7-5 T-S DIAGRAM

Internally reversible process

\[
\frac{\delta Q}{T} = \frac{\delta S}{S} \quad (7-4)
\]

\[
\delta Q = T \delta S \quad (7-14)
\]

For internally reversible process

Heat transfer during the internally reversible process

\[
Q = \frac{2}{T} \delta S \quad (7-15)
\]

\[
q = \frac{2}{T} \delta s \quad (7-17)
\]

Isothermal Process

\[
Q = T_0 \cdot (S_2 - S_1) \quad (7-18)
\]

\[
q = T_0 \cdot (s_2 - s_1) \quad (7-19)
\]

7-4 Isentropic process \((S = \text{const})\)

Isentropic process is associated with internally reversible adiabatic process

Example 7-6 Carnot Cycle

\[
Q_{\text{net.in}} = W_{\text{net.out}}
\]

\[
W_{\text{net.out}} = Q_H - Q_L
\]

h-s diagram (Mollier diagram, p.345) is useful for analysis of steady-flow devices

Richard Mollier (1863–1935)