

TABLE 19. VALUES OF Y TO BE USED WITH FACTORS IN TABLE 18 AND TABLE 20 IN THE DETERMINATION OF INSTANTANEOUS RATES OF HEAT GAIN DUE TO CONVECTION AND RADIATION FOR VARIOUS TYPES OF SINGLE GLASS AND COMBINATIONS OF TWO SHEETS OF GLASS SPACED AT $\frac{1}{4}$ IN.

For Clear Atmospheres and 18 Deg Declination, North (August 1)

SUN TIME		VALUES OF Y IN BTU PER (HR) (SQ FT) ^a								
		N	NE	E	SE	S	SW	W	NW	HORIZ.
5 a.m.	40 DEGREES NORTH LATITUDE	0	0	1	0	0	0	0	0	0
6		4	16	18	9	1	1	1	1	3
7		2	24	30	20	2	2	2	2	11
8		2	22	33	25	2	2	2	2	21
9		2	16	30	29	8	3	3	3	32
10		3	5	25	27	14	3	3	3	37
11		3	3	12	21	18	3	3	3	42
12		3	3	3	15	19	12	3	3	45
1 p.m.		3	3	3	3	19	22	10	3	44
2		3	3	3	3	16	27	24	4	41
3		3	3	3	3	10	30	31	15	35
4		3	3	3	3	4	29	36	23	26
5	2	2	2	2	2	23	34	27	17	
6	4	1	1	1	1	14	24	21	6	
7	0	0	0	0	0	2	3	3	1	

SUN TIME	LATITUDE	SE	S	SW	SUN TIME	LATITUDE	SE	S	SW
5 a.m.	30 ^b DEGREES NORTH LATITUDE	0	0	0	5 a.m.		2	0	0
6		7	1	1	6		13	1	1
7		18	2	2	7		22	2	2
8		22	2	2	8		28	3	2
9		24	3	3	9		30	13	3
10		22	5	3	10		31	20	3
11		16	7	3	11		27	25	5
12		6	9	4	12		20	27	17
1 p.m.		3	9	14	1 p.m.		9	25	26
2		3	6	21	2		3	22	32
3		3	5	27	3		3	16	33
4		3	3	26	4		2	7	31
5	2	2	21	5		2	2	26	
6	1	1	11	6		1	1	17	
7	0	0	0	7		0	0	7	

^a Values of Y for 8 and 9 p.m. are zero.

^b For N, NE, E, W, NW and horizontal use 40 deg North Latitude values.

the corresponding Table 17 values. The total instantaneous heat gain is the sum of the gain due to transmitted solar radiation and the gain by convection and radiation.

The values given in Tables 20 and 21 are based upon an A.S.H.V.E. research paper²⁰ to which the reader is directed for additional data. The values in Tables 20 and 21 may be used with fair precision for other patterns of similar transmittance and surface characteristics. For example, the data for hammered glass may be used for glass having shallow, closely-spaced ribs or for glass having small, closely-spaced circular indentations. Because some patterns have distinct orientation properties, no attempt has been made to give values for non-vertical glass.

Design Tables for Glass Block Walls

Tables 23 and 24 give design values of instantaneous rates of heat gain for sunlit walls of Type I pattern 8-in. hollow glass block for a solar declination of 18 deg (see Table 22 for description of block patterns). These tables are based upon the solar intensity values for a clear atmosphere as given in Table 5. For solar energy transmittance data the reader is referred to reference 18. Table 23 presents values of transmitted direct

TABLE 20. APPLICATION FACTORS TO APPLY TO TABLES 17 AND 19 TO OBTAIN INSTANTANEOUS RATES OF HEAT GAIN FOR VERTICAL SINGLE SHEETS OF ROLLED FIGURED GLASS HAVING NORMAL INCIDENCE TRANSMITTANCES AND LISTED THICKNESSES (SMOOTH SIDE INDOORS, FIGURED SIDE OUTDOORS) (See Table 21 for Factors to Apply to Table 16 Values)

GLASS PATTERN	NORMAL INCIDENCE TRANSMITTANCE	THICKNESS, INCHES	FACTOR TO APPLY TO TABLE 17
Hammered	0.75	$\frac{3}{32}$	$1.0(X)^a + 0.50(Y)^b$
Hammered, etched both sides	0.67	$\frac{1}{8}$	$1.0(X) + 0.55(Y)^d$
Deep ribs on 1 in. centers	0.77 approx.	$\frac{3}{32}$	$1.0(X) + 0.50(Y)^e$
Hammered heat absorbing	0.21	$\frac{3}{4}$	$1.0(X) + 1.15(Y)^f$
Hammered heat absorbing, etched both sides	0.14	$\frac{3}{4}$	$1.0(X) + 1.40(Y)$

^a X values are Table 17 values

^b Y values are Table 19 values

^c Use 0.40(Y) for east and west glass

^d Use 0.60(Y) for east and west glass

^e Use 0.35(Y) for east and west glass

^f Use 0.95(Y) for south glass

TABLE 21. INSTANTANEOUS RATES OF HEAT GAIN DUE TO TRANSMITTED DIRECT AND DIFFUSE SOLAR RADIATION BY UNSHADED ROLLED FIGURED GLASS.

Multiply the Table 16 Values by These Percentage Factors

For Clear Atmospheres and 18 Degrees Declination, North (August 1) For 30, 40, and 50 Degrees North Latitude

Note: To obtain total instantaneous heat gain add adjusted Table 16 values to adjusted Table 17 values

INSTANTANEOUS HEAT GAIN DUE TO TRANSMITTED SOLAR RADIATION AS A PERCENTAGE OF SINGLE SHEET OF COMMON WINDOW GLASS												
SUN TIME		HAMMERED					HAMMERED AND ETCHED					
AM ↓		N, NW W, SW	NE	E	SE	S	N, NW W, SW	NE	E	SE	S	
5 a.m.	7 p.m.	80	80	85	70	80	60	65	75	55	60	
6	6	80	85	85	75	80	60	65	75	50	60	
7	5	80	80	85	80	80	60	60	70	55	60	
8	4	80	75	85	80	75	60	55	65	55	60	
9	3	80	60	80	80	60	60	50	55	55	50	
10	2	80	65	75	75	65 ^a	60	55	50	55	50	
11	1	80	80	60	70	65 ^a	60	60	50	50	50	
12		80	80	80	60	65 ^a	60	60	60	50	50	

SUN TIME		RIBS ON 1/4 IN. CENTERS					HAMMERED HEAT ABSORBING				
5 a.m.	7 p.m.	80	75	85	25	60	25	20	25	20	25
6	6	60	80	85	30	60	25	20	25	20	25
7	5	60	65	85	40	60	25	20	25	20	25
8	4	60	40	80	50	55	25	20	20	20	25
9	3	60	30	70	55	35	25	20	20	20	20
10	2	60	40	40	55	35	25	20	20	20	20
11	1	60	60	35	40	35 ^b	25	25	20	20	20
12		60	60	60	35	45 ^b	25	25	25	20	20

SUN TIME		HAMMERED AND ETCHED HEAT ABSORBING									
AM ↓		N, NW W, SW	NE	E	SE	S	N, NE E, SE	NW	W	SW	S
5 a.m.	7 p.m.	20	15	15	10	20					
6	6	20	15	15	10	20					
7	5	20	10	15	10	20					
8	4	20	10	15	10	20					
9	3	20	10	10	10	10					
10	2	20	15	10	10	10					
11	1	20	20	10	10	10					
12		20	20	20	10	10					
PM ↑		N, NE E, SE	NW	W	SW	S					

^a Decrease values 10 percent for 30 deg latitude; increase 15 percent for 50 deg latitude

^b Increase values 30 percent for 50 deg latitude

^a Decrease values 10 percent for 30 deg latitude; increase 15 percent for 50 deg latitude

^b Increase values 30 percent for 50 deg latitude