



## WHAT'S IN A DEGREE

### What does 5° F mean to you?

Consider...it takes 7.53 BTU to heat one gallon of 30% slurry or stock 1° F.

Natural gas has an effective combustion efficiency of 85.7%. This means that for each million BTU of gas purchased, 857 thousand BTUs are transferred to the boiler. Most boilers operate in the range of 70% effectiveness in transferring BTUs to steam energy. This results in around 600,000 BTUs of steam heat energy available from each million BTU of natural gas or 60% of the natural gas energy content.

If your process heats 750 gallons per minute (170 m<sup>3</sup>/hr) of 30% slurry or stock from 185°F to 225°F; (85°C to 107°C) approximately 376,600 natural gas BTUs are consumed each minute. Extrapolated, this is over 22.6 million BTU per hour – approximately \$113 at \$5/MMBTU. And this assumes you have a perfect steam system after the boiler. We all know that leaks, valves, condensate traps, etc. are common energy wasters.

What happens after a few years when your heater begins to wear and becomes unable to maintain accurate temperature control? In order to achieve 225° F (107°C), it is typical to adjust the set point higher – to say, 230° F (110°C).

### Let's Do Some Math

Temperature rise: 45°F [230°F-185°F] (110°C to 85°C)

Required BTU per gallon: 338.9 btu/gal (9.427 lbs/gal x 45°F x .799 btu/lbs °F)

Gallons per minute: 750 gpm (170 m<sup>3</sup>/hr)

Required BTU per minute: 254,210.8 (338.9 btu/gal x 750 gpm) (170 m<sup>3</sup>/hr)

Required natural gas BTU per minute: 423,684.7 (254,210.8 btu/min/.6)

Natural gas used per hour at \$5.00/MMBTU: \$127

### Wasted Energy Expense

\$14/hour in additional cost = **\$339** per 24-hour day = **\$2,371**  
per 7 day week = **\$120,904** per **51** week year

### What would it mean to you to have temperature control within 1°?

It could mean thousands of dollars.

### Compare this to having your Hydroheater® refreshed with new internal components and tuned for accuracy:

Spare heaters: A similar sized heater will cost less than \$50,000, saving you at least \$71,000 the first year.

\*Internals contain stem plug, nozzle, and combining tube replacement. All components may not need to be replaced at the same time. \*Actual quotes by request.

**Need more information about Hydro-Thermal products?**

Go to [www.hydro-thermal.com](http://www.hydro-thermal.com) or  
contact us at [info@hydro-thermal.com](mailto:info@hydro-thermal.com)

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