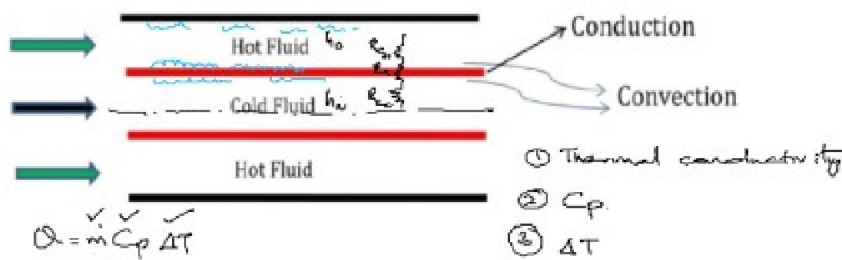




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PHASE CHANGE HEAT TRANSFER AND HEAT EXCHANGERS

Topic - Introduction-boiling regimes

Heat exchangers are the devices that facilitates heat transfer between two (or) more fluids at different temperatures, while keeping them from mixing (or) without mixing. Heat transfer in heat exchanger involves convection in each fluid and conduction through the wall separating the fluids.



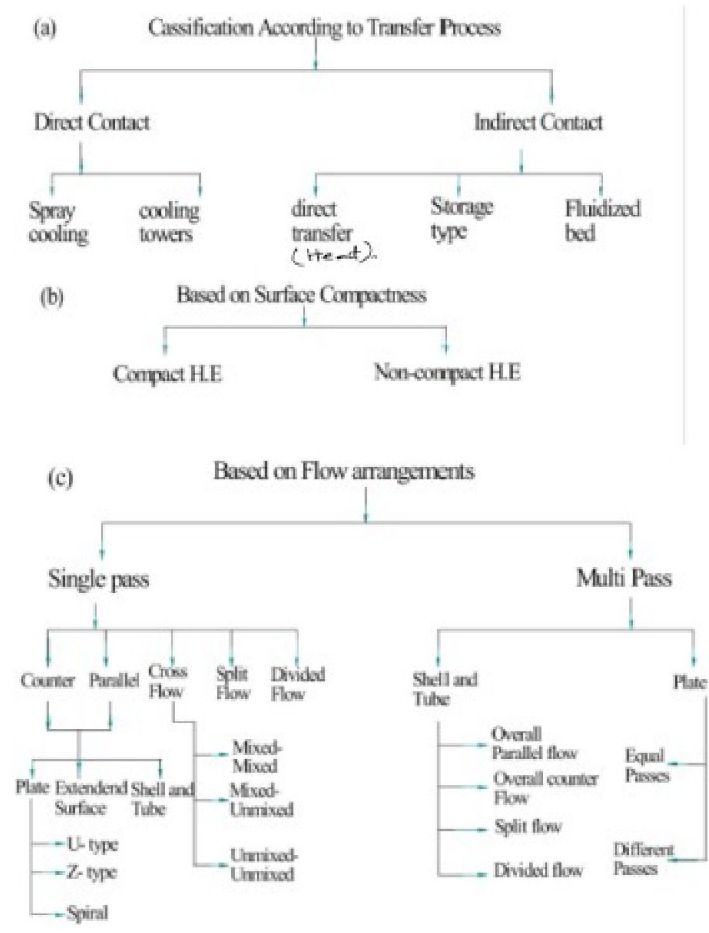
Examples: Shell and tube heat exchanger,  
Boilers,  
Cooling towers  
Car radiators etc.,



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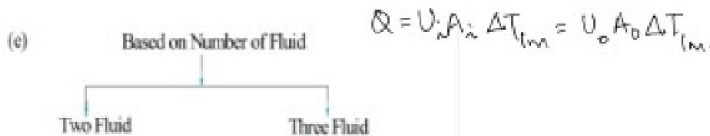
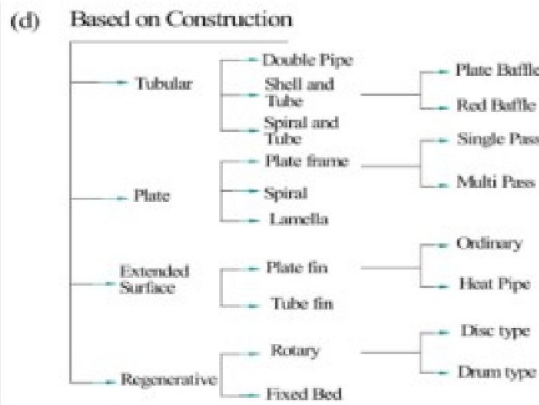
Classification of Heat Exchangers:





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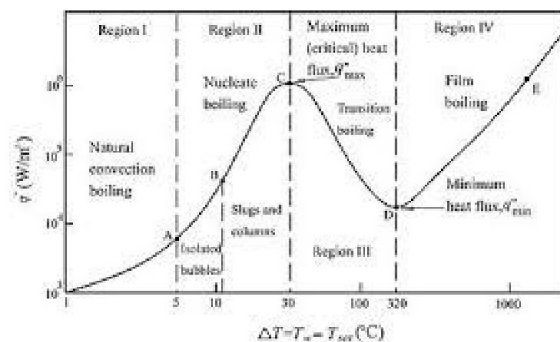


- f) Based on Heat Transfer mechanism
- Single phase convection on both sides.
  - Single phase convection on one side and two phase convection on other side.
  - Two phase convection on both the sides.
  - Combined convective and Radiative heat Transfer.

Overall heat transfer coefficient (HTC)

In the heat transfer analysis of heat exchanger various thermal resistances in the path of heat flow from hot to cold fluid are combined into an overall heat transfer coefficient. For an heat exchanger, the area of heat flow in radial direction depends on the radius  $r$ ;

Boiling regimes:





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EXCHANGERS**

Topic - Introduction-boiling regimes

**References:**

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2. Frank P. Incropera and David P. DeWitt, “Fundamentals of Heat and Mass Transfer”, John Wiley and Sons, New Jersey,6<sup>th</sup> Edition1998(Unit I,II,III,IV, V)
3. MIT open courseware - <https://ocw.mit.edu/courses/mechanical-engineering>

Other web sources