

# DIATHON<sup>®</sup> 4500

## ELASTOMERIC ACRYLIC WATERPROOFING

### Technical Data & Application Instructions

#### PRODUCT DESCRIPTION

DIATHON 4500 is a 45% solids, 100% acrylic elastomeric coating. Superior weatherability, ultraviolet resistance, fire retardance, adhesion, algae resistance, and ease of application make DIATHON 4500 an excellent coating for the protection of polyurethane foam on roofs and tanks.

#### BASIC USES

DIATHON 4500 was especially developed to provide protection for sprayed-in-place polyurethane foam roof and tank systems. The thixotropic consistency of DIATHON 4500 gives it excellent vertical hold, allowing uniform build on the highs and lows of the polyurethane foam texture without pinholing or sagging.

DIATHON 4500 is also an ideal choice for recoating existing polyurethane foam/coating roofs and tanks. It has the ability to “wet” into the surface and achieve excellent adhesion to aged acrylic or urethane coatings.

#### COLORS

DIATHON 4500 is available in standard **White**, **Light Gray** and **Light Tan** colors. Special colors are available on request. Color chips must be furnished to UNITED for all custom colors.

When **White** is specified as the finish color, it is recommended that **Light Gray** or **Medium Gray** be applied for the first coat, making it easier to visually control the application of the second coat in **White**.

DIATHON 4500 color concentrate is available to create a **Dark Gray**, if required, to achieve a faster dry time at lower temperatures.

#### TYPICAL PROPERTIES

- Solids by Weight:**  
57% ( $\pm 2$ )  
[ASTM D2369]
- Solids by Volume:**  
45% ( $\pm 2$ )  
[ASTM D2697]
- Tensile Strength:**  
350 psi ( $\pm 20$ ) (1.66 MPa)  
[ASTM D412]
- Elongation:**  
200% ( $\pm 20$ ) unaged @ 75°F (24°C)  
[ASTM D412]
- Hardness:**  
60 to 70 Shore A  
[ASTM D2240]
- Water Vapor Transmission:**  
2.9 Perms @ 15 mils  
[ASTM D1653]
- Temperature Limits for Normal Service Conditions:**  
-20°F to 200°F (-29°C to 93°C)

#### WARRANTY

UNITED'S 5-Year Standard Warranty is a guarantee that the DIATHON 4500 coating, when properly applied over spray-applied polyurethane foam, will not leak water over a 5-year period. This Standard Warranty is provided by UNITED at **no cost**. Refer to Application Instructions for minimum dry mil thickness requirements.

## **PERFORMANCE PROPERTIES**

PROPERTY	TEST PROCEDURE	VALUE
<b>Ultraviolet (UV) Resistance (Accelerated Weathering)</b>	Atlas Carbon Arc Weather-Ometer Type EH – ASTM D822, ASTM G23 (Continuous UV and water spray cycling)	<b>No deleterious effects: no surface checking or cracking, no delamination or color fade – after 2,000 hours</b>
<b>Adhesion to Polyurethane Foam (Exposed outdoors prior to application)</b>	Peel Adhesion – ASTM D903	<b>Adhesion exceeded cohesion of either coating or polyurethane foam</b>
<b>Low Temperature Flexibility</b>	Withstands 180° bends over 1/8" mandrel @ -15°F (-26°C) ASTM D522	<b>No surface cracks or breaks</b>
<b>High Temperature Stability</b>	Thermostatically controlled heat chamber – ASTM D794	<b>No age-hardening or slump at temperatures up to 200°F (93°C)</b>



**DIATHON 4500** is UL-790 Class "A" Classified system over spray applied polyurethane foam. Refer to UL Building Materials Directory or UL Classification Cards for foam manufacturers and types, foam thicknesses and densities, incline and coating requirements of rated roof systems.

### **PACKAGING & MIXING**

**DIATHON 4500** is a single-component, ready-to-use material available in 5-gallon (19 liter) pails and 55-gallon (209 liter) drums.

**DIATHON 4500** may appear well mixed, but upon standing will settle into a two-stage suspension. Thoroughly mix the contents of all containers using a power mixer for a minimum of five (5) minutes prior to application.

When **Dark Gray DIATHON 4500** is required, mix four (4) 100-gram units of color concentrate into one (1) 55-gallon (209 liter) drum of standard **Medium Gray DIATHON 4500** or seven (7) 100-gram units of color concentrate into one (1) 55-gallon (209 liter) drum of standard **White DIATHON 4500**. **DIATHON 4500** shall be thoroughly mixed before and after color concentrate is added to ensure color uniformity.

Use ¾ horsepower or larger electric or air operated mixer with a blade capable of uniformly mixing the entire container. For 5-gallon pails, use 3" (8 cm) minimum diameter mixing blades. For 55-gallon drums, use 6" (15 cm) minimum diameter mixing blades.

### **THINNING OR REDUCING**

**DIATHON 4500**, properly mixed, is easily pumped and sprayed at 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 4500** and decreases its ability to achieve a heavy film build with excellent vertical hold.

### **SPRAY EQUIPMENT**

**DIATHON 4500** has been applied over a wide variety of substrates utilizing many different brands, types and sizes of conventional and airless equipment.

Airless spray equipment is best suited for field applications. The following minimums are recommended:

**PUMP:** 1 gallon per minute (3.8 l/minute) output and 2,000 psi (13,790 kPa) pressure capability.

**GUN:** Any airless hand gun compatible with pump used.

**SCREEN SIZE:** Filter screens should be 30 mesh or larger.

**TIP SIZE:** A reversible self-cleaning tip with orifice size .027" to .039" (.69 to .99 mm) and a fan angle of 40° or 50°.

**FLUID HOSE:** 3/8" (.95 cm) minimum inside diameter, nylon high-pressure type hose for lengths up to 75 ft. (22.9 m) from pump. From 75 ft. to 200 ft., use 1/2" (1.27 cm) inside diameter hose added to pump side of existing 3/8" (.95 cm) hose to maintain pressure and delivery. Over 200 ft., use 5/8" to 3/4" (1.59 to 1.91 cm) inside diameter hose added to pump side of existing hose.

Larger equipment will increase production capabilities. Larger diameter spray hoses will extend distances and heights that **DIATHON 4500** may be pumped.

## **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. Temperature shall be measured with a surface thermometer. 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 (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 "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.

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 4500 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 foam insulation surface shall be brushed with a stiff bristle broom or mechanically scarfed or sanded. A light pass of foam must then be applied to reseal the surface.

When using **DIATHON 4500** on recoat applications, all existing surfaces shall be cleaned utilizing **United Cleaning Concentrate (UCC)**. Dilute at the rate of 1 part concentrate to 10 parts water. Apply the dilute mixture under low pressure spray at the rate of 200 sq. ft. per gallon (4.9 m<sup>2</sup>/l). After allowing to sit for 15 to 20 minutes, rinse thoroughly with fresh water under high pressure (minimum 2,000 psi/13,790 kPa) to remove the solution from the roof. Heavy deposits of dirt or contamination may require agitation with a stiff-bristle broom or similar mechanical scrubber. Allow the roof to dry thoroughly.

## **APPLICATION INSTRUCTIONS**

**DIATHON 4500** may be applied by either conventional or airless spray equipment. Brush or roller may be used for touch-up and edging work or for small areas which are not practical for spray application.

**DIATHON 4500** should be applied to the polyurethane foam surface within 24 to 72 hours following final application of polyurethane foam.

Polyurethane foam and adjacent surfaces to be coated shall be free of any degraded foam, grease, oil, dirt or other contaminants that will interfere with proper adhesion. Polyurethane foam shall be completely dry and frost free before coating.

Any physical damage to the polyurethane foam shall be repaired or replaced. Do not coat directly over polyurethane foam that has been mechanically scarified or sanded.

**DIATHON 4500** applied at the rate of one gallon per 100 sq. ft. (.4 l/m<sup>2</sup>) will theoretically yield 7.2 dry mils (183 dry microns).

The theoretical mil thickness given for coverage per gallon is based on smooth, non-porous surfaces. Actual gallons required in the field to achieve the minimum dry mil film thickness will depend upon the surface texture, method of application, and weather conditions at the time of application. It is the responsibility of the applicator to apply sufficient material to achieve the minimum dry mil film thickness.

To qualify for **UNITED'S 5-Year Standard Warranty Program**, **DIATHON 4500** shall be applied in two (2) or three (3) separate coats at a minimum total rate of 3<sup>3</sup>/<sub>4</sub> gallons per 100 sq. ft. (1.5 l/m<sup>2</sup>). Depending upon weather at time of application, three (3) separate coats may be necessary. This coverage rate will theoretically result in 27 dry mils (686 dry microns). The actual minimum total dry mil film thickness required at any location to qualify for United's **5-Year Standard Warranty Program** shall be 22 mils (559 microns).

Spray with multi-directional spray passes to assure positive coverage. **DIATHON 4500** must be applied in two or more separate coats to insure proper film build and cure rate, and a pinhole-free continuous film. Each coat shall be applied in a direction perpendicular to the previous coat. Each coat of **DIATHON 4500** must be dry and cured before an additional coat is applied. **All surfaces must be uniformly coated and be free from all voids, pinholes and blisters.**

## APPLICATION (Continued)

If any form of dirt, sand or pollution fallout is detected on the surface of **DIATHON 4500**, it is necessary to remove this material before applying an additional coat.

**DIATHON 4500** is manufactured in standard **White** and **Medium Gray** colors. It is difficult to apply 2 or more coats of **White** and visually verify uniform coverage. For this reason, when **White** is specified for the finish color, it is recommended that **Light** or **Medium Gray** be applied for the first coat, making it easier to visually control the application of the second coat in **White**. For three (3) coat work, it is recommended that **Light** or **Medium Gray** be applied as the first and second coat and **White** be used as the third coat. The second advantage in using the **Light** or **Medium Gray** color for the basecoat is that a faster dry and cure time can be achieved.

If faster dry and cure is required at cool temperatures or high humidity, it is suggested that **Medium Gray DIATHON 4500** be used in lieu of **White**. There is sufficient color contrast between the dry and wet film in the **Medium Gray** color to visually control the application.

**DIATHON 4500** color concentrate is available to create **Dark Gray DIATHON 4500** if required to speed the curing process at temperatures between 50°F and 70°F (10°C and 21°C). This is due to the heat sink created by the **Dark Gray** color, which allows water in the film to evaporate more rapidly. **Dark Gray** should not be applied more than 16 wet mils per coat.

**DIATHON 4500** in the container is very cohesive and difficult to spray at material temperatures below 60°F (16°C). Store **DIATHON 4500** in a warm area 24 hours prior to application. For spraying, a material temperature of 70°F (21°C) or greater is recommended.

At hot temperatures, partially full containers of **DIATHON 4500** may surface-skin. Examine before mixing and remove skin (if present). To prevent formation of skinning in hot weather during application or in partially full containers, cover container with polyethylene sheeting after mixing.

Use UCC or equal to thoroughly flush equipment. Purge the water from the system using Mineral Spirits. Leave the solvent in the lines and equipment until next use. It is **not** recommended practice to leave **DIATHON 4500** in the pump or hoses.

## LIMITATIONS & PRECAUTIONS

**DIATHON 4500** should generally not be used over cold storage tanks or buildings where a vapor barrier coating is required. **DIATHON 4500** shall not be used for interior applications in place of a thermal barrier.

**DIATHON 4500** 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 4500** 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.

Roofs subject to heavy maintenance traffic should have walk pads or granules installed in the walkways.

**DIATHON 4500** 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 **DIATHON 4500** 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 as 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 cleaning.

For specific information on safety requirements, refer to OSHA guidelines and **DIATHON 4500** 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.*