Smith's System Application Guide

GRIND & SEAL – Solvent-based

PDS-GSS-02192024

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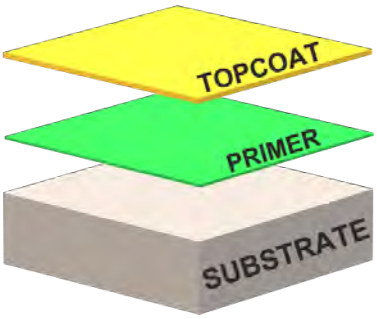
DESCRIPTION: Smith's solvent-based Grind & Seal system is a two-coat economical yet protective sealer system applied over interior concrete after diamond grinding or shotblasting for mechanical preparation. This system improves abrasion resistance, cleanability, aesthetics and stain resistance. While typically applied clear, solid colors as well as stains and dye may be incorporated if desired.

Smith's solvent-based Grind & Seal system is ideally suited for use over interior concrete substrates in commercial, retail, warehouses, showrooms, self-storage facilities or residential settings.

HIGHLIGHTS:

- Economical yet Protective
- Resistant to Hot Tire Pick-up
- Economical
- Topcoat available as a Gloss or Low Sheen Finish

SMITH'S GRIND & SEAL SYSTEM



SECOND COAT - SEALER
- Various options (See Page 4)

FIRST COAT - PRIMER
- Various options (See Page 4)

NECESSARY TOOLS and EQUIPMENT:

- Plastic Sheeting or Ram Board to cover floor for mix station
- Low speed ½" drill (Variable Speed ≤450 rpm)
- Jiffy mixing paddle (for mixing 2-component sealers/topcoats)
- Measuring Cups
- Solvent-resistant Masking Tape (automotive)
- White Rags (for clean-up)
- 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
- Paint Tray (for select topcoats and sealers)

SURFACE PREPARATION: The surface preparation phase should be viewed as the most important. Proper preparation results in the product's longevity, minimizes potential failures and creates the best environment for an aesthetically pleasing work of art.

TEMPERATURE & HUMIDITY: Substrate temperature & materials must be maintained between 50°F (10°C) to 90°F (32°C) with less than 80% Ambient Humidity for 24 hours prior to & 24 hours after installation.

INSPECT THE SUBSTRATE: Ensure the substrate is structurally sound & solid as well as free of any contaminants that may act as a bond breaker, such as oil, paint, densifier/sealers, dirt, debris, adhesives, loose/peeling existing coatings, curing compounds, wax, silicone, etc.

SURFACE PREPARATION – DIAMOND GRINDING:
**See Page 2 & 3 for more detailed preparation instructions*
(i.e. joints, patching, oil contamination, etc.)

1) 1st Pass = 25 to 40 grit metal bonded diamonds *(determined based on how soft or hard the concrete scratches with Mohs Hardness test)* to remove surface paste, existing sealers, paint, stains, etc. and ensure a clean, absorbent bonding surface
2) 2nd Pass = 70 to 100 grit metal bonded diamonds *(determined based on how soft or hard the concrete scratches with Mohs Hardness test then what grit is necessary to smooth out the surface while remaining absorbent)*. Grind to remove grinding swirl marks from the first grinding pass
3) Inspect the substrate for scratch patterns created by the grinding process. If a scratch pattern still exists, continue the grinding process by increasing the grit of the diamond *(not beyond 120 grit metal bond diamonds)*

***Dry Grinding*:**

4) Remove excess dust and debris with vacuum to thoroughly clean
5) Dust mop using a microfiber pad to remove fine dust residue
   a) 3 to 4 passes over the substrate with a new/clean micro-fiber mop per pass
   b) OPTIONAL - Follow by using an auto-scrubber with a soft bristle nylon brush attachment in conjunction with clean, potable water
      - Continue to clean substrate until extracted water is clear
      - Use a leaf blower or a wet vacuum to remove any standing water / puddles left behind after extracting with auto-scrubber
      - Allow the floor to dry until the floor is uniformly "white" not a darkened, blotchy surface

***Wet Grinding*:**

3) Remove slurry from floor via wet vacuum or auto-scrubber with soft bristle nylon brush attachment in conjunction with clean, potable water
   - Continue to clean substrate until extracted water is clear

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TEMPERATURE and HUMIDITY: Substrate temperature and materials must be maintained between 55°F (12.8°C) to 95°F (35°C) with 10% to 80% Ambient Humidity for 24 hours prior to and 24 hours after installation.

- Do not install coatings when the Dew point is within 5° of the temperature
- Do NOT Apply if the temperature is expected to drop below 55°F (12.8°C) within the first 10 hours after application to minimize risk of Amine Blush

TEMPORARY HEAT: Moisture vapor is emitted by fueled temporary direct heaters which creates condensation to develop and can cause an amine blush with epoxy products as other surface defects related to other coating chemistries. Many temporary heating methods also can 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
  - Fisheyes are a result of surface contamination or an amine blush
- Ensure exhaust emissions & toxic fumes from temporary heaters exhaust to the exterior of the building to prevent health hazards & damage to work
- Always clean the mechanically prepared surface with *Smith's Oil Clean* using an auto-scrubber followed by a thorough clean water rinse when temporary heat has been in use

CHECK FOR MOISTURE: Testing concrete moisture via both the Calcium Chloride (ASTM F1869) and In-situ Relative Humidity (ASTM F2170) methods is highly recommended to accurately determine both the Moisture Vapor Emission Rate (ASTM F1869) and the available Moisture Content (ASTM F2170) at the time of testing. Using only one test method will not provide all necessary information and may not indicate other potential risks such as contaminates, etc. that may pose a risk for delamination, chemical attack, etc. which are not caused by moisture vapor emissions or high alkalinity.

Maximum moisture readings are as follows:

ASTM F2659	<4% MC
ASTM F1869	<3 lbs. / 1,000 sq.ft. / 24 hours with 9 to 12 pH
ASTM F2170	<75% Relative Humidity

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.

Smith's Epoxy MAC100 or *Smith's Epoxy MAC125*, in conjunction with proper testing and mechanical preparation, will reduce the moisture vapor emission rate to a level within the tolerance of subsequent coatings and traditional floor covering needs.

Follow the testing manufacturer's instructions precisely or visit www.astm.org, see ASTM F1869 or F2170, to purchase the test methods. Testing MUST occur within an acclimated, interior environment for the results to be valid and conclusive.

Smith Paint Products is strictly a product manufacturer and does NOT offer any testing or analysis but may be able to offer guidance to an appropriate testing lab or third-party inspector. When in doubt, hire a qualified third-party testing firm with appropriate certifications and credentials.

CONTAMINATION OF SUBSTRATE: 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.

Delamination and/or breakdown due to the following causes are examples of substrate contamination:

- AAR (Alkaline Aggregate Reaction)
  - ACR (Alkali-Carbonate Reaction)
  - ASR (Alkali-Silica Reaction)
- 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.)

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.

Potential silicate contamination may be seen during traditional moisture testing with abnormally high pH (above 11.5 to 14 pH) with relatively low CaCl reading (less than 6 lbs. reading) and RH readings above 85%. Should further testing be necessary, concrete cores samples and Petrographic Analysis may offer the most in-depth analysis of the situation.

Concrete contaminated with silicate densifiers / hardeners of these types must be mechanically prepared followed by cleaning *Smith's Green Clean Pro* 24 hours prior to moisture vapor and pH testing in order to obtain accurate readings, otherwise, all testing and subsequent moisture vapor emission warranties are null and 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

CHEMICAL CONTAMINATION **–** Chemical contamination should be determined and may require additional testing. Once the type of contaminant is determined, contact Smith Paint Products for recommendations while following local regulations regarding contaminant and disposal.

OIL CONTAMINATION **–** *Smith's Oil Clean* may be used to remove oils, such as petroleum, synthetic, and food oils, from concrete & other mineral based substrates prior to mechanical preparation. Use *Smith's Epoxy MAC125* as an oil stop primer at 10 to 12 mils, as necessary, in conjunction with shotblasting and *Smith's Oil Clean*.

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AREA PREPARATION: The mix station & all application equipment should be ready for immediate use prior to mixing any product. Higher temperatures & humidity will shorten pot-life of sealers & coatings.

LIMITATIONS:

- For industrial & wheeled traffic / fork lift traffic conditions, a minimum of an ICRI CSP 3 profile is required for mechanical preparation
- When applied clear, an Aliphatic U.V. Stable topcoat or sealer DOES NOT block Ultra Violet light radiation when applied clear over a non-U.V. Stable product (i.e. Epoxy, etc.)
  - Expect epoxy primers to amber
- Do NOT install coatings when the Dew point is within 5° of the temperature
- Application is NOT recommended above 80% Humidity at time of install
- Do NOT apply when ambient humidity is below 30% within the first 5 hours of cure to avoid surface defects

PRECAUTIONS / WARNING:

- *Solvent containing products are Flammable*
- Extinguish all flames, pilot lights & electric motors until all vapors are gone & the coating is hard
- Keep away from sparks, heat & open flame
- Use with adequate ventilation when mixing, applying & curing to avoid solvent asphyxiation, if applicable
- DO NOT SPRAY
- See individual product Safety Data Sheets recommended respiratory equipment, if necessary, as well as any allergy related warnings / precautions

Polyaspartics & Polyurethanes emit harmful solvent & isocyanate vapors when sprayed which can cause respiratory irritation. Individuals with chronic lung or breathing problems or negative reaction to isocyanates should NOT use these products.

JOINTS: Honor expansion joints at the finish floor elevation. Follow ACI 224.3R-95: Joints in Concrete Construction guidelines for proper filling of construction & control joints. ACI recommends allowing a concrete slab to cure for a minimum of 60 to 90 days or longer to allowing the slab to shrink & acclimate to the intended joint width thus reducing the risk of joint wall separation from the joint filler. Cooler climate applications such as freezer & coolers must be brought up to & held at a minimum of 45°F substrate temperature for no less than 10 days prior to as well as 7 to 10 days after filling with an appropriate semi-rigid joint filler, such as Smith's Poly JF or Smith's Poly JF/FC, ideally longer if possible.

Always route out joints with an appropriate width diamond cutting blade attached to a vacuumized & dust controlled joint saw to flush out debris & freshly clean the side walls of the joint. Ensure that all loose edges & broken pieces of the concrete are removed & repaired prior to filling the joint with Smith's Poly JF or Smith's Poly JF/FC. Should joint side walls require extensive repairs, cut out the bad section of concrete back to a sound, solid area then fill with an appropriate mortar for the depth & application.

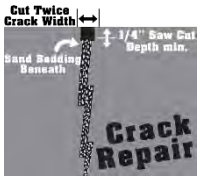
Control Joint

Construction Joint

NOTE - Plastic Media, Soda Blasting, etc. do not yield enough of a profiled surface & will require additional chemical etching to properly adhere the coating to metal.

See data sheet for Smith's Poly JF for more details.

REPAIRS - CRACKS, CHIPS & GOUGES: A variety of different, compatible coating materials may be used to repair chips, gouges, etc., to include but not limited to, Smith's SKM; Smith's Epoxy GEL-150; Smith's Poly-JF or Smith's Poly-JF/FC; Smith's Epoxy U100 / Smith's Epoxy FC125 mixed with Silica Fume; Smith's Epoxy FRM fast repair mortar kit; Smith's Poly PCF-45 or similar *(Click on product name for detailed instructions).*



Ensure resinous patch is hard enough to walk on without imprinting or damage before proceeding with next steps.

Resinous repair products are preferred, however, if a cementitious repair compound is used, ensure the following are met:

- *non-water soluble / recommended for exterior use*
- >5,000 psi
- Reads below 4% MC *(ASTM F2659)* when tested using a concrete moisture impedance meter prior to applying coating
- Mechanical prepare the substrate beneath of the cement-based product to the appropriate CSP necessary for the coating system as well as the surface of the cement product prior to coating
- Portland or CSA cement-based only
  - *rated for direct traffic*
- *Not recommended over Gypsum-based cementitious products, to include synthetic gypsum products*

INSTALLATION: *Cure times based on 72°F with 50% Ambient Humidity*

**Click on product name for more detailed product installation instructions.*

***For solid colors, add Smith's ISC Color Packs to each layer following the mixing instructions found in the sealer's product data sheets. Note that white will require additional coats to achieve opacity.*

Smith Paint Products manufactures several different sealers & topcoat options depending on the aesthetic, traffic, stain & chemical resistance as well as budget & longevity needs. Below are select sealer & topcoat options available *(see individual product data sheets for installation instructions)*.

Sealing damp or incompletely cured concrete may cause a hazy appearance or loss of adhesion once sealed or topcoated. Moisture Vapor Testing is always recommended when coating directly over concrete and is especially important when sealing with high solids sealer or topcoat such as epoxy or polyurethane. **See "Moisture /Alkalinity" section on page 3 for more details.*

ROLLER APPLICATION: Use a 3/8 inch non-shed chemical resistant roller cover to dip & roll out of a paint tray by first V-rolling then cross rolling to remove roller lines and drips. Do not walk in the wet film, use an extension pole to work from the edge to roll.

BRUSH APPLICATION: Utilize traditional soft bristle brush application for cutting in corners and edges.

NOTE: *Low Sheen Sealers are not recommended for the coat directly applied over bare concrete & should be applied only as the final wear surface coat over the recommended primer. Low Sheen finish sealers must be applied at ≥500 sq.ft. per gallon in order to achieve a uniform sheen & finish.*

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1) ***PRIMER*** **-** Apply a thin, even coat of primer a rate of 5 to 7 mils ≈ 225 to 320 sq.ft. per gallon via roller or spray application making sure to remove any puddles or drips. Allow to cure between coats @ 72°F (22.2°C) / 50% Humidity.

Not U.V. Stable:

- Smith's Epoxy FW38 *(Low Odor)* = 2 to 3 hours
- Smith's Epoxy MP300 *(Low Odor)* = Overnight
- Smith's Epoxy U100 *(Low Odor)* = 4 to 5 hours
- Smith's Epoxy FC125 *(Low Odor)* = 2 ½ to 3 hours

U.V. Stable

- Smith's Polyaspartic 1000 = 2 hours
- Smith's Polyaspartic 2000 = 3 hours
- Smith's Polyaspartic 5000$_{LO}$ *(Low Odor)* = 8 to 10 hours

2) ***SEALER*** **–** Apply the seal coat at the appropriate rate stated below via roller

- Smith's CRU'86 *(Low Odor)*
  - **a)** *Gloss* ≈ 400 sq.ft. per gallon
  - **b)** ***Low Sheen* ≈ ≥500 sq.ft. per mixed gallon
    **Add 1 can of Smith's A/O 325 Low Sheen additive per 1 gallon*
- Smith's MCU-60
  - **a)** *Gloss* ≈ 400 sq.ft. per gallon
  - **b)** ***Low Sheen* ≈ ≥500 sq.ft. per mixed gallon
    **Add 1 can of Smith's A/O 325 Low Sheen additive per 1 gallon*
- Smith's Hi-Wear 90S *(Low Odor)*
  - **a)** *Low Sheen* ≈ 535 to 720 sq.ft. per gallon
    **Must be applied at less than 3 mils (≤500 sq.ft./gal.) to avoid foaming / microbubbles*
- Smith's Polyaspartic 1000
  - **a)** *Orange Peel Gloss* ≈ 180 to 267 sq.ft. per gallon
  - **b)** *Smooth, Gloss* ≈ 100 to 160 sq.ft. per gallon
- Smith's Polyaspartic 2000
  - **a)** *Orange Peel Gloss* ≈ 180 to 267 sq.ft. per gallon
  - **b)** *Smooth, Gloss* ≈ 100 to 160 sq.ft. per gallon
- Smith's Polyaspartic 5000$_{LO}$ *(Low Odor)*
  - **a)** *Orange Peel Gloss* ≈ 180 to 300 sq.ft. per gallon
  - **b)** *Smooth, Gloss* ≈ 80 to 160 sq.ft. per gallon

* Angular traction additive, such as Smith's Resin Sand, may be added to this layer if desired.

Although aliphatic topcoats themselves do not yellow, when applied clear over epoxy, Aliphatic topcoats will NOT block U.V. light & yellowing of the epoxy should be expected, even under artificial light exposure conditions.

RECOATING: Smith's CRU'86 & Smith's Hi-Wear 90S requires full deglossing to recoat regardless of cure time.

If recoating the remaining above topcoats after 24 hours has elapsed, degloss existing sealer film with 80 to 100 grit sandpaper or sanding screen.

CURE RATE FOR TRAFFIC AFTER TOPCOAT:

@ 72°F (22.2°C) with 50% Ambient Humidity	Light Foot Traffic	Heavy Traffic	Full Chemical Exposure
Smith's CRU'86	24 hours	36 hours	7 days
Smith's MCU-60	≤12 hours	≤24 hours	7 days
Smith's Hi-Wear 90S	12 hours	24 hours	7 days
Smith's Polyaspartic 1000	≤8 hours	24 hours	2 to 3 days
Smith's Polyaspartic 2000	≤16 hours	36 hours	3 to 4 days
Smith's Polyaspartic 5000$_{LO}$	≤24 hours	up to 48 hours	3 to 4 days

NOTE: *Polyaspartic products cure rate will extend when applied greater than 8 mils. Please refer to individual product data sheet for more specific product information*

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.

***Do NOT Use Smith's A/O 325 Low Sheen Additive for additional traction as it is too fine to be considered "Anti-skid". Instead use Smith's Resin Sand or similar 20 to 60 mesh when using a traction additive to meet the needs for the environment..*

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 72 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.*

Dust mopping, removal of debris & regular cleaning is crucial to maintaining the aesthetics of the coating & obtaining the maximum life span of the floor coating system. Cleaning cannot occur too often & inefficient cleaning will cause the floor to wear out prematurely, possibly stain or discolor depending on what encounters the floor. Spills should be removed quickly. Avoid the use of Polypropylene or abrasive bristle (Tynex®) brushes as these brushes will cause the development of scratch patterns & lessen the sheen.

To optimize your investment, proper floor care is necessary to remove particles & residues that may scratch and/or dull the floor coating using the least aggressive method necessary to clean the floor.

Developing a floor maintenance schedule to be performed at the end of each shift & a set day per week or month for heavy cleaning is best practice:

- Daily = Sweep & dust mop or water only mopping/auto-scrubbing; spot clean spills & oils
- Weekly or Monthly = Scrubbed once per week or month depending on the amount & type of soils present

Health Department or DEA regulations may necessitate more frequent & stringent cleaning practices as will areas more prone to oils, inks, chemicals, etc. on the floor surface.

- Do not drag or drop heavy objects across any floor, including coatings as scratching, gouging or chipping may occur to the concrete or the coating itself. This includes the tip of the forks on a forklift, nails protruding from a pallet, etc.
- Avoid spinning tires on the surface of a coated floor. The heat created from the friction of a spinning tire will quickly soften the coating causing permanent damage to the finish
- Should a gouge, chip or scratch occur, touch-up the damaged areas immediately to avoid chemical or water intrusion to the concrete which could create additional damage. A thin layer of clear nail polish to the damaged area will provide some minimal protection until the area can be properly repaired
- Rubber tires are prone to plasticizer migration, especially aviation tires & high-performance car tires. Plasticizer will stain coatings & commercial flooring leaving an amber, yellow-like stain that can be permanent. Some tire stains can be removed is cleaned before a set-in stain occurs using a d-Limonene based degreaser & some mild agitation using an orbital, low speed floor machine