Paint Problem Advisor
Paint Problems Related to Plastered Masonry

Black mould Fungal or Algal contamination

Description:
Black, grey or brown areas of fungus growth on surface of coating
Can also include Red, Yellow and Green Algae.

Possible diagnosis
• Damp areas receiving little or no sunlight are susceptible to mould.
• Painting over an area that has had mould.
• Low quality paint containing no or low levels of in can biocides.
• Reusing opened containers that have received contamination from application transfer and or storage conditions.

Remedy
• Determine firstly if the contaminant is dirt or mildew by applying a few drops of house hold bleach, if the discolored areas disappear, it’s most likely mould.
• Remove source of moisture by fixing the leak source, sealing or ventilation.
• Apply biocide/sterilizer and or mildew- cide as per manufacturer’s instructions. Then scrub and rinse thoroughly.
• Recoat with paint that is protected with dry film biocide.

Recommended Top Paints products
• Biocidal Wall Wash
• Sand Coat
• Mid - / Velvet - / Super Sheen

Chalking

Description:
The formation of a powder on the surface of a weathered coating. The powders usually consist of broken down binder and freed pigment particles due to UV, temperature and moisture exposure.
Chalking is usually identified by rubbing the surface with a damp cloth which results in a light deposit on the cloth and the restoration of the colour to the cleaned surface.

Possible diagnosis
• Using interior quality paint for outdoors use.
• Using a low grade paint comprising of a low binder and high pigment loading.
• Most SA medium quality paints are in the 65-75% PVC range and chalking can be expected within 2-4 years.

Remedy
• Remove the friable chalk by scrubbing with stiff nylon brush and rinse with water. High pressure equipment can also be used. Check for any remaining chalk after the surface had thoroughly dried. Repeat the cleaning process if powder is still present.
• If chalk persists, recoat with alkali resistant primer/bonding liquid and recoat with appropriate quality top coat.

Recommended Top Paints products
• Bonding Liquid or;
• Plaster Primer
• Sand Coat
• Water-Repellant Latex

Touch up difference

Description:
Areas of indifferent colour with signs of application directionality.

Possible diagnosis
• Touching up with a poorly colour matched paint.
• Touching up with the original retained paint while the existing coat has faded.
• The touch up paint has been stored for a prolonged period of time and has degraded or colour developed.
• Different types or batches of paint.
• Using application techniques that differ from the original e.g. touching up with a brush when the original coat was applied by roller.

Remedy
• Colour match before commencing with painting.
• Recoat entire area from edge to edge / corner to corner.
Wrinkling

Description: The development of wrinkles in a film surface during drying, usually due to the formation of a surface skin while the underlying layer takes longer to cure and is still soft.

Possible diagnosis
- Too thickly applied Oil / Alkyd based paint
- Incorrectly formulated Oil / Alkyd based paint with too much surface drier ingredients.
- Too thickly applied water based paint which has dried to quickly due to exposure to excessive temperature or force drying. Water based paint with higher sheen levels are more prone.

Remedy
- If the coating is still slightly wet, remove with paint remover and recoat in a thin even layer under the correct temperature. Make sure that it was a thickness problem and not a formulation problem.
- If the wrinkled coating had fully dried it can be sanded down and recoated in the correct manner.

Alkali attack

Description: Discolouration of coating in patches generally associated with bright orange, yellow, red and sometimes even the blue and green colours tinted with organic colourants. This normally occurs on fresh or patched up plastered walls. The patches can be both in shaded and UV exposed areas.

Possible diagnosis
- Alkali attack of the coatings pigments by elevated concentrations of Calcium hydroxide salts from cement.
- The former can be attributed by painting when the plaster is still damp. Moisture content exceeding 18%.
- Moisture ingress from hairline cracks allowing calcium hydroxide salts to seep out and conglomerate.
- The lack of a suitable alkali resistant primer.
- Excessive continuous contact with moisture. Areas most affected are those near to parapet walls, horizontal landings, ground level and cracks etc.

Remedy
- Remove or seal the source of moisture ingress if this was the cause.
- Apply a quality solvent based masonry primer after the wall has dried out sufficiently.
- Recoat with a good quality exterior acrylic paint.

Recommended Top Paints products
- Plaster Primer
- Sand Coat

Dirt pickup and dirt retention

Description: Dirt pickup describes the degree to which dirt, dust and other contaminants adhere to a substrate, i.e. degree to which dirt remains on the substrate after cleaning.

Possible diagnosis
- Low quality paints especially some matt paints are more coarse and porous and thus more susceptible to dirt pick up and retention.
- Sheen paints with considerable flexibility could also trap dirt during its expansion and contraction.
- Continuous contact to contaminants like soil and air pollution.

Remedy
- Remove dirt by washing and rinsing.
- Recoat with a good quality medium to high sheen paint.

Recommended Top Paints products
- Mid / Velvet - / Super Sheen

Mud or Star Cracking

Description: Star or mud crack type patterns in paint film. The top of the film dries faster than the internal bottom layer and the differential in tension results into cracks. Cracks are generally large in size ranging from 5-15mm in diameter and they tend to be surface cracks.

Possible diagnosis
- Water based paints applied to hot substrates or under extremely hot conditions.

Remedy
- Sand down and recoat in thinner layers at more moderate temperatures.
- Allow longer drying times between coats.

Recommended Top Paints products
- Mid - / Velvet - / Super Sheen
- Sand Coat
Sags, drips, tears, curtains and runs

Description:
Downward movement of a paint film during application and setting, resulting in an uneven film having a thicker lower edge. In this example rough scratch plaster hollows trap more paint and result in runs.

Possible diagnosis
• Too thickly applied coat due to incorrect roller cover or technique.
• Paint with poor flow properties
• Incorrectly thinned paint
• Painting in too cold or humid conditions
• Spraying to close to the surface.

Remedy
• If still wet; brush or roll out to level.
• Dried paint needs to be sanded level and repainted. Make sure that the paint and application technique match the original.
• Don’t paint in excessively cold or humid conditions.
• Do not overload brush or roller with paint.

Foreign particles

Description:
Particles in paint film.

Possible diagnosis
• Poor quality paint brush or roller equipment loosing bristles and fibers.
• Worn paint brush or roller equipment requiring replacement.
• Using incorrect synthetic paint brushes or rollers with solvent based paints.
• Painting in dusty conditions
• Poor quality paint taking excessive time to dry allowing dust to dry. 
• Flocculated material, skin, gel or foreign particles in paint container.

Remedy
• Sand back to smooth surface and recoat avoiding the above pitfalls.

Poor flow and leveling

Description:
Coating that dries to an uneven surface profile which can include brush and roller striations.

Possible diagnosis
• Incorrect roller cover or poor quality brush.
• To thickly applied, roller/brush overloading.
• Re brushing or rolling partially dried paint.
• The use of a low quality paint with poor flow and leveling properties.

Remedy
• Dried paint needs to be sanded level and repainted.
• Make use of a top quality acrylic paint with good flow and leveling properties.
• Make use of a roller with the correct roller cover and good quality brushes.

Recommended Top Paints products
• Sand Coat or; 
• Velvet - / Super Sheen

Cracking and flaking

Description:
Large sized cracking and simultaneous flaking of multiple layers of coatings. The presence of a friable powdery surface under the flaking paint.

Possible diagnosis
• Multiple layers of paint 3 and more painted on previously chalking paint or gypsum type plaster. The multiple layers of coatings contribute to an increased surface tension of the whole system resulting in breakaway of the subsequent layers from the weaker/ most friable layer.
• Thick coatings subject to extreme temperature changes and subsequent expansion and contraction forces.

Remedy
• Remove all loose and flaking paint. 
• Remove the friable chalk by scrubbing with stiff nylon brush and rinse with water. High pressure equipment can also be used. Check for any remaining chalk after the surface had thoroughly dried. Repeat the cleaning process if powder is still present.
• If chalk persists, recoat with oil based primer and recoat with appropriate quality top coat.

Recommended Top Paints products
• Plaster Primer 
• Sand Coat
Mud or Star Cracking at low temperature

Description:
Micro mud type crack patterns combined with poor adhesion and film integrity associated with application during low temperatures.

Possible diagnosis
• Water based paints applied to extremely cold substrates or under low temperature conditions.
• Most polymer resin systems require a temperature above 10-15°C to coalesce into a coherent layer.

Remedy
• Remove loose and cracked paint.
• Apply bonding liquid and overcoat with water based paint. Ensure that all painting is done at temperatures above 10 - 15 ºC and that the temperature remains above for 2 hours after application.

Recommended Top Paints products
• Bonding Liquid
• Mid - / Velvet - / Super Sheen
• Sand Coat

Snail trail (Water based Sheen Paint)

Description:
Vertical shiny some times sticky streaks in predominantly matt coatings but also with some sheen. Streaks generally start to emanate from flat top walls or parapet walls. Streaks are generally randomly spaced and follow gravitational direction. Not to be confused with dirt streaks.

Possible diagnosis
• Rain has impinged on the paint film that has not fully dried / coalesced. This could have occurred within the first 2 – 24 hours depending on the humidity and dampness experienced during the time of painting. The water has subsequently washed away water soluble paint components.

Prevention and Remedy
• Do not paint under adverse weather conditions.
• Normally the trails weather away within the first 3-6 months or are washed from the film after 2-3 rains.
• Or else recoat taking care to consider touch-up batch variation, difference in application technique etc.

Stipple or roller marks

Description:
Unwanted textured pattern remaining after using a roller for application.

Possible diagnosis
• Use of the incorrect roller cover
• Using the wrong type of textured coating
• Use of the wrong technique and over loading of roller.
• Low quality paint with poor flow and leveling properties.

Remedy
• If still wet; brush or roll out to level.
• Dried paint needs to be sanded level and repainted. Make sure that the paint and application technique is now correct.
Pigment Fading

Description:
Premature colour change related to UV exposure which has resulted in the breakdown of pigment particles. Normally occurs in the areas which receive the most direct sunlight and are uniform. Fading should not be confused with chalking as they can sometimes occur simultaneously. If the friable top layer is wiped away and the colour is restored it is in all likely hood not pigment fading but chalking.

Possible diagnosis
• Using an interior latex binder and or colour pigment selection for exterior use.
• Not all pigment colours have the same degree of UV fastness, especially some bright yellows and red.

Remedy
• Recoat with paint coloured with exterior pigment selection.
• The chances are good that if low cost interior pigments were used, that the binder system could also be of a lower quality. So assess if chalking has occurred and treat appropriately.

Recommended Top Paints products
• Sand Coat or;
• Velvet - / Super Sheen

Flaking

Description:
Top coat flaking with the presence of a friable powdery undercoat.

Possible diagnosis
• Painting on powdery substrate i.e. Old chalking paint, powder like skim plaster, gypsum etc.

Remedy
• Remove all loose and flaking paint.
• Remove friable residue from substrate or use suitable bonding agent/plaster primer before final water based coating.

Recommended Top Paints products
• Bonding Liquid or;
• Plaster Primer
• Mid - / Velvet - / Super Sheen
• Sand Coat

Wrinkling

Description:
Wrinkling of water based coating shortly after application in wet weather. Typical of more flexible sheen coatings. Coating can easily be removed due to a lack of adhesion.

Possible diagnosis
• Recently painted surfaces that have received moisture pressure from beneath the surface. The flexible partially cured paint film expands into blisters and then retracts after the water pressure has subsided. The partial contraction results in a wrinkled paint film.

Remedy
• Remove loose and wrinkled paint.
• Remove all sources of moisture ingress.
• Insure that moisture barriers are in place at ground level, parapets, landings, window sills, etc.
• Allow substrate to dry thoroughly.
• Repaint under the correct weather conditions.

Recommended Top Paints products
• Mid - / Velvet - / Super Sheen

Dirt streaks

Description:
Dirt streaks are generally related to dirt, dust and other contaminants collecting on horizontal surface landings and being transferred down the vertical wall face by rain or condensation. The degree of dirt streak retention is largely dependant on the coating type and type of pollution or dirt.

Possible diagnosis
• Generally a natural occurrence related to design aspects i.e. Landings, overhangs channeled water runoff etc. Dependant on rain and condensation intervals and intensity. Mostly unavoidable and not paint failure related.
• Low quality paints especially some matt paints are more coarse and porous and thus more susceptible to dirt pick up and retention.
• Sheen paints with considerable flexibility could also trap dirt during its expansion and contraction.
• Continuous contact to contaminants like soil and air pollution.

Remedy
• Remove dirt by washing and rinsing.
• Some stains could be impregnated in the coating film and thus not be removed due to the relative porosity and type of contaminant.
• Recoat with a good quality medium to high sheen paint.

Recommended Top Paints products
• Mid - / Velvet - / Super Sheen
**Blistering/Bagging**

**Description:**
Bag shaped blisters ranging from 0.5cm to 1m in diameter. Blisters can be intact or perished and flaking. If not dried out the blisters can be found to be filled with water/liquid.

**Possible diagnosis**
- Excessive moisture ingress at back of paint film.
- Painting too soon before the masonry structure has dried.
- Water based paint exposed to rain; high humidity or dew shortly after the coating has dried.
- Poor structural design aspect related to moisture barriers.

**Remedy**
- Remove all loose and flaking paint.
- Establish cause of moisture ingress and rectify.
- Allow structure to dry out before repainting.
- In the event that the moisture source cannot be removed an ultra high PVC topcoat may have to be used.

**Recommended Top Paints products**
- Water-Repellant Latex

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**Holidays**

**Description:**
Skipped or missing areas, left uncoated with paint

**Possible diagnosis**
- Paint with poor flow and leveling properties.
- Not enough paint loaded onto brush.
- Dragging over partially dried film.
- Poor application equipment i.e. brushes with uneven nip.

**Remedy**
- Repaint affected areas. It might be required to paint from surface edge to edge.

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**Efflorescence**

**Description:**
The formation of randomly white powdery salts on the surface which are generally more visible on darker colored surfaces. Efflorescence is the salts that are present in the sand used to make bricks and plaster. If moisture is present the salts get washed to the surface and even through the paint film.

**Possible diagnosis**
- Failure to remove insitu efflorescence before painting.
- Excessive continuous contact with moisture. Areas most affected are those near to parapet walls, horizontal landings, ground level and cracks etc.

**Remedy**
- Remove or seal the source of moisture ingress if this was the cause. This is best done in dry seasons.
- Remove efflorescence by brushing and power washing with copious amounts of water. Allow substrate to dry out for 2-3 weeks. If salts return the washing procedure should be repeated.
- Apply a quality solvent or water based masonry primer after the wall has dried out sufficiently.
- Recoat with a good quality exterior acrylic paint.

**Recommended Top Paints products**
- Plaster Primer
- Sand Coat

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**Colour difference related to texture**

**Description:**
Perceived colour difference related to plaster texture difference.

**Possible diagnosis**
- Smoothly plastered and rough plastered surfaces will result in perceived colour differences related to more or less light scattering.
- Different surface textures could indicate different levels of porosity in substrate causing premature moisture loss during curing resulting in poor film properties.
- Rough surfaces will also tend to collect and retain dirt more than smooth surfaces.

**Remedy**
- Remove indifferent plastered surfaces and finish substrate with the same consistency in texture and materials.

**Recommended Top Paints products**
- Sand Coat
Crazing plaster cracks

Description:
Crazing is a network of fine cracks, usually in a hexagonal pattern, which measure between 5 and 75 mm across each hexagon. They are usually very fine and shallow and do not extend through the whole depth of the plaster and are thus classed as non structural cracks. ISO/SABS define a hairline crack as one with a width of 0.5mm or less. Cracks larger than 0.5mm is generally a true substrate crack. Generally craze cracks are stable and do not open and close with time.

Possible diagnosis
• Crazing is usually the result of over trowelling a rich mix (high cement content) or using sand containing an excessive amount of dust.
• Plaster that is allowed to dry to quickly due to sun, wind, absorbent brickwork and or badly graded sand.
• Plaster applied in layers that are too thick.

Remedy
• Most sheens and medium build texture coatings can handle hairline cracks. If necessarily, glass fiber tissue can be applied during the painting operation.

Recommended Top Paints products
• Sand Coat

Structural cracks

Description:
These types of cracks are often straight vertical or horizontal lines, or in stepped diagonal lines. The cracks go through the plaster and are generally wider than 0.5mm.

Possible diagnosis
• This can be the cause of differential movement of the foundations, moisture expansion or drying shrinkage of masonry units, or thermal movement of the roof.

Remedy
• Because these cracks originate in the wall and not in the plaster, repairing the plaster is ineffective. A specialist is required to establish the cause and recommend remedial measures.
• Such measures may include structural alterations which change cracks into movement joints. Visible joints can be hidden by coverstrips fixed one side of the joint or sealed with elastometric sealants.

Recommended Top Paints products
(THIS IS TO BE USED AFTER THE STRUCTURE HAS BEEN REPAIRED AS PER ABOVE)
• Plaster Primer
• Filler Coat
• Sand Coat

Snail trail (Water based Matt Paint)

Description:
Vertical shiny some times sticky streaks in predominantly matt coatings but also with some sheen. Streaks generally start to emanate from flat top walls or parapet walls. Streaks are generally randomly spaced and follow gravitational direction. Not to be confused with dirt streaks.

Possible diagnosis
• Rain has impinged on the paint film that has not fully dried / coalesced. This could have occurred within the first 2 – 24 hours depending on the humidity and dampness experienced during the time of painting. The water has subsequently washed away water soluble paint components.

Prevention and Remedy
• Do not paint under adverse weather conditions.
• Normally the trails weather away within the first 3-6 months or are washed from the film after 2-3 rains.
• Or else recoat taking care to consider touch-up batch variation, difference in application technique etc.
Paint Problems Related to Concrete Substrates

Flaking from pre cast concrete

Description:
Paint flaking and delaminating from pre cast concrete substrates.

Possible diagnosis
• Mould release agents are sometimes applied to facilitate the release of shuttering. These release agents can be oily in nature restricting paint adhesion.
• Not removing laitance which is a powdery weak alkaline layer which can compromise coating adhesion.
• Dirt, dust and loose deposits on substrate prior to painting.
• Poor quality paint with inferior adhesion properties.

Remedy
• Remove release agents by etching, sandblasting or by high pressure power washing.

Recommended Top Paints Products
• Bonding Liquid or;
• Plaster Primer
• Sand Coat or;
• Water-Repellant Latex

Flaking from concrete floors

Description:
Paint flaking and delaminating from concrete floor.

Possible diagnosis
• Incorrect paint for traffic conditions or contact with chemicals like oil, petrol, detergents etc.
• Using an interior epoxy in outdoor UV conditions.
• Poor concrete substrate integrity
• Moisture ingress due to inadequate moisture barrier under floor.
• Painting before the floor has dried properly after casting.
• Not removing surface contaminants for example: dust, dirt, oil etc.

Remedy
• Pay attention to all of the above.

Recommended Top Paints Product
• Epoxy Floor Paint
Paint Problems Related to Interior Surfaces

Spatter

Description: Paint droplet spatter produced during roller brush application.

Possible diagnosis
- Low quality emulsion paints are more prone to spatter.
- Incorrect paint type or application equipment.
- Poor roller application technique.

Remedy
- Use high quality paints with low spatter rheology. (Please see recommended products below)
- Don’t overload roller with paint. Work in 1m² sectors utilizing W or M patterns. Use controlled medium speed movements.

Recommended Top Paints products
- Mid - / Velvet Sheen
- If this should occur on the exterior surface of a structure use Sand Coat.

Poor print resistance

Description: Imprint marking of paint film.

Possible diagnosis
- Allowing surface contact to paint film before it has properly dried. Touch dry does not imply hard dry.
- Use of low quality paint with excessive drying time.
- Painting in humid or cold conditions which interfere with the drying and curing of the paint.

Remedy
- Allow defect to dry thoroughly. Sand back and recoat.

Flaking

Description: Top coat flaking with friable powdery undercoat.

Possible diagnosis
- Painting on powdery substrate i.e. old chalking paint, powder like skim plaster, gypsum etc.

Remedy
- Remove all loose and flaking paint. Remove friable residue from substrate or use suitable bonding agent.

Recommended Top Paints products
- Bonding Liquid
- Filler Coat (also Economic Filler Coat)
- Mid - / Velvet - / Super Sheen or;
- High Gloss Enamel or;
- Eggshell Enamel
**Wrinkling, Lifting or pulling up**

Description:
Wrinkling and pulling up of the paint film due to swelling.

Possible diagnosis
- A coating with a strong solvent has been applied on top of alkyd paint. Make sure that solvent of over coating paints are compatible with the existing underlying coating.
- Prolonged contact with solvent spillage or solvent impregnated cloth.
- Accidental contact of coating surface with a paint remover.

Remedy
- Remove loose and lifting paint. Repaint as per manufacturers instructions.

**Cracking**

Description:
Hairline cracking of the paint film which can later progress in to chip flaking.

Possible diagnosis
- Generally associated with paints which are highly filled and too thickly applied. Typically found in runs, puddles and overlaps.
- Rapid drying of water based dispersions as a result of painting over porous and powdery substrate.
- Rapid drying due to extremely hot or windy conditions.
- Low quality paint with poor adhesion and flexibility.
- Over thinning
- Applying the paint to thinly

Remedy
- Remove loose and lifting paint.
- Porous substrates should be sealed with compatible primer.
- Loose powdery crack filler surfaces should be bonded with bonding liquid prior to over coating.

Recommended Top Paints products
- Bonding Liquid or;
- Plaster Primer
- Velvet - / Super Sheen
- If this should occur on the exterior of a structure use Sand Coat or Velvet Sheen.

**Blistering of Enamel paint**

Description:
Loss of paint adhesion resulting in bubbling and flaking of coating.
In this particular example there is a bathroom shower on the opposite side of the wall which is not adequately sealed.

Possible diagnosis
- Excessive moisture ingress at back of paint film.
- Painting too soon before the masonry structure has dried.
- Poor structural design aspect related to moisture barriers.

Remedy
- Remove all loose and flaking paint.
- Establish cause of moisture ingress and rectify.
- Allow structure to dry out before repainting.

Recommended Top Paints products
- Bonding Liquid,
- Filler Coat,
- Velvet - / Super Sheen or;
- Eggshell Enamel

**Marring or Burnishing**

Description:
Marking of paint surface due to rubbing and scuffing. Marks could be due to an increase in gloss similar to polishing or entrapment of material in the course paint film. The problem is generally associated with dark matt paint used in frequently trafficked areas.

Possible diagnosis
- Use of a very matt paint in frequently trafficked areas.
- Use of a poor quality matt paint with low scrub resistance.
- Excessive scrubbing and spot cleaning
- Frequent contact of painted surface to objects like furniture.

Remedy
- Rather use Gloss, sheen or semi matt finish in areas that might require frequent cleaning or traffic.
- Don’t use abrasive means to clean paint surfaces.

Recommended Top Paints products
- High Gloss Enamel
- Mid - / Velvet - / Super Sheen
Poor stain resistance
Description:
Stains and dirt being absorbed by the coating making cleaning difficult.
Possible diagnosis
• Incorrect type of coating used for areas prone to dirt contamination. Sheen, and water based enamels are better suited for kitchens, playrooms, work areas and other surface areas which are likely to get soiled.
• Low quality paints that are porous in nature will be more inclined to staining.
Remedy
• Use stain resistant coatings in areas that are prone to soiling.
• Good quality water based emulsion sheen paints should be adequate for most applications. More specialised coating might be required for more aggressive contaminants.
Recommended Top Paints products
• Velvet - / Super Sheen

Cratering, Pinhole and Pores
Description:
Cratering is a small bowl shaped depression in the paint film.
Possible diagnosis.
• Coatings which are to thickly applied could result in air being trapped. The gas bubbles rise to the surface and burst forming small craters in the wet paint film which fail to flow out before the paint has set.
• Incorrectly formulated water based paint ie. Defoamer additive related.
Remedy
• Sand defect away and recoat.

Poor Hiding
Description:
The paint coating does not obliterate the underlying surface which it is meant to cover resulting in an uneven colour consistency.
Possible diagnosis
• Insufficient layers of paint are applied.
• Not all pigment colours provide the same degree of hiding. Bright yellow and red pigments are notorious for poor hiding and thus it is to be expected that more coats will be required.
• Increased contrast between the background colour and the new paint colour can contribute to hiding difficulty.
• Low cost and quality paints can be expected to require additional coats as they may have poor leveling/flow properties and or pigment selection.
• Spreading the paint out more than what is recommended, either by; thinning/diluting the paint, excessive rolling, using low quality tools and or roller cover.
Remedy
• Apply additional coats with the correct equipment and technique.
• Consider paint colour/pigment selection, cost, quality, substrate background colour. Consult a technical expert for advice.

Tinter Development / Rub up
Description:
Non uniform colour that appears after a surface was painted with a roller and areas were finished of with a brush. Generally not associated with un tinted paint.
Possible diagnosis
• The paint base and tinter is not compatible. The application pressure/shear are different for roller and brush application. A roller has a higher sheer rate compared to brushing and will thus help to wet out and disperse the colourant better compared to brushing. Colour from tin to tin can also vary depending on the method of agitation/mixing. More intense mixing will result in better colour development.
Remedy
• Ensure that the tinter development properties are similar for roller and brush. Test both application methods side by side on a small area before commencing with a project.
**Wrinkling**

Description: The development of wrinkles in a film surface during drying.

Possible diagnosis
- To thickly applied oil based paint, usually due to the formation of a surface skin while the underlying layer takes longer to cure and is still soft.
- Incorrectly formulated oil based paint with too much surface drier ingredients.

Remedy
- If the coating is still slightly wet, remove with paint remover and recoat in a thin even layer under the correct temperature. Make sure that it was a thickness problem and not a formulation problem.
- If the wrinkled coating had fully dried it can be sanded down and recoated in the correct manner.

**Paint pealing/flaking from galvanized substrate.** (Part 1)

Description: The complete paint system is flaking and lifting from the substrate revealing the underlying galvanized surface.

Possible diagnosis
- From galvanized surface. A thin layer of oil generally applied by the steel manufacturer to protect the metal from corrosion during the initial stages of transport and storage. In other situations substances are applied during the rolling and profiling stage of the product to facilitate the forming processes. Water based coatings are more susceptible to delaminating when subjected to this type of surface contamination.

Remedy
- Remove old coating system.
- Remove oil and dirt contamination with an abrasive solvent containing degreaser. This cleaner should be completely removable by means of water washing. The solvent must be water emulsifiable.
- Recoat with an appropriate coating system.

Recommended Top Paints products
- Water based Zinc Phosphate
- Super Sheen
- Roof & Paving Paint
- High Gloss Enamel

**Chalking**

Description: The formation of a powder on the surface of a weathered coating. The powder usually consists of broken down binder and freed pigment particles due to UV, temperature and moisture exposure.

Possible diagnosis
- Different binders react at different rates. Thus it is important to use the correct type and grade for the specific application.
- Using interior quality paint for outdoors use.
- Using low grade paint with a low binder and high pigment loading.

Remedy
- Remove the friable chalk by scrubbing with stiff nylon or wire brush and rinse with water. High pressure equipment can also be used. Check for any remaining chalk after the surface had thoroughly dried. Repeat the cleaning process if powder is still present.
- If chalk persists, recoat with oil based primer and recoat with appropriate quality top coat.

Recommended Top Paint products
- 1. Industrial Red Oxide Primer and,
- QD Enamel.
- 2. Water based Zinc Phosphate and,
- Roof & Paving Paint or;
- Velvet - / Super Sheen
Corrosion undercutting at welds.

Description:
Corrosion under cutting at welds.

Possible diagnosis
- Painting over poorly prepared welded areas. The intense heat of welding leaves behind a thin oxidized carbon film layer at and around the welded area. This oxidized contaminant impairs paint adhesion.
- Weld imperfections like rough welds, weld spatter or pin holes. All of these defects result in inadequate covering of the surface by the subsequent paint coating.
- Failure to remove weld scale.

Remedy
- Remove all weld contaminants by sanding or grit blasting. Wire brushing does not always work as it only tends to polish the surface.
- Don’t hesitate to long prior to painting so as to avoid flash rust from occurring.

Recommended Top Paints products
- 1. Water based Zinc Phosphate and,
- Roof & Paving Paint.
- 2. Industrial Red Oxide Primer,
- High Gloss Enamel or;
- QD Enamel.

(Use water based topcoats with water based primers and vice versa for oil based paints)

Flash rust / Measle corrosion

Description:
Measle like rust spots

Possible diagnosis
- Rust removing and surface preparation of the steel surface before painting involved a lot of water.
- The rust free and cleaned bare steel surface was exposed to humid / damp atmosphere for more than 3 hours.
- Water based or water containing primer or top coat was applied to the cleaned metal and the rust appeared within 30 min. of application.
- Very rough steel surface resulting in high peaks not adequately covered by coating.

Remedy
- Remove paint and rust. Use flash rust inhibiting additive with water. Recoat immediately after surface preparation. Surface must be dry.
- When using water based primers ensure that the paint contains appropriate rust inhibitor additives and or rust inhibiting pigmentation.

Recommended Top Paints products
- 1. Water based Zinc Phosphate and,
- Roof & Paving Paint or;
- Velvet - / Super Sheen.
- 2. Industrial Red Oxide Primer,
- High Gloss Enamel or;
- QD Enamel.

(Use water based topcoats with water based primers and vice versa for oil based paints)

Corrosion Blister

Description:
Fine blisters resulting in lifting and los of adhesion from the substrate. Corrosion products like rust are generally present inside of blister.

Possible diagnosis
- Not using a corrosion resistant primer under a topcoat.
- Insufficient coating system thickness.
- Failure to remove contaminants ie. Rust, salts, chlorides, oil and dirt. prior to painting.
- Applying a coating system not suited to corrosion conditions. Corrosion resistant coatings are generally less permeable, contain functional pigments and posses excellent adhesion and flow properties.

Remedy
- Remove defective paint.
- Remove rust and contaminants from metal substrate.
- Select an appropriate coating for the substrate type and exposure conditions.
- Ensure that surface finish/texture is as per coating system requirements.
- Recoat surface in the prescibed time and during the correct weather conditions.

Recommended Top Paints products
- 1. Water based Zinc Phosphate and,
- Roof & Paving Paint and;
- Velvet - / Super Sheen.
- 2. Industrial Red Oxide Primer and,
- High Gloss Enamel or;
- QD Enamel.

(Note, use water based topcoats with water based primers and vice versa for oil based paints)
Heat Blisters

Description:
Bubble type blisters resulting in lifting and loss of adhesion from the substrate.

Possible diagnosis
• Painting a warm surface ie. Radiators, steam pipes, steel roofs, furnaces/ovens etc.

Remedy
• Remove the affected coating.
• Do not paint hot substrates.
• Use heat resistant coatings for surfaces subject to extreme heat.

Contact Top Paints’ Technical Department for case related coating system.

Paint pealing/flaking from galvanized substrate. (Part 2)

Description:
The complete paint system is flaking and lifting from the substrate. A white powdery layer is present under the primer and on top of the exposed galvanized surface.

Possible diagnosis
• The use of an incorrect alkyd based primer. During the drying phase the alkyd produces small amounts of acid by products, which reacts with the Zinc/ Galvanized layer forming a white powdery salt layer. The powdery layer interferes with the coating adhesion to the substrate.

Remedy
• Remove the old coating system back to galvanized surface. Clean with a suitable abrasive degreaser and rinse thoroughly as described in part 1.

Recommended Top Paints products
• Top Paints Degreaser
• 1. Water based Zinc Phosphate Primer and,
• Velvet - / Super Sheen or;
• Roof & Paving Paint.
• 2. Industrial Red Oxide and,
• High Gloss Enamel

(Note, use water based topcoats with water based primers and vice versa for oil based paints)

Paint pealing/flaking from galvanized substrate. (Part 3)

Description:
The complete paint system is flaking and lifting from the galvanized substrate. Dark grey flecks are observed to be adhering to the back of the primer.

Possible diagnosis
• Poor quality galvanized coating and or when one or two pack acid etch primers have been applied. The primer is adhering or etching onto the topmost layer of the zinc. When subsequent coats (undercoat/topcoat) are applied they produce stresses in the zinc film which delaminates in the process.

Remedy
• Galvanised coating with poor integrity is a difficult substrate to overcoat.
• Follow the recommendations as outlined in part 2.
• Avoid using an acid etch primer on Galvanized or Zinc coated substrates.

Paint pealing/flaking from Calcium plumbate primer. (Part 4)

Description:
Loss of adhesion of a solvent or water based topcoat from a calcium plumbate primer. The problem comes in two forms:
   a. The topcoat peels off after a few months after the coating has been exposed to hail or severe rain.
   b. As “a” but the de-lamination of the topcoat occurs almost immediately.

Possible diagnosis
• For (a); The Calcium plumbate primer was left for more than 48 hours prior to over coating. The calcium plumbate primer has cured too hard and the topcoat has not been able to bond adequately to the primer.
• For (b); A mixture of (a) and possibly a contamination of dirt and oil on the primer prior to applying the topcoat. Water based topcoats are more susceptible.

Remedy
• Remove the loose and flaking coating. Clean, degrease, wash of cleaner, then lightly abrade and reapply topcoat.

Recommended Top Paints products
• Roof & Paving Paint
Solvent based topcoat pealing/flaking from water based primer. (Part 5)

Description:
Loss of adhesion of an Alkyd solvent based topcoat from a water based primer after approximately 7 days of drying.

Possible diagnosis
• The hydrophobic alkyd solvent based topcoat initially does not adhere that well to the hydrophilic water based primer, and it basically sits on the primer surface. When the alkyd paint start to cure and harden a tension is created in the film which pulls the alkyd (water hating) topcoat away from the (water loving) primer.

Remedy
• Preferably water based primers should be used with water based topcoats and similarly for solvent based systems.
• Remove loose and flaking paint and recoat with appropriate top coat.

Recommended Top Paint products
• Velvet - / Super Sheen
• Roof & Paving Paint

White Rust / Wet storage stain (Part 1)

Description:
Thin light white powdery deposit on galvanized sheets. Generally seen on unpainted galvanized sheets. Painting over white rust can result in paint peeling. Not to be confused with “Paint peeling from galvanized substrates - Part 2”

Possible diagnosis
• Galvanized components which were tightly stacked together with the presence of moisture. Generally occurs during storage and or transportation. The exclusion of carbon dioxide and presence of moisture in tightly stacked bundles can result in the formation of unstable zinc hydroxide. Once the galvanized surface is exposed to the atmosphere with the presence of carbon dioxide no further formation of soluble zinc hydroxide will occur and a stable zinc carbonate film will develop.
• The moisture present can be from various sources i.e. rolling fluids during profiling, exposure to rain and dew, condensation in stacked sheets due to rapid changes in temperature and a lack of ventilation between individual sheets even under covered conditions. Drying buildings and wet floors could also contribute to elevated humidity levels.

Remedy
• Asses the degree of the galvanized coating’s depletion. Remove white rust at spot areas with a stiff bristle brush (not a wire brush). Check residual zinc coating thickness with magnetic thickness gauge. SANS 121 (SABS ISO 1461) makes allowance for galvanized coating repairs.
• Superficial white rust that has not resulted in severe zinc coating loss needs to be removed prior to painting as any loose deposits will impair paint adhesion. Small areas can be removed by abrading with a stiff bristle brush (not a wire brush). Large areas can be treated with proprietary products or simple chemical solutions. i.e. 1% solution of Trisodium Phosphate or 1% solution of Potassium or Sodium Dichromate slightly acidified with Sulphuric acid pH6. The solutions may leave a stained surface. In all cases effected sheets should be thoroughly washed and dried after treatment. Follow the appropriate precautions when working with hazardous materials. Follow manufacturer’s instructions.

Recommended Top Paints products
• Water based Zinc Phosphate and, • Roof & Paving Paint

White Rust / Wet storage stain (Part 2)

Remedy
• Mill scale is a reasonably inert material in principle and might prove to be highly protective coating if it adheres well. However, it can be brittle and during handling of steelwork, parts of the scale tend to flake off with comparative ease.
• Mill scale sets up a galvanic corrosion cell when in contact with steel. Consequently at breaks in the mill scale quite deep pitting corrosion may occur and at the edges rust creep will start which will appear inconsistent and patchy as seen in the photo above.
• In most cases it is advisable to remove mill scale prior to painting by means of abrasive blast or acid pickling.

Recommended Top Paints products
• Water based Zinc Phosphate or, • Industrial Red Oxide Primer

Mill scale

Description:
Blue-black shiny surface that is initially strongly bonded to the steel. Generally associated with hot rolled steel sections like angle iron and plate.

Possible diagnosis
• Steel sections and plates are produced by rolling steel while still red hot. The steel reacts with oxygen in the air to form oxide scales.

Remedy
• Mill scale is a reasonably inert material in principle and might prove to be highly protective coating if it adheres well. However, it can be brittle and during handling of steelwork, parts of the scale tend to flake off with comparative ease.
• Mill scale sets up a galvanic corrosion cell when in contact with steel. Consequently at breaks in the mill scale quite deep pitting corrosion may occur and at the edges rust creep will start which will appear inconsistent and patchy as seen in the photo above.
• In most cases it is advisable to remove mill scale prior to painting by means of abrasive blast or acid pickling.

Recommended Top Paints products
• Water based Zinc Phosphate or, • Industrial Red Oxide Primer
Paint Problems Related To Timber Substrates

**Flaking**

Description:
Paint lifting and flaking from wood in exterior applications. Signs of grey weathered wood at exposed areas.

Possible diagnosis
- Natural weathering and a lack of periodic maintenance.
- Moisture ingress from untreated or sealed timber ends/edges.
- The lack of a specialized wood primer.
- Painting over decayed wood without proper surface preparation.
- Using improper coating system that has not got the necessary flexibility required by expanding and contracting wood substrates.
- Timber having high moisture content resulting in shrinkage.

Remedy
- Remove coating and grey weathered wood surface.
- Recoat with a specialized wood coating system as per manufacturer’s instructions.
- Make sure to seal exposed edges/ends.

Recommended Top Paints products
- Universal Undercoat or;
- Pink Wood Primer.
- Roof & Paving Paint or;
- Velvet - / Super Sheen or;
- High Gloss Enamel

**Woodburn**

Description:
Dark golden discoloration of the wood substrate under clear varnish in UV exposed conditions.

Possible diagnosis
- The use of an interior varnish that does not contain UV absorbers in an UV environment.

Remedy
- Remove coating and top layer of wood surface.
- Recoat with appropriate UV stabilized clear varnish.

Recommended Top Paints products
- Exterior Wood Varnish

**Flaking of clear varnish**

Description:
Paint lifting and flaking from wood interior or exterior. Signs of grey weathered wood at exposed areas.

Possible diagnosis
- Natural weathering and a lack of periodic maintenance.
- Insufficient coats of varnish.
- Moisture ingress from untreated or sealed timber ends/edges.
- Using improper coating system that has not got the necessary flexibility required by expanding and contracting wood substrates.

Remedy
- Remove coating and grey weathered wood surface by means of sanding.
- Wash of any varnish residue with white spirits.
- Recoat with a specialized wood coating system as per manufacturer’s instructions.
- Make sure to seal exposed edges/ends.
- Varnished surfaces in good condition can be washed with a solution of detergent and warm water, rubbed down while wet with 400 grit abrasive paper and rinsed with clean water. If the surface has been wax polished, give a preliminary wash with degreaser. Ensure that all surfaces are dry before commencing with recoating.

Recommended Top Paints products
- Interior / Exterior Wood Varnish
**Bleeding**

**Description:**
Staining and discoloration of the topcoat by the migration of volatile components from the underlying coat. In this particular example it is Creosote.

**Possible diagnosis**
- The coloured ingredients in the previous coat are dissolved by the solvents of the subsequent coat and migrate to the top leading to staining and discoloration.
- Over coating coal tar containing paints, bitumen, asphalt or Creosote with white or coloured topcoat will result in the 1st coat bleeding through the subsequent coating.

**Remedy**
- If possible remove all of the coatings to bare substrate. Best results are generally achievable in the case of Creosote if it has weathered well to a sooty grey colour.
- Removing oil, wax or tar like substances from porous substrates are very difficult to achieve and it might be advisable to continue with the original coating.

**Recommended Top Paints products**
- Universal Undercoat.
- Roof & Paving Paint or;
- Velvet - / Super Sheen or;
- High Gloss Enamel

**Fish eyes or Surface breaks**

**Description:**
Retraction of the new coating from the surface leaving voids. In this particular case the previous coat consist of a solvent based wax wood preservative over coated with a white water based emulsion coating.

**Possible diagnosis**
- Oil, grease, wax, moisture and or silicon contamination or coatings on the surface not permitting the surface to be wetted by the subsequent coating.
- Very smooth or polished surfaces which does not provide for a mechanical key.

**Remedy**
- Remove oil, grease, wax, moisture and / or silicon contamination.
- This is often very difficult and costly to achieve with coal tar coatings on porous substrates like wood and it might be better to continue with the original coating/ treatment.
- We do that the nature of the original coat can be difficult to ascertain, and thus finding an appropriate solution might require some small scale experimentation.

**Knots and resin**

**Description:**
Hard cross grained disfigurements in timber which are formed where shoots on trees are developed into branches.
Golden sticky resin exuded at knot.

**Possible diagnosis**
- Normal characteristic of wood.

**Remedy**
- Knots exuding resin should be drilled out whenever possible and the hole plugged with sound wood.
- Alternatively an attempt can be made to remove any free resin and wipe down the surface with white spirit followed by knotting compound.
- Normal knots can be treated with knotting compound at least 1cm beyond the area to be treated, feathering off the edges. Apply knotting compound thinly as to avoid thick edges.

**Disclaimer:**
Top Paints (Pty) Ltd acknowledges that there might be other ways of rectifying the problems referred to in this document. This is merely a guide and should be used in such a manner. For any technical advise or product related enquiries, please contact Top Paints’ technical department on (016) 362 1064 / 54. Top Paints (Pty) Ltd hereby acknowledges ICC (Pty) Ltd’s input in the completion of this guide.
Paint Problems Related to Other Substrates

**Cracking**

Description:
Cracking caused by stresses throughout the film and between the film and substrate. The underlying window putty in this example has shrunk causing stress cracking in the enamel topcoat by compression.

Possible diagnosis
- A less flexible topcoat like an enamel over a more flexible substrate like a bitumen or linseed window putty that is still in the process of drying.
- Water based paints applied directly to linseed oil putty may "cis" or fail to adhere.
- Thick coatings subject to extreme temperature changes and subsequent expansion and contraction forces.

Remedy
- Remove cracking top coat and recoat with a compatible system.
- Allow linseed window putty to harden over several weeks. Consult manufacturer’s instructions. Recoat with solvent based alkyd enamel.

Recommended Top Paints products
- Universal Undercoat
- High Gloss Enamel
- Velvet - / Super Sheen

**Cracking**

Description:
Cracking caused by stresses throughout the film and between the film and substrate. The underlying black bituminous coating and alkyd enamel topcoat in this example has expanded differently causing stress cracking in the enamel topcoat.

Possible diagnosis
- A less flexible topcoat like enamel over a more flexible substrate like bitumen.

Remedy
- Remove cracking top coat and recoat with a compatible system.
- Removing paint from soft flexible substrates can be difficult and might require removal of all coatings back to substrate.

Recommended Top Paints products
- Bitumen Black or;
- Bitumen Aluminium

**Paint Flaking from Fiber Cement building products**

Description:
Top coat flaking with the presence of a friable powdery fiber cement substrate. The top coat consisted of enamel paint.

Possible diagnosis
- Not removing dust and dirt from new or well weathered Fiber cement boards.
- Not removing mould, moss or lichen from weathered boards.
- Not using alkali resistant water based primer.
- Over coating water based primer with alkyd enamel. Water based primers are permeable and will allow the passage of alkali solutions, which will damage the enamel paint applied over it.
- Enamel systems not recommended.

Remedy
- Remove all loose and flaking paint.
- The surface may be damp but not wet.
- Solvent based solution polymer based masonry/alkali resistant primers perform well.
- Pure acrylic emulsion paints like sheen, low sheen or roof paints are best for Fiber cement building materials. No primer required for the above.

Recommended Top Paints products
- Plaster Primer
- Velvet - / Super Sheen
- Sand Coat
- Roof & Paving Paint