

**Table Thermodynamique R 513A (XP10)**

	Liquide	Vapeur	Liquide	Vapeur	Liquide	Vapeur	Liquide	Vapeur
Temperature	Pression	Pression	Densité	Densité	Enthalpie	Enthalpie	Entropie	Entropie
(°C)	(bar abs)	(bar abs)	(Kg/M <sup>3</sup> )	(Kg/M <sup>3</sup> )	(KJ/Kg)	(KJ/Kg)	(KJ/Kg-K)	(KJ/Kg-K)
-77	0.063346	0.060857	1484.6	0.40703	107.03	327.87	0.6029	1.7305
-76	0.068226	0.065643	1482	0.43697	108.14	328.51	0.60858	1.7279
-75	0.073418	0.07074	1479.3	0.46869	109.26	329.14	0.61425	1.7254
-74	0.078938	0.076165	1476.6	0.50228	110.39	329.77	0.61989	1.723
-73	0.084801	0.081933	1474	0.53783	111.51	330.41	0.62552	1.7206
-72	0.091024	0.08806	1471.3	0.57541	112.64	331.05	0.63112	1.7183
-71	0.097625	0.094564	1468.6	0.61511	113.76	331.69	0.63671	1.7161
-70	0.10462	0.10146	1465.9	0.65702	114.89	332.33	0.64229	1.7139
-69	0.11203	0.10878	1463.2	0.70123	116.02	332.97	0.64784	1.7117
-68	0.11987	0.11652	1460.5	0.74784	117.16	333.61	0.65338	1.7096
-67	0.12816	0.12471	1457.8	0.79694	118.29	334.25	0.6589	1.7076
-66	0.13692	0.13338	1455.1	0.84863	119.43	334.9	0.6644	1.7056
-65	0.14617	0.14254	1452.4	0.90302	120.57	335.54	0.66989	1.7037
-64	0.15594	0.15221	1449.7	0.96019	121.72	336.19	0.67537	1.7018
-63	0.16623	0.16241	1447	1.0203	122.86	336.83	0.68082	1.7
-62	0.17709	0.17318	1444.2	1.0833	124.01	337.48	0.68626	1.6982
-61	0.18852	0.18452	1441.5	1.1495	125.16	338.13	0.69169	1.6964
-60	0.20055	0.19646	1438.8	1.2189	126.31	338.77	0.6971	1.6947
-59	0.2132	0.20903	1436	1.2917	127.46	339.42	0.70249	1.6931
-58	0.22651	0.22225	1433.3	1.3679	128.62	340.07	0.70787	1.6915
-57	0.24049	0.23614	1430.5	1.4477	129.77	340.72	0.71324	1.6899
-56	0.25516	0.25074	1427.8	1.5312	130.93	341.38	0.71859	1.6884
-55	0.27056	0.26606	1425	1.6185	132.1	342.03	0.72393	1.6869
-54	0.28672	0.28214	1422.2	1.7097	133.26	342.68	0.72925	1.6855
-53	0.30365	0.299	1419.5	1.805	134.43	343.33	0.73456	1.6841
-52	0.32138	0.31666	1416.7	1.9046	135.6	343.98	0.73985	1.6827
-51	0.33995	0.33517	1413.9	2.0084	136.77	344.64	0.74513	1.6814
-50	0.35939	0.35454	1411.1	2.1167	137.94	345.29	0.7504	1.6801
-49	0.37971	0.3748	1408.3	2.2297	139.12	345.94	0.75565	1.6789
-48	0.40096	0.39599	1405.5	2.3474	140.3	346.6	0.7609	1.6777
-47	0.42316	0.41814	1402.7	2.47	141.48	347.25	0.76612	1.6765
-46	0.44634	0.44127	1399.9	2.5976	142.67	347.91	0.77134	1.6753
-45	0.47053	0.46542	1397	2.7304	143.85	348.56	0.77654	1.6742
-44	0.49578	0.49062	1394.2	2.8685	145.04	349.22	0.78173	1.6732
-43	0.5221	0.51691	1391.3	3.0121	146.23	349.87	0.78691	1.6721
-42	0.54953	0.54431	1388.5	3.1614	147.43	350.53	0.79208	1.6711
-41	0.57811	0.57286	1385.6	3.3165	148.62	351.18	0.79723	1.6701
-40	0.60788	0.6026	1382.8	3.4775	149.82	351.83	0.80238	1.6692
-39	0.63885	0.63356	1379.9	3.6446	151.02	352.49	0.80751	1.6683
-38	0.67108	0.66577	1377	3.8181	152.22	353.14	0.81263	1.6674
-37	0.70459	0.69927	1374.1	3.9979	153.43	353.8	0.81774	1.6665
-36	0.73942	0.7341	1371.2	4.1845	154.64	354.45	0.82283	1.6657
-35	0.77561	0.77029	1368.3	4.3778	155.85	355.11	0.82792	1.6649
-34	0.8132	0.80789	1365.4	4.5781	157.06	355.76	0.83299	1.6641
-33	0.85222	0.84692	1362.5	4.7855	158.28	356.41	0.83806	1.6633

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(°C)	(bar abs)	(bar abs)	(Kg/M <sup>3</sup> )	(Kg/M <sup>3</sup> )	(KJ/Kg)	(KJ/Kg)	(KJ/Kg-K)	(KJ/Kg-K)
-32	0.89272	0.88743	1359.6	5.0003	159.5	357.06	0.84311	1.6626
-31	0.93472	0.92946	1356.6	5.2226	160.72	357.72	0.84816	1.6619
-30	0.97828	0.97304	1353.7	5.4526	161.95	358.37	0.85319	1.6612
-29	1.0234	1.0182	1350.7	5.6905	163.17	359.02	0.85821	1.6606
-28	1.0702	1.065	1347.7	5.9365	164.4	359.67	0.86322	1.6599
-27	1.1186	1.1135	1344.8	6.1908	165.64	360.32	0.86823	1.6593
-26	1.1688	1.1637	1341.8	6.4536	166.87	360.97	0.87322	1.6587
-25	1.2207	1.2157	1338.8	6.725	168.11	361.62	0.8782	1.6582
-24	1.2744	1.2694	1335.8	7.0054	169.35	362.27	0.88318	1.6576
-23	1.33	1.3251	1332.8	7.2949	170.59	362.91	0.88814	1.6571
-22	1.3874	1.3825	1329.7	7.5937	171.84	363.56	0.89309	1.6566
-21	1.4468	1.442	1326.7	7.9021	173.09	364.21	0.89804	1.6561
-20	1.5081	1.5034	1323.6	8.2202	174.34	364.85	0.90298	1.6557
-19	1.5714	1.5668	1320.6	8.5483	175.6	365.49	0.9079	1.6552
-18	1.6368	1.6323	1317.5	8.8866	176.85	366.14	0.91282	1.6548
-17	1.7043	1.6998	1314.4	9.2354	178.11	366.78	0.91773	1.6544
-16	1.7739	1.7696	1311.3	9.5949	179.38	367.42	0.92263	1.654
-15	1.8458	1.8415	1308.2	9.9653	180.64	368.06	0.92753	1.6536
-14	1.9199	1.9157	1305.1	10.347	181.91	368.7	0.93241	1.6533
-13	1.9962	1.9922	1302	10.74	183.18	369.34	0.93729	1.6529
-12	2.0749	2.071	1298.8	11.144	184.46	369.97	0.94216	1.6526
-11	2.156	2.1522	1295.7	11.561	185.74	370.61	0.94702	1.6523
-10	2.2395	2.2358	1292.5	11.99	187.02	371.24	0.95187	1.652
-9	2.3255	2.3219	1289.3	12.431	188.3	371.87	0.95672	1.6517
-8	2.4141	2.4106	1286.1	12.885	189.59	372.51	0.96155	1.6515
-7	2.5052	2.5018	1282.9	13.352	190.88	373.14	0.96638	1.6512
-6	2.5989	2.5957	1279.7	13.832	192.17	373.76	0.97121	1.651
-5	2.6953	2.6922	1276.4	14.326	193.47	374.39	0.97602	1.6508
-4	2.7944	2.7914	1273.2	14.834	194.77	375.01	0.98083	1.6506
-3	2.8963	2.8935	1269.9	15.356	196.07	375.64	0.98563	1.6504
-2	3.0011	2.9984	1266.6	15.893	197.38	376.26	0.99043	1.6502
-1	3.1087	3.1061	1263.3	16.444	198.69	376.88	0.99522	1.65
0	3.2193	3.2168	1260	17.011	200	377.5	1	1.6498
1	3.3328	3.3305	1256.7	17.593	201.32	378.11	1.0048	1.6497
2	3.4494	3.4472	1253.3	18.19	202.64	378.73	1.0095	1.6496
3	3.569	3.567	1250	18.804	203.96	379.34	1.0143	1.6494
4	3.6918	3.6899	1246.6	19.435	205.28	379.95	1.0191	1.6493
5	3.8179	3.816	1243.2	20.082	206.61	380.56	1.0238	1.6492
6	3.9471	3.9454	1239.8	20.747	207.95	381.16	1.0286	1.6491
7	4.0797	4.0781	1236.3	21.429	209.28	381.77	1.0333	1.649
8	4.2156	4.2142	1232.9	22.129	210.62	382.37	1.038	1.6489
9	4.3549	4.3536	1229.4	22.848	211.97	382.96	1.0428	1.6488
10	4.4977	4.4965	1225.9	23.586	213.31	383.56	1.0475	1.6488
11	4.6441	4.643	1222.4	24.342	214.66	384.15	1.0522	1.6487
12	4.794	4.793	1218.9	25.119	216.02	384.75	1.0569	1.6486

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(°C)	(bar abs)	(bar abs)	(Kg/M <sup>3</sup> )	(Kg/M <sup>3</sup> )	(KJ/Kg)	(KJ/Kg)	(KJ/Kg-K)	(KJ/Kg-K)
13	4.9475	4.9467	1215.3	25.915	217.37	385.33	1.0616	1.6486
14	5.1048	5.104	1211.8	26.733	218.74	385.92	1.0663	1.6486
15	5.2658	5.2651	1208.2	27.571	220.1	386.5	1.071	1.6485
16	5.4306	5.43	1204.5	28.431	221.47	387.08	1.0757	1.6485
17	5.5993	5.5988	1200.9	29.313	222.84	387.66	1.0804	1.6485
18	5.7719	5.7715	1197.2	30.217	224.22	388.23	1.0851	1.6484
19	5.9485	5.9482	1193.6	31.144	225.6	388.8	1.0898	1.6484
20	6.1292	6.1289	1189.9	32.095	226.99	389.37	1.0945	1.6484
21	6.3139	6.3137	1186.1	33.071	228.38	389.93	1.0992	1.6484
22	6.5028	6.5027	1182.4	34.071	229.77	390.49	1.1038	1.6484
23	6.6959	6.6958	1178.6	35.096	231.17	391.05	1.1085	1.6484
24	6.8934	6.8933	1174.8	36.147	232.57	391.6	1.1132	1.6484
25	7.0951	7.0951	1170.9	37.225	233.97	392.15	1.1178	1.6484
26	7.3013	7.3013	1167.1	38.33	235.38	392.69	1.1225	1.6484
27	7.512	7.512	1163.2	39.464	236.8	393.23	1.1272	1.6484
28	7.7271	7.7271	1159.3	40.625	238.22	393.77	1.1318	1.6483
29	7.9469	7.9469	1155.3	41.816	239.64	394.3	1.1365	1.6483
30	8.1713	8.1713	1151.3	43.038	241.07	394.83	1.1411	1.6483
31	8.4005	8.4004	1147.3	44.29	242.5	395.35	1.1458	1.6483
32	8.6344	8.6343	1143.3	45.574	243.94	395.87	1.1504	1.6483
33	8.8732	8.8731	1139.2	46.89	245.38	396.39	1.1551	1.6483
34	9.117	9.1167	1135.1	48.24	246.83	396.9	1.1597	1.6483
35	9.3657	9.3654	1131	49.624	248.28	397.4	1.1644	1.6483
36	9.6194	9.619	1126.8	51.044	249.73	397.9	1.169	1.6483
37	9.8783	9.8778	1122.6	52.5	251.2	398.39	1.1737	1.6483
38	10.142	10.142	1118.3	53.993	252.66	398.88	1.1783	1.6482
39	10.412	10.411	1114	55.524	254.14	399.36	1.183	1.6482
40	10.686	10.685	1109.7	57.095	255.61	399.84	1.1876	1.6482
41	10.966	10.965	1105.4	58.707	257.1	400.3	1.1923	1.6481
42	11.252	11.251	1101	60.361	258.59	400.77	1.1969	1.6481
43	11.543	11.541	1096.5	62.058	260.08	401.22	1.2016	1.648
44	11.839	11.838	1092	63.799	261.58	401.67	1.2062	1.6479
45	12.142	12.14	1087.5	65.586	263.09	402.12	1.2109	1.6479
46	12.45	12.448	1082.9	67.421	264.6	402.55	1.2155	1.6478
47	12.763	12.761	1078.3	69.305	266.12	402.98	1.2202	1.6477
48	13.083	13.081	1073.6	71.239	267.64	403.4	1.2248	1.6476
49	13.409	13.406	1068.9	73.226	269.18	403.82	1.2295	1.6475
50	13.741	13.738	1064.1	75.266	270.72	404.22	1.2342	1.6473
51	14.079	14.075	1059.3	77.363	272.26	404.62	1.2389	1.6472
52	14.423	14.419	1054.4	79.518	273.82	405	1.2436	1.647
53	14.773	14.769	1049.4	81.733	275.38	405.38	1.2482	1.6469
54	15.13	15.126	1044.4	84.01	276.95	405.75	1.2529	1.6467
55	15.493	15.488	1039.3	86.352	278.52	406.11	1.2576	1.6465
56	15.863	15.858	1034.2	88.762	280.11	406.46	1.2624	1.6462
57	16.239	16.234	1028.9	91.241	281.7	406.8	1.2671	1.646

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58	16.622	16.616	1023.7	93.794	283.3	407.12	1.2718	1.6457
59	17.012	17.006	1018.3	96.422	284.91	407.44	1.2766	1.6455
60	17.408	17.402	1012.8	99.13	286.53	407.74	1.2813	1.6451
61	17.812	17.805	1007.3	101.92	288.16	408.03	1.2861	1.6448
62	18.222	18.215	1001.7	104.8	289.8	408.31	1.2909	1.6445
63	18.64	18.633	995.98	107.77	291.45	408.57	1.2956	1.6441