

# EndoTherm™ &

# EndoCool™



ENERGY SAVING  
PRODUCT OF THE YEAR



**2018 E Source Forum**  
Denver / 26<sup>th</sup> September 2018

# What is **EndoTherm** / **EndoCool**™?

A hydronic additive that saves up to 15% of heating (EndoTherm) and cooling (EndoCool) costs.

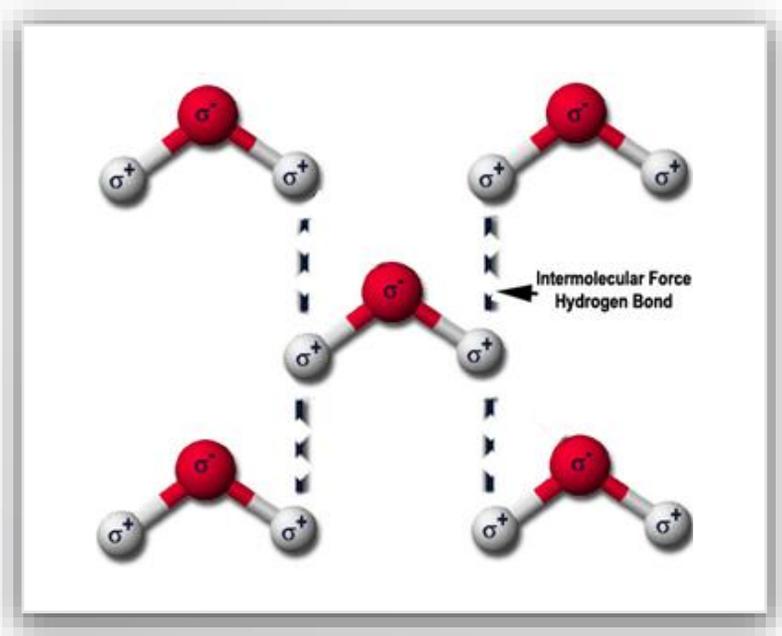
- Independently Tested
- Easy To Install (10-30 minutes per property)
- No disturbance to building or maintenance requirements
- Flexible & Scalable to ANY wet heating system (1% dosage)
- Typical 1-2 year payback
- Non-Corrosive & Compatible with inhibitors
- Award Winning
- Endo**Therm** Launched 2014/ Endo**Cool** Launched 2017





# EndoTherm How it Works?

Water has a high surface tension caused by Hydrogen Bonding



A water molecule can form 4 hydrogen bonds with **4 other water molecules**.

*A hydrogen bond in water is the electrostatic attraction between a hydrogen (H) atom and an oxygen (O) that aren't already covalently bonded. This gives water a high surface tension compared with other liquids.*



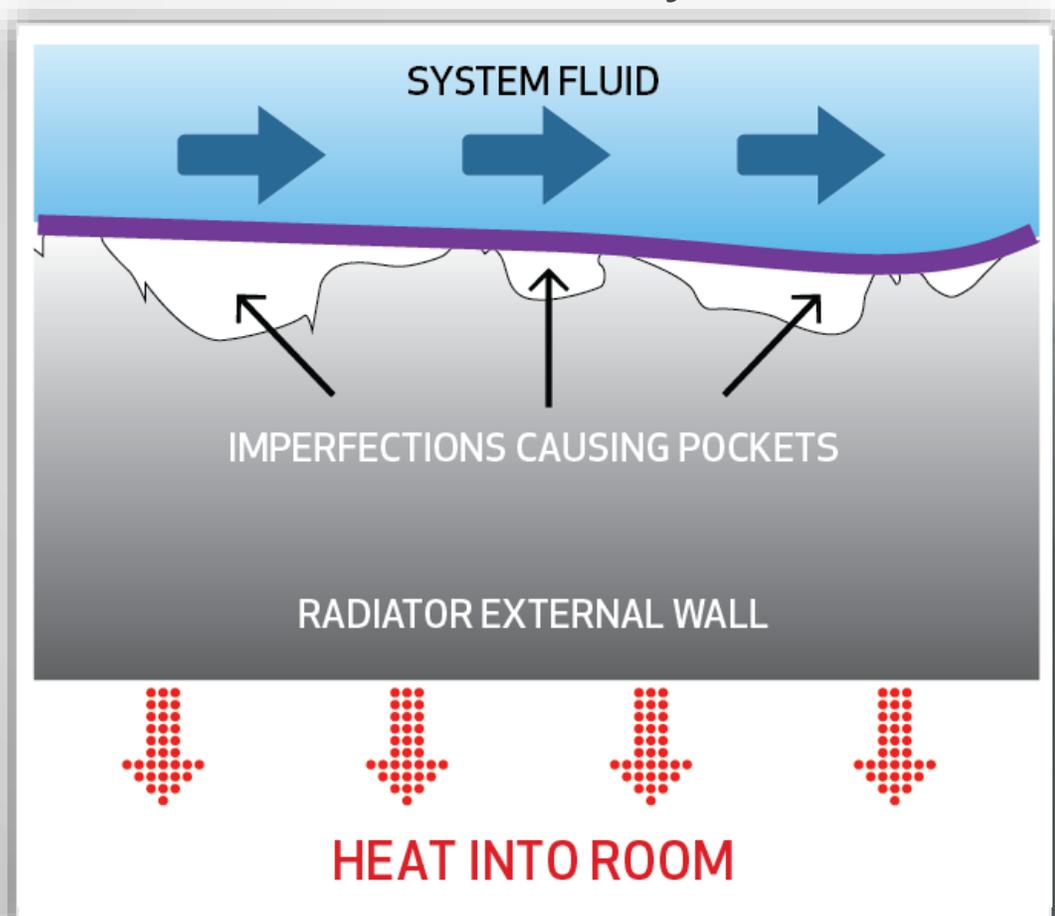
EndoTherm reduces water surface tension by up to 60%



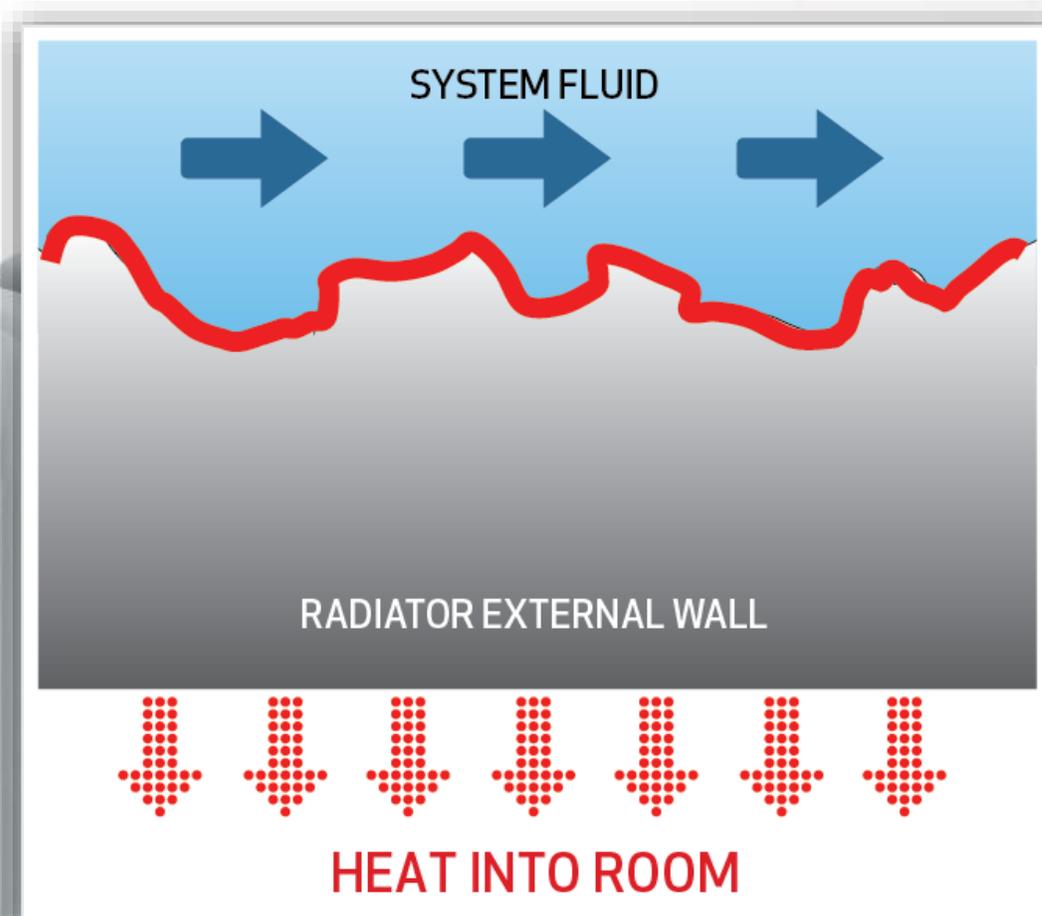


# EndoTherm How it Works?

Water only



EndoTherm



# The EndoTherm Effect

How does this improvement actually reduce consumption?

## 1. Increased heat transfer reduces return temperature and improves $\Delta T$

- Improved sequencing and boiler/chiller efficiency
- Condensing systems can recover more latent heat
- Reduced flue gas losses

## 2. Reduced boiler run times

- Improved heat transfer means rooms reach set temperatures quicker
- Reduced run times to maintain set temperatures
- Measured at 10-15% reduction by testing.

## 3. Reduction in nucleate/film boiling

- Typically in older non-condensing systems (systems without heat exchangers)
- Reduces size of steam bubbles which restrict heat transfer into the water
- Steam bubbles dissipate quicker.

Consumption  
reduced by  
up to

**15%\***

\* Independently tested  
by Enertek International



# EndoTherm CIBSE



The winning formula of CIBSE award-winner EndoTherm

In 2016, heating additive EndoTherm won Energy Saving Product of the Year at the Building Performance Awards. Industry has since been won over with impressive real-life results

<https://www.cibsejournal.com/general/a-winning-formula-cibse-product-of-the-year-endotherm/>



www.facebook.com/centralheatingadditive



@endo\_therm



www.endotherm.co.uk

# Compatibility & Hazchem Testing

**EndoTherm** found to be non-corrosive in use, compatible with leading brand inhibitors and boiler manufacturers



**EndoTherm** is not regarded as hazardous waste as defined by EU Directive 91/689/EEC. (No Discharge Requirements)



Proven compatibility with EPDM rubber seals. EPDM is a common material found within heating systems.



EndoTherm proven not to be a source of bacterial growth in a heating application



# EndoTherm Case Study - Heathrow Airport

**Building:** Engineering Complex (Mini DH)

**Boiler Output:** 6 x 375MBTU

**EndoTherm Required:** 9.3 US Gal

**Saving:** 20.1%

**Simple Payback Period:** 1 year

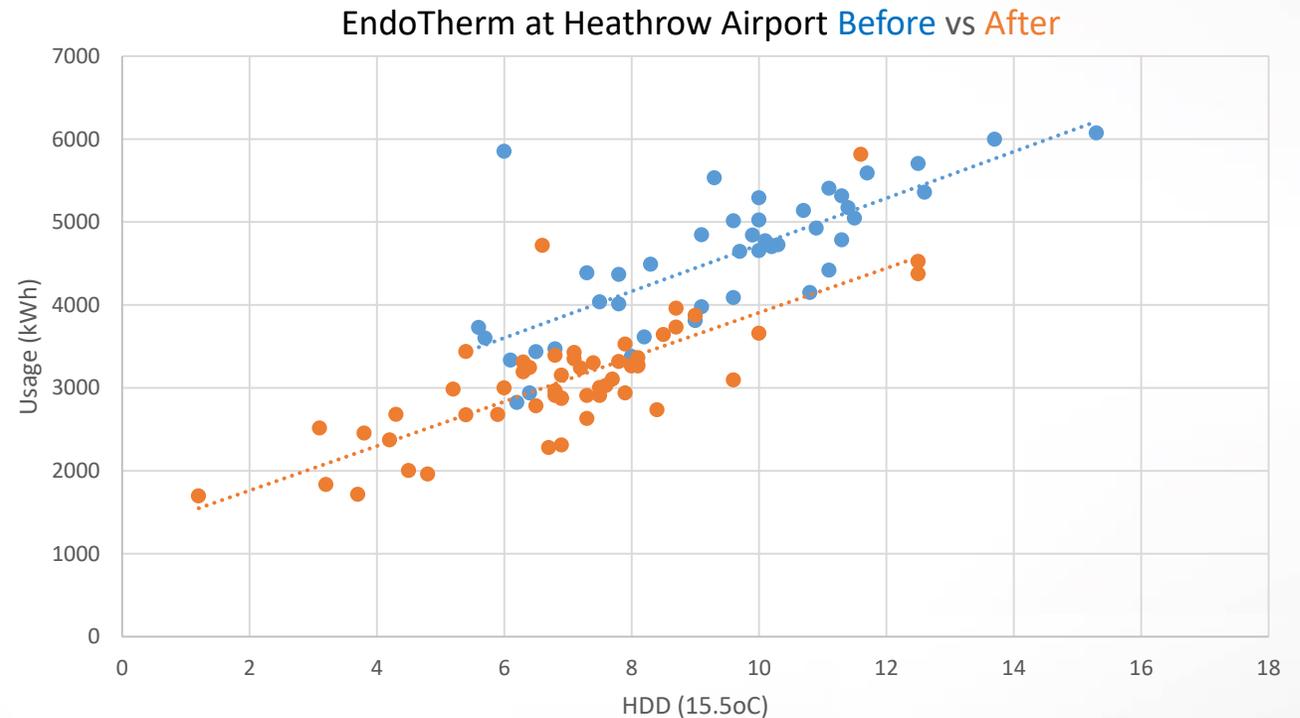
**Actual savings (45 days):** \$1,283

**CO<sub>2</sub> Emission Reduction:** 17,030.2lbs

**4 Year Projected Savings:** \$20,535

**4 Year Projected CO<sub>2</sub> Reduction:** 272,483lbs

**Heathrow**  
Making every journey better

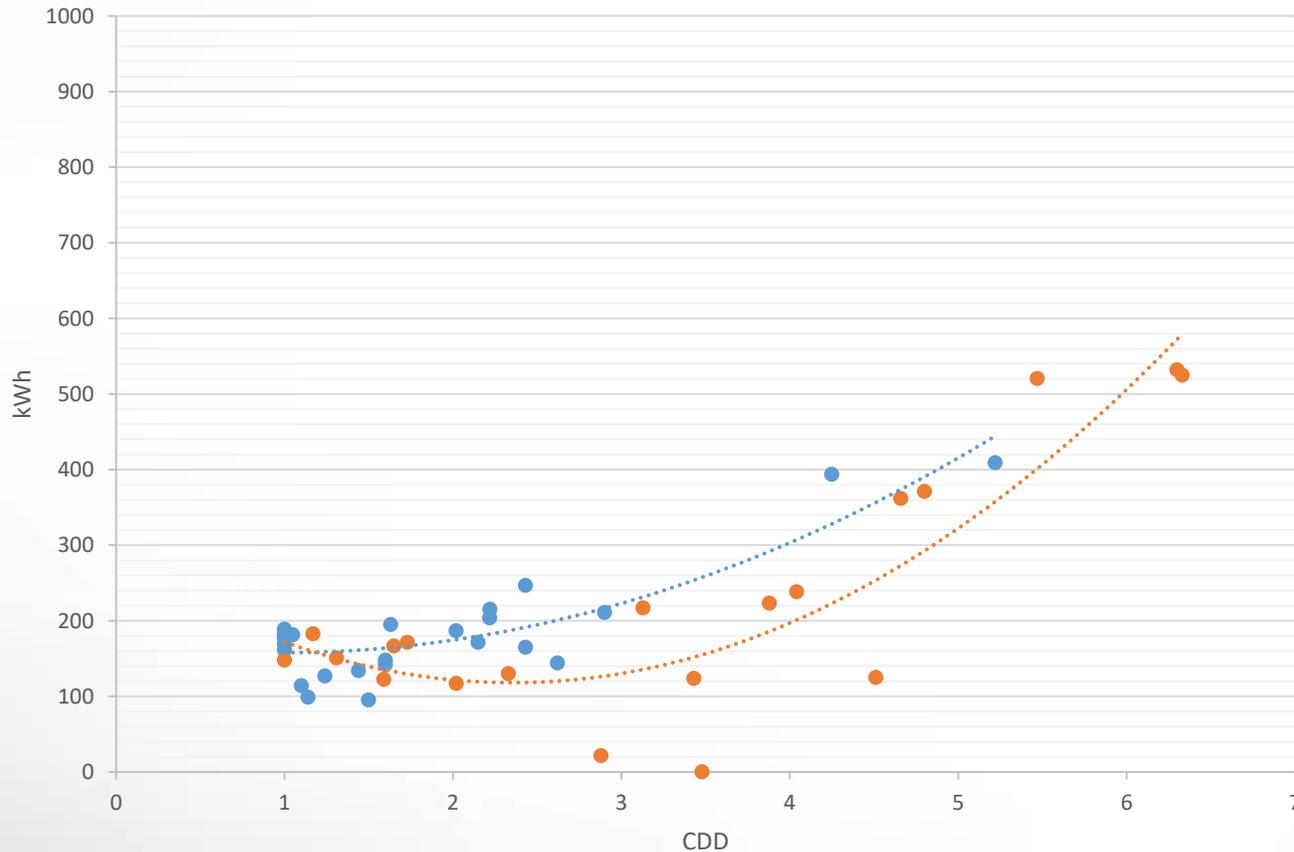




# EndoCool™

## EMCOR UK – Comfort Cooling

IPMVP - Thirlmere (Before and After Installation)



**Building:** Office building with server room  
**System Type:** Fan Coil Units  
**Owners:** United Utilities operated by EMCOR  
**EndoCool Required:** 13.2 US Gal  
**Saving:** 22.16%  
**Test Period:** 3 weeks with 30 second interval data  
**Simple Payback Period:** 1 year



# EndoTherm

Saving Energy Around the World



THE UNIVERSITY  
OF BRITISH COLUMBIA

Beyond, Every Day.



# EndoTherm<sup>®</sup> Working with Utilities

## Step 1: Proving Performance

- Supply test data and case studies for review
- Run pilot programs in utility selected buildings to review M&V and savings generated
  - What makes a good case study?
    - Historical Data (12-24 months). Consistent baseline against HDD
    - Building Type (ideally 100% gas usage for space heating)
    - No other energy saving technologies or major operational / occupancy changes in baseline
    - Tight, clean hydronic system

## Step 2: Utilizing Product

- Rebates
- Product is designed as a one visit installation. Could easily combine with group of technologies to minimize building impact.

# EndoTherm

**Thank you for listening**



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