

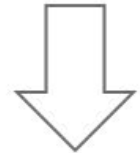


## Eric Alar

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Project: Optimizing Blast Freezers  
Advisor(s): [Doug Reindl](#) & [Greg Nellis](#)  
Sponsor: EPA Region 5



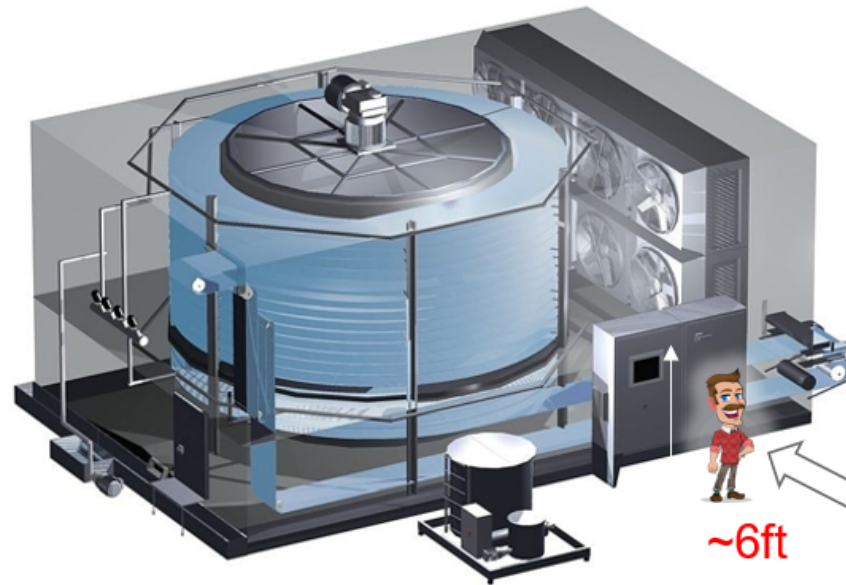
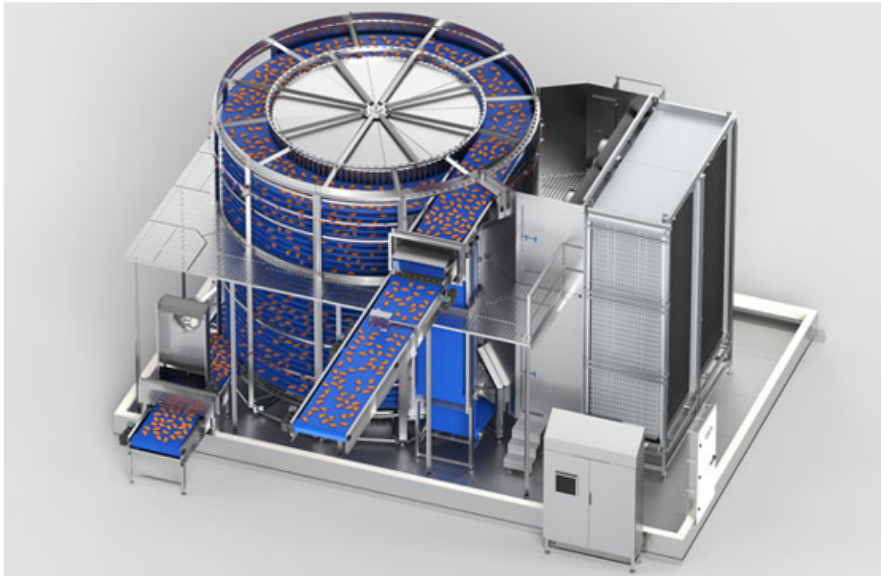
*I build fast cars ...then blow them up*





# Background – what are spiral blast freezers?

- Large insulated rooms with high powered fans (40+ mph) that force cold air (-40F) over product
- Used in food processing to rapidly cool food products like poultry, pizza, vegetables, and ice cream
- Cooling times range from 10 to 60+ minutes
- Typically use ammonia as refrigerant; highly toxic, but very high refrigeration effect, GWP = zero



Refrigerant	RE Effect (btu/lbm) @0 PSIG
R134A	93
R404A	86
R22	101
R410A	117
<b>R717 (ammonia)</b>	<b>589</b>
Water	970

~6ft

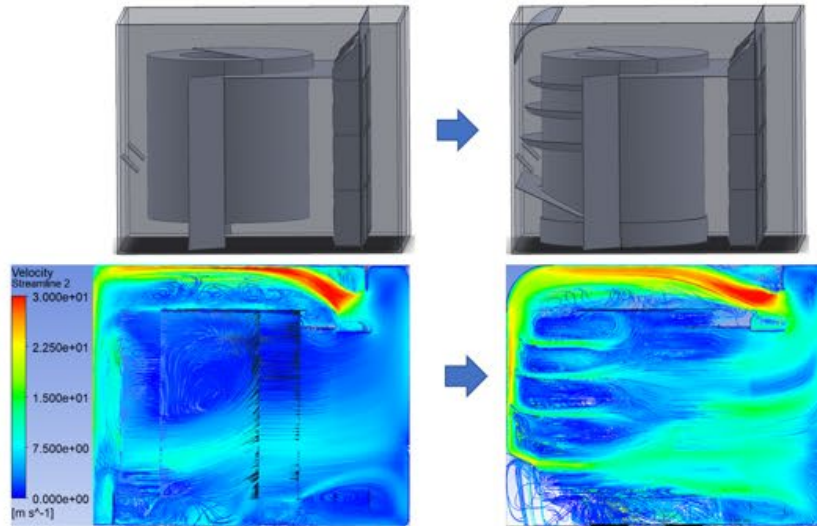
This is me!



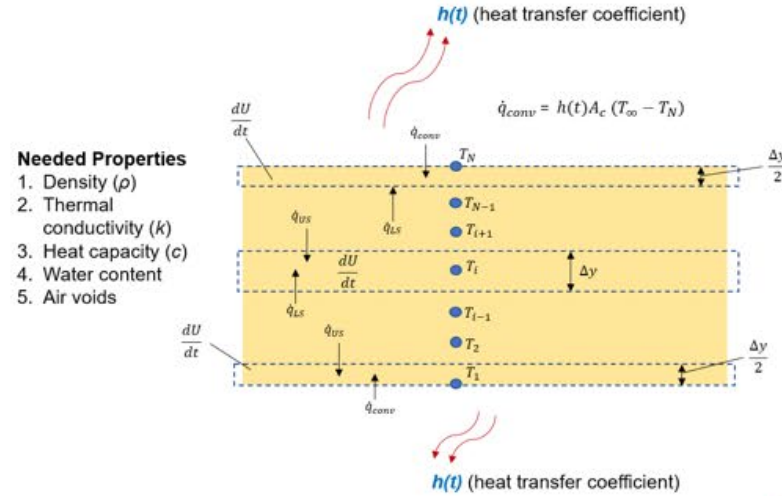
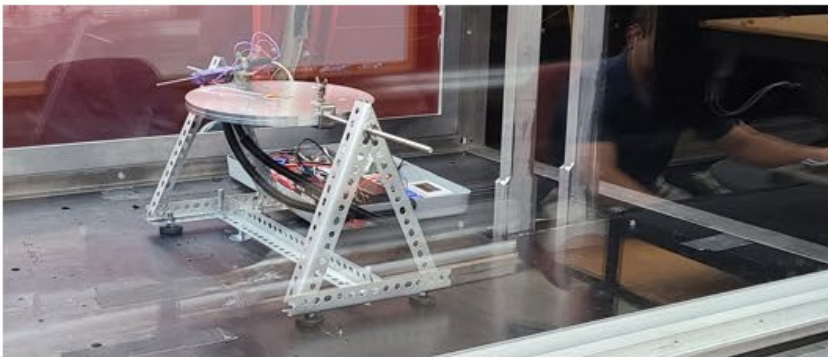


# Project Goals

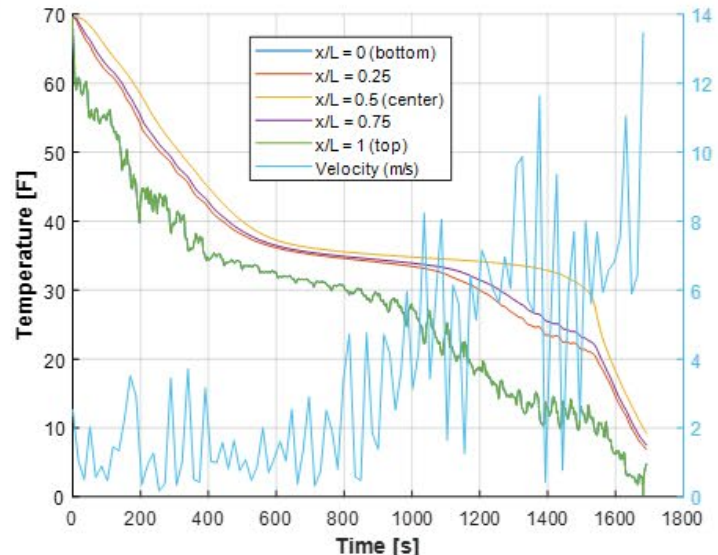
## CFD modeling



## Confirm models



## Transient model



## Numerical modeling

## New correlations

