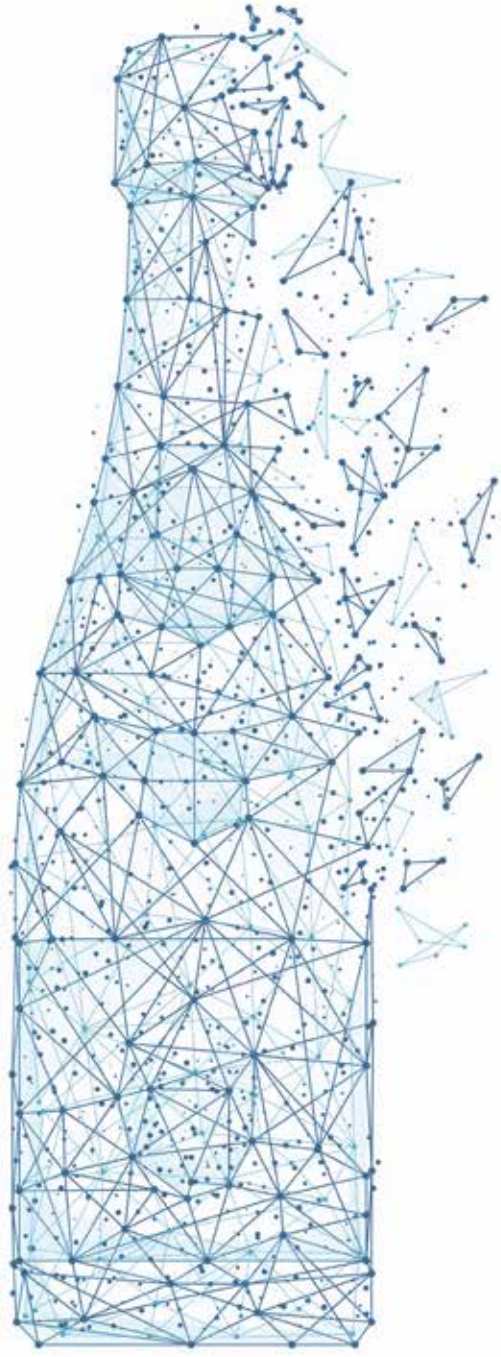
Smarter quality control enabled by TIAMA's AI systems

Artificial intelligence is revolutionizing vision inspection in glass manufacturing – replacing rigid systems with adaptive, real-time solutions. TIAMA's AI-driven innovations enhance accuracy, efficiency and process insight – paving the way for autonomous factories, smarter decision-making and scalable quality control across both new and legacy inspection platforms.



In the rapidly advancing domain of industrial automation, artificial intelligence (AI) is driving a paradigm shift in vision inspection technology – one that transcends incremental improvement and redefines the very framework of quality control. Once dependent upon inflexible, rule-based protocols, vision systems are now infused with the adaptive intelligence of deep learning, capable of real-time decision-making and intelligent defect classification. This transformation is not merely technological; it is a strategic evolution, unlocking unprecedented levels of precision, productivity and operational intelligence across the glass manufacturing sector.

FROM ALGORITHMS TO INTELLIGENCE: THE SHIFT TO DEEP LEARNING

Historically, vision inspection systems functioned through predetermined parameters – requiring manual input to define defect zones, establish sensitivity

thresholds and calibrate tolerances. While these systems delivered reliable results, they were inherently limited by their rigidity and dependence upon human oversight. The emergence of deep learning has profoundly disrupted this model. Today's neural networks are capable of recognizing intricate visual patterns, adapting to subtle variations in form or texture and continuously refining their accuracy with exposure to new data. This means machines can now identify defects even in complex scenarios, such as within engravings or shadowed areas, where traditional systems would falter.

REAL-TIME INSPECTION, REDEFINED

Among the most transformative breakthroughs is the integration of AI capabilities directly within inspection hardware. Tiama's MCAL 4 AI exemplifies this evolution by embedding neural network processing power directly on the machine, enabling it to perform real-time analysis at production line speeds. Decisions are instantaneous, quality interventions are immediate and production remains uninterrupted. This architecture allows manufacturers to achieve higher throughput without compromising inspection integrity - redefining what is possible on the shop floor.

AI verdicts accessible on a cloud based platform

SMARTER MACHINES, SMARTER PROCESSES

AI does more than detect defects; it contextualizes them. By intelligently naming and categorizing anomalies, AI-driven systems deliver actionable insights into the root causes of production issues. Operators gain a new level of process visibility - capable of adjusting mould parameters, fine-tuning furnace conditions, or identifying problematic cavities with surgical precision. Beyond defect identification, AI enables classification by defect type, mould location and severity, laying the foundation for predictive maintenance, process optimization and continuous improvement initiatives. This evolution brings the vision of the autonomous factory closer to reality - where machines self-learn, self-adjust and seamlessly collaborate with human operators.

EFFICIENCY GAINS THAT MATTER

The operational benefits of Tiama's AI integration are both measurable and transformative. Job changeovers -often a bottleneck in production- are accelerated by over 50 percent due to AI's simplified setup protocols. False rejection rates are significantly reduced, as AI distinguishes between critical and non-critical defects, such as mould seams or minor blisters, thereby improving yield by up to 1 percent. Moreover, the system's advanced detection capabilities allow for accurate identification of both defect type and origin, enabling faster operator response and more effective process control across all manufacturing stages.

SCALABLE INNOVATION FOR ALL GENERATIONS OF MACHINES

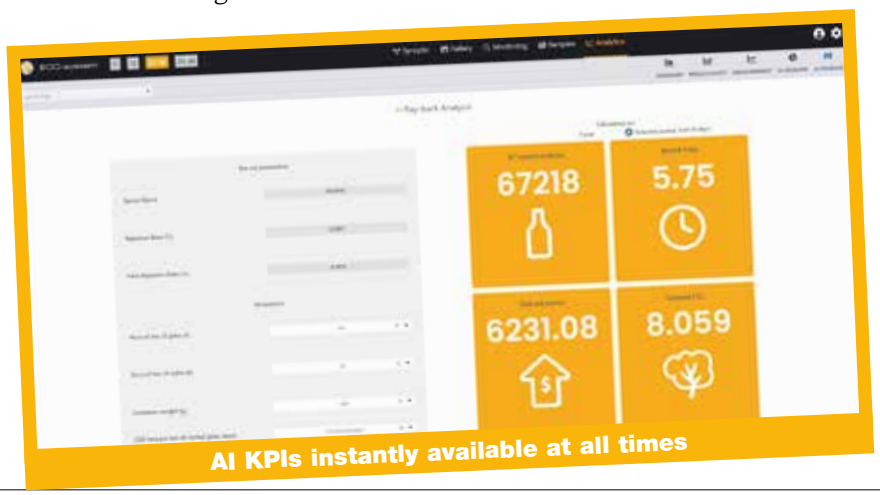
Tiama's approach to AI is rooted in scalability and accessibility. All newly-manufactured MCAL and MULTI machines are natively AI-enabled, while the existing installed base can be retrofitted with ease. No complete system overhaul is required. Activating AI functionality is as seamless as toggling a switch, thereby empowering customers to test, adopt and scale AI innovations with minimal disruption. This inclusive approach ensures that even legacy systems benefit from the latest advancements - maximizing the lifecycle value of every Tiama machine.

QUANTIFIABLE IMPACT FROM FLOOR TO FINANCIALS

The deployment of AI in vision inspection delivers substantial bottom-line value. For instance, a furnace utilizing ten AI-enabled sidewall inspection units can produce an additional 6.5 million packed bottles annually, simply by reducing false rejections and enhancing detection accuracy. This gain translates directly into increased profitability, a reduced carbon footprint and higher customer satisfaction. At the human level, AI democratizes expertise - its intuitive interface and minimal setup requirements allow less experienced staff to achieve expert-level inspection outcomes, an essential capability in a labour-constrained industry.

THE ROAD AHEAD: TOWARD AUTONOMOUS INSPECTION

AI is no longer an optional enhancement - it is a cornerstone of modern glass manufacturing. Tiama's pioneering YOUniverse platform exemplifies this future, aggregating data from multiple inspection points for centralized process optimization. Cloud-based analytics provide remote monitoring, predictive insights and benchmarking capabilities. The journey toward autonomous inspection is well underway and Tiama is leading the charge - turning innovation into industry-wide transformation. ■



AI KPIs instantly available at all times

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