

Trouble shooting guide for tablet coatings

Orange peel / Roughness

Rough, orange-like film surface



Causes

- High viscosity/solid content
- High spray rate
- Low atomization air pressure
- Poor spray gun performance
- Dispersion sedimentation

Remedies

- Reduce viscosity of coating suspension
- Optimize atomizing air pressure
- Reduce spray rate
- Optimize spray gun

Twinning

Two or more tablets stick together



Causes

- Insufficient drying
- Low atomization air pressure
- Spray gun too close to bed
- Slow pan speed
- High spray rate
- Flat surface tablet
- Excessive tacky coating formulation

Remedies

- Increase drying capacity
- Increase atomization air pressure
- Increase gun to bed distance
- Increase pan speed to reduce dwell time
- Decrease spray rate
- Add edge curvature to tablet
- Use less tacky coating system

Film cracking

Cracks on coated surface



Causes

- Poor plasticization; non-flexible film
- Expansion of tablet core
- Inadequate compression coating hold time
- Expansion of core due to heating
- Expansion of core due to water absorption

Remedies

- Reduce thermally expandable excipients
- Extend hold time between compression and coating
- Avoid high tablet blend temperature
- Improve drying capabilities of coating process

Picking and sticking

Surface damage after sticking



Causes

- Poor film adhesion
- Low solid coating formulation
- Too high spray rate
- Drying temperature too low
- Slow pan speed
- Low atomization air pressure

Remedies

- Use high adhesion film coating formulation
- Use high solid film coating formulation
- Reduce spray rate
- Increase drying temperature
- Increase pan speed
- Increase atomization air pressure

Film peeling

Coating peels off



Causes

- Core tablet erosion
- Low film strength coating
- Overheated tablet core
- Excessive attrition
- Insufficient core porosity

Remedies

- Improve tablet core formulation
- Reduce pre-warming temperature and time
- Reduce pan speed
- Increase tablet core porosity

Scuffing

Grey-black marks on tablet surface



Causes

- Large and elongated shaped tablet
- High TiO₂ content
- Slow pan speed
- Longer coating process
- Underloaded coating pan

Remedies

- Change tablet shape
- Reduce TiO₂ level
- Shorten coating time
- Increase pan speed
- Increase pan load

Colour variation

Uneven tablet shades



Causes

- Low opacity (hiding power) of film coating
- Too high solid concentration of coating formulation
- Low or High pan loading
- Low film coat weight gain
- Too low pan speed
- Insufficient number of spray gun

Remedies

- Coating system with increase hiding power
- Reduce solid concentration of coating formulation
- Optimize pan loading
- Increase film coat weight gain
- Increase pan speed
- Increase number of spray gun

Edge erosion

Chipped or worn edges



Causes

- Poor film strength
- High core friability
- Too sharp tablet edges
- Worn tablet tooling
- Low spray rate
- Inappropriate baffle design according to tablet shape
- Under loaded pan
- Too high pan speed

Remedies

- Reformulate core to reduce brittleness
- Change core shape and design
- Replace tablet tooling
- Increase spray rate
- Change baffle design
- Fill pan to correct volume
- Reduce pan speed

Tablet surface erosion

Surface wear during tumbling



Causes

- Low film strength
- Too low solid concentration of coating suspension
- Hygroscopic tablet core
- High core friability
- Logo placement and design
- Too low spray rate
- Too high pan speed

Remedies

- High strength film coating
- Increase coating suspension solid concentration
- Reduce hygroscopic core material
- Reformulate core with improve friability
- Change logo design and placement
- Increase spray rate
- Decrease pan speed

Tablet breakage

Tablets break apart



Causes

- Tablets are too soft or too brittle
- Poor tablet shape
- Too high pan speed
- Inappropriate baffle design
- Too low spray rate
- Under loaded pan

Remedies

- Consider reformulating core
- Change tablet shape
- Reduce pan speed
- Change baffle design
- Increase spray rate
- Fill the pan at optimum volume

Logo bridging

Logo bridging



Causes

- Low adhesion film coating
- Poorly plasticized film coating
- Poor logo design
- Low adhesion core ingredients
- Dispersion sedimentation
- Spray rate too high
- Too low atomization pressure

Remedies

- Use high-adhesion coating
- Use optimally plasticized film coating
- Use appropriate logo design
- Use high adhesion core ingredients
- Decrease spray rate
- Increase atomization air pressure

Logo filling

Filling of logo



Causes

- High solid content/Viscosity
- Low plasticizer
- High spray rate
- Low/high atomizing air pressure

Remedies

- Decrease solid content/viscosity
- Increase plasticizer content
- Reducing the spray rate
- Adjusting the air pressure