How to boost the production efficiency of veneer-based products

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Challenges in veneer-based products

• Raw material
  – Competition of logs increasing => price increasing
  – Log size getting smaller
  – Quality getting worse
• Labor cost
  – Labor cost increasing
  – Availability & “quality” decreasing
• Glue
  – Oil price increasing => glue price increasing
• Energy
  – Price of electrical and heat energy increasing
• Markets
  – Building construction quiet
  – Transportation industry ~OK
Plywood Mill Processes

- Log handling
- Peeling
- Drying
- Veneer grading
- Scarf-jointing
- Composing
- Patching
- Gluing/layup
- Pressing
- Trimming
- Sanding
- Overlaying
- Packaging

Plywood manufacturing costs

- Wood: 64%
- Labor: 17%
- Glue: 11%
- Electrical energy: 4%
- Heat energy: 4%

www.raute.com
The Raute Formula

Maximized performance:

\[(\text{recovery} + \text{productivity} + \text{quality}) \times \text{capacity} = \text{profitable panel production}\]

Recovery

- Curtain laser block scanning
- Veneer value optimization
- XY autocalibration
- Veneer moisture management
- Defect clipping
- Glue application
Curtain laser block scanning

- SMART-SCAN combines state-of-the-art laser curtain measuring technology with new, advanced software functions and features
- Several optimization algorithms
  - Straight cylinder optimization
  - Value optimization
- Autocalibration as an additional option

Veneer value optimization

- SMART-SCAN performs virtual peeling once every rotation of the block
- Value of the ribbon is optimized according to the desired sheet dimensions and given values of the sheets and randoms
- Recovery improvement from 0.4 - 3.0% have been measured on various wood species
- The greater the variation from a perfect cylinder, the greater the improvement achieved
**XY autocalibration**

- On-line monitoring of the XY charging accuracy
- Automatic calibration based on the measured data
- Increased recovery & veneer value

**Veneer moisture management**

- Moisture measurement provides several benefits by
  - Sorting the veneer sheets to stacks by moisture classes
  - Adjusting knock-off arm control
  - Adjusting clipping width
- Moisture meter is configured and calibrated using graphically adjustable limits
- Moisture profile of every veneer ribbon can be seen graphically
Clipping parameters

Glue application
Productivity

- Low labour consumption due to automation and high capacity
  - Automatic patching and grading
  - Layup line
  - Panel repairing

- Easy operation
  - Easy to understand GUI
  - Recipe concept

- Efficient management tools,
  - MIS, real time data from all lines, reports
  - MES,
Automatic layup line

Automatic panel repairing

- Machine vision
- Routing tools
- Poly / putty apply
- Various repairing materials available
Graphical User Interface GUI

Reporting (MIS), production

- Various reports for each production line
- Absolute numbers and graphical effects
Production control (MES)

- Additional module for MIS
- Orders from ERP
- Rough loading
- Capacity graphics
- Work orders / fine loading
- Preset manufacturing models and production flows
- Work queues for operators
- Online follow up for work orders
- Production data to ERP

Quality

- Peeling line features
  - XY centering, OPG Optimized Peeling Geometry

- Veneer moisture management

- Veneer / panel grading
  - Visual quality
  - Moisture
  - Dimensions / shape
  - Roughness

- One side gluing (spray, curtain coater, extruder)
Peeling line features

- Moisture map
- Mask detection

Veneer moisture management
Veneer / panel grading

One side gluing