

Technical Data Sheet

Simple, Efficient Insulated Plaza Decks Using THERMADRY® Insulating Drainage Panels

Table Of Contents

Summary.....	pg. 1
Current Plaza Design.....	pg. 1
New Plaza Design.....	pg. 1
Product History.....	pg. 2
Product Design.....	pg. 2
Product Properties.....	pg. 2
Design Considerations:	
Freeze-Thaw Cycling.....	pg. 2
Double Layer Foam.....	pg. 3
Design Factors.....	pg. 3
Plaza Flatness.....	pg. 3
Specification Guide,	
Section 07220.....	pg. 3
1. Manufacturer.....	pg. 3
2. Materials.....	pg. 3
3. Installation.....	pg. 3

Summary

Introducing a new, alternative method for constructing Plaza Decks. This technical data sheet describes how THERMADRY Insulating Drainage Panels can be used under plaza decks, making the construction simpler to design, easier to install, and less costly for the client.

THERMADRY panels are manufactured by T. Clear Corporation and are made from boards of STYROFOAM® brand insulation which have been grooved on one face and covered with a polymeric filter fabric. Hence, THERMADRY provides insulation for the roof, protection for the waterproofing membrane, and drainage channels for the rainfall — all in one product.

Current Plaza Design: PMR Concept Provides Two Functions

For many years now the preferred way of designing Plaza Decks has been to use the Protected Membrane Roofing (PMR) method. In this method, the insulation product is placed on top of the membrane, where it provides insulation value for the building, and protects the waterproof membrane from physical abuse, UV radiation, and thermal stress.

In current plaza designs, the most common wearing surfaces used over

the extruded polystyrene foam insulation have been either precast concrete pavers supported on a pedestal system, or poured concrete installed over separate layers of filter fabric, pea gravel, and filter fabric (See Figure 1, page 2).

New Plaza Design: THERMADRY Provides Three Functions

The current systems have worked very well for many years, but they can be difficult to detail and expensive to install. Now, a simpler, more economical approach is available. This method allows the paver or poured concrete wearing surfaces to be installed directly on the surface of the THERMADRY Insulating Drainage Panels. These panels inherently provide the drainage and ventilation pathways which are necessary below the plaza wearing surface. And both the high-strength and long-term thermal efficiency of STYROFOAM insulation in the current design are maintained in this new design. But, more importantly, by using THERMADRY panels, the costly pedestal system needed in conventional pedestal-paver construction is eliminated. And in poured-concrete construction, the use of THERMADRY panels means the costly and cumbersome installation of pea gravel and two layers of filter fabric is eliminated (See Figure 2, page 2).

THERMADRY is manufactured using



Figure 1. Current Plaza Design

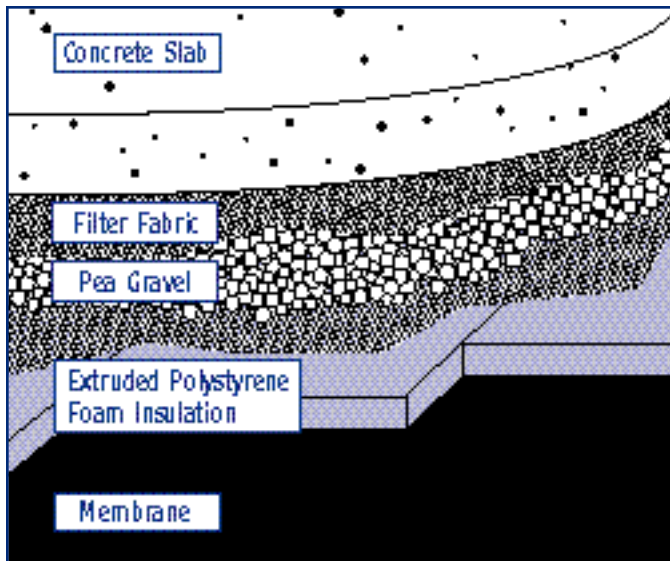
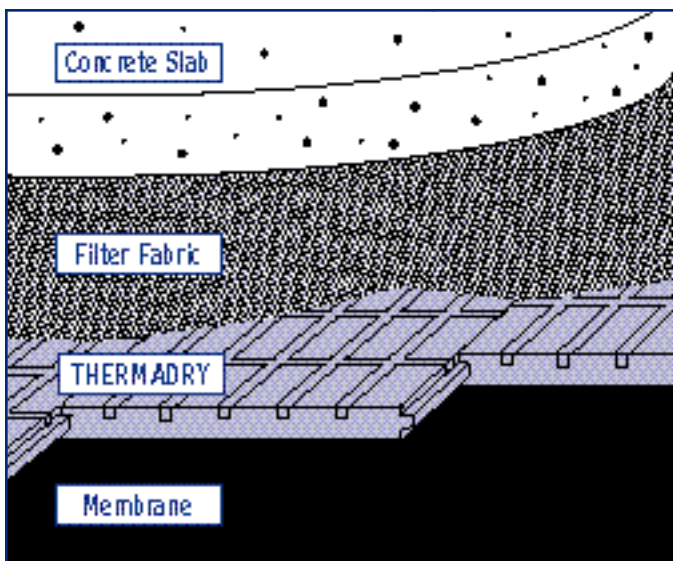


Figure 2. New Plaza Design



Product History

THERMADRY Insulating Drainage Panels are the key to this simpler construction. THERMADRY has primarily been installed on foundation walls, providing soil drainage, insulation, and protection for the foundation waterproofing system. The transition from foundation walls to plaza decks has been a natural evolution for THERMADRY since the design needs are the same in both areas — insulation, drainage, and protection.

Product Design

THERMADRY Insulation Drainage Panels are manufactured using STYROFOAM brand insulation. One face of each 2' x 8' panel has been closely grooved in both directions to provide interconnecting, ventilating drain channels. The channels have then been covered with geotechnical filter fabric, having overlap flaps along two adjoining edges to keep both the channels and the joints free of dust or dirt. On plaza decks, it is installed fabric side up.

Product Properties

To give you maximum design flexibility, THERMADRY is manufactured using two different strength foams in two different thicknesses (See Table 1).

Table 1 — Physical Properties
THERMADRY Insulating Drainage Panels

Panel Property	Type 1250	Type 1750
Thickness in Inches	1 1/2, 2 1/4	1 1/2, 2 1/4
R-Value, min. [†] F•sq. ft.•h/Btu	6.9, 10.6	6.9, 10.6
Recommended Load ^{††} Static Load, lb/sq. ft. Dynamic Load, lb/sq. ft.	1250 700	1750 1000

[†] Values are consistent with the criteria of ASTM C 578 and the requirements of the FTC rule (16CFR Part 460).

^{††} See Design Factors in text.

Design Considerations

Freeze-Thaw Cycling:

Plaza Decks located in geographical areas which are not subject to freezing weather do not require a ventilating drainage system, such as that shown in Figure 1: a layer of pea gravel between two layers of filter fabric. In cold climates, however, research has shown that during the winter, a thin film of water gradually forms on the underside of the concrete wearing surface if there is no ventilating drainage system. This water is gradually absorbed by the concrete and, during freeze-thaw cycling, can ultimately cause the underside of the concrete to spall and deteriorate. These conditions also place severe moisture driving forces on the insulation and, over the long run, can cause limited moisture pick-up. Thus, good design for cold climates calls for drainage and ventilation below the wearing surfaces. The interconnecting channels in THERMADRY provide that function for you easily and economically, replacing the pea gravel.

Double Layer Foam:

The thickest THERMADRY panel currently available provides an R-value of 10.6. When more insulation than this is required, two layers of foam can be used. The under layer can be regular, unchanneled extruded polystyrene foam insulation. However, the under layer should be no thinner and no weaker in compressive strength than the upper layer of THERMADRY. Thus, 40 psi extruded polystyrene foam insulation should be specified below THERMADRY Type 1250, and 60 psi extruded polystyrene foam insulation should be specified below THERMADRY Type 1750. For maximum economy and long-term performance, the under layer of foam should be equal to or thicker than the upper layer.

Design Factors:

STYROFOAM insulation is a visco-elastic material. To prevent long-term compressive creep deformation, design factors should be applied to the strength of the foams. The recommended loads shown in Table 1 include a 3:1 factor for static loads and a 5:1 factor for dynamic loads.

Plaza Flatness:

Please recognize that if major irregularities exist in the roof deck and waterproofing membrane, they will telegraph up through the THERMADRY and cause slight offsets at the paver joints. The pedestal systems which are used to support concrete pavers are better able to compensate for major irregularities in deck flatness, as is the sand setting bed which is used below brick pavers.

Specification Guide, Section 07220 — Roof Insulation Above Waterproofing in Plaza Construction

1. Manufacturer

- 1.1 T. Clear Corporation
3255 Symmes Road
Hamilton, OH 45015

2. Materials

- 2.1 Insulation: THERMADRY Insulating Drainage Panels, Type 1750 (or: Type 1250)
 - 2.1.1 Compressive Strength: 1750 lb/ft² min. at recommended load (ASTM D 1621)
(or: 1250 lb/sq. ft.)
 - 2.1.2 R-Value 10.6 F•sq. ft.•h/Btu min. (ASTM C 518)
(or: 6.9)
 - 2.1.3 Insulation blowing agent shall provide at least a 90% reduction in ozone depletion potential compared to standard CFC blowing agents and shall be certified by the manufacturer.
 - 2.1.4 Submit insulation manufacturer's literature showing compliance with this specification including ozone depletion potential.
- 2.2 Precast Concrete Pavers:
- 2.3 Poured Concrete:
- 2.4 Brick Pavers:
- 2.5 Bedding Sand:
- 2.6 Accessories, etc.:

3. Installation

- 3.1 Plaza Deck Insulation: Where shown on the drawings and after the waterproofing membrane has been tested and accepted by the architect, loose-lay the insulation panels over the waterproofing. (A thin film of water under the insulation will help it resist wind uplift during installation.) Fit all joints tightly, with the fabric up and care fully overlapped at all side and end joints. Cooperate with the contractor installing the wearing surface to assure that it is installed concurrently with insulation. If installation of the wearing surface is delayed, install temporary ballasting on the insulation.
- 3.2 Precast Concrete Pavers: Where shown on the drawings, install the specified precast concrete pavers directly onto the insulation, maintaining tight joints. Shim unsupported paver corners as necessary to prevent rocking, using high density plastic shims.

- 3.3 Poured Concrete: Where shown on the drawings, install the specified concrete, in the thicknesses shown, directly onto the surface of the insulation. Screed, finish, cure, etc.
- 3.4 Brick Pavers: Where Shown on the drawings, install the specified brick pavers directly onto

the insulation in a minimum one-inch thick screeded layer of bedding sand. Maintain tight joints. Vibrate bricks into the bedding sand to achieve a firm, flat, walking surface. Clean surface, brush sand into joints, apply water-repellent treatment, etc., as you wish.

NOTICE: Extruded polystyrene foam insulation will burn and should be stored, handled and installed properly. For proper use consult applicable building code requirements, for regulations, and specific instructions available from your supplier or the T. Clear Corp., 3255 Symmes Road, Hamilton, OH 45015 (1-800-544-7398).

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