

When small defects become big losses: Why process stability is becoming the key competitive factor in tissue production

Andrea Friedrich, Account Director Europe Pulp & Paper, ISRA Vision

INTRODUCTION:

A web break is one of the most visible and disruptive events in tissue production. When it occurs, operators react immediately, production stops, material is lost, and valuable time is spent restoring normal operation. In converting, rethreading the web after a break can take considerable time, creating significant downtime and production losses.

Web breaks rarely happen without warning.

Long before the break itself, the production process often provides signals that something is changing. Small holes, edge defects, contamination, wrinkles, irregular crepe structures, and other imperfections can appear in the material. At first glance, they may seem insignificant. They are frequently early indications of process instability, machine wear, or developing quality issues.

For tissue producers operating in an increasingly competitive market, the ability to recognize and act on these signals has become a critical success factor. Process stability is no longer just an operational objective. It is increasingly a source of competitive advantage.

Why tissue production is becoming more challenging

Over the last decade, tissue manufacturers have faced growing pressure from multiple directions. Customers expect consistent quality. Production lines continue to increase in speed and efficiency. At the same time, manufacturers must control costs, reduce waste, improve sustainability, and maximize asset utilization. Every unnecessary stop, every ton of wasted material, and every quality deviation have a direct impact on profitability.

Modern tissue machines are engineering achievements capable of delivering impressive production volumes. However, higher speeds also mean that small abnormalities can develop into serious problems much faster than in the past.

A minor defect that might once have remained inconsequential can now trigger significant downstream consequences. As production speeds increase, the available reaction time decreases. Process stability therefore becomes increasingly important - not only for quality assurance but also for maintaining productivity and profitability.

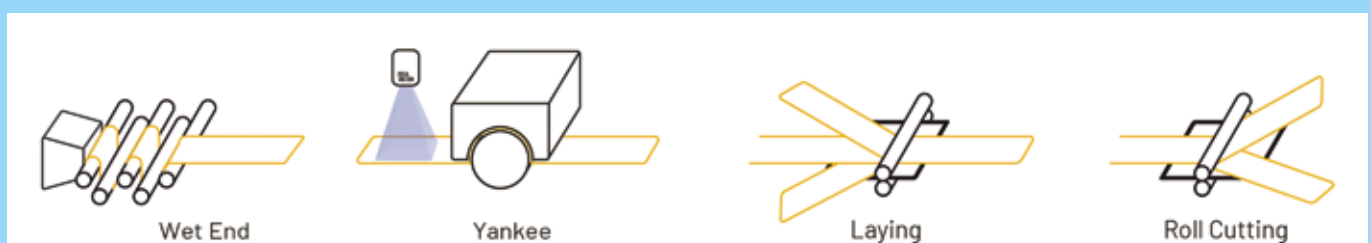


Image 1: IntelliCam-Cam

The warning signs hidden in the web

Every meter of tissue produced contains information about the health of the manufacturing process. Defects are often viewed solely as quality problems. They can also serve as valuable indicators of process conditions. A hole may point to issues with wires or felts. An edge defect may indicate wear in critical components. Contamination may reveal cleaning requirements. Wrinkles or creases may suggest tension-related issues within the machine.

The important point is that these defects rarely occur in isolation. They are often symptoms of underlying process conditions that, if left unaddressed, may eventually result in larger quality issues, production instability, or web breaks. By viewing defects as early warning signals rather than isolated events, manufacturers gain an opportunity to intervene before more costly consequences arise.



This shift in perspective fundamentally changes the role of quality information. Instead of merely documenting what went wrong, defect data can help explain why problems are developing in the first place.

When recurring defects become maintenance signals

Some of the most valuable information does not come from individual defects but from recurring patterns.

A defect that appears repeatedly at regular intervals often points to a specific machine-related issue. Worn blades, damaged wires, contaminated machine elements, or other mechanical conditions can leave recognizable signatures within the product. These recurring patterns can provide important clues about machine health and maintenance requirements.

Historically, many maintenance activities have been performed according to fixed schedules. While preventive maintenance remains important, fixed intervals do not always reflect the actual condition of equipment.

In contrast, process-related defect information offers a more direct view of what is happening inside the production line. If recurring defects indicate developing wear or contamination, maintenance can be planned based on actual machine behaviour rather than assumptions alone.

This approach offers two important advantages. First, it can reduce the risk of unexpected failures. Second, it can help avoid unnecessary maintenance activities that increase costs without creating additional value.

The limits of human observation

Tissue manufacturing has always depended on experienced operators. Their knowledge remains essential for maintaining stable production and responding to changing conditions. However, even the most experienced operator faces limitations.

Modern production lines run at speeds that make comprehensive visual inspection virtually impossible. Large web widths and continuous production generate vast amounts of information every minute. Valuable indicators of machine condition or product quality may be present within the material stream, but they can easily go unnoticed when relying solely on human observation. This is not a question of expertise or commitment. It is simply a consequence of scale.

As production speeds increase and quality requirements become more demanding, manufacturers need additional tools to provide objective visibility into the production process. Access to continuous, data-driven information helps ensure that important signals are identified consistently rather than depending on chance observation.

From quality control to process intelligence

For many years, inspection systems were viewed primarily as quality-control tools.

Their purpose was straightforward: identify defects and separate good material from bad material.

Today, leading manufacturers are beginning to extract additional value from inspection data. Instead of focusing exclusively on defect detection, they are using quality information to gain deeper insight into process performance and operational stability.

This evolution reflects a broader trend across manufacturing.

The most valuable question is often no longer:

“Did a defect occur?”

Instead, manufacturers increasingly ask:

“What does this defect tell us about the process?”

By analysing defect patterns, frequencies, locations, and trends over time, organizations can uncover relationships that would otherwise remain hidden. These insights can support root-cause analysis, reveal recurring issues, and help identify improvement opportunities across the production process.

Inspection data therefore becomes more than a quality record. It becomes a source of operational intelligence.

Breaking down the barriers between quality and maintenance

In many manufacturing environments, quality assurance and maintenance have traditionally operated as separate functions. Quality teams focus on product performance and compliance. Maintenance teams focus on equipment reliability and uptime.

However, the underlying causes of quality issues and maintenance problems are often closely connected. A worn machine component can generate defects in the product. If those defects worsen over time, they may eventually lead to web breaks, downtime, or production losses. In this sense, product quality and machine health represent two different views of the same process reality.

Forward-thinking manufacturers are increasingly recognizing the value of connecting these perspectives. When quality information is shared with maintenance teams and maintenance insights are incorporated into quality analysis, organizations gain a more complete understanding of process behaviour. This transparency supports faster root-cause identification and enables more targeted corrective actions.

Rather than reacting to individual problems, production teams can focus on preventing them.



Image 2: Tissue defect web break 1.



Image 3: Tissue defect web break 2.



Image 4: Tissue defect web break 3.

The economic value of process stability

The benefits of process stability extend far beyond quality metrics. Every avoided web break reduces disruption. Every reduction in downtime contributes to higher machine availability. Every improvement in process consistency can increase the amount of saleable material produced. The cumulative impact of these improvements can be substantial.

More stable production often leads to:

- Reduced waste
- Fewer quality deviations
- Lower maintenance costs
- Improved machine utilization
- Better production planning
- Increased overall productivity

Importantly, these benefits tend to reinforce one another. Improved process stability supports higher quality. Higher quality reduces waste and rework. Lower waste contributes to better economic performance. Better maintenance planning increases availability and extends component life.

In an industry where margins are under constant pressure, these operational improvements can significantly influence competitiveness.

Toward a more proactive production model

The future of tissue manufacturing will likely be defined by increasingly proactive operating strategies. Rather than waiting for visible quality problems or equipment failures to occur, manufacturers are seeking ways to identify emerging issues earlier and respond before disruption takes place.

This shift requires greater process transparency. It requires access to reliable information about both product quality and machine condition. Most importantly, it requires a willingness to view quality data not simply as evidence of past performance, but as a guide for future improvement.

As manufacturers continue their digital transformation journeys, data-driven decision-making is becoming a central component of operational excellence. The organizations that successfully connect quality insights, maintenance activities, and process optimization efforts will be better positioned to improve productivity, reduce costs, and strengthen their competitive position.

Looking beyond the next web break

A web break is rarely the beginning of a problem. More often, it is the final visible consequence of conditions that have been developing throughout the production process.

The manufacturers that achieve long-term success will be those that learn to recognize the signals that appear before disruption occurs. Small defects, recurring patterns, and emerging trends can provide valuable insight into process health and operational stability. When used effectively, these signals enable earlier intervention, smarter maintenance decisions, and more stable production.

Ultimately, the future of tissue manufacturing will not be determined solely by how quickly defects are detected. It will be defined by how effectively manufacturers use the information hidden within those defects to improve process stability, enhance productivity, and create sustainable competitive advantage.



Want to learn more?

Expert Guide: Efficient processes and consistent quality
– How to secure your competitive advantage in tissue production

- **Discover:**
- **Typical causes of web breaks**
- **The role of inspection systems**
- **How monitoring supports maintenance optimization**
- **Practical examples from tissue production**
- **Economic benefits of improved process stability**
- **Approaches to reducing downtime and waste**

Download the Expert Guide from ISRA VISION for a deeper look at strategies for stabilizing tissue production and improving operational performance.

URL for expert guide: <https://www.isravision.com/en-en/forms/download/expert-guide-tissue>

Author:

Andrea Friedrich
Key Account Manager
Pulp & Paper
ISRA VISION

