

Phenomenon	Possible cause	Suggested solution
<b>Powder spills out of the powder hopper</b>	Fluidization air pressure is too high  Proportion of fine-grained particles is excessive	Reduce fluidization air pressure  Reduce the proportion of recycled powder in relation to virgin powder in the powder hopper Discuss with the powder supplier the possibility of supplying powder with a lower proportion of fine-grained particles.
<b>The powder is not fluidized</b>	Insufficient air pressure  Clogged membrane in the bottom of the powder hopper  Powder packed down in the bottom of the hopper	Check the compressed air supply. Examine and if necessary, increase the pressure in the compressed air network Examine the condition of the supply lines.  Empty the hopper and check if the membrane is clogged.  Manually stir the powder in the hopper and increase the air pressure in order to start fluidization.
<b>Poor fluidization</b>	Too little powder in the hopper  Compacted or damp powder  Clogged or damaged membrane	Add virgin powder so the hopper is approximately 2/3 full under fluidization  Increase the air pressure and manually stir the powder in the hopper.  Check the moisture in the compressed air (dew point <3°C)  Empty the hopper and examine the membrane
<b>Lumps of powder in the hopper</b>	Air velocity is too low in relation to the amount of powder	If possible, increase supplemental air flow pressure on the ejector  Change to hoses with a smaller diameter  Install new ejector plug Consider using ejector plugs made of another material
<b>Dust from the spray booth – insufficient ventilation</b>	Unnecessarily large openings in the booth  Clogging of filters in the booth or of the final filter  Amount of powder sprayed is too large	Close unused openings  Adjust the entrance and exit to the size of the objects  Clean and if needed, replace filters or filter cartridges  If possible, increase the ventilation in the spray booth  Reduce the number of spray guns or reduce the amount of powder per gun
<b>Powder is not sufficiently charged</b>  <b>Insufficient wrap-around – poor deposition efficiency</b>	The high-voltage generator is not providing enough voltage to the spray gun's electrodes  Poor earthing connection	Ensure that cables and fuses are intact Ensure that the electrodes are in good condition Increase the generator voltage Ensure that the actual spray gun voltage is the same as that shown on the control panel  Check the connection between the object and the conveyor and between the conveyor and the earth  All contact points must be free of powder coating and other insulating materials

	<p>Too much powder per spray gun</p> <p>Proportion of fine-grained particles are too high</p> <p>Inappropriate type of powder</p>	<p>Reduce the amount so that as much of the powder as possible that passes the spray gun is charged.</p> <p>Reduce the proportion of recycled powder in relation to virgin powder</p> <p>Check with the powder supplier on the possibility of supplying powder with a lower proportion of fine-grained particles</p> <p>Check with the powder supplier if the powder is appropriate for the specific use/powder application equipment</p>
<p><b>Insufficient penetration in corners and recesses</b></p>	<p>Air velocity in the spray gun is too high – the powder is blown off</p> <p>Incorrect distance between the spray gun and the object</p> <p>Amount of powder per spray gun spray gun and the object</p> <p>Poor earthing connection</p> <p>Spray could is too wide</p> <p>Voltage is too high on the high voltage generator</p> <p>Air velocity is too high</p> <p>Incorrect spray gun adjustment</p> <p>Proportion of fine-grained particles are too high</p>	<p>Reduce the supplemental air flow</p> <p>Increase or reduce the distance between the spray gun and the object</p> <p>Increase the air pressure on the ejectors</p> <p>Check the connection between the object and the conveyor and between the conveyor and the earth. All contact points must be free of powder coating and other insulating materials</p> <p>Change to a smaller deflector or to a flat jet beam nozzle</p> <p>Reduce the voltage in order to even out the differences in coating thickness on interior and exterior corners</p> <p>Reduce the supplemental air flow pressure, and if necessary increase the distance between the spray gun and the object to prevent the powder from being blown off</p> <p>Adjust the spray guns so that the cloud of powder is directed as much as possible towards the most difficult areas of the object</p> <p>Reduce the amount of recycled powder by optimising the spraying process</p> <p>Check with the powder supplier on the possibility of supplying powder with a lower proportion of fine-grained particles</p>
<p><b>Difficult to build up sufficient film thickness</b></p>	<p>Not enough charging / charging effectiveness</p>	<p>Ensure that cables, fuses and electrodes are working</p>
<p><b>The powder slides off</b></p>	<p>Poor earth connection</p> <p>Air velocity is too high</p>	<p>Increase the voltage from the generator Check the spray gun voltage</p> <p>Check the connection between the object and the conveyor and between the conveyor and the earth</p> <p>All contact points must be free of powder coating and other insulating materials</p> <p>Reduce the air pressure, and if necessary increase the distance between the spray gun and the object</p>

<b>Adverse moisture in the work area</b>	Avoid relative humidity below 30% and above 70% - the ideal range is 45-55%	
<b>Back- ionisation/uneven powder layer</b>	Unnecessarily high voltage  Insufficient distance between the spray gun and the object  Poor earth connection	Reduce the voltage  Increase the distance  Check the connection between the object and the earth
<b>Large variation in film thickness</b>	Incorrect spray gun adjustment	Check the adjustment and ensure proper over-lapping
	Incorrect distance between spray gun and object	Increase or reduce the distance
	Improperly adjusted conveyor and reciprocator speed	Adjust the conveyor speed and/or the stroke and speed of the reciprocator
	Air flows in the spray booth that disturb the spray pattern	Contact the equipment supplier
	Improper hanging technique	Ensure that objects are as uniform as possible, correctly hung, and at the proper distance
	Uneven powder delivery	Ensure proper fluidisation and that the powder hopper is more than half full  Examine the diameter and length of the hoses
<b>Spray problems after mixing in recycled powder</b>	Change the particle size distribution	Reduce the amount of recycled powder as much as possible through the hanging technique, spray gun adjustments, and charging effectiveness
<b>Spitting</b>	Accumulation of fine-grained powder in spray guns/delivery system	Reduce the amount of recycled powder as much as possible  Reduce the time between each cleaning/ blow through  Check with the powder supplier on the possibility of supplying powder with a lower proportion of fine-grained particles
<b>Poor flow</b>	Film thickness is too low	Measure the thickness with appropriate and calibrated equipment. Adjust the thickness by changing the air pressure on the ejectors
	Heating up metal too slowly	Increase the oven temperature, or adjust the temperature profile. If possible, begin using IR heating in the entrance zone
	Spray gun voltage too high	Reduce the voltage or increase the distance between the spray gun and the object
	Inappropriate type of powder (reactivity is too high or powder particles are too coarse)	Check with the powder supplier if the powder is appropriate for the specific use/powder application equipment
<b>Low gloss on a high gloss finish</b>	Contamination with another product that is not compatible  Extreme temperature stress during heating	Thorough cleaning of the spray booth, delivery system and recycling system before adding virgin powder  Reduce the effect in the IR-zone

<b>Pinholes in the finish</b>	Film thickness is too high  Moisture	Reduce the film thickness  Check if there is moisture in the compressed air or if drying after the pre-treatment is insufficient  Check the degree of porosity in the substrate (cast iron)
<b>High gloss on a low gloss finish</b>	Insufficient curing	Increase the temperature and/or time in the oven
<b>Discolouration in the finish</b>	Contamination from powder used earlier in the equipment	Thorough cleaning of the spray booth, delivery system and recycling system before adding virgin powder
	Contaminated virgin powder	Check with the powder supplier
<b>Craters in the finish/surface</b>	Contamination with another product that is not compatible	Stop and do a thorough cleaning before adding virgin powder
	Grease on the metal surface after insufficient pre-treatment	Check and replenish the pre-treatment baths
	Moisture and/or oil in the compressed air	Examine the oil and water separators
<b>Porosity in the coating</b>	Moist substrate	Check the material after pre-treatment/ drying
	The powder quality is unsuitable for the specific substrate	Contact the powder supplier
<b>Incorrect or uneven colour</b>	Curing conditions exceed the specified range	Refer to the product data sheet and make necessary adjustments
	Variation in film thickness	Measure the thickness and make necessary adjustments
	Varying substrate thickness	Switch to polyester-based powder coatings
	Unsuitable type of powder	Check with the powder supplier if the Check with the powder supplier if the
<b>Drop formation/sagging</b>	Film thickness is too high	Check the thickness and make necessary adjustments
	Type of coating is unsuitable for the specific use (flow too good)	Contact the powder supplier
<b>Poor coverage of edges</b>	Sharp cutting edges on the metal	Contact the metal supplier/processor for changes Alternative hanging technique (sharp edges down)
	Type of coating is unsuitable for the specific use (flow too good)	Contact the powder supplier
<b>Poor mechanical properties – impact strength/flexibility</b>	Insufficient curing	Take measurements of the metal's temperature profile Increase the temperature and/or time in the oven
	Film thickness is too high	Check the thickness and reduce it by reducing the amount of powder or possibly increasing the conveyor speed
	Poor adhesion due to insufficient pre-treatment	Check and replenish the pre-treatment baths
	The nature of the powder coating	Check with the powder supplier

<b>Poor adhesion to the substrate</b>	Inadequate pre-treatment	Check and replenish the pre-treatment baths
	Insufficient curing	Increase the temperature and/or time in the oven
<b>Poor chemical resistance</b>	Insufficient curing	Increase the temperature and/or time in the oven
	Improper choice of powder type	Check with the powder supplier
<b>No charging</b>	Short circuit in the spray gun	Change to a special nozzle for metallic powder coatings
	Improper spraying equipment	Contact the powder supplier
<b>Changes in the metallic effect over time</b>	Uneven consumption of base and metal pigment (dry mixed powder) spraying process	Reduce the amount of recycled powder as much as possible by optimising the spraying process Frequent addition of virgin powder
<b>Textured powder coatings</b>		
<b>The substrate is visible under the texture</b>	Film thickness is too low	Increase the thickness
<b>Uneven texture</b>	Uneven film thickness	Optimise the spraying process for the most even thickness possible
<b>Variation in texture over time</b>	Variation in particle size distribution	Reduce the amount of recycled powder as much as possible by optimising the spraying effectiveness
<b>Recoating</b>		
<b>Phenomenon</b>	<b>Possible cause</b>	<b>Suggested solution</b>
<b>Poor flow</b>	The first layer insulates thus limiting the earth connection	Reduce the spray gun voltage to 30-40 kV
<b>Poor adhesion between</b>	Impurities on the surface of the first layer  The powder coating is unsuitable for re-spraying	Ensure thorough grease removal and rinsing  Contact the powder supplier
<b>Oven problems</b>		
<b>Phenomenon</b>	<b>Possible cause</b>	<b>Suggested solution</b>
<b>Smoke/odour from the curing process comes into contact with the zone. Check damper and fans to ensure</b>	Dry powder is blown off and comes into contact with the heating elements	Reduce air speed in the oven's entrance zone. Check damper and fans to ensure that the oven is properly aired out.
	Overheating of the powder coat	Take measurements of the metals temperature profile and reduce the temperature if necessary
		Check the effect and distance between lamps and materials in the IR zone, if one exists

- End of trouble shooting file -

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