

Hemp Biomass Recycling Facility Expansion-Team 1.2

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Background

- Botanical extraction company located in Aurora, Oregon



vanguard[™]
scientific



Sample of the biomass



Hempcrete

What is hempcrete?



Why is it useful/important?



Paper and Pulp



- Utilizes spent biomass and is biodegradable
- More energy efficient than using trees



Ecofriendly and innovative processing of hemp hurds fibers for tissue and towel paper. (2020). <https://bioresources.cnr.ncsu.edu/resources/ecofriendly-and-innovative-processing-of-hemp-hurds-fibers-for-tissue-and-towel-paper/>



Dryer System

Assume thin film mass transfer

$$D_{AB} = \frac{0.001858 * T^{3/2} * \left(\frac{1}{M_A} + \frac{1}{M_B}\right)^{1/2}}{P * \sigma_{AB}^2 * \Omega_D} \text{ Eq. (24 - 33) Welty}$$

$$K_c = 0.664 * \frac{D_{AB}}{L} * \left(\frac{V_{Bulk} * L}{\nu}\right)^{1/2} * Sc^{1/3} \text{ Eq. (28 - 27) Welty}$$

$$N_A = K_c * \frac{P_A}{RT}$$

$$P_A = \exp\left[A - \frac{B}{T + C}\right] \text{ Antoine's Eq}$$

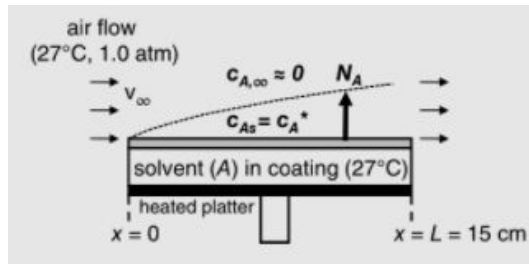
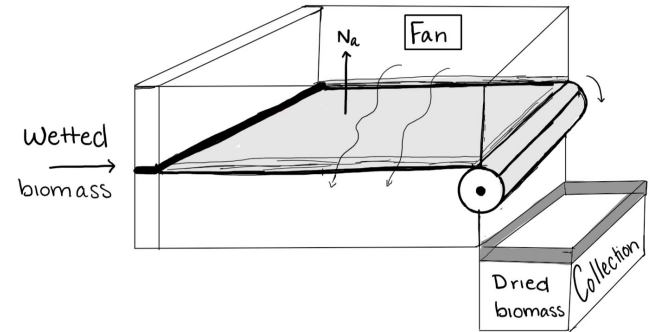
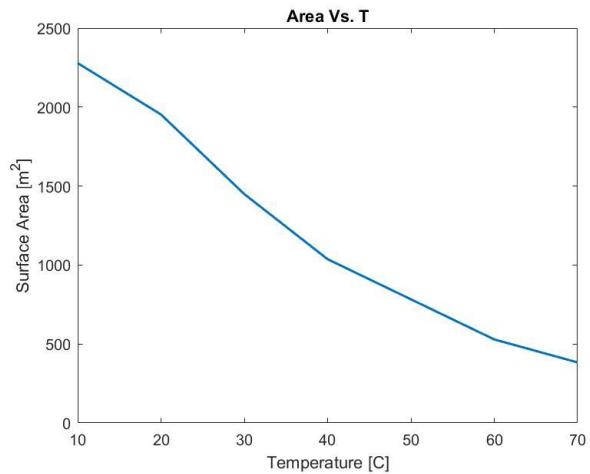
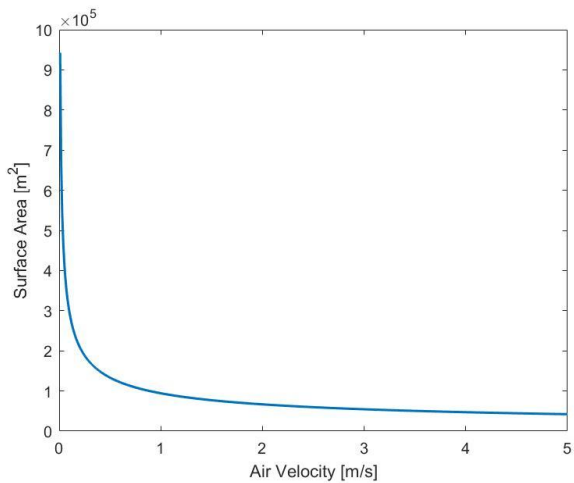
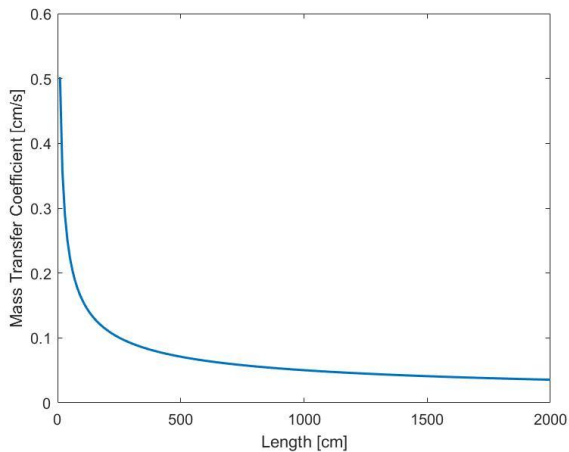


Figure 28.2 Evaporation of MEK solvent vapor from wet photoresist coating into a flowing air stream, Example 1.

Air Velocity [m/s]	Length [m]	Temp. [°C]	Area [m ²]
2	10	70	542
2	10	20	1904



Summary

- Remove ethanol from spent biomass via an industrial dryer
- Dryer performance optimized by increasing temperature and air flow
- Utilize spent biomass in hempcrete and paper and pulp industry



Thanks!

