

PROCESS SPECIFICATION 101 Coating of Stacks with 3M Electrical Resin 5230N

Scope

- This process specification will provide instructions for applying Electrical Resin Powder for the purpose of insulating metals as laminated cores and over coating windings.

Safety/Precautions

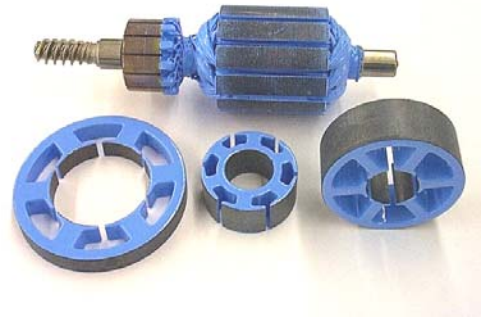
- Operator should be certified to wear a respirator prior to operating the Coating Machine.
- Approved Mouth/Nose Dust Respirator should be worn at all times while the Coating Machine is running.
- Hand and arm protection must be worn while handling parts from the oven.

Maintenance

- Clean workstation, and organize as necessary.
- Empty Dust Collector as required.
- Inspect/clean refrigerator dryer and desiccant filter if applicable.

Tools and Supplies

- Electrostatic Fluidizing Bed Coater (Model # CM-1000)
- Dust Collector
- Oven with Log
- Miscellaneous Supplies (Air Knives, Brush, Fixtures, Masking Aids, Oven Racks, Tooling, etc.)



Equipment Set-up

(Unless specifically stated otherwise on a Router or Traveler, this process specification applies).

- Pre-heat oven to be used per Curing Instructions on page 2.
- Bring the powder bed level about ½ full with fresh powder.
NOTE: If powder has been refrigerated, allow it to reach room temperature before unsealing the package/container to prevent moisture condensation on the powder.
- Set up the coating area with the bed cover, tools, spindles, air knives, and ground springs that are appropriate for the parts to be coated and or specified by traveler.
- The controls should be set to achieve the proper coating thickness of 6 to 14 mills after baking (unless otherwise specified on the drawing) and slot penetration in the shortest amount of time. Note: All control scales are used as reference. Drawing coating thickness refers to after baking cure.
- Turn Coating Machine ON.
- Turn Dust Collector ON.
- Connect Spindle Motor if using.
- Turn air knife timer ON if used. Set air knife timer for approximately 2 spindle revolutions. Its airflow valve can be adjusted to obtain the best cleaning results.
- Set High Voltage to maximum. May be decreased if a thin coating is required.
- Adjust Bed Timer to 15 seconds, may adjust timer as necessary to achieve an even and desired coating thickness.
- Attach the ground clip to ground springs or clamps.
- The Coating Bed Airflow Valve is opened slowly during the first coating cycle to achieve a cloud of powder to surround the parts to be coated. The valve may have to be increased occasionally to compensate for the powder level lowering as the powder is consumed. Adding new powder to the bed may require lowering the airflow.

Part Preparation

- Parts should be dry and free of contaminants as oils, solvents, and corrosion.

By Creative Method

- Mask part areas to be free of coating that cannot be easily removed by equipment or operator prior to baking.

Operation

- Check drawing, traveler, bill of material, and/or kit for proper raw materials, tools, fixtures and machinery.
- Insert as many parts into the coating area allowed by the tooling, over the bed openings.
- Depress the cycle foot switch to start cycle. Periodically adjust the coating timer (if equipped) and airflow to compensate for the level of powder decreasing. Add more powder to the bed when lengthy coating time causes idle operator time and or proper coating thickness is not easily achieved.
- After cycle, remove coated parts, spot check coverage. Repeat process is coating has not reached proper thickness.
- Powder is removed from unwanted areas by one of the following methods (Be careful not to disturb the powder in other areas), air knife, brush, and vacuum, wipe.



Curing

- Rack coated parts and load into a preheated oven for one hour at $400^{\circ} \pm 25^{\circ}\text{F}$.
- Remove parts from oven after baking a minimum of one hour and cool.
- Remove any masking materials, spot check coat quality and place in trays.

Operator Quality Control

- Powder should be in a closed container and refrigerated when not in use for extended periods.
- Powder must be at room temperature prior to use.
- Maintain proper powder levels in coating bed.
- Spot-check coating coverage before and after baking.

Troubleshooting

Problem: After baking, coating has a dull or flat finish and or chips easily.

- Powder contaminated by moisture.
- Powder left out of refrigeration for extended periods.
- Under cured, oven temperature is too low or bake time is too short. Oven was over loaded or oven door was opened often during cure time.
- Contamination from oil on laminations.
- Received bad batch of powder from vendor. Note shelf life on bags. Regardless of shelf life, if stored in a sealed container and kept refrigerated, powder remains good almost indefinitely. If not sealed and refrigerated, shelf life is reduced drastically.

Problem: Coating has a darkened color after baking.

- Caused by over temperature during baking. (Generally does not affect coating performance.)

Problem: After baking, coating is too thin, not even or does not coat well in slots.

- Parts are not grounded properly.
- Voltage setting is off or set too low.
- Coating timer set too short.
- Coating airflow is set too high or low and or powder level is too high or low to product adequate cloud.
- Parts not aligned over bed cover openings.

Problem: Coating is too thick, bridging in slots, large voids.

- Too much powder added to bed.
- Coating time is too long.