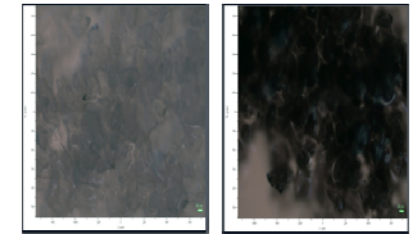
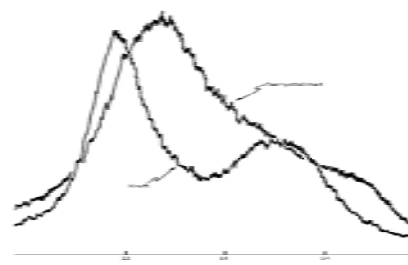
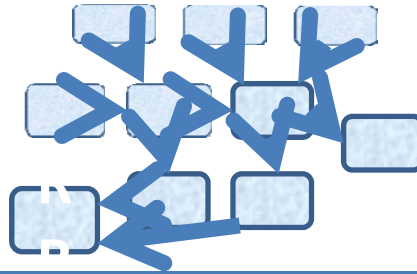
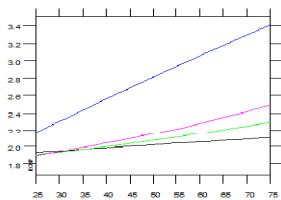


Nano-Porous Cellulose: A New Fiber

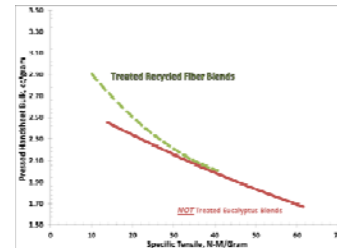
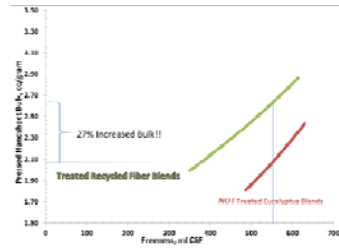
- Simple to Produce
- Reduced Crystallinity → Much More Open Structure
 1. X-Ray
 2. Staining
- Generates Sheets With:
 1. Higher Bulk
 2. Higher Porosity
 3. Lower Strength
- Especially Effective With Recycled Fiber



CSI Treatment Exceeds the Bulk Potential of Eucalyptus fiber, even mercerization!

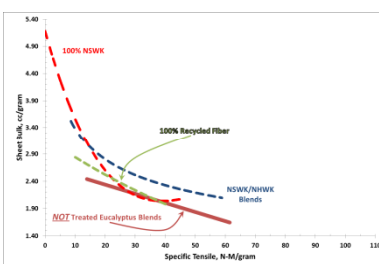
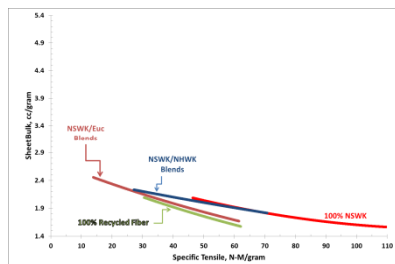


Extremely Large Bulk Gains in Recycled Fibers at High Freeness and Strength Levels! We Believe a High Potential to Produce Soft Recycled Fiber sheets at or nearly equivalent to those made with Eucalyptus.

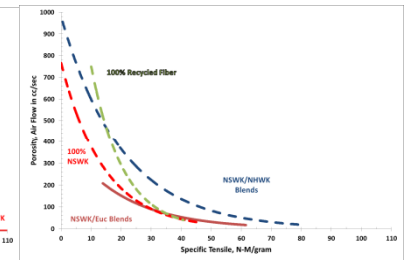
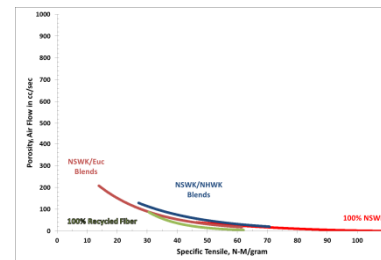


- Reduce Drying Costs
 - Add Treated Fibers to Furnish Increase Wet Pressing
 - Higher Dryness with No Bulk Loss
 - Maintain Target Tensile Values
 - Wide Crescent Former Running at 39% Post Pressure Consistency
 - Install Shoe Press, Raise Consistency to 45 to 50%
 - Reduce Drying Load 22% to 36% → Or Increase Production!
- Increase Sheet Porosity
 - Add Treated Recycled Fiber to Premium Sheets
 - Bonding of Recycled Reduced
 - More Uniform Drying, especially with Through Air Drying Process
 - More Effective Creping since Sheet Density Reduced
 - Premium Quality with Relatively Large Amounts of Recycle Fiber!

While Strengths Are Considerably Reduced by 1/3 or more, Bulks increase by 50% or more! Treated NSWK should be a great towel bulking fiber!



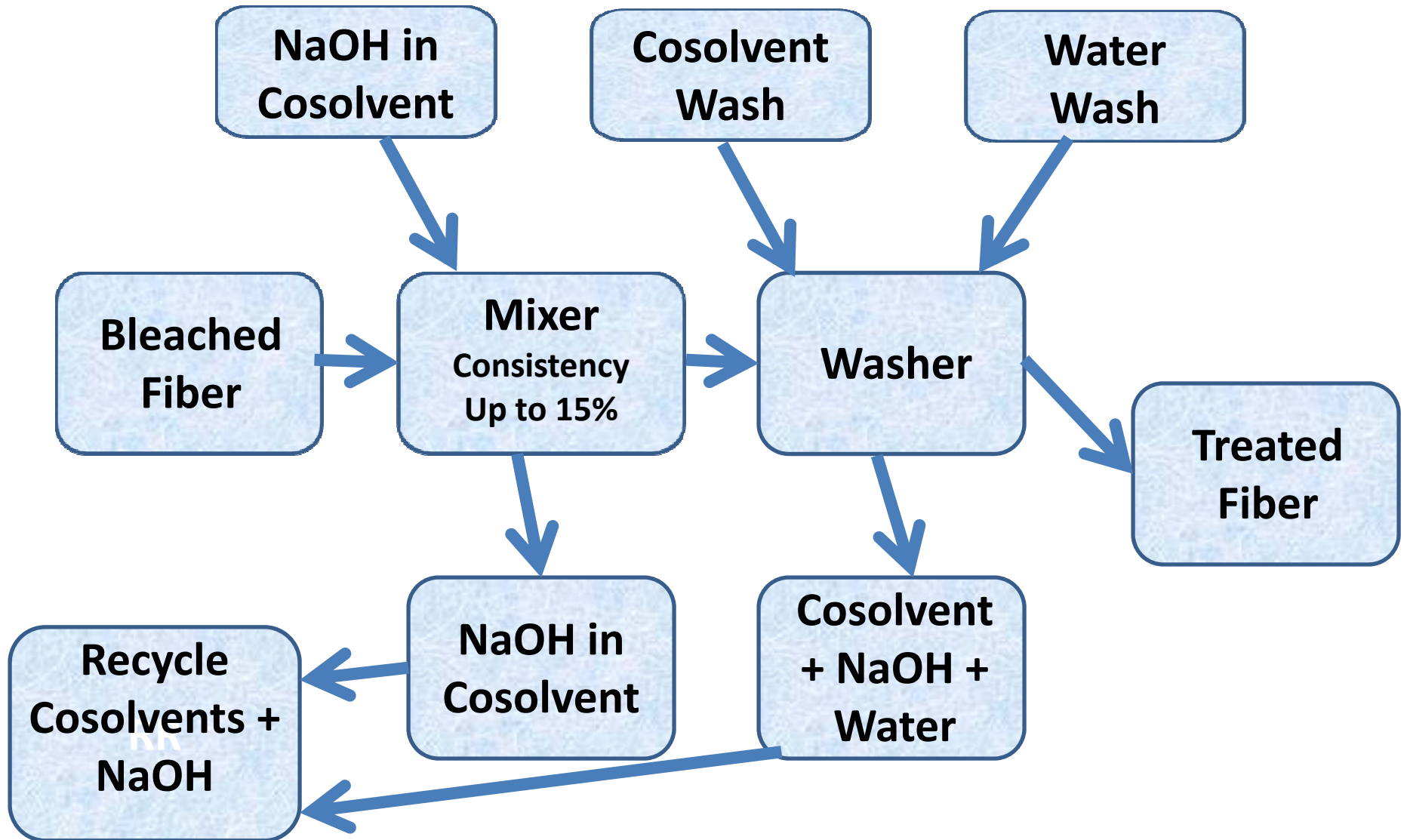
Treatment yields up to a 5-fold increase in air flow rates through the pressed handsheets! The high porosities and bulks will not only increase sheet quality levels but also ease of through air drying strong towel and high recycled fiber sheets!



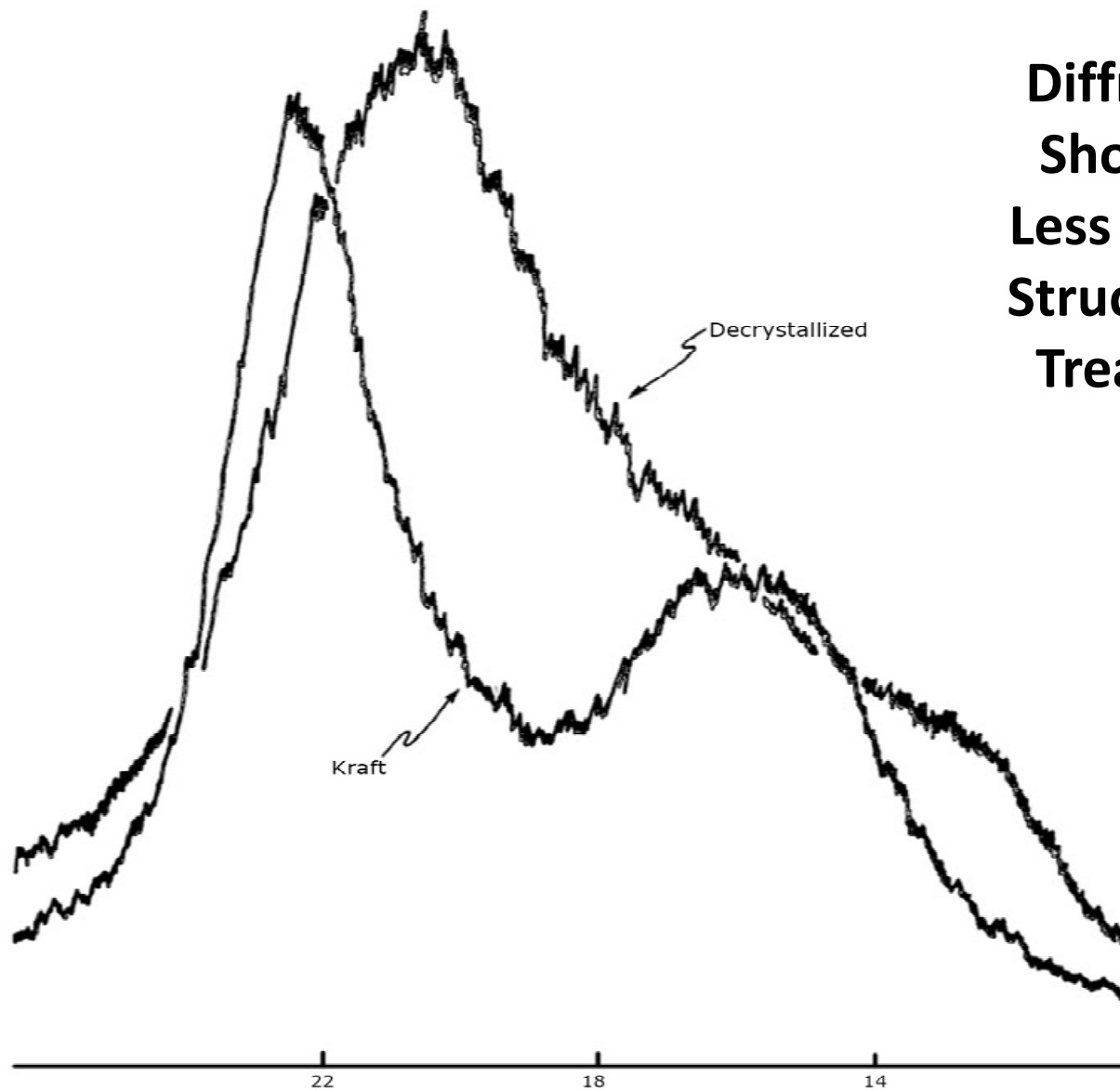
What's Different About These Fibers?

1. Simple to Produce
2. Reduced Crystallinity → Much More Open Structure
 1. X-Ray
 2. Staining
3. Generates Sheets With:
 1. Higher Bulk → Even Under High Wet Pressing Loads!
 2. Higher Porosity → Increase Drying Uniformity and Speeds!
 3. Lower Strength → Reversible by Wet Pressing Without Bulk Loss!
4. Especially Effective With Recycled Fiber

CSI Treatment Process

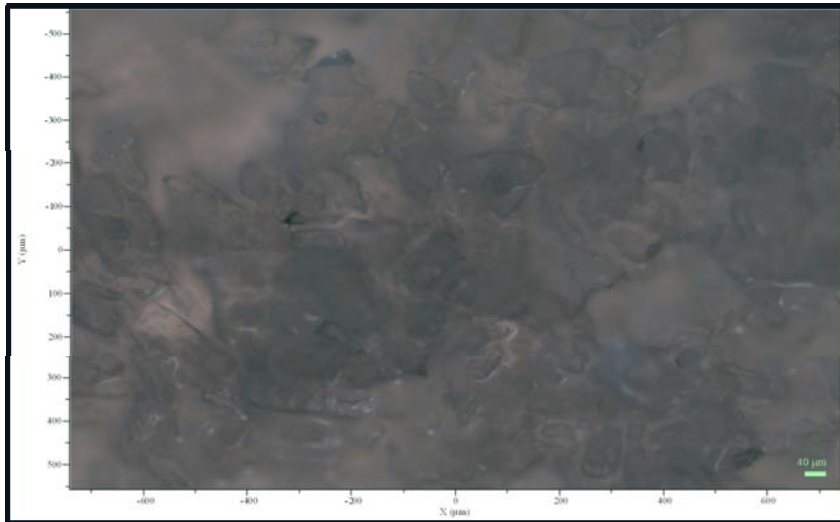


**X-ray
Diffractogram
Shows Much
Less Crystalline
Structure in CSI
Treated Kraft
Fiber**

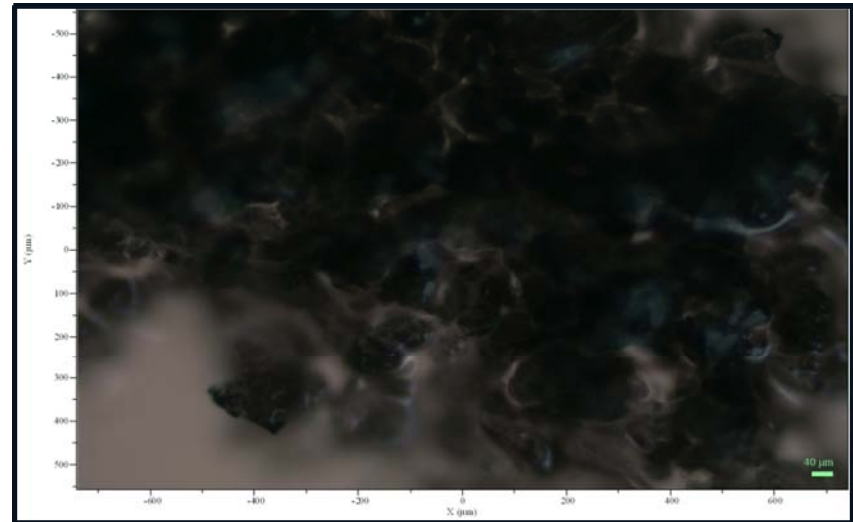


X-ray diffractogram of bleached Kraft pulp before and after CSI Decrystallization treatment

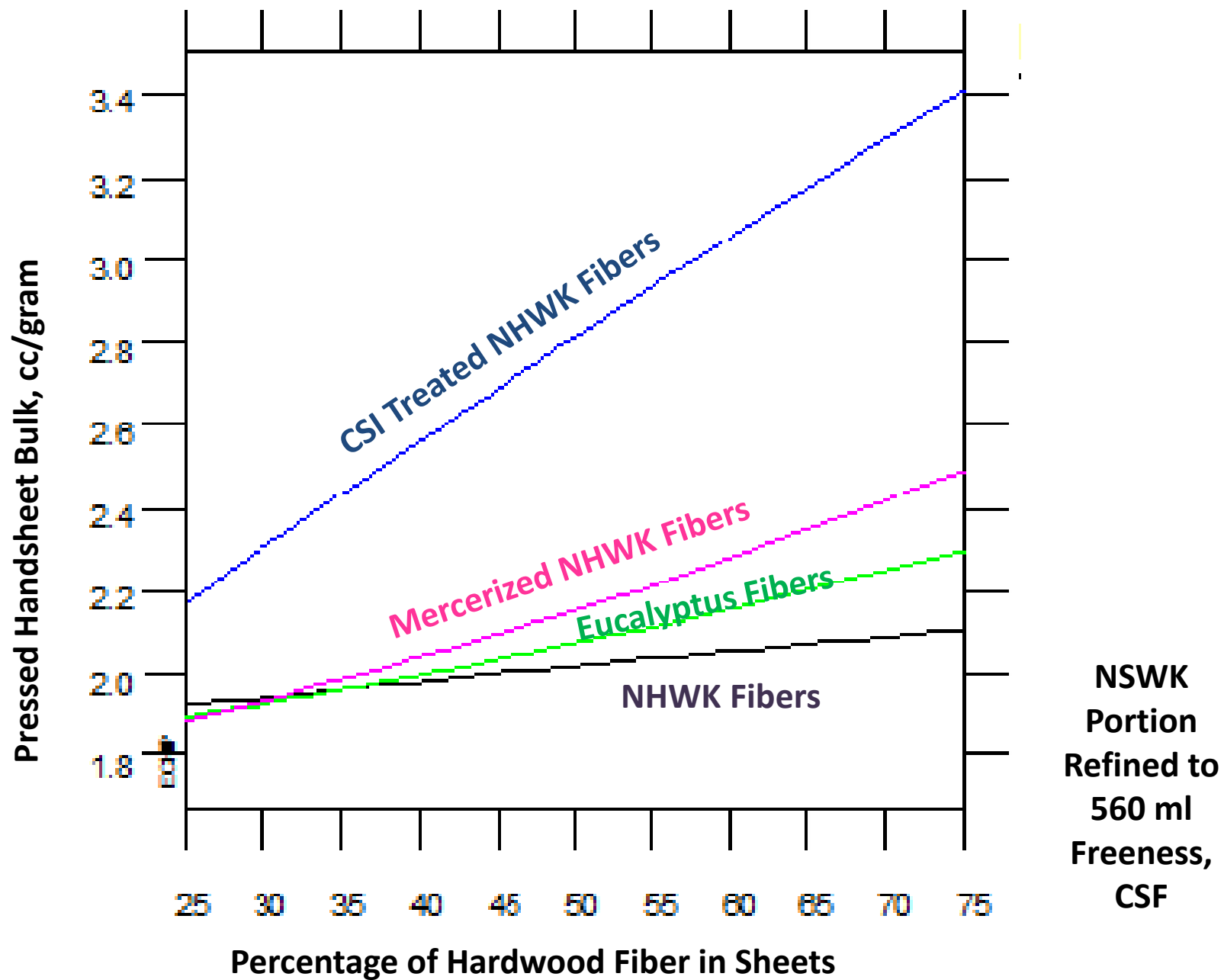
Dark Staining of CSI Treated Avicel Shows The More Open Structure of This Cellulose

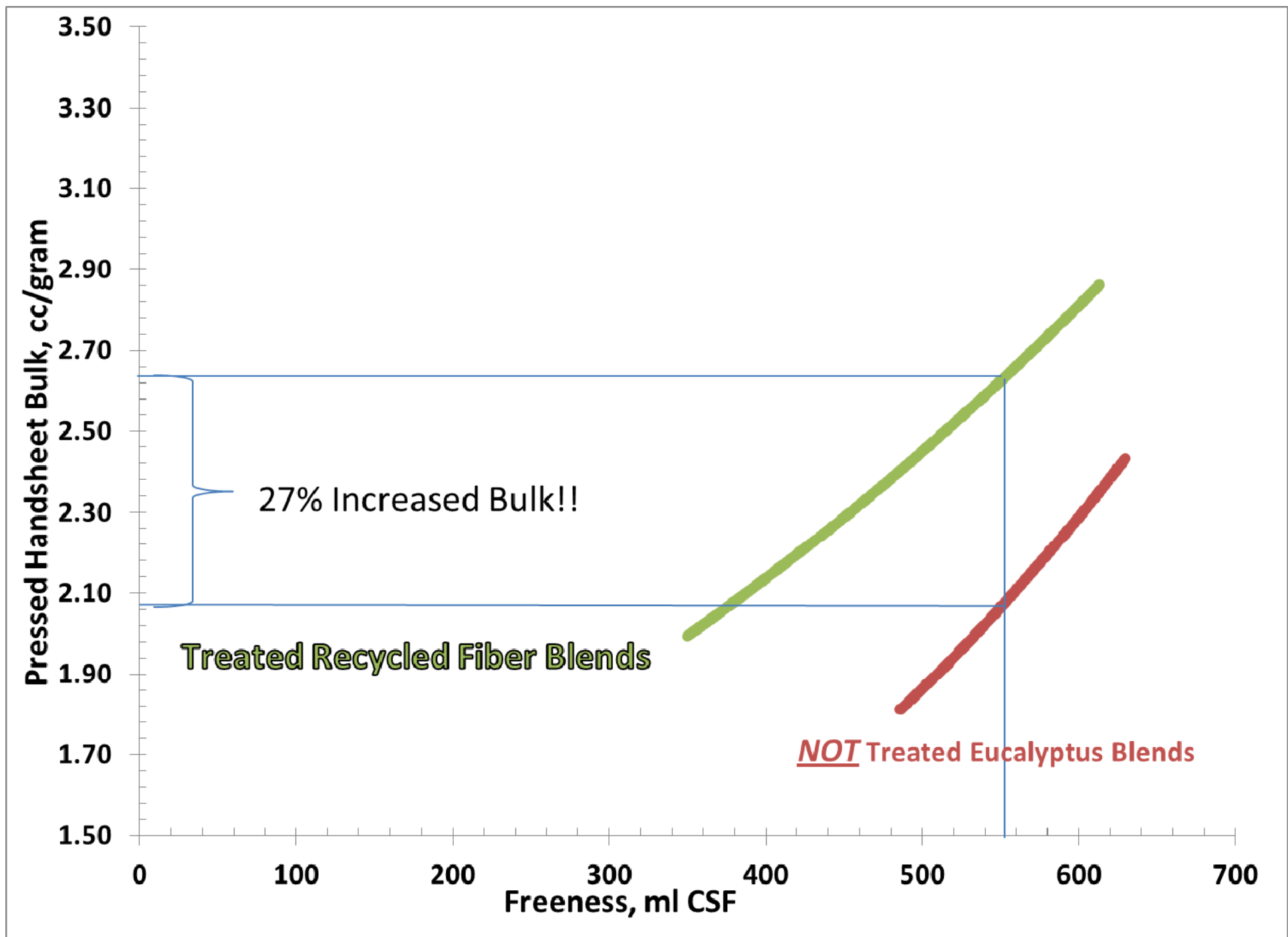


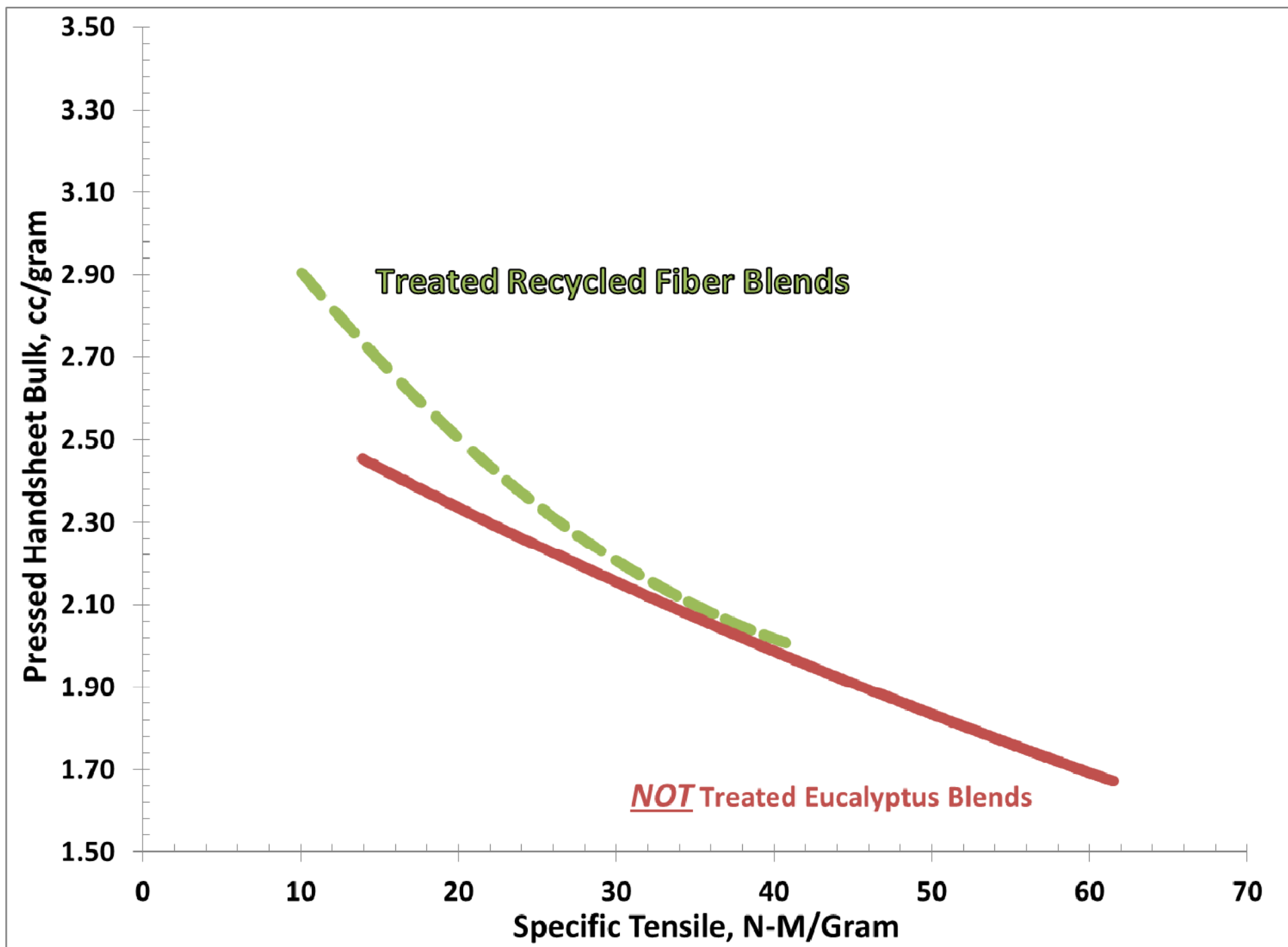
Avicel microcrystalline cellulose after staining with Graff's C-Stain.



Avicel microcrystalline cellulose pretreated with CSI process after staining with Graff's C-stain.







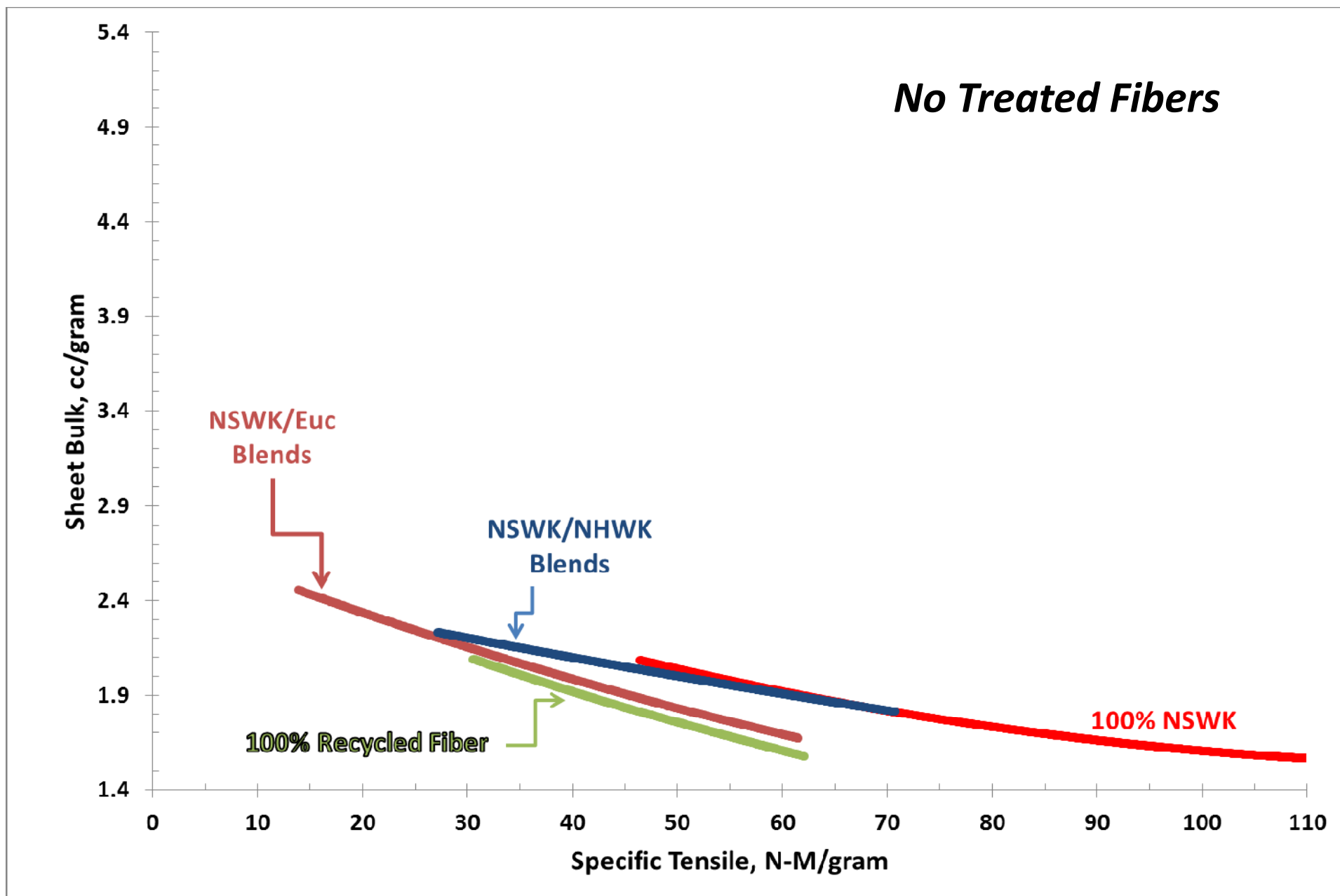
Examples of Potential Uses

1. Reduce Drying Costs

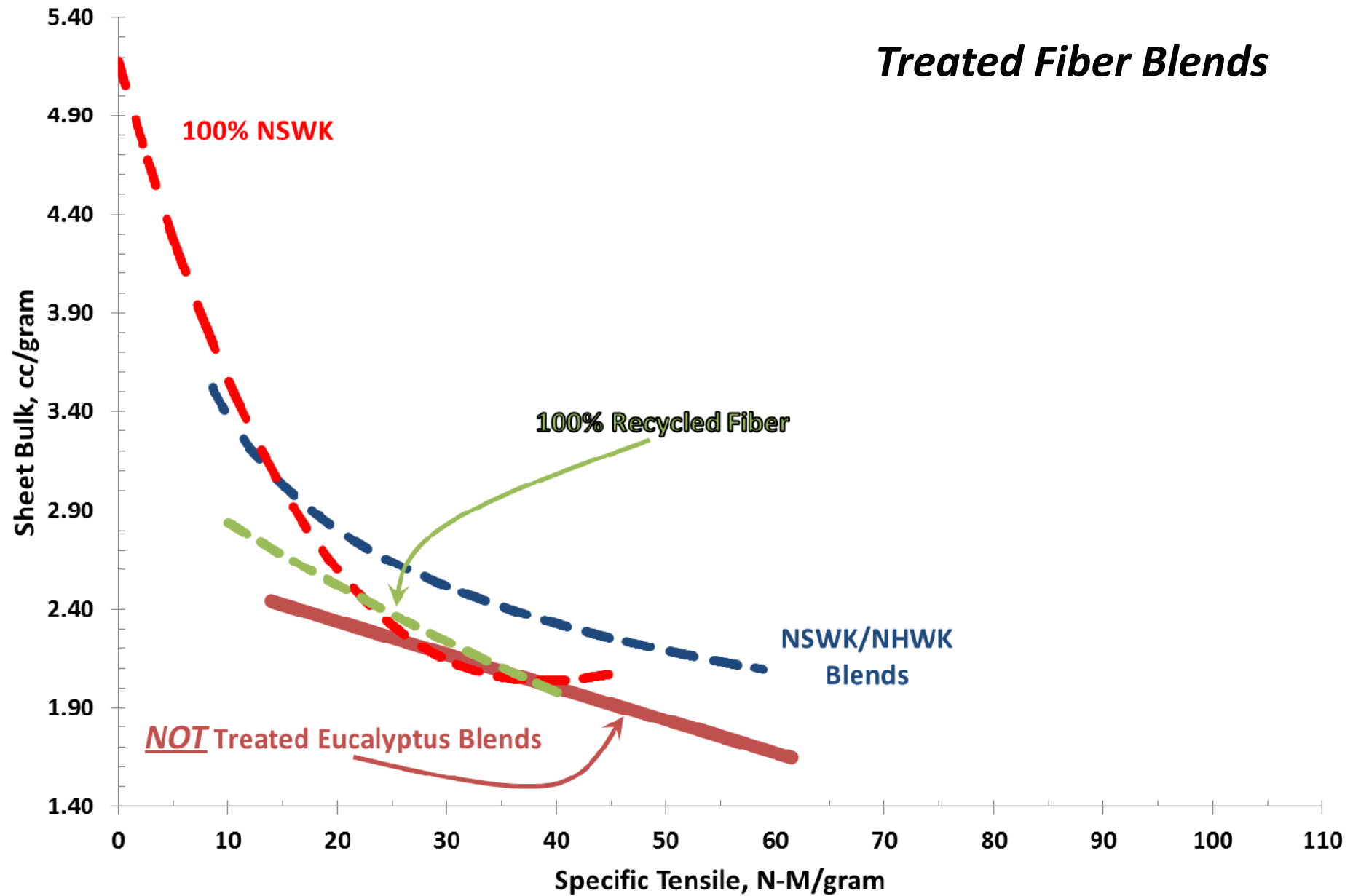
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Treated Fiber Blends



No Treated Fibers

