 © 2013 ASHRAE, Inc.

BREST, France

WMO#: **071100**

Lat: **48.45N** Long: **4.42W** Elev: **99** StdP: **100.14** Time Zone: **1.00 (EUW)** Period: **86-10** WBAN: **99999**

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)	
(1)	2	-2.0	-0.6	-5.7	2.4	-0.3	-3.9	2.8	1.0	13.4	9.6	12.3	9.3	3.0	80	(1)

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)	
(2)	8	7.3	25.7	18.9	23.5	18.0	21.8	17.2	19.9	24.3	18.8	21.9	17.9	20.3	3.8	50	(2)

	Dehumidification DP/MCDB and HR									Enthalpy/MCDB						Hours 8 to 4 & 12.8/20.6	
	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)	
(3)	18.4	13.4	21.1	17.8	12.9	20.0	17.0	12.3	18.9	57.2	24.5	53.6	21.9	50.9	20.1	1407	(3)

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)	
(4)	11.4	10.1	9.0	25.3	-4.2	29.1	2.0	2.5	-5.7	30.8	-6.8	32.3	-8.0	33.7	-9.4	35.4	(4)

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		11.4	6.8	6.7	8.4	9.5	12.7	14.9	16.6	16.8	15.1	12.6	9.4	7.2	(5)
(6)		Sd			3.26	3.11	2.57	2.48	2.75	2.37	2.08	2.10	2.29	2.59	2.69	3.22	(6)
(7)		HDD10.0		448	104	95	62	37	6	0	0	0	0	7	42	96	(7)
(8)		HDD18.3		2554	358	324	308	265	177	108	64	57	102	178	269	345	(8)
(9)		CDD10.0		964	4	4	12	22	88	146	204	212	152	88	23	9	(9)
(10)		CDD18.3		28	0	0	0	0	2	4	9	10	3	0	0	0	(10)
(11)		CDH23.3		200	0	0	0	1	16	38	71	58	17	0	0	0	(11)
(12)		CDH26.7		35	0	0	0	0	1	6	12	14	2	0	0	0	(12)
(13)	Precipitation	PrecAvg		1110	138	108	105	72	76	54	46	59	80	110	121	140	(13)
(14)		PrecMax		1706	248	230	177	191	161	120	102	163	163	216	263	331	(14)
(15)		PrecMin		778	19	10	16	5	21	2	10	10	27	10	33	43	(15)
(16)		PrecSD		196.3	54.5	62.7	46.9	42.3	34.0	31.5	25.2	36.9	40.0	64.3	57.7	71.5	(16)
(17)	Monthly Design Dry Bulb and Mean Coincident Wet Bulb Temperatures	0.4%	DB		13.1	14.1	18.5	21.1	25.4	27.5	28.2	28.2	25.4	21.0	16.0	13.8	(17)
(18)			MCWB		11.7	11.1	12.5	14.3	17.7	19.7	20.2	20.5	19.4	17.2	14.4	12.8	(18)
(19)		2%	DB		12.2	12.3	14.9	17.2	22.2	23.8	25.2	24.5	22.8	18.8	14.7	13.1	(19)
(20)			MCWB		11.3	10.7	11.1	12.5	16.4	17.7	18.9	19.2	17.8	15.9	13.4	12.2	(20)
(21)		5%	DB		11.8	11.7	13.0	14.9	19.9	21.2	22.8	22.2	20.6	17.2	14.0	12.6	(21)
(22)			MCWB		11.0	10.5	10.6	11.4	15.2	16.5	17.9	18.1	16.7	15.2	12.9	11.6	(22)
(23)		10%	DB		11.1	11.0	11.9	13.3	17.3	19.3	20.5	20.7	18.9	16.2	13.2	11.9	(23)
(24)			MCWB		10.2	10.1	10.3	10.7	14.0	15.4	16.8	17.2	16.0	14.7	12.2	11.0	(24)
(25)	Monthly Design Wet Bulb and Mean Coincident Dry Bulb Temperatures	0.4%	WB		12.2	12.1	13.4	14.9	18.9	20.5	21.0	21.6	20.5	17.8	15.0	13.2	(25)
(26)			MCDB		12.5	13.1	17.3	18.9	23.7	26.0	26.1	26.0	24.5	19.9	15.6	13.5	(26)
(27)		2%	WB		11.8	11.4	12.1	13.1	16.6	18.5	19.5	19.7	18.7	16.7	13.9	12.6	(27)
(28)			MCDB		12.1	12.0	13.5	16.1	21.1	22.4	24.2	23.4	20.8	17.9	14.4	13.0	(28)
(29)		5%	WB		11.2	10.9	11.3	12.1	15.4	17.0	18.3	18.7	17.7	15.8	13.2	11.9	(29)
(30)			MCDB		11.6	11.4	12.4	14.1	19.2	20.4	21.4	21.2	19.2	16.8	13.7	12.4	(30)
(31)		10%	WB		10.5	10.2	10.7	11.4	14.2	15.9	17.3	17.9	16.8	15.1	12.5	11.1	(31)
(32)			MCDB		11.1	10.9	11.6	13.0	16.9	18.4	19.6	19.8	18.3	16.0	13.2	11.8	(32)
(33)	Mean Daily Temperature Range		MDBR		4.8	5.3	6.0	6.7	7.2	7.2	7.0	7.3	7.4	6.0	5.3	5.0	(33)
(34)		5% DB	MCDBR		4.4	5.3	7.9	9.8	11.7	11.3	11.5	10.3	10.1	7.0	5.3	4.0	(34)
(35)			MCWBR		4.3	4.5	5.3	6.0	6.8	6.2	6.1	5.6	5.8	4.8	4.4	4.1	(35)
(36)		5% WB	MCDBR		4.0	4.2	6.1	7.7	10.3	9.9	9.7	8.6	8.1	6.0	4.4	4.1	(36)
(37)			MCWBR		4.2	4.2	4.6	5.1	6.3	5.8	5.5	5.2	5.2	4.6	4.3	4.4	(37)
(38)	Clear Sky Solar Irradiance	taub			0.373	0.378	0.390	0.361	0.368	0.342	0.347	0.367	0.370	0.374	0.371	0.357	(38)
(39)		taud			2.478	2.442	2.363	2.370	2.354	2.409	2.436	2.433	2.458	2.468	2.486	2.533	(39)
(40)		Ebn,noon			684	771	820	888	892	917	907	873	834	763	678	658	(40)
(41)		Edh,noon			66	83	103	112	118	113	108	104	93	79	64	56	(41)

Nomenclature: See separate page