

## FEATURE

# Wet End Rebuild Improves Board Quality at Smurfit Carton y Papel

*Upgrading aging cylinder machines to be competitive with fourdrinier formed webs*

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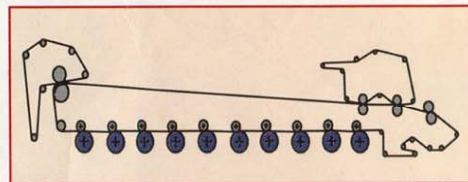
Three years ago, Smurfit Carton y Papel's Los Reyes mill (SCPM) was losing market share for the clay coated cylinder board manufactured on their No. 3 paper machine. Mills that had installed multi-fourdrinier machines had better control over quality variables than can be achieved with current "vat" or hydraulic formers. Pressure from the market demanded that the mill manufacture a less dense sheet with better bending characteristics and surface smoothness.

SCPM concluded that a rebuild of the wet end would be required in order to gain control over profile, smoothness and productivity. However, due to an extremely competitive economic environment, the mill's first rebuild option — a folded fourdrinier style machine — was not economically feasible. The project's cost had to be in line with more common hydraulic former rebuilds.

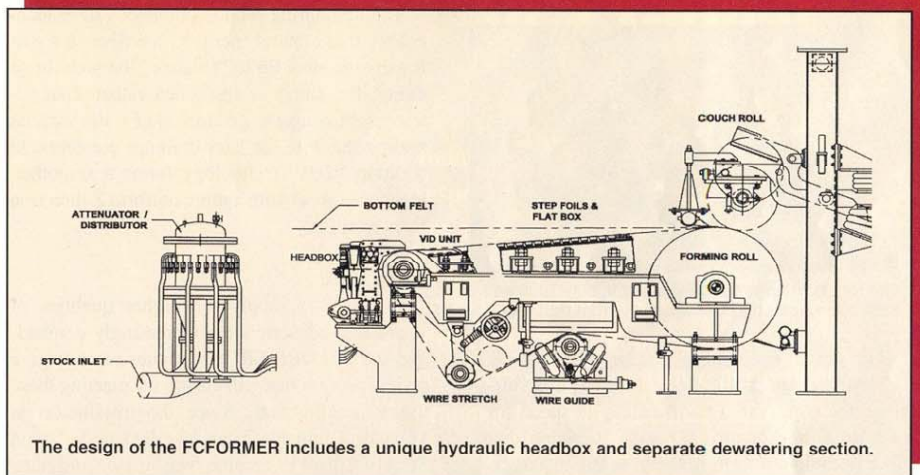


The No. 3 paper machine wet end at Los Reyes consisted of nine conventional counterflow vats and one dry vat which formed board from 55 to 110 pounds per 1000 square feet (#/msf). Production speeds range from 250 to 450 feet per minute

Mill engineering then came up with the idea of designing a former which would suit their needs, and contract the fabrication portion of the project to an outside firm.



No. 3 PM Felt Run - Before Rebuild



The design of the FCFORMER includes a unique hydraulic headbox and separate dewatering section.

As SCPM developed their design concept, a list of desirable forming characteristics emerged. These included:

- The ability to carry a high fiber loading (basis weight)
- Improved control of cross direction profile
- The ability to operate at higher speeds consistent with future production demands
- The ability to control and vary MD/CD strength ratios
- The ability to control couch nip moisture content independently of the basis weight
- The ability to operate across a wide range of basis weights
- Uniform dispersion of the fines throughout the Z direction of the sheet
- Improved quality properties for the desired grade

The initial phase of the project called for removal of the first two vats from the paper machine and replacement with the prototype former. The existing felt run was to remain the same, the former had to fit in the physical envelope vacated by the two vats and carry the load of the both vats removed.

With the design concepts in place, SCPM's engineering personnel drew the plans for a mini fourdrinier that would incorporate a compact hydraulic headbox and independent dewatering

section. Once the fiber slurry is on the forming wire the dewatering table, consisting of a series of vacuum boxes with slotted covers, would take over removing water and increasing sheet consistency to the couch nip. The dewatering table would be short in length due to the physical envelope size restriction, but have to achieve a consistency at least equal to that of the existing vats. The forming wire was inclined upward to allow the unit to fit under the existing horizontal bottom felt run.

The remainder of the design incorporated a wire stretch and guide for fabric control and reused the existing forming cylinder and couch roll. AES Equipos y Sistemas, in Guadalajara, was contracted for the rebuild.

The prototype FCFORMER™ was built and installed in 1995, and was started up with excellent results. SCPM used the prototype both to assure themselves that the unit performed as it had been designed, with no adverse effect sheet properties — such as plybond — and as an inspiration for generating a number of key design improvements for further upgrades.

Based on the results of the prototype unit, SCPM contracted AES to build four second-generation units to replace the remaining eight conventional forming vats. These new units utilize VID™ technology, a radial distributor to feed the headbox and a redesigned dewatering table composed of two low vacuum Stepfoil™ boxes.

IMPROVED MD / CD RATIO	52%
	3.75 TO 2.55
REDUCED FIBER COSTS	5%
REDUCED WET END ENERGY COSTS	48% (200KW)

**Table I summarizes the operating benefits the mill has realized from the installation**

The modification to the accumulator / distributor system will allow future units to change the CD basis weight profile through zone controlled consistency changes. This change will enable the profile to easily be controlled either manually or by the mills' computer system to further level the cross direction profile. Additionally, a stock pressure monitor will automatically compensate for pressure changes to reduce pulsations at the slice lip.