

b) Linear machine

It was very similar to rotary machine.

The rate of production is higher than rotary machine i.e 10000 per hour.

Displacement value and its calculations

→ The volume of suppository for particular mould is uniform but its weight will vary because of difference in density of base and medicament used

displacement value is defined as

"The quantity of drug which displaces one part of the base"

→ 1 gm of suppository base can be displaced by 1 gm of drug if the displacement value is exceeded

→ suppository bases are commonly made from Cocoa butter & Theobroma oil

→ In suppositories 1gm or 2gms of the base are generally placed in a mold to hold the suppositories

- molds have fixed volume that cannot change.
- mold volume remains constant.
- The addition of a drug or Excipient to the base displaces some of the bases and takes up some space

displacement value of a given medicament can be determined as

- ① prepare and weigh 6 suppositories containing base = a gm
- ② prepare and weigh 6 suppositories containing 40% drug = b gm
- ③ Calculate amount of base in medicated suppositories = $\frac{60}{100} \times b$ = c gm
- ④ Calculate amount of drug in medicated suppositories = $\frac{40}{100} \times b$ = d gm
- ⑤ Calculate the amount of base displaced by d g of drug = $(a - c)$ gm

So displacement value of drug = $\frac{d}{a-c}$

1) Calculate the displacement value of medicament in Cocoa butter suppositories containing 40% medicament, prepared in 1gm suppository mould
(wt of 10 Medicated suppositories is 15 gm)

→ wt of pure base : 5 $= 1 \text{ gm} \times 10$
 $= 10 \text{ gm} \rightarrow a$

wt of 10 medicated : 5 $= 15 \text{ gm} \rightarrow b$

Amt of base in medicated 5 $= \frac{60}{100} \times b$
 $= \frac{60}{100} \times 15 = \frac{900}{100} = 9$

9 gm $\rightarrow c$

Amt of medicament in medicated 5 $= \frac{40}{100} \times 15 = \frac{600}{100} = 6$

6 gm $\rightarrow d$

So displacement value $= \frac{d}{a-c}$
 $= \frac{6}{10-9}$

$= \frac{6}{1}$
 $= 6 \text{ gm}$