



Steam separator 1

Consider a liquid – steam separator, which is a big vessel where a saturated mixture enters that is separated into a saturated vapor and a saturated liquid. The saturated vapor leaves the liquid – steam separator at a mass flow rate of 165 kg/s while the saturated liquid leaves at a mass flow rate of 45 kg/s.

What is the mass flow rate of the saturated mixture entering the liquid – steam separator?

Answer: 210 kg/s

Explanation: Conservation of mass requires the incoming mass flow rate to be equal to the outgoing mass flow rates: $\dot{m}_{mix} = \dot{m}_{sat.vapor} + \dot{m}_{sat.liquid} = 165 + 45 = 210 \text{ kg/s}$