



Product Data Sheet & Application Guide

HI-WEAR 90S

ALIPHATIC CHEMICAL RESISTANT URETHANE WITH HIGH TRAFFIC ADDITIVE

HW90S-PDS-031819

DESCRIPTION:

Smith's Hi-Wear 90S is a satin finish, Aliphatic, 3 component clear or 4 component pigmented chemical resistant urethane for use in high traffic environments needing a chemical and abrasion resistant UV Stable satin finish topcoat.

RECOMMENDED USES:

- Hangar Floors
- Food & Beverage Floors
- Forklift traffic areas
- Manufacturing areas
- Aisleways
- Loading Docks
- Pharmaceutical Floors
- Vehicle Service areas

HIGHLIGHTS:

- Developed for heavy traffic and abusive environments
- Greatly improves the service life of the coating system
- Resists development of traffic patterns and finish dulling
- Excellent rolling load resistance to forklift traffic
- Improves light reflectivity
- Easy to clean
- Chemical resistant to most alcohols, caustics, fuels, oils and solvents
- Meets FDA Food Code – Physical Facilities 6-101.11 Surface Characteristics. *Not tested for CFR 21 Direct Food Contact.*
- Overnight return to service

STORAGE:

Indoors between 65°F - 90°F

APPLICATION TEMPERATURE & HUMIDITY RANGE:

Between 50°F - 90°F and 20% - 80% Ambient Humidity

SHELF LIFE:

18 Months in original, unopened containers

AVAILABLE KIT SIZES:

1.15 gallon kit – SCS-HW90S-1.15gal
4 gallon kit – SCS-HW90S-4gal

OPTIONS:

Colors: Use Smith's Industrial Solid Colorant packs at the quantity per kit size stated below:

- 1.15 gallon Kit = 1 unit per kit*
- 4 gallon Kit = 4 units per kit*

* White or Yellow ISC color packs require double quantity

POTLIFE & CURE TIMES (72°F / 50% Relative Humidity):

**Cure time is effected by temperature and humidity.*

Pot Life	2 ½ hours
Working Time	2 ½ hours
Tack Free	3 hours
Foot Traffic	12 hours
Heavy Traffic	24 hours
Full Chemical Resistance	7 days

CURED COATING PROPERTIES (DRY FILM):

Property	Test Method	Results
Abrasion Resistance, mg/loss* Taber Abraser	ASTM D4060	16.8 mg loss
VOC's-Volatile Organic Compounds	ASTM D3960	±43 g/L
Gloss (60°)	ASTM 1455	20° (±5°)
Hardness (Pencil)	ASTM 3363	3H
Impact	ASTM D2794	140 in.lbs. Direct & Reverse
Adhesion to Steel - Pull Strength, psi (MPa)	ASTM D4541	2,625 psi (18.1 MPa)
Percent Elongation	ASTM D2370	6%
Water Absorption, 24-hour immersion test	ASTM C413	<0.02%
Viscosity – Mixed	ASTM 2196	383 cPs
Flash Point - Liquid State	ASTM 3278	200°F (93°C)
Volume Solids (Mixed)	ASTM D2196	±90%

*CS-17 Taber Abrasion Wheel, 1,000 gram load, 1,000 revolutions Results are based on conditions at 77°F (25°C), 50% relative humidity.

APPROXIMATE COVERAGE (DRY FILM):

Coverage will vary depending on the application thickness, floor profile and absorbency of the substrate.

Coverage Equation: $1604 \div \text{milage} \times 0.9 = \text{Dry Film Thickness}$

Mil Thickness	Approximate Yield per kit per square foot	
(Dry Film Thickness)	1.15 gal kit	4 gal kit
2 mils	830 sq.ft./kit	2,888 sq.ft./kit
2.5 mils	660 sq.ft./kit	2,300 sq.ft./kit
3 mils	550 sq.ft./gal	1,924 sq.ft./kit





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Typical Chemical & Stain Resistance

Covered Spot Test - 3 mil film at 7 day cure:

E - Excellent; G - Good (slight sign of exposure/stains, coating recovers);

NR - Not Recommended (Permanent Damage)

Acids	24 hour Exposure
Acetic Acid 25% (Vinegar)	E
Citric Acid 10%	E
Lactic Acid (Milk)	E
Phosphoric Acid 85%	E (Clear) / G (Tinted)
Sulfuric Acid 25% (Battery Acid)	E
Sulfuric Acid 98%	G (Clear) / NR (Tinted)
Hydrochloric Acid 32% (Muriatic)	E
Nitric Acid 50%	NR

Bases

Ammonium Hydroxide 10%	E
EBGE	E
Sodium Chloride 20%	E
Sodium Hydroxide 50%	E
Sodium Hypochlorite (Bleach)	E
Trisodium Phosphate 10%	E

Alcohols

Ethylene Glycol (Antifreeze)	E
Hand Sanitizer	E
Isopropyl Alcohol 91%	E
Methanol	E

Solvents

Acetone	E
d-Limonene	E
MEK	E
Methylene Chloride	E
Mineral Spirits	E
PGMEA	E

Hydrocarbons

Brake Fluid	E
Transmission Fluid	E
Motor Oil	E
Gasoline	E
Kerosene	E
Hydraulic Fluid	E
Skydrol® - LD-4	E

MISCELLANEOUS

Coffee	E
Coke®	E
Dish Detergent (Dawn®)	E
Hydrogen Peroxide 3%	E
Ketchup	E
Monster Energy® Drink	E
Mustard	E
Tide® 1%	E
Windex® (Ammonia Based)	E
Wine - Red	E

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 only give all of the necessary information and may not indicate other potential risks such as contaminants, etc. that may pose a risk for delamination, chemical attack, etc. which are not caused by moisture vapor emissions or high alkalinity. The absence of an effective moisture vapor barrier may create an environment for moisture vapor transmission as well as high levels of alkalinity in concrete slabs.

Smith's Epoxy MAC100 or 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.

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. Contact Smith Paint Products for remedial 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 the surface of the concrete prior to mechanical preparation. Wood substrates contaminated with oil may require removal and replacement of the oil contaminated area with new wood to ensure proper adhesion.

NECESSARY TOOLS and EQUIPMENT:

- Plastic Sheeting or Ram Board to cover floor for mix station
- Paint mixing paddle
- Low speed ½" drill (Variable Speed ≤450 rpm or less)
- 5 gallon Plastic Mixing Buckets
- Premium, Non-Shed ¼" or 3/8" Nap Paint Roller Covers
- Several 18" wide, non-metallic Paint Roller Frames
- Wide paint trays (for dip & roll applying)
- Multiple Extension Poles
- Cleaning Solvent (Acetone, MEK, or Xylene)

NOTE: The Mix station and all application equipment should be ready for immediate use prior to mixing any product. Higher temperatures and humidity will shorten pot life.

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

TEMPERATURE and HUMIDITY: Substrate temperature and materials must be maintained between 50°F (10°C) and 90°F (32°C) with less than 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.



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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 dissipative curing compound is believed to have been present, use [Smith's Green Clean Pro](#) biodegradable etching gel after mechanical preparation methods.

SUBSTRATE PREPARATION

NOTE: Methyl Methacrylate (MMA) is NOT an acceptable substrate and delamination will occur if topcoated.

AS A TOPCOAT OVER A NEW COATING SYSTEM: Ensure the previous layer has cured enough to receive another layer, shows no indication of blushing and has NOT exceeded the recoat window. Correct any surface imperfections in the previous layer prior to topcoating. If the previous layer has cured beyond the recoat window, the surface must be mechanically abraded using 80 to 100 grit sand paper or screens to a uniformly dull surface with no remaining shiny areas then cleaned to remove all dust/debris prior to receiving a topcoat of Smith's Hi-Wear 90S.

TOPCOATING EXISTING FLOOR COATING SYSTEMS:

Adhesion to any existing coating system is only as good as the adhesion the existing coating system has to its substrate. Always test to determine the suitability of an existing substrate and mock-ups are highly encouraged. Allow the mock-up to cure for no less than 1 week before performing adhesion testing, such as a tape test or using an Elcometer. To verify the existing coatings bond strength to its substrate, follow ASTM D 4541 using an Elcometer to determine an in-situ direct tensile pull-off strength greater than 250 psi (1.7 MPa) to pass the test. Once the existing coating system has been deemed to be well bonded and sound, thoroughly degrease as necessary using Smith's Oil Clean prior to diamond grinding with 100 to 150 grit diamonds or sanding the entire surface with 80 to 120 grit sandpaper or screens to a uniformly dull finish. Ensure no shiny areas remain then thoroughly vacuum and tack rag the entire surface with Acetone.

DIRECT TO CONCRETE: Achieve a CSP 2-3 (Concrete Surface Profile in accordance with ICRI Guideline 310.2R2013, as published by the International Concrete Repair Institute) yielding a surface texture similar to 80 to 120 grit sand paper or more course in order to maintain long term adhesion to the substrate and to ensure a porous substrate.

Recommended preparation methods below:

Diamond Grind: Use 25 to 80 grit metal bond diamonds with an appropriate industrial, weighted head floor grinder to thoroughly remove the concrete surface until uniformly white. Do NOT use resin bond diamonds to prepare concrete to be sealed due to the risk of resin residue transfer to the concrete surface and potential for fisheyes or a bond breaker.

***Etching Compound:** [Smith's Green Clean Pro](#) etching compound may be used as follows:

- Remediation method for removing densifiers/silicates

When using [Smith's Green Clean Pro](#), ensure a uniformly dull appearance and sandpaper texture. Thoroughly rinse with potable water and allow to dry. Should shiny areas remain, further treatment with [Smith's Green Clean Pro](#) will be necessary.

NOTE:

- DO NOT USE MURIATIC / HYDROCHLORIC ACID TO PREPARE CONCRETE AS CHLORIDE CONTAMINATION CAN 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 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.

Please refer to ICRI Guideline 310.2R2013 for more in-depth preparation details and recommendations.

JOINTS, CRACKS & PATCHING: Cut all joints and moving cracks open with a Diamond cutting blade and fill with an appropriate semi-rigid joint filler, such as Smith's Poly JF, prior to priming the substrate. Honor the joint at the surface after the coating is applied then fill with an appropriate joint filler can lessen joint telegraphing. Smith's Hi-Wear 90S may be applied as a topcoat over semi-rigid epoxy joint fillers or Smith's Poly JF but is not recommended over caulking, Polyurea, silicone, flexible urethane or other flexible joint fillers. Patching of chips, gouges, etc. may be repaired with a variety of different, compatible coating materials, to include, [Smith's Epoxy GEL150](#); [Smith's Epoxy U100](#) / [Smith's Epoxy FC125](#) mixed with Silica Fume; Smith's Poly PCF-45 or similar. Ensure patching products are hard enough to walk on without the risk of damage before proceeding with subsequent coatings. Should the surface of the concrete require extensive resurfacing or repairs, please contact Smith's for more recommendations on crack repairs, joint wall rebuilding, etc. based on the site conditions.

MIXTURE: Add the entire contents of Part B into the Part A container as well as any optional Smith's ISC Industrial Solid Colorant Packs mixing with a slow speed drill (<450 RPM max.) with a paint mixing paddle for 1 minute. While continuing to mix, slowly add in the Part C powder and continue to mix for an additional 2-3 minutes to ensure no powder clumps occur. **DO NOT ATTEMPT TO PART MIX KITS.** Avoid whipping air into the mixture as bubbles will occur in the finished coating and under mixing may leave lumps in the finish or lessen the coating properties.

Optional Smith's ISC Color Packs per kit size:

1.15 gallon Kit = 1 ISC color pack per kit*

4 gallon Kit = 4 ISC color packs per kit*

* White or Yellow ISC color packs require double quantity

APPLICATION: Smith's Hi-Wear 90S is strictly a finish topcoat product intended for no more and will blister if applied too thick. Any imperfections, sanding marks/swirls, scratches, gouges, etc. that can be felt by hand or catch a finger nail when pulled across the area in the prior layer may transfer through this finish due to the minimal thickness of Smith's Hi-Wear 90S in a single coat application. Surface defeats are purely aesthetic and pose no threat to the long term performance of the coating system.

Once mixed, immediately pour Smith's Hi-Wear 90S into a tall paint tray, such as a Wooster® Wide Boy™ 5 gallon paint tray. **DO NOT POUR Smith's Hi-Wear 90S onto the floor and spread!**

Dip the 3/8" nap roller into the mixture coat the roller head then roll off any excess into the paint tray avoiding liquid build-up on the sides of the roller caps and/or the frame.





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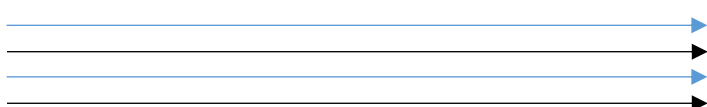
Avoid dripping Smith's Hi-Wear 90S during placement on the floor as the metallic fillers will concentrate in the drip and may not evenly disperse while finishing the coating.

NOTE: DO NOT TURN THE MIXING VESSEL UPSIDE DOWN ON THE SUBSTRATE TO ALLOW THE RESIDUAL PRODUCT TO DRAIN ONTO THE FLOOR TO AVOID THE RISK OF ANY UNMIXED OR NON-THOROUGHLY CATALYZED PRODUCT FROM THE SIDES AND BOTTOM OF THE MIXING VESSEL FROM REACHING THE FINISHED FLOOR. Best practice is to pour the mixed contents into a paint tray then dip and roll onto the substrate when applying Smith's Hi-Wear 90S.

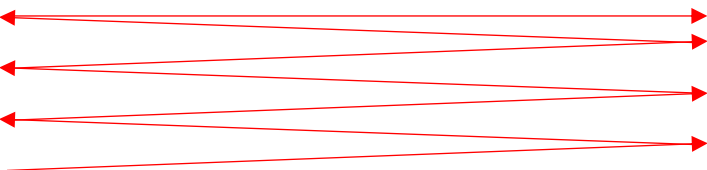
Roll out two parallel pathways roughly 8 to 10 feet in length



Then rewet the roller and repeat.



Next, cross roll in a V-shaped pattern starting at one of the lines on the end working across the area while overlaying one side of the roller to connect and evenly place the Hi-Wear 90S ensuring a uniform film thickness.



Finish by extending the roller out to the furthest point of this area and pull back across the surface with light pressure in a straight line to remove roller marks and overlap each pass by 1/2" continuing across the entire section.



Occasionally use the roller cover to remix the filler into the liquid in the paint tray. Ideally every 20 minutes.

On larger projects, it is recommended to have a separate person perform for each stage of the product placement, V-roll and finishing process to ensure productivity and a uniform appearance to avoid roller lines.

If the appearance is less than unsatisfactory, repeat the finish roll process again until a satisfactory appearance is achieved.

Continue until the entire area desired is topcoated and allow to cure.

COVERAGE: Not less than 530 sq.ft. per mixed gallon (WFT)

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 48 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.*

Dust mopping, removal of debris and regular cleaning is crucial to maintaining the aesthetics of the coating and obtaining the maximum life span of the floor coating system. Cleaning cannot occur too often and inefficient cleaning will cause the floor to wear out prematurely and possibly stain or discolor depending on what comes in contact with 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 and lessen the sheen.*

To maximum your investment with proper floor care and maintenance, remove all particles that may scratch and/or dull the floor coating using the least aggressive method necessary to clean the floor.

It is good practice to develop a floor maintenance schedule to be performed at the end of each shift and a set day per week or month for heavy cleaning:

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

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

DETERGENT: Always use the least aggressive detergent necessary to remove the residue. Smith's Neutral Detergent, or similar, may be used for general purpose cleaning. Use Smith's Oil Clean, or similar degreaser, for more degreasing and heavy duty weekly or monthly cleaning.

Caution: 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 pallets, 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 and high performance car tires. Plasticizer will stain coating and commercial flooring leaving an amber, yellow-like stain that can be permanent. This can be more noticeable where aircraft or vehicles are stationary for longer period of time, more so in non-climate controlled environments such as aircraft hangar with lighter colored floors. To avoid plasticizer staining, use a piece of Plexiglas® or LEXAN® panels, cut a few inches in diameter larger than the tires that will rest on the panels, between the floor and the contact point of the tire when storing rubber tired vehicles on any floor, including floor coating systems. Some tire stains can be removed is cleaned before a set-in stain occurs using a d-Limonene based degreaser and some mild agitation using an orbital, low speed floor machine.

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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.

MOISTURE/ALKALINITY: The absence of an effective moisture vapor barrier may create an environment for moisture vapor transmission as well as high levels of alkalinity in concrete slabs. Blistering, delamination flaking, etc. may occur in these environments when a non-breathable coating is applied over the surface of the concrete. Moisture testing is extremely important has part of the investigation process prior to quoting a project and should occur following the most current industry accepting testing methods, such as, a Calcium Chloride test (ASTM F-1869) and/or Relative Humidity probe (ASTM 2170). It is the contractors' responsibility to determine the moisture vapor transmission and pH of a floor. It is the contractors' responsibility to determine whether or not a substrate is sound, solid and suitable prior to selecting and applying any floor coating system.

Never use silicate based products as a means of moisture remediation as these products may crystallize in the pores of the concrete surface and impede on the adhesion of the coating system and are highly discouraged for use under any circumstance. This includes products containing Potassium Silicate, such as Smith's Base Boost, and Sodium Silicate based products.

Smith Paint Products is not responsible for failures due to the presence of moisture vapor emissions (Osmotic), Hydrostatic Pressure and/or high levels of alkalinity.

LIMITED LIABILITY: Liability is limited to replacement of defectively manufactured product of the same type and cost of the originally purchased product upon presentation of a valid, fully paid invoice at the time of a claim. No warranty shall be granted for outstanding invoices or for accounts with unpaid balances until paid in full. No damages, whether consequential, liquidated or other, shall be provided under this Limitation of Liability and Limited Warranty. Should a product defect be suspected at the time of application, cease use of the product immediately and notify Smith Paint Products for investigation as you will be responsible for the cost to repair or replace any work performed with product(s) suspected of defect. Record batch codes and save all products you purchased in order for any warranty to occur allow with the invoice that matches said quantity. Defects determined after installation must be reported to Smith Paint Products within 10 business days of discovery.

Upon information, belief and to the best of our knowledge, the information contained herein is true accurate as of the date of issuance of this particular document and any and all information conveyed, whether expressed or implied. Is subject to change without prior notice. We guarantee our products to confirm to Smith Paint Products quality control standards, but not to any other standards unless specifically stated in written documentation. Smith Paint Products assumes no liability for coverage, performance, injury results from use, misuse or usage not described in any promotional materials or regulatory infraction determined by using our products. The applicator assumes all liability for use and local regulatory compliance. Promotional materials are not a supplementation to any product purchase agreement, nor should such documents be considered a type of contract, if any is reduce to writing.

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