AUTOMOTIVE REFINISH

IDENTIFYING COMMON PAINT DEFECTS

A GUIDE TO IDENTIFYING AND SOLVING COMMON PAINT DEFECTS

TABLE OF CONTENTS

ACID RAIN

DESCRIPTION

Discoloration in the pigments of the topcoat.
The clearcoat may lose some transparency or gloss

CAUSES

- Contamination can derive from agricultural and horticultural sprays. The process may be accelerated with time and higher temperatures
- Effluents coming from manufacturing and chemical industries. Some effluents may be acidic or alkaline in the presence of water

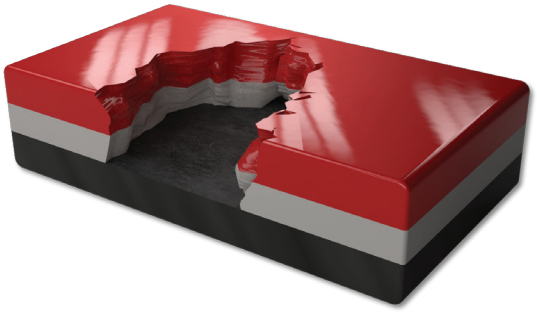
PREVENTION

- Avoid known contaminated atmosphere
- Immediately clean and neutralize contamination with mild soap and water
- Frequently wash vehicle
- Maintain and protect the topcoat finish of vehicle

CORRECTING

- Wash vehicle with warm soapy water. Rinse thoroughly to neutralize the contamination
- Sand and buff the affected area with rubbing compound and polish
- In severe cases the finish will need to be removed and refinished

ADHESION LOSS
PLASTIC PARTS



DESCRIPTION

Loss of adhesion of the refinish system over a plastic substrate

CAUSES

- Improper prep and cleaning
- Failure to utilize an adhesion promoter on bare plastic
- Applying basecoat directly to a factory primed part

PREVENTION

- Thoroughly abrade and clean plastic part
- Use recommended adhesion promoter on bare plastic
- Avoid excessive film builds
- Use appropriate sealer over primed part

CORRECTING

- Remove finish from affected areas
- Refinish part using approved plastic prep recommendations

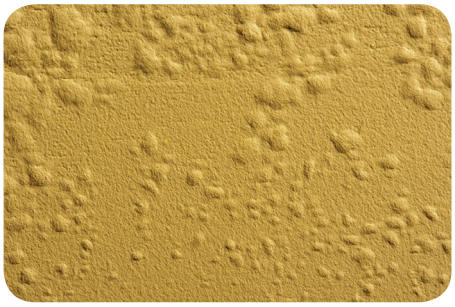
BLISTERING

DESCRIPTION

Small bubbles or pimples ranging in size from .5mm - 1.5mm in the topcoat application

CAUSES

- High humidity
- Improper surface cleaning
- Incompatibility of materials
- Excessive film builds
- Water, oil, or dirt in airlines



PREVENTION

- Insure you are within recommended film build per product data sheet
- Select proper reducer for spray conditions
- Carefully clean substrate
- Do not touch cleaned areas with bare hands
- Drain and clean compressor and regulator to remove trapped contaminants

CORRECTING

- Establish where the blisters are
- If in between layers, sand blisters down to a solid surface and refinish
- In severe cases the finish will need to be removed and refinished

CHIPPING

DESCRIPTION

Small chips of finish losing adhesion typically caused by stones or other hard objects coming into contact with the vehicles finish

CAUSES

- Damage caused by impact, typically from stones or other loose road debris hitting the vehicle at a high speed rate

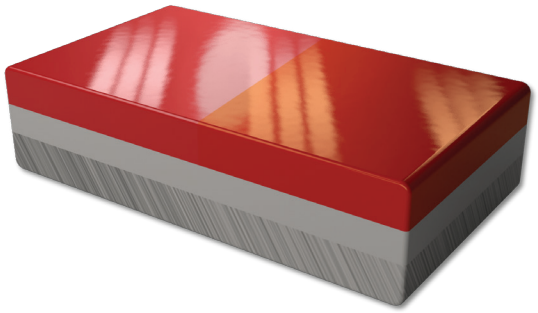
PREVENTION

- Properly activate the basecoat
- Use flexible additive in undercoats and clearcoats
- Avoid gravel roads

CORRECTING

- Repair affected area using flexible additive, focusing on the leading edge of the vehicle

CLEARCOAT YELLOWING



DESCRIPTION

After clearcoat application, discoloration noticed compared to adjacent panel

CAUSES

- Incorrect, contaminated or expired hardener used
- Excessive clearcoat film build over repair

PREVENTION

- Use recommended hardener
- Lids should be dated upon initial opening, and tightly replaced after each use
- Follow recommended film build per product data sheet

CORRECTING

- Once finish is thoroughly cured, sand and refinish affected area

DELAMINATION OF CLEARCOAT

DESCRIPTION

Clear losing adhesion to the basecoat system

CAUSES

- Excessive film build of the basecoat
- Not allowing the basecoat to flash off long enough
- Not mixing clear properly

PREVENTION

- Apply basecoat per the recommended film builds on the product data sheet
- Allow ample flash off of the basecoat before clearcoating
- Mix clear properly
- Properly activate the basecoat

CORRECTING

- Sand areas affected and refinish as needed
- For vehicles subject to harsh conditions, repair area with activated basecoat

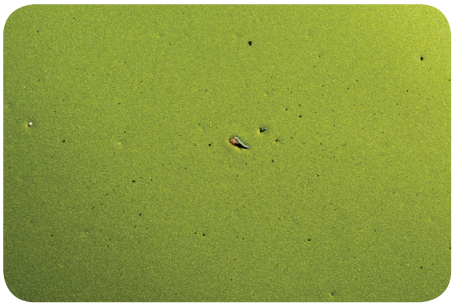
DIRT IN BASECOAT

DESCRIPTION

Dust and debris of different sizes will be noticed in the color

CAUSES

- Dirt and dust coming from dry sanding, clothes, etc.
- Contamination coming from compressed air supply
- Static on vehicle
- Dirty booth filters
- Paint was not strained



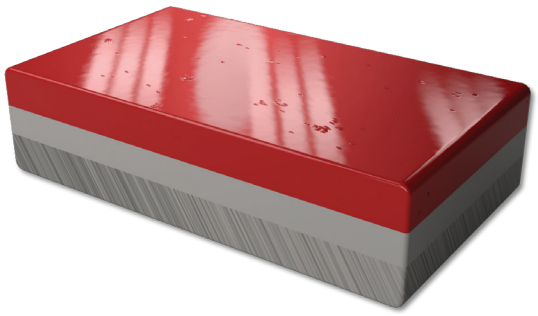
PREVENTION

- Establish a regular compressor maintenance schedule
- Change booth filters regularly
- Strain paint
- Tack off basecoat between coats
- Wear a paintsuit
- Keep booth doors closed

CORRECTING

- Sand dirt particles and re-apply basecoat to affected areas as needed

DIRT IN CLEAR



DESCRIPTION

Dust and debris of different sizes will be noticed in the clearcoat

CAUSES

- Dirt and dust attracted to the clear during application
- Contamination coming from compressed air supply
- Static on vehicle
- Dirty booth filters

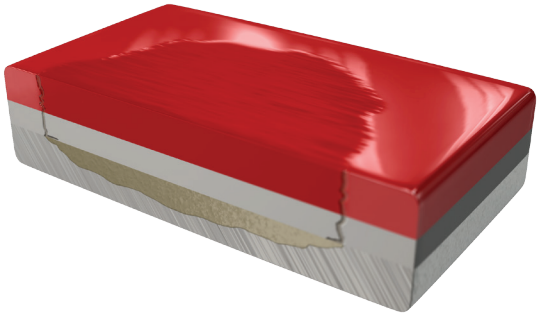
PREVENTION

- Establish a regular compressor maintenance schedule
- Change booth filters regularly
- Wear a paintsuit
- Keep the booth doors closed
- Tack off basecoat before clearcoating

CORRECTING

- After fully cured, the surface dirt can be sanded and polished out
- Dirt below the surface will need to be sanded and refinished once cured

EDGE RINGING (MAPPING)



DESCRIPTION

Enlarged sand scratches caused by swelling action of the topcoat solvents around the repair area

CAUSES

- Too coarse of sandpaper used
- Improper reducer used
- Undercoats not thoroughly cured before applying color
- High film build of undercoats
- Improper cleaning

PREVENTION

- Use appropriate grit sandpaper being careful not to sand through soft or sensitive substrates
- Use appropriate reducer for spray environment
- Do not apply excessive film build of undercoats
- Use compatible paint system

CORRECTING

- Insure undercoats are thoroughly cured before topcoating
- Sand the affected area and seal before topcoating

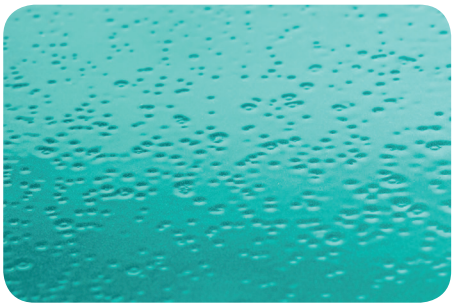
FISH-EYES

DESCRIPTION

Dimples or craters that form in the wet paint film immediately after spraying. In some cases, the substrate can be seen at the bottom of the crater

CAUSES

- Improper cleaning of the substrate
- Spraying over surfaces that contain silicone
- Contamination of air lines and hoses
- Contamination of rags, sanding dust, or dirty hands that come in contact with the substrate to be painted



PREVENTION

- Wear clean gloves when touching the substrate
- Use appropriate solventborne and waterborne surface cleaners to remove all contaminants from the substrate
- Use clean, disposable cloths
- Drain and clean air filters and compressors regularly and service air line filters and driers periodically
- As a final effort a fisheye preventer may be utilized

CORRECTING

- Spray an additional coat over the affected area to see if the paint will flow out smooth over the fisheyes
- Allow paint to cure, then sand the affected area to level the defects in the surface. Repaint the area as needed
- Utilize fisheye eliminator additive in the paint

LIFTING/WRINKLING

DESCRIPTION

Surface imperfections, which include shriveling, swellings, wrinkles or folds of varying severity in the paint surface. Can be noticed during application or while curing

CAUSES

- Excessive film build
- Improper reducer selection
- Finishing over old non-catalyzed lacquer or enamel finishes
- Sanding thin, or sanding through clearcoat
- Improper flash times

PREVENTION

- Avoid high film builds
- Use appropriate reducer for shop conditions
- Solvent check old or questionable finishes
- Take caution when sanding clear that needs to be refinished
- Follow product data sheet recommendation for proper flash and topcoat times

CORRECTING

- Remove finish from affected areas
- Prime the area past where the defect stopped
- Refinish as needed

ORANGE PEEL

DESCRIPTION

Uneven, bumpy, or textured surface formation that resembles that of an orange peel. Some orange peel is common in most OEM finishes

CAUSES

- Improper spray gun adjustment prevents the paint from flowing out smoothly such as too little air pressure, wide fan patterns or excessive distance from the panel
- Using too fast of a reducer or hardener that does not give the paint time to flow out
- Adding too little reducer, resulting in paint being too thick
- High paint booth temperatures
- Improper mixing of components

PREVENTION

- Use proper spray gun setup as outlined in the product data sheet
- Allow proper flash and dry times as per product data sheet
- Use correct mix ratio with appropriate reducer for your application conditions
- Stir all products thoroughly

CORRECTING

- Apply full wet coats of clear and allow for the recommended flash times
- Machine polish or compound to remove orange peel in the cured coating

PEELING

DESCRIPTION

Loss of adhesion between finished area and substrate

CAUSES

- Improper preparation of the substrate (sanding and cleaning)
- Excessive film build
- Dry spray application
- Tape left on too long before being removed

PREVENTION

- Thoroughly sand and clean area to be finished
- Avoid high film builds
- Carefully remove tape at a hard angle

CORRECTING

- Remove the material from the affected area and sand a slightly larger area
- Refinish as needed

PINHOLES

DESCRIPTION

Tiny holes from the undercoat that penetrate through the top surface

CAUSES

- Improper surface cleaning
- Too much spraygun air pressure
- Not thoroughly sanding body filler or primer surfacer
- Improper mixing and application of body filler

PREVENTION

- Thoroughly sand and clean repair area
- Use appropriate spraygun air pressure and distance
- Throughly mix fillers as per product data sheet recommendations, use the scale when possible
- Thoroughly sand filler and apply surfacer and sealer to the repair

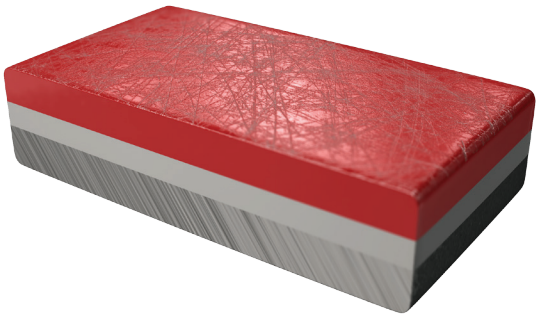
CORRECTING

- After surface is fully cured, sand the affected areas to a solid substrate and refinish as needed

POLISHING MARKS

DESCRIPTION

Microgrooves or smears on the finish typically in a curved or swirling pattern

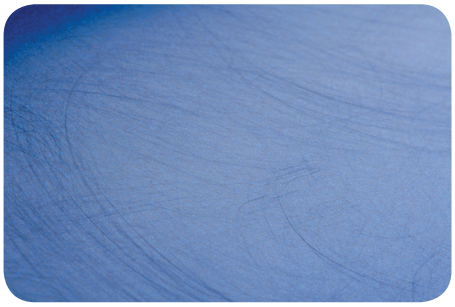


CAUSES

- Polishing the final finish too soon
- Using sandpaper that is too coarse
- Using poor quality polishing compounds

PREVENTION

- Follow recommended polish time per product data sheet
- Use recommended sandpaper grit
- Use ammonia free polish
- Finish with a foam pad



CORRECTING

- Lightly sand with fine grit sandpaper if needed
- Re-polish area
- Sanding and refinishing may be required

POOR COLOR MATCH

DESCRIPTION

Color of repair area differs from the original finish

CAUSES

- Improper application of the basecoat
- Basecoat not thoroughly mixed
- Incorrect color formula used
- Blend area too small

PREVENTION

- Use color tools to select best color match
- Clean adjacent panels when selecting color
- Spray a color test panel before applying to vehicle
- Mix basecoat color thoroughly
- Blend an area large enough to achieve a seamless transition

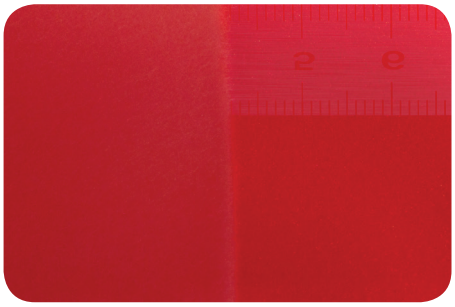
CORRECTING

- Use color tools to select proper color
- Sand and refinish after have chosen the correct color formula. Tint the existing formula if needed

POOR GLOSS

DESCRIPTION
Final finish lacks a normal shine

CAUSES
- Polishing too soon
- High film build and/or high humidity
- Poor air flow in spray booth
- Using incorrect reducer and/or hardener for spray conditions
- Too short flash time between coats of clear



PREVENTION
- Provide ample cure time before polishing
- Check for proper spray booth air flow
- Follow product data sheet for proper reducer/hardener selections
- Follow recommended flash times per product data sheet

CORRECTING
- Sand and polish repair area
- Sand and repaint affected areas

RAIL DUST

DESCRIPTION

Gold or rusty spots embedded in the finish

CAUSES

- Contamination coming from small particles of metal

PREVENTION

- Clean surface immediately
- Polish frequently to make it more difficult for the small flakes to adhere to the vehicle

CORRECTING

- Minor defects can be polished off, often times a clay bar will suffice
- In severe cases finish will need to be sanded and refinished

RUNS AND SAGS

DESCRIPTION

Running or sagging of a wet paint film that resembles drips or a curtain of film

CAUSES

- Applying too much paint in 1 coat
- Low air pressure
- Too little flash time between coats
- Holding gun too close to the surface and/or moving too slow
- Surface and/or spray conditions are too cold
- Using too slow of a reducer and/or hardener

PREVENTION

- Allow sufficient flash times between coats
- Choose the proper reducer for the spray temperature and hardener as recommended per the product data sheet
- Adjust air pressure and fluid control per product data sheet or spray gun chart
- Allow substrate and spray booth to reach proper spray temperature before refinishing

CORRECTING

- Use solvent to remove the sag and then refinish
- Allow paint to fully cure and then sand the run/sag smooth before polishing

SAND SCRATCH SWELLING

DESCRIPTION

Visible lines in the paint film that follow sanding marks caused by the swelling action of topcoat solvents

CAUSES

- Sanding with too coarse grit sandpaper
- Insufficient dry time of undercoats before topcoating
- Too fast of solvent in surfacer causing film to "bridge' over
- Refinishing over soft or soluble substrates

PREVENTION

- Use appropriate grit sandpaper
- Allow undercoats to cure thoroughly before topcoating
- Apply a sealer over the primer surfacer
- Use appropriate reducer in the primer surfacer for the spray conditions

CORRECTING

- Sand and refinish the area, using a sealer before topcoating

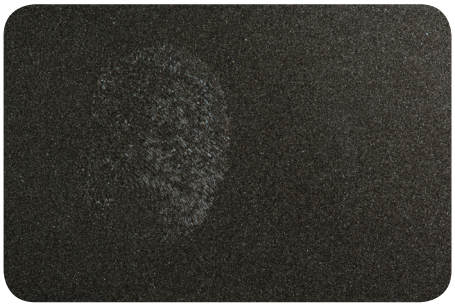
SLOW DRYING

DESCRIPTION

Paint isn't curing within the time outlined on the product data sheet

CAUSES

- Heavy application
- Insufficient spray booth air flow or high humidity conditions
- Too little flash time between coats
- Improper mixing of product components
- Improper reducer or hardener selection
- Spray conditions too cold



PREVENTION

- Avoid high film builds
- Perform routine spray booth maintenance
- Mix and apply per the product data sheet
- Use appropriate reducer or hardener for the spray booth conditions
- Do not apply urethane coatings below 55°F

CORRECTING

- Maintain spray booth temperature above 55°F

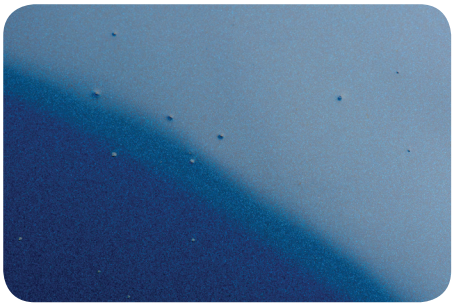
SOLVENT POP

DESCRIPTION

Open blisters on the finished surface

CAUSES

- Too much air flow over repair area
- Solvent trapped in the film during the curing process forming bubbles in the paint film
- High film builds
- Using too fast of a reducer and/or hardener for the spray conditions
- Bake temperature too high or IR lamp too close to the surface



PREVENTION

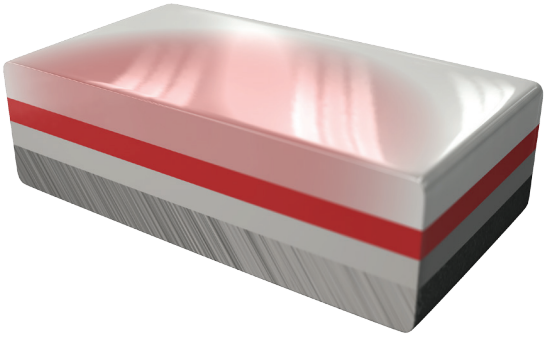
- Use appropriate reducer and/or hardener for spray booth conditions per product data sheets
- Apply recommended film builds per product data sheet
- Keep booth at recommended bake temperature and times
- Insure proper spray booth air flow

CORRECTING

- Sand surface blisters smooths and refinish
- Severe cases must be sanded back to undercoat and refinished

STAINING

DESCRIPTION
Over hardening body filler causing a discoloration of the new finish



CAUSES
- Original finish not sealed correctly
- Using too much hardener in the body filler
- Body filler not mixed thoroughly

PREVENTION
- Seal repair area with appropriate sealer
- Carefully measure the hardener when adding to the body filler
- Mix filler on the scale

CORRECTING
- Remove body filler and reapply over repair
- Isolate and sand the repair, seal and reapply topcoat

TREE SAP

DESCRIPTION

Droppings from trees leaving a sticky substance on the finish

CAUSES

- Secretions coming from tree resin

PREVENTION

- Avoid parking under trees
- Polishing vehicle will deter the sap from sticking making removal easier

CORRECTING

- Minor defects can be polished out
- In severe cases finish will need to be removed and refinished

WATER SPOTTING

DESCRIPTION

Dulling of gloss in spots or large areas due to water droplets sitting on the surface

CAUSES

- Washing vehicle in the sun
- Water evaporating on a freshly painted surface

PREVENTION

- Do not allow water to air dry on freshly painted repairs
- Wash vehicle in the shade and wipe dry completely

CORRECTING

- Remove marks by compounding and polishing
- Severe cases may need to be sanded and refinished

PPG
Automotive Refinish
19699 Progress Drive
Strongsville, Ohio 44149
800.647.6050

PPG Canada Inc.
2301 Royal Windsor Drive, Unit #6
Mississauga, Ontario L5J 1K5
888.310.4762

Follow us online:
www.ppgrefinish.com

We protect and beautify the world™