

The background of the image is a deep purple with a network of glowing, intersecting diagonal lines in shades of cyan and magenta, creating a sense of digital connectivity and data flow.

AVEVAWORLD

ACCELERATE INDUSTRIAL INTELLIGENCE



Golden Batch Optimization

CONNECT & AVEVA™ Advanced Analytics

Francesco Terracciano – Engineering and Maintenance Manager
Milan, 19/05/2026

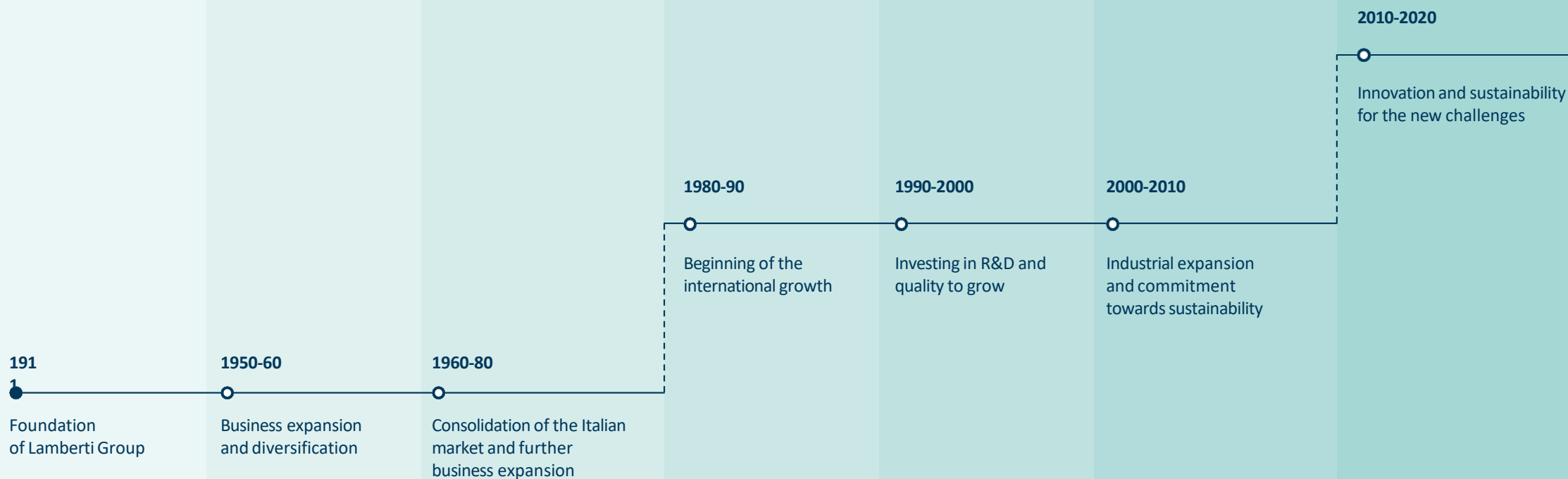
Company and Site Profile

Lamberti Group – Zanica Site



Heritage

The history of our company is continually written by people's living stories.





Our Global Presence





Highlights. *Overall*

617 M€

Net group sales 2025

1384

Total number of employees worldwide 2025

40

Total number of operations



Highlights. *Sustainability 2024*

3.7 KWh/MT

Energy intensity ratio

42%

Water consumption reduction Vs. 2019

4% CO₂ eq

CO₂ eq reduction Vs. 2021 - Scopes 1 and 2 GHG emissions

12%

Reuse, recycled, recovered hazardous waste



Science

We develop and manufacture molecules that generate innovation while minimizing our impact on the environment.

Our practices are sustained by multidisciplinary where different disciplines (chemistry, biology, materials science) allow people to find solutions with significant value.

Our Research and Development activities are carried out by dedicated teams in close collaboration with our customers and partners.

160+

Researchers

10+

Synthesis Laboratories

20+

Application Laboratories

540

Active Patents

>92%

Eco-friendly products



Our technological expertise

Natural polymers,
carboxymethyl cellulose
and hydrocolloids

**Waterborne
synthetic polymers**
(acrylic and polyurethanes)

**Oleochemicals
and fatty derivatives**

Polymer beads
(acrylic and polyurethanes)

Hydroxyapatite

Active ingredients
for cosmeceuticals
(or cosmeceutical products)



Zanica Site

- Location: Zanica, 15 km south of Bergamo
- Total Site Area: 43,000 m²
- Buildings & Facilities: 14,000 m²
- Paved Area: 22,000 m²
- Employees: 120



Zanica Site

Natural Polymers Department:

Production of vegetable flour derivatives (e.g., guar and tamarind) through etherification reactions or hydrolysis

Synthetic Polymers Department:

Production of polyurethanes and polyacrylates in emulsions or aqueous solutions through polymerization reactions

Technologies and business sectors

		Natural Polymers		Synthetic Polymers		Oleochemistry	Others
		Cellulosics	Hydrocolloids	Acrylics	Water-based Polyurethanes	Oleochemicals	Pigments & Enzyme Formulations
Geo Science	Agrochemicals & Veterinary	●	●	●	●	●	●
	Home, Personal Care & Cosmetics	●	●	●	●	●	
	Food Industry	●	●				
	Oil & Gas	●	●	●		●	
	Mining	●	●	●		●	
	Civil Engineering	●	●	●		●	
Material Science	Ceramics	●		●	●	●	●
	Construction & Paints	●	●	●	●	●	
	Paper	●	●	●	●	●	●
	Leather Finishing			●	●	●	●
	Soft & Textile Coating Compounds			●	●	●	
	Industrial Coating			●	●	●	
	Printing Ingredients for Textile & Digital Industrial Inks	●	●	●	●	●	●
	Surfactants for Polymerization & Chemical Industry			●		●	

A Cross-Functional Collaboration

Integrated Project Team

A multidisciplinary team combining local site expertise with corporate strategic vision

Zanica Site

- Process
- Production
- Automation
- Engineering & Maintenance

Global Functions

- Manufacturing & Engineering
 - Automation
 - Energy management
- Sustainability
- Digital team
- IT



The Digital Backbone

AVEVA™ PI System™



The Need for a Digital Backbone

Why AVEVA PI System?

- Consolidating scattered data into a single organized infrastructure
- Turning raw data into insights to improve production and product quality
- Monitoring real-time consumption to drive energy-saving initiatives
- Improving asset reliability and maintenance management



Project Timeline & Milestones

Concept and Ideation

2023 Q4

Network Infrastructure Setup

2024 Q1

Pilot Launch - Natural Polymers Department

2024 Q3

AVEVA Business Value Consulting

2025 Q1

Full Rollout - Natural Polymers Department

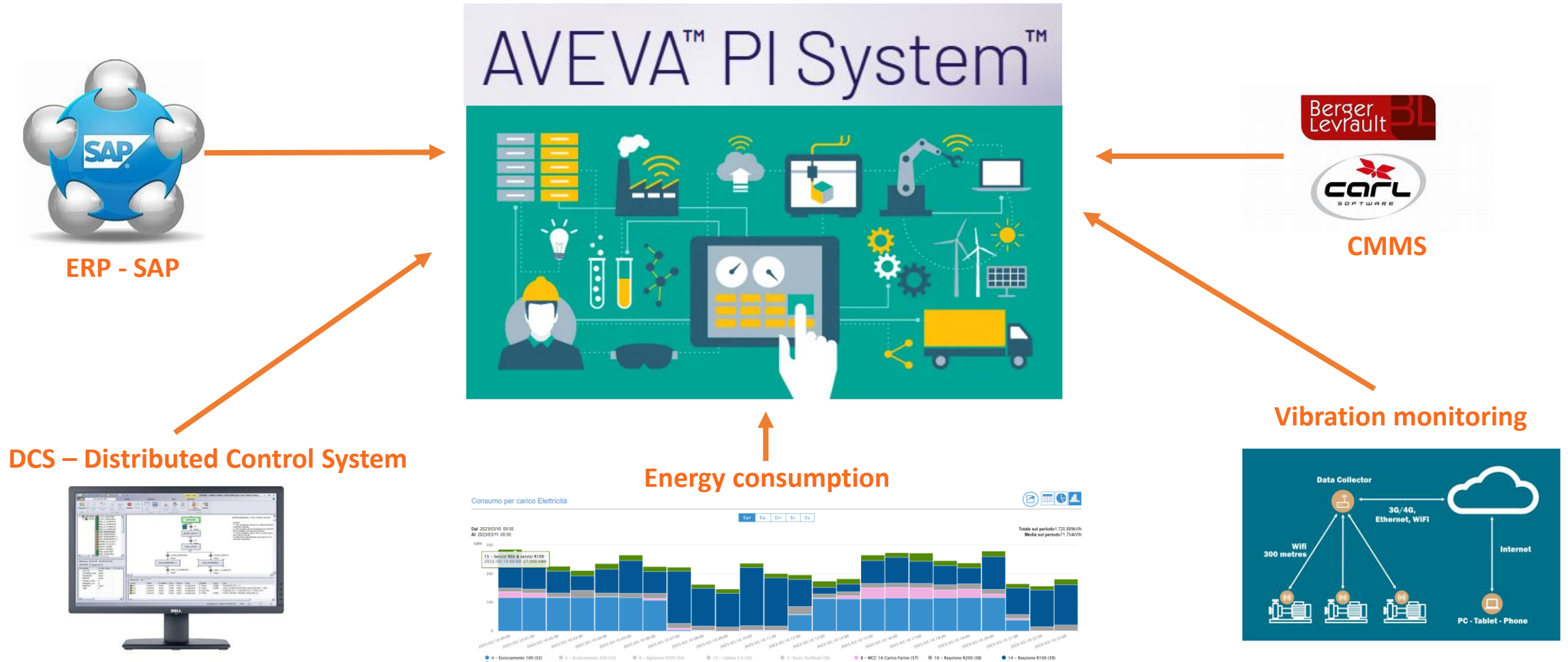
2025 Q2

Advanced Features Implementation

2026 Q2

Integrated platform – Data collection

Transform data into information supporting decision-making





Data processing times, reporting, and KPI tracking

AVEVA™ PI System™

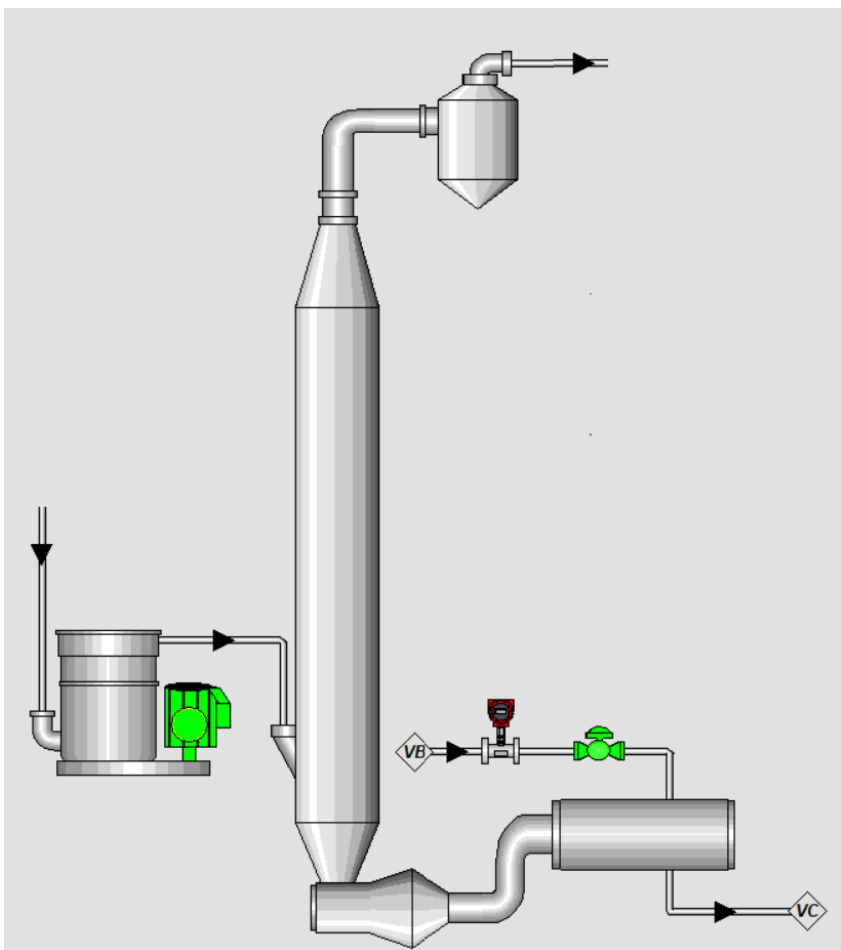
1 – 5 min



3 – 5 h

Initial findings – Energy savings

Dynamic Balancing of Grinding Speed and Steam Flow



- Energy consumption is driven by mill rotation speed and steam flow rate in the drying column
- By lowering the mill rotation speed it is possible to keep the product particle size within specs while saving nearly 10% of electrical power
- Higher granulometry leads to an increased demand for steam in the drying phase
- Thanks to the PI System's real-time total energy balance calculation, this correlation was easily identified
- The overall energy balance remains positive:
 - Electrical consumption: -10%
 - Thermal consumption: +5%
 - Total Energy Impact: 5% net Reduction

Beyond Visualization

From Real-Time Monitoring to Advanced Analytics

AVEVA Advanced Analytics

Moving from visualization to intelligence

- **Handling Data Complexity:**
 - Managing data streams from different production lines
 - Processing historical "Big Data" for long-term trend analysis
 - Implementing a versatile, multi-product system
- **Machine Learning :**
 - Identifying hidden correlations between variables invisible to the naked eye
 - Predictive Quality Control: shifting from "reactive" adjustments to "proactive" process control
 - Real-Time Anomaly Detection: identification of process drifts before they impact production

AVEVA Advanced Analytics

Getting more from PI System

- **Advanced Optimization:**
 - Multi-Objective Optimization: maximize production, quality while minimize energy
 - Reducing "out-of-spec" batches by identifying tighter process boundaries for controllable variables
- **Data-Driven Decision Making:**
 - Empowering "operator intuition" with validated insights
 - Continuous Improvement: learning from every batch to further refine efficiency

Case Study – Reactor Optimization in Guar Derivatives

Lighthouse Project: Multi-Objective Modeling for IPA Distillation

- The Challenge: Managing a process where variables (agitation, temperature, and vacuum levels) must be perfectly synchronized
- Process Context: Distillation phase for Isopropyl Alcohol (IPA) recovery from the reactor
- Implementation: Deployment of a Multi-Objective Mathematical Model designed to find the optimal balance between process variables using **Aveva Connect and Advanced Analytics**
- Data Integration: The optimization engine is fed with real-time data in **Connect**, synchronized with the **PI System** (rotation speed, power, jacket flow and temperature, reactor pressure)

Case Study – Reactor Optimization in Guar Derivatives

Lighthouse Project: Targets and Strategic Goals

- Dual-Resource Minimization:
 - Electrical Power: Reducing the energy consumption of the reactor agitator by optimizing the rotation speed
 - Thermal Energy: Minimizing hot water usage in the heating jacket through precise flow and temperature control
- Quality Preservation: Ensuring that energy-saving measures do not affect the product's properties
- Process Stability: Reducing batch-to-batch variability by defying the optimal setpoint during the IPA recovery phase
- Expected return: reduction in specific energy consumption per ton of Guar derivative

Case Study – Distillation Phase Dashboard



The path to golden batch

Work in Progress and Expansion Plan

- **Real-world Validation**
 - Live Implementation: recommended parameters to the distillation phase during actual production runs
 - Performance Benchmarking: comparison with historical batches is underway to quantify savings
- **Next steps**
 - Full Recipe Optimization: extending the model to cover all phases of the production recipe
 - Product Portfolio Scale-up: implementing the optimization model across more product codes
 - Department-wide Rollout: Expanding the "Golden Batch" to all three production lines within the Natural Polymers department



Lamberti saves data analysis time and energy consumption while implements the Golden Batch

Challenge

- Consolidating scattered data into a single organized digital backbone
- Providing a tool to rapidly analyze data enabling process and energy optimization
- Testing a Machine Learning-based application to identify the "Golden Batch"

Solution

- Implementation of AVEVA™ PI System™ as the core infrastructure for data management
- Launch of the Advanced Analytics project on CONNECT to model complex variables

Results

- **Data organized and synchronized within a single unified OT/IT infrastructure**
- **Approximately 5% energy reduction achieved during the milling and drying phase**
- **Testing parameters suggested by Advanced Analytics during live production runs**

