DIATHON®

100% ACRYLIC ELASTOMERIC WATERPROOFING
Exceeds ASTM D6083 Standards

Technical Data

PRODUCT DESCRIPTION

DIATHON is a 100% acrylic elastomer coating that combines high solids emulsion polymers, reinforcing laminar pigments, biocides and non-migrating fire retardants for superior durability, weatherproofing, mildew resistance, ultraviolet resistance and fire resistance. The fire retardant chemicals are permanently locked into the cured coating. **DIATHON is unique among acrylic elastomers in that elongation and tensile strength properties are both maintained at lower temperatures.**

BASIC USES

DIATHON was specifically developed for protecting sprayed polyurethane foam insulation from degradation caused by normal weathering, aging and ultraviolet exposure. **DIATHON** has the unique property of being an elastomeric coating that is able to uniformly cover the profile of textured substrates. It has excellent adhesion to polyurethane foam, concrete, masonry, primed metal, primed wood and asphalt. **DIATHON** is used for protection of sprayed polyurethane foam on new roofs, existing roofs, and hot or ambient storage tanks.

COLORS

DIATHON is available in standard **White**, **Light Gray** and **Light Tan** colors, which are certified to meet ENERGY STAR®, Cool Roof Rating Council (CRRC) and LEEDS reflectance criteria. It is also available in standard **Medium Gray**. 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.

DIATHON color concentrate is available to create a **Dark Gray DIATHON**, if required, to achieve a faster dry time at lower temperatures. If a white topcoat is desired, **DIATHON** is available in a **Quick-Set** version (**Diathon QS**). The **Quick Set** formulation sets up, or congeals, faster than standard **DIATHON** so that it will achieve resistance to wash-off from a light rain or dew in a shorter period of time.

TYPICAL PROPERTIES

1. **Solids by Weight:**
   66% (±2) [ASTM D1644]
2. **Solids by Volume:**
   55% (±2) [ASTM D2697]
3. **Dry Time for Foot Traffic Resistance:***
   2 hours at 75°F (24°C), 50% R.H.
   Medium Gray @ 16 wet mils (406 microns)
   4 hours at 75°F (24°C), 50% R.H.
   Pearl White @ 16 wet mils (406 microns)
   **Dry times will increase with lower temperature and/or higher humidities.*
4. **Ultimate Tensile Strength:**
   250 psi (±20) @ 75°F (24°C)
   440 psi (±20) @ 0°F (-18°C)
   [ASTM D412]
5. **Elongation at Break:**
   280% (±20) @ 75°F (24°C)
   320% (±20) @ 0°F (18°C)
   [ASTM D412]
6. **Hardness:**
   55-65 Shore A [ASTM D2240]
7. **Permeance:**
   3.0 Perms @ 20 mils [ASTM E96]
8. **Permeability:**
   0.06 Perm Inches [ASTM E96]
9. **Temperature Limits for Normal Service Conditions:**
   -30°F to 200°F (-35°C to 93°C)

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 thickness requirements to qualify for warranty programs.

System Warranty programs are also available at an additional cost. Consult UNITED'S System Warranty Explanation Form and **DIATHON** Application Instructions for details.

UNITED COATINGS®
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PERFORMANCE PROPERTIES

1. **ASTM D6083 Conformance:**
   ASTM D6083 was specifically developed to establish a threshold level of quality for acrylic roof coatings. It contains detailed procedures for conducting 13 separate test methods in order to ensure consistency of the values obtained. **DIATHON** has been independently tested and certified to exceed ASTM D6083 standards.

2. **Resistance to Accelerated Weathering:**
   DIATHON test panels were placed in the Q-Sun Xenon Test Chamber. Cycling was set at 9 minutes of water spray with ultraviolet radiation, and 51 minutes of ultraviolet radiation only. Temperature within the test chamber during UV cycle was maintained at 145°F (63°C). After 3,000 hours of continuous exposure, **DIATHON** showed no deleterious effects, no surface checking or cracking, no delamination and no color fade when tested in accordance with ASTM D6083 standards. ASTM D6083, ASTM D4798

3. **EPA ENERGY STAR® Program:**
   UNITED COATINGS is a Charter Partner in the Environmental Protection Agency's ENERGY STAR Roof Products Program as well as the Cool Roof Rating Council (CRCC). **DIATHON** has been independently tested and certified to surpass ENERGY STAR and CRCC guidelines for energy efficiency.

4. **Resistance to Wind Driven Rain:**
   DIATHON test panels were placed in a pressurized test chamber producing 5" (12.7cm) of water pressure, equivalent to 100 mph (161 km/h) wind force. After 40 hours of continuous testing, no apparent moisture penetrated the **DIATHON** coating when measured with a moisture meter. Increase in weight of sample after test was 0.3%. Tested in accordance with Federal Specification TTC-55 B

5. **Film Breathing Ability:**
   Permeance was determined using perm cups in accordance with the Standard Test Method for Water Vapor Transmission. **DIATHON** at 20 dry mils (508 microns) has a perm rating of 3.0 Perms (1.98 metric perm). ASTM E96

6. **Cold Temperature Flex After Weathering:**
   After 1,000 hours exposure in the Q-Sun Xenon Test Chamber, **DIATHON** retained its ability to withstand multiple ½" (1.2 cm) mandrel bends without cracking at -15°F (-18°C). ASTM D6083, ASTM D522

7. **High Temperature Stability:**
   Tested in thermostatically controlled heat chamber – **DIATHON** will not age-harden or slump at temperatures up to 200°F (93°C). ASTM D794

8. **Simulated Hail Damage:**
   DIATHON test panels passed multiple impacts from a 1¾" (4.4 cm) diameter, ¾ lb. (.3 kg) steel ball dropped 17 ft. 9½", (4.6 m) with no evidence of membrane failure. Test was repeated following 1,000 hours Weather-Ometer exposure. No changes were noted.
   Factory Mutual Standard 4470

9. **Bond Strength:**
   Instron Universal Testing Instrument – 50-60 lbs./sq. inch (.34 to .41 MPa) breaking strength. There was no adhesive failure between the **DIATHON** coating and the polyurethane foam substrate. **DIATHON** remained totally bonded to the polyurethane foam under all stress conditions. Separation occurred within the polyurethane foam itself. ASTM C297

10. **Elongation Unaged:**
    DIATHON is unique among acrylic elastomers in its cold temperature elongation properties. It achieved the following ultimate elongations when tested in the Instron Universal Testing Instrument:
    320% @ 0°F (-18°C)
    280% @ 75°F (24°C)
    ASTM D412

11. **Elongation Retained After Aging:**
    After 1,000 hours exposure in the Q-Sun Xenon Test Chamber, **DIATHON** passed the requirements of ASTM D6083, ASTM D2370 – minimum 100% @ 73°F (23°C). Elongation was measured before and after weathering, using the Instron Universal Testing Instrument.

12. **Resistance to Foot Traffic:**
    Penetration plate – 29 lbs./sq. inch (200 kPa). No tearing, cracking, rupturing or permanent deformation of the **DIATHON** coating, or exposure of the polyurethane foam was observed. Tested in accordance with Factory Mutual Standard 4470 using nominal 3 lb./cu. ft. (48 kg/m³) density foam. This test exceeds the stresses of normal roof maintenance traffic.

13. **Low Temperature Flexibility:**
    DIATHON is capable of withstanding 180° bends over a 3/16" (5 mm) mandrel @ -21°F (-30°C). Federal Test Method No. 141a-6221

14. **Ponded Water Adhesion:**
    A 5" (12.7 cm) high column of water was established over polyurethane foam coated with **DIATHON.** After 30 days of continuous testing, **DIATHON** 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.

DIATHON®
Fire-Retardant Acrylic Elastomer For Sprayed Polyurethane Foam Roof Systems

FIRE RATINGS & APPROVALS

UL-790 Class "A" Systems*: DIATHON has UL-790 Class "A" classification over many different types of UL classified spray-applied polyurethane foams. Refer to UL Roofing Materials and Systems Directory for foam manufacturers and types, foam thicknesses and densities, inclines and coating requirements of rated roof systems. **UL Construction Nos. 74, 82, 136, 181 & 206–U.S. Navy White House Test/UL Standard 1256**: DIATHON** has UL fire classification with a variety of polyurethane foams sprayed over metal decking. Refer to UL Roofing Materials and Systems Directory under Roof Deck Construction for illustration & description of each rated roof system.

California State Fire Marshal: DIATHON conforms to Class "A" requirements with various spray-applied polyurethane foam systems. Contact UNITED'S Technical Service Department for current listing number and specific details.

Factory Mutual (FM) Approvals: DIATHON is approved (a) as a Class 1 Insulated Steel or Concrete Deck Roof System for new construction, and (b) as a Class 1 Re-Cover Application System when installed over existing Class 1 built-up roofing. These approved systems are based on any manufacture's spray-applied polyurethane foam having a flame spread of 30 or less (ASTM E84). Subject to the conditions of approval as described in the Factory Mutual Approval Guide, or job Identification No. 2NIA3.AM.

International Conference of Building Officials (ICBO) Approval: DIATHON is approved as a fire-retardant roof coating over many different types of spray-applied polyurethane foam on non-combustible substrates, existing fire-retardant BUR & new wood substrates. See ICBO Evaluation Report No. 3129 for specifications and conditions of use concerning material presented in this document.

BUILDING CODE & INSURANCE ACCEPTANCE

Building Code Acceptance:
DIATHON/Polyurethane Foam Roofing Systems are accepted by all major model building code authorities for Class "A" and Class "B" constructions. These building code authorities also accept UL Construction No. 136 as an approved roof system over metal decks without a thermal ignition barrier.

Insurance Acceptance:
DIATHON/Polyurethane Foam Roofing Systems are readily accepted by major commercial and industrial insurance underwriters. **DIATHON**/Polyurethane Foam Roofing Systems have been accepted by Industrial Risk Insurers (IRI) for UL Construction No. 136 as a Class "A" roof system.

*Cements and Coatings for Built-Up Roof Coverings Classified by Underwriters Laboratories Inc.® as to an external fire exposure only. See UL Roofing Materials and Systems Directory.

**Roof Coatings Classified by Underwriters Laboratories Inc.® as roof deck construction material with resistance to an internal fire exposure only for use in Construction Nos. 74, 82, 136, 181 & 206. See UL Roofing Materials and Systems Directory.

ADVANTAGES OF DIATHON

1. **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** 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'S** overall high performance is achieved through the use of 100% elastomer acrylic polymers.

2. **No Plasticizers:**
   There are no migratory plasticizers in **DIATHON.** The purpose of a plasticizer is to give good initial flexibility to the cured film. The plasticizer gradually leaches from the coating when exposed to sunlight and moisture, causing it to become brittle and exhibit poor flexibility and elongation properties. Surface checking and cracking occur, allowing moisture into the polyurethane foam and underlying substrate. **This does not occur with DIATHON**.

3. **Uniform Film Build:**
   The thixotropic consistency of **DIATHON** gives it excellent vertical hold, allowing uniform build on the highs and lows of the polyurethane foam texture. This quality maximizes the coating's ability to provide prolonged weather resistance.

4. **Long Term Fire Protection:**
   Non-migratory fire retardants are dispersed into the raw material complex during the manufacturing process. These fire retardants become an integral and inseparable part of the **DIATHON** coating. The non-leaching qualities of the specific fire retardants chosen by UNITED add another dimension to the long term protective qualities of **DIATHON.**

5. **Abrasive Weather Conditions:**
   DIATHON will take normal abrasive weather conditions of all types. Ice, snow and sand will not penetrate its tough, dense surface under normal conditions.

6. **Non - Polluting:**
   DIATHON contains no solvents. It conforms to all federal, state and local air pollution standards and VOC requirements.

7. **Volume Solids:**
   The high volume solids of **DIATHON**, along with its excellent hide and vertical hold characteristics, allows for higher film build in fewer coats. This enables **DIATHON** to uniformly cover the uneven texture of the polyurethane foam surface.

8. **Single Package:**
   No catalyzation – **DIATHON** is a ready-to-use material. It has no pot life limitations.

LIMITATIONS & PRECAUTIONS

Do not apply **DIATHON** at temperatures below 50°F (10°C), or when there is possibility of temperatures falling below 32°F (0°C) within a 4-hour period after application.

DIATHON 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 or freezing temperatures occur. Do not apply in the late afternoon if heavy condensation may appear during the night.

DIATHON will freeze and become unusable at temperatures below 32°F (0°C). Do not ship or store unless protection from freezing is available.

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

For additional information, refer to OSHA guidelines and **DIATHON** Material Safety Data Sheet.

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ENERGY STAR ASK ABOUT ENERGY STAR

CRRC COOL ROOF RATING COUNCIL

SPRAY POLYURETHANE FOAM ALLIANCE SPFA a Business Unit of the American Plastics Council

MIAMI-DADE