

MEng Projects

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Design and scale up of a flash freezing system for liquid foods

Modern technologies are needed to become more energy efficient in order to reduce their environmental footprint and lower energy costs. Our food engineering lab has developed an energy efficient, novel system for flash-freezing liquid foods that promotes fresh and clean-label food products, especially ice cream. Furthermore, this process relies on economy of scale to be profitable and therefore large, single product batches are common while customized products can be difficult or even impossible to produce economically. The on-demand freezing/cooling system, based on the combined Joule-Thompson and Bernoulli principles, requires expertise and interest in modeling and simulation to provide a framework for scale up and coefficient of performance evaluation compared to the vapor compression refrigeration systems.