Driving Changeover Efficiency and Throughput in Modern Flexo

Lessons from the TRESU Flexo Innovator

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The New Speed Imperative

In today's high-mix, fast-turnaround packaging environment, converters face a familiar challenge: how to reduce changeover time without compromising quality or throughput. Job runs are getting shorter, product variants are multiplying, and customers expect consistent print results with minimal lead times.

The question is no longer if printing presses can make job changes quickly — it's how effectively they can do it, and how consistently they can maintain performance across shifts and sites.

A new generation of press design is making this possible.

The TRESU's Flexo Innovator is a next-generation inline flexographic printing press engineered to improve automation, flexibility, and overall equipment effectiveness (OEE).
With its modular architecture, optimized web path, automation and user-focused control interface and Dual ink Decks, it illustrates how the industry's best presses are combining engineered intelligent mechanics and digital control to deliver real business gains.

The new Next Generation TRESU Flexo Innovator's modular design supports single or dual ink-deck configurations, giving converters flexibility for diverse job mixes and job changes on the fly – with minimum waste.

The Economics of Speed

Every minute of downtime costs production capacity and impacts Overall Equipment Effectiveness (OEE).
With job changes lasting up to an hour, a press may lose the equivalent of a full day of printing each week. Multiply that across a multi-press plant, and the cost is significant — in both productivity and profitability.

Reducing changeover times creates a direct capacity uplift. That means more jobs per shift, faster time-to-market, and better asset utilization — without adding

headcounts or capital equipment.

“Automation builds confidence - presses reach stable print quality faster, with less waste and fewer adjustments.”

Engineering Change at Machine Level
TRESU designed the new TRESU Flexo Innovator around a clear goal: reduce the non-printing portion of every production cycle. The new printing press was designed and engineered around four key pillars: Automation, flexibility, quality and sustainability, which are built into the features of the new TRESU Flexo Innovator.

1. **Engineered modular configuration – built for purpose**
   The TRESU Flexo Innovator’s modular structure and the free choice of any single- or dual ink decks allow converters to tailor and configure a press design matching their needs while securing an ability and flexibility to adapt quickly to any changing production needs, whether that means running a sequence of short jobs or shifting to longer, high-volume orders with minimal setup time.

2. **Raw Speed Delivers – Not Just on Paper**
   When evaluating press performance, the headline “Mechanical Speed” only tells part of the story. What truly matters is whether the press can maintain full production speed under demanding conditions. At TRESU, we believe “just slow down if drying becomes an issue” is not an acceptable answer.

   The latest generation of the Innovator has been designed for bounce stability under heavy impression loads. This capability is the result of extensive analysis of data from our installed base, advanced computer-aided simulations (including FEM), and extensive real-life testing on demanding production scenarios.

   The Flexo Innovator is configured to run at its specified top speed at 800m/min (2,625 ft/min) on the most challenging jobs defined by the customer – for example, heavy recycled board of 600 gsm combined with large solid areas and wet laydowns of 4 gsm. WB ink or coating.

   To achieve this, each printing unit features TRESU’s unique Velocidryer™ system, engineered and dimensioned for the defined job requirements. This ensures perfect drying even under extreme conditions, avoiding issues such as ghost printing and other common challenges in water-based flexo printing.

3. **Sustainability Built into the Process**
   The VelociDryer™ concept isn’t a recent innovation—it was engineered long before sustainability became a headline priority and has been fine-tuned over many years.

   Each dryer section features a recirculating airflow system with two compartments, reusing up to 70% of the hot air. While this design adds complexity to hood construction, it delivers long-term benefits through highly efficient drying and significantly reduced energy consumption -

providing not only a win for the climate but also a logical economic advantage. Paired with an adaptive temperature control system, the press automatically optimizes drying performance and energy consumption - eliminating operator overrides based on personal assumptions. Data collection and process reporting confirm that this approach can cut energy consumption by more than 30%, even before factoring in the additional energy load typically required by print room ventilation systems.

And this is only one dimension of the Innovator's sustainability profile. Other features such as minimized ink volumes and reduced paperboard waste further reduce the environmental impact while maintaining uncompromising printing quality and throughput.

The optimized web path not only minimizes substrate waste, but also accelerates start-up, since less material is needed for registration and colour control

4. **Enhanced integrated ink logistics**
   TRESU's advanced ink management systems reduce ink waste and maintain consistent viscosity and colour balance. This eliminates the traditional trial-and-error adjustments that often extend setup time and increase material waste.

   Precise ink control further ensures consistent output and predictable performance. For brands and converters alike, this reliability translates directly into stronger supplier relationships and better total cost of ownership.

5. **Simplified operation and integrated automation build confidence**
   A redesigned human machine interface (HMI) and portable tablets put critical controls literally in the hands of the operators. The system guides job setup and changeover in a clear, structured sequence, reducing operator dependency and training time.

   Recipe-driven job presets, and inline quality monitoring combine to stabilise printing conditions quickly after each job change: The press reaches sellable quality faster, with fewer adjustments and less material wasted.

   The Innovator's ergonomic design and mobile controls support these workflows, making it easier for teams to run multiple tasks and follow consistent routines. The compact design improves ergonomics with easy access to each printing unit and all daily operations taking place at floor level.
   This also means faster maintenance access and improved serviceability - critical factors for sustaining uptime.

6. **Reducing Changeover Time with Dual ink Decks**
   In modern packaging workflows, every minute of non-printing time impacts overall efficiency. Apart from a superior thorughput and speed, the new generation Flexo Innovator also addresses the challenge of fast change over times with an integrated approach combining Dual Ink Deck (DID) technology and Auto Impression to streamline job transitions.

   With DID, preparation for the next job begins while the current job is still running. The complete job - including

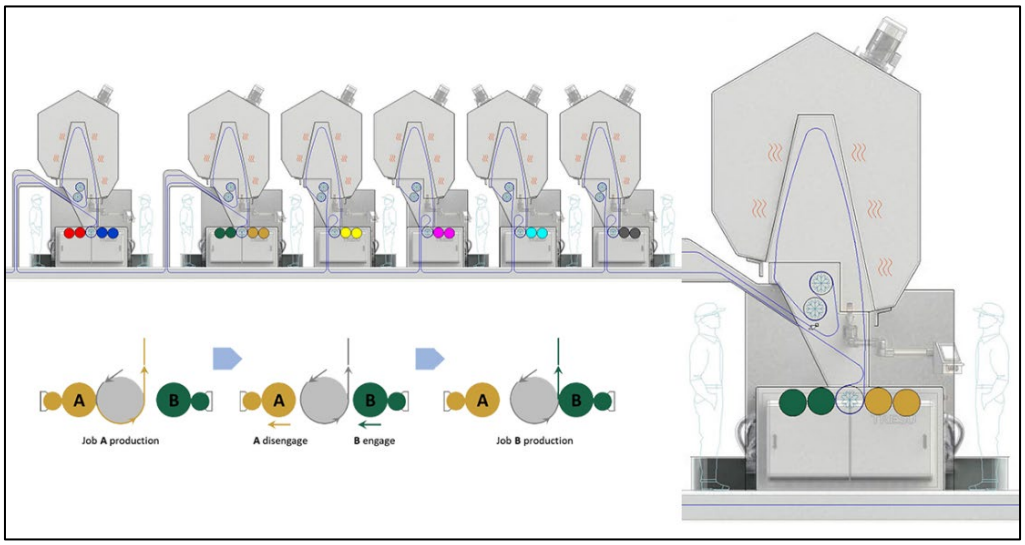
print image, ink, and settings - is staged in parallel, so when the changeover starts, everything is ready.

In real-life cases, this coordinated process has proven the ability for the press to reach sellable quality in less than 10 repeats, minimizing waste and maximizing uptime significantly.

It's not about adding complex automation steps for job changeover—it's about eliminating them entirely so the next job takes over immediately.

Auto impression settings are made possible because topography scanning is embedded in the sleeve-mounting workflow, ensuring precise adjustments in the press without adding extra process steps during preparation.

This integration simplifies the process and supports consistent print quality across demanding production schedules.



The Next Generation TRESU Flexo Innovator features Dual ink Decks with job changes on the fly and also optimized web path to reduce waste. This new compact footprint reduces floor-space requirements too.

"Reducing change over time isn't just about running faster — it's about running smarter."

From Machine Innovation to Operational Discipline

Technology alone doesn't deliver efficiency — it enables it. The most successful converters pair advanced equipment with disciplined operations practices and KPI measurements.

Many of these are inspired by lean manufacturing. By distinguishing between internal (press-stopped) and external (press-running) setup tasks, and by pre-staging tooling, ink, and substrates, printers can trim changeovers a lot.

Standardised changeover checklists, accessible via tablets or control screens,

ensure that best practices are repeated across shifts — reducing waste and improving uptime.

Measuring the Right Metrics
For executive leadership, the goal is not just faster setup, but measurable business improvements. Some key metrics are:

- Average changeover time
- Jobs completed per shift
- First-pass yields
- Substrate and ink waste per run
- Overall Equipment Effectiveness (OEE)

Tracking these KPIs allows leadership teams to see the real value of automation and operational refinement.
Today's converters report significant OEE improvements, largely driven by shorter changeovers and faster restart times.

Flexibility for a Changing Market
The market trend toward shorter print runs is accelerating. The ability to switch rapidly between jobs and designs - without compromising consistency - is already a commercial necessity.

Reducing waste is not only a cost advantage - it's also a sustainability win.

Less substrate and ink consumption per job, combined with an optimized web path and improved print stability, helps converters lower their environmental footprint while maintaining top-tier print quality.

A Blueprint for the Modern Flexo Plant
Ultimately, the TRESU Flexo Innovator represents more than a single machine — it reflects the broader direction of the flexographic industry: smarter automation, modular design, connected workflows, and a renewed focus on uptime and efficiency.

For executives planning their next investment cycle, the lesson is clear:

Productivity gains in flexo no longer come solely from running faster. They come from running smarter - from eliminating idle minutes, automating setup and quality control, and empowering operators with intuitive, data-driven tools.

As converters align these technologies with lean, standardised processes, they unlock a powerful competitive edge: faster changeovers, higher throughput, and consistent print excellence - all from a more sustainable operation.

The Flagship of Water-Based Flexo – Complete Integration by Design
TRESU Flexo Innovator is more than a press – it is TRESU's flagship solution, combining all of TRESU's well-known core competencies in flexo technology into a fully integrated, turnkey delivery.

Every element of the system works in symbiosis: ink logistics, flexo ink deck technology, drying, heating, cooling, web control, and control systems are engineered to operate seamlessly under one unified control platform.

No complicated interfaces.

No fragmented responsibility.

From Bucket to Board
This integration ensures that performance is optimized across the entire workflow: From ink logistics to print quality and process stability.

All components are engineered, designed, and assembled by TRESU under one roof, guaranteeing consistency, reliability, and accountability.