Thermodynamic equilibrium

@wikipedia

A state of a thermodynamic system which is in thermal, mechanical, and chemical equilibrium.

Specifically it is achieved at:

Maximum Entropy	Minimum Helmholtz free energy	Minimum Gibbs Free Energy
$S \to \max$	$A(T,V) \to \min$	$G(p,T) \to \min$
for isolated system	for a system with $T = \text{const},\ V = \text{const}$	for a system with $p = \text{const},\ T = \text{const}$

Particularly in Fluid Dynamics it means that:

(1) $G \to \min \Leftrightarrow \mathrm{dG} = 0$	The Gibbs free energy is at minimum
(2) $T = \text{const}$	the fluid temperature is constant at any moment of time t and spatial location $\mathbf{r} = (x, y, z)$ of a fluid flow
(3) $p = \text{const}$	the fluid pressure is constant at any moment of time t and spatial location $\mathbf{r} = (x, y, z)$ of a fluid flow
(4) $\rho = \rho(p,T) = \text{const}$	fluid density is a function of pressure p and temperature T only
(5) $\mu = \mu(p,T) = \text{const}$	fluid viscosity is a function of pressure p and temperature T only
(6) $\lambda = \lambda(p,T) = \text{const}$	fluid thermal conductivity is a function of pressure p and temperature T only
(7) $c_p = c_p(p,T) = \text{const}$	fluid isobaric specific heat capacity is a function of pressure p and temperature T only
(8) $\alpha = \alpha(p,T) = \text{const}$	fluid Joule–Thomson coefficient is a function of pressure p and temperature T only

See also