

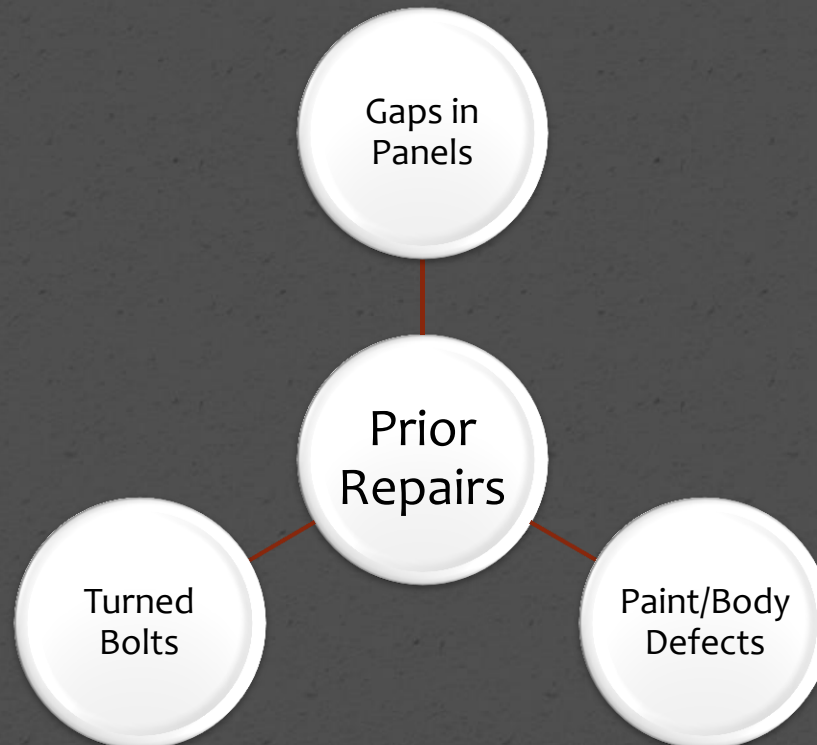


**Identification
and
Correction**

Paint Defects

Overview

- “Paint & Body Defects” is one of the 3 most consistent indicators when inspecting for ‘prior repairs’ that could ultimately indicate structural repairs, existing damage or alterations.
- Use this guide to better understand the various paint and body defects.



Correcting Paint Conditions

- ★ Corrective processes not involving refinishing operations must maintain proper UV protection
 - ★ Check film thickness before starting
 - ★ Check film thickness after correction
 - ★ If more than 0.3-0.5* mil of clearcoat is removed the affected area should be re-painted
 - ★ *Varies by OEM paint process



Paint Condition List

- o Acid Rain
- o Industrial Fallout
- o Water Spotting
- o Scratches
- o Environmental Contamination
- o Polishing marks
- o Stonechip
- o Corrosion
- o Orange Peel / Texture
- o Dirt Inclusions
- o Adhesion Problems with Plastics
- o Adhesion Problems with Clearcoat
- o Clouding / Mottling
- o Contamination / Fish-eyes
- o Peeling Problems
- o Sanding Marks - Topcoats
- o Sanding marks - Substrates
- o Loss of Gloss / Matting
- o Hiding Power (Coverage, Opacity)
- o Color Off Shade
- o Clearcoat Yellowing
- o Moisture Blisters
- o Adhesion Problems with Polyester
- o Edge Mapping
- o Wrinkling / Lifting
- o Shrinkage / Edge mapping
- o Striping / Banding
- o Pinholes - Topcoats
- o Pinholes - Substrates
- o Solvent Pop
- o Runs
- o Peroxide Staining



Acid Rain

o Cause

- o Rain containing airborne contaminants from manufacturing processes, chemical industries, and power stations
- o Contaminants may become acidic or alkaline when combined with water (sulfur dioxide - acidic, cement dust - alkaline)

o Prevention

- o Avoid heavily contaminated atmospheres
- o Wash surface immediately after exposure to remove and neutralize the contaminants

o Remedy

- o Neutralize the surface with mild detergent and water, thoroughly rinse
- o Sand, and polish
- o Sand, and repaint



Industrial Fallout

- Cause
 - Iron and steel particles from heavy industry, foundries, railroads
- Prevention
 - Thoroughly wash vehicle immediately after exposure
 - Protect vehicle from exposure to such environments, cover if possible
- Remedy
 - Clean surface with a suitable solution to dissolve the particles, neutralize, then polish
 - Remove particles, sand, and repaint



Water Spotting

o Cause

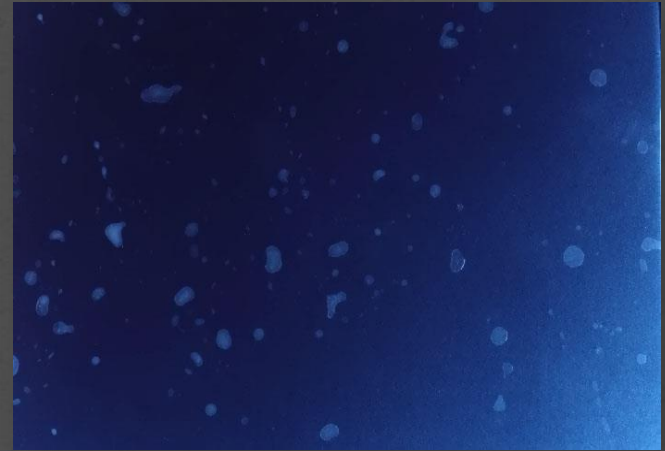
- o Droplets of water on paint which is not sufficiently cured due to:
- o Excessive film thickness, drying time too short
- o Failure of cross linking due to moisture contamination
- o Unsuitable thinner

o Prevention

- o Follow technical recommendations
- o Ensure lids are tightly replaced after using hardeners

o Remedy

- o Remove marks by polishing
- o Sand, isolate and repaint



Scratches

- Cause
 - Frequent use of brush or soft cloth automated car wash facilities
 - Wiping a dry surface instead of rinsing with water
- Prevention
 - Maintain and protect the finish with quality, non-silicone polish or wax
 - Rinse vehicle, never dry wipe the surface
- Remedy
 - Polish
 - For severe scratches, sand and repaint



Environmental Contamination

- o Cause

- o Bird droppings, acid rain, other environmental influences

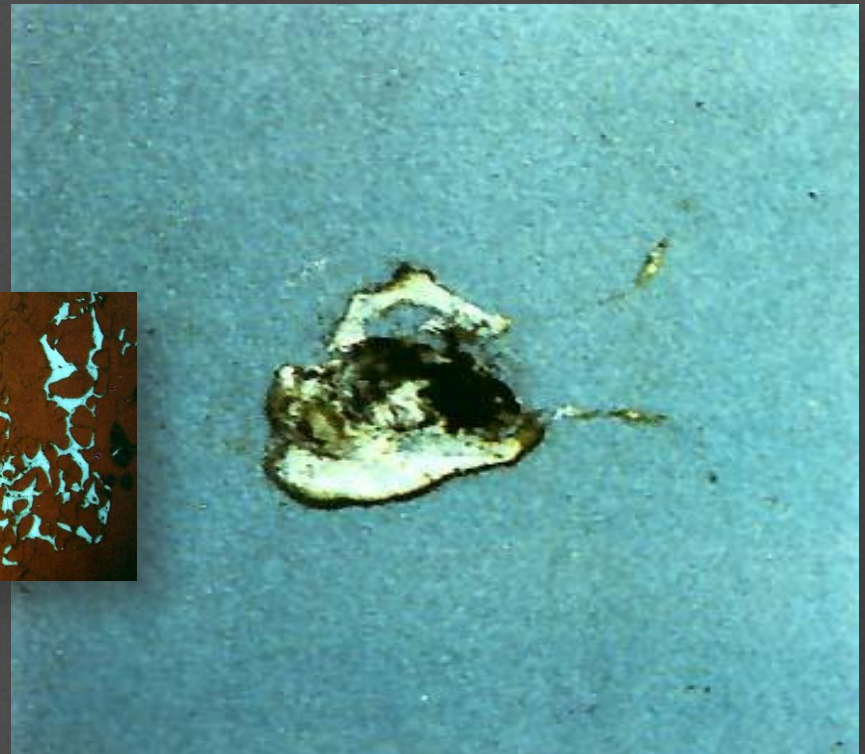
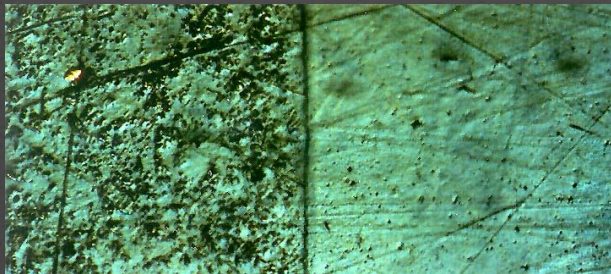
- o Prevention

- o Immediately clean and neutralize the contamination with mild detergent and water before etching starts

- o Remedy

- o Neutralize, sand, and polish

- o Neutralize, sand, and repaint



Polishing Marks

- o Cause
 - o Top coat not through-dried
 - o Sandpaper too coarse
 - o Unsuitable polish
 - o Polishing through layers on edges
- o Prevention
 - o Thoroughly dry top coat, if necessary re-bake
 - o Use suitable polish and equipment
 - o Use correct sandpaper
 - o Use polish, free of ammonia
- o Remedy
 - o Thoroughly dry topcoat and re-polish
 - o Thoroughly dry topcoat, sand and repaint



Stonechip

- Cause
 - High use of gravel roads
 - Frequent highway use
 - Following vehicles too close
 - Improper film build
- Prevention
 - Careful driving habits
 - Proper film builds
 - Anti-chipping paint systems
- Remedy
 - Sand and repaint with proper systems



Corrosion

o Cause

- o Paint removed by chipping or scratching exposing bare metal
- o Inadequate pre-treatment of metal
- o Rust not removed before application of coatings
- o Metal surface contaminated before application of coatings

o Prevention

- o Remove all rust before applying coatings
- o Properly pre-treat metal substrates
- o Use correct coating materials

o Remedy

- o Thoroughly remove all rust
- o Sand and repaint with proper systems



Orange Peel / Texture

o Cause

- o Incorrect spray pressure, gun setup, viscosity, technique, or application temperature
- o Wrong combination of solvents or non-system solvents
- o Substrate not sanded thoroughly

o Prevention

- o Follow recommendations on technical data sheets
- o Prepare and sand substrate correctly
- o Use recommended gun set up
- o Always use system thinners

o Remedy

- o Sand and polish
- o Sand and repaint



Dirt Inclusions

- Cause

- Various types of contamination typically introduced during the application or drying process

- Prevention

- Proper vehicle/technician cleaning procedures, booth/spray equipment maintenance, material preparation, masking, etc.

- Remedy

- Sand, and polish
- Sand, and repaint



Adhesion Problems with Plastics

- o Cause
 - o Insufficient cleaning, drying (tempering)
 - o Incorrect primer has been used
- o Prevention
 - o Clean and degrease properly
 - o Temper parts before priming
 - o Ensure proper solvents evaporation
 - o Use suitable adhesion primer
- o Remedy
 - o Remove damaged finish and repaint
 - o Steam clean, sand, clean and repaint



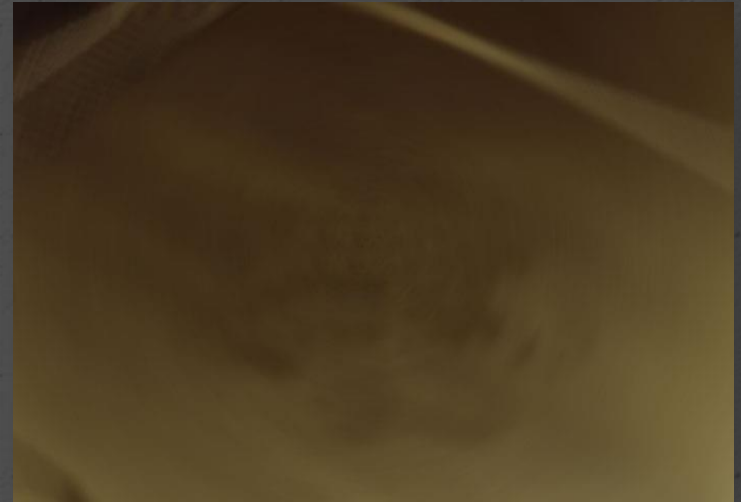
Adhesion Problems - Clearcoat

- o Cause
 - o Excessive coat thickness of basecoat
 - o Intermediate and final flash-off times of the basecoat too short
 - o Wrong mixing ratio for clearcoat and hardener
- o Prevention
 - o Allow proper flash off time
 - o Apply proper film thickness
 - o Mix clearcoat correctly
- o Remedy
 - o Sand and repaint



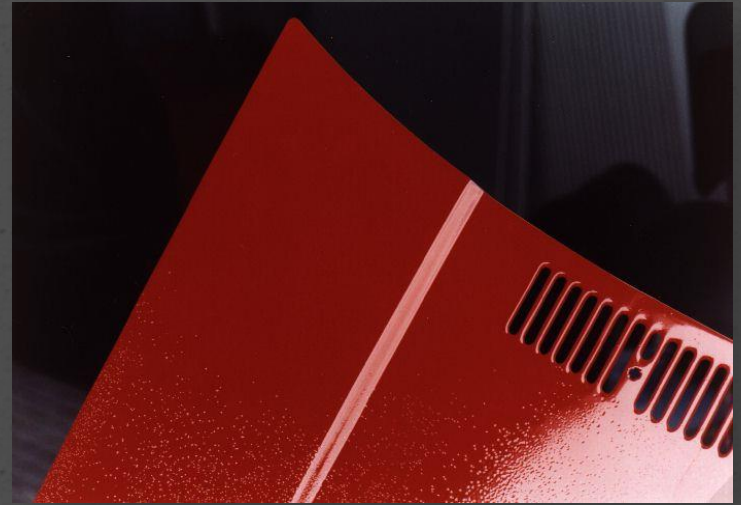
Clouding / Mottling

- o Cause
 - o Incorrect spray viscosity, technique, flash off times, spray temperature
 - o Defective spray gun setup, incorrect spray pressure
 - o Unsuitable thinners
- o Prevention
 - o Use correct viscosity and spray gun setup
 - o Keep spray gun parallel to object
 - o Use correct thinner with sufficient flash off time
 - o Observe recommendations in technical data sheets
- o Remedy
 - o Use droplet method before spraying clear
 - o After clear has thoroughly dried, sand surface and repaint



Contamination (Fish-eyes / Silicone)

- o Cause
 - o Oil, wax, grease or silicone contamination
 - o Contaminated air supply
 - o Use of polishes or aerosol sprays containing silicone (e.g. interior cleaners or dressings)
 - o Insufficient cleaning
- o Prevention
 - o Regular maintenance of air supply
 - o Thoroughly clean with a suitable wax and grease remover
- o Remedy
 - o Apply light coats of basecoat until defect is covered
 - o Sand panel, clean / isolate, and repaint
 - o If required, use fish-eye eliminator



Peeling Problems

o Cause

- o Substrate not sufficiently prepared (rust, grease, moisture, poor sanding or cleaning)
- o Use of incompatible material or an incompatible substrate
- o Flash off and drying times too short
- o Condensation of substrate due to temperature changes

o Prevention

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

o Remedy

- o Sand damaged area and repaint



Sanding Marks - Topcoats

- o Cause
 - o Sanding paper too coarse
 - o Soft, solvent reversible substrates
e.g. acrylic lacquer (T.P.A.)
 - o Insufficient film build
- o Prevention
 - o Solvent test to identify soft, reversible substrates (T.P.A.)
 - o Isolate soft finishes
 - o Use recommended sandpaper
 - o Apply proper film thickness
- o Remedy
 - o Thoroughly dry affected area
 - o Sand, isolate, and repaint



Sanding Marks - Substrate Preparation

- Cause
 - Insufficiently sanded polyester stopper
 - Insufficient isolation of the polyester before topcoat application
- Prevention
 - Use suitable sanding paper
 - Isolate polyester areas with 2K filler
- Remedy
 - Thoroughly sand damaged area and repaint



Loss of Gloss / Matting

o Cause

- o Film thickness/ air humidity
- o Solvent-sensitive substrate
- o Incorrect mixing or contaminated hardener, or unsuitable thinner
- o Insufficient airflow in oven or interrupted baking

o Prevention

- o Follow application recommendations on technical data sheets
- o Close hardener cans firmly after use
- o Ensure sufficient airflow in oven and do not interrupt baking cycle

o Remedy

- o Sand and polish
- o Sand and repaint



Hiding Power (Coverage, Opacity)

- Cause
 - Substrate not uniform (effect finishes)
 - Color coat film build too low
- Prevention
 - Spray a uniform substrate
 - Spray sufficient color to obtain opacity
- Remedy
 - Sand and repaint



Color Off-shade

o Cause

- o Weathered surface
- o Incorrect spraying technique
 - o too wet or dry, poor opacity
- o Incorrect spray gun setup or PSI
- o Incorrect mixing
- o Variations of the OEM finish (multiple color shades)

o Prevention

- o Check color for variations
- o Mix color correctly
- o Spray a test panel for verification
- o Apply with recommended procedures
- o Use blending techniques

o Remedy

- o Polish adjoining panel for color verification
- o Blend the color
- o Tint the color, sand, repaint



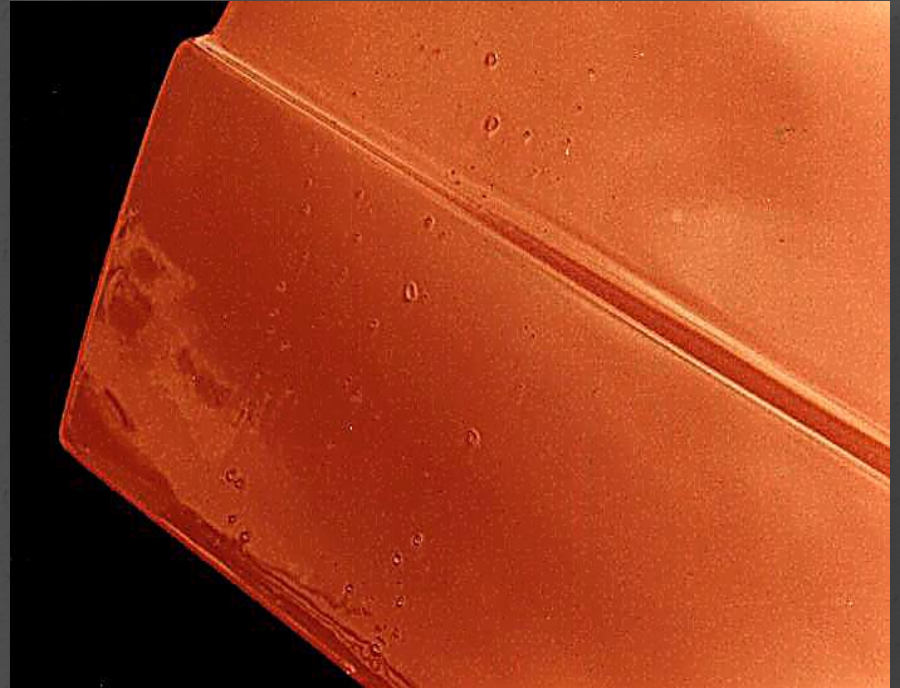
Clearcoat Yellowing

- Cause
 - Wrong or contaminated hardener
 - Insufficient clearcoat film thickness
- Prevention
 - Ensure lids are tightly replaced after using hardeners
 - Follow technical recommendations
 - Use system hardeners
- Remedy
 - Sand and repaint



Moisture Blisters

- Cause
 - Residue of sanding water in corners, edges, crevices, or below decorative strips
 - Contaminated air supply
 - Insufficient isolation of polyesters
 - Ambient humidity too high
- Prevention
 - Always remove exterior trim
 - Blow and dry carefully
 - Check air supply equipment regularly
- Remedy
 - Remove contaminated finish and repaint



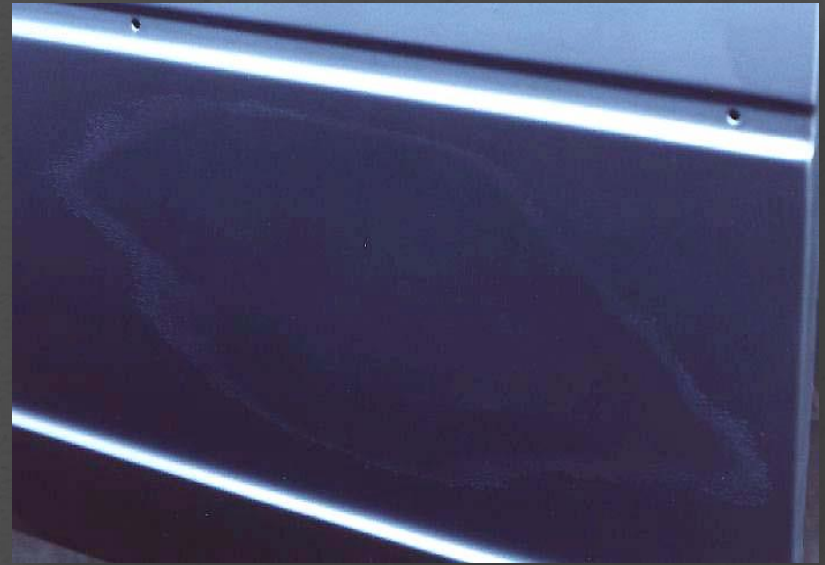
Adhesion Problems - Polyester

- o Cause
 - o Substrate not carefully prepared
 - o Polyester material unsuitable for galvanized substrate
 - o Too high surface temperature while forced drying
 - o Undercured - too much or too little hardener
- o Prevention
 - o Clean and sand thoroughly
 - o Follow the manufacturer's instructions for forced drying
 - o Use proper mixing ratio
 - o Ensure the hardener is thoroughly mixed
- o Remedy
 - o Sand the damaged repair-area well
 - o Repair and repaint



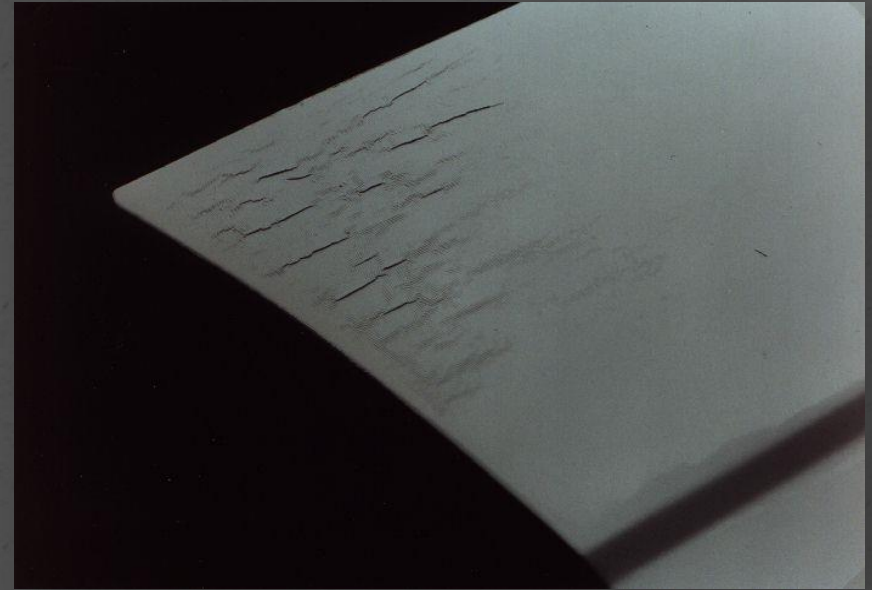
Edge Mapping Due to Solvent Penetration

- o Cause
 - o Insufficient isolation where topcoat was sanded through to substrate
 - o Isolated with unsuitable filler
 - o Filler incorrectly applied
 - o Insufficient drying of substrate
- o Prevention
 - o Solvent Test to identify soft substrates
 - o Apply only several thin coats of 2K Primer Filler
 - o Avoid sanding through to soft substrate
- o Remedy
 - o Thoroughly dry affected area
 - o Sand, isolate, and repaint



Wrinkling, Rippling, Lifting

- Cause
 - Finish not fully cured (synthetic resin finishes)
 - Unsuitable substrate (aerosol paints, acrylic lacquer or nitrocellulose)
 - Excessive film build
- Prevention
 - Solvent test
 - Remove or isolate solvent-sensitive substrates
 - Ensure sufficient drying
 - Avoid excessive film thickness
- Remedy
 - Remove finish in affected area and repaint



Shrinkage / Edge Mapping

o Cause

- o Substrate not fully cured
- o Subsequent coats applied too soon to preparatory materials
- o Excessive film thickness
- o Sanding paper too coarse

o Prevention

- o Solvent test to identify soft substrates
- o Do not apply polyester products directly to soft substrates
- o Isolate with 2K filler, applying thin coats with sufficient inter-coat flash off
- o Dry prep materials thoroughly
- o Use proper grit sandpaper
- o Follow recommendations

o Remedy

- o Thoroughly dry affected area
- o Sand, isolate if necessary, and repaint



Striping / Banding

o Cause

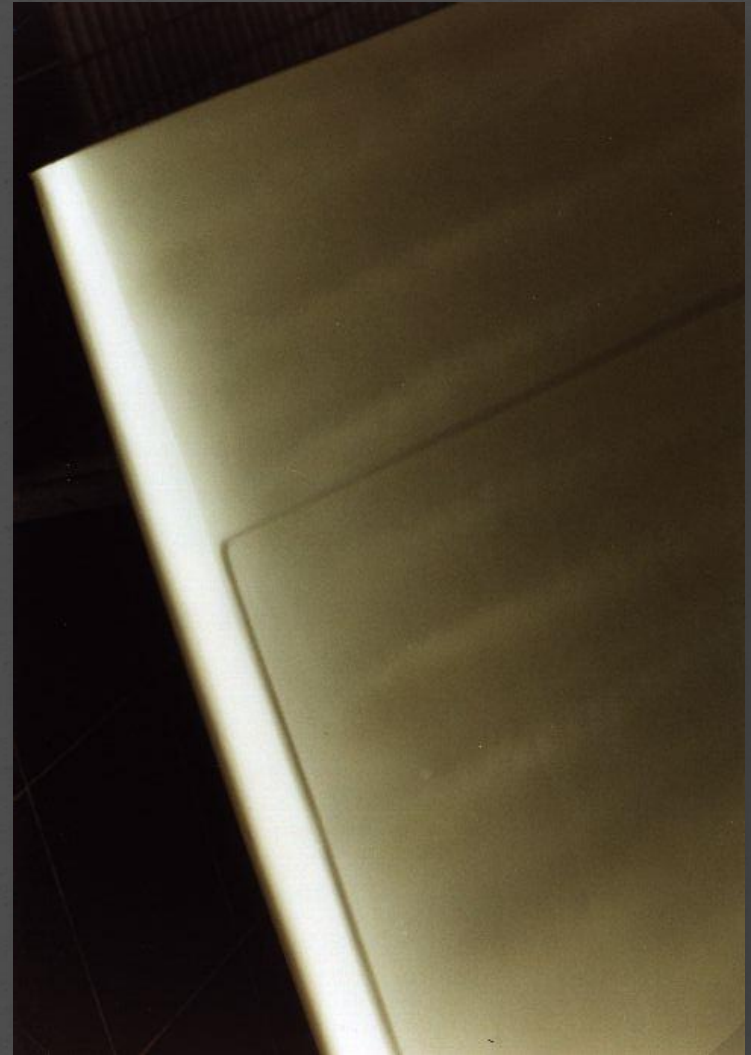
- o Spray technique or PSI, material viscosity, or spray gun setup
- o Flash off time too short
- o Unsuitable thinner for application conditions

o Prevention

- o Follow application recommendations
- o Choose suitable spray gun setup
- o Keep spray gun parallel to object
- o Follow manufacturer's product system

o Remedy

- o Ensure even application
- o Keep spray gun in good working order
- o Thoroughly dry, sand, and repaint



Pinholes

o Cause

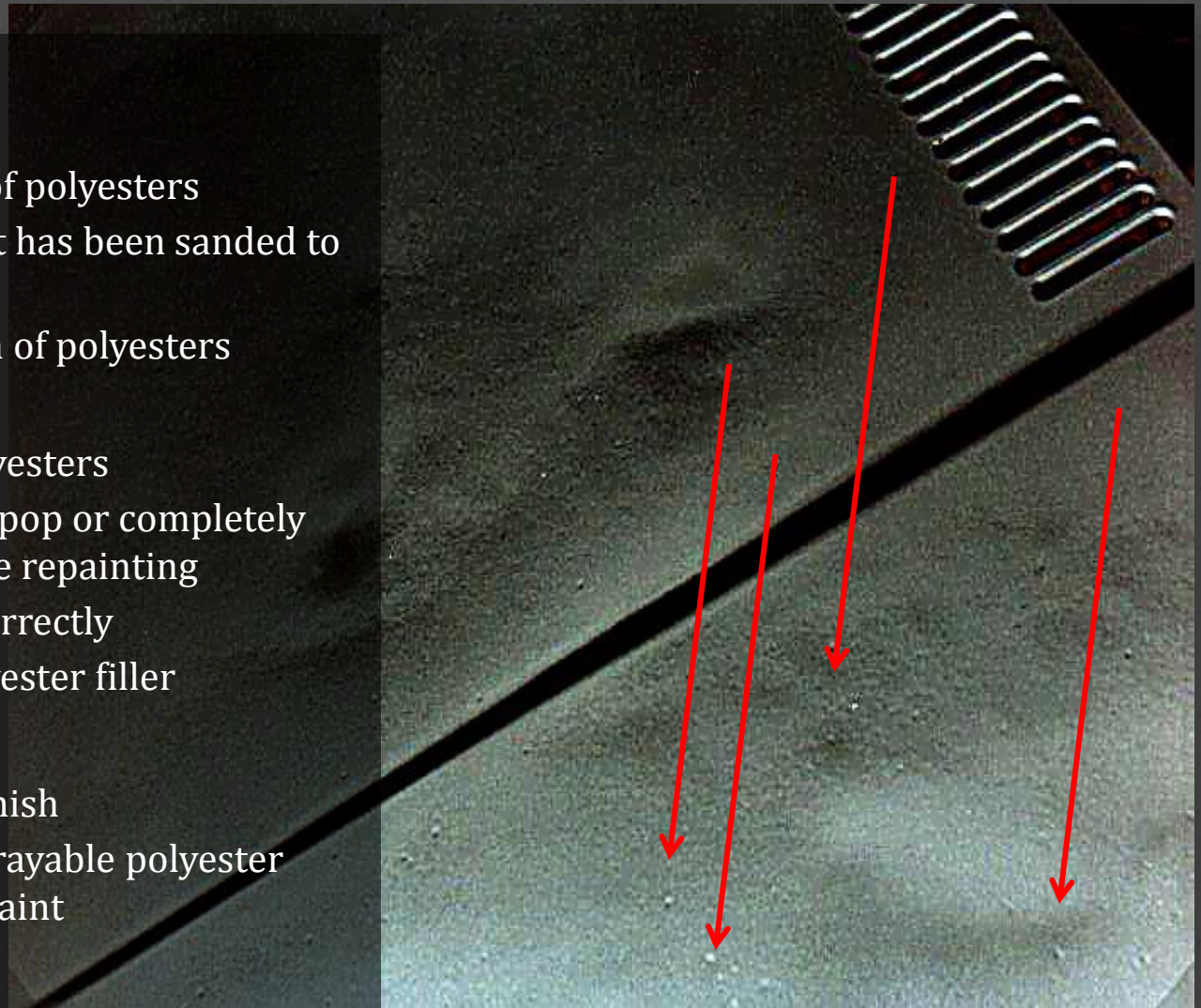
- o Fiberglass bodies
- o Insufficient mixing of polyesters
- o Solvent popping that has been sanded to open the top
- o Insufficient isolation of polyesters

o Prevention

- o Thoroughly mix polyesters
- o Do not sand solvent pop or completely remove defect before repainting
- o Isolate polyesters correctly
- o Use a sprayable polyester filler

o Remedy

- o Remove damaged finish
- o Sand and apply a sprayable polyester filler, prime, and repaint



Pinholes - Substrate Preparation

o Cause

- o Substrate insufficiently dried
- o Polyester material not sufficiently isolated
- o Pores not deeply sanded

o Prevention

- o Allow prep materials to dry thoroughly
- o Thoroughly sand pinholes and repaint
- o Thoroughly sand, re-apply polyester and repaint

o Remedy

- o Thoroughly dry affected area
- o Sand, isolate, and repaint



Solvent Pop

o Cause

- o Solvent or air trapped in film escapes during drying leaving pop marks
- o Caused by incorrect spray viscosity, spray pressure, flash off time, or improper drying
- o Incorrect choice of hardeners and thinners
- o Over application of material resulting in excessive film build
- o Incorrect drying of primer / fillers

o Prevention

- o Apply film at proper thickness
- o Allow proper flash off time
- o Follow technical recommendations

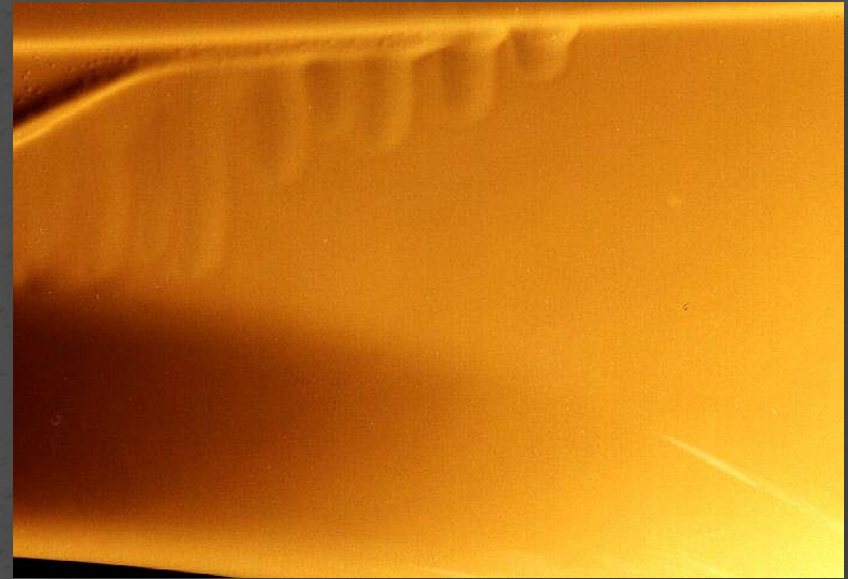
o Remedy

- o After drying, repaint without sanding (within 24 hours) or scuff with a gray scuff pad
- o After drying and sanding apply a sprayable polyester, or remove damaged layers; then sand, prime and repaint



Runs

- o Cause
 - o Incorrect spray viscosity, flash off time, technique, or film thickness
 - o Defective spray gun, incorrect gun setup, or spray pressure
 - o Temperature of paint, substrate or room too low
 - o Incorrect choice of hardener and/or thinner
- o Prevention
 - o Follow technical recommendations
 - o Ensure that the spray gun is in good working order
 - o Warm object and material up to room temperature of 20°C / 68°F
 - o Use correct combination of hardener and thinner
- o Remedy
 - o Sand and polish
 - o Sand and repaint



Peroxide Staining from Hardener in Polyester Body Filler

- o Cause
 - o Incorrect addition of hardener
 - o Insufficient mixing
- o Prevention
 - o Use recommended amount of hardener
 - o Check quantity of hardener, mix by weight or use a dispensing machine
 - o Mix thoroughly
- o Remedy
 - o Remove polyester and re-do repair
 - or
 - o Sand, isolate with a sprayable polyester, prime and repaint



Sources

- DuPont Refinishing Systems
- Matt Arias, Director of Manheim Arbitration

