Hemp Biomass Recycling Facility 2 Expansion-Team 1.2

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Background

• Botanical extraction company located in Aurora, Oregon







Sample of the biomass

Hempcrete

What is hempcrete?





Why is it useful/important?



F-H3-PALLET. (2021). HempTraders.Com. https://www.hemptraders.com/American-Hemp-Hurds-Pallet-p/f-h3-pallet.htm Hemptopia. (2021). One Pallet Bulk Hemp Hurd (31 bales). Hemptopia | Quality Hemp Products & Apparel. https://www.hemptopia.com/one-pallet-bulk-hemp-hurd-31-bales/ Roberts, T. (2020, October 16). *Building with Hempcrete*. Rise. https://www.buildwithrise.com/stories/building-with-hempcrete

Paper and Pulp





More energy efficient than using trees

biodegradable



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

Dryer System

Assume thin film mass transfer

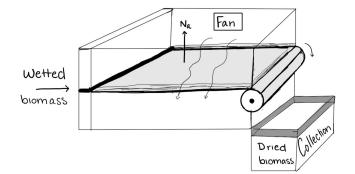
$$D_{AB} = \frac{0.001858 * T^{\frac{3}{2}} * \left(\frac{1}{M_A} + \frac{1}{M_B}\right)^{\frac{1}{2}}}{P * \sigma_{AB}^2 * \Omega_D} Eq. (24 - 33) Welty$$

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

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

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





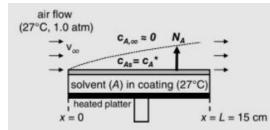
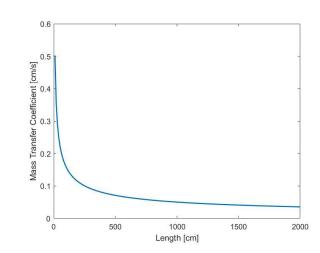
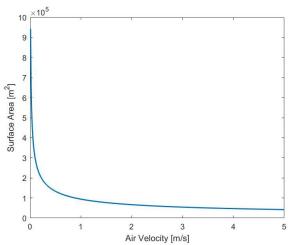


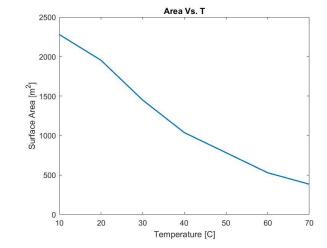
Figure 28.2 Evaporation of MEK solvent vapor from wet photoresist coating into a flowing air stream, Example 1.

Air Velocity [m/s]	Length [m]	Temp. [°C]	Area [m²]
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!

