

UNISIL

Elastomeric Silicone Waterproofing

Technical Data & Application Instructions

PRODUCT DESCRIPTION

UNISIL is a high volume solids, pure elastomeric silicone coating that provides superior weatherproofing, ultraviolet resistance and fire retardancy over polyurethane foam insulation and other appropriate substrates. The fire retardant chemicals are permanently locked into the cured coating and will not leach out upon extended aging.

UNISIL is a single component elastomer that exhibits a rapid cure when exposed to ambient conditions. Long term elastomeric properties are retained under all types of weather conditions, from sub-zero temperatures to high heat in excess of 250 °F (121°C).

Aged UNISIL roofs have been tested and certified to meet EPA guidelines for ENERGY STAR® compliance. Use of this product will help save energy and reduce electrical costs. UNISIL is also sustainable. Through periodic recoating, the elastomeric coating can be maintained throughout the life of the building.

BASIC USES

UNISIL is designed for protecting a wide range of substrates from the effects of moisture intrusion and weathering. UNISIL is particularly effective as a protective coating over polyurethane foam on new or existing roofs, and hot or ambient storage tanks. It provides a barrier to the effects of degradation caused by normal weathering, aging and ultraviolet exposure. UNISIL also achieves excellent adhesion to primed concrete, masonry, metal and wood surfaces.

RECOATING

UNISIL adheres tenaciously to previously applied UNISIL, as well as all other silicone coatings tested. A test area should be applied to existing silicones to ensure adequate adhesion on recoats. Surface should first be washed using a chemical cleaner, such as **United Cleaning Concentrate (UCC)**, rinsed thoroughly, and allowed to dry.

TYPICAL PROPERTIES

- Solids By Weight:**
78% (±5) [ASTM D1353]
- Solids By Volume:**
65% (±2) [ASTM D2697]
- Flash Point:**
>105°F (41°C) [ASTM D93]
- Dry Time To Walk On:**
3 to 4 hours @ 75°F (24°C), 50% R.H.
- Tensile Strength:**
500 psi (4.2 MPa) (±25) [ASTM D412]
- Elongation:**
150% (±10) [ASTM D412]
- Hardness:**
45-55 Shore A [ASTM C661]
- Permeance:**
3.6 US Perms @ 30 mils (762 microns) [ASTM E96, Procedure B]
- Reflectivity:**
84% White [ASTM C1549]
- Emissivity:**
.85 White [ASTM C1371]
- Low Temperature Flexibility:**
Passes 180 degree flex over 1" (2.5 cm) mandrel @ 2°F (-17°C) [ASTM C734]
- Temperature Limits For Normal Service Conditions:**
-35°F to 180°F (-37°C to 82°C)
- Fire Resistance:**
UL-790 Class "A" listed system over spray applied polyurethane foam. Consult UL Building Materials Directory for specifics.
- VOC:**
<250 Grams/Liter [ASTM D3690]
- Specific Gravity:**
1.23 @ 77°F (25°C) [ASTM D1875]
- Shelf Life:**
6 months in unopened containers stored between 35°F and 75°F (2°C and 24°C)

PERFORMANCE PROPERTIES

1. **Fire Testing:** UNISIL is a UL-790 Class "A" coating over various polyurethane foam substrates. Refer to UL Building Materials Directory for foam manufacturers and types, foam thicknesses and densities, inclines, and coating requirements of rated roof systems.



2. **Building Code Acceptance:** These UL-790 classified roofing systems are accepted by all major model building code authorities for Class "A" construction. These code authorities include the Uniform Building Code (UBC), Building Officials and Code Administrators (BOCA), and Southern Building Code Authority (SBCA).
3. **Resistance to Accelerated Weathering:** UNISIL test panels were placed in the QUV Accelerated Weathering Cabinet. After **8,760 hours** of continuous exposure, UNISIL had no deleterious effects, no surface checking or cracking, no delamination and no color fade. ASTM G53.
4. **Resistance to Freeze-Thaw:** UNISIL test panels were exposed to freeze-thaw cycles under complete immersion in deionized water. Cycles consisted of 16 hours at 0°F (-18°C) and 8 hours at 70°F (21°C). After 4 complete cycles, the physical integrity of the coating remained unaffected. There was no loss of adhesion and no blistering or softening.
5. **Water Absorption:** After 14 days immersion in deionized water at 75°F (24°C), UNISIL showed only a 1% weight gain. ASTM D471
6. **High Temperature Stability:** Tested in thermostatically controlled heat chamber—UNISIL will not age harden or slump at temperatures up to 250°F (121°C). ASTM D794
7. **Low Temperature Flexibility:** UNISIL is capable of withstanding 180° bends over a 1" (2.5 cm) mandrel @ 2°F (-17°C). ASTM C734
8. **Flexibility After Weathering:** After **500 hours** exposure in the QUV Accelerated Weathering Cabinet. UNISIL retains its ability to withstand multiple 1" (2.5 cm) mandrel bends at 2°F (-17°C) without cracking. ASTM D4338

WARRANTY

UNITED'S standard Warranty to the Building Owner is available for 5-year, 10-year or 15-year periods at **no cost**. Refer to Application Instructions for minimum dry film thicknesses required to qualify for warranty programs.

System Warranty Programs are also available for 5, 10 and 15-year periods at an additional cost. Consult UNITED'S Warranty Explanation Form and section entitled Coating Application for details.

FOAM REQUIREMENTS

Polyurethane foam components shall be metered and sprayed in accordance with Foam Manufacturer's directions and specifications. Polyurethane foam should **not** be sprayed during inclement weather or when the following conditions exist:

1. If surface temperature is above 120°F (49°C) or below 35°F (2°C), or when the dew point is less than 5°F (3°C) above the surface temperature. For surface temperatures between 35°F and 50°F (2°C and 10°C), special catalyzed foam with short cream time must be used.
2. If surface moisture is present, or where moisture meter readings are in excess of 10% (this may vary slightly depending on geographic location).
3. If wind velocity is above 12 miles per hour .
4. If relative humidity is above 80%.

The finished surface texture of the applied polyurethane foam shall range from smooth to medium "orange peel". **Surface textures defined as "popcorn" or "tree bark", or surfaces that exhibit crevices, voids or pinholes are not acceptable.** The finished surface shall not have any soft or spongy areas, or areas of improperly proportioned material. Polyurethane foam shall be a minimum of 1" (2.5 cm) thickness and 2.5 lbs. (5.5 kg) density.

Foamed-in-place cants and crickets shall be smooth and uniform to allow positive drainage. Filing of foam to parapet walls, vents, roof mounted equipment, etc., shall provide a smooth transition to the roof deck and be of uniform cross-sectional thickness.

Apply UNISIL within 72 hours of the polyurethane foam application to eliminate excess oxidation of the surface skin. Not all polyurethane foams have the same ultraviolet stability. Some will require topcoating in less than 72 hours. Should oxidation of the polyurethane foam occur, the foam insulation surface shall be brushed with a stiff bristle broom or mechanically scarified or sanded. A light pass of foam must then be applied to reseal the surface.

PACKAGING & MIXING

UNISIL is a single-component, ready-to-use material available in 5-gallon (19 liter) pails and 50-gallon (189 liter) drums.

Gently mix all containers with an air-driven power mixer, taking care not to incorporate air into the product. Do not use an electric mixer. Mixed **UNISIL** shall then be used immediately to avoid reacting in the container with trace amounts of atmospheric moisture. Containers which have been stored for any length of time may develop a skin on top of the coating. This should be removed prior to mixing.

Thinning the material is not recommended. If required under specific conditions, minimal quantities of VM & P Naphtha or Mineral Spirits may be utilized.

Store **UNISIL** in a dry area between 40°F and 90°F (5°C and 32°C).

COATING APPLICATION

UNISIL is best suited for application through airless spray equipment. Utilize a pump with a minimum output of 3 gallons (11 liters) per minute and 3,500 psi (24,138 kPa) pressure capability with a reversible spray tip having a minimum orifice of .030" (.76 mm) and 50° fan angle. A natural bristle brush or a medium nap roller may be utilized for touch-up and edging work, or for small areas that are not practical for spray application.

Polyurethane foam and adjacent surfaces to be coated shall be completely dry, and free of any degraded foam, grease, oil, dirt or other contaminants that may interfere with proper adhesion. Any physical damage to the polyurethane foam shall be repaired before coating application commences.

Each coat of **UNISIL** shall be applied in a direction perpendicular to the previous coat. Edges of flat roof areas shall be pre-coated in a "picture frame" configuration.

UNISIL must be applied in two or more separate coats to ensure proper coverage and cure rate, and a pinhole-free continuous film. **All surfaces must be uniformly coated and be free from voids, pinholes or blisters.** Each coat of **UNISIL** must be dry and cured before the next coat is applied. This will normally require 2 to 4 hours.

UNISIL applied at the rate of one gallon per 100 sq. ft. (.4 l/m²) will theoretically yield 10.4 dry mils (264 microns).

To qualify for **UNITED'S 5-Year Standard Warranty Program**, the following requirements shall be adhered to:

1. **UNISIL** shall be applied in a minimum of two (2) separate coats at a minimum total of 2 gallons per 100 sq. ft. (.8 l/m²) It is recommended that contrasting colors be used for each coat to ensure positive, uniform coverage.
2. This coverage rate will theoretically result in 20.8 dry mils (528 microns). The nominal total dry film thickness required to qualify for United's **5-Year Standard Warranty** shall be 20 mils (508 microns), with a minimum dry film thickness at any location of 18 mils (457 microns).

To qualify for **UNITED'S 10-Year Standard or 5-Year System Warranty Programs**, the following requirements shall be adhered to:

1. **UNISIL** shall be applied in two (2) or three (3) separate coats at a minimum total of 2½ gallons per 100 sq. ft. (1.0 l/m²). It is recommended that contrasting colors be used for each coat to ensure positive, uniform coverage.
2. This coverage rate will theoretically result in 26.0 dry mils (660 microns). The nominal total dry film thickness required to qualify for **UNITED'S 10-Year Standard or 5-Year System Warranty** shall be 24 mils (610 microns), with a minimum dry film thickness at any location of 22 mils (559 microns).

To qualify for **UNITED'S 15-Year Standard or 10-Year System Warranty Programs**, the following requirements shall be adhered to:

1. **UNISIL** shall be applied in a minimum of three (3) separate coats at a minimum total of 3 gallons per 100 sq. ft. (1.2 l/m²). It is recommended that contrasting colors be used for each coat to ensure positive, uniform coverage.
2. This coverage rate will theoretically result in 31.2 dry mils (792 microns). The nominal total dry film thickness required to qualify for **UNITED'S 15-Year Standard or 10-Year System Warranty** shall be 28 mils (711 microns), with a minimum dry film thickness at any location of 25 mils (635 microns).

To qualify for **UNITED'S 15-Year System Warranty Program**, the following requirements shall be adhered to:

1. **UNISIL** shall be applied in a minimum of three (3) separate coats at a minimum total of 3½ gallons per 100 sq. ft. (1.4 l/m²). It is recommended that contrasting colors be used for each coat to ensure positive, uniform coverage.
2. This coverage rate will theoretically result in 36.4 dry mils (924 microns). The nominal total dry film thickness required to qualify for **UNITED'S 15-Year System Warranty** shall be 32 mils (813 microns), with a minimum dry film thickness at any location of 28 mils (711 microns).

UNISIL shall be extended up and over all polyurethane foam on vent pipes and parapets, and terminated a minimum of 2" (5 cm) above the foam, creating a self-terminating flashing.

Apply subsequent coats of **UNISIL** as soon as the previous coat is completely dry and cured. If any form of dirt, sand or pollution fallout is detected on the surface of the **UNISIL**, it is necessary to remove this material before applying additional coating. Surfaces should be washed using a chemical cleaner, such as **UCC**, only after the **UNISIL** film has fully cured. Rinse thoroughly with clean, fresh water to remove all traces of the chemical cleaner and allow to dry.

COATING APPLICATION (Cont.)

As work proceeds, the applicator must periodically check the number of gallons used against square feet coated. If adequate gallonage has not been used according to UNITED'S warranty requirements or project specifications, adjust accordingly and apply additional material to previously coated area(s).

In hot temperatures, and upon extended storage, partially full containers of UNISIL may surface-skin. Remove skin prior to mixing, and cover container with polyethylene sheeting after mixing to help prevent further skinning.

UNISIL should not be applied when the ambient temperature is below 50°F (10°C), or if rain is anticipated within 4 hours of application. Store UNISIL in a warm area for a sufficient length of time to bring material temperature to 70 °F (21°C) prior to application. The sprayability of UNISIL will depend on the combination of proper equipment and temperature of the coating at the time of application.

Use VM &P Naphtha or Mineral Spirits to thoroughly flush equipment. Leave solvent in the lines and equipment until next use. It is not recommended practice to leave UNISIL in the pump or hoses.

ROOFING GRANULES

Because UNISIL is impervious to ultraviolet degradation, it does not readily release dirt, dust or other airborne pollutants. It is recommended that ceramic roofing granules be utilized in areas where aesthetics are of prime importance. Application of the granule surface is achieved through the addition of an extra coat of UNISIL applied over the minimum thickness required for the specified warranty for the project. Ceramic roofing granules are broadcast into the wet coating at approximately 45 pounds per 100 sq. ft. (2.2 kg/m²), in a manner that ensures uniform coverage over the entire surface without voids. No traffic shall be allowed on the granuled area for a minimum of 24 hours after application. Roofing granules are available in a wide range of colors.

Roofing granules are also recommended in walkway areas that receive regular maintenance traffic, as they provide additional wear and impact resistance. It is recommended procedure to wear flat-soled shoes when walking over foam/silicone roofing systems.

COLORS

UNISIL is available in standard White, Light Gray and Dark Gray colors. Limited custom colors are available upon request.

LIMITATIONS & PRECAUTIONS

UNISIL is affected by moisture and must be protected from moisture contamination. Keep all containers tightly closed during storage. Containers are factory sealed with an inert gas to prevent contamination. After opening, if all material is not to be used, containers must be purged with nitrogen or dry air and tightly sealed to protect from moisture contamination. Remove any skin prior to mixing the material.

Solvents in UNISIL are flammable. Use only in a well ventilated area. Keep away from heat, sparks, open flame or lighted cigarettes. Use explosion-proof mixing and application equipment that has been grounded and bonded.

If used in cryogenic storage or cold temperature storage applications, a vapor barrier must be applied prior to UNISIL. Not recommended for immersion conditions. While it will withstand ponding water typically encountered on flat roofs, the National Roofing Contractors Association considers excessive ponding water on any roof unacceptable. Refer to NRCA manual for additional information.

UNISIL is slippery when wet, as are loose roofing granules. Exercise caution when walking on a roof under these conditions.

Avoid breathing of vapor or spray mist. For exterior applications, approved MSHA/NIOSH chemical cartridge respirator must be worn by applicator and personnel in vicinity of application. Check filters frequently to ensure proper protection. If used indoors, provide mechanical exhaust ventilation. During indoor spray operations, air line masks or positive-pressure hose masks must be worn. Avoid contact with eyes and contact with skin.

Adequate precautions must be taken when applying UNISIL to occupied buildings to ensure that air conditioners and ventilation units are turned off and covered to prevent solvent vapors from entering the building. Windows should also be kept closed. Signs should be posted around the area to advise building occupants or visitors of the spray activity.

It is good roofing practice to schedule an annual cleaning of the roof surface. This will eliminate the accumulation of leaves, dirt, debris and other contamination. It will also alert the Owner to any mechanical damage or other problems that may compromise the integrity of the roofing system. Roofs subject to a high degree of traffic or pollution fallout may require more frequent cleanings.

For additional information refer to OSHA guidelines and UNISIL Material Safety Data Sheets.



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