



# endocube

**Cut Refrigeration Running Costs!**

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universal master products

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# Who are we

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universal master products

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are a British Research and Development Company based in the UK specialising in refrigeration.

we provide refrigeration solutions to the commercial refrigeration sector

our products reduce clients operating costs, improve temperature efficiency, improve product integrity and increase profits whilst reducing the impact of refrigeration on the environment



# universal master products company Information

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# Who is using the endocube?





## What is an endocube?

The endocube is a Refrigeration Control device developed by universal master products in the UK



The endocube has been fully independently tested and certified as Food Safe by the US NSF International and HACCP Australia and is patented World-wide.

the endocube

- saves energy from 14% to 22% .... and more!
- uses no electricity, has no electronics and no mechanical moving parts, has no maintenance – a *'Fit & Forget'* device – it cannot fail
- it cannot be the 'wrong' temperature
- protects the compressor from excessive wear and tear
- comes with a 10 year warranty
- gives return on investment (ROI) typically from 3 to 12 months

# endocube Independent Certifications

Independently TESTED and certified as food safe by:-

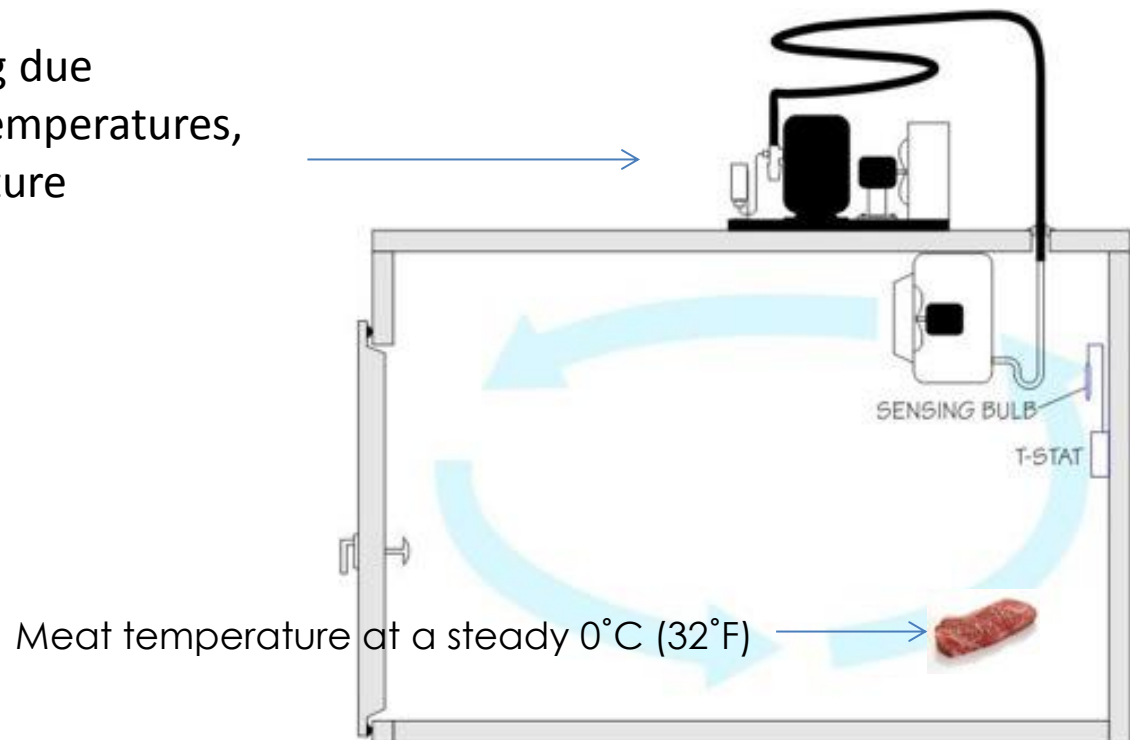
- NSF International under protocol P235, a UN World Health Organisation (USA) 
- Hazard and Critical Control Point HACCP (Australia)   
Download HACCP Certificate
- The Food Refrigeration & Process Engineering Research Centre<sup>4</sup> at the University of Bristol (U.K.)



# How refrigeration systems waste energy

Refrigeration systems waste energy by switching 'on' and 'off' based on fluctuating air temperature, when the meat actually stays at a steady 0°C (32°F)

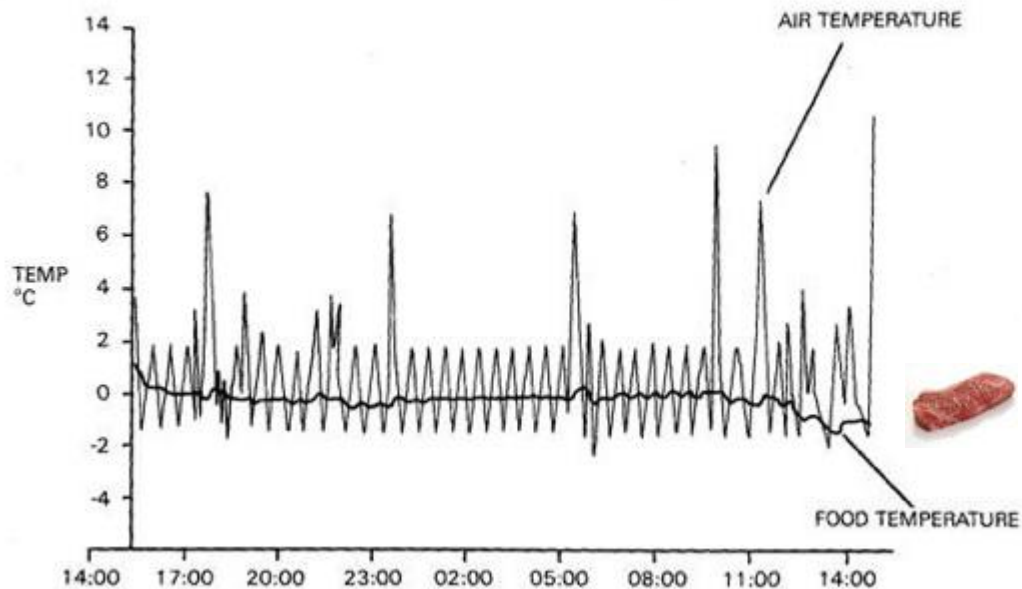
Compressor cycling due to fluctuating air temperatures, not meat temperature



# Actual air temperature record of a walk-in chiller

Compressor cycling 'on' and 'off' due to fluctuating air temperature.

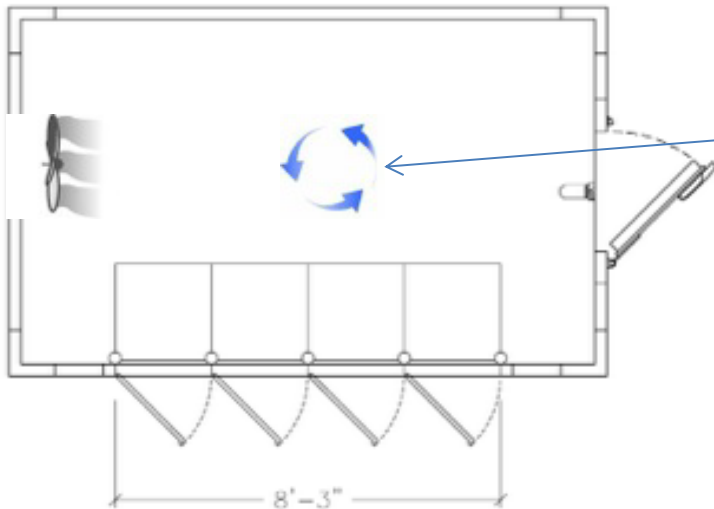
The compressor works unnecessarily hard to keep the air temperature from fluctuating too violently, when the meat (food) temperature remains stable anyway.





.....blowing away your company profits!

4 door reach-in-drinks chiller



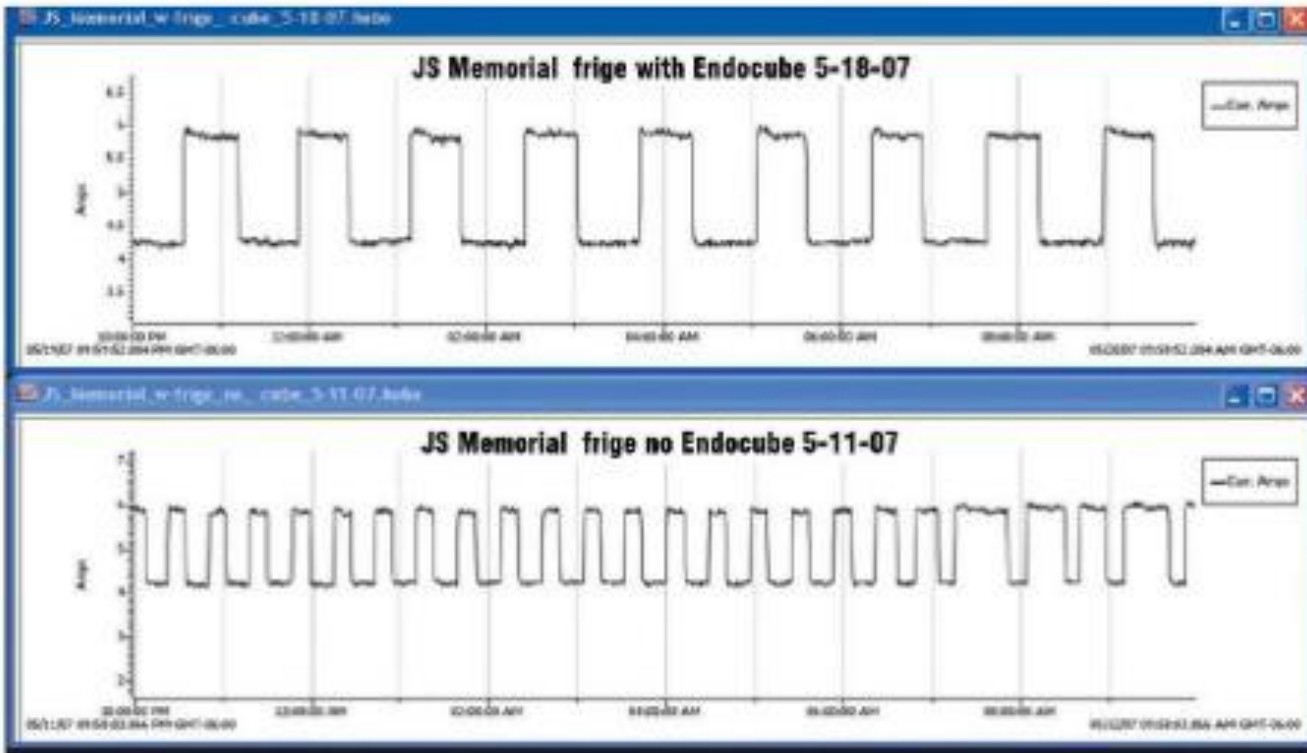
Example - frequent door openings cause fluctuating air temperature which increases refrigeration compressor 'on and off' cycles and **increases energy usage.**

## How the **endocube** works

- Very simple..... The **endocube** sits over the thermostat sensor
- the sensor now lies at 10mm within the patented microcrystalline food product. Fluctuating air temperature is not now controlling the refrigeration.
- Food temperature, represented by the **endocube** is controlling the refrigeration, switching it 'on and off' when food temperature requires it, not the air temperature.
- Because fluctuating air temperature no longer causes so many random 'on and off' starts of the compressor motor this leads to considerable savings.

endocube fewer compressor starts and stops

After the endocube is fitted there are 9 starts



compared to before the endocube was fitted, where the graph shows 25 starts for the same time period. A massive 64% reduction.

## endocube key benefits

- A longer 'off' period allows the pressure of the refrigerant gas to 'balance', this allows for a more efficient refrigeration cycle, and when the system starts again it does so with a softer start, leading to a quieter refrigeration system.
- This improved efficiency usually makes the refrigeration run cooler, often by 2°C (3°F), so the set point may have to be adjusted.
- Less starts means less use of the compressor, giving it a greater life span. Compressor manufacturers recommend fewer starts.
- Less use means less call out charges.
- Less cost on spare parts
- .....and finally, less breakdowns!

# endocube key benefits

Help the Environment

Reduced Greenhouse Gas emissions

Reduced Carbon footprint

