

2017 ASHRAE Handbook - Fundamentals (IP)																
TUSTIN MCAF, CA, USA (WMO: 722915)																
Lat: 33.700N			Long: 117.833W			Elev: 54			StdP: 14.67			Time zone: -8.00		Period: 86-97		WBAN: 93114
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		
12	38.9	41.4	16.6	12.7	57.2	21.3	16.0	59.6	25.3	65.8	20.3	62.7	0.6	70		
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	
8	19.4	93.1	69.7	89.4	69.1	86.3	68.5	73.4	86.2	72.1	85.0	70.9	83.4	8.0	240	
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		
69.0	106.9	80.4	67.5	101.4	79.5	66.1	96.4	78.2	36.9	86.0	35.7	85.3	34.6	83.6		81.1
Extreme Annual Design Conditions																
Extreme Annual WS			Extreme Annual Temperature						n-Year Return Period Values of Extreme Temperature							
			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		
16.7	13.2	11.8	DB	35.1	101.5	2.6	4.8	33.2	104.9	31.7	107.7	30.2	110.4	28.3	113.8	
			WB	31.0	76.9	2.5	2.2	29.2	78.5	27.8	79.8	26.4	81.0	24.6	82.6	
Monthly Climatic Design Conditions																
Temperatures, Degree-Days and Degree-Hours		Annual	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
		DBAvg	65.5	57.2	58.6	61.2	64.4	66.6	69.5	72.9	74.6	72.9	68.8	62.3	56.8	
		DBStd	7.33	4.41	5.13	4.10	4.39	3.63	3.60	3.26	3.53	4.33	4.21	4.28	4.10	
		HDD50	10	3	3	0	0	0	0	0	0	0	0	0	4	
		HDD65	1019	245	185	131	60	25	5	0	0	2	11	101	254	
		CDD50	5675	225	245	347	433	514	585	709	763	686	584	368	216	
		CDD65	1209	2	7	13	43	74	140	244	298	238	130	19	1	
		CDH74	9699	139	179	269	602	456	890	1546	2270	1885	982	413	68	
		CDH80	3064	21	46	77	231	91	238	389	772	710	367	112	10	
Wind	WSAvg	4.1	3.4	3.9	3.8	4.6	5.0	4.9	4.9	4.5	3.9	3.7	3.3	3.2		
Precipitation	PrecAvg	10.60	2.40	2.70	2.20	0.80	0.10	0.00	0.00	0.10	0.30	0.20	1.20	1.50		
	PrecMax	26.10	7.90	12.40	9.90	4.10	0.50	0.50	0.20	1.70	1.90	1.00	5.30	4.20		
	PrecMin	3.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	PrecStd	5.90	2.30	3.00	2.30	1.10	0.10	0.10	0.10	0.10	0.40	0.60	0.20	1.20	1.30	
Monthly Design Dry Bulb and Mean Coincident Wet Bulb Temperatures	0.4%	DB	82.9	85.8	87.7	94.9	87.3	93.3	91.6	95.1	97.4	97.4	89.5	80.8		
		MCWB	57.5	61.0	63.6	64.7	69.0	69.0	71.8	71.7	71.1	67.3	63.6	57.8		
	2%	DB	78.2	79.3	80.9	86.2	82.0	85.6	87.1	90.6	91.3	89.2	82.9	75.2		
		MCWB	56.9	59.5	60.0	62.5	65.8	68.4	71.2	71.5	71.4	66.6	60.3	57.8		
	5%	DB	73.5	74.1	76.0	80.7	78.7	82.0	84.0	87.4	87.3	83.0	78.7	71.5		
		MCWB	55.8	56.9	60.0	62.9	64.4	67.5	69.9	71.1	70.7	66.8	59.2	56.8		
10%	DB	69.0	69.8	72.0	75.8	75.9	78.8	81.5	84.1	83.7	78.7	74.7	68.0			
	MCWB	54.8	56.1	60.0	62.2	63.8	66.0	69.0	70.2	69.7	65.2	59.2	56.0			
Monthly Design Wet Bulb and Mean Coincident Dry Bulb Temperatures	0.4%	WB	63.6	66.4	66.2	68.0	69.7	71.6	74.6	75.3	75.2	72.6	67.5	63.8		
		MCDB	72.9	80.8	78.0	82.3	82.4	86.3	86.4	89.2	89.8	85.8	77.5	73.2		
	2%	WB	61.0	62.1	63.9	66.0	67.4	69.7	72.4	73.4	73.0	70.2	65.3	61.2		
		MCDB	66.9	72.4	75.4	80.5	78.9	83.2	84.2	86.4	86.4	82.8	75.6	68.8		
	5%	WB	59.3	60.1	62.1	64.4	65.7	68.3	70.8	72.1	71.4	68.4	63.4	59.3		
		MCDB	66.5	67.8	72.7	77.7	76.7	80.3	82.1	85.1	84.6	79.1	73.5	66.5		
10%	WB	57.5	58.4	60.4	62.7	64.3	66.8	69.5	70.7	70.1	66.7	61.6	57.6			
	MCDB	65.5	65.8	70.0	74.7	74.5	77.8	80.0	83.0	82.7	76.4	71.0	65.3			
Mean Daily Temperature Range	5% DB	MDBR	23.4	21.4	21.0	21.7	18.1	18.1	17.7	19.4	21.3	21.7	25.2	23.5		
		MCDBR	33.9	31.4	31.2	33.5	24.3	24.9	21.5	24.6	28.2	31.3	34.0	30.7		
		MCWBR	18.3	16.8	17.1	17.0	12.6	12.6	10.6	12.0	13.5	16.2	17.9	18.2		
	5% WB	MCDBR	22.4	22.4	24.3	25.2	19.9	21.6	19.4	21.3	24.2	24.2	25.4	23.7		
MCWBR		14.9	14.2	15.2	14.6	11.0	11.7	10.4	11.3	13.5	16.2	17.9	18.2			
Clear Sky Solar	taub	0.323	0.332	0.356	0.363	0.361	0.376	0.383	0.367	0.353	0.353	0.311	0.310			

Irradiance	taud	2.536	2.523	2.430	2.418	2.457	2.416	2.467	2.495	2.526	2.500	2.610	2.613
	Ebn,noon	283	292	292	293	293	287	285	288	289	280	286	283
	Edn,noon	26	29	35	37	36	37	35	34	31	30	24	23
All-Sky Solar Radiation	RadAvg	1013	1269	1692	2050	2250	2326	2318	2204	1862	1398	1089	891
	RadStd	60	102	91	102	152	149	114	72	85	109	64	59
CDDn	Cooling degree-days base n°F, °F-day			Lat	Latitude, °			Period					Years used to calculate the design conditions
CDHn	Cooling degree-hours base n°F, °F-hour			Long	Longitude, °			Sd					Standard deviation of daily average temperature, °F
DB	Dry bulb temperature, °F			MCDB	Mean coincident dry bulb temperature, °F			StdP					Standard pressure at station elevation, psi
DP	Dew point temperature, °F			MCDBR	Mean coincident dry bulb temp. range, °F			taub					Clear sky optical depth for beam irradiance
Ebn,noon	Clear sky beam normal and diffuse horizontal irradiances at solar noon, Btu/h/ft ²			MCDP	Mean coincident dew point temperature, °F			taud					Clear sky optical depth for diffuse irradiance
Edh,noon				MCWB	Mean coincident wet bulb temperature, °F			Tavg					Average temperature, °F
Elev	Elevation, ft			MCWBR	Mean coincident wet bulb temp. range, °F			Time Zone					Hours ahead or behind UTC
Enth	Enthalpy, Btu/lb			MCWS	Mean coincident wind speed, mph			WB					Wet bulb temperature, °F
HDDn	Heating degree-days base n°F, °F-day			MDBR	Mean dry bulb temp. range, °F			Hours 8/4 & 55/69					Number of hours between 8 a.m. and 4 p.m. with DB between 55 and 69 °F
PCWD	Prevailing coincident wind direction, °, 0 = North, 90 = East			WS	Wind speed, mph			HR					Humidity ratio, grains of moisture per lb of dry air