

الجداول الملحقه

جدول (1 - 1) - خواص التشبع للماء وبخار الماء (H₂O) : دالة في درجات الحرارة *

Temp. °C T	Press. kPa P	Specific Volume		Internal Energy			Enthalpy			Entropy		
		Sat. Liquid v _f	Sat. Vapor v _g	Sat. Liquid u _f	Evap. u _{fg}	Sat. Vapor u _g	Sat. Liquid h _f	Evap. h _{fg}	Sat. Vapor h _g	Sat. Liquid s _f	Evap. s _{fg}	Sat. Vapor s _g
0.01	0.6113	0.001 000	206.14	.00	2375.3	2375.3	.01	2501.3	2501.4	.0000	9.1562	9.1562
5	0.8721	0.001 000	147.12	20.97	2361.3	2382.3	20.98	2489.6	2510.6	.0761	8.9496	9.0257
10	1.2276	0.001 000	106.38	42.00	2347.2	2389.2	42.01	2477.7	2519.8	.1510	8.7498	8.9008
15	1.7051	0.001 001	77.93	62.99	2333.1	2396.1	62.99	2465.9	2528.9	.2245	8.5569	8.7814
20	2.339	0.001 002	57.79	83.95	2319.0	2402.9	83.96	2454.1	2538.1	.2966	8.3706	8.6672
25	3.169	0.001 003	43.36	104.88	2304.9	2409.8	104.89	2442.3	2547.2	.3674	8.1905	8.5580
30	4.246	0.001 004	32.89	125.78	2290.8	2416.6	125.79	2430.5	2556.3	.4369	8.0164	8.4533
35	5.628	0.001 006	25.22	146.67	2276.7	2423.4	146.68	2418.6	2565.3	.5053	7.8478	8.3531
40	7.384	0.001 008	19.52	167.56	2262.6	2430.1	167.57	2406.7	2574.3	.5725	7.6845	8.2570
45	9.593	0.001 010	15.26	188.44	2248.4	2436.8	188.45	2394.8	2583.2	.6387	7.5261	8.1648
50	12.349	0.001 012	12.03	209.32	2234.2	2443.5	209.33	2382.7	2592.1	.7038	7.3725	8.0763
55	15.758	0.001 015	9.568	230.21	2219.9	2450.1	230.23	2370.7	2600.9	.7679	7.2234	7.9913
60	19.940	0.001 017	7.671	251.11	2205.5	2456.6	251.13	2358.5	2609.6	.8312	7.0784	7.9096
65	25.03	0.001 020	6.197	272.02	2191.1	2463.1	272.06	2346.2	2618.3	.8935	6.9375	7.8310
70	31.19	0.001 023	5.042	292.95	2176.6	2469.6	292.98	2333.8	2626.8	.9549	6.8004	7.7553
75	38.58	0.001 026	4.131	313.90	2162.0	2475.9	313.93	2321.4	2635.3	1.0155	6.6669	7.6824
80	47.39	0.001 029	3.407	334.86	2147.4	2482.2	334.91	2308.8	2643.7	1.0753	6.5369	7.6122
85	57.83	0.001 033	2.828	355.84	2132.6	2488.4	355.90	2296.0	2651.9	1.1343	6.4102	7.5445
90	70.14	0.001 036	2.361	376.85	2117.7	2494.5	376.92	2283.2	2660.1	1.1925	6.2866	7.4791
95	84.55	0.001 040	1.982	397.88	2102.7	2500.6	397.96	2270.2	2668.1	1.2500	6.1659	7.4159

* Adapted from Joseph H. Keenan, Frederick G. Keyes, Philip G. Hill, and Joan G. Moore. Steam Tables, (New York: John Wiley & Sons, Inc., 1978).

تابع جدول (1 - 1) - خواص التشبع للماء وبخار الماء دالة في درجات الحرارة .

Temp. °C T	Press. MPa P	Specific Volume		Internal Energy			Enthalpy			Entropy		
		Sat. Liquid v_f	Sat. Vapor v_g	Sat. Liquid u_f	Evap. u_{fg}	Sat. Vapor u_g	Sat. Liquid h_f	Evap. h_{fg}	Sat. Vapor h_g	Sat. Liquid s_f	Evap. s_{fg}	Sat. Vapor s_g
100	0.101 35	0.001 044	1.6729	418.94	2087.6	2506.5	419.04	2257.0	2676.1	1.3069	6.0480	7.3549
105	0.120 82	0.001 048	1.4194	440.02	2072.3	2512.4	440.15	2243.7	2683.8	1.3630	5.9328	7.2958
110	0.143 27	0.001 052	1.2102	461.14	2057.0	2518.1	461.30	2230.2	2691.5	1.4185	5.8202	7.2387
115	0.169 06	0.001 056	1.0366	482.30	2041.4	2523.7	482.48	2216.5	2699.0	1.4734	5.7100	7.1833
120	0.198 53	0.001 060	0.8919	503.50	2025.8	2529.3	503.71	2202.6	2706.3	1.5276	5.6020	7.1296
125	0.2321	0.001 065	0.7706	524.74	2009.9	2534.6	524.99	2188.5	2713.5	1.5813	5.4962	7.0775
130	0.2701	0.001 070	0.6685	546.02	1993.9	2539.9	546.31	2174.2	2720.5	1.6344	5.3925	7.0269
135	0.3130	0.001 075	0.5822	567.35	1977.7	2545.0	567.69	2159.6	2727.3	1.6870	5.2907	6.9777
140	0.3613	0.001 080	0.5089	588.74	1961.3	2550.0	589.13	2144.7	2733.9	1.7391	5.1908	6.9299
145	0.4154	0.001 085	0.4463	610.18	1944.7	2554.9	610.63	2129.6	2740.3	1.7907	5.0926	6.8833
150	0.4758	0.001 091	0.3928	631.68	1927.9	2559.5	632.20	2114.3	2746.5	1.8418	4.9960	6.8379
155	0.5431	0.001 096	0.3468	653.24	1910.8	2564.1	653.84	2098.6	2752.4	1.8925	4.9010	6.7935
160	0.6178	0.001 102	0.3071	674.87	1893.5	2568.4	675.55	2082.6	2758.1	1.9427	4.8075	6.7502
165	0.7005	0.001 108	0.2727	696.56	1876.0	2572.5	697.34	2066.2	2763.5	1.9925	4.7153	6.7078
170	0.7917	0.001 114	0.2428	718.33	1858.1	2576.5	719.21	2049.5	2768.7	2.0419	4.6244	6.6663
175	0.8920	0.001 121	0.2168	740.17	1840.0	2580.2	741.17	2032.4	2773.6	2.0909	4.5347	6.6256
180	1.0021	0.001 127	0.194 05	762.09	1821.6	2583.7	763.22	2015.0	2778.2	2.1396	4.4461	6.5857
185	1.1227	0.001 134	0.174 09	784.10	1802.9	2587.0	785.37	1997.1	2782.4	2.1879	4.3586	6.5465
190	1.2544	0.001 141	0.156 54	806.19	1783.8	2590.0	807.62	1978.8	2786.4	2.2359	4.2720	6.5079
195	1.3978	0.001 149	0.141 05	828.37	1764.4	2592.8	829.98	1960.0	2790.0	2.2835	4.1863	6.4698
200	1.5538	0.001 157	0.127 36	850.65	1744.7	2595.3	852.45	1940.7	2793.2	2.3309	4.1014	6.4323
205	1.7230	0.001 164	0.115 21	873.04	1724.5	2597.5	875.04	1921.0	2796.0	2.3780	4.0172	6.3952
210	1.9062	0.001 173	0.104 41	895.53	1703.9	2599.5	897.76	1900.7	2798.5	2.4248	3.9337	6.3585

تابع جدول (1 - 1) - خواص التشبع للماء وبخار الماء دالة في درجات الحرارة .

215	2.104	0.001 181	0.094 79	918.14	1682.9	2601.1	920.62	1879.9	2800.5	2.4714	3.8507	6.3221
220	2.318	0.001 190	0.086 19	940.87	1661.5	2602.4	943.62	1858.5	2802.1	2.5178	3.7683	6.2861
225	2.548	0.001 199	0.078 49	963.73	1639.6	2603.3	966.78	1836.5	2803.3	2.5639	3.6863	6.2503
230	2.795	0.001 209	0.071 58	986.74	1617.2	2603.9	990.12	1813.8	2804.0	2.6099	3.6047	6.2146
235	3.060	0.001 219	0.065 37	1009.89	1594.2	2604.1	1013.62	1790.5	2804.2	2.6558	3.5233	6.1791
240	3.344	0.001 229	0.059 76	1033.21	1570.8	2604.0	1037.32	1766.5	2803.8	2.7015	3.4422	6.1437
245	3.648	0.001 240	0.054 71	1056.71	1546.7	2603.4	1061.23	1741.7	2803.0	2.7472	3.3612	6.1083
250	3.973	0.001 251	0.050 13	1080.39	1522.0	2602.4	1085.36	1716.2	2801.5	2.7927	3.2802	6.0730
255	4.319	0.001 263	0.045 98	1104.28	1496.7	2600.9	1109.73	1689.8	2799.5	2.8383	3.1992	6.0375
260	4.688	0.001 276	0.042 21	1128.39	1470.6	2599.0	1134.37	1662.5	2796.9	2.8838	3.1181	6.0019
265	5.081	0.001 289	0.038 77	1152.74	1443.9	2596.6	1159.28	1634.4	2793.6	2.9294	3.0368	5.9662
270	5.499	0.001 302	0.035 64	1177.36	1416.3	2593.7	1184.51	1605.2	2789.7	2.9751	2.9551	5.9301
275	5.942	0.001 317	0.032 79	1202.25	1387.9	2590.2	1210.07	1574.9	2785.0	3.0208	2.8730	5.8938
280	6.412	0.001 332	0.030 17	1227.46	1358.7	2586.1	1235.99	1543.6	2779.6	3.0668	2.7903	5.8571
285	6.909	0.001 348	0.027 77	1253.00	1328.4	2581.4	1262.31	1511.0	2773.3	3.1130	2.7070	5.8199
290	7.436	0.001 366	0.025 57	1278.92	1297.1	2576.0	1289.07	1477.1	2766.2	3.1594	2.6227	5.7821
295	7.993	0.001 384	0.023 54	1305.2	1264.7	2569.9	1316.3	1441.8	2758.1	3.2062	2.5375	5.7437
300	8.581	0.001 404	0.021 67	1332.0	1231.0	2563.0	1344.0	1404.9	2749.0	3.2534	2.4511	5.7045
305	9.202	0.001 425	0.019 948	1359.3	1195.9	2555.2	1372.4	1366.4	2738.7	3.3010	2.3633	5.6643
310	9.856	0.001 447	0.018 350	1387.1	1159.4	2546.4	1401.3	1326.0	2727.3	3.3493	2.2737	5.6230
315	10.547	0.001 472	0.016 867	1415.5	1121.1	2536.6	1431.0	1283.5	2714.5	3.3982	2.1821	5.5804
320	11.274	0.001 499	0.015 488	1444.6	1080.9	2525.5	1461.5	1238.6	2700.1	3.4480	2.0882	5.5362
330	12.845	0.001 561	0.012 996	1505.3	993.7	2498.9	1525.3	1140.6	2665.9	3.5507	1.8909	5.4417
340	14.586	0.001 638	0.010 797	1570.3	894.3	2464.6	1594.2	1027.9	2622.0	3.6594	1.6763	5.3357
350	16.513	0.001 740	0.008 813	1641.9	776.6	2418.4	1670.6	893.4	2563.9	3.7777	1.4335	5.2112
360	18.651	0.001 893	0.006 945	1725.2	626.3	2351.5	1760.5	720.5	2481.0	3.9147	1.1379	5.0526
370	21.03	0.002 213	0.004 925	1844.0	384.5	2228.5	1890.5	441.6	2332.1	4.1106	.6865	4.7971
374.14	22.09	0.003 155	0.003 155	2029.6	0	2029.6	2099.3	0	2099.3	4.4298	0	4.4298

جدول (1 - 2) - خواص التشبع للماء وبخار الماء (H₂O) : دالة في الضغوط .

Press. kPa P	Temp. °C T	Specific Volume		Internal Energy			Enthalpy			Entropy		
		Sat. Liquid v _f	Sat. Vapor v _g	Sat. Liquid u _f	Evap. u _{fg}	Sat. Vapor u _g	Sat. Liquid h _f	Evap. h _{fg}	Sat. Vapor h _g	Sat. Liquid s _f	Evap. s _{fg}	Sat. Vapor s _g
0.6113	0.01	0.001 000	206.14	.00	2375.3	2375.3	.01	2501.3	2501.4	.0000	9.1562	9.1562
1.0	6.98	0.001 000	129.21	29.30	2355.7	2385.0	29.30	2484.9	2514.2	.1059	8.8697	8.9756
1.5	13.03	0.001 001	87.98	54.71	2338.6	2393.3	54.71	2470.6	2525.3	.1957	8.6322	8.8279
2.0	17.50	0.001 001	67.00	73.48	2326.0	2399.5	73.48	2460.0	2533.5	.2607	8.4629	8.7237
2.5	21.08	0.001 002	54.25	88.48	2315.9	2404.4	88.49	2451.6	2540.0	.3120	8.3311	8.6432
3.0	24.08	0.001 003	45.67	101.04	2307.5	2408.5	101.05	2444.5	2545.5	.3545	8.2231	8.5776
4.0	28.96	0.001 004	34.80	121.45	2293.7	2415.2	121.46	2432.9	2554.4	.4226	8.0520	8.4746
5.0	32.88	0.001 005	28.19	137.81	2282.7	2420.5	137.82	2423.7	2561.5	.4764	7.9187	8.3951
7.5	40.29	0.001 008	19.24	168.78	2261.7	2430.5	168.79	2406.0	2574.8	.5764	7.6750	8.2515
10	45.81	0.001 010	14.67	191.82	2246.1	2437.9	191.83	2392.8	2584.7	.6493	7.5009	8.1502
15	53.97	0.001 014	10.02	225.92	2222.8	2448.7	225.94	2373.1	2599.1	.7549	7.2536	8.0085
20	60.06	0.001 017	7.649	251.38	2205.4	2456.7	251.40	2358.3	2609.7	.8320	7.0766	7.9085
25	64.97	0.001 020	6.204	271.90	2191.2	2463.1	271.93	2346.3	2618.2	.8931	6.9383	7.8314
30	69.10	0.001 022	5.229	289.20	2179.2	2468.4	289.23	2336.1	2625.3	.9439	6.8247	7.7686
40	75.87	0.001 027	3.993	317.53	2159.5	2477.0	317.58	2319.2	2636.8	1.0259	6.6441	7.6700
50	81.33	0.001 030	3.240	340.44	2143.4	2483.9	340.49	2305.4	2645.9	1.0910	6.5029	7.5939
75	91.78	0.001 037	2.217	384.31	2112.4	2496.7	384.39	2278.6	2663.0	1.2130	6.2434	7.4564
MPa												
0.100	99.63	0.001 043	1.6940	417.36	2088.7	2506.1	417.46	2258.0	2675.5	1.3026	6.0568	7.3594
0.125	105.99	0.001 048	1.3749	444.19	2069.3	2513.5	444.32	2241.0	2685.4	1.3740	5.9104	7.2844
0.150	111.37	0.001 053	1.1593	466.94	2052.7	2519.7	467.11	2226.5	2693.6	1.4336	5.7897	7.2233
0.175	116.06	0.001 057	1.0036	486.80	2038.1	2524.9	486.99	2213.6	2700.6	1.4849	5.6868	7.1717
0.200	120.23	0.001 061	0.8857	504.49	2025.0	2529.5	504.70	2201.9	2706.7	1.5301	5.5970	7.1271
0.225	124.00	0.001 064	0.7933	520.47	2013.1	2533.6	520.72	2191.3	2712.1	1.5706	5.5173	7.0678

تابع جدول (1 - 2) - خواص التشبع للماء وبخار الماء (H₂O) دالة لى الضغوط .

0.250	127.44	0.001 067	0.7187	535.10	2002.1	2537.2	535.37	2181.5	2716.9	1.6072	5.4455	7.0527
0.275	130.60	0.001 070	0.6573	548.59	1991.9	2540.5	548.89	2172.4	2721.3	1.6408	5.3801	7.0209
0.300	133.55	0.001 073	0.6058	561.15	1982.4	2543.6	561.47	2163.8	2725.3	1.6718	5.3201	6.9919
0.325	136.30	0.001 076	0.5620	572.90	1973.5	2546.4	573.25	2155.8	2729.0	1.7006	5.2646	6.9652
0.350	138.88	0.001 079	0.5243	583.95	1965.0	2548.9	584.33	2148.1	2732.4	1.7275	5.2130	6.9405
0.375	141.32	0.001 081	0.4914	594.40	1956.9	2551.3	594.81	2140.8	2735.6	1.7528	5.1647	6.9175
0.40	143.63	0.001 084	0.4625	604.31	1949.3	2553.6	604.74	2133.8	2738.6	1.7766	5.1193	6.8959
0.45	147.93	0.001 088	0.4140	622.77	1934.9	2557.6	623.25	2120.7	2743.9	1.8207	5.0359	6.8565
0.50	151.86	0.001 093	0.3749	639.68	1921.6	2561.2	640.23	2108.5	2748.7	1.8607	4.9606	6.8213
0.55	155.48	0.001 097	0.3427	655.32	1909.2	2564.5	655.93	2097.0	2753.0	1.8973	4.8920	6.7893
0.60	158.85	0.001 101	0.3157	669.90	1897.5	2567.4	670.56	2086.3	2756.8	1.9312	4.8288	6.7600
0.65	162.01	0.001 104	0.2927	683.56	1886.5	2570.1	684.28	2076.0	2760.3	1.9627	4.7703	6.7331
0.70	164.97	0.001 108	0.2729	696.44	1876.1	2572.5	697.22	2066.3	2763.5	1.9922	4.7158	6.7080
0.75	167.78	0.001 112	0.2556	708.64	1866.1	2574.7	709.47	2057.0	2766.4	2.0200	4.6647	6.6847
0.80	170.43	0.001 115	0.2404	720.22	1856.6	2576.8	721.11	2048.0	2769.1	2.0462	4.6166	6.6628
0.85	172.96	0.001 118	0.2270	731.27	1847.4	2578.7	732.22	2039.4	2771.6	2.0710	4.5711	6.6421
0.90	175.38	0.001 121	0.2150	741.83	1838.6	2580.5	742.83	2031.1	2773.9	2.0946	4.5280	6.6226
0.95	177.69	0.001 124	0.2042	751.95	1830.2	2582.1	753.02	2023.1	2776.1	2.1172	4.4869	6.6041
1.00	179.91	0.001 127	0.1944	761.68	1822.0	2583.6	762.81	2015.3	2778.1	2.1387	4.4478	6.5865
1.10	184.09	0.001 133	0.1775	780.09	1806.3	2586.4	781.34	2000.4	2781.7	2.1792	4.3744	6.5536
1.20	187.99	0.001 139	0.1633	797.29	1791.5	2588.8	798.65	1986.2	2784.8	2.2166	4.3067	6.5233
1.30	191.64	0.001 144	0.1512	813.44	1777.5	2591.0	814.93	1972.7	2787.6	2.2515	4.2438	6.4953
1.40	195.07	0.001 149	0.1408	828.70	1764.1	2592.8	830.30	1959.7	2790.0	2.2842	4.1850	6.4693
1.50	198.32	0.001 154	0.1317	843.16	1751.3	2594.5	844.89	1947.3	2792.2	2.3150	4.1298	6.4448
1.75	205.76	0.001 166	0.1134	876.46	1721.4	2597.8	878.50	1917.9	2796.4	2.3851	4.0044	6.3896
2.00	212.42	0.001 177	0.0996	906.44	1693.8	2600.3	908.79	1890.7	2799.5	2.4474	3.8935	6.3409
2.25	218.45	0.001 187	0.0887	933.83	1668.2	2602.0	936.49	1865.2	2801.7	2.5035	3.7937	6.2972
2.5	223.99	0.001 197	0.0799	959.11	1644.0	2603.1	962.11	1841.0	2803.1	2.5547	3.7028	6.2575
3.0	233.90	0.001 217	0.0668	1004.78	1599.3	2604.1	1008.42	1795.7	2804.2	2.6457	3.5412	6.1869

تابع جدول (1 - 2) - خواص التشبع للماء وبخار الماء (H₂O) دالة في الضغوط .

Press. MPa <i>P</i>	Temp. °C <i>T</i>	Specific Volume		Internal Energy			Enthalpy			Entropy		
		Sat. Liquid <i>v_f</i>	Sat. Vapor <i>v_g</i>	Sat. Liquid <i>u_f</i>	Evap. <i>u_{fg}</i>	Sat. Vapor <i>u_g</i>	Sat. Liquid <i>h_f</i>	Evap. <i>h_{fg}</i>	Sat. Vapor <i>h_g</i>	Sat. Liquid <i>s_f</i>	Evap. <i>s_{fg}</i>	Sat. Vapor <i>s_g</i>
3.5	242.60	0.001 235	0.057 07	1045.43	1558.3	2603.7	1049.75	1753.7	2803.4	2.7253	3.4000	6.1253
4	250.40	0.001 252	0.049 78	1082.31	1520.0	2602.3	1087.31	1714.1	2801.4	2.7964	3.2737	6.0701
5	263.99	0.001 286	0.039 44	1147.81	1449.3	2597.1	1154.23	1640.1	2794.3	2.9202	3.0532	5.9734
6	275.64	0.001 319	0.032 44	1205.44	1384.3	2589.7	1213.35	1571.0	2784.3	3.0267	2.8625	5.8892
7	285.88	0.001 351	0.027 37	1257.55	1323.0	2580.5	1267.00	1505.1	2772.1	3.1211	2.6922	5.8133
8	295.06	0.001 384	0.023 52	1305.57	1264.2	2569.8	1316.64	1441.3	2758.0	3.2068	2.5364	5.7432
9	303.40	0.001 418	0.020 48	1350.51	1207.3	2557.8	1363.26	1378.9	2742.1	3.2858	2.3915	5.6772
10	311.06	0.001 452	0.018 026	1393.04	1151.4	2544.4	1407.56	1317.1	2724.7	3.3596	2.2544	5.6141
11	318.15	0.001 489	0.015 987	1433.7	1096.0	2529.8	1450.1	1255.5	2705.6	3.4295	2.1233	5.5527
12	324.75	0.001 527	0.014 263	1473.0	1040.7	2513.7	1491.3	1193.6	2684.9	3.4962	1.9962	5.4924
13	330.93	0.001 567	0.012 780	1511.1	985.0	2496.1	1531.5	1130.7	2662.2	3.5606	1.8718	5.4323
14	336.75	0.001 611	0.011 485	1548.6	928.2	2476.8	1571.1	1066.5	2637.6	3.6232	1.7485	5.3717
15	342.24	0.001 658	0.010 337	1585.6	869.8	2455.5	1610.5	1000.0	2610.5	3.6848	1.6249	5.3098
16	347.44	0.001 711	0.009 306	1622.7	809.0	2431.7	1650.1	930.6	2580.6	3.7461	1.4994	5.2455
17	352.37	0.001 770	0.008 364	1660.2	744.8	2405.0	1690.3	856.9	2547.2	3.8079	1.3698	5.1777
18	357.06	0.001 840	0.007 489	1698.9	675.4	2374.3	1732.0	777.1	2509.1	3.8715	1.2329	5.1044
19	361.54	0.001 924	0.006 657	1739.9	598.1	2338.1	1776.5	688.0	2464.5	3.9388	1.0839	5.0228
20	365.81	0.002 036	0.005 834	1785.6	507.5	2293.0	1826.3	583.4	2409.7	4.0139	.9130	4.9269
21	369.89	0.002 207	0.004 952	1842.1	388.5	2230.6	1888.4	446.2	2334.6	4.1075	.6938	4.8013
22	373.80	0.002 742	0.003 568	1961.9	125.2	2087.1	2022.2	143.4	2165.6	4.3110	.2216	4.5327
22.09	374.14	0.003 155	0.003 155	2029.6	0	2029.6	2099.3	0	2099.3	4.4298	0	4.4298

جدول (1 - 3) - خواص البخار المحمص .

T	P = .010 MPa (45.81)				P = .050 MPa (81.33)				P = .10 MPa (99.63)							
	v	u	h	s	v	u	h	s	v	u	h	s				
Sat.	14.674	2437.9	2584.7	8.1502	3.240	2483.9	2645.9	7.5939	1.6940	2506.1	2675.5	7.3594				
50	14.869	2443.9	2592.6	8.1749	3.418	2511.6	2682.5	7.6947	1.6958	2506.7	2676.2	7.3614				
100	17.196	2515.5	2687.5	8.4479	3.889	2585.6	2780.1	7.9401	1.9364	2582.8	2776.4	7.6134				
150	19.512	2587.9	2783.0	8.6882	4.356	2659.9	2877.7	8.1580	2.172	2658.1	2875.3	7.8343				
200	21.825	2661.3	2879.5	8.9038	4.820	2735.0	2976.0	8.3556	2.406	2733.7	2974.3	8.0333				
250	24.136	2736.0	2977.3	9.1002	5.284	2811.3	3075.5	8.5373	2.639	2810.4	3074.3	8.2158				
300	26.445	2812.1	3076.5	9.2813	6.209	2968.5	3278.9	8.8642	3.103	2967.9	3278.2	8.5435				
400	31.063	2968.9	3279.6	9.6077	7.134	3132.0	3488.7	9.1546	3.565	3131.6	3488.1	8.8342				
500	35.679	3132.3	3489.1	9.8978	8.057	3302.2	3705.1	9.4178	4.028	3301.9	3704.7	9.0976				
600	40.295	3302.5	3705.4	10.1608	8.981	3479.4	3928.5	9.6599	4.490	3479.2	3928.2	9.3398				
700	44.911	3479.6	3928.7	10.4028	9.904	3663.6	4158.9	9.8852	4.952	3663.5	4158.6	9.5652				
800	49.526	3663.8	4159.0	10.6281	10.828	3854.9	4396.3	10.0967	5.414	3854.8	4396.1	9.7767				
900	54.141	3855.0	4396.4	10.8396	11.751	4052.9	4640.5	10.2964	5.875	4052.8	4640.3	9.9764				
1000	58.757	4053.0	4640.6	11.0393	12.674	4257.4	4891.1	10.4859	6.337	4257.3	4891.0	10.1659				
1100	63.372	4257.5	4891.2	11.2287	13.597	4467.8	5147.7	10.6662	6.799	4467.7	5147.6	10.3463				
1200	67.987	4467.9	5147.8	11.4091	14.521	4683.6	5409.6	10.8382	7.260	4683.5	5409.5	10.5183				
1300	72.602	4683.7	5409.7	11.5811												
					P = .20 MPa (120.23)				P = .30 MPa (133.53)				P = .40 MPa (143.63)			
Sat.	.8857	2529.5	2706.7	7.1272	.6058	2543.6	2725.3	6.9919	.4625	2553.6	2738.6	6.8959				
150	.9596	2576.9	2768.8	7.2795	.6339	2570.8	2761.0	7.0778	.4708	2564.5	2752.8	6.9299				
200	1.0803	2654.4	2870.5	7.5066	.7163	2650.7	2865.6	7.3115	.5342	2646.8	2860.5	7.1706				
250	1.1988	2731.2	2971.0	7.7086	.7964	2728.7	2967.6	7.5166	.5951	2726.1	2964.2	7.3789				
300	1.3162	2808.6	3071.8	7.8926	.8753	2806.7	3069.3	7.7022	.6548	2804.8	3066.8	7.5662				
400	1.5493	2966.7	3276.6	8.2218	1.0315	2965.6	3275.0	8.0330	.7726	2964.4	3273.4	7.8985				

تابع جدول (3 - 1) - خواص البخار المحمص .

T	P = .20 MPa (120.23)			P = .30 MPa (133.55)			P = .40 MPa (143.63)					
	v	u	h	s	h	u	v	h	u	v	h	s
500	1.7814	3130.8	3487.1	8.5133	1.1867	3130.0	3486.0	8.3251	1.8893	3129.2	3484.9	8.1913
600	2.013	3301.4	3704.0	8.7770	1.3414	3300.8	3703.2	8.5892	1.0055	3300.2	3702.4	8.4558
700	2.244	3478.8	3927.6	9.0194	1.4957	3478.4	3927.1	8.8319	1.1215	3477.9	3926.5	8.6987
800	2.475	3663.1	4158.2	9.2449	1.6499	3662.9	4157.8	9.0576	1.2372	3662.4	4157.3	8.9244
900	2.706	3854.5	4395.8	9.4566	1.8041	3854.2	4395.4	9.2692	1.3529	3853.9	4395.1	9.1362
1000	2.937	4052.5	4640.0	9.6563	1.9581	4052.3	4639.7	9.4690	1.4685	4052.0	4639.4	9.3360
1100	3.168	4257.0	4890.7	9.8458	2.1121	4256.8	4890.4	9.6585	1.5840	4256.5	4890.2	9.5256
1200	3.399	4467.5	5147.3	10.0262	2.2661	4467.2	5147.1	9.8389	1.6996	4467.0	5146.8	9.7060
1300	3.630	4683.2	5409.3	10.1982	2.4201	4683.0	5409.0	10.0110	1.8151	4682.8	5408.8	9.8780
	P = .50 MPa (151.86)											
Sat.												
200	.3749	2561.2	2748.7	6.8213	.3157	2567.4	2756.8	6.7600	.2404	2576.8	2769.1	6.6628
250	.4249	2642.9	2855.4	7.0592	.3520	2638.9	2850.1	6.9665	.2608	2630.6	2839.3	6.8158
300	.4744	2723.5	2960.7	7.2709	.3938	2720.9	2957.2	7.1816	.2931	2715.5	2950.0	7.0384
350	.5226	2802.9	3064.2	7.4599	.4344	2801.0	3061.6	7.3724	.3241	2797.2	3056.5	7.2328
400	.5701	2882.6	3167.7	7.6329	.4742	2881.2	3165.7	7.5464	.3544	2878.2	3161.7	7.4089
500	.6173	2963.2	3271.9	7.7938	.5137	2962.1	3270.3	7.7079	.3843	2959.7	3267.1	7.5716
600	.7109	3128.4	3483.9	8.0873	.5920	3127.6	3482.8	8.0021	.4433	3126.0	3480.6	7.8673
700	.8041	3299.6	3701.7	7.3522	.6697	3299.1	3700.9	8.2674	.5018	3297.9	3699.4	8.1333
800	.8969	3477.5	3925.9	8.5952	.7472	3477.0	3925.3	8.5107	.5601	3476.2	3924.2	8.3770
900	.9896	3662.1	4156.9	8.8211	.8245	3661.8	4156.5	8.7367	.6181	3661.1	4155.6	8.6033
1000	1.0822	3853.6	4394.7	9.0329	.9017	3853.4	4394.4	8.9486	.6761	3852.8	4393.7	8.8153
	1.1747	4051.8	4639.1	9.2328	.9788	4051.5	4638.8	9.1485	.7340	4051.0	4638.2	9.0153
	P = .80 MPa (170.43)											
200												
250												
300												
350												
400												
500												
600												
700												
800												
900												
1000												

تابع جدول (3 - 1) - خواص البخار المصحح .

1100	1.2672	4256.3	4889.9	9.4224	1.0559	4256.1	4889.6	9.3381	.7919	4255.6	4889.1	9.2050
1200	1.3596	4466.8	5146.6	9.6029	1.1330	4466.5	5146.3	9.5185	.8497	4466.1	5145.9	9.3855
1300	1.4521	4682.5	5408.6	9.7749	1.2101	4682.3	5408.3	9.6906	.9076	4681.8	5407.9	9.5575
$P = 1.00 \text{ MPa (179.91)}$												
Sat.	.194 44	2583.6	2778.1	6.5865	.163 33	2588.8	2784.8	6.5233	.140 84	2592.8	2790.0	6.4693
200	.2060	2621.9	2827.9	6.6940	.169 30	2612.8	2815.9	6.5898	.143 02	2603.1	2803.3	6.4975
250	.2327	2709.9	2942.6	6.9247	.192 34	2704.2	2935.0	6.8294	.163 50	2698.3	2927.2	6.7467
300	.2579	2793.2	3051.2	7.1229	.2138	2789.2	3045.8	7.0317	.182 28	2785.2	3040.4	6.9534
350	.2825	2875.2	3157.7	7.3011	.2345	2872.2	3153.6	7.2121	.2003	2869.2	3149.5	7.1360
400	.3066	2957.3	3263.9	7.4651	.2548	2954.9	3260.7	7.3774	.2178	2952.5	3257.5	7.3026
500	.3541	3124.4	3478.5	7.7622	.2946	3122.8	3476.3	7.6759	.2521	3121.1	3474.1	7.6027
600	.4011	3296.8	3697.9	8.0290	.3339	3295.6	3696.3	7.9435	.2860	3294.4	3694.8	7.8710
700	.4478	3475.3	3923.1	8.2731	.3729	3474.4	3922.0	8.1881	.3195	3473.6	3920.8	8.1160
800	.4943	3660.4	4154.7	8.4996	.4118	3659.7	4153.8	8.4148	.3528	3659.0	4153.0	8.3431
900	.5407	3852.2	4392.9	8.7118	.4505	3851.6	4392.2	8.6272	.3861	3851.1	4391.5	8.5556
1000	.5871	4050.5	4637.6	8.9119	.4892	4050.0	4637.0	8.8274	.4192	4049.5	4636.3	8.7559
1100	.6335	4255.1	4888.6	9.1017	.5278	4254.6	4888.0	9.0172	.4524	4254.1	4887.5	8.9457
1200	.6798	4465.6	5145.4	9.2822	.5665	4465.1	5144.9	9.1977	.4855	4464.7	5144.4	9.1262
1300	.7261	4681.3	5407.4	9.4543	.6051	4680.9	5407.0	9.3698	.5186	4680.4	5406.5	9.2984
$P = 1.40 \text{ MPa (195.07)}$												
$P = 1.20 \text{ MPa (187.99)}$												
$P = 1.80 \text{ MPa (207.15)}$												
$P = 2.00 \text{ MPa (212.42)}$												
Sat.	.123 80	2596.0	2794.0	6.4218	.110 42	2598.4	2797.1	6.3794	.099 63	2600.3	2799.5	6.3409
225	.132 87	2644.7	2857.3	6.5518	.116 73	2636.6	2846.7	6.4808	.103 77	2628.3	2835.8	6.4147
250	.141 84	2692.3	2919.2	6.6732	.124 97	2686.0	2911.0	6.6066	.111 44	2679.6	2902.5	6.5453
300	.158 62	2781.1	3034.8	6.8844	.140 21	2776.9	3029.2	6.8226	.125 47	2772.6	3023.5	6.7664
350	.174 56	2866.1	3145.4	7.0694	.154 57	2863.0	3141.2	7.0100	.138 57	2859.8	3137.0	6.9563
400	.190 05	2950.1	3254.2	7.2374	.168 47	2947.7	3250.9	7.1794	.151 20	2945.2	3247.6	7.1271
500	.2203	3119.5	3472.0	7.5390	.195 50	3117.9	3469.8	7.4825	.175 68	3116.2	3467.6	7.4317
600	.2500	3293.3	3693.2	7.8080	.2220	3292.1	3691.7	7.7523	.199 60	3290.9	3690.1	7.7024
700	.2794	3472.7	3919.7	8.0535	.2482	3471.8	3918.5	7.9983	.2232	3470.9	3917.4	7.9487

تابع جدول (3 - 1) - خواص البخار المصحح .

T	P = 1.60 MPa (201.41)			P = 1.80 MPa (207.15)			P = 2.00 MPa (212.42)					
	v	u	h	s	v	u	h	s	v	u	h	s
800	.3086	3658.3	4152.1	8.2808	.2742	3657.6	4151.2	8.2258	.2467	3657.0	4150.3	8.1765
900	.3377	3850.5	4390.8	8.4935	.3001	3849.9	4390.1	8.4386	.2700	3849.3	4389.4	8.3895
1000	.3668	4049.0	4635.8	8.6938	.3260	4048.5	4635.2	8.6391	.2933	4048.0	4634.6	8.5901
1100	.3958	4253.7	4887.0	8.8837	.3518	4253.2	4886.4	8.8290	.3166	4252.7	4885.9	8.7800
1200	.4248	4464.2	5143.9	9.0643	.3776	4463.7	5143.4	9.0096	.3398	4463.3	5142.9	8.9607
1300	.4538	4679.9	5406.0	9.2364	.4034	4679.5	5405.6	9.1818	.3631	4679.0	5405.1	9.1329
	P = 3.00 MPa (233.90)											
Sat.	.079 98	2603.1	2803.1	6.2575	.066 68	2604.1	2804.2	6.1869	.057 07	2603.7	2803.4	6.1253
225	.080 27	2605.6	2806.3	6.2639								
250	.087 00	2662.6	2880.1	6.4085	.070 58	2644.0	2855.8	6.2872	.058 72	2623.7	2829.2	6.1749
300	.098 90	2761.6	3008.8	6.6438	.081 14	2750.1	2993.5	6.5390	.068 42	2738.0	2977.5	6.4461
350	.109 76	2851.9	3126.3	6.8403	.090 53	2843.7	3115.3	6.7428	.076 78	2835.3	3104.0	6.6579
400	.120 10	2939.1	3239.3	7.0148	.099 36	2932.8	3230.9	6.9212	.084 53	2926.4	3222.3	6.8405
450	.130 14	3025.5	3350.8	7.1746	.107 87	3020.4	3344.0	7.0834	.091 96	3015.3	3337.2	7.0052
500	.139 98	3112.1	3462.1	7.3234	.116 19	3108.0	3456.5	7.2338	.099 18	3103.0	3450.9	7.1572
600	.159 30	3288.0	3686.3	7.5960	.132 43	3285.0	3682.3	7.5085	.113 24	3282.1	3678.4	7.4339
700	.178 32	3468.7	3914.5	7.8435	.148 38	3466.5	3911.7	7.7571	.126 99	3464.3	3908.8	7.6837
800	.197 16	3655.3	4148.2	8.0720	.164 14	3653.5	4145.9	7.9862	.140 56	3651.8	4143.7	7.9134
900	.215 90	3847.9	4387.6	8.2853	.179 80	3846.5	4385.9	8.1999	.154 02	3845.0	4384.1	8.1276
1000	.2346	4046.7	4633.1	8.4861	.195 41	4045.4	4631.6	8.4009	.167 43	4044.1	4630.1	8.3288
1100	.2532	4251.5	4884.6	8.6762	.210 98	4250.3	4883.3	8.5912	.180 80	4249.2	4881.9	8.5192
1200	.2718	4462.1	5141.7	8.8569	.226 52	4460.9	5140.5	8.7720	.194 15	4459.8	5139.3	8.7000
1300	.2905	4677.8	5404.0	9.0291	.242 06	4676.6	5402.8	8.9442	.207 49	4675.5	5401.7	8.8723

تابع جدول (1 - 3) - خواص البخار المصمم .

Sat.	P = 4.0 MPa (250.40)					P = 4.5 MPa (257.49)					P = 5.0 MPa (263.99)					
	.049 78	2602.3	2801.4	6.0701	.044 06	2600.1	2798.3	6.0198	.039 44	2597.1	2794.3	5.9734	.041 41	2631.3	2838.3	6.0544
275	.054 57	2667.9	2886.2	6.2285	.047 30	2650.3	2863.2	6.1401	.045 32	2698.0	2924.5	6.2084	.051 94	2808.7	3068.4	6.4493
300	.058 84	2725.3	2960.7	6.3615	.058 40	2817.8	3080.6	6.5131	.057 81	2906.6	3195.7	6.6459	.063 30	2999.7	3316.2	6.8186
350	.066 45	2826.7	3092.5	6.5821	.064 75	2913.3	3204.7	6.7047	.068 57	3091.0	3433.8	6.9759	.078 69	3273.0	3666.5	7.2589
400	.073 41	2919.9	3213.6	6.7690	.070 74	3005.0	3323.3	6.8746	.088 49	3457.6	3900.1	7.5122	.098 11	3646.6	4137.1	7.7440
450	.080 02	3010.2	3330.3	6.9363	.076 51	3095.3	3439.6	7.0301	.107 62	3840.7	4378.8	7.9593	.117 07	4040.4	4625.7	8.1612
500	.086 43	3099.5	3445.3	7.0901	.087 65	3276.0	3670.5	7.3110	.126 48	4245.6	4878.0	8.3520	.135 87	4456.3	5135.7	8.5331
600	.098 85	3279.1	3674.4	7.3688	.098 47	3459.9	3903.0	7.5631	.145 26	4672.0	5398.2	8.7055	.150 98	4878.0	5825.5	8.8255
700	.110 95	3462.1	3905.9	7.6198	.109 11	3648.3	4139.3	7.7942	.161 39	5399.4	6199.4	9.1933	.161 39	5399.4	6199.4	9.1933
800	.122 87	3650.0	4141.5	7.8502	.119 65	3842.2	4380.6	8.0091								
900	.134 69	3843.6	4382.3	8.0647	.130 13	4041.6	4627.2	8.2108								
1000	.146 45	4042.9	4628.7	8.2662	.140 56	4246.8	4879.3	8.4015								
1100	.158 17	4248.0	4880.6	8.4567	.150 98	4457.5	5136.9	8.5825								
1200	.169 87	4458.6	5138.1	8.6376												
1300	.181 56	4674.3	5400.5	8.8100												
Sat.	P = 6.0 MPa (275.64)					P = 7.0 MPa (285.88)					P = 8.0 MPa (295.06)					
300	.032 44	2589.7	2784.3	5.8892	.027 37	2580.5	2772.1	5.8133	.023 52	2569.8	2758.0	5.7432	.024 26	2590.9	2785.0	5.7906
350	.036 16	2667.2	2884.2	6.0674	.029 47	2632.2	2838.4	5.9305	.029 95	2647.7	2847.7	5.8301	.029 95	2647.7	2847.7	5.8301
400	.042 23	2789.6	3043.0	6.3335	.035 24	2769.4	3016.0	6.2283	.034 32	2863.8	3138.3	6.3634	.034 32	2863.8	3138.3	6.3634
450	.047 39	2892.9	3177.2	6.5408	.039 93	2878.6	3158.1	6.4478	.038 17	2966.7	3222.0	6.5551	.038 17	2966.7	3222.0	6.5551
500	.052 14	2988.9	3301.8	6.7193	.044 16	2978.0	3287.1	6.6327	.041 75	3064.3	3398.3	6.7240	.041 75	3064.3	3398.3	6.7240
550	.056 65	3082.2	3422.2	6.8803	.048 14	3073.4	3410.3	6.7975	.045 16	3159.8	3521.0	6.8778	.045 16	3159.8	3521.0	6.8778
600	.061 01	3174.6	3540.6	7.0288	.051 95	3167.2	3530.9	6.9486	.048 45	3254.4	3642.0	7.0206	.048 45	3254.4	3642.0	7.0206
700	.065 25	3266.9	3658.4	7.1677	.055 65	3260.7	3650.3	7.0894	.054 81	3343.9	3882.4	7.2812	.054 81	3343.9	3882.4	7.2812
800	.073 52	3453.1	3894.2	7.4234	.062 83	3448.5	3888.3	7.3476	.060 97	3636.0	4123.8	7.5173	.060 97	3636.0	4123.8	7.5173
900	.081 60	3643.1	4132.7	7.6566	.069 81	3639.5	4128.2	7.5822	.067 02	3832.1	4368.3	7.7351	.067 02	3832.1	4368.3	7.7351
1000	.089 58	3837.8	4375.3	7.8727	.076 69	3835.0	4371.8	7.7991	.073 01	4032.8	4616.9	7.9384	.073 01	4032.8	4616.9	7.9384
1100	.097 49	4037.8	4622.7	8.0751	.083 50	4035.3	4619.8	8.0020	.078 96	4238.6	4870.3	8.1300	.078 96	4238.6	4870.3	8.1300
	.105 36	4243.3	4875.4	8.2661	.090 27	4240.9	4872.8	8.1933								

تابع جدول (1 - 3) - خواص البخار المحمص .

T	P = 6.0 MPa (275.64)			P = 7.0 MPa (285.88)			P = 8.0 MPa (295.06)					
	v	u	h	s	v	u	h	s	v	u	h	s
1200	.113 21	4454.0	5133.3	8.4474	.097 03	4451.7	5130.9	8.3747	.084 89	4449.5	5128.5	8.3115
1300	.121 06	4669.6	5396.0	8.6199	.103 77	4667.3	5393.7	8.5473	.090 80	4665.0	5391.5	8.4842
	P = 9.0 MPa (303.40)			P = 10.0 MPa (311.06)			P = 12.5 MPa (327.89)					
Sat.	.020 48	2557.8	2742.1	5.6772	.018 026	2544.4	2724.7	5.6141	.013 495	2505.1	2673.8	5.4624
325	.023 27	2646.6	2856.0	5.8712	.019 861	2610.4	2809.1	5.7568				
350	.025 80	2724.4	2956.6	6.0361	.022 42	2699.2	2923.4	5.9443				
400	.029 93	2848.4	3117.8	6.2854	.026 41	2832.4	3096.5	6.2120				
450	.033 50	2955.2	3256.6	6.4844	.029 75	2943.4	3240.9	6.4190				
500	.036 77	3055.2	3386.1	6.6576	.032 79	3045.8	3373.7	6.5966				
550	.039 87	3152.2	3511.0	6.8142	.035 64	3144.6	3500.9	6.7561				
600	.042 85	3248.1	3633.7	6.9589	.038 37	3241.7	3625.3	6.9029				
650	.045 74	3343.6	3755.3	7.0943	.041 01	3338.2	3748.2	7.0398				
700	.048 57	3439.3	3876.5	7.2221	.043 58	3434.7	3870.5	7.1687				
800	.054 09	3632.5	4119.3	7.4596	.048 59	3628.9	4114.8	7.4077				
900	.059 50	3829.2	4364.8	7.6783	.053 49	3826.3	4361.2	7.6272				
1000	.064 85	4030.3	4614.0	7.8821	.058 32	4027.8	4611.0	7.8315				
1100	.070 16	4236.3	4867.7	8.0740	.063 12	4234.0	4865.1	8.0237				
1200	.075 44	4447.2	5126.2	8.2556	.067 89	4444.9	5123.8	8.2055				
1300	.080 72	4662.7	5389.2	8.4284	.072 65	4460.5	5387.0	8.3783				

تابع جدول (1 - 3) - خواص البخار المصنوع .

Sal.	P = 15.0 MPa (342.24)				P = 17.5 MPa (354.75)				P = 20.0 MPa (365.81)							
	.010 337	2455.5	2610.5	5.3098	.007 920	2390.2	2528.8	5.1419	.005 834	2293.0	2409.7	4.9269				
350	.011 470	2520.4	2692.4	5.4421	.012 447	2685.0	2902.9	5.7213	.009 942	2619.3	2818.1	5.5540				
400	.015 649	2740.7	2975.5	5.8811	.015 174	2844.2	3109.7	6.0184	.012 695	2806.2	3060.1	5.9017				
450	.018 445	2879.5	3156.2	6.1404	.017 358	2970.3	3274.1	6.2383	.014 768	2942.9	3238.2	6.1401				
500	.020 80	2996.6	3308.6	6.3443	.019 288	3083.9	3421.4	6.4230	.016 555	3062.4	3393.5	6.3348				
550	.022 93	3104.7	3448.6	6.5199	.021 06	3191.5	3560.1	6.5866	.018 178	3174.0	3537.6	6.5048				
600	.024 91	3208.6	3582.3	6.6776	.022 74	3296.0	3693.9	6.7357	.019 693	3281.4	3675.3	6.6582				
650	.026 80	3310.3	3712.3	6.8224	.024 34	3398.7	3824.6	6.8736	.021 13	3386.4	3809.0	6.7993				
700	.028 61	3410.9	3840.1	6.9572	.027 38	3601.8	4081.1	7.1244	.023 85	3592.7	4069.7	7.0544				
800	.032 10	3610.9	4092.4	7.2040	.030 31	3804.7	4335.1	7.3507	.026 45	3797.5	4326.4	7.2830				
900	.035 46	3811.9	4343.8	7.4279	.033 16	4009.3	4589.5	7.5589	.028 97	4003.1	4582.5	7.4925				
1000	.038 75	4015.4	4596.6	7.6348	.035 97	4216.9	4846.4	7.7531	.031 45	4211.3	4840.2	7.6874				
1100	.042 00	4222.6	4852.6	7.8283	.038 76	4428.3	5106.6	7.9360	.033 91	4422.8	5101.0	7.8707				
1200	.045 23	4433.8	5112.3	8.0108	.041 54	4643.5	5370.5	8.1093	.036 36	4638.0	5365.1	8.0442				
1300	.048 45	4649.1	5376.0	8.1840												
					P = 25.0 MPa				P = 30.0 MPa				P = 35.0 MPa			
375	.001 973 1	1798.7	1848.0	4.0320	.001 789 2	1737.8	1791.5	3.9305	.001 700 3	1702.9	1762.4	3.8722				
400	.006 004	2430.1	2580.2	5.1418	.002 790	2067.4	2151.1	4.4728	.002 100	1914.1	1987.6	4.2126				
425	.007 881	2609.2	2806.3	5.4723	.005 303	2455.1	2614.2	5.1504	.003 428	2253.4	2373.4	4.7747				
450	.009 162	2720.7	2949.7	5.6744	.006 735	2619.3	2821.4	5.4424	.004 961	2498.7	2672.4	5.1962				
500	.011 123	2884.3	3162.4	5.9592	.008 678	2820.7	3081.1	5.7905	.006 927	2751.9	2994.4	5.6282				
550	.012 724	3017.5	3335.6	6.1765	.010 168	2970.3	3275.4	6.0342	.008 345	2921.0	3213.0	5.9026				
600	.014 137	3137.9	3491.4	6.3602	.011 446	3100.5	3443.9	6.2331	.009 527	3062.0	3395.5	6.1179				
650	.015 433	3251.6	3637.4	6.5229	.012 596	3221.0	3598.9	6.4058	.010 575	3189.8	3559.9	6.3010				
700	.016 646	3361.3	3777.5	6.6707	.013 661	3335.8	3745.6	6.5606	.011 533	3309.8	3713.5	6.4631				
800	.018 912	3574.3	4047.1	6.9345	.015 623	3555.5	4024.2	6.8332	.013 278	3536.7	4001.5	6.7450				
900	.021 045	3783.0	4309.1	7.1680	.017 448	3768.5	4291.9	7.0718	.014 883	3754.0	4274.9	6.9886				
1000	.023 10	3990.9	4568.5	7.3802	.019 196	3978.8	4554.7	7.2867	.016 410	3966.7	4541.1	7.2064				
1100	.025 12	4200.2	4828.2	7.5765	.020 903	4189.2	4816.3	7.4845	.017 895	4178.3	4804.6	7.4057				

تابع جدول (3 - 1) - خواص البخار المحمص .

T	v	u	h	s	v'	u	h	s	v	u	h	s
P = 25.0 MPa												
1200	.027 11	4412.0	5089.9	7.7605	.022 589	4401.3	5079.0	7.6692	.019 360	4390.7	5068.3	7.5910
1300	.029 10	4626.9	5354.4	7.9342	.024 266	4616.0	5344.0	7.8432	.020 815	4605.1	5333.6	7.7653
P = 30.0 MPa												
375	.001 640 7	1677.1	1742.8	3.8290	.001 559 4	1638.6	1716.6	3.7639	.001 502 8	1609.4	1699.5	3.7141
400	.001 907 7	1854.6	1930.9	4.1135	.001 730 9	1788.1	1874.6	4.0031	.001 633 5	1745.4	1843.4	3.9318
425	.002 532	2096.9	2198.1	4.5029	.002 007	1939.7	2060.0	4.2734	.001 816 5	1892.7	2001.7	4.1626
450	.003 693	2365.1	2512.8	4.9459	.002 486	2159.6	2284.0	4.5884	.002 085	2053.9	2179.0	4.4121
500	.005 622	2678.4	2903.3	5.4700	.003 892	2525.5	2720.1	5.1726	.002 956	2390.6	2567.9	4.9321
550	.006 984	2869.7	3149.1	5.7785	.005 118	2763.6	3019.5	5.5485	.003 956	2658.8	2896.2	5.3441
600	.008 094	3022.6	3346.4	6.0114	.006 112	2942.0	3247.6	5.8178	.004 834	2861.1	3151.2	5.6452
650	.009 063	3158.0	3520.6	6.2054	.006 966	3093.5	3441.8	6.0342	.005 595	3028.8	3364.5	5.8829
700	.009 941	3283.6	3681.2	6.3750	.007 727	3230.5	3616.8	6.2189	.006 272	3177.2	3553.5	6.0824
800	.011 523	3517.8	3978.7	6.6662	.009 076	3479.8	3933.6	6.5290	.007 459	3441.5	3889.1	6.4109
900	.012 962	3739.4	4257.9	6.9150	.010 283	3710.3	4224.4	6.7882	.008 508	3681.0	4191.5	6.6805
1000	.014 324	3954.6	4527.6	7.1356	.011 411	3930.5	4501.1	7.0146	.009 480	3906.4	4475.2	6.9127
1100	.015 642	4167.4	4793.1	7.3364	.012 496	4145.7	4770.5	7.2184	.010 409	4124.1	4748.6	7.1195
1200	.016 940	4380.1	5057.7	7.5224	.013 561	4359.1	5037.2	7.4058	.011 317	4338.2	5017.2	7.3083
1300	.018 229	4594.3	5323.5	7.6969	.014 616	4572.8	5303.6	7.5808	.012 215	4551.4	5284.3	7.4837
P = 40.0 MPa												
P = 50.0 MPa												
P = 60.0 MPa												

جدول (4 - I) - خواص الماء السائل المضغوط

Compressed Liquid Water (SI Units)																
T	P = 5.00 MPa (263.99)					P = 10.00 MPa (311.06)					P = 15.00 MPa (342.24)					
	v	u	h	s	v	u	h	s	v	u	h	s	v	u	h	s
Sat.	.0012859	1147.78	1154.21	2.9201	.0014524	1393.00	1407.53	3.3595	.0016581	1585.58	1610.45	3.6847	.0016581	1585.58	1610.45	3.6847
0	.0009977	0.03	5.02	0.0001	.0009952	0.10	10.05	0.0003	.0009923	0.15	15.04	0.0004	.0009923	0.15	15.04	0.0004
20	.0009995	83.64	88.64	0.2955	.0009972	83.35	93.32	0.2945	.0009950	83.05	97.97	0.2934	.0009950	83.05	97.97	0.2934
40	.0010056	166.93	171.95	0.5705	.0010034	166.33	176.36	0.5685	.0010013	165.73	180.75	0.5665	.0010013	165.73	180.75	0.5665
60	.0010149	250.21	255.28	0.8284	.0010127	249.34	259.47	0.8258	.0010105	248.49	263.65	0.8231	.0010105	248.49	263.65	0.8231
80	.0010268	333.69	338.83	1.0719	.0010245	332.56	342.81	1.0687	.0010222	331.46	346.79	1.0655	.0010222	331.46	346.79	1.0655
100	.0010410	417.50	422.71	1.3030	.0010385	416.09	426.48	1.2992	.0010361	414.72	430.26	1.2954	.0010361	414.72	430.26	1.2954
120	.0010576	501.79	507.07	1.5232	.0010549	500.07	510.61	1.5188	.0010522	498.39	514.17	1.5144	.0010522	498.39	514.17	1.5144
140	.0010768	586.74	592.13	1.7342	.0010737	584.67	595.40	1.7291	.0010707	582.64	598.70	1.7241	.0010707	582.64	598.70	1.7241
160	.0010988	672.61	678.10	1.9374	.0010953	670.11	681.07	1.9316	.0010918	667.69	684.07	1.9259	.0010918	667.69	684.07	1.9259
180	.0011240	759.62	765.24	2.1341	.0011199	756.63	767.83	2.1274	.0011159	753.74	770.48	2.1209	.0011159	753.74	770.48	2.1209
200	.0011530	848.08	853.85	2.3254	.0011480	844.49	855.97	2.3178	.0011433	841.04	858.18	2.3103	.0011433	841.04	858.18	2.3103
220	.0011866	938.43	944.36	2.5128	.0011805	934.07	945.88	2.5038	.0011748	929.59	947.52	2.4952	.0011748	929.59	947.52	2.4952
240	.0012264	1031.34	1037.47	2.6978	.0012187	1025.94	1038.13	2.6872	.0012114	1020.52	1033.99	2.6770	.0012114	1020.52	1033.99	2.6770
260	.0012745	1127.92	1134.30	2.8829	.0012645	1121.03	1133.68	2.8698	.0012550	1114.59	1133.41	2.8575	.0012550	1114.59	1133.41	2.8575
280	.0013315				.0013216	1220.90	1234.11	3.0547	.0013084	1212.47	1232.09	3.0392	.0013084	1212.47	1232.09	3.0392
300					.0013972	1328.34	1342.31	3.2468	.0013770	1316.58	1337.23	3.2259	.0013770	1316.58	1337.23	3.2259
320									.0014724	1431.05	1453.13	3.4246	.0014724	1431.05	1453.13	3.4246
340									.0016311	1567.42	1591.88	3.6545	.0016311	1567.42	1591.88	3.6545

تابع جدول (4 - I) خواص الماء السائل المضغوط

Sat.	P = 20 MPa (365.81)			P = 30 MPa			P = 50 MPa				
0	0.000000	1785.47	1826.18	4.0137	0.00004	0.25	29.82	0.0001	0.20	49.03	0.00014
20	0.000004	0.20	20.00	0.0004	0.000856	82.16	111.82	0.2898	80.98	130.00	0.2947
40	0.000023	82.75	102.61	0.2922	0.009886	164.01	193.87	0.5606	161.84	211.20	0.5526
60	0.000092	165.15	185.14	0.5646	0.009951	246.03	276.16	0.8153	242.96	292.77	0.8051
80	0.000354	247.66	267.82	0.8205	0.010042	328.28	358.75	1.0561	324.32	374.68	1.0439
100	0.001099	330.38	350.78	1.0623	0.010156	410.76	441.63	1.2844	405.86	456.87	1.2703
120	0.002337	413.37	454.04	1.2917	0.010290	493.58	524.91	1.5017	487.63	539.37	1.4857
140	0.004496	496.75	517.74	1.5101	0.010445	576.86	608.73	1.7097	569.76	622.33	1.6915
160	0.007678	580.67	602.03	1.7192	0.010621	660.81	693.27	1.9095	652.39	705.91	1.8890
180	0.011120	665.34	687.11	1.9203	0.010821	745.57	778.71	2.1024	735.68	790.24	2.0793
200	0.015387	750.94	773.18	2.1146	0.011047	831.34	865.24	2.2892	819.73	875.46	2.2634
220	0.020693	837.70	860.47	2.3031	0.011302	918.32	953.09	2.4710	904.67	961.71	2.4419
240	0.027416	925.89	949.27	2.4869	0.011590	1006.84	1042.60	2.6489	990.69	1049.20	2.6158
260	0.035262	1015.94	1040.04	2.6673	0.011920	1097.38	1134.29	2.8242	1078.06	1138.23	2.7860
280	0.044796	1108.53	1133.45	2.8459	0.012303	1190.69	1228.96	2.9985	1167.19	1229.26	2.9536
300	0.056396	1204.69	1250.62	3.0248	0.012755	1287.89	1327.80	3.1740	1258.66	1322.95	3.1200
320	0.070437	1306.10	1333.29	3.2071	0.013304	1390.64	1432.63	3.3538	1353.23	1420.17	3.2867
340	0.087583	1415.66	1444.53	3.3978	0.013997	1501.71	1546.47	3.5425	1451.91	1522.07	3.4556
360	0.108226	1539.64	1571.01	3.6074	0.014919	1626.57	1675.36	3.7492	1555.97	1630.16	3.6290
380	0.133126	1702.78	1739.23	3.8770	0.016265	1781.35	1837.43	4.0010	1667.13	1746.54	3.8100

جدول (1 - 5) - خواص الماء المشبع بخار - صلب

Temp. °C T	Specific Volume m ³ /kg			Internal Energy kJ/kg			Enthalpy kJ/kg			Entropy kJ/kg K		
	Press. kPa P	Sat. Solid $v_f \times 10^3$	Sat. Vapor v_g	Sat. Solid u_f	Subl. u_{fg}	Sat. Vapor u_g	Sat. Solid h_f	Subl. h_{fg}	Sat. Vapor h_g	Sat. Solid s_f	Subl. s_{fg}	Sat. Vapor s_g
.01	.6113	1.0908	206.1	-333.40	2708.7	2375.3	-333.40	2834.8	2501.4	-1.221	10.378	9.156
0	.6108	1.0908	206.3	-333.43	2708.8	2375.3	-333.43	2834.8	2501.3	-1.221	10.378	9.157
-2	.5176	1.0904	241.7	-337.62	2710.2	2372.6	-337.62	2835.3	2497.7	-1.237	10.456	9.219
-4	.4375	1.0901	283.8	-341.78	2711.6	2369.8	-341.78	2835.7	2494.0	-1.253	10.536	9.283
-6	.3689	1.0898	334.2	-345.91	2712.9	2367.0	-345.91	2836.2	2490.3	-1.268	10.616	9.348
-8	.3102	1.0894	394.4	-350.02	2714.2	2364.2	-350.02	2836.6	2486.6	-1.284	10.698	9.414
-10	.2602	1.0891	466.7	-354.09	2715.5	2361.4	-354.09	2837.0	2482.9	-1.299	10.781	9.481
-12	.2176	1.0888	553.7	-358.14	2716.8	2358.7	-358.14	2837.3	2479.2	-1.315	10.865	9.550
-14	.1815	1.0884	658.8	-362.15	2718.0	2355.9	-362.15	2837.6	2475.5	-1.331	10.950	9.619
-16	.1510	1.0881	786.0	-366.14	2719.2	2353.1	-366.14	2837.9	2471.8	-1.346	11.036	9.690
-18	.1252	1.0878	940.5	-370.10	2720.4	2350.3	-370.10	2838.2	2468.1	-1.362	11.123	9.762
-20	.1035	1.0874	1128.6	-374.03	2721.6	2347.5	-374.03	2838.4	2464.3	-1.377	11.212	9.835
-22	.0853	1.0871	1358.4	-377.93	2722.7	2344.7	-377.93	2838.6	2460.6	-1.393	11.302	9.909
-24	.0701	1.0868	1640.1	-381.80	2723.7	2342.0	-381.80	2838.7	2456.9	-1.408	11.394	9.985
-26	.0574	1.0864	1986.4	-385.64	2724.8	2339.2	-385.64	2838.9	2453.2	-1.424	11.486	10.062
-28	.0469	1.0861	2413.7	-389.45	2725.8	2336.4	-389.45	2839.0	2449.5	-1.439	11.580	10.141
-30	.0381	1.0858	2943	-393.23	2726.8	2333.6	-393.23	2839.0	2445.8	-1.455	11.676	10.221
-32	.0309	1.0854	3600	-396.98	2727.8	2330.8	-396.98	2839.1	2442.1	-1.471	11.773	10.303
-34	.0250	1.0851	4419	-400.71	2728.7	2328.0	-400.71	2839.1	2438.4	-1.486	11.872	10.386
-36	.0201	1.0848	5444	-404.40	2729.6	2325.2	-404.40	2839.1	2434.7	-1.501	11.972	10.470
-38	.0161	1.0844	6731	-408.06	2730.5	2322.4	-408.06	2839.0	2430.9	-1.517	12.073	10.556
-40	.0129	1.0841	8354	-411.70	2731.3	2319.6	-411.70	2838.9	2427.2	-1.532	12.176	10.644

جدول (2 - 1) - خواص التشبع للسائل وبخار غاز التبريد (فريون 12)

SATURATION PROPERTIES OF REFRIGERANT-12 (SI UNITS)

TEMP. °C	PRES.	VOLUME m ³ /kg · 10 ³		DENSITY kg/m ³		ENTHALPY kJ/kg			ENTROPY kJ/kg K		TEMP. °C
		LIQUID v _l	VAPOR v _g	LIQUID 1/v _l	VAPOR 1/v _g	LIQUID h _l	LATENT h _{fg}	VAPOR h _g	LIQUID s _l	VAPOR s _g	
-45	0.5044	0.65355	302.683	1.53818	0.00330	159.549	171.674	331.223	0.83901	1.59142	-45
-44	0.5298	0.65472	289.157	1.52736	0.00346	160.427	171.260	331.697	0.84285	1.59016	-44
-43	0.5562	0.65590	276.362	1.52462	0.00367	161.306	170.845	332.151	0.84667	1.58893	-43
-42	0.5836	0.65709	264.249	1.52186	0.00378	162.186	170.429	332.615	0.85047	1.58773	-42
-41	0.6121	0.65828	252.779	1.51910	0.00395	163.067	170.011	333.078	0.85427	1.58655	-41
-40	0.6417	0.65949	241.918	1.51633	0.00413	163.948	169.593	333.541	0.85805	1.58539	-40
-39	0.6724	0.66070	231.607	1.51355	0.00432	164.831	169.173	334.004	0.86181	1.58426	-39
-38	0.7043	0.66192	221.835	1.51076	0.00451	165.714	168.757	334.466	0.86557	1.58315	-38
-37	0.7373	0.66315	212.562	1.50796	0.00470	166.598	168.329	334.927	0.86931	1.58207	-37
-36	0.7714	0.66438	203.759	1.50515	0.00491	167.483	167.905	335.388	0.87304	1.58100	-36
-35	0.8071	0.66563	195.398	1.50233	0.00512	168.369	167.480	335.849	0.87676	1.57994	-35
-34	0.8438	0.66689	187.453	1.49951	0.00533	169.255	167.054	336.309	0.88046	1.57894	-34
-33	0.8819	0.66815	179.900	1.49667	0.00555	170.143	166.626	336.768	0.88415	1.57795	-33
-32	0.9211	0.66942	172.716	1.49382	0.00579	171.031	166.196	337.227	0.88783	1.57697	-32
-31	0.9620	0.67071	165.881	1.49097	0.00603	171.920	165.765	337.686	0.89150	1.57601	-31
-30	1.0041	0.67200	159.375	1.48810	0.00627	172.810	165.333	338.143	0.89516	1.57507	-30
-29	1.0477	0.67330	153.179	1.48522	0.00653	173.701	164.899	338.600	0.89880	1.57416	-29
-28	1.0927	0.67461	147.275	1.48234	0.00679	174.593	164.463	339.057	0.90244	1.57326	-28
-27	1.1392	0.67593	141.649	1.47944	0.00706	175.486	164.024	339.513	0.90606	1.57238	-27
-26	1.1872	0.67726	136.284	1.47653	0.00734	176.380	163.587	339.968	0.90967	1.57152	-26
-25	1.2364	0.67860	131.164	1.47361	0.00762	177.275	163.147	340.422	0.91327	1.57068	-25
-24	1.2868	0.67996	126.282	1.47068	0.00792	178.171	162.705	340.876	0.91686	1.56985	-24
-23	1.3384	0.68132	121.620	1.46774	0.00822	179.068	162.261	341.328	0.92043	1.56904	-23
-22	1.3913	0.68269	117.167	1.46479	0.00853	179.965	161.815	341.780	0.92400	1.56825	-22
-21	1.4455	0.68407	112.913	1.46183	0.00886	180.864	161.367	342.231	0.92756	1.56748	-21
-20	1.5003	0.68547	108.847	1.45886	0.00919	181.764	160.918	342.682	0.93110	1.56672	-20
-19	1.5568	0.68687	104.960	1.45587	0.00953	182.665	160.466	343.131	0.93464	1.56598	-19
-18	1.6138	0.68829	101.242	1.45288	0.00988	183.567	160.013	343.580	0.93816	1.56526	-18
-17	1.6713	0.68972	97.684	1.44987	0.01024	184.470	159.558	344.028	0.94168	1.56454	-17
-16	1.7294	0.69115	94.278	1.44685	0.01061	185.374	159.100	344.474	0.94518	1.56385	-16
-15	1.7880	0.69261	91.018	1.44382	0.01099	186.279	158.641	344.920	0.94868	1.56317	-15
-14	1.8471	0.69407	87.895	1.44078	0.01138	187.185	158.180	345.365	0.95216	1.56250	-14
-13	1.9067	0.69554	84.902	1.43773	0.01178	188.093	157.716	345.809	0.95564	1.56185	-13
-12	1.9668	0.69703	82.034	1.43466	0.01219	189.001	157.250	346.252	0.95910	1.56121	-12
-11	2.0274	0.69853	79.282	1.43158	0.01261	189.911	156.783	346.693	0.96256	1.56059	-11
-10	2.0892	0.70004	76.644	1.42849	0.01305	190.822	156.312	347.134	0.96601	1.55997	-10
-9	2.1521	0.70157	74.115	1.42538	0.01349	191.734	155.840	347.574	0.96945	1.55938	-9
-8	2.2161	0.70310	71.684	1.42227	0.01395	192.647	155.365	348.012	0.97287	1.55879	-8
-7	2.2811	0.70465	69.343	1.41914	0.01442	193.562	154.888	348.450	0.97629	1.55822	-7
-6	2.3471	0.70622	67.086	1.41599	0.01490	194.477	154.408	348.886	0.97971	1.55765	-6
-5	2.4141	0.70780	64.909	1.41284	0.01539	195.395	153.926	349.321	0.98311	1.55710	-5
-4	2.4821	0.70939	62.802	1.40967	0.01590	196.313	153.442	349.755	0.98650	1.55657	-4
-3	2.5511	0.71099	60.765	1.40648	0.01642	197.233	152.955	350.187	0.98989	1.55604	-3
-2	2.6211	0.71261	58.793	1.40328	0.01695	198.154	152.465	350.619	0.99327	1.55552	-2
-1	2.6921	0.71425	57.879	1.40007	0.01750	199.076	151.972	351.049	0.99664	1.55502	-1
0	2.7641	0.71590	57.012	1.39685	0.01805	200.000	151.477	351.477	1.00000	1.55452	0
1	2.8371	0.71756	56.184	1.39361	0.01863	200.925	150.979	351.905	1.00335	1.55404	1
2	2.9111	0.71924	55.391	1.39035	0.01922	201.852	150.479	352.331	1.00670	1.55356	2
3	2.9861	0.72094	54.630	1.38708	0.01981	202.780	149.975	352.755	1.01004	1.55310	3
4	3.0621	0.72265	53.900	1.38379	0.02043	203.710	149.468	353.179	1.01337	1.55264	4
5	3.1391	0.72438	53.200	1.38049	0.02108	204.642	148.959	353.600	1.01670	1.55220	5
6	3.2171	0.72612	52.530	1.37718	0.02176	205.575	148.444	354.020	1.02001	1.55176	6
7	3.2961	0.72788	51.890	1.37384	0.02246	206.509	147.926	354.439	1.02333	1.55133	7
8	3.3761	0.72966	51.280	1.37050	0.02318	207.445	147.411	354.856	1.02663	1.55091	8
9	3.4571	0.73146	50.690	1.36713	0.02391	208.383	146.899	355.272	1.02993	1.55050	9

تابع جدول (2 - 1) - خواص التشبع للسائل وبخار غاز التبريد (فريون 12)

TEMP. °C	PRES.	VOLUME m ³ /kg · 10 ³		DENSITY kg/m ³		ENTHALPY kJ/kg			ENTROPY kJ/kg K		TEMP. °C
		LIQUID v _l	VAPOR v _g	LIQUID 1/v _l	VAPOR 1/v _g	LIQUID h _l	LATENT h _{lg}	VAPOR h _g	LIQUID s _l	VAPOR s _g	
10	4.2730	0.73327	40.9137	1.36375	0.02444	209.323	144.263	355.686	1.03772	1.55010	10
11	4.3431	0.73518	39.7352	1.36025	0.02517	210.264	145.434	356.098	1.03650	1.54970	11
12	4.4087	0.73695	38.5975	1.35694	0.02591	211.207	146.302	356.509	1.03579	1.54931	12
13	4.4702	0.73867	37.4991	1.35380	0.02667	212.152	146.764	356.918	1.04305	1.54893	13
14	4.5274	0.74031	36.4392	1.35084	0.02744	213.099	146.826	357.325	1.04632	1.54856	14
15	4.5817	0.74187	35.4133	1.34809	0.02824	214.048	143.683	357.730	1.04958	1.54819	15
16	5.0401	0.74455	34.4210	1.34540	0.02905	214.998	143.135	358.134	1.05284	1.54783	16
17	5.2074	0.74649	33.4454	1.34290	0.02988	215.951	142.588	358.535	1.05609	1.54748	17
18	5.3504	0.74863	32.4845	1.34060	0.03073	216.906	142.029	358.935	1.05933	1.54713	18
19	5.5145	0.75085	31.6457	1.33853	0.03160	217.863	141.470	359.333	1.06258	1.54679	19
20	5.6799	0.75245	30.7402	1.33697	0.03249	218.821	140.967	359.729	1.06581	1.54645	20
21	5.8167	0.75449	29.9479	1.32539	0.03340	219.773	140.340	360.122	1.06904	1.54612	21
22	5.9904	0.75655	29.1327	1.32179	0.03433	220.748	139.764	360.514	1.07227	1.54579	22
23	6.1694	0.75863	28.3485	1.31917	0.03529	221.712	139.197	360.904	1.07549	1.54547	23
24	6.3465	0.76073	27.5404	1.31453	0.03625	222.670	138.611	361.291	1.07871	1.54515	24
25	6.5167	0.76286	26.8542	1.31086	0.03724	223.650	138.024	361.676	1.08193	1.54484	25
26	6.6954	0.76491	26.1422	1.30718	0.03825	224.623	137.436	362.059	1.08514	1.54453	26
27	6.8797	0.76719	25.4524	1.30347	0.03929	225.598	136.841	362.439	1.08835	1.54423	27
28	7.0647	0.76978	24.7940	1.29974	0.04035	226.576	136.241	362.817	1.09155	1.54393	28
29	7.2550	0.77161	24.1767	1.29599	0.04143	227.557	135.636	363.193	1.09475	1.54363	29
30	7.4490	0.77344	23.5942	1.29222	0.04254	228.540	135.026	363.566	1.09795	1.54334	30
31	7.6464	0.77614	22.9993	1.28842	0.04367	229.526	134.411	363.937	1.10115	1.54305	31
32	7.8485	0.77885	22.4008	1.28460	0.04483	230.515	133.799	364.305	1.10434	1.54276	32
33	8.0561	0.78079	21.7359	1.28075	0.04601	231.506	133.184	364.670	1.10753	1.54247	33
34	8.2674	0.78316	21.1107	1.27688	0.04721	232.501	132.532	365.033	1.11072	1.54219	34
35	8.4777	0.78556	20.6408	1.27298	0.04845	233.498	131.894	365.392	1.11391	1.54191	35
36	8.6944	0.78798	20.1173	1.26906	0.04971	234.489	131.250	365.749	1.11710	1.54163	36
37	8.9144	0.79045	19.6091	1.26511	0.05100	235.483	130.600	366.103	1.12028	1.54135	37
38	9.1377	0.79294	19.1154	1.26113	0.05231	236.479	129.947	366.454	1.12347	1.54107	38
39	9.3723	0.79546	18.6762	1.25713	0.05364	237.477	129.281	366.802	1.12665	1.54079	39
40	9.6055	0.79802	18.1706	1.25309	0.05500	238.475	128.611	367.146	1.12984	1.54051	40
41	9.8451	0.80062	17.7187	1.24903	0.05644	239.472	127.935	367.487	1.13302	1.54024	41
42	10.0914	0.80325	17.2784	1.24494	0.05789	240.474	127.252	367.825	1.13620	1.53996	42
43	10.3355	0.80597	16.8511	1.24082	0.05934	241.479	126.561	368.160	1.13938	1.53968	43
44	10.5877	0.80863	16.4354	1.23667	0.06084	242.477	125.864	368.491	1.14257	1.53941	44
45	10.847	0.81137	16.0316	1.23248	0.06234	243.459	125.159	368.818	1.14575	1.53913	45
46	11.104	0.81416	15.6396	1.22824	0.06394	244.436	124.445	369.141	1.14894	1.53885	46
47	11.369	0.81691	15.2563	1.22401	0.06555	245.406	123.725	369.461	1.15213	1.53856	47
48	11.639	0.81965	14.8844	1.21973	0.06718	246.371	122.996	369.777	1.15532	1.53828	48
49	11.914	0.82277	14.5224	1.21541	0.06886	247.330	122.254	370.088	1.15851	1.53799	49
50	12.193	0.82573	14.1701	1.21185	0.07057	248.284	121.512	370.394	1.16170	1.53770	50
51	12.477	0.82873	13.8271	1.20846	0.07232	249.242	120.757	370.699	1.16490	1.53741	51
52	12.764	0.83179	13.4931	1.20523	0.07411	250.204	119.993	370.997	1.16810	1.53712	52
53	13.054	0.83489	13.1478	1.20217	0.07594	251.170	119.220	371.292	1.17130	1.53682	53
54	13.359	0.83804	12.8009	1.19926	0.07782	252.144	118.437	371.581	1.17451	1.53653	54
55	13.663	0.84125	12.5421	1.19671	0.07973	253.122	117.644	371.865	1.17772	1.53624	55
56	13.977	0.84451	12.2812	1.19442	0.08169	254.104	116.841	372.145	1.18093	1.53595	56
57	14.298	0.84783	11.9478	1.19234	0.08370	255.092	116.027	372.419	1.18415	1.53567	57
58	14.625	0.85121	11.6420	1.19040	0.08575	256.086	115.202	372.688	1.18736	1.53538	58
59	14.979	0.85464	11.3832	1.18860	0.08785	257.085	114.367	372.952	1.19061	1.53509	59
60	15.359	0.85814	11.1113	1.18691	0.09000	258.089	113.519	373.210	1.19384	1.53481	60
61	15.744	0.86171	10.8460	1.18542	0.09220	259.098	112.660	373.461	1.19709	1.53452	61
62	16.135	0.86534	10.5872	1.18409	0.09445	260.110	111.789	373.707	1.20034	1.53423	62
63	16.532	0.86904	10.3346	1.18290	0.09676	261.124	110.905	373.947	1.20359	1.53394	63
64	16.937	0.87287	10.0881	1.18177	0.09913	262.142	110.008	374.180	1.20684	1.53365	64

جدول (3 - 1) - خواص التبغ للسائل وبخار الأمونيا

REFRIGERANT-717 (AMMONIA) PROPERTIES OF LIQUID AND SATURATED VAPOR

Temp F t	Pressure		Liquid, density lb/cu ft l/l _v	Vapor, sp vol cu ft/lb v _g	Enthalpy, datum -40 F Btu per lb		Entropy, datum -40 F Btu per lb F	
	psia	psig			Liquid h _f	Vapor h _g	Liquid s _f	Vapor s _g
-105	1.00	*27.9	45.71	273.14	-68.5	570.3	-0.1774	1.6243
-104	1.04	27.8	45.67	214.23	-67.5	570.7	-0.1744	1.6205
-103	1.08	27.7	45.63	205.90	-66.4	571.2	-0.1714	1.6167
-102	1.14	27.7	45.59	197.70	-65.4	571.6	-0.1685	1.6129
-101	1.19	27.5	45.55	190.08	-64.3	572.1	-0.1655	1.6092
-100	1.24	*27.4	45.51	182.90	-63.3	572.5	-0.1626	1.6055
-99	1.29	27.3	45.47	175.42	-62.2	572.9	-0.1597	1.6018
-98	1.35	27.2	45.43	168.48	-61.2	573.4	-0.1568	1.5982
-97	1.41	27.0	45.40	161.98	-60.1	573.8	-0.1539	1.5945
-96	1.47	26.9	45.36	155.92	-59.1	574.3	-0.1510	1.5910
-95	1.52	*26.8	45.32	150.30	-58.0	574.7	-0.1481	1.5874
-94	1.59	26.7	45.28	144.68	-57.0	575.1	-0.1452	1.5838
-93	1.65	26.5	45.24	139.27	-55.9	575.6	-0.1423	1.5803
-92	1.73	26.4	45.20	134.06	-54.9	576.0	-0.1395	1.5768
-91	1.79	26.2	45.16	129.06	-53.8	576.5	-0.1366	1.5734
-90	1.86	*26.1	45.12	124.28	-52.8	576.9	-0.1338	1.5699
-89	1.94	26.0	45.08	119.75	-51.7	577.3	-0.1309	1.5665
-88	2.02	25.8	45.04	115.37	-50.7	577.8	-0.1281	1.5631
-87	2.11	25.6	45.00	111.31	-49.6	578.2	-0.1253	1.5597
-86	2.18	25.5	44.96	107.39	-48.6	578.6	-0.1225	1.5564
-85	2.27	*25.3	44.92	103.63	-47.5	579.1	-0.1197	1.5531
-84	2.36	25.1	44.88	99.87	-46.5	579.5	-0.1169	1.5498
-83	2.46	24.9	44.84	96.28	-45.4	579.9	-0.1141	1.5465
-82	2.55	24.7	44.80	92.86	-44.4	580.4	-0.1113	1.5432
-81	2.65	24.5	44.76	89.65	-43.3	580.8	-0.1085	1.5400
-80	2.74	*24.3	44.73	86.54	-42.2	581.2	-0.1057	1.5365
-79	2.85	24.1	44.68	83.50	-41.2	581.6	-0.1030	1.5332
-78	2.96	23.9	44.64	80.61	-40.1	582.1	-0.1002	1.5300
-77	3.07	23.6	44.60	77.90	-39.1	582.5	-0.0975	1.5273
-76	3.19	23.4	44.56	75.30	-38.0	582.9	-0.0947	1.5242
-75	3.30	*23.2	44.52	72.80	-37.0	583.3	-0.0920	1.5211
-74	3.43	22.9	44.48	70.35	-35.9	583.8	-0.0892	1.5180
-73	3.56	22.7	44.44	68.01	-34.9	584.2	-0.0865	1.5149
-72	3.69	22.4	44.40	65.78	-33.8	584.6	-0.0838	1.5119
-71	3.82	22.2	44.36	63.70	-32.8	585.0	-0.0811	1.5089
-70	3.94	*21.9	44.32	61.65	-31.7	585.5	-0.0784	1.5059
-69	4.09	21.6	44.28	59.60	-30.7	585.9	-0.0757	1.5029
-68	4.24	21.3	44.24	57.64	-29.6	586.3	-0.0730	1.4999
-67	4.39	21.0	44.19	55.78	-28.6	586.7	-0.0703	1.4970
-66	4.54	20.7	44.15	54.01	-27.5	587.1	-0.0676	1.4940
-65	4.69	*20.4	44.11	52.34	-26.5	587.5	-0.0650	1.4911
-64	4.86	20.1	44.07	50.79	-25.4	588.0	-0.0623	1.4883
-63	5.03	19.6	44.03	49.26	-24.4	588.4	-0.0596	1.4854
-62	5.20	19.3	43.99	47.74	-23.3	588.8	-0.0570	1.4826
-61	5.38	18.9	43.95	46.23	-22.2	589.2	-0.0543	1.4797
-60	5.55	*18.6	43.91	44.73	-21.2	589.6	-0.0517	1.4769
-59	5.74	18.2	43.87	43.37	-20.1	590.0	-0.0490	1.4741
-58	5.93	17.8	43.83	42.05	-19.1	590.4	-0.0464	1.4713
-57	6.13	17.4	43.78	40.79	-18.0	590.8	-0.0438	1.4686
-56	6.33	17.0	43.74	39.56	-17.0	591.2	-0.0412	1.4658
-55	6.54	*16.6	43.70	38.38	-15.9	591.6	-0.0386	1.4631
-54	6.75	16.2	43.66	37.24	-14.8	592.1	-0.0360	1.4604
-53	6.97	15.7	43.62	36.15	-13.8	592.4	-0.0334	1.4577
-52	7.20	15.3	43.58	35.09	-12.7	592.9	-0.0307	1.4551
-51	7.43	14.8	43.54	34.06	-11.7	593.2	-0.0281	1.4524

تابع جدول (3 - 1) - خواص التشبع للسائل وبخار الأمونيا

Temp F t	Pressure		Liquid, density	Vapor, sp vol	Enthalpy, datum -40 F Btu per lb		Entropy, datum -40 F Btu per lb F	
	psia	psig	lb/cu ft l/l _f	cu ft/lb g _g	Liquid h _f	Vapor h _g	Liquid s _f	Vapor s _g
-50	7.67	*14.3	43.49	33.08	-10.6	593.7	-0.0256	1.4497
-49	7.91	13.8	43.45	32.12	-9.6	594.0	.0230	1.4471
-48	8.16	13.3	43.41	31.20	-8.5	594.4	.0204	1.4445
-47	8.42	12.8	43.37	30.31	-7.4	594.9	.0179	1.4419
-46	8.68	12.2	43.33	29.45	-6.4	595.2	.0178	1.4393
-45	8.95	*11.7	43.28	28.62	-5.3	595.6	.0127	1.4368
-44	9.23	11.1	43.24	27.82	-4.3	596.0		1.4342
-43	9.51	10.6	43.20	27.04	-3.2			1.4317
-42	9.81	10.0	43.16	26.29	-2.1			1.4292
-41	10.10	9.3	43.12	25.56	-1.1			1.4267
-40	10.41	*8.7	43.08	24.86	0.0	597.6	0.0000	1.4242
-39	10.72	8.1	43.04	24.18	1.1	598.0	.0025	1.4217
-38	11.04	7.4	42.99	23.53	2.1	598.3	.0051	1.4191
-37	11.37	6.8	42.95	22.89	3.2	598.7	.0076	1.4169
-36	11.71	6.1	42.90	22.27	4.3	599.1	.0101	1.4144
-35	12.05	*5.4	42.86	21.68	5.3	599.5	0.0126	1.4120
-34	12.41	4.7	42.82	21.10	6.4	599.9	.0151	1.4096
-33	12.77	3.9	42.78	20.54	7.4	600.2	.0176	1.4072
-32	13.14	3.2	42.73	20.00	8.5	600.6	.0201	1.4048
-31	13.52	2.4	42.69	19.48	9.6	601.0	.0226	1.4025
-30	13.90	*1.6	42.65	18.97	10.7	601.4	0.0250	1.4001
-29	14.30	0.8	42.61	18.48	11.7	601.7	.0275	1.3978
-28	14.71	0.0	42.57	18.00	12.8	602.1	.0300	1.3955
-27	15.12	0.4	42.54	17.54	13.9	602.5	.0325	1.3932
-26	15.55	0.8	42.48	17.09	14.9	602.8	.0350	1.3909
-25	15.98	1.3	42.44	16.66	16.0	603.2	0.0374	1.3885
-24	16.42	1.7	42.40	16.24	17.1	603.6	.0399	1.3863
-23	16.88	2.2	42.35	15.83	18.1	603.9	.0423	1.3840
-22	17.34	2.6	42.31	15.43	19.2	604.3	.0448	1.3818
-21	17.81	3.1	42.26	15.05	20.3	604.6	.0472	1.3796
-20	18.30	3.6	42.22	14.68	21.4	605.0	0.0497	1.3774
-19	18.79	4.1	42.18	14.32	22.4	605.3	.0521	1.3752
-18	19.30	4.6	42.13	13.97	23.5	605.7	.0545	1.3729
-17	19.81	5.1	42.09	13.62	24.6	606.1	.0570	1.3708
-16	20.34	5.6	42.04	13.29	25.6	606.4	.0594	1.3686
-15	20.88	6.2	42.00	12.97	26.7	606.7	0.0618	1.3664
-14	21.43	6.7	41.96	12.66	27.8	607.1	.0642	1.3643
-13	21.99	7.8	41.91	12.36	28.9	607.5	.0666	1.3621
-12	22.56	7.9	41.87	12.06	30.0	607.8	.0690	1.3600
-11	23.15	8.5	41.82	11.78	31.0	608.1	.0714	1.3579
-10	23.74	9.0	41.78	11.50	32.1	608.5	0.0738	1.3558
-9	24.35	9.7	41.74	11.23	33.2	608.8	.0762	1.3537
-8	24.97	10.3	41.69	10.97	34.3	609.2	.0786	1.3516
-7	25.61	10.9	41.65	10.71	35.4	609.5	.0809	1.3495
-6	26.26	11.6	41.60	10.47	36.4	609.8	.0833	1.3474
-5	26.92	12.2	41.56	10.23	37.5	610.1	0.0857	1.3454
-4	27.59	12.9	41.52	9.991	38.6	610.5	.0880	1.3433
-3	28.28	13.6	41.47	9.763	39.7	610.8	.0904	1.3413
-2	28.98	14.3	41.43	9.541	40.7	611.1	.0928	1.3393
-1	29.69	15.0	41.38	9.326	41.8	611.4	-.0951	1.3372
0	30.42	15.7	41.34	9.116	42.9	611.8	0.0975	1.3352
1	31.16	16.5	41.29	8.912	44.0	612.1	0.0998	1.3332
2	31.92	17.2	41.25	8.714	45.1	612.4	.1022	1.3312
3	32.69	18.0	41.20	8.521	46.2	612.7	.1045	1.3292
4	33.47	18.8	41.16	8.333	47.2	613.0	.1069	1.3273
5	34.27	19.6	41.11	8.150	48.3	613.3	.1092	1.3253
6	35.09	20.4	41.07	7.971	49.4	613.6	0.1115	1.3234
7	35.92	21.2	41.01	7.798	50.5	613.9	.1138	1.3214
8	36.77	22.1	40.98	8.629	51.6	614.3	.1162	1.3195
9	37.63	22.9	40.93	7.464	52.7	614.6	.1185	1.3176
10	38.51	23.8	40.89	7.304	53.8	614.9	.1208	1.3157
11	39.40	24.7	40.84	7.148	54.9	615.2	0.1231	1.3137
12	40.31	25.6	40.80	6.996	56.0	615.5	.1254	1.3118
13	41.24	26.5	40.75	6.847	57.1	615.8	.1277	1.3099
14	42.18	27.5	40.71	6.703	58.2	616.1	.1300	1.3081
15	43.14	28.4	40.66	6.562	59.2	616.3	.1323	1.3062

تابع جدول (3 - 1) - خواص التشبع للسائل وبخار الأمونيا

Temp t	Pressure		Liquid, density	Vapor, sp vol	Enthalpy, datum -40 F Btu per lb		Entropy, datum -40 F Btu per lb F	
	psia	psig	lb/cu ft l/v _l	cu ft/lb v _g	Liquid h _f	Vapor h _g	Liquid s _f	Vapor s _g
16	44.12	29.4	40.61	6.425	60.3	616.6	0.1346	1.3043
17	45.12	30.4	40.57	6.291	61.4	616.9	.1369	1.3025
18	46.13	31.4	40.52	6.161	62.5	617.2	.1392	1.3006
19	47.16	32.5	40.48	6.034	63.6	617.5	.1415	1.2988
20	48.21	33.5	40.43	5.910	64.7	617.8	.1437	1.2969
21	49.28	34.6	40.38	5.789	65.8	618.0	0.1460	1.2951
22	50.36	35.7	40.34	5.671	66.9	618.3	.1483	1.2933
23	51.47	36.8	40.29	5.556	68.0	618.6	.1505	1.2915
24	52.59	37.9	40.25	5.443	69.1	618.9	.1528	1.2897
25	53.78	39.0	40.20	5.334	70.2	619.1	.1551	1.2879
26	54.90	40.2	40.15	5.227	71.3	619.4	0.1573	1.2861
27	56.08	41.4	40.10	5.123	72.4	619.7	.1596	1.2843
28	57.28	42.6	40.06	5.021	73.5	619.9	.1618	1.2825
29	58.50	43.8	40.01	4.922	74.6	620.2	.1641	1.2808
30	59.74	45.0	39.96	4.825	75.7	620.5	.1663	1.2790
31	61.00	46.3	39.91	4.730	76.8	620.7	0.1686	1.2773
32	62.29	47.6	39.86	4.637	77.9	621.0	.1708	1.2755
33	63.59	48.9	39.82	4.547	79.0	621.2	.1730	1.2738
34	64.91	50.2	39.77	4.459	80.1	621.5	.1753	1.2721
35	66.26	52.6	39.72	4.373	81.2	621.7	.1775	1.2704
36	67.63	52.9	39.67	4.289	82.3	622.0	0.1797	1.2686
37	69.02	54.3	39.63	4.207	83.4	622.2	.1819	1.2669
38	70.43	55.7	39.58	4.126	84.6	622.5	.1841	1.2652
39	71.87	57.2	39.54	4.048	85.7	622.7	.1863	1.2635
40	73.32	58.6	39.49	3.971	86.8	623.0	.1885	1.2618
41	74.80	60.1	39.44	3.897	87.9	623.2	0.1908	1.2602
42	76.31	61.6	39.39	3.823	89.0	623.4	.1930	1.2585
43	77.83	63.1	39.34	3.752	90.1	623.7	.1952	1.2568
44	79.38	64.7	39.29	3.682	91.2	623.9	.1974	1.2552
45	80.96	66.3	39.24	3.614	92.3	624.1	.1996	1.2535
46	82.55	67.9	39.19	3.547	93.5	624.4	0.2018	1.2519
47	84.18	69.5	39.14	3.481	94.6	624.6	.2040	1.2502
48	85.82	71.1	39.10	3.418	95.7	624.8	.2062	1.2486
49	87.49	72.8	39.05	3.355	96.8	625.0	.2083	1.2469
50	89.19	74.5	39.00	3.294	97.9	625.2	.2105	1.2453
51	90.91	76.2	38.95	3.234	99.1	625.5	0.2127	1.2437
52	92.66	78.0	38.90	3.176	100.2	625.7	.2149	1.2421
53	94.43	79.7	38.85	3.119	101.3	625.9	.2171	1.2405
54	96.23	81.5	38.80	3.063	102.4	626.1	.2192	1.2389
55	98.06	83.4	38.75	3.008	103.5	626.3	.2214	1.2373
56	99.91	85.2	38.70	2.954	104.7	626.5	0.2236	1.2357
57	101.8	87.1	38.65	2.902	105.8	626.7	.2257	1.2341
58	103.7	89.0	38.60	2.851	106.9	626.9	.2279	1.2325
59	105.6	90.9	38.55	2.800	108.1	627.1	.2301	1.2310
60	107.6	92.9	38.50	2.751	109.2	627.3	.2322	1.2294
61	109.6	94.9	38.45	2.703	110.3	627.5	0.2344	1.2278
62	111.6	96.9	38.40	2.656	111.5	627.7	.2365	1.2262
63	113.6	98.9	38.35	2.610	112.6	627.9	.2387	1.2247
64	115.7	101.0	38.30	2.565	113.7	628.0	.2408	1.2231
65	117.8	103.1	38.25	2.520	114.8	628.2	.2430	1.2216
66	120.0	105.3	38.20	2.477	116.0	628.4	0.2451	1.2201
67	122.1	107.4	38.15	2.435	117.1	628.6	.2473	1.2186
68	124.3	109.6	38.10	2.393	118.3	628.8	.2494	1.2170
69	126.5	111.8	38.05	2.352	119.4	628.9	.2515	1.2155
70	128.8	114.1	38.00	2.312	120.5	629.1	.2537	1.2140
71	131.1	116.4	37.95	2.273	121.7	629.3	0.2558	1.2125
72	133.4	118.7	37.90	2.235	122.8	629.4	.2579	1.2110
73	135.7	121.0	37.84	2.197	124.0	629.6	.2601	1.2095
74	138.1	123.4	37.79	2.161	125.1	629.8	.2622	1.2080
75	140.5	125.8	37.74	2.125	126.2	629.9	.2643	1.2065
76	143.0	128.3	37.69	2.089	127.4	630.1	0.2664	1.2050
77	145.4	130.7	37.64	2.055	128.5	630.2	.2685	1.2035
78	147.9	133.2	37.58	2.021	129.7	630.4	.2706	1.2020
79	150.5	135.8	37.53	1.988	130.8	630.5	.2728	1.2006
80	153.0	138.3	37.48	1.955	132.0	630.7	.2749	1.1991

تابع جدول (3 - 1) - خواص التشبع للسائل وبخار الأمونيا

Temp F t	Pressure		Liquid, density lb/cu ft l/l _f	Vapor, sp vol cu ft/lb v _g	Enthalpy, datum -40 F Btu per lb		Entropy, datum -40 F Btu per lb F	
	psia	psig			Liquid h _f	Vapor h _g	Liquid s _f	Vapor s _g
81	155.6	140.9	37.43	1.923	133.1	630.8	0.2769	1.1976
82	158.3	143.6	37.37	1.892	134.3	631.0	.2791	1.1962
83	161.0	146.3	37.32	1.861	135.4	631.1	.2812	1.1947
84	163.6	149.0	37.26	1.831	136.6	631.3	.2833	1.1933
85	166.4	151.7	37.21	1.801	137.8	631.4	.2854	1.1918
86	169.2	154.5	37.16	1.772	138.9	631.5	0.2875	1.1904
87	172.0	157.3	37.11	1.744	140.1	631.7	.2895	1.1889
88	174.8	160.1	37.05	1.716	141.2	631.8	.2917	1.1875
89	177.7	163.0	37.00	1.688	142.4	631.9	.2937	1.1860
90	180.6	165.9	36.95	1.661	143.5	632.0	.2958	1.1846
91	183.6	168.9	36.89	1.635	144.7	632.1	0.2979	1.1832
92	186.6	171.9	36.84	1.609	145.8	632.3	.3000	1.1818
93	189.6	174.9	36.78	1.584	147.0	632.3	.3021	1.1804
94	192.7	178.0	36.73	1.559	148.2	632.5	.3041	1.1789
95	195.8	181.1	36.67	1.534	149.4	632.6	.3062	1.1775
96	198.9	184.2	36.62	1.510	150.5	632.6	0.3083	1.1761
97	202.1	187.4	36.56	1.487	151.7	632.8	.3104	1.1747
98	205.3	190.6	36.51	1.464	152.9	632.9	.3125	1.1733
99	208.6	193.9	36.45	1.441	154.0	632.9	.3145	1.1719
100	211.9	197.2	36.40	1.419	155.2	633.0	.3166	1.1705
101	215.2	200.5	36.34	1.397	156.4	633.1	0.3187	1.1691
102	218.6	203.9	36.29	1.375	157.6	633.2	.3207	1.1677
103	222.0	207.3	36.23	1.354	158.7	633.3	.3228	1.1663
104	224.4	210.7	36.18	1.334	159.9	633.4	.3248	1.1649
105	228.9	214.2	36.12	1.313	161.1	633.4	.3269	1.1635
106	232.5	217.8	36.06	1.293	162.3	633.5	0.3289	1.1621
107	236.0	221.3	36.01	1.274	163.5	633.6	.3310	1.1607
108	239.7	225.0	35.95	1.254	164.6	633.6	.3330	1.1593
109	243.3	228.6	35.90	1.235	165.8	633.7	.3351	1.1580
110	247.0	232.3	35.84	1.217	167.0	633.7	.3372	1.1566
111	250.8	236.1	35.78	1.198	168.2	633.8	0.3392	1.1552
112	254.5	239.8	35.72	1.180	169.4	633.8	.3413	1.1538
113	258.4	243.7	35.67	1.163	170.6	633.9	.3433	1.1524
114	262.2	247.5	35.61	1.145	171.8	633.9	.3453	1.1510
115	266.2	251.5	35.55	1.128	173.0	633.9	.3474	1.1497
116	270.1	255.4	35.49	1.112	174.2	634.0	0.3495	1.1483
117	274.1	259.4	35.43	1.095	175.4	634.0	.3515	1.1469
118	278.2	263.5	35.38	1.079	176.6	634.0	.3515	1.1455
119	282.3	267.6	35.32	1.063	177.8	634.0	.3556	1.1441
120	286.4	271.7	35.26	1.047	179.0	634.0	.3576	1.1427
121	290.6	275.9	35.20	1.032	180.2	634.0	0.3597	1.1414
122	294.8	280.1	35.14	1.017	181.4	634.0	.3618	1.1400
123	299.1	284.4	35.08	1.002	182.6	634.0	.3638	1.1386
124	303.4	288.7	35.02	0.987	183.9	634.0	.3659	1.1372
125	307.8	293.1	34.96	0.973	185.1	634.0	.3679	1.1358

* Inches of mercury below one standard atmosphere (29.92 in.)

U. S. Dept. of Commerce, Bureau of Standards, Thermodynamic Properties of Ammonia, Circular No. 142 (1923) and Circular No. 472 (1948).

جدول (3 - 2) - خواص البخار المحمص للأمونيا

Superheated Ammonia

Abs. Press. kPa (Sat. Temp.) °C	Temperature, °C											
	-20	-10	0	10	20	30	40	50	60	70	80	100
<i>v</i>	2.4474	2.5481	2.6482	2.7479	2.8473	2.9464	3.0453	3.1441	3.2427	3.3413	3.4397	
<i>h</i>	1435.8	1457.0	1478.1	1499.2	1520.4	1541.7	1563.0	1584.5	1606.1	1627.8	1649.7	
<i>s</i> (-46.54)	6.3256	6.4077	6.4865	6.5625	6.6360	6.7073	6.7766	6.8441	6.9099	6.9743	7.0372	
<i>v</i>	1.6233	1.6915	1.7591	1.8263	1.8932	1.9597	2.0261	2.0923	2.1584	2.2244	2.2903	
<i>h</i>	1433.0	1454.7	1476.1	1497.5	1518.9	1540.3	1561.8	1583.4	1605.1	1626.9	1648.9	
<i>s</i> (-39.18)	6.1190	6.2028	6.2828	6.3597	6.4339	6.5058	6.5756	6.6434	6.7096	6.7742	6.8373	
<i>v</i>	1.2110	1.2631	1.3145	1.3654	1.4160	1.4664	1.5165	1.5664	1.6163	1.6659	1.7155	1.8145
<i>h</i>	1430.1	1452.2	1474.1	1495.7	1517.3	1538.9	1560.5	1582.2	1604.1	1626.0	1648.0	1692.6
<i>s</i> (-33.61)	5.9695	6.0552	6.1366	6.2144	6.2894	6.3618	6.4321	6.5003	6.5668	6.6316	6.6950	6.8177
<i>v</i>	0.9635	1.0059	1.0476	1.0889	1.1297	1.1703	1.2107	1.2509	1.2909	1.3309	1.3707	1.4501
<i>h</i>	1427.2	1449.8	1472.0	1493.9	1515.7	1537.5	1559.3	1581.1	1603.0	1625.0	1647.2	1691.8
<i>s</i> (-29.08)	5.8512	5.9389	6.0217	6.1006	6.1763	6.2494	6.3201	6.3887	6.4555	6.5206	6.5842	6.7072
<i>v</i>	0.7984	0.8344	0.8697	0.9045	0.9388	0.9729	1.0068	1.0405	1.0740	1.1074	1.1408	1.2072
<i>h</i>	1424.1	1447.3	1469.8	1492.1	1514.1	1536.1	1558.0	1580.0	1602.0	1624.1	1646.3	1691.1
<i>s</i> (-25.23)	5.7526	5.8424	5.9266	6.0066	6.0831	6.1568	6.2280	6.2970	6.3641	6.4295	6.4933	6.6167

تابع جدول (3 - 2) - خواص البخار المحمص للأمونيا

v 200 (-18.86) s		0.6199	0.6471	0.6738	0.7001	0.7261	0.7519	0.7774	0.8029	0.8282	0.8533	0.9035
	h	1442.0	1465.5	1488.4	1510.9	1533.2	1555.5	1577.7	1599.9	1622.2	1644.6	1689.6
	s	5.6863	5.7737	5.8559	5.9342	6.0091	6.0813	6.1512	6.2189	6.2849	6.3491	6.4732
v 250 (-13.67) s		0.4910	0.5135	0.5354	0.5568	0.5780	0.5989	0.6196	0.6401	0.6605	0.6809	0.7212
	h	1436.6	1461.0	1484.5	1507.6	1530.3	1552.9	1575.4	1597.8	1620.3	1642.8	1688.2
	s	5.5609	5.6517	5.7365	5.8165	5.8928	5.9661	6.0368	6.1052	6.1717	6.2365	6.3613
v 300 (-9.23) s			0.4243	0.4430	0.4613	0.4792	0.4968	0.5143	0.5316	0.5488	0.5658	0.5997
	h		1456.3	1480.6	1504.2	1527.4	1550.3	1573.0	1595.7	1618.4	1641.1	1686.7
	s		5.5493	5.6366	5.7186	5.7963	5.8707	5.9423	6.0114	6.0785	6.1437	6.2693
v 350 (-5.35) s			0.3605	0.3770	0.3929	0.4086	0.4239	0.4391	0.4541	0.4689	0.4837	0.5129
	h		1451.5	1476.5	1500.7	1524.4	1547.6	1570.7	1593.6	1616.5	1639.3	1685.2
	s		5.4600	5.5502	5.6342	5.7135	5.7890	5.8615	5.9314	5.9990	6.0647	6.1910
v 400 (-1.89) s			0.3125	0.3274	0.3417	0.3556	0.3692	0.3826	0.3959	0.4090	0.4220	0.4478
	h		1446.5	1472.4	1497.2	1521.3	1544.9	1568.3	1591.5	1614.5	1637.6	1683.7
	s		5.3803	5.4735	5.5597	5.6405	5.7173	5.7907	5.8613	5.9296	5.9957	6.1228
v 450 (1.26) s			0.2752	0.2887	0.3017	0.3143	0.3266	0.3387	0.3506	0.3624	0.3740	0.3971
	h		1441.3	1468.1	1493.6	1518.2	1542.2	1565.9	1589.3	1612.6	1635.8	1682.2
	s		5.3078	5.4042	5.4926	5.5752	5.6532	5.7275	5.7989	5.8678	5.9345	6.0623

تابع جدول (3 - 2) - خواص البخار المحمص للأمونيا

Superheated Ammonia		Temperature, °C											
		20	30	40	50	60	70	80	100	120	140	160	180
Abs. Press. kPa (Sat. Temp.) °C	v	0.2698	0.2813	0.2926	0.3036	0.3144	0.3251	0.3357	0.3565	0.3771	0.3975		
	h	1489.9	1515.0	1539.5	1563.4	1587.1	1610.6	1634.0	1680.7	1727.5	1774.7		
	s	5.4314	5.5157	5.5950	5.6704	5.7425	5.8120	5.8793	6.0079	6.1301	6.2472		
600 (9.29)	v	0.2217	0.2317	0.2414	0.2508	0.2600	0.2691	0.2781	0.2957	0.3130	0.3302		
	h	1482.4	1508.6	1533.8	1558.5	1582.7	1606.6	1630.4	1677.7	1724.9	1772.4		
	s	5.3222	5.4102	5.4923	5.5697	5.6436	5.7144	5.7826	5.9129	6.0363	6.1541		
700 (13.81)	v	0.1874	0.1963	0.2048	0.2131	0.2212	0.2291	0.2369	0.2522	0.2672	0.2821		
	h	1474.5	1501.9	1528.1	1553.4	1578.2	1602.6	1626.8	1674.6	1722.4	1770.2		
	s	5.2259	5.3179	5.4029	5.4826	5.5582	5.6303	5.6997	5.8316	5.9562	6.0749		
800 (17.86)	v	0.1615	0.1696	0.1773	0.1848	0.1920	0.1991	0.2060	0.2196	0.2329	0.2459	0.2589	
	h	1466.3	1495.0	1522.2	1548.3	1573.7	1598.6	1623.1	1671.6	1719.8	1768.0	1816.4	
	s	5.1387	5.2351	5.3232	5.4053	5.4827	5.5562	5.6268	5.7603	5.8861	6.0057	6.1202	
900 (21.54)	v		0.1488	0.1559	0.1627	0.1693	0.1757	0.1820	0.1942	0.2061	0.2178	0.2294	
	h		1488.0	1516.2	1543.0	1569.1	1594.4	1619.4	1668.5	1717.1	1765.7	1814.4	
	s		5.1593	5.2508	5.3354	5.4147	5.4897	5.5614	5.6968	5.8237	5.9442	6.0594	

تابع جدول (3 - 2) - خواص البخار المحمص للأمونيا

1000 <i>v</i> <i>h</i> <i>s</i> (24.91)			0.1321	0.1388	0.1450	0.1511	0.1570	0.1627	0.1739	0.1847	0.1954	0.2058	0.2162
			1480.6	1510.0	1537.7	1564.4	1590.3	1615.6	1665.4	1714.5	1763.4	1812.4	1861.7
			5.0889	5.1840	5.2713	5.3525	5.4299	5.5021	5.6392	5.7674	5.8888	6.0047	6.1159
1200 <i>v</i> <i>h</i> <i>s</i> (30.96)				0.1129	0.1185	0.1238	0.1289	0.1338	0.1434	0.1526	0.1616	0.1705	0.1792
				1497.1	1526.6	1554.7	1581.7	1608.0	1659.2	1709.2	1758.9	1808.5	1858.2
				5.0629	5.1560	5.2416	5.3215	5.3970	5.5379	5.6687	5.7919	5.9091	6.0214
1400 <i>v</i> <i>h</i> <i>s</i> (36.28)				0.0944	0.0995	0.1042	0.1088	0.1132	0.1216	0.1297	0.1376	0.1452	0.1528
				1483.4	1515.1	1544.7	1573.0	1600.2	1652.8	1703.9	1754.3	1804.5	1854.7
				4.9534	5.0530	5.1434	5.2270	5.3053	5.4501	5.5836	5.7087	5.8273	5.9406
1600 <i>v</i> <i>h</i> <i>s</i> (41.05)					0.0851	0.0895	0.0937	0.0977	0.1053	0.1125	0.1195	0.1263	0.1330
					1502.9	1534.4	1564.0	1592.3	1646.4	1698.5	1749.7	1800.5	1851.2
					4.9584	5.0543	5.1419	5.2232	5.3722	5.5084	5.6355	5.7555	5.8699
1800 <i>v</i> <i>h</i> <i>s</i> (45.39)					0.0739	0.0781	0.0820	0.0856	0.0926	0.0992	0.1055	0.1116	0.1177
					1490.0	1523.5	1554.6	1584.1	1639.8	1693.1	1745.1	1796.5	1847.7
					4.8693	4.9715	5.0635	5.1482	5.3018	5.4409	5.5699	5.6914	5.8069
2000 <i>v</i> <i>h</i> <i>s</i> (49.38)					0.0648	0.0688	0.0725	0.0760	0.0824	0.0885	0.0943	0.0999	0.1054
					1476.1	1512.0	1544.9	1575.6	1633.2	1687.6	1740.4	1792.4	1844.1
					4.7834	4.8930	4.9902	5.0786	5.2371	5.3793	5.5104	5.6333	5.7499

جدول (2 - 3) - خواص التشبع للسائل وبخار غاز التبريد (فريون 22)

REFRIGERANT-22 (MONOCHLORODIFLUOROMETHANE) PROPERTIES OF LIQUID AND SATURATED VAPOR

Temp F t	Pressure		Liquid, density	Vapor, sp vol	Enthalpy, datum -40 F Btu per lb		Entropy, datum -40 F Btu per lb F	
	psia	psig	lb/cu ft l/v _l	cu ft/lb v _g	Liquid h _f	Vapor h _g	Liquid s _f	Vapor s _g
-155	0.10901	29.51*	97.67	188.1	-29.07	86.78	-0.0808	0.2996
-150	0.2605	29.39*	97.33	146.1	-27.79	87.36	-0.0767	0.2952
-145	0.3375	29.23*	96.99	114.5	-26.52	87.94	-0.0727	.2912
-140	0.4332	29.0*	96.63	90.61	-25.25	88.53	-0.0687	0.2874
-135	0.5511	28.80*	96.27	72.33	-23.99	89.11	-0.0647	.2837
-130	0.6949	28.51*	95.91	58.21	-22.73	89.70	-0.0609	0.2803
-125	0.8692	28.15*	95.53	47.23	-21.47	90.29	-0.0571	.2770
-120	1.079	27.72*	95.15	38.60	-20.22	90.88	-0.0534	0.2738
-115	1.329	27.21*	94.76	31.77	-18.98	91.47	-0.0497	.2708
-110	1.626	26.61*	94.37	26.33	-17.73	92.07	-0.0461	0.2680
-105	1.976	25.90*	93.97	21.96	-16.48	92.67	-0.0425	.2653
-100	2.386	25.06*	93.56	18.43	-15.23	93.27	-0.0390	0.2627
-95	2.865	24.09*	93.14	15.54	-13.98	93.87	-0.0356	.2602
-90	3.417	22.96*	92.72	13.20	-12.73	94.47	-0.0322	0.2579
-85	4.055	21.67*	92.29	11.26	-11.47	95.08	-0.0288	.2556
-80	4.787	20.18*	91.85	9.650	-10.22	95.68	-0.0255	0.2535
-78	5.100	19.55*	91.67	9.086	-9.72	95.92	-0.0242	.2526
-76	5.430	18.87*	91.49	8.561	-9.21	96.16	-0.0229	.2518
-74	5.79	18.14*	91.31	8.072	-8.70	96.40	-0.0216	.2510
-72	6.17	17.37*	91.13	7.616	-8.20	96.64	-0.0203	.2502
-70	6.57	16.55*	90.95	7.192	-7.69	95.88	-0.0253	0.2494
-68	6.99	15.70*	90.77	6.795	-7.19	97.12	-0.0177	.2487
-66	7.40	14.86*	90.58	6.426	-6.68	97.36	-0.0164	.2479
-64	7.86	13.93*	90.39	6.079	-6.17	97.60	-0.0151	.2472
-62	8.35	12.93*	90.21	5.755	-5.67	97.84	-0.0138	.2465
-60	8.86	11.89*	90.03	5.452	-5.16	98.08	-0.0126	0.2458
-58	9.39	10.81*	89.84	5.166	-4.65	98.32	-0.0113	.2451
-56	9.94	9.69*	89.65	4.900	-4.13	98.56	-0.0100	.2444
-54	10.51	8.53*	89.46	4.650	-3.61	98.80	-0.0087	.2438
-52	11.11	7.31*	89.27	4.415	-3.09	99.04	-0.0075	.2431
-50	11.74	6.03*	89.08	4.192	-2.58	99.28	-0.0062	0.2425
-48	12.40	4.68*	88.88	3.986	-2.06	99.52	-0.0050	.2418
-46	13.09	3.28*	88.68	3.793	-1.54	99.76	-0.0037	.2412
-44	13.80	1.83*	88.49	3.611	-1.02	100.00	-0.0025	.2406
-42	14.54	0.326*	88.30	3.440	-0.51	100.23	-0.0012	.2400
-40	15.31	0.610	88.10	3.279	0.00	100.46	0.0000	0.2394
-38	16.12	1.42	87.90	3.126	0.53	100.70	.0013	.2389
-36	16.97	2.27	87.70	2.981	1.05	100.93	.0025	.2383
-34	17.85	3.15	87.50	2.844	1.58	101.17	.0037	.2377
-32	18.77	4.07	87.29	2.713	2.10	101.40	.0050	.2372
-30	19.72	5.02	87.09	2.590	2.62	101.63	0.0062	0.2367
-28	20.71	6.01	86.89	2.474	3.15	101.86	.0074	.2361
-26	21.73	7.03	86.69	2.365	3.69	102.10	.0086	.2356
-24	22.79	8.09	86.48	2.262	4.22	102.33	.0099	.2351
-22	23.88	9.18	86.27	2.165	4.75	102.56	.0111	.2346
-20	25.01	10.31	86.06	2.074	5.28	102.79	0.0123	0.2341
-18	26.18	11.48	85.85	1.987	5.82	103.02	.0135	.2336
-16	27.39	12.69	85.64	1.905	6.40	103.25	.0147	.2331
-14	28.64	13.94	85.43	1.827	6.90	103.48	.0159	.2326
-12	29.94	15.24	85.21	1.752	7.43	103.70	.0170	.2321
-10	31.29	16.59	84.99	1.681	7.96	103.92	0.0182	0.2316
-8	32.69	17.99	84.78	1.613	8.49	104.14	.0194	.2312
-6	34.14	19.44	84.56	1.549	9.02	104.36	.0205	.2307
-4	35.64	20.94	84.34	1.488	9.55	104.58	.0217	.2302
-2	37.19	22.49	84.12	1.429	10.09	104.80	.0228	.2298
0	38.79	24.09	83.90	1.373	10.63	105.02	0.0240	0.2293
2	40.43	25.73	83.68	1.320	11.17	105.24	0.0251	0.2289
4	42.14	27.44	83.45	1.270	11.70	105.45	.0262	.2285
5	43.02	28.33	83.34	1.246	11.97	105.56	.0268	.2283
6	43.91	29.21	83.23	1.221	12.23	105.66	.0274	.2280
8	45.74	31.04	83.01	1.175	12.76	105.87	.0285	.2276
10	47.63	32.93	82.78	1.130	13.29	106.08	0.0296	0.2272
12	49.58	34.88	82.55	1.088	13.82	106.29	.0307	.2268
14	51.59	36.89	82.32	1.048	14.36	106.50	.0319	.2264
16	53.66	38.96	82.09	1.009	14.90	106.71	.0330	.2260
18	55.79	41.09	81.86	0.9721	15.44	106.92	.0341	.2257

تابع جدول (2 - 3) - خواص التشبع للسائل وبخار غاز التبريد (فريون 22)

Temp F t	Pressure		Liquid, density	Vapor, sp vol	Enthalpy, datum -40 F Btu per lb		Entropy, datum -40 F Btu per lb F	
	psia	psig	lb/cu ft lbf	cu ft/lb %g	Liquid h _f	Vapor h _g	Liquid s _f	Vapor s _g
20	57.98	43.28	81.63	0.9369	15.98	107.13	0.0352	0.2253
22	60.23	45.53	81.39	.9032	16.52	107.33	.0364	.2249
24	62.55	47.85	81.16	.8707	17.06	107.53	.0375	.2246
26	64.94	50.24	80.92	.8398	17.61	107.73	.0379	.2242
28	67.40	52.70	80.69	.8100	18.17	107.93	.0398	.2239
30	69.93	55.23	80.45	0.7816	18.74	108.13	0.0409	0.2235
32	72.53	57.83	80.21	.7543	19.32	108.33	.0421	.2232
34	75.21	60.51	79.97	.7283	19.90	108.52	.0433	.2228
36	77.97	63.27	79.73	.7032	20.49	108.71	.0445	.2225
38	80.81	66.11	79.49	.6791	21.09	108.90	.0457	.2222
40	83.72	69.02	79.25	0.6559	21.70	109.09	0.0469	0.2218
42	85.69	71.99	79.00	.6339	22.29	109.27	.0481	.2215
44	89.74	75.04	78.76	.6126	22.90	109.45	.0493	.2211
46	92.88	78.18	78.51	.5922	23.50	109.63	.0505	.2208
48	96.10	81.40	78.26	.5726	24.11	109.80	.0516	.2205
50	99.40	84.70	78.02	0.5537	24.73	109.98	0.0528	0.2201
52	102.8	88.10	77.77	.5355	25.34	110.14	.0540	.2198
54	106.2	91.5	77.51	.5184	25.95	110.30	.0552	.2194
56	109.8	95.1	77.26	.5014	26.58	110.47	.0564	.2191
58	113.5	98.8	77.01	.4849	27.22	110.63	.0576	.2188
60	117.2	102.5	76.75	0.4695	27.83	110.78	0.0588	0.2185
62	121.0	106.3	76.50	.4546	28.46	110.93	.0600	.2181
64	124.9	110.2	76.24	.4403	29.09	111.08	.0612	.2178
66	128.9	114.2	75.98	.4264	29.72	111.22	.0624	.2175
68	133.0	118.3	75.72	.4129	30.35	111.35	.0636	.2172
70	137.2	122.5	75.46	0.4000	30.99	111.49	0.0648	0.2168
72	141.5	126.8	75.20	.3875	31.65	111.63	.0661	.2165
74	145.9	131.2	74.94	.3754	32.29	111.75	.0673	.2162
76	150.4	135.7	74.68	.3638	32.94	111.88	.0684	.2158
78	155.0	140.3	74.41	.3526	33.61	112.01	.0696	.2155
80	159.7	145.0	74.15	0.3417	34.27	112.13	0.0708	0.2151
82	164.5	149.8	73.89	.3313	34.92	112.24	.0720	.2148
84	169.4	154.7	73.63	.3212	35.60	112.36	.0732	.2144
86	174.3	159.8	73.36	.3113	36.28	112.47	.0744	.2140
88	179.6	164.9	73.09	.3019	36.94	112.57	.0756	.2137
90	184.8	170.1	72.81	0.2928	37.61	112.67	0.0768	0.2133
92	190.1	175.4	72.53	.2841	38.28	112.76	.0780	.2130
94	195.6	180.9	72.24	.2755	38.97	112.85	.0792	.2126
96	201.2	186.5	71.95	.2672	39.65	112.93	.0803	.2122
98	206.8	192.1	71.65	.2594	40.32	113.00	.0815	.2119
100	212.6	197.9	71.35	0.2517	40.98	113.06	0.0827	0.2115
102	218.5	203.8	71.05	.2443	41.65	113.12	.0839	.2111
104	224.6	209.9	70.74	.2370	42.32	113.16	.0851	.2107
106	230.7	216.0	70.42	.2301	42.98	113.20	.0862	.2104
108	237.0	222.3	70.11	.2233	43.64	113.24	.0874	.2100
110	243.4	228.7	69.78	0.2167	44.35	113.29	0.0886	0.2096
112	249.9	235.2	69.45	.2104	45.04	113.34	.0898	.2093
114	256.6	241.9	69.12	.2043	45.74	113.38	.0909	.2089
116	263.4	248.7	68.78	.1983	46.44	113.42	.0921	.2085
118	270.3	255.6	68.44	.1926	47.14	113.46	.0933	.2081
120	277.3	262.6	68.10	0.1871	47.85	113.52	0.0945	0.2078
122	284.4	269.7	67.75	.1825	48.6	113.57		
124	291.6	276.9	67.40	.1772	49.4	113.61		
126	298.8	284.1	67.05	.1724	50.2	113.65		
128	306.1	291.4	66.70	.1675	50.8	113.69		
130	313.5	298.8	66.35	0.1629	51.5	113.71		
132	321.0	306.3	66.00	.1585	52.3	113.74		
134	328.7	314.0	65.65	.1538	53.1	113.77		
136	336.6	321.9	65.25	.1492	53.8	113.79		
138	344.6	329.9	64.85	.1449	54.6	113.80		
140	352.7	338.0	64.45	0.1408	55.3	113.81		
142	361.0	346.3	64.05	.1368	56.1	113.80		
144	369.7	355.0	63.65	.1330	56.9	113.79		
146	379.0	364.3	63.25	.1292	57.7	113.78		
148	388.8	374.1	62.85	.1253	58.4	113.76		
150	399.0	384.3	62.45	0.1216	59.2	113.74		
152	407.0	392.3	62.02	.1179	60.0	113.71		
154	416.0	401.3	61.58	.1141	60.8	113.67		
156	426.0	411.3	61.13	.1105	61.6	113.62		
158	436.5	421.8	60.67	.1070	62.5	113.56		
160	448.0	433.3	60.20	0.1035	63.5	113.50		

جدول (4 - 1) الانتالپيا h والطاقة الداخلية u للغازات المتساوية ، kJ/kg

$t, ^\circ\text{C}$	الهواء		N_2		O_2		CO_2		CO		H_2	
	h	u	h	u	h	u	h	u	h	u	h	u
0	273.2	194.8	283.3	202.2	247.8	176.8	192.1	140.5	283.5	202.5	384.4	271.8
50	323.4	230.7	335.2	239.3	293.6	209.6	234.3	173.2	335.5	239.6	455.8	322.5
100	373.8	266.7	387.3	276.5	340.0	243.0	278.9	208.4	387.6	276.9	527.8	373.9
150	424.4	303.0	439.5	313.9	387.0	277.0	325.7	245.8	440.0	314.4	600.1	425.6
200	475.4	339.7	491.9	351.5	434.7	311.8	374.5	285.1	492.7	352.3	672.6	477.5
250	526.9	376.8	544.7	389.4	483.2	347.3	425.1	326.3	545.9	390.6	745.1	529.4
300	578.9	414.4	597.9	427.8	532.6	383.7	477.4	369.1	599.6	429.5	817.7	581.4
350	631.4	452.5	651.6	466.7	582.7	420.8	531.1	413.4	654.9	469.0	890.4	633.4
400	684.5	491.3	705.9	506.1	633.5	458.6	586.2	459.0	708.9	509.1	963.2	685.6
450	738.1	530.6	760.7	546.1	685.0	497.1	642.5	505.9	764.5	549.9	1036.1	737.9
500	792.4	570.5	816.2	586.8	737.1	536.3	699.9	553.9	830.8	591.3	1109.4	790.5

تابع جدول (4 - 1) - الإنثالبي (h) والطاقة الداخلية (u) للغازات المثالية

550	847.3	611.1	872.3	628.0	789.8	576.0	758.4	602.9	877.7	633.4	11 828	8 433
600	902.8	652.2	929.0	669.9	843.1	616.2	817.8	652.8	935.3	676.1	12 576	8 964
650	958.8	693.9	986.2	712.3	896.7	656.9	878.0	703.6	993.4	719.4	13 306	9 499
700	1015.4	736.1	1044.1	755.3	950.8	698.0	939.0	755.2	1052.1	763.3	14 051	10 038
750	1072.4	778.8	1102.5	798.8	1005.3	739.5	1000.8	807.5	1111.4	807.7	14 800	10 581
800	1129.9	821.9	1161.3	842.9	1060.1	781.3	1063.2	860.5	1171.1	852.6	15 554	11 128
850	1187.9	865.5	1220.7	887.4	1115.4	823.5	1126.2	914.0	1231.3	897.9	16 312	11 680
900	1246.2	909.5	1280.5	932.3	1170.7	865.9	1189.7	968.1	1291.9	943.7	17 076	12 237
950	1304.9	953.9	1340.7	977.7	1226.4	908.6	1253.8	1022.8	1352.9	989.8	17 844	12 799
1000	1364.0	998.6	1401.2	1023.4	1282.4	951.6	1318.4	1077.9	1414.2	1036.3	18 617	13 367
1050	1423.4	1043.6	1462.2	1069.5	1338.7	994.9	1383.4	1133.4	1475.9	1083.2	19 396	13 939
1100	1483.1	1089.0	1523.5	1116.9	1395.2	1038.4	1448.8	1189.4	1538.0	1130.4	20 180	14 517
1150	1543.0	1134.6	1585.1	1162.8	1451.9	1082.1	1514.6	1245.8	1600.3	1177.9	20 970	15 101
1200	1603.3	1180.5	1647.0	1209.8	1508.8	1126.0	1580.8	1302.5	1662.8	1225.6	21 765	15 689
1250	1663.8	1226.7	1709.2	1257.2	1565.9	1179.1	1647.3	1359.5	1725.7	1273.6	22 565	16 283
1300	1724.6	1273.1	1771.7	1304.9	1623.2	1214.4	1714.0	1416.9	1788.9	1321.9	23 371	16 883

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