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A DETAILED REPORT ON TABLETS WITH SPECIAL EMPHASIS ON ITS FORMULATION AND MANUFACTURING TECHNOLOGY.

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ABSTRACT

Tablets and Capsules are the foremost commonly used dosage forms everywhere the planet, thanks to patient compliance, flexibility in dosage regimen and designing of the dosage form. Presently the research scientists have involved industry, academic liaison to propose to implement newer heights in tablet technology. Apart from the oral mode of administration, the other tablets may possess more or less the same features which are attributed to conventional oral tablets. Among the various steps involved in tablet manufacturing granulation is one of the most important unit operations in the production of pharmaceutical oral dosage forms. This process will improve the properties of flow and compression, reduce segregation, improve the uniformity of content and eliminate excessive amounts of fine particulate matter. Granulation improved yields, reduced tablet defects, increased productivity, and reduced downtime. Tablets are processed all over the world using the direct-compressing, wet-granulation, or dry granulation methods. Appropriate method selection depends on the ingredients of individual characteristics and the ability to properly flow, compresses, eject, and disintegrate. This review highlights the tablets as dosage forms along with the quality control tests in tablet manufacturing.

Keywords: patient compliance, dosage forms, granulation, content uniformity, tablet defects.

1. Introduction

Enteral route of drug delivery is the most widely utilized route of administration among all the routes for the systemic delivery of drugs. The main goal drug delivery system is to provide the therapeutic amount of the drug at the site of action as effective throughout the whole period of therapy and then maintain the desired drug concentration. The conventional dosage form produces a wide range of variations in drug concentration in the bloodstream and body tissues which leads to the reduction of drug effectiveness or increased incidence of adverse effects with subsequent undesirable toxicity and poor efficiency. Recent advances in the tablet formulation contain immediate-release tablets like orally dispersible mini tablets, mouth dissolving or fast-dissolving, conventional effervescent, uncoated and film-coated tablets. Modified-release tablet formulations including layered tablets such as inlay tablets, tablet in tablet, bi-layered tablet, medicated chewing gum, tablet tarts, pastilles, lollipop, tablet inserts, clinicaps, caplets, and child ecstasy tablets. Tablets [1-2] are unit dosage forms that offer the greatest strengths of all oral dosage forms for the highest accuracy of the dose and the least variation in quality, cost is the lowest of all oral dosage forms, lighter and compact, easiest and cheapest to package and strip, easy to swallow with the least tendency for hang-up, sustained-release product is possible by enteric coating, greatest chemical and microbial stability overall oral dosage form.³⁰⁻⁴⁶ Disadvantages of tablet dosage form can be summarized as difficult to swallow just in case of youngsters and unconscious patients, some drugs resist compression into dense compacts because of their amorphous nature and the character of rareness, drugs with poor wetting and dissolution properties, optimum absorption may even be difficult to formulate or produce as a tablet that can still provide sufficient or maximum bio-availability of the drug, bitter drugs, drugs with a disagreeable odor or oxygen-sensitive drugs may require encapsulation or coating. In such cases, the capsule may offer the simplest and lowest cost. [2-14]

2. Formulation of Tablet/Ingredients^[15-24]:-

Many excipients for pharmaceutical use are available in several grades. Both classes are often classified by physical and chemical properties. The explanation for the grades is to modify the excipient performance characteristics. Excipients are chosen in a tablet formulation to perform a variety of functions like for providing essential manufacturing technology functions (binders, glidant, lubricants may be added), for enhancing patient acceptance (flavors, colorants may be added), for providing aid in product identification (colorants may be added), for Optimizing or modifying drug release (disintegrant, hydrophilic polymers, wetting agents, biodegradable polymers may be added), for enhancing stability (antioxidant, UV absorbers may be added).^[17-24]

a. Diluents (Fillers)

To facilitate the handling of tablets during fabrication and to understand the uniformity of the targeted content, the tablet size should be kept above 2-3 mm and the weight of tablets above 50 mg usually in the range of diluent may vary from 5-80%. Tablet diluent or filler may also be classified on the basis of their solubility in water and are shown in Table No.1.

Table No.1: Types of Diluents

Sr. No.	Insoluble Tablet Diluents	Soluble Tablet Diluents
1.	Starch	Lactose
2.	Powdered cellulose	Sucrose
3.	Microcrystalline cellulose	Mannitol
4.	Calcium phosphates	Sorbitol

b. Binders

Binders serve as an adhesive for 'locking together' powders, granules, and tablets to provide the required mechanical strength. Examples of binders are dry binders like pre-gelatinized starch, cross-linked PVP, solution binders like HPMC, PVP and soluble in water/ethanol mix are PVP etc.

c. Disintegrant:-

Disintegrant, an essential excipient of tablet formulation, is always applied to the tablet to cause tablet breakdown when it comes into contact with an aqueous fluid, and this process of disintegrating constituent particles before product dissolution occurs is known as disintegrating phase and disintegrating excipients are known as disintegrating. The aims behind adding disintegrant are to raise the surface area of the tablet fragments and to resolve cohesive forces that bind particles in a tablet together. Different types of disintegrant shown in Table No.2.

Table No.2: List of Disintegrant

Sr. No.	Disintegrant	Concentration in granules (%w/w)	Special comments
1.	Starch USP	5-20	Higher amount is required, poorly compressible
2.	Avicel®(PH 101 & 102)	10-20	Lubricant properties and directly compressible
3.	Solka floc®	5-15	Purified wood cellulose
4.	Alginic acid	1-5	Acts by swelling
5.	Na alginate	2.5-10	Acts by swelling
6.	Explotab®	2-8	Sodium starch glycolate, superdisintegrant.

d. Superdisintegrants

All over the world the demand for the faster disintegrating formulation is increased. So, the pharmacist needs to formulate disintegrant i.e. Superdisintegrants which are effective at low concentration and have greater efficiency in disintegrating and are more intra-granular efficient. Table No.3 contains different types of super disintegrant.

Table No.3: List of Super-disintegrants

Sr. No.	Superdisintegrants	Example of Superdisintegrants	Mechanism of action	Special Comment
1.	Crospovidone Crospovidone M® Kollidon® Polyplasdone	Crosslinked PVP	Swells very little and returns to original size after compression but act by capillary action	Water-insoluble and spongy in nature so get porous tablet
2.	Sodium starch glycolate Explotab® Primogel®	Crosslinked starch	Swells 7-12 folds in < 30 seconds	Swells in three dimensions and high level serve as sustain release matrix
3.	Alginic acid NF Satialgine®	Crosslinked alginic acid	Rapid swelling in aqueous medium or wicking action	Promote disintegration in both dry or wet granulation

e. Anti-adherents

Some material has strong adhesive properties against punches and dies metal or the tablet formulation containing excessive moisture which tends to cause picking and sticking problems. Anti-adherents or anti-adhesive agents thus prohibit the tablet surface from adhering to the die walls and the punches. Talc, stearate from magnesium, and starch from corn have excellent anti-adherent properties. (Different types of anti-adherents shown in Table No.4).

Table No.4: List of Anti-adherents

Sr. No.	Anti-adherent	Concentration Range (%w/w)	Comments
1.	Talc	1-5	Lubricant with excellent anti-adherents properties
2.	Corn starch	3-10	Lubricant with excellent anti-adherents properties
3.	Colloidal silica	0.1-0.5	It does not give satisfactory results due to the small surface area. Cab-O-Sil® and Syloid®

f. Glidant

It is applied to the formulation to enhance the flow properties of the material to be fed into the die cavity and to assist in the rearrangement of particles within the die during the early compression stage. If the flow properties are extremely poor then glidant is ineffective and utilization of force-free mechanisms may be necessary. (e.g. talcum, starch, colloidal silica silicates, stearates calcium phosphate).

g. Wetting Agents

Wetting agents in tablet formulation help to absorb water and thereby improve disintegration and aid in drug dissolution. It is known to accelerate the dissolution by adding anionic surfactants such as Sodium Lauryl Sulphate (SLS). It has been established that SLS improves the permeation of drugs through biological membranes since it destroys the path through which the drug has to pass and thus minimizing the path length for the drug to travel. (e.g. SLS, Sodium di-isobutyl sulfosuccinate are used as a wetting agent in tablet formulation)

h. Dissolution Retardants

Dissolution retardants are introduced into tablet formulation when the controlled release of drugs is necessary e.g. stearic acid and their esters etc.

i. Dissolution Enhancers

These are the agents that alter the molecular forces between ingredients to enhance the dissolution of a solute in the solvent e.g. fructose, povidone, surfactants etc.

j. Adsorbents

The agents that can retain large quantities of liquids are known as adsorbents. Therefore liquids like Vitamin E can be incorporated into tablets by the addition of adsorbents. e.g. Anhydrous calcium phosphate, starch, magnesium carbonate, bentonite, kaolin, magnesium silicate, magnesium oxide, and silicon dioxide.

k. Buffers

Buffers are added to maintain a required pH in the formulation. Since a change in pH may cause significant alteration in the stability e.g. Sodium bicarbonate, calcium carbonate, and sodium citrate etc.

l. Antioxidants

Antioxidants are added in a tablet formulation to prevent oxidation. Antioxidants undergo oxidation instead of drugs or block the reaction to oxidation, or act as synergists with other antioxidants. Chelators can act as antioxidants, too. e.g. ascorbic acid and their esters, alpha-tocopherol, ethylene di-amine tetra-acetic acid, sodium metabisulfite, sodium bisulfite, butylated hydroxy toluene (BHT), butylated hydroxy anisole (BHA), citric acid and tartaric acid.

m. Chelating Agents

Chelating agents tend to form complexes with trace amounts of heavy metal ions which inactivate their catalytic activity in drug oxidation e.g. ethylene-di-amine tetra acetic acid and its salts, di-hydroxy ethyl glycine, citric acid and tartaric acid.

n. Preservatives

Preservatives may be a part of tablet formulation. It prevents the growth of microorganisms in tablet formulation e.g. parabens like methyl, propyl, benzyl, butyl p-hydroxybenzoate are used as preservatives.

o. Colorants

Colorants do not contribute to therapeutic action or boost the bioavailability or stability of the drug. But these are incorporated into tablets to facilitate identification of similar looking products within a product line; to avoid mix-ups; to facilitate identification of products of similar appearance that exist in the lines of different manufacturers; to overcome color change on aging, disguising of off-color drugs, for brand image in the market; to enhance the aesthetic appearance of the product to have better patient acceptance. Some commonly used pharmaceutical colorants shown in Table No.5.

Table No.5: Some Commonly Used Pharmaceutical Colorants (Synthetic)

S.No	FD & C Colour	Common Name
1	Red 3	Erythrosine
2	Red 40	Allura Red AC
3	Yellow 5	Tartrazine

p. Flavors

Flavors are commonly used to improve the taste of chewable and mouth dissolved tablets. Flavors may be incorporated as either solids (spray-dried flavors) or oils or aqueous (water-soluble) flavors.

q. Sweeteners

Sweeteners are added primarily to chewable tablets. Table No.6 shows different types of pharmaceutical sweeteners).

Table No.6: Some of the Sweeteners Used in Tablet Formulation

S.No	Natural Sweeteners	Artificial Sweeteners
1	Mannitol	Saccharin
2	Lactose	Cyclamate
3	Sucrose	Aspartame

3. TABLET PROCESSING

Pharmaceutical products are processed all over the world using direct compressing, wet granulation, or dry granulation methods. The process chosen depends on the ingredients' individual characteristics like flow property, compressibility. The right choice of the method requires a thorough investigation of each proposed ingredient in the formula for the comprehensive approach for interactions and stability.³⁰⁻⁴⁰

1. Direct Compression:

The tablets are made by compressing the powdered materials directly, without altering the materials' physical nature. The main advantages of direct compression are time-saving, the safety of operations and low cost.

2. Wet Granulation:

This is the commonly used method for tablet preparation. In this method, the powders are bound by a suitable binder by "adhesion". The binder is added by diluting with a suitable solvent prior to addition to the blended

powders to form wet granules which in turn are dried suitably to expel the solvent forming dried granules.

3. Dry Granulation:

The dry granulation process is used without the application of a liquid solution to form granules. For goods which are prone to moisture and heat, this kind of process is recommended. Forming granules without moisture demands that the powders be compacted and densified.

4. Dispensing:

Dispensing is the first step in any process of pharmaceutical fabrication. Dispensing is one of the most important steps in pharmaceutical manufacturing; as during this stage the weight of each component in the mixture is calculated by dosage.

5. Sizing:

Sizing (size reduction, milling, crushing, grinding, pulverizing) is an important step involved in tablet production (unit operation). Mixing or mixing of several solid pharmaceutical ingredients in the manufacture of compressed tablets becomes simpler and more standardized when the ingredients are approximately the same size.

6. Powder Blending:

Successful mixing of powder is recognized as a more difficult unit operation because perfect homogeneity is practically unattainable, unlike the situation with liquid. In practice, problems arise also due to the inherent cohesiveness and resistance between the individual particles to movement. The blending of powder/granules is involved in the pre-granulation and/or post-granulation phases of tablet production.

7. Granulation:

The formulation may be granulated after particle size reduction and blending, which offers homogeneity of drug distribution within the blend.

8. Drying:

Drying is the most important step in the formulation and development of pharmaceutical products. It is important to keep the residual moisture low enough to prevent degradation of the product and to guarantee free-flowing properties. The widely used dryer includes a fluidized dryer-bed dryer, vacuum tray dryer, microwave dryer, spray dryer, freeze dryer, turbo dryer, pan dryer, and so on.

9. Tablet compression:

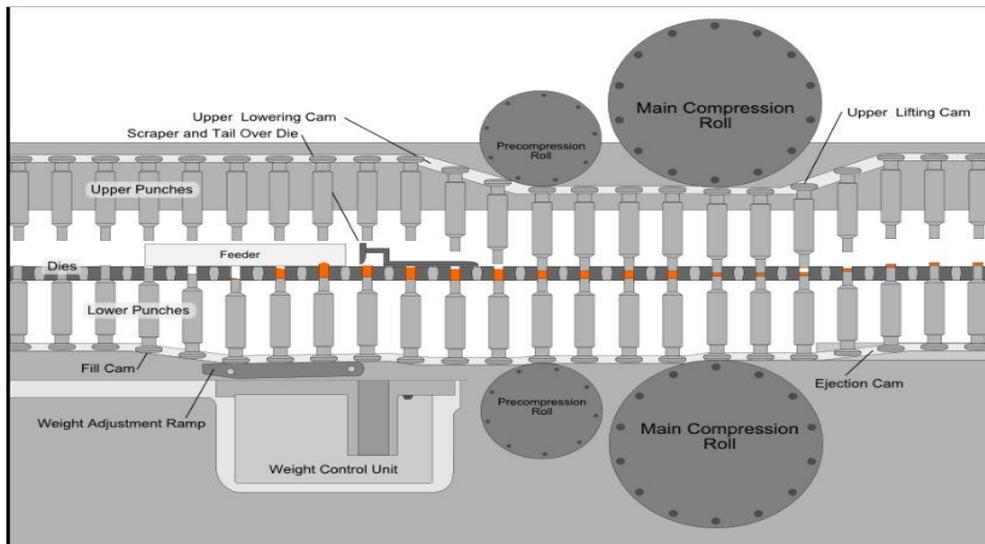
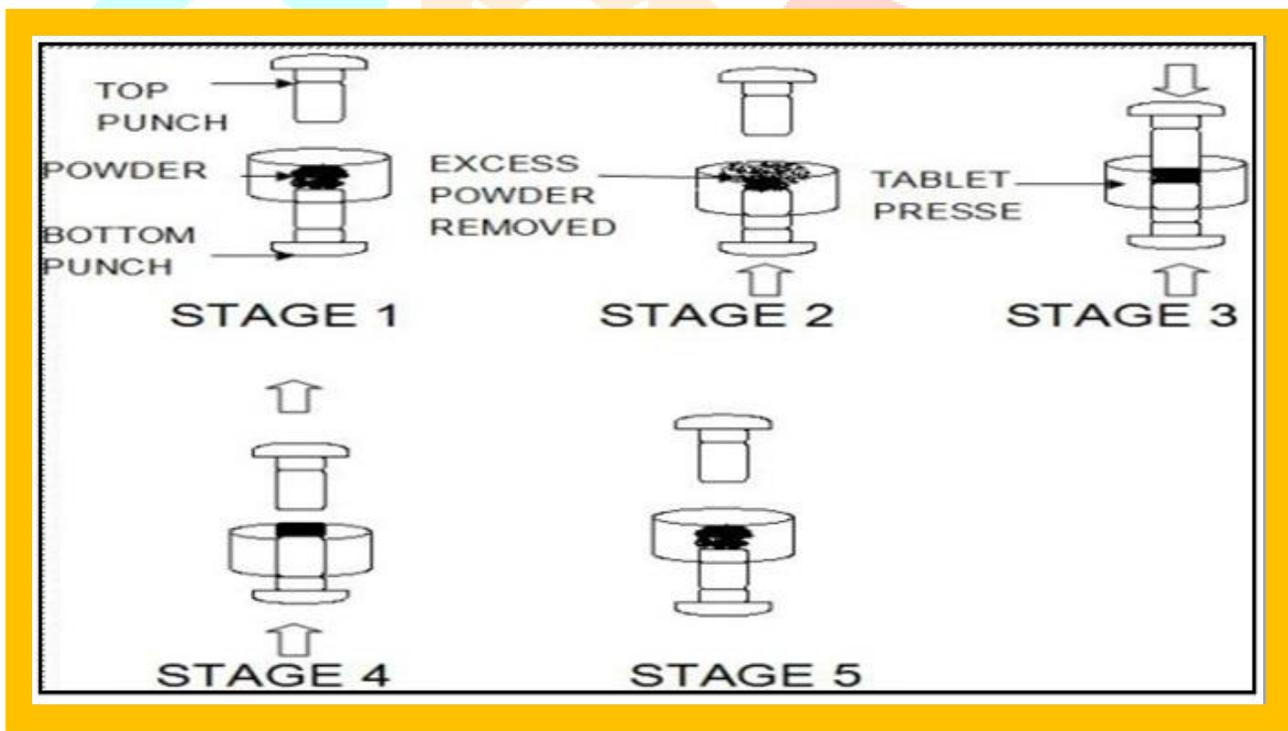


Fig.1 Stages of compression

COMMON STAGES OCCURRING DURING COMPRESSION



4. EVALUATION OF TABLET ^[25-45]

PRE-COMPRESSION EVALUATION PARAMETERS FOR TABLETS

A. The angle of repose (θ)

The frictional forces within a loose powder or granules can be measured by the angle of repose. This is the maximum possible angle between the surface of a powder or granulated pile and the horizontal plane.

$$\theta = \tan^{-1} \frac{h}{r}$$

Where, θ = angle of repose, h = height, r = radius.

B. Bulk Density (D_b)

The bulk density of a powder is dependent upon particle packing, which varies as the powder consolidates. A condensed powder may have a greater arch strength than a less concentrated one, and thus may be more resistant to powder flow. Apparent bulk density (gm/ml) is measured by pouring bulk powder into a graduated cylinder via a wide funnel, and by measuring volume and weight. The formula below makes calculating the bulk density,

$$\text{Bulk density } (D_b) = \frac{M}{V_b}$$

Where M = mass of the powder; V_b = bulk volume of the powder.

C. Tapped density (D_t):

Tapped density is the bulk density of a powder that has been compacted by tapping or vibration. Tapped density was calculated by placing on a mechanical tapping system a graduated cylinder containing a known mass of powder which is controlled for a fixed number of taps (100) or until the volume of the powder bed has reached the minimum. The tapped density is computed by taking the weight of the drug in the cylinder and final volume.

$$\text{Tapped density } (D_t) = \frac{M}{V_t}$$

Where M = mass of the powder; V_t = bulk volume of the powder.

D. Compressibility Index (Carr's Consolidation Index)

Carr developed another indirect method of measuring bulk densities in powder flow shape. A powder's percent compressibility is a direct measure of the possible force and stability of the powder arch or bridge. It is estimated by the following equation;

$$\text{Carr's index } (\%) = \left(\frac{D_t - D_b}{D_t} \right) \times 100$$

Where, D_t = tapped density of the powder; D_b = bulk density of the powder.

E. Hausner Ratio:

Hausner Ratio is an indirect powder flow easiness metric. If the Powder Hausner ratio is equal to 1.25. It shows a better flow of powder.

$$\text{Hausner's Ratio} = \frac{D_b}{D_t}$$

Where, D_t = tapped density of the powder; D_b = bulk density of the powder.

F. Void Volume:

The volume between the spaces is known as the void volume "V" and is given by the formula,

$$V = V_b - V_p$$

Where, V_b = Bulk volume (volume before tapping); V = True volume (volume after tapping).

G. Porosity

The following formula calculates the porosity ϵ of powder as the ratio of void volume to the package bulk volume. The powder porosity is provided by

$$\epsilon = 1 - \frac{V_p}{V_b}$$

Porosity is frequently expressed in percentage and is given as

$$\epsilon = \left(1 - \frac{V_p}{V_b}\right) \times 100$$

The powder porosity indicates the types of packaging that a powder undergoes when subjected to vibrations, when packed, or when passed via hopper or feed frame in a tablet system.

POST-COMPRESSION EVALUATION PARAMETERS FOR TABLETS^[34-46]

Evaluation of tablets includes the assessment of the tablet's physical, chemical and biological properties. To study, the following test is formulated.

A. General Appearance

In general appearance physical appearance is addressed in two ways like first one is the patient compliance and second one is for the manufacturer; which helps him in trouble-free manufacturing if there is the tablet to tablet, batch to batch uniformity of tablet. (e.g. size, shape, odor, taste, texture, legibility, and identifying marks)

B. Size and Shape

Tablet thickness should be tested within a normal value range of ± 5 percent. A tablet's shape and size will vary based on the tooling used in tablet fabrication. The micrometer is used to measure the crown height, and a sliding caliper scale is used to measure the size of 5 to 10 tablets at a time.

C. Unique Identification Mark

Pharmaceutical manufacturers emboss special labeling on the tablet in order to differentiate their drug from the other manufacturers. The decoration can be an embossing, printing or engraving. In addition to the company branding, impressions may be available that include product code, product name, and product potency.

D. Organoleptic Properties

The tablet is given a specific color for easy identification of the tablet and customer acceptance, the tablet color will allow the user to distinguish the tablet lot from the vendor type. The tablet's color uniformity and gloss were measured using a reflectance spectrophotometer, colorimetric calculation with tri-stimulus, and a photometer with micro-reflectance. The odor of the tablet indicates the stability of the tablet, for example, the smell of acetic acid in aspirin tablet indicates that the tablet is degraded.

E. Hardness (Crushing Strength):

“Hardness is defined as the resistance of the tablet against the applied force until it breaks” Tablet hardness and strength are essential in order to see that the tablet can be treated by the patient with the shock and tension during packaging and transport manufacturing. The measure of the mechanical integrity of tablets is their breaking force, which is the force required to cause them to fail (i.e., break) in a specific plane. (Unit- kg/cm² or Newton; Criteria: Tablet hardness should lie between 5 to 10 kg/cm²; Result limit: ± 5%)

F. Friability:

Friability is the phenomenon where the surface of the tablet is damaged or shown a site of damage due to mechanical shock. It is tested by using Roche friabilator. This is made up of a plastic drum fixed with a machine that rotated at 25 rpm for 100 revolutions (25X4=100). In each turn, the tablet falls within the apparatus from 6 inches in height. According to B.P/I.P, the Percentage of friability should be not more than 0.8% - 1.0% & U.S.P. demands percentage of friability should be not more than 4%. For most items, overall mean weight loss of not more than 1.0 percent from the three samples is considered acceptable.

$$\text{Percentage Friability} = \frac{w_1 - w_2}{w_1} \times 100$$

Where W1 = weight of tablets before testing; W2 = weight of tablets after testing.

G. Weight Variation

Weight variation test is performed to check for uniform weight of the tablets produced. Weigh 20 randomly selected units individually, and measure the average weight. No more than two of the individual weights deviate by more than the percentage given in the pharmacopeia from the average weight and none deviates by more than twice that percentage.⁴⁷⁻⁵¹

H. Disintegration

Disintegration does not mean complete solution of the dosage unit or even of its active constituent for the purposes of this study. Disintegration is characterized as the condition in which no residue of the product being tested remains on the screen of the system or, if the residue remains, consists of pieces of disintegrated sections of the capsule component parts such as insoluble capsule shell coating or any melted fatty material from the pessaries or suppositories or is a soft mass with no detectable center. (28-32 cycles (strokes) per minute IP; 29-32 cycle (strokes) per minute BP/USP)

Table No.8 Comparison of DT for various types of tablets

Type of Tablet	Disintegration Time (D.T.)
Uncoated Tablet	15 Minute (B.P/I.P)
Film Coated	30 Minute (B.P/I.P)
Sugar Coated	60 Minute (B.P/I.P)
Enteric Coated/ Gastric Resistant Tablet	0.1M HCl for 2 hrs and phosphate buffer 6.8 for 1 hr. (B.P/I.P) OR The test is carried out first in distilled water (at room temperature for 5 min. Than stimulated gastric fluid 1 hour. Then, stimulated intestinal fluid without enzymes 1 hour (USP)
Effervescent Tablet	3 Minute (B.P/I.P)
Dispersible Tablet	5 Minute (B.P/I.P)
Sublingual Tablet	3 Minute

Table no.9 Disintegration testing condition and interpretation (IP/BP)

Sr. No	Type of tablets	Medium	Temperature	Limit
1	Uncoated	Water/buffer	37 °± 2 °C	15 min or as per individual monograph
2	Film-coated	Water	37 °±2 °C	30 min or as per individual monograph
3	Sugar-coated	Water/0.1 N HCl	37 °±2 °C	60 min or as per individual monograph
4	Dispersible Tablets	Water	25 °±1 °C 20 °±5 °C (BP)	03 min or as per individual monograph
5	Effervescent Tablets	Water	25 °±5 °C 20 °±5 °C (BP)	05 min or as per individual monograph
6	Enteric-coated Tablets	0.1 M HCl mixed phosphate buffer pH 6.8	37 °±2 °C	02 hour in HCl: no disintegration 60 min in a buffer: disintegrate
7	Soluble Tablets	Water	20 °±5 °C	03 minutes

Table no.10 Disintegration testing condition and interpretation (USP)

S.No	Type of tablets	Medium	Temperature	Limit
1	Uncoated	Water/as specified in the monograph	37 °± 2 °C	As per individual monograph
2	Coated	Water/as specified in the monograph	37 °±2 °C	As per individual monograph
3	Enteric-coated Tablets	Simulated gastric fluid TS Simulated intestinal fluid TS	37 °±2 °C	01 hour in Simulated gastric fluid TS: No disintegration As per individual monograph: Simulated intestinal fluid TS
4	Buccal Tablets	Water/as specified in the monograph	37 °± 2 °C	4 hour
5	Sublingual tablets	Water/as specified in monograph	37 °± 2 °C	As per individual monograph

I. CONTENT UNIFORMITY

The uniformity test of the content of single-dose formulations is focused on the analysis of a number of single-dose units of the individual contents of the active substance(s) to determine whether the individual contents are within limits set by comparison with the average content of the sample. The preparation complies with the test if each individual content is 85 to 115 percent of the average content.

J. Dissolution Test (U.S.P.):

The rate and extent of drug release from the tablet (under standardized condition of temperature and solvent composition) are estimated by the dissolution test. It is a dynamic property that changes with time and describes the process by which a homogeneous mixture of solid or a liquid can be obtained in a solvent. Different types of devices are used to research tablet dissolution examinations. As per the IP apparatus, I (paddle) and apparatus II (basket) are used.

5. DISCUSSION

Tablet coating is a well-known pharmaceutical process of projecting a thin polymer-based film to a tablet or a granule comprising of active pharmaceutical ingredients (APIs). Solids are coated due to various reasons, the most prominent among which is controlling the release profiles. The extent of coating on the top age of a tablet is challenge in the effectiveness of the oral dosage form. Tablets are usually coated in horizontal revolving pans with the coating solution sprayed onto the free surface of the tablet bed. The significance of tablet coating are taste masking, odour masking, physical and chemical protection, protects the drug from the gastric environment etc. Many techniques are available for tablet coating such as sugar coating, film coating, and enteric coating. Nowadays due to advances in pharmaceutical technologies it witnesses development of coating methods which overcomes the various disadvantages associated with solvent based coatings. Among them the latest

technologies coating materials are directly coated onto the surface of solid dosage forms without using any solvent. Many solvent free coatings are available viz. electrostatic dry coating, magnetically assisted impaction coating, compression coating, hot melt coating, powder coating, and supercritical fluid coating. Super-cell coating method has brought complete revolution in tablet coating which accurately deposits controlled amounts of coating solutions on solids even though are extremely hygroscopic or friable. Magnetically assisted impaction coating, electrostatic dry coating in solventless coatings, aqueous film coating and Supercell coating technology are also well established technique of coating. Basically an ideal tablet should be free from any visual defect. Recent advancements and innovations in tablet manufacture have not decreased the problems which one has to face in the production in fact have increased the problems, mainly because of the complexities of tablet presses; and/or the greater demands of quality. An ideal tablet should be free from any visual defect/ functional defect. Many visual defects are because of inadequate fines, inadequate moisture in the granules ready for compression and due to faulty machine setting. In order to solve many of the manufacturing problems this demands an in-depth knowledge of granulation processing and tablet punching machine, and is acquired only through an exhaustive study and a vast experience.

6. CONCLUSION

Tablets are the most common of the oral dosage types and are often used. This is due to its relatively low cost and ease of administration. They are the conventional dosage forms compared to any other oral dosage forms. It is necessary for pharmaceutical formulators to develop a given drug entity in a new and improved dosage form with good bioavailability. Every batch of the tablets should undergo the above-mentioned evaluation tests before dispatching into markets. Deficiencies in the tablets can occur during processes of production, storage or transport. Such visual defects can reduce consumer acceptability and product efficacy. In this review types of tablets, formulation ingredients, quality control tests, defects, causes and measures to overcome these defects have been discussed and that the same could be minimized and prevented. This discussion focused on how to repair common defects in the tablet press and determine the root cause of each and eventually correct the defect before it enters the tablet press.

7. Conflict of Interest

There is no conflict of interest in this review.

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