TABLE 12. TRANSMITTANCES AND ABSORPTANCES OF COMMON WINDOW GLASS FOR DIRECT AND DIFFUSE SOLAR RADIATION

Angle of Incidence, θ, deg	Single Sheets		Two Air-Spaced Sheets		
	τ_D	α_D	τ_D	α_D Outdoor Sheet	α_D Indoor Sheet
	For Direct Radiation				
0	0.87	0.05	0.76	0.06	0.04
20	0.87	0.05	0.76	0.06	0.04
40	0.86	0.06	0.74	0.06	0.04
50	0.84	0.06	0.72	0.07	0.05
60	0.79	0.06	0.66	0.07	0.05
70	0.67	0.06	0.52	0.07	0.05
80	0.42	0.06	0.25	0.07	0.05
90	0.0	0.0	0.0	0.0	0.05
	For Diffuse or Sky Solar Radiation				
	0.79	0.06	0.68	0.07	0.05

dry-bulb temperature cycle, with a 95 F maximum as tabulated. *The total heat gain is the sum* of the Table 13 and Table 14 values. In preparing Table 14, convection and radiation heat exchange were combined, and a combined surface conductance of 4.0 used. Corrections to be applied for other design temperatures are given in Table 23 in a later section, Effect of Deviation from Design Conditions.

Tables 13 and 14 may be used for other types of glass with good accuracy, by using the factors given in Table 15. Table 13 values are multiplied by the appropriate factor given in Table 15 to obtain heat gain due to transmitted solar radiation. For glasses having a transmittance for normally incident radiation differing from the table values, factors may be found by linear interpolation. To obtain instantaneous rates of heat gain by convection and radiation, two steps are required. First, Table 14 values are multiplied by the appropriate coefficient of X listed in Table 15. Second, Table 16 values are multiplied by the appropriate coefficient of Y listed

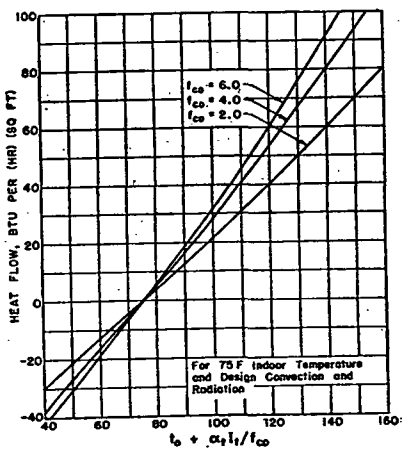

FIG. 3. CONVECTION AND RADIATION HEAT FLOW FOR VERTICAL SINGLE GLASS

TABLE 13. INSTANTANEOUS RATES OF HEAT GAIN DUE TO TRANSMITTED DIRECT AND DIFFUSE OR SKY SOLAR RADIATION BY A SINGLE SHEET OF UNSHADED COMMON WINDOW GLASS

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

Note: For total instantaneous heat gain, add these values to the Table 14 values.

Latitude	Sun Time	Instantaneous Heat Gain in Btu per (hr) (sq ft)								
	AM → ↓	N	NE	E	SE	S	SW	W	NW	Horiz.
30 Deg North	6 a.m. 6 p.m.	25	98	108	52	5	5	5	5	17
	7 5	23	155	190	110	10	10	10	10	71
	8 4	16	148	205	136	14	13	13	13	137
	9 3	16	106	180	136	21	15	15	15	195
	10 2	17	54	128	116	34	17	16	16	241
	11 1	18	20	59	78	45	19	18	18	267
	12	18	19	19	35	49	35	19	19	276
40 Deg North	5 a.m. 7 p.m.	3	7	6	2	0	0	0	0	1
	6 6	26	116	131	67	7	6	6	6	25
	7 5	16	149	195	124	11	10	10	10	77
	8 4	14	129	205	156	18	12	12	12	137
	9 3	15	79	180	162	42	14	14	14	188
	10 2	16	31	127	148	69	16	16	16	229
	11 1	17	18	58	113	90	23	17	17	252
	12	17	17	19	64	98	64	19	17	259
50 Deg North	5 a.m. 7 p.m.	20	54	54	20	3	3	3	3	6
	6 6	25	128	149	81	8	7	7	7	34
	7 5	12	139	197	136	12	10	10	10	80
	8 4	13	107	202	171	32	12	12	12	129
	9 3	14	54	176	183	72	14	14	14	173
	10 2	15	18	124	174	110	16	15	15	206
	11 1	16	16	57	143	136	42	16	16	227
	12	16	16	18	96	144	96	18	16	234
	↑ PM →	N	NW	W	SW	S	SE	E	NE	Horiz.

TABLE 14. INSTANTANEOUS RATES OF HEAT GAIN BY CONVECTION AND RADIATION FROM A SINGLE SHEET OF UNSHADED COMMON WINDOW GLASS

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

For 80 F Indoor Temperature

Note: For total instantaneous heat gain, add these values to the Table 13 values.

Sun Time	Dry-Bulb Deg F	North Latitude Degrees	Instantaneous Heat Gain in Btu per (hr) (sq ft)								
			N	NE	E	SE	S	SW	W	NW	Hor.
5 a.m.	74		−6	−6	−6	−6	−6	−6	−6	−6	−6
6	74		−5	−4	−4	−5	−5	−6	−6	−6	−5
7	75		−5	−2	−2	−3	−5	−5	−5	−5	−3
8	77		−3	0	1	0	−2	−3	−3	−3	0
9	80		0	2	4	3	1	0	0	0	3
10											
11	83		3	4	6	6	5	3	3	3	8
12	87		8	8	10	11	10	9	8	8	13
1 p.m.	90	30, 40, 50	12	12	12	13	14	13	12	12	16
2	93		15	15	15	16	17	17	17	15	20
	94		16	16	16	16	18	19	19	17	21
3											
4	95		17	17	17	17	19	21	21	19	21
5	94		16	16	16	16	17	20	20	19	19
6	93		15	15	15	15	15	18	19	18	17
7	91		13	13	13	13	13	14	15	15	13
	87		8	8	8	8	8	8	8	8	8
8											
9	85		6	6	6	6	6	6	6	6	6
	83		3	3	3	3	3	3	3	3	3