

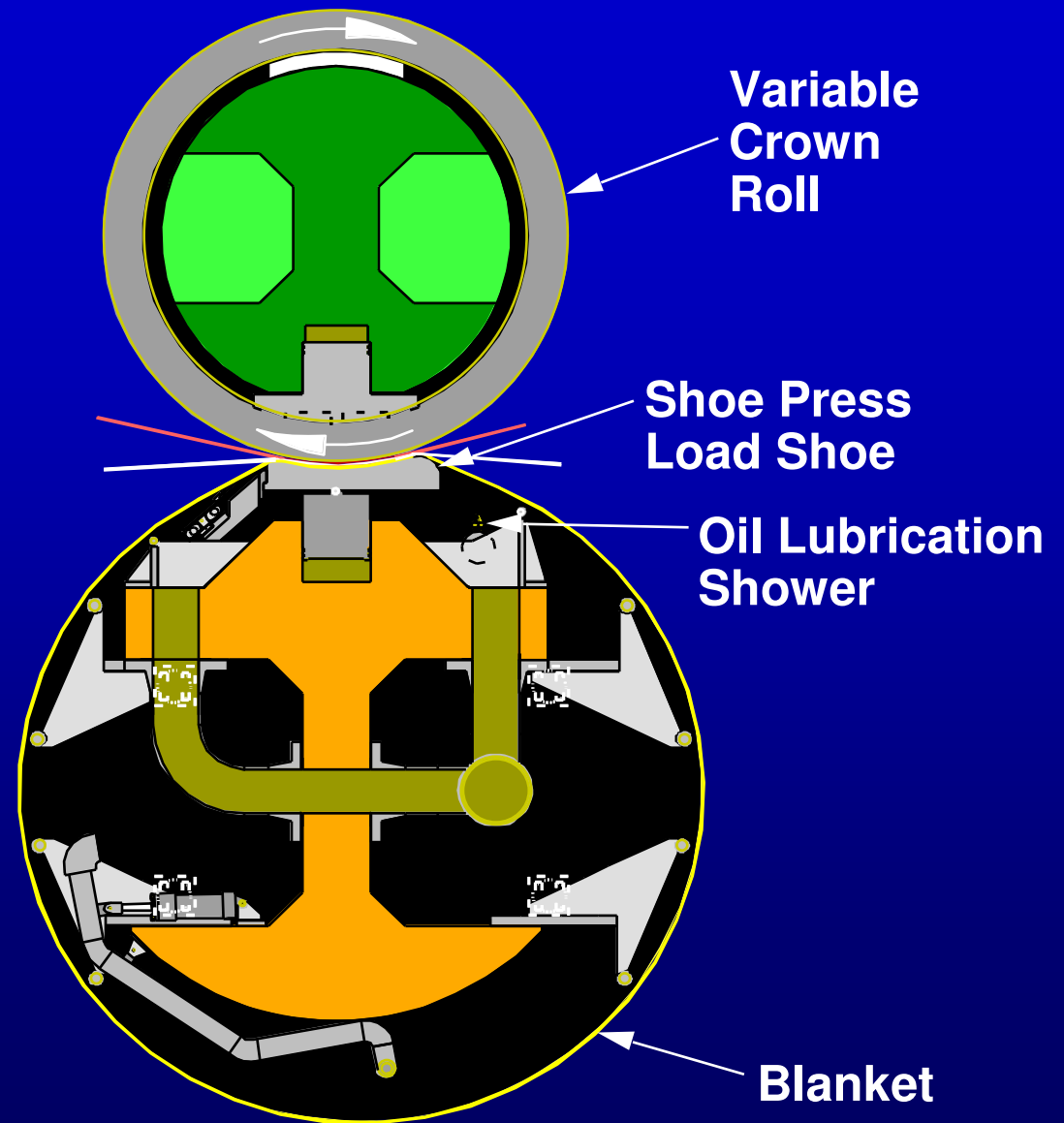
# Lake States Tappi

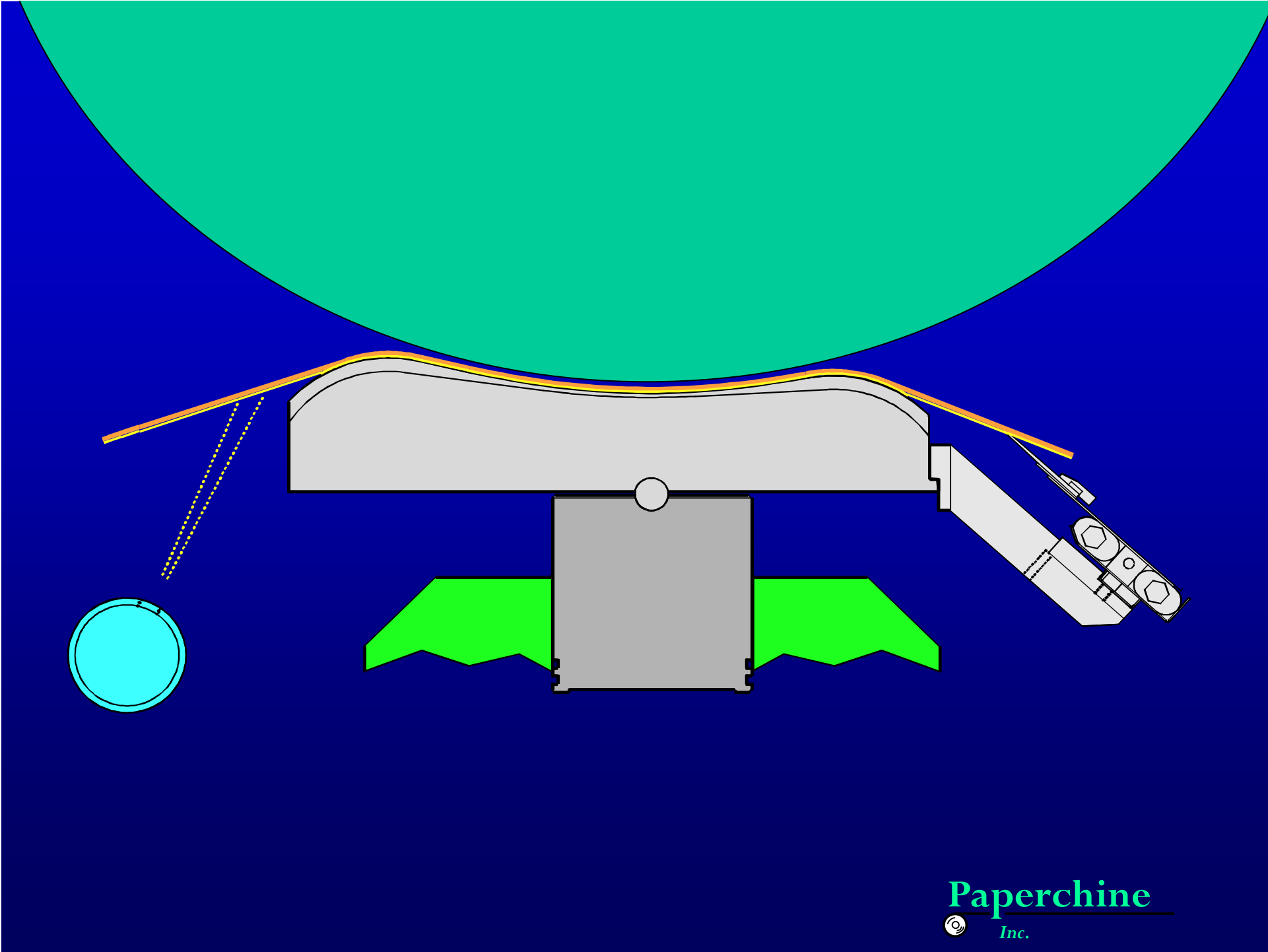
## Energy Forum

# Press Section Energy Savings with a Shoe Press

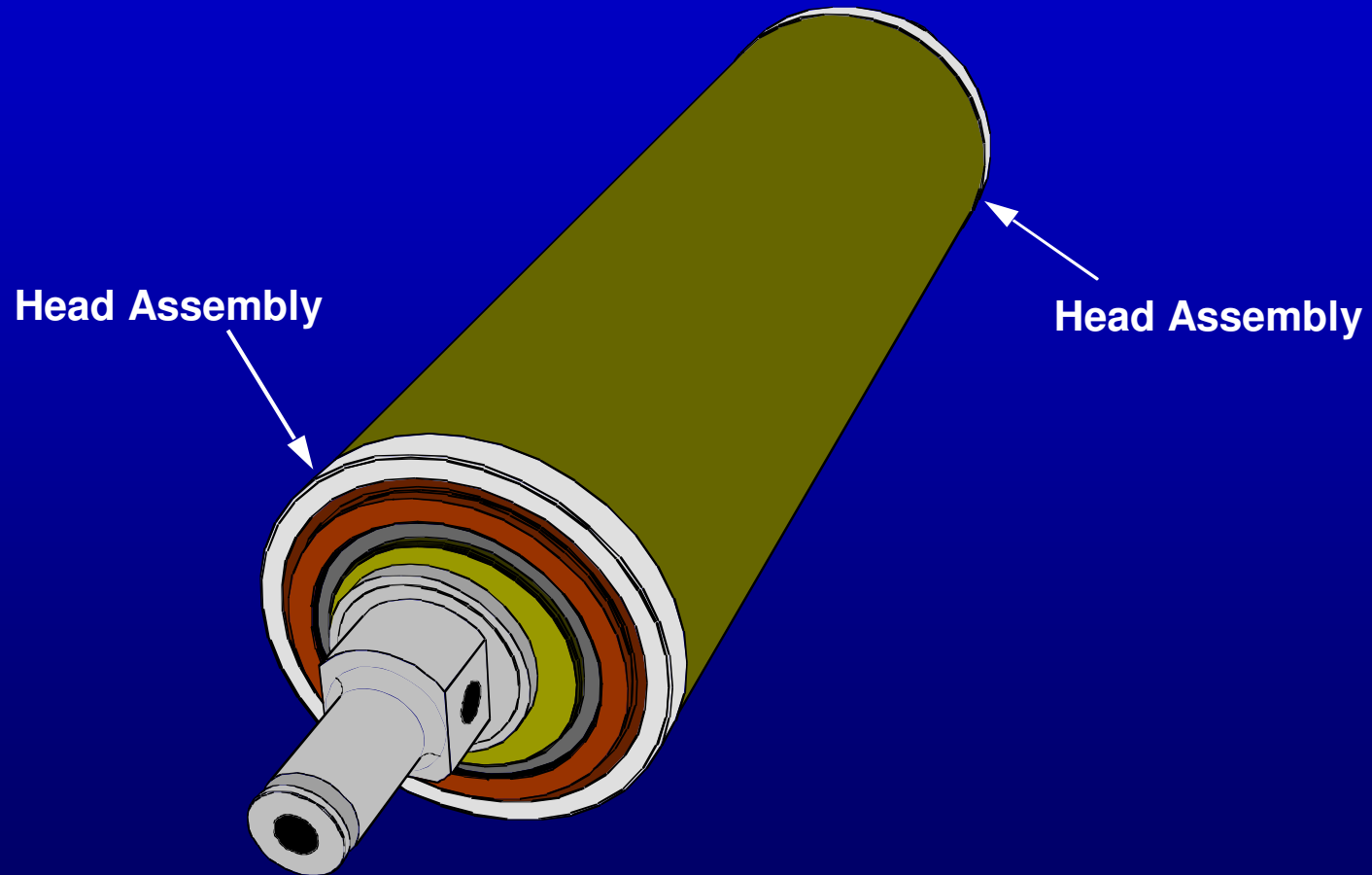
Laurie Wicks  
Paperchine, Inc

# CLOSED SHOE PRESS

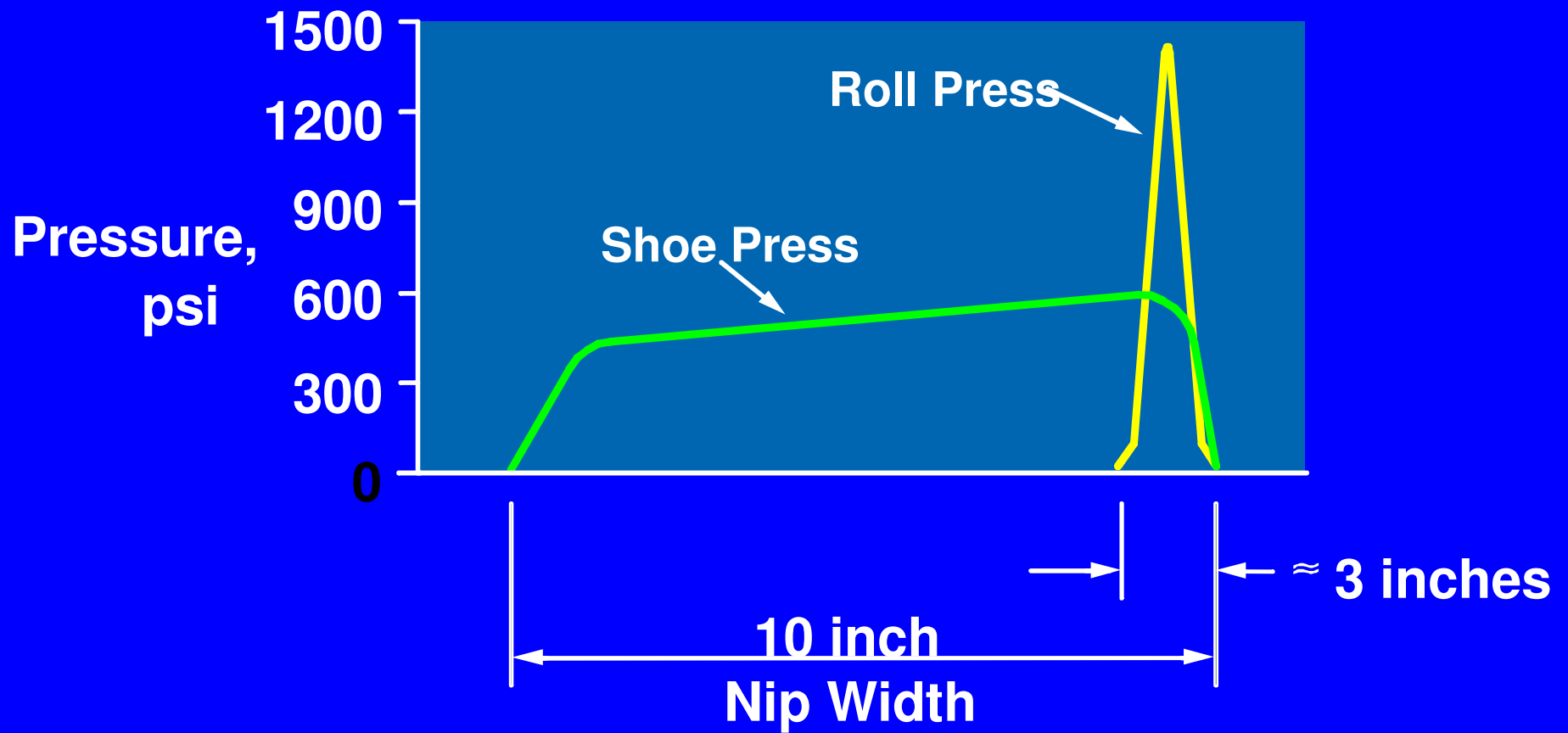




# SHOE PRESS Module



# PRESSURE vs NIP WIDTH



# Press Impulse

**PI = Avg Nip Pressure x Nip Residence Time**

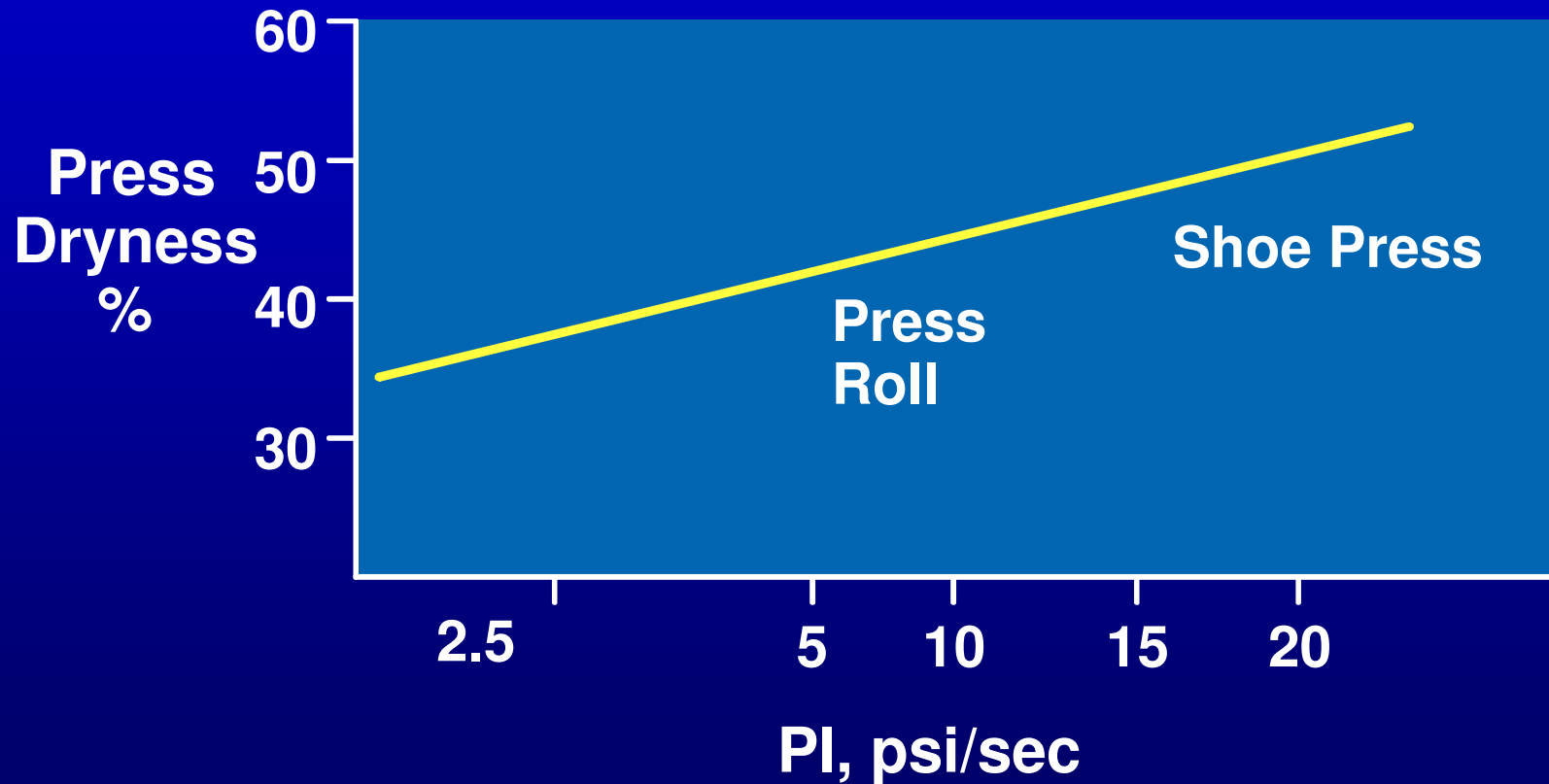
**Avg nip Pressure(psi) = Loading (PLI) / Nip Width(Inches)**

**Nip Residence Time(Sec) = Nip Width(Inches)x5 / Speed(FPM)**

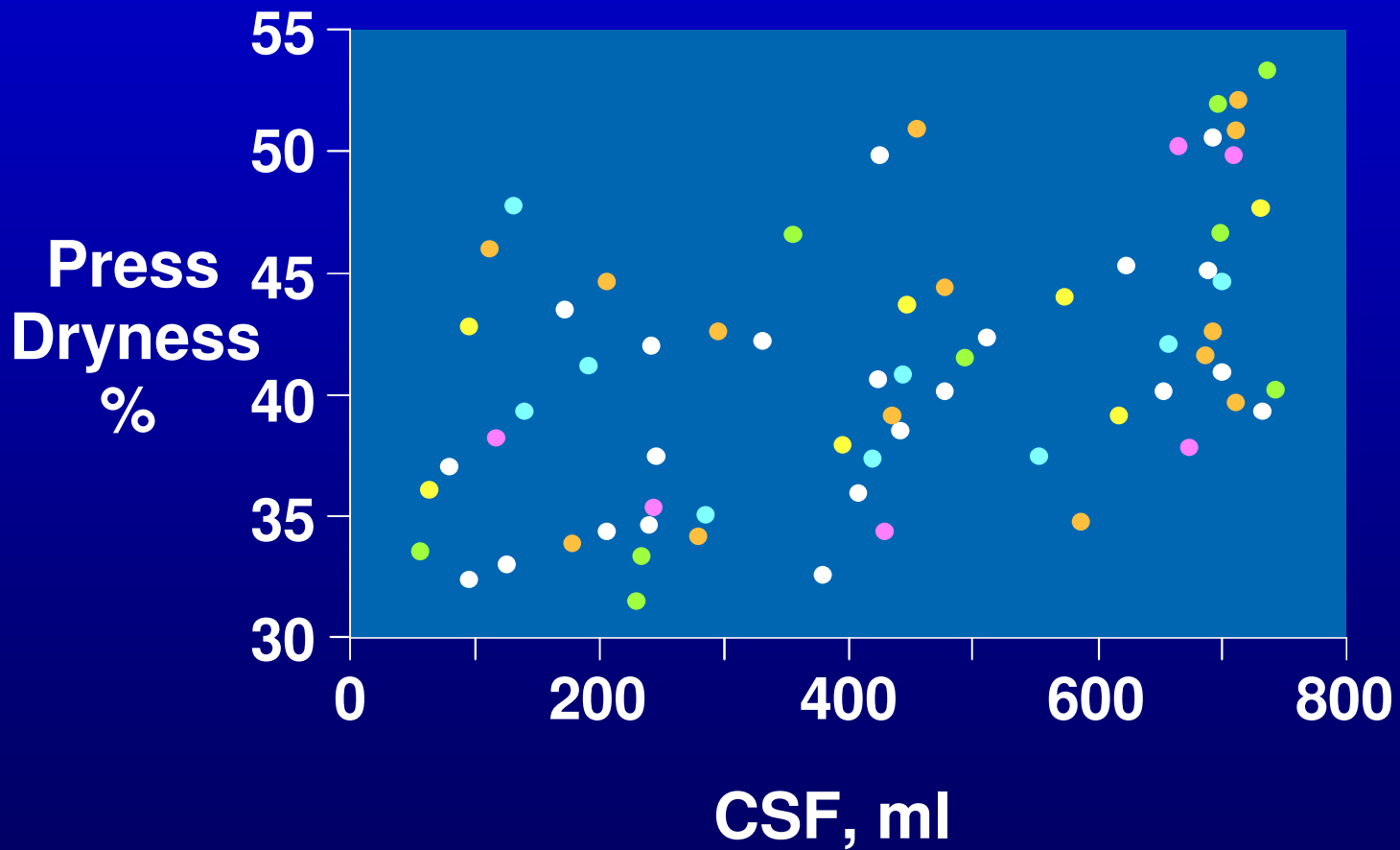
**PI(psi/sec) = Loading (PLI) x 5 / Speed(FPM)**

**PI is independent of nip width.**

# DRYNESS vs PRESS IMPULSE



# PREDICTING PRESS DRYNESS Using CSF



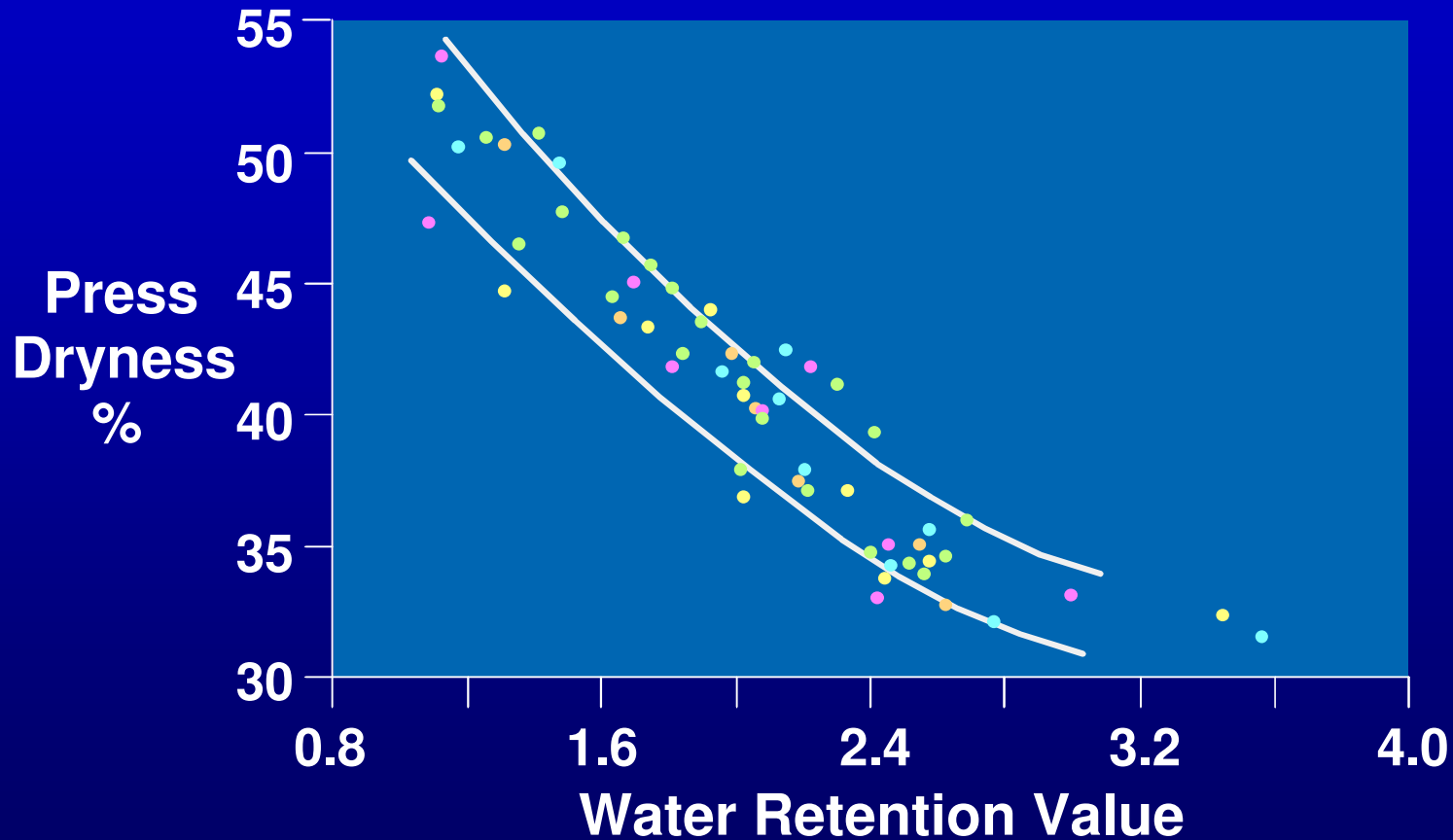
# **WATER RETENTION VALUE (WRV)**

**Water Retention Value is a Measure of the Water Retained by a 1400 gms Pulp Pad after Centrifuging for 30 Minutes at 900 G's**

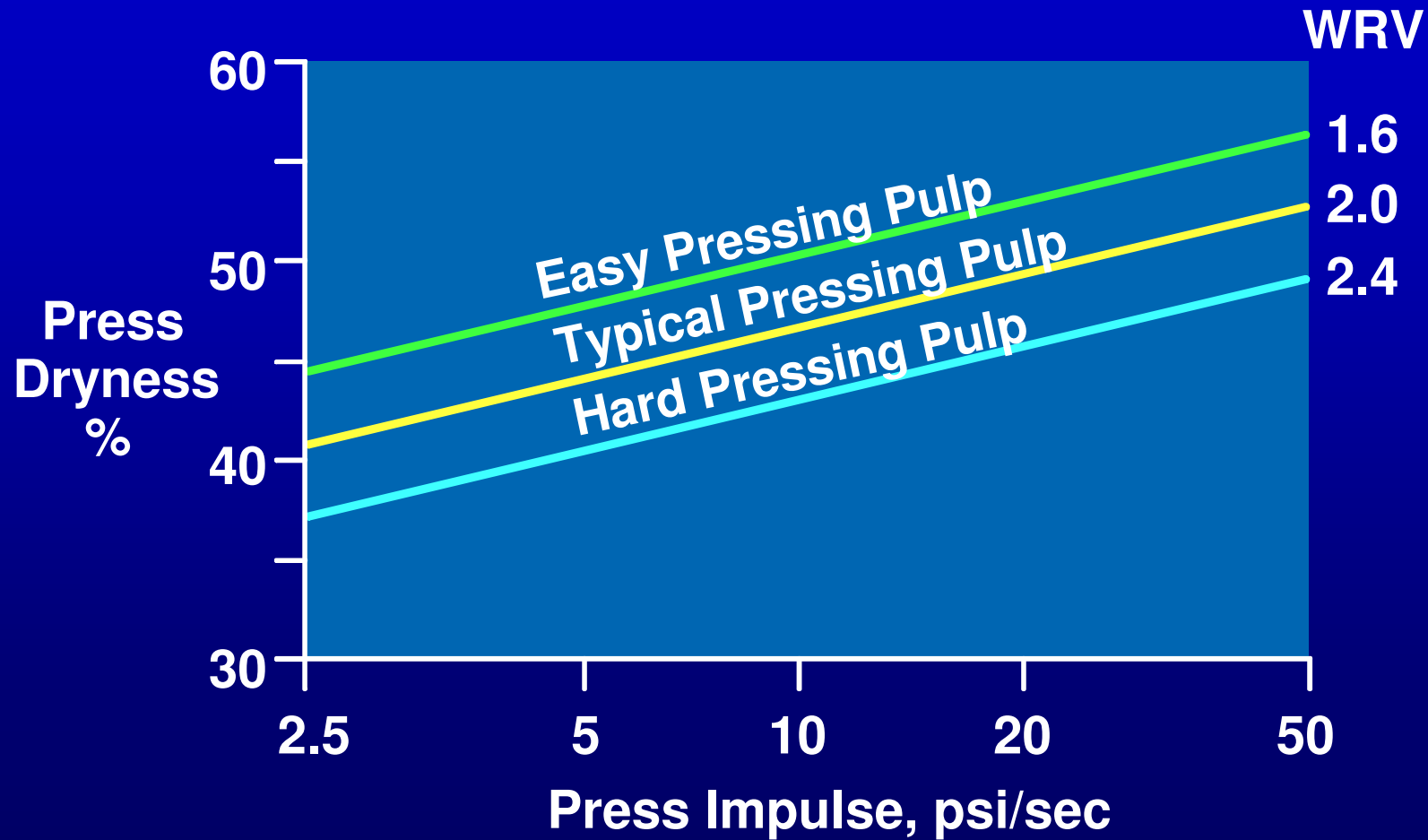
**The WRV Number is the Water to Fiber Ratio of the Pad after Centrifuging**

TAPPI Useful Method #256

# PREDICTING PRESS DRYNESS Using WRV



# EFFECT OF WRV



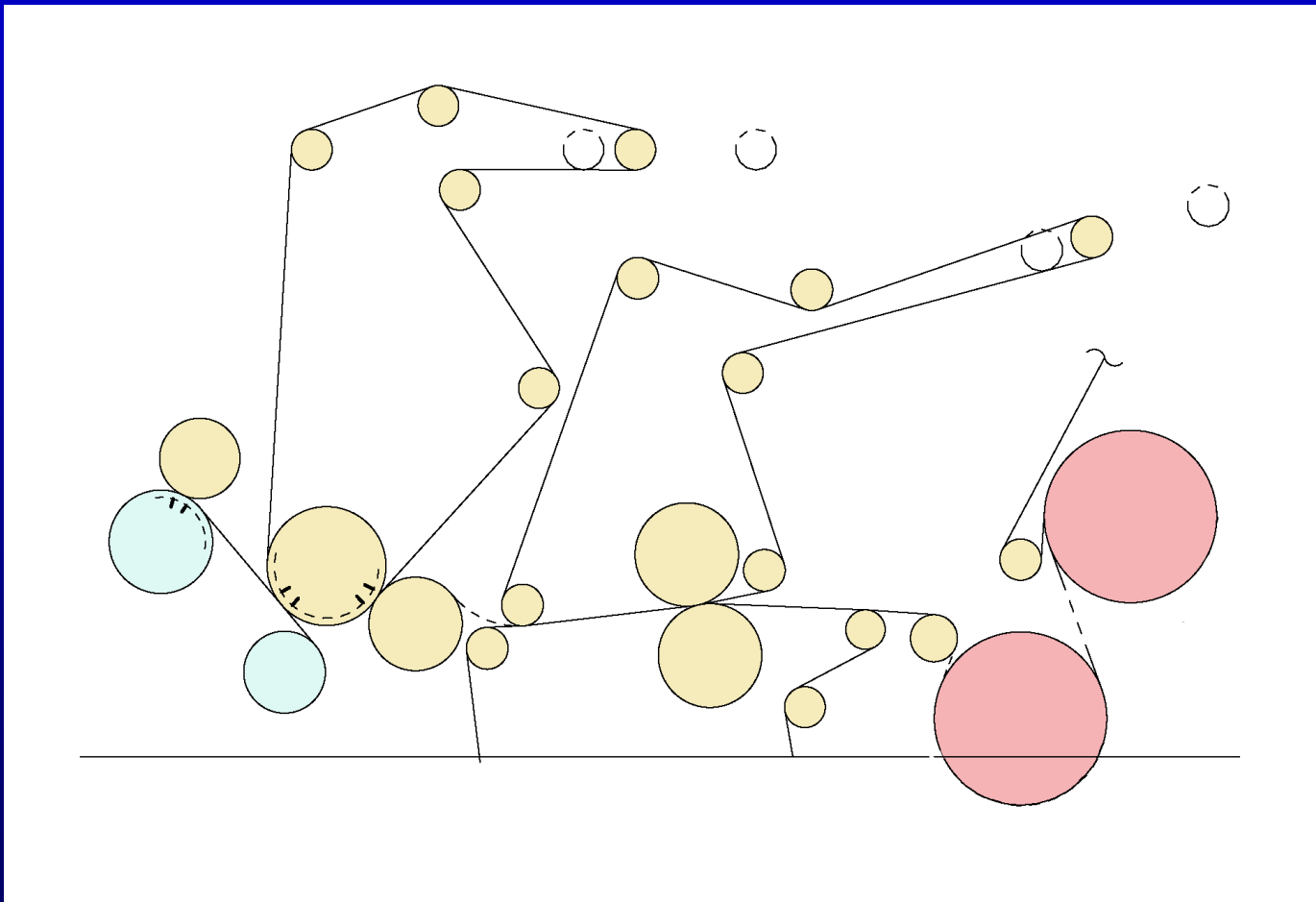
# Case Study #1

- Lightweight Linerboard Machine

# Existing Press

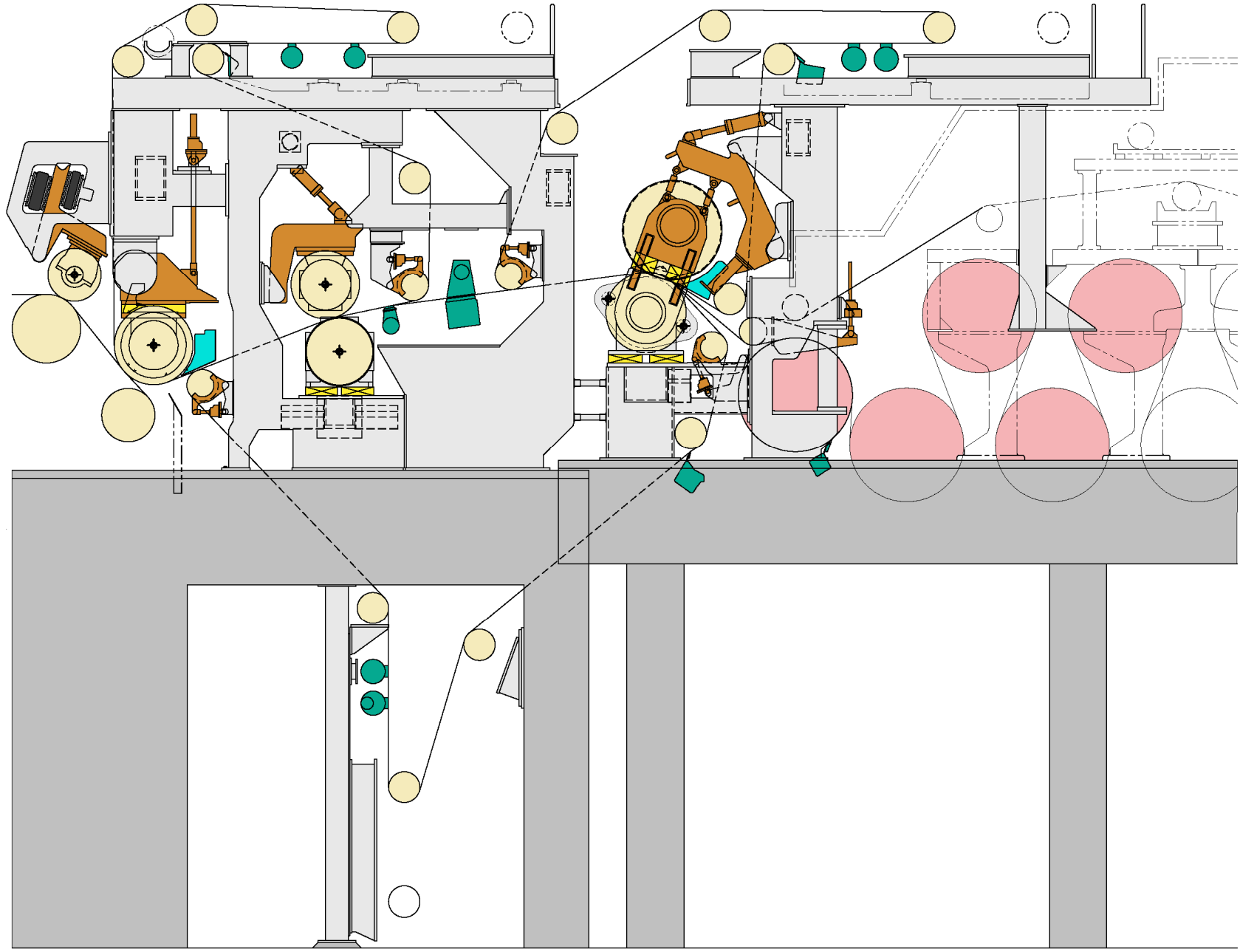
- Grade: Linerboard
- Basis Weight: 21 – 46#/1000
- Wire Width: 192”
- Design Speed: 2500 fpm
- Operating Speed: 2200 fpm
- Design Load:
  - First Press: 350PLI
  - Second Press: 900PLI

# Existing Press Arrangement



# Press Rebuild

- Grade: Linerboard
- Basis Weight: 21 – 46#/1000
- Wire Width: 192”
- Design Speed: 3000 fpm
- Operating Speed: 2500 fpm
- Design Load:
  - First Press: 900PLI
  - Second Press: 6000PLI



# Rebuild Results

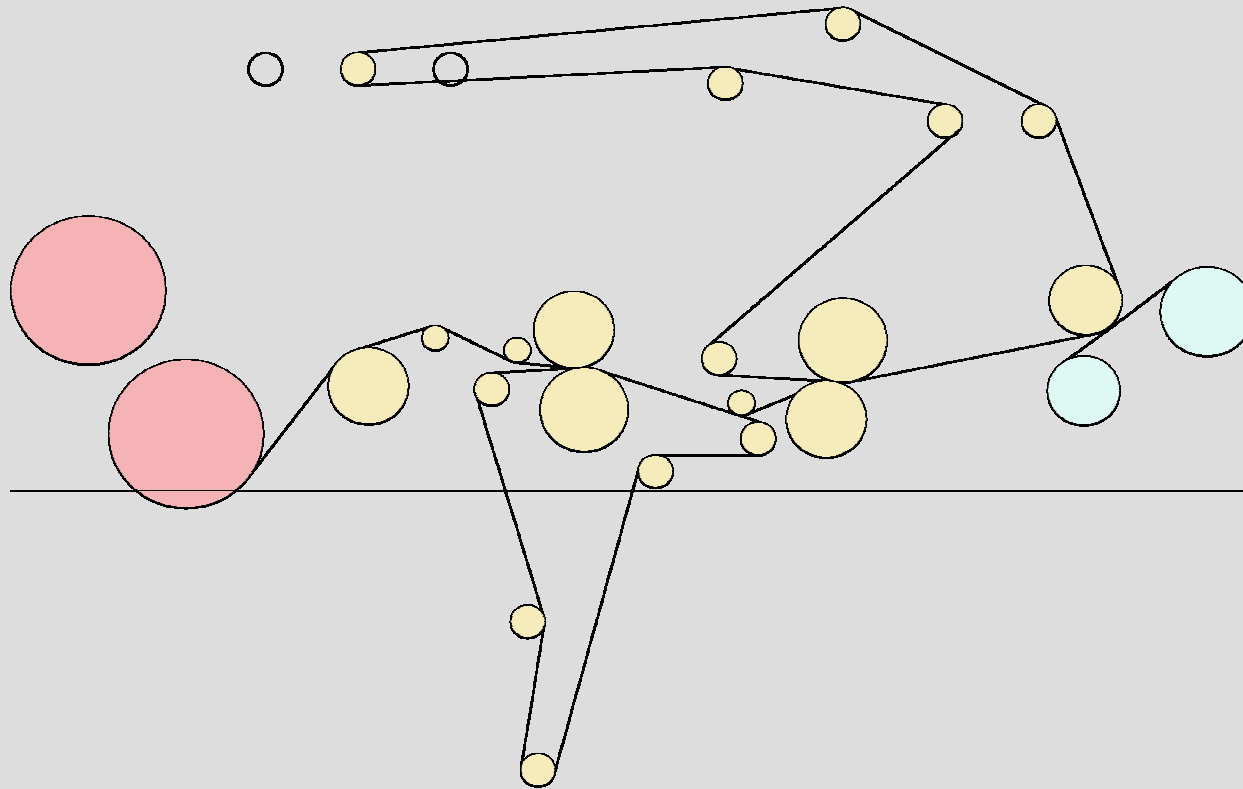
	Before Rebuild	After Rebuild
<b>Avg #steam/#paper</b>	2.19	1.63
<b>Avg prod. Rate TPH</b>	11.1	11.5
<b>% Change Steam Usage</b>		-17.6%
<b>% Change Prod.</b>		4.4%
<b>% Change #steam/#paper</b>		-25.7%

# Case Study #2

- Lightweight Paper Machine

# Lightweight Papers

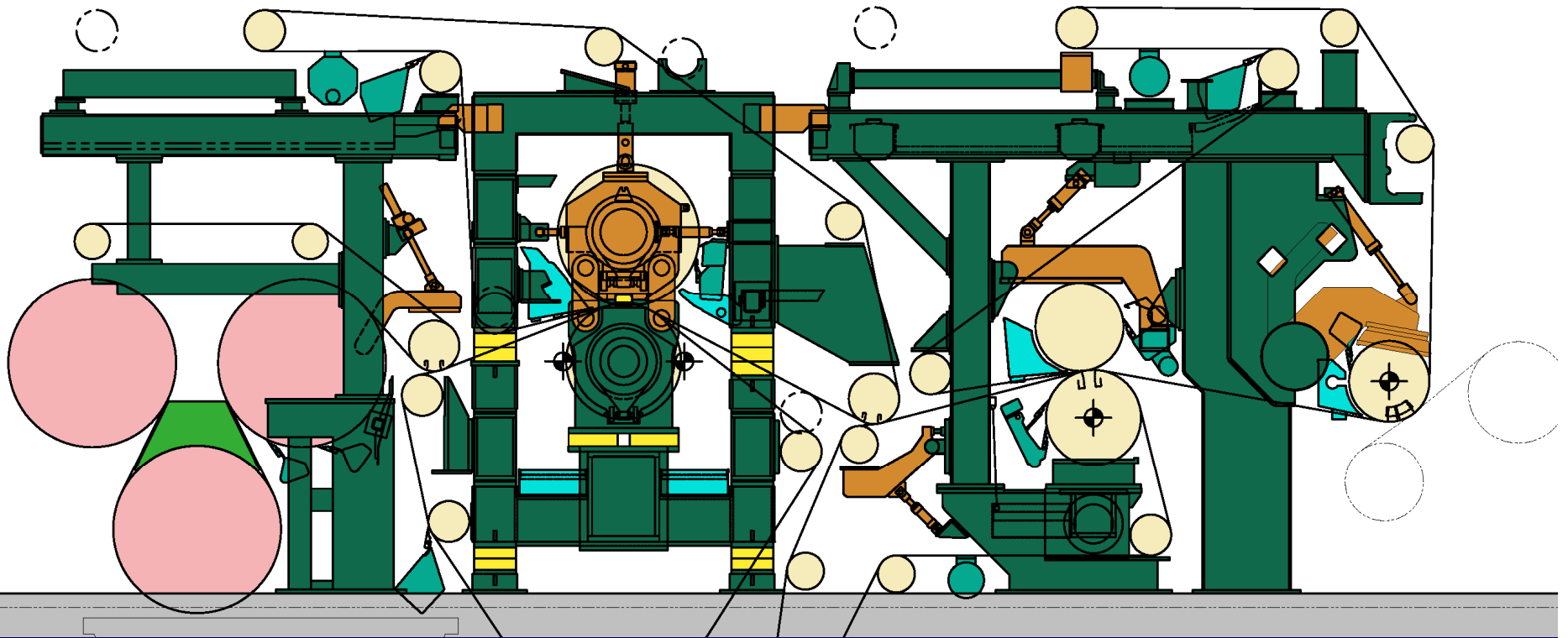
## Existing Press Arrangement

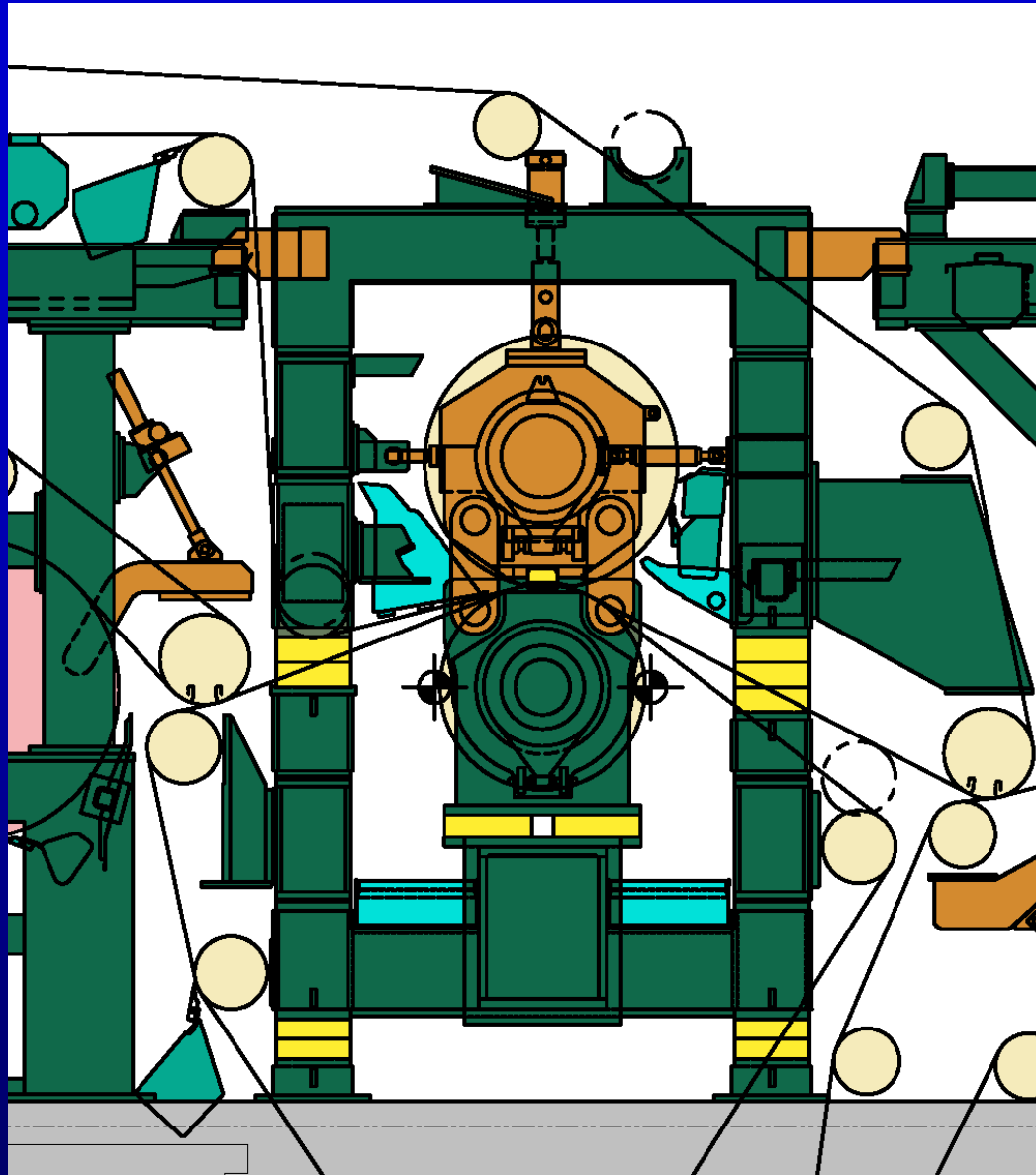


# Press Design Objectives

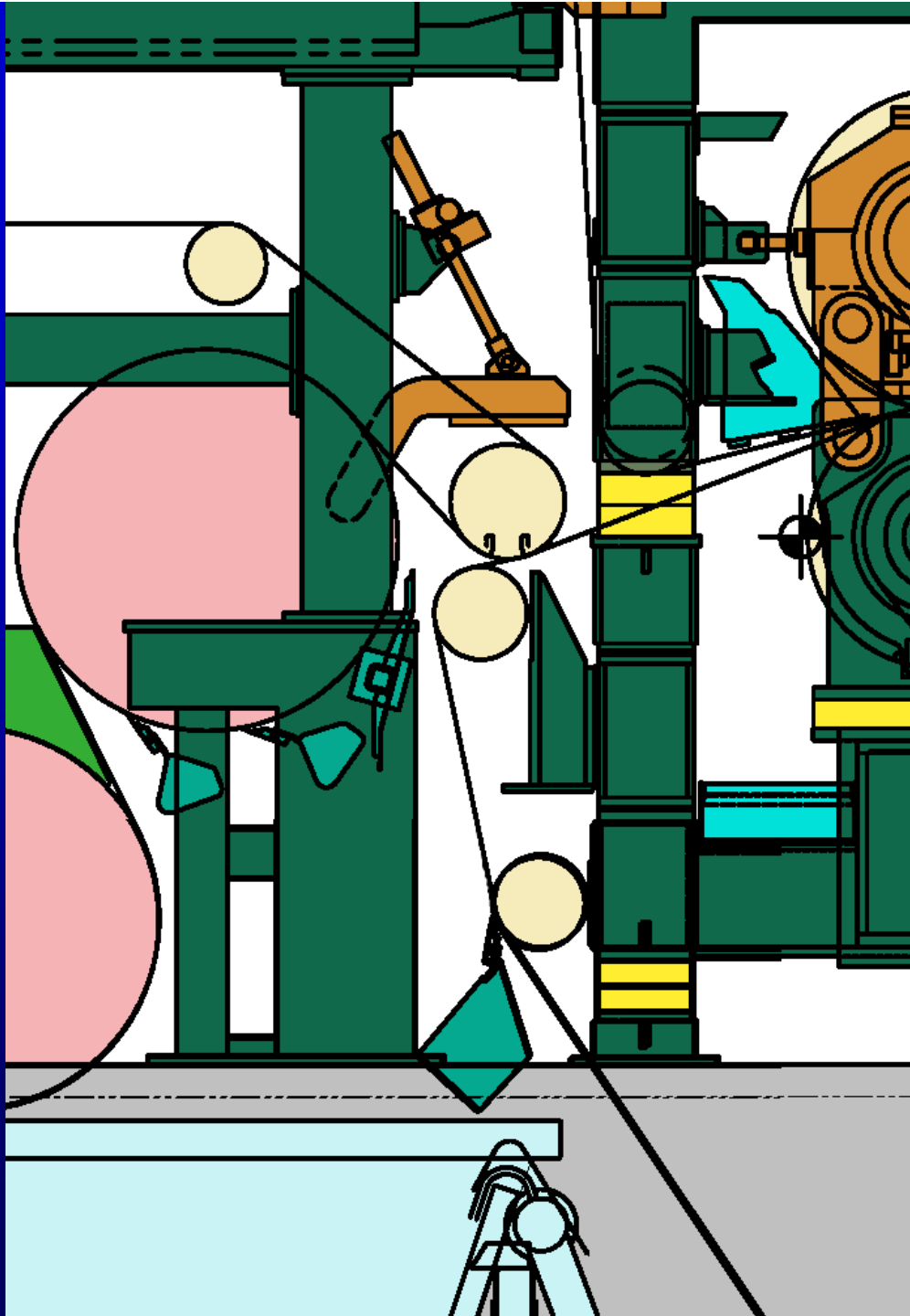
- Improved efficiency
  - Eliminate open draws
- Improved press Solids (Reduce energy)
- Increased machine speed
- Smooth roll on bottom side of sheet
- Improved coater efficiency
  - Better porosity

# Lightweight Paper Press Arrangement





# Shoe Press Module



# Press to Dryer Transfer

**Paperchine**  
Inc.

# Rebuild Results

	Pre Rebuild	Post Rebuild	Pre Rebuild	Post Rebuild
BW (3000Ft2)	28	28	45.5	45.5
Speed (FPM)	2400	2750	2350	2600
Total Draw (FPM)	110	65	100	70
	4.6%	2.4%	4.3%	2.7%
Press Solids	38-39	45-47	38-39	45-47
Tensile		No change		No change
Tear		No Change		No Change
Stiffness		No Change		No change
Porosity (Sheffield)	166	81	N/A	N/A
FS Smoothness (Sheffield)	91	130	73	113
WS Smoothness (Sheffield)	89	100	59	61