NIP SYSTEM SOLUTIONS

On-Site Nip Roller Diagnostics + Web Handling Expertise

TJWALKER+ ASSOCIATES INC

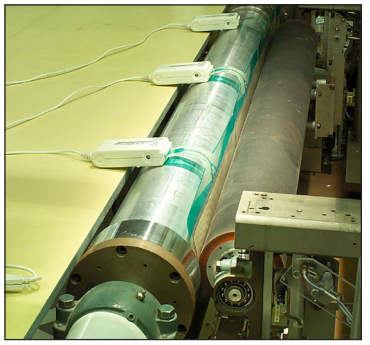
OPTIMATION

Nipped roller systems are vital to many industries controlling web-based processes such as coating, laminating, and winding. They can also be a major source of waste and product variations. Most nipped roller systems operate in simple open-loop pressure control with no feedback to their actual pressure uniformity.

Our **Nip System Solutions** are designed to help you:

- *Measure how your system is performing*
- *Diagnose the cause of waste and variations*
- *Recommend remedies for a more robust process*

Improve your profitability by understanding your process nips and eliminating nip related defects such as web shifting, wrinkling, creasing, de-lamination and web curl



How Much is Uneven Nipping Costing your Process?

Problems caused by poor nipping include:

At any nipped process: shifting, wrinkling, foldover, speed variations, tension variations, and web breaks

At coating, printing, calendaring, and embossing nips: crossweb and machine direction variations

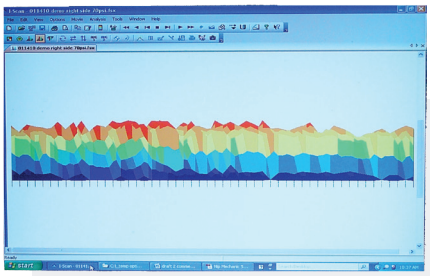
At laminating: wrinkles, air bubbles, and web curl

At winding: wrinkling, shifting, bagginess, buckles, tight wind, and loose wind

Uniform Pressure is the first step towards solving your process problems

Nipped roller systems are difficult to diagnose and model due to the complex interaction of many variables. The ideal nip roller system for your process includes understanding:

Loading mechanism and structure
Rubber roller coverings
Web material properties
Web path mechanical behavior
Tensioning system
Web-to-roller traction



Our Nip Diagnostic Package:

On-site Nip Pressure Characterization, Measurement, and Engineering Report

Pre-Trip: We will talk with you to understand your process and your goals.

On-Site: Our field engineer will work with your team, providing complete measurement and diagnostic assessment of your nip roller system.

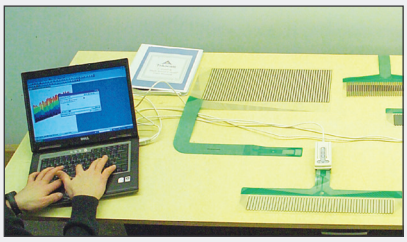
Post-Trip: One of our web handling specialists will review the field diagnostics and measurements, then deliver a complete nip pressure characterization and process improvement recommendation report.

- The Nip Diagnostic Package includes 12 hours of field engineering time divided roughly 50-50 between in-plant measurements and pre- and post-trip conditioning, calibration, data analysis, and technical summary.
- The Nip Diagnostic Package report will include 3D nip roller pressure profile, comparisons of pressure vs. process variables, what-if analysis of changes to your process, and a recommended action plan addressing your specific goals (such as eliminating wrinkles, reducing web shifting, eliminating curl, or other nip-related defects).
- We will work with your people and process to ensure safety and confidentiality.

NIP SYSTEM SOLUTIONS: On-Site Nip Roller Diagnostics + Web Handling Expertise

Nip Diagnostic Package: *More Details*

Pressure Mapping System



1. **Nip System Evaluation:**
   Evaluate your Nip System Capabilities:
   Define the rollers of the nip system, the nip loading mechanism, web properties, tension control and roller drive systems. Output: All variables required to understand and model your nip system
2. **Nip System Measurements and Analysis**
   Roller Diameter and Contact Length Measurement vs. Width:
   Pi tape across their full width to detect any variations from machining or wear.
   Use one or more techniques to measure nip footprint dimension.
   Two-Dimensional Nip Pressure Mapping:
   Use the I-Scan Nip Pressure Measurement System from Tekscan to map out nip pressure in both machine and traverse directions.
   Rubber Roller Modeling:
   We will compare your measured pressures and footprint to a 2D roller contact model and show how changes in basic variables would improve your nip system performance.
3. **Nip System Engineering Analysis and Recommendation Report:**
   A complete report on how your system works, including our measurements, opportunities for improvement, possible remedies, and a recommended action plan.

Additional Services:

The Nip Diagnostic Package alone may provide the answers to your problems, but when you need more you will find we are ready. No other resource can provide the 1-2-3 combination of complete measurement system support, internationally recognized web handling experts who provide root cause understanding, and a full service design-build-install-commission team to implement your solutions.

3D Nip Loading and Deflection Analysis

Your system will be entered into our proprietary 3D model to understand the contribution of your roller design and loading mechanism compared to the measured values of Tekscan I-Scan pressure map. This analysis will provide a predictive model to help identify the best of alternate remedies and extrapolate to other products or processes.

Nip-Related Defect Assessment

If you are interested in more than pressure mapping, select this option to combine defect problem solving and process experiments with the Nip Diagnostic Package. Investigate and understand general (wrinkling, shifting, spreading) and lamination-specific (curl, bubbles) nip-induced defects, either at your facility or at the state-of-the-art Optimation Media Conveyance Facility.

Complete Engineering Solutions

Optimation Technology Inc. is fully integrated, with expertise in process development, machine design, installation, and commissioning. The Nip Diagnostic Service may be the first step in a complete turn-key solution to your process needs.

Training and Technology Transfer

Employee training in nip system fundamentals or nip uniformity measurement methods can be tailored to your specific process requirements, and can be delivered as on-site training classes or web-based training presentations.

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