

Who is Turners Falls Paper ?

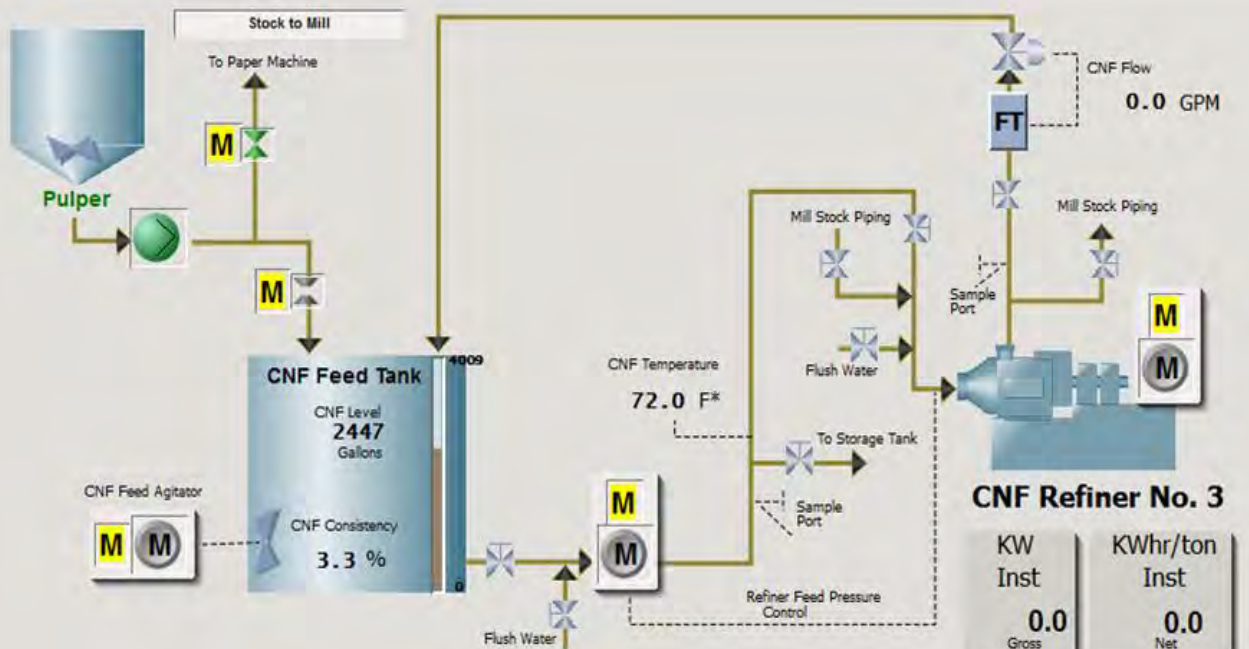
- A small, privately owned company with a paper mill located in Turners Falls, MA
- Formally known as Southworth / Paperlogic
- Actively involved in evaluating new and innovative technologies (cellulose nanomaterials)
- Ultimate goal is to maintain a competitive advantage in the specialty paper marketplace.



CNF/MFC System

Big brother to UMaine PDC Pilot System



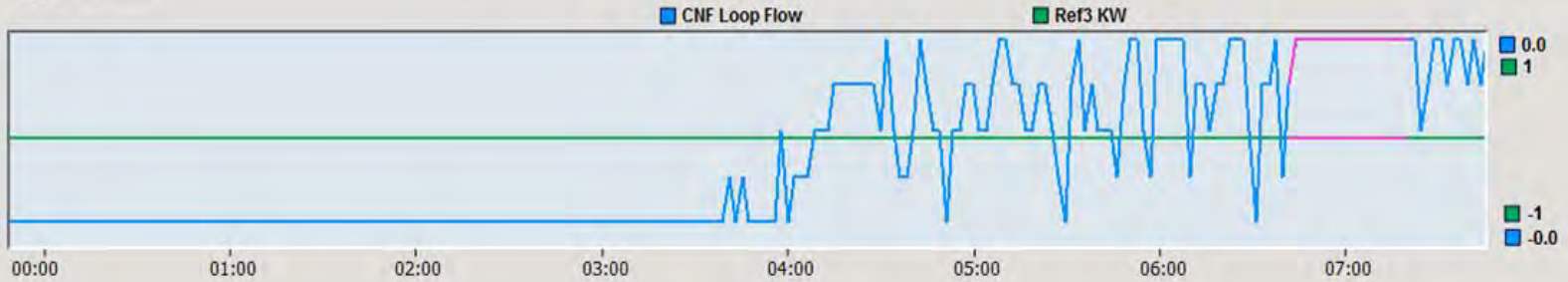


Current Batch	
Start	15-05-15 09:18:47
Duration	00 06:07:09
KWhr Total	271.0 Gross
KWhr/ton	9.0 Net
Previous Batch	
KWhr Total	0 Gross
KWhr/ton	0 Net

Idle Power	Refining Power	Production Rate	KW Last Hour
37	0 kW Net	0.00 ton/hr	0 Gross

KW Inst	KWhr/ton Inst
0.0 Gross	0.0 Net

8 Hour Trends

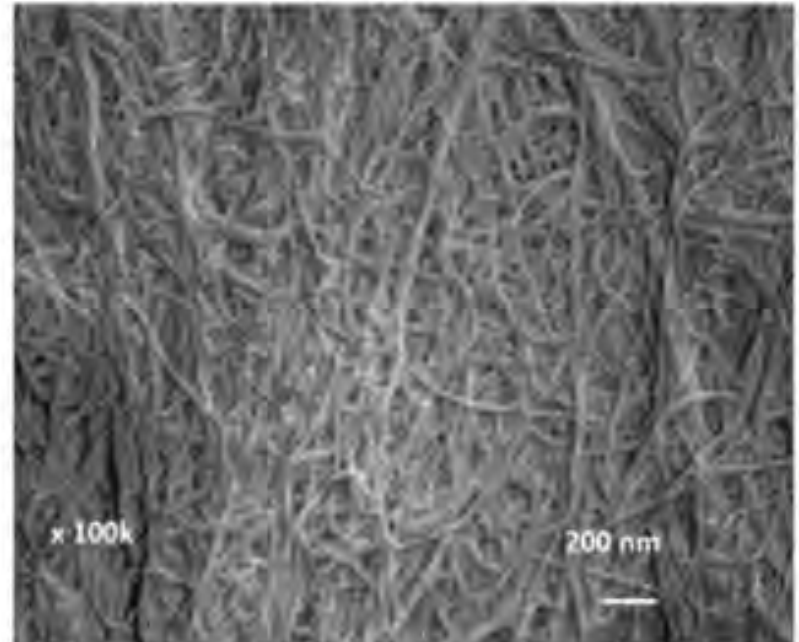


Manufacturing Challenges

- Time
- Energy Input
- Temperature control
- Material Characterization
 - % Fines
 - Viscosity
 - SEM
- % Solids (3 – 5 %)
- Application control

Cellulose Nanofibrils

- Fibril width 10 – 100 nm
- Lengths up to 10's of microns
- High aspect ratio (100 – 1000)
- Large specific surface area (100-200 g/m²)

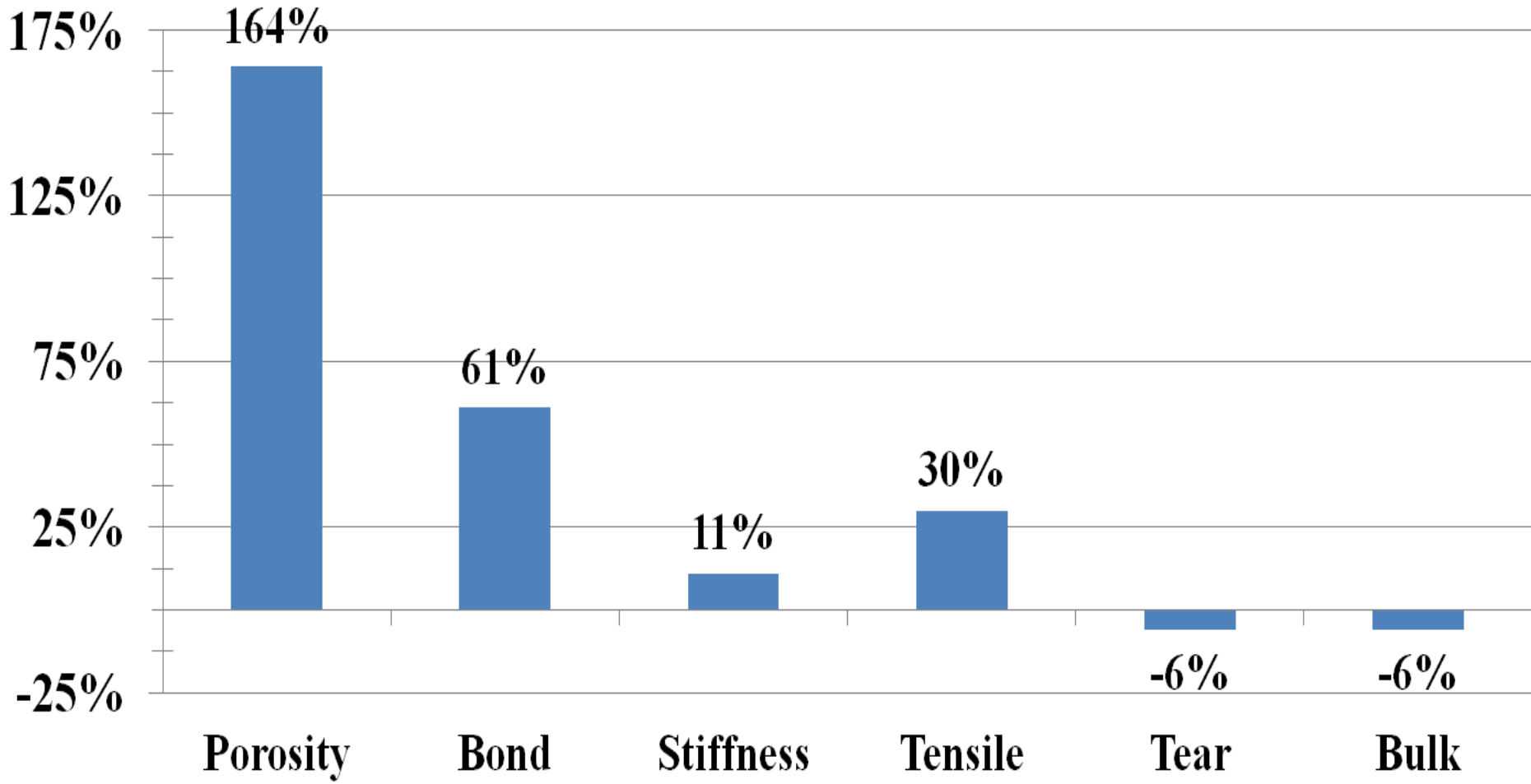


SEM image of isolated
Cellulose Nanofibrils

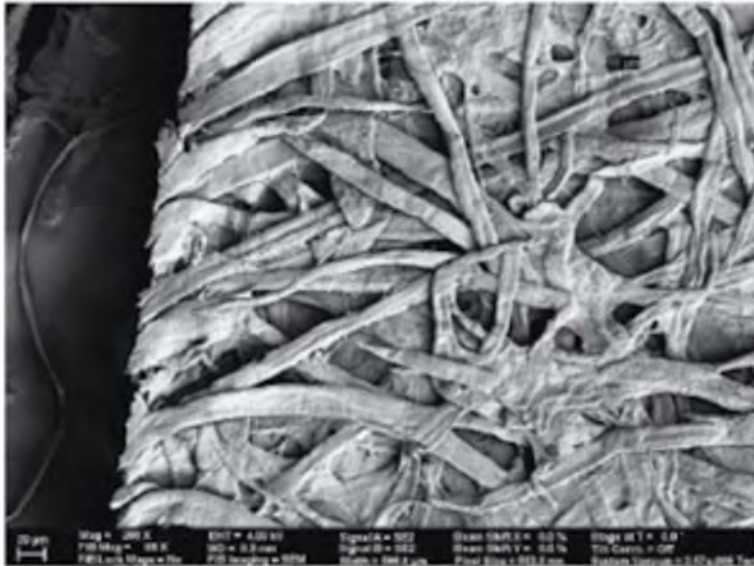
Functionality

- Strength - high surface area increases bonding potential
- Sheet Density - fills voids in the sheet for barrier properties
- Smoothness - fills surface irregularities for improved release
- Retention - active surface area for fine particle / color deposition

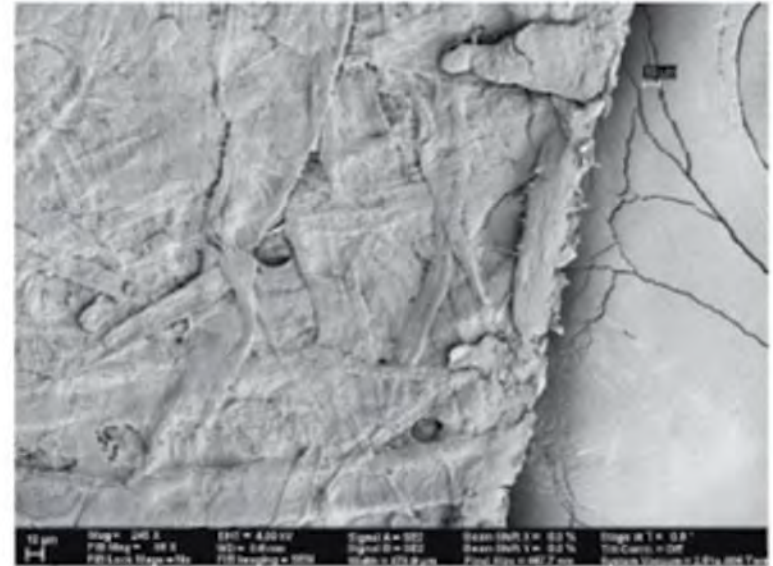
% Change from Control



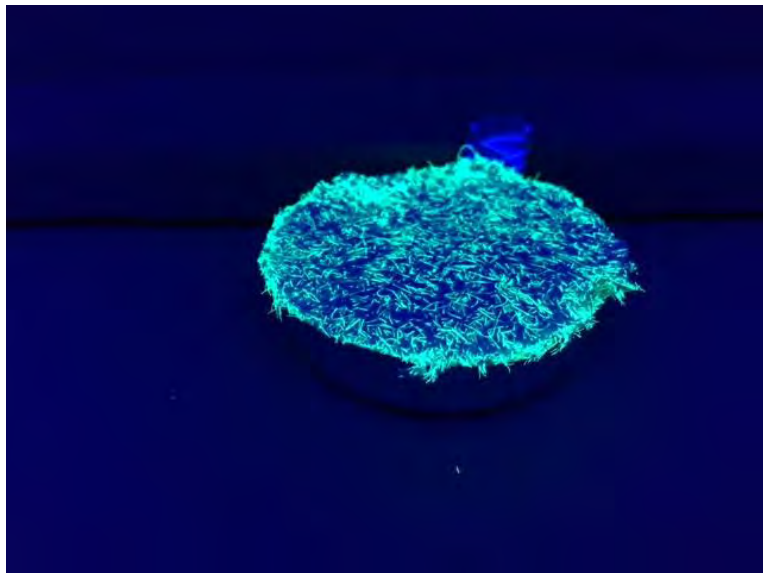
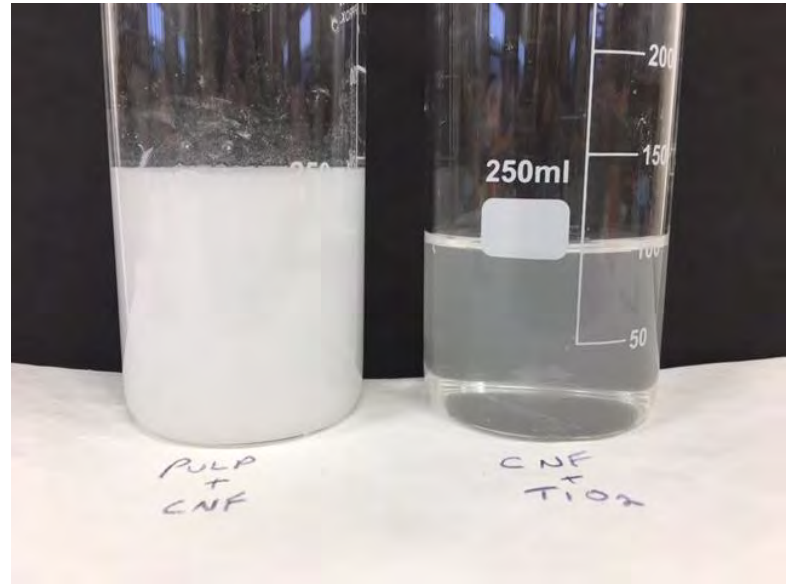
Surface Application



Control – 208 X



CN 200 – 245 X



Turners Falls *Paper*

