



# What's in a °Degree for Water Heating?

## What does 5°F mean to you?

Consider...it takes 8.34 BTU to heat one gallon of water 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 330 gallons per minute of water from 145°F to 190°F; approximately 206,415 natural gas BTUs are consumed each minute. Extrapolated, this is over 12.3 million BTU per hour – approximately \$60 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 190°F, it is typical to adjust the set point higher – to say, 195°F.

## Let's do some math...

Temperature rise:	50°F (195°F-145°F)
Required BTU per gallon:	418.7 btu/gal (8.34 lbs/gal x 50°F x 1.004 btu/lbs °F)
Gallons per minute:	330 gpm
Required BTU per minute:	138,160 (376.8 btu/gal x 330 gpm)
Required natural gas BTU per minute:	230,267 (138,160 btu/min/.6)
Natural gas used per hour at \$5.00/MMBTU:	\$70

### Wasted Energy Expense

\$10/hour in additional cost	=	\$240 per 24-hour day	=	\$1,680 per 7 day week	=	\$85,714 per 51 week year
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*What would it mean to you to have temperature control within 1°F?  
It could mean thousands of dollars.*

**Compare this to having your EZ Heater® refreshed with new internal components and tuned for accuracy:**

Spare heaters: The largest and most advanced spare heater will likely cost less than \$20,000\*, saving you at least \$40,000 the first year.

\*Actual quotes by request.