



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 Fundamentals of Food Processing

I – YEAR II SEMESTER

UNIT III TYPES DRYERS

TOPIC – Spouted Bed Dryer & Pneumatic Dryer.

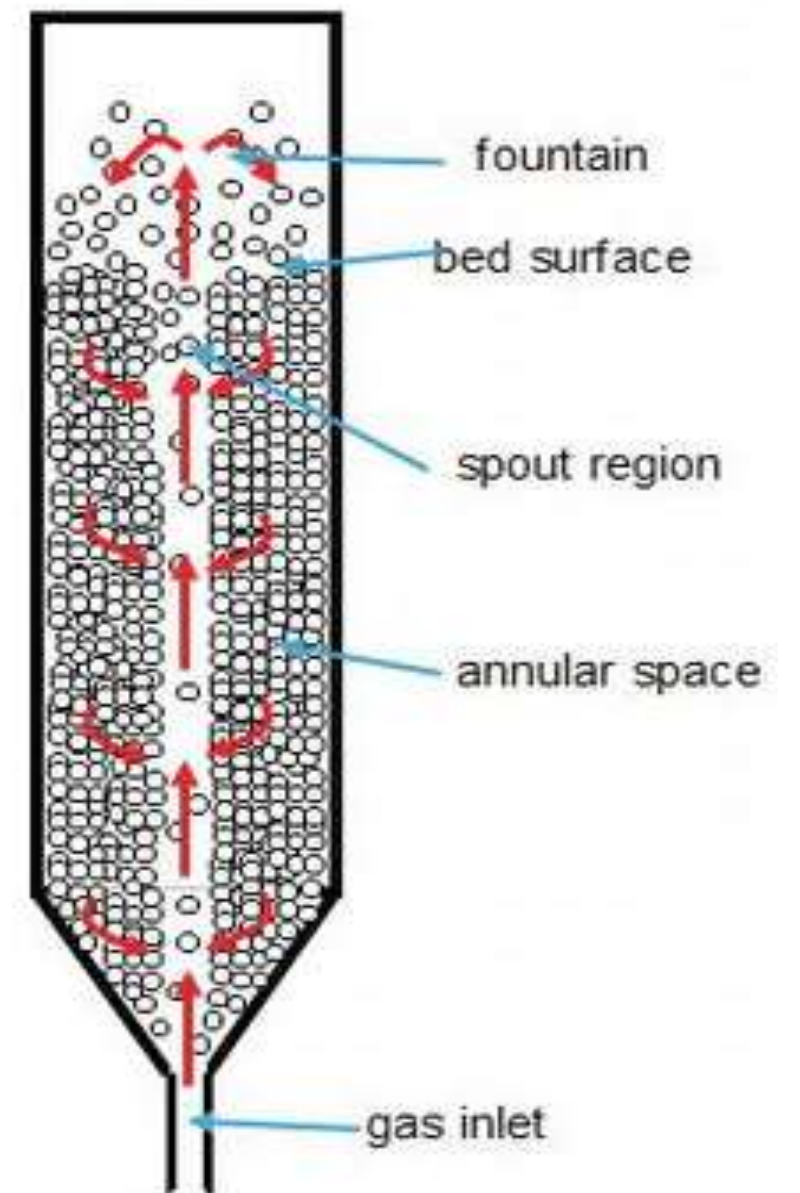


Introduction



- Spouted bed fluidization is the process in which the fluid is vertically introduced upwards at a suitable velocity through the center of the bottom granular material bed.
- The bed particles are carried up in the central jet by the fluid stream and on reaching the top medium layer they rain back onto the peripheral annular region. Next, they slowly move downward the column.
- The process cycle is repeated many times causing the bed's circulation

Classic spouted bed apparatus



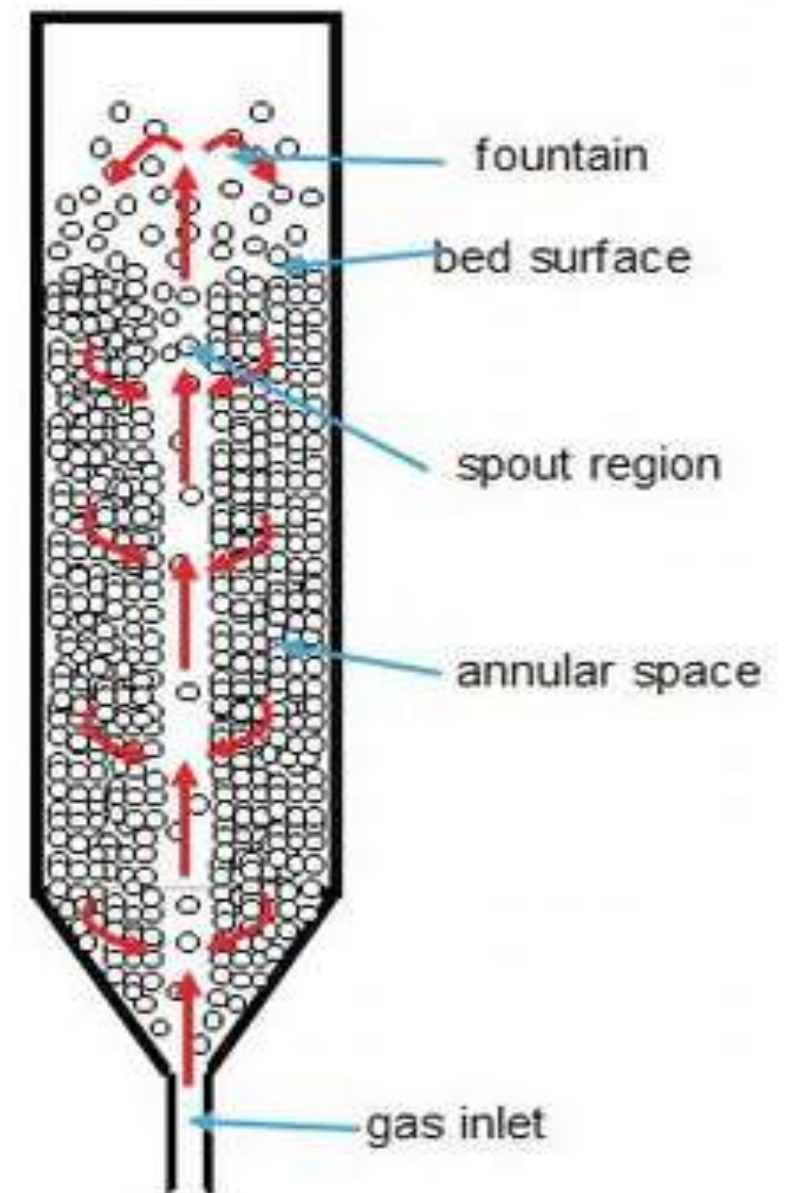


Introduction



- Areas of spouted bed fluidization application overlap with that of classic fluidization use; however, the mechanisms of fluid flow and bed elements motion differ substantially in both cases. The motion and mixing of particles in the spouted bed are regular and cyclic, imposed by the constant upward-flowing fluid jet, opposed to a more random and complicated particle motion in the conventional fluidized bed

Classic spouted bed apparatus



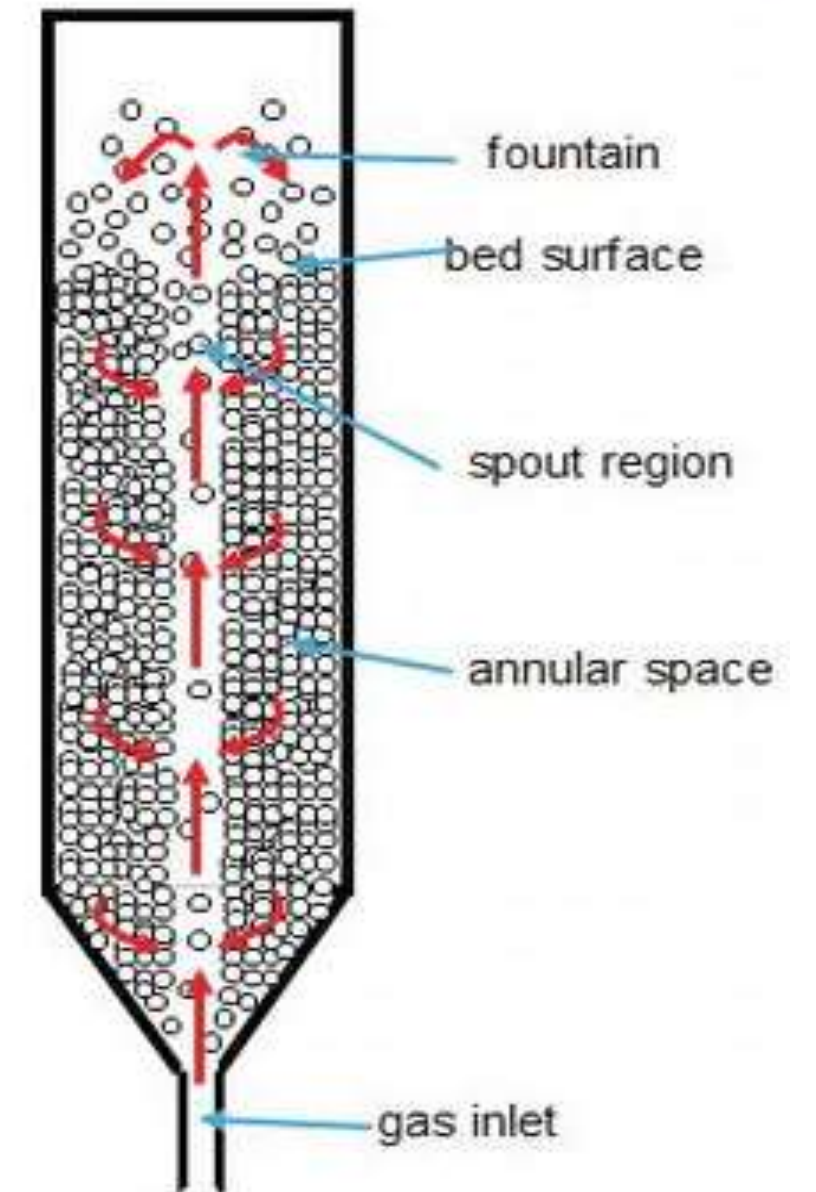


Application



- **Spouted Bed Dryers** introduced an improved drying technique for groundnuts in an attempt to reduce post-harvest losses in quality and quantity. The applicability of the spouted bed technique to drying of granular products that are too coarse to be readily fluidized (e.g. grains) was recognized in the early 1950s

Classic spouted bed apparatus

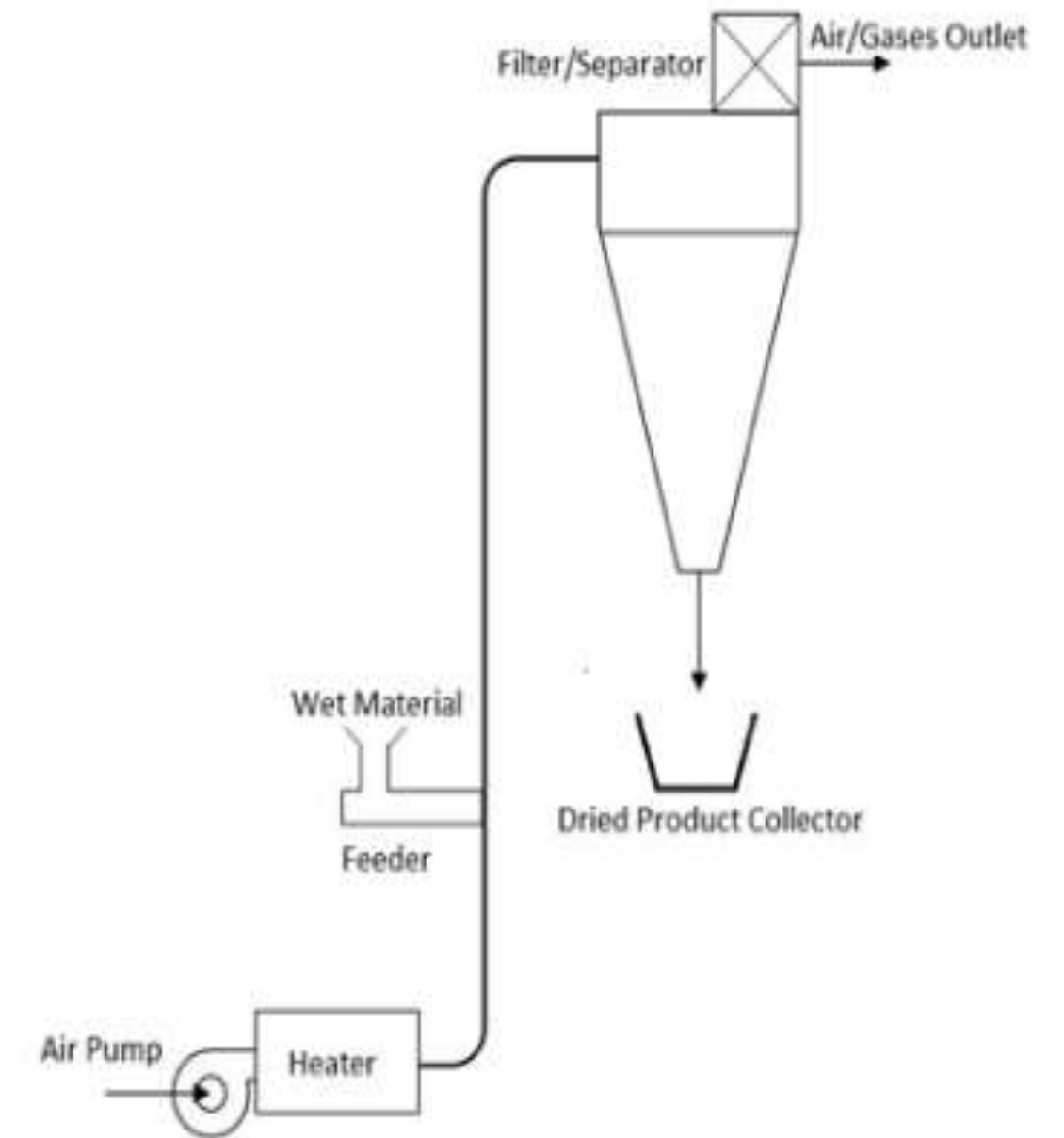




Pneumatic/ Flash dryers



- Pneumatic/ Flash dryers are direct drying units and are known as convective dryers. In pneumatic flash drying system particulate solids to be dried travels through the drying duct along with hot air and it get dried during transport in a hot gas stream. The pneumatic flash dryer system consist of below components: 1) Gas Heater, 2) Wet Material Feeder, 3) Drying Duct, 4) Separator, 5) Exhaust Fan, and 6) Dried Product Collector.

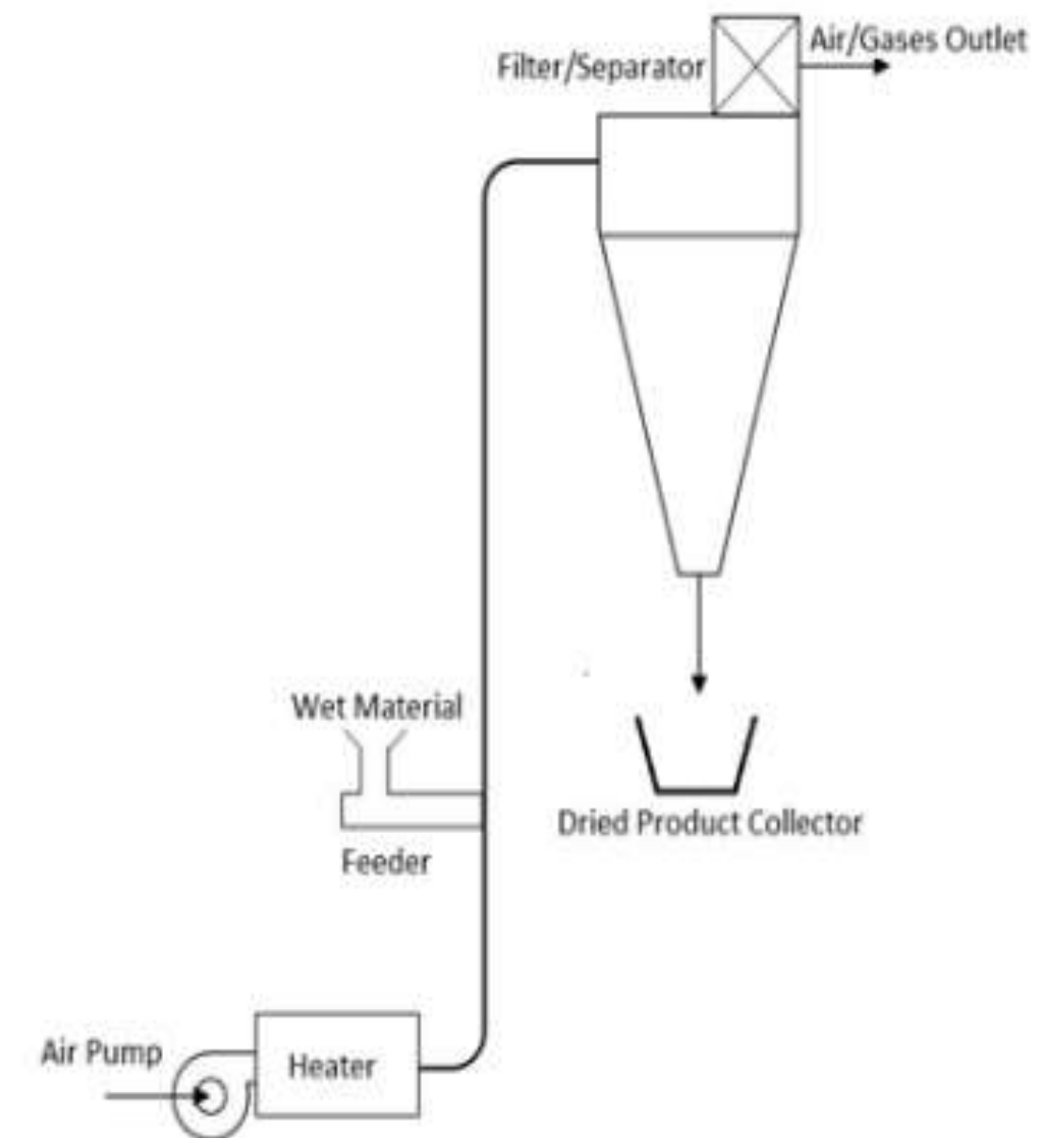




Working of Pneumatic/ Flash dryers



- The material to be dried is fed into hot air/gas stream, the stream flows up the drying tube. The gases travel within the stream with velocity higher than the velocity of largest particle. The flash dryer are usually suitable for the removal of external moisture as the contact time between the hot air/gas stream and particle are for very short time. The Dried material and air/gas stream both are collected in separator unit, separator arrangement help to disperse the dried material from the gas stream. It must comply with the regulations for pollution control. For this purpose cyclone dust separators, fabric filters, electrostatic precipitators, wet scrubbers, and fabric filters are used.

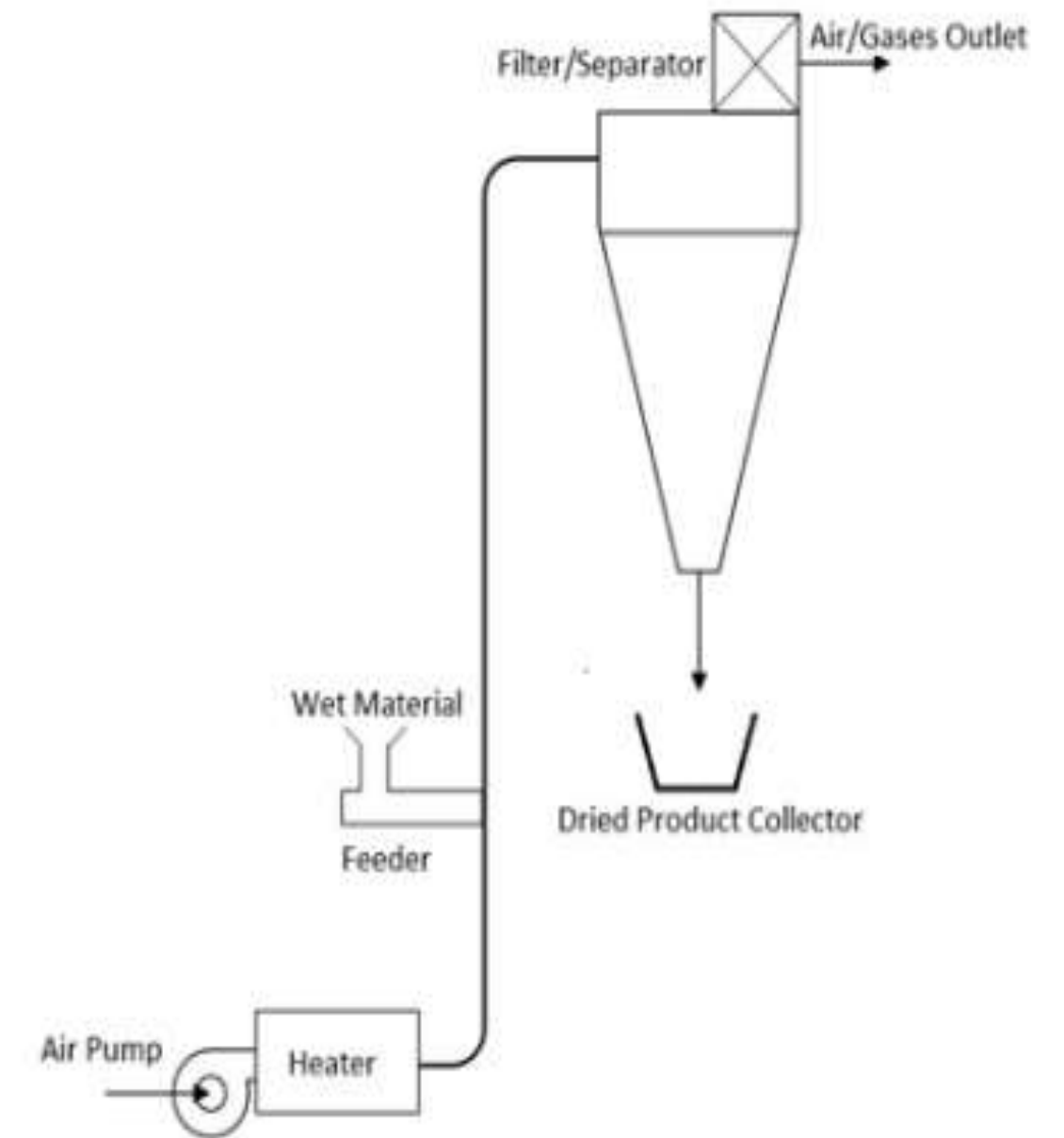




Application of Pneumatic/ Flash dryers



- Drying of Bread Crumbs
- Drying of Cornstarch
- Drying of Corn Gluten
- Drying of Casein
- Drying of Gravy Powder
- Drying of Soup Powder
- Drying of Vegetable Protein
- Drying of Spent Tea
- Drying of Wheat Starch
- Drying of Soybean Protein
- Drying of Meat Residue
- Drying of Flour





THANK YOU