Automatic Shrinkage Measurement System for Textiles
In textile manufacturing, the **compressive shrinking process** can cause elongation and **shrinkage inconsistencies** which negatively affect product quality and overall production costs.

**Manual stick testing** is performed by a production operator who places ink marks on the fabric roll before the shrinkage processing, then manually measures the marks to calculate shrinkage after shrinkage processing. This is the production method most trusted to predict **residual shrinkage** and still widely used today.

Traditionally, manufacturers have managed and controlled the cost of **shrinkage inconsistencies** by stick-testing a small portion of fabric (<0.1%) and adjusting compressive shrinking factors to obtain the target shrinkage **while ignoring the untested 99+%**.

Precisely measuring shrinkage of 100% of the fabric would yield the highest quality product but has not been practical… until now.
Reasons Inaccurate Compressive Shrinking Measurement can be Costly:

- **Undershrinkage**
  - Requires reprocessing
  - Affects brand quality and reputation

- **Overshrinkage**
  - Losses in fabric yield and corresponding revenue
  - Potential for undesirable “fabric growth”

- **Excessive Wash Tests**
  - 1.0M of fabric + production resource lost with each test

- **Customer Dissatisfaction**
  - Increased Customer returns and complaints
  - Creates opportunities for competitive brands
Some manufacturers use alternative measurement methods to calculate a “relative shrinkage measurement”. These methods may not be adequate for textile applications that require precise shrinkage measurement.

- Alternative methods may utilize complex algorithms to hide read errors inherent with counting threads.

- Shrinkage measurement accuracy of an estimated ½ to 1% for alternative methods.

- Using an overall average for shrinkage measurement per roll will not capture isolated production problem areas.
What is the Best Solution to Minimize Costs, Maximize Revenue and retain Customer Satisfaction from Compressive Fabric Shrinkage?

Best Solution: YieldMAX

YieldMAX (AMST)
YieldMAX Measurement Process

2. Fabric is processed through the Sanforizer system.
3. YieldMAX Detector Module captures non-invasive fluid marks after shrinkage.
4. YieldMAX Controller calculates the post process shrinkage measurements.
5. YieldWARE PC software captures the process data and generates production reports.
YieldMAX is simple to operate
PC Software keeps history of the production results.
Residual Shrinkage Consistency: with YieldMax vs. without

The accuracy and continuous measurement by YieldMAX produces a more accurate residual shrinkage from beginning to end of the lot, and roll to roll. Consistent residual shrinkage facilitates tightening shrinkage standards in the process (see figure at left).

Consistent fabric yield minimizes:
1. Wash test failures
2. Reprocessing of fabric
3. Over shrinkage
4. Fabric returns
5. Customer complaints
### YieldMAX ROI Calculator

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working Weeks Per Year</td>
<td>50 weeks/year</td>
</tr>
<tr>
<td>Fabric Selling Price Per Linear Meter</td>
<td>$3.00 dollars/meter</td>
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<tr>
<td>Percent Reduction in Overshrinkage</td>
<td>0.20% reduction</td>
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<tr>
<td>Number of Compressive Shinking Ranges</td>
<td>2 Ranges</td>
</tr>
<tr>
<td>YieldMAX Investment per Machine</td>
<td>$34,950 dollars per YieldMAX</td>
</tr>
<tr>
<td>Distance Between Shrinkage Reads (Marks)</td>
<td>4.00 meters/ marking</td>
</tr>
<tr>
<td>Meters Produced per Year Total</td>
<td>30,000,000 meters/ Year</td>
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<tr>
<td>Annual Sales Total</td>
<td>$90,000,000 dollars/ year</td>
</tr>
<tr>
<td>YieldMAX Residual Cost estimate</td>
<td>$6,250 dollars/ year</td>
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<tr>
<td>Annual Savings Total</td>
<td>$173,750 dollars/ year</td>
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<tr>
<td>Total Investment</td>
<td>$69,900 dollars</td>
</tr>
<tr>
<td>Return on Investment (months)</td>
<td>4.8276259 months</td>
</tr>
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Listing of YieldMAX Major System Revisions since 2010:

- Reduced the number of ink heads per system to one, which reduced maintenance and ink consumption by 50%.
- Improved ink heads by design upgrades and parts improvements. The original heads used a small capacity filter that caused most issues. By upgrading to high volume filter, the clogging problems were eliminated.
- Added head automatic water flush, which greatly reduced head incidents.
- Reduced ink pricing.
- Reduced YieldMAX system and parts pricing.
- We have improved and streamlined Customer support response time by PSI directly supporting all customers.
YieldMAX Maximizes Profits by:

- **Minimizing Undershrinkage**
  - Close monitoring minimizes or eliminates reprocessing

- **Minimizing Overshrinkage**
  - Consistent shrinkage allow customers to optimize their residual shrinkage target

- **Reducing Wash Testing**
  - Fewer wash tests per batch required

- **Improving Customer Satisfaction**
  - Roll Shrinkage history can be easily produced in Yieldware and serves as historical record
Why YieldMAX?

- **YieldMAX** uses an automated, reliable, highly accurate, non-invasive marking technology that can **measure each yard of fabric to produce maximum fabric yield!**

- **YieldMAX** accuracy and consistency:
  - requires **less frequent stick testing**.
  - can greatly **reduce wash testing**.
  - eliminates or greatly reduces Overshrinking, which **MAXimizes revenue**.
  - eliminates or greatly reduces Undershinking, which **MAXimizes brand quality**.
  - allows manufacturers to realize **MAXimum yield** and **MAXimum profit** by preserving fabric usually lost from using less precise methods.

- **YieldMAX** is the only trusted shrinkage measurement system used in closed-loop control Sanforizer systems.

- **YieldWare** logs data for each yard of every roll, which serves as historical record and helps **prevent customer returns**.
Maker of the world’s most trusted shrinkage measurement technology for textiles

and

YieldMAX™

and

YieldWARE™