GO EARLY TECHNOLOGY™
For Fast Track Construction

The Go-Early Solution

Contemporary Breakthroughs in Concrete Curing, Vapor Reduction, and Fast-Track Construction

Traditionally, moisture testing, moisture mitigation, cementitious underlayments, flooring and finishes are all installed near project completion under Division 9 in the CSI Master-Format.

Also traditionally, concrete pouring, finishing, curing, drying, and hardening is accomplished in Division 3, completely separate from the control of moisture, vapor and alkalinity in the concrete slab.

Go-Early Technology™ is a new specification system developed with cost, time and performance in mind. With Go-Early Technology™, AC•Tech has combined vapor reduction, alkalinity control, concrete curing, and slab protection together in Division 3.

Construction Is a Tough Gig

First we have economic upswings, downswings and U turns to contend with. Then, protracted and dramatic weather patterns play havoc with even our most conservative and well-planned construction schedules. Mix in the ever-changing world of building and material specifications and the plethora of 'new and improved' building technologies, products, and supplies, then combine that with government regulations and environmental mandates! With all that, one can understand why the architect, general contractor, material supplier, and building owner all have to be nimble and proactive at every stage in the construction process.

Only the very strongest problem-solvers among us are able to control costs and deliver consistent quality on time. Only those agile professionals can survive long in the construction marketplace of today.

AC•TECH
Allied Construction Technologies, Inc.
When Performance Counts!

Frequently Asked Questions

Q Can a vapor reduction/moisture control product be applied in Division 3 on Green concrete?

A YES!

Q Will a manufacturer of a vapor reduction/moisture control product applied in Division 3 warrant the successful installation of a flooring system in Division 9?

A YES!

Q Are concrete curing agents and/or densifiers containing silicates also vapor reduction/moisture control products?

A NO!

Q Can vapor reduction/moisture control products be applied in Division 9 over curing agents and/or densifiers containing silicates applied in Division 3?

A NO!

Q Can newly developed adhesives with moisture control properties be applied in Division 9 and are they effective?

A Generally, YES!

Q Will a manufacturer of an adhesive product with moisture control properties provide a warranty if applied over a concrete slab containing silicates or high alkalinity?

A NO!

Q Do curing agents and/or densifiers allow all construction trades to get on the concrete slab earlier?

A NO!

Q Is there any product out there that will allow Fast-Track Construction to get started on the slab earlier while not compromising the integrity of the slab itself?

A YES: Go-Early Technology™

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Fast-Track Construction Is Here to Stay

Fast-Track Construction now accounts for as much as 40 percent of all active building projects. Fast tracking compresses the project schedule by performing design and construction phases simultaneously. Design may run as little as a week ahead of construction, and myriad design decisions are made in the field. Client, architect, and construction manager must perform a delicate balancing act between compressing the construction process to save time and money and maintaining construction quality and performance.

Fast tracking can also be risky, since many of the final costs are unknown during the building and design process and trade-offs are constantly being made as the building progresses. Many or all of the potential upsides can evaporate quickly if a moisture problem is later discovered in the slab prior to flooring installation. Actual flooring failure may occur near the very end of the project, often due to lack of moisture control measures or concrete moisture testing.

Throw Traditional Curing & Drying Times Out the Window

The Portland Cement Association estimates that concrete typically takes 3–14 days to cure, after which it begins drying. Traditionally, a minimum of 28 days is required to allow a concrete slab to properly dry, though modern ASTM standards say this will likely take 90 to 120 days. The rule of thumb for concrete drying is 1 month for every inch of thickness; this has been the standby for many years. This time frame has also been associated with other phases of the construction process, such as when moisture testing for flooring can be initiated and vapor reduction coatings can be applied.

With the advent of modern LEED initiatives, additives such as slag and fly ash are now routinely added to the concrete mix design. While this reduces the cost of concrete and supports efforts to make construction more environmentally sustainable, the addition of slag and fly ash can also dramatically extend drying times.

The Problem: A Moving Target

Moisture and vapor problems related to the curing and sealing of concrete have increased for a number of reasons:

- Changes in concrete mix designs including the use of both slag and fly-ash resulting in slower drying times
- Use of lightweight rock and aggregates which absorb moisture
- The addition of set retardants, densifiers and admixtures
- The pressure created by writing Fast-Track Construction demands into contract documents
- Lack of a replacement for 'breathable'* asbestos flooring tiles

**Breathable flooring tiles no longer exist since asbestos was outlawed in the US. A non-toxic breathable substitute has not yet been developed which means moisture/vapor cannot escape.*

In fact, drying times have almost doubled. The new rule of thumb is now *two months for every inch of thickness*!

In Fast-Track Construction, waiting 28 days or more for the concrete slab to set, cure and dry is an eternity. Waiting two months or more may be a deal breaker!

It is of little wonder that all involved are looking for ways to get on the slab faster, to make up for pre-project or weather delays, and to finish projects on time and on budget. The pressure is enormous. The temptation to speed things up or 'value engineer' steps out of the equation and deal with the possible consequences later is hard to resist.

A Great Deal Rests on the Slab: Rushing a Wet Slab in Fast-Tracked Hospitals

We fast track all sorts of construction projects these days. This includes retail stores and franchises, office and hotel complexes, warehouses and manufacturing plants, apartment buildings and condos, as well as municipal buildings, schools, universities and hospitals.

Let's look at the case of hospitals, where many non-permeable and highly moisture sensitive flooring systems are installed. Here a flooring failure can be catastrophic.

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Hospital buildings are usually massive, with many types and styles of flooring systems. If flooring failure occurs, the entire facility or sections of it may have to be shut down. This causes great inconvenience to patients, relocation of staff and medical equipment, costly repairs, and down time for hospital income-generating services. Once repairs and restoration are accomplished, legal ramifications may continue for years.

These Fast-Track Construction problems can be avoided by the proper understanding of the interplay between concrete curing, vapor/moisture control, and floor installation systems.

Taking the Mystery Out of Concrete Curing

By definition, curing is the process of controlling the rate and extent of moisture loss from concrete during cement hydration. The length of the curing period may depend on the properties required of the concrete. Traditional curing methods fall into three general categories which are determined by many factors, such as site conditions and construction methods.

No matter how it is cured, concrete retains moisture, period. Concrete never completely dries but rather has residual moisture in it that can take literally years or decades to come out of the matrix.

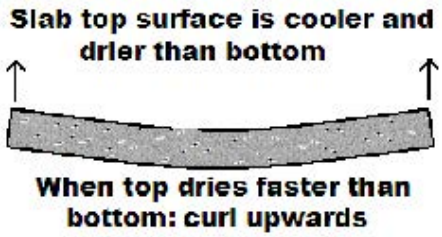
The first method is a cover cure, which involves covering concrete with a moisture rich material such as burlap or an impermeable material like plastic. The second method is known as a wet cure. Wet curing involves 'ponding', or retaining several inches of water on the surface of the concrete, and 'fogging', or continuously misting or spraying the concrete while it cures. The third method is a chemical cure, which involves treating the concrete with a spray-applied curing compound. No matter the method, the concrete must cure before anything else can be done on it.

Why Cure at All? What's Going On in There Anyway?

Let's get a bit more technical. The main purpose of curing is to maintain a moist environment while the concrete cures, gains strength and reaches its desired properties. There are several 'water-releases' during the hydration process of freshly placed concrete. As the ready mix is placed, the ***first water release*** will be at the bottom of the pour, i.e. the bottom of the slab. As hydration takes place, the calcium hydroxide reacts with the calcium silicates in the cement as it continues to cure, creating heat and shrinkage.

Next, a ***secondary water release*** occurs during which the 'bleedwater' is forced out of the concrete to the surface during shrinkage creating 'bleedwater tracks' or capillaries that will, in turn, be the future pathways for residual moisture to move from the interior of the slab to the surface.

This is what causes all the trouble later with flooring. Curing techniques, coverings and compounds will retard this moisture loss and allow the concrete to gain strength as the curing process evolves. However, if vapor control steps are not taken in the early stage, moisture issues will become a serious problem during the final flooring system installation. If the concrete is allowed to cure too fast, then hydration generates more heat and more shrinkage causing surface cracking and possible warping. This may also lead to differential curing in which one side of the concrete cures faster than the other. For example, if the top of the concrete cures faster than the bottom due to wind, heat, or sun, the top will shrink faster than the bottom forcing the edges up to a small but noticeable curl.



The Dilemma

In the context of Fast-Track Construction, how does one: A) properly cure the concrete, B) address the inherent delays of LEED concrete mixtures and drying times, and C) control vapor, moisture and alkalinity levels in the slab so as not to interfere with the successful installation of the final flooring system later on in the construction cycle?

And, if that were not a complicated enough question, can we avoid contaminating the concrete surface with substances that cause efflorescence to form, vapor coatings to blister, mold and mildew to grow, adhesives not to bond, and flooring systems to fail?

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Choose Wisely

There are a variety of topically applied curing compounds and concrete additives available today that are purported to harden the concrete more quickly while controlling slab moisture content and resisting alkalinity. There are also new innovative concrete mixes that are low in moisture to begin with and cure rapidly.

Some of these systems work, some don't, and some take a little longer than expected to deliver the results. As with many things in life, there are trade-offs.

Vapor Control and Permeance

When choosing a vapor reduction product, ASTM E96 test results should be studied to determine a product's permeance rating and therefore to validate or invalidate its vapor reducing ability.

A rating greater than 0.1 perms means that the product will allow too much vapor to pass through it. The higher the number, the more vapor will pass through it.

Silicates will ***waterproof*** concrete, which is, by nature, already waterproof. However, studies and tests conclusively show that reactive silicates will not stop water vapor from permeating concrete. This applies both to silicates introduced into the concrete mix as an admixture and to silicates applied topically to the slab after placement.

Alkalinity

Moisture Drive brings damaging water-soluble salts contained in concrete to the surface where they can concentrate and form a pool of high alkalinity (usually at a pH of ~13 to 14). This occurs exactly at the bond interface where high alkalinity is extremely destructive to adhesives and many epoxy coatings. Any moisture control system chosen should remain bonded and provide a chemical barrier to protect the flooring from this alkalinity.

Remedies That May Boomerang

Many fast track projects use silicate-based reactive products as admixtures to the concrete mix design, as surface applied liquids and sealers, and as densifiers and hardeners. Silicates will harden and densify concrete. Silicates will block liquid water, but silicates ***will not block*** water vapor.

These products rely on the reaction of the silicate (sodium and potassium) with the calcium hydroxide in the concrete to work. The 'left-overs' or unreacted silicates are the ones that will be troublesome later as they migrate to the bond interface of surface applied systems. There, in Division 9, the silicates will act as bond breakers to any vapor reduction epoxy coatings and flooring adhesives.

Beware of the boomerang effect of sodium or potassium based silicate products advertised as vapor-reducing or moisture controlling. Most flooring and epoxy systems will not warrant their products on concrete slabs treated with silicates.

Go-Early Technology™

- 0.07 perms @ 150 sqft/gal
- No upper limit for moisture (ASTM F2170 and ASTM F1869)
- Resists pH of 14, Sustained.
- 14,500 PSI (vs. 3000-4000 PSI for concrete)
- 100% Reactive Solids
- No Added Solvents; Odor Free
- Superior spread ability and coverage permitting applicators to deliver a consistent, high quality job
- 0.000 g/L VOC emissions

Start Early. Finish Early. Open Early. Bank it Early.

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Surprise! By dealing with all vapor, moisture and alkalinity issues cost-effectively in Division 3 with Go-Early Technology™, you can now also get all trades productive on the slab days or weeks earlier.

Concrete Curing + Vapor Barrier + Alkalinity Barrier + Slab Protection: All in One Step/All in Division 3

The Go-Early Technology™ system features the AC•Tech 2170 FC™ vapor reduction epoxy. When applied to prepared green concrete 3 -5 days old, it acts as a curing compound, helps prevent cracking and curling, and forms a long-term moisture and alkalinity barrier all in one application. The Go-Early Technology™ system is backed by a 15-year comprehensive warranty.

Go-Early Technology™ forms a very hard (harder than concrete) 14,500 psi non-permeable membrane to act as the curing compound. This allows the contractor to get on the slab with other trades faster, speeding up construction time, and putting everyone ahead of schedule.

It also allows fast rack projects to remain on schedule by avoiding the 11th hour change-order delays that frequently pop up when moisture, alkalinity, or silicates are detected just as the flooring contractors come on the scene to perform their work.

Go-Early Technology™ works because of the high quality resins in AC•Tech 2170 FC™. When applied to green concrete, it forms a tenacious bond to the substrate and stays bonded no matter what the moisture content or the alkalinity levels. This application is a permanent membrane that will stay on the concrete all through the subsequent construction phases, and will later act as a moisture and alkalinity barrier when the final flooring is installed in Division 9.

Back to the FAQ's:
Can a vapor reduction/moisture control product be applied in Division 3 (on Green Concrete)? YES.

In the new Go-Early Technology™ process, AC•Tech 2170 FC™ Vapor Reduction System (4-hour fast cure) is applied 3-5 days after concrete placement. Only a lay-down 8th and 10 finish is required. Hard troweling is not recommended.

Shot blasting to a CSP of 3 is accomplished quickly and cost-effectively on the open slab in Division 3 because there are no interior walls to go around and no difficult knee work required to grind edges.

A distinct advantage of applying the Go-Early Technology™ system on the entire slab in Division 3 is that all interior walls will be protected from vapor/moisture wicking, a common source of mold and mildew issues in walls built on slabs not treated with a vapor reduction system.

Will a manufacturer of a vapor reduction/moisture control product applied in Division 3 warrant the successful installation of a flooring system in Division 9? YES.

AC•Tech offers a comprehensive 15-year material and labor warranty against moisture and alkalinity, covering not only the AC•Tech 2170FC™ epoxy, but all subsequent flooring installed over it.

AC•Tech's brain trust of experienced concrete and moisture mitigation experts also backs up its products with always available/always offered technical support to avoid potential problems before they occur.

Is there a product out there that will allow Fast-Track Construction to get started on the slab earlier while not compromising the integrity of the slab itself? YES.

What distinguishes Go-Early Technology™ from other 2-part epoxy resin moisture control/vapor reduction systems is Part B, the hardener in the AC•Tech 2170 FC™. Although they have tried, the industry has yet to replicate our B formula. It is available nowhere else.

This is what allows Fast-Tract Construction to Go Early! Go-Early Technology™ increases slab durability to more than double the compressive strength of concrete.

Go-Early Technology™ locks moisture and vapor in concrete, which can actually aid in the long term curing.

Go-Early Technology™ prevents concrete curling and cracking by controlling moisture levels in the slab and avoiding differential drying.

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GO EARLY TECHNOLOGY™
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Call or email us today for a FREE TECHNICAL CONSULTATION

"After one of the harshest winters on record, the average Midwest construction project is more than a month behind schedule. Go-Early can be installed over freshly poured concrete in as little as three days. This allows an entire building deck to be abraded, coated and cured, edge-to-edge within one week of the pour, making it possible for immediate build-out of interior walls and utility installations. The floors are ultimately flatter, walls are truer, and the moisture mitigation system is installed in half the time. … This is saving weeks to months of construction time for the average hospital project."

—Mark Tisinger, Territory Manager - Choice Polymers, Chicago / Midwest

"With Go-Early, we can get right on the concrete floor before the walls go up. That makes it much easier for us… and much more cost-efficient for our customers… to get in and out early!"

—Mike Portwood, Division Project Manager - Baker Paints, Tucker, GA

"I first saw this product in North Carolina, where it was being installed on a concrete floor that had been poured just 72 hours earlier. I was really impressed. After much scrutiny, there was absolutely nothing detrimental I could find. Everything the manufacturers of Go-Early said this system would do, (and they said it would do quite a bit) it certainly did!"

—Bill Lepito, Principal - Floor Covering Consultants, Amesbury, MA

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AC•Tech, Allied Construction Technologies Inc. is headquartered in Norfolk Virginia. We actively collaborate with AB-Polymerchemie (Germany) and Chowgule Construction Technologies (India) to develop, manufacture and support specialty coatings for construction, industrial, commercial, residential, and infrastructure markets in the US and around the world.

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