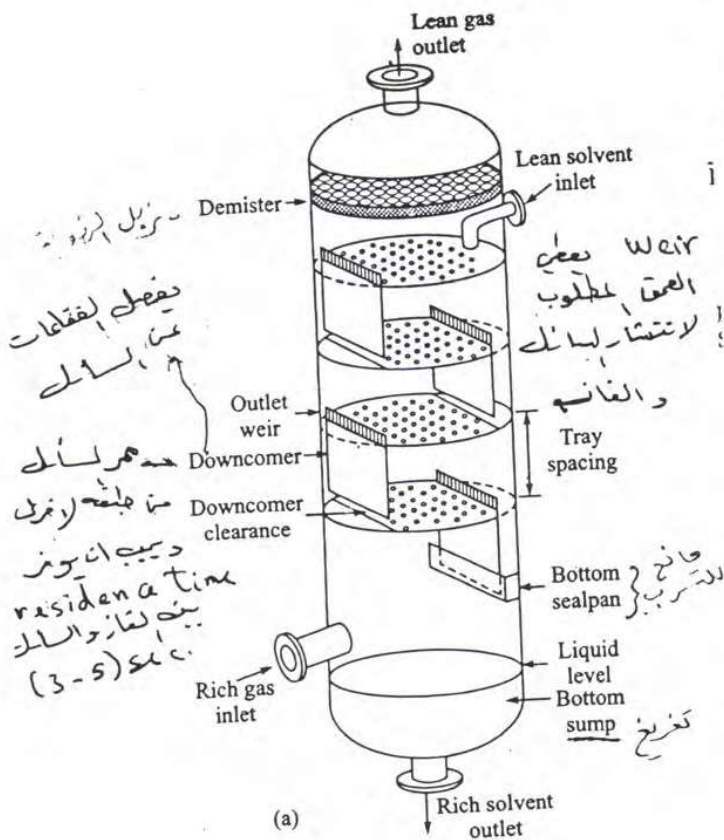


- Tray or Plate Columns -

A tray column primarily consists of a vertical cylindrical shell and a set of "tower internals" that include:

- 1- Tray or plates on which the gas-liquid contact occurs.
- 2- Arrangements for flow of the liquid from one tray to the lower one through the down-comer.
- 3- Inlet and outlet nozzles for the two phases.

Figure below shows a few essential parts of a (sieve-tray) column.



The Trays - (Plate)

A tray has two major functions:

① It allows the gas to flow through the holes, the gas bubbles through the liquid to form "gas-liquid dispersion", the tray holds the dispersion.

② The tray separate the column into a number of compartments, each of which constitutes a stage. M.T. between the phases occurs on a tray. Therefore trays as a whole constitute the

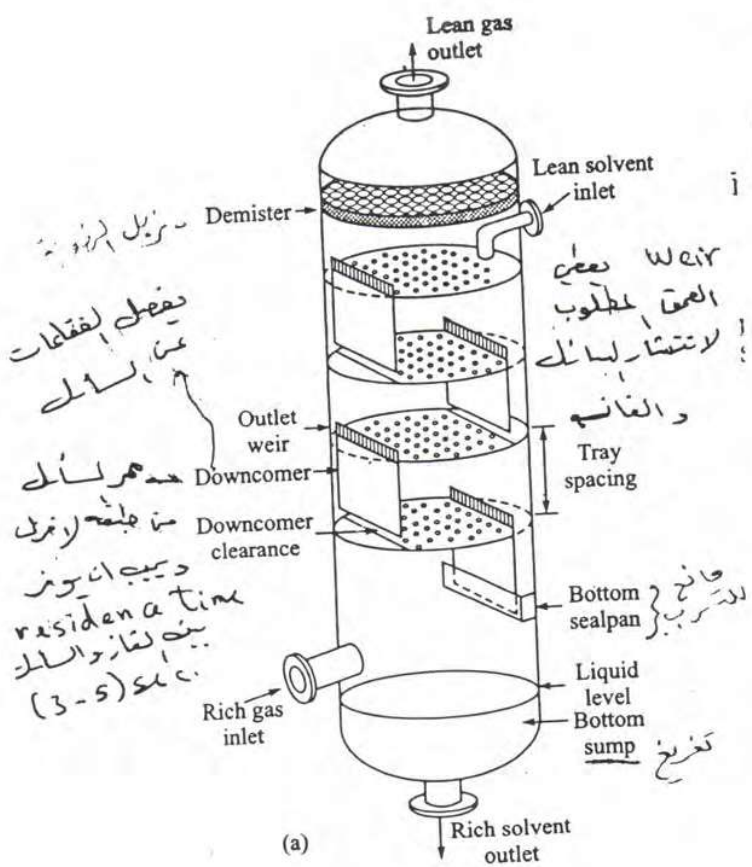
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The Types of trays :- ① Bubble - Cap tray.
② Sieve - Tray. ③ Valve - Tray.

Stage :- Any device or combination of devices in which two immiscible phases are brought into contact in order to achieve mass transfer of one or more solute from one phase to other is called "Stage". An efficient contact of the phases in a stage tends to bring them to equilibrium. If the contacting is so efficient that the phases reach equilibrium when they leave, the stage is called an "ideal stage".

The stage efficiency gives a measure of how close to equilibrium the phases may reach in a stage.

An ideal stage has 100% efficiency.

Difference between Packed and Plate Columns

- 1 - Plate col. provide more positive contact between the two fluid phases by repeated mixing and separation. whereas packed col. may be subject to by-passing or back-mixing.
- 2 - Plate col. can handle greater liquid loads without flooding.
- 3 - s s are more easily cleaned.
- 4 - Packed col. give lower pressure drop for gas flow, which is of particular importance in vacc. operations.
- 5 - liquid hold-up is less in packed col.
- 6 - Packed col. may be more economical in processing.
- 7 - Small diameter packed col. are usually cheaper than plate col. of the same size.