

Solar Heat Gain Factors (SHGFs) for selected latitudes of the Northern Hemisphere

Source:

Handbook of Fundamentals
American Society of Heating, Refrigeration and Air-Conditioning (ASHRAE)

Use:

Select latitude (16° – 64° N)
month of year (January–December) and
orientation of exposure (North, East, South, West or intermediate orientation).
Then look up the daily total (highlighted in yellow).

Values are in Btus per day and per square foot.

Example: January at 40° N

SHGF for eastern exposure = 514 Btu/(day.ft²)

SHGF for southeastern exposure = 1,177 Btu/(day.ft²)

SHGF for southern exposure = 1,626 Btu/(day.ft²)

Latitude 16°N

	N	NE	E	SE	S	SW	W	NW
half-day total	110	196	760	1096	781	211	111	110
January	220	306	871	1307	1562	1307	871	306
half-day total	124	321	865	1034	582	174	124	124
February	248	445	989	1208	1164	1208	989	445
half-day total	141	494	928	879	319	153	139	139
March	282	633	1067	1032	638	1032	1067	633
half-day total	179	674	922	653	174	157	155	155
April	358	829	1077	810	348	810	1077	829
half-day total	283	804	897	493	172	167	167	169
May	566	973	1064	660	344	660	1064	973
half-day total	356	850	876	430	174	171	172	176
June	712	1026	1048	601	348	601	1048	1026
half-day total	296	799	878	478	176	171	171	173
July	592	972	1049	649	352	649	1049	972
half-day total	191	666	891	624	180	165	163	163
August	382	829	1054	789	360	789	1054	829
half-day total	146	475	885	842	319	159	145	144
September	292	619	1030	1001	638	1001	1030	619
half-day total	127	318	836	996	563	175	128	127
October	254	445	964	1171	1126	1171	964	445
half-day total	112	197	749	1077	767	210	112	112
November	224	309	861	1287	1534	1287	861	309
half-day total	104	159	710	1099	836	228	105	104
December	208	263	815	1327	1672	1327	815	263

Solar Heat Gain Factors - Daily Totals

$$\frac{Btu}{ft^2 \cdot day}$$

Latitude 24°N

	N	NE	E	SE	S	SW	W	NW
half-day total	95	148	671	1076	840	241	96	95
January	190	243	767	1317	1680	1317	767	243
half-day total	113	257	806	1072	699	200	113	113
February	226	370	919	1272	1398	1272	919	370
half-day total	133	422	906	970	458	169	133	133
March	266	555	1039	1139	916	1139	1039	555
half-day total	168	607	940	773	244	163	155	154
April	336	761	1095	936	488	936	1095	761
half-day total	238	749	943	614	187	174	172	172
May	476	921	1115	788	374	788	1115	921
half-day total	284	802	932	544	187	180	179	180
June	568	982	1111	724	374	724	1111	982
half-day total	247	746	925	595	191	178	177	177
July	494	923	1102	773	382	773	1102	923
half-day total	179	601	910	740	243	171	164	163
August	358	764	1074	911	486	911	1074	764
half-day total	139	406	863	927	451	174	139	138
September	278	544	1002	1101	902	1101	1002	544
half-day total	116	255	778	1032	675	200	117	116
October	232	371	895	1232	1350	1232	895	371
half-day total	97	149	661	1056	825	239	98	97
November	194	246	759	1295	1650	1295	759	246
half-day total	88	118	611	1054	868	257	89	88
December	176	206	700	1311	1736	1311	700	206

Solar Heat Gain Factors - Daily Totals

$$\frac{Btu}{ft^2 \cdot day}$$

Latitude 32°N

	N	NE	E	SE	S	SW	W	NW
half-day total	79	107	570	1015	853	264	80	79
January	158	186	650	1279	1706	1279	650	186
half-day total	100	201	735	1080	780	228	100	100
February	200	301	835	1308	1560	1308	835	301
half-day total	124	359	875	1041	589	193	125	124
March	248	483	1000	1234	1178	1234	1000	483
half-day total	161	550	952	889	360	177	153	152
April	322	702	1105	1066	720	1066	1105	702
half-day total	222	702	985	747	250	183	175	174
May	444	876	1160	930	500	930	1160	876
half-day total	261	762	985	678	225	189	184	183
June	522	945	1169	867	450	867	1169	945
half-day total	231	701	967	726	248	187	180	179
July	462	880	1147	913	496	913	1147	880
half-day total	171	546	922	854	352	184	162	160
August	342	706	1084	1038	704	1038	1084	706
half-day total	130	345	831	993	574	197	130	129
September	260	474	961	1190	1148	1190	961	474
half-day total	103	200	708	1038	753	226	104	103
October	206	303	812	1264	1506	1264	812	303
half-day total	80	108	561	996	838	261	81	80
November	160	188	642	1257	1676	1257	642	188
half-day total	71	84	500	965	852	275	71	71
December	142	155	571	1240	1704	1240	571	155

Solar Heat Gain Factors - Daily Totals

$$\frac{Btu}{ft^2 \cdot day}$$

Latitude 40°N

	N	NE	E	SE	S	SW	W	NW
half-day total	61	73	452	904	813	273	62	61
January	122	134	514	1177	1626	1177	514	134
half-day total	84	152	648	1049	821	250	85	84
February	168	236	733	1299	1642	1299	733	236
half-day total	114	302	832	1087	694	220	114	113
March	228	415	946	1307	1388	1307	946	415
half-day total	154	501	957	994	488	199	148	147
April	308	648	1105	1193	976	1193	1105	648
half-day total	215	666	1024	881	358	200	176	174
May	430	840	1200	1081	716	1081	1200	840
half-day total	253	734	1038	818	315	204	188	186
June	506	920	1226	1022	630	1022	1226	920
half-day total	223	666	1008	858	352	204	181	180
July	446	846	1189	1062	704	1062	1189	846
half-day total	164	498	928	956	474	205	157	156
August	328	654	1085	1161	948	1161	1085	654
half-day total	119	291	787	1003	672	222	119	118
September	238	409	906	1225	1344	1225	906	409
half-day total	88	152	623	1006	791	247	89	88
October	176	240	712	1253	1582	1253	712	240
half-day total	63	75	445	887	798	269	63	63
November	126	138	508	1156	1596	1156	508	138
half-day total	52	56	374	822	775	276	53	52
December	104	108	427	1098	1550	1098	427	108

Solar Heat Gain Factors - Daily Totals

$$\frac{Btu}{ft^2 \cdot day}$$

Latitude 48°N

	N	NE	E	SE	S	SW	W	NW
half-day total	43	46	316	729	701	259	43	43
January	86	89	359	988	1402	988	359	89
half-day total	68	107	541	968	813	261	68	68
February	136	175	609	1229	1626	1229	609	175
half-day total	100	250	775	1100	767	244	101	100
March	200	350	876	1344	1534	1344	876	350
half-day total	147	461	957	1081	605	226	141	140
April	294	601	1098	1307	1210	1307	1098	601
half-day total	215	645	1065	1007	483	225	174	173
May	430	818	1239	1232	966	1232	1239	818
half-day total	257	722	1095	955	436	228	189	188
June	514	910	1284	1183	872	1183	1284	910
half-day total	223	646	1050	983	474	229	181	179
July	446	825	1231	1212	948	1212	1231	825
half-day total	157	459	929	1040	587	231	151	149
August	314	608	1080	1271	1174	1271	1080	608
half-day total	105	240	729	1040	737	243	106	105
September	210	345	835	1283	1474	1283	835	345
half-day total	71	108	519	925	779	256	72	71
October	142	179	591	1181	1558	1181	591	179
half-day total	44	47	310	713	686	255	44	44
November	88	91	354	968	1372	968	354	91
half-day total	33	34	233	610	616	247	34	33
December	66	67	267	857	1232	857	267	67

Solar Heat Gain Factors - Daily Totals

$$\frac{Btu}{ft^2 \cdot day}$$

Latitude 56°N

	N	NE	E	SE	S	SW	W	NW
half-day total	23	24	163	468	487	206	24	23
January	46	47	187	674	974	674	187	47
half-day total	49	66	409	821	737	253	50	49
February	98	115	459	1074	1474	1074	459	115
half-day total	85	200	699	1071	800	258	86	85
March	170	285	785	1329	1600	1329	785	285
half-day total	139	430	951	1147	699	252	132	131
April	278	561	1083	1399	1398	1399	1083	561
half-day total	222	644	1112	1120	604	256	172	170
May	444	814	1284	1376	1208	1376	1284	814
half-day total	275	738	1162	1082	562	260	190	189
June	550	927	1352	1342	1124	1342	1352	927
half-day total	231	646	1097	1096	593	259	179	177
July	462	823	1276	1355	1186	1355	1276	823
half-day total	149	429	923	1104	678	256	142	140
August	298	569	1065	1360	1356	1360	1065	569
half-day total	89	191	652	1004	761	255	90	89
September	178	280	742	1259	1522	1259	742	280
half-day total	52	68	390	779	702	246	53	52
October	104	120	443	1025	1404	1025	443	120
half-day total	24	24	161	457	475	202	24	24
November	48	48	185	659	950	659	185	48
half-day total	14	14	88	311	343	163	15	14
December	28	28	103	474	686	474	103	28

Solar Heat Gain Factors - Daily Totals

$$\frac{Btu}{ft^2 \cdot day}$$

Latitude 64°N

	N	NE	E	SE	S	SW	W	NW
half-day total	5	5	25	121	141	75	5	5
January	10	10	30	196	282	196	30	10
half-day total	29	33	244	578	560	212	30	29
February	58	62	274	790	1120	790	274	62
half-day total	68	150	596	984	779	257	68	68
March	136	218	664	1241	1558	1241	664	218
half-day total	131	410	943	1186	763	273	121	120
April	262	530	1064	1459	1526	1459	1064	530
half-day total	247	680	1177	1218	708	288	169	168
May	494	848	1346	1506	1416	1506	1346	848
half-day total	326	806	1256	1195	679	297	192	192
June	652	998	1448	1492	1358	1492	1448	998
half-day total	258	684	1163	1193	697	292	177	175
July	516	859	1340	1485	1394	1485	1340	859
half-day total	142	410	914	1141	740	275	131	130
August	284	540	1045	1416	1480	1416	1045	540
half-day total	71	142	547	910	731	249	72	71
September	142	213	619	1159	1462	1159	619	213
half-day total	31	34	231	542	527	202	32	31
October	62	65	263	744	1054	744	263	65
half-day total	5	5	26	120	140	74	6	5
November	10	10	32	194	280	194	32	10
half-day total	0	0	1	9	11	7	0	0
December	0	0	1	16	22	16	1	0

Solar Heat Gain Factors - Daily Totals

$$\frac{Btu}{ft^2 \cdot day}$$