AERODRY CONNECT

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Plastics Automation

Closing the Loop: From Disconnected Machines to Intelligent Material Ecosystems

Dear Partners, Clients & Team,

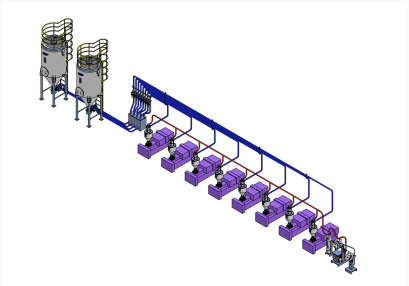
In today's plastics manufacturing environment, competitive advantage is no longer defined by machine speed alone. It is defined by how intelligently material flows through the plant.

Across the industry, we see processors investing in advanced dryers, high-precision blenders, and high-performance processing machines - yet still struggling with quality issues, downtime, excess manpower, and rising costs. The reason is simple: these systems often operate in silos.

Material handling is not a series of independent steps. It is a continuous lifecycle - from material receipt to drying, blending, conveying, processing, and changeover. Any break in this chain leads to waste, inefficiency, and risk.

In this edition of Aerodry CONNECT, we introduce the concept of Integrated Material Management - a closed-loop approach that connects every material-related operation into one intelligent, self-regulating system.

This is not just automation - but process intelligence.
- Team Aerodry



This issue:

In the next section, we explore the industry forces making integration essential.

Industry Forces Driving Integration

The plastics industry is undergoing a structural shift:

- More Complex Materials - Recycled, bio-based, filled, and multi-layer formulations demand stricter control.
- Shorter Runs & Faster Changeovers - High-mix, low-volume production leaves no room for manual handling errors.
- Skilled Labour Shortages - Plants cannot rely on operator expertise alone.
- Energy & Sustainability Pressure - Inefficient material movement wastes power and material.

Critical Pain Points on the Shop Floor

- **Material Identity Loss -** Wrong resin or masterbatch reaching the wrong machine can destroy an entire production batch.
- **Moisture Re-Absorption -** Properly dried material exposed during manual handling quickly reabsorbs moisture - nullifying dryer performance.
- **Manual Dependency - O**perators constantly coordinating material movement leads to variability, fatigue, and errors.
- **Unplanned Downtime -** Machines waiting for material despite full silos and dryers elsewhere in the plant.
- **Contamination & Dust** - Open transfer, spillage, and improper cleaning cause rejection, rework, and unsafe working conditions.
- **Scaling Nightmares** - As plants grow, ad-hoc additions turn material handling into an uncontrollable maze.

DID YOU KNOW?
Even 0.5% daily material loss can translate into crores annually for a mid-sized processor

The Hidden Costs of Fragmented Material Handling

Most plants are aware of visible losses - scrap, downtime, breakdowns. But the largest losses are often invisible, quietly eroding profitability every day.

The Future of Plastics Processing

The plastics industry is rapidly moving toward intelligent, connected manufacturing environments.

Key trends shaping plastics processing:

- AI-driven process optimisation
- Fully automated material tracking
- Increased use of recycled and bio-based materials
- Smart factories with predictive maintenance
- Energy-efficient processing technologies

Integrated material management is the foundation enabling this transformation.

Plants with integrated systems report

✅ 20–30% improvement in OEE

✅ Virtually zero in downtime

✅ Reduction in scrap & rework

Manual coordination can cost hundreds of production hours per year. These issues don't appear on balance sheets - but they directly impact margins.

Quality

Excellence Defined Uncompromising Quality, Every Time

Material Storage → Drying → Blending → Conveying → Processing → Continuous Feedback

What "Closing the Loop" Really Means

Integrated material management ensures:

- Material demand automatically triggers material movement.
- Every transfer is controlled, monitored, and verified
- Drying, blending, and conveying are synchronised
- Feedback loops prevent errors before they occur

Result: Material moves only when required, only where required, and only in the correct condition.

How Closed-Loop Material Management Works

A Day in a Non-Integrated Plant

- Dryer finishes drying, but no signal reaches the loader
- Operator manually transfers material
- Wrong material loaded during shift change
- Machine runs with incorrect or moist resin
- Batch rejected → rework → downtime

A Day in an Integrated Aerodry-Enabled Plant

- **Material Demand Generated** - Processing machine signals requirement.
- **Automated Conveying Activated -** AVL loaders deliver material through dedicated lines.
- **Dryer–Loader Interlock -** Only properly dried material is released.
- Blender Synchronisation - Gravimetric blender doses accurately per recipe.
- Continuous Feedback - Sensors confirm level, flow, and availability.
- Exception Handling - System alerts operators before material runs out.

Real-World Example

A packaging plant running 8 machines:

✅ Reduced manual material handling by 90%

✅ Eliminated material mix-ups entirely

✅ Recovered over 1,200 production hours annually

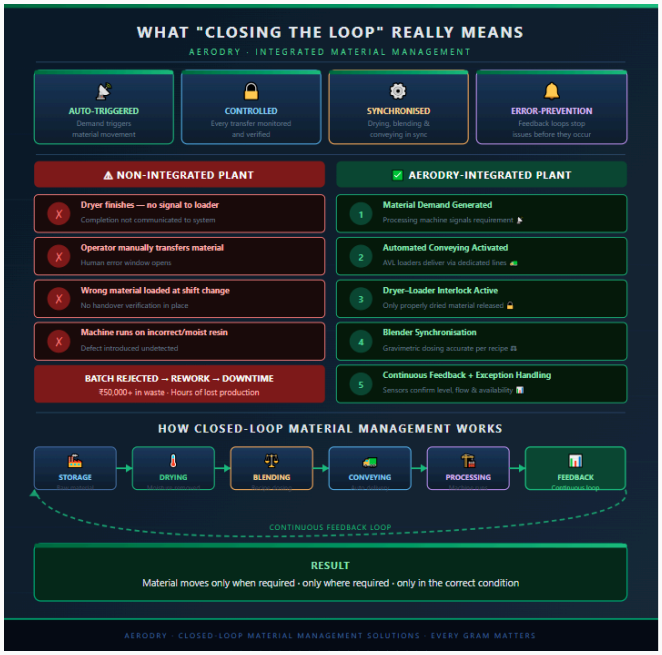
Material Traceability in Modern Plastics Plants

Traceability ensures that every batch of material can be tracked from receipt to final product.

Why Traceability Matters

- Prevents material mix-ups
- Enables faster root-cause analysis
- Supports regulatory compliance
- Improves quality control
- Reduces recall risk

Integrated material management enables automated tracking and full process visibility.



A single mis-routed batch due to manual conveying can cost a processor up to ₹50,000 in wasted material and rework.

Common Processing Problems - Causes & Solutions

- **Silver Streaks / Bubbles**
  Cause: Moisture in material
  Solution: Improve drying control and closed material transfer.
- **Colour Variation**
  Cause: Inconsistent blending or material contamination
  Solution: Gravimetric dosing and dedicated conveying lines.
- **Inconsistent Product Dimensions**
  Cause: Variable material feed or moisture level
  Solution: Controlled conveying and material monitoring.
- Frequent Machine Stoppages
  Cause: Irregular material supply
  Solution: Automated demand-driven material delivery.
- Systematic material control reduces quality defects and production interruptions.

Customer Perspective

What Processors Experience After Integration

"After implementing Aerodry's integrated conveying and drying solution, we observed immediate improvements in process stability and material control. Manual dependency reduced significantly, and our rejection rate dropped within the first quarter."

- Processing Head, Consumer Durable, Bhiwadi

ROI Focus - Quantifying the Value of Integration

Where ROI Comes From

- **Reduced Material Waste -** Closed conveying prevents spillage, contamination, and incorrect loading.
- **Lower Labour Costs -** Fewer manual transfers and less operator dependency.
- **Higher Machine Utilisation -** Machines no longer wait for material availability.
- **Reduced Rework & Scrap -** Consistent material quality reduces rejection rates.
- **Energy Efficiency -** Optimised drying and conveying minimise unnecessary energy use.

Typical Payback Timeline

Improvement Area	Typical Impact
Material loss reduction	1–2% savings annually
Productivity increase	10–20%
Downtime reduction	100%
ROI payback	6–12 months

A well-designed integrated system typically pays for itself through operational savings and efficiency gains.

Integrated material management transforms daily plant operations from reactive troubleshooting to predictable performance.

Aerodry Shines at Plast India 2026

Aerodry made a powerful impact at Plast India 2026, showcasing cutting-edge innovations and next-generation material handling solutions at Bharat Mandapam. The six-day exhibition saw overwhelming response from industry leaders and customers, with the launch of the world's smallest gravimetric blender emerging as a major highlight. The event strengthened partnerships, enabled meaningful industry interactions, and reinforced Aerodry's commitment to innovation, precision, and customer-centric excellence.

Key Engagements

✅ Live product demonstrations
✅ Technical discussions with processors & OEMs
✅ Industry collaboration opportunities
✅ New customer partnerships

We thank all partners and visitors who interacted with our team and explored Aerodry's automation solutions.

From Aerodry Product Desk

Built for Real Industrial Conditions

At Aerodry, our solutions are engineered for reliability, efficiency, and long-term operational stability in demanding production environments.

- Contamination-free material transfer
- Seamless integration of drying, conveying, and processing
- Reduced material loss and handling risk
- Energy-efficient design
- Scalable automation

Aerodry systems ensure consistent material quality and uninterrupted production.

Let's Talk Integrated Material Management

Looking to optimise or automate your material handling system? Aerodry specialists can help design custom conveying layouts tailored to your throughput, resin types, and plant layout.

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