2021 ASHRAE Handbook - Foundamentals (SI)

CHAMICAL, ARGENTINA (WMO: 873200)

| Lat:**30.3478S** | Long:**66.2961W** | Elev:**461** | StdP: **95.91** | Time zone:**-3.00 (W03)** | Period:**94-19** | WBAN:**99999** |

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	
7	2.0	3.8	-7.8	2.1	10.3	-5.7	2.5	10.2	10.9	13.0	9.2	15.2	1.0	140	0.375

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
1	11.4	38.2	23.6	36.6	23.0	35.1	22.4	25.6	34.3	24.7	33.2	24.0	32.0	5.0	90

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	
23.2	19.1	29.6	22.3	18.0	28.9	21.6	17.2	28.3	81.7	34.7	78.0	33.2	74.9	32.0	30.2

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
11.9	10.0	8.4	DB	-0.9	40.7	2.6	2.0	-2.7	42.1	-4.2	43.3	-5.7	44.5	-7.5	45.9
			WB	-3.0	26.8	2.2	1.6	-4.6	27.9	-5.8	28.9	-7.0	29.7	-8.6	30.9

Monthly Climatic Design Conditions

		Annual	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Temperatures, Degree-Days and Degree-Hours	DBAvg	20.4	27.9	26.1	23.5	19.6	15.6	12.6	12.3	15.2	18.5	22.4	24.6	26.7
	DBStd	6.43	3.33	3.34	3.42	3.54	3.40	2.77	3.60	4.20	4.36	3.94	3.74	3.43
	HDD10.0	33	0	0	0	1	2	8	16	5	1	0	0	0
	HDD18.3	667	0	0	4	26	99	171	188	115	51	10	2	1
	CDD10.0	3824	555	451	418	289	175	87	89	167	255	384	437	517
	CDD18.3	1418	297	218	164	64	14	1	3	19	56	136	189	259
	CDH23.3	14720	3558	2277	1280	394	61	3	23	193	507	1364	2056	3004
	CDH26.7	6935	1923	1062	474	102	11	0	4	59	164	582	1003	1551
Wind	WSAvg	2.6	3.0	2.6	2.1	2.1	1.6	1.5	1.8	2.4	3.0	3.6	3.6	3.4
Precipitation	PrecAvg	441	96	77	70	21	8	3	5	4	13	24	55	83
	PrecMax	631	188	230	215	84	43	20	26	31	46	172	178	240
	PrecMin	296	34	0	3	1	0	0	0	0	0	0	0	6
	PrecStd	103	41	49	43	19	10	5	8	7	14	33	40	50

			Annual	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Monthly Design Dry Bulb and Mean Coincident Wet Bulb Temperatures	0.4%	DB	40.3	38.0	35.8	32.1	28.0	23.5	26.5	31.5	33.9	37.7	38.1	39.7
		MCWB	24.6	25.1	24.5	22.2	19.8	16.7	17.3	19.1	20.3	21.7	22.1	23.5
	2%	DB	38.6	36.0	33.3	29.3	24.9	20.9	23.3	28.0	30.7	34.8	36.0	37.4
		MCWB	24.0	24.4	23.3	21.1	18.1	14.7	15.5	16.7	18.1	20.6	21.3	22.9
	5%	DB	36.6	34.1	31.4	27.3	22.8	19.5	20.9	25.2	28.4	32.3	34.1	35.5
		MCWB	23.6	23.4	22.6	19.8	16.9	13.7	13.6	15.5	17.1	19.5	20.5	22.2
	10%	DB	34.6	32.5	29.4	25.5	21.1	18.1	18.9	22.8	26.2	30.1	32.2	33.6
		MCWB	23.1	22.9	21.8	19.2	16.0	13.1	12.2	13.8	16.0	18.5	19.9	21.8
Monthly Design Wet Bulb and Mean Coincident Dry Bulb Temperatures	0.4%	WB	27.3	28.0	25.5	23.4	20.4	17.2	18.4	19.7	21.8	23.7	24.2	25.6
		MCDB	36.5	35.2	33.4	28.8	25.7	21.1	25.1	29.5	30.6	34.5	34.0	35.9
	2%	WB	25.6	25.6	24.5	22.3	19.2	15.8	16.5	18.0	19.5	22.0	23.0	24.5
		MCDB	35.4	32.7	31.1	26.8	23.8	19.4	21.7	26.3	28.2	31.4	32.2	34.1
	5%	WB	24.6	24.5	23.5	21.3	18.1	14.8	15.0	16.3	18.1	20.7	21.9	23.6
		MCDB	34.1	31.7	29.5	25.5	21.6	18.4	19.2	23.5	26.4	29.8	31.1	32.9
	10%	WB	23.7	23.7	22.6	20.3	17.0	13.7	13.5	14.7	16.8	19.5	20.9	22.7
		MCDB	32.5	30.5	28.1	24.3	20.2	17.0	17.8	21.6	24.9	28.2	30.2	31.7

Mean Daily Temperature Range		MDBR	11.4	10.4	9.4	9.6	8.9	9.7	11.3	12.6	12.3	12.1	12.2	11.8
	5% DB	MCDBR	13.7	12.1	11.6	11.9	10.7	11.8	13.4	15.2	14.6	14.7	14.7	14.3
		MCWBR	4.8	4.5	4.8	5.7	5.5	6.7	7.3	7.4	7.0	6.4	5.8	5.1
	5% WB	MCDBR	12.4	10.6	10.2	9.1	9.0	9.8	11.4	14.2	13.3	12.8	12.5	12.6
		MCWBR	5.2	4.7	4.5	4.7	4.8	6.1	6.5	7.5	7.0	6.4	5.8	5.1
Clear Sky Solar Irradiance		taub	0.391	0.380	0.368	0.360	0.331	0.316	0.312	0.348	0.389	0.382	0.382	0.386
		taud	2.424	2.459	2.492	2.472	2.504	2.526	2.502	2.387	2.274	2.356	2.396	2.421
		Ebn at noon	950	942	920	874	854	846	865	872	882	929	952	958
		Edn at noon	124	116	106	97	84	78	83	104	129	127	127	125
All-Sky Solar Radiation		RadAvg	7.38	6.48	5.36	4.16	3.25	3.00	3.42	4.45	5.60	6.62	7.46	7.67
		RadStd	0.42	0.46	0.43	0.43	0.32	0.28	0.20	0.25	0.34	0.49	0.39	0.42

Historical Trends

	DBAvg	Heating		Cooling			Degree-Days				
		99% DB	99% DP	1% DB	1% WB	1% DP	HDD10.0	HDD18.3	CDD10.0	CDD18.3	
Station Only	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Regional (0 neighbors)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	

CDDn	Cooling degree-days base n°C, °C-day	Lat	Latitude, °	Period	Years used to calculate the design conditions
CDHn	Cooling degree-hours base n°C, °C-hour	Long	Longitude, °	Sd	Standard deviation of daily average temperature, °C
DB	Dry bulb temperature, °C	MCDB	Mean coincident dry bulb temperature, °C	StdP	Standard pressure at station elevation, kPa
DP	Dew point temperature, °C	MCDBR	Mean coincident dry bulb temp. range, °C	taub	Clear sky optical depth for beam irradiance
Ebn,noon Edh,noon	Clear sky beam normal and diffuse horizontal irradiances at solar noon, W/m2	MCDP	Mean coincident dew point temperature, °C	taud	Clear sky optical depth for diffuse irradiance
		MCWB	Mean coincident wet bulb temperature, °C	Tavg	Average temperature, °C
Elev	Elevation, m	MCWBR	Mean coincident wet bulb temp. range, °C	Time Zone	Hours ahead or behind UTC
Enth	Enthalpy, kJ/kg	MCWS	Mean coincident wind speed, m/s	WB	Wet bulb temperature, °C
HDDn	Heating degree-days base n°C, °C-day	MDBR	Mean dry bulb temp. range, °C	Hours 8/4 & 12.8/20.6	Number of hours between 8 a.m. and 4 p.m with DB between 12.8 and 20.6 °C
PCWD	Prevailing coincident wind direction, °,0 = North, 90 = East	WS	Wind speed, m/s	HR	Humidity ratio, g of moisture per kg of dry air