ThermaDrain®

THERMADRAIN® WITH STYROFOAM (EXTRUDED POLYSTYRENE) INSULATED DRAINAGE SYSTEM

1. Product Name
ThermaDrain® with Styrofoam Insulated Drainage System

2. Manufacturer
ThermaDrain® Inc.
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800-837-4065
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www.thermadrain.com

3. Product Description
ThermaDrain® with STYROFOAM insulated drainage board combines STYROFOAM brand high-quality closed cell extruded polystyrene rigid insulation with a high impact non-compressible styrene drainage panel adhered to its face. When installed within a masonry wall, *ThermaDrain® with STYROFOAM* increases the R-Value of the wall (over conventional cavity wall construction) and forms a continuous unobstructed drainage path within the masonry wall to the flashing and weepholes.

ThermaDrain® with STYROFOAM eliminates the need for excessive, open airspace in drainage walls and eliminates the concern of mortar droppings in the cavity. *ThermaDrain® with STYROFOAM* is ideal for use in cavity wall and masonry veneer wall construction, as well as below grade to insulate and provide drainage for foundation walls.

ThermaDrain® with STYROFOAM increases the quality of masonry wall construction by:

- Eliminating water related problems in cavity walls caused by excessive mortar droppings which block weep systems and render flashing installations useless
- Allowing for more insulation in the cavity wall, giving structures increased R-Value and thermal efficiency
- Providing the mason with an easy and conventional one-step means of installation of the insulation and continuous drainage system

ThermaDrain® with STYROFOAM generates savings by:

- Increasing the masons productivity by eliminating the extra effort required to keep the airspace clean of mortar, as well as it's one-step installation process
- Reducing wall and foundation thickness up to 2" through the reduction of cavity size and elimination of oversized airspace
- Substantially reducing shelf angle size subsequently reducing the eccentricity and tension caused by loading
- Generates long-term savings for the building owner by increasing wall R-Value, thereby lowering heating and cooling costs

4. Technical Data
SPECIFICATION & DETAILING
In order to obtain the most effectiveness of the *ThermaDrain® with STYROFOAM* wall system, the design professional must use the following formula to properly size the product for the wall cavity:

A + B = C, where:
A = Overall thickness of ThermaDrain
B = Tolerance Space
C = Cavity Dimension

For example, if 2" *ThermaDrain® with STYROFOAM* is desired to get a 10.0 R-Value, and the available cavity dimension is 3", then the formula would be:

A	+	B	=	C
2⅜"	+		=	3"
2⅜"	+	⅝"	=	3"

The drawings would reflect a ⅝" tolerance space, *ThermaDrain® with STYROFOAM* at 2" (overall thickness of 2⅜") and a total cavity dimension of 3".

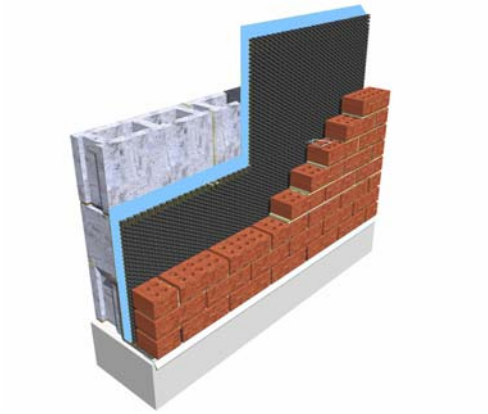
If only the cavity space is known, then utilize the formula backwards (**C-B=A)** starting with the total cavity dimension **(C)**, less a typical tolerance space of ⅝" **(B),** with the remaining dimension to accommodate as much *ThermaDrain® with STYROFOAM* as is allowed **(A).** Adjust the tolerance space as necessary to accommodate the insulation dimension. The face brick can also be projected off the ledge slightly to adjust for the size of insulation desired.

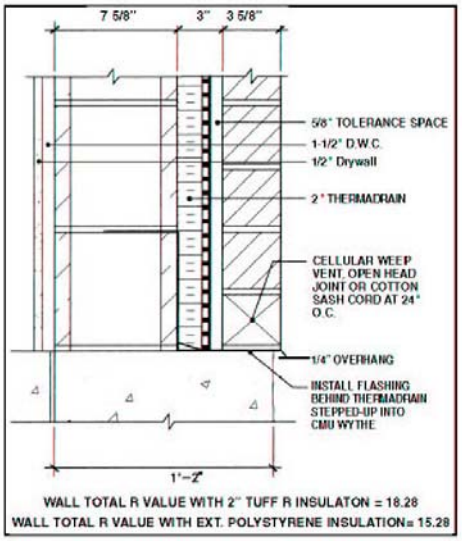
To achieve the best results, it is critical to combine the correct sizing and specifying of *ThermaDrain® with STYROFOAM* with an effective and properly detailed flashing system, including flashing material, preformed corners and end dams, stainless steel drip edge, termination bar and weepholes, all installed per the manufacturers recommendations and at the proper height and location.

SIZES
ThermaDrain® with STYROFOAM is available in standard thicknesses ranging from 1⅜" to 3⅜" and is provided in 16"x96" cavity cut pieces, or full 4'x8' pieces as required per the installation. Special insulation thicknesses or piece sizing is available upon request.

When provided in 16" x 96" pieces, *ThermaDrain® with STYROFOAM* includes our patented Cavity Cut, providing a downward sloping angle on the horizontal joint with square edges on the vertical joints. All 4'x8' boards are provided with square edges on all four sides.

For standard sizing of *ThermaDrain® with STYROFOAM* see chart at right.





TECHNICAL DATA
INSULATION PRODUCT:
Dow STYROFOAM Square Edge Insulation (cavity walls)
Dow STYROFOAM Highload (below grade)
(See Dow Building Materials Commercial Products Selector Guide for specific insulation technical data)

DRAINAGE MAT:
⅜" thick high-impact, non-compressible polystyrene drainage material, commercially laminated to insulation material

***ThermaDrain® with STYROFOAM* standard sizing**

INSULATION THICKNESS	OVERALL THICKNESS	R-VALUE	INSULATION PRODUCT
1"	1⅜"	5.0	Dow Styrofoam
1½"	1⅞"	7.5	Dow Styrofoam
2" Highload*	2⅜"	10.0	Dow Sub-Grade Ext
2" Regular	2⅜"	10.0	Dow Styrofoam
2½"	2⅞"	12.5	Dow Styrofoam
3"	3⅜"	15.0	Dow Styrofoam

**2" Highload for below-grade applications, and provided in 4'x8' sheets only. All other products are provided in either 4'x8' sheets or 16"x96" pieces.*

TESTING
A testing program was developed to determine the effectiveness of a *ThermaDrain® with STYROFOAM* wall system in comparison to a standard cavity wall system. Walls for this study were tested in accordance to ASTM E514 "Test Method for Water Permeance of Masonry". Walls were constructed unsupervised to simulate field conditions and to allow normal amounts of mortar droppings and extrusions to accumulate in the wall. Flashings were property installed at the base of each wall to facilitate the collection of water.

The results of the study indicate that the *ThermaDrain® with STYROFOAM* wall system substantially outperformed the standard cavity wall system and exhibited nearly 400% more drainage capability. See Table 1 below for a summary of the results of this study. For a complete copy of the test results please contact *ThermaDrain®.*

	TEST WALL WITH THERMADRAIN	TEST WALL WITH 3" CAVITY AND PEA GRAVEL
First visible water on cavity side of brick	6 minutes	7 minutes
Appearance of flowing water on cavity side of brick	14 minutes	16 minutes
Water passing through weephole at the brick wythe face:		
- At 3 hours	3.4 gal/hr	.52 gal/hr
- At 72 hours	4.1 gal/hr	1.06 gal/hr

Table 1: Test Results

5. Installation
The method of installation for *ThermaDrain® with STYROFOAM* is similar to the installation of standard rigid insulation board used in cavity wall construction. However, the following procedures and precautionary measures must be followed during installation to achieve the desired results and successful performance of the *ThermaDrain® with STYROFOAM* wall system:

1. For concrete masonry backup walls, remove all mortar droppings from the face of the concrete masonry backup to ensure direct and flush contact between the *ThermaDrain® with STYROFOAM* and the backup wythe.

2. For 16"x96" pieces: Install the *ThermaDrain® with STYROFOAM* between the wall ties, with the cavity cut sloping downward and the vertical joints butted tightly together. The black drainage mat must face the wall exterior. Any building wrap or other air or vapor barriers should be installed on the interior side of the *ThermaDrain® with STYROFOAM.* Flashing should be terminated behind the *ThermaDrain® with STYROFOAM*

3. For 4'x8' sheets: Install the *ThermaDrain® with STYROFOAM* against the exterior sheathing with the black drainage mat facing the wall exterior. Any building wrap or other air or vapor barriers should be installed on the interior side of the *ThermaDrain® with STYROFOAM.* All edges (horizontal and vertical) should be tightly butted together. Flashing should be terminated behind the *ThermaDrain® with STYROFOAM.*

4. If the interior wall structure is metal studs, all masonry anchors should be installed directly through the *ThermaDrain® with STYROFOAM* and as directed by the anchor manufacturer. 4'x 8' sheets should be used for easy installation.

5. If the bed joints and head joints of the insulation are set into a bead of NP-1 sealant, and the insulation is sealed to the window frames, an air permeance of .0062 of cfm/ft² of the assembly can be obtained. Contact ThermaDrain for a copy of this report.

6. No more than 1"and no less than 3/8", of space should be left between the face of the *ThermaDrain® with STYROFOAM* and the back of the outer wythe of masonry (tolerance space).

7. For exterior corner conditions, use tape or sealant on the end joint. Tape or sealant can be used between any vertical or horizontal joint if desired for maximum protection.

8. Use *ThermaDrain® with STYROFOAM* only in walls that contain properly installed flashing. The flashing is to be terminated behind the *ThermaDrain® with STYROFOAM* board.

9. All field adjustments required for the alteration of size or shape of *ThermaDrain® with STYROFOAM* must be performed with a power table saw. The top slope of the board (cavity cut) is not to be removed.

10. Do not allow the *ThermaDrain® with STYROFOAM* to be exposed to the elements for longer than sixty (60) days.

6. Availability and Cost
ThermaDrain with Styrofoam is available through a nationwide network of masonry and building supply distributors.

7. Warranty
The recommendations and properties attributed to the products are based upon what is believed to be reliable information. We warrant our materials to be of good quality and will replace unused material proven to be defective. No expressed or implied warranty of installed material is made because satisfactory results depend not only on product quality but also upon factors that are beyond our control.

8. Maintenance
No maintenance is required after proper installation.

9. Technical Services
Contact the manufacturer for any required technical services. Details and suggested application drawings are available on each individual product data sheet. ThermaDrain Material Safety Data Sheets should be read and understood by all personnel before using the products.

10. Filing Systems
Product information is available from the manufacturer in the following formats:

- Complete ThermaDrain Inc. product line catalog in printed and CD format
- Online access to all data sheets at: www.thermadrain.com

WRITTEN SPECIFICATION
The written specification for *ThermaDrain® with STYROFOAM* is:

1. The masonry cavity wall insulated drainage board shall be *ThermaDrain® with STYROFOAM,* sized as indicated on the drawings. The product shall be a combination of extruded polystyrene insulation bonded with a 3/8" high impact styrene drainage panel integrated with a non-woven fabric, all products bonded by the manufacturer.

2. The *ThermaDrain® with STYROFOAM* shall be provided as shown on the drawings, or as required so that no more than a 1" tolerance space and no less than a 3/8" tolerance space is present. The tolerance space shall be equivalent to the total cavity dimension, less the overall thickness of the *ThermaDrain® with STYROFOAM* being used.

3. Products that alter the original state of the insulation or do not provide a drainage panel bonded by the manufacturer and as stated above shall not be allowed.

4. The product shall be *ThermaDrain® with STYROFOAM* and available through local distributors. Contact ThermaDrain, Inc. at 800-837-4065 for a complete list of local distributors.