MUNICH, GERMANY	
Latitude = 48.13 N	WMO No. 108660
Longitude = 11.70 E	Elevation = 1736 feet
Period of Record = 1973 to 1996	Average Pressure = 28.15 inches Hg

Design Criteria Data

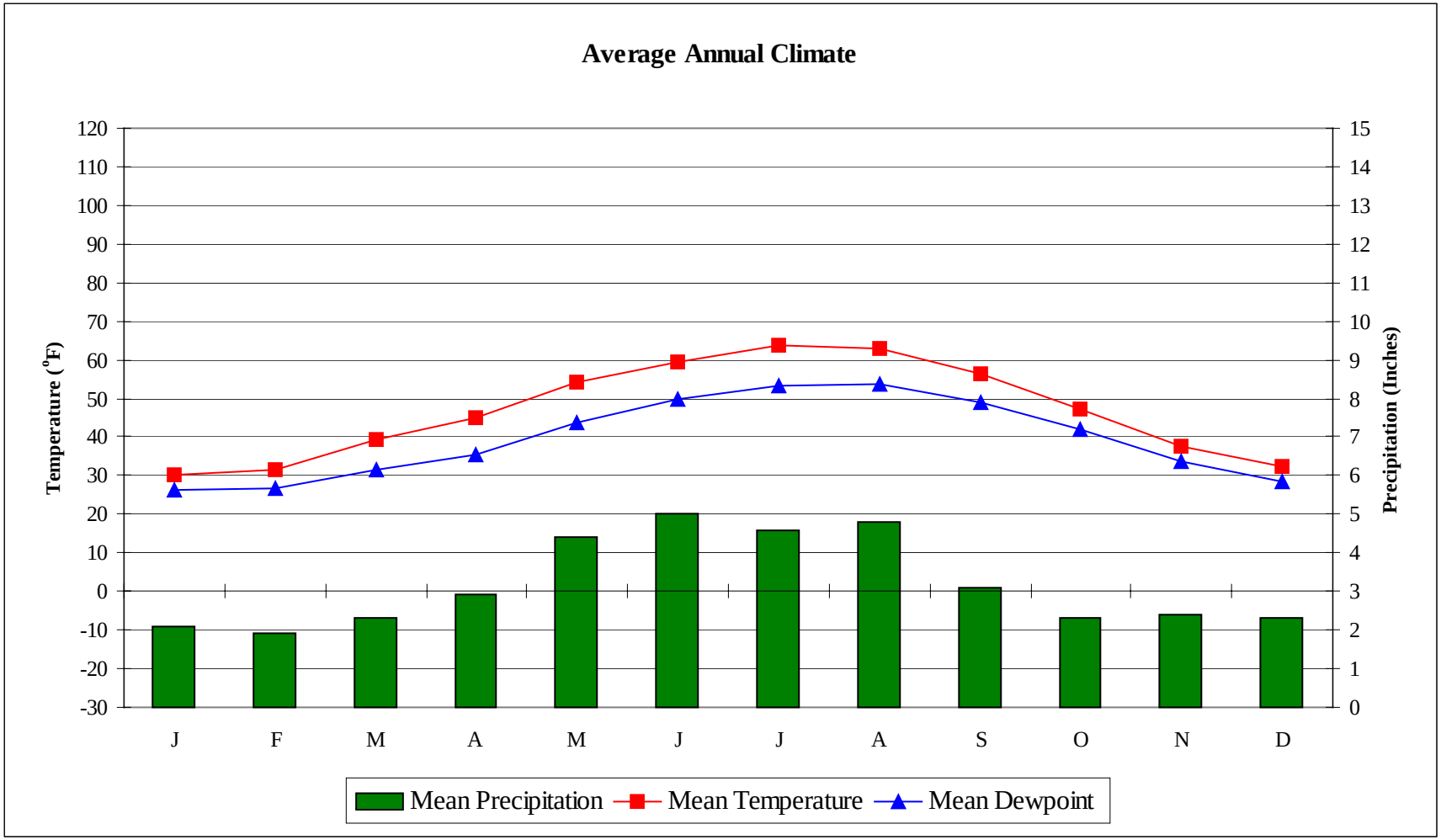
		Mean Coincident (Average) Values			
Dry Bulb Temperature (T)	**Design Value (^oF)**	Wet Bulb Temperature (^oF)	Humidity Ratio (gr/lb)	Wind Speed (mph)	Prevailing Direction (NSEW)
Median of Extreme Highs	88	67	71	7.3	E
0.4% Occurrence	84	66	73	7.9	E
1.0% Occurrence	81	65	70	7.1	E
2.0% Occurrence	77	63	70	7.2	E
Mean Daily Range	16	-	-	-	-
97.5% Occurrence	18	17	13	5.0	E
99.0% Occurrence	12	11	10	3.6	S
99.6% Occurrence	7	7	7	3.3	E
Median of Extreme Lows	1	0	5	3.7	E
		Mean Coincident (Average) Values			
Wet Bulb Temperature (T_{wb})	**Design Value (^oF)**	Dry Bulb Temperature (^oF)	Humidity Ratio (gr/lb)	Wind Speed (mph)	Prevailing Direction (NSEW)
Median of Extreme Highs	70	83	92	6.4	E
0.4% Occurrence	67	79	84	6.5	E
1.0% Occurrence	66	77	82	6.5	E
2.0% Occurrence	64	74	78	6.6	E
		Mean Coincident (Average) Values			
Humidity Ratio (HR)	**Design Value (gr/lb)**	Dry Bulb Temperature (^oF)	Vapor Pressure (in. Hg)	Wind Speed (mph)	Prevailing Direction (NSEW)
Median of Extreme Highs	102	74	0.65	6.3	SW
0.4% Occurrence	91	71	0.57	5.9	SW
1.0% Occurrence	86	70	0.54	6.4	E
2.0% Occurrence	84	69	0.54	5.8	W
Air Conditioning/		$T \geq 93^oF$	$T \geq 80^oF$	$T_{wb} \geq 73^oF$	$T_{wb} \geq 67^oF$
Humid Area Criteria	# of Hours	1	100	0	60

Other Site Data

Weather Region	Rain Rate 100 Year Recurrence (in./hr)	Basic Wind Speed 3 sec gust @ 33 ft 50 Year Recurrence (mph)	Ventilation Cooling Load Index (Ton-hr/cfm/yr) Base 75°F-RH 60% Latent + Sensible
6	N/A	N/A	0.0 + 0.1
Ground Water Temperature (^oF) 50 Foot Depth *	Frost Depth 50 Year Recurrence (in.)	Ground Snow Load 50 Year Recurrence (lb/ft^2)	Average Annual Freeze-Thaw Cycles (#)
49.3	N/A	N/A	59

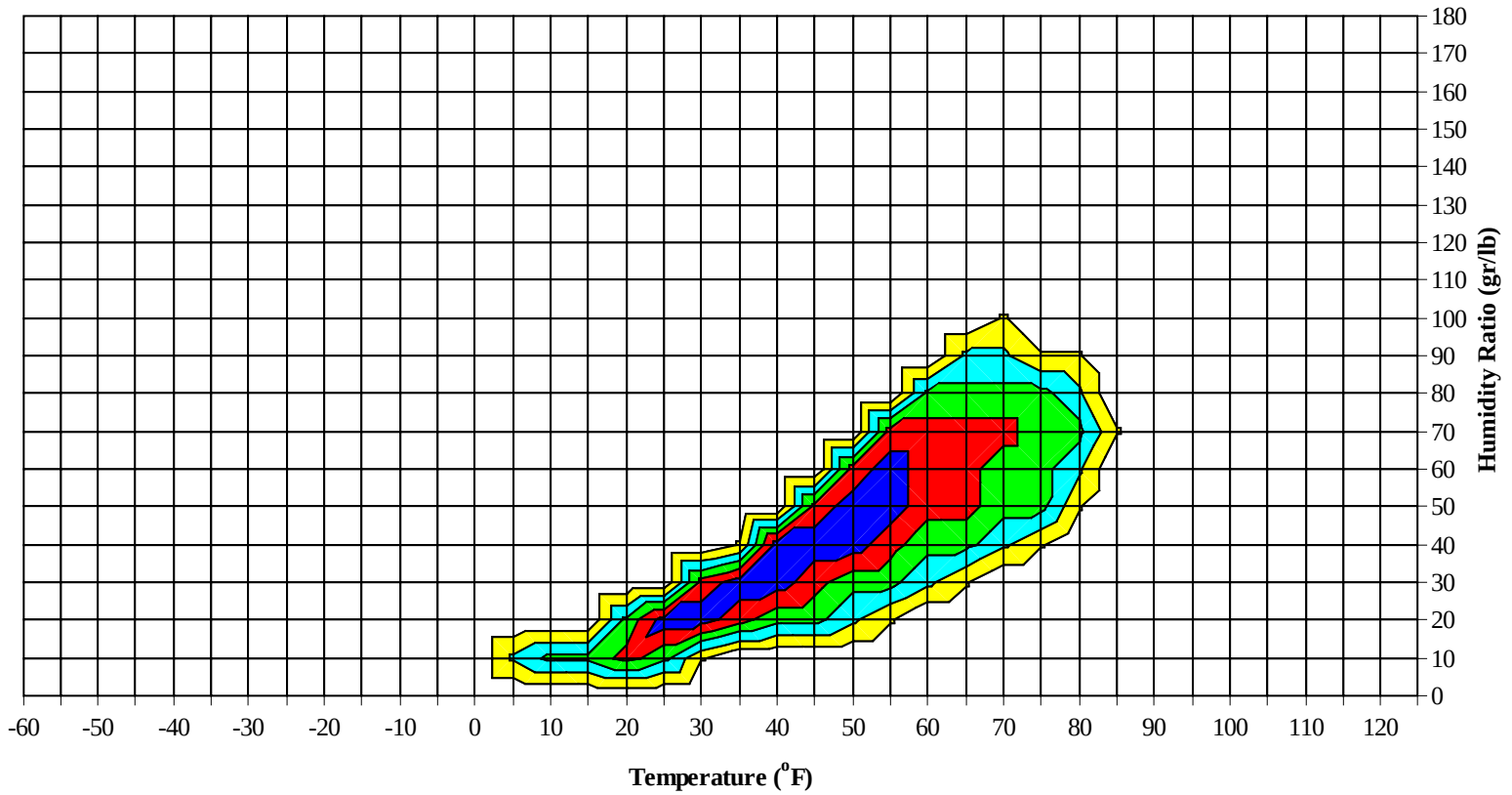
*Note: Temperatures at greater depths can be estimated by adding 1.5°F per 100 feet additional depth.

MUNICH, GERMANY WMO No. 108660



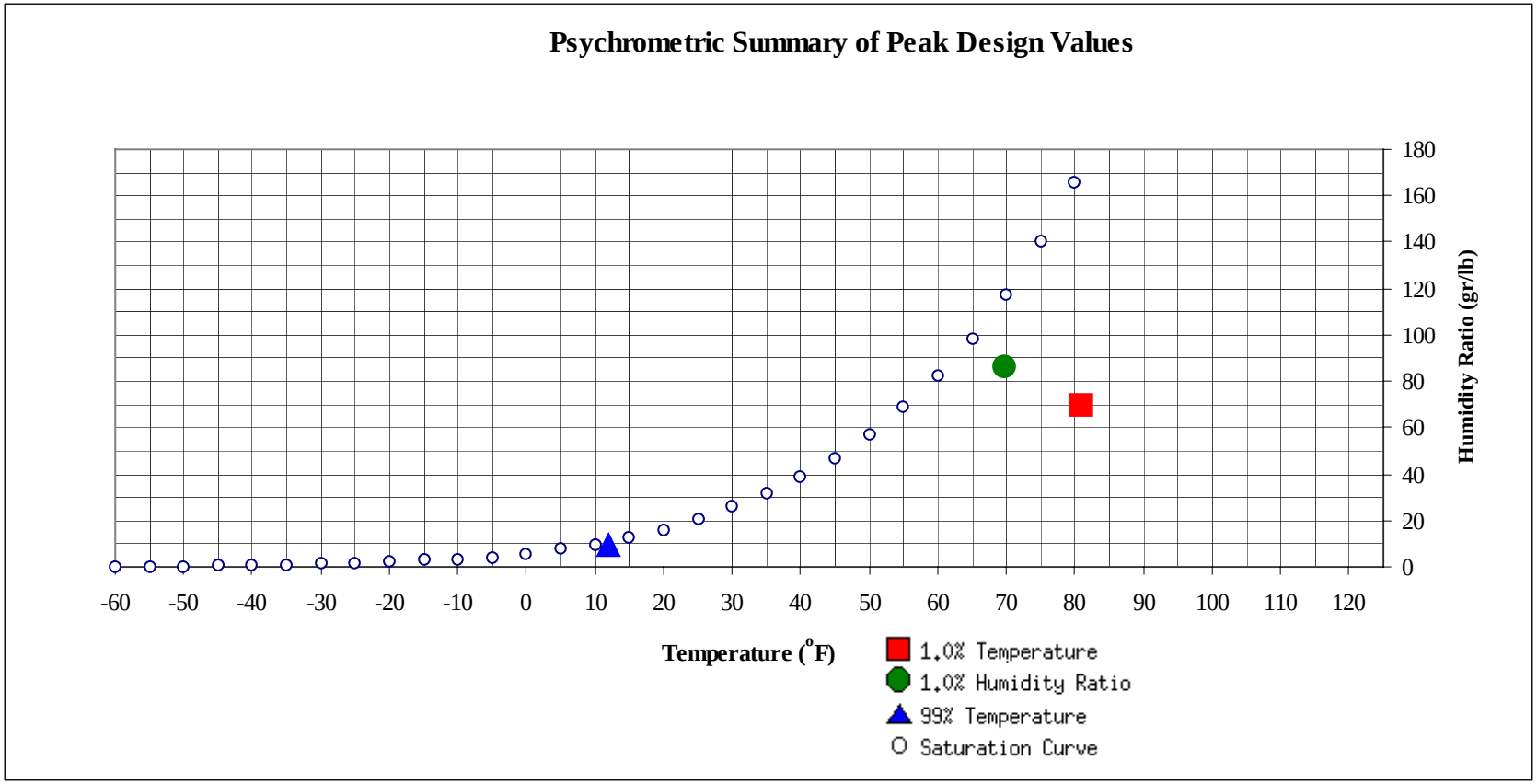
MUNICH, GERMANY WMO No. 108660

Long Term Psychrometric Summary



- 50% of all observations
- 80% of all observations
- 95% of all observations
- 97.5% of all observations
- 99% of all observations

MUNICH, GERMANY WMO No. 108660



	(°F)	MCHR (gr/lb)	Enthalpy (btu/lb)
99% Dry Bulb	12	9.5	4.3

	(gr/lb)	MCDB (°F)	MCWB (°F)	MC Dewpt (°F)	Enthalpy (btu/lb)
1.0% Humidity Ratio	86.1	69.6	63.9	61.1	30.1

	(°F)	MCHR (gr/lb)	MCWB (°F)	Enthalpy (btu/lb)
1.0% Dry Bulb	81	69.6	64.3	30.3

MUNICH, GERMANY WMO No. 108660

Dry-Bulb Temperature Hours For An Average Year (Sheet 1 of 5)

Period of Record = 1973 to 1996

Temperature Range (°F)	January					February					March				
	Hour Group (LST)				MCWB	Hour Group (LST)				MCWB	Hour Group (LST)				MCWB
	01 To 08	09 To 16	17 To 00	Total Obs	(°F)	01 To 08	09 To 16	17 To 00	Total Obs	(°F)	01 To 08	09 To 16	17 To 00	Total Obs	(°F)
95 / 99															
90 / 94															
85 / 89															
80 / 84															
75 / 79															
70 / 74							0		0	49.0		1	0	1	53.4
65 / 69							0	0	0	49.7		2	1	3	52.3
60 / 64		0		0	47.4		1	0	1	48.7		10	4	14	50.1
55 / 59	0	1	0	1	47.1	0	3	1	4	46.7	1	21	10	32	47.8
50 / 54	3	7	4	14	44.9	1	10	4	15	44.5	7	32	24	63	45.3
45 / 49	9	22	12	43	41.9	4	20	10	34	41.4	20	43	38	101	42.0
40 / 44	15	24	22	61	38.9	12	28	22	62	38.5	32	38	39	109	38.7
35 / 39	36	46	43	125	35.0	35	45	45	125	35.0	55	51	56	162	34.9
30 / 34	60	60	65	185	30.6	58	54	61	173	30.6	76	38	54	168	30.7
25 / 29	55	43	47	145	25.9	50	36	43	129	25.8	38	10	16	64	25.8
20 / 24	21	17	22	60	21.4	25	14	16	55	21.1	11	2	5	18	20.9
15 / 19	22	14	15	51	16.6	17	9	11	37	16.5	6	1	1	8	16.7
10 / 14	14	8	11	33	11.8	10	3	7	20	11.6	2	0	0	2	11.9
5 / 9	8	3	4	15	6.8	7	1	4	12	6.7	1		0	1	7.1
0 / 4	3	1	2	6	1.7	4	0	1	5	2.3	0			0	4.0
-5 / -1	1	1	1	3	-2.8	1	0	0	1	-2.2					
-10 / -6	1	0	0	1	-7.3	0	0		0	-7.0					
-15 / -11	1	0	0	1	-12.0										
-20 / -16		0		0	-16.0										

Caution: This summary reflects the typical distribution of temperature in a typical year. It does not reflect the typical moisture distribution. Because wet bulb temperatures are averaged, this summary understates the annual moisture load. For accurate moisture load data, see the long-term humidity summary and the ventilation and infiltration load pages in this manual.

MUNICH, GERMANY WMO No. 108660

Dry-Bulb Temperature Hours For An Average Year (Sheet 2 of 5)

Period of Record = 1973 to 1996

Temperature Range (°F)	April Hour Group (LST) 01 To 08	April 09 To 16	April 17 To 00	April Total Obs	April MCWB (°F)	May Hour Group (LST) 01 To 08	May 09 To 16	May 17 To 00	May Total Obs	May MCWB (°F)	June Hour Group (LST) 01 To 08	June 09 To 16	June 17 To 00	June Total Obs	June MCWB (°F)
95 / 99															
90 / 94												0	0	0	67.2
85 / 89							0	0	0	62.0		1	0	1	67.1
80 / 84		0		0	56.5		1	0	1	62.0		9	4	13	64.3
75 / 79		1	0	1	55.7		10	4	14	60.0	0	26	14	40	62.7
70 / 74		6	2	8	54.4		28	13	41	57.3	2	40	22	64	60.2
65 / 69		11	4	15	52.7	0	35	18	53	55.6	6	36	28	70	58.4
60 / 64	0	25	12	37	50.6	6	52	35	93	53.5	30	46	49	125	56.3
55 / 59	3	34	23	60	48.3	30	48	56	134	51.2	67	48	58	173	53.3
50 / 54	16	41	39	96	45.8	71	37	55	163	48.4	78	26	43	147	49.7
45 / 49	38	44	49	131	42.5	71	25	42	138	44.2	43	8	20	71	45.4
40 / 44	48	35	45	128	39.0	40	8	18	66	40.3	11	1	2	14	41.3
35 / 39	69	31	41	141	35.3	24	3	6	33	36.3	3		0	3	37.3
30 / 34	56	12	22	90	31.2	5	0	1	6	31.7					
25 / 29	9	1	2	12	26.4	0			0	27.4					
20 / 24	1			1	22.2										
15 / 19															
10 / 14															
5 / 9															
0 / 4															
-5 / -1															
-10 / -6															
-15 / -11															
-20 / -16															

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MUNICH, GERMANY WMO No. 108660

Dry-Bulb Temperature Hours For An Average Year (Sheet 3 of 5)

Period of Record = 1973 to 1996

Temperature Range (°F)	July Hour Group (LST) 01 To 08	July 09 To 16	July 17 To 00	July Total Obs	July MCWB (°F)	August Hour Group (LST) 01 To 08	August 09 To 16	August 17 To 00	August Total Obs	August MCWB (°F)	September Hour Group (LST) 01 To 08	September 09 To 16	September 17 To 00	September Total Obs	September MCWB (°F)
95 / 99		0	0	0	66.7		0		0	65.0					
90 / 94		2	1	3	68.1		2	1	3	66.4					
85 / 89		6	3	9	66.6		6	2	8	66.5		0	0	0	66.8
80 / 84		21	10	31	65.0		18	8	26	65.3		5	1	6	64.6
75 / 79	1	43	24	68	63.6	0	40	19	59	63.6		15	4	19	63.1
70 / 74	5	54	35	94	61.4	3	51	33	87	61.6	0	30	11	41	61.1
65 / 69	18	42	40	100	59.7	11	41	38	90	60.0	1	33	19	53	58.7
60 / 64	60	40	61	161	57.8	62	47	66	175	58.2	16	53	46	114	56.6
55 / 59	88	31	49	168	54.3	87	31	51	169	54.5	56	54	63	173	53.5
50 / 54	60	10	22	92	50.4	60	11	25	96	50.5	72	36	56	163	49.6
45 / 49	15	1	3	19	46.1	20	1	5	26	45.9	59	14	34	107	45.4
40 / 44	1			1	41.3	4		0	4	41.7	25	1	6	32	41.2
35 / 39	0			0		1			1	38.3	10	0	1	11	37.0
30 / 34											1			1	32.7
25 / 29															
20 / 24															
15 / 19															
10 / 14															
5 / 9															
0 / 4															
-5 / -1															
-10 / -6															
-15 / -11															
-20 / -16															

Caution: This summary reflects the typical distribution of temperature in a typical year. It does not reflect the typical moisture distribution. Because wet bulb temperatures are averaged, this summary understates the annual moisture load. For accurate moisture load data, see the long-term humidity summary and the ventilation and infiltration load pages in this manual.

MUNICH, GERMANY WMO No. 108660

Dry-Bulb Temperature Hours For An Average Year (Sheet 4 of 5)

Period of Record = 1973 to 1996

Temperature Range (°F)	October					November					December				
	Hour Group (LST)				MCWB	Hour Group (LST)				MCWB	Hour Group (LST)				MCWB
	01 To 08	09 To 16	17 To 00	Total Obs	(°F)	01 To 08	09 To 16	17 To 00	Total Obs	(°F)	01 To 08	09 To 16	17 To 00	Total Obs	(°F)
95 / 99															
90 / 94															
85 / 89															
80 / 84															
75 / 79		2		2	60.6										
70 / 74		7	0	7	59.0										
65 / 69		11	2	13	57.3		0		0	52.0		0		0	52.5
60 / 64	1	26	8	35	55.0	1	3	1	5	52.3	0	0	0	0	52.4
55 / 59	8	45	31	84	52.2	3	12	2	17	49.5	1	4	1	6	47.5
50 / 54	44	53	56	153	49.1	6	22	11	39	47.0	6	11	7	24	45.9
45 / 49	61	56	60	177	44.5	19	41	31	91	43.7	12	23	17	52	42.8
40 / 44	56	30	48	134	40.7	37	43	42	122	40.0	20	27	26	73	39.2
35 / 39	45	14	31	90	36.5	56	54	61	171	35.8	41	48	46	135	35.2
30 / 34	25	4	10	39	31.5	68	41	56	165	31.2	65	64	65	193	30.9
25 / 29	8	0	1	9	27.0	33	17	25	75	26.3	54	42	47	143	26.1
20 / 24	1			1	22.6	12	5	7	24	21.7	20	14	16	50	21.3
15 / 19						4	1	2	7	17.3	13	8	12	33	16.8
10 / 14						1	0	1	2	11.8	8	5	7	20	11.8
5 / 9						1		0	1	7.3	6	2	4	12	6.5
0 / 4											2	0	1	3	1.2
-5 / -1											1	0	0	1	-3.2
-10 / -6											0	0		0	-6.0
-15 / -11															
-20 / -16															

Caution: This summary reflects the typical distribution of temperature in a typical year. It does not reflect the typical moisture distribution. Because wet bulb temperatures are averaged, this summary understates the annual moisture load. For accurate moisture load data, see the long-term humidity summary and the ventilation and infiltration load pages in this manual.

MUNICH, GERMANY WMO No. 108660

Dry-Bulb Temperature Hours For An Average Year (Sheet 5 of 5)

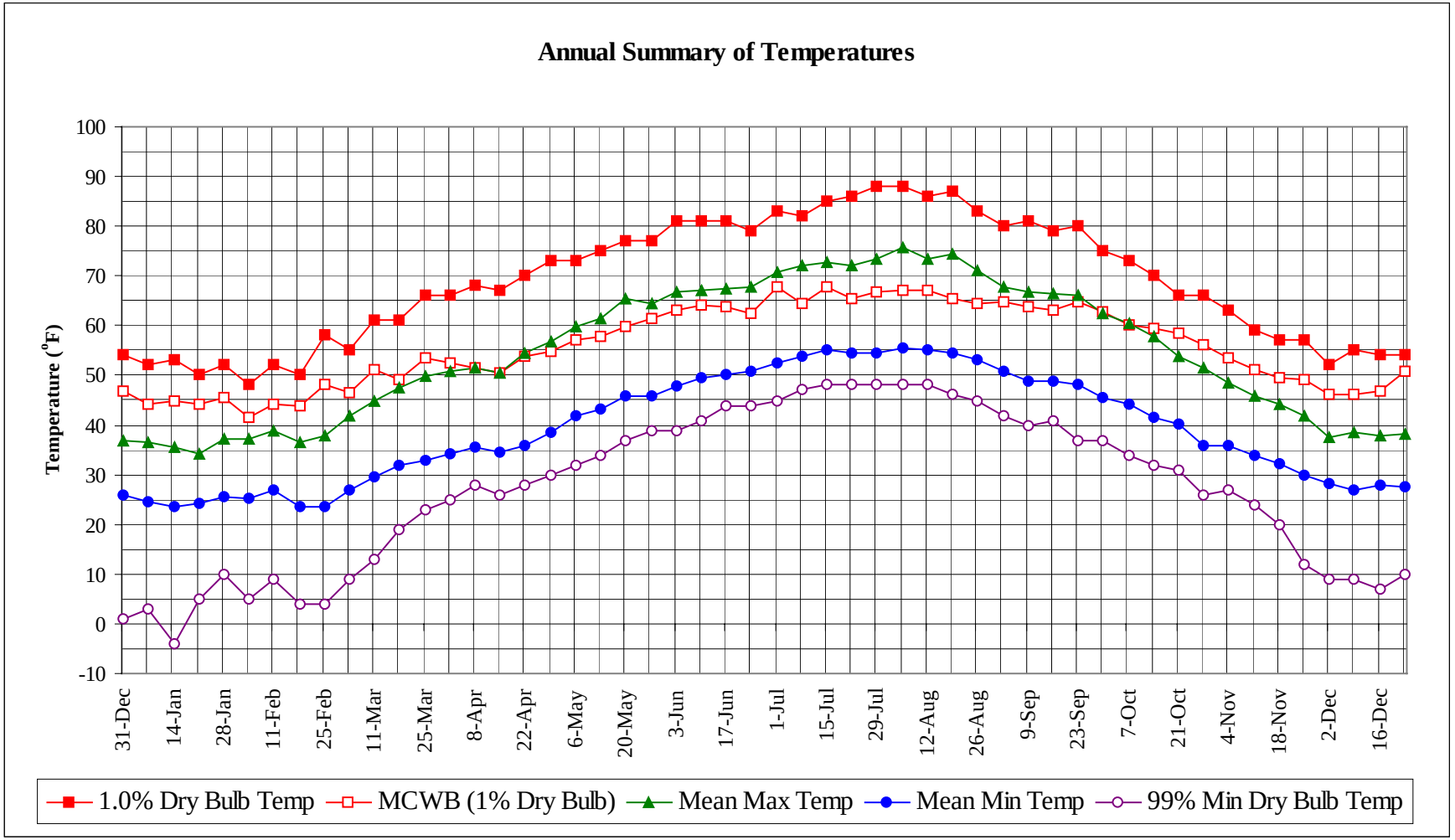
Period of Record = 1973 to 1996

Annual Totals

Temperature Range (°F)	Hour Group (LST) 01 To 08	09 To 16	17 To 00	Total Obs	MCWB (°F)
95 / 99		0	0	0	66.3
90 / 94		4	2	6	67.2
85 / 89		13	5	18	66.5
80 / 84		54	23	77	64.9
75 / 79	1	137	66	204	63.0
70 / 74	9	217	116	341	60.4
65 / 69	36	210	151	396	58.5
60 / 64	176	301	282	759	56.3
55 / 59	343	332	344	1020	52.7
50 / 54	423	295	345	1063	48.6
45 / 49	373	297	321	991	43.8
40 / 44	300	236	270	806	39.6
35 / 39	374	291	329	993	35.4
30 / 34	413	274	333	1020	30.9
25 / 29	248	149	183	580	26.0
20 / 24	91	53	66	210	21.3
15 / 19	61	33	41	135	16.7
10 / 14	35	16	26	77	11.7
5 / 9	23	6	12	41	6.7
0 / 4	10	2	4	16	1.8
-5 / -1	2	1	1	4	-2.7
-10 / -6	1	0	0	1	-7.1
-15 / -11	1	0	0	1	-12.0
-20 / -16		0		0	-16.0

Caution: This summary reflects the typical distribution of temperature in a typical year. It does not reflect the typical moisture distribution. Because wet bulb temperatures are averaged, this summary understates the annual moisture load. For accurate moisture load data, see the long-term humidity summary and the ventilation and infiltration load pages in this manual.

MUNICH, GERMANY WMO No. 108660



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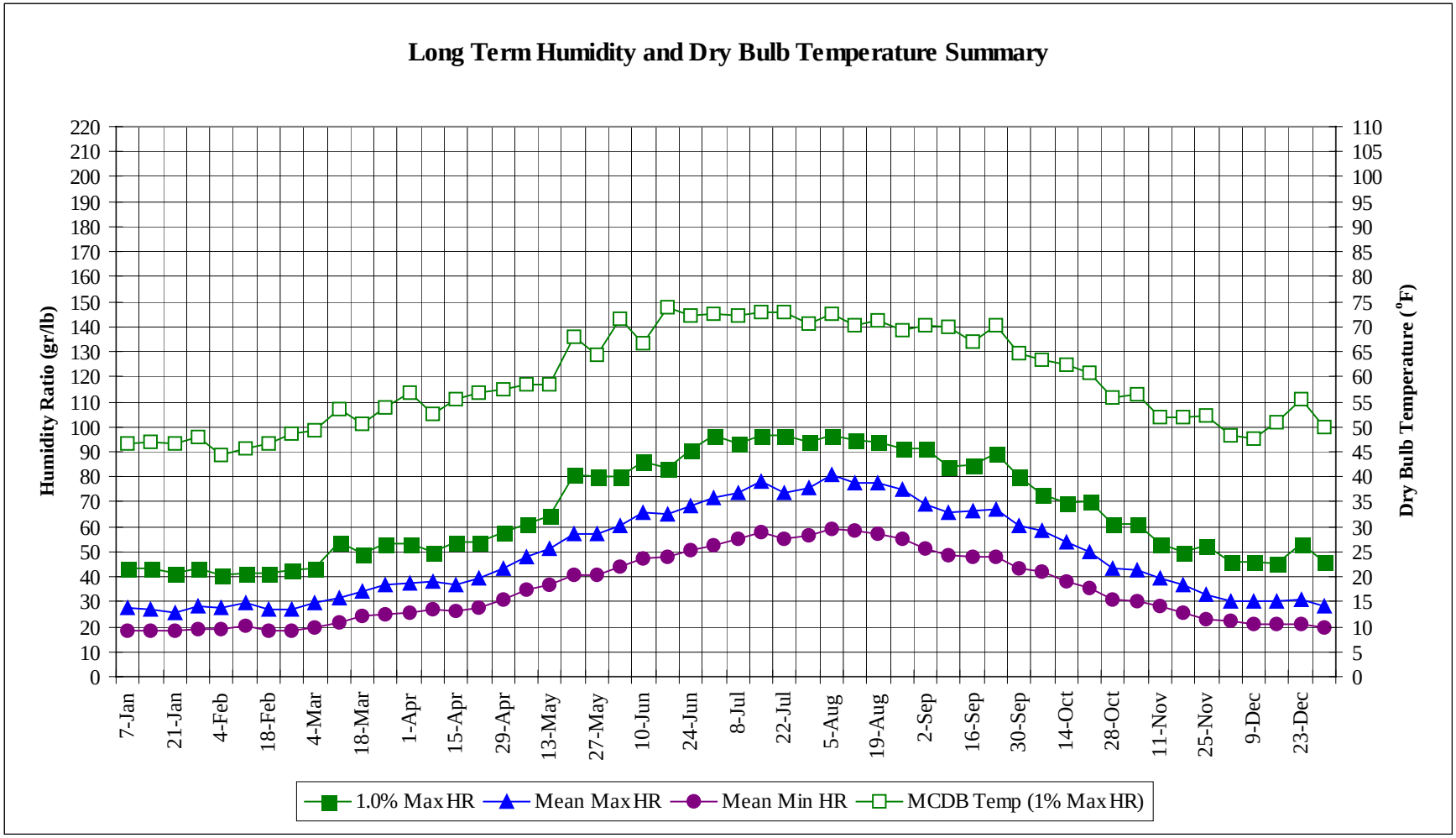
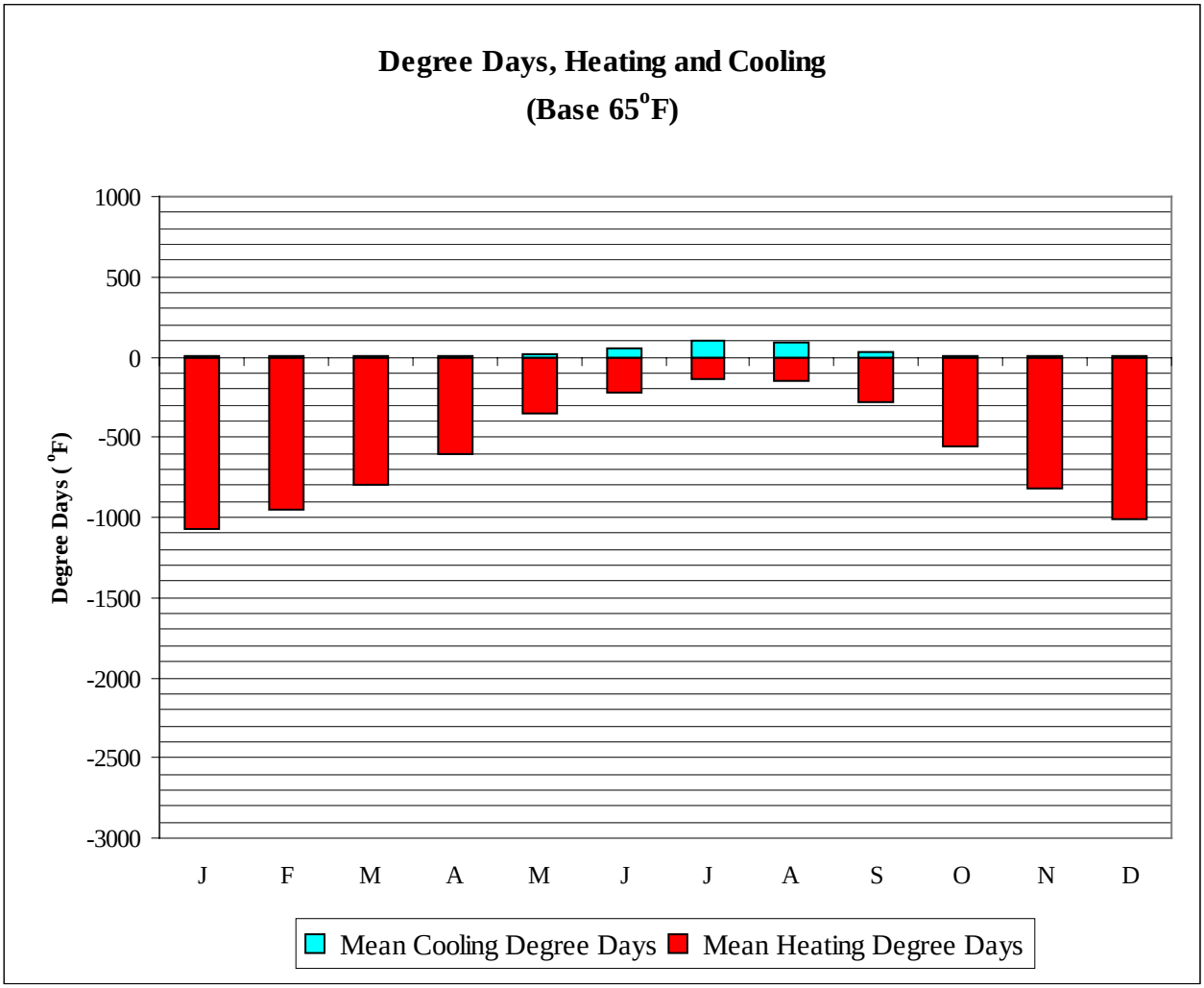


MUNICH, GERMANY WMO No. 108660

Long Term Dry Bulb Temperature and Humidity Summary

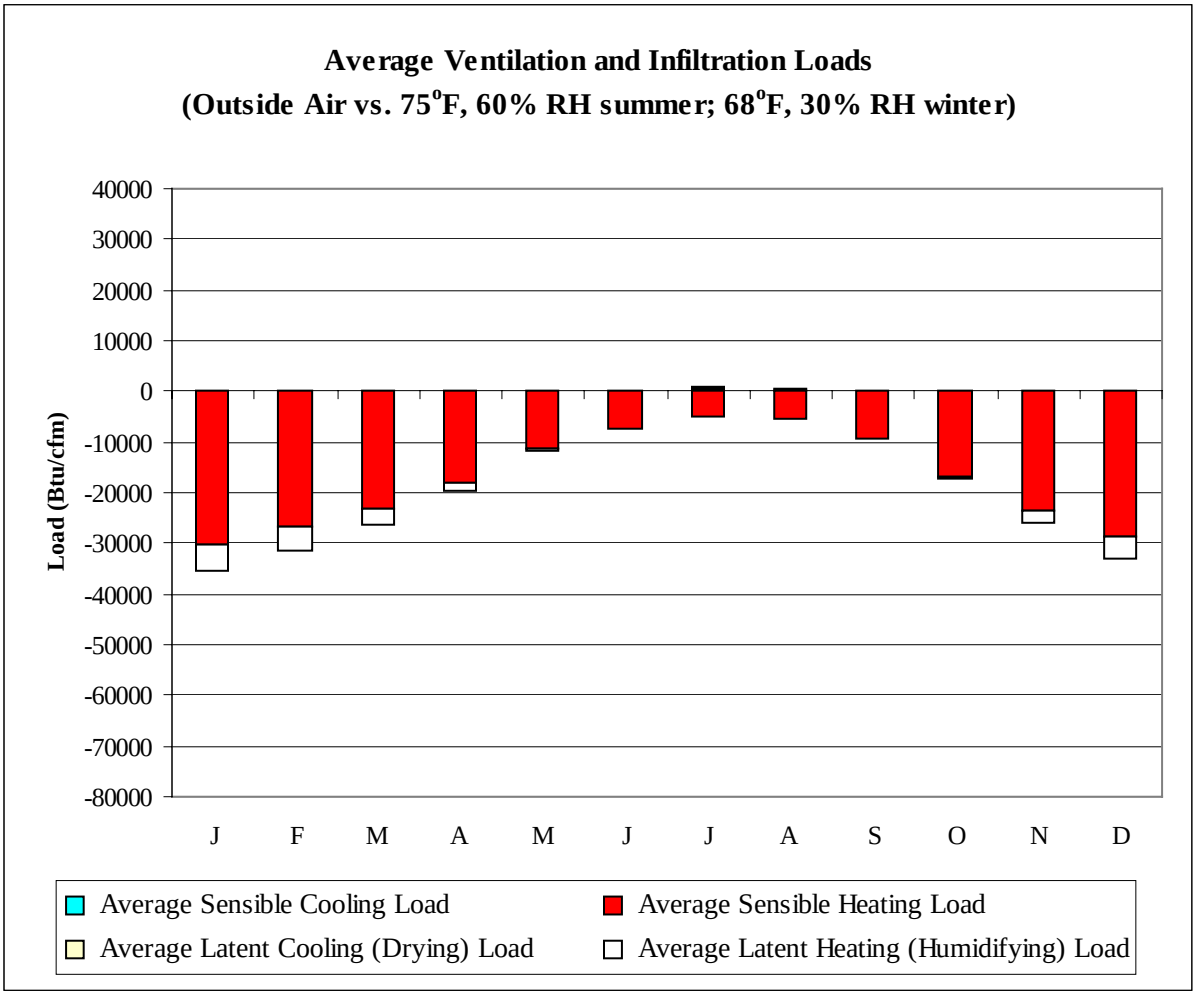
Week Ending	1.0% Temp (°F)	MCWB @ 1% Temp (°F)	Mean Max Temp (°F)	Mean Min Temp (°F)	99% Temp (°F)	1.0% HR (gr/lb)	MCDB @ 1% HR (°F)	Mean Max HR (gr/lb)	Mean Min HR (gr/lb)
7-Jan	52.0	44.1	36.6	24.6	3.0	43.4	46.6	27.7	18.4
14-Jan	53.0	44.8	35.6	23.4	-4.0	43.4	46.8	27.1	18.5
21-Jan	50.0	44.2	34.3	24.1	5.0	41.3	46.7	25.9	18.3
28-Jan	52.0	45.5	37.2	25.7	10.0	43.4	47.8	28.5	18.9
4-Feb	48.0	41.5	37.2	25.2	5.0	40.6	44.4	27.8	18.9
11-Feb	52.0	44.1	39.0	26.8	9.0	41.3	45.6	29.5	20.3
18-Feb	50.0	43.8	36.4	23.7	4.0	41.3	46.5	26.9	18.1
25-Feb	58.0	48.0	37.9	23.7	4.0	42.7	48.7	26.9	18.2
4-Mar	55.0	46.6	41.8	26.7	9.0	43.4	49.1	29.4	19.8
11-Mar	61.0	51.3	44.8	29.6	13.0	53.9	53.6	31.5	21.9
18-Mar	61.0	49.3	47.3	31.8	19.0	49.0	50.7	34.4	24.0
25-Mar	66.0	53.4	49.8	33.0	23.0	53.2	53.8	37.1	25.0
1-Apr	66.0	52.4	50.9	34.2	25.0	53.2	56.8	37.1	25.6
8-Apr	68.0	51.4	51.5	35.7	28.0	49.7	52.4	38.3	27.1
15-Apr	67.0	50.4	50.5	34.6	26.0	53.9	55.4	36.8	26.1
22-Apr	70.0	53.7	54.4	35.9	28.0	53.9	56.8	39.1	27.5
29-Apr	73.0	54.8	56.8	38.6	30.0	58.1	57.5	43.1	30.8
6-May	73.0	57.2	59.9	41.7	32.0	60.9	58.6	48.0	34.8
13-May	75.0	58.0	61.4	43.1	34.0	64.4	58.5	51.1	36.7
20-May	77.0	59.9	65.6	45.8	37.0	80.5	68.1	57.2	40.9
27-May	77.0	61.4	64.5	45.7	39.0	79.8	64.5	57.0	40.5
3-Jun	81.0	63.0	66.9	47.8	39.0	79.8	71.6	60.7	44.2
10-Jun	81.0	64.0	67.1	49.4	41.0	86.1	66.6	65.4	47.4
17-Jun	81.0	63.7	67.3	50.2	44.0	83.3	73.9	65.2	48.1
24-Jun	79.0	62.6	67.8	50.8	44.0	90.3	72.2	68.3	50.4
1-Jul	83.0	67.9	70.8	52.4	45.0	96.6	72.4	71.9	52.4
8-Jul	82.0	64.4	72.1	53.9	47.0	93.1	72.4	73.6	55.0
15-Jul	85.0	67.9	72.8	55.0	48.0	96.6	72.8	78.0	57.9
22-Jul	86.0	65.3	72.2	54.4	48.0	96.6	72.9	73.7	55.1
29-Jul	88.0	66.9	73.5	54.5	48.0	93.8	70.6	75.7	56.2
5-Aug	88.0	67.1	75.7	55.3	48.0	96.6	72.4	81.0	59.1
12-Aug	86.0	67.2	73.5	55.0	48.0	94.5	70.1	77.4	58.3
19-Aug	87.0	65.4	74.4	54.6	46.0	93.8	71.1	77.4	57.4
26-Aug	83.0	64.3	71.2	53.2	45.0	91.0	69.3	74.9	55.4
2-Sep	80.0	64.6	67.9	50.8	42.0	91.0	70.4	69.0	51.1
9-Sep	81.0	63.8	66.7	48.7	40.0	84.0	69.9	65.8	48.3
16-Sep	79.0	63.2	66.3	48.9	41.0	84.7	67.0	66.5	48.2
23-Sep	80.0	64.9	66.0	48.1	37.0	89.6	70.1	66.8	48.3
30-Sep	75.0	62.8	62.5	45.7	37.0	79.8	64.8	60.4	43.6
7-Oct	73.0	60.1	60.6	44.2	34.0	72.8	63.5	58.3	41.9
14-Oct	70.0	59.4	57.9	41.7	32.0	69.3	62.4	53.9	38.0
21-Oct	66.0	58.6	53.9	40.1	31.0	70.0	60.9	50.2	35.7
28-Oct	66.0	56.2	51.4	35.9	26.0	60.9	55.9	43.3	30.8
4-Nov	63.0	53.6	48.3	36.0	27.0	60.9	56.6	42.4	30.2
11-Nov	59.0	51.1	45.9	33.8	24.0	53.2	52.0	39.1	28.0
18-Nov	57.0	49.4	44.3	32.4	20.0	49.7	51.9	36.7	25.6
25-Nov	57.0	49.1	41.9	29.7	12.0	52.5	52.3	33.1	23.2
2-Dec	52.0	46.2	37.6	28.1	9.0	46.2	48.2	30.4	22.2
9-Dec	55.0	46.2	38.4	26.9	9.0	46.2	47.7	30.2	20.9
16-Dec	54.0	46.8	38.0	27.8	7.0	45.5	50.9	30.0	20.8
23-Dec	54.0	50.7	38.4	27.7	10.0	53.2	55.6	30.9	21.0
31-Dec	54.0	47.0	36.8	25.8	1.0	46.2	49.9	28.2	19.5

MUNICH, GERMANY WMO No. 108660



	Mean Cooling Degree Days (°F)	Mean Heating Degree Days (°F)
JAN	0	1077
FEB	0	950
MAR	1	801
APR	4	606
MAY	23	358
JUN	53	219
JUL	98	134
AUG	89	149
SEP	28	283
OCT	4	553
NOV	0	824
DEC	0	1012
ANN	298	6966

MUNICH, GERMANY WMO No. 108660



	Average Sensible Cooling Load (Btu/cfm)	Average Sensible Heating Load (Btu/cfm)	Average Latent Cooling Load (Btu/cfm)	Average Latent Heating Load (Btu/cfm)
JAN	0	-30318	0	-5155
FEB	0	-26832	0	-4474
MAR	0	-23158	0	-2993
APR	2	-17972	0	-1560
MAY	35	-11400	1	-229
JUN	187	-7488	81	-10
JUL	496	-5012	230	-1
AUG	454	-5486	190	0
SEP	71	-9357	30	-19
OCT	2	-16692	0	-447
NOV	0	-23692	0	-2247
DEC	0	-28656	0	-4296
ANN	1247	-206063	532	-21431

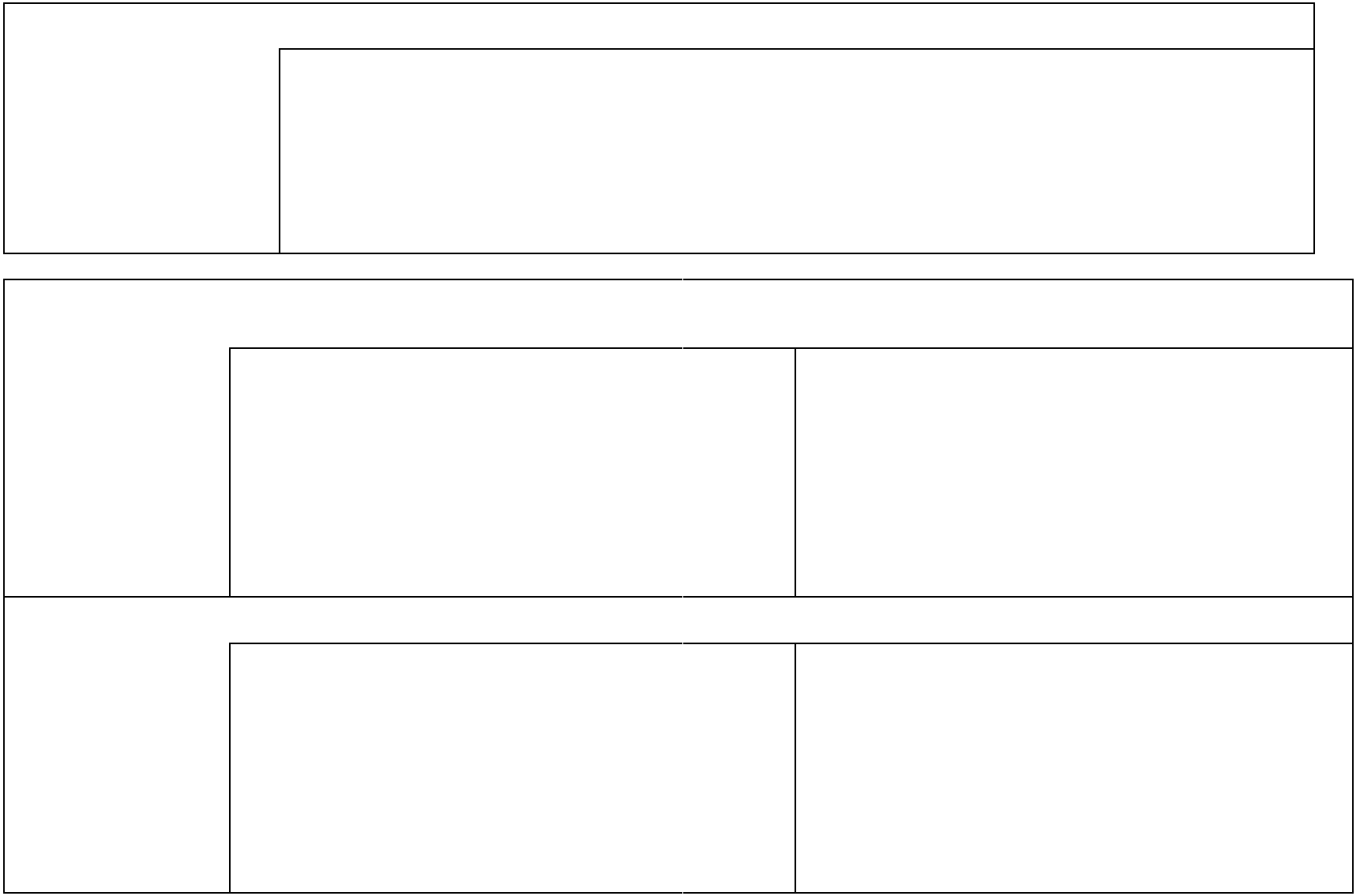
Average Annual Solar Radiation – Nearest Available Site

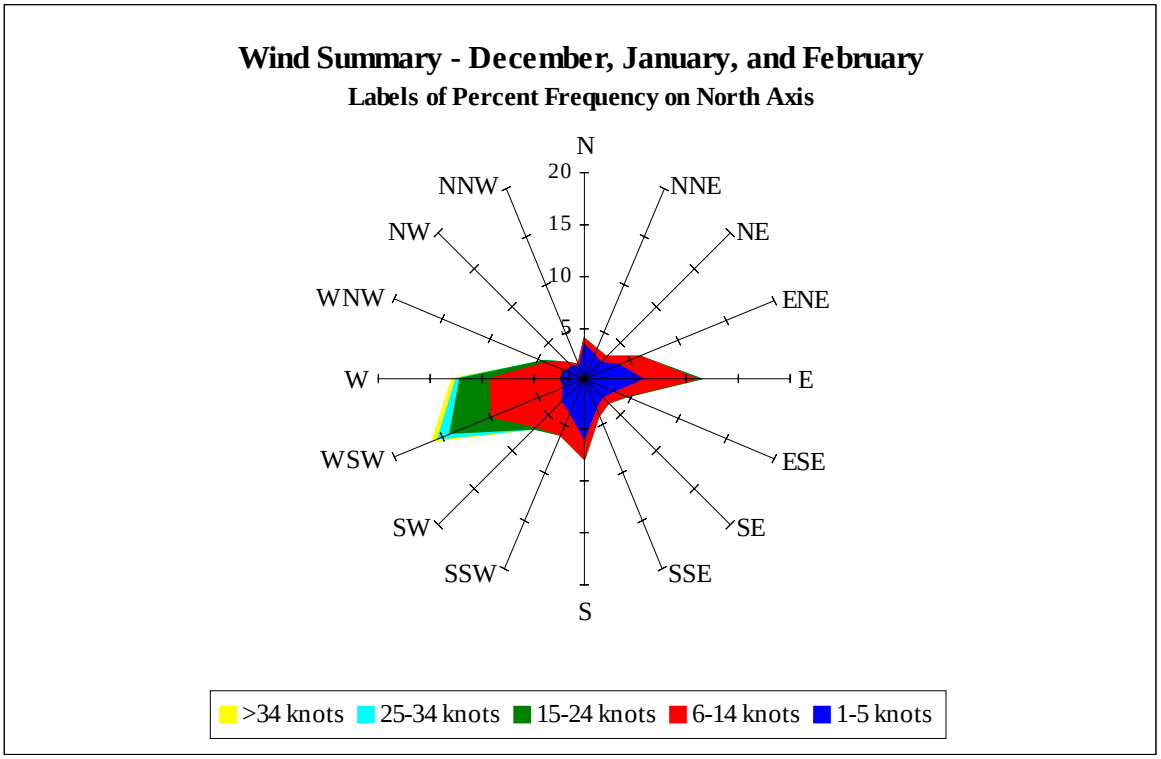
(Source: National Renewable Energy Laboratory, Golden CO, 1995)

No Solar Radiation
Data Available

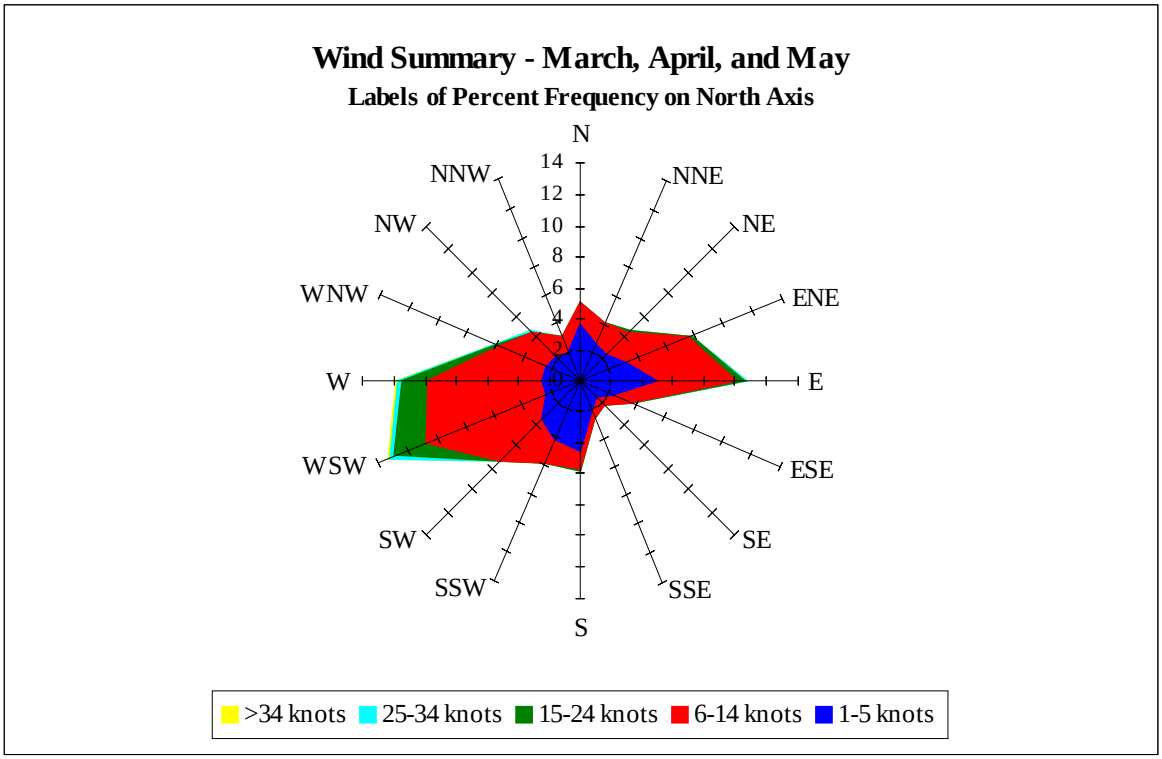
Average Annual Solar Heat and Illumination – Nearest Available Site

(Source: National Renewable Energy Laboratory, Golden CO, 1995)

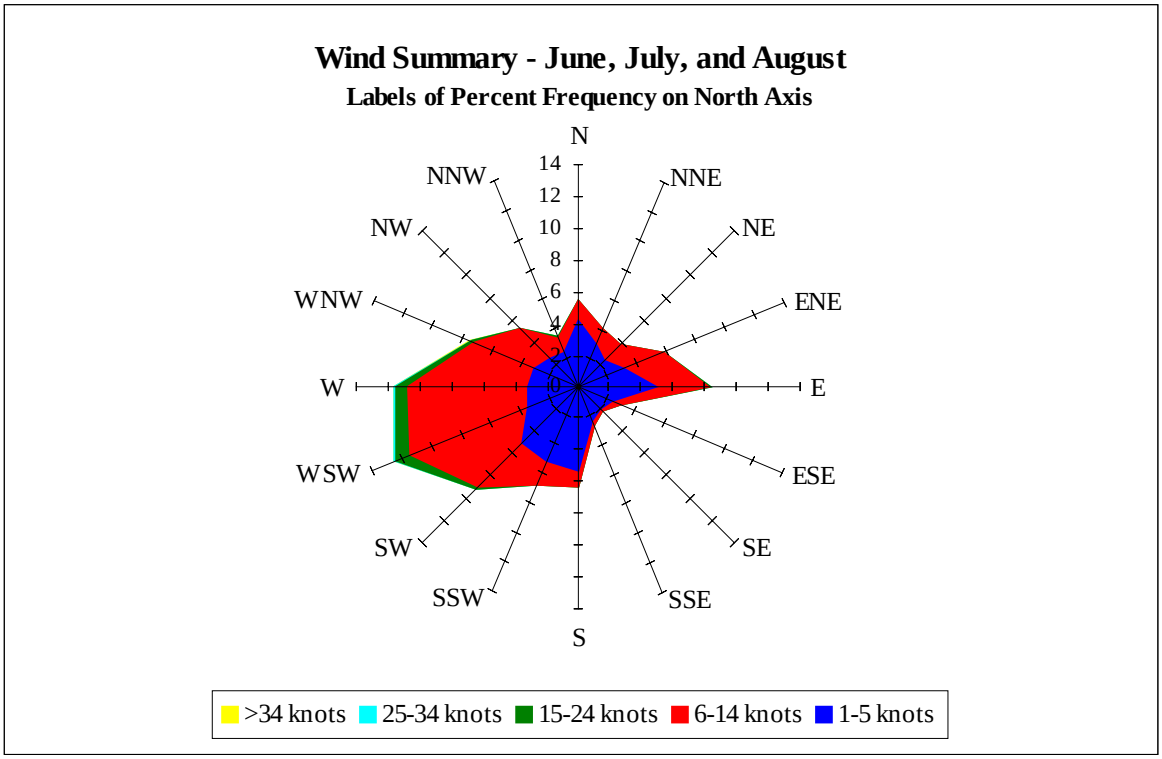




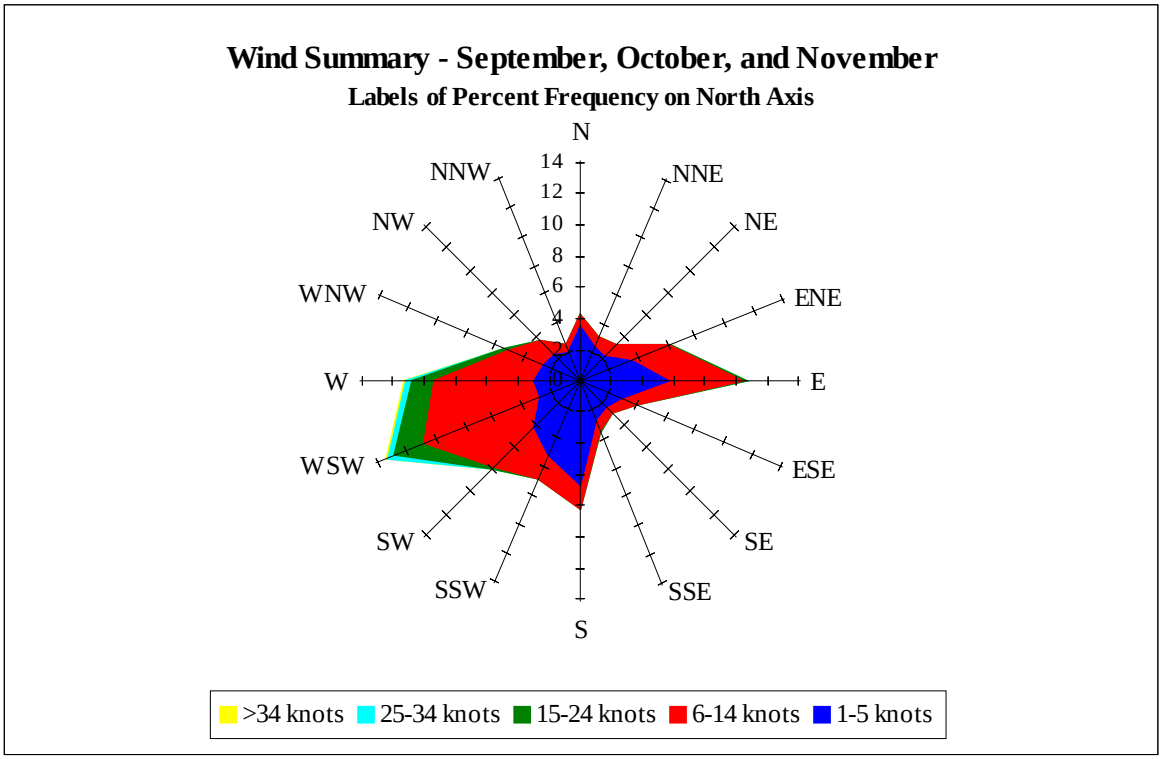
Percent Calm = 3.82



Percent Calm = 2.27



Percent Calm = 3.15



Percent Calm = 4.08