CAPSULES

PRESENTED BY :

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$6\frac{2}{3}\%$
Gelatin gel

10°C, 17hrs

CAPSULES

Animal (Pork/calf) bone/skin

Acid | Base

Collagen

>80°C | H_2O

Gelatin

- Fe^{3+} NMT 15 ppm
- Bloom strength 150 – 250 gm
- Viscosity 25-45 milli poise

Gelatin - A
(Isoelectric point – 9)

Gelatin - B
(Isoelectric point – 4.7)

HARD GELATIN CAPSULE

I. Moisture content in finished capsule shell

Brittle <12 – 15% H_2O < sticky

II. Formulation of capsule shell

- Gelatin **(Shell forming agent)**
- Tio_2 **(Opacifying agent)**
- So_2 **(Preservative)**

SOFT GELATIN CAPSULE

I. Moisture content in finished capsule shell

Brittle <6 – 10% H_2O < sticky

II. Formulation of capsule shell

Plasticized Gelatin

Ex: Glycerin,
Sorbitol
Propylene glycol etc.,

The ratio between dry plasticizer & dry gelatin determining the “Hardness” of the gelatin shell

- ✓ 0.4/1 – Hard
- ✓ 0.6/1 – Medium
- ✓ 0.8/1 – Soft

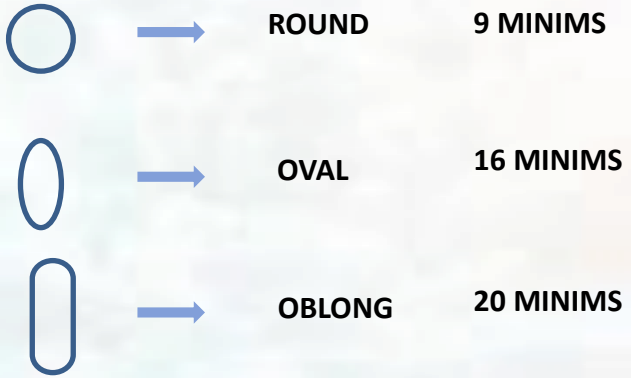
- Parabens
- Sorbic acid

} **Preservatives**

III. Empty capsule sizes

CAPSULE SIZE	≈ VOLUME (in ml)	≈ CAPACITIES (in mg)
0	0.75	450
1	0.55	300
2	0.4	250
3	0.3	200
4	0.25	150
5	0.15	100

III. Empty capsule sizes



IV. FILLING MATERIALS

- ✓ Dry solids
- ✓ Pellets

IV. FILLING MATERIALS

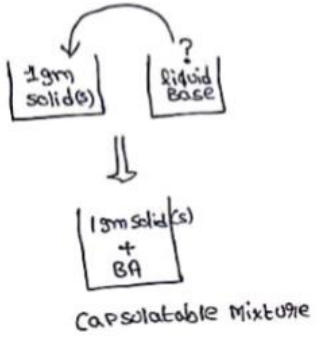
- ✓ Dry Solids
- ✓ **Solutions**
- ✓ **Suspensions**

VEHICLE
Ex: PEG 400
TWEEN 80
Mineral oil
Vegetable oil etc.,

NOTE:

Base adsorption of solid(s) to be suspended

No. of grams of liquid base required to produce a capsulatable mixture when mixed with 1g of solid(s)



The **Minim per gram factor (M/g)** is the volume in minims that is occupied by 1g of the solid(s) plus the weight of the liquid base (BA) required to make a capsulatable mixture

$$M/g = (S + BA)/\rho$$

$$M/g = \frac{(S + BA)}{W/V_{minims}}$$

$$M/g = \frac{(S + BA)V_{minims}}{W_{gm}}$$

V. FILLING MACHINES

I. **ACCOFIL**
   → Fill dry solids

II. **ROTOFIL**
   → Fill Pellets

III. **ROTOSORT**
   → Eject Unfilled capsules

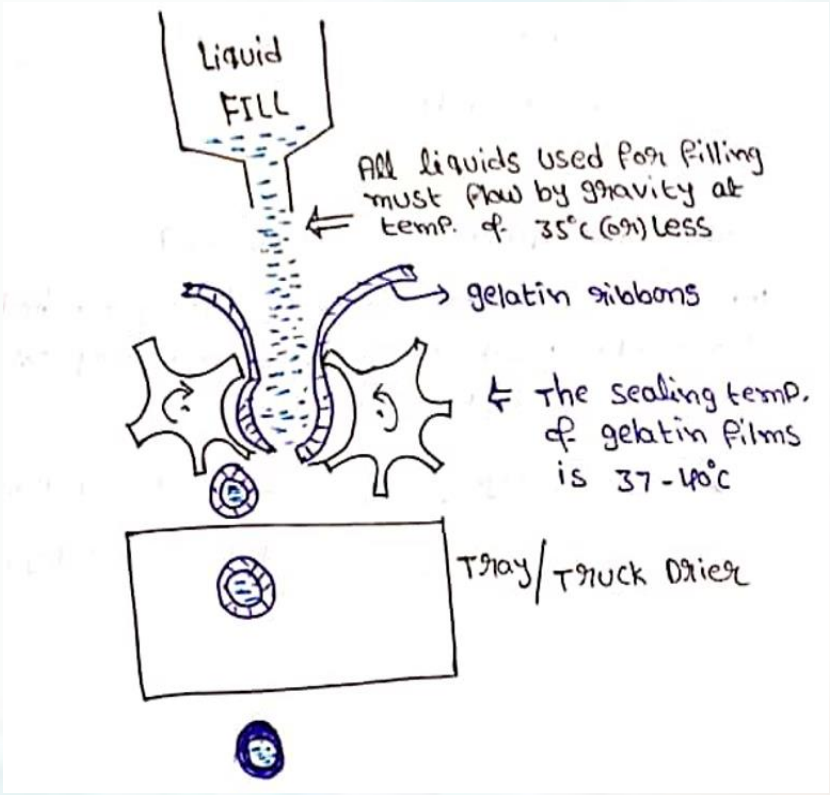
IV. **ROTOWEIGH**
   → Weigh Capsules

V. FILLING MACHINES

I. **ACCOGEL**
   → Fill dry solids

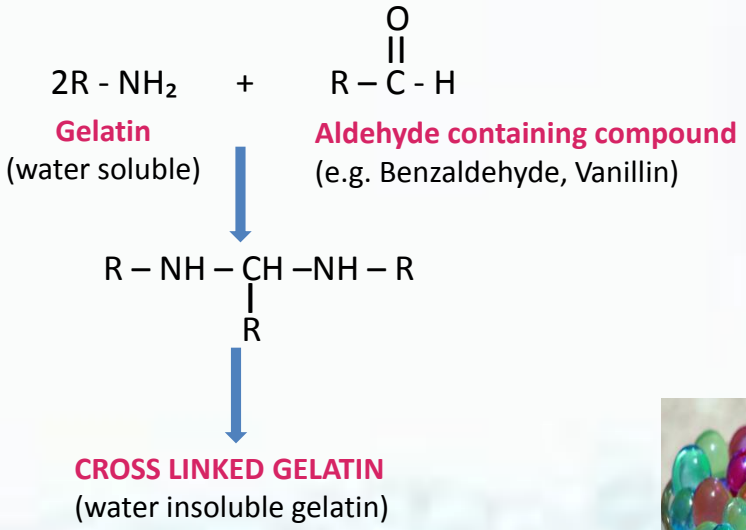
II. **ROTARY DYE**
   → Fill liquids

Capsules manufactured from Rotary die having negligible **wt. variation of < ±3%**


Liquid
FILL
All liquids used for filling must flow by gravity at temp. of 35°C (or) less
gelatin ribbons
The sealing temp. of gelatin films is 37 - 40°C
Tray/Truck Drier

INCOMPATIBILITIES OF GELATIN

- ✓ Gelatin prone to cross linking when exposed to aldehyde containing compounds (Ex: Benzaldehyde, Vanillin) etc.,
- ✓ Cross linked gelatin shows reduced water solubility



- ✓ Cross linking (Tanning) of gelatin can be reduced by addition of **Fumaric acid** (i.e., Solubility Aid)

PREVIOUS QUESTIONS:

GPAT 2010, NIPER – 2018

Q) Bloom strength is used to check the quality of

1. Lactose 2. Ampoules 3. Hardness of Tablets **4. Gelatin**

GPAT 2011, NIPER – 2015, DRDO -2009

Q) Which one of the following drying method is commonly used in pharma industry for drying of soft- shell capsules

1. **Truck drying**
2. Fluid bed drying
3. Vacuum drying
4. Microwave drying

GPAT 2018

Q) Isoelectric Point of Type-A gelatin is:

1.pH 7.0 2. pH 4.7 **3. pH 9.0** 4. pH 7.4

THANK YOU

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