

T (°C)	P (bar)	H_{water} (kJ)	H_{steam} (kJ)	S_{water} (kJ/K)	S_{steam} (kJ/K)
0	0.006	0	2501	0	9.156
10	0.012	42	2520	0.151	8.901
20	0.023	84	2538	0.297	8.667
30	0.042	126	2556	0.437	8.453
50	0.123	209	2592	0.704	8.076
100	1.013	419	2676	1.307	7.355

Table 4.1. Properties of saturated water/steam. Pressures are given in bars, where 1 bar = 10^5 Pa \approx 1 atm. All values are for 1 kg of fluid, and are measured relative to liquid water at the triple point (0.01°C and 0.006 bar). Excerpted from Keenan et al. (1978).

P (bar)		Temperature (°C)				
		200	300	400	500	600
1.0	H (kJ)	2875	3074	3278	3488	3705
	S (kJ/K)	7.834	8.216	8.544	8.834	9.098
3.0	H (kJ)	2866	3069	3275	3486	3703
	S (kJ/K)	7.312	7.702	8.033	8.325	8.589
10	H (kJ)	2828	3051	3264	3479	3698
	S (kJ/K)	6.694	7.123	7.465	7.762	8.029
30	H (kJ)		2994	3231	3457	3682
	S (kJ/K)		6.539	6.921	7.234	7.509
100	H (kJ)			3097	3374	3625
	S (kJ/K)			6.212	6.597	6.903
300	H (kJ)			2151	3081	3444
	S (kJ/K)			4.473	5.791	6.233

Table 4.2. Properties of superheated steam. All values are for 1 kg of fluid, and are measured relative to liquid water at the triple point. Excerpted from Keenan et al. (1978).

at point 3 in Table 4.2, then interpolate in Table 4.1 to find what mixture of liquid and gas has the same entropy at the lower pressure.

For example, suppose that the cycle operates between a minimum pressure of 0.023 bar (where the boiling temperature is 20°C) and a maximum pressure of 300 bars, with a maximum superheated steam temperature of 600°C. Then for each kilogram of water/steam, $H_1 = 84$ kJ and $H_3 = 3444$ kJ. The entropy at point 3 is 6.233 kJ/K, and to obtain this same entropy at point 4 we need a mixture of 29% water and 71% steam. This same mixture has an enthalpy of $H_4 = 1824$ kJ, so the efficiency of the cycle is approximately

$$e \approx 1 - \frac{1824 - 84}{3444 - 84} = 48\%. \quad (4.13)$$