TECHNICAL GUIDE

TROUBLESHOOTING

Prepared by NEOGARD®® Technical Service • November, 2014

WATERPROOFING, FLOORING & ROOFING

CAUSE, REPAIR, & PREVENTION

November 2015 Edition

Introduction

Dear Customer,

Elastomeric coating technology, from product development to application, has expanded rapidly in recent years. Experience and knowledge are essential for keeping pace and excelling in this ever expanding arena.

Developing this knowledge involves learning curves and years of experience. Against a backdrop of intensive competition in the industry, association with experts in the field of elastomeric coating materials is a determining advantage.

In this “Troubleshooting Guide”, NEOGARD® has attempted to categorize and comprehensively interpret several decades of knowledge for your use. Many troubleshooting causes and repair procedures as well as preventions are provided in this handbook.

We hope this guide provides you with assistance in your daily construction schedules and look forward to a continuing relationship with your company for all your waterproofing, roofing and flooring needs. For questions related to this manual, contact techservice@NEOGARD®.com.

Your NEOGARD® Team

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PINHOLES

DESCRIPTION

Pinholes appear as tiny blisters or bubbles. When these blisters pop they usually leave a round crater and the pinhole should be easily seen through the film.

CAUSE

- POROUS CONCRETE: Concrete releases air and moisture vapor that expands as temperatures rise. Also, aggressive shot-blasting or scarifying can open concrete pores and bug holes.
- EXCESSIVE AGGREGATE: Air entrapped in wear coat when aggregate is applied too heavily, leaving air pockets.
- EXCESSIVE ADDITIVES: When over accelerated, coating rapidly forms a film, trapping air from the substrate, preventing escape during the curing process. Adding solvents can result in surface pinhole blisters if the solvent is not allowed to escape prior to gel.

REPAIR

1. Break blisters with a stiff bristle broom or squeegee before additional coating is applied.
2. A light abrasion may be required to maintain good aesthetic appeal.
3. Large areas of pinholes may need to be ground with a wire cup grinder.
4. Clean surface and solvent wipe if necessary.
5. Apply additional coating.

PREVENTION

- POROUS CONCRETE:
  - Begin application as temperatures are dropping and continuing to drop. Rising temperatures result in detrimental expansion of the moisture and air in the concrete. Falling temperatures do the opposite; the air and moisture are contracting within the concrete. See ***Weather Impact*** in the Support Information section of this manual.
  - Apply the specified system in thinner coats. Obviously, this procedure means more coats are involved in applying the full system.
  - Thin the material being used in the first base coat. Thinner applications may displace the air in the pinholes. Thicker applications may result in larger craters forming around the pinhole that will affect the aesthetics of the system. Use only commercial grade solvents and never thin products more than 10% by volume. Excessive thinning may affect physical properties of the coating.
- EXCESSIVE AGGREGATE: Apply wear coat at specified rates, taking care to prevent aggregate from leaving entrapped air pockets.
- EXCESSIVE ADDITIVES: Avoid using accelerators during hot temperatures. See ***Weather Impact*** in the Support Information section of this manual.

CRATERS DUE TO MOISTURE CONTAMINATION

DESCRIPTION

Craters due to moisture will typically occur in clusters.

CAUSE

- Moisture from relative humidity or moisture contaminated aggregate will react with the coating material and cause a bubbling effect as shown above. This is caused by a chemical reaction between moisture and the urethane coating material.

REPAIR

1. Grind affected areas smooth.
2. Clean surface and solvent wipe if necessary.
3. Apply additional coating to match adjacent areas.

PREVENTION

- Ensure that the deck is completely dry before coating. Moisture may not be readily apparent, particularly if aggregate has been introduced into the system. Conduct a moisture test before coating application to ensure that there is no contamination.
- Keep aggregate dry as it can be a source of moisture contamination.
- Ambient surface temperature should be more than 5°F above dew point. See ***Dew Point Chart*** in the Support Information section of this manual for ambient temperature and relative humidity guidelines.

BLISTERING DUE TO WATER CONTAMINATION

DESCRIPTION

Blisters look like bubbles in the coating surface. The blisters will have a trace of water or moisture trapped inside them. Moisture between the aggregated wear coat and topcoat leaves an orange peel texture on the backside of the blister, mirroring the sand coat texture.

Blisters from rain/sprinkler system

Blisters from dew

CAUSE

- Water from rain, dew or other sources, mixed or rolled into wet, uncured coating. The urethane coating reacts with the water and attempts to cure on the surface, forming blisters and stress wrinkled areas.

REPAIR

1. Cut out and remove all blistered and wrinkled areas.
2. Grind affected areas to sound coating.
3. Allow to dry thoroughly.
4. Re-apply coating as needed to bring system to specified thickness.

PREVENTION

- Do not apply coating if rain is imminent.
- Ensure that sprinkler/lawn systems remain off for the duration of the cure.
- Ambient temperature should be more than 5° above dew point. See ***Dew Point Chart*** in the Support Information section of this manual for ambient temperature and relative humidity guidelines.
- Ensure that the deck is completely dry before coating. Moisture may not be readily apparent, particularly if aggregate has been introduced into the system. Conduct a moisture test before application to ensure that there is no water contamination.

BLISTERING DUE TO THICK COATING

DESCRIPTION

Blisters look like small to large unbroken bubbles in the coating surface and can appear round or oblong. Depending on the state of cure, they can feel spongy or fluid beneath the surface.

CAUSE

- Coating was applied at a rate greater than application instructions.

REPAIR

1. Completely remove affected areas down to cured coating or substrate.
2. Reapply coating system per NEOGARD® specifications and recommendations.

PREVENTION

- During installation of coating, frequently check the wet film thickness by use of recommended mil gauges.
- Laying out the job prior to coating by gridding out the area will help to maintain proper and uniform coating thicknesses.
- During application, backroll to eliminate low spot areas where self-leveling coating may pool.

WRINKLING

DESCRIPTION

Coating is wrinkled in appearance. Multiple lines of parallel wrinkling may occur.



CAUSE

- UNCURED/OFF-RATIO COATING: Material applied over uncured or off-ratio coating, causing stress on topcoat.
- COATING TOO THICK: Coating applied at a thickness that exceeds application instructions.

REPAIR

1. Remove coating in affected areas to cured coating or sound substrate.
2. Apply coating at rates specified by NEOGARD®.

PREVENTION

- UNCURED COATING: Ensure that coatings are completely cured prior to proceeding with the application of additional coats.
- COATING TOO THICK: Apply coatings at recommended coverage rates.
- OFF-RATIO COATING: Mix all materials thoroughly, following mix ratios printed on product labels or the Product Data Sheet. See ***Product Mixing Instructions*** in the Support Information section of this manual.

BLISTERING DUE TO SLOW CURE/NOT CURING

DESCRIPTION

Coating is soft and may transfer when touched. Coating may also delaminate.

Typical blister

Area underneath removed blister

Off-ratio

CAUSE

- Product is not mixed properly and is off-ratio. Generally, the coating will feel tacky, but in the worst case scenarios the coating will remain in a liquid state.

REPAIR

1. Cut out blister to sound, clean substrate.
2. Solvent wipe to remove all residue.
3. Grind down edges for a smooth transition.
4. Ensure all edges are totally bonded leaving no fish mouths or air gaps.
5. Re-apply system.

PREVENTION

- Allow previous coats sufficient time to cure prior to applying additional coats.
- Mix all materials thoroughly, following mix ratios printed on product labels or the Product Data Sheet. See ***Product Mixing Instructions*** in the Support Information section of this manual.

PEELING/DELAMINATION

DESCRIPTION

Premature failure of coating can occur through delamination. Coating may peel off in places and show signs of concrete laitance or other contaminants on the backside.

Delamination due to moisture

Delamination due to incompatible materials

Delamination due to improper surface preparation

CAUSE

- IMPROPER SURFACE PROFILE: Surface was not shot-blasted or abraded prior to applying membrane or the base coat was applied over epoxy primer after the 24 hour window.
- MOISTURE: There was dew or other moisture on the surface that was coated.
- CONTAMINATION FROM DUST, DIRT, ETC.: Coating over contaminated surfaces will lead to coating failures such as loss of bond.
- INCOMPATIBLE MATERIALS: Materials that are incompatible with the coating will cause an array of issues including delamination.
- THIN TOPCOAT APPLICATION: A final topcoat applied at insufficient coverage rates may delaminate and peel from the coating system.

REPAIR

1. Remove all loosely bonded material.
2. If substrate is exposed, abrasion may be necessary.
3. Clean repair area.
4. Re-apply material as specified and per NEOGARD® recommendations.

PREVENTION

- IMPROPER SURFACE PROFILE: Substrate should be shot-blasted or abraded and cleaned prior to application of primer. Surface should ideally be shot-blasted to the required ICRI surface texture (CSP3 to CSP4) to remove surface contamination or concrete laitance and allow for optimal bonding. Base coat must be applied within 24 hours of primer application. If base coat cannot be applied within 24 hours, clean and re-apply primer or consult NEOGARD® Technical Services.
- CONTAMINATION–Ensure deck is clean and dry prior to application of material.
- INCOMPATIBLE MATERIALS: Perform field adhesion test prior to application of the coating when installing coating over existing coating system. See ***Field Adhesion Testing*** in Support Information section of this manual.
- Apply coating at specified rates and per NEOGARD® recommendations.

CRACKS

DESCRIPTION

Cracks in concrete substrate may telegraph through the coating and become clearly visible. Over time, these cracks may increase in number as well as in size.

CAUSE

- SETTLING: Substrate cracks are caused by shifting and settling of the structure after original construction.
- EXPANSION/CONTRACTION: Concrete structures continually experience expansion and contraction driven by temperature, moisture and load. All cracks should receive detail treatment prior to application of the base coat.

REPAIR

1. Route cracks.
2. Fill with NEOGARD® 70991 or 70995 polyurethane sealant and strike flush. Allow sealant to fully cure.
3. Clean repair area with NOEGARD's 8500 BioDegradable Cleaner or solvent wipe. Extend cleaning 6"–8" beyond the affected area.
4. Prime any exposed concrete.
5. Install a detail coat of base coat material extended to a minimum of 2" on either side of the crack to yield a thickness of 30 dry mils. Allow to cure and then apply required system.
6. Option to # 5 Above: Apply base coat material extended to a minimum of 3" on either side of the crack at 30 dry mils and embed reinforcing fabric into wet coating. Center fabric over urethane sealant and allow to fully cure. Apply additional base coat material as necessary to fully encapsulate reinforcing fabric. Allow detail coats to cure, then apply required system.

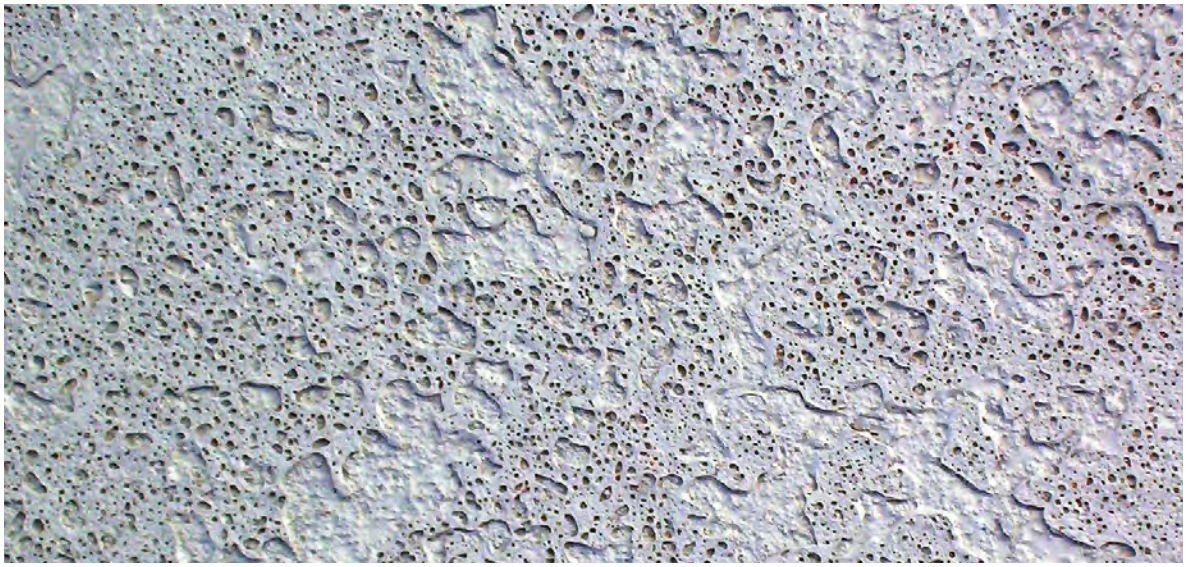
PREVENTION

- Prior to application of the coating system, perform proper surface preparation including crack detail:
    - Hairline cracks (<1/16") should receive a 30 mil detail coat utilizing base coat material, a minimum of 2" on either side of crack.
    - Large cracks (>1/16") should be routed and filled with NEOGARD® 70991 or 70995 polyurethane sealant. After sealant is fully cured, apply a 30 mil detail coat utilizing base coat material extended to a minimum of 2" on either side of the crack. Reinforcing fabric is optional.

WATER DAMAGE TO UNCURED COATING

DESCRIPTION

Surface has areas of sponge-like, cratered patterns where water has come in contact with uncured coating.



CAUSE

- Heavy rain, sprinklers or other water source caused damage to uncured coating.

REPAIR

1. Grind all affected areas to eliminate ridges in the cratered areas.
2. Clean and allow to completely dry.
3. Re-apply coating as specified and according to NEOGARD® recommendations.
4. In severe situations, the coating may have to be totally removed prior to re-coating.

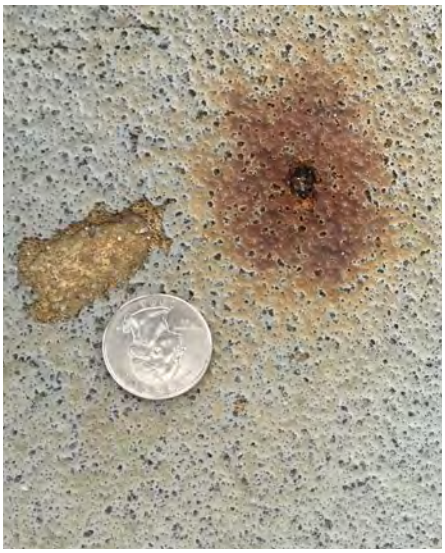
PREVENTION

- Do not apply coatings if rain is imminent.
- Ensure sprinkler systems are disabled for duration of the project.

RUST/METAL CONTAMINATION

DESCRIPTION

There are rusty, reddish-brown stains in the coating. The presence of rust can be purely aesthetic or may indicate a condition which affects the integrity of the coating system.


CAUSE

- SHOT-BLAST BEADS: Rust stains develop when shot-blast beads utilized during surface preparation are not properly removed. Rust stains will bleed through the entire system if metal is not removed prior to applying the coating system.
- METAL IN AGGREGATE: Rust may also develop from metal fines contained in the aggregate.
- REBAR OR MESH: Rust from rebar or mesh too close to the surface can also appear.

REPAIR

- SURFACE CONTAMINATION:
  - If the contamination source is from the surface, power washing along with the use of a rust neutralizer may remove stained area.
- SUBSTRATE CONTAMINATION:
  1. If the contamination source is located in the substrate, remove the coating down to the substrate and abrade the surface to remove all rust.
  2. Apply Ureprime HS2 or HS4 at a rate of 300 sf/gal to properly prepared area and allow to cure.
  3. Apply 70714/70715 Series epoxy at a rate of 100 sf/gal (16 WFT/16 DFT).
  4. Re-apply coating per specifications and NEOGARD® recommendations in the Waterproofing Application Manual.

PREVENTION

- SHOT-BLAST BEADS: Remove all iron and metal residue from the substrate surface including cracks and joints.
- METAL IN AGGREGATE: Use NEOGARD® or NEOGARD® approved aggregates.
- REBAR/MESH: After the deck is cleaned and shot-blasting completed, inspect for rebar and/or mesh near the surface. If rebar or mesh is near the surface, it may be necessary for the owner to consult with a structural engineer.

COLOR DIFFERENTIAL

DESCRIPTION

Finished waterproofing surface shows different shades of color. While considered less than aesthetically appealing, this condition does not affect the integrity of the waterproofing system.

CAUSE

- DIFFERENT BATCHES OF TOPCOAT: There may be slight shade variation from batch to batch of material.
- DECK NOT COATED ALL AT ONCE: The older material has weathered.
- IMPROPER MIXING: Product not mixed sufficiently to disperse pigment. See ***Product Mixing Instructions*** in the Support Information section of this manual.

REPAIR

- Apply an additional wear coat and topcoat.
- Allow sufficient time for weathering.

PREVENTION

- DIFFERENT BATCHES OF TOPCOAT: Always purchase or set aside enough topcoat from the same production batch to coat the entire surface area. Use odd batches elsewhere such as in the wear coat if applicable. If there is not enough topcoat of a single batch to complete the project, “boxing” batches is an alternative. Boxing is the process of combining all the coating you will be using as the topcoat into one large container. This is especially important when coating a large surface area or if there is insufficient coating from a single batch, where a color variation from one batch to another is likely.
- DECK NOT COATED ALL AT ONCE: When deck coating is completed in phases, a transition such as a wide joint, will help to minimize appearance differential from weathering.
- IMPROPER MIXING: Always mix material sufficiently to properly disperse the pigment. See ***Product Mixing Instructions*** in the Support Information section of this manual.

FIBER REINFORCED CONCRETE (FRC)

DESCRIPTION

Fibers have been added to the concrete mix to control shrinkage cracks and to improve other physical properties. These fibers will protrude and breach the coating system and may cause future leaks.

CAUSE

- Fibers that have been added to the concrete mix will protrude through the concrete surface.

REPAIR

- Mechanically prepare surface by shot-blasting to industry standard texture (ICRI CSP3–CSP4) without causing defects to substrate.
- Remove fibers by burning with a propane torch.
- Remove any remaining residue prior to coating application.

PREVENTION

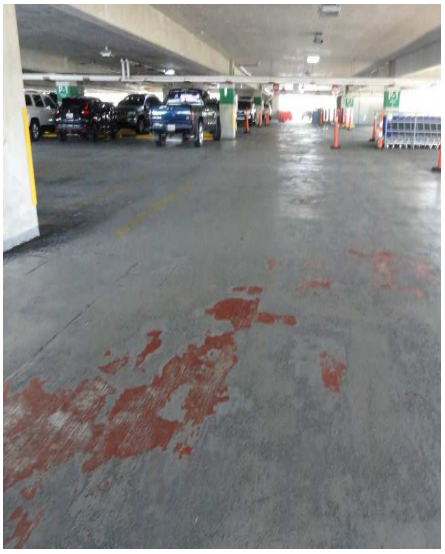
- It is not recommended to use fibers in the concrete mix when a coating is to be applied. If fibers are present, remove prior to application of coating.

EXCESSIVE WEAR

DESCRIPTION

Coating is worn, exposing primer and bare concrete.





CAUSE

- INAPPROPRIATE APPLICATION: Excess aggregate in wear coat and insufficient topcoat material led to premature wear.
- WRONG SYSTEM SPECIFIED: Applied system not designed for heavy duty areas such as drive lanes, turns, ticket splitters, etc.
- MOISTURE CONTAMINATION: Premature wear due to moisture contamination during application.
- IMPROPER MIXING: Failure to mix components properly prior to installation, scraping unmixed material from walls of buckets, insufficient mixing time for proper dispersion, or a contaminated mixing paddle, resulting in off-ratio components and prohibiting the proper development of physical properties.

REPAIR

1. Remove all loosely bonded material. In areas where primer is exposed, grind to expose substrate.
2. Clean repair area with NEOGARD® 8500 BioDegradable Cleaner and solvent wipe.
3. Re-apply coating as specified and according to NEOGARD® recommendations.

PREVENTION

- INSUFFICIENT COATING: Apply system as recommended by manufacturer; include heavy duty application in designated areas.
- SYSTEM SPECIFICATIONS: Ensure that the appropriate system is specified for existing project conditions and use.
- MOISTURE CONTAMINATION: Ensure that the deck is completely dry prior to coating. Moisture may not be readily apparent, particularly if aggregate has been introduced into the system. Monitor the ambient surface temperature for the entire duration of the application process . See ***Dew Point Chart*** in the Support Information section of this manual for ambient temperature and relative humidity guidelines.
- IMPROPER MIXING: Mix all materials thoroughly following recommended mix ratios printed on product labels or the Product Data Sheet. All mixing equipment should be clean to prevent contamination. See ***Product Mixing Instructions*** in the Support Information section of this manual.

DELAMINATION CAUSED BY SEALANT

DESCRIPTION

Coating delamination has occured due to off-ratio, uncured sealant.

CAUSE

- Two-component sealant was improperly mixed or was contaminated.

REPAIR

1. Completely remove all sealant and residue from joint or affected area.
2. Solvent wipe with Xylene.
3. Re-apply properly mixed, compatible, urethane sealant to joint or affected area.
4. Solvent wipe cured sealant surface prior to application of coating.

PREVENTION

- When mixing sealant, scrape sides of bucket and thoroughly mix with the catalyst and color pack. Carefully follow sealant manufacturer's mixing instructions.

BLISTERS CAUSED BY TRAPPED MOISTURE

DESCRIPTION

The coating system fails due to delamination caused by moisture migration in the concrete substrate.

CAUSE

- Trapped excess moisture in or below the concrete substrate.

REPAIR

1. Identify the source of the moisture.
2. Remove coating in affected areas down to clean substrate.
3. Re-apply coating per specifications and recommendations in the NEOGARD® Waterproofing Application Manual.

PREVENTION

- MOISTURE CONTAMINATION: Ensure that the deck is completely dry prior to coating. Moisture may not be readily apparent, particularly if aggregate has been introduced into the system. Monitor the ambient surface temperature for the entire duration of the application process. See ***Dew Point Chart*** in the Support Information section of this manual for ambient temperature and relative humidity guidelines.
- MOISTURE TEST: Ensure that the deck is completely dry before coating. Moisture may not be readily apparent, particularly if aggregate has been introduced into the system. Conduct a moisture test before application to ensure that there is no water contamination.

PINHOLES/AIR BUBBLES

DESCRIPTION

Pinholes appear as tiny blisters or bubbles. When these blisters pop they usually leave a round crater and the pinhole should be easily seen through the film.

CAUSE

- OUTGASSING: Air escapes from porous concrete and becomes trapped in the coating.
- AIR MOVEMENT: Excessive air movement from vents, doors or other sources may cause flash drying and prevent necessary air release from coating.
- TEMPERATURE/HUMIDITY: Too hot or too humid conditions can result in rapid drying that results in air entrapment in coating.
- DIRECT SUNLIGHT: Floors exposed to direct sunlight can tack off before sufficient air release has occurred, forming bubbles.
- IMPROPER MIXING: Fast speed mixing equipment and improper mixing procedures may result in entrapped air.
- ROLLER COVERS: Too short or too long of a nap roller can cause air to be introduced into the coating causing air bubbles.
- SURFACE PREP: Aggressive shot-blasting or sandblasting will open up pores in the concrete causing air to become trapped when coating is applied.

REPAIR

1. Sand affected areas to a smooth, flat finish with 60 grit sandpaper.
2. Fill large craters with 100% solids epoxy material.
3. Vacuum to remove dust and debris.
4. Re-apply coating at the rate of 250 sf/gal.

PREVENTION

- OUTGASSING: For very porous concrete it may be necessary to pre-prime with 7779/7781. You may also use 70714/70715 or 70714/70715-09 as a pre-primer, thinned with 7055 Odorless Reducer at 3%-5%. Spike rolling will help eliminate blisters when they begin to appear but may not remove them entirely.
- AIR MOVEMENT: Avoid any condition that can generate fast air movement across the coating. When providing ventilation, always exhaust air rather than blowing with fans.
- TEMPERATURE/HUMIDITY: Wait until the temperature and humidity are within the ranges specified in the Product Data Sheet to apply the material.
- DIRECT SUNLIGHT: Prevent direct sunlight exposure during initial cure.
- IMPROPER MIXING: Use slow speed mixing equipment with a paddle-type blade. If air is introduced into the material, let stand until air is visibly released.
- ROLLER COVERS: Use the appropriate length nap roller of 1/4”–3/16” and apply without vigorous rolling. De-air with a spike roller if necessary.
- SURFACE PREP: Avoid aggressive shot-blasting. Sandblasting is not a proper surface preparation method for NEOGARD® flooring systems.

FISH EYE

DESCRIPTION

Fish eyes are round indentations or separation in the coating finish. Upon closer examination, they look like a crater with a rim around the perimeter of the defect along with a very small dot in the center – hence the name “fish eye”.

CAUSE

- SILICONE CONTAMINANTS: Certain manufacturing processes such as welding or spraying can deposit silicones on the floor causing fish eyes to appear.
- OIL/GREASE CONTAMINANTS: Oil or grease contaminants can cause the coating to function improperly and fish eyes to appear.

REPAIR

- SILICONE CONTAMINANTS:
  1. For minor fish eyes, abrade with #60 grit sandpaper.
  2. For widespread fish eyes, completely remove coating.
  3. Solvent wipe to remove contaminants.
  4. Recoat the area.
- OIL/GREASE CONTAMINANTS:
  1. Remove the coating by grinding, stripping or other suitable methods.
  2. Clean the substrate, removing all contaminants.
  3. Recoat the area.

PREVENTION

- SILICONE CONTAMINANTS: Become familiar with certain types of operations and test areas prior to application. Properly prepare the substrate before coating.
- OIL/GREASE CONTAMINANTS: Degrease surface properly. After degreasing, surface may need to be scarified. If all contaminants cannot be removed, contact NEOGARD® Technical Services department.

PEELING/DELAMINATION

DESCRIPTION

Coating is peeling or de-bonding from either the substrate or between layers of coating.

Delamination–substrate

Delamination–between coats

DELAMINATION FROM SUBSTRATE

CAUSE

- INADEQUATE CLEANING: Coating will not adhere to oil, grease or other contaminants.
- NO PRIMER USED: Without primer, peeling/delamination may occur.
- MOISTURE VAPOR TRANSMISSION: Water vapor penetrating through the substrate can cause peeling/delamination. After removing delaminated areas, moisture may be visible or the concrete may be dark in appearance.

REPAIR

- INADEQUATE CLEANING:
  1. The coating must be removed by stripping, shot-blasting or other suitable means.
  2. Re-apply the coating after proper surface preparation.
- NO PRIMER USED:
  1. Remove any coating that is not tightly bonded by stripping, shot-blasting, or other suitable means.
  2. Prime and recoat after proper surface preparation.
- MOISTURE VAPOR TRANSMISSION:
  1. Remove any coating that is not tightly bonded by stripping, shot-blasting, or other suitable means.
  2. Consult NEOGARD® Technical Services if this condition exists.

PREVENTION

- INADEQUATE CLEANING: Properly clean the substrate and provide a suitable profile for adhesion by stripping, shot-blasting, or other suitable means.
- NO PRIMER USED: Use a suitable primer prior to coating the substrate after proper surface preparation.
- MOISTURE VAPOR TRANSMISSION:
  - Substrates in contact with ground must have a properly installed, effective vapor barrier to help prevent potential problems resulting from hydrostatic, capillary or moisture vapor pressure.
  - Always perform a calcium chloride test to ASTM standards prior to installation. Test results should yield no more than 3 pounds of moisture per 1,000 square feet per 24 hours.
  - When calcium chloride test results are higher than 3 pounds per 1,000 square feet per 24 hours, consult NEOGARD® Technical Services.

PEELING/DELAMINATION–CONTINUED

DELAMINATION BETWEEN COATS

CAUSE

- BEYOND RECOAT WINDOW: Coating was not applied within 24 hours of previous coat.
- SURFACE CONTAMINATION: Surface was contaminated by water, humidity, oil, grease, or dust.
- IMPROPER MIXING:Coating was not mixed at proper mix ratio or not mixed for a minimum of 3 minutes.

REPAIR

- BEYOND RECOAT WINDOW:
  1. Remove all loose, peeling, or un-bonded material.
  2. Sand surface using a circular floor sander with #60 grit sandpaper.
  3. Vacuum surface to remove any dust or debris left by sanding.
  4. Solvent wipe the floor with 20653 Xylene or 7055 Odorless Reducer.
  5. Reapply coating as per the NEOGARD® Flooring Application Manual.
- SURFACE CONTAMINATION:
  1. Surface needs to be clean/dry of any contaminants prior to coating. Vacuum or mop any water or dust. Oil or grease will need to be removed first by using an industrial-type degreaser or NEOGARD® 8500 BioDegradable Cleaner.
  2. Make sure the surface is completely dry before applying next coat. If surface has gone beyond the 24 hour recoat window, it will need to be sanded using a circular floor sander and #60 grit sandpaper.
  3. Vacuum surface to remove any dust or debris left over from sanding.
  4. Solvent wipe the surface using 20653 Xylene or NEOGARD® 7055 Odorless Reducer.
  5. Re-apply coating as per the NEOGARD® Flooring Application Manual.
- IMPROPER MIXING:
  1. Remove any loose, peeling, or uncured coating.
  2. Remove all uncured material by solvent wiping with 20653 Xylene or 7055 Odorless Reducer.
  3. Sand surface using a circular floor sander and #60 grit sandpaper.
  4. Vacuum surface to remove any dust or debris resulting from sanding.
  5. Solvent wipe surface with 20653 Xylene or 7055 Odorless Reducer.
  6. Re-apply coating as per the NEOGARD® Flooring Application Manual.

PREVENTION

- BEYOND RECOAT WINDOW: Each coat needs to be applied within 24 hours.
- SURFACE CONTAMINATION: Check substrate carefully before applying coating. Remove any existing contaminants.
- IMPROPER MIXING: Follow mixing instructions printed on labels, Product Data Sheets, guide specifications, or in the NEOGARD® Flooring Application Manual.

MILKY / CLOUDY COATING

DESCRIPTION

There is a milky or cloudy appearance in wet or cured coating material.

CAUSE

- MOISTURE: Moisture in the concrete or high humidity levels can cause moisture to be present on the surface when the material is applied, or before it is fully cured. This can result in a milky appearance or greasy film. This condition is sometimes referred to as “blush” and is more prevalent with certain epoxies.
- THICK APPLICATION: A milky or cloudy appearance may result from the coating being applied too thick. In this case, the milky appearance will be more noticeable if the coating is clear.

REPAIR

- MOISTURE:
  1. Remove affected material by sanding with #60 grit sandpaper.
  2. Apply additional coats when humidity is at acceptable levels.
  3. If a “greasy” film appears, solvent wipe with 20653 Xylene or 7055 Odorless Reducer.
- THICK APPLICATION:
  1. Remove affected material by sanding with #60 grit sandpaper.
  2. If a greasy film appears, solvent wipe with 20653 Xylene or 7055 Odorless Reducer.

PREVENTION

- MOISTURE: Test the concrete for moisture per ASTM standards prior to application. Apply material when humidity levels are low.
- THICK APPLICATION: Apply material in accordance with guide specifications on material thickness/coverage rates.

PRODUCT SETTLING

DESCRIPTION

Solid material settles in the bottom of the bucket. This typically occurs in the pigmented/color side of a product.

CAUSE

- TIME: Some products have a tendency to settle over time.

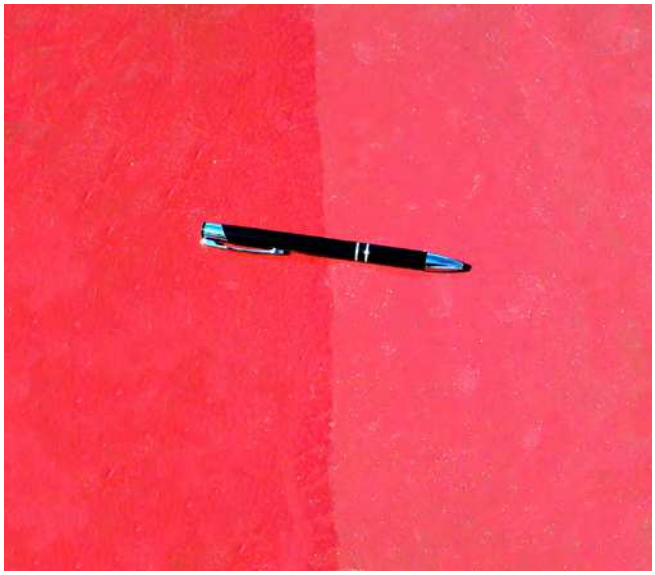
PREVENTION

- If there are signs of pigment settling, special care needs to be taken during initial mixing.
- Make sure mixing paddle reaches bottom of bucket and mix the settled material well to ensure pigments are dispersed back into product.
- Always pre-mix pigmented side before adding hardener.
- If settlement is pasty or dry and does not mix back into material, do not use.

COLOR DIFFERENTIAL

DESCRIPTION

Coated surface has different shades of color.



CAUSE

- RETOUCHING AFTER 15 MINUTES: Color float issues arise when a pigmented material has been applied and it is retouched after it has been sitting for 15 minutes or longer. Different shades in color may appear.
- DIFFERENT BATCH NUMBERS: As coloring can vary from batch to batch, using different batch numbers at a job site can also cause differences in color appearance.

REPAIR

1. Backroll entire area with an 18” roller going from side to side.
2. Recoat the entire area with material from the same production batch.
3. If batch numbers are different, box the pigmented side first before adding hardener.

PREVENTION

- RETOUCHING AFTER 15 MINUTES: If material needs to be retouched for any reason, it should be done within 10 minutes of application.
- DIFFERENT PRODUCTION BATCH NUMBERS: When applying the topcoat, make sure you have enough material from the same production batch. If not, you will need to box the topcoat material. Boxing is the process of combining all the coating you will be using as the final coat into one container. This is especially important when coating a large surface area or if there is insufficient coating from a single production batch, where a color variation from one batch to another is likely. You will need to box the pigmented side before adding hardner.

SLOW CURE/NOT CURING

DESCRIPTION

The material does not fully cure or is still soft after 24 hours.

CAUSE

- IMPROPER MIX RATIO
- IMPROPER MIXING
- COLD MATERIALS
- COLD AMBIENT TEMPERATURES
- COLD SURFACE TEMPERATURES

REPAIR

1. Fully remove the uncured coating down to the clean substrate by solvent wiping, scraping, grinding or shot-blasting.
2. Recoat per the instructions in the NEOGARD® Flooring Application Manual.

PREVENTION

- IMPROPER MIX RATIO: Always read and follow the mix ratios printed on the bucket labels or on the Product Data Sheet. Always use some type of measuring device: i.e., plastic buckets that have pre- measured increments printed on them, gallon or quart cans.
- IMPROPER MIXING**:** Always pre-mix the pigmented (color) side before adding the hardener. When both A & B components have been properly measured and combined, mix for 3 minutes using a Jiffy mixing paddle. Never use drywall or two-part caulking paddles. Do not turn buckets upside down and let drain on floor as you will run the risk of unmixed material left on the sides of the bucket contaminating the floor.
- COLD MATERIALS**:** When dealing with epoxies and urethanes, cold material will result in slower than normal cure times and can affect their physical properties once cured. Cold materials are more difficult to mix, roll out and level. Before applying materials in cold temperatures, they should be stored in a heated environment or heated storage container at the ideal temperature listed on the Product Data Sheet. The longer the materials can be stored in a heated environment, the better they will perform.
- COLD AMBIENT TEMPERATURES**:** This condition will also cause slower than normal cure of epoxies and urethanes. It will also make them more difficult to roll out and level. It can cause bubbling/blister issues because the viscosity of the epoxy has increased due to the colder temperatures, preventing entrapped vapor in the substrate from escaping. Before application, the temperature in the application area should be at normal service temperature for a minimum of 48 hours. If necessary, utilize forced heat by means of portable heaters.
- COLD SURFACE TEMPERATURES**:** Concrete surfaces that are 50°F or lower will drastically slow normal curing of epoxies and urethanes and can slow the cure as much as 6 hours or more. It can also affect the cured physical properties, making some epoxies flexible. Cold substrate temperatures can prevent epoxies from “wetting out” or penetrating into the concrete surface, thus causing adhesion issues. Before application, service temperatures should be at normal operating conditions, a minimum of 60°F, for a minimum of 48 hours. If this cannot be achieved, the use of forced heat may be necessary.
- **NOTE: Never coat over uncured material.**

STAINING

DESCRIPTION

There are dark or discolored spots in the coating system.

CAUSE

- CHEMICAL EXPOSURE OR SPILLS: Floor has been exposed to chemicals.
- TIRE MARKS: Floor has been exposed to vehicular traffic.

REPAIR

1. Solvent wipe and/or sand stained areas to remove the stain.
2. Apply additional coating.

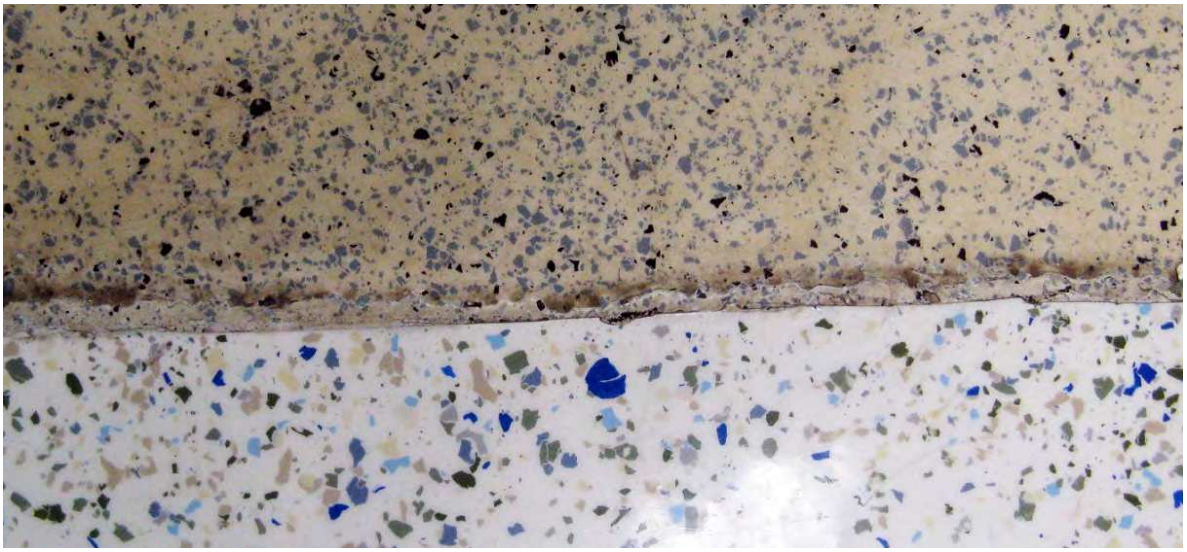
PREVENTION

- CHEMICAL EXPOSURE/SPILLS: In general, epoxies and urethanes do not reach full chemical cure for 7 days. It is important that the completed system is allowed to fully cure for a minimum of 24–48 hours for foot traffic, forklift or heavy loads. Before the floor is subject to chemical exposure/spills, it should be allowed to cure for a minimum of 7 days. Spills should be cleaned immediately and not allowed to remain on the surface for any length of time.
- TIRE MARKS: Let final topcoat cure for a minimum of 7 days. To help avoid tire marks, it may be necessary to place a rubber mat or carpet in areas exposed to tire traffic.

YELLOWING

DESCRIPTION

Topcoat has developed a yellow hue. This problem will affect epoxies regardless if the epoxy is clear or not.



CAUSE

- Epoxy has been exposed to partial or direct sunlight.

REPAIR

REMOVAL FOR ALL FLOOR TYPES:

1. Remove any dirt, grease, oil or any other contaminants by pressure washing. Heavy oil or grease will need to be cleaned by using NEOGARD® 8500 BioDegradable Cleaner.
2. Once floor is dry, sand entire area using #60 grit sandpaper with a circular floor sanding machine.
3. Clean floor to remove dust/debris from sanding.

AFTER REMOVAL:

- FLAKE SYSTEMS:
  4. Re-apply flake system using a 90% or total coverage of flakes.
  5. Topcoat with 70805/7962, 70815/70816, or 70860/70865.
- SMOOTH PIGMENTED (SOLID COLOR) EPOXY FLOORS:
  4. Apply one coat of pigmented epoxy, a minimum of 12 mils DFT, and let cure.
  5. Apply 1 or 2 coats of NEOGARD® pigmented 70805/7952 urethane topcoat.
- TEXTURED SYSTEMS:
  4. Re-apply one broadcast application.
  5. Apply both seal coats using 100% solids pigmented epoxy.
  6. Apply one final coat of NEOGARD® pigmented 70805/7952 urethane topcoat.

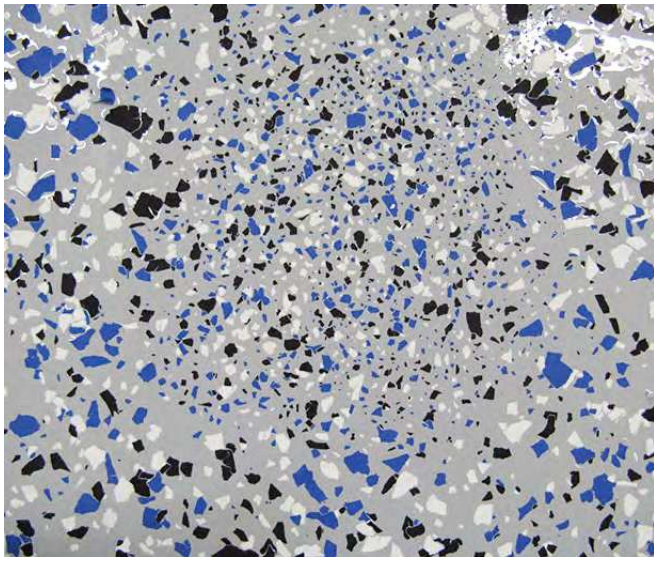
PREVENTION

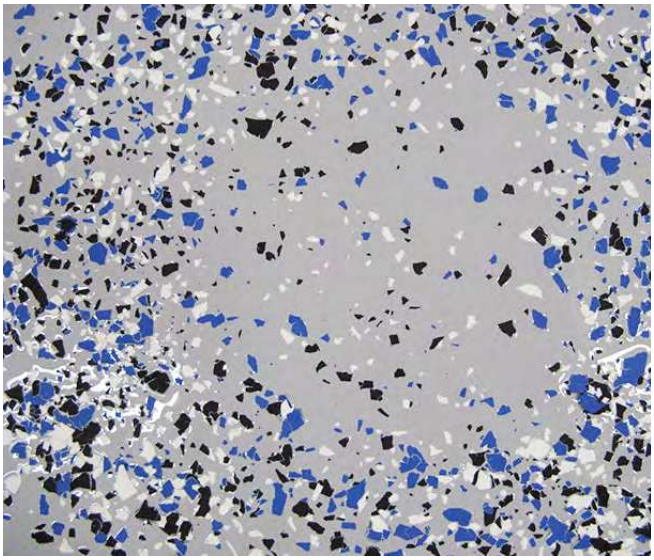
- On flake systems that may be exposed to excessive UV or direct sunlight, it is best to install a 90% or total flake coverage system. Then apply NEOGARD® clear urethane topcoats 70805/7952, or if odor is a concern, 70815/70816 or 70860/70861 polyurea.
- On pigmented epoxy floors exposed to excessive UV or direct sunlight, it will be necessary to apply NEOGARD® pigmented 70805-xx/7952 urethane topcoats.

UNEVEN FLAKE DISBURSEMENT

DESCRIPTION

Even flake disbursement is a key factor in the aesthetics of a random flake flooring system. Having the same size and coverage of flakes is key to a uniform appearance. **Note: It is best to do a mock-up for this type flooring system, allowing the owner to see the color blend, amount and size of flake, and finish texture.**





CAUSE

- FLAKES BROADCASTED TOO QUICKLY: This leaves an uneven disbursement in the base coat. It is important that the person broadcasting the flakes take their time to ensure coverage is uniform.
- FLAKES CRUSHED DURING BROADCAST: This causes variations in the size of flakes. Size variation of flakes in the floor is caused by crushing the flakes in your hand as you broadcast them. In addition, each time you reach for more flakes in the bucket, you inadvertently crush them.
- CLUMPED FLAKES: Once clumped flakes are introduced into the wet base coat, they will remain so and dry in a clumped formation.

REPAIR

1. Sand the floor flat with a circular floor sander using #60–#80 grit sandpaper.
2. Vacuum all debris resulting from sanding.
3. Re-broadcast the system.

PREVENTION

- Ensure flakes are loose in your hand before broadcasting in the base coat.
- Gently handle the flakes during broadcast to ensure that the flakes are not crushed.
- Use a small bucket to hold the flakes; the bigger the bucket, the more flakes you carry around, increasing the number of times you put your hand in the bucket, crushing the flakes into smaller pieces.
- Periodically empty the bucket, disposing of the small pieces and maintaining uniform same size flakes.
- Evenly broadcast flakes over entire floor area to maintain flake pattern as in jobsite mock-up.

ORANGE PEEL

DESCRIPTION

Orange peel is a stipple finish appearance in the final topcoat of epoxy or urethane flooring system. Some flooring manufacturers offer this finish as part of their systems; however, it is not always desirable to the customer.

CAUSE

- COLD SUBSTRATE/MATERIALS: If the substrate temperature is below 50°F, the epoxy or urethane will not flow and level out, and can produce the orange peel finish. This will be more prevalent if the topcoat is applied in a thin layer, somewhere between 3-6 wet mils. The combination of a cold substrate and cold materials can readily produce this type of finish.
- HOT SUBSTRATE/MATERIALS: Hot temperatures can also result in an orange peel finish. If the substrate is above 90°F, the topcoat may cure too quickly. This rapid curing will cause the material not to flow and level out. Just as in cold temperatures, thin topcoat layers, hot substrate temperatures and hot material can produce an orange peel finish.

REPAIR

1. To remove the orange peel finish, the floor will need to be sanded with a circular floor sander using 60-80 grit sandpaper. Sand the floor to a smooth finish.
2. Vacuum thoroughly to remove dirt/debris and solvent wipe with 7055 Odorless Reducer or 20653 Xylene.
3. Apply topcoat material.

PREVENTION

- HOT OR COLD SUBSTRATE/MATERIALS: Keep the substrate at 60°F or above and store materials at 70°F to 75°F. If thinning is needed, thin with 7055 Odorless Reducer or 20653 Xylene; 3% to 5% by volume.

PEELING IN PARKING AREAS

Flooring system is delaminating and peeling in areas where tires are consistently in contact with the coating.

CAUSE

- THIN SYSTEM APPLICATION: A floor coating system applied at insufficient coverage rates may delaminate.
- PROJECT SPECIFICATION: The applied system was not designed for project conditions.
- POOR SURFACE PREPARATION: Substrate was not properly prepared for acceptance of coating system.
- IMPROPER CURE TIME: Coating was not fully cured.

REPAIR

1. Remove all loose, peeling, or unbonded material.
2. Remove oil or grease by using an industrial-type degreaser or NEOGARD® 8500 BioDegradable Cleaner. Deeply penetrated contaminants may require removal by mechanical methods.
3. Abrade concrete to an ICRI CSP3 or CSP4 surface profile.
4. Ensure substrate is clean and dry prior to coating.
5. Re-apply coating as per the NEOGARD® Flooring Application Manual.

PREVENTION

- POOR SURFACE PREPARATION: Mechanically prepare substrate to industry standard (ICRI surface profile CSP3 or CSP4). Ensure substrate is clean and dry.
- PROJECT SPECIFICATION/THIN SYSTEM APPLICATION: Ensure that the appropriate system is specified for existing project conditions and intended use. Install coatings at recommended application rates.
- IMPROPER CURE TIME: It is important that the completed system is allowed to fully cure for a minimum of 24–48 hours for foot traffic, forklift or heavy loads. Before the floor is subject to chemical exposure/spills, it should be allowed to cure for a minimum of 7 days.

MECHANICAL DAMAGE

Flooring system has been scratched and/or gouged.

CAUSE

- Pallets have been dragged or pushed across the floor.
- Heavy loads have been dropped onto the floor.
- Forklift forks have scraped the floor.

REPAIR

1. Remove all loose, peeling, or unbonded material down to sound concrete.
2. Lightly abrade the area using 60-grit sandpaper on a hand-held sander or floor buffing machine.
3. Clean floor to remove dust/debris from sanding.
4. Mix epoxy and fumed silica (Cab-O-Sil) to make patching material. (Refer to “Epoxy Patching and Mortar Blends” in the NEOGARD® Flooring Application Manual for more information.)
5. Apply patching material to scratches/gouges and fill flush with existing floor level.
6. Re-apply epoxy topcoat or entire flooring system to match existing installed system.

PREVENTION

Avoid the following:

- Dragging or pushing pallets across floor surface, especially if the pallets have exposed nails.
- Dropping heavy objects or loads onto floor surface. Be sure to slowly lower heavy loads or objects to the floor.
- Allowing a forklift’s forks to scrape the floor surface. Make sure the forks are above the floor surface when the forklift is moving. Stop the forklift before lowering the forks.

ROLLER LINT IN COATING

DESCRIPTION

Roller lint is embedded in the coating after application.

CAUSE

- Low-quality roller covers were used.
- Roller nap was too long.

REPAIR

1. Sand the floor using a floor sanding machine with 60-grit sandpaper until the surface is smooth. Note: You may need to sand down to the substrate.
2. Vacuum dust and debris.
3. Recoat the sanded area as per the NEOGARD® Flooring Application Manual.

PREVENTION

- Only use high-quality, non-shedding roller covers.
- Use 1/4” or 3/16” nap mohair roller covers.
- Pre-roll covers on a piece of cardboard to help remove lint prior to applying material.

DELAMINATION (Between Layers of Coating)

DESCRIPTION

There is loss of bond between coats or between the coating and the substrate.

Delamination due to thin topcoat and ponding

Delamination due to improper cleaning

CAUSE

- INSUFFICIENT COATING: Delamination can occur when the minimum dry film thickness is not achieved.
- CONTAMINATION: Contamination, moisture, debris between coating applications.
- PONDING: Areas that pond water longer than 48 hours.

REPAIR

1. Remove any poorly adhered material.
2. Clean affected area with NEOGARD® 8500 BioDegradable Cleaner or solvent wipe. Extend cleaning 6”-8” beyond the affected area.
3. Add Tietex fabric to reinforce affected area.
4. Apply additional coating to yield 24 mils (dry film thickness) to cleaned area and allow to cure.

PREVENTION

- INSUFFICIENT COATING: Ensure that coatings are applied at recommended rates to achieve the specified dry film thickness. Frequently check wet film thickness making sure it complies with the recommended coverage rates. Check previous day’s application with slits to verify dry film thickness.
- CONTAMINATION: Contaminants such as dirt, pollen, rust, mold, algae, leaves, tree limbs, nuts, water and other similar contaminants must be removed. Be careful of wind-borne debris and/or moisture settling in low areas between coating applications. It may be necessary to solvent wipe between coating applications.
- PONDING: Areas that pond water may require additional cleaning prior to coating application. The use of stiff bristle brooms or mechanical scrubbers may be required to remove heavy deposits of dirt or other contaminants from the surface. After cleaning, be sure these areas are allowed to thoroughly dry prior to coating.

FOAM BLISTERS

DESCRIPTION

Foam blisters are medium to large bubbles on the surface of the foam. They are typically randomly dispersed.

Typical unopened foam blister

Foam blister that has been cut open

CAUSE

- MOISTURE: Moisture present between lifts or passes of polyurethane foam can cause blistering.
- FOAM-RELATED ISSUES: Adhesion between foam passes is too weak to withstand roof stress. This can be caused by slightly off-ratio mix, impurities in one of the foam components, foam left exposed to UV for an extended period of time or contaminates such as water, dirt, etc.
- THIN FOAM APPLICATION: Foam lifts or passes are applied less than 1/2 inch in thickness.

REPAIR

- CLOSED/UNOPENED BLISTERS: Closed or unopened blisters are to be left as is, per Spray Polyurethane Foam Alliance guidelines.
- OPEN BLISTERS:
    1. Cut back blister until all non-bonded foam is removed.
    2. Inspect area beneath the blister for degradation, moisture or other contaminants. Remove any contaminant and/or degraded foam.
    3. Over-fill the void created by the blister removal with replacement foam until it exceeds roof surface level.
    4. Shear off and sand excess foam.
    5. Solvent wipe existing coating 6”- 8” beyond the repair area.
    6. Coat the repair area with roofing system coating, overlapping a minimum of 6” onto existing coating surface.

PREVENTION

- MOISTURE: Be aware of sources of water contamination such as condensation from air conditioner units, drink bottles, imminent rain, or dew.
- FOAM-RELATED ISSUES: Use summer/winter foam as appropriate. Maintain equipment to prevent off-ratio foam. Take measures to prevent contamination between lifts or passes of foam. Do not leave foam exposed beyond foam manufacturer’s acceptable guidelines. First base coat should go down the same day as the foam.
- THIN FOAM APPLICATION: Apply foam in lifts of 1/2 inch or greater. If possible, apply the full thickness of foam on the same day.

COATING BLISTERS

DESCRIPTION

Coating blisters look like small to medium bubbles in the coating surface and can either be randomly dispersed or centralized in one location. The open blister will typically be a single bubble and will be smooth with no presence of a pinhole or multi-chambered cells.

Blister due to contamination

Blisters due to trapped solvent

Removed blister

CAUSE

- WATER/OIL CONTAMINATION: Blisters may appear in clusters around the contamination source. Common sources are: condensation from water bottles, soda cans or coolers, sweat and other bodily fluids, dew, frost, leaky A/C lines, etc.; oil leaks from compressed air lines/hoses, oven vents, equipment leaks, etc.
- TRAPPED SOLVENT: These blisters occur when solvent is trapped by a cured surface skin of polyurethane. This can be the result of over accelerating the coating, applying the coating too thick or when solvent used during cleaning has not flashed off prior to coating or a solvent puddle remains in a low lying area.

REPAIR

- WATER/OIL CONTAMINATION:
  1. Remove all poorly adhered material.
  2. Clean affected area with NEOGARD® 8500 BioDegradable Cleaner or solvent wipe. Extend cleaning 6”- 8” beyond the affected area.
  3. Prime exposed non-foam substrates.
  4. Apply base coat over primed areas.
  5. Apply topcoat, extending material at least 4” beyond the repair area.
- TRAPPED SOLVENT: Often no repair is required. However, if repair is necessary:
  1. Remove blister.
  2. Clean affected area with NEOGARD® 8500 BioDegradable Cleaner or solvent wipe. Extend cleaning 6”- 8” beyond the affected area.
  3. Prime any exposed, non-foam substrate.
  4. Apply base coat over primed areas.
  5. Apply topcoat, extending material at least 4” beyond the repair area. Apply coating in thinner coats, using multiple passes to achieve the specified thickness.

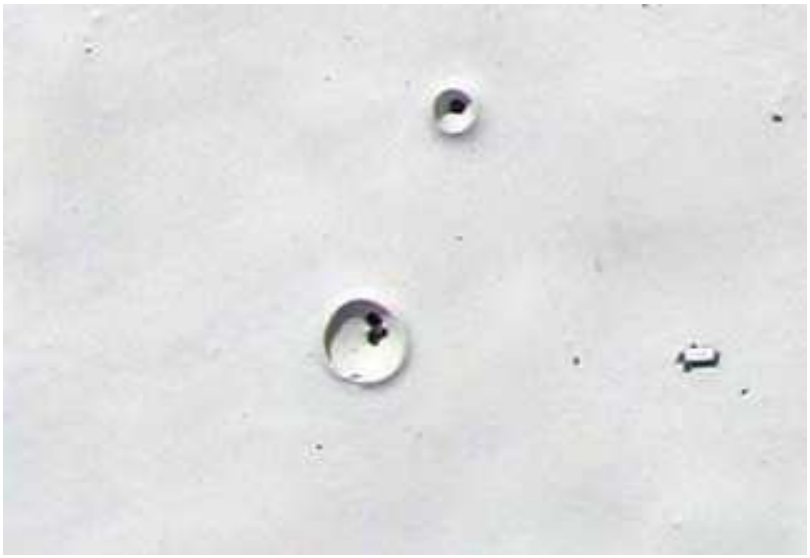
PREVENTION

- WATER/OIL CONTAMINATION: Properly clean the substrate and remove contamination sources using NEOGARD® 8500 BioDegradable Cleaner or solvent wipe.
- TRAPPED SOLVENT: During application, frequently check the wet film thickness using mil gauges, lay out the project prior to coating by gridding the area, maintaining proper and uniform coating thickness. Apply coating in thinner coats, using multiple passes to achieve the specified thickness. Avoid using accelerators during hot temperatures. See ***Weather Impact*** in the Support Information section of this manual.

PINHOLES/OUTGASSING FROM SUBSTRATE

DESCRIPTION

Pinholes due to outgassing appear as tiny blisters or bubbles. When these blisters pop they usually leave a round crater and the pinhole should be easily seen through the film. This condition most often occurs when applying a coating system to concrete roof decks.



CAUSE

- These blisters develop from small open pockets or voids in concrete, commonly referred to as pinholes. The coating may initially bridge these small openings. However as temperatures rise, the concrete releases air and moisture vapor, blowing a bubble or blister, which typically ruptures.

REPAIR

1. Clean affected area with NEOGARD® 8500 BioDegradable Cleaner or solvent wipe. Extend cleaning 6”- 8” beyond the affected area.
2. After the heat of the day, recoat the area with topcoat material, usually mixed with a dry, fine sand at 1 to 3 pounds per 100 square feet. Work the wet coating and sand by backrolling to displace air entrapped in the voids. Vertical additive or accelerators will help reduce the self-leveling of the coating. Repeat if needed.
3. Apply additional topcoat material to yield 24 mils (dry film thickness) to repair area and allow to cure.

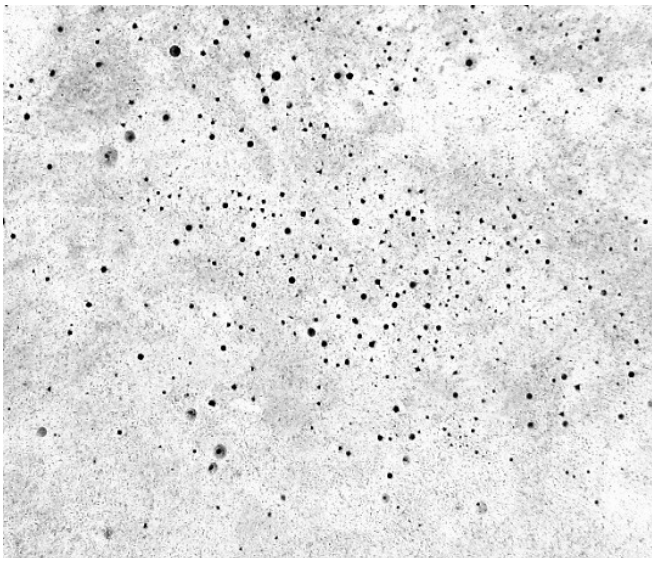
PREVENTION

- In hot climates, apply the first (and optionally the second) coat during the last few hours of the day or overnight, when temperatures are low.
- Slightly increase the amount of primer being used.
- Apply the specified system in thinner coats. This procedure requires more coats to achieve application of the full system.
- Thin the material being used in the first base coat. Use only commercial grade solvents and never thin products more than 10% by volume. Excessive thinning may affect physical properties of the coating.
- Begin application of base coat as temperatures are dropping and continuing to drop. Rising temperatures result in detrimental expansion of the moisture and air in the substrate. Falling temperatures increase the tendency of the coating to pull down into the substrate. See ***Weather Impact*** in the Support Information section of this manual.

COATING OUTGASSING (Pinholes)

DESCRIPTION

There are small voids which penetrate through the coating. A crosscut will show intact base coat material, with the voids contained only in the topcoat.



CAUSE

- COATING APPLIED TOO THICK: Outgassing voids in the coating look similar to pinholes that originate in the substrate but are contained in the coating only. They are produced when entrapped solvents try to escape during the curing process. These voids will typically be restricted to areas in which the coating is applied thicker than published rates.
- EXCESSIVE THINNING: Excessive thinning may adversely affect the physical properties of the coating and outgas, causing pinholes.

REPAIR

1. Clean affected area with NEOGARD® 8500 BioDegradable Cleaner or solvent wipe. Extend cleaning 6”- 8” beyond the affected area.
2. After the heat of the day, recoat the area with topcoat material, usually mixed with a dry, fine sand at 1–3 pounds per 100 square feet. Work the wet coating and sand with extra backrolling to displace air entrapped in the voids. NEOGARD® Vertical Additive or accelerators will help reduce the self-leveling of the coating. Repeat if needed.
3. Apply additional topcoat material to yield 24 mils (dry film thickness) to repair area and allow to cure.

PREVENTION

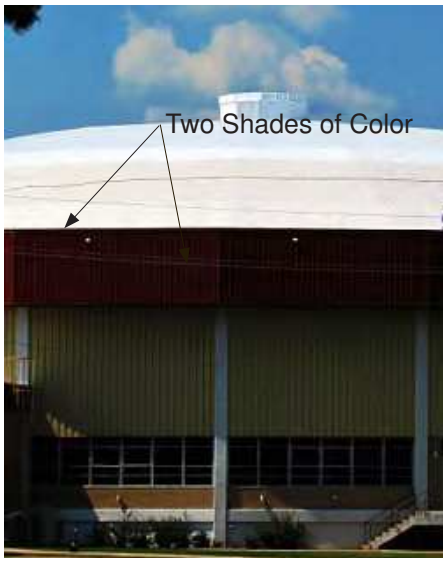
- COATING APPLIED TOO THICK: Ensure that coating is applied at the published rates. When thicker coating applications are necessary, apply in multiple passes.
- EXCESSIVE THINNING: Use only commercial grade solvents and never thin products more than 10% by volume.

DULL FINISH

DESCRIPTION

Surface of coating does not cure to a glossy finish and reflect light as is ideal for a roofing topcoat.

Roof with shade variation



Roof with moisture contamination


Magnified view of darker area

CAUSE

- Dull coating is caused by the presence of surface moisture or water exposure prior to cure.

REPAIR

Although this is typically an aesthetic issue, repairs can be made as follows:

1. Clean affected area with NEOGARD® 8500 BioDegradable Cleaner or solvent wipe. Extend cleaning 6”–8” beyond the affected area.
2. Apply additional coating to achieve 12 mils DFT and allow to cure.

PREVENTION

- Do not apply when temperatures are within 5° of dew point or when rain is imminent.

COLOR/SHADE VARIATION

DESCRIPTION

The coating appears to be different shades. This is most often noticeable in white products.

CAUSE

- DIFFERENT BATCH NUMBERS: Products from different batches can have slight variations in color.
- TOPCOAT NOT APPLIED IN A SINGLE APPLICATION: The older coating has had more UV exposure and has weathered.
- IMPROPER MIXING: Pigmentation not thoroughly dispersed.

REPAIR

Although this is typically an aesthetic issue, repairs can be made as follows:

1. Clean affected area with NEOGARD® 8500 BioDegradable Cleaner or solvent wipe. Extend cleaning 6”–8” beyond the affected area.
2. Apply additional coating at 12 mils DFT to the cleaned area and allow to cure.

PREVENTION

- DIFFERENT BATCH NUMBERS: Ensure that you have enough topcoat from the same batch number to complete the entire project. Always purchase or set aside enough topcoat from the same production batch to coat the entire surface area. Use odd batches elsewhere such as in the intermediate coat if applicable. If there is not enough topcoat of a single batch to complete the project, ‘boxing’ batches is an alternative. Boxing is the process of combining all the coating you will be using as the topcoat into one large container. This is especially important when coating a large surface area or if there is insufficient coating from a single batch, where a color variation from one batch to another is likely.
- TOPCOAT NOT APPLIED IN A SINGLE APPLICATION: Complete the topcoat application with minimal delay between applications.
- IMPROPER MIXING: Always use a jiffy mixer to mix products thoroughly before application. See ***Product Mixing Instructions*** in the Support Information section of this manual.

YELLOWING

DESCRIPTION

Surface of coating has taken on a yellow hue. Yellowing may be splotchy.

CAUSE

- OIL: Color variation is due to oils migrating from the substrate.
- POLLEN: Pollen may settle in wet coating, giving a yellow appearance.
- LEAVES/FOLIAGE: Contamination from plant debris on fresh coating can cause yellowing.
- CHEMICAL: Chemicals from exhaust stacks and vents can leave oily or greasy residue on coating causing coating to yellow.
- USE OF ASPHALTIC ROOF CEMENTS: Using asphaltic roof cements to repair coating products or single ply membranes can cause yellowing.

REPAIR

Typically no repair is necessary for this condition. Most oils burn off from ultraviolet exposure. When the yellowing is excessive and/or the customer finds the appearance unacceptable, the contractor should first allow some weathering to reduce the migrating oil then:

1. Clear area of any debris and clean affected area with NEOGARD® 8500 BioDegradable Cleaner or solvent wipe. Extend cleaning 6”- 8” beyond the affected area.
2. Apply additional coating to the cleaned area at a minimum 12 mils DFT and allow to cure.

PREVENTION

- OIL: Use of a primer will reduce oil migration from the substrate.
- POLLEN/LEAVES/FOLIAGE: Clean roof periodically and do not let foliage accumulate.
- CHEMICAL: Check the job site every day for contamination and clean as necessary.
- USE OF ASPHALTIC ROOF CEMENTS: Only use similar or like (i.e. for TPO, use TPO materials) products for repair.

SLOW CURE/NOT CURING

DESCRIPTION

After expected curing time has elapsed, coating is still soft and may transfer when touched.

CAUSE

- COLD TEMPERATURES: Cure times are typically published at 75°F with 50% relativity humidity. As temperatures drop below 60°F and/or relative humidity drops below 30%, cure times can be expected to extend from 16 hours to days.
- NO ACCELERATOR USED: When using 7419 (not 7419HB or 70620), failure to add the accelerator (7932) can cause slow curing. 7419 can cure through normal moisture cure mechanism without the addition of 7932 accelerator; however, 3-6 days may be needed prior to recoat.
- ALCOHOL CONTAMINATION: Alcohol reacts adversely with the urethane coating resulting in improper cure, cross linking and film forming capabilities which can retard curing and/or cause delamination.
- OFF-RATIO MATERIAL: For two component products, this can be due to mixing the incorrect ratio of part A to part B, failure to thoroughly mix the components prior to installation, buckets turned upside down and allowed to drain, or scraping unmixed material from walls of buckets.

REPAIR

- COLD TEMPERATURES/NO ACCELERATOR USED:
  Most slow cure issues can be corrected by allowing extended cure times. Typically coating will cure within a week with cool temperatures, low humidity, or if lacking accelerator. If extended water exposure occurs to the uncured base coat, the coating will need to be removed and replaced.
- ALCOHOL CONTAMINATION/OFF-RATIO MATERIAL:
  1. Remove material down to clean substrate.
  2. Apply primer, base coat, and topcoat as per NEOGARD® system specifications, extending topcoat application 4” beyond the repair area.

PREVENTION

- COLD TEMPERATURES: Do not apply when temperatures are below 45°F. Add accelerators (typically 7932) to coating prior to application when temperatures are below 60°F. Use a stronger accelerator for 40°-50°F temperatures such as 7923 (roughly 4 x the strength of 7932). See ***Weather Impact*** in the Support Information section of this manual.
- NO ACCELERATOR: When using 7419, always add 7932 accelerator.
- ALCOHOL CONTAMINATION: Do not use alcohol-based solvents or cleaners on roofing projects.
- OFF-RATIO MATERIAL: Read mix ratio instructions on bucket labels. Mix thoroughly. Do not invert empty buckets on roof deck. See ***Product Mixing Instructions*** in the Support Information section of this manual.

WRINKLING

DESCRIPTION

Coating appears wrinkled in places.



CAUSE

- Coating was applied before previous coats were allowed to cure. The topcoat application will appear smooth but is floating over a solvent rich base coat. Once the base coat material releases solvents, the film shrinks and it is 10%–20% smaller. The base coat pulls the topcoat material into wrinkles to alleviate the stress of the oversized surface.

REPAIR

1. Test the area for soft of spongy coating. Repair is only necessary if coating is excessively spongy, torn from traffic, or if customer is displeased with the aesthetics.
2. If repair is required, remove any poorly adhered or spongy material.
3. Clean affected area with NEOGARD® 8500 BioDegradable Cleaner or solvent wipe. Extend cleaning 6”- 8” beyond the affected area.
4. Prime exposed substrate.
5. Apply base coat as per NEOGARD® system specifications.
6. Apply topcoat extending topcoat application 4” beyond the repair area.

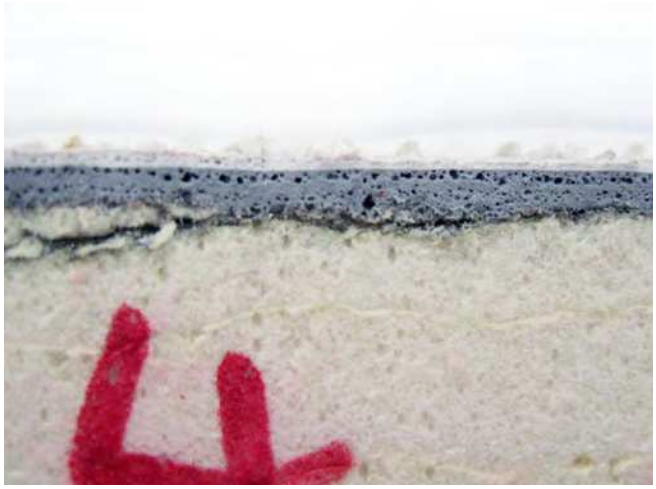
PREVENTION

- Test coating prior to adding additional coats by touching the coat. If the coating transfers to touch or wrinkles when pushed, it has not cured. Additional coats should not be applied until the cure has increased past the point of wrinkles and transferring of coating.

CELLULAR COATING

DESCRIPTION

A cross section reveals a large number of open cells in the coating. During the curing process, the coating can surface cure. The chemical reaction of isocyanate and moisture develops gas bubbles which are trapped in the coating film.



CAUSE

- COATING TOO THICK: Applying elastomeric coatings too thick can result in a cellular film and may prevent trapped gas from being released.
- MOISTURE ON SUBSTRATE: Moisture on the substrate prior to coating will give a similar cellular appearance.
- IMPROPER PRODUCT PREPARATION: Improper preparation of the product prior to coating, such as over thinning or improper mixing.

REPAIR

1. Grind area down to solid material until no further cellular material is found.
2. Clean affected area with 8500 BioDegradable Cleaner or solvent wipe. Extend cleaning 6”–8” beyond the affected area.
3. Prime exposed substrate.
4. Apply base coat as per NEOGARD® system specifications.
5. Apply topcoat as per NEOGARD® system specifications, extending material application 4” beyond the repair area.
6. If multiple days pass between application, solvent wipe or pressure wash the area before proceeding with repairs.

PREVENTION

- COATING TOO THICK: Do not exceed specified application rates. Use multiple coats to achieve required build if necessary.
- MOISTURE ON SUBSTRATE: Ensure that the substrate is clean and dry prior to application of coating.
- IMPROPER PRODUCT PREPARATION: Use only commercial grade solvents. Never thin products more than 10% by volume.See ***Product Mixing Instructions*** in the Support Information section of this manual.

SPLITTING AT SEAMS

DESCRIPTION

Splitting at the seams typically occurs in modified bitumen and asphalt cap sheets and is compounded by ponding water conditions. Coatings will initially display a crack transforming into a small blister type opening. The coating will then form a fish mouth, and finally the sheet will separate and pull back to form a curled edge.

Curled seam edge

Split seam

CAUSE

- SEAM NOT PROPERLY DETAILED: Splitting seams are caused by thin coating application at the seam. When the membrane seam is not detailed per NEOGARD® specifications, the coating will leave a thin edge on the top of the seam. As roof membrane seams vary from 40 mils to 240 mils, considerable self leveling will occur in the coating at this location. Thin coating on the seam, combined with the tension transfer from membrane sheet to membrane sheet, will create a stress crack across the top of the seam. Over time, this may turn into a larger opening.

REPAIR

1. Remove all curled, loose or poorly adhered material.
2. Clean affected area with NEOGARD® 8500 BioDegradable Cleaner or solvent wipe. Extend cleaning 6”–8” beyond the affected area.
3. Prime exposed substrate.
4. Apply detail coat of base coat material over primed areas at 24 mils DFT and embed minimum 6” wide reinforcing fabric into wet coating. Only use proper reinforcing fabric to detail seams or repairs; do not use vinyl-type tapes or coating will not adhere. Center the fabric over the split. Work reinforcing fabric into wet base coat material,using a brush or roller to eliminate air pockets, wrinkles and gaps. Apply additional base coat material as necessary to fully encapsulate reinforcing fabric.
5. Apply topcoat material, extending the material application 4” beyond the repair area.

PREVENTION

- To prevent splitting seams, detail all the original seams with adequate base coat material and embed NEOGARD® 86220 Tietex roofing fabric into the wet coating.
- At pitch pans and penetrations, 70991 sealant may be needed at base where target paths have pulled and left open voids.

CRACKS IN CONCRETE ROOF DECK DUE TO SETTLING

DESCRIPTION

Cracks in concrete substrate may telegraph through the coating and become clearly visible. Over time, these cracks may increase in number as well as in size.

Crack before coating

Crack in coating telegraphed from concrete deck

CAUSE

- Substrate cracks are caused by shifting and settling of the roof after original construction.

REPAIR

- STATIC CRACKS:
  1. Saw cut cracks to a minimum 1/4” width and minimum 1/4” depth.
  2. Prime if necessary.
  3. Fill with NEOGARD® 70991 or 70995 polyurethane sealant and strike flush with concrete deck. Allow sealant to fully cure.
  4. Clean repair area with NEOGARD® 8500 BioDegradable Cleaner and/or solvent wipe. Extend cleaning 6”–8” beyond the affected area.
  5. Prime any exposed substrate.
  6. Apply base coat material over any primed areas at 24 mils DFT and embed reinforcing fabric into wet coating, centering fabric over the saw cut crack. Allow to fully cure.
  7. Apply additional base coat material as necessary to fully encapsulate reinforcing fabric.
  8. Apply topcoat, extending application of material at least 4” beyond the repair area.

- DYNAMIC CRACKS:
  1. Moving cracks are a fundamental issue related to the substrate and need to be addressed before repair can be done to the coating.
  2. Once movement has been addressed, follow steps outlined for repairing static cracks.

PREVENTION

- This is an issue with the underlying roof structure and should be addressed as it occurs.

HAIL DAMAGE TO SPRAY POLYURETHANE FOAM ROOF

DESCRIPTION

Hail damage is a random pattern of physical damage which ranges in size from that of a dime to that of a half dollar. Hail damage is generally repeated throughout large areas of the roof and not limited to single occurrences.

CAUSE

- HAIL: Damage is a result of impact from hail stones. Roofs should be inspected for this type of damage after reports of hail storms in the vacinity.

REPAIR

1. Using a moisture meter, test the affected area for moisture content. Polyurethane foam containing more than 15% moisture content, as read on a moisture meter, must be removed and replaced.
2. If the damaged area is small (within the circumference of hail impact ring), remove with a small knife to sound polyurethane foam and fill with NEOGARD® 70991 *OR* 70995 polyurethane sealant.
3. Bevel edges of repair for smooth transition between sealant repair and existing surface.
4. Solvent wipe surface adjacent to the repair. Extend cleaning 6”–8” beyond the repair.
5. Apply topcoat material as per NEOGARD® system specifications, extending application of coating a minimum 4” beyond repair.

PREVENTION

- No prevention is available for hail damage.

CONTAMINATED COATING

DESCRIPTION

Discharge from condensation lines of rooftop equipment causes contamination of the coating.

Disconnected condensate drain lines contaminated coating.

Poorly maintained condensate drain lines results in contaminated coating.

CAUSE

- POOR PREVENTIVE MAINTENANCE: Failure to perform routine maintenance on rooftop mechanical equipment.

REPAIR

1. Remove any poorly adhered material.
2. Any chemical, biological, or foreign contaminants from mechanical equipment must be removed from area with NEOGARD® 8500 BioDegradable Cleaner. Stiff bristle brooms or mechanical scrubbers may be necessary to remove heavy contamination. Extend cleaning 6”- 8” beyond the affected area.
3. After cleaning, be sure these areas are allowed to thoroughly dry prior to coating. Apply additional coating to yield 24 mils DFT and allow to cure.

PREVENTION

- POOR PREVENTIVE MAINTENANCE: Follow a regimented preventive maintenance program on all roof related equipment (i.e. condensate drain lines, exhaust hoods). Inspect roof on a regular basis and perform necessary repairs on rooftop mechanical equipment.

IMPROPER SURFACE PREPARATION: REPAIRS & RECOATS

DESCRIPTION

All repairs and/or recoats require a clean, dry substrate to sufficiently bond and accept new coating material. Without proper cleaning the roof coating system repair may not provide a watertight condition.

Area was not cleaned prior to repair.

CAUSE

- Surface not cleaned properly and does not extend 6”- 8” beyond the affected area.

REPAIR

1. Remove any deteriorated, and/or water saturated roofing materials, adhesives, and foreign materials down to the sound substrate.
2. Affected roof surface shall be cleaned using NEOGARD® 8500 BioDegradable Cleaner. Stiff bristle brooms or mechanical scrubbers may be required to remove heavy deposits or dirt from surface. Extend cleaning 6”- 8” beyond the affected area in all directions.
3. Before proceeding with coating application, ensure that the substrate is clean, sound and dry.
4. Apply coating to yield 24 mils DFT and allow to cure.

PREVENTION

- Perform proper surface preparation prior to application of coating. Ensure that the substrate is clean, sound and dry.

POOR DRAINAGE

DESCRIPTION

An improperly installed scupper can result in ponding of water and prevent drainage of low spots. Drains should be cleaned periodically to remove debris and allow for proper roof drainage.

Scupper installed too high

Topcoat delaminating from ponding due to clogged roof drain.

CAUSE

- Roof has insufficient positive slope for water to drain. Poor drainage and ponding water results in topcoat delamination.
- Water should not 'pond' or remain on a roof surface longer than 48 hours after the termination of the most recent rain event.

REPAIR

1. Remove any curled, loose, or poorly adhered material.
2. Repair any roof slope deficiencies. Replace or repair any damaged or non-working roof drainage.
3. Affected roof surface shall be cleaned using NEOGARD® 8500 BioDegradable Cleaner. Stiff bristle brooms or mechanical scrubbers may be required to remove heavy deposits or dirt from surface. Extend cleaning 6"- 8" beyond the affected area in all directions.
4. Prime any exposed substrate.
5. Apply base coat material over any primed areas at a 24 mil (dry film thickness) and embed reinforcing fabric into wet coating, centering fabric and rolling with a semi-dry roller to remove any wrinkles and undulations. Allow to fully cure prior to any additional coating applications. Apply additional base coat material as necessary to fully encapsulate reinforcing fabric.
6. Apply topcoat, extending application of material at least 4" beyond the repair area.

PREVENTION

- Inspect roof on a regular basis to ensure the roof has sufficient positive slope for water to drain, preventing ponds. Roof drains and scuppers should be inspected and cleaned periodically.

WATER DAMAGE TO UNCURED COATING

DESCRIPTION

Surface has craters or ‘dimples’ where rain has come in contact with uncured coating.

Rain on uncured coating.

CAUSE

- Rain occurred before the coating system had time to fully cure, causing dimples on coating system.

REPAIR

1. Clean affected area with NEOGARD® 8500 BioDegradable Cleaner. If coating system is more than 24 hours old, the surface may need to be solvent wiped. Extend the cleaning 6”- 8” beyond the affected area.
2. Recoat the affected area with material to produce system’s intended DFT.
3. Allow coating material to fully cure between coats.

PREVENTION

- Do not proceed with application of materials if a rain event is imminent.

IMPROPER APPLICATION TECHNIQUE

DESCRIPTION

A 1/4” notched squeegee was used to apply coating and was not backrolled.

Coverage rates and aggregate distribution is inconsistent

CAUSE

- Proper application technique was not followed. Coating was applied with a notched squeegee but was not backrolled.

REPAIR

1. Clean affected area with NEOGARD® 8500 BioDegradable Cleaner or solvent wipe. Extend cleaning 6”–8” beyond the affected area.
2. Apply coating material using a 1/2” roller nap and roll evenly until ridges are gone and the surface is smooth, taking care to avoid puddling of material. Confirm that coating will meet the dry mil requirements.
3. Allow coating to cure.

PREVENTION

- When coating is applied with a notched squeegee, it is essential to backroll in order to achieve specified coverage rates and even distribution of coating and aggregate.

SKIN ON PRODUCT IN CONTAINER

DESCRIPTION

A skin forms on the top of the product in a pail or barrel.

CAUSE

- Single-component urethanes are moisture-cured. The pail or barrel has been opened, allowing moisture to be introduced to the coating material, and the curing process begins.

REPAIR

1. Remove the skin from the top of the product. **Note: Be sure to remove all cured material from the can.**
2. Mix the remainder of the coating material with a Jiffy Mixer using a maximum of 10% solvent to thin the product.

PREVENTION

- Open containers only when you are ready to immediately use the coating material.
- Use the entire container of coating material whenever possible.
- Pour a small amount of Xylene or Odorless Reducer on the top of the coating material left in pail or barrel.
- Lay a piece of plastic directly over the remaining coating material.

Calculating Coverage Rates

Coverage Rates
Theoretical vs Actual

Theoretical coverages are those calculated for glass-smooth surfaces with no allowances made for loss. Manufacturers publish theoretical coverages instead of actual coverages because they cannot anticipate job or surface conditions. Therefore, published coverage rates should only be used as a guide for estimating material requirements for a given job.

Actual coverage will be less than theoretical coverage. When coatings are applied over concrete, many factors such as the surface texture, overspray loss, container residue, equipment characteristics, applicator technique, etc. will directly affect the amount of coating material required to meet the designed in-place dry film thickness (DFT). Therefore, it is very important that additional material be added to the theoretical quantities to ensure that the proper coating thickness is applied. Items to consider are:

- Shot-blasted Concrete: Even though the surface texture appears to be fairly smooth, this surface can require 5%–15% additional material to the theoretical amount.
- Wind Loss: During spray applications, up to 30% of the coating may be lost due to wind. Consider using wind screens and add wind loss to your coating calculations.
- Miscellaneous Loss: A miscellaneous factor must be added to the theoretical coverage rate to cover losses due to material left in containers, equipment problems, etc. Use a percentage factor of between 3% to 10%, depending on the contractor's experience and efficiency.

Calculating Theoretical Coverage

Any liquid, when applied at a thickness of one mil (1/1000 inch) will cover 1604 square feet per gallon. Another way to state this is that one gallon of any liquid, applied over a 100 square foot surface, will be 16 mils thick when wet. To determine dry mils (or how much is left when the solvents are gone), multiply 16 (wet mils) times the solids content (by volume) of the particular liquid. Solids by weight should not be used in this formula.

Example

50% solids by volume = 16 (wet mils) x 0.5 (50% solids by volume) = 8 dry mils.

To determine how much total material is required to cover 100 square feet, divide the total system thickness (expressed in mils) by the number of dry mils per gallon.

Example

System = 32 dry mils total
Material (50% solids by volume) = 8 dry mils per gallon
32 divided by 8 = 4 gallons per 100 square feet
% Solids by Volume X 1604 ÷ Desired Dry Mils = Coverage Rate

Calculating Actual Coverage

To determine total material requirements for a job, add estimated losses due to field conditions to theoretical coverages. Depending on jobsite conditions, up to 50% additional material may be required to meet the designed in-place dry film thickness (DFT).

Dew Point of Moist Air Chart

Dew Point is the temperature at which moisture will condense on a surface. No coatings should be applied unless surface temperature is a minimum of 5°F above this point. Temperature must be maintained during curing.

This chart illustrates how to determine the dew point:

Ambient Air Temperature

Relative Humidity	20°F	30°F	40°F	50°F	60°F	70°F	80°F	90°F	100°F	110°F	120°F
90%	18°F	28°F	37°F	47°F	57°F	67°F	77°F	87°F	97°F	107°F	117°F
85%	17°F	26°F	36°F	45°F	55°F	65°F	75°F	84°F	95°F	104°F	113°F
80%	16°F	25°F	34°F	44°F	54°F	63°F	73°F	82°F	93°F	102°F	110°F
75%	15°F	24°F	33°F	42°F	52°F	62°F	71°F	80°F	91°F	100°F	106°F
70%	13°F	22°F	31°F	40°F	50°F	60°F	68°F	78°F	88°F	96°F	105°F
65%	12°F	20°F	29°F	36°F	47°F	57°F	66°F	76°F	85°F	93°F	103°F
60%	11°F	19°F	27°F	36°F	45°F	55°F	64°F	73°F	83°F	92°F	101°F
55%	9°F	17°F	25°F	34°F	43°F	53°F	61°F	70°F	80°F	89°F	96°F
50%	6°F	15°F	23°F	31°F	40°F	50°F	59°F	67°F	77°F	86°F	94°F
45%	4°F	13°F	21°F	29°F	37°F	47°F	58°F	64°F	73°F	82°F	91°F
40%	1°F	11°F	18°F	26°F	35°F	43°F	52°F	61°F	69°F	78°F	87°F
35%	-2°F	8°F	16°F	23°F	31°F	40°F	48°F	57°F	65°F	74°F	83°F
30%	-6°F	4°F	13°F	20°F	28°F	36°F	44°F	52°F	61°F	69°F	77°F

Example: If ambient air temperature is 70°F and relative humidity is 65%, the dew point is 57°F. No coating should be applied unless the surface temperature is 62°F minimum (57°F + 5°F = 62°F).

Surface Conditioners

(For Structural Concrete Decks)

Use

Surface conditioners are used to fill voids, areas of aggregate loss and excessively rough, damaged or exposed aggregate surfaces prior to the application of NEOGARD® Auto-Gard and Peda-Gard traffic bearing waterproofing systems in order to assure effective installation and long term performance.

Description

NEOGARD® offers two variations of surface conditioners for patching or resurfacing structural concrete decks. They are:

- 70702/70703 two component, 100% solids epoxy slurry that is specially formulated to resurface deteriorated concrete to leave a smooth, durable finish.
- 70714/70715-09 two-component, 100% solids epoxy resin, designed as an economical super high strength binder. Mixing #200 fumed silica flour into the mixed epoxy makes an excellent concrete surface conditioner. The following mix will yield approximately 4.8 gallons of mixed material. Spread at approximately 50 square feet per gallon.

  3 parts by volume mixed epoxy
  3 parts by volume #200 fumed silica flour

Application Methods

- For a smooth surface, apply epoxy slurry mix to effected areas with a notched squeegee and allow to cure. **Do exceed 1/4" in depth per application**.
- For filling in depressed, scaled or exposed aggregate areas of the structural slab, spread epoxy slurry mix to affected areas with a notched squeegee and immediately broadcast 16-30 mesh aggregate into wet mix to rejection. **Do not exceed 1/2" in depth per application**. Allow to cure and remove excess aggregate.
  - **Note: The surface profile obtained by broadcasting 16-30 mesh aggregate into the epoxy slurry will leave a rough surface and will require a grout coat of neat epoxy applied at the rate of 1/2 gallon per 100 square feet or a fill coat of polyurethane base coat at the rate of 3/4 gallon per 100 square feet prior to the application of either Auto-Gard or Peda-Gard. In lieu of applying the epoxy neat coat or polyurethane base coat, surface can be ground smooth with the use of terrazzo or portable cup grinders**.

Safety

- Consult Material Safety Data Sheet (MSDS) for instructions related to safety and handling.

Field Adhesion Testing

Adhesion Testing

Often, it is important to conduct field adhesion tests to confirm the proper procedure for recoating an existing coating system.

If compatibility between two systems is ever a question, NEOGARD®® recommends performing one of the following adhesion tests. It is more useful to conduct adhesion testing in the field than in the lab as it represents the actual job conditions.

- ASTM D4541: This test requires the use of an elcometer and provides a “pull off” value.
  - Instructions for this test are provided by the testing equipment manufacturer and follow the guidelines set by ASTM D4541. Test values above 250 psi are considered acceptable for recoat applications.

- ASTM D903: Standard Test Method for Peel or Stripping of Adhesive Bonds. This test is also known as the “Adhesion in Peel” test and results in a quantitative value stated in lbs.
  - The surface is prepared as required. The primer is applied and allowed to cure. The coating is applied and a fiberglass cloth or similar fabric is worked into the coating. The fabric is not to be placed “under” the coating. Allow a strip of the fabric, a minimum of 6” in length, to remain free of the coating. When coating has cured, generally after 7–10 days, a spring scale is attached to the fabric and pulled 180° in the same plane as the fabric. Test values above 5 lb/in are considered acceptable for recoat applications.

- Rag Test: This test gives an indication of bond with no value. It is typically the recommended procedure for field adhesion tests.
  - The surface is prepared as required. The primer is applied and allowed to cure. The coating is applied and a fiberglass cloth or similar fabric is worked into the coating. The fabric is not to be placed “under” the coating. Allow a strip of the fabric, a minimum of 6” in length, to remain free of the coating. When coating has cured, generally after 7–10 days, pull the free strip of fabric back towards the test area for indication of bond strength.

Weather Impact

NEOGARD®®s single component and two component polyurethanes are designed to be applied through an ambient temperature range of 70º to 90ºF to provide ideal handling and application characteristics.

Cold Weather Impact

Polyurethane Coating Materials

Note: Substrate temperatures can effect the cure of the polyurethane materials as much as or more than ambient temperatures can. Application of heated material to a cold substrate will not reduce the curing time. Consult NEOGARD®® for recommendations.

As material component temperatures become colder and start to drop below 60ºF, they increase in material viscosity. An increase in material viscosity increases the material's resistance to flow and can result in the following:

- Single component systems that utilize accelerators become difficult to mix. If the accelerator is not thoroughly mixed with the polyurethane, the cure of the material can be slowed down.
- Plural component systems also become more difficult to mix together. If a thorough mix is not obtained, the off-ratio mixture can cause improper curing.
- Polyurethanes become more difficult to spray. They produce erratic spray pressures, poor atomization, fingering at the spray tip or a complete loss of the spray pattern. Some applicators are tempted to add solvent to the polyurethane material so that it can be sprayed. Unfortunately, adding solvent may slow down the cure time and change the thixotropy and resulting dry film thickness. All of this can lead to material puddles, uneven coating coverage and an added expense to the job cost in the form of downtime.
- Accelerators and catalysts are packaged to provide good pot life and reasonable cure of materials at 70º to 90ºF. As material temperatures become colder and start to drop below 60ºF, the pot life of the material is increased and the speed of the cure may be severely reduced. If the material is applied at 60ºF (material temperature) and the air temperature drops to 40ºF or below, the cure is slowed down; particularly if windy conditions exist. The cure is further retarded due to slow solvent evaporation at cold temperatures. Materials that normally cure at a rate of 8–12 hours can be extended to 14–24 hours or more.

Don't risk these problems. Keep enough material at 70º to 80ºF for about 2 days of production. This will minimize the storage space required to keep the material warm. Refer to NEOGARD® Accelerator Curing Charts when these conditions exist. When possible, apply the coatings earlier in the day, making sure the substrate is dry, and quit early enough to allow several hours of cure from the sun. Remember, if the application area is enclosed with no exchange of air over the membrane, the relative humidity (moisture) may be severely reduced, resulting in a slow curing time.

Hot Weather Impact

Polyurethane Coating Materials

High substrate, ambient, and material temperatures can impact material viscosity and accelerate the curing process. Single component, solvent based products cure from the top down. If the surface of the

coating skins over too quickly, the solvents that are released during the curing process become trapped, resulting in blisters and/or bubbles in the coating. Two component products are also affected by high temperatures. Pot life and working time can be reduced significantly. To minimize the impact of high temperatures during coating application:

- Store material in a cool, dry place; never in direct sunlight or in areas of high temperatures. The mixing station should also be in a shaded area.
- Consider coating in the evening as the substrate cools, or if applicable, on the shady side of the building. This will help to minimize outgassing as the material cures and extend working time of the material.
- As the material viscosity decreases, the sag resistant properties will also be affected. In sloped areas, it may be necessary to apply the specified system in thinner coats, increasing the number of coats required to apply the full system. NEOGARD®®'s 7922 Vertical Additive is compatible with most NEOGARD®® single component, solvent based coatings and will enhance the sag resistant properties of the coating material. Contact NEOGARD®® Technical Services for specifics.

Product Mixing Instructions

Single Component Polyurethane Coatings

- Read labels and Application Manual prior to mixing materials.
- The accelerator or small container is always to be added to the color side; one gallon containers in 55's and half pint and pint containers in 5's.
- Always pre-mix the color side thoroughly prior to the addition of the accelerator. Pre-mix 55 gallon drums for 5 to 10 minutes and 5 gallon pails for 3 to 5 minutes. Time will vary depending on temperature conditions.
- Add the accelerator slowly at the end of the pre-mix time while still mixing. After all of the accelerator has been added, continue to mix the material for a minimum of 20 minutes for 55 gallon drums and a minimum of 5 to 10 minutes for 5 gallon pails. Time will vary depending on temperature conditions.
    - **Note: Use a low-medium speed drill and a Jiffy Mixer to mix all materials thoroughly. Mixing at too high rate of speed or with the wrong mixer can introduce air bubbles into the coating. These bubbles may develop into blisters during application**.
- Any thinning of the materials should come after the materials are mixed. Do not thin materials more than 10%.

Jiffy Mixer

All Two-Part Polyurethane Coatings or Epoxies

- Check mix ratio on labels, Product Data Sheets and in Application Manual prior to mixing materials. Proper ratios are essential for optimum coating performance and development of physical properties. Pay particular attention to pot life instructions.
- The catalyst or clear side of the mix is always to be added to the color side. Never add the color to the catalyst, as mixing will be poor.
- Always mix the pigmented or color side thoroughly (3 to 5 minutes) prior to addition of the catalyst.
- Once the two parts are combined, mix for a minimum of 5 minutes. It is essential that all two-component materials be mixed thoroughly so that off-ratio materials are not produced.
    - **Note: Use a low-medium speed drill and a Jiffy Mixer to mix all materials thoroughly. Mixing at too high rate of speed or with the wrong mixer can introduce air bubbles into the coating. These bubbles may develop into blisters during application**.
- Any thinning of two-part materials should come after the materials are mixed. If solvents are added prior to mixing, proper coating ratios will not be achieved. Do not thin materials more than 10%.
- If one elects to pump the two-part polyurethane through plural-component equipment (such as Graco's Hydra-Cat), be sure to mix the pigmented side thoroughly prior to pumping. **Thinning in such an application must be done equally to both sides prior to spraying**.

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TECHNICAL GUIDE
TROUBLESHOOTING

Waterproofing, Flooring & Roofing

Cause, Repair & Prevention

November, 2014

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