

Paint Troubleshooting Guide

No.	Issue	Alternate Term
1.	Air Entrapment	Craters
2.	Bleeding	Discoloration
3.	Blistering	Pimples, Bubbles, Bumps
4.	Blushing	Milkiness
5.	Chalking	Fading, Oxidation, Weathering
6.	Colour Mismatch	Wrong Colour
7.	Cracking	Checking, Cracking, Splitting, Alligatoring, Crowsfeet
8.	Dust Contamination	Dirt in Finish
9.	Fisheyes	Silicon Contaminations, Cratering
10.	Lifting	Shrivelling, Swelling, Raising, Alligatoring, Wrinkling
11.	Loss of Gloss	Hazing Dulling, Dieback, Matting, Weathering
12.	Mottling	Streaking, Tiger/Zebra Stripes, Floating, Flooding
13.	Orange Peel	Poor Flow, Texture
14.	Peeling	Delamination, Flaking
15.	Runs/Sags	Hangers, Curtains, Signatures
16.	Sanding Marks	Streaked Finish, Sand scratches
17.	Sand scratches	Swelling, Sinking, Shrinkage
18.	Seediness	Gritty, Dirty, Grainy, Speckled
19.	Shrinkage	Bulleyes, Ringing, Edge Mapping
20.	Soft Film	Slow Dry
21.	Solvent Popping	Boiling, Blowing, Gassing
22.	Wave	Uneven surface

1. Air Entrapment

Alternative Names/Symptoms

Craters

Description

Small crater like openings in or on the paint film.

Cause

Trapped or buried air pockets in the wet paint film that rise to the surface and “burst” causing small craters. Lack of atomisation is the cause of air entrapment and may be due to one or more of the following:

- Spray gun travel too slow.
- Spray gun distance too close.
- Air pressure too low.
- Improper spray gun setup.

Repair

1. Sand with 2000 or finer grit sand paper, then compound and polish to restore gloss.
2. Or, sand smooth and refinish.

Prevention

- Maintain correct spray gun speed.
- Maintain correct spray gun distance.
- Use the recommended air pressure.
- Use the correct air cap/nozzle/needle recommended for clear coats.

Note: Some cases of air entrapment may have an appearance very similar to solvent pop or dust contamination. However, air entrapment normally occurs when the film is still wet and can be removed with compounding procedures. On the other hand, solvent pop will appear after the film is “skinned over” and when sanded will have pinholes. Dust contamination will appear while the film is drying but still “tacky.” These craters, under close examination, will have a speck of dirt in the centre of the crater.

2. Bleeding

Alternative Names/Symptoms

Discoloration

Description

A Red or Yellow discoloration in the topcoat colour.

Cause

- Solvent in the new topcoat dissolves soluble dyes or pigments in the original finish, allowing them to seep into and discolour the new topcoat.

Repair

1. Allow colour to cure isolate with two component undercoat(s) and refinish.
2. Or, remove original paint film and refinish.

Prevention

- Isolate suspected bleeding finish by applying a two-component surfacer clear sealer. Allow to cure and then apply desired topcoat.

3. Blistering

Alternative Names/Symptoms

Pimples, Bubbles, Bumps

Description

Swelled areas appearing as pimples or bubbles in the topcoat film, often months after application.

Cause

- Moisture trapped beneath the paint film due to:
 - Contaminated airlines.
 - Spraying in extreme high humidity conditions.
- Using a poor grade and/or too fast evaporating thinner/reducer for spray conditions.
- Too long a flash time between coats.
- Improper dry time of undercoats before top coating.
- Painting over grease or oil.

Repair

1. Remove affected area by sanding and refinish.

Prevention

- Drain moisture from compressor and airlines regularly. Allow additional flash time between coats and/or add retarder when spraying in humid conditions, or spray at times of/low humidity when possible.
- Select proper thinner/reducer for spray conditions.
- Apply materials according to product recommendations, allowing sufficient flash time between coats but not too long.
- Allow undercoats to thoroughly dry/cure before top coating.
- Clean and prep substrate using recommended products and procedures.

4. Blushing

Alternative Names/Symptoms:

Milkiness

Description

A milky grey cloud appears on the surface of the paint film immediately or shortly after application.

Cause

- When spraying during humid conditions, air from the spray gun and solvent evaporation lowers the substrate temperature below the dew point, causing moisture in the air to condense in or on the paint film. The condition is aggravated when too fast drying or unbalanced thinner/reducer is used.

REPAIR

1. If the finish has dried, minor blushing may be corrected by compounding or polishing.

Prevention

- Always use appropriate solvent and thin/reduce material according to Manufacturer's directions.
- Select proper thinner/reducer for spray condition.

5. Chalking

Alternative Names/Symptoms:

Fading, Oxidation, Weathering

Description

A chalky white appearance on the surface of the paint film

Cause

- Pigment is no longer held and protected by resin, resulting in a powder-like surface and lack of gloss due to:
 - Natural weathering of the paint film.
 - Improper application of paint material.
 - Using generic thinner/reducer and/or hardener in the paint material.

Repair

1. Compound to remove oxidation and polish to restore gloss.
2. Or, sand to remove “weathered” paint film and refinish.

Prevention

- Occasional polishing or waxing will remove oxidation from the finish.
- Thoroughly stir, shake or agitate all paint materials.
- Use the recommended thinner/reducer, hardener, and measure accurately.

6. Colour Mismatch

Alternative Names/Symptoms:

Wrong colour

Description

The colour that you want is not the same that you have sprayed.

Cause

- Received the wrong colour.
- Ordered the wrong colour.
- Ordered the right colour, but the wrong source. ie Dulux instead of Wattyl.
- Not stirred the paint.
- Applied too much paint on the surface & floatation has occurred.
- Recoated the surface on several times.
- Be aware of metamerism.
- Shadows.

Repair

1. Sand back with 400 Grit and respray.
2. If resprayed several times, you may have to recolour match.

Prevention

- Always check the spray out on the side of the paint tin that it matches by sight, that the name of the colour and the source is correct.
- Always open the tin and stir well before using.
- Do not over apply paint to surface. Have spray gun set up correctly.
- Check colour under Australian standards lights.

7. Cracking

Alternative Names/Symptoms:

Checking, Cracking, Spitting, Alligatoring, Crowsfeet

Description

Cracks or lines of various lengths and widths in the topcoat finish often resembling the cracking of dried mud.

Cause

- Excessive film thickness of the undercoat and/or topcoat.
- Refinishing over a previously crazed/cracked surface.
- Insufficient flash time between coats and/or force drying undercoats using air from the spray gun.
- Mixing incorrectly or using too much hardener.
- Paint ingredients not thoroughly stirred or agitated.
- Break down of finish due to prolonged exposure to sunlight, moisture, and extreme temperature changes.

Repair

1. Remove all cracked paint film and refinish.

Prevention

- Apply all materials following manufacturer's direction.
- Completely remove crazed/cracked finishes before refinishing.
- Do not over force dry undercoats.
- Mix ingredients thoroughly using the recommended additives. Add each component in proper sequence following the recommended mixing ratio.
- Stir or agitate materials thoroughly before use.
- Use correct two-component undercoat and topcoat system to provide maximum gloss and durability.
- Use the recommended thinner/reducer and hardener, and then measure accurately.

8. Dust Contamination

Alternative Names/Symptoms:

Dirt in finish

Description

Foreign particles embedded in paint film.

Cause

- Inadequate cleaning of the surface to be painted.
- Dirty spraying environment.
- Inadequate air filtration or unfiltered air entering the booth.
- Dirty or unsuitable work clothes that contain dust, lint, or fibbers.
- Particles from deteriorated air supply lines.
- Dirty spray gun.
- Removing job from the spray booth before the finish is 'dust free.

Repair

1. Sand with 2000 or finer grit sandpaper, then compound and polish to restore gloss.
2. Or, sand smooth and refinish.

Prevention

- Thoroughly blow off mouldings. Wipe the surface to be painted and the masking paper with the tack rag.
- Maintain a clean working area.
- Install proper air filters. Repair any leakage found in the spray booth due to poor fitting doors, gaskets, seams or filters.
- Wear a lint free paint suit during the spray application.
- Use quality masking materials. "Wicks" found on newspaper can break away and blow into the wet paint.
- Repair or replace defective airlines.
- Properly clean and maintain spray equipment.
- Job should be kept in a clean environment until finish is "dust free"
- Always strain paint.

9. Fisheyes

Alternative Names/Symptoms:

Silicone Contamination, Cratering

Description

Small circular, crater-like openings that appear during or shortly after the spray application.

Cause

- Spraying over surfaces contaminated with oil, wax, silicone, grease, etc.
- Use of thinner/reducer in place of a solvent cleaner.
- Spraying over previously repaired areas containing “fisheye eliminator additive.
- Contaminations from airlines, food or air born.

Repair

1. Remove wet paint film with solvent, clean and refinish.
2. Add the recommended fisheye eliminator and respray the affected area.
3. If the paint has dried, wash with wax and grease remover then sand to a smooth finish below the fisheye cratering. Dust down wash with wax and grease remover and refinish.

Prevention

- Use fisheye eliminator that is specifically recommended for the topcoat.
- Install an air filtering system that removes and prevents oil and moisture contamination.
- Maintain air supply by draining, cleaning and changing filter(s) on a routine basis.

10. Lifting

Alternative Names/Symptoms:

Wrinkling, Raising, Alligatoring, Shriveling, Swelling

Description

The existing paint film shrivels, wrinkles, or swells during new finish application or drying.

Cause

- Solvents in a newly applied product attack the previous finish causing wrinkling, raising, or puckering of the paint film due to:
 - Recoating urethanes that are not fully cured due to the lack of hardener.
 - Recoating over enamels.

Repair

1. Remove and refinish.

Prevention

- Check questionable finishes by rubbing a small inconspicuous area with a shop towel saturated with lacquer thinner finishes susceptible to lifting will soften, swell or shrivel as lacquer thinner is applied. If any of these reactions occur the coating must be removed before recoating.

11. Loss of Gloss

Alternative Names/Symptoms:

Hazing, Dulling, Dieback, Matting

Description

A dulling of the gloss as the film dries

Cause

- Topcoat applied in heavy, wet coats.
- Inadequate flash time between coats.
- Insufficient drying /curling of undercoats before applying topcoats.
- Using too fast evaporating thinner/reducer for spray conditions.
- Improper cleaning of the substrate.
- Insufficient air movement during and after application.
- Spraying over a deteriorated or solvent sensitive substrate finish without proper priming or sealing procedures.

Repair

1. Allow finish to cure thoroughly, compound or polish to restore gloss.
2. Or, sand and refinish.

Prevention

- Apply the topcoat according to manufacturer's directions using the recommended gun set-up and air pressure.
- Allow all coatings sufficient flash between coats.
- Apply sufficient number of coats to achieve recommended proper film thickness. Check with film thickness gauge if possible.
- Allow undercoats to thoroughly dry/cure before top coating.
- Select recommended thinner/reducer based on temperature, humidity, air movement, and size of repair.
- Clean substrate thoroughly before and after sanding.
- For air dry situations: (1) allow exhaust fan to run 40 minutes or longer after spraying; (2) open booth doors after finish is dust free.
- For maximum holdout, use a premium Abrasives.

12. Mottling

Alternative Names/Symptoms:

Streaking, Tiger/Zebra Stripes, Floating, Flooding

Description

A streaked spotty, or striped appearance in a metallic colour.

Cause

- An uneven distribution of metallic flake caused by:
 - Using a spray gun that gives an unbalanced spray pattern.
 - Improper application technique such as tilting the spray gun during application, causing the spray pattern to become heavy at the top or bottom.
- Holding the gun too close to the surface (flooding).
- Uneven spray pattern overlap.
- Omitting /improper use of mist coats.
- Too much thinner/reducer. Colour over thinned/reduced.
- Applying clear coat to a basecoat that has not thoroughly flashed off.

Repair

1. Reapply a high-pressure mist coat, while previous coat is still wet.
2. Or, allow colour to flash, and then apply a low-pressure mist coat.
3. Finishes that have dried must be sanded and refinished.

Prevention

- Use recommended spray gun, including fluid tip and air cap for the material being sprayed. Always adjust the gun for best atomisation and balanced spray pattern before paint application.
- Use the correct ratio of thinner/reducer
- Allow basecoat proper flash off before clear coating.

13. Orange Peel

Alternative Names/Symptoms:

(Poor Flow, Texture)

Description

Paint film having an uneven texture that resembles the skin of an orange.

Cause

- Under reduction and/or air pressure too low.
- Thinner/reducer evaporates too fast for spray conditions.
- Excessive film thickness or piling on of heavy wet coats.
- Improper spray gun set-up.
- Improper painting technique.

Repair

1. Compound or polish to reduce surface texture.
2. Or, sand smooth with 2000 or finer grit sandpaper, compound and polish to restore gloss.
3. Or, sand smooth and refinish.

Prevention

- Use proper reduction ratio and spray at recommended air pressure.
- Select recommended thinner/reducer based on temperature, humidity, air movement, and size of job.
- Avoid heavy coats and excessive film thickness.
- Use recommended spray gun, fluid tip and air cap for the material being sprayed. Always adjust the gun for best atomisation and balanced spray pattern before paint application.
- During paint application, hold the gun perpendicular and parallel to the surface. Adjust speed of pass, pattern overlap, and distance from the panel to achieve the desired appearance.
- Select recommended Hardener based on temperature, humidity, air movement, and size of job.

14. Peeling

Alternative Names/Symptoms:

Flaking, Delaminating

Description

A loss of adhesion or separation of the paint film from the substrate.

Cause

- Improper preparation of the substrate (sanding and cleaning).
- Omitting or applying an incompatible undercoat to a specific substrate (e.g. aluminium, galvanized, plastics, etc.).
- Exceeding the products maximum recoat time.
- Insufficient film thickness of undercoat, or topcoat.
- Using more than recommended fisheye eliminator.
- Incompatible clear coat.
- To little or to much hardener.

Repair

1. Remove the finish, and refinish.

Prevention

- Clean and prepare all substrates according to product recommendations.
- Use the recommended undercoat (primer) for the substrate being finished.
- Recoat all products within their recommended minimum and maximum recoat time.
- Apply a sufficient number of coats to obtain the recommended film thickness.
- Use only recommended/compatible products.
- Adhesion promoter' should only be used when specifically recommended.

15. Runs/Sags

Alternative Names/Symptoms:

Hangers, Curtains, Signatures

Description

Coatings that fail to adhere uniformly, causing beads, droplets, or slippage of the total film.

CAUSE

- Over reduction and/or too slow evaporating thinner/reducer.
- Applying paint materials without proper flash time between coats.
- Applying excessive wet coats due to:
 - Holding the gun too close to the surface.
 - Slow gun speed.
 - Double coating.
- Air pressure too low during spray application.
- Improper spray gun set-up or an unbalanced spray pattern.
- Material and/or substrate temperature too cold.

Repair

1. Remove the wet paint film with solvent, clean and refinish.
2. Or, after finish is completely dry. Remove excess paint by sanding with 2000 or finer grit sandpaper, compound and polish to restore gloss.
3. Or sand smooth and refinish.

Prevention

- Mix according to product directions. Select recommended solvent and hardeners for spray conditions based on temperature, humidity, air movement.
- Spray medium wet coats and allow sufficient flash time between coats.
- Adjust the spray gun for the best atomisation and balanced spray pattern before paint application. Hold the spray gun perpendicular and parallel to the panel. Adjust speed of pass, pattern overlap, and distance from the panel until the desired results are achieved.
- Set air pressure at the gun.
- Use recommended spray gun, including fluid tip and air cap combination.
- Allow the paint material and substrate to reach room temperature before application.

16. Sanding Marks

Alternative Names/Symptoms:

Streaked Finish, Sand Scratches

Description

Dark and/or streaked marks that resemble sand scratches in the paint film.

Cause

- Scratching or distorting metallic/mica flakes close to the surface of the paint film due to:
 - Sanding metallic finishes prior to clear coating.
 - Sanding metallic finishes prior to buffing.

Repair

1. Allow finish to dry, sand and refinish.

Prevention

- Avoid sanding metallic finishes before clear coating. If sanding is necessary apply additional colour following label direction.
- When sanding finishes confine the sanding to minor imperfections (nib sanding rather than entire panels).

17. Sand Scratches

Alternative Names/Symptoms:

Swelling, Sinking, Shrinkage

Description

Visible lines or marks in the paint film that follow the direction of the sanding process.

Cause

- Sanding the substrate with too coarse grit sandpaper.
- Insufficient dry/cure of undercoats before sanding and top coating.
- Refinishing over soft, soluble substrates.
- Using a poor grade and/or too fast evaporating thinners/reducers for spray conditions causing:
 - Primer surfacer to bridge" over sand scratches;
 - Topcoat to skin over," trapping solvent which swells sensitive substrates.
- Using a solvent cleaner that is too strong for the substrate or using thinner/reducer as a surface cleaner after sanding.

Repair

1. Allow finish to dry/cure, sand smooth, compound or polish to restore gloss.
2. Or, sand and refinish.

Prevention

- Sand with recommended grit sandpaper.
- Allow undercoats to thoroughly dry/cure before sanding and top coating.
- Select recommended thinner/reducer based on temperature, humidity, air movement.
Avoid "bridging" existing scratches by applying primer surfacer in thin wet coats, allowing adequate flash time between each coat.

18. Seediness

Alternative Names/Symptoms:

Gritty, Dirty, Grainy, Speckled

Description

Solid particles of various shapes and sizes embedded evenly throughout the paint film.

Cause

- Material not properly stirred or agitated.
- Failure to strain material.
- Using material exceeding its shelf life.
- Using generic reducers and/or hardeners.
- Using materials beyond their specified pot life.
- Using contaminated thinner/reducer or hardener.
- Using contaminated water borne products.

Repair

1. Remove the wet paint film with solvent, clean and refinish.
2. Or, sand smooth and refinish.

Prevention

- Stir or shale materials thoroughly to be sure all pigment/resin is in solution.
- Strain all undercoats and topcoats.
- Do not use material that cannot be stirred or strained. Caution. Repeated straining will not completely remove seediness.
- Use the recommended thinner/reducer and hardener, and then measure accurately.
- Mix only enough material that can be used within specified pot life.
- Use material as soon as possible, close and tighten container lids immediately after use.
- Do not allow thinner/reducer to come into contact with water borne products.

19. Shrinkage

Alternative Names/Symptoms:

Bullscyes, Ringing, Edge Mapping

Description

The repaired area, featheredge, or sand scratches become visible within hours, days or weeks after the repair is completed.

Cause

- Top coating before undercoats have thoroughly dried /cured.
- Undercoats applied excessively wet with inadequate flash time between coats.
- Undercoats under reduced.
- Using a poor grade and /or too fast evaporating thinner/reducer for spray conditions.
- Finishing over body filler that has not thoroughly cured.
- Using too strong solvent cleaner or using thinner/reducer as a surface cleaner.

Repair

1. Allow the affected area to thoroughly dry/cure, sand and refinish
2. If additional filling is necessary, apply a primer surfacer, sand smooth and refinish.

Prevention

- Allow undercoats to thoroughly dry/cure before sanding and /or top coating.
- Thin or reduce undercoats according to product label directions. Apply in thin wet coats allowing adequate flash time between coats to avoid 'bridging' scratches.
- Select recommended thinner/reducer based on temperature, humidity, air movement, and size of repair.
- Follow body filler manufactures recommended cure time.
- Use solvent cleaner designated for either lacquer soluble or cured enamel/urethane insoluble substrate.

20. Soft Film

Alternative Names/Symptoms:

Slow Dry

Description

The paint film is soft to the touch, and will fingerprint or water spot within hours/days after application.

Cause

- Applying undercoat and/or topcoat excessively wet.
- Insufficient dry time between coats.
- Improper shop ventilation or heating.
- Adding too much or too little hardener to the paint material.
- Using the incorrect thinner/reducer for spray conditions.

Repair

1. Allow additional dry time.
2. Or, force dry following temperature and time recommendations.
3. Or, remove soft paint film and refinish.

Prevention

- Use recommended spray gun, fluid tip and air cap for the material being sprayed. Always adjust the gun for best atomisation and balance spray pattern before paint application.
- Allow sufficient flash time between coats.
- Maintain shop temperature. Properly cure.
- Use the recommended hardener and measure accurately.
- Select appropriate thinner /reducer based on temperature, humidity, air movement, and size. Allow additional flash time when spraying in high humidity or low temperature/high humidity conditions.

21. Solvent Popping

Alternative Names/Symptoms:

Boiling, Blowing

Description

Small bubbles, pinholes, crater-like openings in or on the paint film.

Cause

- Liquid solvent (thinners/reducers) becomes “trapped” in the paint film when the surface layer skins over too quickly, preventing their evaporation into the atmosphere. Solvents that vaporize within the paint film leave bubbles, pinholes or craters as they push through and “pop” the surface. Solvents can be trapped due to:
 - Thinner/reducer evaporating too fast for spraying conditions;
 - Inadequate flash time between coats;
 - Excessive film thickness or piling on” of heavy/wet coats;
 - Not sufficient air movement to strip out solvents.
 - Excessive purge/flash time before force drying.
 - Board manufacturing problem.

Repair

1. Allow finish to thoroughly dry/cure, sand 320 then 400 Grit and refinish. Inspect surface carefully to ensure all craters have been removed.
2. Severe popping will require removal of the affected film. Prime, seal and recoat, as necessary.

Prevention

- Select recommended thinner/reducer based on temperature, humidity, air movement and size of Job.
- Allow for proper flash time between coats.
- Avoid “piling on” or double wet coats.
- Check air movement over the surface being painted.
- Avoid extended purge/flash time before force drying.

22. Wave

Alternative Names/Symptoms:

N/a

Description

A wave in appearance of the paint film.

Cause

- Excessive film thickness or piling on” of heavy/wet coats.
- The use of too much air Pressure.
- Wrong grade board.

Repair

1. Allow finish to thoroughly dry/cure, sand 320 then 400 Grit and refinish.

Prevention

- Avoid “piling on” or double wet coats.
- Check air Pressure used.
- Recommend correct board.