

Study of Pharmaceutical Machinery: Construction and Working

Practical 07 | Pharmaceutical Engineering

Aim

To study Pharmaceutical Machinery: Construction and Working, and interpret the recorded observations.

Principle

- Compare compression in a rotary tablet press, coating in a fluidized bed, gas-driven size reduction in a fluid-energy mill and moisture removal in a dehumidifier.
- The construction and operating principle determine the function of the equipment.
- The practical distinguishes the input, working zone, controlled variables and output.
- Rotary tablet press: a feeder supplies dies on a rotating turret; punches perform filling, compression and ejection. Application: repeated tablet compression.
- Fluidized-bed coater: controlled air suspends the particles while an assigned spray deposits coating. Air distribution, atomization and drying balance affect the coat.
- Fluid-energy mill: high-velocity gas creates particle impacts/attrition in the milling chamber. The assigned classification arrangement separates the suitable product fraction.
- Dehumidifier: a condensation or desiccant system removes water vapour from air. Air temperature, moisture load and airflow affect its performance.

Materials and Apparatus

- Labelled demonstrations or schematics of the four specified machines.
- Assigned equipment demonstration, labelled schematic or manufacturer-approved training material.
- Observation sheet and any instructor-supplied performance readings.

Method

1. Identify the major components on the actual equipment or training diagram.
2. Trace the material, energy or signal path through the system.
3. Observe the instructor demonstration and note the purpose of each control.
4. Record the operating variables and the output relevant to the exercise.
5. Relate the equipment principle to its pharmaceutical application.
6. Summarize the variables that influence performance and the checks required before operation.

Observation Record

Complete this record using actual laboratory findings or the provided teaching data.

Observation / parameter	Record / finding
Machine	_____
Major components	_____
Material path	_____
Operating variable	_____
Pharmaceutical application	_____

Calculations and Interpretation

- Calculate a performance metric only when a suitable set of demonstration readings is supplied.

Result

Record the actual finding, calculated value with units where relevant, and a conclusion supported by the observations.

Finding: _____

Conclusion: _____

Precautions

- Use equipment demonstrations and trained operation for moving, hot or pressurized components.
- Do not bypass guards, interlocks or the assigned operating limits.
- Distinguish operating performance from the appearance of the machine.

Viva Questions

1. Why trace the material or energy path?

It connects the equipment construction to the process it performs.

2. Why are operating variables recorded?

They are needed to explain or reproduce the observed performance.

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