Smith's SYSTEM APPLICATION GUIDE

AG-ETM-040323

EPOXY THIN-MIL (3-COAT SYSTEM)

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DESCRIPTION: Smith's Epoxy Thin-mil System is either a solid color or clear 3-coat seamless floor coating system ideal for interior commercial, retail, institutional or residential applications. The Thin-mil (3-Coat) System is typically installed between 15 to 30 mils making it ideal for Aviation Hangars (Military or Executive), Warehouses, Showrooms, Mechanical Rooms and much more.

HIGHLIGHTS:

- Meets requirements for Unified Facilities Guide Specification 09 67 23.15 for typical 3 coat, thin-mil floor coating systems for aircraft hangars
- Resistant to Hot Tire Pick-up
- Good Stain & Chemical Resistance
- Clear or Solid Color – 24 ISC Standard Solid Colors available separately
  - *Custom color matching available at additional cost*
- Durable & Easy to Maintain
- Low VOC's – Available in all regions

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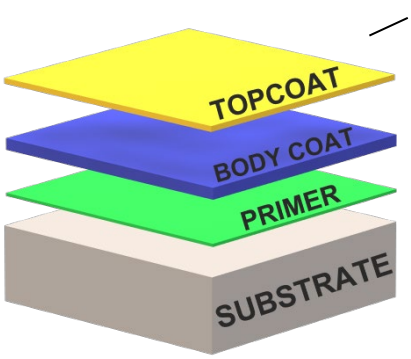

TOPCOAT – **See options pg. 2*

BODY COAT – Smith's 100% Solids Epoxy **See options pg.*

PRIMER – Smith's Epoxy Primer **See options pg. 2*

SUBSTRATE

AREA PREPARATION: Be sure to mask or cover all areas that are not intended to be coated; including, but not limited to; door frames, doors, walls and windows.

NECESSARY TOOLS and EQUIPMENT:

- Plastic Sheeting or Ram Board to cover floor for mix station
- Jiffy mixing paddle
- Low speed ½" drill (Variable Speed ≤450 rpm)
- 5 gallon Plastic Mixing Buckets
- 18" wide, Premium, Non-Shed 3/8" Nap Paint Roller Covers
- 18" wide, non-metallic Paint Roller Frames
- Multiple Extension Poles
- Spiked shoes or Soccer Cleats
- Flat Window Squeegee or Magic Trowel (optional)
- V-Notched Squeegee for primer & body coats (optional)
- Wide Boy Paint Tray (for topcoat Dip & Roll application)
- Cleaning Solvent (Acetone or Xylene)

NOTE: The mix station and all application equipment should be ready for immediate use prior to mixing any product.

SURFACE PREPARATION: The surface preparation is the *most important phase of a success floor coating application.* The more detail and time dedicated to preparation will dramatically affect the appearance as well as the durability of the finished floor. Proper floor preparation maximizes the product longevity, minimizes potential failures and creates the best environment for an aesthetically pleasing installation.

1) Allow new concrete to cure for at least 28 days to obtain ideal design strength to allow for proper preparation*
Minimum 28 day cure per 1" thickness for optimal moisture content
- Coatings applied to a damp or incompletely cured concrete substrate may loss of adhesion or develop undesirable surface irregularities. Moisture Vapor Testing is always recommended when coating directly over concrete
- Concrete must test below 4% MC (ASTM D2659) and between 9 to 12 pH surface alkalinity after mechanical preparation has been completed. ** For information regarding osmotic moisture vapor priming, click Epoxy MAC100 or Epoxy MAC125*

2) Concrete Surface Profile
- CSP 2 to CSP 4 must be achieved via mechanical grinding with a 30 (or less) metal bonded diamonds or shot-blasting
- If water is introduced to the intended application area, allow substrate to fully dry
- Please refer to ICRI Guideline 310.2R2013 for more in-depth preparation details and recommendations

3) Remove paint, adhesive and loose particulates from the intended application surface.

TEMPORARY HEAT: During application in environments using temporary heat, make sure to exhaust emissions & toxic fumes from temporary heaters to the exterior of the building to prevent health hazards & damage to work. Moisture vapor is emitted by fueled temporary heaters which can cause an amine blush with epoxy products. Many temporary heating methods emit unburned petroleum into the air which act as a bond breaker once it falls onto the surface of the substrate.

- Precautions must be taken when using LP, gasoline, diesel, etc. fueled temporary heat
- Always shut off temporary heat at least 2 to 3 hours prior to application to reduce risk of an amine blush
- Always clean the mechanically prepared surface with Smith's Oil Clean or TSP using an auto-scrubber followed by a thorough clean water rinse when temporary heat has been in use
- Fisheyes are a result of surface contamination or an amine blush

CLEANING: Detergent scrub with Smith's Neutral Detergent, or similar, and rinse with clean, potable water to remove surface dirt, light surface grease/oil and contaminants prior to mechanical preparation. Heavy grease and oil should be removed using Smith's Oil Clean.

If a densifier or dissipating curing compound is believed to have been previously used, clean the concrete with Smith's Green Clean Pro after mechanical preparation.

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CONTAMINANTS: Concrete is porous and can become contaminated with oils, chemical from spills, etc. which act as a bond breaker. Determine if a potential bond breaker exists and a proper course of remediation. Core sample Petrographic Analysis is the best method for testing of concrete for contaminate type and depth as well as for documenting and determining if other risks exist prior to proceeding with quoting and application of a flooring system. It is the contractors' responsibility to determine the substrate suitability and the course of action for remediation. Smith Paints is a product manufacturer, NOT a testing or analysis service but may provide testing lab references upon request. When in doubt, hire a third party inspector with appropriate certifications and credentials.

Delamination and/or breakdown due to the following causes can be determined via Petrography:

- AAR (Alkali Aggregate Reaction)
  - ACR (Alkali-Carbonate Reaction)
  - ASR (Alkali-Silica Reaction)
- Hydrostatic Pressure
- Near Surface ASR *(may occur in certain environments which have been topically treated with Sodium Silicates or Potassium Metasilicates)*
- Substrate contamination *(i.e. Oils, Solvents, PERT, PCB's, Silicone, etc.)*

CHEMICAL CONTAMINATION – If chemical contaminants exist, additional testing may be required. Once the type of contaminant is determined, contact Smith Paint Products for recommendations. Petrography of concrete cores may be necessary to determine what chemicals are present as well as the depth of penetration.

***SILICATE CONTAMINATION* –** Substrates which may have been previously treated with silicates (Potassium or Sodium Silicates) such as polished or burnished concrete as well as certain surface hardeners such as "Ashford Formula" or similar may skew moisture testing results.

A good indication of potential silicate contamination may be seen during traditional moisture testing with abnormally high pH (between 11.5 to 14 pH) but relatively low CaCl reading (less than 6 lbs. reading) with RH readings above 85%.

Testing pH levels with a pH pencil or Litmus paper along with distilled water is a very inexpensive, easy way of identifying a potential risk, in conjunction with Moisture Vapor testing methods to determine whether more in-depth testing should occur. Petrographic Analysis of concrete core samples may offer the most in-depth analysis of the situation should this be deemed necessary.

Concrete contaminated with silicate densifiers / hardeners of these types must be mechanically prepared followed by cleaning *Smith's Green Clean Pro* utilizing an auto-scrubber with soft bristle nylon brush heads and through clean, potable water rinsing at least 24 hours prior to moisture vapor & pH testing in order to obtain accurate readings, otherwise, all testing & subsequent moisture vapor emission warranties are null & void.

NOTE:

- *DO NOT USE* MURIATIC/HYDROCLORIC ACID TO PREPARE CONCRETE AS CHLORIDE CONTAMINATION MAY OCCUR
- When etching, ensure all Green Clean Pro has been thoroughly removed with potable water with no remaining soapy residue or cement slurry
- *DO NOT USE* Green Clean Pro on *"Green"* concrete *(less than 30 days old), Hard Trowel Finished* concrete or *previously sealed/coated/painted concrete* to including any type of curing compound

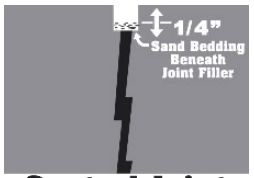
OIL CONTAMINATION – *Smith's Oil Clean* may be used to remove oils, such as petroleum, synthetic and food oils, from the surface of the concrete prior to mechanical preparation.

1) Scrape to remove heavy build-up of oil and grease
2) Shotblast to a CSP 3 to 4 to remove the surface paste of the concrete as well as paint, adhesives, dirt, debris, etc.
3) Wet down a 10 ft. x 10 ft. area with water
4) Pour ½ gallon of *Smith's Oil Clean* on the surface
5) Use a low-speed orbital floor machine with a soft bristle brush head to agitate the microbial cleaner across the entire area in multiple passes for approximately 10 to 20 minutes
6) DO NOT ALLOW AREA TO DRY
   - Keep the area wet and reapply water as necessary
7) Allow to dwell for 30 minutes, longer for heavy contamination
8) Extract the remaining liquid thoroughly with wet vacuum or auto-scrubber
9) Clean water rinse and extract again leaving no puddles nor standing water, including in gouges, chips, cracks, or joints
   a) If oil continues to weep out of the concrete, repeat the process
   b) Excessive oil contamination may require 2 applications with the second application being soaked with water then covered with at least 3 mil plastic overnight then shotblasted again to remove purged contamination
10) While the floor remains damp, apply *Smith's Epoxy MAC125* at 10 to 12 mils (333 to 400 sq.ft. per kit)
11) Allow to cure a minimum of 5 hours or overnight
12) Screen the surface of the primer dull to remove any contamination that may have floated through the primer before it cured
13) Vacuum the dust off the primer then clean with warm potable water & Dawn soap *(cap full to 5 gallons)* or
    Smith's Neutral Detergent (16 parts potable water to 1 part by volume Neutral Detergent)
    DO NOT USE simple green® or Soy based detergents
14) Dry mop the floor then allow to air dry for 60 to 90 minutes or use a floor fan to assist in completely drying the surface
15) Tack rag the surface with Acetone on a lightly dampened microfiber mop head or cotton rag replacing the rag frequently. Repeat until surface is clean then allow to dry for 30 minutes

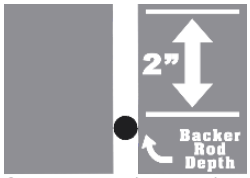
simple green® is registered trademark of Sunshine Maker's Inc.

JOINTS: Cut all joints open with a Diamond cutting blade and fill with an appropriate semi-rigid joint filler, such as *Smith's Poly JF* or *Smith's Poly JF/FC*. Use a dry fine grade washed sand to prefill joints to provide a bond break at the bottom and to support the joint filler.

Use a broom to remove any excess sand leaving the recess twice the width of joint.



Control Joint



Construction Joint

Epoxy is not as flexible as a moving joint, honoring of the joint at the surface after the resurfacing layer is applied then fill will an appropriate joint filler can lessen joint telegraphing. Please contact Smith's for more recommendations for crack repairs, joint wall rebuilding, etc.

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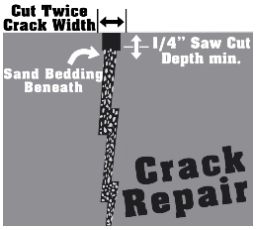
REPAIRING CRACKS, CHIPS & GOUGES: Surface defects may be repaired with a variety of different, compatible coating products, including but not limited to:



- Smith's SKM
- Smith's Epoxy GEL150
- Smith's Epoxy GEL150/FC
- Smith's Epoxy MP300 mixed with Fumed Silica
- Smith's Epoxy U100 mixed with Fumed Silica
- Smith's Epoxy FC125 mixed with Fumed Silica
- Smith's Poly PCF-45

Ensure patching products are hard enough to walk on without the risk of damage before proceeding with subsequent sanding & coatings.

Resinous repair methods are preferred. Should a cementitious repair compound be used for repairs, it *must be:*

- *non-water soluble; >5,000 psi*
- *Recommended as a direct traffic bearing surface / topping / overlay*
- *rated for exterior use*
- *cement product data sheet states "for use under a resinous coating" or similar*
- *Must be tested with a moisture impedance meter with a reading below 4% MC (ASTM F2659) prior to coating application*

Should the surface of the concrete require extensive resurfacing or repairs, please contact Smith Paints for more recommendations based on the site conditions.

INSTALLATION: *Cure times based on 72°F / 40% RH*

1) **PRIMER** – Apply epoxy primer *(see below options)* at a rate of 5 to 7 mils ≈ 225 to 320 sq.ft. per gallon*. Allow to cure:
   - Epoxy MP300 Extended Working Time ≈ Overnight
   - Epoxy U100 Regular Cure ≈ 4 to 5 hours
   - Epoxy FC125 Fast Cure ≈ 2 to 3 hours
   - Epoxy FW38 Waterborne Fast Cure ≈ ±3 hours
   - Epoxy MAC100** Slow Cure MVT ≈ minimum overnight cure
   - Epoxy MAC125** Oil Stop Fast Cure ≈ 2 to 3 hours

   ** *Screen the surface of the primer dull to remove any contamination that may have floated through the primer before it cured*

2) **BODY COAT** – Apply body coat of 100% Solids Epoxy *(see below options)* at a rate of 8 to 20 mils ≈ 80 to 200 sq.ft.* per gallon pouring out in ribbons then spread with a squeegee followed immediately by back rolling. Allow to cure:
   - Epoxy MP300 Extended Working Time ≈ Overnight
   - Epoxy U100 Regular Cure ≈ 4 to 5 hours
   - Epoxy FC125 Fast Cure ≈ 2 to 3 hours

3) **DEGLOSS** – Scuff cured epoxy surface removing any surface defects *(i.e. bugs, roller lint, airborne particulate, etc.)* in the films surface, vacuum thoroughly then solvent wipe clean with Acetone and Microfiber mop.

   ***This step is critical for the aesthetics of gloss finish Thin-mil systems*

NOTE: If recoating after 24 hours has elapsed, degloss previous layer via a 100 to 120 grit sandpaper or sanding screen or 120 to 150 grit metal bond diamonds on a diamond grinder with the weigh removed.

Sanding is critical for the aesthetics of gloss finish Thin-mil systems

APPLICATION TEMPERATURES:

MP300	Material	Surface	Ambient	Humidity
Best (ideal)	65° to 80°F	65° to 80°F	65° to 85°F	10 to 60%
Minimum	60°F	50°F	50°F	0%
Maximum	86°F	85°F	95°F	80%

- USE Smith's Epoxy FC125 for Cooler Temperature (between 45°F to 65°F)

U100	Material	Surface	Ambient	Humidity
Best (ideal)	60° to 80°F	65° to 80°F	65° to 85°F	10 to 60%
Minimum	50°F	50°F	50°F	0%
Maximum	90°F	85°F	95°F	70%

- High temperature will decrease pot-life & working time
- USE Smith's Epoxy FC125 for Cooler Temperature (between 45°F to 65°F) installations to achieve similar cure rates as Smith's Epoxy U100 (70°F to 85°F)

FC125	Material	Surface	Ambient	Humidity
***Best** (ideal)	55° to 60°F	50° to 60°F	50° to 72°F	10 to 60%
***Minimum**	45°F	45°F	45°F	0%
***Maximum**	65°F	65°F	75°F	80%

** Above for similar cure rates as Epoxy U100 at normal conditions. Becomes a fast cure product beyond these conditions.*

FW38	Material	Surface	Ambient	Humidity
Best (ideal)	60° to 90°F	65° to 85°F	65° to 85°F	10 to 60%
Minimum	55°F	55°F	50°F	0%
Maximum	95°F	95°F	100°F	80%

MAC100	Material	Surface	Ambient	Humidity
Best (ideal)	65° to 85°F	65° to 85°F	65° to 85°F	30 to 60%
Minimum	50°F	50°F	55°F	30%
Maximum	90°F	90°F	95°F	80%

MAC125	Material	Surface	Ambient	Humidity
Best (ideal)	50° to 65°F	55° to 65°F	50° to 75°F	30 to 60%
Minimum	40°F	45°F	40°F	30%
Maximum	80°F	80°F	85°F	80%

** DO NOT APPLY Epoxy during direct sun exposure or if that can occur during cure*
** * High temperature will decrease pot-life & working time*

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INSTALLATION (cont.)

4) **TOPCOAT** – A variety of topcoats are available depending on the desired aesthetics, cure rate / return-to-service, sheen, and chemical exposure anticipated:

- Smith's Poly-WB Water-based Polyester Polyurethane topcoat
- Smith's MCU-60 (Gloss) or with A/O 325 Low Sheen additive
- Smith's Hi-Wear 90S (Low Sheen, Regular Cure, Low Odor, High Traffic)
- Smith's CRU'86 (High Gloss, Regular Cure, Low Odor, CRU)

** Angular traction additive, such as Smith's Resin Sand, is highly recommended in areas exposed to grease / oil / soap / water / or less than 60°F service temperatures*

5) **CURE RATE FOR TRAFFIC:**

@ 72°F (22.2°C) with 50% Ambient Humidity	Light Foot Traffic	Heavy Traffic	Full Chemical Exposure
Smith's Poly-WB	16 to 24 hours	24 to 48 hours	7 days
Smith's MCU-60	12 hours	24 hours	≤3 days
Smith's Hi-Wear 90S	12 hours	24 hours	7 days
Smith's CRU'86	24 hours	36 hours	7 to 14 days

NOTE: *As Polyurethane products are moisture cured, cure rate will be greatly affected by humidity, especially at higher installation temperatures. High humidity may cause reduced leveling properties, development of roller markets, and even foaming under certain conditions. It is highly recommended to use monitor humidity as well as Dew Point during installation.*

***Smith's Hi-Wear 90S and Smith's CRU'86 should be applied at a final, single topcoat as these products do NOT have a recoat window. Should recoating be necessary, the surface must diamond ground using* 120 to 150 grit metal bond diamonds on a diamond grinder with the weigh removed or counter weighed then thoroughly vacuumed clean prior to a microfiber tack rag which has been slightly dampened with Acetone then allowed to dry for at least 45 minutes prior to recoating. Do NOT Use solvents such as Alcohols which draw moisture to the surface from the air to tack rag.

Topcoats must be applied thin. Please refer to individual product data sheet for more specific product information. Click on product name above for hyperlink to website product specific documents

SLIP RESISTANCE: Smith Paint Products recommends the use of angular slip-resistant aggregate in all coatings that may be exposed to wet, oily or greasy conditions as well as any condition where increased traction may be necessary. It is the contractor and end users' responsibility to determine the appropriate traction needs and footwear necessary for the conditions as well as setting performance parameters prior to beginning the application, testing to determine parameters have been met upon completion to achieve the end users documented safety standards.

Mock-ups are highly recommended as part of the evaluation process to determine the appropriate amount of slip-coefficient necessary for the environment.

Low Sheen powder additives, such as Smith's Hi-Wear 90S or Smith's A/O 325 Mesh Aluminum Oxide, are too fine to offer much additional traction improvement and are too fine to be considered "Anti-skid". Instead use Smith's Resin Sand or similar 20 to 60 mesh when using a traction additive or Smith's Glass Beads in high gloss executive aircraft hangars which will have limited exposure to oils or grease and need ease of dust mopping more so than traction.

MAINTENANCE: *The coating system must be allowed to cure for no less than one week before using any mechanical cleaning equipment on the surface and no less than 24 hours before neutral cleaner or water exposure. This includes auto-scrubbers, swing buffers, sweepers, etc. Only dust and wet mopping may occur the first week. Please click here more in-depth maintenance procedures.*