VALIDATION OF PACKAGING

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Outline…

PART I
- Definition of Validation
- Validation VS Qualification
- Definition of Process validation
- Process validation of Solid dosage form

PART II
- Process validation of Liquid dosage form
- Process validation of Semi-solid dosage form
- Process validation of Sterile product

PART III
- Qualification

PART IV
- Validation of Packaging

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PACKING

☑ Pharmaceutical packaging : has to be carried out for purpose of the safety of the pharmaceutical preparations in order to keep them free from contamination, hinder microbial growth, and ensure product safety though the intended shelf life for the pharmaceuticals.

Characteristics of packing materials :

- ☑ Must be FDA approved
- ☑ Must be non toxic
- ☑ Must not impart odor/taste to the product
- ☑ Must not reactive with the product
- ☑ They must protect the preparation from environmental condition

Several key areas that affect Packing process :

- ☑ Packaging Material
- ☑ Packaging Equipment
- ☑ Training of operation

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1 Type of packaging material

☑ Primary packaging material :

"Material which directly comes in contact with medicinal product"

Ampoules

Vials

Strip package

Blister package

Bottle

☑ Secondary packaging material :

"Material with comes in contact with primary packaging material"

Print box

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1 Type of packaging material

☑ Printed packaging material :

"All packaging material which have anything printe on it "

Labels

☑ Tertiary packaging material :

"Used for bulk handling, ware house storage and transport shipping "

Carton boxes

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2 Packing Equipment

☑ Packaging equipment carriers higher contribution towards the packaging quality of pharmaceutical product.

☑ Modern technology enhances the productability as well as quality.

☑ E.g. Blister packaing machine,
Strip packing machine ,
Bottle packing machine

3 Training of operation

☑ Training of operator on packaging lines is integral part of equipment installation and qualification.

☑ Supplier should identified training Need and provide appropriate training.

☑ It is important to periodically review training requirements.

☑ Record of training and experience should be maintained.

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Pharmaceutical packing validation

- Packaging equipment qualification
  - Design qualification [DQ]
  - Installation qualification [IQ]
  - Operational qualification [OQ]
  - Performance qualification [PQ]
- Packaging process validation

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Packaging equipment qualification

Design Qualification

- User Requirements Specification — Prepare prior to purchase of equipment
  - Spec เครื่องมือ เครื่องจักร
- Functional Specification — Specification includes
  - Function การทำงานตาม URS
- Design Specificaion
  - รายละเอียดการออกแบบ

Purpose of equipment ,
Target production rate,
Size & location of equipment ,
Safety consideration
Types of maintenance required

DQ protocols is for conformance of the system to URS and GMP requirements.

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V – MODEL APPROACH

IQ

- IQ protocol is checklist to ensure that the system or equipment is properly is installed.
- In this engineering drawing should be checked and updated as appropriate.

OQ

- OQ protocol will challenge to system to demonstrate that it can operate within specified parameters.
- Challenge the upper and lower operating limits, to test the process and system.

PQ

- PQ should performed in normal daily operation
- ☑ Testing of each piece of equipment
- ☑ Test interaction between different pieces of equipment
- ☑ Test all critical steps.

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Pharmaceutical packing validation

- Packaging equipment qualification
  - Design qualification [DQ]
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  - Operational qualification [OQ]
  - Performance qualification [PQ]
- Packaging process validation

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Packaging process validation

☑ Packaging process validation is performed when new product is being packed for the first time on existing packaging line, using current or new packaging material.

☑ Packaging process validation refers to monitor process for establishing documented evidence to ensure that the process variables including the critical process parameter are under control and to demonstrate that the process consistently produces a product meeting its predetermined specifications and quality attributes.

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Validation protocol

☑ Purpose
☑ Scope
☑ Equipment for packaging
☑ Details for material
☑ Short description of the process with a summary of the critical processing steps or critical parameters to be monitored during validation.
☑ Acceptance criteria
☑ Sampling plan
☑ Details for recording form and evaluation of results.

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Validation report

☑ Introduction : A description of the objectives of the study.

☑ Summary : A summary and discussion of the results organized in the sequence set out in the protocol, including a summary of deviations (if any).

☑ Conclusions and recommendations :

A general conclusion for all verifications and observations indicating the acceptability of the equipment for operation. Recommendations and remarks can be incorporated in this section.

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Justification of skipping filling validation

Validation of tablet / capsule products filling may not be performed provided that …

☑ Employing manual or semi – automatic process.
☑ A 100% inspection of sealed strips or blisters is carried out prior to packaging step.
☑ Appropriate in-process control (IPC) is carried out.
☑ Stability data, for finished products undergoing the same filling procedure, are in place.

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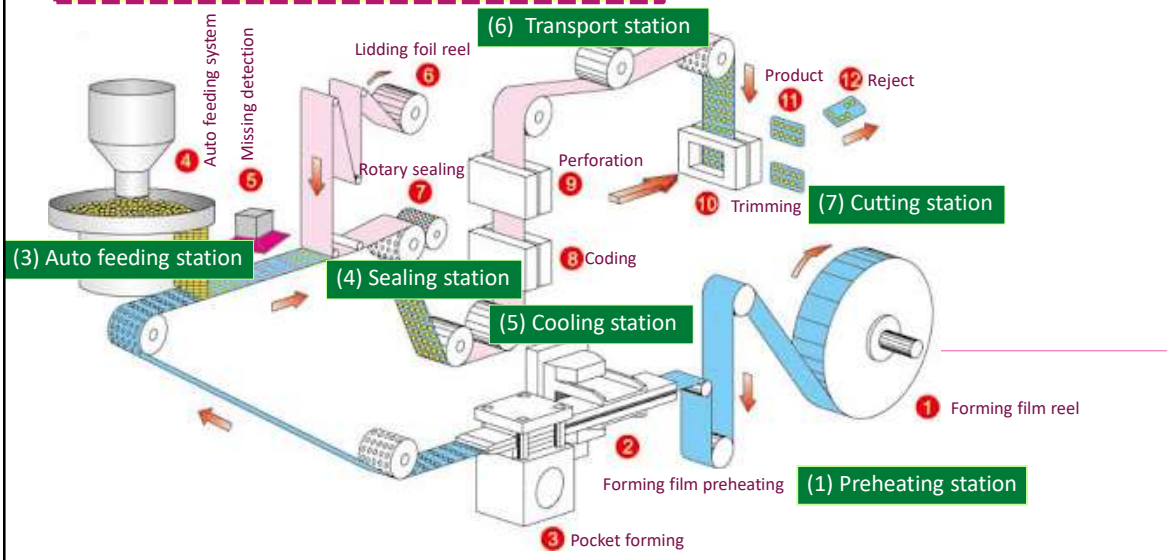
Blister packaging for tablets



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Primary blister packaging for tablets

CPP

- Forming station
  -Upper and lower temperature
- Feeding station (Vibrator)
  -Upper feed – Lower feed
- Sealing station
  -Upper and lower heater temperature
  -Low pressure –Hight pressure
- Cooling station
  -Upper and lower temperature
- Machine speed (Stokes/min)
  -Upper feed - lower feed

Film derivery (PVC sheet)

Head treatment to PVC sheet

Blister forming from PVC sheet

Filler-Tablet filling to blister

Sealing of blister by aluminum foil

Cooling of blister

Cutting of blister

Rejection system

Aluminium foil delivery

Printing labeling details on Aluminium foil

CQA

- Quantity of products per blister pack
- Apperance
- Leak test

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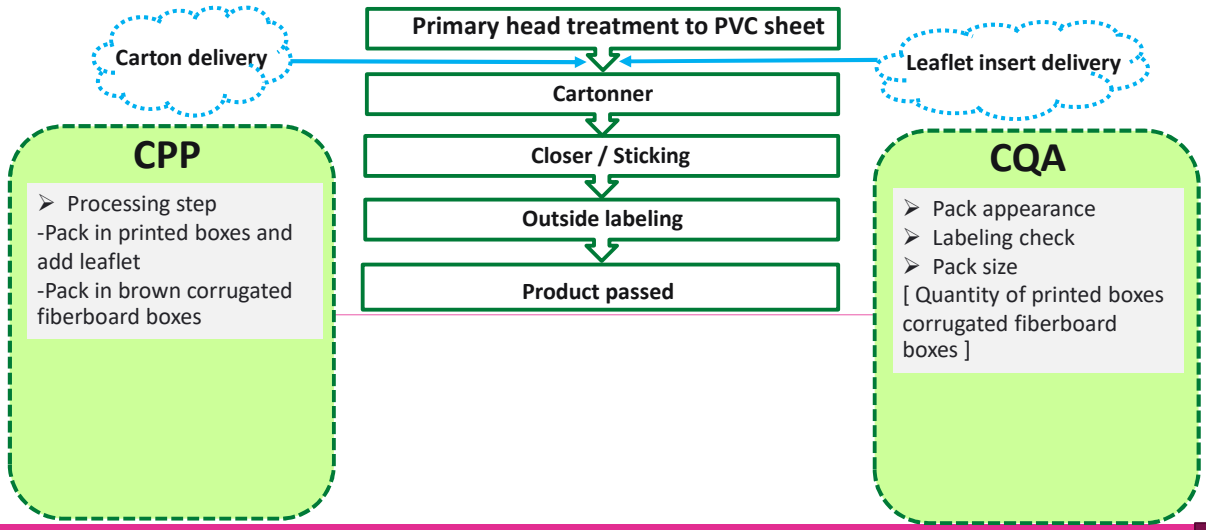
Secondary blister packaging



CPP

- Processing step

-Pack in printed boxes and add leaflet

-Pack in brown corrugated fiberboard boxes

CQA

- Pack appearance
- Labeling check
- Pack size

[Quantity of printed boxes corrugated fiberboard boxes]

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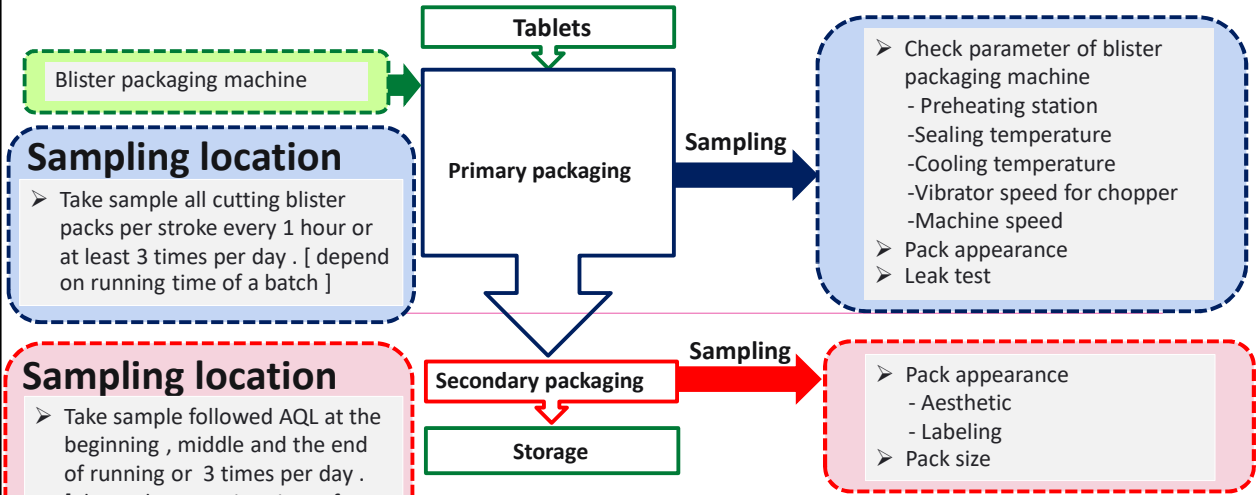
The process flow diagram of Blister packaging



Sampling location

- Take sample all cutting blister packs per stroke every 1 hour or at least 3 times per day . [depend on running time of a batch]

- Check parameter of blister packaging machine
  - Preheating station
  -Sealing temperature
  -Cooling temperature
  -Vibrator speed for chopper
  -Machine speed
- Pack appearance
- Leak test

Sampling location

- Take sample followed AQL at the beginning , middle and the end of running or 3 times per day . [depend on running time of a batch]

- Pack appearance
  - Aesthetic
  - Labeling
- Pack size

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Bottle packaging machine

Silica gel inserter

Tablet/Capsule counter

Sampling

Rotary capper

Induction seal

Labeling machine

Sampling

Product

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Bottle packaging (primary and secondary)

CPP

- Silica gel inserter
  - -Set the silica gel inserter with the construction parameter (roll feeding, cutting, conveyor)
- Tablet / Capsule counter
  - - Number of bottle per minute (BPM)
  - -Vibrator speed
- Rotary capper
  - -Speed (BPM)
  - -Conveyor (RPM)
  - -Cap feeder (%)
  - -Chuck speed (RPM)
  - -Capping torque
- Induction seal
  - -Sealing check (set power %)
- Labeling machine
  - -Bottle feeding speed (BPM)
  - -Labeling check
- Packing in printed boxes and brown corrugated fiberboard boxes

Primary bottle packaging

Silica gel inserter

↓

Tablet / Capsule counter

↓

Rotary capper

↓

Induction seal

Secondary bottle packaging

Labeling machine

↓

Packing in printed boxes

↓

Brown corrugated fiberboard boxes

CQA

Primary bottle packaging

- Check silica gel in the bottle
- Quantity in bottle
- Aesthetics
- Leak test
- Aluminium foil lid sealed tightly
- Loose

Secondary bottle packaging

- Pack appearance (Aesthetic)
- Labeling check
- Pack size (Quantity of printed boxes per brown corrugated fiberboard boxes)

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The process flow diagram of bottle packaging for tablets

One complete set of packing machine (bottle packing)

Tablets

Primary packaging

Secondary packaging

Storage

Sampling location

- Take 2 bottles every 1 hour or at least 3 time per day to perform visual inspection and use 1 bottle to perform leak test [depend on running time of a batch]

Sampling

Check current parameter
- Vibrator speed
  - Speed (BPM)
  - Conveyor (RPM)
  - Cap feeder (%)
  - Capping torque
- Pack appearance (aesthetics)
- Leak test (sealing quality)

Sampling location

- Take sample followed AQL at the beginning , middle and the end of running or 3 times per day . [depend on running time of a batch]

Sampling

- Pack appearance
  - Aesthetic
  - Labeling
- Pack size

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