Process modelling

Background

Computer-based modelling can be anything from simple equation or set of equations to a complex model of a process created by assembling many interacting equations and factors. These models can allow the user to simulate simple or complex processes and allow visualisation of the process in a way that may otherwise be impossible by just using measurements.

Models can eliminate a significant amount of experimentation time and expense and the knowledge and understanding gained from their use can be used to improve processes and their control. These computer models can also be used to investigate processes that do not exist yet or processes that would be difficult, time consuming, expensive or impossible to measure in their normal situation.

The computer models that frperc have created and regularly use in support of their work include:

Models of heat flows in foods that allow the user to simulate temperature changes in foods and their surroundings, including models of domestic refrigerators, refrigerated transport vehicles and cold stores (e.g. the ColdRoom model).

Models that enable the design and specification of refrigeration systems.

Models that take in simple inputs and are then used to control systems, including cutting and separation equipment.

Models that estimate the thermophysical properties of foods over a range of temperatures (these can be used in heat transfer models and calculations).

In addition frperc use a commercial Computational Fluid Dynamics (CFD) program that can be used to model systems containing air flows, such as refrigerated cabinets, supermarkets and store rooms. For more information, see the CFD page.

How frperc can help

Should you wish to optimise your processes or ascertain the likely impact on your systems of greater or altered production, frperc can use process modelling to help you.

We would usually gather data specific to your processes and use this to alter the model we use to simulate your process. Using modelling techniques gives us a better understanding of processes and so allows us to improve them or understand the implications of creating new processes or changing existing ones.

Process modelling can be used on its own to give guidelines to how processes could be optimised. However, it is best combined with measurement and/or experimentation, as the resulting recommendations will be more accurate. frperc can carry out both experimental trials and modelling to help you optimise your processes in a shorter time, at a lower cost and with a much reduced risk.

If you are interested to find out more about process modelling or how it could help you improve your products or processes, please contact please contact us on +44 (0)1472 582400 or email us on frperc@grimsby.ac.uk