

2021 ASHRAE Handbook - Fundamentals (SI)																	
EL CALAFATE LAGO ARGENTINO, ARGENTINA (WMO: 879030)																	
Lat: 50.336S			Long: 72.249W			Elev: 220		StdP: 98.71			Time zone: -3.00 (W03)			Period: 91-00		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			
6	-6.6	-5.3	-13.3	1.2	8.6	-11.7	1.4	7.6	11.9	5.1	10.4	3.7	0.9	N/A	0.708		
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	8.9	22.2	11.9	20.7	10.7	19.2	10.0	12.9	20.3	11.8	18.7	11.0	17.6	5.7	N/A		
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			
9.5	7.6	14.3	8.1	6.9	14.1	6.9	6.3	13.6	37.2	20.7	34.4	18.7	32.2	17.6	19.1		
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		
14.6	12.2	10.5	DB	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
			WB	-10.7	16.0	1.4	1.5	-11.8	17.1	-12.6	18.0	-13.4	18.8	-14.4	19.9		
Monthly Climatic Design Conditions																	
		Annual	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec			
Temperatures, Degree-Days and Degree-Hours	DBAvg	7.6	13.4	12.8	11.1	8.3	4.5	0.5	0.7	3.1	5.2	8.4	10.9	12.1			
	DBStd	5.36	2.65	2.96	2.76	2.96	3.07	3.12	3.58	2.94	3.15	2.90	2.65	2.73			
	HDD10.0	1298	3	7	19	67	172	284	289	214	147	65	21	10			
	HDD18.3	3938	155	156	223	301	429	534	547	473	395	307	224	193			
	CDD10.0	406	107	85	54	17	1	0	0	0	2	16	47	76			
	CDD18.3	2	1	1	0	0	0	0	0	0	0	0	0	1			
	CDH23.3	14	4	6	1	0	0	0	0	0	0	0	1	3			
	CDH26.7	0	0	0	0	0	0	0	0	0	0	0	0	0			
Wind		WSAvg	3.4	5.2	4.3	2.9	2.4	1.9	1.3	2.2	3.0	3.5	4.4	4.9	5.1		
Precipitation	PrecAvg	200	12	9	14	26	30	22	28	20	17	13	9	13			
	PrecMax	364	58	32	41	82	75	78	77	47	42	37	36	82			
	PrecMin	59	0	0	0	5	0	0	0	0	0	0	0	0			
	PrecStd	86	12	8	12	21	21	19	18	13	12	11	9	17			
Monthly Design Dry Bulb and Mean Coincident Wet Bulb Temperatures	0.4%	DB	23.8	24.1	22.5	18.6	14.3	10.2	11.6	12.7	16.2	18.6	21.1	23.6			
		MCWB	12.6	13.6	12.6	10.3	7.5	5.2	5.6	5.2	7.3	8.8	10.3	12.7			
	2%	DB	21.7	22.0	19.8	16.3	11.8	8.2	9.7	10.9	13.4	16.7	19.2	21.1			
		MCWB	11.3	12.2	10.7	9.1	6.3	3.9	4.5	4.9	5.7	7.8	9.6	10.5			
	5%	DB	20.2	20.0	17.9	15.0	10.4	6.7	7.9	9.3	11.9	15.2	17.8	19.1			
		MCWB	10.3	11.1	9.7	8.3	5.3	2.8	3.3	3.9	5.1	7.0	8.8	9.9			
	10%	DB	18.7	18.2	16.3	13.3	9.0	5.1	6.0	7.9	10.5	14.0	16.4	17.6			
		MCWB	9.4	9.8	8.9	7.2	4.6	1.8	2.4	3.0	4.4	6.7	8.0	8.8			
Monthly Design Wet Bulb and Mean Coincident Dry Bulb Temperatures	0.4%	WB	14.0	14.5	13.3	12.6	8.3	5.7	6.3	6.6	7.6	10.3	13.0	13.8			
		MCDB	21.9	21.7	20.5	16.4	12.4	9.3	10.6	11.2	14.4	15.9	18.6	21.4			
	2%	WB	12.1	12.8	11.8	9.9	7.0	4.3	4.7	5.2	6.4	8.7	10.7	12.0			
		MCDB	19.8	20.4	17.3	15.2	10.5	7.7	8.8	9.7	12.5	14.6	17.1	19.3			
	5%	WB	11.1	11.5	10.8	8.7	6.1	3.1	3.7	4.3	5.5	7.9	9.6	10.7			
		MCDB	18.8	18.5	16.2	13.6	9.3	6.1	7.2	8.5	11.0	13.8	16.4	17.4			
	10%	WB	10.2	10.5	9.8	7.7	5.2	2.1	2.6	3.4	4.6	7.1	8.7	9.6			
		MCDB	17.8	17.1	15.3	12.4	8.2	4.7	5.9	7.4	9.7	13.1	15.4	16.1			

Mean Daily Temperature Range		MDBR	8.9	8.9	8.5	7.8	6.3	5.5	5.7	6.7	7.7	8.8	9.5	9.0
	5% DB	MCDBR	10.8	10.8	10.5	9.7	8.1	7.2	7.7	8.5	9.8	10.6	11.2	10.8
		MCWBR	5.6	5.8	5.9	5.9	5.1	4.7	5.1	4.9	5.5	5.8	6.4	5.7
	5% WB	MCDBR	9.9	9.9	9.1	8.7	7.4	6.8	7.4	8.1	9.3	9.5	10.3	9.4
		MCWBR	5.7	5.9	5.7	6.3	5.2	4.8	5.2	5.3	5.5	5.8	6.4	5.7
Clear Sky Solar Irradiance	taub		0.308	0.306	0.293	0.281	0.259	0.245	0.249	0.266	0.287	0.299	0.300	0.310
	taud		2.553	2.569	2.599	2.595	2.525	2.397	2.385	2.419	2.463	2.517	2.542	2.527
	Ebn at noon		1004	974	933	854	773	717	761	847	918	970	1007	1010
	Edn at noon		101	93	79	64	51	49	56	73	88	97	102	106
All-Sky Solar Radiation	RadAvg		5.83	4.91	3.40	2.06	1.18	0.83	1.02	1.75	2.98	4.25	5.47	5.97
	RadStd		0.37	0.28	0.19	0.13	0.11	0.07	0.09	0.18	0.23	0.25	0.30	0.37
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	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
Edh,noon		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