Industrial Pharmacy II
5th Stage
College of Pharmacy



Lab 2:
Tablet Dosage Form

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Msc in Pharmaceutics

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Semester: 1st

Introduction

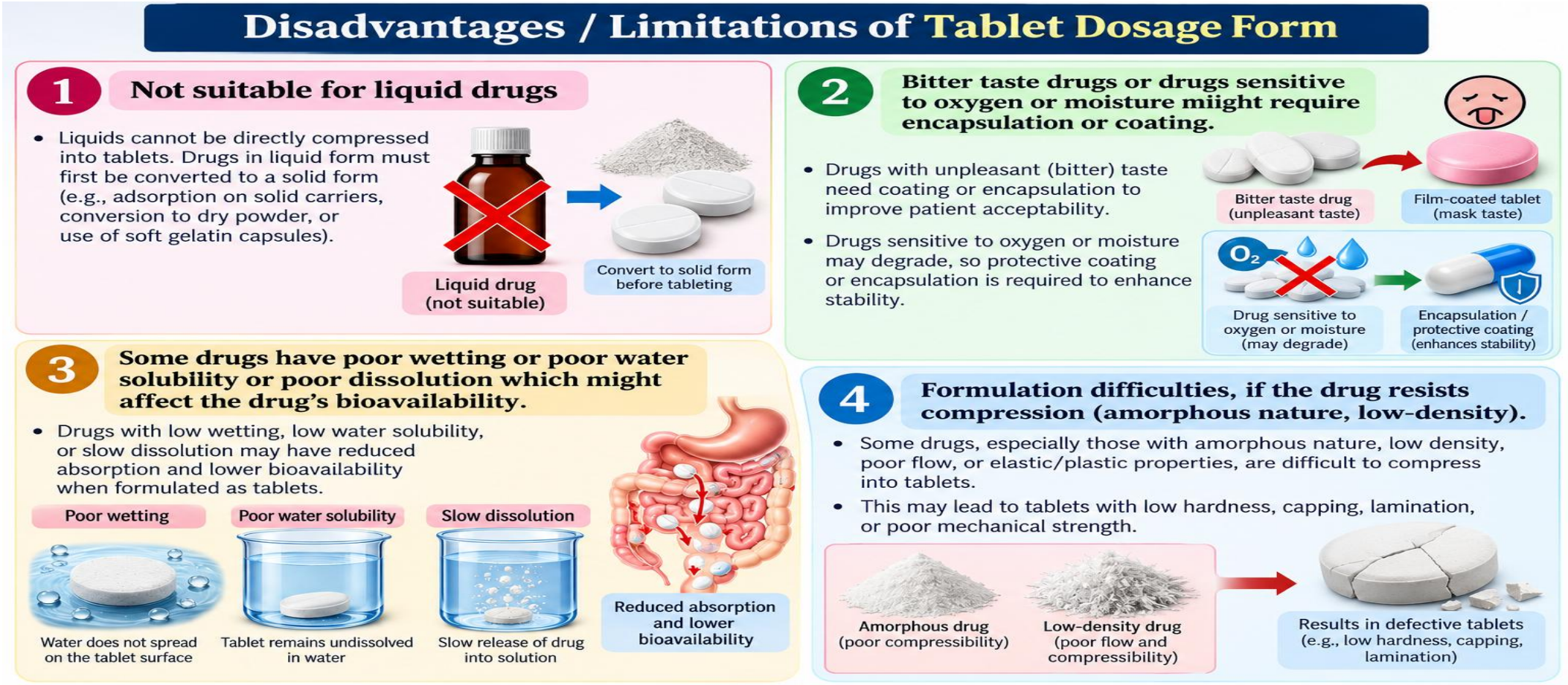
- **Tablets** are solid dosage forms usually prepared with the aid of suitable pharmaceutical excipients.
- They may vary in Size, shape, weight, hardness, thickness, disintegration, and dissolution characteristics
- **Tablets are classified according to** The *Route of administration of tablets* And in other aspects; depending upon their *intended use and method of manufacturing*



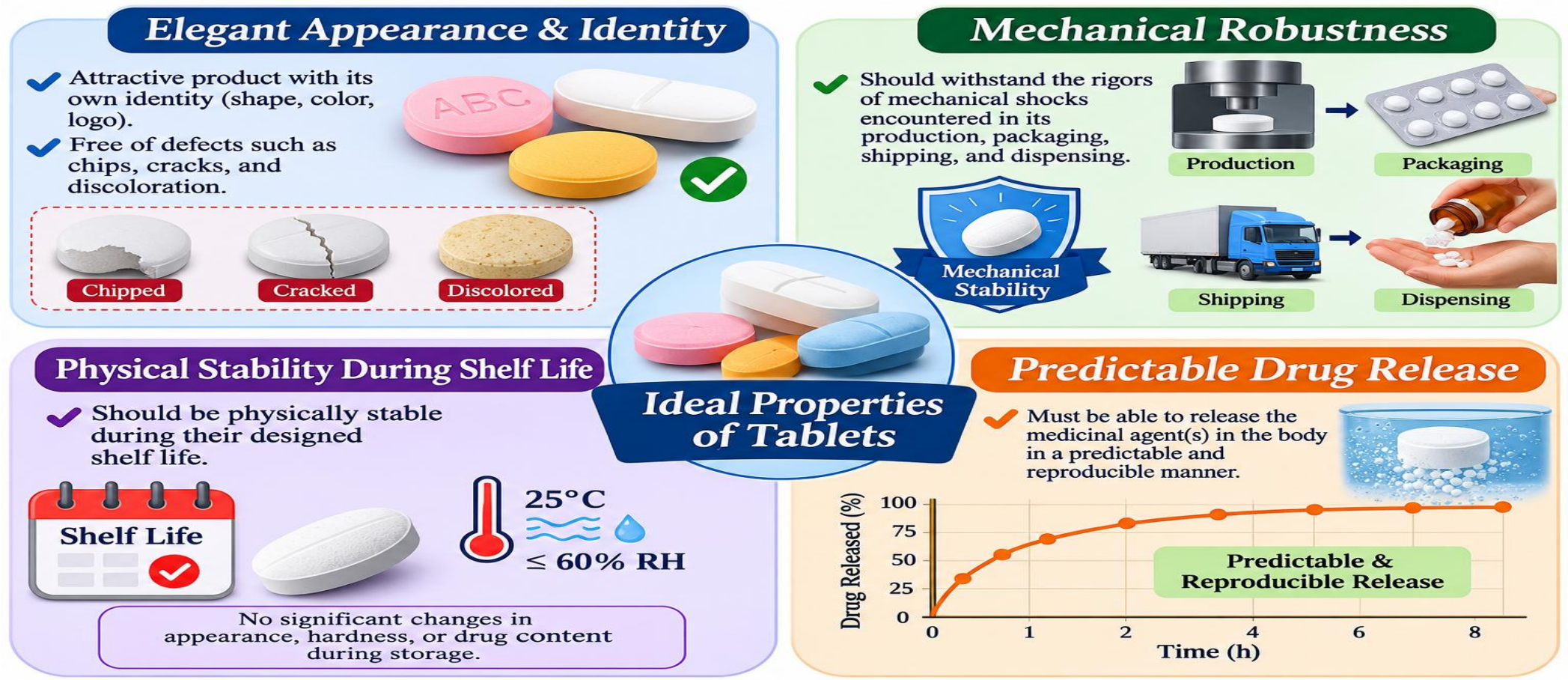
Advantages


1 Can be coated or designed for delayed release
• Can be film-coated (improve appearance, mask taste, protect from moisture).
• Can be enteric-coated or formulated for delayed/controlled release.
Film-coated
Enteric-coated (delayed release)
Controlled/ sustained release
2 Patient acceptability
• Portable
• Easy to swallow, especially if coated (smooth surface).
3 Relatively easy to manufacture and package
• Simple and well-established manufacturing processes.
• Economical (low cost per unit).
Advantages of Tablet Dosage Form
4 Provide accurate dosing (Unit dosage form)
• Each tablet contains a precise amount of active ingredient.
• Ensures consistent and reliable dosing.
500 mg
5 Increased stability of the drug
• More stable than liquid dosage forms (less prone to chemical degradation).
• Better resistance to microbial growth.
Liquid dosage form (less stable)
Tablet dosage form (more stable)
6 Product identification is easy
• Tablets can be embossed, engraved, or imprinted with codes, logos, or letters.
• Helps in identification, reduces medication errors, and improves patient compliance.
A
500
GX
M
7 Convenient for transportation and storage
• Lightweight and compact.
• Easy to carry and store (high portability).
8 Flexible design
• Can be formulated to suit different therapeutic needs (immediate release, modified release, chewable, dispersible, etc.).
Immediate release
Chewable tablet
Dispersible tablet
Modified release

disadvantages



Ideal properties of tablets



Ideal properties of tablets

- Elegant products have their own identity while free of defects such as chips, cracks, and discoloration.
- Should withstand the rigors mechanical shocks encountered in its production, packaging, shipping, and dispensing.
- Should be physically stable during their designed shelf life.
- Must be able to release the medicinal agent(s) in the body in a predictable and reproducible manner.

Ingredients used in tablets

- Drugs
- Tablet Excipients

Tablet Excipients

Fillers or diluents (bulking agent)

- To make a reasonably sized tablet
- Improve cohesion, permit direct compression, promote flow.

- It is essential that fillers be inert and stable.
  - A - **Soluble** : lactose , sucrose , mannitol , sorbitol .
  - B- **Insoluble**: calcium sulfate, dibasic calcium phosphate (low moisture), starch, calcium carbonate.

✓Filler must be:

✓Having good flowability and compressibility.

✓ Inert, cheap, tasteless, able to disintegrate,e and stable

Tablet Excipients

Binders (adhesives):

- To promote adhesion of particles of formulation and enable granulation also maintenance of integrity of the final tablet
- Binders may be added as:
  - Dry powder in dry granulation
  - Solution in wet granulation
- They are either sugars or polymeric materials
- **Examples**
  - Water
  - Ethanol
  - Acacia mucilage (10-20%)
  - Gelatin solutions (2-10%)
  - Starch mucilage (5-10 %)
  - PVP(3-15%)

Tablet Excipients

Lubricants, glidants, and anti–adherents:

- **they prevent the most common problem during tableting.**
  - **Lubricants:** e.g. magnesium stearate
    - Reduce friction between the tablet material and the equipment (punches and die walls) during compression and ejection.
    - Prevent sticking of the tablet mass to the punches and dies.
    - reducing wear on equipment and preventing tablet defects like capping or lamination.
    - Lubricants are usually added at the very last step before compression
  - **Glidants :**
    - Reducing friction between the particles
    - To improve the flow properties of the granulations (spherical)
    - e.g. talc, Silica derivatives
  - **Anti–adherents:** Function to prevent tablet granulation from sticking to the faces of the punches and the die walls e.g. talc, and starch.

Tablet Excipients

Disintegrants :

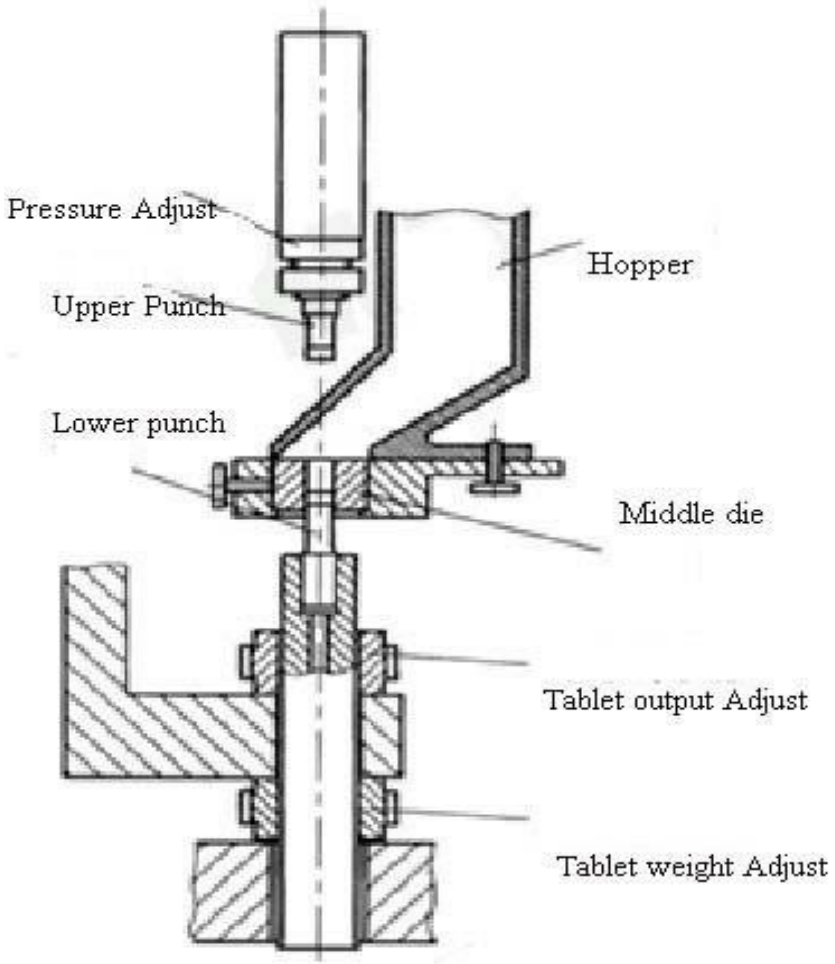
- To promote the breakup of the tablets into small particles
  - To promote rapid release of the drug and thus rapid availability
- **Method of adding disintegrant** :
  - It is better to add it in two portions, one half is added to the powdered components before the wet granulation process and the remaining portion is added to the finished granulation just prior to the compression.
    - This method Optimizes disintegration by promoting both granule breakup and tablet disintegration.
  - Common Disintegrants Used : Starch (5-20% w/w) , Avicel (5-20 % w/w) , Alginic acid (5-10 %w/w) ,Bentonite (5-15 % w/w)

Tablet Excipients

- **Dissolution agents (enhancers and retardants)**
- **Wetting agents: increase wettability by using surfactant like SLS**
- **Antioxidants**
- **Preservatives**
- **Coloring agents: improve appearance and distinguish products from each other.**
- **Flavoring agents and sweetening agents: improve taste and flavor like lozenges and chewable tablets e.g. mannitol and artificial sweetener.**

Single Punch Tablet Machines

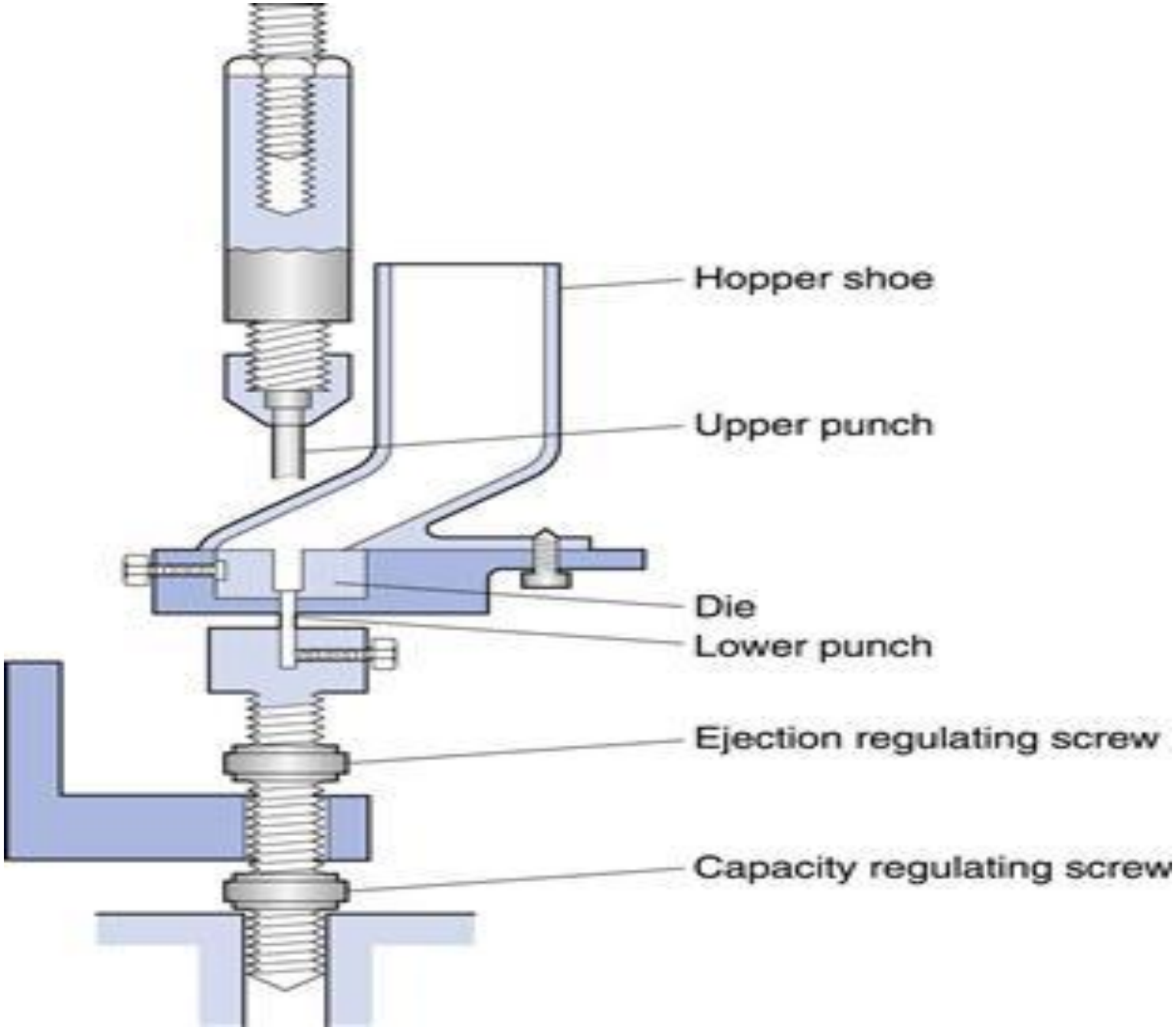
- Consists of hopper which delivers the powder blend into the die
- The die which gives the size and shape of the tablet
- The upper punch and lower punch are moving to fill the die and eject the tablet



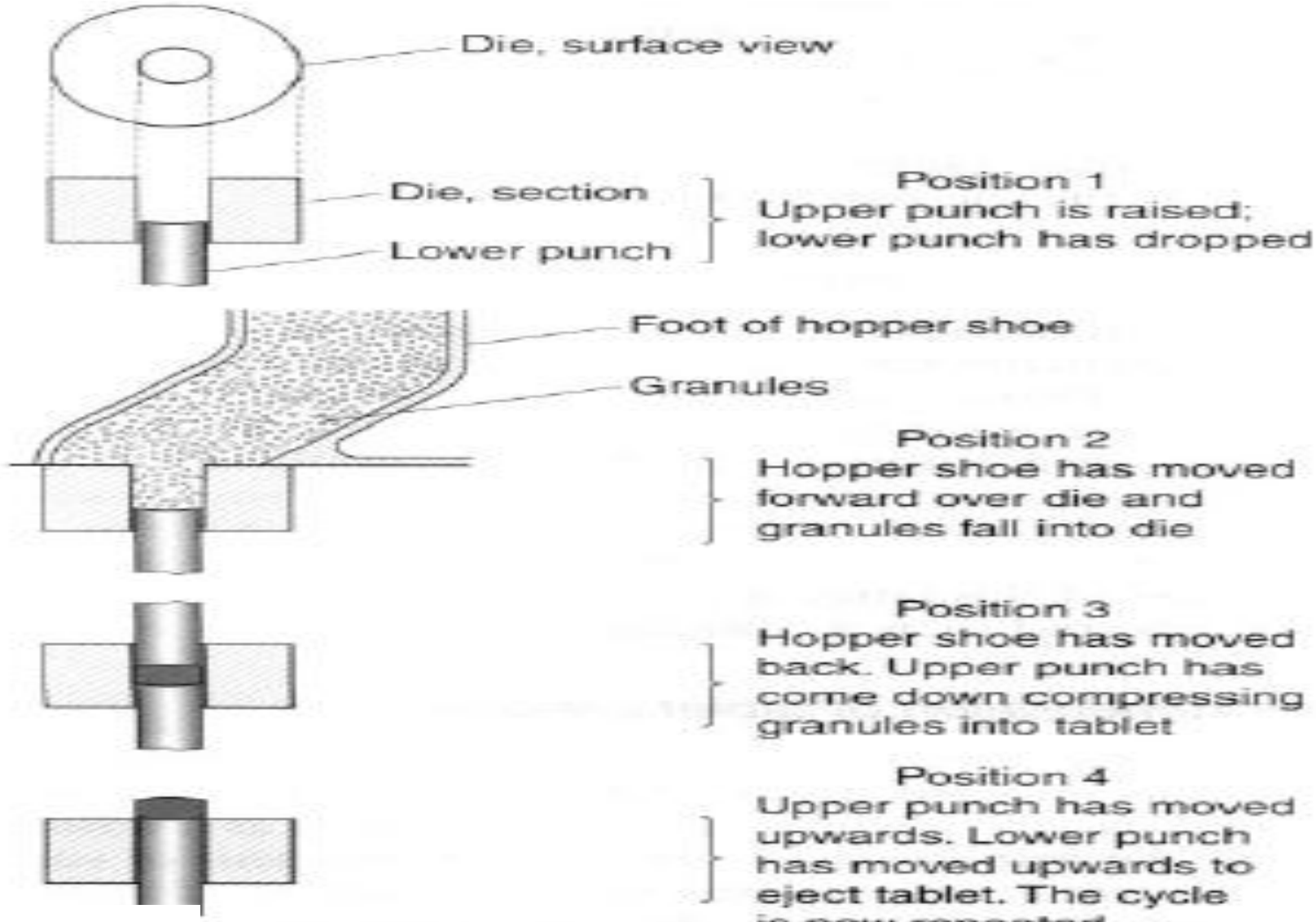
Single punch Press machine

Tablet compression machine

- **Hopper** for holding and feeding granulation (or powder) to be compressed
- **Feed frame** for distributing granulation from the hopper into the dies
- **Dies** for controlling the size and shape of the tablet
- **Punches** for compressing the granulation within the dies
- **Cam** tracks for guiding the movement of the punches



Single Punch Tablet Machines



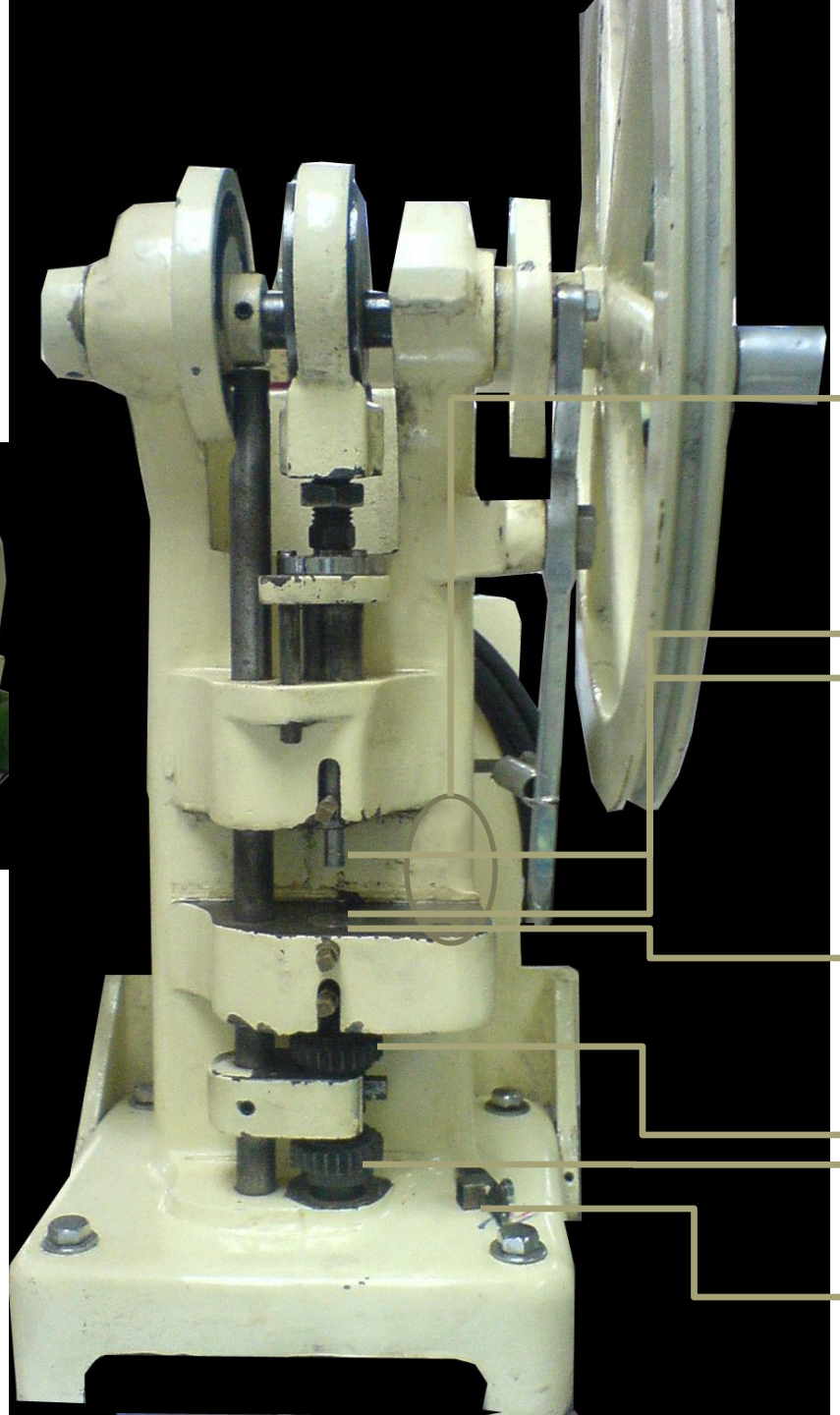
The sequence of events involved in the formation of tablets.

Compression process

- **Filling**
  - By gravitational flow of powder from hopper via the die table into die. The die is closed at its lower end by the lower punch.
- **Compression**
  - The upper punch descends and enters the die and the powder is compressed until a tablet is formed.
  - During the compression phase, the lower punch can be stationary or can move upwards in the die.
  - After maximum applied force is reached, the upper punch leaves the powder i.e. the decompressed phase.
- **Ejection**
  - During this phase, the lower punch rises until its tip reaches the level of the top of the die. The tablet is subsequently removed from the die and die table by a pushing device.

Single Punch Machine (Tablets)











Upper and Lower Collar

Collar locker

Tablet production methods

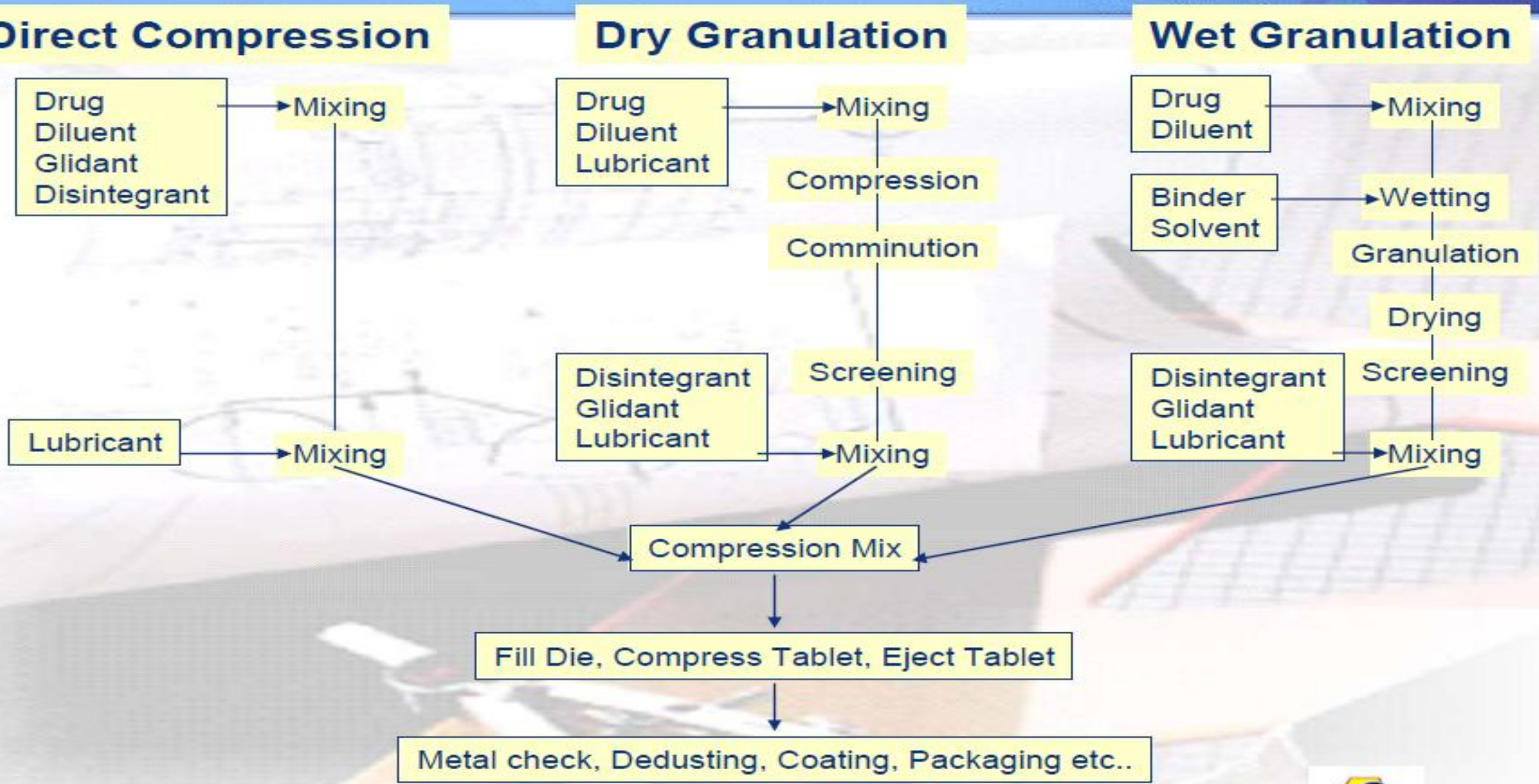
Dry methods

- Direct compression
- Dry granulation

Wet methods

- Wet granulation

Process Route for Tablet Manufacture




I Holland: The Tabletting Cycle
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TABLETTING SCIENCE
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المزيد من الفيديوهات
يمكنك النقر هنا أو التمرير بسرعة للأعلى لعرض جميع الفيديوهات


Thank You