



MasterProtect® Wall Coating Troubleshooting Guide



Master your challenges with our systems and expertise

The Master Builders Solutions brand is built on the experience gained from more than a century in the construction industry. At the core of the Master Builders Solutions brand is the combined know-how and experience of a global community of Master Builders Solutions construction experts who help solve your construction challenges. As an industry leader in high build acrylic wall coatings, Master Builders Solutions has the right products and technical expertise to help you meet your project needs while saving time, money and labor.

Master Builders Solutions is committed to your continued success and safety

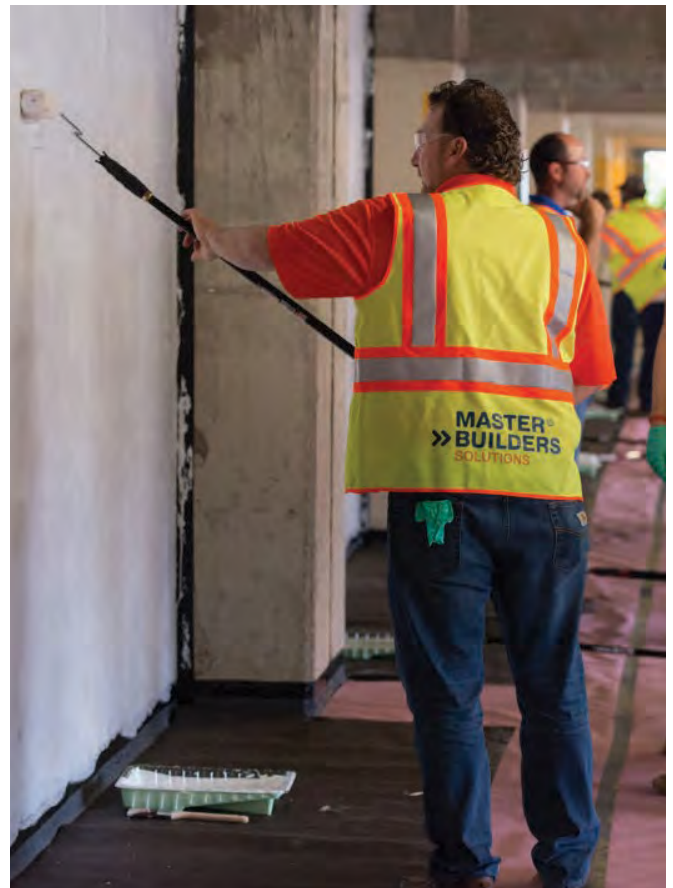
Safety is at the core of Master Builders Solutions' culture. We believe that business success and safety are interdependent. We are committed to enhancing health and safety awareness on projects. This troubleshooting guide was designed with safety in mind, since effective troubleshooting and application technique is critical to ensuring the safety of installers and facility users. Consult your Master Builders Solutions resources, such as this guide and your local sales specialist, to explore best practices for improving safety and productivity on all your projects.



Master Builders Solutions' troubleshooting guide connects you to industry leadership and years of extensive experience to identify the best solutions for the most common wall coating issues

This guide is designed to provide relevant information to help you minimize challenges and troubleshoot problems on wall coating projects, helping to keep you safe and productive. This guide includes information to:

- Identify common problems associated with wall coatings applications
- Provide tips on how to safely repair or resolve identified issues
- Share best practices to help minimize problems on future projects
- Provide additional resources to improve future applications



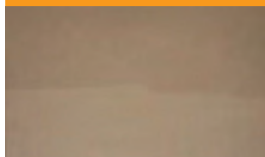
Master Builders Solutions' MasterProtect Wall Coatings Training Program connects you to application expertise

For further training on MasterSeal Wall Coatings applications, consider attending Master Builders Solutions' Wall Coating Applicator Training programs. These live events teach pertinent application details such as adhesion testing, detailing, moisture testing, mixing, mock ups, surface preparation, and managing challenging weather conditions. Contact your local Master Builders Solutions Sales Specialist for more information.

Note: This information and all further technical advice are based on Master Builders Solutions present knowledge and experience. As always, refer to the current Technical Data Guide for product and system specific information.

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This guide includes the following common topics associated with wall coating troubleshooting along with likely causes.



06 Picture Framing

Picture framing occurs when the edges and corners of a surface appear darker or lighter than the rest of the wall.



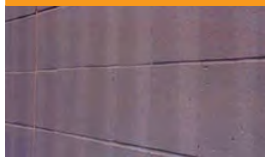
06 Lapping

Lapping appears as denser color or increased gloss at areas of paint application overlaps.



07 Sagging

Sagging is an excess of paint appearing in a droop formation on the wall immediately after application.



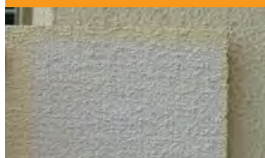
07 Zebra Striping / Roller Stipple

Roller stipple is the unintentional textured pattern caused by roller application of coating.



07 Texture Variance

Texture variation shows up as different overall colors or textures of a single product due to differences in application.



08 Fading

Lightening or loss of vibrancy of coating color.



08 Surfactant Leaching

Soapy residue on the coating causing glare, streaks, and blotches. Typically evident within the first month of application.



08 Dirt Pick-Up

Dirt pick-up is the appearance of dust or dirt on a building.



09 Rust Stains

Rust stains show up as rust colored deposits on a coating where iron and water may be present.



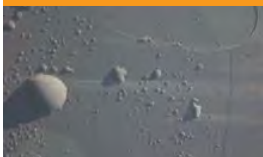
09 Efflorescence

White, powdery residue on the surface of a substrate or coating. Efflorescence can appear at any time; however, it is most common within the first year of construction of a new building or remediation of an existing wall.



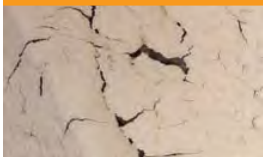
09 Pinholes

Pinholes are tiny holes in the coating caused by rupturing of miniscule bubbles.



10 Blistering / Wrinkling

Sporadic areas of lifting or swelling of the coating filled with air or fluid. Blisters can vary significantly in size, shape, and thickness. Wrinkles show up as crinkled or wrinkled coating which may be isolated or wide spread.



12 Cracking / Flaking

Splitting or detaching of dry coating film. Fractures in the existing substrate that telegraph through coating; or fractures that occur in cured membrane after application.



14 Peeling

Poor adhesion of coating resulting in loss of coating. Can occur at most recent or previous layers and may be isolated or wide spread.



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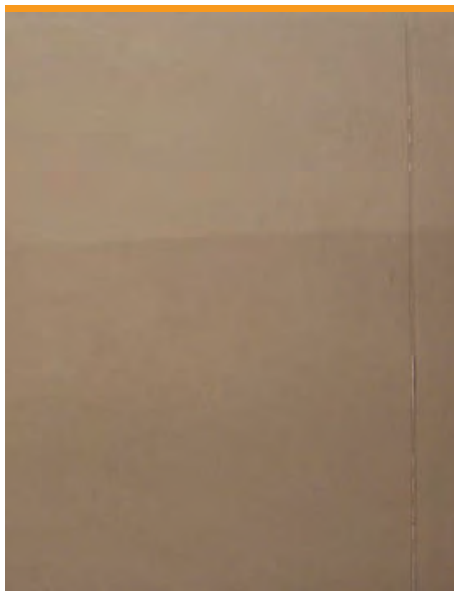


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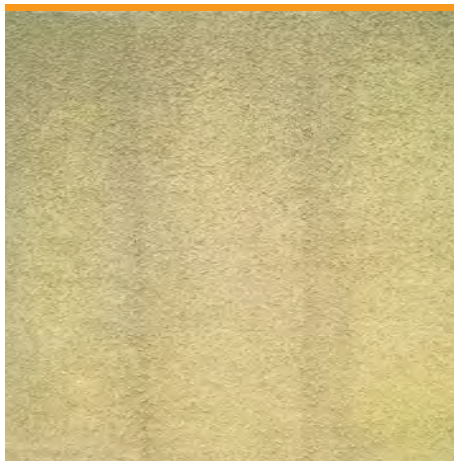
Aesthetic Issues Caused by Application Technique

Color problems are often caused by texture – even for smooth coatings. All acrylic coatings will appear different depending on how they are applied to the surface and the direction of application. Many of the following issues demonstrate this concept.



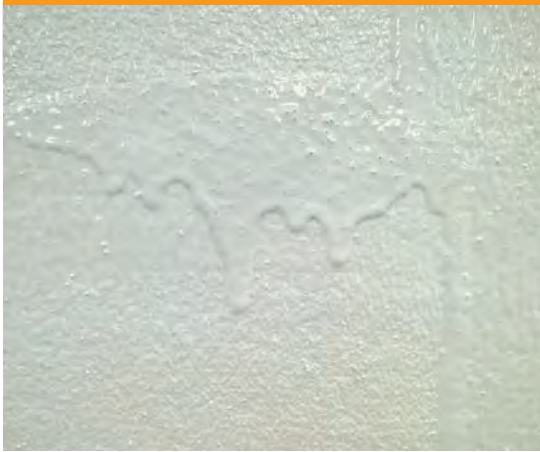
PICTURE FRAMING

- Cause:** Different coating thickness and texture during application of perimeter detailing.
- Repair:** Apply additional material to match existing texture or recoat entire affected area.
- Prevent:** Utilize proper equipment, consistent tools and application techniques while maintaining a wet on wet application. Stipple cut-in brush work to match roller application texture.



LAPPING

- Cause:** Failure to maintain a wet edge and natural break points during application. Lapping can also be a result of buildup of coating on roller cover edges.
- Repair:** Recoat entire affected area.
- Prevent:** Always maintain a wet edge while coating, honor existing joints and natural breaking points. Properly maintain installation equipment throughout application.



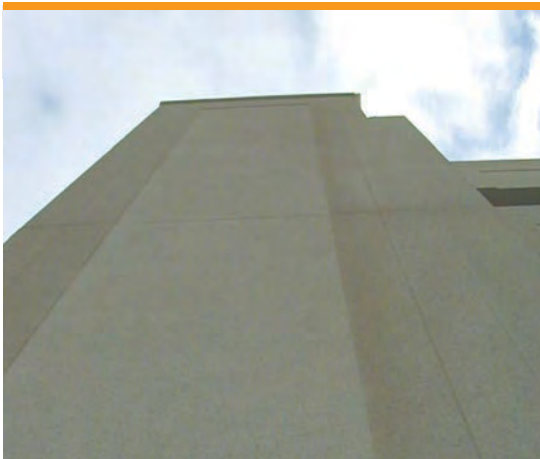
SAGGING

- Cause:** Over application of coating resulting in downward dripping of excess material. Sagging can also happen during cool weather due to uneven drying times.
- Repair:** Sand coating to remove any sags and recoat affected areas.
- Prevent:** Ensure proper application thicknesses throughout installation. During application, properly back roll any visible sags while coating is still wet. Only apply material when ambient temperature is adequate throughout coating cure.



ROLLER STIPPLE / ZEBRA STRIPING

- Cause:** Incorrect or low quality roller nap, poor rolling technique.
- Repair:** Recoat entire affected area.
- Prevent:** Always back roll finish stroke in a downward fashion while maintaining a wet edge.



TEXTURED COATING VARIANCE

- Cause:** Applying high texture coating improperly, possibly due to inadequate spray technique. Also caused by rolling highly textured coating.
- Repair:** Reapply coating to blend into existing texture.
- Prevent:** Always spray a highly textured coating with proper techniques and equipment.

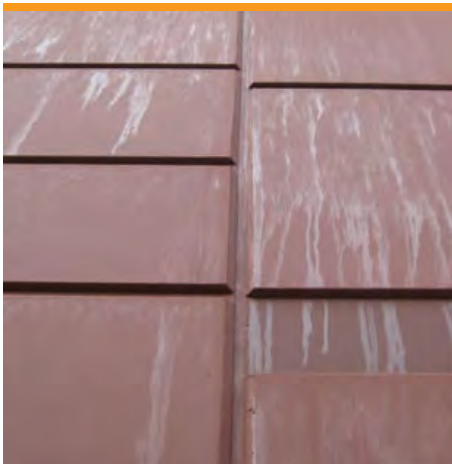
Note: Please consult your Master Builders Solutions representative for project-specific repair method recommendations.

Aesthetic Issues Caused by Ambient Conditions



FADING

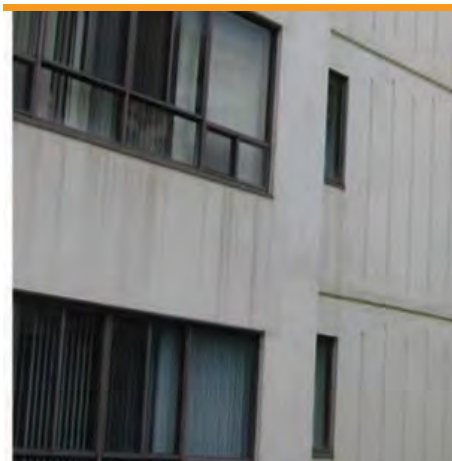
- Cause:** High UV exposure leading to loss of color vibrancy due to degradation of pigments.
- Repair:** Recoat with fresh material utilizing UV stable pigments.
- Prevent:** Utilize appropriate pigments, avoiding organic pigments. Consider color selection prior to coating, and manage expectations when using deep colors.



SURFACTANT LEACHING

Definition: Soapy residue on the coating causing glare, streaks, and blotches. Typically evident within the first month of application. Surfactant leaching is a natural occurrence of acrylic coatings and does not affect the performance of the material.

- Cause:** Often occurs following cool, damp curing conditions and is more prevalent when using dark colors.
- Repair:** This residue is water soluble and will typically be removed by rain. Low pressure washing can assist in removal process.
- Prevent:** Avoid coating when damp, cool conditions are expected within 24 hours of application.



DIRT PICK-UP

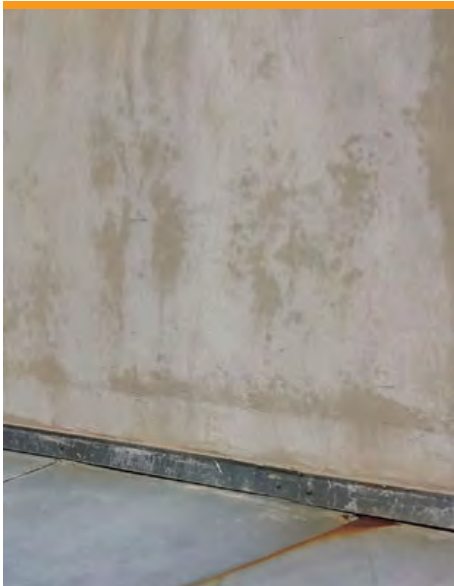
- Cause:** Soft, semi-sticky material, more often associated with coatings with softer films such as silicones or elastomeric coatings that pick up ambient air pollution, dirt, or other contaminants. This can also occur when coatings do not cure properly.
- Repair:** Introduce a maintenance cleaning program for the building that includes low pressure-washing.
- Prevent:** This is a function of some material properties associated with silicones and acrylic elastomerics and may not be entirely preventable. Select proper material for building environment and install under proper ambient conditions. Be sure to install mock-ups.

Aesthetic Issues Related to Substrate and Surface



RUST STAINS

- Cause:** Rust stains can result from a number of causes, including natural iron ore aggregate within the substrate, corrosion within the substrate and nearby irrigation systems with hard water.
- Repair:** Determine the source of corrosion, correctly remove any rust, and patch or repair. Recoat as necessary.
- Prevent:** Ensure proper building envelope detailing. Investigate external substrate contaminants.



EFFLORESCENCE

- Definition:** White, powdery residue on the surface of a substrate or coating. Efflorescence can appear at any time; however, it is most common within the first year of construction of a new building or remediation of an existing wall.
- Cause:** Hydration of Portland cement creates byproduct of soluble salts. When exposed to moisture, the salts form a solution that is carried to the surface due to heating and cooling of the wall assembly, leaving a white residue on the surface.
- Repair:** This residue is water soluble and will typically be removed by rain. Low pressure washing can assist in removal process. Never use power washing to remove efflorescence.
- Prevent:** Allow sufficient cure of new concrete or masonry and remove any visible efflorescence on the substrate prior to coating.



PINHOLES

- Cause:** Improperly sealing of porous substrate. Applications during high heat.
- Repair:** Apply additional coats of high build coating until no pinholes are visible. Avoid over application of individual coats.
- Prevent:** Utilize block filler or primers on porous substrates prior to application of coating. Apply coating at proper mil thickness in a two coat application. Install coating under proper ambient conditions.

Note: Please consult your Master Builders Solutions representative for project-specific repair method recommendations.

Bubbling / Wrinkling

Blistering: Sporadic areas of lifting or swelling of the coating that are filled with air or fluid. Blisters can vary significantly in size, shape, and thickness.

Wrinkling: Crinkled or wrinkled coating which may be isolated or widespread.



Likely Causes

A. Ambient Conditions

- High humidity or moisture during or immediately after cure
- Coating a hot surface
- Exposure to rain prior to full coalescence of coating

B. Moisture

- Moisture in the substrate
- Excess vapor drive

C. Surface / substrate

- Contaminated surface
- Incompatibility with surface, sealant, primer, patching material or previous coating
- Moisture on surface

D. Over application of coating

Possible Repair Method

If substrate is not visible through blister:

- Remove loose coating and blisters
- Recoat per manufacturer's recommendations

If blister goes down to substrate:

- Remove coating to the substrate
- Determine and eliminate source of moisture
- Remove debonded or uncured material if necessary
- Prime and recoat per manufacturer's recommendations

Tips to Minimize Future Occurrences

Ensure proper detailing of the building enclosure

- Install under proper ambient conditions (temperature and moisture)
- Allow full cure of previous coatings prior to application
- Utilize mock-ups to ensure compatibility and adhesion of coatings
- Apply coating per manufacturer's recommended thickness and yields



Cracking / Flaking

Splitting or detaching of a dry coating film.



Likely Causes

- A. Application methods
 - Applying material too thinly
 - Over application that results in mudcracking
 - Thinning the coating prior to application
- B. Surface / Substrate
 - Contaminated surface
 - Poor preparation
 - Incompatibility with surface, sealant, primer, patching material or previous coating
- C. Ambient conditions
 - Coating in windy conditions, which causes uneven cure rates
 - Hot surface temperatures
- D. Product
 - Coating with insufficient adhesion and elasticity properties
 - Coating beyond intended service life

Possible Repair Method

If substrate is not visible through flakes / cracking:

- Remove loose coating and flakes
- Recoat per manufacturer's recommendations

If cracks goes down to substrate:

- Remove coating to the substrate
- Determine and eliminate source of moisture if present
- Remove debonded or uncured material if necessary
- Prime and recoat per manufacturer's recommendations

Tips to Minimize Future Occurrences

- Select material with adequate characteristics based on required performance. Utilize appropriate primers if necessary.
- Install under proper ambient conditions (temperature and moisture)
- Allow full cure of previous coatings prior to application
- Utilize mock-ups to ensure compatibility and adhesion of coatings
- Apply coating per manufacturer's recommended thickness and yields



Peeling

Poor adhesion of coating resulting in delamination of coating. Can occur at most recent or previous layers and may be isolated or widespread.



Likely Causes

A. Surface / Substrate

- Contaminated surface
- Surface moisture present
- Poor preparation
- Incompatibility with surface, sealant, primer, patching material or previous coating

B. Moisture

- Excess moisture vapor through wall
- Moisture escaping due to poor building envelope detailing

C. Loss of total permeability due to excessive thickness of previous coatings

Possible Repair Method

- Remove coating to the substrate
 - May require removal of entire coating
- Determine and eliminate source of moisture
- Remove debonded or uncured material if necessary
- Prime and recoat per manufacturer's recommendations

Tips to Minimize Future Occurrences

- Investigate previous coating thicknesses and total permeance
- Install under proper ambient conditions (temperature and moisture)
- Utilize mock-ups to ensure compatibility and adhesion of coatings
- Perform surface moisture test / Check for surface moisture

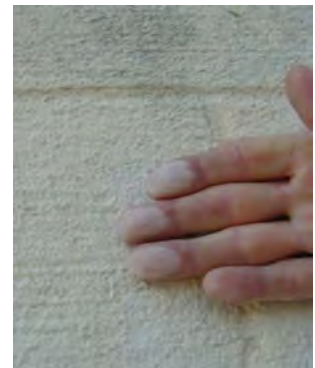


Surface Preparation Considerations and Common Issues

Surface preparation is the first step to a successful application. Understanding how coatings interact with a substrates, surfaces, and features of the substrate/surface are critical.

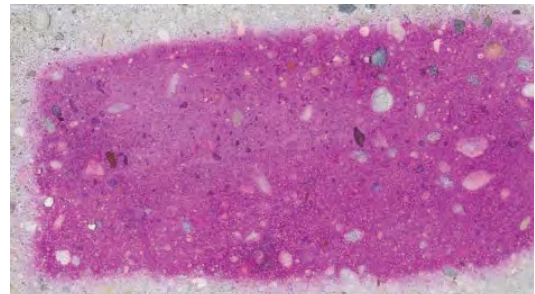
Dusting

Dusting is a condition that refers to the phenomena of a dusty layer of particulate appearing on the surface of concrete structures. This typically occurs not long after initial placement and curing of the concrete, but can be seen after cleaning a concrete surface as well. The dust is most commonly a layer of weakened concrete that has deposited on the surface of the concrete. This can either be from chemical cleaning that has degraded the concrete, excess water used in the concrete mix, extra water used to finish the surface of the concrete, or from a cold weather cure. This dust layer needs to be removed and cleaned before application of any coating to ensure a proper bond to the concrete.



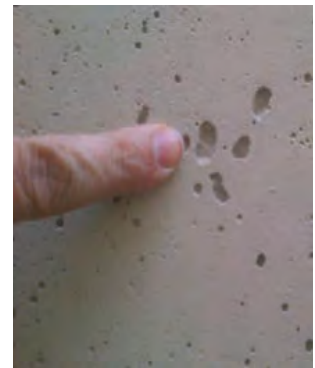
pH

pH is the measure of how acidic or alkaline materials are. Freshly placed concrete and other cementitious materials have a pH of around 13, making them extremely basic. Even after final set and curing, these materials can still have a high pH. If a coating is placed onto concrete while it still has a high pH, the curing of the coating can be negatively affected. A simple way to check to make sure that the pH levels of a substrate are safe to coat is to use a pH pencil. This useful tool will indicate pH levels of substrates based on the color of a marking applied. It is not recommended to apply coatings on any surface with a pH higher than 12.



Bug Holes

Bug holes are small, regular or irregular cavities, usually not exceeding 5/8" (15 mm) in diameter, resulting from entrapment of air bubbles in the surface of formed concrete during placement and consolidation. If these are left unaddressed and coated over, the coating may not be able to bridge the surface of the bug hole after curing, or they may act as moisture pockets that will degrade the coating and cause further issues. If individual bug holes or pop-outs are found, they should be filled with a filler compound or patched with a cementitious patching material, depending on size. If there are large groups or widespread areas of bug holes and pop-outs, further investigation should be done to verify the integrity of the concrete. The top surface layer may need to be removed and repaired to ensure the coating is applied to a sound substrate.



Patching

Cracks in a substrate need to be addressed. Failure to address them may cause the coating to fail. It should be first determined if the crack is a static (non-moving) or dynamic (moving) crack. If the crack is static, it is recommended to use an acrylic patching compound to fill the crack. For cracks up to 1/16" (1.6 mm), the material can be applied with a damp sponge to fill it. For cracks between 1/16" (1.6 mm) and 1/4" (6.35 mm), it is recommended that a putty knife be used to fill the crack, then smoothed over with a trowel. If cracks are larger than 1/4" (6.35 mm), or are dynamic, they need to be routed and sealed with an elastomeric sealant that is compatible with acrylic wall coatings.

Honoring Joints vs. Coating Over Sealants

When a crack or joint is sealed, there are several ways to approach coating in combination with a sealant. Use of nonelastomeric coatings over expansion joints is not recommended. An investigation into how much movement the joint experiences should be done to determine if an elastomeric will hold up to the joint movement or if the joint should be "honored". Honoring the joint means that during the application of the wall coating, an applicator would coat up to the unsealed joint, without allowing any coating to get into the joint, then properly install the backer rod and sealant to the joint. If an investigation finds that the elastomeric coating will not accommodate more movement than the joint will experience, the joint should be honored to prevent tearing of the coating. If an elastomeric coating is applied over a sealed expansion joint, the sealant should be allowed to fully cure, then be primed before applying the coating. Whenever a non-elastomeric is going to be used in combination with sealant it is recommended to honor the joint.



Porous Substrate

Applying coating over a very porous substrate can cause "pinholes" to appear in the cured coating. This is due to the coating not being able to effectively coat the very rough surface. For a successful installation of a coating over porous substrate, the substrate should be checked for moisture level and soundness. The substrate should be sound and have a moisture level below 12%. Once confirmed, a block filling compound should be used to fill the pores of the substrate. This will contribute to obtaining a pinhole free application.



Guideline Procedures for Coatings Mock-ups

Mock-ups are an important part of the construction process. A mock-up serves to manage the expectations of the customer while confirming to all parties the color, texture, coverage rates and workmanship of the final system to be applied to the structure. The intent of this section is to assist in a successful application of a high-build coatings job mock-up.

1. Field samples need to be applied at least one week prior to any specified coatings pre-installation site conference.
2. The location and size should be dictated by the specifications or at the direction of the project/ construction manager, or owner. The mock-up should be located where it can be viewed easily from the ground. The location should be recorded and noted for future consultation.
3. High-build coatings are best applied out of the direct sunlight.
4. An accepted sample mock-up needs to be maintained during construction, should not be altered or destroyed, and will be the standard for judging color, texture and workmanship on the remainder of the project.
5. A complete mock-up system must be applied, including base, primer materials or multiple coats, as specified. A block filler should be used if required as per the specification.

Cold Weather Application Recommendations

During autumn and into winter, the application and proper curing of acrylic coatings can be significantly affected by low air and substrate temperature, as well as increased moisture levels in the atmosphere. Master Builders Solutions highly discourages exterior coating in temperature below 40° F (4° C).

The following factors, either individually or in combination with each other, can negatively affect the outcome of a cold weather coating application:

Air Temperature - The proper formation of the coating film can be affected if the coating is applied when the air temperature is below the specified temperature range. Temperature variations can affect the degree of coalescence (film formation) of an acrylic coating, causing color variations.

Moisture levels - The moisture level in the air increases as temperature drops during the winter, which can cause large amounts of condensation to form on the exposed surfaces. If the condensation forms on a coating film that has not fully cured, it can cause surfactant bleed or shadowing, primarily in deep and accent colors as evidenced by dark streaks or blotches on the coating film. Condensation can also dramatically slow the dry time and cure time of the film, increasing the water sensitivity of the coating film until it has fully cured.

Substrate Temperature - When surface temperature of the substrate is below the specified temperature range, it can significantly slow the drying time and even prevent proper coalescence of the coating. It is important to note that the surface temperature can vary between different areas on the same structure, causing dry time and proper coalescence to vary as well. Keep surface temperature 5° F above dew point when coating.

Glossary of Terms

Blisters:

Sporadic areas of lifting or swelling of the coating filled with air or fluid. Blisters can vary significantly in size, shape, and thickness. (See also wrinkles)

Chalking:

Formation of a powder on the surface of a paint film caused by disintegration of the binder during weathering. Can be affected by the choice of pigment or binder.

Coalescence:

The formation of resinous or polymeric material when water evaporates from an emulsion or a latex system, permitting contact and fusion of adjacent particles. Proper coalescence during coating curing is vital to the integrity of a wall coating.

Cracks:

Splitting or detaching of dry coating film. Fractures in the existing substrate that telegraph through coating, or fractures that occur in cured membrane after application. (See also flakes)

Debonding:

Bond line failure between the coating and existing substrate. (See delamination)

Delamination:

Bond line failure between the coating and existing substrate. (See debonding)

Efflorescence:

White, powdery residue on the surface of a substrate or coating. Efflorescence can appear at any time; however, it is most common within the first year of construction of a new building or remediation of an existing wall.

Fading:

Lightening or loss of vibrancy of coating color.

Flakes:

Splitting or detaching of dry coating film. (See also cracks)

Lapping:

Appear as denser color of increased gloss at areas of paint application overlaps.

Peeling:

Poor adhesion, resulting in loss of coating. Can occur at most recent or previous layers and may be isolated or widespread.

Picture Framing:

Picture framing occurs when the edges and corners of a surface appear darker or lighter than the rest of the wall.

Pinholes:

Pinholes are tiny holes in the coating caused by rupturing of miniscule bubbles.

Roller Stipple:

Unintentional textured pattern caused by roller application of coating.

Sagging:

Excess paint appearing in a droop formation on the wall immediately after application.

Surfactant Leaching:

Soapy residue on the coating causing glare, streaks, and blotches. Typically evident within the first month of application. Surfactant leaching is a natural occurrence of acrylic coatings and does not affect the performance of the material.

Texture:

Profile of finished coating to impart aesthetic features to the overall system.

Water Damage:

Displacement of material due to a water event before the system has cured. Severity of damage is typically proportional to the length of time the coating has been allowed to cure.

Wrinkles:

Crinkled or wrinkled coating which may be isolated or wide spread. (See also blisters)

Additional Resources

Consult the following for more information:

Master Builders Solutions Technical Support:

A team of experienced Technical Support Specialists are available to assist with your immediate needs. Technical Support can be reached at 1(800)243-6739 or at BLDGSTECHSUPPORT@mbcc-group.com

Master Builders Solutions Website:

For Technical Data Guides and SDS for MasterSeal Traffic Deck Membrane systems and components: www.master-builders-solutions.com.us/en-us/products/masterseal

For Technical Bulletins and Technical Drawings pertaining to specific MasterSeal Traffic systems and application:

www.master-builders-solutions.com.us/en-us/support-for-professionals/technical-service





Master Builders Solutions

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The know-how and experience of a global community of MBCC Group construction experts form the core of Master Builders Solutions. We combine the right elements from our portfolio to solve your specific construction challenges. We collaborate across areas

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Solutions for concrete strengthening

MasterCast®

Solutions for manufactured concrete product industry

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