

Solar Position and Insolation Values for 56° North Latitude

BTUH/ft² Total Insolation on Surfaces^a

Date	Solar Time			Solar Position		Normal ^b	Horiz.	South Facing Surface Angle with Horiz.			
	a.m.	p.m.	Alt.	Azm.	46			66	76	86	90
January 21	9	3	5.0	41.8	78	11	50	55	59	60	60
	10	2	9.9	28.5	170	39	35	146	154	156	53
	11	1	12.9	14.5	207	58	183	197	206	208	201
	12		14.0	0.0	217	65	198	214	222	225	217
Surface daily totals				1126	282	934	1010	1058	1074	1044	
February 21	8	4	7.6	59.4	129	25	65	69	72	72	69
	9	3	14.2	45.9	214	65	151	159	162	161	151
	10	2	19.4	31.5	250	98	215	225	228	224	208
	11	1	22.8	16.1	266	119	254	265	268	263	243
Surface daily totals				24.0	0.0	270	126	268	279	282	276
March 21	7	5	8.3	77.5	128	28	40	40	39	37	32
	8	4	16.2	64.4	215	75	119	120	117	111	97
	9	3	23.3	50.3	253	118	192	193	189	180	154
	10	2	29.0	34.9	272	151	249	251	246	234	205
April 21	11	1	32.7	17.9	282	172	285	288	282	268	236
	12		34.0	0.0	284	179	297	300	294	280	246
	Surface daily totals				2586	1268	2066	2084	2040	1938	1700
	5	7	1.4	108.8	0	0	0	0	0	0	0
	6	6	9.6	96.5	122	32	14	9	8	7	6

7	5	18.0	84.1	201	81	74	66	57	46	29			
8	4	26.1	70.9	239	129	143	135	123	108	82			
9	3	33.6	56.3	260	169	208	200	186	167	133			
10	2	39.9	39.7	272	201	259	251	236	214	174			
11	1	44.1	20.7	278	220	292	284	268	245	200			
	<u>12</u>	<u>45.6</u>	<u>0.0</u>	<u>280</u>	<u>227</u>	<u>303</u>	<u>295</u>	<u>279</u>	<u>255</u>	<u>209</u>			
Surface daily totals				3024	1892	2282	2186	2038	1830	1458			
May 21													
4	8	1.2	125.5	0	0	0	0	0	0	0			
5	7	8.5	113.4	93	25	10	9	8	7	6			
6	6	16.5	101.5	175	71	28	17	15	13	11			
7	5	24.8	89.3	219	119	88	74	58	41	16			
8	4	33.1	76.3	244	163	153	138	119	98	63			
9	3	40.9	61.6	259	201	212	197	176	151	109			
10	2	47.6	44.2	268	231	259	244	222	194	146			
11	1	52.3	23.4	273	249	288	274	251	222	170			
	<u>12</u>	<u>54.0</u>	<u>0.0</u>	<u>275</u>	<u>255</u>	<u>299</u>	<u>284</u>	<u>261</u>	<u>231</u>	<u>178</u>			
Surface daily totals				3340	2374	2374	2188	1962	1682	1218			
June 21													
4	8	4.2	127.2	21	4	2	2	2	2	1			
5	7	11.4	115.3	122	40	14	13	11	10	8			
6	6	19.3	103.6	185	86	34	19	17	15	12			
7	5	27.6	91.7	222	132	92	76	57	38	15			
8	4	35.9	78.8	243	175	154	137	116	92	55			
9	3	43.8	64.1	257	212	211	193	170	143	98			
10	2	50.7	46.4	265	240	255	238	214	184	133			
11	1	55.6	24.9	269	258	284	267	242	210	156			
	<u>12</u>	<u>57.5</u>	<u>0.0</u>	<u>271</u>	<u>264</u>	<u>294</u>	<u>276</u>	<u>251</u>	<u>219</u>	<u>164</u>			
Surface daily totals				3438	2526	2388	2166	1910	1606	1120			

(continued)

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September 21	7	5	8.3	77.5	107	25	36	34	32	28
	8	4	16.2	64.4	194	72	111	111	108	89
	9	3	23.3	50.3	233	114	181	182	178	147
	10	2	29.0	34.9	253	146	236	237	232	193
	11	1	32.7	17.9	263	166	271	273	267	223
	<u>12</u>		34.0	0.0	266	173	283	285	279	233
Surface daily totals				2368	1220	1950	1962	1918	1820	1594
October 21	8	4	7.1	59.1	104	20	53	57	59	57
	9	3	13.8	45.7	193	60	138	145	148	138
	10	2	19.0	31.3	231	92	201	210	213	195
	11	1	22.3	16.0	248	112	240	250	253	230
	<u>12</u>		23.5	0.0	253	119	253	263	266	241
Surface daily totals				1804	688	1516	1586	1612	1588	1480
November 21	9	3	5.2	41.9	76	12	49	54	57	58
	10	2	10.0	28.5	165	39	132	143	149	148
	11	1	13.1	14.5	201	58	179	193	201	196
	<u>12</u>		14.2	0.0	211	65	194	209	217	211
Surface daily totals				1094	284	914	986	1032	1046	1016
December 21	9	3	1.9	40.5	5	0	3	4	4	4
	10	2	6.6	27.5	113	19	86	95	101	103
	11	1	9.5	13.9	166	37	141	154	163	164
	<u>12</u>		10.6	0.0	180	43	159	173	182	182
Surface daily totals				748	156	620	678	716	734	722

Source: Kreider, J.F. and Kreith, F., *Solar Heating and Cooling*, revised 1st edn., Hemisphere Publ. Corp., Washington, DC, 1977.

^a 1 Btu/h · ft² = 3.152 W/m². Ground reflection not included on normal or horizontal surfaces.

^b Normal insolation does not include diffuse component.