

HAHN, GERMANY

Latitude = 49.95 N

Longitude = 7.27 E

Period of Record = 1966 to 1995

WMO No. 106160

Elevation = 1634 feet

Average Pressure = 28.23 inches Hg

Design Criteria Data

	Design Value	Mean Coincident (Average) Values			
		Wet Bulb Temperature (°F)	Humidity Ratio (gr/lb)	Wind Speed (mph)	Prevailing Direction (NSEW)
Dry Bulb Temperature (T)	(°F)				
Median of Extreme Highs	84	65	65	7.3	VARIABLE
0.4% Occurrence	81	65	69	7.7	VARIABLE
1.0% Occurrence	77	63	69	7.2	VARIABLE
2.0% Occurrence	73	61	67	6.7	W
Mean Daily Range	11	-	-	-	-
97.5% Occurrence	21	20	13	8.6	SE
99.0% Occurrence	18	17	11	8.0	SE
99.6% Occurrence	14	13	9	8.6	SE
Median of Extreme Lows	10	9	7	9.4	SE
	Design Value	Mean Coincident (Average) Values			
		Dry Bulb Temperature (°F)	Humidity Ratio (gr/lb)	Wind Speed (mph)	Prevailing Direction (NSEW)
Wet Bulb Temperature (T_{wb})	(°F)				
Median of Extreme Highs	69	80	92	7.1	W
0.4% Occurrence	67	77	87	6.8	SE
1.0% Occurrence	65	75	80	6.6	W
2.0% Occurrence	63	72	76	6.5	W
	Design Value	Mean Coincident (Average) Values			
		Dry Bulb Temperature (°F)	Vapor Pressure (in. Hg)	Wind Speed (mph)	Prevailing Direction (NSEW)
Humidity Ratio (HR)	(gr/lb)				
Median of Extreme Highs	102	75	0.65	6.1	W
0.4% Occurrence	90	71	0.57	6.2	W
1.0% Occurrence	85	69	0.54	6.1	W
2.0% Occurrence	79	67	0.50	6.5	W
Air Conditioning/ Humid Area Criteria	# of Hours	T ≥ 93°F	T ≥ 80°F	T _{wb} ≥ 73°F	T _{wb} ≥ 67°F
		0	49	1	36

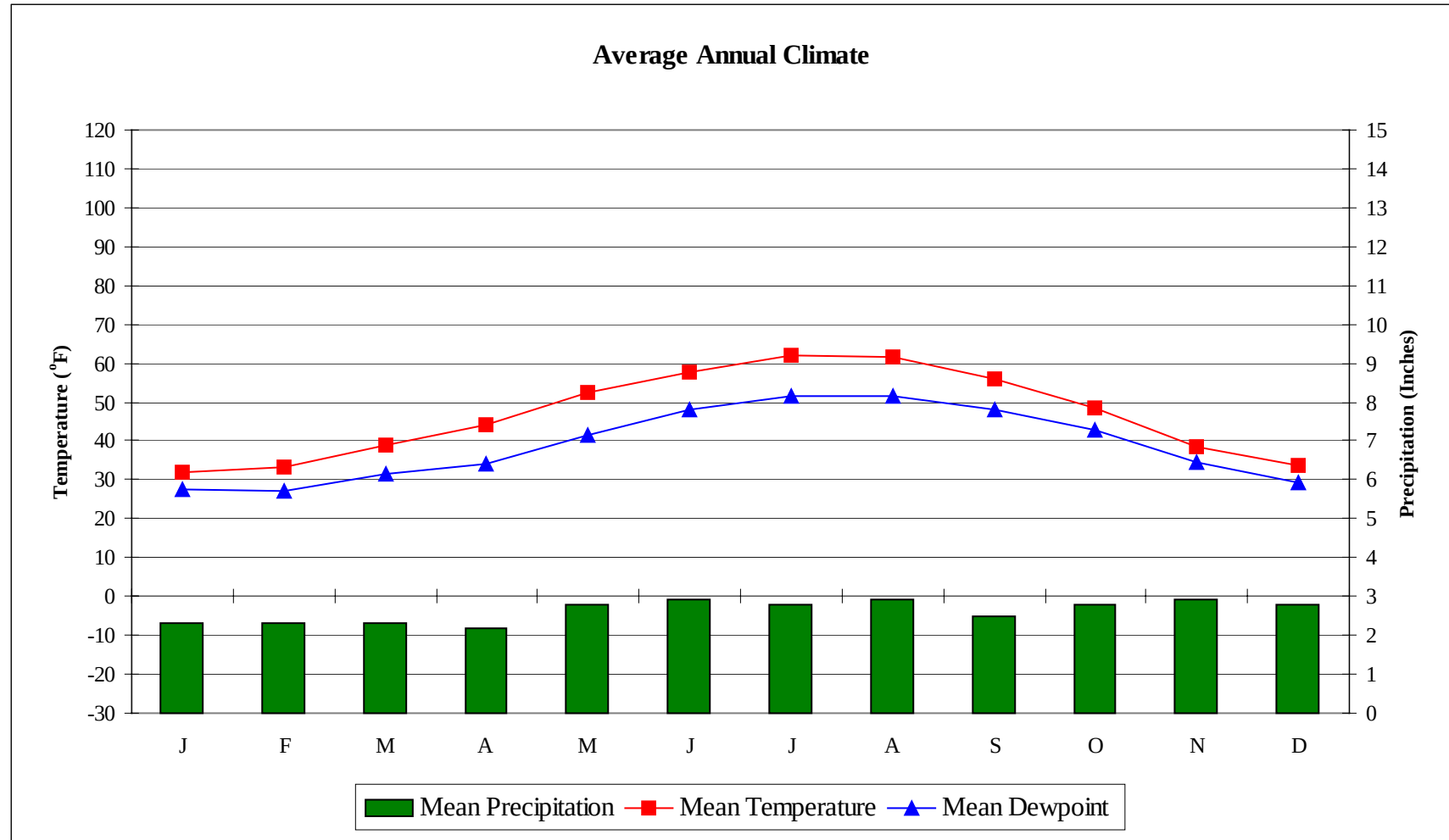
Other Site Data

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 + 0.0
Ground Water Temperature (°F) 50 Foot Depth *	Frost Depth 50 Year Recurrence (in.)	Ground Snow Load 50 Year Recurrence (lb/ft ²)	Average Annual Freeze-Thaw Cycles (#)
49.0	N/A	N/A	34

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

HAHN, GERMANY

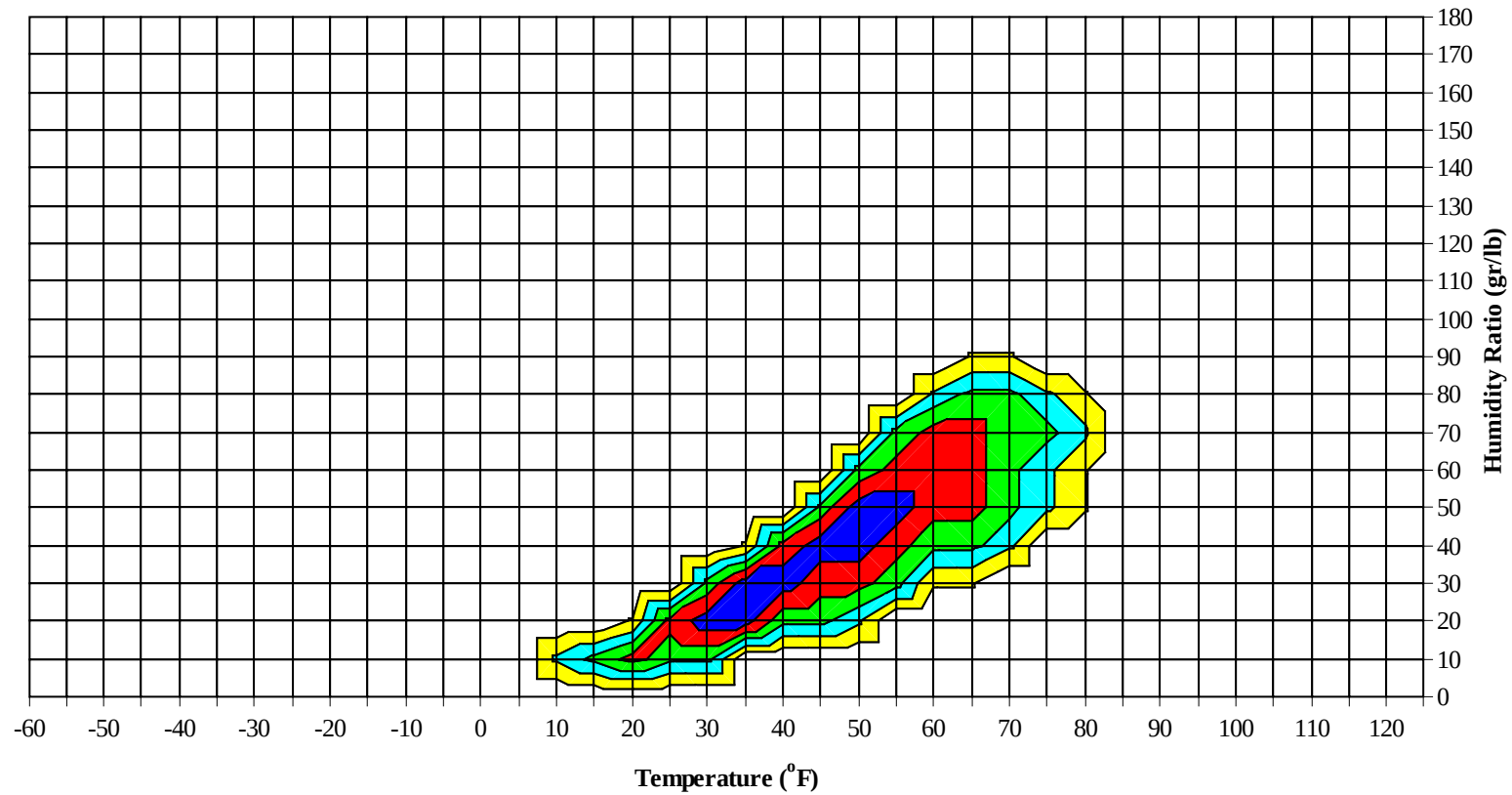
WMO No. 106160



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Long Term Psychrometric Summary

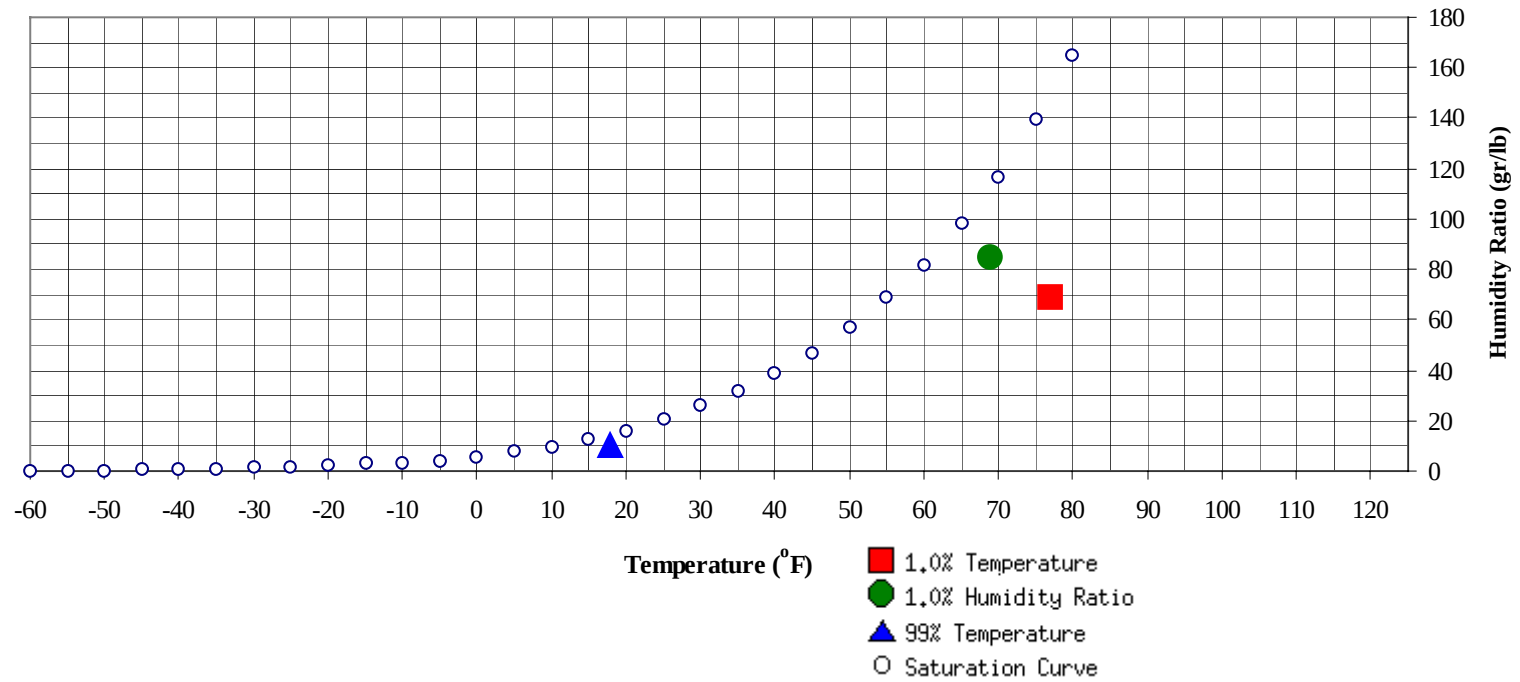


- 50% of all observations
- 80% of all observations
- 95% of all observations
- 97.5% of all observations
- 99% of all observations

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Psychrometric Summary of Peak Design Values



	(°F)	MCHR	Enthalpy	1.0% Humidity Ratio	(gr/lb)	MCDB	MCWB	MC Dewpt	Enthalpy
		(gr/lb)	(btu/lb)			(°F)	(°F)	(°F)	(btu/lb)
99% Dry Bulb	18	10.3	5.9	Ratio	84.7	68.8	63.6	60.8	29.7

1.0% Dry Bulb	(°F)	MCHR	MCWB	Enthalpy
		(gr/lb)	(°F)	(btu/lb)
	77	68.7	63.1	29.2

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

Period of Record = 1966 to 1995

Temperature Range (°F)	January					February					March				
	Hour Group (LST)			Total Obs	M C W B (°F)	Hour Group (LST)			Total Obs	M C W B (°F)	Hour Group (LST)			Total Obs	M C W B (°F)
	01 To 08	09 To 16	17 To 00			01 To 08	09 To 16	17 To 00			01 To 08	09 To 16	17 To 00		
90 / 94															
85 / 89															
80 / 84															
75 / 79															
70 / 74												0	0	0	54.9
65 / 69												1	0	1	52.9
60 / 64							0		0	53.0		3	1	4	50.9
55 / 59						0	1	0	1	49.7	1	8	5	14	48.6
50 / 54	0	3	1	4	46.7	1	6	3	10	45.8	7	21	17	45	46.1
45 / 49	9	15	14	39	43.6	11	21	16	49	42.7	23	46	39	108	42.2
40 / 44	24	26	23	73	40.0	20	26	25	72	39.4	38	50	47	134	38.6
35 / 39	54	61	58	173	35.4	46	53	53	152	34.8	80	68	78	226	34.6
30 / 34	67	68	71	206	30.5	60	58	61	179	30.0	63	40	47	150	29.9
25 / 29	47	39	43	129	25.6	46	37	41	123	24.7	27	10	12	48	25.0
20 / 24	17	13	14	45	20.8	19	12	14	45	20.3	6	1	2	9	20.4
15 / 19	15	14	15	45	16.2	16	7	8	31	16.2	3	1	0	4	16.5
10 / 14	10	6	7	23	11.0	4	2	2	8	11.1	0	0	0	0	10.2
5 / 9	2	2	1	5	6.3	1	1	1	3	6.4					
0 / 4	1	0	0	1	2.5	0			0	3.0					

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.

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

Period of Record = 1966 to 1995

Temperature Range (°F)	April					May					June				
	Hour Group (LST)			Total Obs	M C W B (°F)	Hour Group (LST)			Total Obs	M C W B (°F)	Hour Group (LST)			Total Obs	M C W B (°F)
	01 To 08	09 To 16	17 To 00			01 To 08	09 To 16	17 To 00			01 To 08	09 To 16	17 To 00		
90 / 94															
85 / 89												1	0	1	61.9
80 / 84							0	0	0	63.0		4	2	6	63.1
75 / 79							4	2	6	60.4	0	13	7	21	62.6
70 / 74		1	0	1	55.7		15	8	24	57.9	2	30	20	51	60.7
65 / 69	0	3	1	4	52.9	1	19	12	31	55.7	7	29	21	57	58.4
60 / 64	1	16	8	26	50.8	6	43	32	81	53.3	33	52	49	134	55.8
55 / 59	2	25	20	47	48.0	31	54	51	137	50.3	59	55	60	174	52.3
50 / 54	17	44	39	101	45.3	64	57	61	181	47.1	69	42	54	165	48.6
45 / 49	51	57	59	166	42.2	77	40	52	169	43.2	57	13	25	95	44.3
40 / 44	47	39	40	126	38.4	39	11	19	70	39.3	11	1	2	14	40.2
35 / 39	66	41	49	157	34.4	25	6	9	40	35.4	2	0	0	2	36.5
30 / 34	48	13	23	83	30.3	4	0	1	5	30.9					
25 / 29	8	1	1	10	25.3										
20 / 24	0		0	0	20.8										
15 / 19	0			0	17.3										
10 / 14															
5 / 9															
0 / 4															

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

Period of Record = 1966 to 1995

Temperature Range (°F)	July					August					September				
	Hour Group (LST)			Total Obs	M C W B (°F)	Hour Group (LST)			Total Obs	M C W B (°F)	Hour Group (LST)			Total Obs	M C W B (°F)
	01 To 08	09 To 16	17 To 00			01 To 08	09 To 16	17 To 00			01 To 08	09 To 16	17 To 00		
90 / 94		0	0	0	65.5		0	0	0	68.8					
85 / 89		3	1	4	66.4		1	1	2	66.8		0		0	68.0
80 / 84		14	7	21	65.1		10	4	14	64.8		2	0	2	64.9
75 / 79	1	26	16	44	63.5	1	22	12	36	63.2		5	1	6	64.0
70 / 74	8	42	33	83	61.2	4	48	30	81	60.8	1	17	8	26	61.4
65 / 69	17	36	31	84	59.3	12	38	31	81	59.3	3	23	11	37	58.8
60 / 64	56	58	62	176	56.7	61	63	71	196	56.9	20	58	47	125	56.2
55 / 59	78	48	62	188	53.1	85	47	63	195	53.2	55	68	71	194	52.7
50 / 54	69	20	32	121	49.4	64	18	31	112	49.4	80	50	68	198	49.0
45 / 49	19	1	4	24	45.4	19	1	5	25	45.3	67	17	30	114	44.6
40 / 44	0		0	0	43.3	2		0	2	41.4	11	1	3	15	40.6
35 / 39											2	0	0	2	36.6
30 / 34															
25 / 29															
20 / 24															
15 / 19															
10 / 14															
5 / 9															
0 / 4															

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.

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

Period of Record = 1966 to 1995

Temperature Range (°F)	October					November					December				
	Hour Group (LST)			Total Obs	M C W B (°F)	Hour Group (LST)			Total Obs	M C W B (°F)	Hour Group (LST)			Total Obs	M C W B (°F)
	01 To 08	09 To 16	17 To 00			01 To 08	09 To 16	17 To 00			01 To 08	09 To 16	17 To 00		
90 / 94															
85 / 89															
80 / 84															
75 / 79															
70 / 74		3	0	3	60.6										
65 / 69	0	5	2	7	58.9										
60 / 64	3	19	12	35	56.0	0	0	0	0	53.2					
55 / 59	21	44	33	97	53.0	1	3	1	5	52.2	0	1	0	1	49.9
50 / 54	55	65	65	184	49.1	10	19	15	45	48.9	4	6	6	16	47.9
45 / 49	75	66	72	213	44.3	35	52	39	126	44.2	21	22	18	61	44.0
40 / 44	43	29	38	111	40.0	35	43	42	120	40.0	22	29	27	77	39.9
35 / 39	40	16	22	78	36.2	69	66	73	209	35.7	53	55	55	163	35.6
30 / 34	10	2	3	15	31.3	56	39	49	144	30.6	72	73	73	219	30.5
25 / 29	0		0	0	27.0	27	15	18	61	25.6	42	38	41	121	25.5
20 / 24						5	2	3	10	20.9	19	16	17	52	20.8
15 / 19						1	0		1	17.8	12	7	9	28	16.7
10 / 14											3	1	1	5	12.1
5 / 9											0	0		0	8.0
0 / 4															

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WMO No. 106160

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

Period of Record = 1966 to 1995

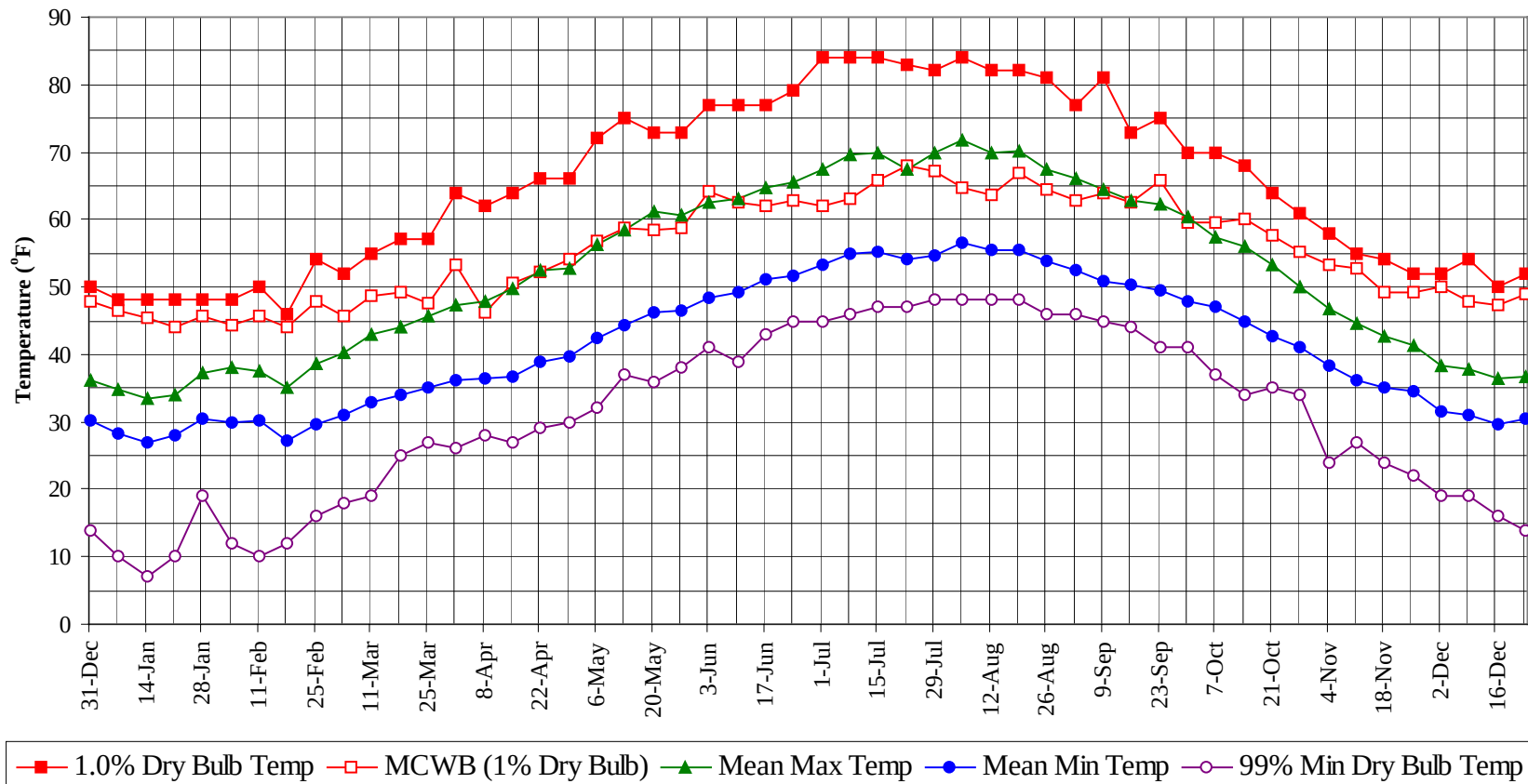
Annual Totals					
Temperature Range (°F)	Hour Group (LST)			Total Obs	M C W B (°F)
	01 To 08	09 To 16	17 To 00		
90 / 94		1	0	1	66.8
85 / 89		4	2	6	66.0
80 / 84		28	13	41	64.7
75 / 79	2	70	38	110	63.1
70 / 74	15	155	98	269	60.7
65 / 69	41	152	108	300	58.6
60 / 64	180	312	279	771	55.9
55 / 59	333	353	362	1048	52.2
50 / 54	437	348	387	1172	48.3
45 / 49	464	353	373	1190	43.6
40 / 44	290	256	268	814	39.4
35 / 39	438	367	403	1209	35.2
30 / 34	383	295	332	1011	30.3
25 / 29	198	141	159	498	25.3
20 / 24	68	44	50	163	20.6
15 / 19	48	29	33	109	16.4
10 / 14	18	10	11	39	11.2
5 / 9	3	3	2	8	6.4
0 / 4	1	0	0	1	2.5

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.

HAHN, GERMANY

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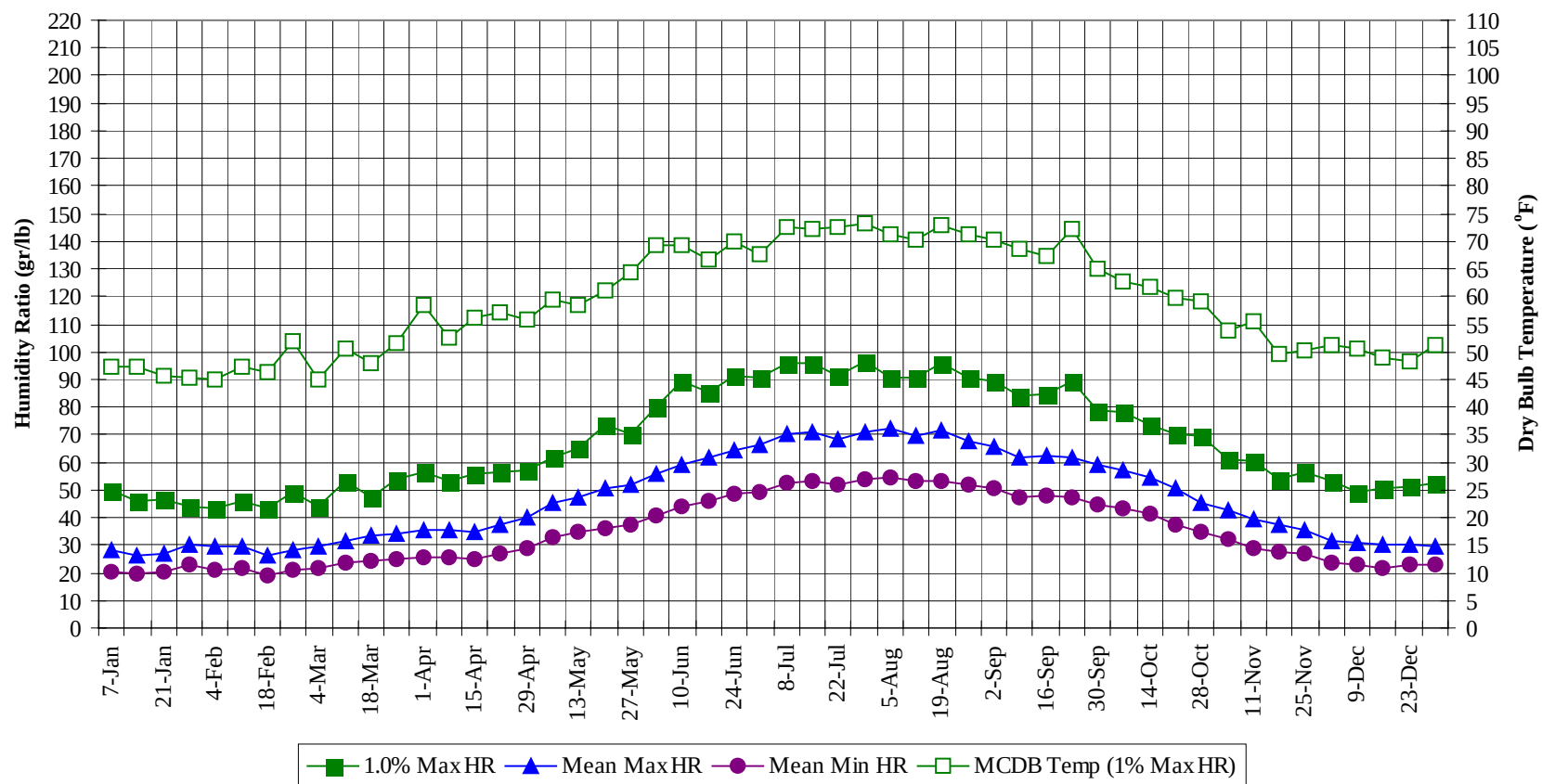
Annual Summary of Temperatures



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Long Term Humidity and Dry Bulb Temperature Summary

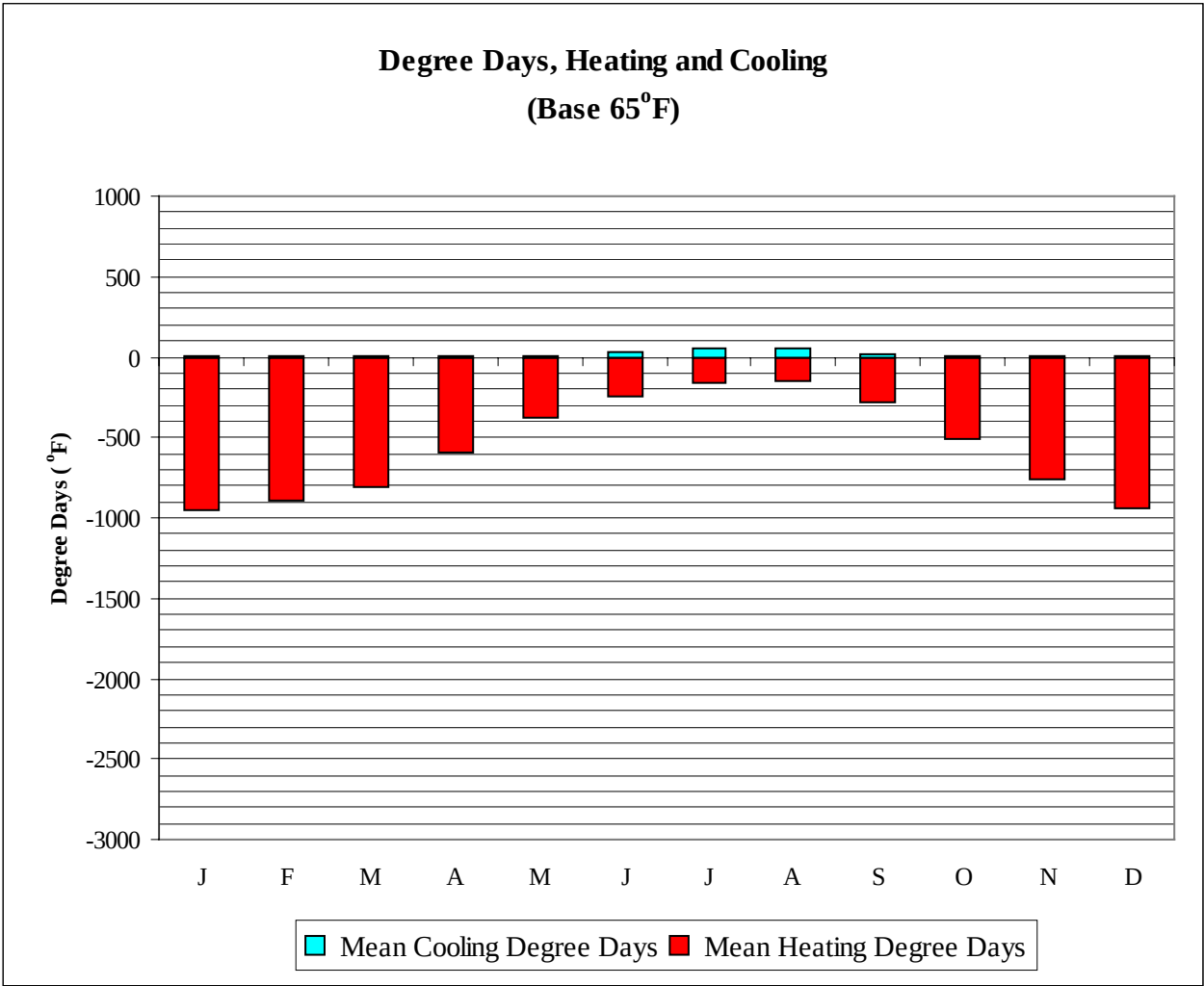


HAHN, GERMANY

WMO No. 106160

Long Term Dry Bulb Temperature and Humidity Summary

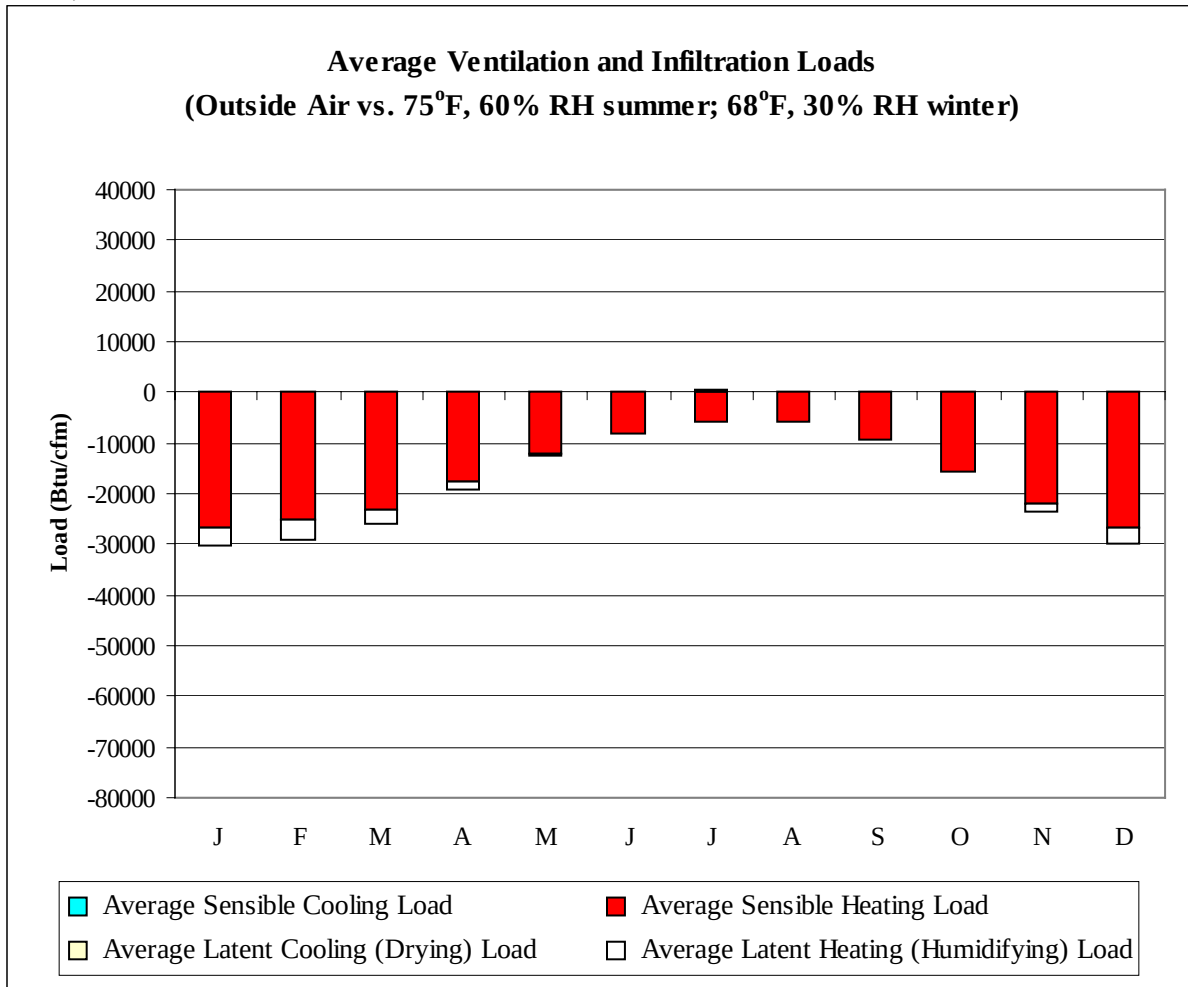
Week Ending	1.0% Temp (°F)	MCWB @ 1% Temp (°F)	Mean Max Temp (°F)	Mean Min Temp (°F)	99% Temp (°F)	1.0% HR (gr/lb)	MCDB @ 1% HR (°F)	Mean Max HR (gr/lb)	Mean Min HR (gr/lb)
7-Jan	48.0	46.4	34.9	28.4	10.0	49.7	47.1	28.2	20.5
14-Jan	48.0	45.5	33.4	26.9	7.0	46.2	47.4	26.4	19.8
21-Jan	48.0	44.0	34.1	27.9	10.0	46.9	45.8	27.0	20.3
28-Jan	48.0	45.6	37.2	30.4	19.0	44.1	45.4	30.2	22.7
4-Feb	48.0	44.4	38.0	30.0	12.0	43.4	45.0	29.4	21.2
11-Feb	50.0	45.7	37.5	30.2	10.0	46.2	47.3	29.8	21.6
18-Feb	46.0	43.9	35.2	27.2	12.0	43.4	46.1	26.0	19.2
25-Feb	54.0	47.8	38.6	29.6	16.0	49.0	52.0	28.5	20.8
4-Mar	52.0	45.8	40.3	31.0	18.0	44.1	44.8	29.6	21.5
11-Mar	55.0	48.6	42.9	32.9	19.0	53.2	50.7	31.5	23.6
18-Mar	57.0	49.3	44.0	34.1	25.0	47.6	47.9	33.2	24.5
25-Mar	57.0	47.7	45.6	35.0	27.0	53.9	51.4	34.2	25.0
1-Apr	64.0	53.3	47.4	36.0	26.0	56.7	58.4	35.6	25.8
8-Apr	62.0	46.3	48.0	36.4	28.0	53.2	52.5	35.3	25.9
15-Apr	64.0	50.6	49.7	36.8	27.0	56.0	56.1	35.0	25.1
22-Apr	66.0	52.1	52.4	38.8	29.0	56.7	57.1	37.6	27.0
29-Apr	66.0	54.1	52.8	39.8	30.0	57.4	55.9	39.8	28.9
6-May	72.0	56.9	56.4	42.3	32.0	61.6	59.6	45.1	32.7
13-May	75.0	58.6	58.4	44.2	37.0	65.1	58.4	47.5	34.7
20-May	73.0	58.6	61.3	46.3	36.0	73.5	61.1	50.7	36.4
27-May	73.0	58.7	60.8	46.6	38.0	70.0	64.3	51.8	37.6
3-Jun	77.0	64.1	62.6	48.5	41.0	79.8	69.2	56.0	40.6
10-Jun	77.0	62.6	63.1	49.3	39.0	89.6	69.2	59.1	43.7
17-Jun	77.0	61.9	64.8	51.1	43.0	85.4	66.8	61.6	45.8
24-Jun	79.0	62.7	65.4	51.8	45.0	91.0	69.9	64.5	48.7
1-Jul	84.0	62.0	67.4	53.3	45.0	90.3	67.5	66.6	49.5
8-Jul	84.0	63.0	69.6	54.9	46.0	95.9	72.7	70.3	52.7
15-Jul	84.0	65.8	70.0	55.2	47.0	95.9	72.3	71.2	53.0
22-Jul	83.0	68.0	67.5	54.0	47.0	91.0	72.7	68.1	51.6
29-Jul	82.0	67.1	69.8	54.7	48.0	96.6	73.4	70.7	53.7
5-Aug	84.0	64.8	71.7	56.5	48.0	90.3	71.4	72.3	54.6
12-Aug	82.0	63.7	69.8	55.4	48.0	90.3	70.3	69.8	53.1
19-Aug	82.0	66.8	70.2	55.4	48.0	95.9	73.0	71.8	53.0
26-Aug	81.0	64.4	67.5	53.8	46.0	90.3	71.4	68.0	51.7
2-Sep	77.0	62.7	66.0	52.6	46.0	89.6	70.3	65.4	50.3
9-Sep	81.0	64.0	64.4	50.8	45.0	84.0	68.7	62.0	47.1
16-Sep	73.0	62.5	62.7	50.2	44.0	84.7	67.3	62.5	47.6
23-Sep	75.0	65.9	62.2	49.6	41.0	89.6	72.4	61.7	47.0
30-Sep	70.0	59.5	60.2	47.9	41.0	79.1	64.9	59.4	44.4
7-Oct	70.0	59.5	57.4	47.0	37.0	78.4	62.6	57.4	43.4
14-Oct	68.0	60.1	56.1	45.0	34.0	73.5	61.8	54.6	41.2
21-Oct	64.0	57.6	53.2	42.7	35.0	70.0	59.9	50.3	37.5
28-Oct	61.0	55.1	50.1	41.1	34.0	69.3	59.1	45.4	35.0
4-Nov	58.0	53.2	46.7	38.3	24.0	60.9	54.0	42.5	32.0
11-Nov	55.0	52.7	44.6	36.1	27.0	60.2	55.5	39.3	29.2
18-Nov	54.0	49.3	42.8	35.1	24.0	53.9	49.7	37.4	27.9
25-Nov	52.0	49.4	41.3	34.6	22.0	56.7	50.4	35.5	27.0
2-Dec	52.0	49.9	38.4	31.5	19.0	53.2	51.1	31.7	23.7
9-Dec	54.0	48.0	37.7	31.0	19.0	49.0	50.5	30.9	23.0
16-Dec	50.0	47.4	36.4	29.6	16.0	50.4	48.9	30.0	22.0
23-Dec	52.0	49.0	36.7	30.6	14.0	51.1	48.2	30.5	22.7
31-Dec	50.0	47.9	36.1	30.3	14.0	52.5	51.3	29.9	22.8



	Mean Cooling Degree Days (°F)	Mean Heating Degree Days (°F)
JAN	0	950
FEB	0	891
MAR	0	805
APR	1	591
MAY	9	383
JUN	28	241
JUL	59	156
AUG	50	154
SEP	12	278
OCT	1	507
NOV	0	763
DEC	0	940
ANN	161	6659

HAHN, GERMANY

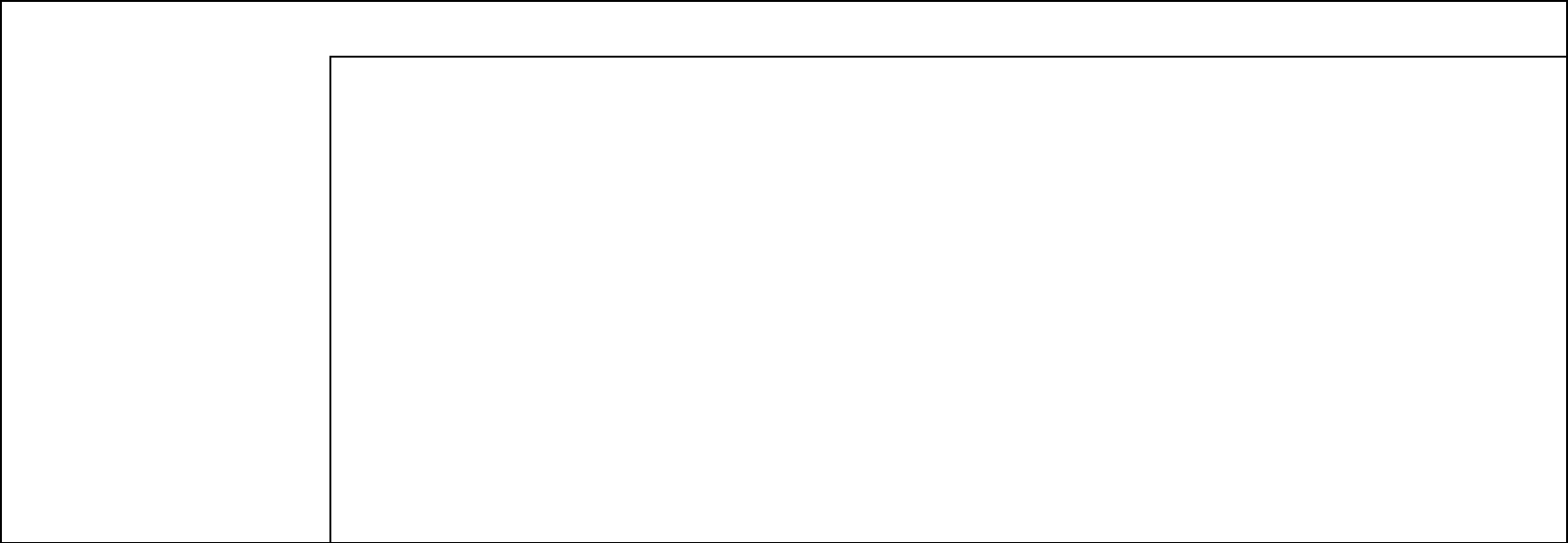
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	Average Sensible Cooling Load	Average Sensible Heating Load	Average Latent Cooling Load	Average Latent Heating Load
	(Btu/cfm)	(Btu/cfm)	(Btu/cfm)	(Btu/cfm)
JAN	0	-26843	0	-3542
FEB	0	-25272	0	-3800
MAR	0	-23265	0	-2541
APR	0	-17526	0	-1640
MAY	8	-12124	0	-364
JUN	80	-8158	56	-49
JUL	271	-5755	148	-1
AUG	172	-5715	93	-2
SEP	23	-9325	21	-30
OCT	0	-15490	1	-291
NOV	0	-22054	0	-1680
DEC	0	-26698	0	-3058
ANN	554	-198225	319	-16998

Average Annual Solar Radiation – Nearest Available Site
(Source: National Renewable Energy Laboratory, Golden CO, 1995)

No Solar Radiation
Data Available

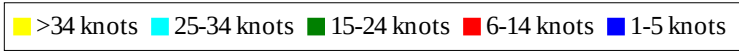
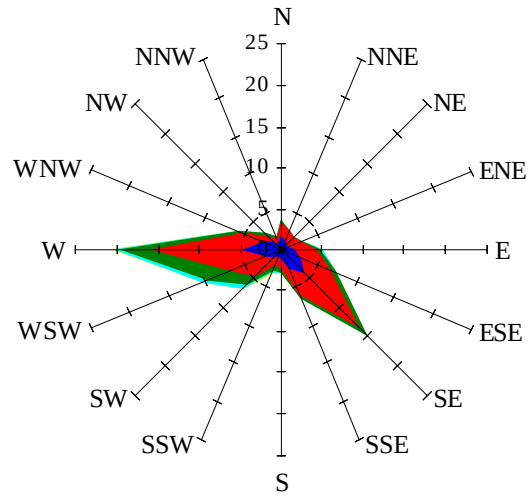


Average Annual Solar Heat and Illumination – Nearest Available Site

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

Wind Summary - December, January, and February

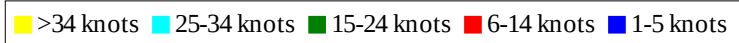
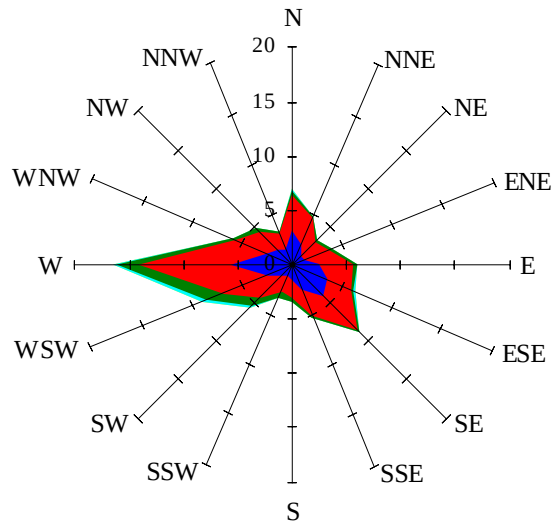
Labels of Percent Frequency on North Axis



Percent Calm = 4.41

Wind Summary - March, April, and May

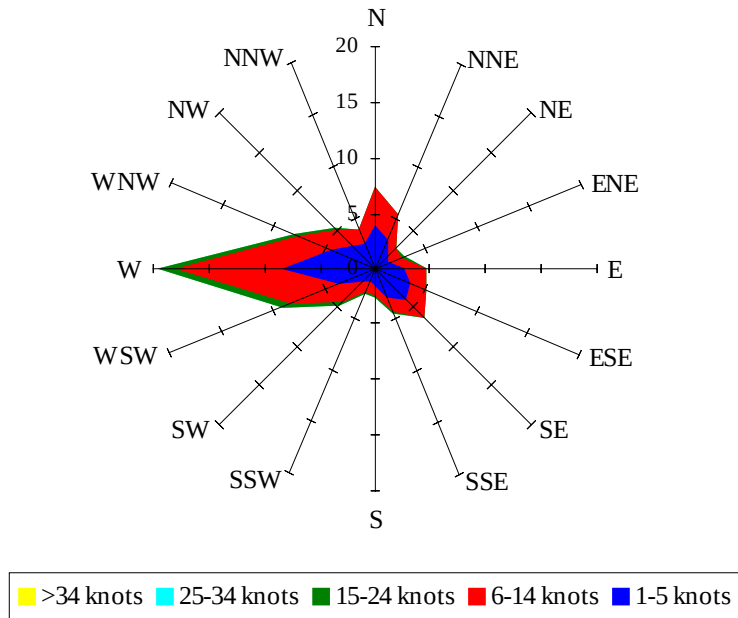
Labels of Percent Frequency on North Axis



Percent Calm = 5.44

Wind Summary - June, July, and August

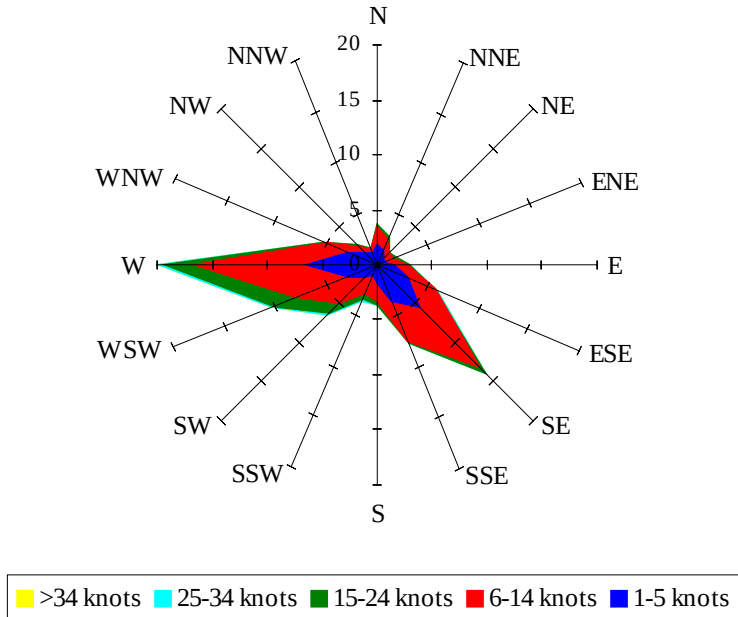
Labels of Percent Frequency on North Axis



Percent Calm = 7.85

Wind Summary - September, October, and November

Labels of Percent Frequency on North Axis



Percent Calm = 6.21