

KLEA® 407A



## Thermodynamic Property Data British Units

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# SYSTEM PERFORMANCE WITH NON-AZEOTROPIC REFRIGERANT BLENDS

With a non-azeotropic refrigerant blend the composition of the vapour changes in the evaporator and the condenser.

Evaporator inlet and outlet temperatures are different.

Condenser inlet and outlet temperatures are different.

At all other points in the system the fluid behaves as normal.

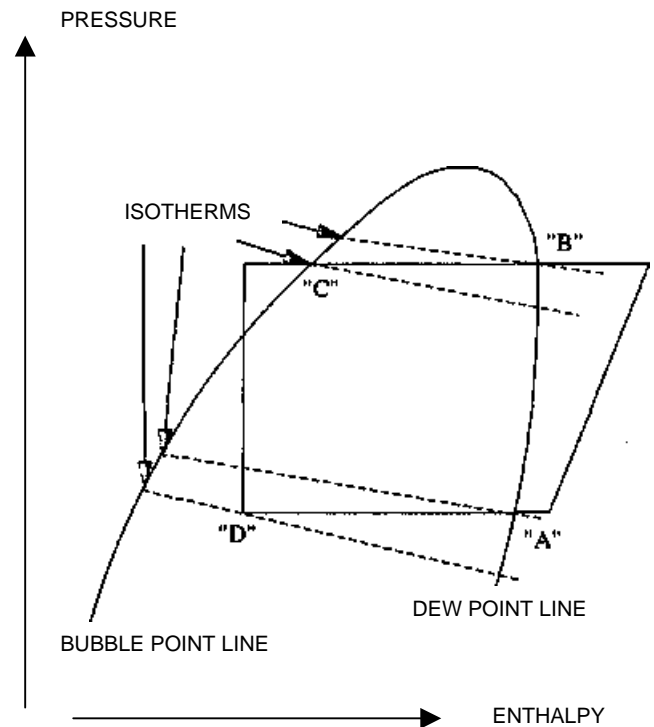
System design path.

Select evaporator outlet (Dew point 'A') against the desired cold space temperature.

Condenser inlet and outlet temperatures 'B' & 'C' should be sufficient to reject heat.

Liquid enthalpy at expansion device and table 3 can be used to get evaporator inlet temperature 'D'.

Refrigeration effect is enthalpy change 'D' to 'A' as normal.



Pressure-Enthalpy Diagram for Non-azeotropic Refrigerant Blends

KLEA<sup>®</sup> 407A

Saturated Liquid and Saturated Vapor Properties Table 1 Sheet 1

Pressure psia	Dew Point °F	Bubble Point °F	Liquid Density lb/ft <sup>3</sup>	Vapor Density lb/ft <sup>3</sup>	Liquid Enthalpy Btu/lb	Vapor Enthalpy Btu/lb	Vapor Entropy Btu/lb.F
10	-51.56	-63.75	89.12989	0.21028	-7.618	96.761	0.24138
11	-48.33	-60.44	88.77540	0.22988	-6.552	97.252	0.24053
12	-45.31	-57.36	88.44392	0.24937	-5.562	97.709	0.23976
13	-42.49	-54.48	88.13212	0.26876	-4.637	98.136	0.23907
14	-39.84	-51.77	87.83736	0.28807	-3.767	98.537	0.23844
15	-37.33	-49.20	87.55751	0.30730	-2.945	98.916	0.23786
16	-34.94	-46.77	87.29083	0.32646	-2.166	99.274	0.23733
17	-32.68	-44.45	87.03588	0.34555	-1.425	99.615	0.23684
18	-30.51	-42.24	86.79146	0.36458	-0.718	99.940	0.23638
19	-28.44	-40.12	86.55654	0.38356	-0.041	100.250	0.23595
20	-26.44	-38.09	86.33024	0.40249	0.608	100.548	0.23555
21	-24.53	-36.14	86.11180	0.42137	1.233	100.833	0.23517
22	-22.69	-34.26	85.90057	0.44021	1.834	101.107	0.23481
23	-20.91	-32.44	85.69597	0.45901	2.415	101.371	0.23448
24	-19.19	-30.68	85.49750	0.47778	2.976	101.626	0.23416
25	-17.52	-28.98	85.30470	0.49651	3.520	101.872	0.23385
26	-15.90	-27.33	85.11718	0.51521	4.046	102.110	0.23357
27	-14.34	-25.73	84.93458	0.53388	4.558	102.341	0.23329
28	-12.81	-24.18	84.75658	0.55252	5.055	102.565	0.23303
29	-11.33	-22.66	84.58289	0.57113	5.538	102.781	0.23278
30	-9.89	-21.19	84.41325	0.58973	6.010	102.992	0.23254
31	-8.48	-19.76	84.24741	0.60830	6.469	103.197	0.23230
32	-7.11	-18.36	84.08517	0.62685	6.917	103.396	0.23208
33	-5.77	-16.99	83.92633	0.64539	7.354	103.590	0.23187
34	-4.47	-15.66	83.77069	0.66390	7.782	103.780	0.23166
35	-3.19	-14.35	83.61811	0.68240	8.200	103.964	0.23146
36	-1.94	-13.08	83.46841	0.70089	8.610	104.144	0.23127
37	-0.71	-11.83	83.32147	0.71936	9.010	104.320	0.23109
38	0.47	-10.60	83.17715	0.73782	9.403	104.492	0.23091
39	1.65	-9.40	83.03532	0.75627	9.788	104.659	0.23074
40	2.80	-8.23	82.89588	0.77471	10.166	104.823	0.23057

Standard state : At -40°F, Liquid Enthalpy=0.0 Btu/lb, Liquid Entropy=0.0 Btu/lb.F

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KLEA® 407A

Saturated Liquid and Saturated Vapor Properties Table 1 Sheet 2

Pressure psia	Dew Point °F	Bubble Point °F	Liquid Density lb/ft <sup>3</sup>	Vapor Density lb/ft <sup>3</sup>	Liquid Enthalpy Btu/lb	Vapor Enthalpy Btu/lb	Vapor Entropy Btu/lb.F
40	2.80	-8.23	82.89588	0.77471	10.166	104.823	0.23057
45	8.24	-2.67	82.23097	0.86678	11.957	105.594	0.22980
50	13.24	2.42	81.61242	0.95871	13.607	106.292	0.22913
55	17.87	7.15	81.03220	1.05059	15.141	106.930	0.22853
60	22.18	11.56	80.48426	1.14248	16.577	107.517	0.22799
65	26.23	15.70	79.96390	1.23444	17.931	108.060	0.22750
70	30.05	19.60	79.46738	1.32651	19.213	108.565	0.22706
75	33.66	23.30	78.99168	1.41874	20.433	109.036	0.22664
80	37.09	26.81	78.53435	1.51117	21.598	109.477	0.22626
85	40.36	30.16	78.09331	1.60382	22.714	109.891	0.22590
90	43.49	33.36	77.66683	1.69673	23.787	110.282	0.22556
95	46.48	36.44	77.25344	1.78992	24.820	110.650	0.22524
100	49.36	39.39	76.85188	1.88343	25.818	110.998	0.22493
105	52.13	42.23	76.46104	1.97726	26.784	111.327	0.22464
110	54.80	44.97	76.07996	2.07145	27.721	111.640	0.22435
115	57.38	47.62	75.70781	2.16601	28.630	111.936	0.22408
120	59.88	50.19	75.34384	2.26096	29.515	112.218	0.22382
125	62.30	52.67	74.98738	2.35632	30.377	112.487	0.22356
130	64.64	55.08	74.63785	2.45211	31.218	112.742	0.22332
135	66.92	57.42	74.29470	2.54835	32.039	112.985	0.22308
140	69.13	59.70	73.95744	2.64505	32.842	113.217	0.22284
145	71.28	61.92	73.62566	2.74224	33.628	113.438	0.22261
150	73.38	64.08	73.29893	2.83991	34.398	113.649	0.22238
155	75.42	66.19	72.97689	2.93810	35.153	113.850	0.22216
160	77.41	68.24	72.65922	3.03681	35.894	114.042	0.22194

Standard state : At -40°F, Liquid Enthalpy=0.0 Btu/lb, Liquid Entropy=0.0 Btu/lb.F

Version 2a 1st September 1993

KLEA® 407A  
Saturated Liquid and Saturated Vapor Properties Table 1 Sheet 3

Pressure psia	Dew Point °F	Bubble Point °F	Liquid Density lb/ft <sup>3</sup>	Vapor Density lb/ft <sup>3</sup>	Liquid Enthalpy Btu/lb	Vapor Enthalpy Btu/lb	Vapor Entropy Btu/lb.F
160	77.41	68.24	72.65922	3.03681	35.894	114.042	0.22194
170	81.26	72.22	72.03570	3.23587	37.338	114.401	0.22151
180	84.94	76.02	71.42614	3.43721	38.734	114.727	0.22109
190	88.46	79.66	70.82859	3.64096	40.089	115.023	0.22067
200	91.84	83.17	70.24132	3.84724	41.407	115.292	0.22026
210	95.10	86.55	69.66279	4.05617	42.692	115.535	0.21986
220	98.23	89.81	69.09157	4.26788	43.946	115.754	0.21945
230	101.26	92.95	68.52638	4.48250	45.173	115.950	0.21904
240	104.19	96.00	67.96600	4.70017	46.375	116.125	0.21864
250	107.02	98.96	67.40927	4.92102	47.555	116.279	0.21823
260	109.77	101.83	66.85508	5.14520	48.715	116.414	0.21782
270	112.44	104.62	66.30231	5.37286	49.857	116.529	0.21741
280	115.03	107.33	65.74989	5.60418	50.982	116.626	0.21699
290	117.55	109.97	65.19670	5.83932	52.092	116.706	0.21656
300	120.00	112.54	64.64158	6.07847	53.189	116.768	0.21613
310	122.39	115.05	64.08332	6.32181	54.274	116.813	0.21570
320	124.71	117.51	63.52064	6.56956	55.348	116.841	0.21525
330	126.98	119.90	62.95209	6.82194	56.413	116.854	0.21480
340	129.20	122.25	62.37612	7.07919	57.469	116.849	0.21434
350	131.37	124.54	61.79093	7.34157	58.518	116.829	0.21387
360	133.48	126.78	61.19445	7.60936	59.562	116.793	0.21339
370	135.55	128.98	60.58422	7.88285	60.600	116.740	0.21290
380	137.58	131.14	59.95728	8.16238	61.635	116.672	0.21240
390	139.56	133.26	59.30995	8.44832	62.667	116.586	0.21189
400	141.50	135.33	58.63753	8.74104	63.698	116.485	0.21136
410	143.41	137.37	57.93383	9.04100	64.728	116.366	0.21081
420	145.27	139.38	57.19036	9.34866	65.758	116.230	0.21026
430	147.10	141.35	56.39485	9.66457	66.790	116.076	0.20968

Standard state : At -40°F, Liquid Enthalpy=0.0 Btu/lb, Liquid Entropy=0.0 Btu/lb.F  
Version 2a 1st September 1993

# KLEA® 407A

## Saturated Liquid and Saturated Vapor Properties Table 2 Sheet 1

10.0 psia  
Dew Point = -51.56°F

20.0 psia  
Dew Point = -26.44°F

30.0 psia  
Dew Point = -9.89°F

Temp °F	Density lb/ft <sup>3</sup>	Enthalpy btu/lb	Entropy btu/lb.R	Temp °F	Density lb/ft <sup>3</sup>	Enthalpy btu/lb	Entropy btu/lb.R	Temp °F	Density lb/ft <sup>3</sup>	Enthalpy btu/lb	Entropy btu/lb.R
-50.00	0.209420	97.025	0.2420								
-45.00	0.206750	97.871	0.2441								
-40.00	0.204140	98.722	0.2461								
-35.00	0.201600	99.578	0.2481								
-30.00	0.199120	100.440	0.2502								
-25.00	0.196710	101.308	0.2522	-25.00	0.40100	100.802	0.2361				
-20.00	0.194360	102.181	0.2542	-20.00	0.39594	101.685	0.2382				
-15.00	0.192060	103.059	0.2562	-15.00	0.39102	102.573	0.2402				
-10.00	0.189820	103.944	0.2581	-10.00	0.38623	103.466	0.2422				
-5.00	0.187640	104.833	0.2601	-5.00	0.38156	104.365	0.2441	-5.00	0.58239	103.881	0.2345
0.00	0.185500	105.728	0.2621	0.00	0.37701	105.268	0.2461	0.00	0.57510	104.794	0.2365
5.00	0.183420	106.629	0.2640	5.00	0.37258	106.177	0.2481	5.00	0.56800	105.712	0.2385
10.00	0.181380	107.535	0.2659	10.00	0.36825	107.091	0.2500	10.00	0.56110	106.634	0.2405
15.00	0.179390	108.447	0.2679	15.00	0.36403	108.010	0.2520	15.00	0.55437	107.562	0.2424
20.00	0.177440	109.364	0.2698	20.00	0.35991	108.935	0.2539	20.00	0.54782	108.495	0.2444
25.00	0.175540	110.286	0.2717	25.00	0.35589	109.865	0.2559	25.00	0.54144	109.433	0.2463
30.00	0.173680	111.215	0.2736	30.00	0.35197	110.800	0.2578	30.00	0.53522	110.375	0.2483
35.00	0.171860	112.148	0.2755	35.00	0.34813	111.741	0.2597	35.00	0.52915	111.323	0.2502
40.00	0.170070	113.087	0.2774	40.00	0.34438	112.686	0.2616	40.00	0.52323	112.276	0.2521
45.00	0.168330	114.032	0.2793	45.00	0.34072	113.637	0.2635	45.00	0.51744	113.234	0.2540
50.00	0.166620	114.982	0.2812	50.00	0.33713	114.594	0.2654	50.00	0.51180	114.197	0.2559
55.00	0.164940	115.937	0.2830	55.00	0.33363	115.555	0.2672	55.00	0.50629	115.165	0.2578
60.00	0.163310	116.898	0.2849	60.00	0.33020	116.522	0.2691	60.00	0.50090	116.138	0.2597
65.00	0.161700	117.864	0.2867	65.00	0.32684	117.494	0.2710	65.00	0.49564	117.116	0.2616
70.00	0.160120	118.836	0.2886	70.00	0.32356	118.471	0.2728	70.00	0.49049	118.100	0.2634
75.00	0.158580	119.813	0.2904	75.00	0.32034	119.454	0.2747	75.00	0.48545	119.088	0.2653
80.00	0.157070	120.796	0.2922	80.00	0.31719	120.442	0.2765	80.00	0.48053	120.081	0.2671
85.00	0.155580	121.784	0.2941	85.00	0.31410	121.435	0.2783	85.00	0.47571	121.080	0.2690
90.00	0.154130	122.777	0.2959	90.00	0.31108	122.433	0.2802	90.00	0.47099	122.084	0.2708
95.00	0.152700	123.776	0.2977	95.00	0.30811	123.437	0.2820	95.00	0.46637	123.092	0.2726

Standard state : At -40°F, Liquid Enthalpy=0.0 Btu/lb, Liquid Entropy=0.0 Btu/lb.F  
Version 2a 1st September 1993

# KLEA<sup>®</sup> 407A

## Saturated Liquid and Saturated Vapor Properties Table 2 Sheet 2

10.0 psia  
Dew Point = -51.56°F

20.0 psia  
Dew Point = -26.44°F

30.0 psia  
Dew Point = -9.89°F

Temp °F	Density lb/ft <sup>3</sup>	Enthalpy btu/lb	Entropy btu/lb.R	Temp °F	Density lb/ft <sup>3</sup>	Enthalpy btu/lb	Entropy btu/lb.R	Temp °F	Density lb/ft <sup>3</sup>	Enthalpy btu/lb	Entropy btu/lb.R
100.00	0.15130	124.779	0.2995	100.00	0.30521	124.445	0.2838	100.00	0.46184	124.106	0.2744
105.00	0.14992	125.789	0.3013	105.00	0.30236	125.459	0.2856	105.00	0.45741	125.125	0.2763
110.00	0.14857	126.803	0.3031	110.00	0.29956	126.478	0.2874	110.00	0.45307	126.149	0.2781
115.00	0.14725	127.823	0.3049	115.00	0.29682	127.503	0.2892	115.00	0.44881	127.178	0.2799
120.00	0.14594	128.848	0.3066	120.00	0.29413	128.532	0.2910	120.00	0.44464	128.212	0.2817
125.00	0.14467	129.879	0.3084	125.00	0.29149	129.567	0.2928	125.00	0.44055	129.251	0.2834
130.00	0.14341	130.914	0.3102	130.00	0.28890	130.607	0.2945	130.00	0.43653	130.295	0.2852
135.00	0.14218	131.955	0.3119	135.00	0.28635	131.651	0.2963	135.00	0.43260	131.344	0.2870
140.00	0.14096	133.001	0.3137	140.00	0.28385	132.701	0.2980	140.00	0.42873	132.398	0.2888
145.00	0.13977	134.052	0.3154	145.00	0.28140	133.757	0.2998	145.00	0.42494	133.458	0.2905
150.00	0.13860	135.108	0.3172	150.00	0.27899	134.817	0.3015	150.00	0.42122	134.522	0.2923
155.00	0.13745	136.170	0.3189	155.00	0.27662	135.882	0.3033	155.00	0.41756	135.591	0.2940
160.00	0.13632	137.237	0.3206	160.00	0.27429	136.953	0.3050	160.00	0.41398	136.666	0.2958
165.00	0.13520	138.309	0.3223	165.00	0.27200	138.029	0.3067	165.00	0.41045	137.746	0.2975
170.00	0.13411	139.386	0.3241	170.00	0.26976	139.109	0.3085	170.00	0.40699	138.830	0.2992
175.00	0.13303	140.468	0.3258	175.00	0.26755	140.195	0.3102	175.00	0.40359	139.920	0.3009
180.00	0.13197	141.556	0.3275	180.00	0.26537	141.287	0.3119	180.00	0.40025	141.015	0.3027
185.00	0.13093	142.648	0.3292	185.00	0.26324	142.383	0.3136	185.00	0.39696	142.115	0.3044
190.00	0.12990	143.746	0.3309	190.00	0.26114	143.484	0.3153	190.00	0.39373	143.220	0.3061
195.00	0.12889	144.848	0.3326	195.00	0.25907	144.590	0.3170	195.00	0.39056	144.329	0.3078
200.00	0.12790	145.956	0.3343	200.00	0.25703	145.701	0.3187	200.00	0.38744	145.444	0.3095
205.00	0.12692	147.068	0.3359	205.00	0.25503	146.817	0.3204	205.00	0.38437	146.563	0.3112
210.00	0.12596	148.186	0.3376	210.00	0.25306	147.937	0.3221	210.00	0.38135	147.687	0.3129
215.00	0.12501	149.308	0.3393	215.00	0.25112	149.063	0.3237	215.00	0.37838	148.816	0.3145
220.00	0.12407	150.436	0.3409	220.00	0.24922	150.194	0.3254	220.00	0.37546	149.951	0.3162
225.00	0.12315	151.568	0.3426	225.00	0.24734	151.330	0.3271	225.00	0.37258	151.090	0.3179
230.00	0.12224	152.705	0.3443	230.00	0.24549	152.471	0.3287	230.00	0.36975	152.234	0.3195

Standard state : At -40°F, Liquid Enthalpy=0.0 Btu/lb, Liquid Entropy=0.0 Btu/lb.F  
Version 2a 1st September 1993

# KLEA<sup>®</sup> 407A

## Saturated Liquid and Saturated Vapor Properties Table 2 Sheet 3

40.0 psia  
Dew Point = 2.80°F

50.0 psia  
Dew Point = 13.24°F

60.0 psia  
Dew Point = 22.18°F

Temp °F	Density lb/ft <sup>3</sup>	Enthalpy btu/lb	Entropy btu/lb.R	Temp °F	Density lb/ft <sup>3</sup>	Enthalpy btu/lb	Entropy btu/lb.R	Temp °F	Density lb/ft <sup>3</sup>	Enthalpy btu/lb	Entropy btu/lb.R
0.00	0.78043	105.231	0.2314								
5.00	0.77030	106.164	0.2334								
10.00	0.76047	107.100	0.2354								
15.00	0.75092	108.042	0.2374	15.00	0.95428	106.624	0.2298				
20.00	0.74164	108.988	0.2394	20.00	0.94191	107.576	0.2318				
25.00	0.73261	109.939	0.2413	25.00	0.92991	108.531	0.2338	25.00	1.13389	108.060	0.2291
30.00	0.72383	110.895	0.2433	30.00	0.91825	109.491	0.2358	30.00	1.11900	109.030	0.2311
35.00	0.71527	111.856	0.2452	35.00	0.90692	110.456	0.2377	35.00	1.10457	110.004	0.2331
40.00	0.70694	112.821	0.2471	40.00	0.89591	111.425	0.2397	40.00	1.09056	110.982	0.2351
45.00	0.69882	113.791	0.2490	45.00	0.88520	112.398	0.2416	45.00	1.07696	111.964	0.2370
50.00	0.69091	114.766	0.2509	50.00	0.87477	113.376	0.2435	50.00	1.06375	112.951	0.2390
55.00	0.68319	115.746	0.2528	55.00	0.86462	114.359	0.2455	55.00	1.05091	113.941	0.2409
60.00	0.67565	116.731	0.2547	60.00	0.85473	115.346	0.2474	60.00	1.03843	114.936	0.2428
65.00	0.66830	117.721	0.2566	65.00	0.84509	116.338	0.2493	65.00	1.02628	115.936	0.2447
70.00	0.66112	118.715	0.2585	70.00	0.83569	117.334	0.2512	70.00	1.01445	116.939	0.2466
75.00	0.65411	119.715	0.2603	75.00	0.82653	118.335	0.2530	75.00	1.00293	117.947	0.2485
80.00	0.64726	120.719	0.2622	80.00	0.81758	119.341	0.2549	80.00	0.99171	118.960	0.2504
85.00	0.64056	121.728	0.2640	85.00	0.80885	120.352	0.2568	85.00	0.98076	119.977	0.2523
90.00	0.63402	122.743	0.2658	90.00	0.80032	121.367	0.2586	90.00	0.97009	120.999	0.2542
95.00	0.62761	123.762	0.2677	95.00	0.79199	122.387	0.2605	95.00	0.95968	122.025	0.2560
100.00	0.62135	124.786	0.2695	100.00	0.78385	123.412	0.2623	100.00	0.94951	123.056	0.2579
105.00	0.61521	125.815	0.2713	105.00	0.77589	124.441	0.2642	105.00	0.93958	124.091	0.2597
110.00	0.60921	126.849	0.2731	110.00	0.76810	125.475	0.2660	110.00	0.92988	125.131	0.2615
115.00	0.60333	127.887	0.2749	115.00	0.76049	126.514	0.2678	115.00	0.92041	126.175	0.2634
120.00	0.59757	128.931	0.2767	120.00	0.75304	127.558	0.2696	120.00	0.91114	127.224	0.2652
125.00	0.59193	129.980	0.2785	125.00	0.74575	128.607	0.2714	125.00	0.90208	128.278	0.2670
130.00	0.58641	131.033	0.2803	130.00	0.73860	129.660	0.2732	130.00	0.89322	129.337	0.2688
135.00	0.58099	132.092	0.2821	135.00	0.73161	130.719	0.2750	135.00	0.88455	130.400	0.2706
140.00	0.57568	133.155	0.2838	140.00	0.72476	131.782	0.2768	140.00	0.87606	131.467	0.2724
145.00	0.57047			145.00	0.71804	132.849	0.2785	145.00	0.86775	132.540	0.2742

Standard state : At -40°F, Liquid Enthalpy=0.0 Btu/lb, Liquid Entropy=0.0 Btu/lb.F  
Version 2a 1st September 1993



# KLEA<sup>®</sup> 407A

## Saturated Liquid and Saturated Vapor Properties Table 2 Sheet 4

40.0 psia  
Dew Point = 2.80°F

50.0 psia  
Dew Point = 13.24°F

60.0 psia  
Dew Point = 22.18°F

Temp °F	Density lb/ft <sup>3</sup>	Enthalpy btu/lb	Entropy btu/lb.R	Temp °F	Density lb/ft <sup>3</sup>	Enthalpy btu/lb	Entropy btu/lb.R	Temp °F	Density lb/ft <sup>3</sup>	Enthalpy btu/lb	Entropy btu/lb.R
150.00	0.56536	134.224	0.2856	150.00	0.71146	133.922	0.2803	150.00	0.85961	133.617	0.2759
155.00	0.56034	135.297	0.2873	155.00	0.70501	135.000	0.2821	155.00	0.85164	134.699	0.2777
160.00	0.55542	136.376	0.2891	160.00	0.69869	136.083	0.2838	160.00	0.84383	135.787	0.2795
165.00	0.55059	137.460	0.2908	165.00	0.69248	137.171	0.2856	165.00	0.83617	136.879	0.2812
170.00	0.54585	138.548	0.2926	170.00	0.68640	138.263	0.2873	170.00	0.82867	137.976	0.2830
175.00	0.54120	139.642	0.2943	175.00	0.68042	139.361	0.2890	175.00	0.82131	139.078	0.2847
180.00	0.53663	140.741	0.2960	180.00	0.67456	140.464	0.2908	180.00	0.81409	140.185	0.2864
185.00	0.53214	141.845	0.2977	185.00	0.66881	141.572	0.2925	185.00	0.80701	141.297	0.2882
190.00	0.52773	142.953	0.2994	190.00	0.66316	142.685	0.2942	190.00	0.80006	142.414	0.2899
195.00	0.52340	144.067	0.3012	195.00	0.65761	143.802	0.2959	195.00	0.79325	143.535	0.2916
200.00	0.51914	145.185	0.3029	200.00	0.65217	144.924	0.2976	200.00	0.78655	144.661	0.2933
205.00	0.51495	146.308	0.3045	205.00	0.64681	146.050	0.2993	205.00	0.77998	145.791	0.2950
210.00	0.51084	147.435	0.3062	210.00	0.64156	147.182	0.3010	210.00	0.77353	146.926	0.2967
215.00	0.50679	148.568	0.3079	215.00	0.63639	148.318	0.3027	215.00	0.76719	148.066	0.2984
220.00	0.50281	149.706	0.3096	220.00	0.63131	149.460	0.3044	220.00	0.76097	149.212	0.3001
225.00	0.49890	150.849	0.3113	225.00	0.62631	150.606	0.3061	225.00	0.75485	150.362	0.3018
230.00	0.49505	151.997	0.3129	230.00	0.62140	151.757	0.3078	230.00	0.74884	151.517	0.3035
235.00	0.49126	153.149	0.3146	235.00	0.61658	152.913	0.3094	235.00	0.74293	152.676	0.3052
240.00	0.48754	154.306	0.3163	240.00	0.61183	154.073	0.3111	240.00	0.73712	153.840	0.3068
245.00	0.48387	155.467	0.3179	245.00	0.60716	155.238	0.3128	245.00	0.73141	155.008	0.3085
250.00	0.48026	156.634	0.3196	250.00	0.60256	156.408	0.3144	250.00	0.72579	156.181	0.3102
255.00	0.47671	157.804	0.3212	255.00	0.59804	157.582	0.3161	255.00	0.72027	157.358	0.3118
260.00	0.47321	158.980	0.3229	260.00	0.59359	158.761	0.3177	260.00	0.71483	158.540	0.3135
265.00	0.46976	160.160	0.3245	265.00	0.58921	159.944	0.3194	265.00	0.70949	159.726	0.3151
270.00	0.46637	161.344	0.3261	270.00	0.58490	161.131	0.3210	270.00	0.70422	160.917	0.3167
275.00	0.46303	162.534	0.3277	275.00	0.58065	162.324	0.3226	275.00	0.69905	162.113	0.3184
280.00	0.45974	163.727	0.3294	280.00	0.57647	163.520	0.3242	280.00	0.69395	163.312	0.3200

Standard state : At -40°F, Liquid Enthalpy=0.0 Btu/lb, Liquid Entropy=0.0 Btu/lb.F  
Version 2a 1st September 1993

# KLEA<sup>®</sup> 407A

## Saturated Liquid and Saturated Vapor Properties Table 2 Sheet 5

70.0 psia  
Dew Point = 30.5°F

80.0 psia  
Dew Point = 37.09°F

90.0 psia  
Dew Point = 43.49°F

Temp °F	Density lb/ft <sup>3</sup>	Enthalpy btu/lb	Entropy btu/lb.R	Temp °F	Density lb/ft <sup>3</sup>	Enthalpy btu/lb	Entropy btu/lb.R	Temp °F	Density lb/ft <sup>3</sup>	Enthalpy btu/lb	Entropy btu/lb.R
40.00	1.29139	109.539	0.2290	40.00	1.49896	110.058	0.2274	45.00	1.6894	110.588	0.2262
45.00	1.27457	110.527	0.2310	45.00	1.47852	111.060	0.2294	50.00	1.6658	111.604	0.2282
50.00	1.25826	111.519	0.2330	50.00	1.45876	112.066	0.2314	55.00	1.6429	112.623	0.2302
55.00	1.24244	112.514	0.2350	55.00	1.43963	113.074	0.2334	60.00	1.6209	113.646	0.2321
60.00	1.22709	113.514	0.2369	60.00	1.42109	114.087	0.2353	65.00	1.5995	114.671	0.2341
65.00	1.21218	114.517	0.2389	65.00	1.40312	115.103	0.2373	70.00	1.5788	115.700	0.2361
70.00	1.19768	115.524	0.2408	70.00	1.38569	116.123	0.2392	75.00	1.5588	116.733	0.2380
75.00	1.18359	116.536	0.2427	75.00	1.36877	117.147	0.2411	80.00	1.5394	117.769	0.2399
80.00	1.16987	117.551	0.2446	80.00	1.35233	118.174	0.2430	85.00	1.5205	118.808	0.2418
85.00	1.15652	118.571	0.2465	85.00	1.33636	119.206	0.2450	90.00	1.5022	119.852	0.2437
90.00	1.14352	119.595	0.2484	90.00	1.32082	120.242	0.2468	95.00	1.4845	120.899	0.2456
95.00	1.13085	120.624	0.2503	95.00	1.30570	121.281	0.2487	100.00	1.4672	121.949	0.2475
100.00	1.11849	121.656	0.2521	100.00	1.29098	122.325	0.2506	105.00	1.4504	123.004	0.2494
105.00	1.10644	122.693	0.2540	105.00	1.27664	123.373	0.2525	110.00	1.4340	124.063	0.2513
110.00	1.09469	123.735	0.2559	110.00	1.26267	124.425	0.2543	115.00	1.4181	125.126	0.2531
115.00	1.08321	124.781	0.2577	115.00	1.24904	125.481	0.2562	120.00	1.4025	126.192	0.2550
120.00	1.07200	125.831	0.2595	120.00	1.23575	126.542	0.2580	125.00	1.3874	127.263	0.2568
125.00	1.06106	126.886	0.2614	125.00	1.22279	127.607	0.2598	130.00	1.3726	128.338	0.2586
130.00	1.05036	127.945	0.2632	130.00	1.21013	128.676	0.2617	135.00	1.3582	129.417	0.2605
135.00	1.03990	129.008	0.2650	135.00	1.19776	129.749	0.2635	140.00	1.3442	130.500	0.2623
140.00	1.02967	130.077	0.2668	140.00	1.18568	130.827	0.2653	145.00	1.3305	131.588	0.2641
145.00	1.01967	131.149	0.2686	145.00	1.17388	131.909	0.2671	150.00	1.3171	132.680	0.2659
150.00	1.00988	132.226	0.2704	150.00	1.16233	132.996	0.2689	155.00	1.3040	133.777	0.2677
155.00	1.00029	133.308	0.2722	155.00	1.15104	134.088	0.2706	160.00	1.2912	134.879	0.2695
160.00	0.99091	134.395	0.2739	160.00	1.14000	135.185	0.2724	165.00	1.2787	135.985	0.2712
165.00	0.98172	135.488	0.2757	165.00	1.12919	136.286	0.2742	170.00	1.2664	137.095	0.2730
170.00	0.97272	136.584	0.2775	170.00	1.11862	137.392	0.2760	175.00	1.2544	138.211	0.2748
175.00	0.96390	137.685	0.2792	175.00	1.10826	138.503	0.2777	180.00	1.2427	139.332	0.2765
180.00	0.95526	138.792	0.2810	180.00	1.09811	139.619	0.2795	185.00	1.2312	140.457	0.2783
185.00	0.94678	139.904	0.2827	185.00	1.08818	140.740	0.2812				

Standard state : At -40°F, Liquid Enthalpy=0.0 Btu/lb, Liquid Entropy=0.0 Btu/lb.F  
Version 2a 1st September 1993

# KLEA® 407A

## Saturated Liquid and Saturated Vapor Properties Table 2 Sheet 6

70.0 psia  
Dew Point = 30.5°F

80.0 psia  
Dew Point = 37.09°F

90.0 psia  
Dew Point = 43.49°F

Temp °F	Density lb/ft <sup>3</sup>	Enthalpy btu/lb	Entropy btu/lb.R	Temp °F	Density lb/ft <sup>3</sup>	Enthalpy btu/lb	Entropy btu/lb.R	Temp °F	Density lb/ft <sup>3</sup>	Enthalpy btu/lb	Entropy btu/lb.R
190.00	0.93848	142.140	0.2862	190.00	1.07844	141.865	0.2829	190.00	1.22000	141.59	0.2800
195.00	0.93033	143.266	0.2879	195.00	1.06890	142.994	0.2847	195.00	1.20899	142.72	0.2818
200.00	0.92233	144.395	0.2896	200.00	1.05954	144.128	0.2864	200.00	1.19821	143.86	0.2835
205.00	0.91449	145.530	0.2914	205.00	1.05036	145.266	0.2881	205.00	1.18764	145.00	0.2852
210.00	0.90679	146.669	0.2931	210.00	1.04136	146.409	0.2898	210.00	1.17728	146.15	0.2869
215.00	0.89923	147.812	0.2948	215.00	1.03253	147.557	0.2915	215.00	1.16712	147.30	0.2887
220.00	0.89181	148.962	0.2965	220.00	1.02386	148.710	0.2932	220.00	1.15716	148.46	0.2904
225.00	0.88452	150.116	0.2982	225.00	1.01536	149.868	0.2949	225.00	1.14739	149.62	0.2921
230.00	0.87736	151.274	0.2998	230.00	1.00701	151.030	0.2966	230.00	1.13780	150.79	0.2938
235.00	0.87033	152.437	0.3015	235.00	0.99881	152.197	0.2983	235.00	1.12839	151.96	0.2955
240.00	0.86342	153.605	0.3032	240.00	0.99076	153.368	0.3000	240.00	1.11915	153.13	0.2971
245.00	0.85663	154.777	0.3049	245.00	0.98285	154.544	0.3017	245.00	1.11008	154.31	0.2988
250.00	0.84996	155.953	0.3065	250.00	0.97508	155.723	0.3033	250.00	1.10117	155.49	0.3005
255.00	0.84340	157.134	0.3082	255.00	0.96745	156.908	0.3050	255.00	1.09243	156.68	0.3022
260.00	0.83694	158.319	0.3098	260.00	0.95994	158.096	0.3067	260.00	1.08383	157.87	0.3038
265.00	0.83060	159.508	0.3115	265.00	0.95256	159.289	0.3083	265.00	1.07539	159.07	0.3055
270.00	0.82436	160.702	0.3131	270.00	0.94531	160.486	0.3100	270.00	1.06708	160.27	0.3071
275.00	0.81821	161.901	0.3148	275.00	0.93817	161.688	0.3116	275.00	1.05892	161.47	0.3088
280.00	0.81217	163.103	0.3164	280.00	0.93115	162.893	0.3132	280.00	1.05090	162.68	0.3104
285.00	0.80622	164.310	0.3180	285.00	0.92425	164.104	0.3149	285.00	1.04301	163.90	0.3121
290.00	0.80037	165.522	0.3196	290.00	0.91746	165.318	0.3165	290.00	1.03525	165.11	0.3137
295.00	0.79461	166.738	0.3213	295.00	0.91077	166.537	0.3181	295.00	1.02762	166.34	0.3153
300.00	0.78893	167.958	0.3229	300.00	0.90419	167.760	0.3197	300.00	1.02010	167.56	0.3169
305.00	0.78335	169.182	0.3245	305.00	0.89771	168.987	0.3213	305.00	1.01271	168.79	0.3185
310.00	0.77784	170.411	0.3261	310.00	0.89134	170.219	0.3229	310.00	1.00544	170.03	0.3202

Standard state : At -40°F, Liquid Enthalpy=0.0 Btu/lb, Liquid Entropy=0.0 Btu/lb.F  
Version 2a 1st September 1993

# KLEA<sup>®</sup> 407A

## Saturated Liquid and Saturated Vapor Properties Table 2 Sheet 7

100.0 psia  
Dew Point = 49.36°F

130.0 psia  
Dew Point = 64.64°F

160.0 psia  
Dew Point = 77.41°F

Temp °F	Density lb/ft <sup>3</sup>	Enthalpy btu/lb	Entropy btu/lb.R	Temp °F	Density lb/ft <sup>3</sup>	Enthalpy btu/lb	Entropy btu/lb.R	Temp °F	Density lb/ft <sup>3</sup>	Enthalpy btu/lb	Entropy btu/lb.R
50.00	1.87994	111.128	0.2252								
55.00	1.85294	112.159	0.2272								
60.00	1.82691	113.192	0.2292								
65.00	1.80179	114.228	0.2312	65.00	2.44937	112.818	0.2235				
70.00	1.77752	115.267	0.2331	70.00	2.41162	113.892	0.2255				
75.00	1.75406	116.309	0.2351	75.00	2.37539	114.968	0.2275				
80.00	1.73135	117.354	0.2371	80.00	2.34058	116.045	0.2295	80.00	3.01042	114.620	0.2230
85.00	1.70935	118.402	0.2390	85.00	2.30708	117.123	0.2315	85.00	2.96110	115.738	0.2251
90.00	1.68803	119.453	0.2409	90.00	2.27482	118.203	0.2335	90.00	2.91399	116.855	0.2271
95.00	1.66735	120.508	0.2428	95.00	2.24370	119.286	0.2354	95.00	2.86891	117.972	0.2291
100.00	1.64728	121.567	0.2447	100.00	2.21367	120.370	0.2374	100.00	2.82570	119.090	0.2311
105.00	1.62778	122.629	0.2466	105.00	2.18464	121.457	0.2393	105.00	2.78422	120.208	0.2331
110.00	1.60884	123.695	0.2485	110.00	2.15657	122.547	0.2413	110.00	2.74435	121.327	0.2351
115.00	1.59041	124.764	0.2504	115.00	2.12939	123.640	0.2432	115.00	2.70598	122.448	0.2371
120.00	1.57248	125.837	0.2522	120.00	2.10306	124.735	0.2451	120.00	2.66900	123.569	0.2390
125.00	1.55502	126.914	0.2541	125.00	2.07753	125.833	0.2469	125.00	2.63332	124.693	0.2409
130.00	1.53802	127.995	0.2559	130.00	2.05277	126.935	0.2488	130.00	2.59887	125.819	0.2429
135.00	1.52145	129.080	0.2577	135.00	2.02872	128.039	0.2507	135.00	2.56557	126.946	0.2448
140.00	1.50529	130.169	0.2596	140.00	2.00535	129.147	0.2525	140.00	2.53336	128.076	0.2467
145.00	1.48953	131.262	0.2614	145.00	1.98264	130.258	0.2544	145.00	2.50216	129.209	0.2485
150.00	1.47415	132.359	0.2632	150.00	1.96054	131.373	0.2562	150.00	2.47193	130.344	0.2504
155.00	1.45914	133.462	0.2650	155.00	1.93904	132.493	0.2581	155.00	2.44261	131.484	0.2523
160.00	1.44447	134.569	0.2668	160.00	1.91810	133.617	0.2599	160.00	2.41416	132.628	0.2541
165.00	1.43015	135.680	0.2686	165.00	1.89770	134.745	0.2617	165.00	2.38653	133.774	0.2560
170.00	1.41615	136.796	0.2703	170.00	1.87782	135.876	0.2635	170.00	2.35969	134.923	0.2578
175.00	1.40247	137.916	0.2721	175.00	1.85843	137.012	0.2653	175.00	2.33359	136.077	0.2596
180.00	1.38909	139.042	0.2739	180.00	1.83952	138.154	0.2671	180.00	2.30820	137.236	0.2614
185.00	1.37600	140.172	0.2756	185.00	1.82107	139.299	0.2689	185.00	2.28350	138.398	0.2632
190.00	1.36319	141.306	0.2774	190.00	1.80306	140.447	0.2706	190.00	2.25944	139.563	0.2650
195.00	1.35065	142.444	0.2791	195.00	1.78546	141.600	0.2724	195.00	2.23600	140.732	0.2668

Standard state : At -40°F, Liquid Enthalpy=0.0 Btu/lb, Liquid Entropy=0.0 Btu/lb.F  
Version 2a 1st September 1993

# KLEA® 407A

## Saturated Liquid and Saturated Vapor Properties Table 2 Sheet 8

100.0 psia  
Dew Point = 49.36°F

130.0 psia  
Dew Point = 64.64°F

160.0 psia  
Dew Point = 77.41°F

Temp °F	Density lb/ft <sup>3</sup>	Enthalpy btu/lb	Entropy btu/lb.R	Temp °F	Density lb/ft <sup>3</sup>	Enthalpy btu/lb	Entropy btu/lb.R	Temp °F	Density lb/ft <sup>3</sup>	Enthalpy btu/lb	Entropy btu/lb.R
200.00	1.33838	143.587	0.2809	200.00	1.76827	142.756	0.2742	200.00	2.21316	141.903	0.2686
205.00	1.32635	144.733	0.2826	205.00	1.75147	143.917	0.2759	205.00	2.19088	143.078	0.2704
210.00	1.31457	145.884	0.2843	210.00	1.73504	145.080	0.2777	210.00	2.16914	144.257	0.2722
215.00	1.30303	147.040	0.2861	215.00	1.71897	146.249	0.2794	215.00	2.14792	145.440	0.2739
220.00	1.29171	148.201	0.2878	220.00	1.70325	147.424	0.2811	220.00	2.12720	146.629	0.2757
225.00	1.28062	149.368	0.2895	225.00	1.68786	148.603	0.2829	225.00	2.10697	147.822	0.2774
230.00	1.26975	150.538	0.2912	230.00	1.67280	149.786	0.2846	230.00	2.08720	149.019	0.2792
235.00	1.25908	151.712	0.2929	235.00	1.65805	150.973	0.2863	235.00	2.06787	150.219	0.2809
240.00	1.24861	152.891	0.2946	240.00	1.64361	152.164	0.2880	240.00	2.04897	151.422	0.2826
245.00	1.23834	154.074	0.2963	245.00	1.62945	153.358	0.2897	245.00	2.03049	152.629	0.2843
250.00	1.22825	155.261	0.2979	250.00	1.61558	154.557	0.2914	250.00	2.01240	153.840	0.2861
255.00	1.21835	156.452	0.2996	255.00	1.60198	155.759	0.2931	255.00	1.99469	155.054	0.2878
260.00	1.20863	157.647	0.3013	260.00	1.58864	156.965	0.2948	260.00	1.97735	156.272	0.2895
265.00	1.19908	158.847	0.3029	265.00	1.57556	158.176	0.2964	265.00	1.96037	157.494	0.2912
270.00	1.18970	160.051	0.3046	270.00	1.56272	159.390	0.2981	270.00	1.94373	158.719	0.2928
275.00	1.18049	161.259	0.3062	275.00	1.55012	160.608	0.2998	275.00	1.92742	159.948	0.2945
280.00	1.17143	162.471	0.3079	280.00	1.53776	161.830	0.3014	280.00	1.91144	161.181	0.2962
285.00	1.16252	163.687	0.3095	285.00	1.52561	163.056	0.3031	285.00	1.89576	162.417	0.2979
290.00	1.15376	164.908	0.3112	290.00	1.51369	164.286	0.3047	290.00	1.88038	163.657	0.2995
295.00	1.14515	166.133	0.3128	295.00	1.50198	165.520	0.3064	295.00	1.86529	164.901	0.3012
300.00	1.13668	167.362	0.3144	300.00	1.49047	166.759	0.3080	300.00	1.85048	166.149	0.3028
305.00	1.12835	168.595	0.3160	305.00	1.47916	168.001	0.3096	305.00	1.83595	167.400	0.3045
310.00	1.12015	169.832	0.3176	310.00	1.46805	169.247	0.3113	310.00	1.82168	168.655	0.3061
315.00	1.11209	171.073	0.3192	315.00	1.45712	170.497	0.3129	315.00	1.80766	169.914	0.3077
320.00	1.10415	172.319	0.3208	320.00	1.44637	171.751	0.3145	320.00	1.79389	171.177	0.3094
325.00	1.09633	173.569	0.3224	325.00	1.43581	173.009	0.3161	325.00	1.78036	172.444	0.3110

Standard state : At -40°F, Liquid Enthalpy=0.0 Btu/lb, Liquid Entropy=0.0 Btu/lb.F  
Version 2a 1st September 1993

# KLEA<sup>®</sup> 407A

## Saturated Liquid and Saturated Vapor Properties Table 2 Sheet 9

190.0 psia  
Dew Point = 88.46°F

220.0 psia  
Dew Point = 98.23°F

250.0 psia  
Dew Point = 107.02°F

Temp °F	Density lb/ft <sup>3</sup>	Enthalpy btu/lb	Entropy btu/lb.R	Temp °F	Density lb/ft <sup>3</sup>	Enthalpy btu/lb	Entropy btu/lb.R	Temp °F	Density lb/ft <sup>3</sup>	Enthalpy btu/lb	Entropy btu/lb.R
90.00	3.62046	115.380	0.2213								
95.00	3.55598	116.544	0.2234								
100.00	3.49478	117.704	0.2255	100.00	4.23789	116.182	0.2202				
105.00	3.43654	118.862	0.2276	105.00	4.15618	117.393	0.2224				
110.00	3.38102	120.018	0.2296	110.00	4.07913	118.599	0.2245	110.00	4.85771	117.034	0.2196
115.00	3.32797	121.174	0.2316	115.00	4.00627	119.799	0.2266	115.00	4.75688	118.295	0.2218
120.00	3.27720	122.329	0.2336	120.00	3.93717	120.996	0.2287	120.00	4.66247	119.547	0.2239
125.00	3.22854	123.483	0.2356	125.00	3.87147	122.190	0.2307	125.00	4.57372	120.792	0.2261
130.00	3.18182	124.638	0.2376	130.00	3.80888	123.381	0.2327	130.00	4.49001	122.029	0.2282
135.00	3.13691	125.794	0.2395	135.00	3.74913	124.571	0.2348	135.00	4.41082	123.262	0.2303
140.00	3.09369	126.950	0.2415	140.00	3.69198	125.759	0.2367	140.00	4.33569	124.490	0.2323
145.00	3.05203	128.108	0.2434	145.00	3.63723	126.947	0.2387	145.00	4.26425	125.715	0.2343
150.00	3.01183	129.267	0.2453	150.00	3.58469	128.134	0.2407	150.00	4.19616	126.937	0.2364
155.00	2.97302	130.430	0.2472	155.00	3.53421	129.325	0.2426	155.00	4.13115	128.160	0.2384
160.00	2.93551	131.596	0.2491	160.00	3.48566	130.517	0.2446	160.00	4.06897	129.384	0.2403
165.00	2.89922	132.764	0.2510	165.00	3.43890	131.710	0.2465	165.00	4.00941	130.606	0.2423
170.00	2.86409	133.934	0.2528	170.00	3.39381	132.904	0.2484	170.00	3.95226	131.828	0.2443
175.00	2.83004	135.108	0.2547	175.00	3.35029	134.101	0.2503	175.00	3.89736	133.051	0.2462
180.00	2.79703	136.287	0.2565	180.00	3.30825	135.302	0.2522	180.00	3.84454	134.278	0.2481
185.00	2.76500	137.468	0.2584	185.00	3.26760	136.504	0.2540	185.00	3.79368	135.504	0.2500
190.00	2.73391	138.651	0.2602	190.00	3.22827	137.708	0.2559	190.00	3.74465	136.731	0.2519
195.00	2.70369	139.837	0.2620	195.00	3.19017	138.914	0.2577	195.00	3.69732	137.959	0.2538
200.00	2.67432	141.026	0.2638	200.00	3.15324	140.121	0.2596	200.00	3.65159	139.188	0.2557
205.00	2.64575	142.217	0.2656	205.00	3.11741	141.331	0.2614	205.00	3.60737	140.417	0.2575
210.00	2.61793	143.411	0.2674	210.00	3.08262	142.542	0.2632	210.00	3.56457	141.648	0.2594
215.00	2.59085	144.610	0.2692	215.00	3.04883	143.758	0.2650	215.00	3.52310	142.882	0.2612
220.00	2.56446	145.815	0.2710	220.00	3.01599	144.980	0.2668	220.00	3.48291	144.123	0.2630
225.00	2.53874	147.023	0.2728	225.00	2.98406	146.205	0.2686	225.00	3.44392	145.366	0.2649
230.00	2.51366	148.234	0.2745	230.00	2.95299	147.432	0.2704	230.00	3.40608	146.610	0.2667
235.00	2.48919	149.448	0.2763	235.00	2.92274	148.661	0.2722	235.00	3.36933	147.857	0.2685

Standard state : At -40°F, Liquid Enthalpy=0.0 Btu/lb, Liquid Entropy=0.0 Btu/lb.F  
Version 2a 1st September 1993

# KLEA® 407A

## Saturated Liquid and Saturated Vapor Properties Table 2 Sheet 10

190.0 psia  
Dew Point = 88.46°F

220.0 psia  
Dew Point = 98.23°F

250.0 psia  
Dew Point = 107.02°F

Temp °F	Density lb/ft <sup>3</sup>	Enthalpy btu/lb	Entropy btu/lb.R	Temp °F	Density lb/ft <sup>3</sup>	Enthalpy btu/lb	Entropy btu/lb.R	Temp °F	Density lb/ft <sup>3</sup>	Enthalpy btu/lb	Entropy btu/lb.R
240.00	2.46531	150.666	0.2780	240.00	2.89328	149.894	0.2739	240.00	3.33360	149.105	0.2703
245.00	2.44199	151.886	0.2798	245.00	2.86457	151.129	0.2757	245.00	3.29886	150.356	0.2720
250.00	2.41921	153.110	0.2815	250.00	2.83657	152.366	0.2775	250.00	3.26504	151.608	0.2738
255.00	2.39695	154.337	0.2832	255.00	2.80925	153.607	0.2792	255.00	3.23212	152.863	0.2756
260.00	2.37519	155.567	0.2849	260.00	2.78259	154.850	0.2809	260.00	3.20004	154.121	0.2773
265.00	2.35390	156.801	0.2866	265.00	2.75656	156.097	0.2827	265.00	3.16877	155.381	0.2791
270.00	2.33308	158.038	0.2883	270.00	2.73114	157.346	0.2844	270.00	3.13828	156.643	0.2808
275.00	2.31270	159.278	0.2900	275.00	2.70629	158.598	0.2861	275.00	3.10853	157.908	0.2825
280.00	2.29275	160.522	0.2917	280.00	2.68199	159.854	0.2878	280.00	3.07949	159.176	0.2843
285.00	2.27321	161.769	0.2934	285.00	2.65824	161.112	0.2895	285.00	3.05112	160.447	0.2860
290.00	2.25406	163.020	0.2951	290.00	2.63499	162.374	0.2912	290.00	3.02341	161.720	0.2877
295.00	2.23531	164.274	0.2967	295.00	2.61224	163.639	0.2929	295.00	2.99633	162.997	0.2894
300.00	2.21692	165.532	0.2984	300.00	2.58997	164.908	0.2945	300.00	2.96985	164.276	0.2911
305.00	2.19889	166.793	0.3001	305.00	2.56816	166.179	0.2962	305.00	2.94394	165.558	0.2928
310.00	2.18120	168.058	0.3017	310.00	2.54679	167.454	0.2979	310.00	2.91859	166.844	0.2944
315.00	2.16386	169.326	0.3033	315.00	2.52585	168.732	0.2995	315.00	2.89378	168.132	0.2961
320.00	2.14683	170.598	0.3050	320.00	2.50532	170.014	0.3012	320.00	2.86949	169.423	0.2978
325.00	2.13012	171.874	0.3066	325.00	2.48519	171.298	0.3028	325.00	2.84569	170.718	0.2994
330.00	2.11372	173.153	0.3082	330.00	2.46545	172.587	0.3044	330.00	2.82238	172.016	0.3011
335.00	2.09761	174.436	0.3099	335.00	2.44608	173.878	0.3061	335.00	2.79953	173.317	0.3027
340.00	2.08178	175.722	0.3115	340.00	2.42708	175.173	0.3077	340.00	2.77712	174.621	0.3043
345.00	2.06623	177.012	0.3131	345.00	2.40842	176.472	0.3093	345.00	2.75515	175.928	0.3060
350.00	2.05096	178.306	0.3147	350.00	2.39010	177.774	0.3109	350.00	2.73360	177.239	0.3076
355.00	2.03594	179.603	0.3163	355.00	2.37212	179.080	0.3125	355.00	2.71245	178.552	0.3092
360.00	2.02118	180.904	0.3179	360.00	2.35445	180.388	0.3141	360.00	2.69170	179.870	0.3108
365.00	2.00666	182.209	0.3195	365.00	2.33709	181.701	0.3157	365.00	2.67133	181.190	0.3124

Standard state : At -40°F, Liquid Enthalpy=0.0 Btu/lb, Liquid Entropy=0.0 Btu/lb.F  
Version 2a 1st September 1993

# KLEA® 407A

## Saturated Liquid and Saturated Vapor Properties Table 2 Sheet 11

280.0 psia  
Dew Point = 115.03°F

310.0 psia  
Dew Point = 122.39°F

340.0 psia  
Dew Point = 129.20°F

Temp °F	Density lb/ft <sup>3</sup>	Enthalpy btu/lb	Entropy btu/lb.R	Temp °F	Density lb/ft <sup>3</sup>	Enthalpy btu/lb	Entropy btu/lb.R	Temp °F	Density lb/ft <sup>3</sup>	Enthalpy btu/lb	Entropy btu/lb.R
120.00	5.47381	117.947	0.2193	125.00	6.23475	117.546	0.2170				
125.00	5.35241	119.259	0.2215	130.00	6.07921	118.932	0.2193	130.00	7.04549	117.087	0.2147
130.00	5.23951	120.559	0.2237	135.00	5.93645	120.296	0.2216	135.00	6.84627	118.562	0.2172
135.00	5.13401	121.847	0.2259	140.00	5.80453	121.643	0.2239	140.00	6.66641	120.003	0.2196
140.00	5.03501	123.126	0.2281	145.00	5.68193	122.974	0.2261	145.00	6.50241	121.416	0.2220
145.00	4.94178	124.397	0.2302	150.00	5.56742	124.293	0.2283	150.00	6.35170	122.807	0.2243
150.00	4.85370	125.662	0.2323	155.00	5.46004	125.607	0.2304	155.00	6.21230	124.186	0.2265
155.00	4.77025	126.926	0.2343	160.00	5.35900	126.915	0.2325	160.00	6.08268	125.552	0.2288
160.00	4.69101	128.187	0.2364	165.00	5.26360	128.214	0.2346	165.00	5.96158	126.904	0.2309
165.00	4.61559	129.444	0.2384	170.00	5.17327	129.507	0.2367	170.00	5.84796	128.245	0.2331
170.00	4.54365	130.698	0.2404	175.00	5.08753	130.799	0.2387	175.00	5.74098	129.580	0.2352
175.00	4.47491	131.953	0.2424	180.00	5.00597	132.089	0.2407	180.00	5.63997	130.912	0.2373
180.00	4.40913	133.209	0.2443	185.00	4.92822	133.377	0.2427	185.00	5.54431	132.237	0.2393
185.00	4.34608	134.463	0.2463	190.00	4.85396	134.660	0.2447	190.00	5.45350	133.557	0.2414
190.00	4.28555	135.717	0.2482	195.00	4.78291	135.942	0.2467	195.00	5.36708	134.871	0.2434
195.00	4.22736	136.970	0.2501	200.00	4.71482	137.221	0.2486	200.00	5.28467	136.181	0.2454
200.00	4.17136	138.222	0.2521	205.00	4.64946	138.499	0.2506	205.00	5.20594	137.487	0.2474
205.00	4.11739	139.474	0.2539	210.00	4.58664	139.775	0.2525	210.00	5.13058	138.791	0.2493
210.00	4.06531	140.727	0.2558	215.00	4.52617	141.053	0.2544	215.00	5.05833	140.095	0.2512
215.00	4.01503	141.982	0.2577	220.00	4.46793	142.338	0.2563	220.00	4.98899	141.405	0.2532
220.00	3.96643	143.243	0.2596	225.00	4.41177	143.622	0.2582	225.00	4.92235	142.712	0.2551
225.00	3.91942	144.506	0.2614	230.00	4.35756	144.906	0.2600	230.00	4.85823	144.019	0.2570
230.00	3.87391	145.769	0.2632	235.00	4.30517	146.190	0.2619	235.00	4.79646	145.325	0.2589
235.00	3.82981	147.033	0.2651	240.00	4.25450	147.474	0.2637	240.00	4.73688	146.630	0.2608
240.00	3.78706	148.299	0.2669	245.00	4.20545	148.760	0.2656	245.00	4.67934	147.935	0.2626
245.00	3.74556	149.566	0.2687	250.00	4.15792	150.046	0.2674	250.00	4.62374	149.240	0.2645
250.00	3.70527	150.835	0.2705	255.00	4.11184	151.333	0.2692	255.00	4.56995	150.545	0.2663
255.00	3.66611	152.106	0.2723	260.00	4.06712	152.622	0.2710	260.00	4.51786	151.851	0.2681
260.00	3.62804	153.378	0.2740	265.00	4.02369	153.911	0.2728	265.00	4.46739	153.157	0.2699
265.00	3.59099	154.652	0.2758								

Standard state : At -40°F, Liquid Enthalpy=0.0 Btu/lb, Liquid Entropy=0.0 Btu/lb.F  
Version 2a 1st September 1993



# KLEA® 407A

## Saturated Liquid and Saturated Vapor Properties Table 2 Sheet 12

280.0 psia  
Dew Point = 115.03°F

310.0 psia  
Dew Point = 122.39°F

340.0 psia  
Dew Point = 129.20°F

Temp °F	Density lb/ft <sup>3</sup>	Enthalpy btu/lb	Entropy btu/lb.R	Temp °F	Density lb/ft <sup>3</sup>	Enthalpy btu/lb	Entropy btu/lb.R	Temp °F	Density lb/ft <sup>3</sup>	Enthalpy btu/lb	Entropy btu/lb.R
270.00	3.55492	155.929	0.2776	270.00	3.98149	155.203	0.2745	270.00	4.41843	154.465	0.2717
275.00	3.51979	157.208	0.2793	275.00	3.94045	156.496	0.2763	275.00	4.37092	155.773	0.2735
280.00	3.48555	158.489	0.2810	280.00	3.90053	157.791	0.2781	280.00	4.32477	157.083	0.2753
285.00	3.45216	159.772	0.2828	285.00	3.86165	159.088	0.2798	285.00	4.27992	158.394	0.2770
290.00	3.41959	161.058	0.2845	290.00	3.82379	160.386	0.2816	290.00	4.23630	159.706	0.2788
295.00	3.38780	162.346	0.2862	295.00	3.78689	161.687	0.2833	295.00	4.19385	161.020	0.2806
300.00	3.35675	163.637	0.2879	300.00	3.75090	162.990	0.2850	300.00	4.15252	162.336	0.2823
305.00	3.32642	164.931	0.2896	305.00	3.71580	164.296	0.2867	305.00	4.11225	163.654	0.2840
310.00	3.29679	166.227	0.2913	310.00	3.68153	165.603	0.2884	310.00	4.07300	164.973	0.2857
315.00	3.26781	167.526	0.2930	315.00	3.64807	166.914	0.2901	315.00	4.03472	166.295	0.2875
320.00	3.23947	168.828	0.2947	320.00	3.61539	168.226	0.2918	320.00	3.99738	167.619	0.2892
325.00	3.21174	170.132	0.2963	325.00	3.58344	169.541	0.2935	325.00	3.96092	168.945	0.2909
330.00	3.18460	171.440	0.2980	330.00	3.55221	170.859	0.2952	330.00	3.92531	170.273	0.2925
335.00	3.15802	172.750	0.2996	335.00	3.52166	172.179	0.2968	335.00	3.89053	171.604	0.2942
340.00	3.13200	174.064	0.3013	340.00	3.49177	173.502	0.2985	340.00	3.85653	172.937	0.2959
345.00	3.10650	175.380	0.3029	345.00	3.46252	174.828	0.3001	345.00	3.82328	174.273	0.2976
350.00	3.08151	176.700	0.3046	350.00	3.43387	176.157	0.3018	350.00	3.79076	175.611	0.2992
355.00	3.05701	178.022	0.3062	355.00	3.40582	177.488	0.3034	355.00	3.75894	176.952	0.3009
360.00	3.03298	179.348	0.3078	360.00	3.37833	178.823	0.3051	360.00	3.72778	178.295	0.3025
365.00	3.00942	180.676	0.3094	365.00	3.35139	180.160	0.3067	365.00	3.69728	179.641	0.3041
370.00	2.98630	182.008	0.3110	370.00	3.32498	181.500	0.3083	370.00	3.66740	180.990	0.3058
375.00	2.96360	183.343	0.3126	375.00	3.29908	182.843	0.3099	375.00	3.63812	182.341	0.3074
380.00	2.94133	184.682	0.3142	380.00	3.27368	184.190	0.3115	380.00	3.60942	183.695	0.3090
385.00	2.91946	186.023	0.3158	385.00	3.24875	185.539	0.3131	385.00	3.58129	185.052	0.3106
390.00	2.89797	187.368	0.3174	390.00	3.22429	186.891	0.3147	390.00	3.55369	186.412	0.3122
395.00	2.87687	188.716	0.3190	395.00	3.20027	188.246	0.3163	395.00	3.52662	187.775	0.3138

Standard state : At -40°F, Liquid Enthalpy=0.0 Btu/lb, Liquid Entropy=0.0 Btu/lb.F  
Version 2a 1st September 1993

# KLEA<sup>®</sup> 407A

## Saturated Liquid and Saturated Vapor Properties Table 2 Sheet 13

370.0 psia  
Dew Point = 135.55°F

400.0 psia  
Dew Point = 141.5°F

430.0 psia  
Dew Point = 147.1°F

Temp °F	Density lb/ft <sup>3</sup>	Enthalpy btu/lb	Entropy btu/lb.R	Temp °F	Density lb/ft <sup>3</sup>	Enthalpy btu/lb	Entropy btu/lb.R	Temp °F	Density lb/ft <sup>3</sup>	Enthalpy btu/lb	Entropy btu/lb.R
140.00	7.65730	118.145	0.2153	145.00	8.51611	117.678	0.2133	150.00	9.42631	117.158	0.2115
145.00	7.43105	119.677	0.2178	150.00	8.23158	119.321	0.2160	155.00	9.06838	118.943	0.2144
150.00	7.22809	121.169	0.2203	155.00	7.98137	120.911	0.2186	160.00	8.76117	120.642	0.2171
155.00	7.04403	122.635	0.2226	160.00	7.75797	122.456	0.2211	165.00	8.49169	122.275	0.2198
160.00	6.87567	124.076	0.2250	165.00	7.55613	123.965	0.2236	170.00	8.25151	123.857	0.2223
165.00	6.72055	125.495	0.2273	170.00	7.37202	125.443	0.2259	175.00	8.03482	125.403	0.2247
170.00	6.57674	126.896	0.2295	175.00	7.20278	126.900	0.2282	180.00	7.83747	126.924	0.2271
175.00	6.44274	128.286	0.2317	180.00	7.04626	128.344	0.2305	185.00	7.65633	128.417	0.2294
180.00	6.31736	129.668	0.2339	185.00	6.90072	129.769	0.2327	190.00	7.48896	129.888	0.2317
185.00	6.19959	131.038	0.2360	190.00	6.76474	131.179	0.2349	195.00	7.33344	131.340	0.2339
190.00	6.08859	132.399	0.2381	195.00	6.63718	132.577	0.2370	200.00	7.18823	132.775	0.2361
195.00	5.98364	133.751	0.2402	200.00	6.51709	133.964	0.2391	205.00	7.05209	134.197	0.2383
200.00	5.88414	135.097	0.2422	205.00	6.40366	135.342	0.2412	210.00	6.92398	135.608	0.2404
205.00	5.78958	136.437	0.2442	210.00	6.29622	136.711	0.2433	215.00	6.80304	137.011	0.2425
210.00	5.69951	137.771	0.2462	215.00	6.19420	138.077	0.2453	220.00	6.68859	138.416	0.2445
215.00	5.61355	139.104	0.2482	220.00	6.09713	139.447	0.2473	225.00	6.58001	139.813	0.2466
220.00	5.53138	140.442	0.2502	225.00	6.00461	140.810	0.2493	230.00	6.47676	141.203	0.2486
225.00	5.45272	141.776	0.2522	230.00	5.91624	142.170	0.2513	235.00	6.37837	142.587	0.2506
230.00	5.37729	143.108	0.2541	235.00	5.83168	143.525	0.2533	240.00	6.28442	143.966	0.2526
235.00	5.30486	144.437	0.2560	240.00	5.75064	144.877	0.2552	245.00	6.19455	145.341	0.2545
240.00	5.23521	145.765	0.2579	245.00	5.67287	146.227	0.2571	250.00	6.10844	146.712	0.2565
245.00	5.16816	147.091	0.2598	250.00	5.59811	147.574	0.2590	255.00	6.02581	148.081	0.2584
250.00	5.10352	148.416	0.2617	255.00	5.52616	148.920	0.2609	260.00	5.94641	149.446	0.2603
255.00	5.04114	149.741	0.2635	260.00	5.45683	150.264	0.2628	265.00	5.87000	150.810	0.2622
260.00	4.98088	151.065	0.2654	265.00	5.38996	151.607	0.2647	270.00	5.79640	152.171	0.2641
265.00	4.92262	152.389	0.2672	270.00	5.32537	152.949	0.2665	275.00	5.72541	153.532	0.2659
270.00	4.86623	153.714	0.2691	275.00	5.26295	154.291	0.2683	280.00	5.65686	154.891	0.2678
275.00	4.81160	155.038	0.2709	280.00	5.20255	155.633	0.2702	285.00	5.59061	156.250	0.2696
280.00	4.75865	156.363	0.2727	285.00	5.14406	156.975	0.2720				
285.00	4.70727	157.689	0.2744								

Standard state : At -40°F, Liquid Enthalpy=0.0 Btu/lb, Liquid Entropy=0.0 Btu/lb.F  
Version 2a 1st September 1993

# KLEA® 407A

## Saturated Liquid and Saturated Vapor Properties Table 2 Sheet 14

370.0 psia  
Dew Point = 135.55°F

400.0 psia  
Dew Point = 141.5°F

430.0 psia  
Dew Point = 147.1°F

Temp °F	Density lb/ft <sup>3</sup>	Enthalpy btu/lb	Entropy btu/lb.R	Temp °F	Density lb/ft <sup>3</sup>	Enthalpy btu/lb	Entropy btu/lb.R	Temp °F	Density lb/ft <sup>3</sup>	Enthalpy btu/lb	Entropy btu/lb.R
290.00	4.65739	159.016	0.2762	290.00	5.08737	158.317	0.2738	290.00	5.52653	157.608	0.2714
295.00	4.60893	160.344	0.2780	295.00	5.03239	159.660	0.2756	295.00	5.46447	158.967	0.2732
300.00	4.56181	161.674	0.2797	300.00	4.97901	161.003	0.2773	300.00	5.40434	160.325	0.2750
305.00	4.51598	163.004	0.2815	305.00	4.92717	162.348	0.2791	305.00	5.34602	161.683	0.2768
310.00	4.47136	164.337	0.2832	310.00	4.87678	163.693	0.2808	310.00	5.28942	163.042	0.2786
315.00	4.42791	165.670	0.2850	315.00	4.82777	165.039	0.2826	315.00	5.23445	164.402	0.2803
320.00	4.38556	167.006	0.2867	320.00	4.78007	166.387	0.2843	320.00	5.18102	165.763	0.2821
325.00	4.34428	168.343	0.2884	325.00	4.73362	167.737	0.2860	325.00	5.12906	167.124	0.2838
330.00	4.30400	169.683	0.2901	330.00	4.68837	169.087	0.2878	330.00	5.07850	168.487	0.2856
335.00	4.26470	171.024	0.2918	335.00	4.64425	170.440	0.2895	335.00	5.02927	169.851	0.2873
340.00	4.22632	172.368	0.2935	340.00	4.60123	171.794	0.2912	340.00	4.98130	171.216	0.2890
345.00	4.18884	173.713	0.2951	345.00	4.55925	173.150	0.2929	345.00	4.93455	172.583	0.2907
350.00	4.15221	175.061	0.2968	350.00	4.51826	174.508	0.2945	350.00	4.88896	173.952	0.2924
355.00	4.11639	176.411	0.2985	355.00	4.47823	175.868	0.2962	355.00	4.84447	175.322	0.2941
360.00	4.08137	177.764	0.3001	360.00	4.43912	177.230	0.2979	360.00	4.80104	176.694	0.2958
365.00	4.04710	179.119	0.3018	365.00	4.40088	178.594	0.2995	365.00	4.75863	178.067	0.2974
370.00	4.01357	180.476	0.3034	370.00	4.36350	179.961	0.3012	370.00	4.71719	179.443	0.2991
375.00	3.98073	181.836	0.3050	375.00	4.32692	181.330	0.3028	375.00	4.67669	180.821	0.3008
380.00	3.94857	183.199	0.3067	380.00	4.29113	182.701	0.3045	380.00	4.63709	182.201	0.3024
385.00	3.91707	184.564	0.3083	385.00	4.25609	184.074	0.3061	385.00	4.59835	183.583	0.3040
390.00	3.88619	185.932	0.3099	390.00	4.22178	185.451	0.3077	390.00	4.56044	184.967	0.3057
395.00	3.85592	187.303	0.3115	395.00	4.18816	186.829	0.3093	395.00	4.52333	186.354	0.3073
400.00	3.82624	188.676	0.3131	400.00	4.15522	188.210	0.3110	400.00	4.48699	187.743	0.3089
405.00	3.79713	190.052	0.3147	405.00	4.12294	189.594	0.3126	405.00	4.45139	189.134	0.3105
410.00	3.76856	191.431	0.3163	410.00	4.09128	190.980	0.3142	410.00	4.41651	190.528	0.3121
415.00	3.74053	192.813	0.3179	415.00	4.06023	192.369	0.3158	415.00	4.38232	191.924	0.3137

Standard state : At -40°F, Liquid Enthalpy=0.0 Btu/lb, Liquid Entropy=0.0 Btu/lb.F  
Version 2a 1st September 1993

## TABLE 3

### TABLE OF EVAPORATOR INLET TEMPERATURES

- (1) Read the enthalpy value at the expansion valve along top of the table.
- (2) Read down the table for the evaporator operating pressure.
- (3) The value in the table is the evaporator inlet temperature in °F.
- (4) The evaporator outlet temperature is the dew point temperature at the evaporator operating pressure.

KLEA® 407A  
Evaporator Inlet Temperatures Table 3 Sheet 1

Pressure psia	Enthalpy in btu/lb								
	-5.00	0.00	5.00	10.00	15.00	20.00	25.00	30.00	35.00
	°F	°F	°F	°F	°F	°F	°F	°F	°F
10.00	-63.55	-63.15	-62.73	-62.28	-61.81	-61.31	-60.79	-60.24	-59.67
15.00		-48.97	-48.56	-48.12	-47.66	-47.18	-46.67	-46.14	-45.59
20.00			-37.74	-37.31	-36.86	-36.38	-35.89	-35.37	-34.83
25.00			-28.86	-28.44	-28.00	-27.53	-27.04	-26.53	-26.00
30.00			-24.36	-20.86	-20.42	-19.96	-19.48	-18.98	-18.45
35.00				-14.20	-13.77	-13.31	-12.84	-12.34	-11.82
40.00				-8.75	-7.82	-7.36	-6.89	-6.40	-5.88
45.00					-2.41	-1.96	-1.49	-1.00	-0.49
50.00					-2.55	3.00	3.46	3.95	4.46
55.00						7.59	8.05	8.54	9.04
60.00						11.87	12.33	12.81	13.31
65.00						15.89	16.35	16.83	17.32
70.00						19.68	20.13	20.61	21.10
75.00							23.72	24.19	24.78
90.00							27.13	27.60	28.09
85.00							30.38	30.85	31.33
90.00							33.48	33.95	34.44
95.00							36.46	36.93	37.41
100.00								39.78	40.27

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KLEA® 407A  
Evaporator Inlet Temperatures Table 3 Sheet 2

Pressure psia	Enthalpy in btu/lb								
	40.00	45.00	50.00	55.00	60.00	65.00	70.00	75.00	80.00
	°F	°F	°F	°F	°F	°F	°F	°F	°F
10.00	-59.07	-58.46	-57.82	-57.17	-56.50	-55.82	-55.14	-54.46	-53.78
15.00	-45.01	-44.42	-43.80	-43.16	-42.51	-41.85	-41.18	-40.51	-39.83
20.00	-34.27	-33.68	-33.08	-32.46	-31.82	-31.17	-30.51	-29.84	-29.17
25.00	-25.45	-24.87	-24.28	-23.67	-23.04	-22.40	-21.74	-21.08	-20.42
30.00	-17.91	-17.34	-16.75	-16.15	-15.53	-14.89	-14.25	-13.59	-12.93
35.00	-11.28	-10.72	-10.14	-9.55	-8.93	-8.30	-7.66	-7.01	-6.35
40.00	-5.35	-4.80	-4.22	-3.63	-3.02	-2.40	-1.76	-1.12	-0.46
45.00	0.04	0.59	1.15	1.74	2.34	2.96	3.59	4.23	4.88
50.00	4.98	5.53	6.09	6.67	7.27	7.88	8.51	9.15	9.80
55.00	9.56	10.10	10.66	11.24	11.83	12.44	13.07	13.70	14.35
60.00	13.83	14.37	14.92	15.50	16.09	16.70	17.32	17.95	18.59
65.00	17.84	18.37	18.93	19.50	20.08	20.69	21.30	21.93	22.57
70.00	21.62	22.15	22.70	23.27	23.85	24.45	25.06	25.69	26.33
75.00	25.20	25.72	26.27	26.84	27.42	28.01	28.63	29.25	29.88
80.00	28.60	29.12	29.67	30.23	30.81	31.40	32.01	32.63	33.26
85.00	31.84	32.36	32.91	33.47	34.04	34.63	35.24	35.86	36.49
90.00	34.94	35.46	36.00	36.56	37.13	37.72	38.33	38.94	39.57
95.00	37.91	38.43	38.97	39.53	40.10	40.68	41.29	41.90	42.52
100.00	40.77	41.29	41.82	42.38	42.95	43.53	44.13	44.74	45.36

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# KLEA® 407A



**Mexichem.**  
FLUOR

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