

# DIATHON<sup>®</sup> HT

## HIGH TENSILE ADVANCED ACRYLIC ELASTOMER

Exceeds ASTM D6083 Standards

## Technical Data & Application Instructions

### PRODUCT DESCRIPTION

DIATHON HT is a unique advanced acrylic elastomer coating that combines high tensile emulsion polymers, reinforcing laminar pigments and non-migrating fire retardants for superior physical properties, durability, weatherproofing, dirt and mildew resistance, ultraviolet resistance and fire retardancy. The fire retardant chemicals are permanently locked into the cured coating and will not leach out upon extended weathering. DIATHON HT is a “breathing” coating, allowing moisture vapor to pass through the film while remaining impervious to mass water penetration.

### BASIC USES

DIATHON HT was specifically developed as a superior coating for protecting sprayed-in-place polyurethane foam insulation from degradation caused by normal weathering, aging and ultraviolet exposure. DIATHON HT has the ability to uniformly cover the profile of textured substrates. Its dense, tight finish repels dirt and pollutants while the elastomeric membrane remains permanently flexible. DIATHON HT can be used for protecting sprayed-in-place polyurethane foam on new or existing roofs as well as heated or ambient storage tanks. It also achieves excellent adhesion over concrete, masonry, primed metal, primed wood and asphaltic surfaces.

### COLORS

DIATHON HT is available in standard **White**, **Tan**, **Light Tan** and **Solar Gray** colors, which are certified to meet ENERGY STAR<sup>®</sup>, Cool Roof Rating Council (CRRC) and LEED reflectance and emissivity criteria. **White** and **Light Tan** also meet California Title 24 requirements. All other colors are custom matched by UNITED for the specific application. Color chips or samples must be furnished to UNITED for all custom colors. It is recommended that dark colors be tinted in KYMAX topcoat only.

### TYPICAL PROPERTIES

- Solids By Weight:**  
62% (±2) [ASTM D1644]
- Solids By Volume:**  
52% (± 2) [ASTM D2697]
- Dry Time For Foot Traffic Resistance:\***  
3 hours – Medium Gray @ 16 wet mils  
(406 microns)  
5 hours – White @ 16 wet mils  
(406 microns)  
75°F (24°C), 50% R.H.  
[ASTM D1640]  
\*Dry times will increase with higher humidity &/or lower temperature
- Ultimate Tensile Strength:**  
550 psi (± 50) @ 70°F (21°C)  
[ASTM D412]
- Elongation at Break:**  
500% (± 50) @ 70°F (21°C)  
[ASTM D412]
- Tear Strength:**  
126 lbf/in (±10) [ASTM D624]
- Hardness:**  
75 to 80 Shore A [ASTM D626]
- Permeance:**  
2.5 Perms @ 20 mils [ASTM D1653]
- Temperature Limits For**  
Normal Service Conditions:  
-30°F to 200°F (-35°C to 93°C)

DIATHON HT meets or exceeds all requirements of ASTM D6083

### WARRANTY

UNITED'S Standard Warranty, issued to the Building Owner, is available for 5-year, 10-year and 15-year periods at no cost. DIATHON HT also qualifies for UNITED'S System Warranties, available in 5-year, 10-year and 15-year periods. The System Warranties require additional fees as well as independent inspection. Refer to section entitled Application Instructions, as well as individual Warranty Explanation Forms, for additional details.

## FIRE RATINGS, APPROVALS & ADVANTAGES

**Fire Test:** DIATHON HT is a UL 790 Class “A” coating over various polyurethane foam substrates. The FMRC fire test measures the maximum rate of fuel contribution of the sample roof cover/insulation combination. **DIATHON HT** also achieved a Class 1 rating in the Factory Mutual fire test for Insulated



Steel Deck Roof Construction over a variety of polyurethane foams. Subject to the conditions of approval as described in the UL Building Material Directory, the Factory Mutual Approval Guide or Job Identification #J.I.0Z3Q4.AM.

**Spread Of Flame Fire Test:** Tests were conducted in accordance with ASTM E 108 Fire Tests of Roof Coverings for Class A non-combustible deck test procedures. **DIATHON HT** achieved a Class A rating over a variety of polyurethane foams. At no time during the Spread of Flame Tests were flying brands developed or excessive lateral flame spreads observed. Refer to Factory Mutual Approval Guide or Job Identification #J.I.0B9A2.AM.

**Simulated Windstorm Classification Pull Tests:** Wind uplift tests were conducted to evaluate the ability of the deck components to resist a simulated wind uplift force without failure of the assembly. **DIATHON HT** passed the Class 1-180 wind uplift requirements over a variety of polyurethane foams. Refer to Factory Mutual Approval Guide or Job Identification #J.I.0Z3Q4.AM.

**Simulated Hail Damage Tests:** Simulated hail damage tests were conducted to evaluate the ability of the roof cover/insulation combination to withstand a hailstorm without damage to the covering. After 10 drops of the impactor apparatus, the **DIATHON HT** showed no sign of cracking, splitting, internal separation, delamination or rupture. Refer to Factory Mutual Approval Guide or Job Identification # J.I.0B9A2.AM.

**Resistance To Foot Traffic:** Tests were conducted to determine the ability of the roof cover/insulation combination to resist foot traffic. After completion of the testing, the samples showed no sign of tearing or cracking. Refer to Factory Mutual Approval Guide or Job Identification #J.I.0B9A2.AM.

**Susceptibility To Leakage Test:** Tests were conducted to determine the resistance of the roof cover/insulation assembly to water intrusion when subjected to a 6" (15 cm) head of water above the sample as well as air pressure below the sample. After 7 days exposure, the **DIATHON HT** showed no signs of water leakage. Refer to Factory Mutual Approval Guide or Job Identification #J.I.0B9A2.AM.

**High Tensile Strength & Elongation Properties:** **DIATHON HT** achieves outstanding elongation, tensile strength and tear resistance properties, which are carefully balanced to provide optimum long term performance. The cured film provides excellent abrasion and impact resistance to withstand extreme weather conditions and maintenance traffic. Its tight finish also exhibits excellent chemical, dirt pickup and mildew resistance.

**Bond Strength:** **DIATHON HT** achieved a 50 to 60 lbs./sq. inch (.34 to .41 MPa) breaking strength when tested in the Instron Universal Testing Instrument. There was no adhesive failure between the **DIATHON HT** and the polyurethane foam substrate. **DIATHON HT** remained totally bonded to the polyurethane foam under all stress conditions. Separation occurred within the polyurethane foam itself. ASTM C 297

**High Acrylic Resin Content:** The percent solids by volume is only one measure of a coating's quality. Another basis for determining longevity of a coating is the ratio of filler pigment to polymer content. **DIATHON HT** contains lower filler pigment load and higher levels of acrylic polymer than most coatings. This high ratio of pure acrylic polymer provides long term weather resistance. **DIATHON HT**'s overall high performance is achieved through the use of advanced elastomer acrylic polymers.

**Ponded Water Adhesion:** A 5" (12.7 cm) high column of water was established over polyurethane foam coated with **DIATHON HT**. After 30 days of continuous testing, **DIATHON HT** showed no significant loss of adhesion. No blistering or other deleterious effects were observed. There was no migration of water into the polyurethane foam substrate.

**Low Temperature Flexibility:** **DIATHON HT** is capable of withstanding 180° mandrel bends over a 3/16" (5 mm) mandrel @ -25°F (-30°C). Federal Test Method No. 141a-6221

**Uniform Film Build:** The thixotropic consistency of **DIATHON HT**, along with its high solids content, gives it excellent vertical hold and high hide characteristics. This enables **DIATHON HT** to uniformly cover the uneven texture of the polyurethane foam surface, maximizing its ability to provide prolonged weather resistance.

**Dirt Pick-Up Resistance:** A dispersion of natural red iron oxide pigment and soot-like particles were brushed over the **DIATHON HT** finish. After rinsing with water, **DIATHON HT** retained 99% of its original reflectance value.

## 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.
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 (unless adequate windscreens are provided).
4. If relative humidity is above 80%.

The finished surface texture of the applied polyurethane foam shall range from a smooth to a medium "orange peel" finish. **Surface textures defined as "popcorn" or "treebark", 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. Foamed-in-place cants and crickets shall be smooth and uniform to allow for positive drainage. Filleting of foam to parapet walls, vents, roof mounted equipment, etc., shall provide a relatively smooth transition to the roof deck and be of uniform cross-sectional thickness.

If uncoated polyurethane foam is exposed to ultraviolet light for an extended length of time, a fine powder (oxidation) will form on the surface of the foam. **Applying DIATHON HT within 72 hours of the foam application will eliminate this potential problem.** 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 surface shall be brushed with a stiff bristle broom, mechanically scarified or sanded. A light pass of foam must then be applied to reseal the surface.

## PACKAGING & MIXING

DIATHON HT is a single-component, ready-to-use material available in 5-gallon (19 liter) pails and 55-gallon (208 liter) drums. DIATHON HT may appear well mixed, but upon extended standing will settle into a two-stage suspension. Use a ¾ horsepower or larger mixer with a blade capable of uniformly mixing the entire container. For 5-gallon (19 liter) pails, use 3" (7.5 cm) minimum diameter mixing blades. For 55-gallon (208 liter) drums, use 6" (15 cm) minimum diameter mixing blades.

DIATHON HT, properly mixed, is easily pumped and sprayed at material temperatures of 60°F (16°C) or greater. Thinning or reducing the mixture is not recommended. Addition of water reduces the rich thixotropic nature of DIATHON HT and decreases its ability to achieve a heavy film build with excellent vertical hold and hide.

## COATING APPLICATION

DIATHON HT may be applied by conventional or airless spray equipment. Brush or roller may be used for touch-up and edging work, or for small areas that are not practical for spray application. Airless spray is best suited for field application. Use a pump with a minimum 1-gallon per minute (3.8 l/minute) output and 2,000 psi (13,790 kPa) pressure capability. Use a reversible, self-cleaning tip with an orifice size of .027" to .039" (.69 to .99 mm).

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 could interfere with proper adhesion. Any physical damage to the polyurethane foam shall be repaired before coating application commences. All oxidized polyurethane foam shall be repaired or replaced. Do not coat directly over polyurethane foam that has been mechanically scarified or sanded.

Each coat of DIATHON HT 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. DIATHON HT must be applied in two or more separate coats to ensure proper coverage and cure rate, and to achieve a pinhole-free continuous film. **All surfaces must be uniformly coated and free from voids, pinholes or blisters.** Each coat must be dry and cured prior to application of an additional coat. DIATHON HT applied at the rate of one gallon per 100 sq. ft. (.4 l/m<sup>2</sup>) will theoretically yield 8.3 dry mils (211 microns).

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

1. DIATHON HT shall be applied in a minimum of two (2) coats at a minimum total of 3 gallons per 100 sq. ft. (1.2 l/m<sup>2</sup>). It is recommended that no more than 1½ gallons per 100 sq. ft. (.6 l/m<sup>2</sup>) be applied on the first coat.
2. This coverage rate will theoretically result in 25.0 dry mils (635 dry microns). The actual minimum total dry film thickness required at any location to qualify for UNITED'S 5-Year Standard Warranty is 22 dry mils (559 microns).

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

1. DIATHON HT shall be applied in three (3) separate coats at a minimum total of 3½ gallons per 100 sq. ft. (1.4 l/m<sup>2</sup>) It is recommended that no more than 1½ gallons per 100 sq. ft. (.6 l/m<sup>2</sup>) be applied per coat.
2. This coverage rate will theoretically result in 29.1 dry mils (739 dry microns). The actual minimum total dry film thickness required at any location to qualify for UNITED'S 10-Year Standard or 5-Year System Warranties is 25 dry mils (635 microns).

## COATING APPLICATION (Cont.)

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

1. **DIATHON HT** shall be applied in a minimum of three (3) separate coats at a minimum total of 4 gallons per 100 sq. ft. (1.6 l/m<sup>2</sup>) It is recommended that no more than 1½ gallons per 100 sq. ft. (.6 l/m<sup>2</sup>) be applied per coat.
2. This coverage rate will theoretically result in 33.3 dry mils (846 dry microns). The actual minimum total dry film thickness required at any location to qualify for UNITED'S **15-Year Standard Warranty** or **10-Year System Warranty** is 28 mils (711 microns).

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

1. **DIATHON HT** shall be applied in a minimum of four (4) separate coats at a minimum total of 5 gallons per 100 sq. ft. (2.0 l/m<sup>2</sup>).
2. This coverage rate will theoretically result in 41.6 dry mils (1,057 microns). The actual minimum total dry film thickness required at any location to qualify for UNITED'S **15-Year System Warranty** is 35 dry mils (889 microns).

**DIATHON HT** shall extend up and over all polyurethane foam on vent pipes and parapets, and terminate a minimum of 2" (5 cm) above the foam, creating a self-terminating flashing.

Initial cure or dry time to achieve resistance to rain or overnight dew will normally take several hours. Total cure to achieve long term resistance to ponded water will normally take 24 to 72 hours, depending upon weather conditions.

If any form of dirt, sand, pollution fallout, etc. is detected on the surface of **DIATHON HT**, it is necessary to remove this material before applying an additional coat. Surfaces should be washed using a biodegradable cleaner such as UNITED'S **United Cleaning Concentrate (UCC)** only after the **DIATHON HT** film has fully cured. Rinse thoroughly with clean, fresh water to remove all traces of the chemical cleaner and allowed to dry.

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

Use water and **UCC** or other similar detergent to thoroughly flush equipment. Purge the water from the system using Mineral Spirits or Glycol Ether. Leave the solvent in the lines and equipment until next use. It is not recommended practice to leave **DIATHON HT** in the pump or hoses.

Application of a granular surface is achieved through the addition of an extra coat of **DIATHON HT**, which is sprayed over the minimum coverage required for the specified warranty. The ceramic roofing granules are then broadcast into the wet film of this additional coat.

## LIMITATIONS & PRECAUTIONS

**DIATHON HT** should generally not be used over cold storage tanks or buildings where a vapor barrier is required. **DIATHON HT** will freeze and become unusable at temperatures below 32°F (0°C), or when there is a possibility of temperatures falling below 32°F (0°C) within a 24-hour period after application.

**DIATHON HT** requires complete evaporation of water to cure. Cool temperatures and high humidity retard cure. **Do not apply if weather conditions will not permit complete cure before rain, dew, fog or freezing temperatures occur.** Do not apply in the late afternoon if heavy moisture condensation may appear during the night.

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 **DIATHON HT** to occupied buildings to ensure that air conditioners and ventilation units are turned off and covered to prevent 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 specific information on safety requirements, refer to OSHA guidelines and **DIATHON HT** Material Safety Data Sheet.



*Our products are guaranteed to meet established quality control standards. Information contained in our technical data is based on laboratory and field testing, but is subject to change without prior notice. No guarantees of accuracy are given or implied, nor does UNITED assume any responsibility for coverage, performance or injuries resulting from storage, handling or use of our products. Liability, if any, is limited to product replacement or, if applicable, to the terms stated within the executed project warranty.*