



INSTALLATION GUIDE

Staycell® 504 HFO Spray Foam Insulation

General Information

Staycell® 504 HFO is a spray polyurethane foam system intended for installation by qualified contractors trained in the processing and application of closed cell, rigid polyurethane systems as well as plural-component dispensing equipment. Contractors and applicators must be certified in writing by Preferred Solutions, Inc. and must comply with all applicable storage, handling, processing and safety guidelines. Preferred Solutions, Inc. should be consulted in all cases where the application conditions or materials are questionable. Refer to the Staycell® 504 HFO technical data sheet and SDS sheets for additional information.

Cautions & Recommendations

Staycell® 504 HFO is not designed for use as an exterior roofing system. Coolers & freezers demand special design considerations with regard to thermal insulation and moisture-vapor drive. Staycell® 504 HFO should not be installed in cooler or freezers unless designed by a certified professional. PSI Authorized Applicators must contact Preferred Solutions, Inc. prior to any application in cold-storage structures.

Improperly installed foam plastic insulation materials in walls or ceilings may present a fire hazard. Contact Preferred Solutions, Inc. for approved configurations and assemblies prior to application.

Worker Exposure Hazards: Both Components “A” and “B” can cause severe inhalation and skin sensitization. Please refer to the Staycell® 504 HFO technical data sheet and SDS sheets for more information.

In addition to reading and understanding the SDS & technical data sheets, all applicators and workers who may come into contact with the Staycell® 504 HFO must be trained in the safe usage of this product, with emphasis on appropriate respiratory, skin and eye protection (PPE - Personal Protective Equipment). To obtain safety information and training materials, visit Preferred Solutions Inc.’s (PSI) website www.preferredsolutions.net, Spray Polyurethane Foam Alliance (SPFA) www.sprayfoam.org and the Center for the Polyurethane Industry websites www.sprappolyurethane.com and www.polyurethane.org.

For interior applications, full body protection is recommended including an air-supplied respirator such as a self-contained breathing apparatus (SCBA) or a supplied air respirator (SAR) in the positive pressure or continuous flow mode (this includes air supplied hoods). Alternatively, a full-face air purifying respirator with suitable organic vapor/particulate filter combination cartridge (OV/P100) may be worn.

Environmental & Substrate Conditions

Applicators must recognize and anticipate climatic conditions prior to application to ensure highest quality foam and to maximize yield. Ambient air and substrate temperatures and moisture are critical determinants of foam quality, which will influence the chemical reaction of the two components, directly affecting the yield, adhesion and the resultant physical properties of the foam insulation.

Staycell® 504 HFO should be applied to substrates when ambient air and substrate temperatures are between 30°F and 120°F. For applications below 40°F, please refer to the Cold Weather Processing Guide.

PSI does not recommend the spraying of this system when the relative humidity (RH) exceeds 85%. Excessive wind velocities may result in loss of exotherm and interfere with the mixing efficiency of the spray gun affecting foam surface texture, cure, physical properties and will cause overspray. Precautions must be taken to prevent damage to adjacent areas from overspray.

All surfaces must be clean and dry, free of dirt, oil, solvent, grease, loose particulates, curing compounds, frost, ice and other foreign matter, which could inhibit adhesion. Moisture content and surface conditions of

substrate are critical for adhesion and need to be verified in small test areas before proceeding with full application. Prime substrates when necessary.

Suitable substrates include gypsum sheathing, OSB, plywood, lumber, CMU, structural and lightweight concrete and galvanized, aluminum and painted metal. Lightweight insulating concrete or other friable substrates are not recommended.

In freezing conditions ($\leq 32^{\circ}$ F), when adding heat to the spray area, it may be required to maintain an elevated temperature during the foam cure cycle (24-72 hours) so extreme temperature drops to the "green" foam are not experienced, which could cause shrinking or cracking.

PSI should be consulted in all cases where application conditions are marginal.

Equipment

The proportioning equipment shall be manufactured specifically for heating, mixing and spray application of polyurethane foam and be able to maintain 1:1 metering with $\pm 2\%$ variance. All proportioners shall have adequate main heating capacity to deliver heated and pressurized materials up to 135° F. Heated hose shall be able to maintain pre-set temperatures for the full length of the hose. Minimum 2:1 ratio feeder pumps are recommended to supply stored materials through 3/4" inch supply hoses.

Recommended equipment (contact PSI for more details):

- Graco or PMC proportioners set at 1:1 volume ratio. Contact PSI for specific models.
- Graco Fusion AP or PMC AP-2 or AP-3 spray guns with AR5252 or #2 equivalent mixing chamber.
- Graco or PMC 2:1 "stick" transfer pumps.

Spraying / Processing Information

Material in containers should be maintained at 65° F to 85° F while in use. Heated trailers, hotboxes, or other temperature controlled areas may be necessary. Material temperature should be confirmed with a thermometer or an infrared gun.

Do not recirculate or mix other suppliers' "A" or "B" components into Staycell® 504 HFO containers.

Processing parameters: Pre-heaters and hose heaters should be set to deliver 120° F - 135° F materials to the spray gun. Proportioner dynamic pressures should be 1,000 - 1,200 psi range.

In preparation for spraying, an off-target test spray should be performed to verify the processing pressure, primary heater and hose temperature settings. It is important to observe the foam and the reaction time of the reacting mass and make additional adjustments throughout the day as needed to maintain proper cell structure, adhesion, cohesion and general foam quality.

Staycell® 504 HFO should be applied by spraying perpendicular (90° angle) to the substrate at an approximate 18-24" distance. Apply by spraying into the wet line as it is rising, overlapping each pass approximately 50%-80%. It is recommended that the total design thickness be completed each day. If the processing parameters are set too high, the pattern may be uncontrollable, the mixing chamber may clog often, the wet line will not be as pronounced, and the surface characteristics will be rough. When the parameters are too low the foam may spray in a direct stream and remain un-reacted for several seconds. Staycell® 504 HFO should be applied in uniform, minimum pass thickness of one inch and maximum pass thickness of four inches. Spraying sections too thick, too fast may result in charring of the foam, or in extreme conditions a fire may result. Thin foam layers ($\frac{1}{4}$ " or less "flash passes") should be avoided if possible as it can result in poor chemical reaction, poor physical properties, reduced coverage and loss of adhesion due to low exothermic heat generated from the chemical reaction, which is needed to create proper closed cell formation. If touch-ups or subsequent passes are needed to achieve the prescribed

thickness, allow the foam lifts to cool to 100°F (38°C) or below before additional foam is applied. When multiple layers are necessary to achieve the proper R-value, cross-hatching should be done. This technique aids in proper cohesion of passes. To avoid heat damage when applying over membranes (such as Blueskin SA), apply initial one-inch pass and allow to fully cool before subsequent passes. Water on the substrate from rain, fog, condensation, etc. will affect the chemical reaction of the foam adversely affecting the physical properties, performance and adhesion. It should not be applied when the relative humidity is above 85%. For applications where the substrate and/or ambient air temperature is ≤ 40°F, refer to the Cold Weather Processing Guide.

As with all SPF systems, improper application techniques should be avoided. Examples of improper application techniques include, but are not limited to, excessive thickness of SPF and off-ratio material. Potential results of improperly installed SPF include dangerously high reaction temperatures that may result in fire and offensive odors that may or may not dissipate. Improperly installed SPF must be removed and replaced with properly installed materials. On a daily basis remove all debris and shavings from the jobsite leaving a clean work area.

Handling & Storage

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Both components should be stored in their original containers and away from excessive heat and moisture, especially after the seals have been broken or some materials have been used. Drums should be stored indoors and maintained between 65° - 85°F. Containers should be opened carefully to allow any pressure buildup to be vented safely while wearing full safety protection. Excessive venting of Part “B” component may result in higher density foam and reduced yield. Materials stored at temperatures below 65°F will increase viscosity and some application equipment may not reach adequate spray temperature set points. Supply pumps and hoses must be sized to provide adequate supply when materials are cold and at a higher viscosity. Use moisture desiccant cartridges installed in bung opening in isocyanate (Component A) drums.

Do not store in direct sunlight. Water, solvents or oil in the liquid components will degrade foam quality. Protect from heat, sparks and open flame. Do not cut or weld near this container. Do not smoke near container. Do not store near food or feed.

Limited Warranty Information

The technical and application information herein is based on the present state of our best scientific and practical knowledge and is provided to users to help determine suitability of our products for specific applications. Our products are intended only for sale to PSI Authorized Applicators. Customers of our products assume full responsibility for quality control, testing and determination of suitability of products for their intended application or use, including compliance with applicable building regulations. We warrant that our products meet our written liquid component specifications. We make no other warranty of any kind, either express or implied, by fact or law, including any warranty of merchantability or fitness for a particular purpose. Our total liability and customers' exclusive remedy for all proven claims is to receive replacement of non-conforming products and in no event shall PSI be liable for incidental, consequential or any other damages. PSI's technical literature and installation guides are updated on a regular basis; it is the user's responsibility to obtain and to comply with the most recent versions. Information contained in data sheets and installation guides may change without notice.

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