

film coating troubleshooting

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aquarius™
film coating systems



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tablet twinning

tablets stuck together, usually after becoming aligned along flat surfaces



cause	recommendation
coating formulation	
tacky coating formulation	select a less tacky aquarius film coating from ashland
coating process	
low pan speed	increase pan speed
spray rate too high	decrease spray rate
ineffective drying capacity	increase inlet air temperature and/or air volume
poor spray gun performance	ensure proper gun to bed distance; increase atomization air pressure
tablet core	
poor tablet design	choose better tablet design to eliminate flat surfaces

film peeling

coating peels off tablet during coating process



cause	recommendation
coating formulation	
thermal expansion of core and coating	reduce pre-warming temperature or time and avoid high product temperature
coating process	
poor mechanical and adhesion properties	select an optimized Aquarius film coating system
poor plasticizer selection	select an optimally plasticized Aquarius film coating system
tablet core	
thermal expansion of core and coating	reduce the level of mineral excipients
tablet core hygroscopic, causing expansion	reduce content of water absorbent excipients
tablet core erosion	reduce tablet friability and choose better tablet shape

excessive roughness (orange peel)

the surface of the coated tablet appears extremely rough, like the surface of an orange



cause	recommendation
coating formulation	
high film coating suspension viscosity	select a low viscosity film coating
suspension solids concentration too high	decrease coating suspension solids concentration
coating process	
atomization pressure too low	increase atomization air pressure
spray rate too high	decrease spray rate
poor spray gun performance	ensure proper setup and maintenance of spray gun

film cracking

the surface of the coated tablet exhibits cracks and fractures



cause	recommendation
coating formulation	
poor plasticizer selection	select an optimally plasticized aquarius film coating system
coating process	
thermal expansion of core and coating	avoid high product temperature
tablet core expands due to absorption of water	increase air volume, reduce the spray rate and/or increase product temperature
tablet core	
thermal expansion of core and coating	reduce the level of mineral excipients
tablet core hygroscopic, causing expansion	reduce content of absorbent excipients
expansion due to post compaction strain recovery	extend time between tableting and coating

tablet discoloration

color change seen either through or on the coating by interactions of ingredients or excessive heat



cause	recommendation
coating formulation	
discoloration caused by moisture	select a coating with higher solids concentration or a moisture barrier coating
discoloration caused by melting of ingredients	select a coating capable of being applied at lower processing temperatures
coating process	
discoloration caused by moisture	decrease spray rate and/or increase processing temperature; select a moisture barrier coating
discoloration caused by melting of ingredients	increase spray rate or reduce product temperature

surface erosion

tablet surfaces erode as tablets tumble during the coating process



cause	recommendation
coating formulation	
low film strength	select a high strength aquarius film coating
suspension solids concentration too low	increase coating suspension solids concentration
coating process	
high pan speed	reduce pan speed
spray rate too low	increase spray rate
inappropriate baffle design	replace baffles or change baffle design
tablet core	
high tablet friability	improve tablet core formulation
tablet core hygroscopic, causing expansion	reduce content of absorbent excipients
poor logo placement or tablet design	investigate better logo design and placement

edge chipping

the edges of the tablets are worn away, or chipped, as the coating is being applied



cause	recommendation
coating formulation	
low film strength	select a high strength aquarius film coating
suspension solids concentration too low	select a high solids aquarius film coating system
coating process	
high pan speed	reduce pan speed
spray rate too low	increase spray rate
insufficient pan fill	fill pan to correct volume
inappropriate baffle design	replace baffles or change baffle design
tablet core	
high tablet friability	improve tablet core formulation
damaged tablet tooling	refurbish or replace damaged/worn punches
sharp tablet edges	improve tablet core design

color variation

visible differences in color, tablet-to-tablet, are readily apparent



cause	recommendation
coating formulation	
poor opacity of film coating	select a high opacity Aquarius film coating
suspension solids concentration too high	lower coating suspension solids concentration
coating process	
insufficient coating weight gain	increase weight gain of film coating
low pan speed	increase pan speed
spray rate too low	increase spray rate
inappropriate baffle design	replace baffles or change baffle design
poor spray gun performance	ensure proper setup and maintenance of spray gun
tablet core	
poor tablet design	improve tablet core formulation

logo in-filing/spray drying

coating droplets are over-dried before contacting tablet surface, increasing tablet surface roughness and filling in the logo, thus reducing logo/break-line clarity



cause	recommendation
coating formulation	
coating suspension too high	decrease solids concentration
coating suspension is too foamy	optimize suspension mixing process
coating process	
drying conditions are excessive	decrease drying air temperature; reduce turbulent airflow; increase spray rate
non-ideal spray gun operation	decrease atomization pressure; adjust gun to bed distance; replace and service spray gun

picking and sticking

tablets momentarily stick together, often just after they pass through the spray zone, and then break apart leaving defects in the surface of the coating



cause	recommendation
coating formulation	
low film strength	select a high strength aquarius film coating
suspension solids concentration too low	select a high solids aquarius film coating system
coating process	
low pan speed	increase pan speed
spray rate too high	reduce spray rate
low drying capacity and temperature	increase air volume and/or inlet temperature
insufficient atomization air pressure	increase atomization air pressure
poor coating uniformity	replace damaged baffles or change baffle design; increase number of spray guns; maintain proper gun to bed distance
tablet core	
poor tablet design	change design to increase curvature on faces and edges of tablets
poor adhesion to tablet core	incorporate excipient with high adhesion

logo bridging

the coating as it dries overcomes the forces of attachment of the coating to the tablet surface, causing the coating to pull away within the logo or break line, making either less visible



cause	recommendation
coating formulation	
poor plasticizer selection	select an optimally plasticized aquarius film coating system
low adhesion film coating	select an aquarius film coating system with high adhesion
coating process	
spray rate too high	reduce spray rate
low bed/product temperature	increase inlet air temperature
low atomization air pressure	optimize atomization air pressure
tablet core	
low adhesion of tablet core ingredients	introduce high adhesion materials
poor logo placement and design	investigate better logo design and placement

tablet breakage

tablets break apart during pan loading, coating process, or unloading of the coating pan



cause	recommendation
coating formulation	
low suspension solids concentration	select a high solids aquarius film coating system
coating process	
high pan speed	lower pan speed
low spray rate	increase spray rate
inappropriate baffle design	replace baffles or change baffle design
tablet core	
tablets are soft or brittle	improve tablet core formulation
expansion due to post compaction strain recovery	extend time between tableting and coating
poor tablet shape and design	improve tablet shape and design

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