

Università degli Studi di Genova

DIPARTIMENTO DI TERMOENERGETICA E CONDIZIONAMENTO AMBIENTALE

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	Dati fondamentali - (T=300K, p=1bar)										
	massa molecolare	R_1	C _v	c_p	Press. crit.	Temp. crit.					
	[kg/kmol]	[J/kgK]	[J/kgK]	[J/kgK]	[bar]	[K]					
Azoto	28.01	296.8	743	1039	33.9	126					
Idrogeno	2.018	4124	10183	14307	12.9	33.2					
CO	28.01	296.8	744	1040	35	133					
	32.00	259.8	658	918	50.5	154					
Ossigeno											
Aria	28.97	287	718	1005	37.7	133					
CO_2	44.01	188.9	657	846	73.9	304					
Vapor acqueo	18.02	461.8	1440	1900	220.9	647					
(p=p _{sat})		Enorgio	l interna gas perfetti	u [l: I/l: a]							
mrvr.		1		1		90					
T[K]	Azoto	Idrogeno	CO	Ossigeno	Aria	CO ₂					
260 300	193.0 222.7	2611.8 3012.5	193.0 222.7	169.3 195.5	185.5 214.5	131.5 156.9					
400	296.9	4052.0	298.4	262.3	287.0	227.9					
500	371.9	5101.5	373.5	332.0	361.0	307.1					
600	446.8	6150.5	449.9	405.3	436.3	392.9					
700 800	526.4 608.9	7200.0 8271.5	530.9 614.8	480.2 558.8	513.1 592.8	484.3 580.6					
900	692.8	9343.5	698.6	638.8	675.3	680.7					
1000	780.4	10433.0	787.2	721.4	759.4	783.5					
1200	958.1	12659.0	968.5	890.7	936.1	997.9					
1400	1142.5	14967.5	1157.3	1063.8	1115.8	1219.9					
1600 1800	1332.8 1526.2	17361.0 19857.0	1349.2 1544.1	1240.7 1421.7	1298.0 1489.4	1447.7 1679.2					
2000	1722.4	22418.5	1743.3	1604.0	1679.2	1914.1					
2200	1920.3	25039.5	1945.7	1788.7	1873.3	2152.5					
2400	2121.1	27725.5	2147.9	1977.7	2068.7	2392.0					
2600	2323.3	30474.0	2350.3	2169.0	2265.9	2634.8					
2800 3000	2527.1 2732.4	33287.5 36139.0	2552.5 2761.0	2363.0 2558.1	2496.0 2668.6	2877.7 3122.9					
	_,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		alpia gas perfetti h [0.110					
T[K]	Azoto	Idrogeno	СО	Ossigeno	Aria	CO_2					
260	270.2	3684.0	270.2	236.9	260.1	180.6					
300	311.8	4259.6	311.8	273.4	300.6	213.6					
400	415.7	5714.8	417.1	366.2	401.8	303.5					
500 600	520.4 625.0	7180.0 8644.7	522.0 628.0	461.9 561.2	504.5 608.5	401.6 506.2					
700	734.3	10109.9	738.7	662.0	714.0	616.6					
800	846.4	11597.1	852.3	766.7	822.4	731.8					
900	960.0	13084.4	965.9	872.6	933.5	850.8					
1000	1077.3	14590.0	1084.1	981.3	1046.4	972.5					
1200 1400	1314.5 1558.2	17647.4 20787.3	1324.8 1573.0	1202.5 1427.5	1280.5 1517.6	1224.7 1484.4					
1600	1807.8	24012.2	1824.3	1656.4	1757.1	1750.0					
1800	2060.7	27339.6	2078.5	1889.4	2006.0	2019.3					
2000	2316.3	30732.5	2337.1	2123.6	2253.2	2292.0					
2200	2573.6	34184.9	2598.9	2360.3	2504.7	2568.2					
2400 2600	2833.7 3095.3	37702.3 41282.2	2860.5 3122.3	2601.2 2844.5	2757.5 3012.1	2845.4 3126.1					
2800	3358.5	44927.1	3383.9	3090.4	3299.6	3406.8					
3000	3623.2	48610.0	3651.8	3337.5	3529.5	3689.8					
		 	fetti alla pressione d	1							
T[K]	Azoto	Idrogeno	CO	Ossigeno	Aria	CO ₂					
260 300	6.7036 6.8536	65.4000 65.4500	6.3214 7.0714	6.2906 6.4219	6.7276 6.8726	4.7477 4.8650					
400	6.8536 7.1536	65.4500	7.0714	6.6906	6.8726 7.1626	4.8659 5.1227					
500	7.3893	72.9000	7.6071	6.9031	7.3904	5.3409					
600	7.5857	75.6500	7.7964	7.0844	7.5803	5.5318					
700	7.7500	77.8500	7.9714	7.2313	7.7459	5.7045					
800 900	7.8929 8.0321	79.8500 81.5500	8.1214 8.2571	7.3781 7.5031	7.8909 8.0221	5.8591 5.9977					
1000	8.1536	83.1500	8.3821	7.6188	8.1395	6.1273					
1200	8.3714	85.9500	8.6036	7.8188	8.3500	6.3568					
1400	8.5571	88.3500	8.7929	7.9938	8.5330	6.5568					
1600	8.7250	90.5500	8.9607	8.1469	8.6952	6.7341					
1800	8.8714	92.5000	9.1107	8.2313	8.8402	6.8932					
2000 2200	9.0071 9.1321	94.2500 95.9000	9.2464 9.3714	8.4063 8.5188	8.9713 9.0922	7.0364 7.1682					
2400	9.2429	97.4500	9.4857	8.6219	9.2026	7.1082					
2600	9.3664	98.9000	9.5893	8.7219	9.3027	7.4000					
2800	9.4464	100.2500	9.6857	8.8125	9.3959	7.5045					
3000	9.5393	101.5000	9.7786	8.8969	9.4891	7.6023					

Dai valori dell'entropia di riferimento si deducono quelli per p qualunque aggiungendo -R1 $log_n(p)$, p espressa in bar $s = s_r - R1 \ log_n(p)$

DITEC	PROPRIETA' TERMODINAMICHE DELL'ACQUA (liquido e vapore) ALLA SATURAZIONE	TAB. 2A
DITEC	TROTRIETA TERMODINAMICTE DELL'ACQUA (figuido e vapore) ALLA SATURAZIONE	IAD. 2

t	p	volume	specifico	m³/kg	Entalpia		kJ/kg	Entropia		kJ/kg K	t
°C	bar	\mathbf{v}_{l}	(v_v-v_l)	$v_{\rm v}$	h_1	r	$h_{\rm v}$	s_1	r/T	S _v	°C
0 0.01	0.006 017 0.006 112	0.001 000 2 0.001 000 2	206.298 206.162	206.299 206.163	-0.0 +0.0	2501.6 2501.6	2501.6 2501.6	-0.0 0	9.1578 9.1575	9.1578 9.1575	0 0.01
2	0.006 112	0.001 000 2	179.922	179.923	8.4	2496.8	2505.2	0.0306	9.0741	9.1373	2
4	0.008 129 0.009 345	0.001 000 0	157.271	157.272	16.8	2492.1	2508.9	0.0611	8.9915 8.9102	9.0526	4
6 8	0.009 343 0.010 720	0.001 000 0 0.001 000 1	137.779 120.965	137.780 120.966	25.2 33.6	2487.4 2482.6	2512.6 2516.2	0.0913 0.1213	8.9102 8.8300	9.0015 8.9513	6 8
10	0.012 270	0.001 000 3	106.429	106.430	42.0	2477.9	2519.9	0.1510	8.7510	8.9020	10
12	0.014 014	0.001 000 4	93.834	93.835	50.4	2473.2	2523.6	0.1805	8.6731	8.8536	12
14 15	0.015 973 0.017 139	0.001 000 7 0.001 000 8	82.899 77.977	82.900 77.978	58.8 62.9	2468.5 2466.1	2527.2 2529.1	0.2098 0.2243	8.5963 8.5582	8.8060 8.7826	14 15
16	0.018 168	0.001 001 0	73.383	73.384	67.1	2463.8	2530.9	0.2388	8.5205	8.7593	16
18	0.020 624 0.023 366	0.001 001 3 0.001 001 7	65.086	65.087	75.5 83.9	2459.0	2534.5	0.2677	8.4458	8.7135 8.6684	18
20 25	0.023 366 0.031 660	0.001 001 7	57.837 43.401	57.838 43.402	83.9 104.8	2454.3 2442.5	2538.2 2547.3	0.2963 0.3670	8.3721 8.1922	8.5592	20 25
30	0.042 415	0.001 004 3	32.928	32.929	125.7	2430.7	2556.4	0.4365	8.0181	8.4546	30
35 40	0.056 216 0.073 750	0.001 006 0 0.001 007 8	25.244 19.545	25.245 19.546	146.6 167.5	2418.8 2406.9	2565.4 2574.4	0.5049 0.5721	7.8495 7.6861	8.3543 8.2583	35 40
45	0.095 820	0.001 009 9	15.275	15.276	188.4	2394.9	2583.3	0.6383	7.5277	8.1661	45
50 55	0.123 35 0.157 41	0.001 012 0 0.001 014 5	12.045 9.577 9	12.046 9.578 9	209.3 230.2	2382.9 2370.8	2592.2 2601.0	0.7035 0.7677	7.3741 7.2248	8.0776 7.9925	50 55
60	0.137 41	0.001 014 3	7.677 5	7.678 5	251.1	2370.8	2609.7	0.8310	7.0798	7.9108	60
65 70	0.250 09 0.311 62	0.001 019 9 0.001 022 8	6.201 3	6.202 3	272.0 293.0	2346.3 2334.0	2618.4	0.8933 0.9548	6.9388 6.8017	7.8321	65 70
75 75	0.311 62	0.001 022 8	5.045 3 4.133 1	5.046 3 4.134 1	313.9	2334.0	2626.9 2635.4	1.0154	6.6681	7.7565 7.6835	70 75
80	0.473 60 0.578 03	0.001 029 2	3.408 1	3.409 1	344.9	2308.8	2643.8	1.0753	6.5380	7.6133 7.5454	80
85 90	0.378 03	0.001 032 6 0.001 036 1	2.827 8 2.360 3	2.828 8 2.361 3	355.9 376.9	2296.1 2283.2	2652.0 2660.1	1.1343 1.1925	6.4111 6.2873	7.3434	85 90
95	0.845 26	0.001 039 9	1.981 2	1.982 2	398.0	2270.2	2668.1	1.2501	6.1665	7.4166	95
100 105	1.013 25 1.208 0	0.001 043 7 0.001 047 7	1.672 0 1.418 3	1.673 0 1.419 3	419.1 440.2	2256.9 2243.6	2676.0 2683.7	1.3069 1.3630	6.0485 5.9331	7.3554 7.2962	100 105
110	1.432 7	0.001 051 9	1.208 9	1.209 9	461.3	2230.0	2691.3	1.4185	5.8203	7.2388	110
115 120	1.690 6 1.985 4	0.001 056 2 0.001 060 6	1.035 3 0.890 46	1.036 3 0.891 52	482.5 503.7	2216.2 2202.2	2698.7 2706.0	1.4733 1.5276	5.7099 5.6017	7.1832 7.1293	115 120
125	2.321 0	0.001 060 0	0.769 17	0.891 32 0.770 23	525.0	2188.0	2713.0	1.5813	5.4957	7.0769	125
130 135	2.701 3 3.130 8	0.001 070 0 0.001 075 0	0.667 07 0.580 74	0.668 14 0.581 81	546.3 567.7	2173.6 2158.9	2719.9 2726.6	1.6344 1.6869	5.3917 5.2897	7.0261 6.9766	130 135
140	3.613 8	0.001 073 0	0.507 41	0.508 49	589.1	2144.0	2733.1	1.7390	5.1894	6.9284	140
145	4.155 2	0.001 085 3	0.444 89	0.445 97	610.6	2128.7	2739.3	1.7906	5.0910	6.8815	145
150 155	4.760 0 5.433 3	0.001 090 8 0.001 096 4	0.391 36 0.345 55	0.392 45 0.346 44	632.1 653.8	2113.2 2097.4	2745.4 2751.2	1.8416 1.8923	4.9941 4.8989	6.8358 6.7911	150 155
160	6.180 6	0.001 102 2	0.305 66	0.306 76	675.5	2081.3	2756.7	1.9425	4.8050	6.7473	160
165 170	7.007 7 7.920 2	0.001 108 2 0.001 114 5	0.271 29 0.241 44	0.272 40 0.242 55	697.3 719.1	2064.8 2047.9	2762.0 2767.1	1.9923 2.0416	4.7126 4.6214	6.7048 6.6630	165 170
175	8.924 4	0.001 120 9	0.215 42	0.216 54	741.1	2030.7	2771.8	2.0906	4.5314	6.6221	175
180 185	10.027 11.233	0.001 127 5 0.001 134 4	0.192 67 0.172 63	0.193 80 0.173 86	763.1 785.3	2013.2 1995.2	2776.3 2780.4	2.1393 2.1876	4.4426 4.3548	6.5819 6.5424	180 185
190	12.551	0.001 141 5	0.155 18	0.156 32	807.5	1976.7	2784.3	2.2356	4.2680	6.5036	190
195	13.987	0.001 148 9	0.139 69	0.140 84	829.9	1957.9	2787.8	2.2833	4.1821	6.4654	195
200 205	15.549 17.243	0.001 156 5 0.001 164 4	0.126 01 0.113 87	0.127 16 0.115 03	852.4 875.0	1938.6 1918.8	2790.9 2793.8	2.3307 2.3778	4.0971 4.0128	6.4278 6.3906	200 205
210	19.077 21.060	0.001 172 6	0.103 07 0.093 45	0.104 24 0.094 625	897.7	1898.5	2796.2	2.4247	3.9293	6.3539	210
215 220	23.198	0.001 181 1 0.001 190 0	0.093 45	0.094 623	920.6 943.7	1877.6 1856.2	2798.3 2799.9	2.4713 2.5178	3.8463 3.7639	6.3176 6.2817	215 220
225	25.501 27.976	0.001 199 2 0.001 208 7	0.071 15 0.070 24	0.078 349 0.071 450	966.9 990.3	1834.3 1811.7	2801.2 2802.0	2.5641 2.6102	3.6820 3.6006	6.2461 6.2107	225
230 235	30.632	0.001 208 7	0.064 03	0.071 430 0.064 245	1013.8	1788.5	2802.0	2.6561	3.5194	6.1756	230 235
240	33.478	0.001 229 1	0.058 42	0.059 645	1037.6	1764.6	2802.2	2.7020	3.4386	6.1406	240
245 250	36.523 39.776	0.001 239 9 0.001 251 3	0.051 37 0.048 79	0.054 606 0.050 037	1061.6 1085.8	1740.0 1714.7	2801.6 2800.4	2.7478 2.7935	3.3579 3.2773	6.1057 6.0708	245 250
255	43.246	0.001 263 2	0.048 79	0.045 896	1110.2	1688.5	2798.7	2.8392	3.1968	6.0359	255
260 265	46.943 50.877	0.001 275 6 0.001 288 7	0.040 86 0.037 43	0.042 130 0.038 710	1134.9 1159.9	1661.5 1633.5	2796.4 2793.5	2.8848 2.9306	3.1161 3.0353	6.0010 5.9658	260 265
270	55.058	0.001 302 5	0.034 29	0.035 588	1185.2	1604.6	2789.9	2.9763	2.9541	5.9304	270
275 280	59.496 64.202	0.001 317 0 0.001 332 4	0.031 42 0.028 80	0.032 736 0.030 126	1210.9 1236.8	1574.7 1543.6	2785.5 2780.4	3.0222 3.0683	2.8725 2.7903	5.8947 5.8586	275 280
285	69.186	0.001 348 7	0.026 38	0.027 733	1263.2	1511.3	2774.5	3.1146	2.7074	5.8220	285
290 295	74.461 80.037	0.001 365 9 0.001 384 4	0.024 17 0.022 13	0.025 535 0.023 513	1290.0 1317.3	1477.6 1442.6	2767.6 2759.8	3.1611 3.2079	2.6237 2.5389	5.7848 5.7469	290 295
300	85.927	0.001 304 4	0.022 13	0.023 513	1345.1	1406.0	2751.0	3.2552	2.4529	5.7081	300
305	92.144	0.001 425 2	0.018 41	0.019 927	1373.4	1367.7	2741.1	3.3029	2.3656	5.6685	305
310 315	98.700 105.61	0.001 443 0 0.001 472 6	0.016 88 0.015 09	0.018 334 0.016 856	1402.4 1432.1	1327.6 1285.5	2730.0 2717.6	3.3512 3.4002	2.2766 2.1856	5.6278 5.5858	310 315
320	112.89	0.001 499 5	0.013 98	0.015 480	1462.6	1241.1	2703.7	3.4500	2.0923	5.5423	320
325 330	120.56 128.63	0.001 528 9 0.001 561 5	0.012 67 0.011 43	0.014 195 0.012 989	1494.0 1526.5	1194.0 1143.6	2688.0 2670.2	3.5008 3.5528	1.9961 1.8962	5.4969 5.4490	325 330
335	137.12	0.001 597 8	0.010 26	0.011 854	1560.3	1089.5	2649.7	3.6063	1.7916	5.3979	335
340 345	146.05 155.45	0.001 638 7 0.001 685 8	0.009 14 0.008 07	0.010 780 0.009 763	1595.5 1632.5	1030.7 966.4	2626.2 2598.9	3.6616 3.7193	1.6811 1.5636	5.3427 5.2828	340 345
350	165.35	0.001 741 1	0.007 06	0.008 799	1671.9	895.7	2567.7	3.7800	1.4376	5.2177	350
355	175.77	0.001 808 5	0.006 05	0.007 859	1716.6	813.8	2530.4	3.8489	1.2953	5.1442	355
360 365	186.75 198.33	0.001 895 9 0.002 016 0	0.005 04 0.003 99	0.006 939 0.006 011	1764.2 1818.0	721.3 610.0	2485.4 2428.0	3.9210 4.0021	1.1390 0.9558	5.060 4.9579	360 365
370	210.54	0.002 213 6	0.002 76	0.004 972	1890.2	452.6	2342.8	4.1108	0.7036	4.8144	370
374 374.15	220.81 221.20	0.002 842 7 0.003 17	0.000 63 0	0.003 465 0.003 17	2046.7 2107.4	109.5 0	2156.2 2107.4	4.3493 4.4429	0.1692 0	4.5185 4.4429	374 374.15
									-		

p	t	Volume spec	ifico m³/kg	Е	ntalpia kJ/k	g	Energia in	terna kJ/kg	En	tropia kJ/kg	g K	p
bar	°C	\mathbf{v}_{l}	$v_{\rm v}$	h_l	r	h_{v}	u_l	$u_{\rm v}$	s_1	r/T	s_v	bar
0.006 02	0	0.001 000 2	206.298 7	-0.0	2501.6	2501.6	-0.0	2375.6	-0.0	9.1578	9.1578	0.006 02
0.006 11	0.01	0.001 000 2	206.162 9	+0.0	2501.6	2501.6	0	2375.6	0	9.1575	9.1575	0.006 11
0.010	6.98	0.001 000 1	129.210 7	29.3	2485.0	2514.4	29.3	2385.2	0.1060	8.8706	8.9767	0.010
0.020	17.51	0.001 001 2	67.011 6	73.5	2460.2	2533.6	73.5	2399.6	0.2606	8.4640	8.7246	0.020
0.030	24.10	0.001 002 7	45.670 0	101.0	2444.6	2545.6	101.0	2408.6	0.3543	8.2242	8.5785	0.030
0.040	28.98	0.001 004 0	34.803 3	121.4	2433.1	2554.5	121.4	2415.3	0.4225	8.0530	8.4755	0.040
0.050	32.90	0.001 005 2	28.194 5	137.8	2423.8	2561.6	137.8	2420.6	0.4763	7.9197	8.3960	0.050
0.060	36.18	0.001 006 4	23.740 6	151.5	2416.0	2567.5	151.5	2425.1	0.5209	7.8103	8.3312	0.060
0.070	39.03	0.001 007 4	20.530 4	163.4	2409.2	2572.6	163.4	2428.9	0.5591	7.7176	8.2767	0.070
0.080	41.54	0.001 008 4	18.103 8	173.9	2403.2	2577.1	173.9	2432.3	0.5926	7.6370	8.2295	0.080
0.090	43.79	0.001 009 4	16.203 4	183.3	2397.9	2581.1	183.3	2435.3	0.6224	7.5657	8.1881	0.090
0.10	45.83	0.001 010 2	14.673 7	191.8	2392.9	2584.8	191.8	2438.1	0.6493	7.5018	8.1511	0.10
0.15	54.00	0.001 014 0	10.022 1	226.0	2373.2	2599.2	226.0	2448.9	0.7549	7.2544	8.0093	0.15
0.20	60.09	0.001 017 2	7.649 2	251.5	2358.4	2609.9	251.5	2456.9	0.8321	7.0773	7.9094	0.20
0.25	64.99	0.001 019 9	6.204 0	272.0	2346.4	2618.3	272.0	2463.2	0.8933	6.9390	7.8323	0.25
0.30	69.13	0.001 022 3	5.229 0	289.3	2336.1	2625.4	289.6	2468.2	0.9441	6.8254	7.7695	0.30
0.35	72.71	0.001 024 5	4.525 5	304.3	2327.2	2631.5	304.3	2473.1	0.9878	6.7288	7.7166	0.35
0.40	75.89	0.001 026 5	3.993 2	317.7	2319.2	2636.9	317.7	2477.2	1.0261	6.6448	7.6709	0.40
0.45	78.74	0.001 028 4	3.576 1	329.6	2312.0	2641.7	329.6	2480.8	1.0603	6.5703	7.6306	0.45
0.50	81.35	0.001 030 1	3.240 1	340.6	2305.4	2646.0	340.5	2484.0	1.0912	6.5035	7.5947	0.50
0.60	85.95	0.001 033 3	2.731 7	359.9	2293.6	2653.6	359.8	2489.7	1.1455	6.3872	7.5327	0.60
0.70	89.96	0.001 036 1	2.364 7	376.8	2283.3	2660.1	376.3	2494.6	1.1921	6.2883	7.4804	0.70
0.80	93.51	0.001 038 7	2.086 9	391.7	2274.0	2665.8	391.6	2498.8	1.2330	6.2022	7.4352	0.80
0.90	96.71	0.001 041 2	1.869 1	405.2	2265.6	2670.9	405.1	2502.7	1.2696	6.1258	7.3954	0.90
1.00	99.63	0.001 043 4	1.693 7	417.5	2257.9	2675.4	417.4	2506.0	1.3027	6.0571	7.3598	1.00
1.013 25	100.00	0.001 043 7	1.673 0	419.1	2256.9	2676.0	419.0	2506.5	1.3069	6.0485	7.3554	1.013 25
1.20	104.81	0.001 047 6	1.428 1	439.4	2244.1	2683.4	439.3	2512.0	1.3609	5.9375	7.2984	1.20
1.40	109.32	0.001 051 3	1.236 3	458.4	2231.9	2690.3	458.3	2517.2	1.4109	5.8356	7.2465	1.40
1.60	113.32	0.001 054 7	1.091 1	475.4	2220.9	2696.2	475.2	2521.6	1.4550	5.7467	7.2017	1.60
1.80	116.93	0.001 057 9	0.977 18	490.7	2210.8	2701.5	490.5	2525.6	1.4944	5.6677	7.1622	1.80
2.00	120.23	0.001 060 8	0.885 40	504.7	2201.6	2706.3	504.5	2529.2	1.5301	5.5967	7.1268	2.00
2.50	127.43	0.001 067 6	0.718 40	535.4	2181.0	2716.4	535.1	2536.8	1.6072	5.4448	7.0520	2.50
3.00	133.54	0.001 073 5	0.605 53	561.4	2163.2	2724.7	561.1	2543.0	1.6717	5.3192	6.9909	3.00
3.50	138.88	0.001 078 9	0.523 97	584.3	2147.3	2731.6	583.9	2548.2	1.7273	5.2118	6.9392	3.50
4.00	143.63	0.001 083 9	0.462 20	604.7	2132.9	2737.6	604.3	2552.7	1.7764	5.1179	6.8943	4.00
4.50	147.92	0.001 088 5	0.413 73	623.2	2119.7	2742.9	622.7	2556.7	1.8204	5.0342	6.8547	4.50
5.00	151.85	0.001 092 8	0.374 66	640.1	2107.4	2747.5	639.6	2560.2	1.8604	4.9588	6.8192	5.00
6.00	158.84	0.001 100 9	0.315 46	670.4	2085.0	2755.5	669.7	2566.2	1.9308	4.8267	6.7575	6.00
7.00	164.96	0.001 108 2	0.272 68	697.1	2064.9	2762.0	696.3	2571.1	1.9918	4.7134	6.7052	7.00
8.00	170.41	0.001 115 0	0.240 26	720.9	2046.5	2767.5	720.0	2575.3	2.0457	4.6139	6.6596	8.00
9.00	175.36	0.001 121 3	0.214 82	742.6	2029.5	2772.1	741.6	2578.8	2.0941	4.5251	6.6192	9.00
10.00	179.88	0.001 127 4	0.194 30	762.6	2013.6	2776.2	761.5	2581.9	2.1382	4.4447	6.5828	10.00
11.00	184.06	0.001 133 1	0.177 39	781.1	1991.6	2779.7	779.9	2584.6	2.1786	4.3712	6.5498	11.00
12.00	187.96	0.001 138 6	0.163 21	798.4	1984.3	2782.7	797.0	2586.8	2.2160	4.3034	6.5194	12.00
13.00	191.60	0.001 143 8	0.151 14	814.7	1970.7	2785.4	813.2	2588.9	2.2509	4.2404	6.4913	13.00
14.00	195.04	0.001 148 9	0.140 73	830.1	1957.7	2787.8	828.5	2590.8	2.2836	4.1815	6.4651	14.00
15.00	198.28	0.001 153 8	0.131 67	844.6	1945.3	2789.9	842.7	2592.4	2.3144	4.1262	6.4406	15.00
16.00	201.37	0.001 158 6	0.123 70	858.5	1933.2	2791.7	856.6	2593.8	2.3436	4.0740	6.4176	16.00
17.00	204.30	0.001 163 3	0.116 64	871.8	1921.6	2793.4	869.8	2595.1	2.3712	4.0246	6.3958	17.00
18.00	207.11	0.001 167 8	0.110 33	884.5	1910.3	2794.8	882.4	2596.2	2.3976	3.9776	6.3751	18.00
19.00	209.79	0.001 172 3	0.104 67	896.8	1899.3	2796.1	894.6	2597.2	2.4227	3.9327	6.3555	19.00
20.00	212.37	0.001 176 6	0.099 549	908.6	1888.7	2797.2	906.2	2598.1	2.4468	3.8899	6.3367	20.00
25.00	223.94	0.001 197 2	0.079 915	961.9	1839.0	2800.9	958.9	2601.1	2.5542	3.6994	6.2537	25.00
30.00	233.84	0.001 216 3	0.066 632	1008.3	1794.0	2802.3	1004.7	2602.4	2.6455	3.5383	6.1838	30.00
35.00	242.54	0.001 234 5	0.057 028	1049.7	1752.2	2802.0	1045.4	2602.4	2.7252	3.3976	6.1229	35.00
40.00	250.33	0.001 252 1	0.049 749	1087.4	1712.9	2800.3	1082.4	2601.3	2.7965	3.2720	6.0685	40.00
45.00	257.41	0.001 269 1	0.044 035	1122.1	1675.6	2797.7	1116.4	2599.5	2.8612	3.1579	6.0191	45.00
50.00	263.92	0.001 285 8	0.039 425	1154.5	1639.7	2794.2	1148.1	2597.1	2.9207	3.0528	5.9735	50.00
55.00	269.94	0.001 302 3	0.035 624	1184.9	1605.0	2789.9	1177.7	2594.0	2.9758	2.9551	5.9309	55.00
60.00	275.56	0.001 318 7	0.032 433	1213.7	1571.3	2785.0	1205.8	2590.4	3.0274	2.8633	5.8907	60.00
65.00	280.83	0.001 335 0	0.029 714	1241.2	1538.3	2779.5	1232.5	2586.4	3.0760	2.7766	5.8526	65.00
70.00	285.80	0.001 351 4	0.027 368	1267.5	1506.0	2773.4	1258.0	2581.8	3.1220	2.6941	5.8161	70.00
75.00	290.51	0.001 367 8	0.025 323	1292.7	1474.1	2766.9	1282.4	2577.0	3.1658	2.6152	5.7810	75.00
80.00	294.98	0.001 384 3	0.023 521	1317.2	1442.7	2759.9	1306.1	2571.7	3.2077	2.5393	5.7470	80.00
85.00	299.24	0.001 401 0	0.021 923	1340.8	1411.6	2752.4	1328.9	2566.1	3.2480	2.4661	5.7141	85.00
90.00	303.31	0.001 417 9	0.020 493	1363.8	1380.8	2744.6	1351.0	2560.2	3.2867	2.3952	5.6820	90.00
95.00	307.22	0.001 435 1	0.019 206	1386.2	1350.2	2736.3	1372.6	2553.8	3.3242	2.3264	5.6506	95.00
100.00	310.96	0.001 452 6	0.018 041	1408.1	1319.7	2727.7	1393.6	2547.3	3.3606	2.2592	5.6198	100.00
110.00	318.04	0.001 488 7	0.016 007	1450.6	1258.8	2709.3	1434.2	2533.2	3.4304	2.1292	5.5596	110.00
120.00	324.64	0.001 526 7	0.014 285	1491.7	1197.5	2689.2	1473.4	2517.8	3.4971	2.0032	5.5003	120.00
130.00	330.81	0.001 567 1	0.012 800	1531.9	1135.1	2667.0	1511.5	2500.6	3.5614	1.8795	5.4409	130.00
140.00	336.63	0.001 610 5	0.011 498	1571.5	1070.9	2642.4	1549.0	2481.4	3.6241	1.7564	5.3804	140.00
150.00	342.12	0.001 657 8	0.010 343	1610.9	1004.2	2615.1	1586.0	2460.0	3.6857	1.6323	5.3180	150.00
160.00	347.32	0.001 710 2	0.009 309 9	1650.4	934.5	2584.9	1623.0	2435.9	3.7470	1.5063	5.2533	160.00
170.00	352.26	0.001 769 5	0.008 372 1	1691.6	860.0	2551.6	1661.5	2409.3	3.8106	1.3749	5.1856	170.00
180.00	356.96	0.001 839 9	0.007 497 3	1734.8	779.0	2513.9	1701.7	2378.9	3.8766	1.2362	5.1127	180.00
190.00	361.44	0.001 926 2	0.006 675 9	1778.7	691.8	2470.5	1742.1	2343.7	3.9430	1.0900	5.0330	190.00
200.00	365.71	0.002 037 4	0.005 874 5	1826.6	591.6	2418.2	1785.9	2300.7	4.0151	0.9259	4.9410	200.00
210.00	369.79	0.002 201 8	0.005 022 5	1886.3	461.2	2347.5	1840.1	2242.0	4.1040	0.7172	4.8222	210.00
220.00	373.78	0.002 667 5	0.003 734 7	2010.3	186.3	2196.6	1951.6	2144.4	4.2934	0.2881	4.5814	220.00
221.20	374.15	0.003 170 0	0.003 170 0	2107.4	0	2107.4	2037.1	2037.3	4.4429	0	4.4429	221.20

PROPRIETA' TERMODINAMICHE DELL'ACQUA - VAPORE SURRISCALDATO $Volume\ specifico\ v,\ m^3/kg;\ Entalpia\ h,\ kJ/kg;\ Entropia\ s,\ kJ/kg\ K$

Pressione bar (temp. sat. °C)		50	100	150	200	250	300	350	400	500	600	700	800
(temp. sat. C)	v	74.524	86.080	97.628	109.171	120.711	132.251	143.790	155.329	178.405	201.482	224.558	247.634
0.02	h	2594.4	2688.5	2783.7	2880.0	2977.7	3076.8	3177.7	3279.7	3489.2	3705.6	3928.8	4158.7
(17.5)	s	8.9226	9.1934	9.4327	9.6479	9.8441	10.0251	10.1934	10.3512	10.6413	10.9044	11.1464	11.3712
	v	37.240	43.027	48.806	54.580	60.351	66.122	71.892	77.662	89.201	100.740	112.278	123.816
0.04	h	2593.9	2688.3	2783.5	2879.9	2977.6	3076.8	3177.4	3279.7	3489.2	3705.6	3928.8	4158.7
(29.0)	S	8.6016	8.8730	9.1125	9.3279	9.5241	9.7051	9.8735	10.0313	10.3214	10.5845	10.8265	11.0513
0.06	v h	24.812 2593.5	28.676 2688.0	32.532 2783.4	37.383 2879.8	40.232 2977.6	44.079 3076.7	47.927 3177.4	51.773 3279.6	59.467 3489.2	67.159 3705.6	74.852 3928.8	82.544 4158.7
(36.2)	S	8.4135	8.6854	8.9251	9.1406	9.3369	9.5179	9.6863	9.8441	10.1342	10.3973	10.6394	10.8642
, ,	v	18.598	21.501	24.395	27.284	30.172	33.058	35.944	38.829	44.599	50.369	56.138	61.908
0.08	h	2593.1	2687.8	2783.2	2879.7	2977.5	3076.7	3177.3	3279.6	3489.1	3705.5	3928.8	4158.7
(41.5)	S	8.2797	8.5521	8.7921	9.0077	9.2041	9.3851	9.5535	9.7113	10.0014	10.2646	10.5066	10.7314
	v	14.869	17.195	19.512	21.825	24.136	26.445	28.754	31.062	35.679	40.295	44.910	49.526
0.10	h	2592.7	2687.5	2783.1	2879.6	2977.4	3076.6	3177.3	3279.6	3489.1	3705.5	3928.8	4158.7
(45.8)	S	8.1757	8.4486	8.6888	8.9045	9.1010	9.2820	9.4504	9.6083	9.8984	10.1616	10.4036	10.6284
0.50	V	0.001012	3.4181	3.8893	4.3560	4.8205	5.2839	5.7467	6.2091	7.1335	8.0574	8.9810	9.9044
0.50 ((81.3)	h s	209.29 0.70349	2682.6 7.6953	2780.1 7.9406	2877.7 8.1587	2976.1 8.3564	3075.7 8.5380	3176.6 8.7068	3279.0 8.8649	3488.7 9.1552	3705.2 9.4185	3928.6 9.6606	4158.5 9.8855
((01.5)	v	0.001012	1.6955	1.9363	2.1723	2.4061	2.6387	2.8708	3.1025	3.5653	4.0277	4.4898	4.9517
1.00	h	209.33	2676.2	2776.1	2875.4	2974.5	3074.5	3175.6	3278.2	3488.1	3704.8	3928.2	4158.3
(99.6)	s	0.70347	7.3618	7.6137	7.8349	8.0342	8.2166	8.3858	8.5442	8.8348	9.0982	9.3405	9.5654
	v	0.001012	0.001044	0.959 54	1.0804	1.1989	1.3162	1.4328	1.5492	1.7812	2.0129	2.2442	2.4754
2.00	h	209.42	419.14	2768.5	2870.5	2971.2	3072.1	3173.8	3276.7	3487.0	3704.0	3927.6	4157.8
(120.2)	S	0.70342	1.30679	7.2794	7.5072	7.7096	7.8937	8.0638	8.2226	8.5139	8.7776	9.0201	9.2452
2.00	V	0.001012	0.001044	0.633 74	0.716 35	0.796 44	0.875 29	0.953 52	1.0314	1.1865	1.3412	1.4957	1.6499
3.00 (133.5)	h s	209.5 0.70338	419.21 1.30671	2760.4 7.0771	2865.5 7.3119	2967.9 7.5176	3069.7 7.7034	3171.9 7.8744	3275.2 8.0338	3486.0 8.3257	3703.2 8.5898	3927.0 8.8325	4157.3 9.0577
(155.5)	v	0.001012	0.001044	0.470 66	0.534 26	0.595 19	0.654 85	0.713 85	0.772 50	0.889 19	1.0054	1.1214	1.2372
4.00	h	209.59	419.29	2752.0	2860.4	2964.5	3067.2	3170.0	3273.6	3484.9	3702.3	3926.4	4156.9
(143.6)	S	0.70333	1.30664	6.9285	7.1708	7.3800	7.5675	7.7395	7.8994	8.1919	8.4563	8.6992	8.9246
	v	0.001012	0.001044	0.001091	0.424 96	0.47443	0.522 58	0.570 05	0.617 16	0.710 78	0.803 95	0.896 85	0.989 56
5.00	h	209.68	419.36	632.16	2855.1	2961.1	3064.8	3168.1	3272.1	3483.8	3701.5	3925.8	4156.4
(151.8)	S	0.70328	1.30656	1.84161	7.0592	7.2721	7.4614	7.6343	7.7948	8.0879	8.3626	8.5957	8.8213
6.00	V	0.001012	0.001043	0.001091	0.352 04	0.393 91	0.434 39	0.474 19	0.513 61	0.591 84	0.669 63	0.747 14	0.824 47
6.00 (158.8)	h s	209.76 0.70324	419.44 1.30648	632.23 1.8415	2849.7 6.9662	2951.6 7.1829	3062.3 7.3740	3166.2 7.5479	3270.6 7.7090	3482.7 8.0027	3700.7 8.2678	3925.1 8.5111	4155.9 8.7368
(150.0)	v	0.001012	0.001043	0.001091	0.299 92	0.336 37	0.371 39	0.405 71	0.439 64	0.506 89	0.573 68	0.640 21	0.706 55
7.00	h	209.85	419.51	632.29	2844.2	2954.0	3059.8	3164.3	3269.0	3481.6	3699.9	3924.5	4155.5
(165.0)	s	0.70319	1.3064	1.84139	6.8859	7.1066	7.2997	7.4745	7.6332	7.9305	8.1959	8.4395	8.6653
	v	0.001012	0.001043	0.001091	0.260 79	0.293 21	0.324 14	0.354 34	0.384 16	0.443 17	0.501 72	0.560 01	0.618 11
8.00	h	209.93	419.59	632.35	2838.6	2950.4	3057.3 7.2348	3162.4	3267.5 7.5729	3480.5	3699.1 8.1336	3923.9	4155.0
(170.4)	S	0.70314	1.30632	1.84128 0.001091	6.8148	7.0397		7.4107		7.8678 0.393 61		8.3773	8.6033
9.00	v h	0.001012 210.02	0.001043 419.66	632.41	0.230 32 2832.7	0.259 63 2946.8	0.278 39 3054.7	0.314 40 3160.5	0.341 01 3266.0	3479.4	0.445 76 3698.2	0.497 63 3923.3	0.549 33 4154.5
(175.4)	s	0.7031	1.30624	1.84116	6.7508	6.9800	7.1771	7.3540	7.5169	7.8124	8.0785	8.3225	8.5486
	v	0.001012	0.001043	0.00109	0.205 92	0.232 75	0.257 98	0.282 43	0.306 49	0.353 96	0.400 98	0.447 73	0.494 30
10.00	h	210.11	419.74	632.47	2826.8	2943.0	3052.1	3158.5	3264.4	3478.3	3697.4	3922.7	4154.1
(179.9)	S	0.70305	1.30616	1.84105	6.6922	6.9259	7.1251	7.3031	7.4665	7.7627	8.0292	8.2734	8.4997
15.00	V L	0.001011	0.001043	0.001090	0.132 38	0.151 99	0.169 70	0.186 53	0.202 92	0.235 03	0.266 66	0.298 03	0.329 21
15.00 (198.3)	h s	210.54 0.70282	420.11 1.30577	632.78 1.8405	2794.7 6.4508	2923.5 6.7099	3038.9 6.9207	3148.7 7.1044	3256.6 7.2709	3472.8 7.5703	3693.3 7.8385	3919.6 8.0838	4151.7 8.3108
(3,0.5)		0.001011	0.001043	0.001090	0.001156	0.111 45	0.125 50	0.138 66	0.151 13	0.175 55	0.199 50	0.223 17	0.246 66
20.00	v h	210.97	420.49	633.09	852.55	2902.4	3025.0	3138.6	3248.7	3467.3	3689.2	3916.5	4149.4
(212.4)	s	0.70258	1.30538	1.83994	2.32995	6.5454	6.7696	6.9596	7.1296	7.4323	7.7022	7.9485	8.1763
	v	0.001011	0.001043	0.001089	0.001156	0.086 985	0.098 925	0.109 75	0.120 04	0.139 87	0.159 21	0.178 26	0.197 14
25.00	h	211.4	420.86	633.4	852.76	2879.5	3010.4	3128.2	3240.7	3461.7	3685.1	3913.4	4147.0
(223.9)	S	0.70235	1.30499	1.83939	2.32916	6.4077	6.6470	6.8442	7.0178	7.3240	7.5956	7.8431	8.0716
20.00	V h	0.001011	0.001042	0.001089	0.001155	0.070 551	0.081 159 2995.1	0.090 526	0.099 310 3232.5	0.116 08	0.132 34	0.148 32 3910.3	0.164 12 4144.7
30.00 (233.8)	h s	211.83 0.70212	421.24 1.3046	633.71 1.83883	852.96 2.32838	2854.8 6.2857	6.5422	3117.5 6.7471	5232.5 6.9246	3456.5 7.2345	3681.0 7.5079	3910.3 7.7564	7.9857
	v	0.001011	0.001042	0.001089	0.001155	0.058 693	0.068 424	0.076 776	0.084 494	0.099 088	0.113 15	0.126 94	0.140 54
35.00	h	212.26	421.62	634.03	853.17	2828.1	2979.0	3106.5	3224.2	3450.6	3676.9	3907.2	4142.4
(242.5)	s	0.70188	1.30421	1.83828	2.32759	6.1732	6.4491	6.6626	6.8443	7.1580	7.4332	7.6828	7.9128
	v	0.00101	0.001042	0.001088	0.001154	0.001251	0.058 833	0.066 446	0.073 376	0.086 341	0.098 763	0.110 90	0.122 85
40.00	h	212.69	421.99	634.34	853.37	1085.78	2962.0	3095.1	3215.7	3445.0	3672.8	3904.1	4140.0
(250.3)	S	0.70165	1.30382	1.83773	2.32681	2.79343	6.3642	6.5870	6.7733	7.0909	7.3680	7.6187	7.8495
45.00	V	0.00101	0.001041	0.001088	0.001154	0.00125	0.051 336	0.058 696	0.064 721	0.076 427	0.087 570	0.098 425	0.109 10
45.00 (257.4)	h s	213.12 0.70142	422.37 1.30343	634.65 1.83718	853.58 2.32603	1085.77 2.79221	2944.2 6.2852	3083.3 6.5182	3207.1 6.7093	3439.3 7.0311	3668.6 7.3100	3901.0 7.5619	4137.7 7.7934
()				,10		1			2073				

PROPRIETÀ TERMODINAMICHE DELL'ACQUA - VAPORE Volume specifico $v,\,m^3/kg;\,Entalpia\,h,\,kJ/kg;\,Entropia\,s,\,kJ/kg\,K$

TAB. 3B

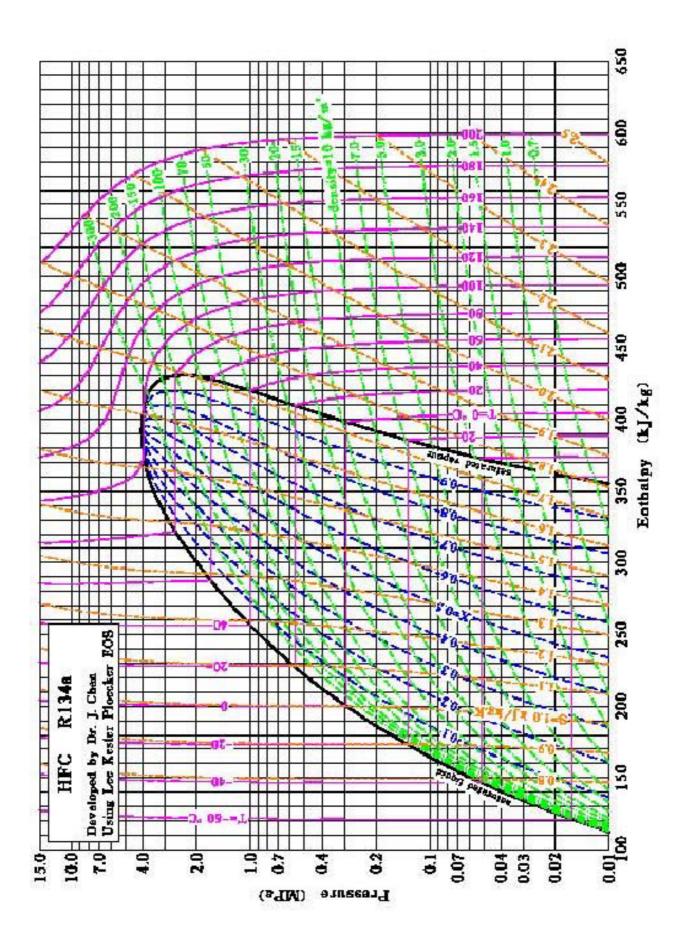
Pressione bar		50	100	150	200	250	200	250	400	500	600	700	000
(temp. Sat. C)		50	100	150	200	250	300	350 0.051 941	400	500	600	700	800
50.00	v h	0.00101 213.55	0.001041 422.74	0.001088 634.96	0.001153 853.79	0.001249 1085.76	0.045 301 29255	3071.2	0.057 791 3198.3	0.068 494 3433.7	0.078 616 3664.5	0.088 446 3897.9	0.098 093 4135.3
(263.9)	S	0.70119	1.30304	1.83663	2.32525	2.791	6.2105	6.4545	6.6508	6.9770	7.2578	7.5108	7.7431
	v	0.001009	0.001041	0.001087	0.001152	0.001248	0.036 145	0.042 222	0.047 379	0.056 592	0.065 184	0.073 478	0.081 587
60.00	h	214.41	423.49	635.58	854.21	1085.75	2885.0	3045.8	3180.1	3422.2	3656.2	3891.7	4130.7
(275.6)	S	0.70072	1.30227	1.83554	2.3237	2.78859	6.0692	6.3386	6.5462	6.8818	7.1664	7.4217	7.6550
	v	0.001009	0.00104	0.001086	0.001151	0.001246	0.029 457	0.035 233	0.039 922	0.048 086	0.055 590	0.062 787	0.069 798
70.00 (285.8)	h s	215.26 0.70026	424.25 1.30149	636.21 1.83445	854.63 2.32217	1085.75 2.78621	2839.4 5.9327	3018.7 6.2333	3161.2 6.4536	3410.6 6.7993	3647.9 7.0880	3885.4 7.3456	4126.0 7.5808
(203.0)	v	0.001009	0.00104	0.001086	0.00115	0.001244	0.024 264	0.029 948	0.034 310	0.041 704	0.048 394	0.054 770	0.060 956
80.00	h	216.12	425	636.84	855.06	1085.77	2786.8	2989.9	3141.6	3398.8	3639.5	3879.2	4121.5
(295.0)	S	0.69979	1.30072	1.83337	2.32064	2.78386	5.7942	6.1349	6.3694	6.7262	7.0191	7.2790	7.5158
	v	0.001008	0.001039	0.001085	0.001149	0.001245	0.001402	0.025 792	0.029 29	0.036 737	0.042 798	0.048 534	0.054 080
90.00	h	216.98	425.75	637.47	855.49	1085.79	1344.55	2959.0	3121.2	3386.8	3631.1	3873.0	4116.7
(303.3)	S	0.69933	1.29995	1.83229	2.31912	2.78153	3.25329	6.0408	6.2915	6.6600	6.9574	7.2196	7.4579
100.00	V	0.001008	0.001039	0.001084	0.001148	0.001241	0.001398	0.022 421	0.026 408	0.032 760	0.038 320	0.043 546	0.048 580
100.00 (311.0)	h s	217.84 0.69887	426.5 1.29919	638.1 1.83121	855.92 2.31761	1085.83 2.77923	1343.36 3.24878	2925.8 5.9489	3099.9 6.2182	3374.6 6.5994	3622.7 6.9013	3866.8 7.1660	4112.0 7.4058
(311.0)	v	0.001007	0.001037	0.001083	0.001146	0.001236	0.001388	0.016 122	0.020 010	0.025 590	0.030 259	0.034 510	0.038 682
125.00	h	219.99	428.39	639.67	857.02	1085.96	1340.65	2828.0	3042.9	3343.3	3601.4	3851.1	4100.3
(327.8)	S	0.69771	1.29728	1.82854	2.31387	2.77357	3.23797	5.7155	6.0481	6.4654	6.7796	7.0504	7.2942
	v	0.001006	0.001036	0.001081	0.001143	0.001232	0.001378	0.011 462	0.015 661	0.020 795	0.024 884	0.028 587	0.032 086
150.00	h	222.13	430.27	641.26	858.14	1086.16	1338.25	2694.8	2979.1	3310.6	3579.8	3835.4	4088.6
(342.1)	S	0.69656	1.29638	1.8259	2.31018	2.76804	3.22776	5.4467	5.8876	6.3487	6.6764	6.9536	7.2013
175.00	V	0.001005	0.001036	0.00108	0.001141	0.001229	0.001369	0.001716	0.012 460	0.017 359	0.021 043	0.024 314	0.027 376
175.00 (354.6)	h s	224.27 0.69541	432.16 1.29351	642.85 1.82328	859.27 2.30655	1096.41 2.76265	1336.14 3.21808	1663.62 3.764	2906.3 5.7274	3276.5 6.2432	3557.8 6.5858	3819.7 6.8698	4077.0 7.1215
(35 1.0)	v	0.001003	0.001034	0.001078	0.001139	0.001225	0.001361	0.001666	0.009 947 0	0.014 771	0.018 161	0.021 111	0.023 845
200.00	h	226.41	434.05	644.45	860.43	1086.72	1334.26	1647.18	2820.5	3241.1	3535.5	3803.8	4065.3
(365.7)	S	0.69427	1.29614	1.82068	2.30296	2.75737	3.20885	3.73084	5.5585	6.1456	6.5043	6.7953	7.0511
	v	0.000999	0.001029	0.001072	0.00113	0.001211	0.001322	0.001554	0.002 830 6	0.008 680 8	0.011 436	0.013 647	0.015 619
300.00	h	234.95 0.68971	441.62	650.9	865.2 2.28907	1088.42	1328.69	1610.04	2161.8 4.4896	3085.0 5.7972	3443.0	3739.7	4018.5 6.8288
	S	0.000995	1.2843 0.001024	1.81053		2.73735 0.001198	3.17565	3.64552 0.00149	0.001 909 1		6.2340	6.5560	
400.00	v h	243.46	449.22	0.001066 657.44	0.001122 870.2	1090.76	0.001308 1325.39	1589.69	1934.1	0.005 615 6 2906.8	0.008 088 4 3346.4	0.009 930 2 3674.8	0.011 521 3971.7
	S	0.68519	1.27714	1.80072	2.27584	2.71879	3.14688	3.58848	4.1190	5.4762	6.0135	6.3701	6.6606
	v	0.000991	0.00102	0.001061	0.001114	0.001187	0.001287	0.001444	0.001 729 1	0.003 882 2	0.006 111 3	0.007 719 7	0.009 075 9
500.00	h	251.94	456.83	664.06	865.4	1093.61	1323.69	1576.39	1877.7	2723.0	3248.3	3610.2	3925.3
	S	0.68069	1.27014	1.79123	2.26319	2.70145	3.12127	3.54361	4.0083	5.1782	5.8207	6.2138	6.5222
600.00	v h	0.000988 260.39	0.001016 464.46	0.001055 670.74	0.001107 880.76	0.001176 1096.88	0.00127 1323.17	0.001408 1567.15	0.001 632 4 1847.3	0.002 915 5 2570.6	0.004 835 0 3151.6	0.006 269 0 3547.0	0.007 460 3 3879.6
000.00	S	0.67622	1.26331	1.78203	2.25105	2.68513	3.09806	3.5059	3.9383	4.9374	5.6477	6.0775	6.4031
	v	0.000984	0.001012	0.00105	0.001101	0.001166	0.001254	0.001379	0.001 567 1	0.002 466 8	0.003 971 9	0.005 256 6	0.006 320 8
700.00	h	268.81	472.1	677.48	886.27	1100.51	1323.57	1560.58	1827.8	2467.1	3060.4	3486.3	3835.3
	S	0.67177	1.25662	1.76308	2.23937	2.66967	3.07674	3.473	3.8855	4.7688	5.4931	5.9562	6.2979
000.00	v	0.000980	0.001008	0.001045	0.001094		0.00124	0.001355		0.002 188 1	0.003 379 2	0.004 519 3	0.005480 5
800.00	h s	277.2 0.66733	479.75 1.25006	684.28 1.76438	891.92 2.22811	1104.43 2.65497	1324.7 3.05696	1555.92 3.4436	1814.2 3.8425	2397.4 4.6488	2980.3 5.3595	3428.7 5.8470	3792.8 6.2034
	v	0.000977	0.001004	0.001041	0.001088	0.001149	0.001227	0.001334	0.001 478 8	0.002 012 9	0.002 966 8	0.003 964 2	0.004 840 7
900.00	h	285.55	487.4	691.12	897.87	1108.62	1326.43	1552.7	1804.6	2349.9	2913.5	3374.6	3752.4
	S	0.6629	1.24363	1.75591	2.21721	2.64093	3.03845	3.41686	3.8059	4.5602	5.2468	5.7479	6.1179
	v	0.000973	0.001	0.001036	0.001082	0.001141	0.001216	0.001315	0.001 446 4	0.001 893 4	0.002 668 1	0.003 535 6	0.004 341 1
1000.00	h	293.87	495.07	698	903.53	1113.02	1328.65	1550.6	1797.6	2316.1	2857.5	3324.4	3714.3
	S	0.65848	1.23732	1.74764	2.20666	2.62748	3.02102	3.39225	3.7738	4.4913	5.1505	5.6579	6.0397

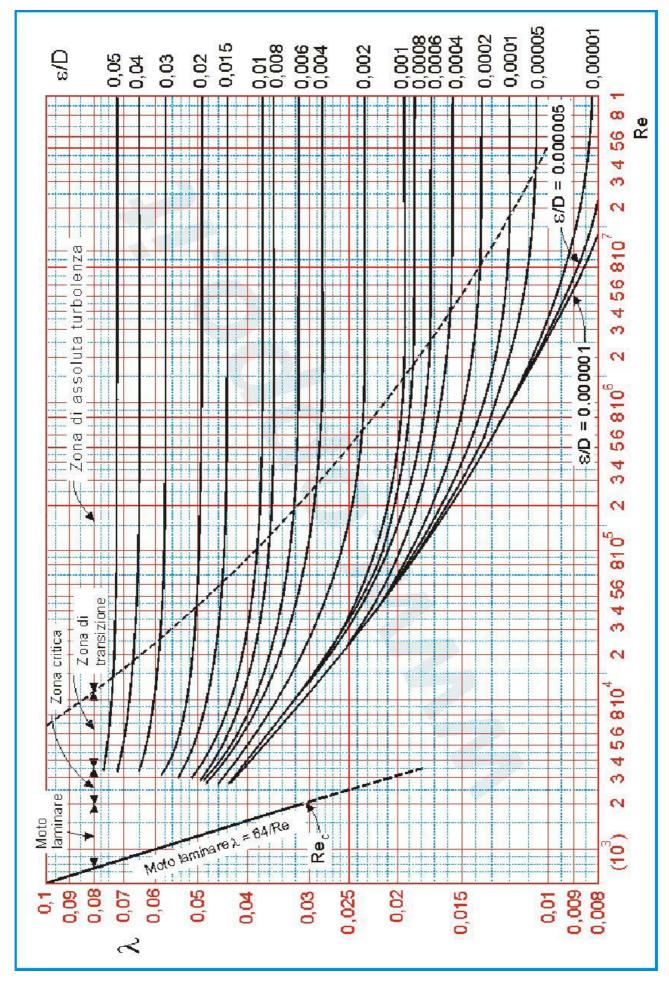
DITEC	PROPRIETA TERMODINAMICHE DEL REFRIGERANTE R134A ALLA SATURAZIONE	TAB. 4A

		Volume S ₁		Energia			Entalpia		Entr		
Temp.	Press.	m ³ /k	g	kJ/	kg		kJ/kg		kJ/k	g K	Temp.
°C	bar	liquido saturo	vapore	liquido	vapore	liquido	vap.	vapore	liquido	vapore	°C
		,	saturo	saturo	saturo	saturo	•	saturo	saturo	saturo	
		$v_1 \times 10^3$	$v_{\rm v}$	\mathbf{u}_{l}	u_v	h _l	Δh_{lv}	h_v	Sl	S _v	
-40	0.5164	0.7055	0.3569	49.94	254.43	49.98	222.88	272.86	0.8030	1.759	-40
-36	0.6332	0.7113	0.2947	54.66	256.71	54.71	220.67	275.38	0.8231	1.7536	-36
-32	0.7704	0.7172	0.2451	59.45	258.99	59.50	218.37	277.88	0.8431	1.7486	-32
-28	0.9305	0.7233	0.2052	64.29	261.27	64.35	216.01	280.36	0.8630	1.7441	-28
-26	1.0199	0.7265	0.1882	66.73	262.41	66.80	214.80	281.60	0.8729	1.7420	-26
-24	1.1160	0.7296	0.1728	69.19	263.55	69.27	213.57	282.83	0.8828	1.7400	-24
-22	1.2192	0.7328	0.1590	71.66	264.68	71.75	212.32	284.06	0.8927	1.7381	-22
-20	1.3299	0.7361	0.1464	74.15	265.82	74.24	211.05	285.29	0.9026	1.7362	-20
-18	1.4483	0.7395	0.1350	76.65	266.95	76.75	209.76	286.51	0.9124	1.7345	-18
-16	1.5748	0.7428	0.1247	79.16	268.08	79.28	208.45	287.72	0.9222	1.7328	-16
-12	1.8540	0.7498	0.1068	84.23	270.34	84.37	205.77	290.13	0.9418	1.7297	-12
-8	2.1704	0.7569	0.0919	89.36	272.58	89.52	203.00	292.52	0.9613	1.7269	-8
-4	2.5274	0.7644	0.0794	94.54	274.82	94.73	200.15	294.88	0.9807	1.7243	-4
0	2.9282	0.7210	0.0689	99.77	277.04	100.00	197.21	297.21	1.0000	1.7220	0
4	3.3765	0.7801	0.0600	105.06	279.25	105.33	194.19	299.51	1.0192	1.7199	4
8	3.8756	0.7884	0.0525	110.41	281.44	110.71	191.07	301.78	1.0384	1.7180	8
12	4.4294	0.7971	0.0460	115.81	283.61	116.16	187.85	304.01	1.0575	1.7162	12
16	5.0416	0.8062	0.0405	121.27	285.76	121.67	184.52	306.20	1.0765	1.7146	16
20	5.7160	0.8157	0.0358	126.78	287.89	127.24	181.09	308.34	1.0954	1.7132	20
24	6.4566	0.8257	0.0317	132.35	289.99	132.88	177.55	310.43	1.1143	1.7119	24
26	6.8530	0.8309	0.0298	135.16	291.03	135.73	175.73	311.46	1.1238	1.7112	26
28	7.2675	0.8362	0.0281	137.98	292.06	138.59	173.89	312.48	1.1332	1.7106	28
30	7.7006	0.8417	0.0265	140.82	293.08	141.47	172.00	313.48	1.1426	1.7100	30
32	8.1528	0.8473	0.0250	143.68	294.10	144.37	170.09	314.46	1.1520	1.7094	32
34	8.6247	0.8530	0.0236	146.56	295.10	147.29	168.14	315.43	1.1614	1.7088	34
36	9.1168	0.8590	0.0223	149.45	296.09	150.23	166.15	316.38	1.1708	1.7083	36
38	9.6298	0.8651	0.0210	152.36	297.07	153.19	164.12	317.31	1.1802	1.7077	38
40	10.164	0.8714	0.0199	155.28	298.04	156.17	162.05	318.22	1.1896	1.7071	40
42	10.720	0.8780	0.0188	158.23	299.00	159.17	159.94	319.12	1.1990	1.7065	42
44	11.299	0.8847	0.0177	161.20	299.94	162.20	157.79	319.99	1.2084	1.7060	44
48	12.526	0.8989	0.0159	167.20	301.77	168.33	153.33	321.66	1.2273	1.7047	48
52	13.851	0.9142	0.0142	173.29	303.53	174.56	148.66	323.22	1.2462	1.7034	52
56	15.278	0.9308	0.0127	179.49	305.21	180.91	143.75	324.66	1.2652	1.7020	56
60	16.813	0.9488	0.0114	185.80	306.79	187.40	138.57	325.97	1.2844	1.7003	60
70	21.162	1.0027	0.0086	206.20	310.13	204.32	124.08	328.41	1.3332	1.6948	70
80	26.324	1.0766	0.0064	219.86	312.12	222.69	106.41	329.10	1.3844	1.6857	80
90	32.435	1.1949	0.0046	239.8	311.32	243.67	82.63	326.30	1.4410	1.6685	90
100	39.742	1.5443	0.0027	268.58	298.47	274.72	34.40	309.11	1.5226	1.6147	100

DITEC PROPRIETÀ TERMODINAMICHE DEL REFRIGERANTE R134A ALLA SATURAZIONE TAB. 4B

Press.	Temp.	Volume Sj m³/k		Energia kJ/			Entalpia kJ/kg		Entro kJ/k		Press.
bar	°C	liquido	vapore	liquido	vapore	liquido	vap.	vapore	liquido	vapore	bar
		saturo	saturo	saturo	saturo	saturo		saturo	saturo	saturo	
		$v_1 \times 10^3$	v_{v}	u_l	u_v	h_l	Δh_{lv}	h_v	Sl	S_v	
0.6	-37.07	0.7097	0.3100	53.39	256.10	53.44	221.27	274.70	0.8177	1.755	0.6
0.8	-31.21	0.7184	0.2366	60.39	259.44	60.45	217.92	278.37	0.8470	1.7477	0.8
1.0	-26.43	0.7258	0.1917	66.20	262.16	66.27	215.06	281.33	0.8708	1.7425	1.0
1.2	-22.36	0.7323	0.1614	71.21	264.48	71.30	212.54	283.84	0.8909	1.7384	1.2
1.4	-18.80	0.7381	0.1395	75.64	266.50	75.75	210.27	286.02	0.9085	1.7352	1.4
1.6	-15.62	0.7435	0.1229	79.64	268.30	79.76	208.19	287.95	0.9241	1.7325	1.6
1.8	-12.73	0.7485	0.1098	83.29	269.92	83.43	206.26	289.69	0.9382	1.7303	1.8
2.0	-10.09	0.7532	0.0993	86.67	271.41	86.82	204.46	291.28	0.9511	1.7283	2.0
2.4	-5.37	0.7618	0.0834	92.75	274.05	92.93	201.14	294.07	0.9740	1.7252	2.4
2.8	-1.23	0.7697	0.0719	98.16	276.36	98.37	198.13	296.5	0.9941	1.7227	2.8
3.2	2.48	0.7770	0.0632	103.04	278.41	103.29	195.35	298.64	1.0119	1.7207	3.2
3.6	5.84	0.7839	0.0564	107.52	280.26	107.80	192.76	300.56	1.0281	1.7190	3.6
4.0	8.93	0.7904	0.0509	111.67	281.95	111.98	190.32	302.30	1.0429	1.7175	4.0
5.0	15.74	0.8056	0.0409	120.91	285.62	121.31	184.74	306.05	1.0753	1.7147	5.0
6.0	21.58	0.8196	0.0341	128.97	288.72	129.46	179.71	309.17	1.1029	1.7127	6.0
7.0	26.72	0.8328	0.0292	136.17	291.4	136.76	175.07	311.83	1.1272	1.7110	7.0
8.0	31.33	0.8454	0.0255	142.73	293.76	143.40	170.73	314.13	1.1489	1.7096	8.0
9.0	35.53	0.8576	0.0226	148.77	295.86	149.54	166.62	316.16	1.1686	1.7084	9.0
10.0	39.39	0.8695	0.0202	154.4	297.75	155.27	162.68	317.95	1.1868	1.7073	10.0
12.0	46.32	0.8928	0.0166	164.67	301.01	165.21	155.23	320.97	1.2194	1.7053	12.0
14.0	52.43	0.9159	0.0140	173.96	303.72	175.24	148.14	323.38	1.2483	1.7033	14.0
16.0	57.92	0.9392	0.0121	182.5	305.98	184.00	141.31	325.31	1.2744	1.7012	16.0
18.0	62.91	0.9631	0.0105	190.47	307.86	192.20	134.60	326.81	1.2984	1.6989	18.0
20.0	67.49	0.9878	0.0093	198	309.39	199.97	127.95	327.92	1.3208	1.6964	20.0
25.0	77.59	1.0562	0.0069	215.46	311.82	218.10	111.06	329.15	1.3717	1.6884	25.0
30.0	86.22	1.1416	0.0053	231.86	312.14	235.28	92.71	327.99	1.4186	1.6765	30.0





DITEC	PROPRIETA' COMBUSTIBILI	TAB. 7
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Proprietà di alcuni combustibili gassosi in condizioni normali (p = 1,01325 bar; t = 0°C)

	ρ/ρ_A	PCS	PCI	$V_{\rm A}/V$
		MJ/m^3	MJ/m^3	
Idrogeno	0,0696	12,1	10,2	2,38
Metano	0,554	37,7	33,9	9,52
Propano commerciale	1,52	93,9	86,4	23,7
Butano commerciale	1,94	118	109	29,9

Simboli:

ρ_A densità dell'aria (1,29 kg/m³)
 PCS potere calorifico superiore
 PCI potere calorifico inferiore

 V_A/V volume d'aria necessario per la completa combustione di un volume unitario del gas combustibile

Nel caso di combustibili costituiti da miscele di diverse sostanze pure i valori esposti sono solo indicativi e possono subire variazioni secondo la composizione della miscela.

Proprietà di alcuni combustibili liquidi in condizioni ordinarie.

	ρ	PCS	PCI
	kg/m^3	MJ/kg	MJ/kg
Propano commerciale	505	50,0	46,3
Butano commerciale	575	49,3	45,8
Benzina	733	46,9	43,7
Kerosene	780	46,5	43,4
Olio combustibile	840	45,4	42.4

Simboli:

PCS potere calorifico superiore PCI potere calorifico inferiore

Per questi liquidi, che sono costituiti da miscele di diverse sostanze, i valori esposti sono solo indicativi.

Equivalenze tra unità di misura della pressione

	Pa	bar	kg₅/cm²	mmHg	mmH ₂ O	atm
1 Pa =	1	10^{-5}	$1,01972\times10^{-5}$	$7,50064 \times 10^{-3}$	0,101972	$9,8692\times10^{-6}$
1 bar =	10^{5}	1	1,01972	750,062	10 197,2	0,98692
$1 \text{ kg}_f/\text{cm}^2 =$	98 066,5	0,980665	1	735,561	10^{4}	0,967 841
1 mmHg =	133,322	$1,33322 \times 10^{-3}$	$1,3595 \times 10^{-3}$	1	13,59510	$1,315789\times10^{-3}$
$1 \text{ mmH}_2\text{O} =$	9,80665	$9,807\times10^{-5}$	10^{-4}	0,073 555 6	1	$9,67841 \times 10^{-5}$
1 atm =	101 325	1,01325	1,033 227	760	10332,27	1

EQUIVALENZE TRA UNITÀ DI MISURA

Si danno qui le equivalenze delle più comuni unità di misura del sistema tecnico, del sistema inglese e di altre unità a quelle del sistema SI. Le equivalenze sono date in generale con cinque cifre significative; i valori esatti sono segnalati con un asterisco.

Accelerazione

1 cm/s² =
$$1 \times 10^{-2}$$
 m/s² (*)
1 ft/s² = 3.048×10^{-1} m/s² (*)

Area

1 ft² = 1 sq.ft =
$$9,2903 \times 10^{-2}$$
 m²
1 in² = 1 sq.in = $6,4516 \times 10^{-4}$ m² (*)
1 yd² = 1 sq.yd = $8,3613 \times 10^{-1}$ m²
1 a = 1×10^{-2} m² (*)

 $1 \text{ ca} = 1 \text{ m}^2 \text{ (*)}$

1 ha = 1×10^4 (*)

1 acre = $4,0469 \times 10^3 \text{ m}^2$

 $1 \text{ mi}^2 = 2,5900 \times 10^6 \text{ m}^2$

Calore specifico

1 cal/g °C =
$$4,1868 \times 10^3$$
 J/kg K
1 Btu/lb °F = $4,1868 \times 10^3$ J/kg K

Conduttività termica

 $1 \text{ kcal/h m }^{\circ}\text{C} = 1,1630 \text{ W/}^{\circ}\text{C m}$ 1 Btu/h ft ${}^{\circ}F = 1,7308 \text{ W}/{}^{\circ}\text{C m}$

Densità di massa

 $1 \text{ g/cm}^3 = 1 \times 10^3 \text{ kg/m}^3 \text{ (*)}$ $1 \text{ lb/ft}^3 = 1,6018 \times 10 \text{ kg/m}^3$ $1 \text{ kg/ft}^3 = 3,5315 \times 10 \text{ kg/m}^3$

Energia, lavoro, calore, entalpia...

1 cal = 4,1868 J

 $1 \text{ kcal} = 4,1868 \times 10^3 \text{ J}$

1 Frig = $4,1868 \times 10^3$ J

1 Btu = $1,0551 \times 10^3$ J

 $1 \text{ erg} = 1 \times 10^{-7} \text{ J} \text{ (*)}$

 $1 \text{ CV h} = 2,6477 \times 10^6 \text{ J}$

 $1 \text{ HP h} = 2,6845 \times 10^6 \text{ J}$

 $1 \text{ kW h} = 3.6 \times 10^6 \text{ J} \text{ (*)}$

1 ft pdl = $4,2139 \times 10^{-2}$ J

 $1 \text{ ft } 1b_f = 1,3558 \text{ J}$

Energia specifica, etc.

 $1 \text{ cal/g} = 4,1868 \times 10^3 \text{ J/kg}$ 1 Btu/lb = $2,3260 \times 10^3$ J/kg Flusso luminoso

1 candela media sferica = 12,566 lm

1 Btu/h ft² = 3.1547 W/m^2

Flusso termico specifico

 $1 \text{ kcal/h m}^2 = 1,1630 \text{ W/m}^2$

1 Btu/h ft² = $3,1547 \text{ W/m}^2$

Forza

 $1 \text{ kg}_f = 9.8067 \text{ N}$

 $1 \text{ dyn} = 1 \times 10^{-5} \text{ N} \text{ (*)}$

1 pdl (poundal) = $1,3825 \times 10^{-1}$ N

 $1 \text{ lb}_f = 4,4482 \text{ N}$

Illuminamento

1 footcandle = 1 fc = 10,764 lx

1 phot = $1 \times 10^4 \text{ lx}$

Luminanza

1 stilb = $1 \times 10^4 \text{ cd/m}^2$ (*)

1 lambert (1)= 3,1831 × 10 3 cd/m 2

1 footlambert = 1 fL = 3,426 cd/m²

Lunghezza

1 ft (piede) = 3.048×10^{-1} m (*)

1 Å (Ångström) = 1×10^{-10} m (*)

1 in (pollice) = 2.54×10^{-2} m (*)

1 yd (iarda) = $9,144 \times 10^{-1}$ m (*)

1 mi (miglio) = $1,6093 \times 10^3$ m

Massa

1 lb (libbra) = $4,5359 \times 10^{-1}$ kg

 $1 \text{ ton} = 1,0160 \times 10^3 \text{ kg}$

1 oz (oncia) = $2,8350 \times 10^{-2}$ kg

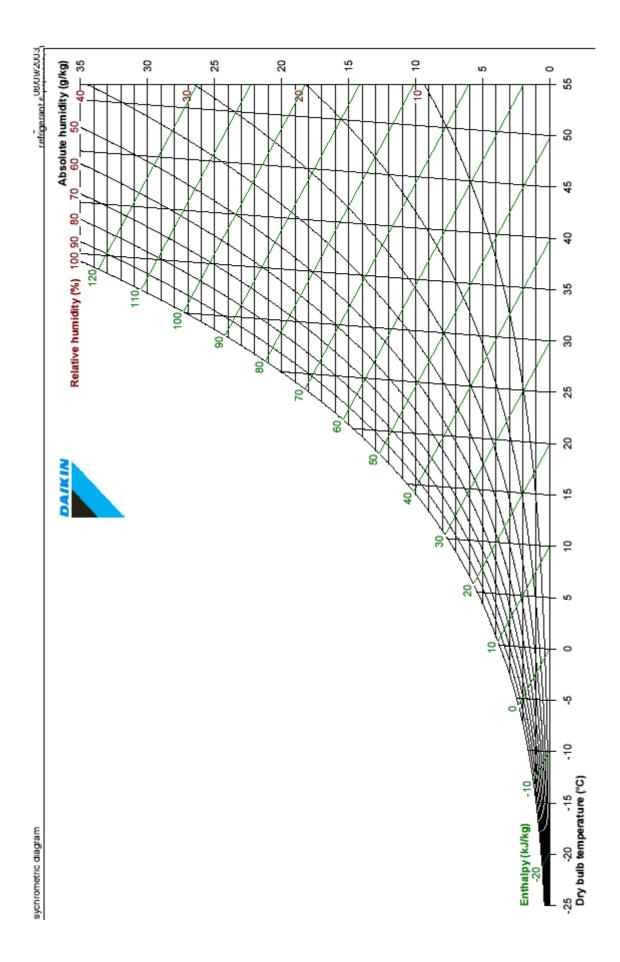
1 gr (grano) = 6.4800×10^{-5} kg

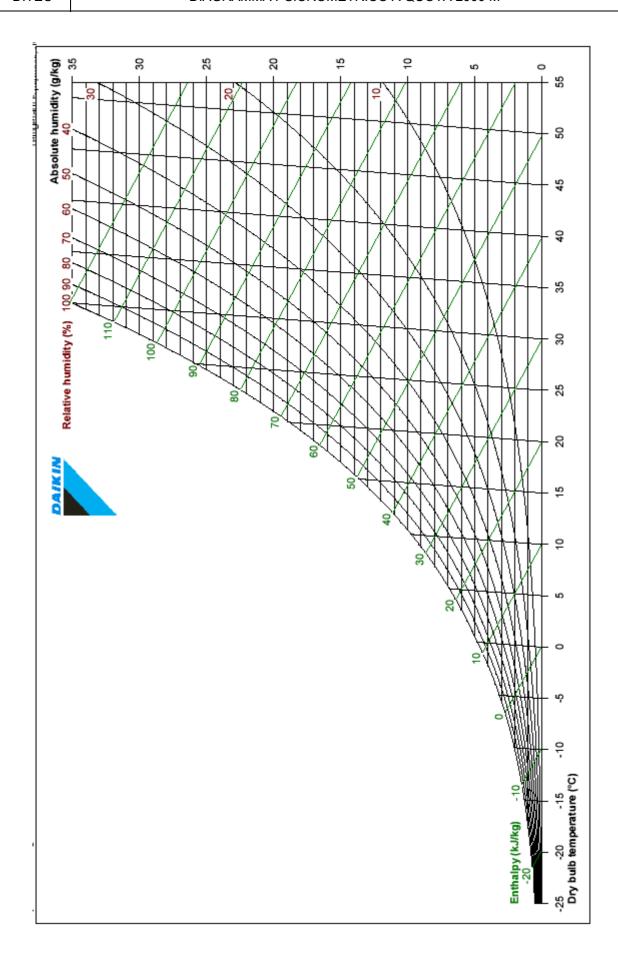
Portata di massa

 $1 \text{ kg/h} = 2,7778 \times 10^{-4} \text{ kg/s}$

 $1 \text{ lb/s} = 4.5349 \times 10^{-1} \text{ kg/s}$

⁽¹⁾ Il simbolo del lambert, unità estranea al sistema SI, è uguale al simbolo L del litro.





PROPRIETÀ TERMOFISICHE DELL'ARIA (p = 1 bar)

TAB. 10

- t Temperatura
- ρ Densità
- c_p Calore specifico a p=cost

- β Coefficiente volumetrico di dilatazione termica, $\ \beta \text{=}(1/v) \ (\delta v/\delta T)_p$
- k Conducibilità termica
- μ Viscosità dinamica
- v Viscosità cinematica
- a Diffusività termica

Pr	Numero	di	Prandtl

t	ρ	c _p	β x 10 ³	k x 10 ³	μ x 10 ⁶	v x 10 ⁷	a x 10 ⁷	Pr
°C	kg/m³	kJ/kg K	1/K	W/mK	kg/sm	m^2/s	m^2/s	
-200	5.106	1.186	17.24	6.886	4.997	9.786	11.37	0.8606
-180	3.851	1.071	11.83	8.775	6.623	17.20	21.27	0.8086
-160	3.126	1.036	9.293	10.64	7.994	25.58	32.86	0.7784
-140	2.639	1.010	7.726	12.47	9.294	35.22	46.77	0.7530
-120	2.287	1.014	6.657	14.26	10.55	46.14	61.50	0.7502
-100	2.019	1.011	5.852	16.02	11.77	58.29	78.51	0.7423
-80	1.807	1.009	5.227	17.74	12.94	71.59	97.30	0.7357
-60	1.636	1.007	4.725	19.41	14.07	85.98	117.8	0.7301
-40	1.495	1.007	4.313	21.04	15.16	101.4	139.7	0.7258
-30	1.433	1.007	4.133	21.84	15.70	109.5	151.3	0.7236
-20	1.377	1.007	3.968	22.63	16.22	117.8	163.3	0.7215
-10	1.324	1.006	3.815	23.41	16.74	126.4	175.7	0.7196
0	1.275	1.006	3.674	24.18	17.24	135.2	188.3	0.7179
10	1.230	1.007	3.543	24.94	17.74	144.2	201.4	0.7163
20	1.188	1.007	3.421	25.69	18.24	153.5	214.7	0.7148
30	1.149	1.007	3.307	26.43	18.72	163.0	228.4	0.7134
40	1.112	1.007	3.200	27.16	19.20	172.6	242.4	0.7122
60	1.045	1.009	3.007	28.60	20.14	192.7	271.3	0.7100
80	0.9859	1.010	2.836	30.01	21.05	213.5	301.4	0.7083
100	0.9329	1.012	2.683	31.39	21.94	235.1	332.6	0.7070
120	0.8854	1.014	2.546	32.75	22.80	257.5	364.8	0.7060
140	0.8425	1.016	2.422	34.08	23.65	280.7	398.0	0.7054
160	0.8036	1.019	2.310	35.39	24.48	304.6	432.1	0.7050
180	0.7681	1.022	2.208	36.68	25.29	329.3	467.1	0.7049
200	0.7356	1.026	2.115	37.95	26.09	354.7	503.0	0.7051
250	0.6653	1.035	1.912	41.06	28.02	421.1	596.2	0.7063
300	0.6072	1.046	1.745	44.09	29.86	491.8	694.3	0.7083
350	0.5585	1.057	1.605	47.05	31.64	566.5	796.8	0.7109
400	0.5170	1.069	1.486	49.96	33.35	645.1	903.8	0.7137
450	0.4813	1.081	1.383	52.82	35.01	727.4	1015	0.7166
500	0.4502	1.093	1.293	55.64	36.62	803.5	1131	0.7194
550	0.4228	1.105	1.215	58.41	38.19	903.1	1251	0.7221
600	0.3986	1.116	1.145	61.14	39.71	996.3	1375	0.7247
650	0.3770	1.126	1.083	63.83	41.20	1093	1503	0.7271
700	0.3576	1.137	1.027	66.46	42.66	1193	1635	0.7295
750	0.3402	1.146	0.9772	69.03	44.08	1296	1771	0.7318
800	0.3243	1.155	0.9317	71.54	45.48	1402	1910	0.7342
850	0.3099	1.163	0.8902	73.98	46.85	1512	2052	0.7368
900	0.2967	1.171	0.8523	76.33	48.19	1624	2197	0.7395
1000	0.2734	1.185	0.7853	80.77	50.82	1859	2492	0.7458

PROPRIETÀ TERMOFISICHE DELL'ACQUA ALLA SATURAZIONE

TAB. 11

t Temperatura

p Pressione

μ Viscosità dinamicaν Viscosità cinematica

PEDICI:
l liquido saturo

v vapore saturo secco

ρ Densità

c Calore specifico a p=cost

β Coefficiente volumetrico di dilatazione termica

k Conducibilità termica

a Diffusività termica

 $\begin{array}{l} Pr \;\; Numero \; di \; Prandtl \\ \\ \sigma \;\; Tensione \; superficiale \end{array}$

 $\Delta h_{lv} Entalpia di passaggio di stato$

t	n					ρ	$\beta_{\rm v}$	k _l	k _v			V				Pr ₁	Pr _v	σ	Δh_{lv}
°C	p bar	ρ ₁	ρ_v $\kappa g/m^3$	c _{pl}	c _{pv} cgK	β ₁ 10 ⁻³ 1			V/mK	μ _l 10 ⁻⁶ k	μ _v g/m s	ν ₁	v_v m^2/s	a ₁	$a_{\rm v}$ m^2/s	111	1 1 _V	10-3	kJ/kg
	our		.g/ III	1071	.61.	10 1	,10	10 1	v/IIII	10 1	.g/ III 3	10	111 / 5	10	111 / 3			N/m	KJ/ Kg
0.01	0.006117	999.78	0.004855	4.229	1.868	-0.08044	3.672	561.0	17.07	1792	9.216	1.792	1898	0.1327	1883	13.51	1.008	75.65	2500.5
10.00	0.012281	999.69	0.009405	4.188	1.874	0.08720	3.548	580.0	17.62	1306	9.461	1.307	1006	0.1385	999.8	9.434	1.006	74.22	2476.9
20.00	0.023388	998.19	0.01731	4.183	1.882	0.2089	3.435	598.4	18.23	1002	9.727	1.004	562.0	0.1433	559.6	7.005	1.004	72.74	2453.3
30.00	0.042455	995.61	0.03040	4.183	1.892	0.3050	3.332	615.4	18.89	797.7	10.01	0.8012	329.3	0.1478	328.3	5.422	1.003	71.20	2429.7
40.00	0.073814	992.17	0.05121	4.182	1.904	0.3859	3.240	630.5	19.60	653.2	10.31	0.6584	201.3	0.1519	200.9	4.333	1.002	69.60	2405.9
50.00	0.12344	987.99	0.08308	4.182	1.919	0.4572	3.156	643.5	20.36	547.1	10.62	0.5537	127.8	0.1558	127.7	3.555	1.001	67.95	2381.9
60.00	0.19932	983.16	0.13030	4.183	1.937	0.5222	3.083	654.3	21.18	466.6	10.93	0.4746	83.91	0.1591	83.92	2.983	1.000	66.24	2357.6
70.00	0.31176	977.75	0.19823	4.187	1.958	0.5827	3.018	666.3	22.07	404.1	11.26	0.4132	56.80	0.1620	56.85	2.551	0.9992	64.49	2333.1
80.00	0.47373	971.79	0.29336	4.194	1.983	0.6403	2.964	670.0	23.01	354.5	11.59	0.3648	39.51	0.1644	39.56	2.219	0.9989	62.68	2308.1
90.00	0.70117	965.33	0.42343	4.204	2.011	0.6958	2.919	675.3	24.02	314.5	11.93	0.3258	28.17	0.1664	28.20	1.958	0.9989	60.82	2282.7
100.00	1.0132	958.39	0.59750	4.217	2.044	0.7501	2.884	679.1	25.09	281.9	12.27	0.2941	20.53	0.1680	20.55	1.750	0.9994	58.92	2256.7
110.00	1.4324	951.00	0.82601	4.232	2.082	0.8038	2.860	681.7	26.24	254.8	12.61	0.2680	15.27	0.1694	15.26	1.582	1.001	56.97	2229.9
120.00	1.9848	943.16	1.12081	4.249	2.126	0.8576	2.846	683.2	27.46	232.2	12.96	0.2462	11.56	0.1705	11.53	1.444	1.003	54.97	2202.4
130.00	2.7002	934.88	1.4954	4.267	2.176	0.9123	2.844	683.7	28.76	213.0	13.30	0.2278	8.894	0.1714	8.840	1.329	1.006	52.94	2174.0
140.00	3.6119	926.18	1.9647	4.288	2.233	0.9683	2.855	683.3	30.14	196.6	13.65	0.2123	6.946	0.1720	6.869	1.234	1.011	50.86	2144.7
150.00	4.7572	917.06	2.5454	4.312	2.299	1.026	2.878	682.1	31.59	182.5	13.99	0.1991	5.496	0.1725	5.399	1.154	1.018	48.75	2114.1
160.00	6.1766	907.50	3.2564	4.339	2.374	1.087	2.916	680.0	33.12	170.3	14.34	0.1877	4.402	0.1727	4.285	1.087	1.027	46.60	2082.3
170.00	7.9147	897.51	4.1181	4.369	2.460	1.152	2.969	677.1	34.74	159.6	14.68	0.1779	3.565	0.1727	3.430	1.030	1.039	44.41	2049.2 2014.5
180.00	10.019	887.06	5.1539	4.403	2.558	1.221	3.039	673.4	36.44	150.2	15.02	0.1693	2.915	0.1724	2.764	0.9822	1.055	42.20 39.95	1978.2
190.00	12.542	876.15	6.3896	4.443	2.670	1.296	3.128	668.8	38.23	141.8	15.37	0.1619	2.405	0.1718	2.241	0.9423	1.073	37.68	1978.2
200.00	15.536	864.74	7.8542	4.489	2.797	1.377	3.238	663.4	40.10	134.4	15.71	0.1554	2.001	0.1709	1.825	0.9093	1.096	35.39	1940.1
210.00	19.062	852.82	9.5807	4.542	2.943	1.467	3.372	657.1	42.07	127.7	16.06	0.1497	1.676	0.1696	1.492	0.8825	1.123	33.08	1857.8
220.00	23.178	840.34	11.607	4.604	3.109	1.567	3.534	649.8	44.15	121.6	16.41	0.1447	1.414	0.1680	1.224	0.8614	1.155	30.75	1813.1
230.00	27.951	827.25	13.976	4.675	3.299	1.680	3.729	641.4	46.35	116.0	16.76	0.1403	1.199	0.1659	1.005	0.8456	1.193	28.40	1765.7
240.00	33.447	813.52	16.739	4.759	3.519	1.808	3.963	632.0	48.70	110.9	17.12	0.1363	1.023	0.1633	0.8268	0.8351	1.237	26.05	1715.4
250.00	39.736	799.07	19.956	4.857	3.772	1.955	4.245	621.4	51.23	106.2	17.49	0.1329	0.8766	0.1601	0.6804	0.8299	1.288	23.70	1661.9
260.00	46.894	783.83	23.700	4.973 5.111	4.068	2.127	4.586	609.4	53.98	101.7	17.88	0.1298	0.7542	0.1564	0.5598	0.8302	1.347 1.415	21.35	1604.6
270.00 280.00	54.999 64.132	767.68 750.52	28.061 33.152	5.111	4.418 4.836	2.331 2.578	5.002 5.519	596.1 581.4	57.04 60.52	97.56 93.57	18.27 18.70	0.1271 0.1247	0.6512 0.5640	0.1519 0.1467	0.4602 0.3775	0.8365 0.8496	1.415	19.00	1543.1
290.00	74.380	730.32	39.119	5.485	5.345	2.884	6.170	565.2	64.59	89.72	19.15	0.1247	0.3640	0.1407	0.3773	0.8490	1.585	16.68	1476.7
300.00	85.838	712.41	46.154	5.746	5.981	3.273	7.010	547.7	69.49	85.96	19.13	0.1223	0.4890	0.1407	0.3089	0.9018	1.691	14.37	1405.7
310.00	98.605	690.95	54.525	6.084	6.799	3.785	8.127	529.0	75.61	82.22	20.20	0.1207	0.3706	0.1338	0.2040	0.9457	1.817	12.10	1325.8
320.00	112.79	667.36	64.615	6.542	7.898	4.491	9.674	509.4	83.59	78.46	20.20	0.1176	0.3700	0.1238	0.1638	1.008	1.969	9.875	1238.5
330.00	128.52	641.00	77.013	7.201	9.458	5.530	11.94	489.2	94.48	74.58	21.60	0.1170	0.2805	0.1060	0.1297	1.098	2.163	7.713	1140.3
340.00	145.94	610.77	92.691	8.238	11.87	7.210	15.55	468.6	110.2	70.45	22.55	0.1153	0.2433	0.09313	0.1002	1.239	2.428	5.636	1027.5
350.00	165.21	574.69	113.48	10.13	16.11	10.37	22.12	447.6	134.6	65.88	23.81	0.1146	0.2098	0.07692	0.07365	1.490	2.849	3.675	893.03
360.00	186.55	528.10	143.64	14.69	25.80	18.30	37.71	427.2	178.0	60.39	25.71	0.1144	0.1790	0.05507	0.04804	2.077	3.726	1.886	721.06
370.00	210.30	453.13	200.29	41.96	78.75	68.20	126.7	428.0	299.4	52.26	29.57	0.1153	0.1477	0.02251	0.01898	5.122	7.780	0.3948	450.42
373.00	220.55	322.00	322.00	∞	∞	∞	∞	1419	1419	43.16	43.16	0.1341	0.1341	0.00000	0.00000	×	∞	0.0000	0.0000
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