ภาคผนวก ค

การแปลงหน่วยและค่าคงที่

Conversion Factors

Acceleration	1 m/s^2	= 4.2520×10^7 ft/h^2
Area	1 m^2	= 1550.0 $in.^2$
		= 10.764 ft^2
Density	1 kg/m^3	= 0.06243 lb_m/ft^3
Energy	1 J (0.2390 cal)	= 9.4787×10^{-4} Btu
Force	1 N	= 0.22481 lb_f
Heat transfer rate	1 W	= 3.4123 Btu/h
Heat flux	1 W/m^2	= 0.3171 Btu/h · ft^2
Heat generation rate	1 W/m^3	= 0.09665 Btu/h · ft^3
Heat transfer coefficient	1 $W/m^2 \cdot K$	= 0.17612 Btu/h · ft^2 · °F
Kinematic viscosity and diffusivities	1 m^2/s	= 3.875×10^4 ft^2/h
Latent heat	1 J/kg	= 4.2995×10^{-4} Btu/lb_m
Length	1 m	= 39.370 in.
		= 3.2808 ft
	1 km	= 0.62137 mile
Mass	1 kg	= 2.2046 lb_m
Mass density	1 kg/m^3	= 0.062428 lb_m/ft^3
Mass flow rate	1 kg/s	= 7936.6 lb_m/h
Mass transfer coefficient	1 m/s	= 1.1811×10^4 ft/h
Power	1 kW	= 3412 Btu/h
		= 1.341 hp
Pressure and stress[1]	1 N/m^2 (1 Pa)	= 0.020886 lb_f/ft^2
		= 1.4504×10^{-4} $lb_f/in.^2$
		= 4.015×10^{-3} in. water
		= 2.953×10^{-4} in. Hg
	1.0133×10^5 N/m^2	= 1 standard atmosphere
	1×10^5 N/m^2	= 1 bar
Specific heat	1 kJ/kg · K	= 0.2389 Btu/lb_m · °F
Temperature	K	= (5/9)°R
		= (5/9)(°F + 459.67)
		= °C + 273.15
Temperature difference	1 K	= 1°C
		= (9/5)°R = (9/5)°F
Thermal conductivity	1 W/m · K	= 0.57782 Btu/h · ft · °F
Thermal resistance	1 K/W	= 0.52750 °F/h · Btu
Viscosity (dynamic)[2]	1 $N \cdot s/m^2$	= 2419.1 $lb_m/ft \cdot h$
		= 5.8016×10^{-6} $lb_f \cdot h/ft^2$
Volume	1 m^3	= 6.1023×10^4 $in.^3$
		= 35.314 ft^3
		= 264.17 gal
Volume flow rate	1 m^3/s	= 1.2713×10^5 ft^3/h
		= 2.1189×10^3 ft^3/min
		= 1.5850×10^4 gal/min

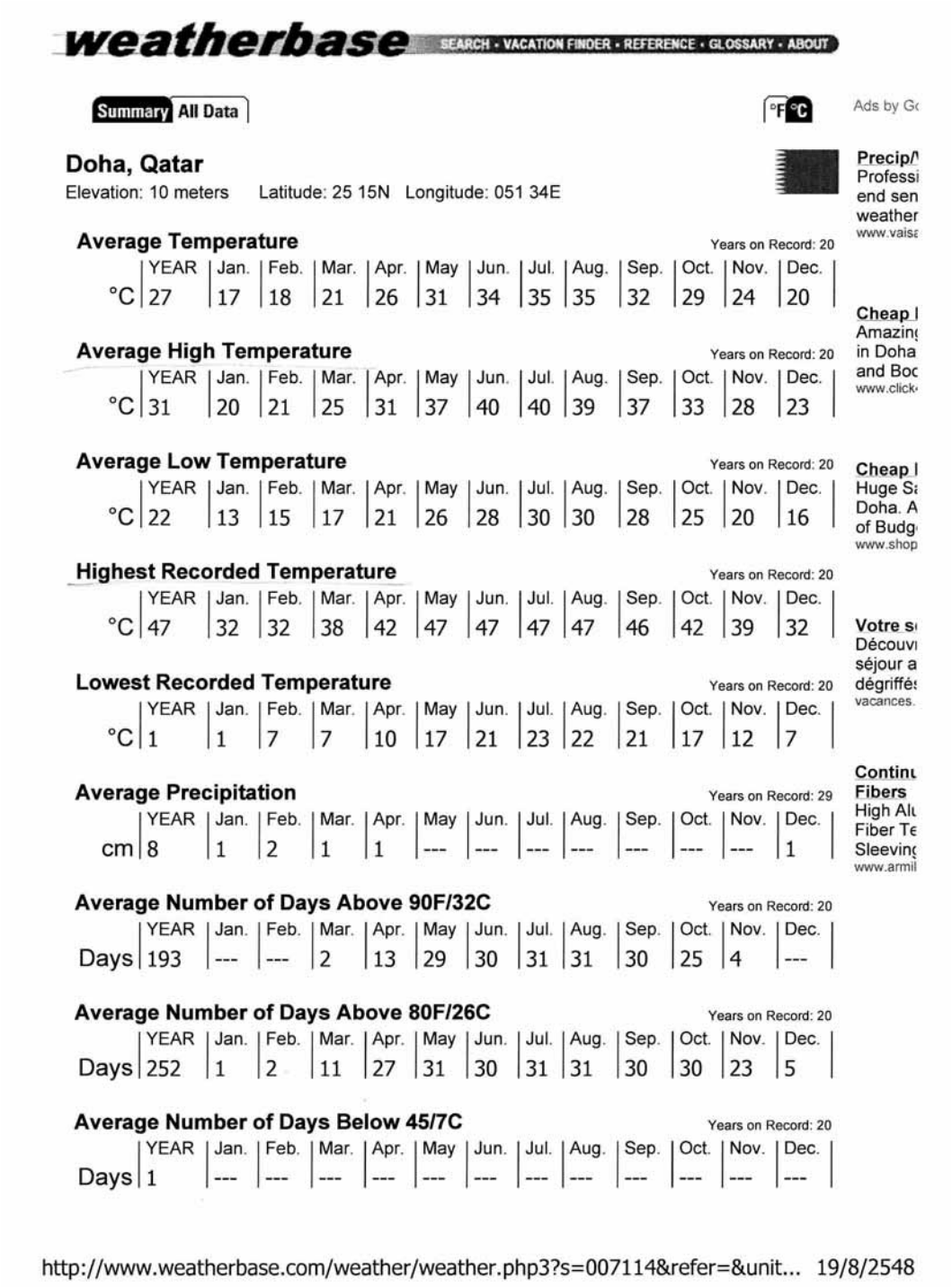
[1] The SI name for the quantity pressure is pascal (Pa) having units N/m^2 or $kg/m \cdot s^2$.
[2] Also expressed in equivalent units of kg/s · m.

ที่มา: Frank (2002)

Thermophysical Properties of Gases at Atmospheric Pressure

T (K)	ρ (kg/m^3)	c_p (kJ/kg · K)	$\mu \cdot 10^7$ (N · s/m^2)	$\nu \cdot 10^6$ (m^2/s)	$k \cdot 10^3$ (W/m · K)	$\alpha \cdot 10^6$ (m^2/s)	Pr
Air							
100	3.5562	1.032	71.1	2.00	9.34	2.54	0.786
150	2.3364	1.012	103.4	4.426	13.8	5.84	0.758
200	1.7458	1.007	132.5	7.590	18.1	10.3	0.737
250	1.3947	1.006	159.6	11.44	22.3	15.9	0.720
300	1.1614	1.007	184.6	15.89	26.3	22.5	0.707
350	0.9950	1.009	208.2	20.92	30.0	29.9	0.700
400	0.8711	1.014	230.1	26.41	33.8	38.3	0.690
450	0.7740	1.021	250.7	32.39	37.3	47.2	0.686
500	0.6964	1.030	270.1	38.79	40.7	56.7	0.684
550	0.6329	1.040	288.4	45.57	43.9	66.7	0.683
600	0.5804	1.051	305.8	52.69	46.9	76.9	0.685
650	0.5356	1.063	322.5	60.21	49.7	87.3	0.690
700	0.4975	1.075	338.8	68,10	52.4	98.0	0.695
750	0.4643	1.087	354.6	76.37	54.9	109	0.702
800	0.4354	1.099	369.8	84.93	57.3	120	0.709
850	0.4097	1.110	384.3	93.80	59.6	131	0.716
900	0.3868	1.121	398.1	102.9	62.0	143	0.720
950	0.3666	1.131	411.3	112.2	64.3	155	0.723
1000	0.3482	1.141	424.4	121.9	66.7	168	0.726
1100	0.3166	1.159	449.0	141.8	71.5	195	0.728
1200	0.2902	1.175	473.0	162.9	76.3	224	0.728
1300	0.2679	1.189	496.0	185.1	82	238	0.719
1400	0.2488	1.207	530	213	91	303	0.703
1500	0.2322	1.230	557	240	100	350	0.685
1600	0.2177	1.248	584	268	106	390	0.688
1700	0.2049	1.267	611	298	113	435	0.685
1800	0.1935	1.286	637	329	120	482	0.683
1900	0.1833	1.307	663	362	128	534	0.677
2000	0.1741	1.337	689	396	137	589	0.672
2100	0.1658	1.372	715	431	147	646	0.667
2200	0.1582	1.417	740	468	160	714	0.655
2300	0.1513	1.478	766	506	175	783	0.647
2400	0.1448	1.558	792	547	196	869	0.630
2500	0.1389	1.665	818	589	222	960	0.613
3000	0.1135	2.726	955	841	486	1570	0.536
Ammonia (NH_3)							
300	0.6894	2.158	101.5	14.7	24.7	16.6	0.887
320	0.6448	2.170	109	16.9	27.2	19.4	0.870
340	0.6059	2.192	116.5	19.2	29.3	22.1	0.872
360	0.5716	2.221	124	21.7	31.6	24.9	0.872
380	0.5410	2.254	131	24.2	34.0	27.9	0.869

ที่มา: Frank (2002)



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Summary | All Data

°F °C

Ads by Go

Doha, Qatar

Elevation: 10 meters Latitude: 25 15N Longitude: 051 34E

Average Temperature

Years on Record: 20

	YEAR	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
°C	27	17	18	21	26	31	34	35	35	32	29	24	20

Average High Temperature

Years on Record: 20

	YEAR	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
°C	31	20	21	25	31	37	40	40	39	37	33	28	23

Average Low Temperature

Years on Record: 20

	YEAR	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
°C	22	13	15	17	21	26	28	30	30	28	25	20	16

Highest Recorded Temperature

Years on Record: 20

	YEAR	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
°C	47	32	32	38	42	47	47	47	47	46	42	39	32

Lowest Recorded Temperature

Years on Record: 20

	YEAR	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
°C	1	1	7	7	10	17	21	23	22	21	17	12	7

Average Precipitation

Years on Record: 29

	YEAR	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
cm	8	1	2	1	1	---	---	---	---	---	---	---	1

Average Number of Days Above 90F/32C

Years on Record: 20

	YEAR	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Days	193	---	---	2	13	29	30	31	31	30	25	4	---

Average Number of Days Above 80F/26C

Years on Record: 20

	YEAR	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Days	252	1	2	11	27	31	30	31	31	30	30	23	5

Average Number of Days Below 45/7C

Years on Record: 20

	YEAR	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Days	1	---	---	---	---	---	---	---	---	---	---	---	---

http://www.weatherbase.com/weather/weather.php3?s=007114&refer=&unit... 19/8/2548

ที่มา: www.weatherbase.com

ประวัติการศึกษาและการทำงาน

ชื่อ –นามสกุล	นางสาวอารีรัตน์ จำปาน้อย
วัน เดือน ปี เกิด	20 กรกฎาคม พ.ศ. 2518
สถานที่เกิด	จังหวัดปทุมธานี
ประวัติการศึกษา	วศ.บ. (วิศวกรรมไฟฟ้า) มหาวิทยาลัยรังสิต
ตำแหน่งหน้าที่การงานปัจจุบัน	วิศวกรไฟฟ้าอาวุโส ฝ่ายออกแบบงานระบบไฟฟ้า
สถานที่ทำงานปัจจุบัน	บริษัท เอ็ม เอ เอ คอนซัลแตนท์ จำกัด