

## PORTLAND TROUTDALE, OR, USA

WMO#: 726985

Lat: **45.55N** Long: **122.40W** Elev: **30** StdP: **14.68** Time Zone: **-8 (NAP)** Period: **98-10** WBAN: **24242**

## Annual Heating and Humidification Design Conditions

Coldest Month	Heating DB		Humidification DP/MCDB and HR						Coldest month WS/MCDB				MCWS/PCWD to 99.6% DB	
			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)
12	25.3	29.5	9.8	9.1	31.3	18.0	13.6	33.6	32.8	37.3	31.3	36.7	16.4	80

## 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	24.0	91.0	67.1	87.9	66.4	83.5	65.6	69.9	86.3	67.9	83.8	66.2	80.7	7.2	300

Dehumidification DP/MCDB and HR									Enthalpy/MCDB						Hours 8 to 4 & 55/69
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)
63.8	88.7	73.9	62.8	85.7	72.4	61.0	80.3	71.0	33.7	86.6	32.1	83.5	30.7	81.2	1078

## Extreme Annual Design Conditions

Extreme Annual WS			Extreme Max WB	Extreme Annual DB				n-Year Return Period Values of Extreme DB							
				Mean		Standard deviation		n=5 years		n=10 years		n=20 years		n=50 years	
1%	2.5%	5%		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)
27.8	25.4	22.9	77.7	22.6	100.3	4.5	4.0	19.3	103.1	16.7	105.5	14.2	107.8	10.9	110.7

## Monthly Climatic Design Conditions

		Annual (d)	Jan (e)	Feb (f)	Mar (g)	Apr (h)	May (i)	Jun (j)	Jul (k)	Aug (l)	Sep (m)	Oct (n)	Nov (o)	Dec (p)
(5) Temperatures, Degree-Days and Degree-Hours	Tavg	53.9	41.2	43.9	47.4	51.4	57.1	62.5	68.9	68.5	63.5	54.4	46.8	40.8
	Sd	5.59	4.11	4.97	5.43	6.17	5.74	5.24	4.60	5.24	5.22	5.72	6.04	
	HDD50	1047	275	175	111	45	7	0	0	0	19	125	290	
	HDD65	4411	738	592	545	409	259	114	19	18	88	331	547	751
	CDD50	2475	3	3	31	86	227	376	585	572	406	154	28	4
	CDD65	364	0	0	0	1	14	40	139	125	44	1	0	0
	CDH74	4375	0	0	0	24	237	574	1583	1341	605	11	0	0
	CDH80	1694	0	0	0	2	75	228	661	539	189	0	0	0
(13) Precipitation	PrecAvg	45.0	6.5	5.0	4.4	3.4	2.7	2.0	0.8	1.3	2.2	3.4	6.2	7.1
	PrecMax	64.6	13.6	11.0	8.3	4.7	4.3	2.7	2.0	4.3	4.9	6.1	11.5	12.9
	PrecMin	22.6	1.1	1.3	1.3	1.0	0.9	0.5	0.0	0.1	0.0	0.4	0.8	1.4
	PrecSD	9.8	3.4	2.1	2.0	1.0	1.1	0.7	0.5	1.1	1.3	1.6	2.8	3.0
(17) Monthly Design Dry Bulb and Mean Coincident Wet Bulb Temperatures	0.4%	DB	57.4	60.7	70.2	77.2	88.0	93.2	99.4	96.7	90.4	75.1	64.3	57.4
		MCWB	52.3	51.7	56.9	59.3	65.5	67.2	71.1	69.3	64.5	59.5	58.8	54.2
	2%	DB	54.3	55.0	63.7	72.1	81.2	86.4	91.1	90.4	84.4	71.9	60.9	54.2
		MCWB	50.1	46.7	52.4	57.1	62.3	65.3	67.9	66.8	63.4	57.8	55.1	51.2
	5%	DB	51.8	53.8	60.5	66.0	73.5	81.0	87.8	86.0	81.4	66.3	56.9	51.8
		MCWB	48.2	46.6	50.3	53.7	58.6	63.7	67.5	66.7	62.7	56.3	52.3	49.0
	10%	DB	48.2	51.6	55.4	62.9	70.1	74.7	82.1	81.7	76.5	63.5	54.5	48.0
		MCWB	45.6	45.7	48.3	52.0	57.5	61.1	65.5	65.3	61.0	54.9	50.6	45.4
(25) Monthly Design Wet Bulb and Mean Coincident Dry Bulb Temperatures	0.4%	WB	55.1	52.7	58.1	61.1	66.7	69.0	74.3	72.3	68.3	64.4	61.9	55.2
		MCDB	58.1	56.1	67.8	73.6	85.5	88.5	93.4	88.3	83.8	67.7	64.3	58.3
	2%	WB	51.0	49.5	54.0	57.5	63.1	66.3	70.5	69.5	65.7	60.3	55.7	51.2
		MCDB	53.6	53.3	60.7	69.2	78.1	83.4	87.3	85.5	79.3	66.7	58.9	53.5
	5%	WB	47.7	47.4	51.5	55.0	60.9	64.2	68.4	67.5	64.1	58.3	53.6	48.5
		MCDB	49.8	51.3	57.3	63.7	72.4	78.9	83.9	82.8	76.5	64.1	56.1	50.6
	10%	WB	46.0	46.1	49.9	52.8	58.6	62.1	66.3	65.8	62.4	56.7	51.5	45.8
		MCDB	47.7	49.1	55.7	60.3	67.7	73.7	80.8	79.8	73.5	62.3	54.3	47.3
(33) Mean Daily Temperature Range	5% DB	MDBR	8.2	12.0	14.6	17.4	18.9	19.7	24.0	23.8	23.0	15.7	10.3	7.6
		MCDBR	12.9	16.3	22.0	27.1	29.6	32.6	33.7	33.9	31.6	22.4	12.8	10.9
		MCWBR	9.1	10.2	12.8	14.9	14.6	14.3	13.5	13.5	13.7	11.5	8.4	8.7
	5% WB	MCDWR	11.6	13.1	18.5	22.6	25.7	29.3	30.1	30.2	27.5	17.6	11.6	10.5
		MCWBR	8.8	8.8	11.6	13.1	13.2	13.2	12.9	12.8	13.1	10.3	8.5	8.6
(38) Clear Sky Solar Irradiance	taub		0.340	0.336	0.330	0.337	0.323	0.329	0.340	0.345	0.347	0.345	0.330	0.326
	taud		2.580	2.574	2.562	2.479	2.505	2.457	2.445	2.479	2.516	2.550	2.634	2.640
	Ebn,noon		245	270	288	293	300	297	292	287	277	262	248	240
	Edh,noon		20	24	28	32	33	34	34	32	29	24	19	18

## Nomenclature:

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