



# TROUBLE SHOOTING GUIDE

## POWDER COATING APPLICATION PT 1

<b>PROBLEM</b> Poor attraction of powder the component	
<b>CAUSE</b>	<b>SOLUTION</b>
Incorrect voltage at the gun	Check voltage, clean or replace gun
Poor earthing	Clean grounding points & hangers
Excessive build up of cured powder coating on hangers	Clean hangers
Moisture in spray booth	Check booth air supply for quality
Gun air pressure too high	Reduce forward air pressure
Incorrectly positioned guns	Reposition offending guns
Poor hanger design	Re-design hangers to reduce shielding

<b>PROBLEM</b> Poor penetration	
<b>CAUSE</b>	<b>SOLUTION</b>
Too low powder delivery	Increase powder flow
Poor grounding	Check & improve grounding
Incorrect spray pattern	Try different spray nozzles
Too high voltage	Reduce voltage so that surfaces closest to the gun do not repel powder
Incorrect powder delivery velocity	Reduce air setting so powder air stream does not blow powder away
Poor gun placement	Adjust gun position to enter more directly into recessed area
Powder too fine	Reduce ratio of reclaim to hopper OR Check particle size distribution

<b>PROBLEM</b> Film thickness on component too low	
<b>CAUSE</b>	<b>SOLUTION</b>
Powder delivery rate insufficient	Set correct powder flow pressure OR Check if venturi is the right size, clean and set correctly
Insufficient coating time	Increase coating time of component by slowing the conveyor speed OR Increase voltage and forward air flow, reposition guns
Faraday cage effect	Adjust voltage and forward air flow, reposition guns
Surface area of hanger too large compared to the surface area of the workpiece	Reduce the size of hangers
Damp powder	Remove powder and replace, ensure powders are sealed and stored in the correct manner



# TROUBLE SHOOTING GUIDE

## POWDER COATING APPLICATION PT 2

<b>PROBLEM</b> Appearance looks uneven and broken before curing	
<b>CAUSE</b>	<b>SOLUTION</b>
Back ionisation	Reduce Voltage OR Check if earthing points are clean OR Reduce deposition rate and film thickness OR Ensure no moisture is entering the system OR Move gun further away from component OR Check for build up of metallic particles within the gun and components, clean if necessary

<b>PROBLEM</b> Film thickness on component too high	
<b>CAUSE</b>	<b>SOLUTION</b>
Excessive powder delivery	Reduce powder feed to gun OR Increase distance between gun and component
Gun voltage too high	Reset gun voltage
Excessive coating duration	Reduce time of component in front of the gun by: Increasing the conveyor speed OR Increase the reciprocator speed

<b>PROBLEM</b> Surging and spitting	
<b>CAUSE</b>	<b>SOLUTION</b>
Damp air supply	Check air drier OR Install refrigeration unit OR Empty water traps
Varying air supply	Possible compressor overload
Damp powder	Remove powder, full plant clean down, start again with new powder. Ensure any remaining powder is resealed securely until re-use
Powder too fine	Check ratio of recovered powder to virgin powder is correct. Alter if required

# RECOVERY AND RECLAIM

<b>PROBLEM</b> Poor containment of powder booth	
<b>CAUSE</b>	<b>SOLUTION</b>
Primary air-filters blocked or damaged	Clean or replace filters OR Check reverse air cleaning system OR Check compressed air for quality
Secondary air-filters overloaded due to damage of main filters	Inspect and replace bag filters OR Clean or replace cartridges
Spray booth opening too large	Reduction of opening
Improper gun position	Re-align spray gun
Powder delivery too high	Reduce number of spray guns

<b>PROBLEM</b> Contamination of surface of work-piece	
<b>CAUSE</b>	<b>SOLUTION</b>
Powder or foreign particles falling from conveyor or hangers	Clean conveyor regularly and strip hangers /hooks
Contamination through reclaim powder, damage to the in-line sieve	Replace torn sieve
Contamination through foreign bodies from work floor entering booth	Clean work floor and improve house keeping
Contamination through compressed air supply	Check compressed air for quality

<b>PROBLEM</b> Contamination by recycled powder	
<b>CAUSE</b>	<b>SOLUTION</b>
Ineffective cleaning of recovery and recycle system	Complete clean down of system

<b>PROBLEM</b> Powder recovery below specified rate	
<b>CAUSE</b>	<b>SOLUTION</b>
Air velocity too low	Compare air flow with specification
Powder too fine	Check PSD of powder , contact the powder manufacturer

# CURING OF POWDER

<b>PROBLEM</b> Gloss too high	
<b>CAUSE</b>	<b>SOLUTION</b>
Cure temperature too low	Increase air temperature and metal temperature OR Decrease track line speed
Oven cycle too short	Decrease track line speed OR Increase oven temperature OR Extend cure time (box oven)

<b>PROBLEM</b> Gloss too low	
<b>CAUSE</b>	<b>SOLUTION</b>
Oven temperature too high	Reduce air temperature and check metal temp OR Increase line speed
Time in the oven too long	Increase line speed OR Decrease oven temp
Contamination with a powder which is incompatible	Clean all equipment including guns, booth and recovery system and re-charge with virgin powder
Contamination with solven which may contain chlorinated hydrocarbons	Check proximity of vapour degreasing plant; restrict air movement to the powder coating application area

<b>PROBLEM</b> Poor flow	
<b>CAUSE</b>	<b>SOLUTION</b>
Heat up rate of the metal too slow	Increase the temperature at the first stage of the oven

<b>PROBLEM</b> Poor hammer or texture development	
<b>CAUSE</b>	<b>SOLUTION</b>
Heat up rate too slow	Increase the temperature at the first stage of the oven
Too much reclaim	Reduce the amount of reclaim with the addition of virgin powder



## CURING OF POWDER PT 2

<b>PROBLEM</b> Poor flow	
<b>CAUSE</b>	<b>SOLUTION</b>
Heat up rate of the metal too slow	Increase the temperature at the first stage of the oven

<b>PROBLEM</b> Poor adhesion	
<b>CAUSE</b>	<b>SOLUTION</b>
Under cure film	Increase oven temperature OR Decrease line speed
Poor pretreatment	Check pre-treatment, adjusting tanks in line with supplier recommendation.

<b>PROBLEM</b> Even discoloration	
<b>CAUSE</b>	<b>SOLUTION</b>
Cure temperature too high	Reduce oven temperature ,or increase line speed

<b>PROBLEM</b> Patchy discolouration	
<b>CAUSE</b>	<b>SOLUTION</b>
Inadequate pre-treatments	a.Check evenness of pre-treatment b.Check and adjust chemical balance of pre-treatment c.Check final rinse water and drying
Corrosion products on the metal surface	Inadequate clean off with chemical pre-treatments OR Check final rinse for contamination
Powder contamination	Check cleanliness of plant and recycling system

## **POWDER SUPPLY, HOSES PUMPS AND VENTURIS**

<b>PROBLEM</b> Poor fluidisation in powder hopper	
<b>CAUSE</b>	<b>SOLUTION</b>
Powder level too low	Add powder to the normal level
Compact or damp powder	Manually loosen powder in hopper OR Check compressed air for quality
Partly plugged membrane	Check bottom of hopper and membrane for any obstruction
Powder particle size	Decrease the amount of reclaim to the hopper OR Check PSD of virgin powder

<b>PROBLEM</b> Blocked hoses powder pump or venturi	
<b>CAUSE</b>	<b>SOLUTION</b>
Normal build up	Clean or replace parts
Too high air pressure	Reduced air pressure on pump and gun
Air supply moist	Check air supply for quality
Material choice of hose	Check hoses for material quality
Powder hoses too long	Modify layout or shorten hose
Worn venturi or pump	Replace worn parts
Too fine powder	Decrease amount of reclaim powder to hopper OR Check PSD of virgin powder

<b>PROBLEM</b> Powder dusting out of hopper	
<b>CAUSE</b>	<b>SOLUTION</b>
Too high air pressure	Reduce air pressure too the fluid bed
Too fine powder	Decrease amount of reclaim to hopper OR Check PSD of virgin powder

## CONTAMINATION OF **SUBSTRATE** OR **POWDER** FILM

<b>PROBLEM</b> Foreign matter in film	
<b>CAUSE</b>	<b>SOLUTION</b>
Inadequate cleaning	Check or adjust flow rate, spray nozzle position and temp in each pre-treatment stage OR Check or adjust operating specs for chemicals OR Clean guns booths and recovery systems
Powder is too course or not sieved	Sieve all reclaim powder, check for holes in sieve,check or change sieve mesh size
Virgin powder is bitty	Talk to your lab

<b>PROBLEM</b> Chemical cross-contamination	
<b>CAUSE</b>	<b>SOLUTION</b>
Improper loading or spacing of parts	Check and adjust parts for maximum drainage OR Check and adjust drain time between stages

<b>PROBLEM</b> Contamination of colour	
<b>CAUSE</b>	<b>SOLUTION</b>
Poor housekeeping when colour changing	Totally clean plant,gun and recycling equipment and recharge with new powder
Cross contamination from manufacturer	Contact lab

<b>PROBLEM</b> Pinholes in the film	
<b>CAUSE</b>	<b>SOLUTION</b>
Silicone contamination	Locate and remove source
Oil contamination	Check degreasing plant
Oil/water in the air supply	Check oil/water seperators on the air supply