

Steam separator 7

The saturated vapor leaves a liquid - steam separator at a mass flow rate of 78 kg/s and the saturated liquid leaves at a mass flow rate of 22 kg/s.

What is the quality of the saturated mixture entering the liquid – steam separator?

Answer: 0.78 or 78%.

Explanation: The quality of a saturated mixture is the ratio of the mass of the saturated vapor over the total mass: $\frac{\dot{m}_{sat.vapor}}{\dot{m}_{mix}} = \frac{\dot{m}_{sat.vapor}}{\dot{m}_{sat.vapor} + \dot{m}_{liquid}} = \frac{78}{78+22} = \frac{78}{100} = 0.78$.
The quality is 78%.