The logo of Galgotias University is a stylized 'G' composed of three curved, overlapping bands in yellow, blue, and red, set against a light grey circular background.

## *MODULE 2:Tablets*

### *Lecture 6*

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## DISCLAIMER

All the content material provided here is only for teaching purpose

The logo of Galgotias University is a stylized, circular emblem. It features a central white swirl that transitions into a blue swirl, which then transitions into a yellow swirl, and finally into a red swirl. The entire emblem is set against a light brown background.

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# FILM DEFECTS

S.NO	Tablet defects	Cause	Remedies
1	Blistering	Entrapment of gases in the film due to overheating during spraying.	Milder drying conditions are warranted in this case.
2	Chipping	Decrease in fluidizing air	Be careful not to over dry the tablets in the pre-heating stage.
3	Picking	It creates overly wet bed where adjacent tablets stick together and break apart	Increase in the drying air temperature and air volume
4	Twinning	Common problem	Increase the pan speed
5	Pitting	Temperature of the tablet core is greater than the melting point of the materials used in the formulation	Control of temperature of tablet core
6	Cratering	Coating solution penetrates the surface of the tablet	-----
7	Blooming	Mostly due to plasticizer	-----
8	Color variation	Alteration of the frequency and duration of the spray zone	A best way is to reformulate with different plasticizers
9	Cracking	Internal stress in the film exceeds tensile strength of the film	Use of high molecular weight polymer blends
10	Orange peeling	Inadequate spreading of the coating solution	Thinning the solution with additional solvent
11	Mottling	Degradation of the product	Prepare coating solution properly

# Coating Defects

## CHIPPING

Involves increased brittleness of the tablet.

□ Causes :

High degree of attrition associated with the coating process like:

excessive use of fillers & pigments

low amount of polymers

Remedy :

Increase hardness of the film by increasing the molecular weight grade of polymer.

# Coating Defects

## STICKING & PICKING

- Sticking involves sticking of the tablets with each other & with pan walls.
- Picking is the aftermath case of sticking involves adhering of some portion of coated layer to pan or to another tablet at the point of contact.

- Causes :

Higher rate of application of coating solution

Inefficient drying.

- Remedy :

Use optimum and efficient drying conditions.

Increase the inlet air temperature.

Decrease the rater of application of coating solution by increasing viscosity of coating solution.



- CRACKING

- The coating cracks when the internal stress exceeds the tensile strength of tablets.

Causes :

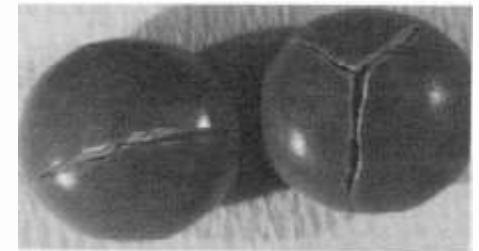
Absorption of moisture.

Internal stress relaxation after compaction.

Excessive coating material concentration.

Remedy :

Adjusting the coating solution concentration.





## TWINNING

Two or more tablets that sticking together.

□ Causes :

Inefficient drying.

Higher rate of application of coating solution.

□ Remedy :

Choosing appropriate shaped tablets.

Controlling the drying & rate of movement of pan.

Adjusting the coating solution concentration.

# Coating Defects

## BLOOMING/HAZING

- The polish of product to take on a fogged appearance.
- Causes :
  - # High temperature during formulation.
  - # Exposure to high humidity conditions.
- Remedy :
  - # Controlling humidity conditions.
  - # Formulation temperature monitoring.



# Coating Defects

## BRIDGING/FILLING

- Occurs in tablets consisting monogram or bisection.
- Coating shrink or pull away – Bridging
- Too much filling & thereby narrowing - Filling
- Causes :
  - improper application of the solution.
  - poor design of the tablet embossing.
  - high coating viscosity.
  - high percentage of solids in the solution.
  - improper atomization pressure.
- Remedy :
  - Control of spraying of coating solution.
  - Soft edged font for monogram.
  - Atomization control.
  - Concentration of coating material.



- BLISTERING

- • An un-smooth coated surface shows a number of uneven spots called blisters.
- Causes :  
Effect of temperature on the strength, elasticity and adhesion of the coat.
- Remedy :  
Use mild drying condition.

## ORANGE PEEL EFFECT

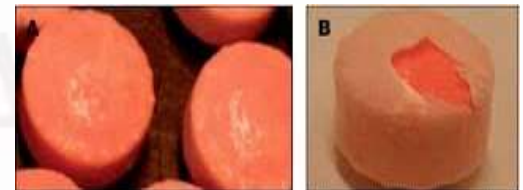
Coating texture that resembles the surface of an orange. Before drying causes a bumpy or “orange-peel” effect on the coating.

Causes :

- # High atomization pressure in combination with spray rates.
- # Too rapid drying.
- # High solution viscosity.

Remedy

- # Thinning the solution with additional solvent.
- # Controlling the drying procedures.



## COLOUR VARIATION (MOTTLING)

Variation in the proposed colour for coating.

Causes :

- # Improper mixing.
- # Uneven spray pattern. # Insufficient coating.
- # Unevenness of the surface of the sub coat.

Remedy

- # Using lake dyes.
- # Go for geometric mixing.
- # Use mild drying conditions.

# References

- Shah A. Coating Tablet Defects: The Cause and The Remedies, 2011, <http://vikramthermoblogspot.in/2011/06picking-and-sticking.html>.
- <https://www.rroij.com/open-access/techniques-of-tablet-coating-concepts-and-advancements-a-comprehensive-review.php?aid=34923>
- The theory and practice of Industrial pharmacy, by Leon Lachmann and Herbert A.Lieberman,3rd edition, Page no: 294 to 336.