

Steam separator 8

The saturated vapor leaves a liquid - steam separator at a mass flow rate of 150 kg/s and the saturated liquid leaves at a mass flow rate of 50 kg/s.

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

Answer: 0.75 or 75%.

Explanation: The quality of a saturated mixture is the ratio of the mass of the saturated vapor over the total mass: $\frac{\dot{m}_{sat.vapor}}{\dot{m}_{mix}} = \frac{\dot{m}_{sat.vapor}}{\dot{m}_{sat.vapor} + \dot{m}_{liquid}} = \frac{150}{150 + 50} = \frac{150}{200} = 0.75$. The quality is 75%.