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ABE 301  
9.12.2012

Project: Modeling  
Deliverable: 1

Description:

Corn fiber is a byproduct of corn wet milling. This product must be dried in order for it be sold. Corn fiber is able to be dried by means of flash dryer, where it is mixed with hot air in a dryer and as the hot air and corn fiber flow, it becomes dry. Corn fiber that is not dry enough enters a recycle chute, and is dried again by the same process.

This model will quantify the drying process of corn fiber through means of using a flash dryer. Flash dryers are commonly used in corn wet mill facilities today, and much of our products in industry are corn-based. This quantitative model is impactful because it will provide a model for a staple process in the United States and potential use for analyzing certain aspects and factors of the flash drying process.

Input Parameters:

- Mass flow rate of corn fiber
- Mass Percent of each component (including moisture content) of corn fiber
- Corn fiber density
- Air flow rate & psychrometric properties
- Burner gas flow rate

Output Parameters:

Mass flow rate of corn fiber  
Mass percent of each component  
Air flow rate & psychrometric properties

Relationships:

The density, mass percent and flow rate of corn fiber affect the ability of it to dry.

The air flow rate and its psychrometric properties also factor into how dry the corn fiber can become.

The burner gas flow rate affects the amount of heat that is put into the system to dry the corn fiber.