Quality

		Liquid				Vapor			
Temp. (C)	Press. (bar)	Volume (v_f, m^3/kg)	Internal Energy (u_f, kJ/kg)	Enthalpy (h_f, kJ/kg)	Entropy (s_f, kJ/kg/K)	Volume (v_g, m^3/kg)	Internal Energy (u_g, kJ/kg)	Enthalpy (h_g, kJ/kg)	Entropy (s_g, kJ/kg/K)
19	0.021983	0.0010016	79.727	79.729	0.282180	61.256	2401.0	2535.6	8.6884
20	0.023393	0.0010018	83.912	83.914	0.296480	57.757	2402.3	2537.4	8.6660
21	0.024882	0.0010021	88.096	88.098	0.310730	54.483	2403.7	2539.3	8.6437

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0.9	96.69	0.0010409	405.10	405.20	1.2696	1.8694	2502.1	2670.3	7.3943
1.0	99.61	0.0010432	417.40	417.50	1.3028	1.6939	2505.6	2674.9	7.3588
1.5	111.35	0.0010527	466.97	467.13	1.4337	1.1593	2519.2	2693.1	7.2230

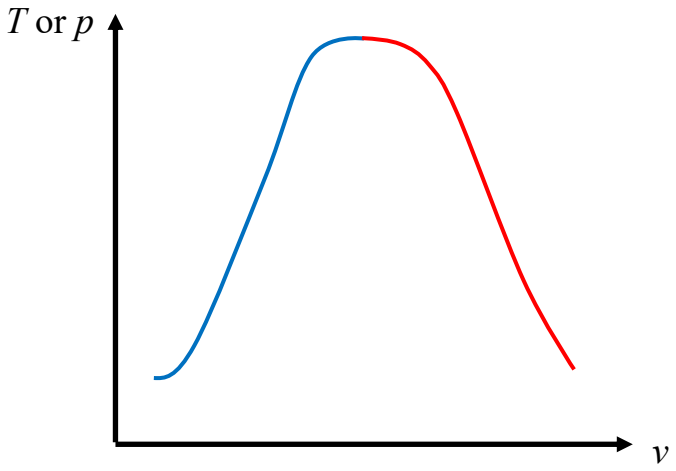
Quality, *x*

The quality of a saturated substance, *x*, is defined as the ratio of the mass of the substance in the vapor phase to the total mass of the substance (mass of vapor + mass of liquid):

$$x \equiv \frac{m_{vapor}}{m_{vapor} + m_{liquid}}$$

$x = 0$ =>

$x = 1$ =>



To determine the value of a specific property, *z* (other than temperature and pressure) in a saturated, i.e., two-phase, state:

$z = (1 - x)z_f + xz_g$ or, after re-arranging, $z = z_f + x(z_g - z_f)$

For example, to evaluate the specific internal energy at a given quality,

$u = (1 - x)u_f + xu_g$ or $u = u_f + x(u_g - u_f)$

Example (properties_03)
What is the specific internal energy of water at a pressure of 7 bar (abs) and temperature of 164.95 °C at a quality of 0.5?

		Liquid				Vapor			
Press. (bar)	Temp. (C)	Volume (v_f, m^3/kg)	Internal Energy (u_f, kJ/kg)	Enthalpy (h_f, kJ/kg)	Entropy (s_f, kJ/kg/K)	Volume (v_g, m^3/kg)	Internal Energy (u_g, kJ/kg)	Enthalpy (h_g, kJ/kg)	Entropy (s_g, kJ/kg/K)
6	158.83	0.0011006	669.72	670.38	1.9308	0.31558	2566.8	2756.1	6.7592
7	164.95	0.0011080	696.23	697.00	1.9918	0.27277	2571.8	2762.8	6.7071
8	170.41	0.0011148	719.97	720.86	2.0457	0.24034	2576.0	2768.3	6.6616