

ATIEUNO MAGAZINE 4.0



Precision in Motion: Digital Integration for Automotive Aluminium Manufacturing

How global coordination, thermal stability, and data integration are shaping the future of zero-defect aluminium extrusion for the automotive industry.

The shift to electric and lightweight vehicles has made aluminium extrusion a cornerstone of automotive innovation. But as OEM standards rise, manufacturers face new challenges: multi-plant consistency, thermal stability, and traceable quality across global operations.

This evolution demands more than automation — it requires digital integration capable of transforming every extrusion line into a source of precise, repeatable intelligence.

We will explore together the actual workflow of an aluminium manufacturing plant, highlighting how to introduce greater speed, visibility, and control at every stage—from the initial RFQ to final delivery.

This session will focus on concrete challenges and the digital tools that enable real, measurable improvements—without generalities or abstractions.

The Global Coordination Gap

Aluminium groups now operate networks of plants across continents. While each site excels individually, global synchronization remains elusive. Each press has unique configurations, dies, and operator habits. The result is fragmented excellence — localized performance, but inconsistent outcomes.

Automotive programs, however, require identical quality everywhere: the same alloy behavior, surface finish, and mechanical integrity, whether produced in Europe or Asia. Without a shared digital support, best practices remain confined, and variability becomes inevitable. Integration is the only path from local expertise to global standardization. From local excellence to global repeatability.

Thermal Stability: The hidden variable in extrusion quality

Among the most critical parameters affecting aluminium extrusion consistency is temperature. Even slight variations in die temperature or billet cooling can alter microstructure, affect surface finish, and increase scrap.

At industrial speed, this challenge magnifies: faster cycles mean greater friction, more heat, and higher risk of deviation.



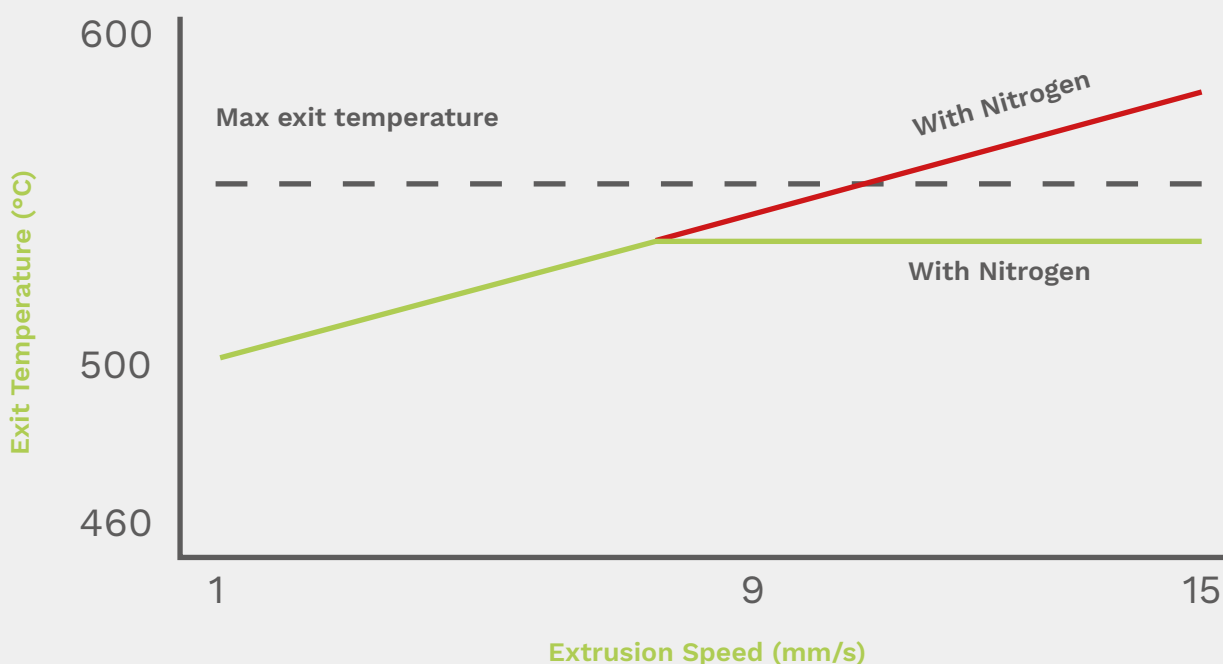
Traditionally, operators compensated with experience — adjusting pressure or extrusion speed to restore stability. But in an environment where **OEM traceability and statistical process control** are mandatory, manual correction is no longer enough.

All of this is made possible by EMS 3rd G Ecosystem, our integrated digital platform developed specifically for the aluminium extrusion and manufacturing industry.

The solution lies in precision thermoregulation — not through guesswork, but through data.

Systems capable of monitoring die temperature in real time, predicting hotspots, and dynamically adjusting cooling are redefining process reliability.

Technologies such as liquid nitrogen cooling, integrated into intelligent extrusion control systems, are proving that productivity and quality can now coexist without compromise.



Digital Manufacturing Integration: The Digital Framework for Minimal-Defect Production

To meet the demands of just-in-time and zero-defect automotive production, aluminium manufacturers must integrate every layer of their process — from die management to quality certification — within a unified digital architecture.

SUCH INTEGRATION DELIVERS THREE FUNDAMENTAL ADVANTAGES:

- **Synchronization across plants:** standardized parameters, identical process logic, shared data.
- **Closed-loop control:** live feedback from the press to quality and maintenance systems.
- **Data-driven traceability:** automatic linkage between billet, die, order, and finished part.

In this model, digital systems become the silent operators ensuring global consistency. They allow a profile extruded in Europe, assembled in Asia, and tested in North America to share a single digital identity — complete with process history, performance metrics, and quality certificate.

This is not the future of manufacturing. It is the new minimum standard for Tier 1 suppliers in the automotive supply chain.



From Correction to Prediction

When process data flows seamlessly between machines and departments, manufacturers can anticipate instead of reacting. Advanced analytics reveal correlations between temperature, pressure, speed, and defect occurrence.

This knowledge fuels **continuous improvement**: each extrusion run refines the next. The factory becomes self-learning — evolving with every billet extruded.

Our Perspective:
Building the Connected Factory



For over four decades, Atieuno has helped aluminium manufacturers lay the digital foundations for operational excellence.

The EMS 3rd G Ecosystem bridges industrial process control and manufacturing intelligence, ensuring data continuity across global plants.

Solution	Benefits
 EXTRUSION MANAGEMENT SYSTEM	The unified MES framework for end-to-end visibility across plants.
 PRESS SUPERVISOR	Real-time control of extrusion parameters for consistent performance.
 N5NITROGEN	Advanced thermal management ensuring stability and superior surface finish.
 EXTRUSION INTELLIGENCE	Predictive analytics for quality assurance and process optimization.

Together, these solutions enable aluminium producers to deliver what the automotive industry demands most: repeatable precision, certified traceability, and measurable performance across every plant and production line.

Automotive manufacturers are redefining what aluminium can achieve. Precision, sustainability, and consistency are now inseparable.

To reach that standard, extrusion plants must evolve from isolated processes into connected, intelligent ecosystems capable of learning from every run and sharing that knowledge globally.

DISCOVER HOW DIGITAL INTEGRATION CAN ELEVATE YOUR ALUMINIUM MANUFACTURING PERFORMANCE.

Visit www.atieuno.com or contact **our experts** for a personalized consultation on multi-plant coordination and process optimization.