

# RESIDENTIAL LOAD CALC WORKSHEET

Job Name \_\_\_\_\_ Date \_\_\_\_\_

Address \_\_\_\_\_

Outdoor Temp: \_\_\_\_\_ Indoor Temp: \_\_\_\_\_ Temp Difference: \_\_\_\_\_

## SENSIBLE LOAD CALCULATIONS

WINDOWS		Single Pane						Double Pane Single Pane & Low e						Triple Pane Double Pane & Low e						BTUH Heat Gain
Clear Glass Internal Shading	No	Design Temperature Difference																		
		10	15	20	25	30	35	10	15	20	25	30	35	10	15	20	25	30	35	
Compass Point	Sq Feet	Heat Transfer Multiplier																		
N		23	27	31	35	39	43	19	21	23	25	27	29	17	18	19	20	21	22	
NE & NW		56	60	64	68	72	76	47	49	51	53	55	57	43	44	45	46	47	48	
E & W		81	85	89	93	97	101	68	70	72	74	76	78	62	63	64	65	66	67	
SE & SW		70	74	78	82	86	90	59	61	63	65	67	69	53	54	55	56	57	58	
S		40	44	48	52	56	60	34	36	38	40	42	44	30	31	32	33	34	35	

Clear Glass Shading - Drapes, Blinds		Single Pane						Double Pane Single Pane & Low e						Triple Pane Double Pane & Low e						BTUH Heat Gain
Compass Point	Sq Feet	Heat Transfer Multiplier																		
		14	18	22	26	30	34	12	14	16	18	20	22	10	11	12	13	14	15	
N		14	18	22	26	30	34	12	14	16	18	20	22	10	11	12	13	14	15	
NE & NW		33	37	41	45	49	53	29	31	33	35	37	39	25	26	27	28	29	30	
E & W		48	52	56	60	64	68	42	44	46	48	50	52	37	38	39	40	41	42	
SE & SW		41	45	49	53	57	61	37	39	41	43	45	47	32	33	34	35	36	37	
S		24	28	32	36	40	44	21	23	25	27	29	31	18	19	20	21	22	23	

DOORS	Sq Feet	Design Temp Difference						BTUH Heat Gain
		10	15	20	25	30	35	
		Heat Transfer Multiplier						
Solid Wood		6.3	8.6	10.9	13.2	14.4	15.5	
Solid Wood**		4.4	6.0	7.6	9.2	10.0	10.8	
Metal Urethane		2.6	3.5	4.5	5.4	5.9	6.4	
Metal Urethane**		2.3	3.2	4.0	4.9	5.3	5.7	

\*\* Weatherstripped or Storm

WALLS	Running Ft		Height of Wall		Sq. Ft.
	_____	_____	_____	_____	
	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____

Frame Wall	Net Sq Ft	Design Temp Difference						BTUH Heat Gain
		10	15	20	25	30	35	
		Heat Transfer Multiplier						
No Insulation		3.7	5.0	6.4	7.8	8.5	9.1	
R 11, 3" Insulation		1.1	1.5	1.9	2.3	2.5	2.7	
R-13, 3 1/2" Insulation		1.0	1.4	1.8	2.1	2.2	2.4	
R-13 + 1" Polystyrene		0.9	1.2	1.5	1.9	2.0	2.2	
R-19 + 1/2" Polystyrene		0.7	1.0	1.3	1.6	1.7	1.8	

Masonry Wall - Above Grade	Net Sq Ft	Design Temp Difference						BTUH Heat Gain
		10	15	20	25	30	35	
		Heat Transfer Multiplier						
No Insulation		3.2	5.8	8.3	10.9	12.2	13.4	
R-5, 1" Insulation		0.9	1.6	2.3	3.1	3.5	3.8	
R-11, 3" Insulation		0.5	0.9	1.3	1.6	1.8	2.0	
R-19, 6" Insulation		0.3	0.5	0.8	1.0	1.2	1.3	

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CEILING  Under Vented Attic	Sq Feet	Design Temp Difference						BTUH Heat Gain
		10	15	20	25	30	35	
		Heat Transfer Multiplier						
No Insulation		14.9	17.0	19.2	21.4	22.5	23.6	
R-11, 3" Insulation		2.8	3.2	3.7	4.1	4.3	4.5	
R-19, 6" Insulation		1.8	2.1	2.3	2.6	2.8	2.9	
R-30, 10" Insulation		1.1	1.3	1.5	1.6	1.7	1.8	
R-38, 12" Insulation		0.9	1.0	1.1	1.3	1.3	1.4	

Roof on Exposed Beams or Rafters	Sq Feet	Design Temp Difference						BTUH Heat Gain
		10	15	20	25	30	35	
		Heat Transfer Multiplier						
1 1/2" Wood decking, no insul.		10.0	11.5	12.9	12.9	14.4	15.9	
1 1/2" Wood decking, R-4		4.8	5.5	6.2	6.2	6.9	7.6	
Shredded wood planks		5.2	6.0	6.8	6.8	7.5	8.3	
Fiber Board Insulation		4.6	5.3	5.9	5.9	6.6	7.3	
1 1/2" Wood decking R-19		1.4	1.6	1.8	1.8	2.0	2.2	

Roof - Ceiling Combination (Cathedral)	Sq Feet	Design Temp Difference						BTUH Heat Gain
		10	15	20	25	30	35	
		Heat Transfer Multiplier						
No Insulation		9.8	11.2	12.6	12.6	14.1	15.5	
R-11 Batts		2.4	2.8	3.2	3.2	3.5	3.9	
R-22 Batts (2" x 8" Rafters"		1.5	1.8	2.0	2.0	2.2	2.4	
R-30 Batts (2" x 10" Rafters"		1.2	1.4	1.5	1.5	1.7	1.9	

FLOOR  Over Unconditioned Space Only (include garage)	Sq Feet	Design Temp Difference						BTUH Heat Gain
		10	15	20	25	30	35	
		Heat Transfer Multiplier						
Floor, No Insulation		1.9	3.9	5.8	7.7	8.7	9.6	
Carpet Floor, No Insulation		1.3	2.5	3.8	5.1	5.7	6.3	
R 11, 3" Insulation, carpet		0.4	0.8	1.1	1.5	1.7	1.9	
R-19, 6" Insulation, carpet		0.2	0.5	0.7	1.0	1.1	1.2	
R-30, 10" Insulation, carpet		0.2	0.4	0.5	0.7	0.8	0.9	

**(total of ALL preceding rows) SENSIBLE HEAT GAIN SUBTOTAL =**

OTHER		Heat Gain
Infiltration - Sensible	Btuh = 1.1 x home cu ft (L x W x H) /60 x .4	
Ventilation - Sensible	Btuh = 1.1 x ventilation CFM x summer design delta T (the design temp diff)	
Internal Heat Gain	Internal Heat Gain Btuh = # ___ x 300 =	
Kitchen Allowance	Add 1200	
Duct Gain - if outside conditioned space	R-4; 1" Flexible Blanket insulation	Multiply subtotal x 1.15
	R-7; 2" Flexible Blanket insulation	Multiply subtotal x 1.10
<b>TOTAL SENSIBLE HEAT GAIN =</b>		

LATENT LOAD CALCULATIONS	
Number of People	Btuh = # x 230 =
Infiltration - Latent	Btuh = 0.68 x home cu ft (L x W x H) /60 x .4
Ventilation - Latent	Btuh = 0.68 x ventilation CFM x grains difference (0 for Colorado)
<b>TOTAL LATENT HEAT GAIN =</b>	

**GRAND TOTAL HEAT GAIN (BTUH) =**

Note: All heat transfer multipliers are from ACCA Manual "J" Sixth Edition, and for a medium outdoor daily temperature range