

DESCRIPTION OF CONSTRUCTION WORKING AND APPLICATION OF PHARMACEUTICAL MACHINERY SUCH AS ROTARY TABLET MACHINE, FLUIDIZED BED COATED, FLUID ENERGY MILL, DEHUMIDIFIER

AIM:

Description of Construction Working and application of Pharmaceutical machinery Such as Rotary Tablet Machine, Fluidized Bed Coated, Fluid Energy Mill, Dehumidifier.

1) ROTARY TABLET MACHINE:

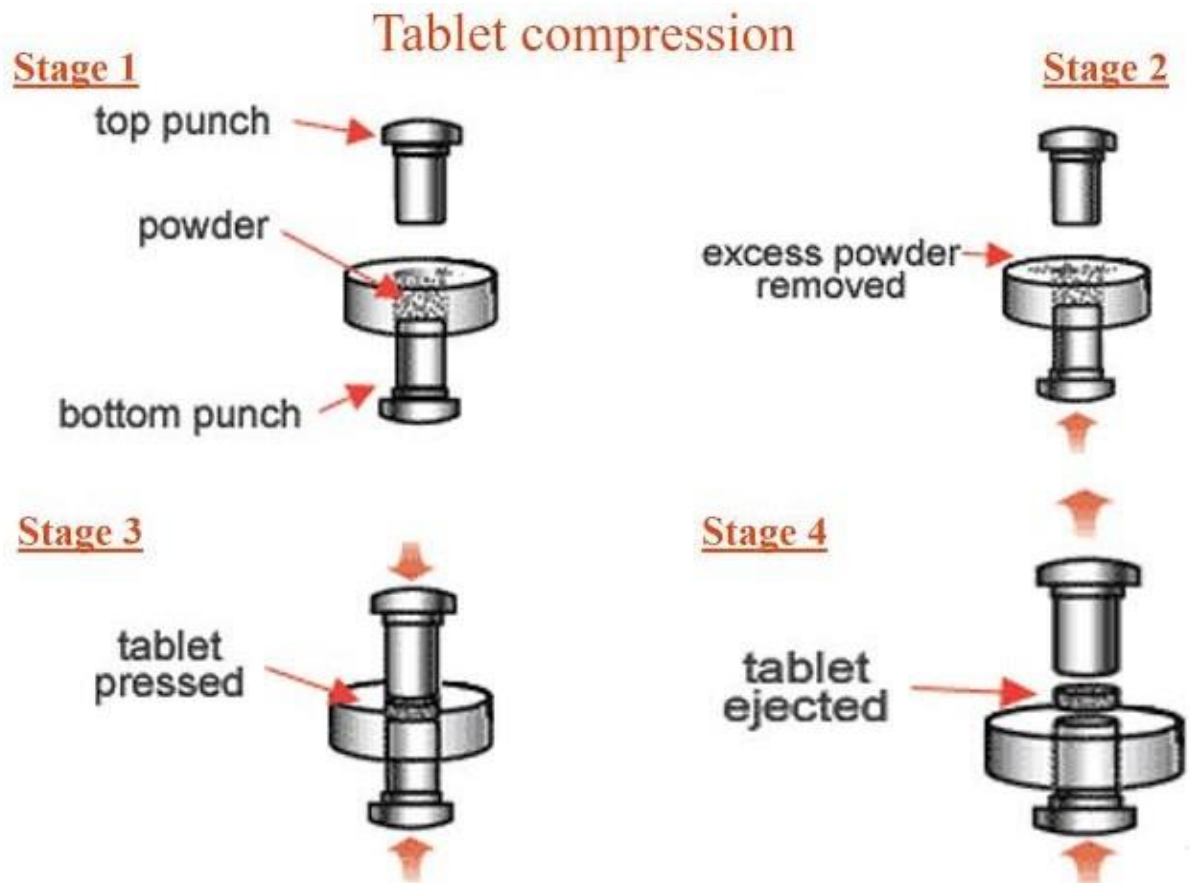
It is also called multi station tablet press. It is called rotary machine rotary machine because the head of the machine that holds the upper punches, dies and lower punches in place rotates.

Steps involved in manufacturing of tablet:

- The material to fed through hopper
- The fill cam pulls the lower punches down to a fixed distance and the dies are filled with material
- The quantity of the material filled is larger than the actual amount required, remove excess amount with the help of spatula
- After that, upper punch is lowered and inserted into the dies
- The material is compressed and the tablet are formed
- After the compression, pulls the upper punches into their top position and simultaneously lift the lower punches until the tablets are ejected from the dies
- Then the tablet is passed through discharge chute

Applications:

- It is operated continuously
- Used for large scale production
- A single rotary press produce 1150 tablets in a minute while double rotary press can produce 10,000 tablets in a minute



2) FLUIDIZED BED COATER:

Three types of air suspension coater are available, namely top spray coater, wurster or bottom spray coater, and tangential spray coater. In top spray coater, there is a counter current (opposite position) movement of powder particles or pellets and liquid spray. In wurster or bottom spray coater, there is a concurrent (same direction) movement of powder particles or pellets and liquid spray. In tangential spray coater, the powder particles or pellets move in a helical fashion due to spinning rotor disk on the bottom of the equipment.

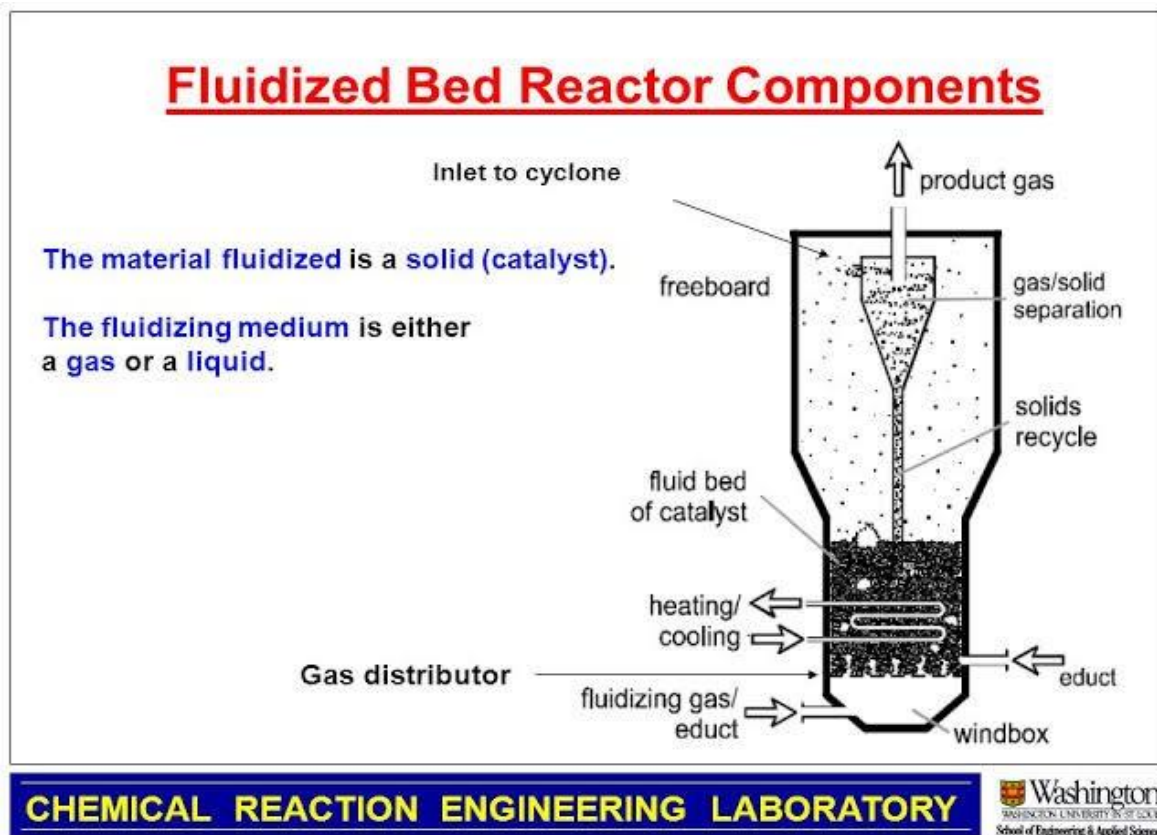
Steps involved in wurster or bottom spray coater:

- ✓ The drying inlet air is passed upwards through the bottom perforated plate into the fluid bed chamber
- ✓ This air passes to wurster column, in which a spray gun perpendicular to bottom plate and parallel to the wurster column
- ✓ This air passes out from the exhaust filters situated at the top of the equipment
- ✓ The material to be coated is located is loaded in the fluid bed chamber and fluidized

- ✓ The inlet air cause fluidization of the material as well as its drying during the coating operation
- ✓ The pellets are pass through the liquid spray of coating solution from the spray gun positioned parallel to the column
- ✓ After coating the coated particle falls by gravity at the bottom of wurster column and recycled to coating zone.

Application:

- ❖ It is used to coat pharmaceutical dosage form with polymeric material to mark objectionable taste or odour and also to protect an unstable ingredient and to improve appearance
- ❖ Fluidized bed coaters are used for coating of powders, granules, tablets, pellets etc by column of air
- ❖ Fluidized bed coating equipment is popular for coating multiparticulate systems such as beads and non parallel seeds

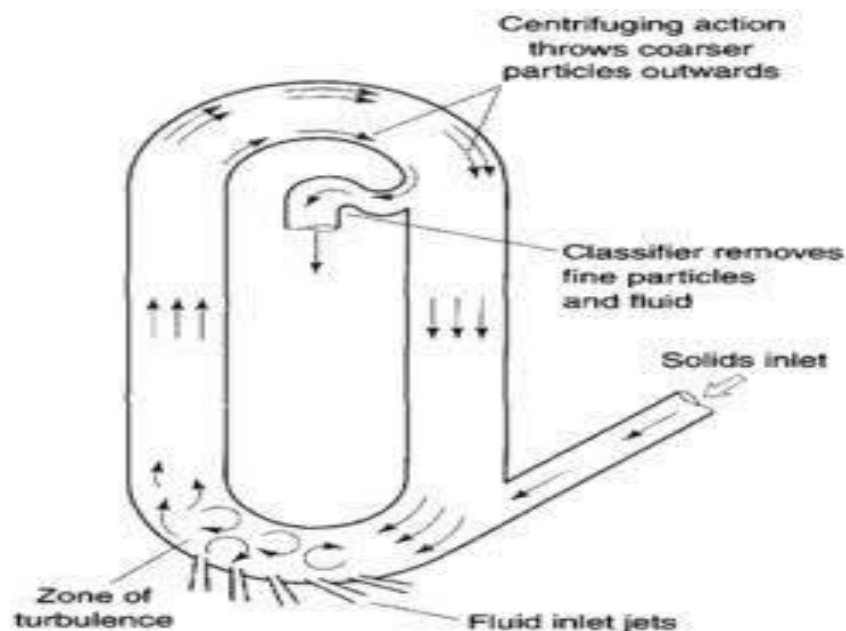


3) FLUID ENERGY MILL:

- ❖ A fluid usually air is injected at very high pressure through nozzles at the bottom of the loop, as a result turbulence produce
- ❖ Solids are introduced into the stream through hopper
- ❖ Due to this turbulence occur and impacts and attrition occur between the particles
- ❖ A classifier is fitted at the exist so that only finer size particles are collected as products
- ❖ The larger size particles are again sent to the stream of air for further size reduction

Application:

- ✓ The particle size of the product is smaller when compared to other method of size reduction
- ✓ No chance of contamination of the product
- ✓ This material is suitable where fine powders are required like micro ionization or griseofulvin



FLUID ENERGY MILL

PHOTO CREDIT: AULTON'S PHARMACEUTICS: THE DESIGN AND MANUFACTURE OF MEDICINE

4) DE-HUMIDIFIER:

- Warm moist air is sucked in through one side of the machine
- An electric fan is used to draw the air inward
- The warm air passes through cold pipes through which a coolant circulates, due to cooling of air, the moisture it contains turns back into liquid water
- Then the air passes over a heating element and warms back up to its original temperature
- Warm, dry air blows back into the room through another side of machine
- The moisture that was in the air drips down into a collecting tray at the bottom of the machine
- As the collecting tray fills up, a plastic float in the machine rises upward
- When the tray is full, the float trips an electric switch that turns off the fan and switches on an indicator light which indicates that the machine needs emptying

Applications:

- A dehumidifier is used to reduce the levels of humidity in the air
- Large dehumidifiers are used in commercial buildings such as indoor ice rinks to control the humidity level

