

MINNEAPOLIS-ST PAUL, MN, USA

WMO: 726580

Lat: 44.883N

Lon: 93.229W

Elev: 872

StdP: 14.24

Time Zone: -6.00 (NAC)

Period: 94-19

WBAN: 14922

Annual Heating, Humidification, and Ventilation Design Conditions

Coldest Month	Heating DB		Humidification DP/MCDB and HR						Coldest Month WS/MCDB				MCWS/PCWD to 99.6% DB		WSF
			99.6%			99%			0.4%		1%				
	99.6%	99%	DP	HR	MCDB	DP	HR	MCDB	WS	MCDB	WS	MCDB	MCWS	PCWD	
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)
1	-10.6	-6.0	-18.9	2.0	-9.4	-14.7	2.6	-4.6	25.2	15.9	22.9	16.4	8.0	310	0.586

Annual Cooling, Dehumidification, and Enthalpy Design Conditions

Hottest Month	Hottest Month DB Range	Cooling DB/MCWB						Evaporation WB/MCDB						MCWS/PCWD to 0.4% DB	
		0.4%		1%		2%		0.4%		1%		2%			
		DB	MCWB	DB	MCWB	DB	MCWB	WB	MCDB	WB	MCDB	WB	MCDB	MCWS	PCWD
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)
7	17.4	90.9	73.3	87.9	72.0	85.2	70.4	76.9	87.2	74.9	84.2	73.0	82.0	12.6	180

Dehumidification DP/MCDB and HR									Enthalpy/MCDB						Extreme Max WB
0.4%			1%			2%			0.4%		1%		2%		
DP	HR	MCDB	DP	HR	MCDB	DP	HR	MCDB	Enth	MCDB	Enth	MCDB	Enth	MCDB	
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)
73.6	129.3	83.6	71.7	121.0	81.3	69.7	112.9	79.0	41.0	87.1	38.9	84.4	37.1	82.1	84.9

Extreme Annual Design Conditions

Extreme Annual WS			Extreme Annual Temperature				n-Year Return Period Values of Extreme Temperature								
1%		2.5%	5%	Mean		Standard Deviation		n=5 years		n=10 years		n=20 years		n=50 years	
Min		Max		Min	Max		Min	Max	Min	Max	Min	Max	Min	Max	
(a)	(b)	(c)		(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)
23.8	20.5	18.6	DB	-16.8	96.3	6.2	3.0	-21.3	98.5	-24.9	100.2	-28.3	101.9	-32.8	104.0
			WB	-17.2	80.3	5.8	2.0	-21.4	81.7	-24.8	82.9	-28.0	84.1	-32.2	85.5

Monthly Climatic Design Conditions

		Annual	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
		(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	
Temperatures, Degree-Days and Degree-Hours	DBAvg	47.0	15.9	20.2	33.1	47.1	59.3	69.6	74.5	71.8	64.1	49.9	35.2	21.8	
	DBStd	22.58	12.75	12.15	12.17	10.07	8.62	6.84	5.70	5.45	8.33	9.22	10.66	11.55	
	HDD50	4064	1058	834	538	169	18	0	0	0	4	115	454	874	
	HDD65	7396	1523	1254	990	541	219	33	4	8	116	476	893	1339	
	CDD50	2977	0	0	14	82	307	587	759	677	427	113	11	0	
	CDD65	834	0	0	1	4	43	170	298	220	89	9	0	0	
	CDH74	7069	0	0	4	48	433	1430	2723	1667	690	74	0	0	
	CDH80	2260	0	0	0	11	137	455	978	475	191	13	0	0	
Wind	WSAvg	9.2	9.2	9.4	9.8	10.7	10.0	8.9	8.3	7.9	8.8	9.5	9.4	8.9	
Precipitation	PrecAvg	29.1	1.0	0.8	1.9	2.4	3.5	4.2	3.7	3.7	2.9	2.2	1.7	0.9	
	PrecMax	40.0	3.6	2.1	4.8	7.0	8.0	9.8	17.9	9.3	6.9	5.7	5.3	4.3	
	PrecMin	16.5	0.1	0.1	0.3	0.2	0.6	0.2	0.6	0.7	0.5	0.2	0.1	0.2	
	PrecStd	6.1	0.7	0.6	1.0	1.4	1.8	2.2	2.9	1.9	1.5	1.6	1.4	0.7	
Monthly Design Dry Bulb and Mean Coincident Wet Bulb Temperatures	0.4%	DB	44.3	52.3	70.5	80.4	90.4	93.2	96.0	92.5	89.7	82.0	67.3	50.6	
		MCWB	38.3	45.9	58.2	61.6	68.1	74.5	76.6	74.5	71.3	64.4	55.2	45.9	
	2%	DB	38.9	44.8	62.2	72.5	83.5	88.8	91.4	88.1	85.2	74.8	60.3	44.1	
		MCWB	35.2	39.9	53.3	56.2	64.4	71.0	75.1	72.8	70.3	61.4	51.9	39.5	
	5%	DB	35.5	40.3	55.9	68.0	78.8	85.2	88.3	84.9	81.5	69.2	54.9	39.7	
		MCWB	33.0	36.2	47.9	53.0	62.6	69.3	73.1	71.2	68.0	58.3	47.2	36.2	
	10%	DB	32.7	36.7	49.9	63.4	73.9	81.8	85.4	82.2	77.8	64.3	50.1	36.4	
		MCWB	30.6	33.3	43.3	50.5	59.7	67.0	71.4	69.6	66.0	55.6	43.8	33.6	
	Monthly Design Wet Bulb and Mean Coincident Dry Bulb Temperatures	0.4%	WB	38.9	46.0	60.7	63.4	72.1	77.7	80.5	78.4	75.2	69.2	58.2	47.7
			MCDB	43.4	52.2	67.5	76.2	86.3	89.2	89.7	88.5	84.7	76.3	64.4	50.8
2%		WB	35.6	40.5	54.2	58.5	67.9	74.2	77.7	75.6	72.6	63.8	52.9	39.7	
		MCDB	38.4	44.7	61.4	69.4	78.0	84.8	88.4	83.9	81.4	70.6	59.3	43.1	
5%		WB	33.2	36.3	48.7	55.0	65.0	71.7	75.5	73.8	70.3	59.8	48.1	36.3	
		MCDB	35.4	39.9	55.4	65.3	74.9	81.6	85.3	82.0	78.2	67.3	54.1	39.3	
10%		WB	30.8	33.4	43.6	51.8	62.0	69.3	73.4	71.7	68.1	56.3	44.3	33.8	
		MCDB	32.8	36.3	49.6	61.8	71.9	78.6	82.3	79.5	75.7	63.3	49.5	36.2	
Mean Daily Temperature Range	5% DB	MDBR	14.1	15.0	15.8	18.1	18.3	17.5	17.4	16.9	17.7	16.1	13.7	12.6	
		MCDBR	15.0	16.8	22.9	25.1	24.6	21.3	19.8	19.1	21.1	23.3	20.4	16.7	
		MCWBR	12.4	12.8	14.5	13.9	11.3	9.5	8.7	8.7	9.8	13.1	13.4	13.2	
	5% WB	MCDBR	14.6	16.1	21.3	22.8	21.7	18.6	18.3	17.3	18.6	19.6	18.9	15.6	
		MCWBR	12.5	12.6	14.4	14.0	11.8	10.2	9.8	9.8	10.5	12.9	13.6	12.7	
Clear-Sky Solar Irradiance	taub	0.271	0.286	0.323	0.379	0.408	0.402	0.402	0.406	0.379	0.324	0.294	0.270		
	taud	2.416	2.356	2.379	2.287	2.258	2.323	2.342	2.332	2.372	2.520	2.509	2.437		
	Ebn at Noon	272	287	289	279	273	275	274	268	266	271	262	260		
	Edh at Noon	23	29	33	40	42	40	38	37	33	25	21	20		
All-Sky Solar Radiation	RadAvg	548	893	1199	1456	1689	1882	1997	1667	1302	828	528	385		
	RadStd	64	91	112	149	138	149	73	119	93	110	50	42		

Historical Trends

		DBAvg	Heating			Cooling			Degree-Days			
			99% DB	99% DP	1% DB	1% WB	1% DP		HDD50	HDD65	CDD50	CDD65
		(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	
(46)	Station Only	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
(47)	Regional (59 neighbors)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Nomenclature: See separate page