XPS Basement

Below Ground Insulation - Technical Data Sheet

Sundolitt XPS Basement Insulation is ideal for use below ground to insulate the floors and walls. XPS has very low water absorption ensuring long term performance below ground, even when installed below the water table.

With excellent thermal performance and high strength XPS can be used outside the basement construction providing continuous insulation below the foundations to prevent cold bridging.

XPS Benefits

- High compressive strengths up to 700 kPa
- Excellent thermal insulating properties
- Resistant to freeze/thaw
- Flame Retardant available
- ODP = 0 GWP = <5
- Rated A in BRE Green Guide
- Fully Recyclable

Standard Sizes Available		
Dimensions (mm)	Length	Width
Rebated Edge	2385	585
Square Edge	2400	600

Thickness	30, 40, 50, 60, 75, 80, 100, 120, 130, 140, 150 and 160mm

Design Considerations

The main factor for consideration in the design of a basement is the depth below ground. This will affect the type and thickness of Sundolitt XPS used.

Hydrostatic pressures increase with the depth below ground. This results in higher strength XPS required when placing the insulation on the outside of the basement construction.

The thermal performance of the basement includes the walls and floor together. This is factored by the depth below ground. The deeper the basement the less insulation is required as the ground will have an insulating effect.

Sundolitt XPS has exceptional high strength and can be installed outside the basement structure to create a whole insulation envelope. XPS is also resistant to hydrostatic pressures deep below ground.

Further information and guidance on the design of basements can be found on The Basement Information Centre (TBIC) website - https://www.basements.org.uk/

Benefits of Building Below Ground

Incorporating a basement into the building design adds extra space to new or existing buildings without increasing its footprint.

Historically basements were viewed as cold, damp, dark spaces fit only for use as storage or left empty. Times have changed and more modern materials have been developed to overcome the issues encountered.

Using XPS insulation along with the advanced tanking membranes now available helps to create a warm modern habitable space. Increasing the value of the property and enabling extension of the living space without compromising land space.

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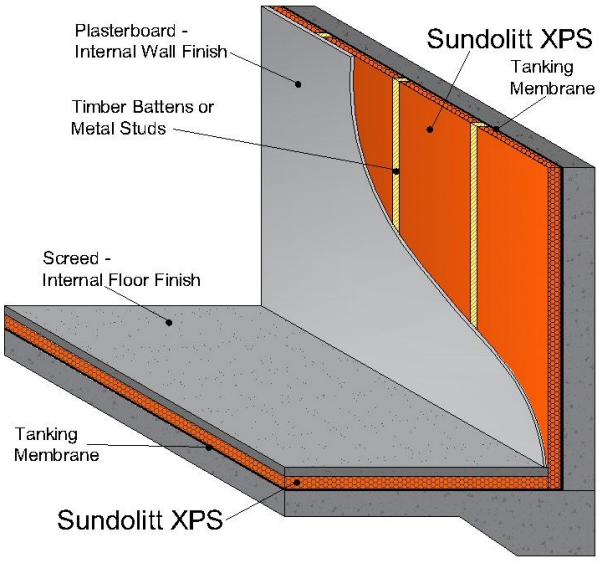
Insulating Internally

The simplest method of insulating a basement is to install the insulation on the inside of the structure.

In every installation a continuous insulation envelope is required to reduce he risk of condensation due to cold spots resulting from thermal bridging.

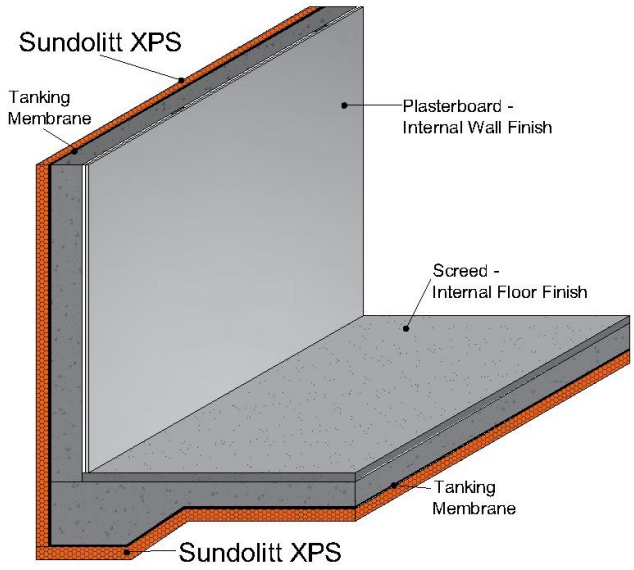
XPS is installed on the inside of the tanking membrane and should also have a vapour control layer on the inside of the insulation. This reduces the risk of interstitial condensation.

The XPS is placed against the wall installed between timber battens or metal studs at 600mm centres. The 12.5mm vapour control plasterboard is then fixed over the insulation into the battens/studs.



XPS insulation boards are placed over the tanking membrane on the floor with a vapour control layer installed over the insulation. An appropriate floor surface is then placed over. This may be screed, chipboard, plywood or OSB of suitable thickness for the building use.

With the insulation placed inside the basement structure the XPS is not subject to hydrostatic loads, therefore standard grades are used. XPS 200 is suitable for use vertically on the walls and XPS 200 or XPS 300 on the floor dependant on the strength required to withstand in-use loading.



Insulating Externally

By placing Sundolitt XPS on the outside of the basement structure and outside the tanking membrane helps to protect the structure and water-proofing. XPS is resistant to moisture and remains an effective insulation for the lifetime of the building even when immersed permanently in water.

One benefit from insulating externally is that the thermal mass of the structure can improve the heating efficiency of the inside space. The insulation also protects the structure and membrane from the effects of freeze/thaw, therefore reducing maintenance and extending its lifespan.

XPS is available in strengths up to 700kPa so can be used where high loads are expected from hydrostatic pressure or below the foundations.

Drainage Board

It is recommended that a drainage system is placed against the vertical sides of a basement to reduce water collection and ensure even distribution of the water table. Our XPS Drainage Board is recommended for use in this application. More information can be found within our Technical Datasheet dedicated to this product - follow this link to our website page. https://www.sundolitt.com/en/construction/xps-applications/

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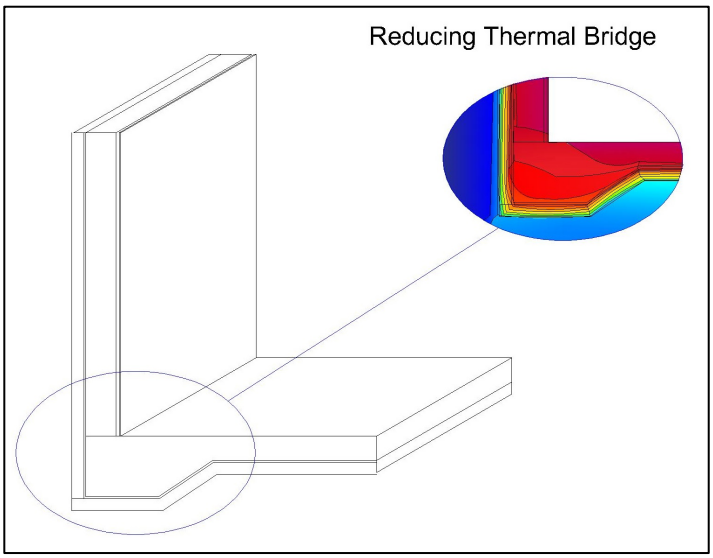
Thermal Performance

When assessing the thermal performance of a basement the whole structure is taken into account.

The calculation in accordance with BR 443 – Conventions for U Value Calculations and BS 13370 – requires the U values of the floor and walls to be included and factored by the depth below ground. The calculation also requires the area of the basement floor and length of exposed perimeter.

Where a basement is built only partially below ground the average depth is calculated.

Sundolitt XPS provides excellent thermal with minimal thickness of insulation. It is easy to install and will continue to insulate for the lifetime of the building.



Thermal Resistance Values (m²K/W)				
Thickness (mm)	XPS200	XPS300	XPS500	XPS700
30	0.909	0.909		
40	1.212	1.212		
50	1.515	1.515	1.471	1.471
60	1.765	1.765	1.765	1.765
75	2.206	2.206		
80	2.353	2.353	2.353	2.353
100	2.778	2.778	2.778	2.778
120	3.077	3.077	3.077	3.077
130	3.333	3.333	3.333	3.333
140	3.590	3.590	3.590	3.590
150	3.846	3.846	3.846	3.846
160	4.103	4.103	4.103	4.103

Environment

Sundolitt XPS is inert and safe to use below ground, even within the water table.

XPS is fully recyclable and can be reclaimed during demolition and processed into new insulation panels.

Accreditation

Sundolitt XPS Flooring is manufactured in accordance with BS EN ISO 13164.

✓ QMS
ISO 9001
Registered Company

✓ EMS
ISO 14001
Registered Company

EPD Certificate – nepd-396-274-EN – demonstrates the excellent environmental performance of Sundolitt XPS which has emissions of 0.0073 kg CO_2 calculated in accordance with ISO 14025.

Sundolitt XPS Basement - Physical Properties				
	XPS200	XPS300	XPS500	XPS700
Design Load at 2% nominal Compression (kPa)	90	140	225	250
Compressive Strength at 10% nominal Compression (kPa)	200	300	500	700
Thermal Conductivity (W/mK) at 50mm thickness	0.033	0.033	0.034	0.034

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