



# Axalta Coating Systems

## Paint Defects Manual



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## Adhesion Loss, Clearcoat

### Description

Loss of adhesion of the clearcoat from the basecoat.

### Origin and Potential Causes:

- Excessive film thickness of basecoat
- Intermediate and final flash-off times of the basecoat too short
- Wrong mixing ratio for clearcoat and activator

### Prevention Techniques:

- Allow proper flash off time of coats of basecoat and before applying clearcoat.
- Apply proper film thicknesses of all layers.
- Mix clearcoat correctly.
- Follow system recommendations per Technical Data Sheet(s).

### Remedy

- Sand, isolate if necessary, and refinish.



## Adhesion Loss, Plastic Parts

### Description

Loss of adhesion of the refinish system and a plastic part substrate. This defect is often noticed some time after the painting took place.

### Origin and Potential Causes:

- Improper cleaning, drying (tempering) or preparation - failure to remove mold-release agents
- Improper treatment
- Wrong identification of substrate
- Failure to use proper sealer/primer
- Failure to use proper/recommended topcoat system

### Prevention Techniques:

- Clean and degrease the plastic part properly.
- Identify the type of plastic substrate and follow recommended paint system for that specific type of substrate.
- Thoroughly clean substrate to be painted using recommended system.
- Use recommended sealer/primer using the correct mixing ratio of recommended activator, flexible additive and thinner.
- Apply sealer/primer to recommended film build using recommended viscosity.
- Use topcoat as recommended for type of plastic substrate to be painted.
- Where recommended, use a suitable adhesion primer for the type of plastic substrate being finished.

### Remedy

- Remove all finish layers from the substrate.
- Refinish using recommended preparation and paint system for type of plastic substrate to be painted.



## Adhesion Loss, Polyesters

### Description

Loss of adhesion between the polyester filler and the substrate.

### Origin and Potential Causes:

- Substrate not carefully prepared.
- Polyester material unsuitable for galvanized substrate.
- Too high surface temperature during forced drying.
- Undercured filler - too much or too little hardener.

### Prevention Techniques:

- Clean and sand substrate thoroughly.
- Follow the manufacturer's instructions for forced drying.
- Use proper mixing ratio of polyester materials.
- Ensure the hardener is thoroughly mixed.

### Remedy

- Sand the damaged repair area well.
- Redo the repair and refinish.



## Bleeding

Also known as: bleed through, staining, stains

### Description

Original finish color or peroxide hardener from polyester body filler seeping through the topcoat, causing a discoloration of the new finish.

### Origin and Potential Causes:

- Reaction of pigments from the original finish with solvents of the coat which has been applied on top of it.
- Contamination - usually in the form of soluble dyes or pigments on the older finish before it was repainted. (This is especially true with older shades of red.)
- Old finish not well sealed.
- Use of too much hardener in the polyester putty or filler.
- Insufficient mixing of the polyester putty or filler.

### Prevention Techniques:

- Test old finish applying a coat of the color on a small area if bleeding is likely to occur, if so apply sealer.
- Use only the recommended quantity of hardener when mixing the polyester putty or filler.
- Check quantity of hardener, mix by weight or use a dispensing machine.
- Mix all putties or fillers thoroughly.

### Remedy

- Remove polyester and re-do repair.
- Sand, isolate the original finish with sealer and reapply the topcoat.



## Blistering

Also known as: moisture blisters, bubbling, blowing, bubbles

### Description

Bubbles or pimples appearing in the topcoat film, application.

### Origin and Potential Causes:

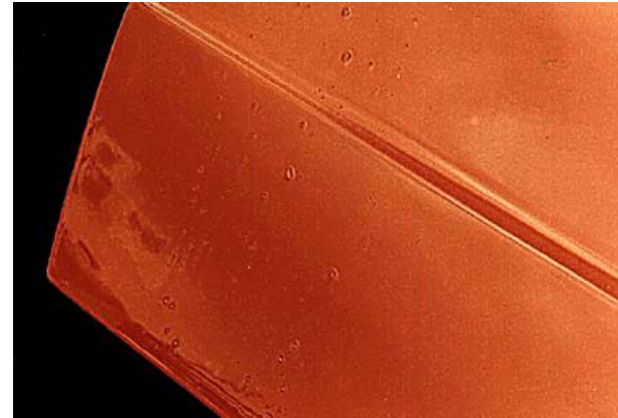
- Residue of sanding water in corners, edges, crevices, or below decorative strips.
- Ambient humidity too high.
- Improper surface cleaning or preparation. Wrong thinner or reducer. Air or moisture can be trapped in the film.
- Excessive film thickness. Insufficient drying time between coats or too heavy application of the undercoats may trap solvents which escape later and blister the color coat.
- Contamination of compressed air lines. Oil, water or dirt in lines.
- When wet sanding polyester and applying topcoat without enough time for the water to evaporate.
- Incompatibility of materials.

### Prevention Techniques:

- Always remove exterior trim.
- Clean substrate carefully. Blow and dry carefully.
- Thoroughly clean areas to be painted before sanding. Be sure surface is completely dry before applying undercoats or topcoats.
- Don't touch a cleaned area as the oils in your hands will contaminate the surface.
- Select the thinner or reducer most suitable for shop conditions.
- Allow proper drying time for undercoats and topcoats. Be sure to let each coat flash before applying the next.
- Drain and clean air pressure regulator and compressor tank daily to remove trapped moisture and dirt.

### Remedy

- If damage is extensive and severe, paint must be removed down to undercoat or metal, then refinish.



## Chipping

### Description

Small chips of a finish losing adhesion from the substrate, usually caused by impact of stones or hard objects against the vehicle's finish. While the refinisher has no control over local road conditions - and thus cannot prevent such occurrences - he can take steps to minimize their effect if he knows beforehand that these conditions will exist.

### Origin and Potential Causes:

- Stones and other hard objects hitting vehicle finish under high speed.

### Prevention Techniques:

- In recommending an appropriate system, ask customer if the car is frequently exposed to potential chipping hazards.
- Use a flexibilized Primer Surfacer within the refinishing system.
- Activated basecoat improves chip resistance.

### Remedy

- Repair area affected by chipping with a flexible system. Areas to pay special attention to: front of hood, leading edge of roof, lower side areas(rocker panels) and around wheel openings.





## Clearcoat Yellowing

### Description

Discoloration causing the appearance of a color mismatch to the adjacent panel after the clearcoat is applied.

### Origin and Potential Causes:

- Wrong or contaminated hardener/activator.
- Incorrect clearcoat film thickness

### Prevention Techniques:

- Ensure lids are tightly replaced after using activators or hardeners.
- Follow recommendations per Technical Data Sheets.
- Use recommended system activators.

### Remedy

- Allow the finish to properly dry, then sand and refinish.



## Color Mismatch

Also known as: Wrong color, off shade, mismatch fading, off color

### Description

The color of the repaired part differs from that originally on the object being painted.

### Origin and Potential Causes:

- The appropriate formula or alternate was not used.
- Incorrect spray gun setup or PSI.
- The original finish has changed due to weathering or exposure.
- Incorrect application technique (especially applicable to metallics), too wet, too dry, poor hiding or coverage.
- The color was not well stirred.
- Variations of the OEM finish.

### Prevention Techniques:

- Check color for variations and use the right formula.
- Stir colors thoroughly.
- Polish adjacent panels to check the color.
- If necessary, follow the instructions of our color guide to match the old finish color.
- Use the spraying technique which better adapts to the required color matching.
- Spray a test panel for color verification.
- Blend the color into adjacent panel(s).

### Remedy

- Sand and refinish after having chosen the right formula, tinted the existing formula and/or set up the repair for a blend.



# Corrosion

## Description

Surface of metal substrate is visible and shows corrosion spots. Brownish-red for steel, white rust in the case of aluminum substrates.

## Origin and Potential Causes:

- The surface of the metal was contaminated (fingermarks, water) before application.
- Paint removed by chipping, scratches, etc.
- Inadequate pre-treatment of the metal surfaces.
- Rust was not completely removed before refinishing.
- Destruction of paint film by contamination.

## Prevention Techniques:

- Treat metals with correct metal treatment and wash-primers.
- Repair all chips and scratches before rust develops.
- Clean the vehicle thoroughly before applying refinish system.
- Residue of water from sanding still on the surface should be wiped off and allowed to completely dry before applying refinish system.

## Remedy

- Paint has to be stripped/sanded back to the bare metal.
- Use the metal conditioner and a phosphoric acid wash primer (etch-primer) applicable for the substrate.
- Refinish



## Cracking

### Description

A series of deep cracks resembling mud cracks in a dry pond. Often in the form of three-legged stars and in no definite pattern, they are usually in the color coat and sometimes the undercoat as well.

### Origin and Potential Causes:

- Excessive film thickness. Excessively thick topcoats magnify normal stresses and strains which can result in cracking even under normal conditions.
- Materials not uniformly mixed.
- Insufficient flash times between coats.
- Incorrect use of additives.
- Substrate is too hot or cold.
- Use of coats incompatible with each other.
- Omitting the activator when mixing a 2K product.

### Prevention Techniques:

- Don't pile on topcoats. Allow sufficient flash and drying time between coats.
- Do not dry by fanning with compressed air from the spray gun.
- Stir all pigmented undercoats and topcoats thoroughly.
- Read and carefully follow recommendations in the Technical Data Sheet(s). Additives not specifically designed for a color coat may weaken the final paint film and make it more sensitive to cracking.

### Remedy

- The affected areas must be sanded to a smooth finish, or in extreme cases removed down to the bare metal, and a full refinish system reapplied.



## Dirt Inclusions

Also known as: bits, dirt in paint, seed, grains, specks, spikes, grits

### Description

A surface with this defect will show particles of different sizes deposited in the primer or color.

### Origin and Potential Causes:

- Various types of contamination typically introduced during the application or drying process.
- Static charge on surface of vehicle. This condition helps the attraction of dust.
- Dust and dirt from dry sanding, cloths, etc.
- Use of poor quality masking paper.
- Tack rag was not used before spraying, or not immediately before.
- Inadequate filtration of air.
- Dry spray dust settling on wet paint.
- Paint kept in dirty containers/tins.
- Paint was not strained.
- Operators clothing bearing dirt, fibres and dust.
- Paint has been kept longer than recommended.
- Inadequate filtration of compressed air.
- Activator or thinner used were incorrect.
- The car was not thoroughly blown out.
- Tintings/pigments were not sufficiently stirred.
- Spray dust accumulated on spray booth surfaces/walls.
- Use, re-thinned, of 2K materials after the recommended potlife.

### Remedies

- Allow the finish to harden completely, fine sand and polish.
- If the defect is severe, sand and respray.

### Prevention Techniques:

- Use anti-static fluid or attach the vehicle to electrical earth.
- Keep bodyshop as clean as possible. Always keep spray booth doors closed. Wet floor and wall if necessary.
- Wear special spraysuits.
- Blow out all mouldings, seams etc.
- Blow the vehicle out before placing it in the spraybooth.
- Use the tack rag immediately before applying each coat.
- Care of the maintenance of the equipment.
- Follow the recommendations (pressure, thinner) to avoid overspray.
- Clean the vehicle before starting the repair.
- Mix the color thoroughly after sufficient stirring of tintings.
- Do not exceed the recommended potlife of 2K materials.
- Use a fine strainer.





# Dissolution

## Description

Metallic particles from the basecoat surface in the clearcoat. If severe, the effect can alter the tone and exaggerate the metallic appearance.

## Origin and Potential Causes:

- Tack cloth was not used before applying the clearcoat.
- Basecoat and clearcoat are incompatible.
- Clearcoat was applied with insufficient flash off of the basecoat, or was applied too wet.
- Air pressure was too high.
- Wrong thinner.
- A coat of basecoat was too dry when the next was applied.

## Prevention Techniques:

- Use tack cloth, if possible.
- Use recommended products only, with recommended air pressure.
- Allow proper flash off time of the basecoat before applying the clear.
- Use recommended thinner/reducer.
- Follow product recommendations in the Technical Data Sheets.

## Remedy

- Sanding and refinishing are necessary if the defect is severe.



## Dry Spray

### Description

Granular texture normally with no gloss at all. This defect is normally limited to small areas.

### Origin and Potential Causes:

- Incorrect viscosity.
- Improper choice of thinner, reducer or activator; generally, too fast for spray conditions.
- Spraying too fast.
- Air pressure too high.
- Spray gun too far from surface while applying.
- Improper spray gun setup.

### Prevention Techniques:

- Follow recommendations on the Technical Data Sheet for mixing ratio and reduction, appropriate to spray conditions.
- Adjust spray gun settings, spray pattern, fluid feed.
- Use recommended air pressure.

### Remedy

- Allow the paint to dry and then sand. After sanding, and depending on the magnitude of the defect, respraying or polishing will be necessary.

## Edge Mapping, Shrinkage

Also known as: featheredge splitting

### Origin and Potential Causes:

- "Piling on" the undercoat in heavy and wet coats. Solvent is trapped in undercoat layers which have not had sufficient time to set up.
- Material not uniformly mixed. Because of the high pigment content of primer-surfacer, it is possible for settling to occur after it has been thinned.
- Improper thinner/reducer selection.
- Improper surface cleaning. When not properly cleaned, primer-surfacer coats may crawl or draw away from the edge because of poor wetting and adhesion.
- Improper drying. Fanning with a spray gun after the primer-surfacer is applied will result in drying the surface before solvent or air from the lower layers is released.
- Finishing grit of sandpaper too coarse.

### Prevention Techniques:

- Apply properly reduced primer-surfacer in thin to medium coats following recommended flash off time between coats.
- Stir all pigmented undercoats and topcoats thoroughly.
- Select only thinners/reducers that are recommended for existing shop conditions.
- Thoroughly clean areas to be painted before sanding.
- Use proper sandpaper grit before applying polyesters or undercoats.
- Follow product recommendations per its Technical Data Sheet.

### Remedy

- Thoroughly dry affected area.
- Sand, isolate if necessary, and refinish.



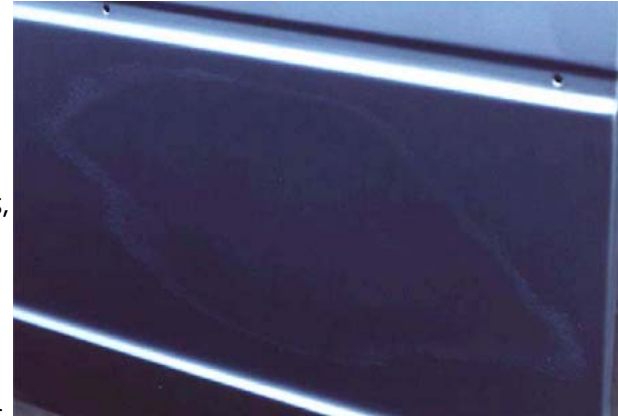


## Edge Mapping, Solvent Penetration

Also known as: Sandscratch swelling, tramlining, lining up, flattening marks, sanding marks, scratch swelling

### Description:

Enlarged sandscratches caused by swelling action of topcoat solvents, appearing at the area of the repair where it was sanded through to the substrate.



### Origin and Potential Causes:

- Improper surface cleaning or preparation. Use of too coarse sandpaper or omitting a sealer in panel repairs greatly exaggerates swelling caused by thinner penetration.
- Improper thinner or reducer, especially a slow-dry thinner or reducer when sealer has been omitted.
- Under-reduced or wrong thinner (too fast) used in primer-surfacer causes "bridging" of scratches.
- Primer not well dried before application of color.
- Application of undercoat too heavy.
- Application of color when the original finish is too sensitive to paint solvents used.

### Prevention Techniques:

- Use appropriate grits of sanding material for the topcoats you are using.
- Avoid sanding through to soft or sensitive substrates.
- Seal to eliminate sandscratch swelling. Select thinner or reducer suitable for existing shop conditions.
- Use proper thinner and reducer for primer-surfacer.
- Do not apply coats of primer too heavily.
- Use compatible paint systems.

### Remedy

- Thoroughly dry affected area.
- Sand smooth, isolate with appropriate sealer, and refinish.

## Environmental Contamination

Also known as: acid rain, bird droppings, spotting, pitting, acid marks

### Description

Discolored spots in the pigments of the topcoat. Clearcoat losing transparency and/or gloss. Etching marks visible in the topcoat.

### Origin and Potential Causes:

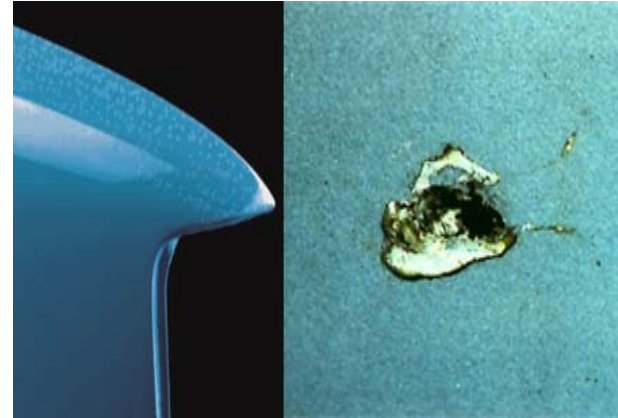
- Contamination from agricultural and horticultural sprays. The problem is seasonal/regional and affected by bird/insect population. The organic etching is accelerated by intensified heat, such as from sunlight. Time and temperature dramatically increases concentration of acid. The damage is more visible on dark or darker colors due to heat absorption.
- Acid rain is the term given to rain containing effluents from manufacturing, chemical industries and particularly power stations. Some of the effluents may be acidic or alkaline in the presence of water (e.g. sulphur dioxide will dissolve in water to give an acidic solution, whilst a mixture of cement dust and water is strongly alkaline).

### Prevention Techniques:

- Avoid contaminated atmosphere.
- Frequent washing is the best safeguard against unseen contaminants.
- Maintain and protect the topcoat of the vehicle using a non-silicone containing polish or wax.
- Immediately clean and neutralize the contamination with mild detergent and water before etching starts.

### Remedy

- Wash the vehicle very carefully with detergent and water using a brush and lots of water to neutralize the contamination.
- Rub affected areas with rubbing compound and polish.
- In severe cases, sand the areas needed and be sure the craters are sanded away completely before using primer and topcoat.



## Fish Eyes

Also known as: poor wetting, saucering, pits, craters, cissing

### Description

Small, crater-like opening in the finish after it has been applied.

### Origin and Potential Causes:

- Improper or insufficient surface cleaning or preparation. Many waxes and polishes contain silicone, the most common cause of fish eyes. Silicones adhere firmly to the paint film and require extra effort for their removal. Even small quantities in sanding dust, rags can cause this type of failure.
- Effects of the old finish or previous repair. The old finish or previous repair may contain excessive amounts of silicone from additives used during their application. Usually solvent wiping will not remove embedded silicone.
- Contamination of air supply, by water or oil.
- Oil, wax, grease or silicone contamination.
- Use of silicone-containing polishes or aerosol sprays (e.g.: interior cleaners or dressings) in proximity to the spray area.

### Prevention Techniques:

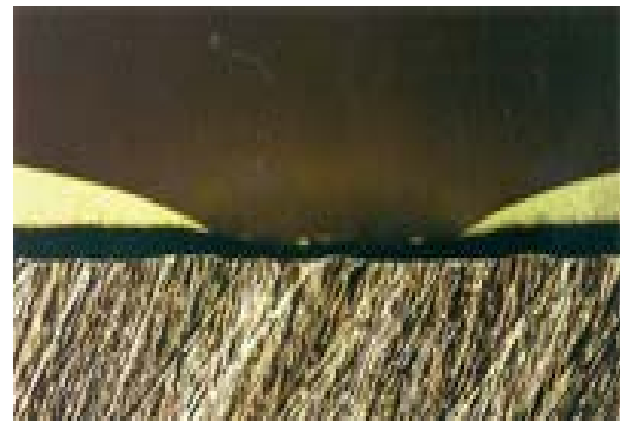
- Precautions should be taken to remove all traces of silicone by thoroughly cleaning the substrate.
- Drain and clean air pressure regulator daily to remove trapped moisture and dirt. Air compressor tank should also be drained daily.
- Regular maintenance of the air supply

### Remedy

- Apply light coats of basecoat until defect is covered.
- If required or recommended, use fish-eye eliminator.
- In severe cases, sand the affected areas, clean thoroughly, isolate and refinish.



Top View (60x)



Cross Section (250x)

## Hiding

Also known as: coverage, opacity, transparency

### Description

When the filler, primer or sealer on the repair area is visible through the topcoat.

### Origin and Potential Causes:

- Inadequate lighting in the spraybooth.
- Color was not well mixed/stirred.
- Too much thinner was used.
- Substrate's color was not correct.
- Substrate not uniform (effect finishes).
- Color coat has insufficient film thickness.

### Prevention Techniques:

- Use recommended thinner.
- Install good lighting equipment.
- Verify proper spray gun setup.
- Mix/stir all colors/tintings thoroughly.
- Use the appropriate ValueShade™ undercoat.
- Spray sufficient color to obtain hiding.

### Remedy

- Allow the finish to properly dry, then sand and refinish.



## Lifting

Also known as: wrinkling, rippling, raising

### Description

Surface distortion or shriveling, while the topcoat is being applied or while drying.

### Origin and Potential Causes:

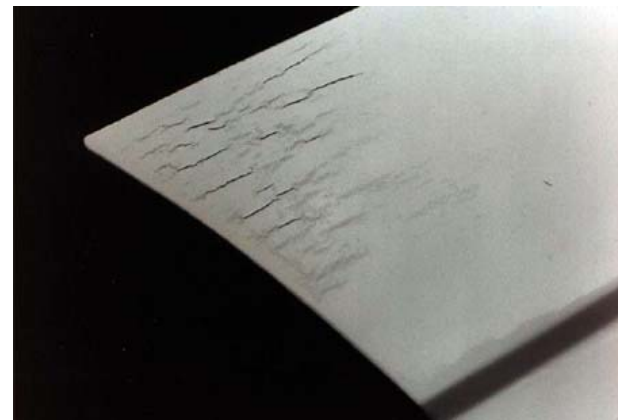
- Use of incompatible materials. Solvents in new topcoat attack old surface which results in a distorted or wrinkled effect.
- Insufficient flash time. Lifting will occur when the paint film is an alkyd enamel and is only partially cured. The solvents from the coat being applied cause localized swelling or partial dissolving which later distorts final surface.
- Improper dry. When synthetic enamel type undercoats are not thoroughly dry, topcoating with lacquer can result in lifting.
- Effect of old finish or previous repair. Lacquer applied over a fresh air-dry enamel finish will cause lifting.
- Improper surface cleaning or preparation. Use of enamel-type primer or sealer over an original lacquer finish which is to be topcoated with a lacquer will result in lifting due to a sandwich effect.
- Wrong thinner or reducer. The use of lacquer thinners in enamel increases the amount of substrate swelling and distortion which can lead to lifting, particularly when two-toning or re-coating.
- Application of coats too heavily.
- Excessive film build

### Remedy

- Remove finish from affected areas and refinish. In very severe cases the whole paint system must be removed to the substrate and be refinished.

### Prevention Techniques:

- Avoid incompatible materials such as a thinner with enamel products, or incompatible sealers and primers.
- Don't pile on topcoats. Allow sufficient flash and dry time. Final topcoat should be applied when the previous coat is still soluble or after it has completely dried and is impervious to topcoat solvents.
- Select thinner or reducer that is correct for the finish applied and suitable for existing shop conditions.
- Solvent test and remove or isolate solvent-sensitive substrates.
- Avoid excessive film thickness.



## Matting

Also known as: loss of gloss, dieback

### Description

Loss of initial gun gloss after finish has dried.

### Origin and Potential Causes:

- Improper film thickness
- Poor airflow, high humidity
- Solvent-sensitive substrate
- Incorrect mixing, contaminated hardener, or unsuitable thinner
- Insufficient airflow in oven or interrupted baking

### Prevention Techniques:

- Follow application recommendations on Technical Data Sheets
- Close activator cans firmly after use
- Ensure sufficient airflow in oven and do not interrupt baking cycle

### Remedy

- For mild cases, sand and polish.
- In extreme cases, sand and refinish.



## Mottling

Also known as: striping, banding, shadowing, flooding, floating, misting, precipitation, blooming, bloom, bleaching

### Description

Occurs mainly in metallics, when the flakes float together to form a spotty or striped appearance.

### Origin and Potential Causes:

- Unsuitable thinner or reducer for application conditions.
- Materials not uniformly mixed.
- Spraying too wet.
- Holding spray gun too close to work.
- Uneven spray pattern.
- Incorrect spray PSI or gun setup
- Low shop temperature.
- The flash time of the basecoat was too short before the clearcoat was applied.
- Coat affected by wet or humid air/weather.

### Prevention Techniques:

- Select the thinner or reducer that is suitable for existing shop conditions and mix properly. In cold, damp weather, use a faster-dry solvent.
- Stir all pigmented topcoats - especially metallics - thoroughly.
- Use proper gun adjustments, techniques, and air pressure.
- Keep your spray gun clean (especially the needle fluid tip and air cap) and in good working condition.
- Do not spray metallic basecoats too wet.
- Keep spray gun parallel to panel.
- Follow application recommendations per the TDS.

### Remedy

- Allow color coat to set-up and apply a drier double coat or two single coats, depending upon which topcoat you are applying.
- If the defect is only visible after the application of the clear, thoroughly dry the clear, sand and refinish.



## Orange Peel

Also known as: poor flow, poor levelling, pebbling

### Description

Uneven surface formation - much like that of the skin of an orange - which results from poor coalescence of atomized paint droplets. Paint droplets dry before they can flow out and level smoothly together.

### Origin and Potential Causes:

- Improper gun adjustment and techniques. Too little air pressure, wide fan patterns or spraying at excessive gun distances causes droplets to become too dry during their travel time to the work surface and they remain as formed by gun nozzle.
- Extreme shop temperature. When air temperature is too high, droplets lose more solvent and dry out before they can flow and level properly.
- Improper dry. Gun fanning before paint droplets have a chance to flow together will cause orange peel.
- Improper flash or recoat time between coats. If first coats of enamel are allowed to become too dry, solvent in the paint droplets of following coats will be absorbed into the first coat before proper flow is achieved.
- Wrong thinner or reducer. Under-diluted paint or paint thinned with fast evaporating thinners or reducers causes the atomized droplets to become too dry before reaching the surface. Too high viscosity.
- Low shop temperature.
- Too little thinner or reducer.
- Materials not uniformly mixed. Many finishes are formulated with components that aid coalescence. If these are not properly mixed, orange peel will result.
- Substrate not sanded thoroughly

### Prevention Techniques:

- Use proper gun adjustments, techniques, and air pressure.
- Schedule painting to avoid temperature and humidity extremes.
- Select the thinner or reducer that is suitable for existing conditions. The use of a slower evaporating thinner or reducer will overcome this.
- Allow sufficient flash and dry time. Do not dry by fanning.
- Allow proper drying time for undercoats and topcoats. Not too long or not too short.
- Reduce to recommended viscosity with proper thinner/reducer.
- Stir all pigmented undercoats and topcoats thoroughly.
- Prepare and sand substrate correctly.
- Follow recommendations on technical data sheets.

### Remedy

- For mild cases, sand and polish using recommended materials and techniques.
- In extreme cases, sand down to smooth surface and refinish, using a slower evaporating thinner or reducer at the correct air pressure.





## Peeling

Also known as: loss of adhesion, shelling, poor bond, delamination, flaking, poor adhesion

### Description

Loss of adhesion between paint and substrate - topcoat to primer and/or old finish, or primer to substrate.

### Origin and Potential Causes:

- Improper cleaning or preparation. Failure to remove sanding dust and other surface contaminants will stop the finish coat from coming into proper contact with the substrate.
- Improper metal treatment.
- Use of incompatible material for substrate.
- Materials not uniformly mixed.
- Failure to use proper sealer.
- Paint film too thick.
- Dry application.
- Film was too dry when the masking tape was removed.
- Flash times too short.
- Poor sanding of substrate or undercoats.
- Too low/too high surface temperature during application.
- Condensation on substrate due to temperature changes.

### Prevention Techniques:

- Use appropriate grits of sanding material.
- Seal to eliminate sandscratch swelling. Select thinner or reducer suitable for existing shop conditions.
- Use proper thinner and reducer for primer-surfacer.
- Do not apply coats of primer too heavily.
- Use compatible paint systems.
- Degrease and prepare substrate carefully.
- Follow application recommendations per Technical Data Sheets.

### Remedy

- Remove finish from an area slightly larger than the affected area and refinish.



# Pinholing

Also known as: pin holes, pock marks, pitting, pops, pin pricks

## Description

Tiny holes or groups of holes in the finish, or in putty or primer, the result of trapped solvents, air or moisture or improper surface preparation.

## Origin and Potential Causes:

- Improper surface cleaning or preparation. Moisture left on primer-surfacers will pass through the wet topcoat to cause pinholing.
- Contamination of air lines. Moisture or oil in airlines will enter paint while being applied and cause pinholes during the drying stage.
- Wrong gun adjustment or technique. If application is too wet, or if the gun is held too close to the surface, pinholes will occur when the air or excessive solvent is released during dry.
- Wrong thinner or reducer. The use of a solvent that is too fast for shop temperature tends to make the refinisher spray too close to the surface in order to get adequate flow. When the solvent is too slow, it is trapped by subsequent topcoats.
- Improper drying. Fanning a newly applied finish can drive air into the surface or cause a skin to form, which result in pinholing when solvents retained in lower layers come to the surface.
- Insufficient sanding or filling of pores in fiberglass substrates.
- Insufficient mixing of polyesters.
- Solvent popping that has not been sanded to smooth.
- Insufficient isolation of polyesters.

## Remedy

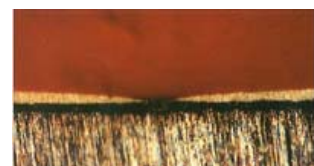
- After thorough drying of the affected area, sand completely smooth, reapply polyesters or undercoats as necessary and refinish.

## Prevention Techniques:

- Thoroughly clean all areas to be painted. Be sure surface is completely dry before applying undercoats or topcoats.
- Drain and clean air pressure regulator daily to remove trapped moisture and dirt. Air compressor tank should also be drained daily.
- Use proper gun adjustments, techniques, and air pressure.
- Select the thinner or reducer that is suitable for existing shop conditions.
- Allow sufficient flash and dry time. Do not dry by fanning.
- Thoroughly mix polyesters.
- Completely sand smooth solvent pop pores and other defects before refinishing.



Top View (60x)



Cross Section (125x)

## Polishing Marks

### Origin and Potential Causes:

- Top coat not through-dried
- Sandpaper too coarse
- Unsuitable polish
- Polishing through layers on edges

### Prevention Techniques:

- Thoroughly dry top coat, if necessary re-bake
- Use suitable polish and equipment
- Use correct sandpaper
- Use polish, free of ammonia

### Remedy

- If layers are not cut through, thoroughly dry topcoat and re-polish.
- If condition is not removed, or layers are cut through, thoroughly dry topcoat, sand and refinish.



# Runs

Also known as: overloading, curtains, gun spits, sags, sagging, drips

## Description

Heavy application of sprayed material that fails to adhere uniformly to the surface.

## Origin and Potential Causes:

- Incorrect spray viscosity, flash time, technique, or film thickness.
- Defective spray gun or incorrect gun setup.
- Wrong thinner or reducer.
- Too much thinner or reducer.
- Lighting in the spraybooth is not accurate and the painter is unable to apply coating correctly.
- Surface is contaminated by oil, grease, etc.
- Shop, surface or paint is too cold.
- Low air pressure (causing lack of atomization), holding gun too close, or making too slow a gun pass.
- Incorrect technique of application.
- Paint drops from the gun.

## Prevention Techniques:

- Allow vehicle surface to warm up to at least room temperature before attempting to refinish.
- Try to maintain an appropriate shop temperature for paint areas.
- Use proper gun adjustment, techniques, and air pressure.
- Allow sufficient flash off and drying time in between coats.
- Select proper thinner/reducer.
- Read and carefully follow label or product data sheet instructions.
- Select suitable thinner and reducer for shop conditions.
- Install accurate lighting systems in the spray booth.
- Ensure that the spray gun is in good working order.

## Remedy

- Wash off the affected area and let dry until you can sand the affected area to a smooth surface and refinish. For solid colors and clearcoats, sanding and polishing is recommended. In the case of a basecoat, refinishing after sanding is necessary.





## Slow Drying

### Description

Paint takes a longer time to set up or dry than detailed in the Technical Data Sheet.

### Origin and Potential Causes:

- Wrong activator.
- Incorrect mixing ratio.
- Heavy application.
- Incorrect reducer or activator for spray conditions.
- Poor drying conditions: too humid, insufficient air flow or ventilation.
- Insufficient flash off time between coats.
- Use of non-system activators or reducers.

### Prevention Techniques:

- Use recommended system activators and reducers, per the Technical Data Sheet.
- Apply recommended film thickness.
- Allow sufficient flash off time between coats.
- Improve spraying and/or drying conditions.

### Remedy

- Place the vehicle in a warmer, more ventilated area. The drying process may be accelerated with the application of heat and improved airflow.

## Solvent Pop

Also known as: Boiling, solvent boil, boil, popping

### Description

Blisters on the paint surface caused by trapped solvents in the topcoats or primer-surfacer, a situation which is further aggravated by force drying or uneven heating.

### Origin and Potential Causes:

- Solvent or air trapped in film escapes during drying leaving pop marks.
- Incorrect viscosity, spray pressure, flash time, or improper drying.
- Incorrect choice of hardeners and/or thinners. Use of fast-dry thinner or reducer, especially when the material is sprayed too dry or at excessive pressure.
- Excessive film thickness. Insufficient drying time between coats and too heavy application of the undercoats may trap solvents causing popping of the color coat as they later escape.
- Incorrect drying of primer / fillers.
- Improper surface cleaning or preparation.
- Infrared facilities too close.
- Baking was started too soon after application.
- Baking temperature too high.

### Prevention Techniques:

- Thoroughly clean all areas to be painted.
- Select suitable thinner or reducer for shop conditions.
- Allow sufficient flash and drying time. Allow each coat of primer-surfacer to flash off naturally - DO NOT FAN.
- Apply film at recommended thickness.
- Follow technical recommendations of products in use.

### Remedy

- If damage is extensive and severe, paint must be removed down to undercoat or metal, depending on depth of blisters; then refinish.
- In less severe cases, sand until smooth, resurface and refinish.



## Water Spotting

### Description

General dulling of gloss in spots or masses of spots.

### Origin and Potential Causes:

- Washing finish in bright sunlight.
- Droplets of water evaporating on finish which is not sufficiently cured due to:
  - Excessive film thickness, drying time too short
  - Failure of cross linking due to moisture contamination
  - Unsuitable thinner

### Prevention Techniques:

- Do not apply water to fresh paint job and try to keep newly-finished car out of rain.
- Allow sufficient drying time before delivering car to customer.
- Wash car in shade and wipe completely dry.
- Follow technical recommendations.
- Ensure lids are tightly replaced after using hardeners.

### Remedy

- Remove marks by compounding or polishing.
- In severe cases, sand affected areas, isolate and refinish.

