SETS INDUSTRY STANDARD FOR DISTORTION INSPECTION

100% REAL-TIME INSPECTION OF EVERY GLASS SHEET

PROCESS CONTROL TO IMPROVE TEMPERING AND LAMINATION YIELDS

INCREASES THROUGHPUT

REDUCES DEFECTS AND WASTE

INCREASES PROFITS

Osprey™ 9 Distortion

Distortion + Flatness Inspection System for Tempered and Laminated Glass or Sheet Plastic

“After installing our Osprey systems, quench breakage dropped from 4% to 1%! The Osprey gives us the process control we lacked before installing the systems.”

— T. MOORE, GENERAL MANAGER, GLASS & MIRROR CRAFT
OSPREY™ 9 DISTORTION

Distortion + Flatness Inspection System

Designed for Tempering Lines, Lamination Lines, Float Lines, and Plastic Sheet Manufacturing

The Osprey™ 9 Distortion by LiteSentry™ is the industry standard for real-time inspection of tempered glass. Designed and manufactured in the U.S. to the highest standards of precision and durability. The Osprey™ is the only system meeting the requirements of leading architects, Vitro (formerly PPG) Certified Fabricators, Guardian Select Fabricators, and suppliers to U.S. government contracts.

Using patented optics, high-speed cameras, and powerful algorithms, the Osprey™ 9 Distortion provides precise measurement of all types of optical distortion in every orientation, with true millidopter (mD) optical measurement accuracy:

- bi-stability
- saddle bow
- local bow
- roll wave
- edge kink
- center kink
- vertical kink
- pocket
- hammer
- belly banding
- bird’s eye
- picture framing
- edge lift

The Osprey™ 9 Distortion is a rugged, production-ready inspection system designed to improve quality and provide process control from day one.

- Inspect for distortion, flatness, size, and thickness
- Certified to ASTM, ISO, EN requirements for optics
- Meets or exceeds Vitro CF, Guardian SF, U.S. government, and leading architectural fabrication specifications
- Improves process control by giving operators real-time data on distortion and flatness

Screen shot of Osprey™ display showing a 3D view of glass distortion
**Standard Features**
The Osprey™ system comes in a self-supporting, rugged enclosure with an integrated cooling system for use in industrial environments.

The Osprey inspects any flat glass or plastic sheet:

- 2-19 mm thick
- Clear, hard or soft coat low-E
- Tinted or reflective

**Optical System, Displays, and Data**

- High resolution visible light cameras inspect sheets from 500-3500 mm (20-138 inches) wide
- Patented reflected white LED lighting and optics provide accurate dynamic measurement of optical distortion in mD (millidiopters) and peak-to-valley measurement in millimeters or inches
- Local and remote displays for immediate operator feedback
- Pop-up 3D visualization shows optical topography and 2D side profiles
- Color-coded distortion maps for immediate problem recognition and operator interpretation and action
- Quality and throughput statistics by sheet area, location on conveyor, shift, date, time
- Trend graphing to evaluate line and operator performance over time
- XML open source data integration with customer databases

**Technical Specifications**

- Dynamic measurement resolution: 0.010 diopter (10 mD) at 400 mm/s substrate velocity
- Measurement range: -550 mD to +550 mD
- Measurement accuracy and precision*: 10 mD over -200 mD to +200 mD range
- Thickness sensor accuracy: +/- 0.1 mm for glass thickness of 0-8 mm and +/- 0.2 mm for glass thickness of 9-25 mm
- Operating environment: 4-50°C (40-122°F)

*Actual dynamic accuracy of 0.004 diopters at 99% confidence interval (Osprey Accuracy Test Report 2016).

**“The Osprey is a great piece of equipment. We don’t need to go through a physical gauge measurement every hour. We make adjustments as we go to improve quality. And we don’t have to sort through an hour’s worth of glass if a measurement is out of specification.”**

— C. ECKBERG, PROCESS ENGINEER, VIRACON

Actual Osprey™ screen images with photos of installed windows showing common optical distortions
Features in the Osprey™ 9

The Osprey™ 9 features upgrades to optics, lighting, measurement specification, user control, and data handling. Operators have even better real-time process control!

- NEW Additional quality analysis tools
  - Pocket distortion analysis
  - Perimeter and center analysis
- NEW Supports Windows 10 LTSC
- NEW DXF file for tracking shapes
- NEW Enhanced TemperQC™ integration capabilities
- NEW Available Touchscreens
- NEW Ability to measure any size glass
- NEW PDF load reports
- NEW Remote access to live throughput data
- NEW TS2000 Thickness + Coating Sensor
- Osprey Process Control Advisor (OPCA) recommends real-time process adjustments
- User-defined quality thresholds for coated and non-coated product
- LED lighting for longer operational life
- Size measurement capabilities:
  - +/- 3 mm (.125 inches)
  - multiple peak-to-valley traces in direction of glass travel
  - vertical kink of peaks or valleys in the direction of glass travel
- Energy-saving automatic shutoff when system is idle
- New browser-based application to allow monitoring from tablets or smart phones
- New data management tools, including a 3D distortion detail file (DDF) for each sheet
- Built-in barcode scanner to track each part in the quality database

Osprey™ Distortion + Flatness Inspection System

<table>
<thead>
<tr>
<th>BENEFIT</th>
<th>IMPROVEMENT</th>
<th>VALUE</th>
<th>ANNUAL COST SAVINGS</th>
</tr>
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<tbody>
<tr>
<td>Quality Improvement</td>
<td>Reduce product returns</td>
<td>Avoid expense of $1,000-$20,000 per incident for repair or replacement</td>
<td>Typical $20,000</td>
</tr>
<tr>
<td>Improved Yield</td>
<td>Reduce losses in downstream fabrication (IG and lamination)</td>
<td>Avoid losses of $50 per IG, $150 per laminate, 10 each per month</td>
<td>$24,000</td>
</tr>
<tr>
<td>Improved Throughput</td>
<td>Better process control increases furnace efficiency</td>
<td>Up to 5% production gain of 630 sq meters (6,775 sf) = $4,750/month</td>
<td>$57,000</td>
</tr>
<tr>
<td>Decreased Quench Break</td>
<td>Better process control decreases loss due to quench break</td>
<td>1% production gain of 125 sq meters (1,355 sf) = $950/month</td>
<td>$11,400</td>
</tr>
<tr>
<td>Reduced Labor</td>
<td>100% machine inspection replaces off-line human inspection</td>
<td>Save up to 25% FTE (2 shift production)</td>
<td>Up to $25,000</td>
</tr>
<tr>
<td>Greater Customer Satisfaction</td>
<td>Higher quality product; more positive market perception of company</td>
<td>More competitive bids; opportunities in new, high-margin markets</td>
<td>$$$$$$</td>
</tr>
</tbody>
</table>

Total ANNUAL Cost Savings, not including new business opportunities: $137,400+

Assumptions based on data from current Osprey users:
- Typical replacement costs reflect a mix of residential, commercial, and industrial products
- 12,500 square meters (134,000 sf) per month typical production through tempering plant
- Average total value of tempered product (including glass and tempering cost) = $10/square meter ($95/sf)
- Labor cost including salary and benefits = $50,000/year

The Bottom Line

- Eliminate costly rejects before coating and lamination processes
- Eliminate costly field replacements
- Improve process control and increase yield
- Delight your customers
- Win new business by demonstrating and delivering quality!

CONTACT US TODAY:
Jakub Kowalczyk
Sales and Marketing Manager

LiteSentry™ Corporation
1403 F Heritage Drive
Northfield, Minnesota 55057 USA
TEL: +1.507.645.2600
EMAIL: sales4@litesentry.com
LiteSentry.com