

Engineering Thermodynamics Exam 1 Cheat Sheet

by shelbeans via cheatography.com/177819/cs/39393/

Simple terms

Thermodynamic System (TS)

any object or system of objects

Types of TS

Isolated (no interaction with surroundings), **Closed** (no mass exchange), **open** (mass exchange)

State Postulate

Defines a number of properties required to fix a state

Intensive properties

(mass ind.) if the property is the same

Extensive properties

(mass dep.) if the property is doubled

Energys

macroscopic energys

(Work) kinetic, potential

microscopic energys

(Heat transfer) thermal, chemical, nuclear, etc

1LT

Closed

U=Qnet-Wnet

Open

U=Qnet-Wnet+ m(ein-eout)

adiabatic

no heat transfer

isothermal

T is constant

isobaric

P is constant

isochoric

V is constant

Equations

Specific ___

x=X/m

kinetic energy

 $ke=v^2/2$

potential energy

pe=gh

specific total energy

e=ke+pe+u

total energy

 $E=mv^2/2 + mgh + u$

electric power

W=Voltage*current

steady electric power

W=Voltage current time

boundary work

W=P*V

shaft work

W= T2pi*number of turns

Devices

Thermal devices

n=Q/mfuel*HV (burner, water heater)

Mechanical devices (Turbine)

n=Wout/Efluid



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