PRODUCT APPLICATION GUIDELINE; GENERAL *EXTERIOR*

ACTECH 2170™ Moisture Mitigation Products

ALLIED CONSTRUCTION TECHNOLOGIES, Inc.

This Guideline has been prepared to assist qualified and experienced applicators/installers through the procedures to successfully apply the ACTECH 2170™ Moisture mitigation products on concrete substrates as a waterproofing primer external/outside Systems. This includes outside decks, verandas, parking decks, roofing projects, split-slabs, and any exterior application with high moisture and alkalinity.

As many roofing manufacturers turn to epoxy-based assembly systems, moisture and alkalinity in the concrete has affected these new systems just as in the flooring industry in the 90's and early 2000's. The ACTECH 2170™™ primers have been a solution for some of the most challenging issues faced on roofing projects, high moisture and alkalinity, split slabs, elevated light weight & LEED qualified concrete, pinholes high temperature swings and more.

This Guideline assumes that the appropriate moisture and alkalinity testing has been completed. The goal of this Guideline is to assist our approved installers/applicators in the various aspects of applying our materials to provide long-term performance in accordance with the ACTECH product warranty.

ACTECH ALWAYS RECOMMENDS THAT A MOCK-UP BE DONE ON ALL SUBSTRATES TO VERIFY PREP, PROFILE, COVERAGE AND COMPATIBILITY OF ALL COMPONENTS OF THE ASSEMBLY.

Excessive moisture and alkalinity in a concrete slab are one of the leading causes of failure in the concrete epoxy/coating and roof-covering industries. Many times, this can be directly traced to installer error, as it is the installer's responsibility to recognize and understand the possibility of failure, due to these issues. It could also be said that the installer is responsible for offering solutions to these problems. These solutions fall under the heading of Moisture Mitigation and Alkalinity control.

The ACTECH performance warranty requires that the installer have a minimum of 5 – years experience in concrete preparation and installing epoxy coatings and has proven to perform acceptable workmanship and provide performance results.

Allied Construction Technologies, Inc. only issues warranties to projects applied by company approved installers and that the approved individual must be present onsite for the duration of the project. Please read and become familiar with all product literature, product Data Sheets, SDS and Application Guideline prior to the start of any ACTECH project.

If any issue or problem arises prior, during or after any ACTECH product installation, please notify the ACTECH Technical Team as soon as possible to investigate the cause of the issue. If the issue arises during product application, HALT the project immediately and contact the ACTECH Technical Team before continuing. If the problem is not corrected the cost of repair is multiplied by not stopping the project and continuing with an issue that will need repair.

Responsibility:

When a decision to proceed with a moisture mitigation product is made, the responsibility then falls directly on the installer. As soon as the material is installed, the installer has declared that the substrate is suitable to receive the subsequent coatings, and roofing assemblies. The installer, and subsequently is then accountable if a failure of the flooring project occurs.

The suitability of the concrete substrate on any given project to receive the ACTECH 2170™ Moisture Mitigation products is entirely the responsibility of the installer. It is mandatory for warranty, that the trained and approved individual be physically onsite during the entire project. Filling out and submitting the 'Pre-project Checklist' to ACTECH is a requirement for a warranty. ACTECH Pre-Project Checklist

Roofing Systems and outside deck applications:

- Many Roofing Systems won't adhere to split slabs or lightweight concrete due to high moisture;
- Will not adhere to high moisture concrete, many at or under RH of 75%;
- Will not adhere to a pH above 11;
- Many epoxy-based systems manufacturers adhere to the 3-pound threshold and have established a limitation at or around 75% – 85% RH;

Concrete has a pH of ~12.5 which is above the threshold of many primers and adhesives.

Associations:

ACTECH supports the following Associations and Standards on all coating projects. These Associations have promulgated standards and guidelines for concrete slab construction; repair, testing protocols, procedures, education and training in all phases of concrete restoration, substrate preparation and coatings for metal and concrete. The following is a list of some of the leading Associations, Societies and Institutes of interest:

1) ICRI; International Concrete Repair Institute: www.icri.org
2) IIBEC; International Institute of Building Enclosure Consultants: www.iibec.org
3) RCMA; Roof Coatings Manufacturer's Association: www.roofcoatings.org
4) ACI; American Concrete Institute: www.aci.org
5) PCA; Portland Cement Association: www.cement.org
6) SSPC; Society for Protective Coatings: www.sspc.org
7) ASTM; ASTM International (American Society for Testing and Materials): www.astm.org
8) NACE; National Association of Corrosion Engineers: www.nace.org
9) LEED; Leadership in Energy and Environmental Design: www.bu.edu
10) USGBC; U.S. Green Building Council: www.usgbc.org

These organizations are aimed at professional education, training/certifying and maintaining a baseline for quality and performance of manufacturers, installers and products through continuing education and testing. ACTECH supports their standards and efforts to formalize various testing for the entire floor coating industry.

1. CONCRETE INSPECTION

Prior to bidding on any project, it is advisable (and in many cases, required) to perform a preliminary on-site walk-through to inspect the general conditions of the concrete substrate, noting any deficiencies observed and submitting a bid based on those observations. It is always advisable to include some "escape" clauses in the bid document to address any unforeseen conditions or circumstances that may be unexpectedly revealed during any phase of the project.

The following procedures are just some suggested items and areas to inspect and look for. Keep a look-out for any- thing that is unusual or "out-of-place". In some cases you may only get a quick walk-through and pictures may not be allowed, take notes as you go and write it down while they are fresh in your mind.

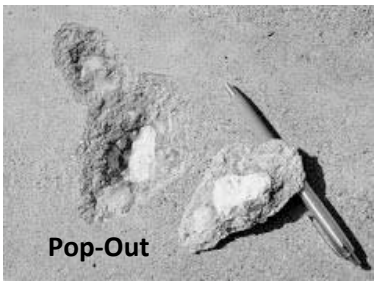
Walk-Through: Some things to look for (these are only suggestions, and it is up to the installer to make assumptions and conclusions based on observations):

This Application Guideline assumes that Moisture Testing has been performed or the substrate has otherwise been deemed a high moisture and alkalinity risk.

EXISTING ROOF-DECK SLABS:

- Has the current roof system failed or is it just being replaced?
- If you see "map-pattern" type cracks (see photo below), please contact the ACTECH technical staff for guidance as this may be a sign of ASR or "Alkali Silica Reaction", which is an expanding action of the internal aggregates causing this type of cracking. "pop-outs" are also a manifestation of the ASR activity. ASR is a permanent condition within the aggregates or the fines in the concrete matrix. There is no "cure" for this expansive reaction, and it will cause any surface applied epoxy, urethane or any other fluid applied systems to fail.
- If the deck has an existing floor covering or coating note if it is failing; cracking, curling, debonding or there are blisters/raised bumps, etc. If possible, find out how old it is and when did the failure start to occur.
- If blisters or bumps are noted, are there many or a few; are they located in one area only or all over the prospective floor, and the approximate size of the blisters. Draw a sketch of where they are located. Note any "pop-outs" and where they are.


"Map Pattern" cracks


Pop-Out

CRACKS:

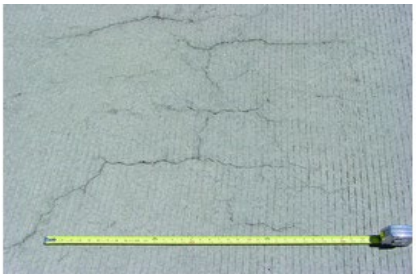
Note the general condition of the concrete: are there many cracks a few cracks or none, expansion joints, control joints visible? Condition of the cracks; if very large or many cracks are observed, there may be a need for further inspection by a structural engineer or like pro.

Non-moving cracks (Static):	Moving cracks (Dynamic):
Shrinkage Cracks	Expansion Joints
Random; Spider Cracks	Settling Cracks
Control Joints; Impact/Damage	Structural Cracks

- Are there spalls, or severe cracking- "map pattern cracking"?
- Take pictures (if allowed) and note the frequency (linear feet), width and where located.
- Are there any "pop-outs"? Impact damage? Settling of slab-height differentials?
- Note any other strange or out of the ordinary manifestations on the project.

Left: Random Crack; may be static or dynamic

Center: Large structural crack; Consult a Structural Engineer



Right: One-time shrinkage; these are static cracks

Control joints cut into new concrete; these are usually a one-time movement and may be filled/flooded

Surface spalling usually associated with freeze-thaw

NEW CONCRETE:

- Obtain the concrete mix design, if available and send to ACTECH technical team for review.
- How old is the "new concrete"?
- New concrete must be a minimum of 72 hours old; this includes trenching where portland-based concrete fill is used.
- Control joints: These are joints cut into green concrete soon after the initial set and are for the purpose of controlling the cracking of the concrete, that is, the concrete will crack in the joint and not across the slab randomly. These joints are said to be "activated" that is they cracked, or "un-activated" where the concrete did not crack at the joint. These are generally considered non-moving or static, but they may move in the future.

NEW (GREEN) CONCRETE:

- New concrete must be a minimum of 3-days or 72 hours from final set. At this point, the concrete is hard enough to mechanically prepare and has gone through the hydration process and the shrinkage and movement have mostly stopped and cure (~80% cured[1]) occurs ~ 7 – 30 days.
- ACTECH calls coating new concrete our "Go-Early" system. It uses the same materials the ACTECH 2170™ FC (Fast Cure), and with slightly different prep techniques is basically the same as any other installation. **We use ONLY the 'FC' or Fast Cure material**; **4 – hour cure material for this application**; do NOT use the 12 – hour cure material.

Note

- The 3 – Day limit for new concrete applies to ambient temperatures of 50°F - 90°F. If applying in cold weather, it would be best if a longer time were allowed for the concrete to cure. If the concrete has been placed in freezing weather, inquire with the GC whether Calcium Chloride was added to the mix design to prevent the concrete from freezing. If it has been added, contact the ACTECH technical team prior to the application of the ACTECH 2170™ FC.

- After the 3 – day wait, the deck must be mechanically abraded (shot blast) to an ICRI value; CSP[2] of 3 (Concrete Surface Profile). This will remove any laitance that has risen to the surface during the finishing procedures and any surface carbonation that may have formed. The same applies to new concrete after the 3 – days, it can be weeks or even months before the GC may allow the ACTECH primer to be installed. Usually the building envelope will be partially erected- walls and roof prior to application.
- When performing the Go-Early in a new facility and the building envelope is incomplete, watch the weather and avoid application if rain or other inclement weather is expected or predicted.

CORE SAMPLES; WHEN TO TAKE:

ACTECH does not require that core samples be taken from any concrete slab for warranty purposes, but if there are contaminates in the concrete, and it has been coated with the ACTECH material, the warranty will be voided (see warranty sheet for details); ACTECH Warranty.

However, when looking at an old roof especially one that has a tar, bitchemen or other asphaltic type roof system, a core may be necessary to determine the depth of the contamination. Consult the ACTECH technical staff for additional information on core testing when necessary.

CORE TESTING (OLD/EXISTING CONCRETE):

If there is any doubt or you suspect contaminates in any concrete substrate to be coated with the ACTECH 2170™ Moisture Mitigation/waterproofing, it may be prudent to have a core sample removed from the concrete and sent to a lab for analysis. Suggest this in writing to the GC or the owner to identify possible contaminates. It is important to get this in writing as a 'verbal only' can be disputed in the event of a future issue.

The results from testing the core sample will identify and quantify any constituents that may cause coatings to fail. The cores should be "short cores" that is they do not penetrate the entire slab thickness, but are ~3" in diameter X 2" in depth. The cores may be wet cut using an appropriate core drill.

[1] This is an estimate only and depends on many factors, such as but not limited to: mix design, water/cement ratio, admixtures, ambient temps and curing methods.

[2] ICRI, (International Concrete Repair Institute), www.icri.org; Guideline 310.2R Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, and Polymer Overlays.

Make sure that the lab the cores are sent to are equipped to test hardened concrete for the following (but not limited to):

1) IR; Infrared Spectroscopy (Organic surface chemistry): Organics, hydrocarbons-oils & grease;
2) IC; Ion Chromatography; (Inorganic surface chemistry): chlorides, sodium and potassium metallic salts,
3) XRD; X-Ray Diffraction: the makeup of the concrete matrix and aggregates
4) In some cases: Petrographic Thin Slice: ASTM C856; test for reactive aggregates; ASR.

Who pays for this core testing? The GC or owner should pay for the testing as it is their property and they should be delivering a slab suitable to receive coatings, however, some applicators take the burden of price and add it into the bid as a pre-project cost as a general cost of business. If you are unwilling to pay and the GC/owner will not pay, make sure to get the details and refusal from the various parties in writing and keep it in the project folder.

Follow all directions in the ACTECH Core Worksheet: ACTECH Core Worksheet and Guide

While taking a core to identify possible contaminates in concrete is a sound precaution, a core is actually only indicative of that particular piece of concrete and only provides a "snapshot" of what the concrete may hold. Below are some limitations that you should be aware of:

- The core results are only for that particular piece/immediate area of the concrete.
- Taking cores and finding no contaminates does not mean there are none elsewhere.
- Even if testing shows no contaminates, it is still not a guarantee of a successful application.
- The lab test results are *assumed* to be indicative of the area or the whole slab.

NOTE: Taking cores is NOT a guarantee that the entire deck is safe for coatings, again it is only a small picture of what may be in the overall deck. A sample core can miss an area of contamination sometimes by inches.

Make sure that all participants are aware of this limitation, and if there are any questions, please refer them to the ACTECH technical staff.

2. CONCRETE PREPARATION

The most critical part of our system is the correct preparation of the concrete substrate. Most of the failures that we have experienced through the years can be traced to a corner cut or procedure skimped on during the prep phase. The old saying that "Prep is 90% of the job" is very true here. Paying close attention to all phases of prep will pay off in a successful installation and long-term performance of the ACTECH 2170™ Moisture Mitigation systems.

CONCRETE REQUIREMENTS:

The general Standards regarding the requirements for acceptable new and old concrete are:

ACI (American Concrete Institute) 201.2R; 302.1R & 302.2R.; ASTM F3010:

The ACTECH requirements for concrete are the following:

- 3,000 psi compressive (Rebound-hammer test: ASTM C805)
- 200 psi cohesive (Pull off test: ASTM D7234)

- Absorptive (water drop test: ASTM F3191)
- Stain and dust-free (visual)
- Comply with ACI standards concerning concrete: ACI 201.2R; ACI 302.1R & 302.2R

Generally, most existing concrete will meet these requirements, even decades old concrete. However, you may run across concrete that is "punky" or weak looking, severely cracked, spalled, or that "just doesn't look right", in which case you should call for some additional concrete testing and/or a core sample. If the issues look critical or extensive, an inspection by a structural engineer may be called for. If this is the case, contact the ACTECH technical staff before bidding or starting the project. Keep in mind, that if you accept the substrate and commence prep and application, the slab is then "yours" with the responsibility falling on your shoulders.

RENOVATION CONCRETE:

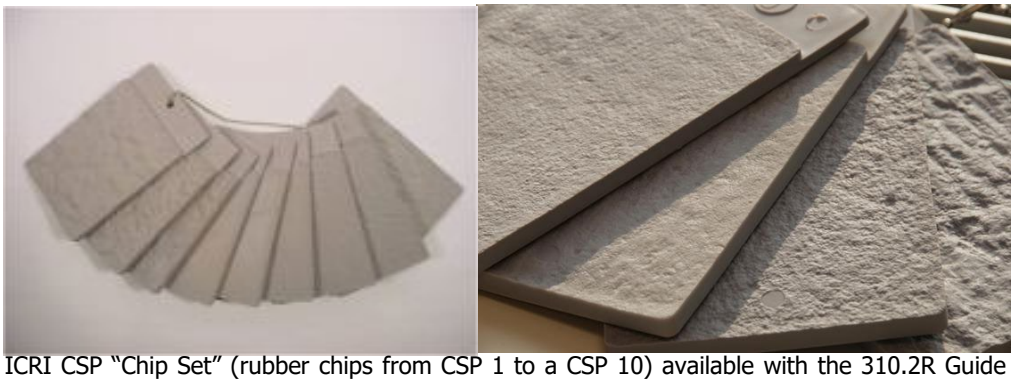
As discussed previously, the most important thing about coating older concrete is what may be in the concrete itself that may or will compromise the performance of the ACTECH moisture mitigation system and the coatings/toppings above. See Section I "Core Testing".

If this is a renovation of an older concrete deck/roof, the concrete may be very challenging as any contaminate, chemicals or hydrocarbon material in the substrate may cause failures or diminish performance. If in doubt or the previous roofing or coating has failed, it would be wise to take a sample core and determine what the failure mode was so as not to repeat the failure.

Basic Prep Requirement for all roof & decks:

- Mechanically remove all existing roofing materials, coatings, coverings, or any other applied materials by best mechanical means.
- Remove all down to the concrete surface leaving no old material, roofing or coatings on deck.

CSP VALUES: New Concrete: CSP 3 minimum; Old; Existing: CSP 4 minimum



ICRI CSP "Chip Set" (rubber chips from CSP 1 to a CSP 10) available with the 310.2R Guide document also available as a separate purchase: https://www.icri.org/store/

PREP METHODS:

Shot or bead blasting is the preferred method of preparation as it provides the most consistent, dust-free anchor pattern for coatings adhesion. In some cases, shot blasting is not possible or allowed, then grinding would have to be done. The problems that we have had with grinding are residual dust (bond-breaker) and inconsistent, improper or slight profile. A planetary grinder may not deliver as consistent a profile as a shot blaster, the CSP value may diminish as the plates or tooling wear. Shot blasting delivers a more consistent and steady value once the machine is properly adjusted and the shot, speed/amps set to achieve the profile needed.

The photo on the right shows the graphic difference between grinding and shot blasting. While this is a somewhat exaggerated example, it is not that infrequent and we have seen substrates prepared similar to the grinding profile, and they did fail.

You can see the advantage of the shot blasted anchor pattern and the dust-free look on the right. Comparatively, the ground, left side has a smoother surface with many voids that are usually filled with dust and debris. While being somewhat absorbent, there is very little anchor pattern for the material to bond to, and the dust would certainly break any bond.

GRINDING:

If grinding must be done due to jobsite restrictions, requirements or circumstances, make sure to use the proper tooling to give the best CSP value in a consistent and acceptable anchor pattern. These include (but not limited to) PCD's and bush hammer tooling. We have found that on medium hard (~4,000+ psi) concrete, the PCD's seem to work very well. On softer concrete ~ 3,000 psi concrete the bush hammer tooling may give a "3". Always perform a test with the tooling of choice to make sure that the proper CSP Value and correct anchor pattern is achieved. You will have to experiment a little with the tooling to find the right combination of CSP and anchor pattern for any given substrate.

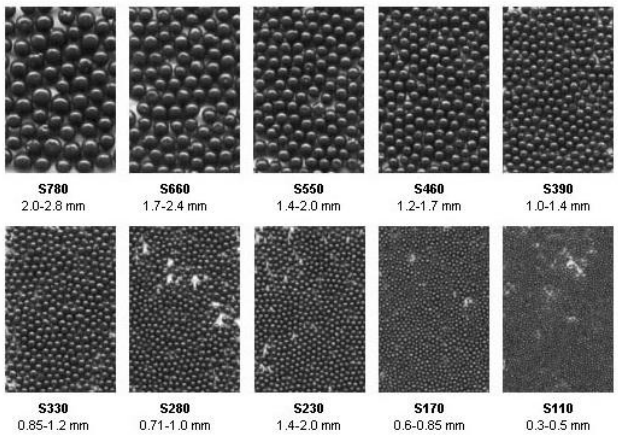
The more consistent the profile is, the better the material will bond to the concrete and provide long-term performance.

Left: PCD's

Right: Bush Hammer

Right; shot size selection; the more common shot is the 330 – 290 size for general prep. If you have a very hard or stubborn substrate, you may want to mix sizes and/or add some "black beauty" or Aluminum Oxide (AL OX) or other hard media to the shot mix as this will give you a more aggressive profile. Watch that you do not over-profile and be careful as the AL OX may/will cause premature wear on the blast machine parts, wheels and liner plates. Check with machine manufacturer for additional advice/information.

"Black Beauty" AL OX



The photo on the right is an extreme example of an improper or no profile. This coating system was applied to new concrete and there was literally no profile or anchor pattern at all. The installer not only did not prep properly, they did no prep at all! The result; lack of profile, moisture and alkalinity debonded the system quickly and a very expensive high-build epoxy deck system went into the dumpster. A very expensive omission! (the scratches are from a 5-1 tool breaking up the coating)

Edge-Grind; Note dust collection

Shot Blast (or grind) up to edging

Edge grind using the appropriate hand grinders with diamond segmented plates, “diamabrush” type plates or best method around the perimeter and any obstructions. It is best to edge first then bring the main prep up to the edge grind pattern. Mechanically abrade the concrete to a CSP-3 (new) and a CSP-4 on older/existing concrete). We have found that the Diamabrush plates give a CSP 3 and the cutting teeth are replaceable.

4” Diamabrush™ plate

7” Diamond segmented

4” Diamond cup

Shot blaster

Blastrac® Shot Blaster with Vacuum/dust collector

Diamatic™ Heavy Planetary Grinder

Revolving & Counter Rotating Diamond Plates

Grind to remove cutback, old adhesives, coatings and surface contaminates.

Follow by shot blasting to profile and remove dust and debris from concrete

Dispose of all dust and debris in accordance with the standards set by the Agency of Authority and follow all local, state and federal guidelines and requirements regarding disposal of these materials.
After mechanical prep, clean up all fugitive shot and vacuum up all dust. If grinding, we recommended to wash the floor after prep with a walk-behind type auto scrubber, (without detergent) using only clean, potable water.

Use a magnet “broom” to pick up fugitive shot, vacuum up dust (or use an auto scrubber); make sure to get into all cracks and joints; for a dust-free surface.

INSPECT: If necessary, any leveling of the deck should be done by grinding as part of initial prep.

- Check to make sure that you have the correct profile on the deck prior to coating, re-blast any area that is not to the specified CSP value,
- After shotblasting and during cleanup; inspect the floor for any foreign objects such as wood chips or any other material.

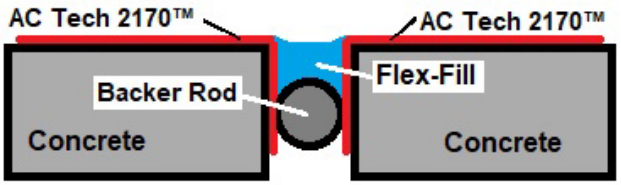


Above: Wood chips embedded in the concrete and exposed during prep. These and any other foreign material must be removed, especially wood; when this wood it is over coated with the ACTECH 2170™ resin, the wood will continue to absorb moisture from the concrete, it will then condense into liquid water, swell and will cause a blister to form above it in the finished roofing/coating assembly.

CRACKS AND EXPANSION JOINTS; USE INDUSTRY BEST PRACTICES:

Honor all expansion joints through the entire assembly;

- Clean out joint; chase with saw if necessary
- Pre-coat the joint sidewalls with the ACTECH 2170™ coating
- Install appropriate backer-rod; The ACTECH material must be below the backer rod
- Use appropriate elastomeric-flexible filler
- Honor all Expansion Joints, unless otherwise specified



Proper Expansion Joint Treatment

Photo on right: Large random cracks-may be dynamic, may be static; you can fill them, but they may crack in future. Remember, the ACTECH 2170™ resin, once cured, is a "High-Modulus" material and has very little flex.

Note

Old or Existing Concrete: Are You Replacing a Failed System?

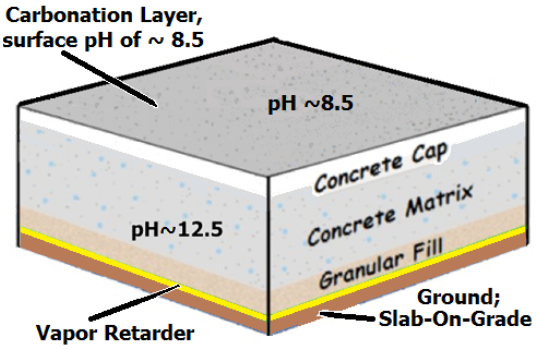
Questions to ask:

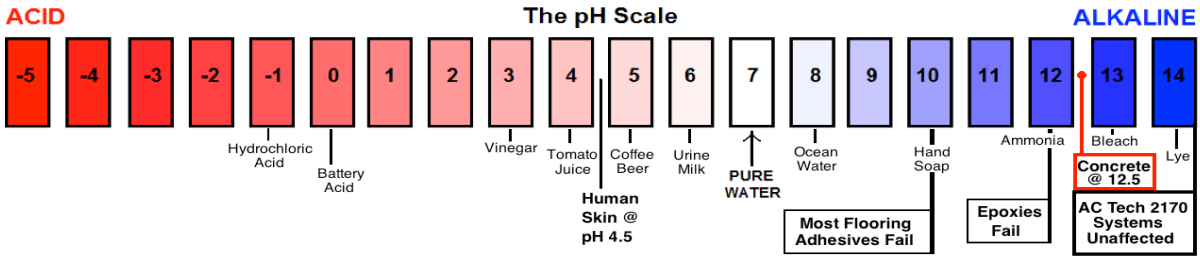
- Why did the previous system fail- failure mode known?
- When did it fail; how long was it down?
- Was Moisture testing performed?
- Core samples taken?
- Whose responsibility is this- YOURS!

DO NOT REPEAT A FAILURE!

As obvious as this is, many installers fall into the "failure repeat" mode when trying to repair a project gone bad. It is very tempting to simply put the system back down without properly identifying the cause of the original failure.

Right: A typical concrete slab section showing the surface carbonation (calcium carbonate) that forms on the surface from a reaction of the calcium hydroxide (in the concrete) with atmospheric CO_2. If the concrete has not been coated or covered, this layer will give a false pH reading, it must be ground off to properly test the pH of the concrete.



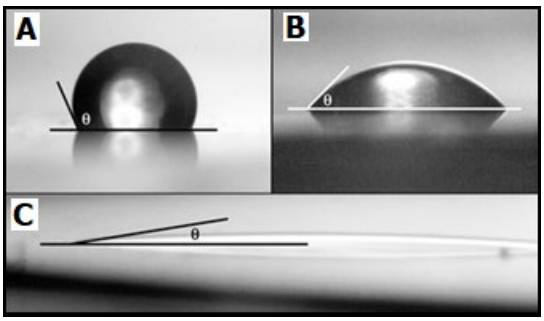


The ACTECH 2170™ Moisture Mitigation Systems can withstand a pH of 14 sustained.

Whichever prep method used, make sure to perform the water drop test (ASTM F3191) as you go to confirm that the concrete is absorptive. If the water drops do not penetrate and absorb, then there is something in the surface of the concrete preventing the water from absorbing. This may be inadequate prep or lefts over penetrating curing compound or some other surface contaminate causing this. This material may also cause fisheyes to occur if the ACTECH coating is applied and there will be very little absorption of the resin into the concrete cap.

ASTM F3191 WATER DROP TEST FOR CONCRETE (NEW AND OLD):

Photo on right: Simple test to determine the porosity of concrete to receive resilient flooring. After prep and the acceptable surface profile has been achieved, place (with a straw-or dropper) do not pour several drops of clean, potable water on the concrete and observe the rate of absorption.



A. Non-absorbent after 1 minute:
Contaminate(?); Core recommended
B. Semi-absorbed, increase in diameter – still not good; additional prep may be needed
C. Absorbed after 1 min, large diameter wet spot: good! Proceed

If the concrete is non-absorbent, (photo of drop on right) after the 1- minute time, there is something in the surface interfering with the absorption and the ACTECH 2170™ resin will not properly penetrate or "wet" the surface and the product's performance will be compromised. Further prep or a core sample may be needed to identify possible contaminates.

If the concrete has fiber reinforcing imbedded, it will be necessary to burn the exposed fibers off after shot blasting or grinding. These fibers are generally not be removed by preparation, but left lying on the deck with part of the fiber still embedded in the concrete and invisible to the naked eye.

When the substrate is coated with the ACTECH 2170™ epoxy (or any epoxy resin), the static electricity will cause the fibers to stand erect during cure.

This will be very visible after cure and will look like thousands of pimples on the deck. These fibers penetrate the thickness of the membrane and form a path for moisture to travel from the concrete to the surface compromising the performance of the moisture mitigating coat.

There is little that can be done at this point except re-grind or sand and then burn the fibers, sweep up debris and apply another coat of material. If burning is not allowed, contact the ACTECH technical team for guidance.

Cordon off area to be coated to prevent unauthorized personnel from walking on wet epoxy floor.

Recap: (Prior to the application of the ACTECH 2170™ system)

- Confirm proper substrate profile & concrete absorption;
- Remove all shot, dust and debris from deck and joints/cracks; pretreat joints with material;
- Cordon off area to keep out unauthorized personnel

MOCK-UP: ACTECH recommends that a full assembly mock-up be performed prior to the general application to verify concrete prep, adequate profile, product coverage/consumption rates and overall compatibility of the components. This is a requirement for a Performance Warranty, please see the ACTECH "Mock-Up form" for application and procedure details. Once the mock-up has been applied and full cure times achieved, performance criteria such as adhesion testing and inter-coat compatibility may be done for warranty purposes.

3. PRODUCT APPLICATION

RULE: Apply the ACTECH 2170™ FC only When the Concrete Temperature is Steady and or Falling and NOT Rising. With few exceptions, this is the RULE.

ENVIRONMENTAL/AMBIENT CONDITIONS:

Before any products are applied and during the entire application process it is necessary to check the ambient conditions such as relative humidity, temperature (ambient and concrete temps), dew point and general weather conditions and forecast.

The ACTECH 2170™ FC must NOT BE APPLIED WHEN THE AMBIENT/CONCRETE TEMPERATURE IS WITHIN 5°F OF THE DEW POINT.

We recommend that the installer have and be familiar with the following test equipment types:

These meters check for humidity & dew point

Elcometer Humidity

Wagner Meter TH-200

Defelsko PosiTect Meter

Wagner Meters C-555 Moisture

SET UP MIX-STATION:

Left: A simple mix-station on cardboard

Right: An elaborate mobile station with built in power and a large (can't miss it) digital timer

Set up mixing station in a location suitable to serve the application area, if project is large, you may consider a mobile mix station on pallets or similar platform that can be moved with the "wet-edge". Break the "A" and "B" cans apart and set aside. When mixing starts, remove the metal clamp from the can's top to mix.

DO NOT PRE-MIX MATERIAL; MIX ONLY WHAT YOU ARE GOING TO USE IMMEDIATELY.

- Pot life for 1st coat (mixed with acetone) is relatively long @ ~40 minutes;
- Pot life for the 2nd is short; ~10 – ~20 minutes
- Both pot-life times are temperature and humidity dependent and will vary depending on ambient temps & humidity: "hot and dry shorter; cool/cold and humid; longer.

MIXING:

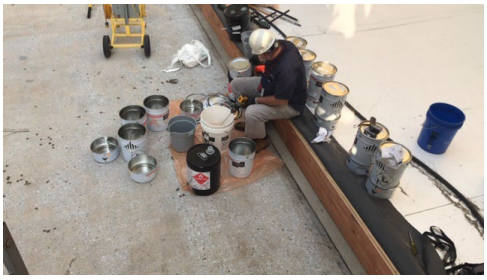
The ACTECH 2170™ FC (4-hour cure) when applied outside (ambient) roofing applications, it is a two-coat system. Coverage rate for the 2-coats is 12-mils WFT (Wet Film Thickness) over all high spots.

Mixing the ACTECH 2170™ FC and acetone in a 5-gallon bucket.

MIXING THE FIRST COAT:

1. Pour the Contents of the "A" component into a 5-gallon bucket. Add 1-gallon of acetone into the "A" component into it and start mixing.
2. Pour the "B" into the bucket and start the 3-minute mix-timing at this point.
3. This mix has a longer pot-life up to ~40 minutes, but it is best to pour it on the deck immediately after mixing. Do not pre-mix buckets.

4. Be careful of splashing when pouring on deck, especially on balconies, parking structures or anywhere near an edge. Wear appropriate PPE- eye protection, safety glasses, gloves a must.
5. Spread with a flat blade squeegee, pull this coat tight, do not try to build up any mils, do not let any material puddle or gather in cracks or voids- brush out all puddles. This coat is mainly to seal the capillaries and guard against pinholes.
6. Back roll with a ¼" nap, lint-free roller suitable for epoxies. Roll out any remaining puddles and work the material into any voids ad cover any missed spots. Maintain the 12 mil minimum over all high spots. Use a wet mil gauge to verify coating thickness.



A mixing station for the 1st coat on a roof application. Acetone is in the black 5-gallon can in the foreground.

When mixing, pour a little of the mixed material into the empty "A" and "B" cans (for both coats) and swirl around and pour back into the main bucket. This will harden the material left in the "A" and "B" cans making them acceptable for disposal in a dumpster. Make sure that all material is hard before dumping, do not discard any liquid resins.

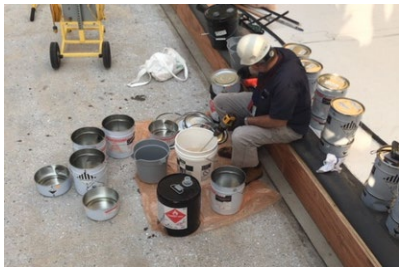
PHOTO GALLERY OF A ROOFING PROJECT Prep and installation of the 1st coat of ACTECH 2170™ FC

Project: Concrete roof; Area in the Shade; Ambient temp: 95ºF; Concrete temp: 90's. Humidity: NOT within 5°F of the dew point:

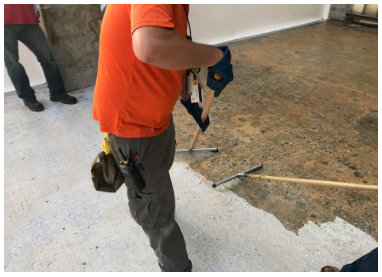
Shot blast the deck to a CSP 3-4

Magnet "broom" to remove shot, vacuum-clean deck prior to start.

Cutting in around perimeter and under pipes and around columns.



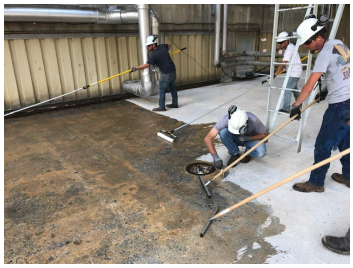
Mix each ACTECH 2170™ FC 2.4 – gallon unit with 1 gallon of acetone. Note acetone in 5-gal black can.



Pour carefully and squeegee 'tight' with a flat blade.

Squeegee- pull tight, no mil buildup, do not allow puddling in cracks and surface gouges.

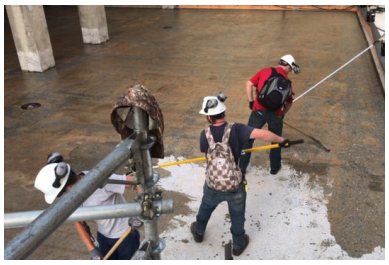
Backroll with ¼" nap rollers; note crewman cutting in around column, he is also brushing out puddles.



Squeegee, backrolling and cutting in around drain.

Note how the thinned material is "wetting" the concrete.

Coating under the pipes.



Crew "painting-out" to the ladder- almost done!

First coat finished, nice penetration, allow to cure.

Allow a minimum of 12-hours to cure and the acetone to flash-out. This cure time will be affected by ambient temperatures and humidity: cold and damp-longer; warm and dry- a bit faster. Ready for second coat, blow off any dirt, dust or debris. Recoat between the coats of the ACTECH 2170™ FC is 7 days maximum, past 7 days the cured 1st coat surface must be abraded. Contact the technical staff if a longer period is needed. This first coat is primarily to control and eliminate pinholes by sealing the surface capillaries.

Installing the 2nd "neat" coat; no acetone:

Mix the ACTECH 2170™ FC 'neat' without acetone. Mix for a full, timed 3 minutes with the low rpm drill and jiffy-type mixing paddle. The "A" component does NOT need to be pre-mixed.

Pour the "B" into the "A" pail and mix. Pour some of the mixed material back into the "B" pail and swish around- pour back into the "A" pail. This will get more of the "B" mixed in and also harden the left-over material in the "B" can for safe disposal.

Mix time: 3-minutes (timed) per unit. Pour the "B" into the "A" pail or use a third bucket for mixing. Use a Jiffy-type mixer and a low rpm (~ 400 or less) drill, do not induce air.

DO NOT PRE-MIX CANS; MIX ONLY AS NEEDED/DEMANDED ON THE WET-EDGE!

Edge first; use brush or small roller, pour some into smaller container. If on a large project, split first mixed can up into small units and proceed with brushes to trim.

Cutting in with a brush on second coat

Cutting in with a brush

Immediately pour entire contents of can onto deck in a long ribbon on the "wet-edge". The mixed material has a short pot-life and is exothermic; it produces heat. Depending on ambient temps, the pot life can be very short ~10-15 minutes if hot and up to ~ 20 minutes in cold. Pot life will vary with differing ambient temperatures. Once poured on the deck, the "kick" time is about 20 minutes a bit longer if the concrete is cool/cold, enough time to squeegee and backroll.

2nd coat, pour on deck spread with a squeegee…

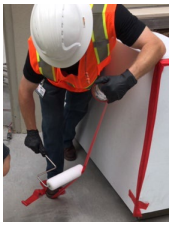
…Backroll to even out coating.

TIP!

Prior to using the roller covers, wrap or roll on the tape with the sticky side to the roller to remove any loose lint. If left on roller, the lint may come off into the wet coating and make a lump noticed (usually) when the resin is cured and will then have to be ground off.

If the "A" and "B" are mixed and let sit in can, the mixed amines and resin are exothermic, that is, the reaction creates heat. When mixed material is left in the pail/in-mass, this reaction speeds up quickly and a thick smoke will be produced. Once this starts there is no way to stop it, DO NOT POUR THIS ON DECK, carefully cover and take the pail immediately downwind/away from all personnel. Remove top and throw sand into pail to cool the reaction (you may use water- but be careful of splashing), cover and stand back. The material should not catch fire but will create a volume of smoke; DO NOT BREATH IN SMOKE-FUMES AS THEY ARE HAZARDOUS. This also happens to a lesser extent with mixed material left in pails after pouring on deck, after use immediately remove all empty pails to a safe area away from the work area.

If any personnel breath this smoke, take them to fresh air immediately and seek medical attention. Avoid breathing in the smoke!



Product Spread Rates:

Spread material out with a squeegee, you can use a flat or a notched blade, if notched a 12 – 16 mil notched blade is best. Spread out to approximate spread rate.

Spread rates will vary as to what CSP profile value achieved in prep, the absorption and porosity of the concrete. *We require a minimum of 12-mils over all high spots for warranty and performance*. Our tested perm rates are based on this mil thickness and it must be adhered to.

It is always best to mix material in a third bucket (5-gallon) and box the material as it is mixed; that is, pour the contents back and forth into the "A" and "B" pails to get a thorough homogenous mix. Also, by pouring back into the pails, the residual material left in pails will harden for easy and safe disposal.

Product Application:

Basic Tools: Shoe spikes; flat or notched squeegees; 3/8" – 9" or 18" rollers with frames & handles, edging brushes, spiny or porcupine roller, rubber/neoprene gloves, eye-protection, rags, NIOSH approved face mask if needed, acetone or xylene for cleaning tools. We also recommend that you have some "fish-eye eliminator" on hand in case of fisheyes, (details below).

1) Make sure that the slab and air temps are steady, and ambient/concrete temperature is 5° above the dew point. If the structure is open to ambient temps and humidity, apply when temps are 50°F - 90°F (normal) and humidity is below
2) For edge coating at walls, columns and other obstructions, mix a pail and pour into smaller pails and with suitable brushes for crew to apply. Trim out to where the squeegee can meet it. Make sure to maintain the 12-mil rule in trimming also.
3) For vertical application: the coating does not have to adhere to the 12-mil thickness rule as there is very little moisture drive in vertical concrete. It is best to apply either a thin coat or two thin coats to avoid sagging or "curtains" in the coating. Contact the ACTECH technical staff for additional information.
4) After mixing, pour entire contents of pail onto deck in a ribbon in the start area or along the previous wet edge.

Do not upend pails on deck to drain as this residual material is likely to be mixed poorly and may not cure properly, resulting in "half-moons" of soft or uncured material in coating.

5) Spread out with a flat-blade or notched squeegee setting the spread rate. Minimum spread rate is 12-mils WFT or ~ 130 sq ft per gallon. **Make sure that the mil rate is above all high spots on deck** (why a consistent profile is necessary). Spread rates may vary according to the porosity, absorption and profile achieved during prep of the concrete. Adjust the spread rate to reflect any deviations in substrate or application to maintain the 12-mil minimum. Notched squeegees at 12 or 16 mils.
6) Immediately after spreading with squeegee, back roll with the 3/8" roller covers. Do not over roll, once out, back and out again should suffice.

If you are applying the correct thickness, you should not hear the roller in the material, if it is making a loud sucking noise then the material is too thin, check spread rate. Backrolling is mainly to even out the coating for a more consistent thickness.

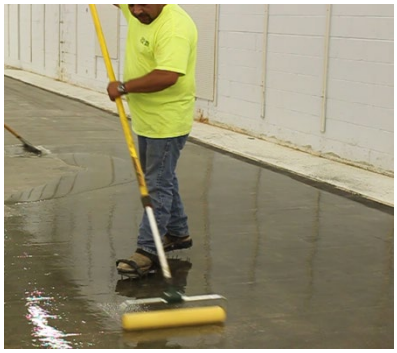
7) If bubbles appear in coating, use the spiny or porcupine roller to pop the bubbles. These bubbles are normally caused by air trapped during mixing or outgassing from the substrate; (see further details below).
8) Control joints and non-moving cracks may be flooded with material. If the control joints are too many, too deep or may use too much material, coat the sidewalls first during floor application do not let material puddle in joints. When floor is cured, the remaining hollows may be troweled with a mixture of the ACTECH 2170™ FC and a fumed silica such as Cabot's Cab-O-Sil® M-5 or Evonic's Aerosil® (hydrophobic type), trowel flush with surrounding deck and let cure, we recommend the 4-hour cure for this operation.
9) The ACTECH 2170™ FC material will self-level or self-heal and it is very forgiving with roller and squeegee marks but make efforts to minimize these application anomalies. The ACTECH material will self-level, but will not level the deck, if the deck is not level, it will still be un-level when cured but with 12-mils of ACTECH 2170™ FC on it. Any leveling procedures required should be done in the initial stages of substrate preparation and are beyond the scope of this Guideline.
10) Allow material to cure; cure times may vary according to the ambient temperatures and humidity. Cure time to walk on are (at ambient of 75°F) ACTECH 2170™ FC: ~4 – hours. For hot and dry conditions, the cure times may be shorter; for cool/cold and humid: longer. Cordon wet area off during the cure phase, keep unauthorized persons from entering. Light and foot traffic only, no heavy rolling loads until full cure.

11) Full cure (@ 75°F) in ~5 days. Keep all heavy point loads off of coating for a minimum of 5 days. If there is to be heavy construction equipment rolling over this coating even after full cure, provide appropriate protection board (such as Skudo Board HT®) to prevent coating/membrane damage.

NOTE: some individuals may have or develop a reaction to exposure to resins, this may show as a rash or other skin or respiratory manifestation. If this occurs, have the personnel wear long sleeves, gloves and other protective gear to minimize this condition. If the condition continues or grows worse, remove the person from direct contact with wet resins.

Pour mixed material out in ribbon

Squeegee out to proper spread rate



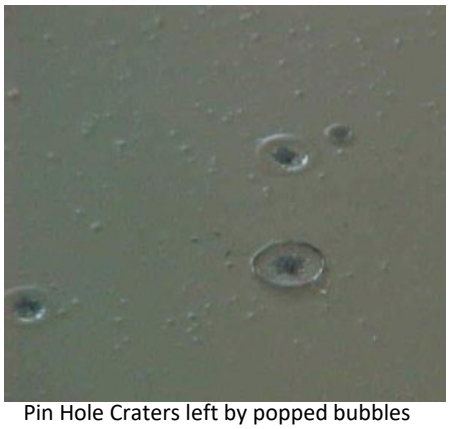
Backroll to even out coat & maintain the 12-mil thickness over ALL high spots.

Continue on working the “wet-edge”; squeegee-backroll

NOTE: If installing a system that requires a sand broadcast over the cured ACTECH 2170™ FC, a THIRD, THIN COAT of ACTECH 2170™ FC must be applied to adhere a sand broadcast. DO NOT BROADCAST INTO THE 2ND OR MOISTURE MITIGATION COAT. Contact the ACTECH technical teams for additional information.

APPLICATION ISSUES:

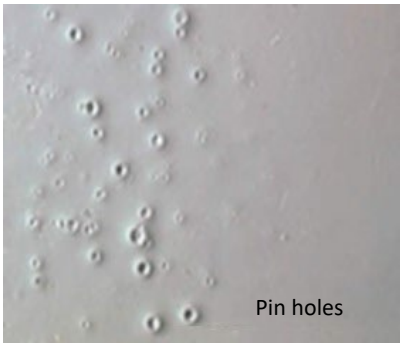
The following are the more common type of issues encountered when installing the ACTECH 2170™ FC Moisture Mitigation product. Most of them can be avoided by astute installers, but sometimes there is no warning or sign that the manifestation is going to happen until it does occur. There are many more things that could go wrong, and every installer has his horror story. These are just a few that can be damaging to any given project large or small.



Pin Hole Craters left by popped bubbles

Pin Holes;

This is a common issue when installing resins outside and are caused mainly by the outgassing of the substrate and will produce literal holes through the coating when cured. This is a very damaging occurrence especially to a moisture mitigation membrane. Out gassing can be caused by a number of things including from the epoxy itself. The ACTECH 2170™ FC is 100% solids, 98% pure resins with no plasticizers, extenders or fillers contained in them. This eliminates the resin outgassing, which leaves the substrate and mixing/application.



Pin holes

Causes:

One of the main causes is a temperature differential between the concrete and the ambient air and is frequently seen to occur in slabs that are open to ambient temps and humidity, especially outside applications in direct sunlight. Example: the concrete is slab's ambient temperature of 65°F overnight, morning sun warms the air and the concrete heats up (especially if in direct sunlight). The trapped air within the concrete expands and when the epoxy coating is applied, the air will push up through the wet epoxy causing a pinhole to form. There is very little actual psi attributed to this phenomenon but it is enough to form a permanent hole through the coating, which will cure with the hole in it. This hole will allow moisture-water vapor to readily pass through negating the moisture inhibiting properties of the ACTECH material as well as forming a very pimpled look on the cured resin.

Other causes are: Inducing air in the mixture with a high-speed drill, over-rolling and/or using a too thick nap roller cover which may "roll" air into the coating are a few of the alternative causes of air induction.

What to do:

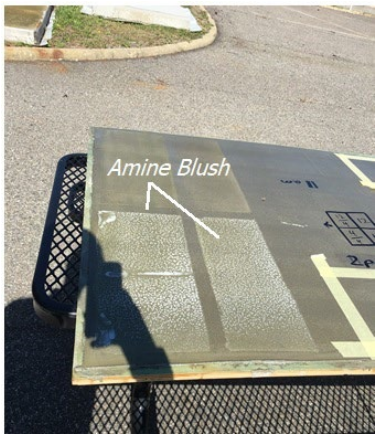
This is the primary reason for the first coat thinned with acetone; to penetrate the concrete cap and seal these capillaries and prevent them from forming in the first place. However, if the pinholes or bubbles form right away, run a spiny or porcupine roller through the material and it will pop bubbles and fill the pin holes if not to aggressive overnight while the material is curing. They may form overnight, if this occurs, please contact the ACTECH technical staff for guidance.

Temperature: Check temps and ambient conditions before installing, apply the ACTECH 2170™ FC system only when: **the temperatures are steady and/or falling and not rising.** A mock-up may reveal the pinhole situation prior to the main application and steps can be taken to correct for the pinholes. If the pinholes continue to occur or are too numerous, HALT the project to minimize any repairs that may be necessary to fix the problem and contact the ACTECH technical staff.

If the pinholes form overnight and are only discovered when the coating has cured, in a small mock-up area, sand with appropriate abrasive paper or screen, the existing coating and apply a second coat, neat, when temps are steady and/or falling and not rising to try to fill the pin holes. If this does not work, contact the ACTECH technical staff for additional guidance.

Halt the project and contact the ACTECH technical staff if you are experiencing difficulties with pinhole for alternative solutions and with any questions or concerns regarding remediation procedures.

Amine Blush:



What is it? Amine curing agents (in the "B" component) being hygroscopic that is, they absorb moisture, can react with ambient moisture (humidity) to form ammonium carbamate by-products. These by-products are created on the surface when the epoxy is in the early cure phase and the moisture reacts with the amines producing a whitish, greasy film or haze over the surface. This will be all over any of the resin that was exposed to moisture while still wet/tacky.

Cause: The wet epoxy is exposed to high relative ambient humidity such as dew, fog and mist when in the early cure phase. CO_2 gas from propane or kerosene heaters can also cause amine blush to form. Provide ventilation in closed areas that have any CO_2 emissions.

Why is this bad? The blush by-product forms a greasy whitish haze layer on the surface of the epoxy. The epoxy will have cured (unless exposed to liquid water-different scenario) and the blush may not be very visible or it may show as a white film. Either way, it is a bond breaker and any coatings or adhesives applied will debond and/or blister.

What to do? The film must be removed entirely prior to any subsequent coatings/material application. If the blush is fresh, it can be washed off with a light detergent and rinsed with water, or a solvent wipe with acetone, denatured alcohol or xylene. If it has been on the surface for a period, it may require sanding with a swing-type sanding machine to remove it. Make sure to clean up all dust and debris from the cleaning/removal process.

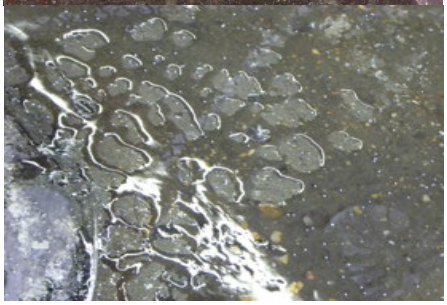
Best way- AVOID: Avoiding the ambient conditions that are conducive to the formation of the blush are the best way to negate the issue. When installing do not apply if inclement weather is predicted before the resins can cure and always watch the dew point or the point that airborne water vapor will condense on surfaces causing dew to form. Once the ACTECH 2170™ FC has cured, it will no longer blush.

Make sure that the temperature of the concrete is NOT within 5° of the Dew Point. Use the Dew Point Chart! (See Dew Point Chart at the end of this Guideline).

The Installation conditions/ambient conditions of temperature and humidity must be followed during mixing, application and the full cure of ACTECH 2170™ FC.

CAUTION! The use of propane or kerosene heaters may also cause amine blush especially if the application is in a semi or closed area. The CO_2 created by the heaters exhaust will also react with the amines and produce a blush on the surface.

Fisheyes:



Fisheyes are almost always caused by a surface contaminate which causes the epoxy to recede or pull away from the point of contamination and form a crater-like manifestation in the surface. There is usually very little to no material in the center of the fisheye, and the performance of the Moisture Mitigation system is compromised. These fisheyes may occur right away or overnight as the material cures. If they are seen right away, halt the project until the cause can be identified. If they occur overnight and the epoxy is cured, then repair will be necessary.

Cause: Surface contamination is the main cause for fisheyes to form. This contamination can be residual sealer or curing compound still in the concrete surface, silicone or mold-release (from tilt-up construction), oils, grease, fats, blood (food processing) and many other organic and hydrocarbon contaminates. They may also be caused by too light or improper surface prep. If contamination is suspected, a sample core may be the solution to identify the chemical contaminate and make a repair procedure. The lab test for identifying these contaminates (either organic or non-organic) is the Infrared Spectroscopy (organics), Ion Chromatography for non-organic metallic salts and chlorides.

Why is this bad? Due to the pulling-away effect and the formation of the crater, there is very little to no material in the center of each fisheye, which would allow moisture to readily flow through to the subsequent coating. Also, the crater edges are usually very thick (comparatively) and may run 80+ mils or an 1/8" or more, thereby reducing or compromising the moisture reduction properties of the ACTECH 2170™ FC.

What to do? If fisheyes are noticed forming during the application, HALT the project immediately, do not proceed. Determine is this is just confined to a small specific area or over the entire project deck; i.e. do the fisheyes occur throughout the area just coated or confined to a specific area. Investigate the cause onsite if possible- question the GC or the owner as to what was done in these areas; petroleum roofing materials-tar, etc., machinery leaking, oil drums or other liquid storage, machine storage, etc. If the cause cannot be determined, then a core may have to be removed and sent to a lab for analysis of contents.

Procedures: If the fisheyes are very few in number then some onsite remedies may be tried; a squirt bottle with acetone in it may be lightly squirted over a small fisheye and will act as a mild surfactant and may close the fisheye. There is also a product available (from Sherwin Williams Automotive supply) called "Fisheye Eliminator" and is also a surfactant that can be added to the material mixture to solve fish eyeing. This material may or may not work, test with one unit and see if it resolves the issue. If the fisheyes are still occurring and very numerous, then a core will be needed to identify the contaminate/s.

When using the Sherwin Williams Dimension DA667 "fisheye eliminator" use the following mix ratios when mixing with the ACTECH 2170™ products.

Add the Fisheye Eliminator to the ACTECH 2170™ FC unit after the "B" component has been added to the "A", mix thoroughly for 3 minutes and pour out, squeegee and backroll as normal.

Mix amounts: using the DA 667 can top/cap as a volume measurement: Use <u>Capfuls ONLY</u>!

~ 3 Capfuls per gallon OR:

- 2.4 - gallon ACTECH 2170™ FC (fast cure): 8 capfuls per unit; measure carefully.
- Mix units for 3 minutes then proceed per installation instructions.

Contact the ACTECH technical staff for additional information or if the issue cannot be resolved or information on core testing is needed.

If severe fisheyes occur, halt the project immediately, do not continue as you may have to remove all that was already applied. Continuing, even if pressured by the GC or the owner, halting the project will minimize repair costs and will give you the necessary time to discover what the cause of the fisheyes are. The ACTECH 2170™ FC material will not fisheye on "normal" concrete and there must be some contaminate on the surface causing them. (doing the "Water-Drop Test" will help to identify possible fisheye causing contaminates during/after concrete prep.

Mil thickness and substrate surface profile: A major issue is the mil rate of the material is too thin. The 12 mils needed must be over the high spots of the deck profile. If the deck has too aggressive a profile, such as a CSP value of 5 or 6, a much greater consumption rate of material will be needed to adequately cover the high spots. If a severe profile is found on a project deck, grinding may be required to lower the profile to a CSP 3 or 4, then shotblast to profile. This is especially true on decks (new and existing) that have a heavy broom finish or rough surface.

ACTECH always recommends that a mockup be applied to verify the consumption rate and reveal any issues that may compromise the application and performance of the coating and identify the need for further prep or any additional procedures and to assure a successful installation and to ascertain if there is a need for extra material purchase.

The two photos above are from a new parking deck project where the installer was faced with coating a CSP 10+ broom finish. The concrete ready-mix company that finished the surface, according to specifications, called for a CSP 4 – 5 in this area, this was lost somewhere in communications. Grinding was not allowed due to the location of the structure due to possible dust, so the high points had to be "buried" adding two additional coats of the ACTECH 2170™ FC, incurring additional material costs.

Recoating: The ACTECH 2170™ FC Moisture Mitigation product; recoat window between coats of the ACTECH 2170™ is 7 days for a chemical bond. If the recoat window is passed, a light sanding with a swing-type (buffer) sander and appropriate grit paper will be necessary to remove the surface gloss and provide "tooth" for subsequent coatings adhesion. It is best to recoat within 24 hours or as soon as possible between the ACTECH 2170™ FC coats and subsequent product coats to a minimum of 24 hours when possible.

The cured surface of the ACTECH 2170™ FC will accept many types of epoxies, urethanes, MMA's, PMMA's, Urea's, Polyaspartics and more. For subsequent roofing or coating assemblies/systems, consult the individual manufacturer's data sheets and product literature for recommended recoat windows over the ACTECH material.

Check with the subsequent manufacturer's coating literature as to the recoat time over the ACTECH 2170™ FC. This may vary from 24 to 72 hours or more. If the recoat window is passed, then a sanding with a swing-type sander with appropriate grit paper or screen to cut the gloss and profile the cured ACTECH. Make sure to remove all dust and debris from any mechanical abrading prior to installing subsequent systems. **MMA's and PMMA's must be installed within 48 hours over the cured ACTECH 2170™ systems, no exceptions.**

4. WARRANTY

Allied Construction Technologies, Inc., lists the following as requirements for receiving a performance warranty for any of our products:

1) The installer must be an ACTECH approved applicator.
2) The approved applicator must be onsite for duration of project.
3) On-Site Supervisor Approval Form must be filled out
4) The Pre-Job Survey and Final Job Installation Checklist must be filled out and submitted to ACTECH.
5) Mock Up must be conducted and Mock Up Test Forms complete.
6) The Warranty Request form must be submitted to ACTECH.
7) The ACTECH 2170™ FC Moisture Mitigation Systems warranty is for failures or issues due to water vapor transmission and alkalinity only.
8) The normal performance warranty lifespan is 15-years; but alternative warranty spans may be made.
9) All warrantees commence only when all material invoices are paid-in-full and all paperwork is submitted and approved by ACTECH.

Please contact the ACTECH Administrator on any questions or concerns regarding the warranty, qualifications, details and availability. 757-855-5100;

Product Features and Benefits:

Features:	Benefits:
100% solids epoxy: Solvent free	No upper moisture limit :
100% reactive	ASTM F1869; 25 lbs+
98% pure resin, no fillers or extenders	ASTM F2170™; 99/100% RH
ASTM E96 Perm rate of 0.06 – 0.09	VOC Emission Free
Zero VOC Emissions (Berkeley Labs)	Alkalinity resistance to pH 14
Fast-Cure; FC @ 4 hours (ambient dependent)	15 – year comprehensive warranty
14,500 psi compressive upon cure	Compatible with most Epoxies, Urethanes, MMA's, PMMA's and others
Shore 'D' of 82 upon cure	No upper moisture limit :
Passes ASTM C1315, 309 (Curing Compound)	ASTM F1869; 25 lbs+
Will not allow mold growth: ASTM G-21	ASTM F2170™; 99/100% RH
15 – year comprehensive warranty	VOC Emission Free
Complete 24/7 technical support	Sustained alkalinity resistance to pH 14

5. Products/Packaging:

ACTECH 2170™ FC™
Available in 2.4 Gallon or 0.5 Gallon Combi-Unit

ACTECH 2170™ FC Plural Component Cartridge

- Moisture and alkalinity resistant-same as the canned material.
- Static mix tubes included.
- Fits most 400 ml guns; (gun sold separately)
- Fast curing.
- Re-sealable- Re-useable.
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Cartridges may be used for a variety of applications including filling voids, cracks, old bolt holes, chips, small areas too small to use a large kit, trimming and coating missed or thin areas.

Industry Associations:
ASTM…….American Society for Testing and Materials; www.astm.org
Roofing & Waterproofing; Committee D08
Resilient Floor Coverings; Committee F06
ICRI……..International Concrete Repair Institute, www.icri.org
ACI…….American Concrete Institute, www.aci-int.org
RCMA……Roof Coatings Manufacturers Association: www.roofcoatings.corg
SSPC: …..The Society for Protective Coatings; HQ: Pittsburg, PA; www.sspc.org
NACE:……National Association of Corrosion Engineers; HQ: Houston, TX; www.nace.org
PCA…….Portland Cement Association: www.cement.org
USGBC….U.S. Green Building Council; Sustainable building designs
LEED…….Leadership in Energy and Environmental Design: 'Points' for sustainable building designs.

LABS: (For Core Test Analysis)
CTL Group: (Construction Technology Labs, Inc.), www.CTLGroup.com
Mineralogy, Inc.: Timothy B. Murphy; Forensic Testing Lab, www.mineralogy-inc.com
Braun Intertech Corp.: Gregory Bauer; Forensic Testing Lab, www.braunintertech.com

Agencies, Publications & Bulletins of Interest:

ACI, American Concrete Institute:

ACI 201.2R-01: Guide to Durable Concrete.

ACI 302.1R-15: Guide to Concrete Floor and Slab Construction

ACI 302.2R-06: Guide to Concrete Slabs to Receive Moisture Sensitive Flooring

ACI 221.1R-98: State-of-the-Art Report on Alkali-Aggregate Reactivity, (ASR).

ICRI, International Concrete Repair Institute: Guideline No.310.2R-2014: Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, andPolymer Overlays.

Portland Cement Association: Concrete Floors and Moisture by Howard M. Kanare. Engineering Buletin 119, PCA 5420 Old Orchard Road Skokie, IL 60077-1083.

ASTM: Significance of Tests and Properties of Concrete and Concrete-Making Materials; Klieger and Joseph F. Lamond, ASTM Publication Code No. 04-169030-07, STP 169C.

SSPC: SSPC-SP 13/NACE No. 6 Surface Preparation of Concrete; Joint Surface Preparation Standard.

NACE: National Association of Corrosion Engineers: Industrial painter certification that validates a working knowledge of surface preparation, industrial coatings application and safety procedures. NACE No. 6.

OSHA: Silica Rule Buletin #3681; Silica Sand/Silicosis.

IIBEC: International Institute of Building Enclosure Consultants: IIBEC is an international association of professionals who specialize in roofing, waterproofing, and exterior wall specification and design.

SCAQMD: South Coast Air Quality Management District: California VOC Limitations for Coatings (1976) Rules 1143; 1171; 1113; 102.

CARB: California Air Resources Board: Air Quality rules (1990).

CA Proposition 65: Identifies chemicals and compounds that are linked to cancer and promulgates warning labels for them.

"Red List": Lists of harmful chemicals that are developed from chemical hazard lists published by government agencies such as the EPA, European Union Commission on Environment and the *CA Dept of Toxic Substances Control*.
ILFI: International Living Future Institute and the *Living Building Challenge* (LBC); Red list of chemicals and materials that should be phased out of production and use.

Articles of Interest:

- Concrete Roof Deck Moisture Research-Executive Summary ; Chicago Roofing Contractors Assoc. (Winter 2020, pages 9-11) Matt Dupuis, PhD, PE.
- The Devil is in the Details: Surface Prep Prior to Coating Your Existing Roof; *Coatings Pro* Magazine; By Scott Gayle, American Weather Star; March 2015.
- Using Coatings in Challenging Weather ;*Construction Canada* By Steve Heinje, Quest Construction Products Jan. 2015.
- Solvent Reduction Technology – What are the Rules? *Coatings World* By Dr. Michael R. Van De Mark and Ameya M. Natu, Missouri S&T Coatings Institute Sept. 2014
- Five Ways to Maximize Your Roof Coating Investment; *Facility MaintenanceDecisions* By RCMA Staff June 2014.
- Strategies for Preventing Roof Coating Problems; *Maintenance Solutions* March 2013.
- Coatings for Today's Roof Systems; *RSI* June 2007.
- Moisture+Concrete = Troublesome Combination | Commercial ...; www.ccr- mag.com moistureconcrete-decks-a-troublesome-combination/ Dec. 31, 2016
- Frequently Asked Roof Coating Questions - National Coatings www.nationalcoatings.com/roof-coating-questions.

Please direct any questions or concerns or for additional information to : ACTECH technical staff: team@actechperforms.com; (757) 855-5100

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