

Table 5.18(f) Banded weather data: Leeds

Hour	Dry-bulb / °C	Incident solar irradiation / W·m ⁻²									
		Horizontal		N		NE		E		SE	
		Direct	Diffuse	Direct	Diffuse	Direct	Diffuse	Direct	Diffuse	Direct	Diffuse
May											
1	11.43	0	0	0	0	0	0	0	0	0	0
2	11.08	0	0	0	0	0	0	0	0	0	0
3	11.09	0	0	0	0	0	0	0	0	0	0
4	11.46	0	1	1	1	1	1	1	1	0	0
5	12.16	12	48	35	43	80	55	79	55	31	42
6	13.15	38	99	28	77	110	99	128	103	71	88
7	14.35	73	153	2	106	112	136	157	148	110	136
8	15.69	108	207	0	105	87	167	157	186	135	180
9	17.07	138	258	0	132	48	191	136	216	144	218
10	18.41	162	303	0	154	3	207	100	236	138	248
11	19.60	177	335	0	171	0	171	53	244	118	264
12	20.57	182	347	0	177	0	177	0	177	85	262
13	21.25	177	335	0	171	0	171	0	171	43	241
14	21.59	162	303	0	155	0	155	0	155	0	155
15	21.58	138	259	0	132	0	132	0	132	0	132
16	21.21	108	207	0	105	0	105	0	105	0	105
17	20.51	73	153	2	107	0	77	0	77	0	77
18	19.52	38	99	28	77	0	49	0	49	0	49
19	18.32	12	48	35	44	0	23	0	23	0	23
20	16.98	0	2	2	1	0	1	0	1	0	1
21	15.60	0	0	0	0	0	0	0	0	0	0
22	14.27	0	0	0	0	0	0	0	0	0	0
23	13.08	0	0	0	0	0	0	0	0	0	0
24	12.11	0	0	0	0	0	0	0	0	0	0

Hour	Dry-bulb / °C	Incident solar irradiation / W·m ⁻²								Altitude	Azimuth
		S		SW		W		NW			
		Direct	Diffuse	Direct	Diffuse	Direct	Diffuse	Direct	Diffuse		
1	11.43	0	0	0	0	0	0	0	0	0	14.55
2	11.08	0	0	0	0	0	0	0	0	0	28.61
3	11.09	0	0	0	0	0	0	0	0	0	41.88
4	11.46	0	0	0	0	0	0	0	0	0.14	54.34
5	12.16	0	23	0	23	0	23	0	23	7.83	66.15
6	13.15	0	49	0	49	0	49	0	49	16.24	77.69
7	14.35	0	77	0	77	0	77	0	77	25.03	89.44
8	15.69	34	152	0	105	0	105	0	105	33.84	102.06
9	17.07	68	196	0	132	0	132	0	132	42.2	116.47
10	18.41	96	235	0	154	0	154	0	154	49.44	133.85
11	19.60	114	263	43	241	0	171	0	171	54.61	155.22
12	20.57	121	273	85	262	0	235	0	177	56.53	180.00
13	21.25	114	263	118	264	53	244	0	171	54.62	204.78
14	21.59	96	235	138	248	100	236	3	207	49.47	226.18
15	21.58	68	197	144	219	136	216	48	191	42.24	243.57
16	21.21	33	152	135	180	157	186	87	167	33.89	257.99
17	20.51	0	77	110	136	157	149	112	137	25.1	270.62
18	19.52	0	49	71	89	128	104	111	99	16.32	282.37
19	18.32	0	23	31	43	79	55	80	56	7.92	293.91
20	16.98	0	1	0	0	2	2	3	2	0.25	305.73
21	15.60	0	0	0	0	0	0	0	0	0	318.18
22	14.27	0	0	0	0	0	0	0	0	0	331.44
23	13.08	0	0	0	0	0	0	0	0	0	345.48
24	12.11	0	0	0	0	0	0	0	0	0	360.00

Dirfac = 0.25; Diffac = 1.22; Maximum dry-bulb = 21.63 °C; Minimum dry-bulb = 11.04 °C; Adaptive comfort range = 22.2–26.2 °C

Table continues

Table 5.18(f) Banded weather data: Leeds — *continued*

Hour	Dry-bulb /°C	Incident solar irradiation / W·m ⁻²									
		Horizontal		N		NE		E		SE	
		Direct	Diffuse	Direct	Diffuse	Direct	Diffuse	Direct	Diffuse	Direct	Diffuse
June											
1	11.72	0	0	0	0	0	0	0	0	0	0
2	11.35	0	0	0	0	0	0	0	0	0	0
3	11.35	0	0	0	0	0	0	0	0	0	0
4	11.72	1	18	16	17	27	27	22	22	4	5
5	12.45	16	66	39	58	84	70	81	69	30	55
6	13.47	44	119	32	92	111	114	125	118	66	102
7	14.73	76	175	7	123	108	152	145	163	98	149
8	16.13	107	232	0	116	84	184	143	202	118	194
9	17.57	134	286	0	144	48	211	123	234	126	235
10	18.97	155	334	0	168	7	230	90	257	120	266
11	20.23	169	369	0	185	0	185	47	266	101	284
12	21.25	174	383	0	192	0	192	0	192	72	283
13	21.98	169	369	0	185	0	185	0	185	34	262
14	22.35	155	334	0	168	0	168	0	168	0	168
15	22.35	134	286	0	144	0	144	0	144	0	144
16	21.98	107	232	0	116	0	116	0	116	0	116
17	21.25	76	175	7	123	0	87	0	87	0	87
18	20.23	44	119	32	92	0	59	0	59	0	59
19	18.97	16	66	39	58	0	32	0	32	0	32
20	17.57	1	18	16	17	0	8	0	8	0	8
21	16.13	0	0	0	0	0	0	0	0	0	0
22	14.73	0	0	0	0	0	0	0	0	0	0
23	13.47	0	0	0	0	0	0	0	0	0	0
24	12.45	0	0	0	0	0	0	0	0	0	0

Hour	Dry-bulb /°C	Incident solar irradiation / W·m ⁻²								Altitude	Azimuth
		S		SW		W		NW			
		Direct	Diffuse	Direct	Diffuse	Direct	Diffuse	Direct	Diffuse		
1	11.72	0	0	0	0	0	0	0	0	0	14.03
2	11.35	0	0	0	0	0	0	0	0	0	27.64
3	11.35	0	0	0	0	0	0	0	0	0	40.54
4	11.72	0	9	0	9	0	9	0	9	2.87	52.71
5	12.45	0	32	0	32	0	32	0	32	10.41	64.30
6	13.47	0	59	0	59	0	59	0	59	18.72	75.64
7	14.73	0	87	0	87	0	87	0	87	27.47	87.20
8	16.13	24	167	0	116	0	116	0	116	36.29	99.66
9	17.57	55	213	0	144	0	144	0	144	44.76	113.98
10	18.97	80	253	0	168	0	168	0	168	52.21	131.53
11	20.23	96	282	34	262	0	185	0	185	57.6	153.69
12	21.25	102	293	72	283	0	259	0	192	59.64	180.00
13	21.98	96	282	101	284	47	266	0	185	57.6	206.31
14	22.35	80	253	120	266	90	257	7	230	52.21	228.47
15	22.35	55	213	126	235	123	234	48	211	44.76	246.02
16	21.98	24	167	118	194	143	202	84	184	36.29	260.34
17	21.25	0	87	98	149	145	163	108	152	27.46	272.80
18	20.23	0	59	66	102	125	118	111	114	18.72	284.36
19	18.97	0	32	30	55	81	69	84	70	10.41	295.70
20	17.57	0	8	4	5	22	22	27	27	2.87	307.29
21	16.13	0	0	0	0	0	0	0	0	0	319.46
22	14.73	0	0	0	0	0	0	0	0	0	332.36
23	13.47	0	0	0	0	0	0	0	0	0	345.97
24	12.45	0	0	0	0	0	0	0	0	0	360.00

Dirfac = 0.23; Diffac = 1.28; Maximum dry-bulb = 22.40 °C; Minimum dry-bulb = 11.30 °C; Adaptive comfort range = 22.6–26.2 °C

Table continues

Table 5.18(f) Banded weather data: Leeds — *continued*

Hour	Dry-bulb /°C	Incident solar irradiation / W·m ⁻²									
		Horizontal		N		NE		E		SE	
		Direct	Diffuse	Direct	Diffuse	Direct	Diffuse	Direct	Diffuse	Direct	Diffuse
July											
1	19.74	0	0	0	0	0	0	0	0	0	0
2	18.76	0	0	0	0	0	0	0	0	0	0
3	18.04	0	0	0	0	0	0	0	0	0	0
4	17.61	0	0	0	0	0	0	0	0	0	0
5	17.51	18	44	53	45	124	63	122	62	48	43
6	17.74	58	93	43	75	170	108	198	115	110	92
7	18.29	113	144	1	98	173	143	244	161	171	142
8	19.13	166	196	0	106	135	167	245	197	211	188
9	20.19	214	245	0	133	75	183	213	221	226	225
10	21.40	251	287	0	156	3	190	156	234	217	251
11	22.68	274	318	0	172	0	172	82	232	185	263
12	23.94	283	329	0	178	0	178	0	178	134	255
13	25.10	274	318	0	172	0	172	0	172	69	228
14	26.08	251	287	0	156	0	156	0	156	0	156
15	26.80	214	244	0	133	0	133	0	133	0	133
16	27.23	166	195	0	106	0	106	0	106	0	106
17	27.33	112	144	1	98	0	77	0	77	0	77
18	27.10	58	93	42	75	0	48	0	48	0	48
19	26.55	17	44	53	44	0	22	0	22	0	22
20	25.71	0	0	0	0	0	0	0	0	0	0
21	24.65	0	0	0	0	0	0	0	0	0	0
22	23.44	0	0	0	0	0	0	0	0	0	0
23	22.16	0	0	0	0	0	0	0	0	0	0
24	20.90	0	0	0	0	0	0	0	0	0	0

Hour	Dry-bulb /°C	Incident solar irradiation / W·m ⁻²								Altitude	Azimuth
		S		SW		W		NW			
		Direct	Diffuse	Direct	Diffuse	Direct	Diffuse	Direct	Diffuse		
1	19.74	0	0	0	0	0	0	0	0	0	14.58
2	18.76	0	0	0	0	0	0	0	0	0	28.68
3	18.04	0	0	0	0	0	0	0	0	0	41.99
4	17.61	0	0	0	0	0	0	0	0	0	54.47
5	17.51	0	22	0	22	0	22	0	22	7.6	66.32
6	17.74	0	48	0	48	0	48	0	48	16.01	77.88
7	18.29	0	77	0	77	0	77	0	77	24.79	89.66
8	19.13	53	145	0	106	0	106	0	106	33.58	102.31
9	20.19	107	192	0	133	0	133	0	133	41.91	116.73
10	21.40	151	232	0	156	0	156	0	156	49.12	134.10
11	22.68	180	261	69	228	0	172	0	172	54.24	155.40
12	23.94	190	271	134	255	0	215	0	178	56.13	180.00
13	25.10	180	261	185	262	82	232	0	172	54.22	204.60
14	26.08	151	232	217	251	156	234	3	190	49.09	225.88
15	26.80	107	192	226	225	213	221	75	183	41.87	243.23
16	27.23	54	145	211	187	245	196	135	167	33.52	257.64
17	27.33	0	77	171	142	243	161	173	143	24.72	270.28
18	27.10	0	48	110	92	198	114	170	107	15.93	282.05
19	26.55	0	22	48	43	121	62	123	62	7.5	293.61
20	25.71	0	0	0	0	0	0	0	0	0	305.46
21	24.65	0	0	0	0	0	0	0	0	0	317.95
22	23.44	0	0	0	0	0	0	0	0	0	331.27
23	22.16	0	0	0	0	0	0	0	0	0	345.38
24	20.90	0	0	0	0	0	0	0	0	0	360.00

Dirfac = 0.39; Diffac = 1.17; Maximum dry-bulb = 27.34 °C; Minimum dry-bulb = 17.5 °C; Adaptive comfort range = 24.1–28.1 °C

Table continues

Table 5.18(f) Banded weather data: Leeds — *continued*

Hour	Dry-bulb / °C	Incident solar irradiation / W·m ⁻²									
		Horizontal		N		NE		E		SE	
		Direct	Diffuse	Direct	Diffuse	Direct	Diffuse	Direct	Diffuse	Direct	Diffuse
August											
1	18.21	0	0	0	0	0	0	0	0	0	0
2	17.18	0	0	0	0	0	0	0	0	0	0
3	16.52	0	0	0	0	0	0	0	0	0	0
4	16.30	0	0	0	0	0	0	0	0	0	0
5	16.52	0	1	2	1	5	1	5	1	2	1
6	17.18	34	42	25	35	172	65	219	75	137	58
7	18.21	107	85	0	49	214	103	335	128	260	112
8	19.57	192	126	0	77	173	122	368	164	347	159
9	21.14	268	164	0	102	83	128	331	182	385	194
10	22.83	328	197	0	122	0	122	246	185	377	215
11	24.52	366	219	0	136	0	136	130	173	330	219
12	26.09	379	227	0	141	0	141	0	141	249	206
13	27.45	366	219	0	136	0	136	0	136	145	176
14	28.48	327	196	0	122	0	122	0	122	30	136
15	29.14	267	164	0	102	0	102	0	102	0	102
16	29.36	191	126	0	76	0	76	0	76	0	76
17	29.14	106	84	0	49	0	49	0	49	0	49
18	28.48	33	42	24	34	0	22	0	22	0	22
19	27.45	0	0	0	0	0	0	0	0	0	0
20	26.09	0	0	0	0	0	0	0	0	0	0
21	24.52	0	0	0	0	0	0	0	0	0	0
22	22.83	0	0	0	0	0	0	0	0	0	0
23	21.14	0	0	0	0	0	0	0	0	0	0
24	19.57	0	0	0	0	0	0	0	0	0	0

Hour	Dry-bulb / °C	Incident solar irradiation / W·m ⁻²								Altitude	Azimuth
		S		SW		W		NW			
		Direct	Diffuse	Direct	Diffuse	Direct	Diffuse	Direct	Diffuse		
1	18.21	0	0	0	0	0	0	0	0	0	16.14
2	17.18	0	0	0	0	0	0	0	0	0	31.57
3	16.52	0	0	0	0	0	0	0	0	0	45.89
4	16.30	0	0	0	0	0	0	0	0	0	59.11
5	16.52	0	0	0	0	0	0	0	0	0.2	71.49
6	17.18	0	23	0	23	0	23	0	23	8.82	83.48
7	18.21	33	65	0	49	0	49	0	49	17.65	95.60
8	19.57	123	111	0	77	0	77	0	77	26.29	108.48
9	21.14	214	156	0	102	0	102	0	102	34.25	122.86
10	22.83	288	194	30	136	0	122	0	122	40.91	139.49
11	24.52	336	220	145	176	0	136	0	136	45.45	158.76
12	26.09	352	229	249	206	0	148	0	141	47.07	180.00
13	27.45	336	220	330	219	130	173	0	136	45.42	201.23
14	28.48	288	194	377	214	246	185	0	122	40.85	220.48
15	29.14	214	156	385	194	331	182	82	128	34.18	237.09
16	29.36	123	111	347	159	368	163	173	122	26.2	251.45
17	29.14	33	65	259	112	334	127	212	102	17.54	264.31
18	28.48	0	22	136	57	217	74	171	65	8.68	276.42
19	27.45	0	0	0	0	1	0	1	0	0.04	288.39
20	26.09	0	0	0	0	0	0	0	0	0	300.77
21	24.52	0	0	0	0	0	0	0	0	0	313.99
22	22.83	0	0	0	0	0	0	0	0	0	328.34
23	21.14	0	0	0	0	0	0	0	0	0	343.81
24	19.57	0	0	0	0	0	0	0	0	0	360.00

Dirfac = 0.61; Diffac = 0.96; Maximum dry-bulb = 29.36 °C; Minimum dry-bulb = 16.30 °C; Adaptive comfort range = 24.2–28.2 °C

Table continues

Table 5.18(f) Banded weather data: Leeds — *continued*

Hour	Dry-bulb /°C	Incident solar irradiation / W·m ⁻²									
		Horizontal		N		NE		E		SE	
		Direct	Diffuse	Direct	Diffuse	Direct	Diffuse	Direct	Diffuse	Direct	Diffuse
September											
1	12.30	0	0	0	0	0	0	0	0	0	0
2	12.05	0	0	0	0	0	0	0	0	0	0
3	12.07	0	0	0	0	0	0	0	0	0	0
4	12.35	0	0	0	0	0	0	0	0	0	0
5	12.87	0	0	0	0	0	0	0	0	0	0
6	13.60	0	1	0	0	1	1	1	1	1	1
7	14.48	13	55	0	26	46	51	83	61	72	57
8	15.46	40	106	0	52	44	86	117	105	121	106
9	16.47	68	152	0	76	16	110	115	137	147	145
10	17.45	91	189	0	95	0	95	89	155	151	172
11	18.31	106	214	0	108	0	108	48	161	136	185
12	19.01	111	222	0	113	0	113	0	113	107	183
13	19.50	106	214	0	108	0	108	0	108	68	167
14	19.74	91	189	0	95	0	95	0	95	25	138
15	19.73	68	151	0	76	0	76	0	76	0	76
16	19.45	40	105	0	52	0	52	0	52	0	52
17	18.93	13	54	0	26	0	26	0	26	0	26
18	18.20	0	0	0	0	0	0	0	0	0	0
19	17.32	0	0	0	0	0	0	0	0	0	0
20	16.33	0	0	0	0	0	0	0	0	0	0
21	15.32	0	0	0	0	0	0	0	0	0	0
22	14.35	0	0	0	0	0	0	0	0	0	0
23	13.49	0	0	0	0	0	0	0	0	0	0
24	12.79	0	0	0	0	0	0	0	0	0	0

Hour	Dry-bulb /°C	Incident solar irradiation / W·m ⁻²								Altitude	Azimuth
		S		SW		W		NW			
		Direct	Diffuse	Direct	Diffuse	Direct	Diffuse	Direct	Diffuse		
1	12.30	0	0	0	0	0	0	0	0	0	18.32
2	12.05	0	0	0	0	0	0	0	0	0	35.50
3	12.07	0	0	0	0	0	0	0	0	0	51.00
4	12.35	0	0	0	0	0	0	0	0	0	64.92
5	12.87	0	0	0	0	0	0	0	0	0	77.70
6	13.60	0	0	0	0	0	0	0	0	0.12	89.91
7	14.48	18	44	0	26	0	26	0	26	8.9	102.12
8	15.46	54	89	0	52	0	52	0	52	17.27	114.92
9	16.47	93	131	0	76	0	76	0	76	24.77	128.85
10	17.45	124	165	25	138	0	95	0	95	30.84	144.38
11	18.31	144	188	68	167	0	108	0	108	34.85	161.62
12	19.01	151	196	107	183	0	154	0	113	36.25	180.00
13	19.50	144	187	136	185	48	161	0	108	34.82	198.38
14	19.74	124	165	151	172	89	155	0	95	30.78	215.59
15	19.73	93	130	147	145	115	136	16	110	24.69	231.10
16	19.45	54	88	120	105	116	104	44	85	17.16	245.01
17	18.93	18	43	71	57	83	60	46	50	8.77	257.78
18	18.20	0	0	0	0	0	0	0	0	0	269.97
19	17.32	0	0	0	0	0	0	0	0	0	282.16
20	16.33	0	0	0	0	0	0	0	0	0	294.94
21	15.32	0	0	0	0	0	0	0	0	0	308.85
22	14.35	0	0	0	0	0	0	0	0	0	324.37
23	13.49	0	0	0	0	0	0	0	0	0	341.60
24	12.79	0	0	0	0	0	0	0	0	0	360.00

Dirfac = 0.24; Diffac = 1.23; Maximum dry-bulb = 19.77 °C; Minimum dry-bulb = 12.03 °C; Adaptive comfort range = 21.9–25.9 °C