

Moving Towards Smart Factory
using Automatic Scanner and Panel Repair Technology



- Established in 1992
- Located in Kongsberg, Norway
- Development and supply of machine vision and robotic technology
 - Surface Grading Systems since 1997
 - Panel Repair Systems since 2009
- Global company, installations in more than 30 countries
- Argos customer industries
 - Particleboard, MDF and OSB panels
 - Parquet and flooring products
 - Plywood, soft and decorative panels
 - Gypsum wallboard and other building products
 - Decorative full-size panels for composite and plywood
 - Furniture components



- 100% owned by Løvenskiold
- Family-owned company
- Headquarter in Oslo, Norway
- Established in 1649
- Carl Otto Løvenskiold is COB of Argos
- About 1400 employees
- Turnover \$600 mio USD
 - Building Materials and DIY
 - Forestry
 - Property development and real-estate
 - High-tech



REPLACING MANUAL INSPECTION

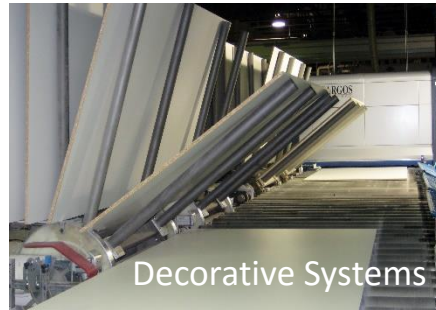
- Argos Grading System (AGS)



REPLACING MANUAL REPAIR

- Panel Repair System (PRS)





INSTALLATION

- Raw Board Press
- Sanding Lines
- Cut-to-size

APPLICATIONS

- Particleboard, MDF & HDF
- Hardboard / Softboard
- Plywood
- OSB
- Transformer Board
- Gypsum Wallboard
- Other

INSTALLATION

- Short-cycle Press
- Lacquering Lines
- Furniture Lines

APPLICATIONS

- Furniture & Flooring Boards
- HPL Boards
- Overlaid Plywood
- Coated Panels
- Direct Print Panels

INSTALLATION

- Auto Patch lines

APPLICATIONS

- Plywood, Soft & Hardwood
- Parquet
- Solid Wood
- Other

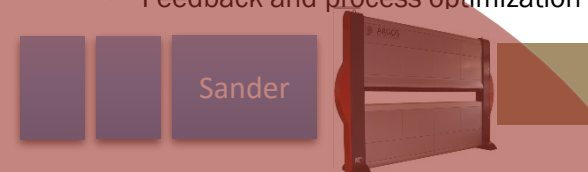
AGS Press

- Monitoring the surface quality
- Stop defects immediately
- Feedback and process optimization



AGS Sander

- Monitoring the surface quality
- Sorting based on customer or product specifications
- Feedback and process optimization



AGS Stack Information

- Accurate information per board
- Stack "value" used for selected MFC product

Stack C-	Stack C+	Stack A+	Stack A	Stack B+	Stack B	Stack B-	Stack C-	Stack C+
Stack A-	Stack A	Stack B+	Stack B	Stack B-	Stack C-	Stack C+	Stack A+	Stack A
Stack B	Stack B-	Stack A+	Stack A	Stack B+	Stack B	Stack B-	Stack C-	Stack C+

Data collection
and
optimization



AGS Decorative

- Final inspection, customized and 100% consistent grading
- Feedback on substrate defects levels
- Feedback and process optimization

THE INDUSTRY WILL CONTINUE TO DEMAND MORE AUTOMATION

The ability to monitor and document quality will continue to increase. AGS and PRS technology becomes very important tools in the automation process:

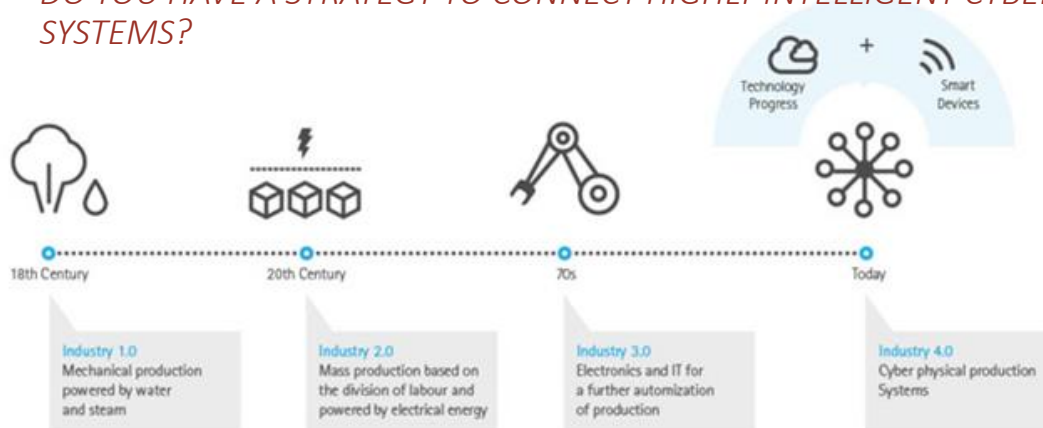
- Automatic Grading Systems
 - after press
 - after trimming or sanding
 - after value-added lines
- Automatic Panel Repair Systems
 - integrated solutions between press, panel repair, trimming and sanding
 - link information between green and finishing -end
- Substantial cost savings:
 - eliminating the man-years
 - customized and consisted quality
 - integrating lines and reducing the need for forklifts, reduce safety risks
 - reduction of filler materials
 - less rework
 - produce a better product
 - Do it RIGHT the first time!

ACCURATE STATISTICS IS KNOWLEDGE!



- INDUSTRY 4,0, NEXT INDUSTRIAL REVOLUTION!
 - Concept that is being embraced in Europe
 - Predicts the **Internet of Things will change manufacturing** as we know it!
 - Many of **today's technologies** being installed **will form the core of Industry 4,0**
- SMART FACTORY
 - *Connecting data, machines, people and processes – delivering the **next generation of highly automated manufacturing!***
 - ***Software based systems** and service platforms **will play a major role** to bring connectivity, incl. data analysis, to machines and workpieces in production.*

DO YOU HAVE A STRATEGY TO CONNECT HIGHLY INTELLIGENT CYBER-PHYSICAL SYSTEMS?



TECHNOLOGIES ENABLING THE SMART FACTORY

YOUR QUALITY. OUR FOCUS.

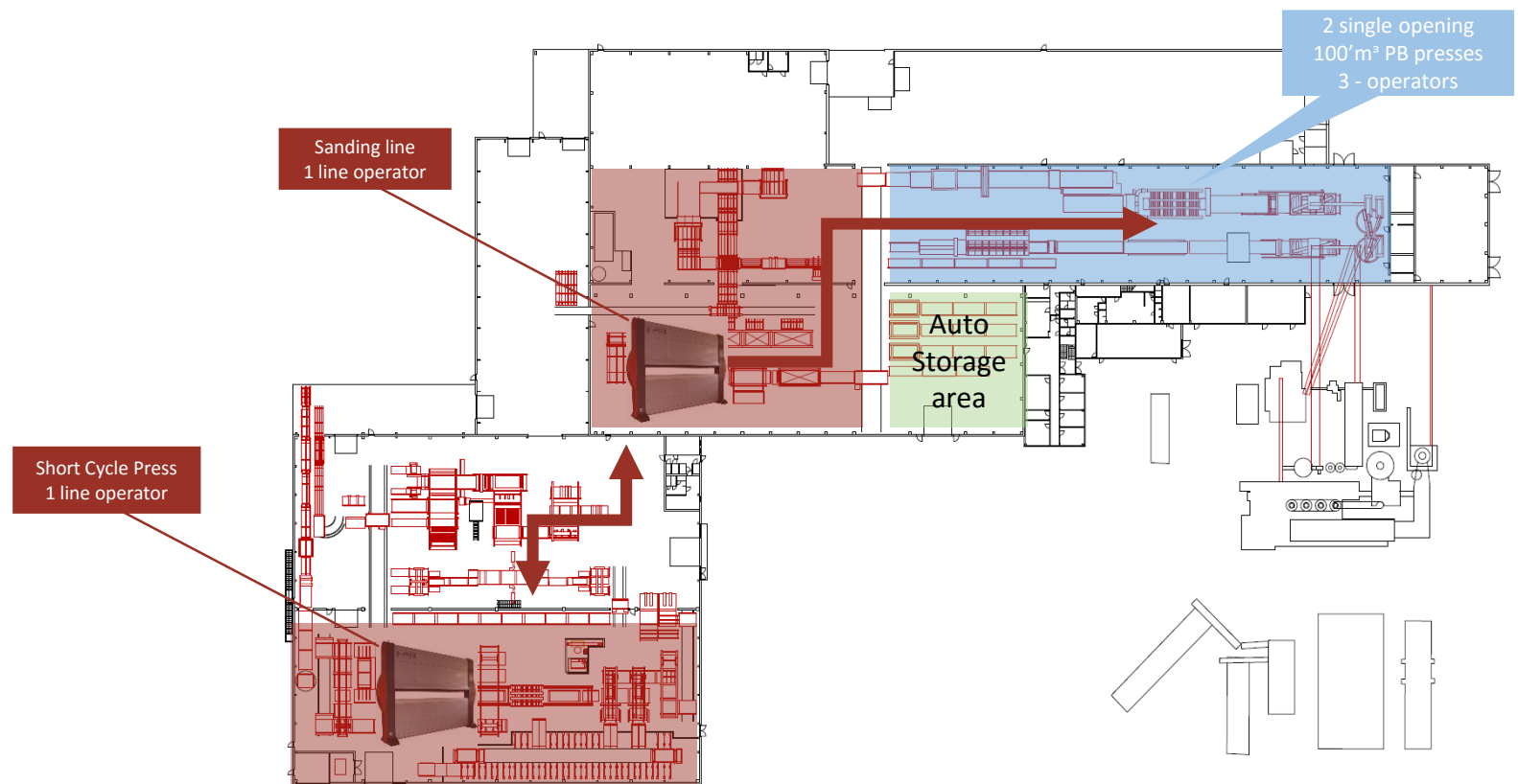
ARGOS SHALL BE IN FRONT OF CONNECTED MANUFACTURING

- Our 4,0 solutions for connected manufacturing shall help our customers optimize the production and logistics processes.
 - FLEXIBLE AND OPEN ARCHITECTURE FOR SEAMLESSLY END-TO-END INTEGRATION
 - Enterprise systems connecting plants, suppliers, distribution and customers
 - Real-time data exchange with shop floor platforms and external IT systems
 - Secure remote access infrastructure, becomes extremely critical.
 - Automatic product changes and configuration settings for customized production
 - Central product recipe exchange for multiple plants/ system,
 - Available information, supporting mobile device platforms
 - Big data, product development, testing and self learning systems
 - Simulation using big data to improve product performance and customization
 - Service & support systems will be interactive.



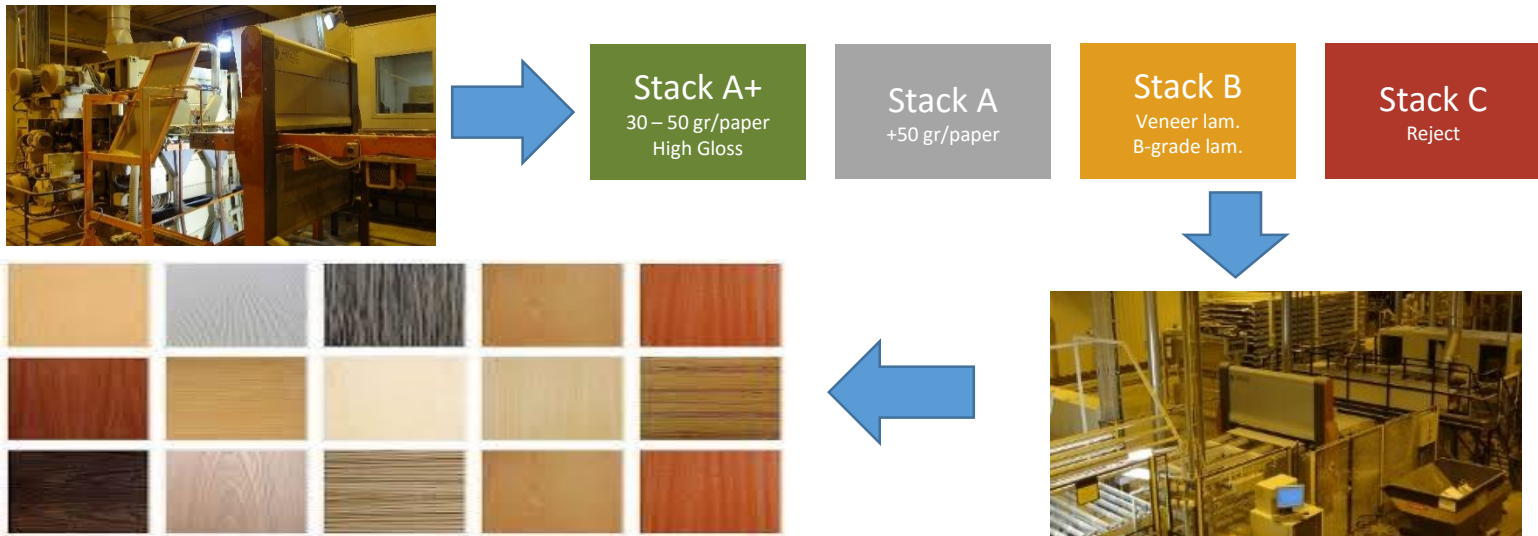
INCREASE MANUFACTURING YIELD

- Argos customers are already taking advantage of the available technology!



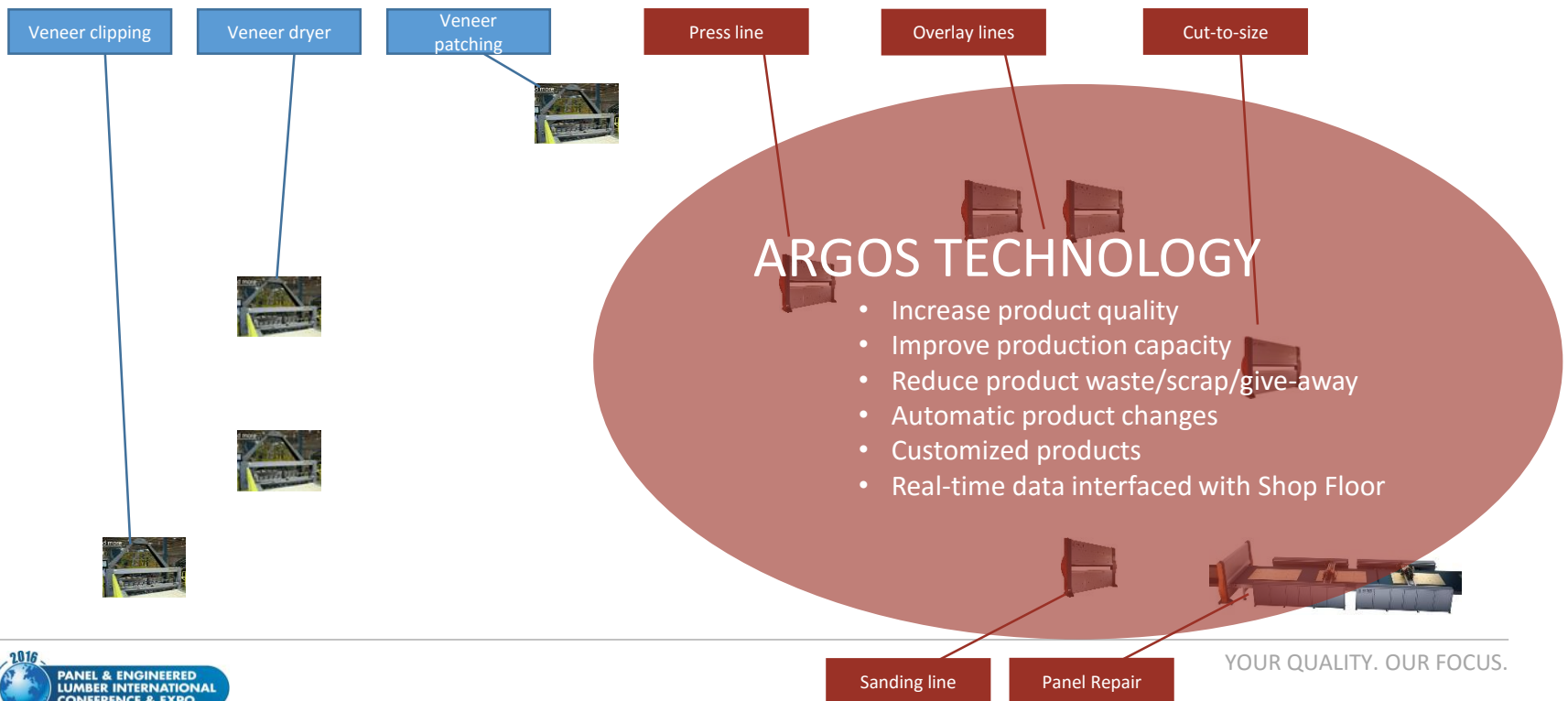
BENEFITS FROM ARGOS GRADING SYSTEMS

- **Quick feedback** from Argos system at sander to press operator about press-related defects.
- Grading recipes provides **correct, customized and consistent grading** at the sander.
 - 2-3% higher A-grade at MEL line compared to manual grading at the sander
- **Monitoring drift in quality** and activating alarms for quick correction of problem.
- Higher yield, less rework, high customer satisfaction = **improved earnings**



MACHINE VISION PROVIDES CRITICAL PRODUCTION DATA

- Modern plywood production is relying on automation
 - Scanner technology is available in all important areas of the production where optimization is critical



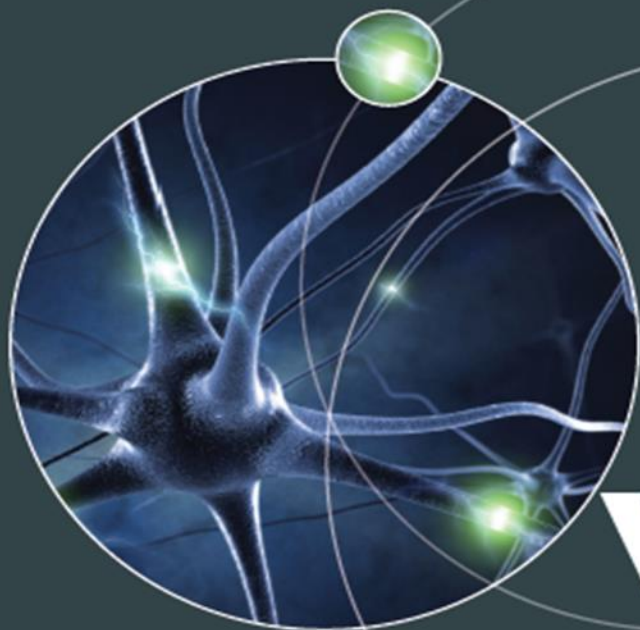


PREPARE FOR THE FUTURE – MAKE A STRATEGY FOR YOUR INVESTMENTS!

- Industry 4.0 addresses the growing demand of digital production:
 - **greater flexibility**, transparency, knowledge and the use of **smart production facilities**.
- Traditional layered shop-floor machines will be transformed into a **smart connected production environment**.
- **Processes** will be supported by **real time information** to the right person or system at the right moment with fit-for-purpose instructions.
- Big Data technologies will require:
 - new generations of human-machine interfaces
 - connectivity to manage the flood of information from smart machines
- Biggest fear, digital Security, it will be a key success factor!

AND IT WILL REQUIRE A DIFFERENT SKILLED WORK FORCE!





**YOUR
QUALITY.
OUR
FOCUS.**



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For in-line control of the surface quality