

HEAT LOSS CALCULATIONS

(RULE OF THUMB SHORTCUT METHODS)

Cubic Foot Method for Calculating Heat Loss:

- ⇒ Homes with a basement: Use 2.75 BTU heat loss/cubic foot for the upper level and 1.75 BTU heat loss/cubic foot for the basement.
- ⇒ Homes on slab or crawlspace: Use 3.1 BTU heat loss/cubic foot for all areas.

Example: Assume a 1000 square foot main level home plus 1000 square foot basement with 8' ceilings
Upper Level Heat Loss = $1000 \times 8 \times 2.75 = 22,000$ BTU
Lower Level Heat Loss = $1000 \times 8 \times 1.75 = 14,000$ BTU
Total Estimated Heat Loss is 36,000 BTU or 10.55 kW (3412 BTU = 1kW).

Cubic Foot Method for Calculating Heat Gain (for cooling needs):

- ⇒ Use 2.25 BTU heat gain/cubic foot for all areas except those below grade. (Ignore the basement.)
- ⇒ 1-Ton of cooling is equal to 12,000btu's

Example: Assume 1000 square foot main level with 8' ceilings
Heat Gain: $1000 \times 8 \times 2.25 = 18,000$ BTU
Cooling System Size: $18,000/12,000 = 1.5$ tons

Square Foot Method:

Assuming 7 to 8 foot high ceilings, use 6.5 watts heat loss/square foot on the upper level and 4 watts heat loss/square foot on the lower level.

Note: The above short cuts assume an average quality built home which has insulation values of approximately R-19 walls, R-38 ceilings, good windows and doors, etc. It is also based on outdoor climate that experiences winter low temperature of approximately -15 (below zero). You can adjust the rule of thumb numbers up or down if your quality of construction is better or worse or if your outdoor coldest winter temperature is warmer or colder.

Caution: Short cuts or rules of thumb have been successfully used for many years; however, extreme caution must be applied. Many factors can impact the heat loss rate. Using a short cut method may save you time and serve you well in many instances; however, it should not be viewed as a replacement for a complete heat loss calculation. To arrive at the most accurate heat loss or heat gain figures, a full calculation that follows engineering and industry guidelines must be completed.