



The European Containerboard Market



SHARP International
AICC Region 9
presented by Randy Banks



The European Containerboard market is changing...

- NEW - State of the art PM's can offer lower basis weights with comparable performance to today's containerboards.
- Improved containerboard quality allow for light weighting opportunities.
- New markets have emerged:
 - Short run pre-print opportunities
 - Microflutes instead of folding carton grades?



When is a Paper Machine Obsolete

By Jim Thompson / March 2006 “*Solutions*”
magazine.

“Big Six Test”

- **Trim width:** Does PM width match existing corrugator widths?
- **Speed:** How does your PM compare to industry standards?
- **Obsolete technology:** Who is producing coated white top?
- **Ancillary issues:** Are 40 year old paper mills efficient?
- **Raw material issues:** Do you need virgin kraft linerboard?
- **Obsolete grade:** Is 42# kraft linerboard still the mainstay?



New PM's in Europe: 2000-2010

- 13 New PM's in Europe
- 8 of the 13 PM's are producing no heavier than 28.7#
- Only 1 of the 13 PM's is producing heavier than 32.8#
- 10 of the 13 PM's produce 15.3# or lighter



Containerboard / Europe

- Technological advancements have allowed 80-90 % of traditional virgin liner applications to be replaced with recycled liner
- End users drive innovation by demanding higher quality and lower costs.
- Privately owned paper producers and paper converters invest heavily in technology and new equipment.

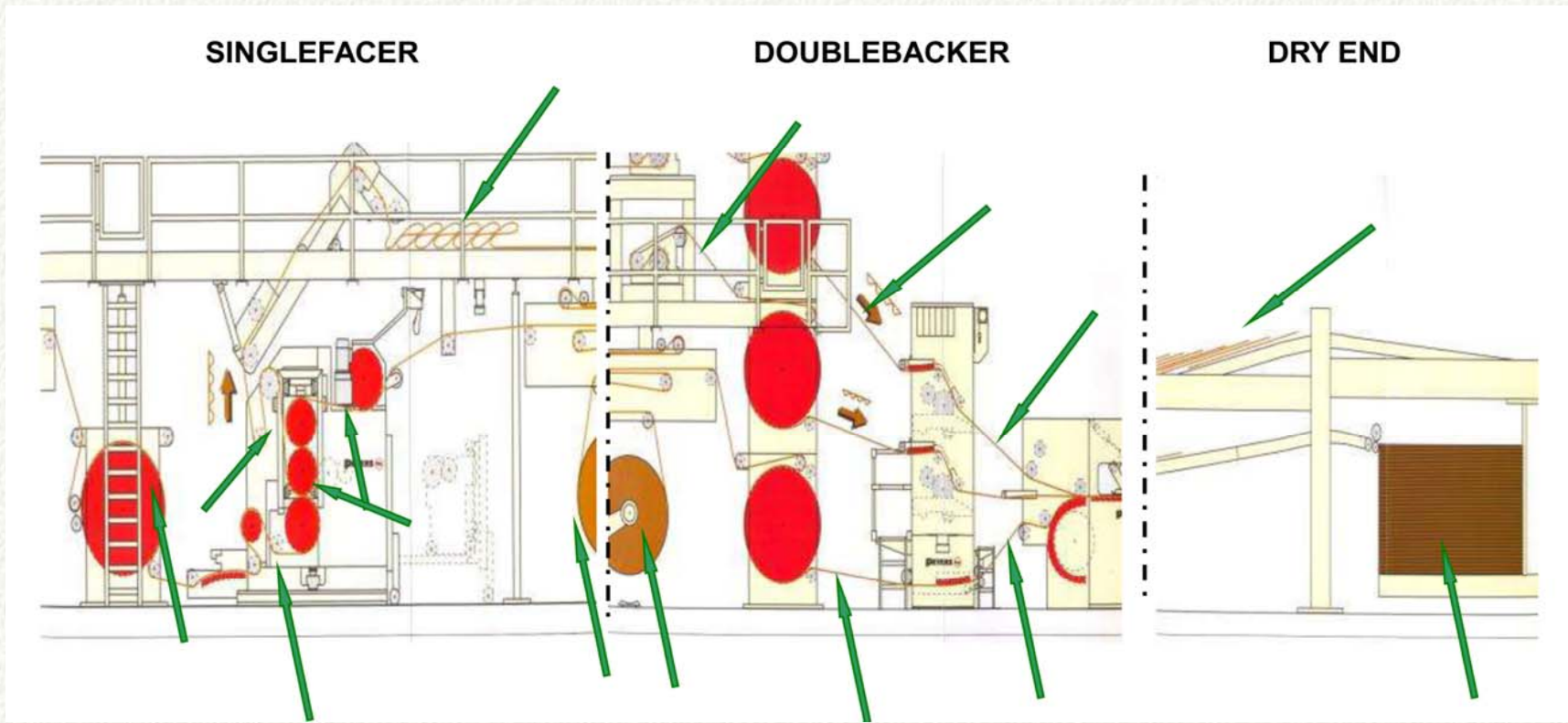


Containerboard / Europe

- European standard basis weights (MSF)
Medium: 14.3#, 16.4#, 18.5#, 20.5#
Recycled linerboard: 18.5# and above
- State of the art corrugators are running faster with increased working widths of 110" & 130"
- 1 million tonnes (plus) of new capacity coming online in 2009/2010.
- Integrated mills will continue to close unproductive PM's



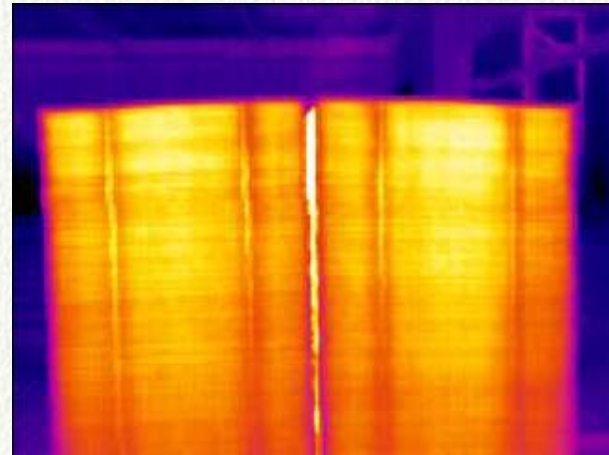
Infrared Sensors / Camera



Source: FEFCO



Infrared Photos



Source: FEFCO



Less is More....

- Less glue/starch
- Less heat
- Less tension
- More productivity
 - Faster running speeds
 - Improved quality



Double Wall instead of Single Wall

- **E/B instead of C flute**
- **E/E instead of B flute**
 - Less fiber
 - Stronger box
 - Better printing surface
 - No upcharge for “light weight” grades



SCT & RCT

- Ring Crush Test and Short Span Compression Test measure the stiffness of linerboard.
- Europeans have not used RCT in 15 years.
- SCT is a better indicator of ECT which is a better indicator of BCT (stacking strength).



Prowell GmbH PM2

- Working Width: 394”
- Annual Capacity: 650,000mt
- Basis Weight range: 14.3# - 22.5#
- Design Speed: 6200 fpm
- 100% waste based
- Waste Paper: 850,000mt/annum
- Start Up: March 15, 2010

Source: Progroup AG



Prowell GmbH PM2 – Components

- Drum Pulper – largest in the world (270mt)
- Two-layer head box
- Gap former
- Two shoe presses
- Film press
- High performance air dryer after pre-drying section
- Impingement dryer provides high production speeds, dimensional stability control, and better runnability

Source: Progroup AG



Combined Board

- There can be huge variations in ECT and BCT even from the same board combination on the same corrugator.
 - Temperature too hot
 - Temperature variation
 - Tension too high
 - Inconsistent moisture, glue, starch
- The Corrugating Process determines the ECT and BCT values. Precise control of the board production process allows light weighting without sacrificing strength.



Summary

- Glean information/techniques from overseas corrugators and implement what is applicable to the US market.
- Don't put all your eggs in the domestic basket. Consider purchasing 10%-20% of your containerboard from non traditional partners (overseas mills).