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TABLET: A COMPLETE REVIEW

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ABSTRACT

Tablet is a unit solid dosage form prepared either by compression or by molding with or without suitable diluents. Tablets are classified into two types: compressed and molded tablets. Tablets contains some excipients with the active pharmaceutical ingredients such as diluents to increase the bulk of the tablet. Tablets can be manufactured by three methods: dry granulation, wet granulation and direct compression. Direct compression is most effective and shortest way to produce tablets. To evaluate quality of the tablets certain test such as friability, hardness test can be done before it is transported or marketed.

KEYWORDS: Tablets, solid dosage form, Excipients, Granulation, compression, ball mill, Manufacturing defects, coating, friability, dissolution, disintegration.

INTRODUCTION

The oral route is the most common way of administering drugs and among the oral dosage forms, tablets of various kinds are the most common type of solid dosage form in contemporary use.[1] Tablets may be defined as the solid unit dosage form of medicament or medicaments with or without diluents and prepared either by molding or by compression.[2] The term 'tablet' is derived from a Latin word "tabuletta" is associated with the appearance of the dosage form, i.e. tablets are in shapes like round, oval, oblong, cylindrical, square, triangular etc.[1,2]

Properties[3]

- The product must have its own identity while being free of defects such as chips, cracks, discolouration and contamination.
- Possess strength to withstand the rigors of shocks encountered in its production, packaging, shipping and dispensing.
- Should have the chemical and physical stability to maintain its physical attributes over time.
- Improved bioavailability.

Advantages[4]

- Tablets are unit dosage form and offer the greatest capabilities of all oral dosage form for the greatest dose precision and the least content variability.
- Cost is lowest of all available dosage forms and is light as well as compact.
- Easy to swallow.
- By coating Objectionable odour and bitter taste can be masked.
- Processed for large scale production.

Disadvantages[4]

1. In case of children and unconscious patients it is difficult to swallow.
2. due to amorphous nature, low density character may resist to compression to form dense compacts.
3. Slow disintegration and dissolution may lead to bioavailability problems.

Types Of Tablets[5]

Mainly the tablets are classified into two classes-

a) Compressed Tablets
b) Molded Tablets

Fig. 1: Types of tablets.

The compressed tablets are usually prepared on large scale production methods whereas the molded tablets are prepared extemporaneously on a small scale.

These two main types are further classified as:
Compressed tablets

1. Oral tablets
2. Chewable tablets
3. Buccal/Sublingual tablets
4. Lozenge tablets
5. Soluble tablets
6. Effervescent tablets
7. Implants
8. Vaginal tablets (inserts)
9. Enteric coated tablets
10. Sustained action tablets
11. Sugar coated tablets
12. Film coated tablets
13. Layered tablets
14. Press coated tablets

Molded Tablets

1. Hypodermic tablets 2.Dispensing tablets.

Compressed Tablets: They are the foremost widely used solid dosage form in order that they must satisfy variety of physical requirements in terms of hardness, thickness, friability and weight uniformity.[6]

1. **Oral Tablets:** These tablets are swallowed as such. They are placed over the tongue and swallowed with a drink of water or any other suitable liquid. They are formulated to disintegrate in stomach and dissolve and absorption takes place from there.[5]
2. **Chewable Tablets**: These tablets are required to be broken and chewed in between the teeth before ingestion. Mostly administered to children who have difficulty in swallowing and also to some adults who dislike swallowing.[5]
3. **Buccal/Sublingual Tablets:** Sublingual and buccal medication administration are two different ways of giving medication by mouth. Sublingual administration involves placing a drug under the tongue to dissolve and absorb into your blood through the tissue there. Buccal administration involves placing a drug between your gums and cheek, where it also dissolves and is absorbed into your blood.[7,8]
4. **Lozenge Tablets:** Lozenges are the flavoured medicated dosage forms intended to be sucked and held in the mouth or pharynx containing one or more medicaments usually in the sweetened base.[9,10]
5. **Soluble tablets:** These tablets are required to dissolve completely within the liquid to produce solution of definite concentration. This may include mouth washes, gargles, skin lotions, douches, etc. the ingredients must be completely soluble in the solvent.[11]
6. Effervescent tablets: Many drugs do not have enough stability levels in the suspension form. Gastric residence also affects drug delivery. Gastro-retentive preparations are created to manage gastric residence. Effervescent mixtures and powders, and compound effervescent powders including saline cathartics are also used.[12,13]
7. **Implants:** These are small tablets meant for insertion under the skin by giving a little surgical cut into the skin which is stitched after the insertion of the tablets.[5]
8. **Vaginal tablets (inserts):** Vaginal suppositories or pessaries are prepared by compression which are also known as vaginal tablets. For the ease of insertion, they are ovoid or almond in shape.[5]
9. **Enteric coated tablets:** A polymer barrier is being applied on oral medication that prevents its dissolution or disintegration in the gastric environment.[14] This helps by protecting drugs from the acidity of the stomach, and delay the action of the drug.[15,16]
10. **Sustained action tablets:** These are designed to release (liberate) a drug at a predetermined rate in order to maintain a constant drug concentration for a specific period of time with minimum side effects.[17]
11. **Sugar coated tablets:** These are the compressed tablets which are given a sugar coating to mask the objectionable taste and odour of the drug as well as to protect the substances from atmospheric conditions.[5]
12. **Film coated tablets:** Various polymers are used for film coating which protect the drug substances from atmospheric conditions.[5]
13. **Layered tablets:** The granules of incompatible substances are compressed using special tablet making machines into two or more layers successively in the tablet.[5]
14. **Press coated tablets:** In these types of tablets, the granules of incompatible ingredient are compressed around the previously compressed tablet, can also be used for giving enteric coating and sustained release to the medicaments.[5]

Molded Tablets: While most commercially available tablets also can be prepared by compression, tablets can also be prepared by molding. Molded tablets are prepared by tablet machinery or manually by forcing dampened tablet material into a mold of any shape.[18] The formed tablet is then ejected from the mold and allowed to dry. Molding is generally reserved for laboratory and small-scale production.[19]

Hypodermic Tablets: These are soft readily soluble tablets which are made in a tablet triturate mold. They are used for preparing solutions to be injected, therefore in selecting the materials used for preparing the tablets care must be taken that they should be completely and readily soluble and no insoluble particle should be present.[5]

Dispemsing Tablets: These tablets are prepared for providing an accurate and convenient quantity of a drug that can be incorporated readily in compounding other dosage forms, powders or capsules thus eliminating the necessity of weighing small quantities of potent substances. These tablets are solely designed to provide a convenient quantity for administration as a dosage form because sometimes they contain very potent drugs which may prove fatal.[5]

Tablet Formulation: In the tablet-pressing process, content uniformity ensures that the same active pharmaceutical ingredient (API) dose is delivered with each tablet. Some APIs may be tableted as pure substances, but this is rarely the case; most formulations include excipients.[20]

An excipient may be a substance formulated alongside the active ingredient of a medicine, **[21]** included for the aim of long-term stabilization, bulking up solid formulations that contain potent active ingredients in small amounts (thus mentioned as "bulking agents", "fillers", or "diluents"), or to confer a therapeutic enhancement on the active ingredient within the final dosage form, such as facilitating drug absorption, reducing viscosity, or enhancing solubility.[22,23,24]

Different types of Excipients are

1. Diluents: The diluent is added in the formulation of a tablet, when the quantity of medicament in each tablet is very small and to increase the bulk of the tablet. The commonly used diluents are lactose, sucrose, mannitol. sorbitol, dextrose, starch, etc.[1]

2. Binders: Binders are used to hold the ingredients together. Binders make sure that tablets and granules are often formed with required mechanical strength.
Binders are usually:

Saccharides and their derivatives

a. Disaccharides: sucrose, lactose
b. Polysaccharides and their derivatives: starches, cellulose or modified cellulose such as microcrystalline cellulose and cellulose ethers such as hydroxypropyl cellulose (HPC);
c. Sugar alcohols such as xylitol, sorbitol or mannitol;

Protein: Gelatin;
Synthetic Polymers: Polyvinylpyrrolidone (PVP), Polyethylene Glycol (PEG).[21]

3. Granulating Agents: These are the substances which are added to powders during granulating process to convert fine powders into granules. The commonly used granulating agents are water, mucilage of acacia, tragacanth and starch; liquid glucose, syrup and alcohol in various dilutions.[5]

4. Disintegrating Agents: Disintegrants expand and dissolve when wet causing the tablet to break apart in the digestive tract, or in specific segments of the digestion process, releasing the active ingredients for absorption. They ensure that when the tablet is in contact with water, it rapidly breaks down into smaller fragments, facilitating dissolution.[25]

Examples of disintegrants include

- Crosslinked polyvinylpyrrolidone (crospovidone), crosslinked, sodium carboxy methyl cellulose (croscarmellose sodium).
- The modified starch sodium starch glycolate.[26]

5. Lubricants and Glidants

Lubricants: Lubricants are intended to prevent the adhesion of the tablet materials to the dies and punches, reduce inter particle friction, or may improve the rate of flow of the tablet granulation.
.

Glidants: Glidants are intended to promote flow of granules or powder materials by reducing the friction between the particles.

Commonly used lubricants: Stearic acid, talc, PEG, magnesium stearate, surfactants.

Commonly used glidants: corn starch, talc, silica derivatives: - colloidal silicas, syloid, etc.[27]

6. Colouring Agents: Colours are added to improve the appearance of a formulation. Colour consistency is important as it allows easy identification of a medication. Furthermore, colours often improve the aesthetic look and feel of medications. Small amounts of colouring agents are easily processed by the body, although rare reactions are known, notably to tartrazine.[26] Commonly used colouring agents are FD&C yellow 6-sunset yellow, FD&C Green 3-Fast Green, etc.[27]

7. Flavouring Agents: Flavours are often used to mask unpleasant tasting active ingredients and improve the acceptance that the patient will complete a course of medication. Flavourings may be natural (e.g. fruit extract) or artificial.[28,26]

For example, to improve[28]

- A bitter product - mint, cherry or anise may be used
- A salty product - peach, apricot or liquorice may be used
- A sour product - raspberry or liquorice may be used
- An excessively sweet product - vanilla may be used

8. Sweetening Agent: Sweeteners are added to form the ingredients more palatable, sugar can be used to mask unpleasant tastes or smells, but artificial sweeteners tend to be preferred, as natural ones tend to cause tooth decay.[26]

Commonly used agents are sugar, saccharin, aspartame.[27]

Tablet Manufacturing: Tablets are made by compressing formulation containing a drug or drugs with excipients on stamping machine called presses. The design and manufacture of pharmaceutical tablets is a complex multi-stage process.[29]

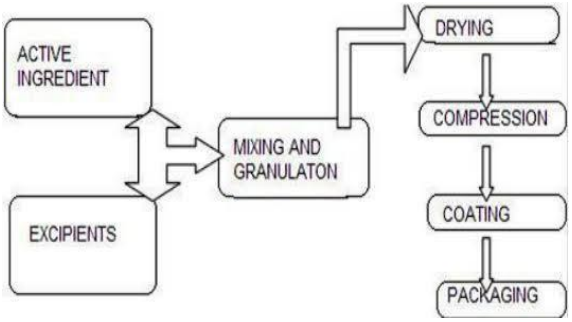


Fig. 2: General steps in tablet manufacturing.

Various steps in tablet manufacturing

1. Dispensing: It is the first step in tablet manufacturing process, may be done by manually by hand scooping from primary containers and weighing each ingredient by hand on a weigh scale, or in large scale with vacuum loading system and screw feed system.

2. Size reduction: It is an important step in tablet manufacturing comes with advantages such as:

- It increases surface area, which increases dissolution rate and bioavailability.
- It increases tablet content uniformity.
- Better flow properties of powders and granules.

Size reduction equipment e.g., hammer mill, vibration mill, roller mill, pin mill, fluidized energy mill, cutter mill and ball mill.

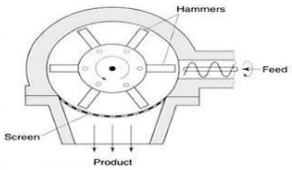


Fig. 3: Hammer Mill.

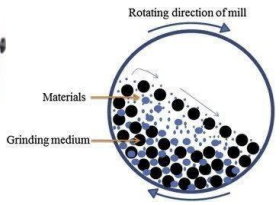


Fig. 4: Ball Mill.

3. Mixing/blending

The powders/granules blending are involved at stage of pre-granulation and /or post-granulation stage of tablet manufacturing.

The various blenders include pneumatic mixers (air- mix mixer or air-driven mixer), diffusion/ tumbling mixers (e.g., V-blender, double cone blender, cubic mixer, drum blender), convective mixers (e.g., ribbon blenders, orbiting screw mixers, horizontal high- intensity blenders, planetary blenders, diffusion mixer with intensifier bar/agitator, Forberg blenders, horizontal double arm mixers, vertical high-intensity mixer).

Fig. 5: Double Cone Blender.

4. Granulation: After particle size reduction and blending, the active ingredient along with the excipients are granulated to form granules with the help of a binder, which provides homogeneity of drug distribution in blend.

FIG 6 FLUIDIZED BED GRANULATOR

Fig. 7: Rapid Mixer Granulator

Granulators
Rotating shape granulators, mechanical agitator granulators (e.g., ribbon or paddle blender, sigma blade mixer, planetary mixer, orbiting screw mixers), high-shear granulator, fluidized bed granulator, dry granulator etc.

5. Drying: It is one of the important steps in formulation. It is important to keep the residual moisture low enough to prevent product deterioration and ensure free flowing properties.

Drying equipment e.g., spray dryer, rotary dryer, fluidized bed dryer etc.

6. Compression: After the preparation of granules (in case of wet granulation) or sized slugs (in case of dry granulation) or mixing of ingredients (in case of direct compression), they are compressed to get final product. The compression is completed either by single punch machine (stamping press) or by multi-station machine (rotary press).

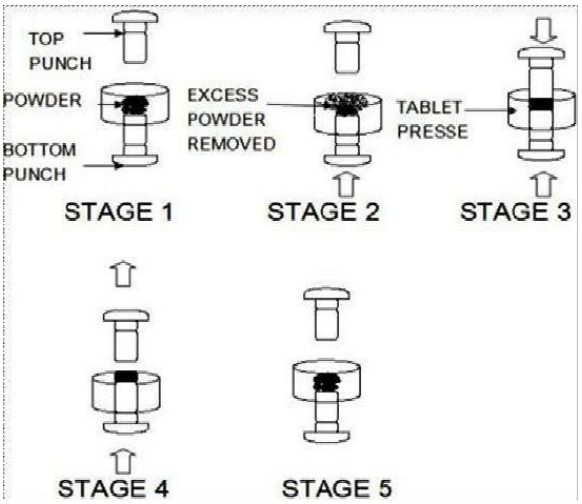


Fig. 8: Steps in compression.

7. Packaging: 'Blister packs' are a common form of packaging used for a wide variety of products. They are safe and easy to use.

Packaging machines e.g., blister packaging machines, strip packing machine, aluminium foil packaging machine, etc.[29]

FIG 9 TABLET COMPRESSION MACHINE

Tablet Manufacturing Methods
The various methods of tablet manufacturing are

1. **Granulation**
   a. **Wet granulation**
   b. **Dry granulation**

2. **Direct compression**

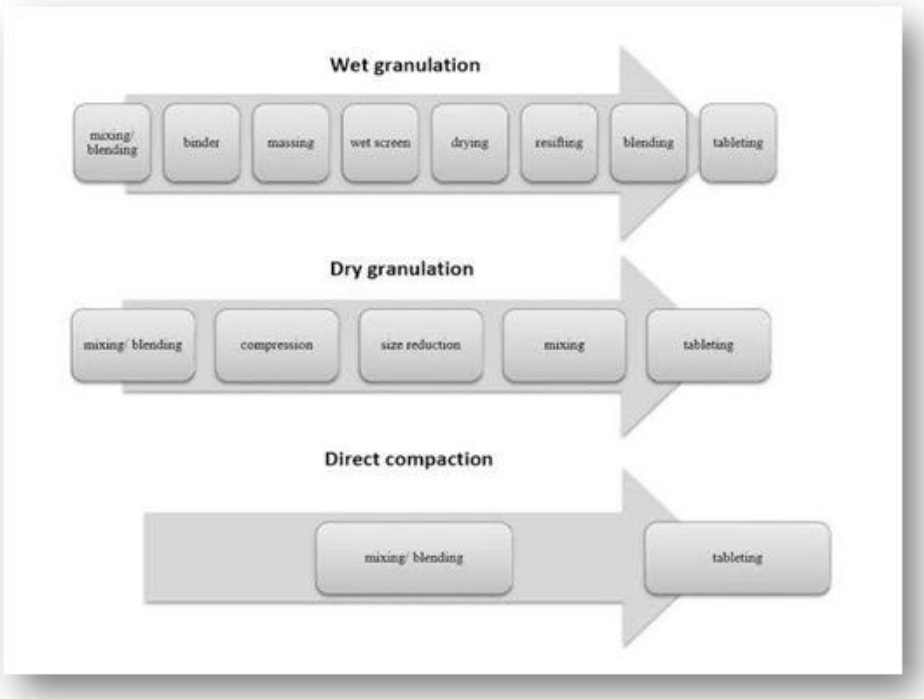
Granulation
If a powder blend's properties don't suit direct compression tabletting, manufacturers will address granulation processes to make the specified flowability and low dustability.

❖ **Dry Granulation:** It is defined as the formation of granules by slugging, if the tablet ingredients are sensitive to moisture and/or unable to withstand elevated temperature during drying.[30] It is less frequently used methods of granulation. The two basic procedures are to

form a compact of material by compression and then to mill the compact to obtain a granule.[29]

❖ **Wet granulation:** In wet granulation the active ingredient, diluents and disintegrants are mixed or blended well in a rapid mixer granulator (RMG). The RMG is a multi-purpose chopper which consists of an impeller with a chopper and is employed for top speed dispersion of dry powders and aqueous or solvent granulations. Moist materials from wet milling steps are placed on large trays and placed in drying chambers with a circulating air current and thermostable heat controller. Commonly used dryers are tray dryer, fluidized bed dryer. After drying, the granules are reduced in particle size by passing through smaller mesh screen. After this, the lubricant or glidant is added as fine powder to promote flow of granules. These granules are then compressed to get a tablet.[31]

❖ **Direct Compression:** Direct compression consists of compressing tablets directly from powdered materials without modifying physical nature of materials. This method is applicable for crystalline chemicals having good compressible characteristic and flow properties such as: Potassium salt (chlorate, chloride, bromide), Sodium chloride, Ammonium chloride, Methenamine etc. It is a popular choice because it provides the shortest, most effective and least complex way to produce tablets.[32]



Problems In Tablet Manufacturing[29]

The manufacturing problems found in tablets along with their cause and related remedy are discussed below. These manufacturing problems are due to:

1. **Tableting process**
2. **Excipient**
3. **Machine**

Tableting process problems are

- Capping
- Lamination
- Cracking

Excipient related problems are

- Chipping
- Sticking
- Picking
- Binding
- Mottling

Defect related to machine is

- Double impression

Capping & Lamination

Capping

It is caused due to continuously high speed of tablet machine and high degree of compression setting which makes the tablets to separate main surface into individual surface.

Lamination
It is major problem among of all defects which causes air entrapment between the layers of the tablets.

CAUSE	REMEDY
Air entrapment in the tablet among granules or among particles	By pre-compression, Reducing final compression, Minimizing tableting rate
Deformational properties of formulation during and after compression	Increasing stress relaxation time Improper/Deep concave punches Better to use flat punches

Cracking: Cracks are defined as the small, fine cracks observed on the upper and lower central surface of tablets.

Cause
- It is due to rapid expansion of tablets, especially when deep concave punches are used.
- Large size of granules.

Remedy
- Reducing granule size and by adding fines.
- Using tapered die.

Chipping
Chipping is defined as the breaking of tablet edges during ejection of tablet from the press or handling and coating process.

Cause
- Sticking on punch faces
- Too dry granules

Remedy
- Drying the granules properly or increasing the amount of lubricant.
- Moisten the granules and by adding hygroscopic substances.

Sticking: Sticking always occurs in low melting point substances. It produces rough and chipping surface tablets. Lack of drying is basis of this one.

Cause
- Presence of low melting point substances.
- Excessive moisture in the granules.

Remedy
- Proper drying of the granules to remove excessive moisture.
- Selection of binding agent is important to unravel sticking.
- Ideal selection of lubricant in desired proportion will minimized this problem.

Picking: Adherence of the tablet material from the surface of a tablet by a punch.

Cause
Because of engraving or embossing or debossing on the punch tips like small enclosed areas in the letters like "A", "B", "D", "O", "Q" etc.

Remedy
- Lettering should be designed as large as possible, even the tablet size can be increased by reformulation
- Avoid wet granules.

Bindinng: It is the term used when the tablets sticks, seize or tier in the die. A film is formed in the die and ejection of a tablet is hindered.

Cause
- Excessive moisture in granules
- Rough or scratched punch faces
- Embossing or engraving letters on punch faces such as B, A, O, R, P, Q, G.

Remedy
- Dry properly the granules
- Polish faces to higher luster.

Mottling: Unequal distribution of colour on the tablet surface with light and dark areas standing out in an otherwise uniform coloured surface.

Cause
- Variation in the colours of ingredients (drug and other additives)
- Migration of dye to the surface of granulation during drying at high temperature
- Improper storage conditions.

Remedy
- By using bright colouring agent that will mask all the colour variations of the ingredients.
- Proper drying by reducing the drying temperature

Double Impression: It involves only those punches, which have a monogram or other engraving on them.

Cause: Free rotation of either upper punch or lower punch during ejection of a tablet
Remedy: Preventing punch rotation

Coating[33-40]
Coating is a process by which an essentially dry, outer layer of coating material is applied to the surface of a dosage form.

Objectives of tablet coating

- To mask the bitter taste and unpleasant odour of some drugs
- To prevent drug-induced irritation at a specific site within the gastrointestinal tract, e.g. the stomach for non-steroidal anti-inflammatory drugs (NSAIDs).
- To protect the drug from the external environment (particularly air, moisture, and light) in order to improve stability.
- To reinforce simple swallowing large dosage forms.

Coating equipment's

For the coating process use of one of the 3 types of following equipment's:

1) Conventional coating pan.
2) The perforated coating pans.
3) The fluidized bed coater.

1) **Conventional coating pan**
2) **The perforated coating pan: -** Accela-Cota, Hi-Coater system Diracoater and the Glatt coater.
3) **The fluidized bed coater: -** The fluidized bed coaters have enhanced drying efficiency. It has a basically two spray application systems they are

I. High pressure airless
II. Low pressure air atomized.

Coating techniques

Generally, three methods are used for tablet coating:

A) Sugar coating.
B) Film coating.
C) Enteric coating.

A) Sugar coating: Steps in sugar coating are:

- Sealing/Water proofing: provides a moisture barrier and harden the tablet surface.
- Sub coating cause a rapid build-up to round off the tablet edges.
- Grossing/Smoothing: smoothest out the sub coated surface and increases the tablet size to predetermine dimension.
- Colouring gives the tablet its colour and finished size.
- Polishing produces the characteristics gloss.

B) Film coating: - Film coating and the sugar-coating share same equipment and the process parameters. There are basically 2 methods of film coating they are:

I. Pan pour methods: Tablets coated by pan pour method subjected to alternate solution application, mixing and drying steps are similar to pan pour sugar coating. This method is relatively slow and relies heavily on the skill of operator.

II. Pan-spray methods: The introduction of spraying equipment was the next evolution in improving the film coating process allows for automated control of liquid application. Broad flat spray patterns are usually chosen by appropriate nozzle systems.

Compression coating

Compression coating also referred to as press coating or dry coating is the process by which a fine dry granulation is compressed onto a tablet core of drug.

Microencapsulation

The process involves the application of relatively thin coating to a small particle of solids, liquids or even gases in a micron dimension. The microcapsules thus formed range dimensionally between 3 – 800 µm in diameter with about 10 – 90 % w/w core.

Tablet Evaluation

Preformulation study[3] (Granule evaluation)

Flow characterization of granules

A. Bulk density

Bulk density = weight of sample in gram / volume occupied by the sample.

B. Tapped density

Tapped density= weight of sample / tapped volume

C. Hausner's ratio and Compressibility index

Hausner's ratio

i. Hausner's ratio = tapped density(gm/cm^2) / bulk density (gm/cm^3)

ii. Compressibility index = Bulk density – Tapped density

General appearance

Carr's index = × (100 %)
Tapped density

Size and shape

- Thickness: $^{\pm}$5% of standard value.
- Thickness of tablet is measured with a micrometre

Organoleptic properties

- **Colour:** colour of product must be uniform (no mottling)
- **Instruments used**

✓ Reflectance spectrophotometer
✓ Tristimulus colourimetry
✓ Micro-reflectance photometer

- **Odor:** (e.g. flim coated tablets)
- **Taste**: (e.g. chewable tablets)

Weight Variation[2]

It is desirable that each individual tablet in a batch should be uniform in weight, but a small variation within the weight of the individual tablet is susceptible to occur.

Weigh 20 tablets and determine their average weight. Not more 2 of the individual weight may deviate from the average by more than percentage deviation given in the table below and none should deviate by more than twice that percentage.

S.NO	Average weight of a tablet deviation	Percentage
1.	80mg or less	10
2.	More than 80mg and less than 250mg	7.5
3.	250mg or more	5

Content Uniformity[5]

Procedure: As per the pharmacopoeia, 20 tablets are taken, powdered and assayed. The average weight of medicament present in each tablet is calculated which is then compared with the desired weight. The pharmacopoeia has prescribed the limit in % of medicament per tablet in the monograph.

Variation in % of medicament per tablet may be due to the

- Weighing of materials before granulation
- During the process of granulation
- Analysis error
- Purity of medicament

Hardness[2]

The pharmacopoeia has not fixed any standard for the hardness of tablets. The manufacturers have employed their own tests to ensure their tablets will withstand the normal risk of handling and transportation. The following devices are commonly used by manufacturers to find out the mechanical strength of tablets:

1. Monsanto hardness tester: The Monsanto chemical co. ltd has designed spring-pressure device to test the hardness of a tablet. It has a graduated scale which gives the reading in kg/Sq. cm. the tablet to be tested is placed between the spindle and the anvil. The desired pressure needed to hold the tablet in position is applied by the screw knob in clockwise direction. The scale is moved so that the indicator is fixed at zero. The pressure is then applied till the tablet breaks. The reading is noted, which indicates the pressure which is needed to break the tablet.

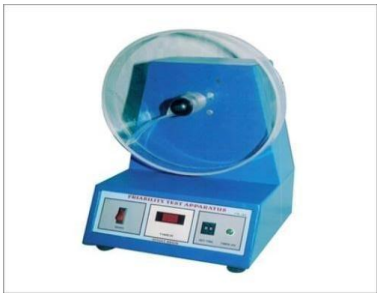
Figure 10: Monsanto hardness tester.

2. Pfizer tablet hardness tester: It is based on the principle of an ordinary plier. Pfizer tablet hardness tester is a plier fitted with a pressure dial. The tablet is placed between the jaw of the plier and is pressure is applied by pressing the handles with hand until the tablet breaks. The reading of the dial indicates the pressure needed to break the tablet.

Figure 11: Pfizer tablet hardness tester.

Friability[5]

Friability test is performed to evaluate the ability pf the tablet to withstand wear and tear in packing, handling and transport. The apparatus used to perform this test is known as "Friabilator" (Fig 12)



The apparatus consists of a plastic chamber which is divided into two parts and it revolves at a speed of 25 r.p.m. 20 tablets are weighed and placed in a plastic chamber. the chamber is rotated for 4 minutes or 100 revolutions. During each revolution the tablet falls from a distance of 6 inch. The tablets are removed from the chamber after 100 revolutions and weighed. Loss weight indicates the friability. The tablets are considered to be of good quality if the loss in weight is less than 0.8%.

Dissolution Test[2]

The test is done for measuring the amount of time required for a given % of the drug substance in a tablet to go into solution under specified condition in vitro. The apparatus is as per specification given in I.P.

Apparatus

It consists of the following parts:

1. A cylindrical covered vessel made of glass or other transparent material having 1000ml capacity. The vessel is fitted with a lid having four holes, one for having the shaft of the stirrer, second for placing the thermometer and remaining two for removing the sample.
2. An electric motor which is capable of rotating the basket in the vessel at a varied speed between 25 and 150 rpm.
3. A cylindrical stainless-steel basket made of woven wire cloth having an aperture size of 425 µm which

is attached to the disc on the driving shafter.

4. The vessel is equipped with a suitable device for the withdrawal of the samples of the dissolution medium.
5. The vessel should be securely clamped in a water bath maintained at 37°± 0.5°C.

Method

- Place 1000ml of water previously warmed to 36.5° to 37.5° into the vessel.
- Place the tablets in the basket
- Set the apparatus.
- Start the motor and adjust to 100rpm or as directed in the monograph.
- Withdraw the stated volume from the vessel after 45 min.
- Filter and determine the amount of active ingredient present in it by the specified method.
- Repeat the complete operation for 4 times.
- The tablet passes the test if for each of the 5 tablets the amount of active ingredient in solution is not than 70% of the stated amount.

Disintegration Test[2]

Disintegration of a tablet means to break the tablet into smaller particles after swallowing. The time required to disintegrate the tablet is called "Disintegration Time". The rate of disintegration depends upon the type of tablets, it may be as short as 1 min or as long as 30mins

Apparatus

The apparatus consists of a glass or plastic tube which is open at one end and the other end is fitted with a rust proof no.10 mesh sieve.ashok The tube is suspended in a bath of water or suitable liquid which is thermostatically maintained at a temp. of 37°C. The assembly is suspended in the liquid medium in a 1000ml beaker.

Method

- Place one tablet in each of the 6 tubes of the basket.
- Add disc to each tube and immerse in the liquid.
- After interval of 15 min lift the basket and observe the tablets.
- The tablets pass the test if all the size tablets have disintegrated.
- In case one or two fails, repeat the test on 12 individual tablets.
- The tablets pass the test if not less than 16 out of 18 tablets tested have disintegrated.

CONCLUSION

The article gives a complete review of tablets including its properties to its evaluation tests and it can also be concluded that tablets are the most preferred oral dosage form which comprises 2/3rd of the prescribed medicaments. Tablets are convenient for use and transport and the quality can be evaluated by the mentioned tests.

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