

## Home Heat Loss Calculator

This calculator will provide an estimate of the heat loss for your home, including:

- Maximum heat loss in BTU/hr for a coldest day (helpful for furnace sizing)
- Total yearly heat loss in millions of BTU.
- Total yearly cost for fuel.
- Total ten year cost for fuel (with 10% fuel price inflation per year).
- Pounds of CO2 gas emissions for heating your house.

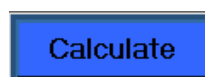
A few changes have been made to the calculator - [details...](#)

Please note these [important sources of error](#).

### To use the Heat Loss Calculator:

Fill in all the input boxes.  
(the light blue boxes)

Then, click on the  
button below that  
looks like this



When you click "Calculate", the output cells will be calculated and displayed. **You must click the Calculate button to see the effect of any changes you make.**

### Examples and Usage Information

Worked [examples here](#).

[Help on R values...](#) If you are starting with no insulation, [read this carefully...](#)

[Handling crawl spaces...](#)

[Handling slabs...](#)

[Help on Heating Degree Day estimates...](#)

Design Temperature and Fuel Type Inputs					
Title	Enter your title here				
Design outdoor Temperature	-12	Degrees F	Coldest temperature expected in a "normal" year <a href="#">more...</a>		
Heating Degree Days	8382	Degree F - day	Heating Degree Days <a href="#">more...</a>		
<input type="radio"/> Natural Gas <input type="radio"/> Fuel Oil <input type="radio"/> Propane <input checked="" type="radio"/> Electricity	0.12	\$'s Per Therm	200	Furnace Efficiency (%) <a href="#">more...</a>	
Area and Rvalue Inputs					
<b>Ceilings</b>	Ceilings --- Enter the area and R value for each ceiling area in the house that is exposed to outside temperatures. <a href="#">Help on R values ...</a>				
	Area (sqft)	Rvalue	UA (BTU/hr-F)	Design Loss (BTU/hr)	Yearly Heat Loss (million BTU/yr)
Ceiling 1	819	60	13.7	1119	2.7
Ceiling 2	0	0	0	0	0
Ceiling 3	0	0	0	0	0
Ceiling 4	0	0	0	0	0
<b>Walls</b>	Enter the area and R value for each wall area in the house that is exposed to outside temperatures. Do not include window and door area.				
	Area (sqft)	Rvalue	UA (BTU/hr-F)	Design Loss (BTU/hr)	Yearly Heat Loss (million BTU/yr)
wall 1	1776	34	52.2	4283	10.5
wall 2	0	0	0	0	0
wall 3	0	0	0	0	0
wall 4	0	0	0	0	0
<b>Windows &amp; Doors</b>	Enter the area and R value for each group of windows or doors having the same R value. (U = 1/R, so a window listed with a U of 0.33 has an R value of 3)				
	Area (sqft)	Rvalue	UA (BTU/hr-F)	Design Loss (BTU/hr)	Yearly Heat Loss (million BTU/yr)
Group 1	368	5	73.6	6035	14.8
Group 2	0	0	0	0	0
Group 3	0	0	0	0	0
Group 4	0	0	0	0	0
<b>Floors</b>	Floors - Wood Joist Type --- Enter the area and R value for each floor area in the house that is exposed to outside temperatures. <a href="#">Estimating R Value for crawl spaces ...</a>				
	Area (sqft)	Rvalue	UA (BTU/hr-F)	Design Loss (BTU/hr)	Yearly Heat Loss (million BTU/yr)
Floor 1	0	0	0	0	0
Floor 2	0	0	0	0	0
Floor 3	0	0	0	0	0
Floor 4	0	0	0	0	0
<b>Slabs</b>	Slab on Grade Floors --- Heat loss from slab on grade floors is primarily dependent on the length of the perimeter and not the area of the floor. "Rvalue" here is the effective R value per foot of perimeter. <a href="#">Estimating effective R Value for slabs ...</a>				
	Perimeter (ft)	Rvalue per ft of perimeter (1)	UA (BTU/hr-F)	Design Loss (BTU/hr)	Yearly Heat Loss (million BTU/yr)
Full Slab	120	4	30	2460	6
<b>Infiltration</b>	House Volume is the total volume of the heated space of the house cubic feet (floor area times the ceiling height) Typical Air Changes Per Hour: 0.33 -- very tight -- minimum for health 0.5 -- tight -- new, careful construction 1.0 -- leaky -- typical existing construction??				
	House Volume (cubic ft)	Air Changes per hour	UA (BTU/hr-F)	Design Loss (BTU/hr)	Yearly Heat Loss (million BTU/yr)
Whole House	13800	.33	82	6722	16.5

**Internal Heat Gains**

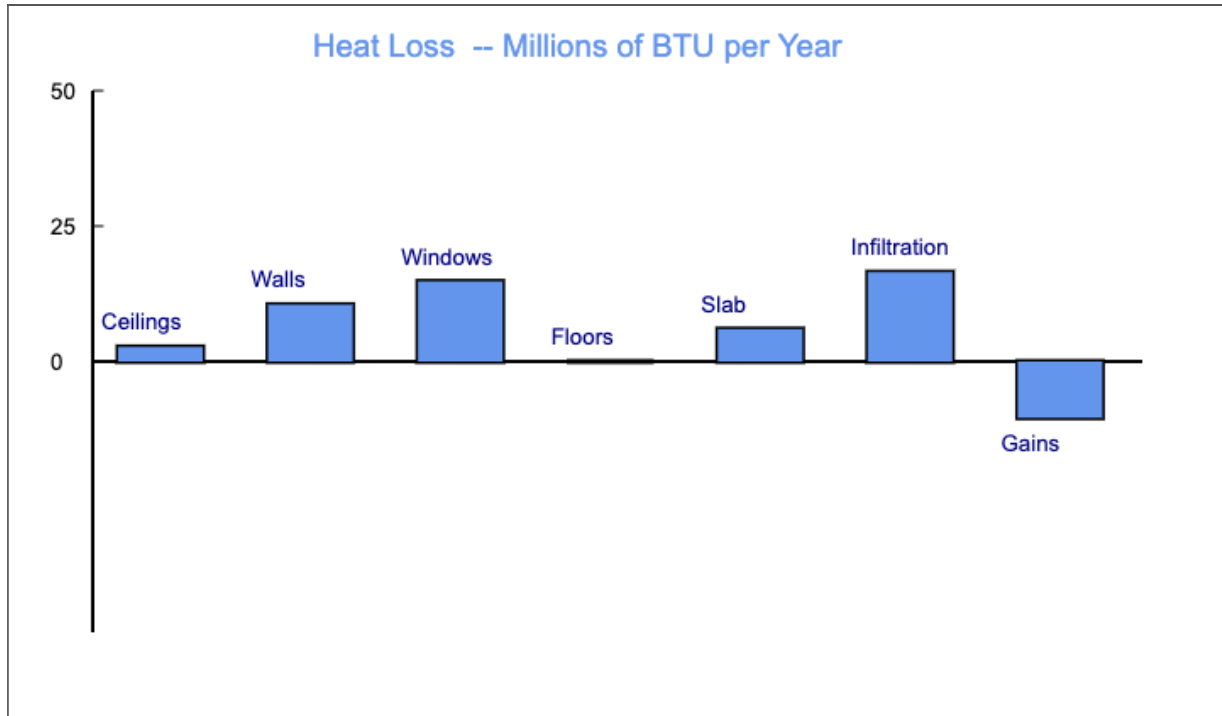
These are heat gains from warm bodies, lights, appliances, ...

This is heat that your furnace does not need to provide.

If you don't want to account for internal heat gains, enter 0 for the number of occupants

Number of Occupants		Internal <i>Gains</i> (BTU/hr)	Design Loss (BTU/hr)	Yearly Heat Loss (million BTU/yr)
2		1187	-1187	-10.4

Summary Outputs (see table above for detail outputs)						
<b>Calculate</b>	Click to update Heat Loss results.					
Item	UA (BTU/hr-F)	Design Loss (BTU/hr)	Year Loss (Million BTU/yr)	Fuel Cost (US dollars)	Ten Year Cost 10% infla \$'s	Greenhouse Gas (lb CO2)
Ceiling Loss	14	1119	2.7	2	26	165
Wall Loss	52	4283	10.5	6	100	630
Window Loss	74	6035	14.8	9	142	888
Floor Loss	0	0	0	0	0	0
Slab Loss	30	2460	6	4	58	362
Infiltration	82	6722	16.5	10	158	989
Totals	251	20619	50.6	30	483	3035
Internal Gains	Internal heat gains (warm bodies, lights, ...) supply some of the heat listed above -- the line below shows approximately the contribution of internal heat gains -- this is heat that your furnace does NOT have to supply.					
		-1187	-10.4	-6	-99	



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**Definitions of the Output Columns:**

- Design Heat Loss -- This is the total heat loss from your house per hour when the outside temperature is at the Design Outdoor Temperature that you input. This can be used as a rough guide for sizing your furnace -- but see the discussion on Internal Gains above. (BTU/hour)
- Year Heat Loss -- This is a rough estimate of the total heat loss from your house for a typical year. It is based on the number of Heating Degree Days you entered. (BTU/year)
- Fuel Cost -- This is the cost of the fuel to heat your house based on the Year Heat Loss from the previous column, and the fuel type, fuel cost, and furnace efficiency you entered. (Dollars)
- Ten Year Cost -- This is the cost of fuel for 10 years with the assumption that fuel costs will rise 10% each year of the 10 years. (Dollars)
- Greenhouse Gas Emissions -- This is the yearly green house gas emissions from your heat plant. It is based on the type of fuel you selected, the furnace efficiency you entered, the Year Heat Loss. For electricity, it is assumed that the electricity was generated at an average US rate of 1.5 lbs CO2 per KWH. (lbs of CO2 per year)

**Note:**

- You must have Javascript enabled in your browser to run this calculator (Tools -> Internet Options -> Security)
- For the Design Day heat loss calculation, the inside temperature is assumed to be 70F.
- Remember that you must click the Calculate button to see the effect of any changes you make to the inputs.

HINT: if you want to save the output use the Print function on your browser to either print it, or save it to a pdf, and sometimes other types of files. One way to access the Print function is to right click anywhere and select print off the right click menu. The right click menu on MS Explorer browser will also export the data to OneNote, which works well.

**Updates:**

Gary 5/5/07, 3/2/08, 12/18/2008

Updated: April 17, 2008 Clarified slab effective R value, added two examples.

Nov 7, 2009 Added some more help files

April 4, 2011 Fixed some formatting and nav menu issues

August 15, 2012 Added plot and title, many cleanups, formatted for better printing and clearer look.

December 3, 2012 added a few clarifications to the labels.

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