

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.

Dirt Inclusions

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

Description

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



Click on the below images for a magnified view of additional examples:



Contaminated Basecoat



Fiber in Surfacer



Metal Particle in E-Coat

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.

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.

Remedies

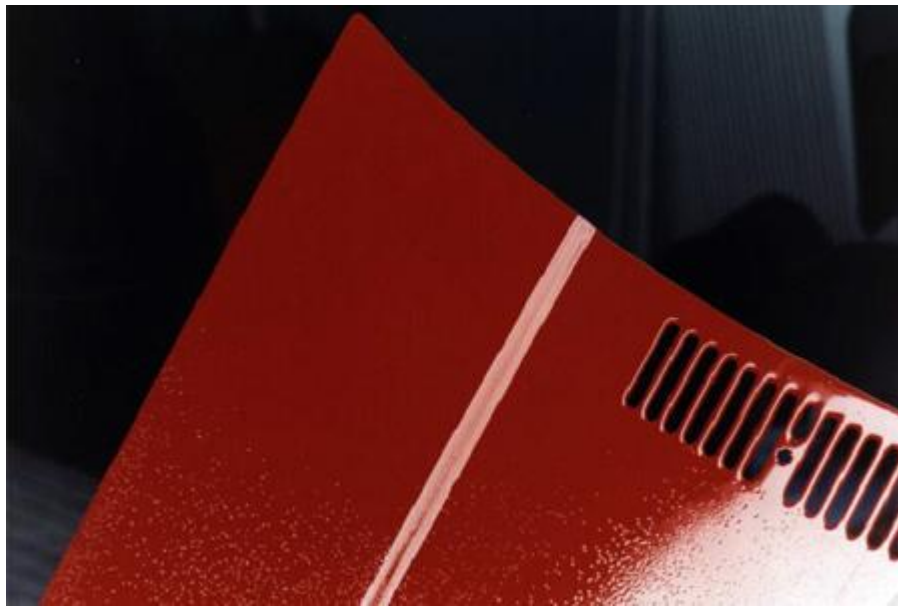
- Allow the finish to harden completely, fine sand and polish.
- If the defect is severe, sand and respray.

Fish Eyes

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

Description

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



Click on the below images for a magnified view of additional examples:



Top View (60x)



Cross Section (250x)

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.

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.

solvent Pop

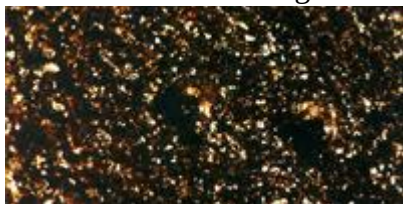
Also known as: Boiling, solvent boil, boil, popping,

Description

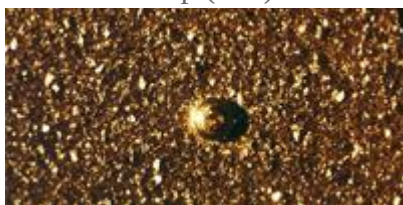
Blisters on the paint surface caused by trapped solvents in the topcoats or primer-surfacer, a situation which is further aggravated by force drying or uneven heating.



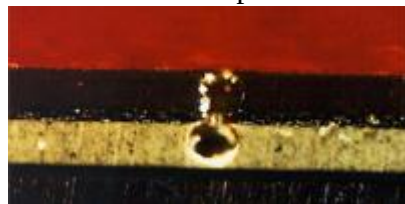
Click on the below images for a magnified view of additional examples:



Undercoat Pop (50x)



Clearcoat Pop (50x)



Undercoat Pop (125x)



Clearcoat Pop (320x)

Origin and Potential Causes:

- Solvent or air trapped in film escapes during drying leaving pop marks.
- Incorrect spray viscosity, spray pressure, flash off 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 the thinner or reducer that is suitable for existing shop conditions.
- Don't pile on undercoats or topcoats. 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.

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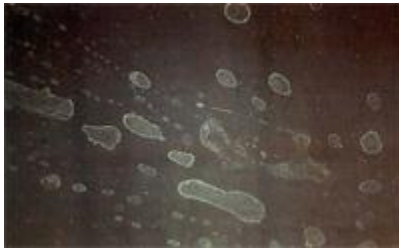
Water Spotting

Description

General dulling of gloss in spots or masses of spots.



Click on the below images for a magnified view of additional examples:



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.

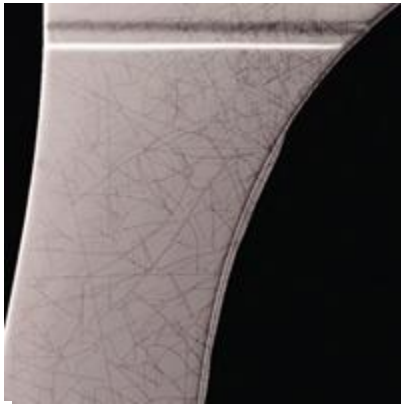
Remedy

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

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.