Chem-Floor Systems

Chem-Floor Industrial/Institutional Flooring System

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Epoxy Flooring System - Surface Preparation

I. Concrete (New Construction)

A. General Construction Practices

- Surfaces to receive Chem-Floor Epoxy flooring systems must be a minimum of 3,500 psi concrete.
- Structural concrete must have a full 28 day cure period prior to material application.
- Insulating concretes (Zonolite, Vermiculite, Perlite, etc.) must never be coated directly with Chem-Crete Flooring Systems.

B. Finish Requirements

- The floor must be double steel troweled with power or hand trowel. After the second steel troweling has been completed, finish concrete by lightly pulling a soft hair broom over the surface to leave a light texture in the concrete. No projection or voids should be present in the concrete surface.
- If the concrete finish is rougher than a light hair broom finish, consult International Chem-Crete for additional surface preparation procedures.
- CCC-100 curing of floor is the preferred method. However, if a curing compound is to be used, it must be of the sodium silicate type. Other types of curing compounds require prior written approval by International Chem-Crete. Chlorinated rubber, wax or resin-based curing compounds must not be used.
- Floor must be free from contaminants such as oils, tars, asphalts, grease, dirt, etc. prior to the application of the decorative aggregate flooring system.

C. Methods for Preparing Concrete Floor

1. Shotblasting
   - Shotblasting is the preferred alternative to acid etching for providing proper surface profile and cleaning. Proper care and procedure should be taken to leave the concrete surface as unopened as possible. Shotblasting is also preferred over sandblasting to remove an unacceptable curing compound. **Note: Shotblasting does not remove deep penetrating oils, grease, tar or asphalt stains. Proper cleaning procedures should be followed to insure proper bonding of the decorative aggregate flooring system.**
   - Shotblasting does not replace acid etching on expansive type concrete decks.
   - Improper shotblasting can cause “pinholes” in concrete surface which can result in blister problems during application of the Epoxy Floor Coating System.
2. Sandblasting
   - Sandblasting is recommended only as a last resort (in lieu of acid etching or shotblasting) or when necessary to remove an unacceptable curing compound.
   - Sandblasting does not replace acid etching on expansive type concrete floors.

- Sandblasting can cause “pinholes” in concrete surfaces which could cause blister problems during the application of the Epoxy Floor Coating System.

3. Acid Etching

   - Purpose: to remove laitance from concrete surface. This method **does not** clean concrete surface.
   - Acid etch deck with 18° to 20° Baume muriatic acid and water mixed 1 to 1. **Always pour acid into water; never water into acid;** Evenly distribute acid solution over entire floor from plastic sprinkling cans at a rate of one gallon acid solution to 40 square feet of floor. As the acid is reacting or foaming, vigorously scrub with a nylon or plastic bristle broom. Use caution so that spent acid solution does not wet floor prior to application of fresh acid. As soon as acid quits foaming, immediately rinse thoroughly with large amounts of water. **Do not allow acid solution to dry on the floor.** Any soluble salt formed by the acid acting on the concrete that remains on the surface will affect the bond of the decorative aggregate flooring system to the substrate, particularly in the low spots where water “puddles.” **Note: If acid does not “boil” or “foam,” there may be a curing compound or other problem present. Consult International Chem-Crete before proceeding.**
   - Allow floor to completely dry after flushing with water (usually overnight). Check for “salty” spots of residue left after concrete has dried. If any are present, use water, brooms and a portable vacuum to remove.
   - **Acid etching has its limitations. Acid will not cut through oil and greases, curing or sealing compounds, paints, heavy dust or dirt accumulation. These contaminates must be removed before etching. Scrub with detergents or use appropriate solvents depending of the type of contaminate.**

4. Concrete Patching

   - Very little repairing should be necessary in new concrete if the slab is placed according to specifications, but minor imperfections must be corrected. There are many jobs that the applicator is called in to do after the structure is complete and the decks were roughly done, not anticipating the use of epoxy floor coating system. Ridges and sharp projections should be ground off and pits, holes and low spots should be filled with Chem-Floor 2 100% solids epoxy and sand mixture at a ratio of one part epoxy to four parts sand by volume. The repairs should be done after any chemical cleaning or acid etching treatments and the epoxy patch allowed to cure approximately one day at 75° to 80°F.
   - One gallon of mixed epoxy mixed with four gallons of 12-70 mesh clean dry sand by volume will yield approximately 6.42 square feet of epoxy patching material one inch thick.

5. Cracks and Cold Joint Preparation

    - Large cracks (over 1/16" in width) shall be routed out, blown clean and filled flush with Chem-Joint 80 flexible epoxy as designed by International Chem-Crete depending upon anticipated movement or loading.

6. Control Joint Preparation

    - Seal secondary control joints with flexible epoxy Chem-Joint 80 as designed by International Chem-Crete depending upon anticipated movement or loading.

II. Concrete (Remedial Construction)

A. General Construction Practices

- Surfaces to receive the epoxy floor coating system must be a minimum of 3,500 psi concrete.
- Structural concrete patches or repairs must have a full 28 day cure period prior to material application.
- Insulating concretes (Zonolite, Vermiculite, Perlite, etc.) must never be coated directly with Chem-Floor Epoxy Flooring System.
- Concrete surfaces must be sound and dry. Remove all weak concrete, paint, tar, asphalt, grease, dirt, waxes, oils, etc., as may be necessary to establish a clean, dry substrate.

B. Finish Requirements

- Existing surface should resemble a steel troweled concrete deck with a light hair broom finish. No projections or voids should be present in the concrete surface.
- If the concrete finish is rougher than a light hair broom finish, consult with International Chem-Crete for additional surface preparation procedures.
- Water curing of structural concrete patches is the preferred method. However, if a curing compound is to be used, it must be of the sodium silicate type. Other types of curing compounds require prior written approval by International Chem-Crete. Chlorinated rubber, wax or resin-based curing compounds must not be used.
- Floor must be free from contaminants such as oils, tars, asphalts, greases, dirt, etc., prior to the application of the Chem-Floor Epoxy Coating System.

C. Methods for Preparing Existing Concrete Floor

- Floor should be cleaned using trisodium phosphate and water and stiff bristle brooms or a power scrubber. Completely rinse away residue. CCC-060 Concentrated Degreaser and Cleaner may also be used with water at a 1 to 3 ratio mix.
- Heavily contaminated areas may require mechanical cleaning before washing.
- Shotblast, acid etch or sandblast floor as follows:

1. Shotblasting (Preferred Remedial Application)

    - Proper care and procedure should be taken to leave the concrete surface as unopened as possible. Shotblasting is the preferred method to remove unacceptable curing compounds. **Note: Shotblasting does not remove deep penetrating oils, grease, tar, or asphalt stains. Proper cleaning procedures should be followed to insure proper bonding of the Chem-Floor Epoxy Floor Coating System.**
    - Shotblasting does not replace acid etching on expansive type concrete decks.
    - Improper shotblasting can cause “pinholes” in concrete surfaces which can result in blister problems during the application of the high-build, light reflective, epoxy floor coating system. Proper use of application technique and priming methods can eliminate “pinholes.”

2. Sandblasting

    - Sandblasting is recommended only as a last resort (in lieu of shotblasting or acid etching) or when necessary to remove an unacceptable curing compound. Sandblasting does not replace acid etching on expansive type concrete floors.
    - Sandblasting can cause “pinholes” in concrete surfaces which could cause blister problems during the application of the Chem-Floor Epoxy Floor Coating.

3. Acid Etching

    - Purpose: to remove laitance from concrete surface. This method does not clean concrete surface.
    - Acid etch deck with 18° to 20° Baume muriatic acid and water mixed 1 to 1. **Always pour acid into water; never water into acid.** Evenly distribute acid solution over entire floor from plastic sprinkling cans at a rate of one gallon acid solution to 40 square feet of floor. As the acid is reacting or foaming, vigorously scrub with a nylon or plastic bristle broom. Use caution so that spent acid solution does not wet floor prior to application of fresh acid. As soon as acid quits foaming, immediately rinse thoroughly with large amounts of water. **Do not allow acid solution to dry on the floor.** Any soluble salt formed by the acid acting on the concrete that remains on the surface will affect the bond of the decorative aggregate flooring system to the substrate, particularly in the low spots where water “puddles.” **Note: If acid does not “boil” or “foam”, there may be a curing compound or other problem present. Consult International Chem-Crete before proceeding.**
    - Allow floor to completely dry after flushing with water (usually overnight). Check for “salty” spots of residue left after concrete has dried. If any are present, use water, brooms and a portable vacuum to remove.
    - **Acid etching has its limitations. Acid will not cut through oil and greases, curing or sealing compounds, paints, heavy dust or dirt accumulation. These contaminates must be removed before etching. Scrub with detergents or use appropriate solvents depending on the type of contaminate.**

4. Concrete Patching and Concrete Replacement

    - Patching of concrete in remedial applications is usually required. Ridges and sharp projection should be ground off and pits, holes, and low spots should be filled with Chem-Floor 100% Solids Epoxy and sand mixture at a ratio of one part epoxy to four parts sand by volume. The repairs should be done after any chemical cleaning or acid etching treatments and the epoxy patch allowed to cure approximately one day at 75° to 80°F.
    - One gallon of mixed epoxy mixed with four gallons of 12-70 mesh clean dry sand by volume will yield approximately 6.42 square feet of epoxy patching material one inch thick.

5. Cracks and Cold Joint Preparation

    - Large cracks (over 1/16" in width) shall be routed out, blown clean and filled flush with Chem-Joint 80 flexible epoxy or as designed by International Chem-Crete depending upon anticipated movement or loading. Sealant shall be applied to inside area of crack only, not applied to deck surface.

6. Control Joint Preparation

    - Seal secondary control joints with Chem-Joint 80 flexible epoxy or as designed by International Chem-Crete depending upon anticipated movement or loading.

III. Ceramic, Quarry Tile, Marble, Slate, Etc.

A. Cleaning Procedure

- Floors should be prepared by removing all oil, grease, paint or other contaminants.
- Scarify floor with sander or similar equipment. Vacuum all dust and then acid etch deck in same manner as outlined for concrete so that all grout lines and joints are clean and sound.
- Floor areas that are covered with a buildup of grease and/or soap scum must be thoroughly cleaned before installing any flooring system. The grease and soap scum cannot be removed by muriatic acid or soap. It is necessary to use the caustic soda treatment outlined below.

1. Caustic Soda Cleaning

    - Caustic soda cleaning is quite effective and used when the floor is very dirty or oil soaked. The solution is made using a ratio of one pound caustic soda to one gallon water, preferably hot. The liquid should be applied quite liberally with a cotton type mop.
    - The solution should be allowed to stand on the floor for one hour and the floor should be kept wet by putting on additional solution as required. The floor should then be scrubbed with a steel brush or coarse steel wool. Be sure steel wool fibers are removed. Do not use brooms or fiber brushes as the caustic soda solution will dissolve them. A mechanical scrubber with a rubber guard will accomplish the job most effectively.

- After scrubbing, mop up the excess caustic soda solution, neutralize and thoroughly rinse the floor. A solution of 10% muriatic acid would then be applied to neutralize the caustic soda solution. Rinse the deck several times with clean water to remove the remaining dirt and chemical residue. The floor must then be allowed to dry thoroughly before installation is begun. **Note: If the floor is very old and completely saturated with oil, no cleaning method will completely remove the oil. Try cleaning a small area and apply a sample of the system before cleaning entire floor.**

B. Patching

- Any loose tiles or deteriorating flooring must be removed and then filled in smoothly with 100% solids epoxy and sand or flexible epoxy and sand patching compounds. The repairs should be done after any chemical cleaning or acid etching treatments and the epoxy patch allowed to cure approximately one day at 75° to 80° F.
- The joints between the tiles can be filled and the surface smoothed using the patching compounds outlined above.

IV. Metal Surfaces

1. Ferrous Metal (Carbon Steel)

- Surface must be wire brushed, ground with wire wheels or sandblasted to a near-white metal blast finish. This is the removal of 95% of all visible rust, mill scale, paint and other foreign matter from the surface.

Chem-Floor Industrial/Institutional

Epoxy Flooring System - System Specification and Application

I. Industrial/Institutional Epoxy Flooring (Broadcast Systems)

A. Product Description

- Chem-Floor “broadcast” applied Industrial/Institutional Epoxy Flooring is a system consisting of oven dry silica aggregate filler, 100% solids pigmented epoxy resin and a uniform grade of high quality clean and graded silica aggregate embedded into the epoxy resin mastic. It is designed to produce a 1/16" to 3/16" thick seamless floor with optional integral cove base.
- Chem-Floor Industrial/Institutional Epoxy Flooring can be applied over most structural building substrates including quarry tile, concrete, steel or wood.
- Chem-Floor Industrial/Institutional Epoxy Flooring is resistant to most greases, fats and a wide range of chemicals.

B. Standard Colors

- Available in five standard colors: clear, light gray, dark gray, tile red, white. *Special colors available upon request/minimum quantities required.

C. Use

- Jails
- Restaurants
- Food Processing
- Pharmaceutical plants
- Bottling plants
- Hospitals
- Nursing homes
- Schools
- Washrooms
- Offices and corridors
- Chemical processing
- Laboratories
- Breweries
- Commercial kitchens
- Wastewater treatment plants
- Other

D. Material Requirements

- The following material requirements are based on Chem-Crete Floor Epoxy Resin Binder or Chem-Floor.

1/8" to 3/16" Double Broadcast System

Chem-Mortar 2 primer (optional)	200 sq. ft./gallon
Chem-Floor resin base coat	25-30 sq. ft./gallon mixed 1:1 by vol.
with #100 filler aggregate	
Broadcast aggregate #50	1-2 lbs. per sq. ft.
Chem-Floor resin grout coat	75-100 sq. ft./gallon

E. Optional Finish Coat

- For the utmost in gloss retention, durability, ease of maintenance and chemical resistance, use CCC-7556 chemical resistant, high gloss polyester aliphatic urethane finish at a rate of 280 square feet per gallon (two coats are required). For ease of maintenance and continued high gloss, apply one finish coat of CCC-7666 aliphatic urethane at a rate of 200 square feet per gallon in lieu of CCC-7556.

F. Application Instructions

- Surface preparations. See **Chem-Floor Industrial/Institutional Epoxy Flooring System** in the Surface Preparation section of the manual.
- Floor surfaces that are damp, porous or have a rough concrete finish should be primed with Chem-Mortar 2 epoxy, mixed 1:1 by volume. Empty entire contents of each component into a mixing container at the proper mix ratio. Using a "Jiffy" mixer, thoroughly mix the two components by raising and lowering the mixer and working it around the sides of the container during mixing. Apply to the surface at a rate of 200 square feet per gallon with a red or white squeegee and then smooth out with a short napped mohair roller with a solvent resistant core.
- The resin base coat consists of Chem-Floor/Clean performance floor epoxy, mixed 1:1 by volume. Empty entire contents of each component into a mixing container at the proper mix ratio. Using a "Jiffy" mixer, thoroughly mix the two components by raising and lowering the mixer and working it around the sides of the container during mixing. Slowly add filler aggregates to the mixed epoxy resin to obtain proper fill and flow characteristics. Wearing spike shoes (golf shoes) apply to the surface at the rate of 25-50 square feet per gallon with notched trowels or squeegees then backroll with a spiked roller to de-air and finish level.
- While the epoxy resin coat is still wet, the broadcast aggregate is sprinkled into it by hand or by any suitable "broadcasting" method. An excess of aggregate must be used to facilitate a good coverage of the substrate, otherwise sparse areas or voids will be formed which will require an additional coat of aggregate. Additional aggregate must be applied until the floor has a dry appearance. If a wet, glossy appearance is in evidence, it is an indication that insufficient aggregate has been applied. **Always leave a wet edge of about one foot without ridges to allow for joining the next course of material.** The epoxy resin base coat with aggregate must be allowed to dry before proceeding with the next step. Usually this occurs overnight at temperatures above 60°F. **Caution: All traffic other than mechanics installing the floor must be kept off floor until the final finish coat has cured.**
- Remove all loose aggregate by either sweeping or preferably by use of a vacuum system. **Warn the mechanic to keep dirt off the floor if he intends to reuse the aggregates.**
- The resin finish coat consists of Chem-Floor performance flooring epoxy, mixed 1:1 by volume. Empty entire contents of each component into a mixing container at the proper mix ratio. Using a "Jiffy" mixer, thoroughly mix the two components by raising and lowering the mixer and working it around the sides of the container during mixing. Apply to the surface at the rate of one gallon per 100 square feet with a red or white squeegee. Draw down the finish coat until the desired surface texture is obtained and backroll with a short nap mohair roller with a phenolic core to smooth out the applied epoxy.

G. Alternate Finish Coat

- The alternate finish coats consist of CCC-7556, two component polyester aliphatic urethane for chemical resistant applications of CCC-7666, one component aliphatic urethane for scratch resistance and ease of maintenance.
- CCC-7556 is mixed 2:1 by volume and is applied in two coats at 250 square feet per gallon using a short napped solvent resistant mohair roller.
- CCC-7666 is applied directly from the container at a rate of 200 square feet per gallon. Only one coat is required. Application is also with a short napped, solvent resistant mohair roller.

H. Cove Base

- If Required, a cove base can be preformed with an aggregate trowel mix applied no sooner than 24 hours prior to application of the “broadcast” Chem-Floor Industrial/Institutional Epoxy system. The aggregate mix is applied by hand into the wet primer.
- It is recommended to use a cap strip at the top of the cove.

I. Equipment Cleanup

- All tools, equipment and reusable containers should be cleaned at lunch break and at the end of the day to prevent epoxy or urethane buildup. Use solvent such as toluene, xylene or methyl ethyl ketone. These solvents have strong odor and should be used outside the building.

J. Safety and Cautionary Notes

- Store all materials at 70°F. during application and for at least 2 days prior to use. Low temperatures will increase viscosity of the product causing poor coverage and retarded cure.
- Substrate temperature must be no lower than 50°F. during installation and during the full 3 to 5 day cure of the floor.
- When using solvent-containing materials in confined spaces, the mechanic should use a NIOSH/MSHA approved self-contained breathing apparatus with a full face piece operated in a positive pressure mode.
- Mask out all areas to be protected. Remove masking tape before the epoxy cures.
- Exhaust ventilation must be provided in enclosed or confined spaces.
- Air conditioning and heat vents must be sealed to prevent solvents from escaping to other parts of the building.
- **Never allow any mix of epoxy resin and curing agent to remain in the mixing container for a prolonged period of time. The reaction of the two cause a heat buildup. This in turn will cause the epoxy mix to decompose! Noxious fumes will be formed! If this occurs, vacate the area, remove the container to the outside and ventilate the area before returning to work.**
- Use only spark-proof equipment in the area during installation and cure.
- Have CO_2 or other dry chemical fire extinguishers available at the job site.
- **Follow all cautionary directions as printed on container labels.**