Coating Equipment

- **We have tow main coating equipment or systems:**

1) Pan coating system or coater: **subdivided into**

a) Standard/conventional ***b) Perforated***

2) Fluidized bed coating system or coater:

subdivided into

a) Top ***b) bottom*** ***c) tangential***

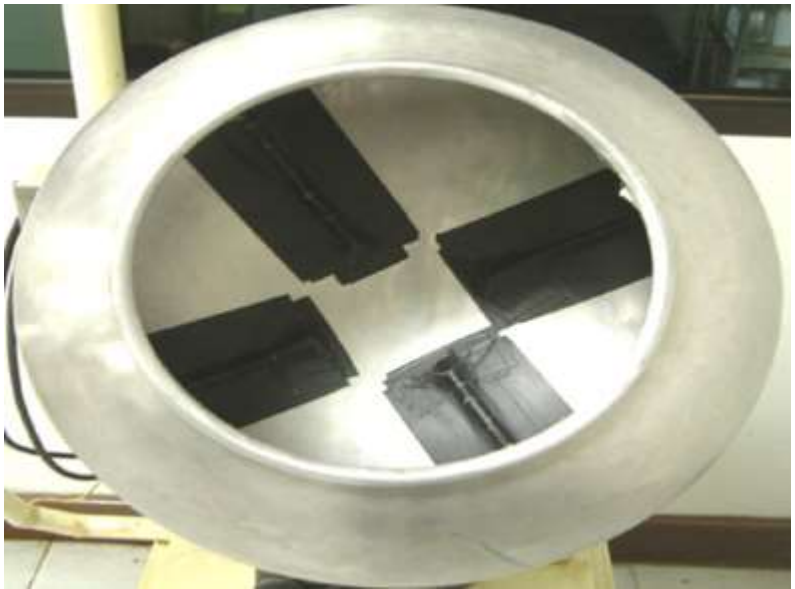
Standard Pan coater

- **Is generally composed of a metal drum (pan) into which the tablets are placed and then rotated at a range of speeds. This rotation is accompanied with application, evaporation and removal of vapors by outlet jackets.**
- **As parameters, important for this system are: rotation rate, air flow rate, air temp., and concentration of the main coating material.**

Notes:

- **This system is mainly used for sugar coating.**
- **It is preferred to apply the coating formulation in form of spray.**

  ???
- **We can increase the efficiency of coating by involvement of baffles within the internal walls (baffled pan) as in Pellegrini system.**

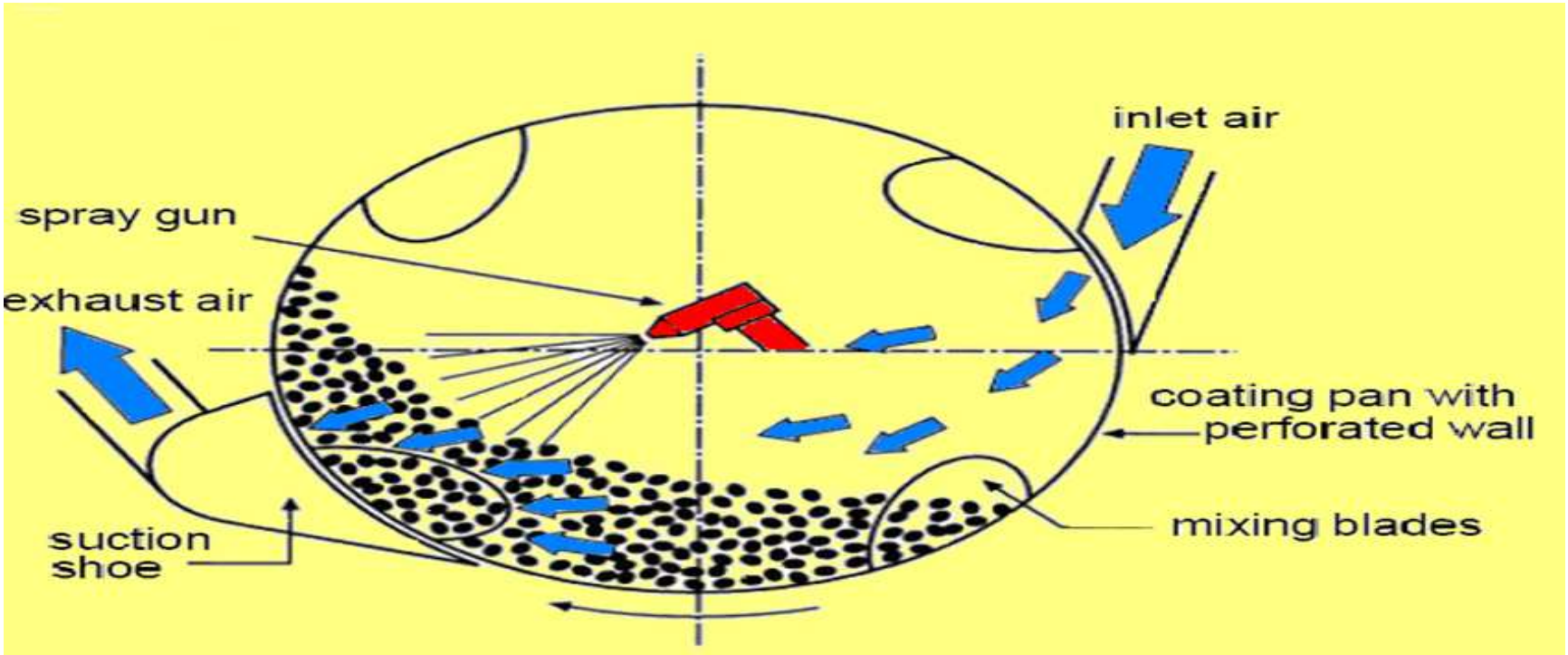


- Pans used may be found into different shapes (spherical or pear shapes).
- The position of pan can affect the coating efficiency (angular or not).
- Position of outlet jacket can affect the coating efficiency, specially for aqueous coating formulations.

Q/ What are the limitations of use of baffled pan coater? H.w

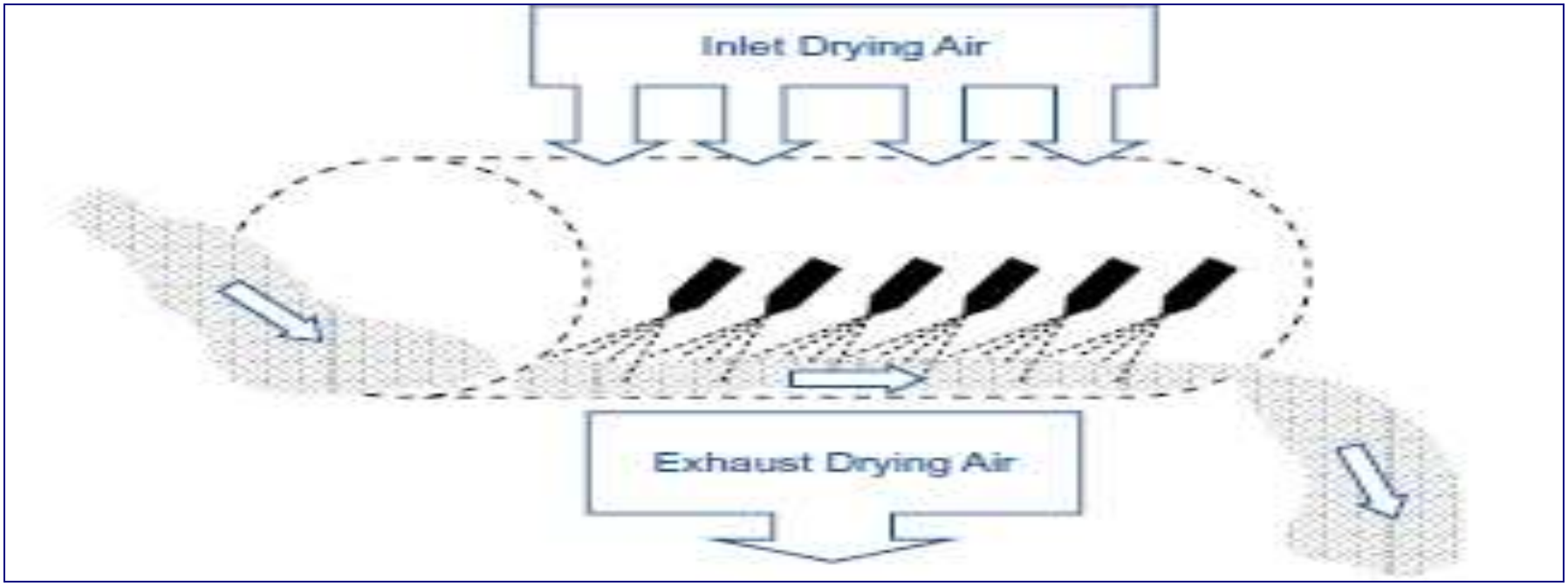
Perforated pan coater

- **The warmed air is passed into the drum and through the tablet bed and then exhausted via the perforations within the drum. (more efficient system)= ex. Accela –Cota system, preferred for film coating.**



NOTE:

- **As trial to increase coating output, reduce residence time of tablet beds, increase uniformity of coating formulation, (Continuous film-coating process) is used.**



H.w

- **What is the meaning of:**

1) **Hi-coater system**

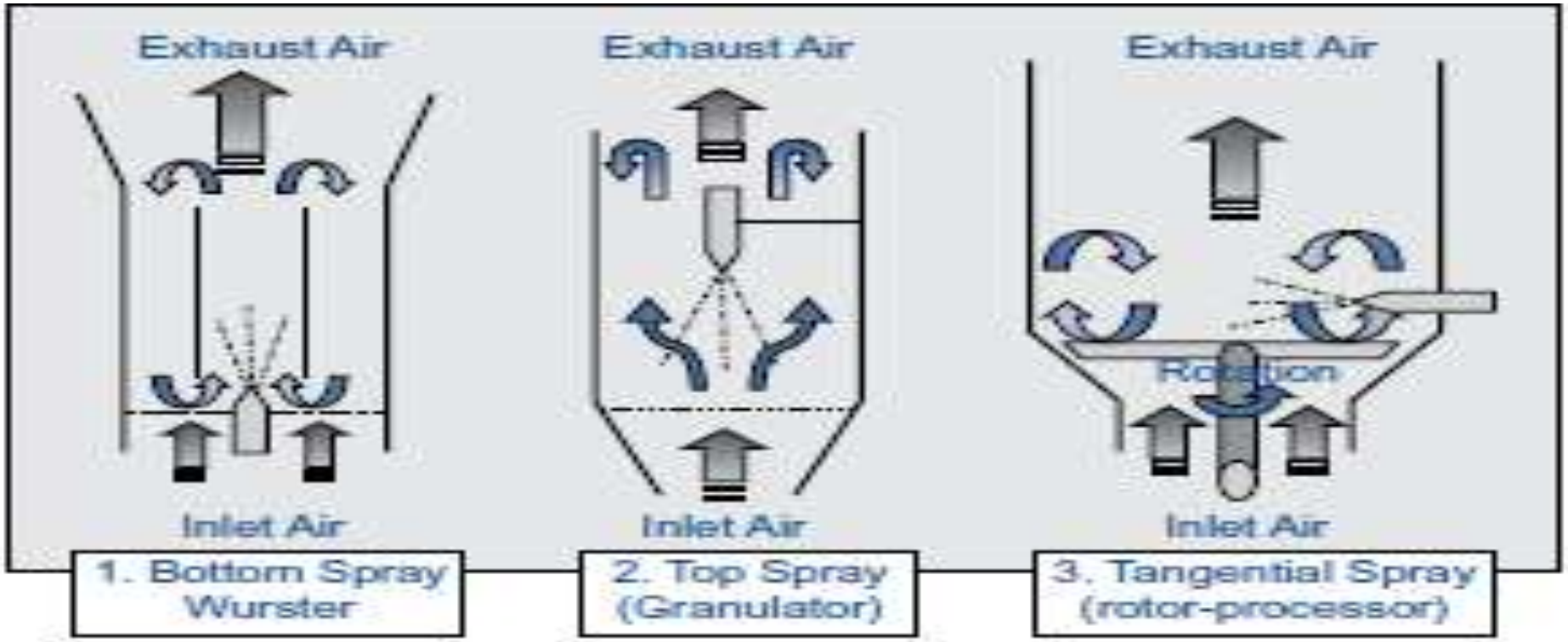
2) **SUPERCELL™ tablet coater**

Fluidized bed coaters

- **Highly efficient system can be used for coating, granulation, drying and mixing.**
- **As main parameters involved here, are:**
  - **Atomizer (its type and atomization rate) and distance from tablet bed.**
  - **Air (volume, pressure, humidity and temperature).**
  - **Evaporation rate.**
  - **The coating formulation properties (like viscosity, composition and amount)**

- **Each subtype is used for certain applications, as examples:**

- ✓ **Top or Upward (granulator): used for all coating processes.**
- ✓ **Bottom or downward (Wurster): film (sustained release) and enteric coating**
- ✓ **Tangential :film and enteric coating**



Coating parameters

- Are used for comparison between the coating equipment like:

1) Air capacity
2) Coating composition (affect on application and quality)
3) Tablet S.A. (can affect application step)
4) Equipment efficiency : a value obtained by dividing the net increase in coated tablet weight to the total non volatile coating wt. applied to the tablet

Some Coating Problems

Twinning or building multiple

- Sticking of two or more of tablets together specially in capsule shaped ones (caplets), mainly related to coating equipment. So decrease by balancing the pan speed and spray rate or modification of equipment design.

Orange peel or Surface roughness

- Coating texture similar to the surface of orange, occurred due to high atomization pressure, or too high spray rates.

Peeling and frosting

- The coating layer peels away from the tablet surface, due to weak or no interaction between the coat and core or may because of over-wetting or coating solution formulation.

Cracking

- Breaking occurred in the coating layer, mainly related to the mechanical properties of the coat.