Steady-flow process

What is a steady-flow process?

Answer: A process in which the fluid properties may change with the position within the device but not with the time.

Explanation: A steady-flow process is defined as a process during which a fluid flows through a device (a control volume) steadily. That is, the fluid properties can change from point to point within the device (thus with position), but at any fixed point they remain the same during the entire process. Therefore, the volume, mass, and the total energy content of the control volume remains constant during a steady-flow process. The opposite of steady is unsteady or transient, that is in a transient flow the properties do change with time. They are more difficult to analyze, however steady-flow conditions can be closely approximated by devices that are intended for continuous operation like pumps, compressors, turbines, boilers and heat exchangers or power plants. These devices are called steady-flow devices (devices that operate for a long period under the same conditions).