



Dow Building Solutions

## Insulating basements with STYROFOAM™ Solutions



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# Design considerations

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## Introduction

Structures below ground must prevent ground water reaching the interior of a building in order to maintain suitable internal conditions (see BS 8102: 2009 for gradings).

A common way of providing waterproofing is to use externally applied tanking membranes of mastic asphalt or bituminous sheet. In such constructions insulation can be located outside the waterproofing, where it will:

- insulate the structure
- protect the tanking material from physical damage caused by the rest of the construction process or by the backfill material
- drain water away from the structure, reducing the hydrostatic pressure on the tanking membrane.

When externally insulating basement walls the insulation boards are laid against the tanking membrane and the excavation is then backfilled (**Figure 1**).

The construction is suitable for new build; it is also suitable for refurbishment projects. For guidance on constructing basements consult the Approved Document: Basements for dwellings.

## STYROFOAM™-A and PERIMATE™ DI-A

STYROFOAM™-A products use carbon dioxide as the main blowing agent - the Ozone Depletion Potential (ODP) is zero and the Global Warming Potential (GWP) is less than five.

**The STYROFOAM™-A Solution for externally insulating basement walls is PERIMATE™ DI-A.**

PERIMATE™ DI-A is designed to give maximum benefit when insulating structures below ground. It has:

- shiplapped edges to ensure continuity of insulation
- vertical channels cut in the face of the board to help drain water away
- a thin layer of filter fabric bonded to the surface to help prevent soil particles blocking the channels.

**For the full physical properties and performance characteristics of PERIMATE™ DI-A see separate guide: STYROFOAM™ performance, product overview and references.**

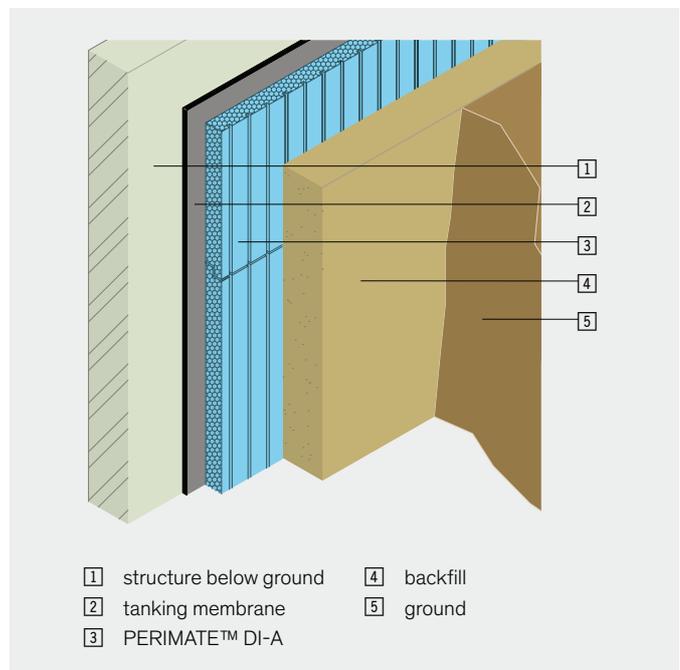


Figure 1: Principles of insulating structure below ground

## Drainage

Water collecting at the base of the PERIMATE™ DI-A boards must be drained away by filter drains formed with perforated or porous pipes laid above the footings or collector drains formed from perforated pipes laid in granular material (**Figure 2**). Depending upon ground conditions drains may be connected to surface drainage systems or soakaways.

## Thermal performance

Methods for calculating U-values for basements are given in BS EN 13370: 2007 and the Approved Document 'Basements for dwellings'. For assistance with U-value calculations contact Dow Building Solutions by calling 08707 104 553 or by emailing [fkitech@dow.com](mailto:fkitech@dow.com).

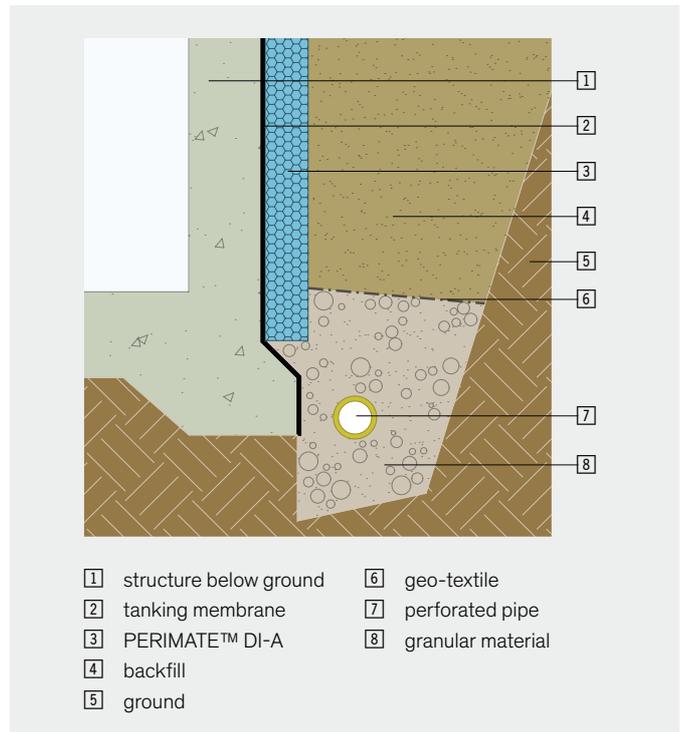


Figure 2: Drainage by collector drain

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# Installation methods

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## Installation sequence

- 1 Install the tanking membrane according to manufacturer's instructions.
- 2 Lay the drainage system.
- 3 Install PERIMATE™ DI-A insulation against the tanking membrane, with the grooved face outward and running vertically, using a suitable adhesive such as INSTA-STIK™ from Dow Building Solutions.
- 4 Backfill to the designated level.

## Key points

- ensure boards butt together tightly
- when installing more than one row of boards ensure the filter fabric on upper rows laps over that of lower rows.

## Recommendations

STYROFOAM™ products include FLOORMATE™, and PERIMATE™.

XENERGY™ products contain a flame retardant additive to inhibit accidental ignition from a small fire source. XENERGY™ is however, combustible and if exposed to an intensive fire may burn rapidly.

During shipment, storage, installation and use XENERGY™ products should not be exposed to flames or other ignition sources.

Fire classification is based on small scale tests, which may not reflect the reaction of the products in its end use state under actual fire conditions. XENERGY™ products should, when installed, be adequately protected from direct exposure to fire.

Recommendations about the methods, use of materials and construction details are given as a service to designers and contractors. These are based on the experience of Dow with the use of XENERGY™ products. Any drawings offered by Dow are meant only to illustrate various possible applications and should not be taken as a basis for design. Since Dow is a materials supplier and exercises no control over the installation of XENERGY™ products, no responsibility is accepted for such drawings and recommendations.

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Visit [www.dowxenergy.co.uk](http://www.dowxenergy.co.uk) for further information on XENERGY™ SL insulation products as well as adhesives and sealants from Dow Building Solutions. For technical enquiries email [FKLTECH@dow.com](mailto:FKLTECH@dow.com).

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