Sawmill Productivity Solutions

Sawmill Toolkits

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Sawmill Toolboxes

• Saw Tooth Inspector
• Band Saw Strain Measuring System.
• Log Movement Measuring System.
• Data Logging for Size Control.
• Top Wheel Movement Measuring System.
• Sawblade Displacement Measuring System.
• Sawblade Temperature Measuring System.
• Glue Line Pressure Sensing System.
• Data Logging using National Instruments
Sensors
Saw Tooth Inspector

- Tooth Angles are critical. One degree difference can double sawing variation.
- Angles are difficult to measure without an inspection system.
- Lowest cost system on display
- System can be changed to suit needs by using different lenses and cameras.

Band Saw Strain Measuring System

- Band Saw Strain is Important as it affects saw stability and saw life.
- Strain is dimensionless: \( \varepsilon = \frac{\Delta L}{L} \)
- Stress: \( S = \frac{P}{A} \)
- Strain Force: \( P = AE\Delta L/L \)
Log Movement Measuring System

- Logs can move after scanning.
- If this happens BOF solution wrong.
- If a log moves while in the saw, sawing variation can increase.
- Log movement is easy to measure using a laser.
- Log movement can be recorded.
Laser Position on Screen

Horizontal Distance (mm)

Vertical Distance (mm)
Data Logging for Size Control.

- Simple system using GaugeLink.
- Feeds data directly to a Spreadsheet.
- Data can be graphed as entered.
- Data saved in Database.
- Pivot Table used to extract data.
- Based on a spreadsheet and reports can be customised.
Top Wheel Movement Measuring System

- Top wheel damping is important as it reflects the condition of the top wheel suspension and strain system.
- Problems can be detected quickly using a LVDT, DAQPad or Pico Scope and a PC.
Typical Top Wheel Movement

<table>
<thead>
<tr>
<th>Time (milliseconds)</th>
<th>Displacement (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooling</td>
<td>Heaing during cut</td>
</tr>
<tr>
<td>Cooling</td>
<td>Heaing during cut</td>
</tr>
<tr>
<td>Enter cut</td>
<td></td>
</tr>
<tr>
<td>End of cut</td>
<td></td>
</tr>
</tbody>
</table>

[Graph showing typical top wheel movement with annotations for cooling, heating during cut, and entry and end of cut points.]
Sawblade Temperature Measuring System

- Heat is the enemy of all saws.
- Sawblade temperature can be recorded and monitored using an infrared camera.

Sawblade Displacement Measuring System

- Saw movement measuring systems available on Market but are difficult to integrate into process control.
- Technical Information is available to Customise System to meet your Needs.
Rotary Encoding

- Position and speed can be measured
Glue Line Pressure Sensing System

- Glue line pressures can now be measured and recorded using paper thin Flexiforce sensors.
- Signal conditioning requires an OP-Amp.
Effect of clamp spacing on glue bond strength: 50 mm laminates @ 80 psig
Data Logging

- National Instruments USB Data Acquisition System
- 200 kilo bytes per second
- Up to 16 analogue channels can be data logged
Sawmill Toolkits

- Saw tooth inspection system
- Saw strain gauge & data analysis
- Saw displacement sensors
- Sawblade temperature measuring devices
- Top wheel movement & damping sensors
- Log movement measuring system
- Glue line pressure sensors
- Digital time study system
- National instruments data acquisition system

Sensor Suppliers

- Sensor Magazines are a good source of sensor information.
- For good catalogues try the following:
  - www.rsnewzealand.com
  - www.farnellinone.co.nz
  - www.omega.com
  - www.keyence.com
Signal Conditioning

- Signal conditioning is a specialised field and may require access to an oscilloscope to sort out problems.
- A strong signal with a low noise ratio is important and wiring, shielding, and noise minimising circuits may be required.

Toolboxes

- Saw Tooth Inspector $5,000 to $10,000
- Band Saw Strain Measuring System. $3,000
- Log Movement Measuring System. $3,500
- Data Logging for Size Control $3,500 to $6,000.
- Top Wheel Movement Measuring System.
  - Consulting only
- Glue Line Pressure Sensing System. $3,500
- Sawblade Temperature Measuring System. $3,000
- Sawblade Displacement Measuring System.
  - Custom design. $3,000 to $5,000