



Metso supplied 25 Jamesbury valves with Neles ND9000 intelligent valve controllers for control of sizing and retention aids.

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## PABCO board machine gets a new lease on life

New Metso-supplied automation infrastructure – which replaced antiquated chart recorders and analog controllers – has paid off handsomely for the California, USA mill. Product quality variability is much improved. In fact, customers rate the quality as the best ever. Production levels are up significantly, and the costs of energy and raw materials have been reduced.

**TEXT** Mark Williamson

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It's often the case that end-use requirements drive the need for improved quality and productivity in paper and board production lines. When the end product converting process makes a step change, the performance of the entire production chain must move up a step in concert. PABCO Paper in Vernon, California was confronted with this challenge when PABCO Gypsum, their main customer and sister company, increased the production of the gypsum wallboard plant near the company's Las Vegas gypsum quarry by

expanding to a new, high speed wallboard line in 2005.

The mill took a hard look at how to achieve the increased production and better quality needed to meet the Las Vegas plant's needs. Then, they decided to invest in the improved process and product quality measurements, process stabilizing controls, and vastly expanded operator information and decision-making tools supplied by Metso. The 110" (2,79 m) wire width machine produces 225 to 250 tpd of gypsum face and back

linerboard and other specialty chip board grades (from 16 to 40 point caliper) which are used for a variety of commercial applications. The furnish comprises 100% recycled materials, sourced mainly in the Los Angeles area.

### **End-users need lower variability**

PABCO Paper was aiming for higher quality and the extra production required to satisfy the wallboard production requirements. **Mike Willoughby**, Vice President of Product Quality and Paper Manufacturing, states: "The new gypsum wallboard line drove the linerboard quality requirements. Uniform appearance, sheet flatness, basis weight and moisture are critical elements for our customer."

**Bill Fraser**, Manufacturing Manager, Paper, adds his thoughts: "We required the extra production, but to run faster we needed more stable control and repeatability on the machine. Also, over the long term, we aimed to lower our costs of manufacturing by reducing chemical consumption and energy cost and by reducing basis weight." The gypsum linerboard grades are sold by coverage area and the specialty chip board grades are specified



**Bill Fraser**, Manufacturing Manager, Paper: "In this difficult economic climate, this automation system allows us to make changes that reduce costs without sacrificing quality."

by caliper, so reducing fiber consumption by minimizing basis weight is a desirable and legitimate goal. But first, stability is needed.

### Integrated solution

After the supplier technical evaluation, the mill chose Metso for an integrated system which combines metsoDNA DCS, PaperIQ Plus QCS and DNAhistorian information management functions. Mike Willoughby reports that Metso's "performance metrics" were rated as the best in the industry by the company he previously worked for.

A considerable amount of preparation work and investment was required to bring the machine's instrumentation and control capabilities to the higher level required to meet their quality objectives. First a Metso-supplied kajaaniMAP online freeness analyzer was installed in May, 2007. The analyzer gathers online data and process responses required to provide up-to-date operator information, implement standard operating procedures, and eventually close the refining energy control loop. The refiner plates are now adjusted manually to achieve a KW energy use target. The more consistent furnish freeness has a stabilizing effect on sheet strength properties and machine draws.

### More information needed

Much more information was needed to properly control the furnish preparation, chemical addition and forming processes, so the mill invested in process instrumentation and control actuators. For precise control over ply weight, formation and sheet strength properties, each of the 7 pressure formers was equipped with thin stock flow meters and variable-speed fan pump drives. Chemical flow measurements and 25 Metso-supplied Jamesbury valves with Neles ND9000 intelligent valve controllers were installed to precisely control furnish sizing and retention aids.

Improved cross-direction weight control was also an important target, so a new radial flow distributor with automatic

CD control valves supplied by Metso was installed on the No. 4 filler ply former. A similar unit with manual mid-ranging control valves was installed on former No. 3 in 2004.

The combined QCS and DCS system started up smoothly in July, 2007. Since the start-up the operators have had much better control over furnish and forming condition uniformity and CD profiles. Regulation of the drying process is also much better. Rather than use the reel moisture measurement to control the drying section, new infrared temperature sensors at three positions across the sheet at the dryer exit are used for steam pressure control. Sheet temperature control gives more uniform sheet quality, provides tighter control of the drying section, and avoids overdrying of the sheet.

### Reduced variability, lower costs

More available and accurate information, standardized operating procedures, and more precise process and quality controls have all added up to a significant return on the mill's investment in automation. Product variability in both the MD and CD has been cut significantly.

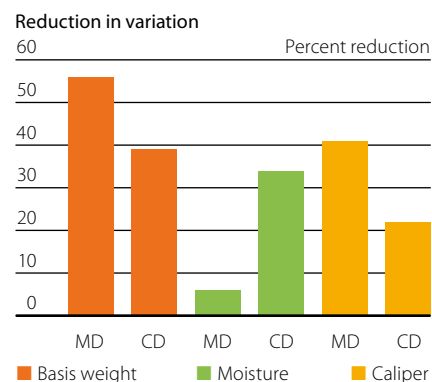
More stable quality can be leveraged to give some impressive savings. The mill reports basis weights have been reduced by 14% with the improved automation.

Other cost savings stand out. Steam consumption has been cut by over 3.5% and chemical consumption has been reduced by almost 2.9%. Bill Fraser adds: "In this difficult economic climate, this system allows us to make changes that reduce costs without sacrificing quality."

### Stability = productivity

A stable machine with more consistent quality is often a more productive machine, and that is exactly what happened at the Vernon mill. Line speed has increased by an average of 6.41%. Mike Willoughby sums up the results: "We now have the ability to detect and control our process parameters and we make a consistent product with higher quality compliance, to meet our customer demands. Reduced basis weight and higher machine speeds have followed. But we could not speed up without the improvement in variability." In fact, Willoughby reports the improvement in quality was noted by a company executive who said the quality is the best he has seen in many years with the company. □

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**Product variability** has been improved significantly, as can be seen from statistics provided by PABCO. The mill now makes a consistent product with higher quality compliance to meet customer demands.

### Summary of results

Basis weight reduction (fiber savings)	14%
Line speed increase	6.41%
Drying steam savings	3.57%
Chemical cost savings	2.87%
Reduced customer complaints	25.96%

### Improvement

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