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# The Professional Gelcoater

## TECHNIQUE & TROUBLESHOOTING GUIDE



## HOW TO RECOGNIZE & PREVENT DEFECTS

### Start-Up Procedure

1. Inspect spray gun, lines and material and catalyst tanks. Clean if necessary.
2. Mix gelcoat thoroughly.
3. Determine catalyst level.
4. Adjust catalyst level for loss by evaporation.
5. Take flow readings on gelcoat and on catalyst.
6. Determine the right pump pressure...and adjust catalyst pressure to proper setting.
7. Fine-tune the catalyst flow.
8. Check the shop temperature throughout the day and adjust material pressure and catalyst level accordingly.

### Gelcoating Technique

1. Start the spray gun outside the mold and then bring it in.
2. Spray one section at a time, not the whole mold.
3. Built-up the 18-mil coat in three 6-mil passes.
4. Keep the gun as perpendicular as possible to the mold surface.
5. Develop a smooth motion.
6. Prevent...watch for...correct problems.
  - A. Watch for changes in pressure and temperature, and adjust catalyst level and material pressure as necessary.
  - B. Check adjustments when you change over to a new supply of materials.
7. Bring the spray gun outside the mold and then shut it off.
8. Clean equipment immediately after using.

# Recognizing and Preventing Defects

## A Troubleshooting Guide

One of the prime reasons for using gelcoats on reinforced plastics is to produce a decorative, highly protective, glossy colored surface that requires little or no subsequent finishing. It is to the molder's advantage to exercise strict quality control methods in that application of the gelcoat. Proper application is doubly important, since many of the defects that result from poor applications do not appear until the part has been removed from the mold. Many gelcoat defects result from conditions that can be easily corrected.

Here are some of the common gelcoat defects, possible causes and correct measures that can be taken to remedy them.



| CAUSES | CORRECTIVE STEPS |
|--------|------------------|
|--------|------------------|

### DEFECT 1 - *Wrinkling or Alligatoring*

- |                      |  |
|----------------------|--|
| a. INSUFFICIENT FILM | a. Apply 18 mills - 6 mills per pass.  |
| b. INCOMPLETE CURE   | B. Shorten gel time.<br>(1) Increase catalyst.<br>(2) Increase room temp<br>(3) Check for moisture in lines. |
| c. TRAPPED SOLVENT   | c. Hold gun farther away.  |

### DEFECT 2 - *Porosity, Pinholes*

- |   |  |
|---|--|
| a. TRAPPED SOLVENT boils off to make tiny holes | a. Hold gun 12 to 16 in. from mold surface.  |
| b. COAT TOO HEAVY AND APPLIED TOO FAST          | b. Spray 15 to 18 mills- 6 mills per pass.   |
| c. WATER IN AIR LINES                           | c. Drain all lines,traps & compressor tank.  |
| d. OVER CATALYZATION                            | d. Do not use more than 3.5% of a 50% MEK peroxide solution.   |
| e. FOREIGN MATTER ON MOLDS                      | e. Keep molds covered when not in use. Molds tend to become charged with static electricity and attract foreign materials. |

### DEFECT 3 - *Crazing and Cracking*

- |  |   |
|--|---|
| a. GELCOAT FILM TOO THICK                    | a. Check spray-in technique.  |
| b. CURING TOO RAPIDLY                        | b. Reduce percent of catalyst. Do not let parts sprayed with "hot" catalysts (ie. Super Delta, etc.) stand overnight. |
| c. ROUGH HANDLING IN REMOVING PART FROM MOLD | c. Good mold maintenance procedures. If necessary to break part loose, use small angle wedges.                        |

| CAUSES | CORRECTIVE STEPS |
|--------|------------------|
|--------|------------------|

### DEFECT 4 - *Blisters, Bubbles*

- |   |   |
|---|---|
| a. BACK-UP GELCOAT SPRAYED TOO SOON         | a. Allow longer gelcoat cure before spraying back-up coating. |
| b. AIR TRAPPED BETWEEN GELCOAT AND LAMINATE | b. Work out air with a squeegee, roller or brush.             |
| c. OVER CATALYZATION WHICH PLASTICIZES      | c. Do not use more than 2% catalyst.                          |

Note: Also see causes for Defect 1.

(Thin coating may not develop enough exothermic heat to effect a cure. Increase film thickness).

### DEFECT 5 - *Sags and Runs*

- |                       |  |
|-----------------------|--|
| a. TOO MUCH GELCOAT   | a. Check for proper viscosity and delivery rate.<br><br>Speed up gun movement.<br><br>Increase gun-to-mold distance. |
| b. IMPROPER GUN ANGLE | b. Hold face of gun parallel to mold surface. DO NOT ARC GUN.  |

### DEFECT 6 - *Discoloration*

- |                                     |  |
|-------------------------------------|--|
| a. NON-UNIFORM CATALYZATION         | a. Be sure you are uniformly mixing at least 1% catalyst with the gelcoat. |
| b. SETTLING OF COLORS IN CONTAINERS | b. Mix gelcoat thoroughly.   |

### DEFECT 7 - *Shrinkage, Lift-Off*

- |   |  |
|---|--|
| a. EXCESSIVE SHRINKAGE CAUSING FILM TO LIFT OFF | a. Apply uniform film. thickness over all surfaces especially at inside corners. |
|---|--|

### DEFECT 8 - *Rough, non-uniform deposit*

- |                |   |
|----------------|---|
| a. DRY DEPOSIT | a. Decrease atomization. Decrease gun-to-mold distance. Slow up gun movement. |
|----------------|---|

| CAUSES | CORRECTIVE STEPS |
|--------|------------------|
|--------|------------------|

### DEFECT 9 - *Poor Gloss*

- |                              |  |
|------------------------------|--|
| a. DULL MOLD                 | a. Polish mold with was and buff to a high gloss.                                    |
| b. WAX BUILDUP               | b. Clean mold with trichloro-ethylene and re-wax.                                    |
| c. ROUGH OR WET PARTING FILM | c. Spray on as smoothly possible. Allow parting film to dry before spraying gelcoat. |

### DEFECT 10 - *Slow Gelation*

- |                    |  |
|--------------------|--|
| a. LOW TEMPERATURE | a. Raise room temperature at least 65 degrees F. |
| b. THIN COATING    | b. Apply 18 mills - 6 mills per pass.            |
| c. UNDERCOATING    | c. Use 1 to 2% catalyst.                         |

### DEFECT 11 - *Spraying Problems*

- |   |  |
|---|--|
| a. NOT ENOUGH DELIVERY<br>(1) Cured gelcoat in gun or lines | (1) Clean equipment with acetone.                      |
| (2) Too little pot pressure                                 | (2) Adjust pot pressure and check gelcoat temperature. |
| (3) No gelcoat in container                                 | (3) Fill pot or roll in new drum.                      |
| b. SPITTING OR INTERMITTENT SPRAY<br>(1) Faulty equipment   | (1) Check gun and air adjustment.                      |

Check for worn gaskets.

Check for nozzle and air leaks.

- |  |                             |
|--|-----------------------------|
| c. MATERIAL BUILDUP<br>(1) Orifice partially clogged | (1) Clean gun with acetone. |
|--|-----------------------------|

### DEFECT 12 - *Unique Problem*

- |               |  |
|---------------|--|
| a. WHO KNOWS? | a. Call your <b>Mini-Craft</b> Tech at: (352) 748-5200 or (800) 282-8244 |
|---------------|--|