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Adhesion problems of the clearcoat

Definition:
The clear coat is peeling off of the base coat.

Cause:
- Excessive film thickness of base coat.
- Intermediate and final flash-off times of the base coat are too short.
- Wrong mixing ratio of clear coat/hardener.

Prevention:
- Observe film thicknesses of the base coat and intermediate and final flash-off times according to specifications.
- Mix clear coat and hardener according to specifications.

Remedy:
- Sand and repaint.
Adhesion problems with plastics

Definition:
Primer and paint are peeling off the plastic surface.

Cause:
- Insufficient cleaning, drying (tempering).
- The incorrect primer has been used.

Prevention:
- Clean and degrease properly.
- Temper parts before priming.
- Ensure solvents have evaporated.
- Use of suitable adhesion primer.

Remedy:
- Remove damaged finish and repaint.
- Steam clean, sand, reclean and paint.
Bleeding of peroxide from hardener in PE Body Filler

Definition:
Discolored patches on top coats.

Cause:
• Surfacer or putty sanded through in patches.
• Too much hardener was used in polyester putty.

Prevention:
• Isolate those patches which have been sanded through using 2K surfacer.

Remedy:
• Sand the whole area after it has through dried, clean with silicone remover and respray.
• If too much hardener is used in polyester putty, remove polyester putty, sand and carry out repair job again, using correctly mixed putty.
Blistering

Definition:
Small raised dots appearing in the paint system.

Cause:
• Moisture was absorbed by the substrate.
• Surface was not allowed to dry properly after having been wet sanded (particularly a problem with polyester products).
• Air humidity was too high prior to painting. Temperature fluctuations resulted in condensation.
• Pores / pin holes in the substrate were not sanded out.
• Polyester products were not isolated.
• Sanding water which has collected in corners, edges and recessed areas. Contaminated air supply.

Prevention:
• Dry sand polyester products and isolate.
• Carefully sand out pin holes or apply more putty to fill them.
• Check the air humidity regularly.

Remedy:
• Sand down the affected area completely, sand the remaining surface well until it is matt in appearance, clean with silicone remover, apply surfacer and then top coat.
Clearcoat yellowing

Definition:
The clear coat is yellowing on the finish of the car.

Cause:
- The wrong hardener was used.

Prevention:
- Close hardener can after use.
- Mixing ration of clear coat / hardener according to specifications.

Remedy:
- Sand and repaint.
**Definition:**

Inconsistent leveling of metallic finish.

**Cause:**
- Spraying viscosity, spray pressure, spraying technique.
- Spray gun set up.
- Unsuitable reducer or spraying temperature.

**Prevention:**
- Apply normal spray coats followed by a mist coat straight after the last spray coat.
- Choose suitable spray gun set up.
- Use manufacturer’s reducer.
- Ensure sufficient flash-off.
- Follow application recommendations

**Remedy:**
- After through-dried, sand surface and repaint.
**Definition:**
The refinish color doesn’t match the color of the original finish.

**Cause:**
- Incorrect spraying technique (too wet, too dry, poor opacity).
- Incorrect spray gun set up.
- Spraying pressure.
- Weathered surface.
- Variations of the OEM finish (multiple color shades).

**Prevention:**
- Check color for variations.
- Spray test panel.
- Blend in Color.

**Remedy:**
- Polish adjoining panel to check color.
- Tint the color, sand, and repaint.
- Blend in Color.
Corrosion / Rust

Definition:
Mechanical damage with rust underneath the paint film.

Cause:
• Impact from stone chips in connection with road salt and moisture.
• Bare metal was exposed to moisture prior to priming.

Prevention:
• Before you apply the primer, clean the substrate thoroughly and blow with air.

Remedy:
• Sand paint down until bare metal becomes visible.
• Refinish with an anti-corrosion primer, then apply the usual surfacer and top coat.
Cratering in the Surfacer

Definition:
Crater-like indentations with raised edges.

Cause:
- Substrate was not thoroughly cleaned with silicone remover.
- Air supply was contaminated with oil or water (defective oil and water separator in air line).

Prevention:
- Thoroughly clean the substrate with silicone remover.
- Ensure that regular maintenance is carried out on the compressed air lines.

Remedy:
- Allow to dry and then sand out the craters.
- Clean the whole surface and apply another coat of surfacer.
**Die back / Matting / Loss of gloss**

**Definition:**
Loss of gloss on the top coat.

**Cause:**
- Surfarcer was not allowed to dry properly.
- Unsuitable reducers were used, causing the substrate to dissolve.
- The hardener used had already reacted with moisture.
- Excessive film thickness of top coat.

**Prevention:**
- Keep to the specified drying times.
- Use only the recommended reducers.
- Close hardener tins firmly after use to ensure proper seal.
- Apply top coat as specified.

**Remedy:**
- After drying, polish the affected area until it is no longer matt, or lightly sand the whole surface, clean with silicone remover and respray.
Dirt / Dirt inclusions

Definition:
Particles protruding from the top coat finish.

Cause:
• The surface was not properly cleaned before the paint was applied.
• The spray booth filters needed replacing.
• The spray booth was set at negative pressure.
• The painters wore unsuitable clothing.

Prevention:
• Before painting, ensure that the surface has been wiped clean with a tack cloth.
• Check the spray booth filters regularly.
• Wear lint-free spray suit.
• Ensure that regular maintenance work is carried out on the spray booth.

Remedy:
• Lightly sand and polish the affected area.
• If this is unsuccessful, lightly sand the whole area, clean with silicone remover and respray.
Edge mapping / Shrinkage

Definition:
Ring-shaped marks in the top coat.

Cause:
• Priming material applied on repair area was not sanded down sufficiently.
• Putty and surfacer were applied on top of elastic or solvent-sensitive factory finish or refinish material.
• Surfacer was not allowed to become fully cured before it was sanded and recoated.
• The substrate was not fully cured.
• Too much surfacer was applied (excessive film thickness) and then not allowed to dry properly.
• First coat applied too wet over a sensitive substrate.

Prevention:
• Carry out a solvent test on the area immediately surrounding the repair (elastic / hard).
• Apply putty on bare metal only.
• With elastic/solvent-sensitive factory finishes, apply surfacer over complete panels.

Remedy:
• After the top coat has become fully cured, lightly sand and polish damaged area, if necessary isolate with a surfacer and respray.
Fish-eyes / Cratering

Definition:  
Crater-shaped indentations with raised edges.

Cause:  
• Substrate was not thoroughly cleaned with silicone remover.  
• Air supply was contaminated with oil or water.  
• Ceiling filter does not meet the requirements.

Prevention:  
• Ensure that regular maintenance is carried out on the compressed air lines.  
• Ensure that the filter is changed regularly (secondary filter once a year, primary filter every three months).  
• Thoroughly clean surface with silicone remover before respraying.

Remedy:  
• Sand the paint surface, clean with silicone remover and then apply the top coat again.
Orange peel

**Definition:**
The finish is uneven, resembling orange peel.

**Cause:**
- Spray viscosity was too high.
- Reducers / hardeners used were too fast.
- Temperature in the spray booth was too high.
- Distance between spray gun and object was too great, not enough paint was applied.

**Prevention:**
- Set the spray booth temperature to approx. 20° C / 68° F.
- Use the right reducer for the respective repair job.
- Check the paint viscosity with a DIN viscosity cup.
- Maintain a spraying distance of approx. 20 cm / 8 inches.

**Remedy:**
- On small areas, sand and polish.
- If necessary, sand down the affected areas and respray.
Pin holes / Pores

Definition:
Pinprick-sized indentations in the finish reaching as far as the surfacer.

Cause:
- The film thickness of the surfacer was too high and then force dried too quickly (low baking / IR).
- Pores in the putty were not treated correctly.

Prevention:
- Apply surfacer at normal film thickness.
- Keep to the recommended flash-off times.

Remedy:
- Allow top coat to dry through, then sand the affected areas, clean with silicone remover, isolate with a 2K surfacer and respray.
- In severe cases, thoroughly sand the top coat and apply the whole paint system again.
**Pin holes in Surfacer**

**Definition:**
Small, pinprick-sized indentations.

**Cause:**
- Spray viscosity was too high.
- Unsuitable hardener was used, e.g. extra fast hardeners at high temperatures.
- Excessive film thicknesses.

**Prevention:**
- Follow the application recommendations.
- Choose the correct hardener for the respective temperature.
- Apply surfacer at the recommended film thickness.

**Remedy:**
- Sand down and reapply surfacer.
Peeling / Adhesion problems with polyester materials

Definition:
Polyester putty starts peeling off in certain areas.

Cause:
- Substrate was not prepared properly.
- The wrong polyester putty was used.
- Infrared drying was not carried out correctly.

Prevention:
- Clean the substrate thoroughly and then sand well.
- Use only those putties and primers which are recommended for galvanized substrates.
- Follow the manufacturer’s instructions for infrared drying.

Remedy:
- Sand the defective paintwork well, then repair and refinish using suitable materials.
Definition:
Top coat is pulling off of the substrate.

Cause:
- The substrate was not sufficiently prepared (rust, grease, moisture, poor sanding or cleaning).
- Incompatible materials were used.
- Flash-off and drying times were too short.
- Condensation on substrate due to temperature changes.

Prevention:
- Follow application recommendations.
- Degrease and prepare substrate carefully.
- Keep to specified drying times.
- Use compatible product systems.

Remedy:
- Sand the damaged area and repaint.
Definition:
Different sized ring-shaped polishing marks where the finish is less glossy or where the texture of the finish has been removed by polishing.

Cause:
- Unsuitable polishing compound was used.
- Too coarse sand paper was used for final sanding.
- The top coat was not thoroughly dry.
- Insufficient polishing to remove sand scratches.

Prevention:
- Use the right polishing compounds and equipment. Check that the top coat is completely dry before polishing. If necessary, allow to dry for longer.
- Finish sand with very fine sand paper.

Remedy:
- Ensure that the top coat is completely dry and then polish again or if necessary, sand and respray.
Definition:
Finish appears uneven.

Cause:
- Not enough top coat was applied to fully cover surfacer (low film thickness).

Prevention:
- Ensure top coats are applied at recommended film thicknesses. With low opacity colors, use a tinted surfacer. Apply a neutral-colored surfacer.

Remedy:
- Sand the whole surface and respray.
Runs or sags

Definition:
Paint runs on vertical body parts.

Cause:
- Uneven paint application.
- Spray viscosity was incorrect.
- Reducers used were too slow.
- Air, material or ambient temperature was too low.
- Film thicknesses were too high.
- Defective spray gun (nozzle).
- Intermediate flash-off time was too short.

Prevention:
- Warm object, paint and ambient temperature up to 20 °C / 68 °F.
- Ensure that the spray gun is in good working order. Follow application recommendations.

Remedy:
- After the specified drying time, sand down and polish. If, after sanding, it is clear that the paint has not dried through, allow to dry for longer, clean thoroughly with silicone remover and respray.
- With smaller defects, polish the affected area after sanding.
**Sanding marks**

**Definition:**
Score marks with swollen edges.

**Cause:**
- Sandpaper used to sand the putty or surfacer was too coarse or the sandpaper used for the final sanding was not fine enough.
- The surfacer was not allowed to become fully cured before it was recoated.

**Prevention:**
- Use the recommended sandpaper for sanding: Putty: initial sanding P 100, final sanding P 220. Surfacer: dry P 400, wet P 800.
- Follow specifications on drying the surfacer.

**Remedy:**
- When the top coat has dried through, finely sand and polish the affected area.
- For deeper score marks, sand and apply another coat of top coat.
Solvent attack / Wrinkling / Lifting

Definition:
Lifting / wrinkling of the paint surface.

Cause:
- Substrate was not fully cured or is solvent-sensitive.
- Areas where clear coat was sanded through to base coat and were not isolated, or were isolated, but with an unsuitable surfacer.
- Unsuitable substrate (e.g. spray finish with TPA or nitrocellulose paints).
- Unsuitable priming materials, top coats or reducers were used.

Prevention:
- Carry out a solvent test on problem substrates.
- Apply several thin coats of a 2K surfacer on problem substrates and allow longer flash-off times.

Remedy:
- Allow to dry until fully cured, remove the wrinkled top coat and the affected area of the substrate and apply the paint system again.
Definition:
Small bubbles and pop marks in the top coat.

Cause:
- Too much paint was applied (high film thickness).
- Top coat was not allowed to flash off long enough before low baking.
- Spray viscosity was not correct.
-Reducers / hardeners used were too fast.

Prevention:
- Apply paint at normal film thickness.
- Keep to specified flash-off times.
- Keep to the specifications on spray viscosity, hardeners and reducers as recommended.

Remedy:
- Allow top coat to become fully cured, then sand the affected areas, clean with silicone remover, isolate any fine pores with a 2K acrylic surfacer and respray top coat.
- Where there is an excessive number of bubbles/pop marks, sand down the top coat completely and apply paint system again.
Specks (metallics)

Definition:
Particles protruding from the top coat.

Cause:
• Metallic base coat was not applied wet enough for the metallic particles to settle into the paint.
• The clear coat was not able to cover these particles which protruded from the surface.

Prevention:
• Apply the base coat in accordance with the specifications.
• Maintain the correct distance between spray gun and object (approx. 20 cm / 8 inches).

Remedy:
• Allow clear coat to dry, lightly sand with P 800 grade sandpaper, clean with silicone remover and apply another coat of clear coat.
• In severe cases, base coat may need to be reapplied.
Staining

Definition:
Isolated patches / stains on the finish.

Cause:
- Surface was contaminated by chemically reactive materials such as chalk, cement dust, highly concentrated detergent cleaners, bird droppings etc.

Prevention:
- Unpreventable due to normal use and exposure of vehicle.

Remedy:
- In most cases, stains can be removed by polishing.
- If this is not successful, lightly sand the area, clean with silicone remover and respray.
- If necessary, sand down the whole surface and apply the paint system again.
- In severe cases, apply 2K surfacer, sand, and apply top coat.
Definition:
Application is uneven, colors are mottled giving a striped appearance.

Cause:
- Defective spray gun (nozzle).
- Fluctuating air pressure, unsuitable reducer, incorrect spraying technique, incorrect spray viscosity.

Prevention:
- Use mixing stick or DIN viscosity cup to set spray viscosity. Ensure spray guns are kept in good working order (maintained regularly). Keep spray gun parallel to object while spraying (at a distance of approx. 20 cm / 8 inches). Follow application recommendations.

Remedy:
- Allow to dry thoroughly, then sand the surface and respray.
**Definition:**

Ring-shaped marks on the paint surface.

**Cause:**

- Water droplets evaporated from fresh paintwork which had not through dried; primarily a problem on horizontal surfaces.

**Prevention:**

- Follow application recommendations for drying times.

**Remedy:**

- Where there are only a few marks, lightly sand with P 1200 - P 1500 grade sandpaper and then polish.
- Where there are lots of marks, sand the area until it is matt in appearance, clean with silicone remover and respray.