Improving Process Quality & Saving Energy
by Todd Forbush

This article involves two technologies that are not new to potato storage, the Variable Frequency Drive (VFD) and CO2 sensor. Each of these pieces of equipment have been utilized in potato storage for over 20 years, however the mass acceptance of this equipment has been slow to come. The reason behind this hesitation by the market was mostly due to the lack of good operating parameters for these devices. The VFD offers the promise of reduced energy costs which is offset by the concern for uniform ventilation and resulting potato tuber health and controlling rot organisms. An approach to storage ventilation design that utilizes this equipment to address these concerns is required. Techmark has developed a design method which provides uniform air distribution at both standard and high airflow rates (above existing airflow rates). This design incorporates a VFD to adjust the airflow rate based on the storage needs. The resulting ventilation system can provide high airflow to assist in the control of rot organisms when they present a quality issue, yet can provide energy savings when operating at standard airflow rates. A typical storage could reduce energy usage at normal airflow rates to 40% of their current consumption while providing the flexibility to increase the airflow by 40% during circumstances which require more air from the ventilation system.

The CO2 sensor offers the promise of reducing stress on potato tubers and improving potato quality, but the question remains, "what level of CO2 is critical for potato quality?" The answer to this question is based on the quality of the potatoes and other undetermined factors. However, our experience is beginning to yield some basic ideas for what CO2 levels have resulted in improved process quality for both chip and french fry processing. The Fancom F755 is equipped to accept the input of a CO2 sensor and can automatically open fresh air inlet doors or louvers to control the CO2 level. While controlling CO2, the F755 also will utilize the heating or cooling equipment in the storage to maintain consistent potato temperatures.

A unique feature of ventilation system designs incorporating these pieces of equipment is that they can be implemented in existing potato storage with little structural modification. Thus allowing you to profit from new technology without replacing existing storage structures.

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