

PRODUCT APPLICATION GUIDELINE *INTERIOR*

ACTECH 2170™ FC Moisture Mitigation

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™ FC moisture mitigation on concrete substrates. This Guideline is divided into 4 sections: 1) Concrete pre-job inspections; 2) Concrete preparation; 3) Application of the ACTECH 2170™ FC; 4) Warranty procedures.

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. Please read all product data sheets, literature and SDS prior to the start of any project.

Excessive moisture and alkalinity in a concrete slabs are the leading causes of failure in the floor covering industry. 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. Please read and become familiar with all product literature, product Data Sheets, SDS and Application Manual 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 determine or 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.

You should also be aware of what the final flooring, covering or coating is to be to be able to make any adjustments to prep, application procedures for warranty and the performance of the system.

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, floor coverings or roofing assemblies. The installer, and subsequently, the floor-covering contractor are 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™ FC 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

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 list is the leading Associations, Societies and Institutes of interest:

- 1) ASTM; ASTM International (American Society for Testing and Materials): www.astm.org
- 2) ICRI; International Concrete Repair Institute: www.icri.org
- 3) ACI; American Concrete Institute: www.aci.org
- 4) SSPC; Society for Protective Coatings: www.sspc.org
- 5) NACE; National Association of Corrosion Engineers: www.nace.org

These organizations are aimed at professional education, training/certifying and maintaining a baseline for quality and performance of 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 some cases, required) to perform a preliminary on-site walk-through to inspect the general conditions of the facility and 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 observe, but is not to say that these are the only things to look for and any other observations or anything that is unusual or “out-of-place” should be noted. 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):

Renovations; Existing Slabs:

- Is the history of the facilities usage known? Find out what type of work was performed there; manufacturing, assembly, food processing, material storage, animal pens, etc., if the concrete has no coating on it then whatever chemicals or contaminants used could, and most likely are still in the concrete.
- 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 like symptoms are noted, consider the following: are the blisters wet or dry; 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.
- Below grade; is there any sign of liquid water, puddles, stains? If there is, contact the ACTECH technical staff prior to start.

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):

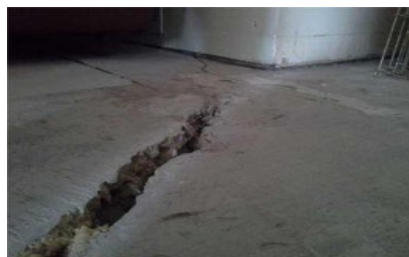
- Shrinkage Cracks
- Random; Spider Cracks
- Control Joints; Impact/Damage

Moving cracks (Dynamic)

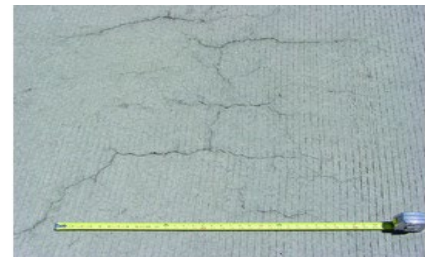
- Expansion Joints
- Settling Cracks
- Structural Cracks



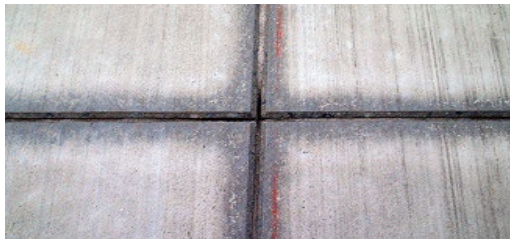
Left: Random Crack; may be static or dynamic



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

- 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.



“Map Pattern”



Pop-Out

New Concrete:

- Obtain the concrete mix design, if available and send to ACTECH technical team for review.
- How old is the “new concrete”? We have known “new concrete” to have been placed up to 2-years (or more) and not coated or covered and used for purposes other than intended, such as parking/storing equipment-trucks-tractors, large machinery, etc.
- 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% cured¹) occurs ~ 7 – 30 days.
- ACTECH calls coating new concrete our “Go-Early” system. It uses the ACTECH 2170™ FC (Fast Cure), with slightly different prep techniques is basically the same as any other installation.

Note

- The 3 – Day limit for new concrete applies to ambient temperatures of 40°F - 90°F. If applying in cold weather, it would be best if a longer time were allowed for the concrete to cure, 4 -5 days. 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; CSP² (Concrete Surface Profile) of 3. 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.

Aircraft Hangars;

Note

The concrete in new hangars is usually very dense, hard (5K to 8K psi), and heavily power-troweled, which may make it very difficult to properly profile and may/will affect the absorption of our resin into the concrete thereby making a weak bond. The concrete may also have additives that will negatively affect coatings, especially low permeance material such as the ACTECH 2170™ FC. We strongly suggest obtaining the concrete mix design and installing a mock-up prior to the project start to confirm absorption and compatibility.

The concrete in existing/older hangars may have high levels of contamination due to years of fuels & lubricants and many other hydrocarbons spills especially if the concrete has been uncoated. If there is a current coating on the concrete, check to see if it is in failure or just worn out, if in failure it is imperative to determine the failure mode so the failure is not

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](http://www.icri.org)), www.icri.org; Guideline 310.2R [Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, and Polymer Overlays](#).

repeated. In all cases, core samples are highly recommended to identify any contaminants that will affect the bond of any surface applied resins.



In prepping the concrete in Hangars, it is necessary to perform the water drop test often during surface prep to verify absorption. A mock-up with the ACTECH 2170™ FC is also highly recommended and if other negative issues occur such as fish eyeing, halt the project and call for a sample core for lab analysis to identify any contaminants.

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 contaminants 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 building/slab that may have been a manufacturing facility or a repair shop or any type of work that where various chemicals and other contaminants were spilled on the concrete, always suggest that some cores be taken to identify and quantify those contaminants that will affect any coatings.

This is especially true when a building is re-purposed, such as an old manufacturing factory now being considered for conversion stores or condominiums. Any oils, assembly fluids, solvents and other chemicals that were used in the past are most likely still in the concrete and when capped by a low-permeable resin, will tend to migrate to the surface where they will break the bond of the resin and cause blistering and flooring failure.



In the renovation of older structures, you may also want to identify any possible hazardous materials that may be in the concrete slab such as asbestos, PCB's, Cadmium, Chlorofluorocarbons (CFCs), Formaldehyde, Chloroprene and other hazardous materials. (This is only a sample list; refer to the "Red List" for additional dangerous chemicals). The general contractor and owner may not be aware that these chemicals are in the concrete, but if they are and you proceed without proper abatement license and certification, you may open yourself up to large fines and possibly much worse.

By identifying any HAZMAT materials prior to the project start and suggesting proper abatement by a licensed company, you release yourself from possible liability and even prosecution for unknowingly handling or illegally disposing these dangerous materials and allow the GC or owner to engage legal abatement procedures.

Right: Old factory facility re-purposed as high-end condos. The concrete may be heavily contaminated and only a core can identify and quantify the possible hazardous materials.



Core Testing (for New and Old Concrete):

If there is any doubt or you suspect contaminants in any concrete substrate to be coated with the ACTECH 2170™ FC (or any epoxy coating), 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 contaminants. 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.

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 contaminants 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 of concrete;
- Taking cores and finding no contaminants does not mean there are none elsewhere;
- Even if testing shows no contaminants, 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.

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.

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

2. CONCRETE PREPARATION

The most critical part of our (and any manufacturer’s) coating system is the correct preparation of the concrete substrate. Most of the failures that we have experienced through the years can be traced to some corner cut or procedure skimmed on during the prep phase. The old saying that “Prep is 90% of the job” is right on the money here. So paying close attention to all phases of prep will pay off in a successful installation and long-term performance of the ACTECH 2170™ FC.



Concrete Parameters (new and old-renovation):

The general Standards regarding the requirements for acceptable concrete are : ACI (American Concrete Institute) 201.2R; 302.1R & 302.2R.

The ACTECH requirements for concrete are the following:

- 2,000 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: Eyes-hands)
- 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 “punk” or weak looking, severely cracked, spalled, or that “just doesn’t look right”, in which case you certainly should call for a core/s or an inspection by a structural engineer, and a call to the ACTECH technical staff before bidding. 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 2170™ FC and the coatings/toppings above. See Section I “Core Testing”.

If this is a renovation of an old manufacturing facility or repurposing an older structure for a new use, coating the concrete may be very challenging as any contaminate chemicals or organic material in the substrate may cause failures or diminish performance.

Knowing the history of the facility, what it was used for will be vital intelligence and can usually be found by asking around, GC, Owner, real estate agent, town hall, etc. This sounds cumbersome and out of your purview; not your job, but when it comes to paying for repairing or replacing an entire coating system, it will be well worth the effort!

Basic Requirement for all decks and floors: Remove all existing coatings, coverings, flooring or any other applied materials by best mechanical means. If there is an underlayment or patching material, try to identify as to whether it is gypsum-based or portland cement-based. If gypsum-based it must be removed entirely as any gyp material left and over coated with the ACTECH 2170™ FC material, moisture beneath the coating will cause the gyp to expand and form a blister immediately above.

The older the concrete/facility, the more varied and hazardous the contaminants may be and may contain chemicals and materials that are outlawed by today's standards. Taking a core or cores is inexpensive insurance and identifies many of the organics or even HAZMAT constituents that may require specialty licensed contractors to abate. If you proceed without testing and especially if there is demolition of old flooring or coatings, you may find yourself with a hefty fine (or worse) from the EPA or OSHA.

Prep Methods (Apply to New and Old Concrete):

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/>

Shotblasting:

Shot or bead blasting is the preferred method of preparation as it provides the most consistent, dust-free anchor pattern for our coatings adhesion. Sometimes 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 improper profile. A planetary grinder may not deliver as consistent a profile, the CSP value may diminish as the plates wear. Shot blasting delivers a more consistent and steady value once the machine is properly adjusted and the 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 may plainly 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. When VCT is installed directly to the surface on the left, many times the swirl pattern may telegraph through the tiles.



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 gives 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.

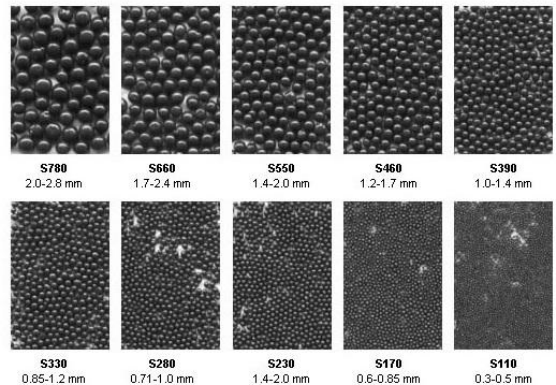
Right; shot size selection; the more common shot is the 330 – 290 size for general prep. If you have a very hard or stubborn substrate, you may want to mix sizes and/or add some "black beauty" or Aluminum Oxide (AL OX) to the shot mix as this will give you a more aggressive profile. Watch that you do not over-profile and be careful as the AL

OX will cause premature wear on the blast machine parts; wheels and liner plates.



Left: PCD's

Right: Bush Hammer



Above: "Black Beauty"



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; moisture and alkalinity debonded the system quickly and a very expensive high-build epoxy deck system went into the dumpster. The owner was ready to sue, and the installer had to pay for a new coating system + prep, 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). We have found that the Diamabrush plates give a CSP 3 and the cutting teeth are replaceable.



Above: 4” Diamabrush



7” Diamond Segmented



4” Diamond Segmented grinding plate



Shot Blaster



Blastrac® Blaster (R) w/vacuum (L)



Diamatic™ Heavy Planetary Grinder



Revolving & Counter Rotating Diamond Plates



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



Follow by shot blasting to profile the cleaned concrete.

Clean-up:

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, it is 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, make sure to get into all cracks and joints; vacuum up dust (or use an auto scrubber) for a dust-free surface.

INSPECT: (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.

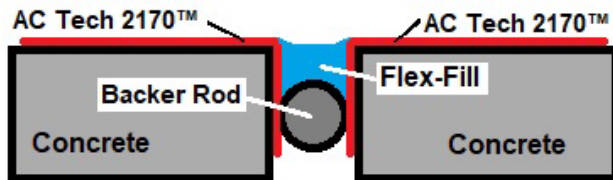


Wood chips embedded in the concrete and exposed during prep. These must be removed, especially wood; when this wood is over coated with the ACTECH 2170™ FC resin, the wood will continue to absorb moisture from the concrete, it will condense into liquid water, swell and cause a blister above it in the finished floor.

Honor Expansion Joints; Use Industry Best Practices:

Cracks, Joints and Patching:

- Clean out joint; chase with saw if necessary
- Pre-coat the joint sidewalls with the ACTECH 2170™ FC 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™ FC, once cured, is a “High-Modulus” material and has very little flex.



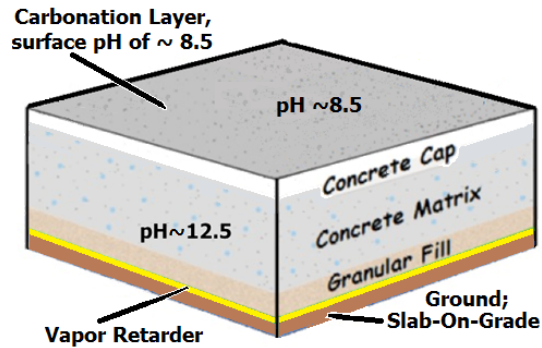
Old or Existing Concrete: Are You Replacing a Failed Floor System?

Questions to ask:

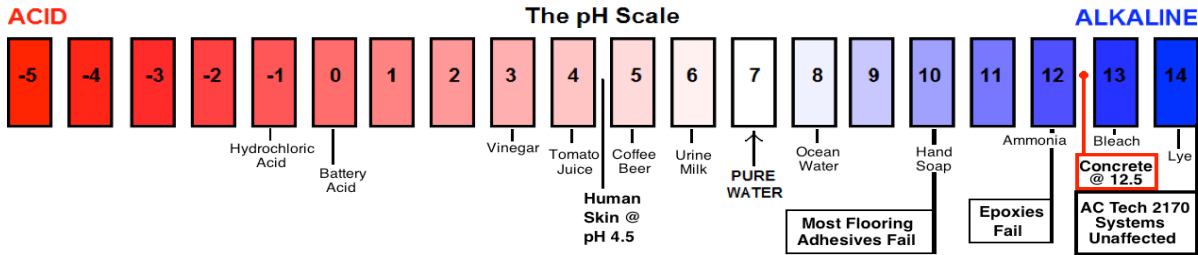
- Why did the previous floor fail- failure mode known?
- When did it fail; how long was it down?
- Was Moisture testing performed?
- Core samples taken?
- Whose responsibility is this- YOURS!

DO NOT REPEAT A FAILURE!

Right: A typical concrete slab section showing the surface (calcium carbonate) that forms on the surface in a reaction calcium hydroxide with ambient CO₂. If the concrete has not or covered, this layer will give a false pH reading, it must be to properly test the pH of the concrete.



carbonation of the been coated ground off

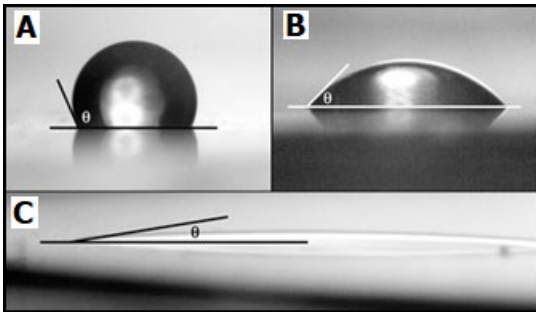


The ACTECH 2170™ FC Moisture Mitigation System can withstand a pH of 14 sustained.

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) the ACTECH 2170™ FC will not properly penetrate or “wet” the surface and the product’s performance will be compromised. A core sample may be needed to identify possible contaminants.

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 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™ FC (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™ FC 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

3. PRODUCT APPLICATION

Mixing:

The ACTECH 2170™ FC (4-hour cure) is a single-coat, zero VOC products. Coverage rate is 12-mils WFT Wet Film Thickness) over all high spots. 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 is short; ~10–~35 minutes and will vary depending on ambient temps: “hot and dry shorter; cool/cold and humid; longer. If cans are mixed prematurely, the mixed amines and resin is exothermic, that is, the reaction creates heat. If left in the pail after mixing, and in-mass, the reaction greatly speeds up and 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 outside away from personnel. Remove top and throw sand into pail to cool the reaction, cover and stand back. The material will not catch fire, but will create a volume of smoke; DO NOT BREATHE IN SMOKE-FUMES AS THEY ARE HAZARDOUS. This may also happen to a lesser extent with mixed material left in pail after pouring on deck, immediately remove all empty pails to a safe area outside.



For any personnel that breath this smoke, immediately get them to fresh air and seek medical attention. Avoid breathing in these fumes/ smoke!

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.

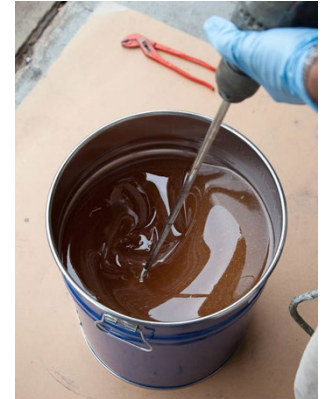


Portable mixing station on a large project. Entire station can be moved with forklift. Note the digital mixing timer



Small mix station on cardboard on outside application.

Mix for 3 minutes
400 RPM drill



Note

Best practice is 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 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, HVAC on if available and 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) After mixing, pour entire contents of pail onto deck in a ribbon in the start area or along the previous wet-edge.

Note

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.

- 4) 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.

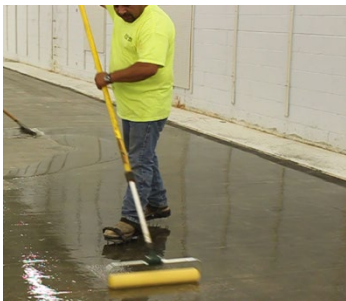
- 5) Immediately after spreading with squeegee, back roll with the 3/8" roller covers. Do not over roll, once out, back and out again should suffice. **TIP:** you should not hear the roller in the material, if it is making a loud sucking noise then the material is too thin, check spread rate. Backrolling is mainly to even out the coating, do not wait to backroll as you will run the risk of leaving roller marks in the material.
- 6) If bubbles appear in coating, use the spiny or porcupine roller to pop the bubbles. These are normally caused by outgassing from the substrate; (see further details below).
- 7) Control joints and non-moving cracks may be flooded with material. If the control joints are too many, too deep and 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.
- 8) The ACTECH 2170™ FC will self-level or self-heal and it is very forgiving with roller and squeegee marks, but try 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.
- 9) Allow material to cure; cure times may vary according to the ambient temperatures and humidity. Provide ventilation if necessary. ACTECH 2170™ FC cure time to walk on (at ambient of 75°F) is 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.
- 10) 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.



Pour mixed material out in



Squeegee out to proper spread



Backroll to even out coat



Continue on working the "wet-edge";
squeegee-backroll

See Spread Rate Chart at the end of this Guideline.

Application Issues:

The following are the more common type of issues encountered when installing the ACTECH 2170™ FC. 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 devastating to any given project large or small.

Pin Holes;

These are caused mainly by the outgassing of the substrate and are literal holes through the coating, 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 resin 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.

Causes:

Main cause is a temperature differential between the concrete and the ambient air and is frequently seen to occur in un acclimatized buildings (open to ambient temps and humidity), and outside external applications. Example: the concrete is slab on grade, 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.

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 air inductions.

What to do:

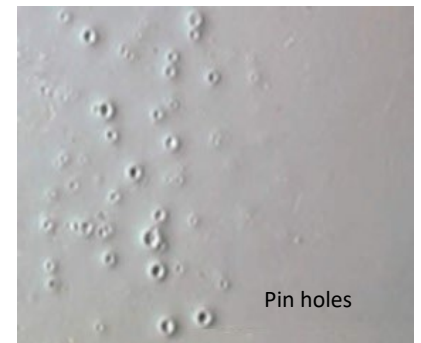
Pinholes or bubbles can form right away or overnight while the material is curing. If you can catch it when the application is underway, run a spiny or porcupine roller through the material and it will pop bubbles and fill the pin holes if not too aggressive.

Temperature: If pinholes are noticed during the application, halt the project and check temps and ambient conditions. If open to outside ambient temp and humidity, apply the ACTECH 2170™ FC only when: **the temperatures are steady and/or falling and not rising.** This should stop the pinholes. A mock-up may reveal the pinhole situation prior to the main application and steps can be taken to correct for the pinholes. The main thing is when this occurs, HALT the project to minimize any repairs that may be necessary to fix the problem.

If the pinholes form overnight and are only discovered when the coating has cured. In a small mock up area, sand 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.



Pin Hole Craters left by popped bubbles



Pin holes



If you are experiencing difficulties with pinholes, HALT the project and contact the ACTECH technical staff for information and alternative solutions or for 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 white or brownish, 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. This is mostly a phenomenon of exterior applications, but can also affect interior applications in structures with no climate control- no HVAC.

Why is this bad? The by-product forms the greasy whitish 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 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, or a solvent wipe with acetone or xylene. If it has been on the surface for a period, it may require sanding with a swing-type sander 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 in ambient or non acclimatized facilities, pay attention to the weather, do not apply if inclement weather is predicted before the resins can cure. 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/below 5° of the Dew Point.



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

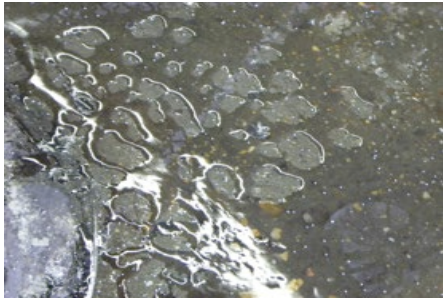


CAUTION! The use of propane or kerosene heaters may also cause amine blush especially if the application is in a closed area. The CO₂ created by the heaters exhaust will also react with the amines and produce a blush on the surface. **See Dew Point Chart at the end of this Guideline.**

Fisheyes: Fisheyes are generally 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.

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 telegraphing through the coatings or flooring system. The ACTECH 2170™ FC will be compromised and not perform.



What to do? If fisheyes are noticed forming during the application, HALT the project, do not proceed. Determine if this is just confined to a small specific area or over the entire project floor; i.e. do the fisheyes occur throughout the area just coated or just in a confined area. Investigate the cause onsite if possible- question the GC or the owner as to what was done in these areas; battery charging of fork lifts, machine repair, oil drum or other liquid storage, machine storage, etc. If the cause cannot be determined then a core must 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 the fisheye and will act as a mild surfactant and may close the fisheye. There is 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™ FC.

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 cap as a volume measurement: Capfuls ONLY!

(~3 capfuls per gallon)

- 2.4 - gallon ACTECH 2170™ FC (fast cure): 8 caps per unit;
- 5.0 – gallon ACTECH 2170™ FC (fast cure): 16 caps per unit;

For the larger units, pre-measure out 16 caps to get a larger volume to avoid fumbling with the cap during the project.

Mix units for 3 minutes then proceed per installation instructions.

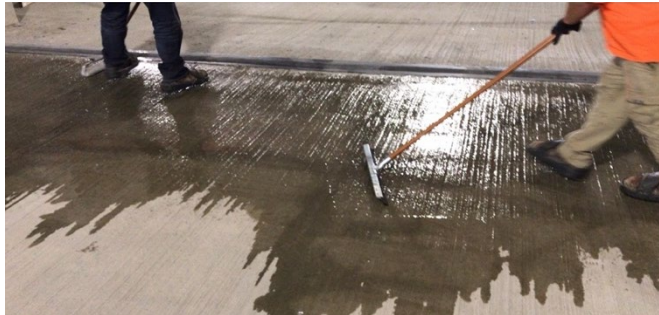
Contact the ACTECH technical staff for additional information or if the issue cannot be resolved or information on core testing is needed.

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 will not fisheye on “normal” concrete, there must be some contaminate on the surface causing them.

Mil thickness and substrate surface profile: A major issue for reduced performance is the mil thickness of the material is too thin. The coating must cover the high spots of the floor profile to 12-mils. 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 will 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.



Always perform a mockup to verify the consumption rate and reveal any issues that would compromise the 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 company that finished the surface, according to specifications, called for a CSP 4 – 5 in this area, this was lost somewhere in the communications. Grinding was not allowed due to the location of the structure, so the high points of the broom finish had to be “buried” utilizing 3-coats of ACTECH 2170™ FC, incurring additional material costs.

Trenching:

Trenching for various reasons in existing structures; no longer wait 28 days!

- Place/finish portland-based concrete in trench; light troweling;
- 48 - 72 HOURS Shotblast to a CSP 3 value
- Apply the ACTECH 2170™FC @ 12 mil WFT/DFTF
- Let system cure ~4 hours (ambient conditional)
- Install or apply final flooring or coatings!



Self-Leveling

Cementitious Materials

Application requirements:

- Always install any cementitious self-leveling, patch or feathering finish over the cured ACTECH 2170™ FC. Consult the ACTECH technical staff with any deviations prior to install.
- The cured ACTECH 2170™ FC surface **must be primed prior to any cementitious underlayment installation**; such as self-leveling and feathering finish products. If any cementitious materials are applied without any adhesive primer will debond and have poor adhesion to the cured ACTECH 2170™ FC.
- Use ACTECH's SLP: (Self Leveling Primer); OR use the proprietary primer for the underlayment brand that is to be applied. ACTECH adheres to the system approach, and using the brands primer along with the underlayment is recommended.
- Our primer (and all other's primers) is formulated for adhesion and **application to a non-porous substrate**.
- The ACTECH 2170™ FC Will accept most manufacturer's underlayments, but all must be primed.



The ACTECH SLP is formulated to adhere to the cured, non-porous surface of the ACTECH 2170™ FC, and then adhere any cementitious self-leveling to it making a permanent bonded composite.

The ACTECH SLP (Self-Leveling-Primer) is:

- VOC free, single component
- Water-based, easy to apply
- Cures in 30 – 50 minutes (temp/humidity dependent)

This material is applied thin- very thin with a 1/8 or ¼" roller cover in one coat. Spread rate of ~800 sf/gal can be expected, actual spread rate achieved may vary.



It is critical that this material be installed in a thin film, do not build up any mils or let material puddle. Brush out all puddles, maintain a thin coat.

Please contact the ACTECH technical staff with any questions or concerns regarding the installation of any self-leveling material over the ACTECH 2170™ FC.

Recoating: The cured surface of the ACTECH 2170™ FC will accept many types of epoxies, urethanes, MMA's, PMMA's, Urea's, Polyaspartics and more. The general rule of thumb for adhesion with a chemical bond is within 48 hours of the ACTECH material's cure. However, recoat between coats of the ACTECH 2170™ FC to the ACTECH 2170™ FC is 7 days.

Consult the subsequent products recoat window recommendations as listed in their data sheets and product literature. If the recoat window is passed, usually a light sanding with a swing-type sander and appropriate grit paper is adequate for recoat adhesion, but it is prudent to consult with material manufacturers technical personnel for details on options and requirements.

MMA's and PMMA's must be installed within 48 hours.

Resilient Flooring: Flooring may be applied directly to the cured ACTECH products provided that the surface is acceptable for doing so. All adhesives used should be designed for application to a *non-porous substrate* as the cured membrane is waterproof and will not allow any water to leech out of the adhesive as would on open concrete.

In many cases, the cured surface will benefit from a quick sanding with a swing sander with appropriate grit paper to knock off any bumps, debris and irregularities in the coating surface. Make sure to remove all dust and debris from any mechanical abrading prior to installing subsequent systems.

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) The Pre-Job Survey and Final Job Installation Report must be filled out and submitted to ACTECH.
- 4) The Warranty Request form must be submitted to ACTECH.
- 5) The ACTECH 2170™ FC warranty is for failures or issues due to water vapor transmission and alkalinity only.
- 6) The normal performance warranty lifespan is 15-years; but alternative spans may be made.
- 7) All warranties commence only when all material invoices are paid-in-full and all paperwork is submitted and approved by ACTECH.

Parameters of the Warranty; (Direct wording taken from the Warranty document):

ACTECH | Allied Construction Technologies Inc. will warrant for a period of fifteen (15) years the listed ACTECH 2170™ FC Water Vapor Reduction System against material defects. In addition, ACTECH will warrant for performance the water vapor transmission reduction as shown in the ACTECH product data sheets and printed literature, provided that all the recommended floor preparation, mixing, application instructions, and any other technical information stipulated in ACTECH literature are strictly followed. This limited warranty covers against performance failure due to concrete water vapor transmission as well as alkalinity up to pH 14 only and includes the following:

1. ACTECH approved adhesives
2. ACTECH approved cementitious underlayments
3. Floor covering systems (including epoxy, polyurethane and MMA systems)
4. All labor charges involved in removing and replacing flooring in the area under warranty

Exclusions to the Warranty; (Direct wording taken from the Warranty document):

This limited warranty is further subject to the following conditions:

1. ACTECH products must be applied as per written product application specifications on “structurally sound” and clean areas in which the concrete meets acceptable industry standards as defined in ACI Committee 201 Report, “Guide to Durable Concrete.” If the areas to which the products are applied now or in the future fail to meet these standards, the aforementioned warranty shall be void.
2. The foregoing warranty shall be void if a cohesive substrate failure in the concrete surface occurs resulting in a delamination of the ACTECH 2170™ FC and/or concrete surfaces have been treated with any kind of penetrating surface sealer such as (but not limited to) silicates, densifiers, hardeners, other manufacturer’s vapor systems including, and any alkaline silica reaction (ASR) related conditions causing the ACTECH 2170™ FC material to fail.
3. The aforementioned warranty shall be void if ACTECH 2170™ FC products are applied to improper substrates such as cracks, expansion joints and surface honeycombs or in areas not properly prepared per ACTECH’s surface preparation requirements, or surface bond inhibiting contaminants are present preventing proper performance/adhesion of the ACTECH 2170™ FC.
4. The foregoing warranty shall be void if the ACTECH 2170™ FC required guidelines for material coverage/surface preparation are not strictly followed (see product data sheets, specifications, and written literature).

5. The foregoing warranty shall be void in those areas where any cracks may develop after the application of the ACTECH 2170™ products due to structural deficiencies, thermal movements or any leakage due to active water-head incursion.
6. The foregoing warranty shall be void if the ACTECH 2170™ FC have been applied by an applicator not approved by ACTECH

Provisions; (Direct wording taken from the Warranty document):

Subject to the foregoing, the sole and exclusive remedy due to a breach of this warranty shall be expressly limited to the repair of defective areas due to the failure of the ACTECH products, and shall expressly exclude consequential damages including, but not limited to; damages to structure or to contents of structures. This warranty will not go into effect until all invoices/accounts are paid in full. The beneficiary of the warranty must provide ACTECH, 3302 Croft Street, Norfolk, VA 23513, a written notice within thirty, (30) days of the discovery of a breach of this warranty in order to assert its right to any repairs covered by this warranty. ACTECH reserves the right to physically inspect the site and obtain samples from the job installation and examine any and all forensic testing documents before any determination is made as to the validity of any claim.

ACTECH reserves the right to reasonably schedule work and utilize techniques and products as necessary to complete repairs, and shall not be liable for any materials or labor ordered by any entity other than ACTECH.

This agreement shall be governed by and construed in accordance with the laws of the Commonwealth of Virginia, and all parties consent to jurisdiction in the courts located in the City of Norfolk, Virginia and agree that no other courts shall be an appropriate venue for any disputes arising out of the relationship between ACTECH and the customer

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:

- 100% solids epoxy: Solvent free
- 100% reactive
- 98% pure resin, no fillers or extenders
- ASTM E96 Perm rate of 0.06 – 0.09
- Zero VOC Emissions (Berkeley Labs)
- 12 – hour or “Fast-Cure” FC @ 4 hours
- 14,500 psi compressive upon cure
- Shore ‘D’ of 82 upon cure
- Passes ASTM C1315, 309 (Curing Compound)
- Will not allow mold growth: ASTM G-21
- 15 – year comprehensive warranty
- Complete 24/7 technical support

Benefits:

- No upper moisture limit :
- ASTM F1869; 25 lbs+
- ASTM F2170™ ; 99/100% RH
- VOC Emission Free
- Alkalinity resistance to pH 14
- 15 – year comprehensive warranty
- Compatible with most resilient flooring systems, Epoxies, Urethanes, MMA’s and others

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
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

Consultants:

Concrete Constructives: Peter Craig; (Consultant); pcfloors@msn.com
Certified Floor Covering Consultants: Bill Lepito; bill@certifiedfloortest.com

Publications, Agencies & 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, and Polymer Overlays.](#)

Portland Cement Association: [Concrete Floors and Moisture](#) by Howard M. Kanare. Engineering Bulletin 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: Industrial painter certification that validates a working knowledge of surface preparation, industrial coatings application and safety procedures. NACE No. 6.

OSHA: Silica Rule Bulletin #3681; Silica Sand/Silicosis

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.

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

Contact: ACTECH
Allied Construction Technologies, Inc.
3302 Croft Street; Norfolk, VA 23513
Office Hours: 8:30 AM to 5:00 PM EST; Mon-Fri
PH: (757) 855-5100
FX: (757) 855-5108

Products/Packaging:

ACTECH 2170™ FC 4-Hour Cure:

0.5 & 2.4 Gallon Combi-Kits



ACTECH 2170™ FC 4- Hour Cure:

5.0 Gallon Kits



Mil Rate / Spread Rate Calculator

All Coatings are normally measured and calculated in “Mil Thickness”, (*thousands of an inch*); 1 mil=.0254”

Formulas For Calculating Coatings Consumption (*assumes that the surface to be coated is flat and smooth*)

There are 1,604 sq. ft., 1 mil thick, in a US gallon of **any liquid**.

- $1,604 \text{ divided by mil thickness (desired)} = \text{sq. ft. Coverage}$
- $1,604 \text{ divided by sq. ft. Coverage (desired)} = \text{mil thickness}$

Use these formulas to calculate any coating project; Or use our ready reference charts below.

| COATINGS RATE-OF-USE MIL THICKNESS CHART | | |
|---|--|---|
| Coatings Thickness Inches | Coatings (thousands) Mil Thickness | Coating Coverage Sq. Feet Per Gallon Area |
| 0.001 | 1 | 1,604 |
| 0.002 | 2 | 802 |
| 0.003 | 3.5 | 458.3 |
| 0.005 | 5 | 320.8 |
| 0.068 | 6.68 | 240.1 |
| 0.01 | 10 | 160.4 |
| 0.012 | 12 | 133.6 |
| 0.015 | 15 | 106.9 |
| 0.02 | 20 | 80.2 |
| 0.03 | 30 | 53.5 |
| 1/32" | 31.25 | 51.3 |
| 0.04 | 40 | 40.1 |
| 0.05 | 50 | 32.1 |
| 1/16" | 62.5 | 25.7 |
| 1/8" | 125 | 12.8 |
| 0.15 | 150 | 10.7 |
| 0.175 | 175 | 9.2 |
| 3/16" | 187 | 8.6 |
| 0.2 | 200 | 8.0 |
| 0.225 | 225 | 7.1 |
| 1/4" | 250 | 6.4 |
| 5/16" | 312 | 5.1 |
| 3/8" | 375 | 4.3 |
| 7/16" | 437 | 3.7 |
| 1/2" | 500 | 3.2 |
| 3/4" | 750 | 2.1 |
| 1" | 1,000 | 1.604 |