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REVIEW ARTICLE

# MOUTH DISSOLVING TABLETS: A REVIEW

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**ABSTRACT**

Conventional dosage forms like tablets and capsules are now days facing the problems like dysphagia, resulting in the high incidence of non compliance and making the therapy ineffective. To obviate the problems associated with conventional dosage forms, mouth dissolving tablets have been developed having good hardness, dose uniformity, easy administration and serves as the first choice of dosage form for paediatrics, geriatrics and travelling patients. The MDTs were developed with an aim of having sufficient hardness, integrity and faster disintegration without water. Fast dissolving Tablets are disintegrating and/or dissolve rapidly in the saliva without the need for water. Some tablets are designed to dissolve in saliva remarkably fast, within a few seconds, and are true fast-dissolving tablets. Others contain agents to enhance the rate of tablet disintegration in the oral cavity, and are more appropriately termed fast-disintegrating tablets, as they may take up to a minute to completely disintegrate. This tablet format is designed to allow administration of an oral solid dose form in the absence of water or fluid intake. Such tablets readily dissolve or disintegrate in the saliva generally within <60 seconds.
**Keywords:** Mouth dissolving tablet, Disintegration, Patented technologies, Marketed MDTs

## INTRODUCTION

Despite of tremendous innovations in drug delivery, the oral route remains the preferred route for administration of therapeutic agents because of accurate dosage, low cost therapy, self medication, non invasive method and ease of administration leading to high level of patient compliance [1]. However, traditional tablets and capsules administered with a glass of water may be inconvenient or impractical for some geriatric patients because of changes in various physiological and neurological conditions associated with aging including difficulty in swallowing/dysphagia, hand tremors, deterioration in their eyesight, hearing, memory, risk of choking in addition to change in taste and smell. Solid dosage forms also present significant administration challenges in other patient groups, such as children, mentally challenged, bed ridden and uncooperative patients. Paediatric patients may suffer from ingestion problems as a result of underdeveloped muscular and nervous control. Moreover, patients travelling with little or no access to water, limit utility of orally administered conventional tablets or capsules.

Therefore, to cater the needs of such patients, recent advancements in technology have resulted in development of viable dosage alternatives popularly known as orally disintegrating tablets (ODTs)[1,2].During the past decade, the FDT (fast dissolving tablet) technology, which makes tablets dissolve or disintegrate in the mouth without additional water intake, has drawn a great deal of attention. The technology is also referred to as fast disintegrating tablet, fast dispersing tablet, rapid dissolve tablet, rapid melt tablet, quick disintegrating tablet, and orally disintegrating tablet. The FDT formulation is defined by the Food and Drug Administration (FDA) as **''a solid dosage form containing medicinal substances which disintegrates rapidly, usually within a matter of seconds, when placed upon the tongue''**. The tablets disintegrate into smaller granules or melt in the mouth from a hard solid structure to a gel like structure, allowing easy swallowing by the patients. The disintegration time for those tablets varies from a few seconds to more than a minute [2,3].

Administration of FDTs is different from conventional tablets, and the FDTs should have several unique properties to accommodate the rapid disintegration time.They should dissolve or disintegrate in the mouth without water or with a very small amount of water as the disintegration fluid is the patient's saliva. The disintegrated tablet should become a soft paste or liquid suspension, which provides good mouth feel and enables smooth swallowing. ''Fast dissolution'' or ''fast disintegration'' typically requires dissolution or disintegrationof a tablet within one minute.[1,2]

### Significance of ODTs [4,5]

ODTs offer dual advantages of solid dosage forms and liquid dosage forms along with special Features which include:

- **Accurate dosing:** Being unit solid dosage forms, provide luxury of accurate dosing, easy portability and manufacturing, good physical and chemical stability and an ideal alternative for pediatric and geriatric patients.
- **Enhanced bioavailability:** Bioavailability of drugs is enhanced due to absorption from mouth, pharynx and esophagus.
- **Rapid action:** Fast onset of therapeutic action as tablet gets disintegrated rapidly along with quick dissolution and absorption in oral cavity.
- **Patient compliance:** No need of water to swallow the dosage form. Hence, it is convenient for patients who are traveling and do not have immediate access to water.
- **Ease of administration:** Convenient to administer specially for geriatric, pediatric, mentally disabled and bed ridden patients who have difficulty in swallowing.

 

**Obstruction free:** No risk of suffocation in airways due to physical obstruction when swallowed, thus providing improved safety and compliance.

**Enhanced palatability:** Good mouth feels, especially for pediatric patients as taste masking technique is used to avoid the bitter taste of drug.

**Simple packaging:** No specific packaging required. It can be packaged in push through blisters.

**Business Avenue:** Provide new business opportunities in the form of product differentiation, line extension, uniqueness and life cycle management.

**Cost effective:** Conventional processing and packaging equipments allow the manufacturing of tablets at low cost.

**Ideal Properties of MDTs** [4]

They should:

- Not require water to swallow, but it should dissolve or disintegrate in the mouth in matter of seconds.
- Be compatible with taste masking.
- Be portable without fragility concern.
- Have a pleasant mouth feel.
- Leave minimum or no residue in the mouth after oral administration.
- Exhibit low sensitive to environmental condition as temperature and humidity.
- Allow the manufacture of the tablet using conventional processing and packaging equipments at low cost.

**Challenges in formulating Fast dissolving tablets:** [5,19]

**Palatability**

As most drugs are unpalatable, FDTs usually contain the medicament in a taste-masked form. Upon administration, it disintegrate or dissolve in patient's oral cavity, thus releasing the active ingredients which come in contact with the taste buds.Hence, taste-masking of the drugs becomes critical to patient compliance .

**Mechanical strength**

In order to allow FDTs to disintegrate in the oral cavity, they are made of either very porous and soft-molded matrices or compressed into tablets with very low compression force, which makes the tablets friable and/or brittle, difficult to handle, andoften requiring specialized peel-off blister packing that may add to the cost. Only Wow tab and durasolv technologies can produce tablets that are sufficiently hard and durable to allow them to be packaged in multi-dose bottles.

**Hygroscopicity**

Several orally disintegrating dosage forms are hygroscopic and cannot maintain physical integrity under normal conditions of temperature and humidity. Hence, they need protection from humidity which calls for specialized product packaging.

**Amount of drug**

The application of technologies used for FDTs is limited by the amount of drug that can be incorporated into each unit dose. For lyophilized dosage forms, the drug dose must be less than 400 mg for insoluble drugs and 60 mg for soluble drugs. This parameter is particularly challenging when formulating a fast-dissolving oral films or wafers.

**Aqueous solubility**

Water-soluble drugs pose various formulation challenges because they form eutectic mixtures, which result in freezing-point depression and the formation of a glassy solid that may collapse upon drying because of loss of supporting structure during the sublimation process. Such collapse sometimes can be prevented by using various matrix-forming excipients such as mannitol that can induce crystallinity and hence, impart rigidity to the amorphous composite.

**Size of tablet**

The ease of administration of a tablet depends on its size. It has been reported that the easiest size of tablet to swallow is 7-8 mm while the easiest size to handle was one larger than 8 mm. Therefore, the tablet size that is both easy to take and easy to handle is difficult to achieve.

**FORMULATION OF MDTs:**[5,6,7,8]

**Drug:**

The ultimate characteristics of a drug for dissolution in the mouth and pre gastric absorption from MDTs include:

- Free from bitter taste
- Dose lower than 20 mg
- Small to Moderate molecular weight
- Good solubility in saliva
- Ability to permeate through oral mucosal tissue

**Bulking materials:**

Bulking materials are significant in the formulation of fast-melting tablets. The material contributes functions of a diluent, filler and cost reducer. Bulking agents improve the textural characteristics that in turn enhance the disintegration in the mouth, besides; adding bulk also reduces the concentration of the active in the composition. The recommended bulking agents for this delivery system should be more sugar-based such as mannitol, polydextrose, lactitol, DCL (direct compressible lactose) and starch hydrolystate for higher aqueous solubility and good sensory perception. Bulking agents are added in the range of 10 percent to about 90 percent by weight of the final composition.

**Emulsifying agents:**

Emulsifying agents are important excipients for formulating fast-melting tablets they aid in rapid disintegration and drug release without chewing, swallowing or drinking water. In addition, incorporating emulsifying agents is useful in stabilizing the immiscible blends and enhancing bioavailability. A wide range of emulsifiers is recommended for fast-tablet formulation, including alkyl sulfates, propylene glycol esters, lecithin, sucrose esters and others. These agents can be incorporated in the range of 0.05 percent to about 15 percent by weight of the final composition.

**Lubricants:**

Lubricants, though not essential excipients, can further assist in making these tablets more palatable after they disintegrate in the mouth. Lubricants remove grittiness and assist in the drug transport mechanism from the mouth down into the stomach.

**Flavours and sweeteners:**

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Flavours and taste-masking agents make the products more palatable and pleasing for patients. The addition of these ingredients assists in overcoming bitterness and undesirable tastes of some active ingredients.

**Superdisintegrants:**

A disintegrant is an excipient, which is added to a tablet or capsule blend to aid in the breakup of the compacted mass when it is put into a fluid environment.

**Table 1: Enlists various existing superdisintegrants and also their mechanism of action**

| Name of disintegrant | Brand name | Concentration (%) | Mechanism of action |
|---|---|---|---|
| **Sodium Starch Glycolate** | Explotab,Primogel | 2-8% | Swelling |
| **Micro crystalline cellulose** | Avicel, Celex | 2-15% | Water wicking |
| **Cross linked povidone** | Cross povidone | 2-5% | Swelling, Water wicking |
| **Low substuted hydroxy propyl cellulose** | LH-11, LH-12 (Grades) | 1-5% | Sweling |
| **Crosscarmellose sodium** | Ac-Di-Sol | 1-3%Direct compression<br>2-4% wet granulation | Wicking and swelling |
| **Pregelatinized starch** | Starch 1500 | 1-20% | Swelling |

**Advantages:** 1. Effective in lower concentrations.

2. Less effect on compressibility and flowability.

**SELECTION OF SUPERDISINTEGRANTS:**

Although superdisintegrants primarily affect the rate of disintegration, but when used at high levels they can also affect mouth feel, tablet hardness and friability. Hence, various ideal factors to be considered while selecting an appropriate superdisintegrants for a particular formulationshould:

• Produce rapid disintegration, when tablet comes in contact with saliva in the mouth/oral cavity.
• Be compactable enough to produce less friable tablets.
• Produce good mouth feel to the patients. Thus, small particle size is preferred to achieve patient compliance.
• Have good flow, since it improves the flow characteristics of total blend.

**Various manufacturing techniques for MDDDS include:**

- Lyophilization
- Moulding
- Direct Compression
- Cotton Candy Process
- Spray Drying
- Sublimation
- Mass Extrusion
- Nanonization
- Fast Dissolving Films

**Freeze-Drying or Lyophilization[4,9,10]**

In freeze-drying process, the water is sublimed from the product after it is frozen. Zydis technology (ZT) is a patented technique, which had been used for drugs like famotidine, loperamide, piroxicam, oxazepam, lorazepam, domeperidone, brompheniramine, olanzepine, ondansetron and rizatriptan. Thirteen products are currently available in the market, which had been manufactured using this technology. In U.S., the MDT products available are: Claritin Reditab, Dimetapp Quick Dissolve, Feldene Melt, Maxalt- MLT, Pepcid RPD, Zofran ODT and Zyprexa Zydis. In the worldwide market, Zydis formulations are also available for oxazepam, lorazepam, loperamide, and enalapril. ZT utilizes a unique freeze-drying process to manufacture finished dosage units which significantly differ from conventional oral systems.

The process involves the following steps:

Stage 1 - bulk preparation of an aqueous drug solution or suspension and its subsequent precise dosing into pre-formed blisters. It is the blister that actually forms the tablet shape and is, therefore, an integral component of the total product package.

Stage 2 - passing the filled blisters through a specially designed cryogenic freezing process to control the ultimate size of the ice crystals which ensures that the tablets possess a porous matrix to facilitate the rapid disintegration property. These frozen units are then transferred to large-scale freeze dryers for the sublimation process, where the majority of the remaining moisture is removed from the tablets.

Stage 3 - Sealing the open blisters using a heat-seal process to ensure stability and protection of the product from varying environmental conditions.

**Lyoc** Lyoc technology lyophilizes, or "freeze-dries" an aqueous solution, suspension, or emulsion of an API and excipients. Lyoc's high degree of porosity yields shorter disintegration times than compressed tablets. The Lyoc manufacturing process produces a stable product without use of additives, preservatives or gelatins. This process is environmentally friendly and cost-effective because it doesn't require organic solvents. Lyoc technology is compatible with CIMA taste-masking techniques, customized release, high dosing and fixed-dose combination products.

**Quicksolv[9,10]** is a porous solid form obtained by freezing an aqueous dispersion/solution of the drug containing matrix and then drying it by removing the water using excess of alcohol (solvent extraction). The final form disintegrates very rapidly but is limited to low drug content and can be used only for those drugs that are insoluble in the extraction solvent. The ideal drug characteristics required for this technology are relative low aqueous solubility, fine particle size < 50 μm and good aqueous stability in the suspension.

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**Advantages**

The major advantage of using this technique is that the tablets produced by this technology have very low disintegration time and have great mouthfeel due to fast melting effect.

**Disadvantages**

Although being a fairly routine process, lyophilization has some disadvantages like it is a relatively expensive and time consuming process. Furthermore, the product obtained is poorly stable and fragile, rendering conventional packaging unsuitable.

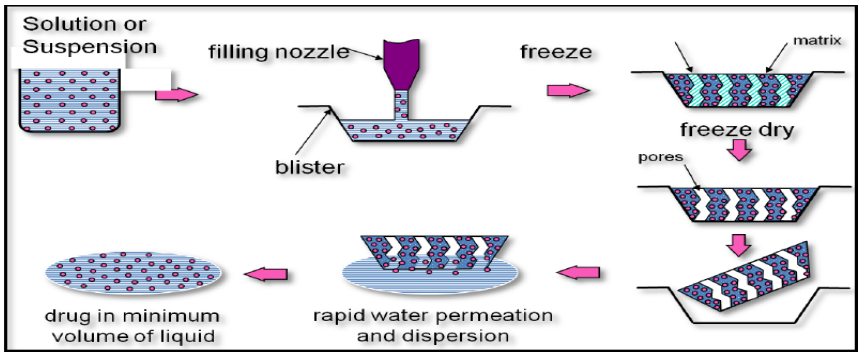


**Figure 5: Lyophilization Technology. Patented technology based on this process is Zydis technology**

**Tablet Moulding[9,11]**

Moulded tablets invariably contain water-soluble ingredients due to which the tablets dissolve completely and rapidly. Following are the different tablet moulding techniques:

**Compression Moulding Process**

This manufacturing process involves moistening the powder blend with a hydroalcoholic solvent followed by pressing into mould plates to form a wetted mass (compression moulding). The solvent is then removed by air drying, a process similar to the manufacture of tablet triturates. Such tablets are less compact than compressed tablets and possess a porous structure that hastens dissolution.

**Heat-Moulding Process**

Heat-moulding process involves setting the molten mass containing a dispersed drug. This process uses agar solution as a binder and a blister packaging well as a mould to manufacture the tablet. A suspension containing drug, agar and sugar is prepared followed by pouring the suspension into the blister packaging well, solidifying the agar solution at room temperature to form a jelly and finally drying at approximately 30 °C under vacuum.

**Moulding by Vacuum Evaporation without Lyophilization**

This process involves pouring of the drug excipient mixture (in the form of a slurry or paste) into a mould of desired dimension, freezing the mixture to form a solidified matrix and finally subjecting it to vacuum drying at a temperature within the range of its collapse temperature and equilibrium freezing temperature. This results in the formation of a partially collapsed matrix. This method differs from the lyophilization technique, as in the former the evaporation of free unbound solvent occurs from a solid through the liquid phase to a gas, under controlled conditions, instead of the sublimation which takes place in the latter process.

**Direct Compression (DC)[9,10,11]**

DC is the simplest and most cost effective tablet manufacturing technique for MDTs as they can be fabricated using conventional tablet manufacturing and packaging machinery and also due to availability of tabletting excipients with improved flow, compressibility and disintegration properties, especially tablet disintegrants, effervescent agents and sugarbased excipients.

**Table 2: Ideal Requirements, Advantages and Limitations of Direct Compression**

| S.No | Ideal requirements | Advantages | Limitations |
|---|---|---|---|
| 1 | Flowability | Cost effective production | Segregation |
| 2. | Compressibility | Better stability of API | Variation in functionality |
| 3. | Dilution Potential | Faster dissolution | Low dilution potential |
| 4. | Reworkability | Less wear and tear of punches | Reworkability |
| 5. | Stability | Simple validation | Poor compressibility of API |
| 6. | Controlled Particle Size | Low microbial contamination | Lubricant sensitivity |

**Disintegrants**

In many MDT products based on DC process, the disintegrants mainly affect the rate of disintegration and hence dissolution which is further enhanced in the presence of water soluble excipients and effervescent agents. The introduction of superdisintegrants has increased the popularity of this technology. Tablet

 

disintegration time can be optimized by focusing on the disintegrant concentration.

Below a critical disintegrant concentration, tablet disintegration time becomes inversely proportional to disintegrant concentration. However, above the critical concentration level of disintegrant, disintegration time remains approximately constant or the decrease is insignificant.

Another DC based technology; Flashtab contains coated crystals of drug and microgranules alongwith disintegrants. In this technology, two types of disintegrants are used: a disintegrating agent (e.g., modified cellulose), which has a high swelling force and a swelling agent (e.g., starch) which has a low swelling force. Bi et al. and Watanbe used microcrystalline cellulose (MCC) and low substituted hydroxypropyl cellulose (HPC) to manufacture MDTs wherein the ratio of MCC to HPC varied from 8:2 to 9:1. Ito and Sugihara investigated the application of agar powder as a disintegrant due to its property of absorbing water and considerable swelling without forming a gel at physiological temperature.

**Effervescent Agents**

The evolution of CO2 as a disintegrating mechanism forms the basis of the patented Orasolv technology (OT) and is frequently used to develop over-the-counter formulations. The product contains microparticles and is slightly effervescent in nature. Saliva activates the effervescent agent which causes the tablet to disintegrate. The OT had been utilized in fabrication of six marketed products: four Triaminic Softchew formulations, Tempra FirsTabs and Remeron SolTab.

**Sugar-Based Excipients**

Another approach to manufacture MDTs by DC is the use of sugar-based excipients (e.g., dextrose, fructose, isomalt, lactitol, maltitol, maltose, mannitol, sorbitol, starch hydrolysate, polydextrose and xylitol) which display high aqueous solubility and sweetness and hence, imparts taste masking and a pleasing mouth feel.

Mizumoto et al., have classified sugar-based excipients into two types based on their mouldability and dissolution rate.

Type I saccharides (e.g., lactose and mannitol) exhibit low mouldability but high dissolution rate.

Type II saccharides (e.g., maltose and maltitol) exhibit high mouldability but low dissolution rate

Mouldability is defined as the capacity of the compound to be compressed/ moulded and to dissolve. It does not refer to the formation of a true mould by melting or solvent wetting process. The mouldability of Type I saccharide can be improved by granulating it with a Type II saccharide solution.

The above technology forms the basis of WOWTAB which involves the use of fluidized bed granulation for the surface treatment of Type I saccharide with Type II saccharide. This technique has been used in the production of Benadryl Fast melt tablets. Here, two different types of saccharides are combined to obtain a tablet formulation with adequate hardness and fast dissolution rate.

**Cotton Candy Process**[3,11,12]

The FLASHDOSE® is a MDDDS manufactured using Shearform™ technology in association with Ceform TI™ technology to eliminate the bitter taste of the medicament. The Shearform technology is employed in the preparation of a matrix known as 'floss', made from a combination of excipients, either alone or with drugs. The floss is a fibrous material similar to cotton-candy fibers, commonly made of saccharides such assucrose, dextrose, lactose and fructose at temperatures ranging between 180–266 °F. However, other polysaccharides such as polymaltodextrins and polydextrose can be transformed into fibers at 30–40% lower temperature than sucrose. This modification permits the safe incorporation of thermolabile drugs into the formulation. The tablets manufactured by this process are highly porous in nature and offer very pleasant mouthfeel due to fast solubilization of sugars in presence of saliva.

**Spray-Drying**[3,12]

Allen et al., have used spray-drying for the production of MDTs. The formulations contained hydrolyzed and unhydrolyzed gelatin as a supporting agent for the matrix, mannitol as a bulking agent and sodium starch glycolate/croscaramellose as a disintegrant. Disintegration and dissolution were further enhanced by adding an acid (e.g., citric acid) or an alkali (e.g., sodium bicarbonate). The suspension of above excipients was spray-dried to yield a porous powder which was compressed into tablets. Tablets manufactured by this method disintegrated in < 20 secs in an aqueous medium.

**Sublimation**[13,19]

Sublimation has been used to produce MDTs with high porosity. A porous matrix is formed by compressing the volatile ingredients alongwith other excipients into tablets, which are finally subjected to a process of sublimation. Inert solid ingredients with high volatility (e.g., ammonium bicarbonate, ammonium carbonate, benzoic acid, camphor, hexamethylene tetramine, naphthalene, phthalic anhydride, urea and urethene) have been used for this purpose. Solvents such as cyclohexane and benzene were also suggested for generating the porosity in the matrix. Makino et al., reported a method using water as a pore-forming material.

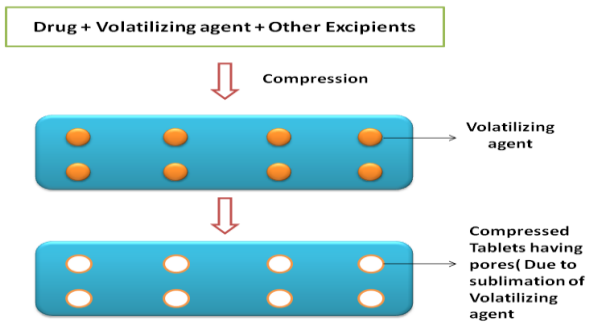


Figure 6: Sublimation technique. Evaporation of volatile agent results in formation of porous tablets thereby causing fast disintegration

**Mass-Extrusion**[17]

This technology involves softening of the active blend using the solvent mixture of water soluble polyethylene

 

glycol and methanol and expulsion of softened mass through the extruder or syringe to get a cylindrical shaped extrude which are finally cut into even segments using heated blade to form tablets. This process can also be used to coat granules of bitter drugs to mask their taste.

**Nanonization**[17]

A recently developed Nanomelt technology involves reduction in the particle size of drug to nanosize by milling the drug using a proprietary wet-milling technique. The nanocrystals of the drug are stabilized against agglomeration by surface adsorption on selected stabilizers, which are then incorporated into MDTs. This technique is especially advantageous for poorly water soluble drugs. Other advantages of this technology include fast disintegration/dissolution of nanoparticles leading to increased absorption and hence higher bioavailability and reduction in dose, cost effective manufacturing process, conventional packaging due to exceptional durability and wide range of doses (up to 200 mg of drug per unit).

**Fast Dissolving Films**[19]

It is a new frontier in MDDDS that provides a very convenient means of taking medications and supplements. In this technique, a non-aqueous solution is prepared containing water soluble film forming polymer (pullulan, carboxy methylcellulose, hydroxypropyl methylcellulose, hydroxyl ethylcellulose, hydroxyl propylcellulose, polyvinyl pyrrolidone, polyvinyl alcohol or sodium alginate, etc.), drug and other taste masking ingredients, which is allowed to form a film after evaporation of solvent. In case of a bitter drug, resin adsorbate or coated microparticles of the drug can be incorporated into the film. This film, when placed in mouth, melts or dissolves rapidly, releasing the drug in solution or suspension form. The features of this system include paper thin films of size less than 2X2 inches, dissolution in 5 sec, instant drug delivery and flavoured after taste.

**EVALUATION PARAMETERS:** [13,14,15,20,21]

**Weight variation test:** Randomly selected 20 tablets were taken and their individual weights & the average weight of 20 tablets were determined. The deviation of each individual tablet from the average weight was calculated and compared with the standard values given in Pharmacopoeia.

The % weight variation of each individual tablet from the average weight is calculated by the given formula

$$\%\ Weight Variation = \frac{\text{Individual weight of each tablet} - \text{Average weight of 20 tablets}}{\text{Average weight of 20 tablets}} \times 100$$

**Hardness test:** Hardness of the tablets was measured by using hardness testers like Monsanto hardness tester, Pfizer hardness tester etc. The pressure required to break the tablets is measured as a function of hardness ( kg/ cm2 ). The values obtained must meet the standard value.

**Friability:** Friability is to measure the extent of tablet breakage during physical stress conditions like Packing, transportation etc. A sample of randomly selected 6 tablets was evaluated for friability using Roche friabilator at 25 rpm for 4 minutes. The % weight loss is calculated by measuring the total weight of 6 tablets before and after operation. Formula for calculating the % weight loss is given below:

$$\%\ Weight\ loss = \frac{\text{Total weight of tablet before} - \text{Total weight of tablets after}}{\text{Total weight of tablets}} \times 100$$

**Wetting time:**

Wetting time and water absorption ratio are the significant parameters for mouth dissolving tablets. The following method for calculating the wetting time of the tablet. A piece of filter paper (circularly cut) was placed in a small petri plate containing water soluble dye solution. Tablet was placed on the paper and the time required for complete wetting of the tablet was determined (Figure 7).Bi Y. et al. used a tissue paper folded twice and was placed in a small culture dish ( i.d = 6.5 cm) containing 6 ml of water.

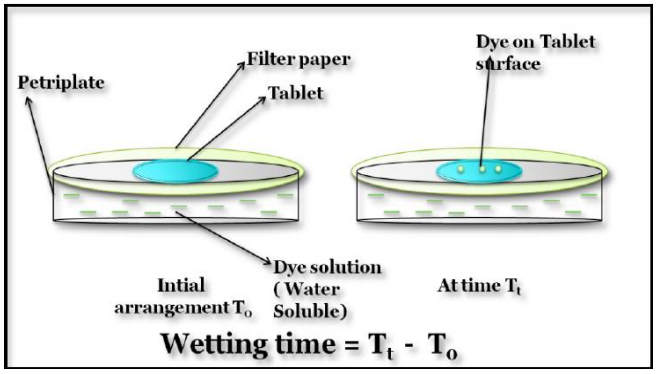


Figure 7: Wetting time of Mouth dissolving tablet. The time taken for appearance of dye colour on tablet is wetting time

**Water absorption ratio:**

Similar to the procedure followed in determination of wetting time (Figures 8). However, here the initial weight and the final weight (after complete wetting) of tablet were calculated and the water absorption ratio was calculated by given formula:

$$R = \frac{\text{Wa} - \text{Wb}}{\text{Wb}} \times 100$$

Where, R is water absorption ratio, Wa and Wb are the weights of tablet before and after wetting respectively.

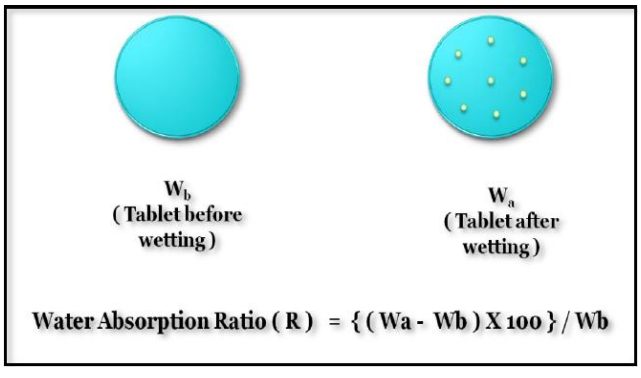


Figure 8: Calculation of water absorption ratio for MDTs. Difference between intial and final weights of tablet is noted Water absorption

**Disintegration time:** Disintegration time for randomly selected 6 tablets was measured using disintegration test apparatus. The average time required for disintegration was calculated and compared with standards.

 

**Invitro dissolution studies:** Randomly selected 6 tablets were subjected to drug release studies using USP dissolution apparatus, in dissolution medium volume of 900 ml was used and a temperature of 37±0.5oC was maintained. 5 ml of the sample was collected for every 5 minutes interval till 30 minutes and replaced with 5 ml of fresh buffer solution. The samples were filtered and suitably diluted and the drug assay was performed using UV spectrophotometer or HPLC system. The results were compared with standard values.

**Taste or mouth feel:** Healthy human volunteers were used for evaluation of mouth feel of the tablet. One tablet was evaluated for its mouth feel. A panel of 5 members evaluate the mouth feel by time intensity method. Sample equivalent to 40 mg was held in mouth for 10 seconds and the opinion is rated by giving different score values. (0: good, 1: tasteless, 2: slightly bitter, 3: bitter, 4: awful).

**Stability studies:** Various stability studies like accelerated stability study, intermediate and long term stability studies were done during preformulation. The sample was subjected to higher temperature or humidity or both, to know their impact on the stability of mouth dissolving tablet.

**Uniformity of dispersion:** Two randomly selected tablets were kept in 100 ml water and stirred for two minutes. The dispersion was passed through 22 meshes. The tablets were considered to pass the test if no residue remains on the screen.

**Drugs to be promising in corporate in Mouth dissolving tablets**[16,17,18,19]

There are no particular limitations as long as it is a substance which is used as a pharmaceutical active ingredient.

**Analgesics and Anti-inflammatory Agents:**

Aloxiprin, Auranofin, Azapropazone, Benorylate, Diflunisal, Etodolac, Fenbufen, Fenoprofen

Calcim, Flurbiprofen, Ibuprofen, Indomethacin, Ketoprofen, Meclofenamic Acid, Mefenamic

Acid, Nabumetone, Naproxen, Oxaprozin, Oxyphenbutazone, Phenylbutazone, Piroxicam, Sulindac.

**Anthelmintics :**

Albendazole, Bephenium Hydroxynaphthoate, Cambendazole, Dichlorophen, Iverrnectin, Mebendazole, Oxarnniquine, Oxfendazole, Oxantel Embonate, Praziquantel, Pyrantel Embonate, Thiabendazole.

**Anti-Arrhythmic Agents:**

Amiodarone, Disopyramide, Flecainide Acetate, Quinidine Sulphate,

**Anti-bacterial Agents:**

Benethamine Penicillin, Cinoxacin, Ciprofloxacin, Clarithromycin, Clofazimine, Cloxacillin,

Demeclocycline, Doxycycline, Erythromycin, Ethionamide, Imipenem, Nalidixic Acid, Nitrofurantoin, Rifampicin, Spiramycin, Sulphabenzamide, Sulphadoxine, Sulphamerazine, Sulphacetamide, Sulphadiazine, Sulphafurazole, Sulphamethoxazole, Sulphapyridine, Tetracycline, Trimethoprim.

**Anti-Fungal Agents:**

Amphotericin, Butoconazole Nitrate, Clotrimazole, Econazole Nitrate, Fluconazole, Fiucytosine, Griseofulvin, Itraconazole, Ketoconazole, Miconazole, Natamycin, Nystatin, Sulconazole Nitrate, Terbinafine, Terconazole, Tioconazole, Undecenoic Acid.

**Anti-Gout Agents:**

Allopurinol, Probenecid, Sulphinpyrazone.

**Anti-Hypertensive Agents:**

Amlodipine, Carvedilol, Benidipine, Darodipine, Dilitazem, Diazoxide, Felodipine, Guanabenz Acetate, Indoramin, Isradipine, Minoxidii, Nicardipine, Nifedipine, Nimodipine,

Phenoxybenzamine, Prazosin, Reserpine, Terazosin.

**Anti-Malarials***:*

Amodiaquine, Chloroquine, Chlorproguanil, Halofantrine, Mefloquine, Proguanil, Pyrimethamine, Quinine Sulphate. Anti-Migraine Agents: Dihydroergotamine Mesyiate, Ergotamine Tartrate, Methysergide Maleate, Pizotifen Maleate, Sumatriptan Succinate.

**Anti-Neoplastic Agents and Immunosuppressants:**

Aminoglutethimide, Amsacrine, Azathiopnne, Busulphan, Chlorambucil, Cyclosporin, Dacarbazine, Estramustine, Etoposide, Lomustine, Melphalan, Mercaptopurine, Methotrexate, Mitomycin, Mitotane, Mitozantrone, Procarbazine, Tamoxifen Citrate, Testolactone.

**Anti-Thyroid Agents:**

Carbimazole, Propylthiouracil.

**Nutritional Agents:**

Betacarotene, Vitamin A, Vitamin B 2 , Vitamin D, Vitamin E, Vitamin K.

**Opioid Analgesics:**

Codeine, Dextropropyoxyphene, Diamorphine, Dihydrocodeine, Meptazinol, Methadone,

Morphine, Nalbuphine, Pentazocine.

**Oral Vaccines:**

Vaccines designed to prevent or reduce the symptoms of diseases of which the following is a

Representative Influenza, Tuberculosis, Meningitis, Hepatitis, Whooping Cough, Polio, Tetanus, Diphtheria, Malaria, Cholera, Herpes, Typhoid, HIV, Aids, Measles, Lyme Disease, Travellers Diarrhea, Hepatitis A, B And C, Otitis Media, Dengue Fever, Rabies, Parainfluenza, Rubella, Yellow Fever, Dysentery, Legionnaires Disease, Toxoplasmosis, Q-Fever, Haemorrhegic Fever, Argentina Haemorrhagic Fever, Caries, Chagas Disease, Urinary Tract Infection Caused By E.Coli, Pneumoccoccal Disease, Mumps, File://H:\Gits Mdt\Fast Dissolving Tablet The Future Of Compaction And Chikungunya.

**Proteins, Peptides and Recombinant Drugs:**

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Insulin (Hexameric/Dimeric/Monomeric Forms), Glucagon, Growth Hormone (Somatotropin), Polypeptides or Their Derivatives, (Preferably With A Molecular Weight from 1000 To 300,000), Calcitonins And Synthetic Modifications Thereof, Enkephalins, Interferons (Especially Alpha-2 Inter Feron For Treatment Of Common Colds).

**Sex Hormones:**

Clomiphene Citrate, Danazol, Ethinyloestradiol, Medroxyprogesterone Acetate, Mestranol,

Methyltestosterone, Norethisterone, Norgestrel, Oestradiol, Conjugated Oestrogens, Progesterone, Stanozolol, Stiboestrol, Testosterone, Tibolone.

## CONCLUSION:

The FDTs have potential advantages over conventional dosage forms, with their improved patient compliance, convenience, bioavailability and rapid onset of action had drawn the attention of many manufactures over a decade. FDTs formulations obtained by some of these technologies have sufficient mechanical strength, quick disintegration/dissolution in the mouth without water. There is a clear opportunity for new enhanced oral products arising within this market segment. Approximately one-third of the population, primarily the geriatric and pediatric populations, has swallowing difficulties, resulting in poor compliance with oral tablet drug therapy which leads to reduced overall therapy effectiveness.. These tablets are designed to dissolve or disintegrate rapidly in the saliva generally within <60 seconds (range of 5- 50seconds). The development of a fast-dissolving tablet also provides an opportunity for a line extension in the marketplace, A wide range of drugs (e.g., neuroleptics, cardiovascular drugs, analgesics, antihistamines, and drugs for erectile dysfunction) can be considered candidates for this dosage form. As a drug entity nears the end of its patent life, it is common for pharmaceutical manufacturers to develop a given drug entity in a new and improved dosage form. A new dosage form allows a manufacturer to extend market exclusivity, while offering its patient population a more convenient dosage form or dosing regimen.

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