive original equipment manufacturers. The company aligns its technology roadmap with the industry's most urgent production requirements, delivers sustained engineering performance in high-volume environments, and supports customers through a globally coordinated commercial and technical network. By combining application maturity, lifecycle reliability, and a clear commitment to advancing in-line dimensional control, Nikon strengthens its position as a critical partner in the evolution of modern BIW inspection.

With its strong overall performance, Nikon earns Frost & Sullivan's 2026 Global Product Leadership Recognition in the body-in-white inspection industry.

## What You Need to Know about the Product Leadership Recognition

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Frost & Sullivan's Product Leadership Recognition is its top honor and recognizes the market participant that exemplifies visionary innovation, market-leading performance, and unmatched customer care.

### Best Practices Recognition Analysis

For the Product Leadership Recognition, Frost & Sullivan analysts independently evaluated the criteria listed below.

#### Business Impact

**Financial Performance:** Strong overall business performance is achieved in terms of revenue, revenue growth, operating margin, and other key financial metrics

**Customer Acquisition:** Customer-facing processes support efficient and consistent new customer acquisition while enhancing customer retention

**Operational Efficiency:** Company staff performs assigned tasks productively, quickly, and to a high-quality standard

**Growth Potential:** Growth is fostered by a strong customer focus that strengthens the brand and reinforces customer loyalty

**Human Capital:** Leveraging innovative technology characterizes the company culture, which enhances employee morale and retention

#### Product Portfolio Attributes

**Match to Needs:** Customer needs directly influence and inspire the product portfolio's design and positioning

**Reliability and Quality:** Products consistently meet or exceed customer expectations for performance and length of service

**Product/Service Value:** Products or services offer the best value for the price compared to similar market offerings

**Positioning:** Product serves a unique, unmet need that competitors cannot easily replicate

**Design:** Product features an innovative design that enhances both visual appeal and ease of use

## Best Practices Recognition Analytics Methodology

### Inspire the World to Support True Leaders

This long-term process spans 12 months, beginning with the prioritization of the sector. It involves a rigorous approach that includes comprehensive scanning and analytics to identify key best practice trends. A dedicated team of analysts, advisors, coaches, and experts collaborates closely, ensuring thorough review and input. The goal is to maximize the company’s long-term value by leveraging unique perspectives to support each Best Practice Recognition and identify meaningful transformation and impact.

STEP		VALUE IMPACT	
		WHAT	WHY
1	<b>Opportunity Universe</b>	Identify Sectors with the Greatest Impact on the Global Economy	Value to Economic Development
2	<b>Transformational Model</b>	Analyze Strategic Imperatives That Drive Transformation	Understand and Create a Winning Strategy
3	<b>Ecosystem</b>	Map Critical Value Chains	Comprehensive Community that Shapes the Sector
4	<b>Growth Generator</b>	Data Foundation That Provides Decision Support System	Spark Opportunities and Accelerate Decision-making
5	<b>Growth Opportunities</b>	Identify Opportunities Generated by Companies	Drive the Transformation of the Industry
6	<b>Frost Radar</b>	Benchmark Companies on Future Growth Potential	Identify Most Powerful Companies to Action
7	<b>Best Practices</b>	Identify Companies Achieving Best Practices in All Critical Perspectives	Inspire the World
8	<b>Companies to Action</b>	Tell Your Story to the World (BICEP*)	Ecosystem Community Supporting Future Success

\*Board of Directors, Investors, Customers, Employees, Partners

## About Frost & Sullivan

Frost & Sullivan is the Growth Pipeline Company™. We power our clients to a future shaped by growth. Our Growth Pipeline as a Service™ provides the CEO and the CEO's growth team with a continuous and rigorous platform of growth opportunities, ensuring long-term success. To achieve positive outcomes, our team leverages over 60 years of experience, coaching organizations of all types and sizes across 6 continents with our proven best practices. To power your Growth Pipeline future, visit Frost & Sullivan at <http://www.frost.com>.

### The Growth Pipeline Generator™

Frost & Sullivan’s proprietary model to systematically create ongoing growth opportunities and strategies for our clients is fueled by the Innovation Generator™.

[Learn more.](#)

#### Key Impacts:

- **Growth Pipeline:** Continuous Flow of Growth Opportunities
- **Growth Strategies:** Proven Best Practices
- **Innovation Culture:** Optimized Customer Experience
- **ROI & Margin:** Implementation Excellence
- **Transformational Growth:** Industry Leadership



### The Innovation Generator™

Our 6 analytical perspectives are crucial in capturing the broadest range of innovative growth opportunities, most of which occur at the points of these perspectives.

#### Analytical Perspectives:

- **Megatrend (MT)**
- **Business Model (BM)**
- **Technology (TE)**
- **Industries (IN)**
- **Customer (CU)**
- **Geographies (GE)**

