



SNS COLLEGE OF TECHNOLOGY

**An Autonomous Institution
Coimbatore - 35**

Accredited by NBA – AICTE and Accredited by NACC – UGC with 'A+ Grade
Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai.

DEPARTMENT OF FOOD TECHNOLOGY

19FTT101 – FUDAMENTALS OF FOOD PROCESSING

I – YEAR II SEMESTER

UNIT II DRYING

TOPIC 2 – Thin Layer Drying & Deep Bed Drying



Thin Layer Drying



- ❖ Process in which all grains are fully exposed to the drying air under constant drying conditions i.e. at constant air temp. & humidity.
- ❖ Up to 20 cm thickness of grain bed is taken as thin layer all commercial dryers are designed based on thin layer drying principles.
- ❖ Represented by Newton's law by replacing moisture content in place of temperature

$$M - M_e / M_o - M_e = e^{-Kq}$$

- ✓ M – Moisture content at any time q, % db
- ✓ M_e - EMC, %db
- ✓ M_o – Initial moisture content, %db
- ✓ K – drying constant
- ✓ q - time, hour

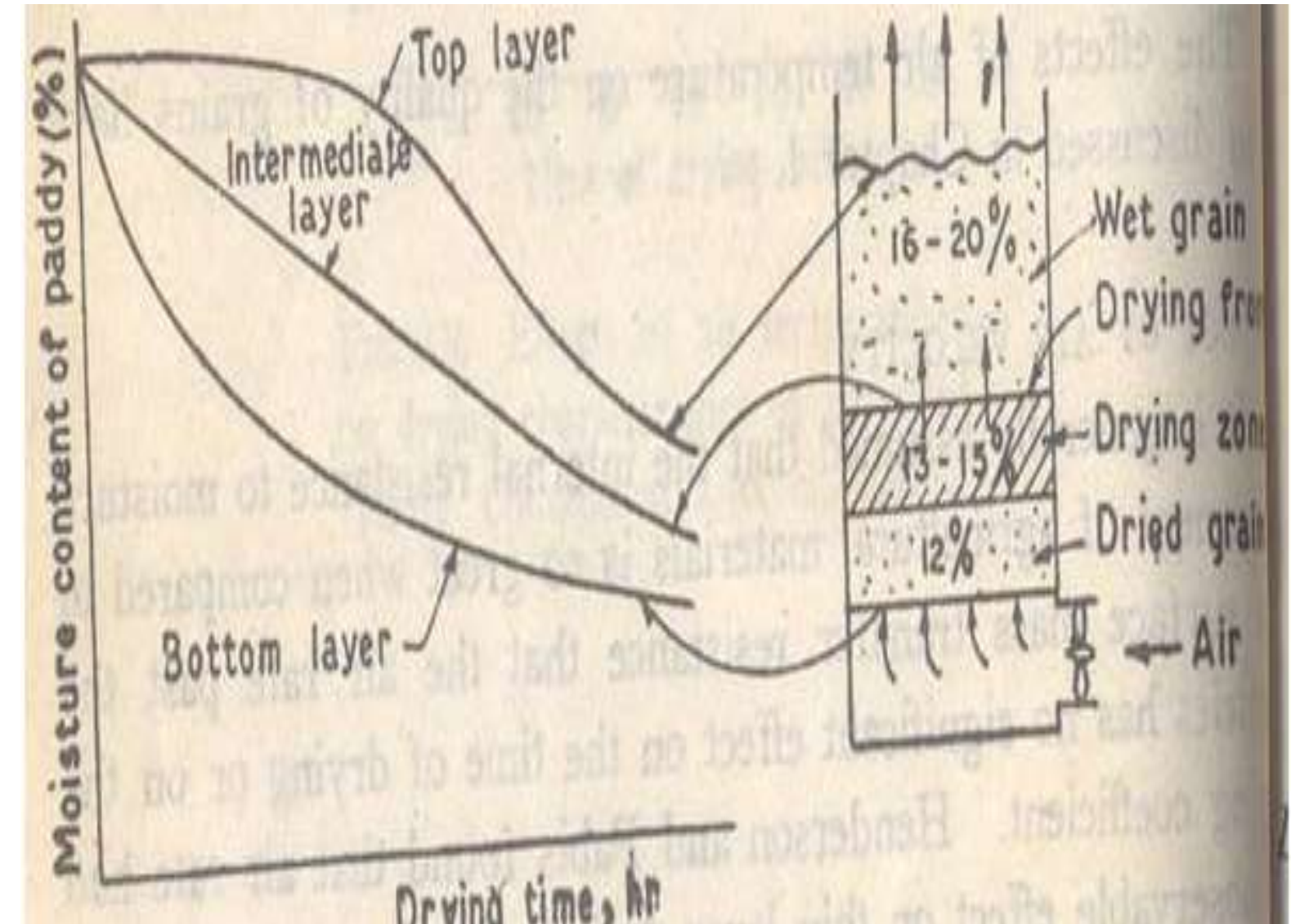


Deep Bed Drying



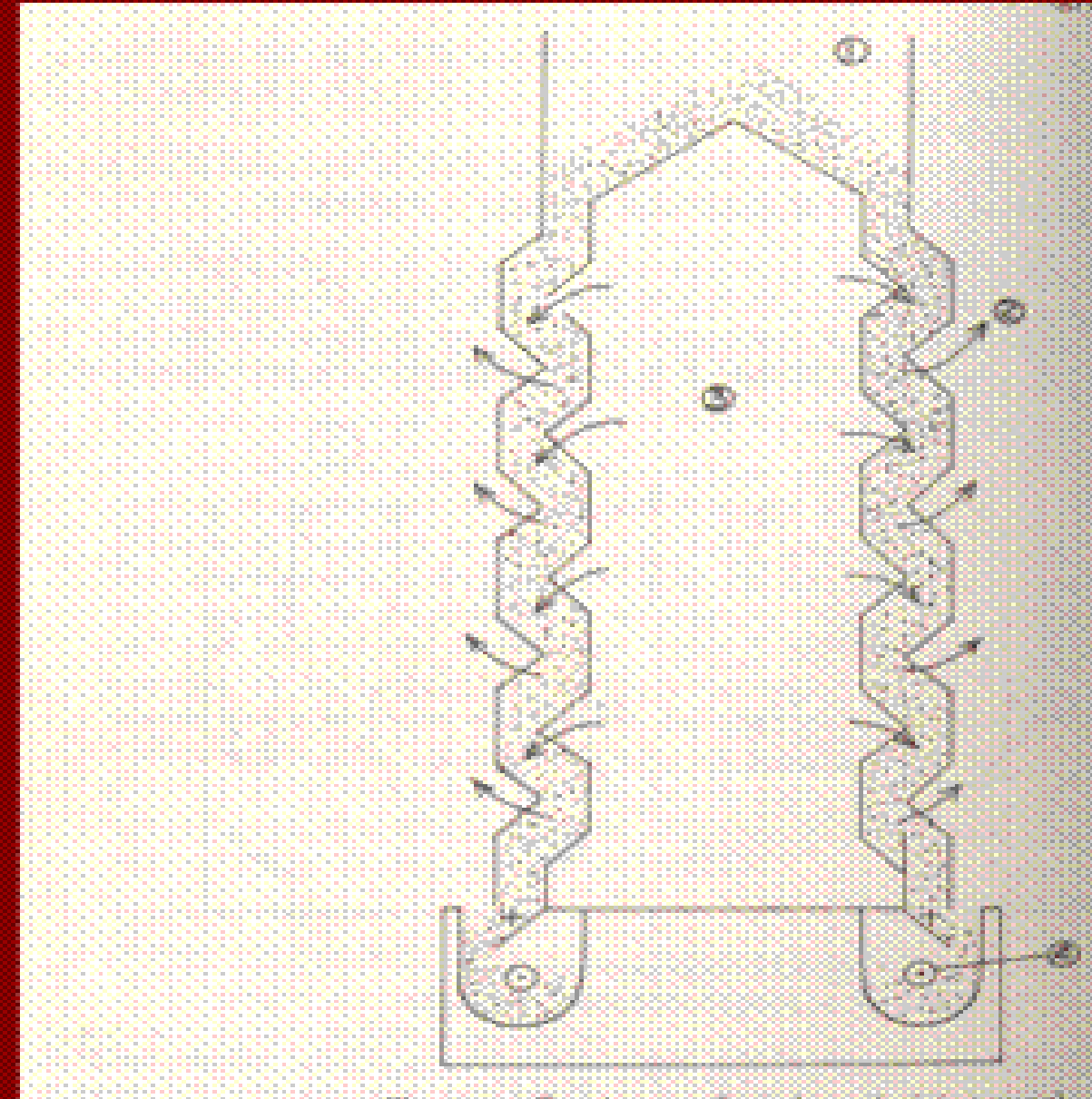
Deep bed drying

- All grains are not fully exposed to the same condition of drying air
- Condition of drying air changes with time and depth of grain bed
- Rate of airflow per unit mass of grain is small
- Drying of grain in deep bin can be taken as sum of several thin layers
- Humidity & temperature of air entering & leaving each layer vary with time
- Volume of drying zone varies with temp & humidity of entering air, moisture content of grain & velocity of air





Deep Bed Drying

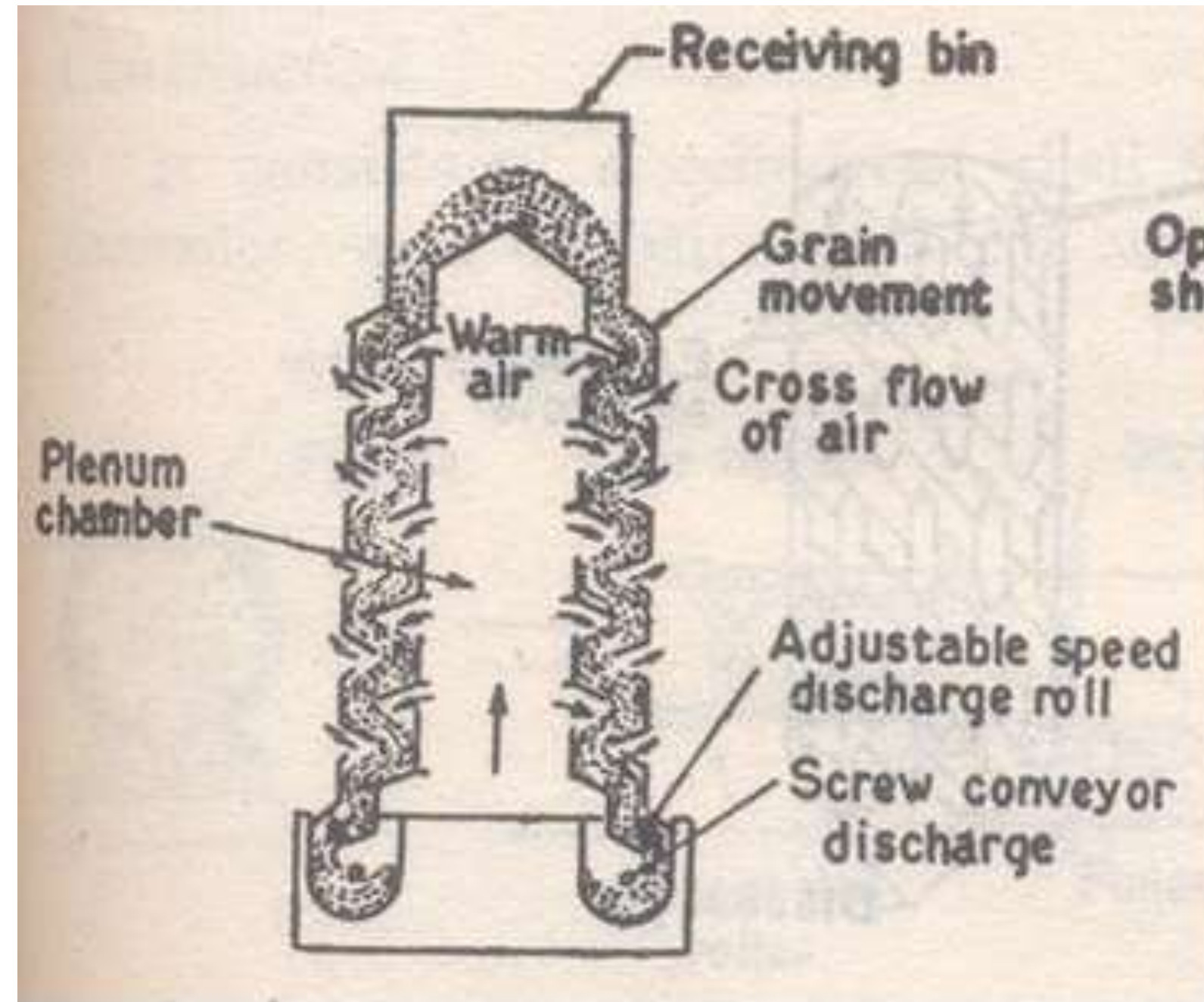


1. Feed hopper
2. Exit air
3. Plenum chamber
4. Dry material outlet

Continuous flow dryer (Mixing type)

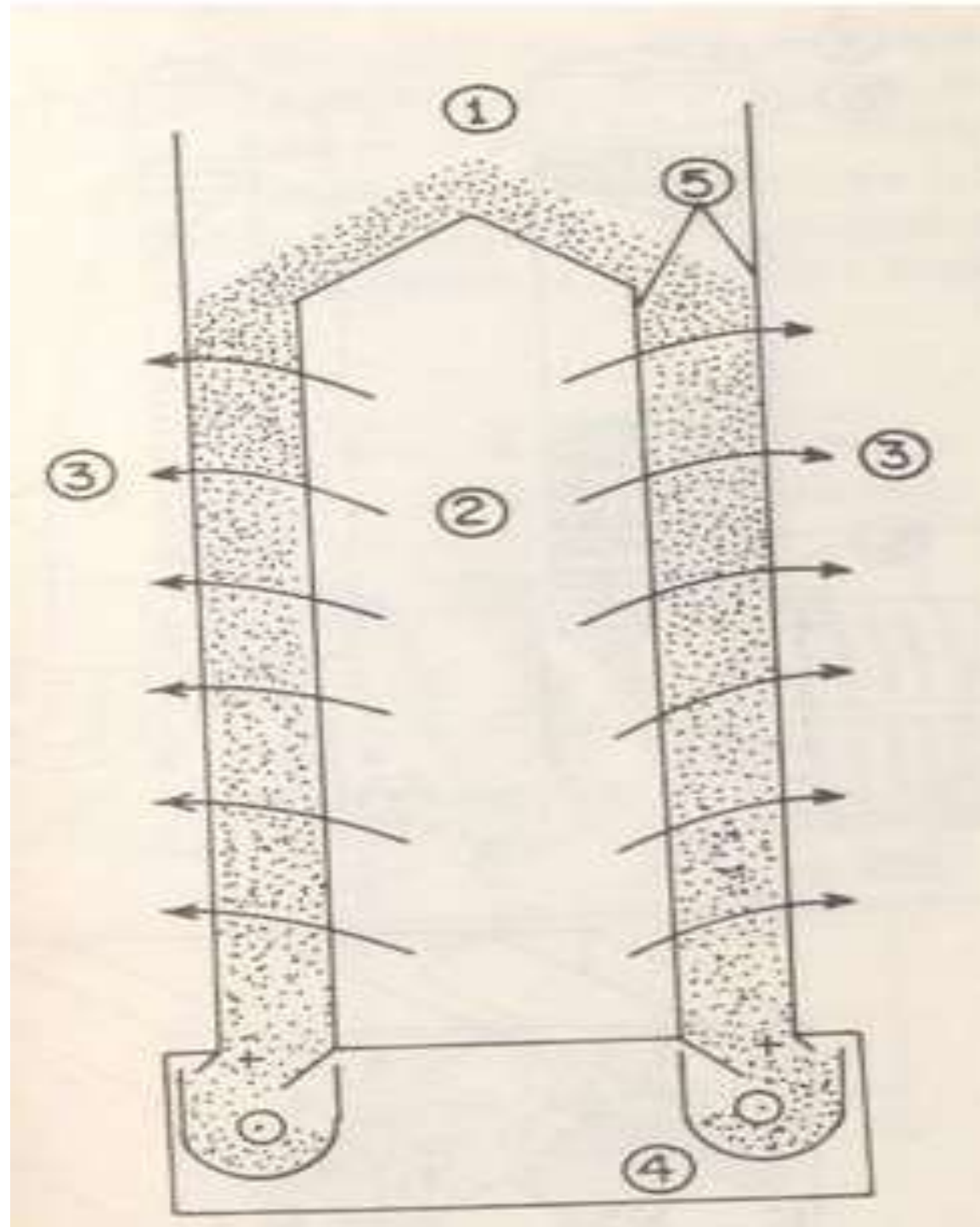


Deep Bed Drying





Deep Bed Drying



- Feed hopper
- Plenum chamber
- Exit air
- Dry grain outlet
- Screened grain column



THANKYOU