POWDER COATING SYSTEM

TROUBLESHOOTING GUIDE

VITRACOAT AMERICA INC.

TROUBLE	POSSIBLE CAUSES	SOLUTIONS
1. Poor charging-inadequate powder film thickness or poor coverage.	1. High voltage source not providing enough KV at charging electrode.	1a. Check if high voltage source is on. Systematically check electrical continuity from voltage source to electrode; including cable, resistors and fuses. 1b. Replace missing or broken electrode. 1c. Clean electrode insulated by powder buildup or impact fusion.
	2. Poor ground.	2. Check ground from conveyor rail (or rub bar when used) through hanger to part. All contact areas must be free of powder buildup, heavy grease and other insulating materials.
	3. Powder delivery rate is too high.	3. Reduce powder delivery rate until material is adequate charged.
	4. Excessive moisture in powder booth air.	4. Moisture in humid air will tend to dissipate the charge on the powder particles. Control the humidity in the powder spray area.
	5. Powder too fine.	5a. Maintain consistent blend of virgin and recycled powder. 5b. Check particle size of powder. Contact your powder supplier.
	6. Powder type or formula.	6. Some powder formulations charge better than others and some formulas are designed for thin film application. Contact your powder supplier.
	7. Powder delivery air too high. Powder blowing by part.	7. Turn down air setting or move gun position farther away from part.
2. Poor penetration. Powder will not coat Faraday cage area (holes, grooves, channels, inside corners and recesses).	1. Powder delivery too low.	1. Turn up powder delivery air setting.
	2. Poor ground.	2. Check ground. Refer to Section A, Trouble 1, Cause 2.
	3. Incorrect powder spray pattern.	3a. Adjust powder spray pattern. 3b. Try alternative nozzle selections.
	4. Voltage too high.	4. Turn voltage setting down so that surfaces closer to the gun do not repel powder from corners.
	5a. Powder delivery velocity too high.	5a. Turn air setting down so powder air stream does not blow powder out of corners.
	5b. Powder delivery velocity too low.	5b. Increase air setting to deliver powder into corners.
	6. Poor gun placement.	6. Adjust gun position so powder cloud has a direct path to recessed areas.
3. Back ionization-powder layers are repelled from part.	1. Voltage too high.	1. Turn down voltage setting.
	2. Gun positioned too close to part.	2. Change gun placement farther away from part.
	3. Poor ground.	3. Check ground. Refer to Section A, Trouble 1, Cause 2.
	4. Excessively heavy powder build-up.	4. Refer to Section A, Trouble 1, Cause 3.
4. Powder feed surging or spitting-interrupted powder feed.	1. Insufficient air pressure or volume.	1. Check air supply. Determine if air supply piping to equipment is large enough. Enough air volume must be provided so that air pressure to powder feed does not drop.
	2. Hoses kinked, flattened or too long.	2. Check powder feed hose routing and condition. Refer to Section B, Trouble 5, Cause 2.
	3. Hoses, powder pumps or suction tubes.	3a. Clean hoses, powder pumps and guns. 3b Check air supply for moisture. 3c. Check powder delivery settings. 3d. Check coating area relative humidity and temperature. 3e. Check powder delivery system for vacuum leaks.
	4. Incorrect powder delivery.	4a. Check powder delivery settings. 4b. For low powder delivery rates, increase powder transport air flow settings. 4c. Replace powder hose with smaller inside diameter hose.
	5. Incorrect feed hopper fluidizing.	5a. Adjust fluidization air pressure. 5b. Check porous fluidizing membrane for clogging or defects. 5c. Refer to Section B, Trouble 3.
	6. Low powder level.	6. Add powder.
1. Powder blowing out of hopper.	1. Fluidization air pressure too high.	1. Adjust air regulator to lower pressure to fluid bed.
	2. Insufficient hopper ventilation.	2a. Check hopper vent for plugging. 2b. Check vent assist device for obstruction and proper air supply.
2. No air percolating through powder surface.	1. Insufficient air pressure.	1. Check hopper fluidization air supply. Increase air pressure as required.
	2. Plugged membrane.	2. Check membrane for plugged pores from dirty or oil air supply.
	3. Obstructed membrane.	3. Check bottom of hopper for obstructions.
	4. Compacted powder on membrane.	4. Manually loosen powder and fluidize well with clean, dry air.
3. Poor fluidization/air blowing large holes through powder surface.	1. Powder level too low.	1. Add powder until hopper is filled to proper level.
	2. Packed or moist powder.	2a. Manually loosen powder and fluidize well with clean, dry air. 2b. Check compressed air and booth air for high humidity or oil content. 2c. Powder sieving may be required.
	3. Obstructed membrane.	3. Check bottom of hopper for obstructions.
	4. Plugged or broken membrane.	4a. Check membrane for plugged pores or oil contaminated air supply, cracks or holes.

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	5. Powder particle size.	4b. Check for proper seating of membrane/leaking around edges. 5a. Maintain consistent bled of virgin and recycled powder. 5b. Check particle size of powder in hopper.
	6. Insufficient fluidizing characteristics of powder.	6. Contact your powder supplier.
4. Plugged hoses and/or powder pumps from impact fusion buildup.	1. Normal buildup.	1. Clean or replace parts.
	2. Air pressure too high.	2a. Reduce powder hose length. 2b. Turn down air settings on pumps and guns.
	3. Moisture in air supply.	3. Check air supply for clean, dry, oil free air.
	4. Composition of powder feed hoses.	4. Check hoses. Contact your equipment supplier.
	5. Worn powder pumps and parts.	5. Replace all worn parts.
	6. Powder particle size.	6a. Maintain consistent blend of virgin and recycled powder. 6b. Check particle size of powder in hopper. Contact your powder supplier.
	7. Powder type or formula.	7. Some powder types are more susceptible to impact fusion. Contact your powder supplier.
	8. Kinked of flattened hoses.	8a. Avoid sharps bends and restrictions in the hose. Protect hoses from external abrasion and abuse. 8b. Replace if permanently deformed.
	9. Powder hose too long, or has too many sharp bends.	9. Reduce powder hose length; modify hose runs.
5. Insufficient powder feed.	1. Powder not fluidizing.	1. Refer to section B, Trouble 2 and 3.
	2. Obstruction of powder delivery system.	2a. Check suction tubes, powder pump, hose and gun. 2b. Check powder supply for contamination. 2c. Sieve powder before using.
	3. Powder hose too long, or has too many sharp bends.	3. Reduce powder hose length; modify hose runs.
	4. Low air pressure.	4. Check air supply. Adjust air settings to pumps and guns.
1. Part surface contamination.	1. Powder or contamination falling in spray booth from conveyor or hangers.	1. Clean conveyor regularly (or continuously) before it enters powder spray booth. Strip hangers as needed.
	2. Contamination from parts entering spray booth.	2. Check cleaning and pretreatment equipment for proper operation. Ensure proper part drying before part enters spray booth.
	3. Contamination from plant air circulated through spray booth.	3. Insolate spray booth area. Preferably, enclose in a room with filtered, humidity controlled air. Maintain positive pressure in coating room. Inspect nearby operations as possible contamination sources; correct as necessary.
	4. Contamination from compressed air supply.	4. Check compressed air supply system.
	5. Powder sieve screen torn, missing.	5. Replace sieve screen.
	6. Inoperable powder sieve.	6. Repair sieve or sieve control circuitry or replace, if necessary.
2. Poor powder containment. Inadequate air flow through spray booth.*	1. Primary filters media blinding.	1a. Clean or replace filter media as required. 1b. Check ambient air humidity in coating area. 1c. Check filter media air pulse operation. 1d. Check for moisture/oil in compressed air supply
	2. Final filters clogged.	2. Check primary filter media for powder leakage. Service, repair or replace as needed.
	3. Use of compressed air for booth clean down.	3. Refer to operations manual for proper cleaning procedures.
	4. Improper powder gun placement/alignment.	4. Correct as necessary, position guns away from openings.
	5. Room drafts leading to powder drifting from booth.	5. Map airflow in powder booth area. Minimize drafts to eliminate powder drift.
	6. Blocked airflow.	6a. Check air volume control damper adjustment. 6b. Check fire safety device for proper operation.
	7. Inadequate blower operation.	7. Check for proper operation.
3. Cross contamination of recycled powder.	1. Inadequate booth/recovery equipment cleaning.	1. Clean equipment per equipment supplier recommendations.
4. Booth turbulence.	1. High powder containment air velocity.	1. Contact equipment supplier.
5. Powder recovery percentage below equipment specification.	1. Insufficient air volume/velocity.	1. Refer to Section C, Trouble 2 above.
	2. Poor system seals.	2. Verify and correct any air leaks.
	3. Too high a percentage of powder fines.	3. Contact your powder and equipments suppliers.
1. Oven temperature does not equal set point.	1. Electrical wiring between thermocouple and heat source fault.	1. Check circuitry to ensure continuity between all components.
	2. Temperature controller out of calibration or failure. components.	2. Calibrate and/or replace defective
	3. Thermocouple or capillary failure.	3. Replace.
	4. Surrounding area has excessive positive or negative pressure.	4. Check surrounding area pressure conditions. Correct as needed.
	5. Air seals, relief hoods or exhaust system failure.	5. Check all air handling equipment for mechanical and air volume performance.
	6. Air turbulence.	6. Do an air survey of all make-up and exhaust air. Make necessary corrections.
	7. Low gas pressure.	7. Check inlet gas pressure with manometer and set to recommended specifications.
	8. Exceeding capacity of product mass loading.	8a. Reduce total product mass loading. 8b. Contact oven supplier.
	9. Fuel/Air ratio incorrect.	9. Adjust to recommended specifications.
	10. Placement of temperature sensor.	10. Check temperature at sensor vs. average oven temperature at product. Contact oven supplier for necessary changes.
2. Pilot will not light.	1. Main valve closed.	1. Open main valve.
	2. One or more safety controls are open.	2. Trace wiring correct faulty “tripped“ safety control.

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	3. Gas pressures not set to manufacturer's specifications.	3. Reference burner manufacturer's specifications.
	4. Ignition transformer igniter fault.	4a. Check igniter, clean and/or replace. 4b. Check ignition cable/connector, replace if necessary. 4c. Check ignition transformer, replace if necessary.
	5. Improper pilot setting.	5. Check pilot orifice setting at burner, follow burner manufacturer's specifications.
	6. Purge cycle not complete.	6a. Complete cycle. 6b. Check purge timer for correct operation.
3. Main burner will not light. (Gas/Oil).	1. Main valve closed.	1. Open main valve.
	2. Fuel manifold valves and/or one more safety control circuits open.	2. Trace wiring look for fault or “tripped“ safety control.
	3. Pilot valve not open.	3. Inspect and replace if necessary.
	4. Faulty signal from flame supervision system.	4. Monitor signal with proper instruments, adjust or replace.
	5. Gas pressures not set to manufacturer's recommendations.	5. Reference burner manufacturer's specifications, correct as necessary.
	6. Fuel control motor failure.	6. Repair and/or replace.
	7. Faulty air flow switch.	7. Check all air flow switches for proper settings and performance. Repair as necessary.
	8. High temperature limit switch lock-out activated.	8. Correct cause of high temperature. Allow oven to cool, press reset limit switch prior to starting oven.
4. Dirt/Contaminant on coated product.	1. Dirt/contaminant in oven interior.	1a. Clean entire oven interior, including duct system and heat house. 1b. Clean and/or replace oven filtration equipment. 1c. Clean oven air handling equipment. 1d. Check surrounding area pressure conditions. Correct as needed. 1e. Check condition of conveyor in oven. Clean, lubricate, or replace as needed. Ensure proper lubricant is being used.
	2. Carbon particulates.	2. Burner firing off ratio, test and balance burner.
5. Coil will not energize. (electric heat)	1. Wiring fault.	1. Check all wires and connections.
	2. Fuse/breaker power supply fault.	2. Correct condition that caused fuse/breaker to fail. Replace with same size fuse or reset breaker.
	3. Air flow too low through coil.	3a. Check air flow sensor. Repair or replace. 3b. Check for adequate air flow. Correct as needed.
6. Powder blown off product prior to cure.	1. High air impingement on product.	1. Reduce or redirect air flow on product.
7. Power on but infrared units do not heat up.	1. Exhauster motor starter failure, wiring fault to exhauster interlocks.	1. Repair or replace starter, check circuitry to ensure continuity.
	2. Wiring fault to system interlocks i.e., conveyor or booth.	2. Check circuitry to ensure continuity.
	3. Percentage timer, temperature controller failure.	3. Repair or replace defective components.
	4. Thermocouple failure.	4. Replace.
	5. Contactor coil not energized or failed.	5. Ensure continuity of circuitry from percentage timer or temperature controller to contact coil.
	6. Contactor fuse blown.	6. Correct condition which caused fuse to fail and replace with same size fuse.
	7. Wiring fault from control panel to heater elements.	7. Ensure continuity between contact points.
8. Heater elements do not come up to full heat.	1. One of three fuses blown on three phase circuit from contactor to elements.	1. Correct condition which caused fuse to fail and replace with same size fuse.
	2. Element burn out or partial burn out.	2. Repair or replace.
	3. Wiring fault to heater element.	3. Ensure continuity to elements, ensure connections are not loose.
9. Heater will not start up.	1. Electrical preheat element heating.	1. Check circuitry for continuity.
	2. Blown fuse or tripped circuit breaker.	2. Correct condition which caused fuse/breaker to fail and replace with same size fuse or reset breaker.
	3. Main gas distribution valve closed.	3. Open valve.
	4. Gas supply pressures not set per manufacturer's recommendations.	4. Reference manufacturers supply pressure recommendations and correct as necessary.
10. Heater unit does not come up to full heat.	1. Gas supply pressure or gas pressure at orifice is incorrect.	1. Reference manufactures supply pressure recommendations and correct as necessary.
	2. Orifice/Injector obstructed.	2. Clean as required.
	3. Thermostat/Thermocouple fault.	3. Reference element manufacturer's specifications and repair or replace.
	4. Gas solenoid valve blockage or failure.	4. Repair or replace.
11. Heater unit output is too high.	1. Incorrect gas type being used.	1. Used only the types of gas unit is designed for replace injector orifice for new gas source.
	2. Gas supply pressure too high.	2. Reference manufacturers supply pressure recommendations and correct as necessary.
1. Chemical cross contamination.	1. Improper part racking or spacing.	1a. Orient all parts to maximize drainage. 1b. Ensure adequate drain time between stages. Contact washer supplier.
2. Dirty parts.	1. Contaminants not being removed from substrate.	1a. Check flow rate and temperature in each stage. Adjust per manufacturer's specifications. 1b. Clean and check spray nozzles. Replace as necessary. 1c. Position and set spray nozzles for maximum part coverage and impingement. 1d. Reference design guidelines for type of nozzles (i.e. flood or scrubbing type) and flow rate. 1e. Check operating specifications for chemicals. Contact chemical supplier.
	2. Inadequate tank temperature.	2a. Heat exchanger (tube, coils, etc.) coated with chemical sludge. Clean as required. 2b. Ensure heat source operating properly.

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