

## New high performance drive nearly doubles production line speed



ABB high performance machinery drives improved the performance of a sheet cutter machine.

A 67% increase in the manufacturing speed of a paper impregnation line has resulted from the servo characteristics of ABB's high performance machinery drive.

Impregnated paper, produced on the line, is used for making laminates or pre-lamination of particle boards, like medium density fiberboards (MDF). The line is used for impregnating paper with a resin which gives the material strong mechanical properties. At Laminating Papers' factory, located in Kotka, Finland, the line was restricted to 120 meters per minute because the sheet cutter machine could not respond fast enough to the signals from a PLC and servo drives. The reason for the slow response was that the software needed to control the servos was written into the PLC as the servo drives did not have the facility to directly program the software within them.

The sheet cutter machine uses the drives to control the rotation of brushes which pushes the cut paper sheets from one conveyor to another. It is the speed and accuracy of these brushes which is critical to the overall machine performance.

Stora Enso's service and maintenance company Kymenso handled the installation and commissioning of the new drive.

### PLC limits performance

The calculations from the PLC were communicated to servo drives via Profibus DP. However, using this combination, the positioning calculations and communication resulted in up to 46 ms delays in the rotations of the brushes. Thus the manufacturing speed of the paper impregnation machine was limited to 120 meters per minute.

### New drives increase speed and improve accuracy

To reach Laminating Papers' speed request of 200 meters per minute, two ABB high performance machinery drives were applied. The drives are installed on the cutter machine to control the rotation of brushes transporting cut paper sheets from one conveyor to another. The solution-programming feature of the new drive enables accurate positioning calculations, which eliminates PLC-based calculations and non-repeatable delays. After the drive replacement, the delays in the brushes were cut down to 2 ms, which was



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well below the tolerance range and enabled the production speed to be increased up to 200 meters per minute.

### Success leads to third drive

Following the success with the drives on the brush application, a third ABB high performance machinery drive is now installed for the actual cutting tool that cuts the sheets of impregnated paper before they proceed through to the rotating brushes.

With the impregnation line now running at its optimum speed, the sheet cutter is able to cut the paper fast enough, while the brushes accurately feed the paper sheets to the conveyor.

According to Mr. Ilkka Vakkari, Maintenance Supervisor, Impregnation Plant at Kymenso, "The reason we chose ABB and the ABB high performance machinery drive for this application is mainly due to the long relationship between the two companies over many years. We know ABB and its products very well and both have proved reliable."

"Furthermore, the new drive appears to have many useful features. The fact that the solution programming takes place within the drive, rather than the PLC is a big benefit. Also the initial results prove that performance is excellent. It makes sense to stick with one supplier."

### Satisfied machine builder

The impregnated paper is used within the laminate industry. Tocchio S.r.l., the Italian manufacturer of impregnation lines, built the sheet cutter machine as an extension to the existing impregnation line of Laminating Papers. Stora Enso's service and maintenance company, Kymenso, together with Tocchio s.r.l., handled the installation and commissioning of the new drives. A total of 29 ABB drives were installed.

"The solution-programming feature and modularity of the ABB high performance machinery drives offer a flexible platform for many different applications while fulfilling the requirements for positioning accuracy and speed in a demanding machinery application," says Claudio Banfo Electronics Manager of Italian machine builder Tocchio S.r.l.

### Solved problem

- Paper impregnation line speed restricted to 120 meters per minute because the sheet cutter could not respond fast enough to signals from PLC and servo drives.
- Calculations from PLC were communicated to servo drives but this resulted in up to 46 ms delays in the rotations of the brushes.

### Solution

- To reach manufacturing speed request of 200 meters per minute three ABB high performance machinery drives are installed.
- The solution-programming feature of the drive eliminates PLC-based calculations and communication delays.

### Benefits

- 200 meters per minute (67% increase) target manufacturing speed achieved at the paper impregnation line.



Three ABB high performance machinery drives of ACSM1 series were installed to the sheet cutter machine.

