

TABLET TOOLING

By

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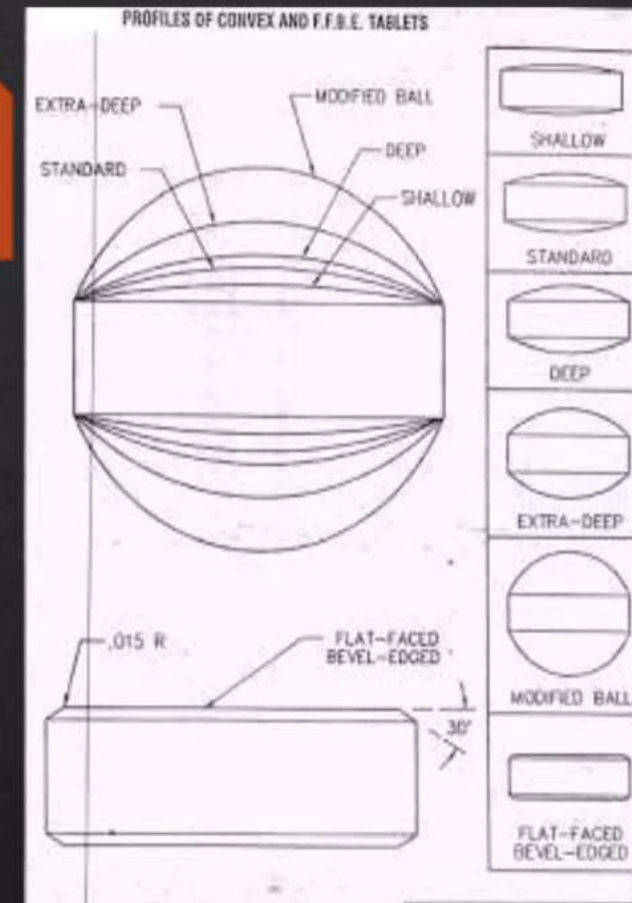
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Tablet tooling

- ◆ For this purpose different types of punches are used :
 - ◆ Flat faced bevel edges
 - ◆ Shallow concave (Round/ Capsule shaped)
 - ◆ Standard concave (Round/ Capsule shaped)
 - ◆ Deep concave (Round/ Capsule shaped)
 - ◆ Extra deep
 - ◆ Modified ball



The basic mechanical unit in all tablet compression equipment includes a lower punch which fits into a die from the bottom and an upper punch, having a head of the same shape and dimension, which enters the die cavity from the top after tablet materials fills the cavity

Round shape Punch Die Set



Used by pharmaceutical and veterinary industry.

Can manufacture following type of tablets:

- ✓ Shallow Concave Ball Shape
- ✓ Deep Concave Flat Faced
- ✓ Concave with Edges Flat with Bevel Edges
- Normal Concave

Oval Shape Punch Die Set



Applicable to pharmaceutical and ayurvedic industries.

Can manufacture following types of tablets:

- ✓ Flat Faced Flat with bevel edges
- ✓ Concave/Deep/Deep Concave with bevel edges.

Capsule shape punch die set



Applicable to pharmaceutical and ayurvedic industries.

Can manufacture following types of tablets:

- ✓ Concave with Edges
- ✓ Deep Concave Flat Faced
- ✓ Normal concave Flat with Bevel Edges.

Geometric Shape Punch Die Set



Applicable to pharmaceutical, confectionery, chemical, industrial powder metallurgy industries. Can manufacture following types of tablet:

- ✓ Triangular
- ✓ Benzene
- ✓ Rhombus
- Rectangular Square

Irregular Shape Punch Die Set



Are applicable to confectionery industries.

Available with different size, concavity, and flat in plain or engraved break line.

TABLET TOOLING TYPES

There are following types of tooling available

- 'B' -Tooling
- 'D' -Tooling
- 'BB' -Tooling
- 'DB' -Tooling

Dimensions

Type of Tooling	Punch Length (mm)	Punch Diameter (mm)	Die Diameter.(mm)	Height of dies (mm)	Max. Tab. size (mm) Round/ Capsule
B	133.6	19	30.15	22.22	16/19
D	133.6	25.4	38.1	23.82	25/25
BB	133.6	19	24.0	22.22	13/14
DB	133.6	25.4	30.15	23.22	19/19

Types of Tooling (Continue)

'B' – tooling

- It has a long and thin body compared with 'D' – tooling , with a smaller punch head and punch tip. Small punch head leaves a restriction on punch pressure, thus tablets and pills requiring high hardness can't be finished by 'B' – tooling , while the small tip directly decides the size(diameter) of tablets. Thus, it is more suitable to make small pills.
- Due to its small punch body occupies less space, more stations of tablet tooling can be designed on the rotary table. Which means that higher yield and quicker production can be achieved at the same working speed.
- Operating force in tons is 6.5.

Types of Tooling (Continue)

'D' – tooling

- It is short and fat in views of its configuration. Fat punch body and big punch head allow high pressure to be engaged, thus the pills can be made hard and strong enough. And big punch tip and tip flat leaves more space for materials, thus big pills with large diameter(20mm) can be made.
- The fat punch body occupies, less stations can be set on the premise of the same size of rotary table. With the same working speed, less tablets and pills are processed.
- Operating force in tons is 10.

Tablet Tooling Terminology

1. **Head** : The end the punch that guides it through the cam track of tablet machine during rotation.
2. **Head flat (Dwell flat)** : The flat area of the head that receives the compression force from the rollers (in upper punches) & determines the weight and ejection height (in lower punches)
3. **Outside head angle** : The area gets in touch in with the roller prior to head flat, while compression.
Inside head angle : This is the area , which pulls down the lower punches after ejection and lifts the upper punches after compression.
4. **Neck** : The relieved area between the head and barrel, which provides clearance to the clams



5. **Barrel** : This area guides the punch (while going up and down) with reference to turret guides
6. **Stem** : The area of the punch opposite the head, beginning at the tip & extending to the point where the full diameter of the barrel begins. If the chamfer is present the barrel usually reaches its full diameter just above the chamber.
7. **Tip**: This determines size, shape & profile of the tablet
8. **Tip face**: This area of punch is where the tablet is formed. Good surface finish is required here to get quality tablets
9. **Working length**: This distance between the bottom of the cup and the head flat is called as working length which determines weight and thickness of the tablet
10. **Overall length**: Distance between top of the cup and the head flat.
11. **Key Angle**: The relationship of the punch key to the tablet shape. The keys position is influenced by the tablet shape, take-off angle, and turret rotation.
12. **Domed Heads**: Increases the dwell time and hence help to achieve the better tablet hardness.
13. **Dwell time**: The time punches spends below the pressure roller while rotating in the machine

