



HARD-LOK™
TECHNICAL DATA SHEET

Cementitious Roofing System

1. GENERAL

1.1 Huntsman Building Solutions HARD-LOK Use and Design

Huntsman Building Solutions HARD-LOK cementitious roof coating system provides building owners a fully adhered monolithic roofing system, ideal for low slope or flat roofs and use in moderate to extreme desert environments. Huntsman Building Solutions HARD-LOK prevents degradation to roofing caused by normal weathering, aging and ultraviolet exposure. It includes special fire retardants, mildew retardants and rust inhibitors that help extend the service life of any roofing system. Huntsman Building Solutions HARD-LOK is easy and convenient to apply. It is fast drying, odor free and environmentally safe. Huntsman Building Solutions HARD-LOK is an ideal heavy-duty cool roofing solution.

1.2 Cool Roofs

A cool roof reflects the sun's heat and offers superior exterior durability and UV light resistance, a cool roof can:

- Increase indoor comfort by keeping a building cooler in the summer months.
- Reduce energy costs. Studies have shown that cool roof coating can lead to energy savings of up to 30-40%.
- Address air pollution and global warming concerns by lowering CO2 and other emissions associated with fossil fuel generated electricity.
- Reduce "urban heat island effect" by reflecting heat back into the atmosphere.
- Source: Cool Roof Rating Council

2. PRODUCTS

2.1 SPRAY POLYURETHANE ROOFING FOAM:

A. LPA 2800-4G is a two-component, closed-cell, polyurethane foam system specifically designed to provide a high performance, light weight roofing system for use over insulation water proofing a wide variety of roof deck construction and configurations. LPA 2800-4G is formulated with the most advanced technology in the spray foam industry utilizing the only 4th generation blowing agent in the market. LPA FOAM-LOK 2800-4G has a GWP of 1 and an ODP of zero, equivalent to that of CO2.

B. LPA 2800-4G Spray Polyurethane Foam Physical Properties

Physical Properties		
Properties	Test Method/Requirements	Value
Aged "R" Value:	ASTM C-518	6.8 per inch
Compressive Strength:	ASTM D-1621 (40 min.)	45-55 psi
Core Density:	ASTM D-1622	2.7-2.9 lbs./ft ³
Closed Cell Content:	ASTM D-2856 (90 min.)	>90%
Tensile Strength:	ASTM D-1623 (60 min.)	75-85 psi
Water Absorption:	ASTM D-2842 (1.0 max per volume)	.40
Water Vapor Permeability @ 74°F, perm inch :	ASTM E-96 (2.5 max)	1.1 @ 1"
Dimensional Stability: 28 days at 158°F, 98%RH	ASTM D-2126	1.20
Shelf Life:	6 months when stored within recommended temperature range	
Coating Recommendation:	TF Series Acrylic	

2.2 ACRYLIC ELASTOMERIC COATINGS:

A. THERMO-FLEX 750 Acrylic Roof Coating is an acrylic elastomeric fluid-applied coating designed to enhance energy savings and water resistance protecting the assets and increase the longevity of the structure.

Physical Characteristics

Properties	Test Method/Requirements	Value
Color:	White	
Tensile Strength:	ASTM D 2370	300psi (±25)
Elongation:	ASTM D 2370	260% (±25)
Adhesion:	ASTM C 794-D 903	7.0 pli PUF (dry) 6.7 pli PUF(wet) 7.1 pli Galv. Steel (wet)
Hardness (Shore A):	ASTM D 2240	62 (±2)
Permeability:	ASTM D 1653A	24 U.S. Perms @ 20mils
Tear Resistance:	ASTM D 624	85 lbs/in. (±2)
Solids by Weight:	ASTM D 1644	67% (±3)
Solids by Volume:	ASTM D 2697	55% (±3)
Weight per Gallon:	ASTM D 1475	11.95 (± .2)
Theoretical Coverage:	13-14 dry mils	1.5 gallons
Viscosity (cps):	ASTM D 562	110 K.U. (±8)

2.3 CEMENTITIOUS TOP-COAT:

A. Huntsman Building Solutions HARD-LOK is comprised of cement and proprietary resin. This system not only increases the durability and life-span of the roof, it also adds increased fire protection as a class A roof assembly, even on a combustible wood deck.

B. Huntsman Building Solutions HARD-LOK Physical Properties

Properties	Value
Polymer Type	Acrylic
Color:	White
Nonvolatile Content (%)	46-48
pH	7.5-9.5
Viscosity (cps)	700
Density (g/ml)	1.04-1.08
Approximate Coverage	40 Mils / 1000 sf / batch

C. Cementitious Batch:

- 45 Gallons (170 L) water
- 10 Bags Huntsman Building Solutions HARD-LOK cementitious mix (40 Pounds ea.(18 kg))
- 5 Gallons (19 L) Huntsman Building Solutions HARD-LOK proprietary resin
- Batch applied on top of 640 Pounds (290 kg) white crushed limestone

Properties	Test Method/Requirements	Value
Solar Reflectance Index (SRI)	ASTM E-980	101%
Solar Reflectance	ASTM E-903	81%
Thermal Emittance	ASTM E-408	87%
UV Resistance	ASTM E-822	2000 hr - no effect
High Temp Stability	ASTM D-794	No Effect
* Values based on in-house testing		

D. Storage and Shelf Life: Cementitious Mix

- Storage temperatures 50-100°F (10-38° C)
- One year shelf life from date of manufacture (unopened bags)
- Keep bag tightly sealed
- Store in a cool dry place, avoid freezing

E. Storage and Shelf Life: Proprietary Resin Mix

- Storage temperatures 50-80°F (10-27° C)
- Six months shelf life from date of manufacture (unopened containers)
- Keep container tightly sealed
- Store out of direct sunlight, in a cool dry place, avoid freezing

F. Approvals/Compliance:

- Class A Roof System
- Class A Combustible Deck—
- Assembly #35
- UL Construction # 136, 181, 206
- LEED

G. CRRC & Energy Star Compliant

3. EXECUTION

3.1 Quality Assurance

The Huntsman Building Solutions HARD-LOK Cementitious Roofing System, as supplied by Huntsman Building Solutions, is approved for use on the project. Applicator Qualifications: The applicator shall be approved by Huntsman Building Solutions to apply the system. Manufacturer's written verification of applicator approval is required.

3.2 Product Delivery, Storage and Handling

Containers and Packaging: Deliver materials in original sealed containers, clearly marked with: manufacturer's logo; full product name; and lot number(s).

Storage: Store materials between 40°F and 100°F with careful handling to prevent damage to products. If conditions exceed these ranges, special consideration in storage must be taken. Do not store at high temperatures in direct sunlight.

Protection: Protect all materials from freezing and other damage during transit, handling, storage, and installation.

3.3 Manufacturer's Instructions

Compliance: Comply with manufacturer's product data, including product technical bulletins and product guide specification instructions.

3.4 Examination

Inspect surfaces which will receive spray polyurethane foam insulation to make sure they are clean, smooth, sound, properly prepared, and free of moisture, dirt, debris, or other contamination. Verify that all roof penetrations, mechanical equipment, cants, edge metal, and other on-roof items are in place and secure.

Verify that all critical areas around the immediate vicinity of the spray area are suitably protected.

Verify all roof drains are clean and in working order.

Verify that all air conditioning and air intake vents are suitably protected or closed.

3.5 Preparation

Prior to foam application, all existing non-embedded gravel surfacing material shall be removed by means of a stiff bristle street broom, powered mechanical sweeper, or vacuuming. Porous volcanic slag must be totally removed from the roof because it may hold moisture and cause bond failure and blisters. All loose dirt and dust remaining after gravel removal must be broomed and/or vacuumed from the roof. All blisters, ridges and other imperfections must be secured; so that the surface will be clean and dry and a secure base for foam application. Existing low areas where water ponds and areas with obviously poor drainage to roof scuppers, drains, or roof edges should be corrected by filling and/or tapering the sprayed foam or by adding drains. To prevent the ponding of water, the entire system must be well sloped into drains. Install additional drains as necessary.

Priming may be required on some substrates. Discuss with a National Coatings Technical Consultant.

Other types of Surfaces: Preparation of surfaces and use of materials may vary substantially with different types of new or existing roofs. Contact the foam manufacturer for specific recommendations over other types of surfaces.

3.6 Application

A. Spray Polyurethane Foam:

- LPA 2800-4G should be applied in lifts or passes of no less than 1.0 inch and no more than 2.0 inch thickness per pass or lift.
- Minimal passes or reduced thickness will result in elevated density and may not cure properly, reducing the physical performance properties of the system.
- Applications of greater than 2 inches will result in reduced density and physical properties and may also create scorching of the foam as a result of the exothermic reaction, both of which will reduce the physical performance characteristics of the foam.

B. Acrylic Elastomeric Coating:

- Apply TF 750 directly to spray polyurethane foam on the same day as the installation whenever possible. Do not allow SPF to remain uncoated for more than 48 hours.
- Lower temperatures and higher humidity prolong drying and cure time. Apply only when air, surface, & product temperature is above 55°F. DO NOT apply when temperatures may drop below the dew point or below 40 °F within 6 hours after application.
- Apply first coat of TF 750 over clean, dry surface. After a curing period of approximately three to eight hours (depending on humidity and temperature) apply second coat.
- Avoid application late in the day when dew or condensation is likely to form or when rain is expected.
- It is recommended that TF 750 be applied in multiple coats and in multi-directional (north-south, east-west) passes to ensure uniform film build. Backrolling sprayed material may be necessary to fill pinholes in substrate. Final cured dry film thickness must be free of voids, pinholes, holidays, cracks or blisters.
- Apply in a minimum of 2 coats with each coat at a maximum rate of 1.5 gallons per 100 square feet, for a total minimum coating rate of 3 gallons per 100 square feet. Additional coats of 1.5 gallons maximum per 100 square feet may be applied to obtain the desired final thickness of coating. The minimum allowable dry mil thickness shall be no less than 24 mils. ~~Granules may be broadcast into the final coating application at a rate of 35—40 pounds per 100 square feet.~~ No foot traffic shall be permitted on the finished coated surface for 24 - 72 hours depending on curing conditions after application.

C. Cementitious Top Coat:

- Mix thoroughly before application
- Coat roof with Huntsman Building Solutions batch applied on top with 640 Pounds (290 kg) white crushed limestone.
- Substrate temperature: 50-130°F (10-54° C)
- Substrate surfaces must be free of moisture, oil, grease, dust and debris.
- Can be applied by hand or concrete sprayer

3.7 Warranty:

Huntsman Building Solutions offers 5 to 15 year material limited warranties on Huntsman Building Solutions FOAM-LOK LPA 2800 roofing foam when coated with Huntsman Building Solutions HARD-LOK. All roof warranties must be registered with Huntsman Building Solutions. See Huntsman Building Solutions Warranty Program for required coating thickness and details.

3.8 Health and Safety:

Huntsman Building Solutions is committed to the health and safety of our customers. Huntsman Building Solutions products should only be installed by a Huntsman Building Solutions certified contractor. Applicators are required to follow all proper handling, safety and installation procedures. For more information consult the product MSDS, contact the SPFA (www.sprayfoam.org) or the ACC (www.spraypolyurethane.org).

3.9 In Case of Spills or Leaks

- Utilize appropriate personal protective equipment
- Ventilate area to remove vapors
- Contain and cover spilled material with a loose, absorbent material such as oil-dry, vermiculite, sawdust or Fuller's earth
- Shovel absorbent waste material into proper waste containers
- Wash the contaminated areas thoroughly with hot, soapy water
- Report sizeable spills to proper environmental agencies

In Case of Fire Extinguishing Media- Water, Carbon Dioxide, Foam or Dry Powder

4.0 DISCLAIMER

The data presented herein is not intended for use by nonprofessional applicators, or those persons who do not purchase or utilize this product in the normal course of their business. The potential user must perform any pertinent tests in order to determine the product's performance and suitability in the intended application, since final determination of fitness of the product for any particular use is the responsibility of the buyer. All guarantees and warranties as to products supplied by Huntsman Building Solutions shall have only those guarantees and warranties expressed in writing by the manufacturer. The buyer's sole remedy as to any material claims will be against the applicator of the product. The aforementioned data on this product is to be used as a guide and is subject to change without notice. The information herein is believed to be reliable, but unknown risks may be present. NO WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING PATENT WARRANTIES OR WARRANTIES OF MERCHANTABILITY OR FITNESS FOR USE, ARE MADE BY HUNTSMAN BUILDING SOLUTIONS WITH RESPECT TO OUR PRODUCTS OR INFORMATION SET FORTH HEREIN.

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