

HULK STPE®

Full Application & Field Specification Manual



This comprehensive guide defines the tools, thickening modifications, structural execution procedures, and limitations required when installing the Hulk STPE® Modified Silicone-Polyurethane Waterproofing Coating System. This document incorporates and builds upon the corporate Surface Preparation & Substrate Specification Guide.

1. Required Equipment, Tools, & Safety Gear

Because Hulk STPE® is a high-solids, heavy-bodied moisture-cure hybrid product, standard paint tools, electric diaphragm pumps, or light-duty electric airless sprayers are insufficient and highly prone to stalling, burning out, or packing out. The following specialized equipment must be on-site:

A. Application Tools

- Rollers: Use 3/8-inch to 3/4-inch nap, solvent-resistant, non-shedding phenolic core rollers. Synthetic or fabric-nap rollers will break down or absorb moisture, causing the product to skin prematurely on the roller.
- Trowels & Squeegees: Heavy-duty steel flat trowels, notched trowels (1/16-inch to 1/8-inch notches for specific mil targets), and heavy-duty solvent-resistant EPDM rubber squeegees for flat fields.
- Spray Equipment Engineering Specifications: Heavy-viscosity applications require heavy-duty airless spray setups powered strictly by pneumatic or hydraulic pumps:
 - Pneumatic (Air-Driven) Piston Pumps: Must utilize a high-ratio severe-duty displacement pump with a ratio between 45:1 and 68:1 (60:1 is highly recommended). Lower ratios cannot safely atomize the high-solids polymer. The air compressor must continuously deliver 80 to 120 psi at the motor regulator with a continuous volume of 50 to 100 CFM. The compressor airline must feature an industrial desiccant air dryer or heavy-duty moisture separator; ambient moisture migrating past throat packings will cause the product to skin and cure inside the fluid section.
 - Hydraulic Pumps: High-output hydraulic airless sprayers (e.g., Graco GH 833 or equivalent) are the preferred industry standard due to their massive stroke length and consistent power delivery without pressure pulsation.
 - System Performance Requirements: System must maintain a continuous operating pressure of 3,500 to 4,000 psi with a minimum fluid delivery flow rate of 1.5 to 2.5 Gallons Per Minute (GPM).
 - Spray Hoses & Tips: Remove all gun and manifold filters. Use a 3/8-inch ID moisture-lock high-pressure hose (standard braided hoses permit atmospheric humidity to permeate through the walls, curing product inside the line). Utilize heavy-viscosity reversible spray tips ranging from .025 to .035 with a 50-degree fan pattern.

B. Mandatory Spray Pump Maintenance: "Wet Cup" Protocol

Whether operating pneumatic or hydraulic systems, the pump must feature an adjustable throat pack nut (wet cup).

- Protocol: Installers must fill the wet cup with TSL (Throat Seal Liquid) or an approved water-free solvent before priming the system.
- Reasoning: Because Hulk STPE® is a moisture-cure coating, any material clinging to the piston rod during the upstroke will cure rapidly upon exposure to ambient humidity. Without TSL in the wet cup, these hardened crystals will rip and destroy the throat packings on the downward stroke, causing catastrophic fluid leakage and instant pump failure.

C. Cleaning, Mixing, & PPE Requirements

- Mixers: High-torque, variable-speed industrial drill equipped with a clean, heavy-duty helical or Jiffler-style mixing paddle. Standard paint sticks cannot properly homogenize the heavy resin matrix.
- Solvents: Copious amounts of technical-grade Xylene or Denatured Alcohol for tool preservation. NEVER introduce water or mineral spirits to the tools or product lines.
- Mandatory Personal Protective Equipment (PPE):
 - Respiratory Protection for Hand-Mixing & Dry Additives: When opening, handling, or blending dry powder thickening agents (specifically fumed silica/Cab-O-Sil), personnel must wear a NIOSH-approved N95 or N100 particulate respirator/dust mask. Fumed silica consists of sub-micron amorphous particles that easily become airborne and pose a severe inhalation hazard to lung tissue.

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- Respiratory Protection for Spray Operations & Cleanup: During high-pressure airless spraying or solvent flush operations using Xylene, technicians must wear a NIOSH-approved half-face or full-face respirator equipped with organic vapor cartridges combined with a particulate pre-filter.
- Skin & Eye Protection: Wear chemical-resistant nitrile gloves (minimum 6 mil thickness) and tight-fitting safety splash goggles or a full-face shield. Wear long-sleeve protective coveralls (e.g., Tyvek) to protect exposed skin from sticky STPE residues and solvent splashes.
- Footwear: High-traction, slip-resistant safety boots are mandatory. Liquid-applied STPE becomes exceptionally slick on metal, concrete, or single-ply membranes prior to curing.

2. On-Site Product Modification: Thickening Agents for Gaps & Slopes

Hulk STPE® is naturally self-leveling to a degree. When working on vertical walls, steep-slope transitions, or filling deep structural voids, it must be field-modified into a thixotropic (non-sag) paste configuration.

A. Approved Thickening Additives

1. Fumed Silica (e.g., Cab-O-Sil or Aerosil): Used to increase viscosity and establish anti-sag traits without altering chemical flexibility.
2. Thixotropic Fibers (e.g., short-strand structural polyethylene or cellulose fibers): Used when high-build bridging strength and physical bulk are required across wide gaps.

B. Field Mixing Procedure

1. Don all mandatory PPE, ensuring your particulate mask/respirator is tightly fitted before handling dry additives.
2. Open the pristine container of Hulk STPE® and perform a baseline mix for 60 seconds with the helical paddle to ensure uniform temperature and consistency.
3. Gradually introduce the fumed silica or fibers in small increments (typically 2% to 5% by weight, depending on desired stiffness) to minimize creating airborne dust clouds.
4. Keep the mixing paddle fully submerged to avoid drawing air bubbles into the liquid. Mix at low speeds (under 400 RPM). Introducing air introduces moisture, which initiates internal curing.
5. Mix until a uniform, smooth, peanut-butter-like paste consistency is achieved.
6. Note: Apply this modified compound via trowel or stiff putty knife. Modified product cannot be run through airless spray pumps.

3. Core Surface Preparation Guidelines (Integrated)

All substrates must be structurally sound, free of loose debris, laitance, grease, oils, curing agents, or standing water before application begins.

- Metal Substrates: Pressure wash at 2,500–2,700 psi. Wire brush loose red rust scale to sound metal. For smooth, unweathered "mill slick" surfaces, a solvent wipe or wash primer is needed to ensure mechanical anchorage.
- Single-Ply Membranes: Pressure wash EPDM to remove all carbon black dust (requires EPDM tie-coat primer). Scrub TPO/PVC with non-filming detergent; smooth TPO requires a thermoplastic adhesion promoter. For Modified Bitumen, wash loose granules; no asphalt bleach-blocker is required due to Hulk STPE's chemical resistance.
- Concrete & Masonry: Sound and clean. Damp or green concrete is acceptable ($\$ > 1,000$ pull-off adhesion per ASTM D4138).
- Wood (Plywood/OSB): Securely fastened with low deflection. Clean and free of sawdust.
- Insulation (XPS/EPS/ICF): Fill gaps exceeding 1/16 inch (1.6 mm) with low-expansion spray foam or thickened Hulk STPE putty.
- MANDATORY FIELD ADHESION TESTING: Adhesion testing must be performed on a mock-up test area for every individual substrate type prior to full-scale application to verify bond strength. If test areas reveal inadequate adhesion, further mechanical profiling (sanding, scarifying, or shot-blasting), chemical etching, or a specialized substrate primer must be performed.

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4. Sequential Application Procedures & Methods

STEP 1: DETAILED FIELD INSPECTION & MOCK-UP ADHESION TEST



STEP 2: BULK SUBSTRATE CLEANING & REMEDIATION
(Pressure washing, scale removal, foam filling)



STEP 3: PRE-TREATMENT OF HIGHER-STRESS DETAILS
(30-mil on cracks/corners; 60-mil on joints/laps)



STEP 4: PRIMARY HULK STPE BROADCAST COAT
(Roller, squeegee, or Airless Spray Application)



STEP 5: TRACTION BROADCAST OR DETAILED TOPCOAT PREPARATION
(Aggregate embedded or scuff-sanded when cured)

Phase I: Detail Pre-Treatment (Flashing, Cracks, Joints, and Laps)

1. Structural Cracks & Dynamic Corners: Apply a 30-mil detail coat of Hulk STPE® directly over the crack or transition line. This detail coat must extend a minimum of 3 inches (7.6 cm) symmetrically on both sides of the center axis.
2. Control/Expansion Joints & Membrane Laps: Apply a minimum 60-mil application of Hulk STPE® (or on-site thickened STPE putty for vertical joints) to yield a smooth, heavy-duty monolithic bridge. Allow detail sections to skin over before main body coating.

Phase II: Main Body Field Application

1. Application Methods:
 - Roller/Squeegee: Pour the liquid product directly onto the substrate in a continuous ribbon. Use a squeegee to pull the product forward evenly, and immediately back-roll at right angles (cross-hatch pattern) with the phenolic roller to eliminate lines and pinholes.
 - Airless Spray: Spray utilizing a continuous, steady overlapping pass technique (50% overlap). Hold the gun perpendicular to the surface at a distance of 12 to 18 inches. Use a wet-film thickness (WFT) gauge continuously to verify mil targets. Ensure spray technicians wear full organic vapor respirators.
2. Thickness Target: Standard applications require a minimum of 20 mils, up to 60 mils in a single lift for high-performance waterproofing zones.

5. Traction and Abrasion Additives

Where the cured Hulk STPE® system will experience pedestrian traffic, maintenance traffic, or mechanical wear, slip-resistant aggregate must be incorporated.

Broadcast Method (Embedded Aggregate)

1. Apply the primary coat of Hulk STPE® to its full target mil thickness.
2. While the coating is completely fluid (wet) and prior to skin formation (within the 35–90 minute window), broadcast a clean, dry, washed architectural aggregate.
 - Approved Aggregates: 20/40 mesh silica sand, quartz, or aluminum oxide pellets.
 - Application Rate: Broadcast to refusal (approximately 20 to 30 lbs per 100 sq. ft.) or evenly spaced for light maintenance paths (approx. 10 lbs per 100 sq. ft.).
3. Once the system achieves full depth-cure, sweep or vacuum away all un-bonded, loose aggregate.
4. Apply a thin lock-coat (5 to 10 mils) of Hulk STPE® over the bonded sand to seal the aggregate matrix into the membrane permanently.

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6. Prepping for Topcoats or Second-Stage Coating Materials

When applying multi-coat configurations, secondary aesthetic colors, or topcoats of differing chemistries; such as Acrylics, Urethanes, or Epoxies, over a cured Hulk STPE® base layer, strict window parameters govern inter-coat adhesion.

A. The Standard Recoat Window

- The ideal recoat window opens as soon as the base layer is firm enough to walk on (minimum 2 hours) and remains open for up to 72 hours under standard conditions. Within this window, subsequent layers establish a direct chemical cross-linking bond without mechanical profiling.

B. The Extended Window: Mechanical Abrasion & Chemical Prep Protocol

If the base coat of Hulk STPE® has cured for longer than 72 hours, or if the surface has accumulated atmospheric dust, construction debris, or a glossy cured sheen, direct chemical bonding is no longer possible.

Because cured Hulk STPE® exhibits flexible elastomer characteristics similar to silicone or soft rubber, its raw mechanical abrasion resistance is low. Heavy, walk-behind floor buffers or aggressive motorized sanding disks are strictly forbidden, as they will gouge, tear, shred, or delaminate the membrane rather than lightly profile it. Treat the material as a highly resilient, low-abrasion elastomeric face and follow this strict manual preparation sequence:

1. Pressure Wash & Cleaning: Wash the existing cured STPE layer with a mild, non-filming detergent solution to lift dirt. Rinse thoroughly with clean water and allow to dry completely.
2. Controlled Chemical Solvent Wipe: Wipe the entire surface with a clean cloth saturated in technical-grade Xylene. The solvent temporarily softens the outer cross-linked boundary layer, opening up micro-pores in the polymer structure. Do not allow the Xylene to puddle.
3. Gentle Manual Scuff-Sanding: To safely introduce a mechanical "tooth" without damaging the waterproofing membrane, perform light manual abrasion:
 - Equipment: Use handheld sanding blocks or pole sanders wrapped in fine-to-medium grit (120 to 180-grit) sandpaper or maroon Scotch-Brite™ abrasive pads.
 - Execution: Lightly scuff the surface using broad, sweeping hand strokes until the entire surface displays a uniform, dull matte finish. Every square inch of factory gloss or cured sheen must be minimized. Stop sanding immediately if the underlying reinforcement fabric or bare substrate becomes visible.
4. De-Dusting: Blow away fine rubberized sanding dust with clean, oil-free compressed air. Perform a final pass with a lint-free dry tack-rag.
5. Topcoat Application Compatibility: Apply the secondary Acrylic, Urethane, or Epoxy topcoat immediately over the freshly prepped layer. Note: Check with the topcoat manufacturer to confirm chemical formulation compatibility, as some highly rigid epoxies may require a flexible transition tie-coat to prevent peeling under extreme thermal movement.

7. Operational Limitations & Curing Expectations

- Weather Shutdown: Do not apply Hulk STPE® if ambient or substrate temperatures drop below -4°C (25°F).
- High-Heat / High-Humidity Alert: High temperatures and extreme humidity dramatically accelerate skin formation. At 80% RH, skin formation can drop to under 20 minutes, reducing working time and aggregate broadcast windows.
- Full Performance Cure Curve: *Skin Formation*: 35 to 90 minutes.
 - *Depth Cure*: 1.5 to 4.0 mm per day.
 - *Full Performance Cure*: **14 to 21 days**. While the system is rain-safe within minutes and traffic-ready within 24 to 48 hours, it requires a full 2 to 3 weeks to complete its internal chemical cross-linking matrix. Do not subject the system to physical pull testing, chemical exposure, or continuous heavy mechanical abrasion until the 14–21 day peak tensile and elongation performance window is satisfied.

General Disclaimer & Liability Limitation: Hulk Systems Inc. ensures the quality and performance of Hulk STPE when used strictly according to corporate guidelines. While the product is designed to deliver consistent, high-performance waterproofing and protection, outcomes may vary based on specific site conditions, environmental variables, and application methods. Liability is strictly limited to the replacement of the product or a refund of the physical purchase price in the rare case of a manufacturing defect. Hulk Systems Inc. explicitly excludes coverage for labor costs, consequential damages, or improper application. For optimal results, users must rigidly adhere to all preparation and application instructions provided.