DATA-DRIVEN PRODUCTION

DATA USAGE IN VENEER, PLYWOOD, AND LVL PRODUCTION

The Management Information System collects, combines, and analyzes a comprehensive amount of data from all essential elements of production.

PEELING

- Visual Analyzer
- Moisture Analyzer
- Strength Analyzer

PATCHING

- Visual Analyzer

COMPOSING

- Visual Analyzer

SCARFING

- Visual Analyzer

DRYING

- Visual Analyzer
- Moisture Analyzer
- Strength Analyzer

PANEL REPAIRING

- Visual Analyzer

LAY-UP

- Visual Analyzer
- Moisture Analyzer

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PEELING

Did you know?
At this stage of production, the analyzers make the cutting decisions by evaluating the dimension of the veneer after drying.

Quality-driven production starts on the peeling line. As the first step of production, it's crucial for the whole production chain after peeling. Material losses or other incorrect decisions in the peeling line cannot be recovered in the next process phases.

BLOCK CENTERING

- Accurate XY block centering produces up to 15% more face veneers

VENEER CONDITION MONITORING

- Veneer condition monitoring prevents material loss and quality downgrading by providing alerts on specific visual thresholds like knife and rub marks.

VISUAL CLIPPING OPTIMIZATION

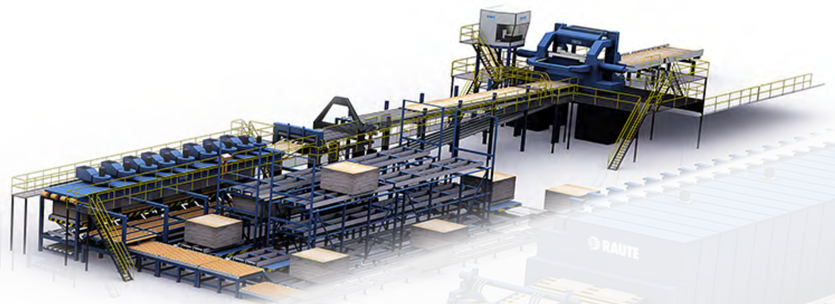
- The advanced visual clipping optimization system analyzes veneer ribbon, making the clipping decision after grading the material into face, core, or composing quality sheets or random-size sheets. The system uses accurate defect detection and grading rules to make decisions.
- Advanced systems also feature optimization to maximize the recovery of face quality sheets, optimize when to start cutting full sheets from the beginning of the veneer ribbon, as well as how to cut the back end of the veneer ribbon for maximum recovery.

MOISTURE MEASURING

- Sorting veneers in 2–3 moisture grades will increase dryer output and veneer quality, because over drying is minimized
  - » Minimizing over drying results in more drying capacity, saved energy, and better veneer quality

COMBINED MEASURING

- Combining multiple measurements will give the possibility to adjust the clipping width of each sheet based on their drying shrinkage forecast
  - » Increased veneer recovery
  - » Dry veneer width variation gets smaller, which results in fewer issues in the lay-up process and fewer panel rejects
- By combining data, the veneer drying can be accurately assessed, and thus the veneers can be sorted into different drying batches based on the drying time, and not only on the veneer moisture.
  - » More drying capacity, lower energy consumption, better dry veneer quality, less over drying, fewer sheets that are too wet after drying



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DRYING

Did you know?
Having the drying line equipped with the visual, moisture, and strength analyzers you get highly valuable data from your drying process. The equipment ensures the best possible veneer grading. The data helps you improve your production and optimize the drying result that leads to higher profit.

In veneer drying, it's crucial to analyze and grade the veneer sheets for the following phases

VISUAL GRADING

- Accurate veneer sorting in different visual grades based on the defect criteria
- Utilizing composing simulation, patching simulation, and scarfing simulation ensures that the correct veneers are chosen for the next processing steps
  - » Increased capacity in next process phases
  - » Less material waste in the next process phases

STRENGTH GRADING

- Accurate strength measuring typically allows veneers to be sorted in 2–4 strength grades to optimize LVL or Plywood structures, and end-product strength

MOISTURE GRADING

- Moisture measuring allows the optimization of the drying speed, ensuring that veneers with moisture that is too high are not sent to hot pressing
  - » Increased drying capacity, increased veneer graded/values, fewer panel rejects because of blow out
  - » Over drying causing decreased veneer quality is minimized with optimal drying time

DENSITY GRADING

- Density measuring allows veneers to be sorted in different density grades. Combined with strength measuring, it enables searching for lightweight high-strength veneers for special end products, for example
  - » Increase in plywood value

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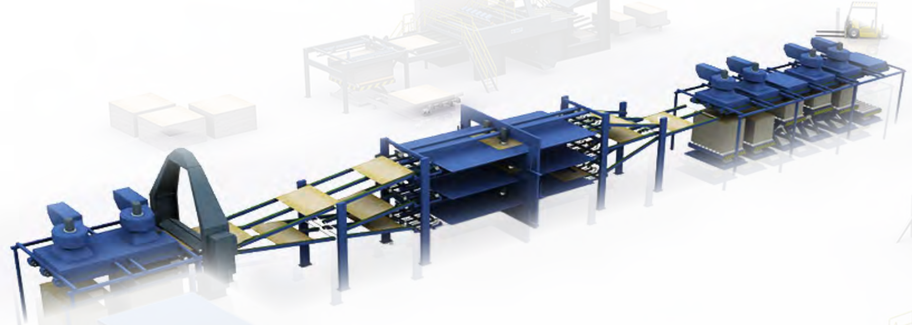
PATCHING



PATCHING OPTIMIZATION

- The patching is made for the desired quality grade, using only the required number of patches. No over-patching.
- Optimizing the veneer quality and the permanence of patches in automated stacking and lay-up as well.

FACE VENEER GRADING

- Advanced analyzer also allows the patching line to be used for face veneer grading when dry veneer sorting lacks the space for all the required grades

VISUAL QUALITY CONTROL AFTER PATCHING

- The vision system monitors patches, making sure they are not missing from the veneer going to stacking
- Important quality control phase on automatic lines, because the operator is not constantly monitoring the line's operation.
  - » Minimize the rejection of veneers in lay-up

Did you know?
A butterfly-type patch is the recommended veneer patch type. The solid wood butterfly patches ensure that the plywood you produce is more eco-friendly and adapts to temperature changes more consistently, for example. The best thing about butterfly type patches is that they don't pop off, and they bear more than twice the load compared to other types of patch. The butterfly patch has also recently been approved for the APA standard.

COMPOSING

Did you know?
Utilizing green composing, all material can be dried with full veneer sheets using an automatic drying line. **No more drying of undersized sheets and manual work.**

GREEN VENEER COMPOSING

Increasing the drying capacity

- With green composing, only the approved material for veneer production is dried, not the material that ends up as waste.
- Green veneer composing removes the need for random drying, and automatic feeders and stacking can be used

CORE VENEER COMPOSING

- Accurate defect detection improves the end quality of the veneer and reduces rejects in the lay-up process
- Improving yield and capacity through precise visual defect detection, defect-specific cutting margins, and cutting optimization
  - » Up to 20% increase in capacity compared to a system without an accurate camera system
  - » Up to 35% increase in veneer yield compared to a system without an accurate camera system

FACE VENEER COMPOSING

- Accurate visual defect detection plays a particularly important role in face veneer composing, because defects that are unsuitable for face veneers cannot be identified by other methods.
- Increasing face veneer amount significantly
  - » By composing smaller face veneer sheets together
  - » By composing full-size face veneersheets from several veneers, from which the necessary defects are cut off
  - » *This enables the utilization of veneers that were previously downgraded to a core veneer due to small defects*
- Accurate vision system optimizes cutting points based on the set veneer quality criteria for face veneers
  - » Accurate defect-recognition minimizes defects in the end product, minimizing the downgrading of ready plywood
  - » Increases total face veneer amount and allows thinner plywood structures
  - » Allows production of oversized panels

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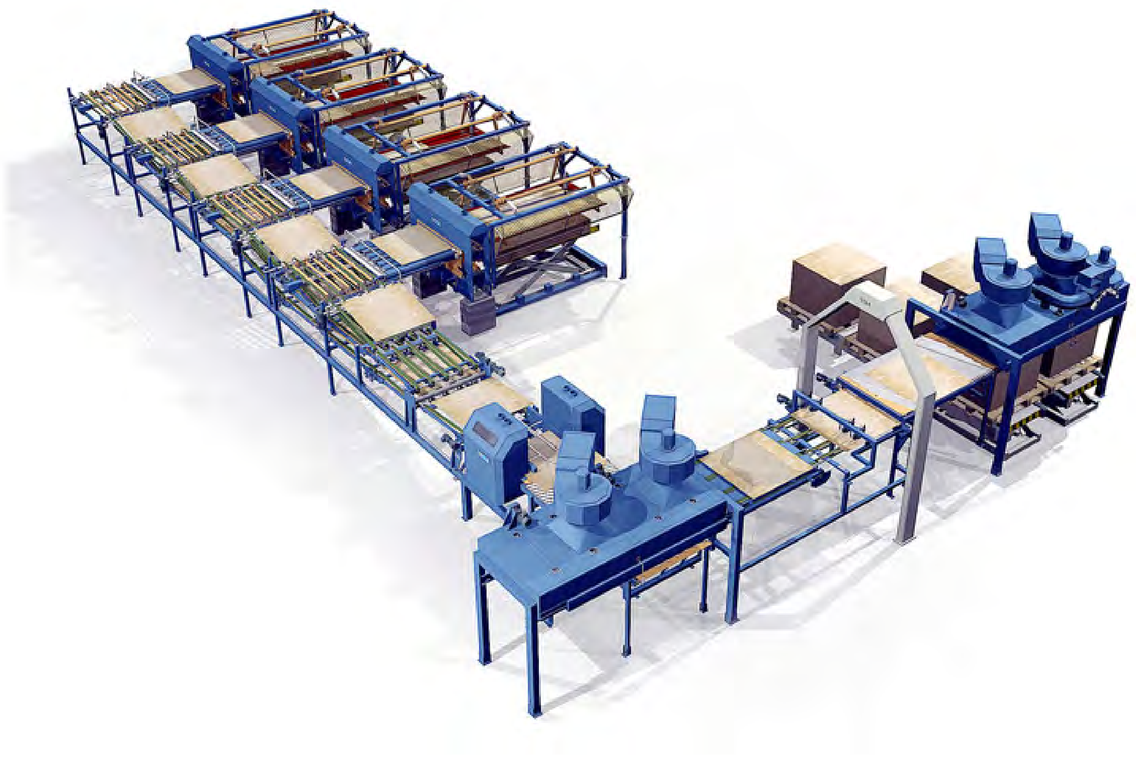
SCARF-JOINTING

VISUAL QUALITY CHECK AND SCARFING OPTIMIZATION

- Visual quality check, ensuring that the veneer sheet is suitable for scarf-jointing: the dimensions are sufficient, and no pieces have come off during processing
  - » Panel rejects because of undersized veneers are minimized
- Maximizing recovery by cutting veneer as little as possible when its size and shape are known



LAY-UP

VISUAL QUALITY CHECK

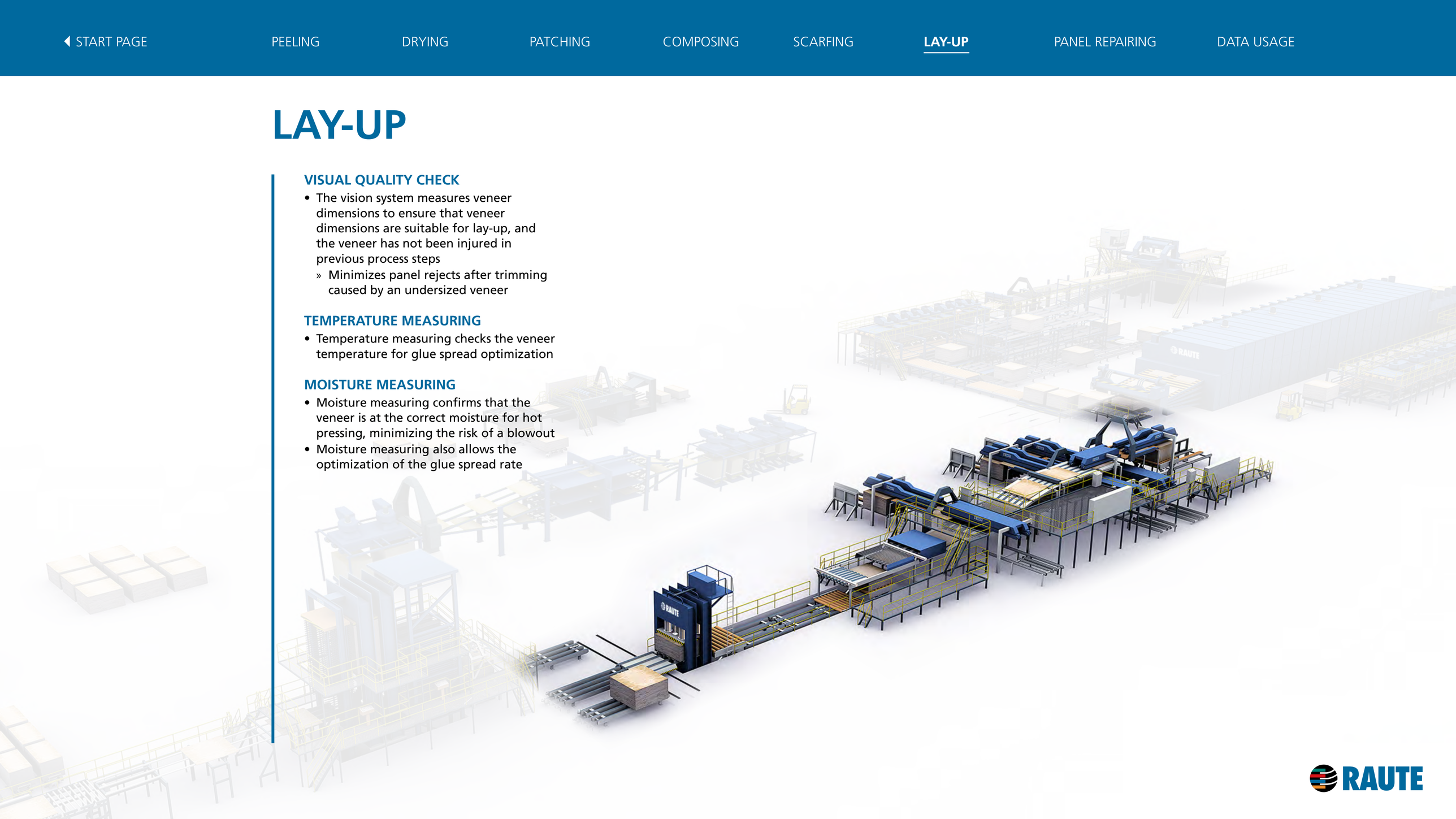
- The vision system measures veneer dimensions to ensure that veneer dimensions are suitable for lay-up, and the veneer has not been injured in previous process steps
  - » Minimizes panel rejects after trimming caused by an undersized veneer

TEMPERATURE MEASURING

- Temperature measuring checks the veneer temperature for glue spread optimization

MOISTURE MEASURING

- Moisture measuring confirms that the veneer is at the correct moisture for hot pressing, minimizing the risk of a blowout
- Moisture measuring also allows the optimization of the glue spread rate



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PANEL REPAIRING

The panels are repaired to the desired quality grade with the aid of the visual analyzer's accurate defect detection.

- Allows the quality grade of the panel surfaces to be increased
- Consumption of repair materials is lower than in manual repair, because over-repairing is avoided, and repair sizes are the smallest possible
- The line can also be used for panel quality checking and grading.

DATA USAGE IN VENEER, PLYWOOD AND LVL PRODUCTION

Did you know?
Data usage is a modern way to enhance production quality. Simply by knowing more about the production phases, raw material quality, and operating efficiency you can improve in all of these segments. Data-based production intelligence is at the core of high-quality veneer production.

Comprehensive data guides you in maximizing sheet quality, production efficiency, and capacity.

Production and process data capturing combined with the data from visual, moisture, and strength analyzers give you a broad view of the mill's performance. This data works as a good tool for continuous improvement and achieving the objectives of the action.

You know how to produce the best possible product mix to maximize profit.

Increased production intelligence leads to more profitable production.

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