



RF41

Finish Application

**Uniform
Procedures For
Collision Repair
UPCR**

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v.4.0



1. Description

This procedure describes methods for applying paint finishes. Inspection and evaluation requirements are also included.



2. Purpose

The purpose of this procedure is to provide industry-accepted requirements for performing high-quality finish application. This procedure is intended for use by professionals who are qualified through training and experience.



3. Referenced Documents

The following documents are considered part of this procedure by reference.

3.1 Procedures

- HM01 Hazardous Materials
- PS01 Personnel Safety
- RF01P Surface Preparation
- RF01S Surface Preparation
- RF11 Masking
- RF21 Finish Removal
- RF81 Finish Defects

3.2 Other Information

- Equipment-specific information
- Product-specific information
- Vehicle paint code information
- Vehicle-specific repair information



4. Equipment And Material Requirements

4.1 Equipment

The use of this equipment is included in this procedure:

- spray gun system
- paint mixing system
- appropriate spray facility
- paint thickness gauge

An electronic color analyzer or color variance decks may be used in the initial color determination.

4.2 Materials

The use of these finishing materials is included in this procedure:

- plastic cleaner
- wax and grease remover
- adhesion promoter
- sealer or primer-sealer
- color coat system
- color test panels
- check-hiding stickers

Use only one product system throughout the refinishing process.



5. Damage Analysis

5.1 Substrate Condition

All remaining substrates must be in good condition. Substrate condition information is in **RF81**.

5.2 Film Thickness

Check the paint film thickness in the repair areas. See **RF01P**, or **RF01S**.

5.3 Paint Code And Type

Check the paint code for the vehicle to be refinished. Some vehicles may have chip- or scratch-resistant finishes, or color variances for panel undersides. Select the proper color code and type of refinish materials required for the vehicle to be refinished.



6. Personnel Safety

6.1 General Safety

General safety information is in **PS01**.

6.2 Safety With Finishing Materials

To prevent injury when working with finishing materials:

- Wear the proper respirator. A properly fitted, positive-pressure, fresh air-supplied respirator is required when working with materials that contain isocyanates.
- Wear solvent-resistant gloves and a paint suit to avoid skin contact with solvents or vapors.
- Wear eye protection when mixing or applying paint materials.
- Do not eat, drink, or smoke in the work area.
- Do not store flammable materials near heat or ignition sources.
- Do not use thinner, gasoline, or other solvents to clean hands, etc.
- Work in a well-ventilated area.

Follow the paint maker's recommendations when cleaning and wiping plastics to avoid the build-up of static electricity and the possibility of fire.



7. Environmental Safety

7.1 Hazardous Materials

Hazardous materials safety information is in **HM01**.

7.2 Finishing Materials

These finishing materials may be considered hazardous waste and should be disposed of following environmental regulations:

- cloths that contain finishing materials
- masking containing overspray, including liquid masking
- paints and other coating materials
- containers with residues
- solvents, such as spray gun cleaning solvents
- spray area filters, when filled with overspray
- sanding dust and sludge

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7. Environmental Safety (cont'd)

7.3 Volatile Organic Compounds (VOCs)

To limit the release of VOCs:

- Use high-transfer spray equipment.
- Use enclosed spray gun cleaners.
- Use VOC-compliant paint and cleaning products.
- Secure and close all containers when not in use.

In addition, follow any record-keeping requirements and other local VOC regulations.



8. Vehicle Protection

8.1 Masking

Masking procedures are in **RF11**.



9. Repair Procedure

Determine the type of finish to be applied, and prepare either a color test panel or a let-down panel. See **9.1** or **9.2**. Record any tinting formulas used, and store the panels for future reference.

Perform final preparation, and apply sealer, primer-sealer, or adhesion promoter as required. See **9.3** and **9.4**.

For basecoat/clearcoat application see **9.5**. For multi-stage finish application see **9.6**. For single-stage finish application see **9.7**.

9.1 Color Test Panel

To prepare a color test panel for basecoat/clearcoat or single-stage finishes:

1. Determine the proper color code and variable for the vehicle being repaired.
2. Apply the basecoat or single-stage finish to a test panel, over the same primer or sealer that will be used on the vehicle. Follow the paint makers recommendations for selecting or tinting the primer or sealer.
3. Allow the proper flash time.

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9. Repair Procedure (cont'd)

- 4. Apply clearcoat to the basecoated test panel for basecoat/clearcoat finishes, following the paint maker's recommendations.
- 5. Allow the test panel to dry.
- 6. Compare the test panel to the vehicle, in daylight or under daylight-corrected lighting.

If the color is not blendable, choose an alternate formula or tint as necessary, and retest on a new panel. Follow the paint maker's tinting procedures and recommendations. Use only the tints contained within the paint formula.

9.2 Let-Down Panel

To prepare a let-down panel for multi-stage finishes:

- 1. Locate an area on the vehicle where there is no mid-coat. Tint the basecoat to the vehicle, if necessary.
- 2. Apply the basecoat to the complete let-down panel over a properly tinted primer or sealer. Select or tint the primer or sealer to match the original sealer on the vehicle, if necessary to provide proper color effect with highly transparent topcoats.
- 3. Mask off one edge of the let-down panel.
- 4. Mask off 3 to 5 sections of the let-down panel.
- 5. Apply one coat of mid-coat to the let-down panel.
- 6. Remove one masked portion from the let-down panel.
- 7. Repeat steps 5 and 6 until all masked portions have mid-coat applied. Allow the proper flash time between coats.
- 8. Mask one half of the let-down panel.
- 9. Apply clearcoat to the let-down panel, following the paint maker's recommendations.
- 10. Allow the test panel to dry.
- 11. Compare the test panel to the vehicle, in daylight or under daylight-corrected lighting.

If no sections of the let-down panel provide a blendable match, choose an alternate formula or tint the basecoat as necessary and retest on a new panel.

9.3 Final Preparation

To prepare the vehicle for entry into the spray facility:

- 1. Clean the surface with the proper wax and grease remover, as recommended by the paint maker.
- 2. Thoroughly inspect the prepared area for sandscratches, unsanded areas, and other surface defects. Repair as necessary in an area away from the spray facility.
- 3. Blow off the vehicle with compressed air using an approved air gun. Carefully blow panel gaps, vents, and other areas where dirt may be trapped.
- 4. Record all electronic memory settings.

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9. Repair Procedure (cont'd)

- 5. Disconnect the negative battery terminal, following the vehicle maker's recommendations.
- 6. Complete as much masking as possible.
- 7. Clean the spray area with the proper wax and grease remover.
- 8. Move the vehicle into the spraybooth.
- 9. Put on a clean paint suit.

After the vehicle has entered the spray facility:

- 1. Apply all final masking.
- 2. Ground the vehicle, if required.
- 3. Blow off the vehicle with compressed air.
- 4. Clean the prepared areas, following the paint maker's recommendations.
- 5. Tack the entire prepared area, including the masking. Avoid skin contact with the surface to be refinished.

9.4 Applying Sealer, Primer-Sealer, Or Adhesion Promoter

To apply sealer, primer-sealer, or adhesion promoter:

- 1. Prepare the material following the paint maker's recommendations. Select or tint the sealer to match the original sealer on the vehicle, if necessary to provide proper color effect with highly transparent topcoats.
- 2. Set up and adjust the spray gun for the material to be sprayed.
- 3. Apply the material following the paint maker's recommendations.

9.5 Applying A Basecoat/Clearcoat Finish

To apply a basecoat/clearcoat finish:

- 1. Support parts being refinished off of the vehicle in the same position as they will be installed on the vehicle.
- 2. Prepare the basecoat following the paint maker's recommendations.
- 3. Set up the spray gun with the correct air cap, needle, and nozzle for the basecoat to be sprayed.
- 4. Adjust and test the spray pattern as necessary.
- 5. Apply the basecoat to the vehicle, following the paint maker's recommended procedures for application and blending. Ensure that proper coverage is obtained. If the basecoat must be sanded to remove defects, reapply the basecoat, following the paint maker's recommendations.
- 6. Prepare the clearcoat following the paint maker's recommendations.
Note: Some substrates may require the use of a flex-additive. Follow the vehicle and paint makers' recommendations.

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9. Repair Procedure (cont'd)

- 7. Set up the spray gun with the correct air cap, needle, and nozzle for the clearcoat to be sprayed.
- 8. Adjust and test the spray pattern as necessary.
- 9. Apply the clearcoat to the vehicle. Follow the paint and vehicle makers' recommended procedures for application blending, and film thickness.
Notes: Follow the paint maker's recommendations on applying clearcoat to jambs and panel undersides. Most vehicle makers and all paint makers recommend clearcoat application be extended to panel edges or break lines.
- 10. Continue the refinish process. See **9.8**.

9.6 Applying A Multi-Stage Finish

To apply a multi-stage finish:

- 1. Support parts being refinished off of the vehicle in the same position as they will be installed on the vehicle.
- 2. Mix the basecoat following the paint maker's recommendations.
- 3. Set up the spray gun with the correct air cap, needle, and nozzle for the basecoat to be sprayed.
- 4. Adjust and test the spray pattern as necessary.
- 5. Apply the basecoat to the vehicle. Follow the paint maker's recommended procedures for application and blending. Ensure that proper coverage is obtained. If the basecoat must be sanded to remove defects, reapply the basecoat. Follow the paint maker's recommendations.
- 6. Prepare the mid-coat following the paint maker's recommendations.
- 7. Set up the spray gun with the correct air cap, needle, and nozzle for the mid-coat to be sprayed.
- 8. Adjust and test the spray pattern as necessary.
- 9. Apply the mid-coat to obtain a proper match. Follow the paint maker's recommendations for application and blending procedures.
- 10. Prepare the clearcoat following the paint maker's recommendations.
Note: Some substrates may require the use of a flex-additive. Follow the vehicle and paint makers' recommendations.
- 11. Set up the spray gun with the correct air cap, needle, and nozzle for the basecoat to be sprayed.
- 12. Adjust and test the spray pattern as necessary.
- 13. Apply the clearcoat to the vehicle. Follow the paint and vehicle makers' recommended procedures for application, blending, and film thickness.
Notes: Follow the paint maker's recommendations on applying clearcoat to jambs and panel undersides. Most vehicle makers and all paint makers recommend clearcoat application be extended to panel edges or break lines.
- 14. Continue the refinish process. See **9.8**.

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9. Repair Procedure (cont'd)

9.7 Applying A Single-Stage Finish

To apply a single-stage finish:

- 1. Support parts being refinished off of the vehicle in the same position as they will be installed on the vehicle.
- 2. Prepare the material following the paint maker's recommendations.
- 3. Set up the spray gun with the correct air cap, needle, and nozzle for the material to be sprayed.
- 4. Adjust and test the spray pattern as necessary.
- 5. Apply the finish material to the vehicle. Follow the paint maker's recommendations for application and blending procedures. Ensure that proper coverage is obtained.
- 6. Continue the refinish process. See **9.8**.

9.8 Refinish Completion

After the vehicle is removed from the spray facility:

- 1. Unmask the vehicle.
- 2. Perform a visual inspection. See **11.1**.
- 3. Reconnect the negative battery cable and reset all electronic memories. Follow the vehicle maker's recommendations.
- 4. Complete the repair.



10. Use Of Recycled (Salvage) Parts

Does not apply.

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11. Inspection And Testing

11.1 Inspection Of The Refinished Area

Inspect the refinished area for these types of defects:

- contaminants in the paint film
- improper texture when compared to adjacent panels
- improper gloss level
- overspray
- runs or sags
- solvent popping
- sandscratches
- improper masking

To correct any of the above defects without refinishing, see **RF81**.

Finish removal and refinishing may be required to correct these types of defects:

- color mis-match
- fisheyes
- tape tracking
- sandscratch swelling
- blistering
- film thickness more than 250 microns (10 mil)

Correct any defects.