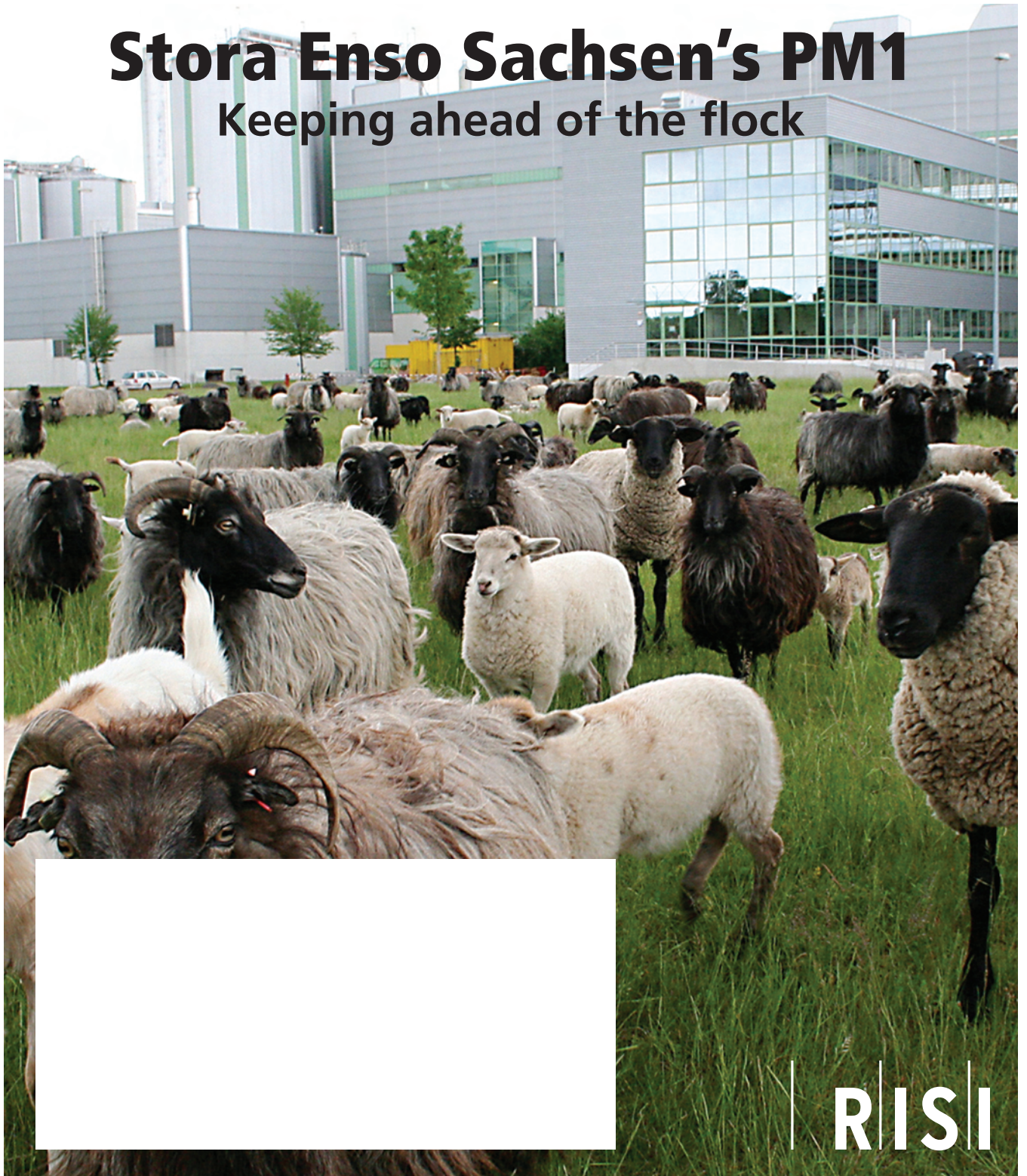


Stora Enso Sachsen's PM1

Keeping ahead of the flock



By MARK RUSHTON, Editor

Recycled newsprint is the most demanding area of papermaking in terms of producing a quality product from inconsistent raw materials

STORA ENSO SACHSEN PM 1 – A TRUE THOROUGHBRED

Like thoroughbred horses, the really big newsprint machines need to be coaxed, maintained, and draped in the very latest in technology to make sure that performance and speed is maximized. And one of the fastest, PM1 at Stora Enso's Sachsen Newsprint and Book paper mill in the state of Saxony in Germany is no exception.

PM1 has always been something of a record breaker. It was built by Valmet (Metso) in 1993-94 and was started up on the 31st of August 1994 and immediately broke the world speed record at that time

with an output of 1236 m/min. By the end of that year it was seeing speeds reaching in excess of 1600 m/min and was the most productive newsprint machine in the world for the next five years. It is still among the quickest in the world, and the fastest newsprint PM running without a shoe press, producing some 340,000 tonnes/yr from 100% recovered paper which it mainly supplies to the local area, but also exports to other neighbouring countries.

Stora Enso's Sachsen mill was built right next to the town of Eilenburg near Leipzig four years after

Stora Enso's Sachsen mill near Leipzig - famous locally for its grazing sheep



the wall came down separating Eastern Germany from Western Germany and at the time there was a lot of incentive from the German government to provide much needed employment in the area. But this was of course not the only reason. The mill is in the middle of an area populated by some of the largest cities in the east of Germany, including Berlin, Dresden and Hannover, all centers where recovered paper - the vital raw material of 100% recycled newsprint - could be obtained. There are also a lot of printing companies in the area, whose high quality waste paper added even more of a bonus for good quality raw material.

CHALLENGES IN THE QUALITY OF RAW MATERIALS

But it has not all been plain sailing, especially over the last few years as recovered paper has become a sought after commodity on the worldwide market. Peter Kluttig, the mill's manager of process automation explains: "As a 100% recovered mill, we rely on good quality waste paper to ensure that our own quality of output can be maintained. As countries like China started to ship waste paper over from Europe for its own mills, good quality raw material became

harder to obtain, and of course the prices soared. We are now still left with the situation that there is more and more recycled paper coming back in, and less good quality paper made from virgin fibers, which, among other things, means much higher ash content. We have had to carry out a lot of work on our fiberline to cope with this."

And there were other challenges the mill had to face in terms of demands from customers. Mr. Kluttig continues: "Newspaper printers are demanding higher, and consistent quality as their presses are speeding up and their own advertisers are making quality demands."

To cope with the increasing challenges of raw material quality, as well as increasing demands from customers as regards quality, there was another challenge, speed. The fact is, the newsprint market is a tight one, and there is no room for poor quality or late deliveries, so Stora Enso Sachsen has had to lead from the front when it comes to everything related to customer satisfaction.

MAINTAINING SPEED, QUALITY AND CONSISTENCY

To achieve the ultimate production figures in terms of speed, quality and consistency, the mill has looked beyond the norm in terms of finding the right fit for its own unique requirements. The mill has historically worked with automation and measurement supplier ABB since the initial start up in 1994 and the company provided mill wide automation in the shape of DCS and QCS systems, as well as drives based on Master/Advant, one of the first integrated systems of its kind.

The two, mill and supplier, have worked closely together on various projects over the years with some major highlights in the last two years. In 2007, the mill upgraded the complete DCS to ABB's latest 800xA technology. Stora Enso Sachsen and ABB worked closely together to replace the complete operator interface layer, area by area. The unique possibility to have the new and the old environments working side by side in the same control system allowed the mill to complete the upgrade without having to interrupt production and with minimized risk.

The latest pioneering work carried out has been in the area of the measurements and especially the



Peter Kluttig (left) manager of process automation at Sachsen, and Paul Goss of ABB in front of PM 1

caliper sensor, an essential tool if quality newsprint production is going to be speedily, and consistently maintained. The first step was to upgrade the 16 year-old Smart Platform measurement scanner to ABB's newest Network Platform in the field, providing the mill with a stable foundation of up-to-date technology for the new sensors.

PM 1 at Sachsen was originally equipped with a contacting sensor supplied by ABB which at that time

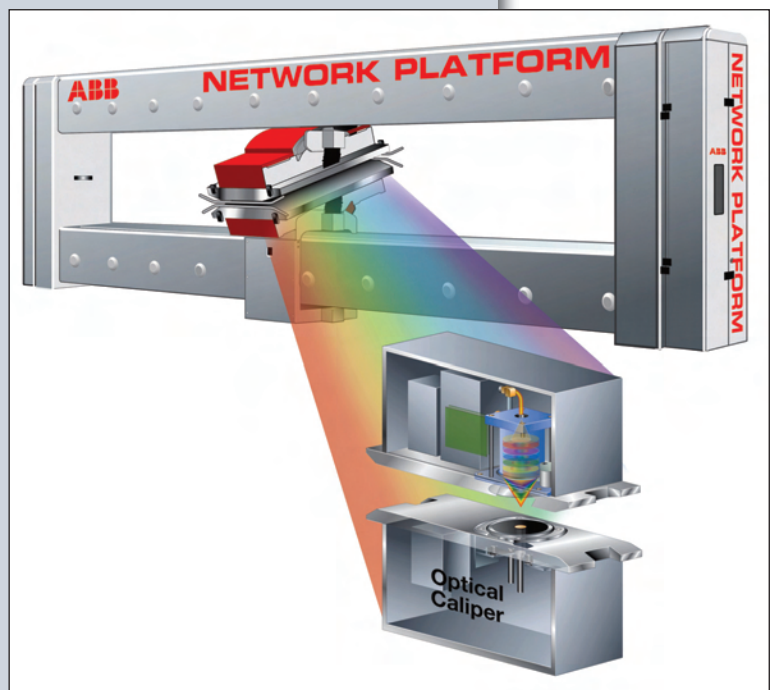
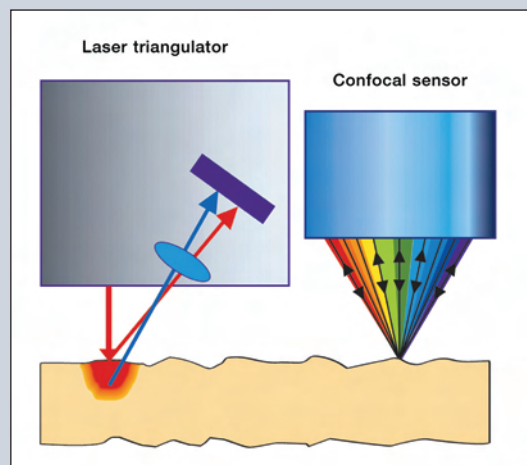
catered for all its needs. However, as the speed of the machine increased, so too the problems associated with having a sensor that actually came into contact with the paper. Paul Goss, ABB's paper system's sales manager for central Europe explains: "In the first 10 years of production, there was no issue with the original caliper sensor simply because the speeds were lower. On very high speed machines like the PM1 at Sachsen, logically you have to increase the pressure

Confocal versus laser

ABB's new optical on-line caliper sensor measures caliper without two-sided contact of the sheet. The new sensor uses a unique optical approach which provides greatly improved measurement accuracy and stability. The sensor is ideal for applications where the sliding skis of traditional caliper sensors gives rise to problems. The new Optical Caliper Sensor is based on a confocal displacement measurement technique. The same technology has made recent advances in microscopy, thin-film research and semiconductor manufacturing. This new sensor, the latest in ABB's 50-year history of pioneering on-line paper quality measurements, finally provides papermakers with the precision tool to measure and control caliper even for some quite demanding paper grades.

Key benefits to the papermaker include:

- Revolutionary optical technology
- Ultra high speed measurement (4 kHz)
- Superb sheet stabilization
- Accurate caliper measurement and control even on the most demanding paper grades
- Insensitive to sheet color, brightness, opacity and density
- Low maintenance with extensive diagnostics



on the contacting calliper to get a good measurement. But this increased pressure results in damage in the shape of holes, leading to the possibility of breaks. It is a very fine balancing act to achieve an accurate measurement, at the same time as applying the least amount of pressure.”

The original caliper measurement system was based on two sensing planes with the paper sandwiched in between them. Pressure onto the sheet is applied by air bellows. The system is very effective on most grades, for instance fine writing paper and packaging grades, but in the case of newsprint, measurement precision of less than one micron has to be achieved, and this can be challenging when running at speed.

Running without an accurate caliper measurement is not an option in newsprint production. Mr. Kluttig explains: “We need to have an accuracy of one micron to maintain consistent thickness, we cannot have any variation”.

SOLUTION: AN OPTICAL SENSOR

After a number of discussions between the mill and ABB, it was decided that Sachsen would become



Peter Kluttig
explaining how ABB's
Optical Caliper works

the first mill to install a brand new product under development by ABB, the Optical Caliper Sensor, a sensor that uses a “confocal displacement” technique that measures caliper based on reflected light. Goss says: “We worked together with Stora Enso and we signed a confidentiality agreement. After a visit to our R&D center at Dundalk in Ireland, we decided jointly that installation of the new sensor would be a good proposal for both parties.”

In the meantime, the mill and ABB together maximised the performance of the existing sensor, making sure that maximum production efficiency and highest quality was achieved.

The very first permanent installation of the Optical Caliper Sensor began in early 2009 and it was measuring effectively “half an hour” after installation. Goss says: “The new sensor has a sheet stabilizer plate that sits underneath the paper which is there to hold the sheet against the optical target. The optical part of the sensor works with visible light, and provides a more precise reflection compared to laser methods which can be influenced by several other parameters of the paper. The hold-down plate design ensures that the system is not sensitive to any build up or marking of the paper, even on sensitive coated surfaces.”

The bottom line is, what does the customer think? Mr. Kluttig concludes: “The new caliper sensor has had a very positive impact, eliminating caliper measurement related holes and breaks and reducing wastage dramatically. It has also improved the quality of measurement which is now sound and dependable. These improvements have allowed us to tackle one of our biggest challenges, the one of improving quality for our heatset web customers, which will hold us in good stead for the future.”

Clearly Stora Enso's PMI at Sachsen is going to be a continuing future contender in the thoroughbred race of the newsprint giants from around the world. **PPI**



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