CDM Fibran XPS 500-C

Closed-Cell Slotted Insulation Board

Revision: 2.6 - 15th July 2024
Code: 500C

INTRODUCTION

CDM Fibran XPS 500-C is a 50 mm deep, closed-cell thermal insulation board made from rigid extruded polystyrene foam (XPS). The product is manufactured in accordance with EN 13164 – "Thermal insulation products for buildings - Factory made products of extruded polystyrene (XPS) specification."

Produced exclusively for Newton Waterproofing Systems, CDM Fibran XPS 500-C boards are used to form a 50 mm insulated spacer adjacent to the CDM Basedrain and CDM Floordrain drainage channels within the Newton CDM System for cavity drain waterproofing. It then remains dimensionally stable even when fully immersed. The insulation boards have a heat hardened surface to increase point load capability below studded membranes, feature specifically designed slots to the underside of the boards that in combination with the perimeter and spine drainage channels of System 500, form a fully drained supporting spacer below the floor drainage membrane.

The insulation boards can also be used as a protection for Newton's liquid waterproofing membranes applied externally to new earth retained structures or retained walls. The CDM Fibran XPS 500-C provides protection, insulation and drainage within one product.

KEY BENEFITS

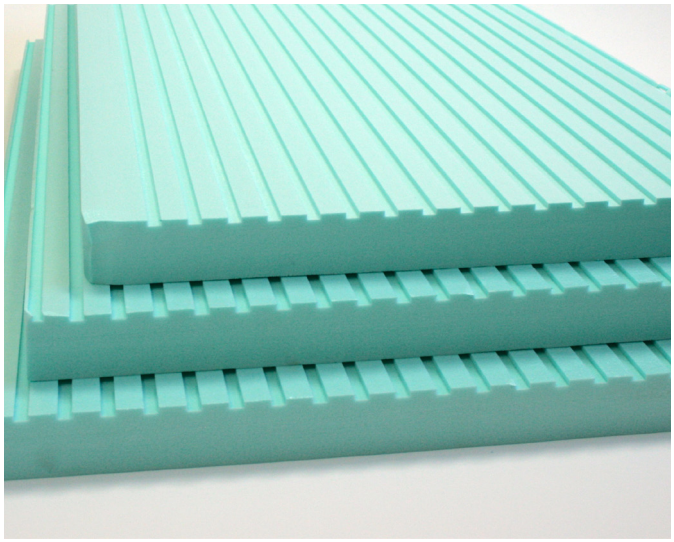
- Third-party tested to confirm the load capability for use below Newton studded, cavity drain membranes
- Excellent thermal insulation characteristics with a very low coefficient of thermal conductivity
- Closed cell structure with no connecting capillaries resulting in extremely high resistance to water absorption and diffusion of water vapour
- Capable of permanent submersion in water
- Fully inert when subjected to climatic variations
- High mechanical and compressive strength and high dimensional stability
- Does not contain CFCs[1], HCFC's[2], PBDEs[3], PFOA[4] or PFCs[5]
- 100% recyclable
- Easy to transport, cut and apply
- Completely rot proof and does not develop any mould or other efflorescence
- No nutritional value for rodents, insects, etc
- Good resistance to acids, alkalines, aggressive ground containments and inorganic gases

TYPICAL APPLICATIONS

- As the spacer below CDM System flooring membranes
- Protection of externally applied Type A waterproofing membranes
- Insulated support below HydroBond 403 Plus waterproofing membrane
- Parking decks and green roofs
- Insulating of subterranean structures sited permanently within the water table

SUITABLE SUBSTRATE

- Compacted, clean, and level surfaces
- Basement concrete floor slabs and rafts
- Earth retained walls of concrete, mortar or ICF
- Compacted blinding



SPECIFICATION

Newton Waterproofing Systems work in partnership with RIBA NBS who publish our products on NBS Source. The platform integrates seamlessly into project workflows, providing all product data from Newton's NBS BIM Objects, NBS Plus Clauses and RIBA Product Selector into one single source of product information.

NBS Source also hosts a large selection of Newton case studies, as well as product literature and certifications.

A wide range of drawings are available on our website.

[1]Chlorofluorocarbons; [2]Hydrochlorofluorocarbons; [3]Polybrominated diphenyl ethers; [4]Perfluorooctanoic acid; [5]Perfluorinated chemicals

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TECHNICAL DATA

Features	Result	Units
Form	Rigid board	
Colour	Green	
Surface	Slotted	
Profile	Square edge	
Density/Specific gravity	0.03	
Board size	50 x 1000 x 600	mm
Board yield	0.60	m^2
Pack size	8	Boards
Pack yield	4.8	m^2

Properties	Result	Units	Test Method
Compressive strength at 10% deformation*	500	kPa	EN 826
Compressive creep over 50 years at < 2% deformation	165	kPa	EN 1606
Service temperature	-50 to +75	°C	
Thermal conductivity**	0.035	W/mk	EN 12667
Thermal conductivity when fully immersed***	0.040	W/mk	EN 12667
Thermal resistance (after 25 years)****	1.29	m^2K/W	EN13164
Water vapour resisitivity	20	MNs/gm	Calculated from μ
Water vapour resistance factor	80	μ	EN13164
Specific heat capacity	1.5	kJ/(kg.K)	
Long term water absorption by immersion*****	0.7	%	EN 12087
Water absorption by diffusion	3	%	EN 12088
Reaction to fire (Euroclass)	Class E		EN 13501-1
Global Warming Potential (GWP)	< 5	kg CO^2 (Eq)	EN 15804

The above data, even if carried out according to regulated tests, are indicative and they may change when specific site conditions vary. *Short term test loads only. **After 25 years. ***When permanently and totally immersed in water for 25 years. **** Calculated using nominal thickness of 45 mm due to grooved surfaces. ***** Smooth surface.

CORRECT DESIGN - FLOTATION RISK

The CDM Basedrain and CDM Floordrain drainage channels that the insulated spacer is placed adjacent to, can develop a maximum of 50 mm of water pressure when at full capacity. To prevent flotation the floor build must exert a force (weight) that is greater than 50 mm of water pressure. The weight is calculated by multiplying the density of the floor elements by the height of the floor elements. For example:
65 mm of Screed - Screed density is 1.7. Multiply by the thickness: 1.7 x 65 mm = 110 mm. The downward force of the weight of screed is more than twice the upward thrusting force of the water pressure and so flotation cannot occur.
18 mm of T&G Chipboard - Chipboard density is 0.65. Multiply by the thickness: 0.65 x 18 mm = 11.7 mm. The downward force of the weight of chipboard is not sufficient to prevent flotation. To prevent flotation, addition downwards force is required, which can be achieved by mechanically fixing the boards to the slab with Newton Insulation Fixings (Product Code IF90), 5 fixings per board, one at 100 mm in from each corner and one in the centre of the board. Further information can be found within this paper.

CORRECT DESIGN - LOAD CAPABILITY

The long term compressive load capability of the CDM Fibran XPS 500-C is 165 kPa, which is 16.8 metric tonnes per square metre. Where Newton CDM System Floor membranes are placed above the insulation, as shown in the Typical Detail on page 3, the reduced lower surface area of the membranes create localised point loadings. This lowers the compressive load capability of the insulation board. Newton have tested the safe load for the floor membranes when used above the CDM Fibran XPS 500-C, to ensure that the insulation board is never compressed by the imposed point-loads by more than 2% over 50-years, to comply with EN 1606.

The safe permanent compressive loads through the Newton floor membranes are:

- **Newton CDM 508** *eco* **Floor** - 50 kPa = 5.0 tonnes/m^2
- **Newton CDM 508R** - 35 kPa = 3.5 tonnes/m^2
- **Newton CDM 520** *eco* - 45 kPa = 4.5 tonnes/m^2

Where higher loads are required, a localised concrete plinth will need to be used to transfer the load through the slab or raft. Further information can be found within this paper.

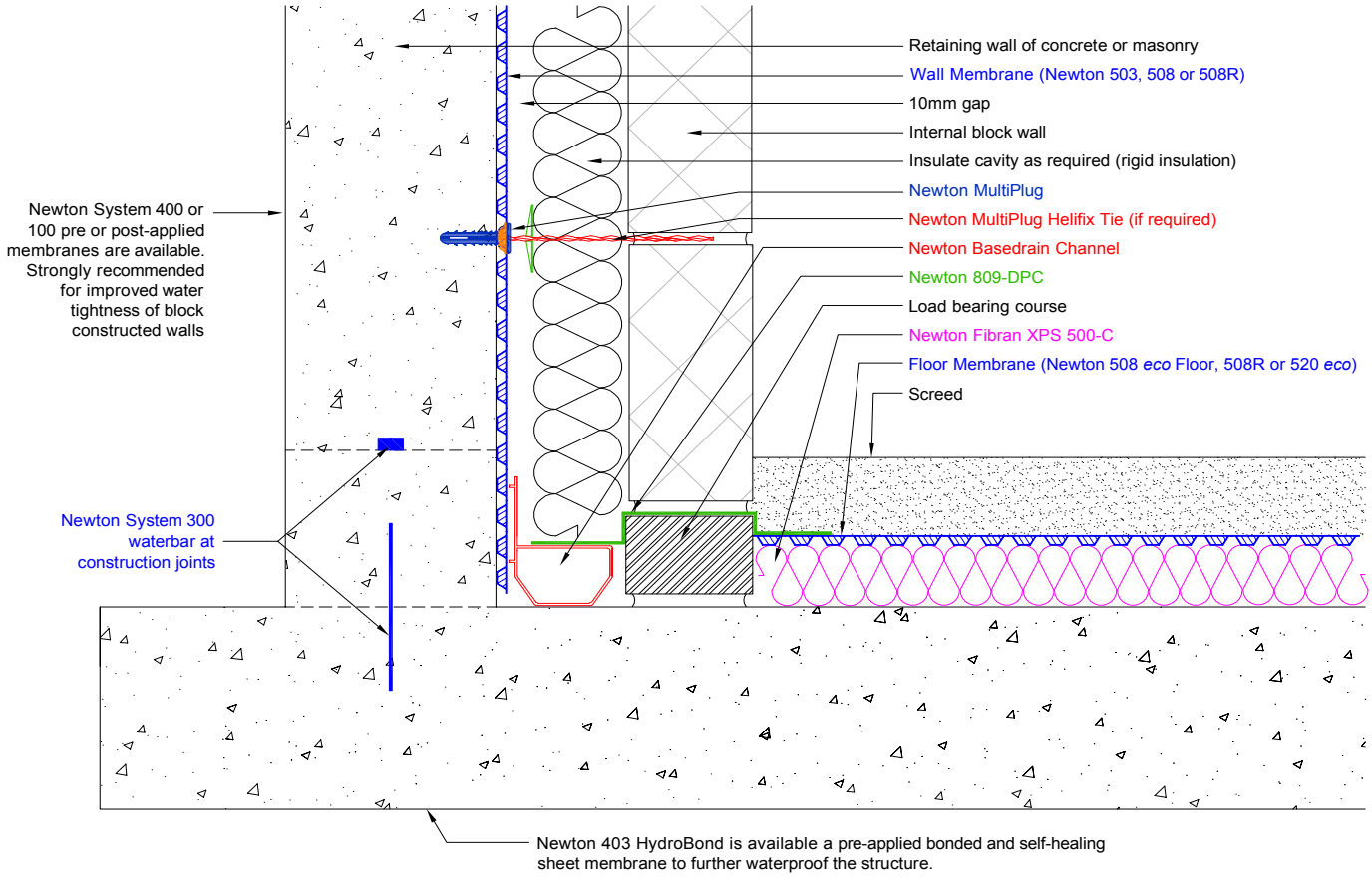
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TYPICAL DETAIL

The drawing below shows a typical CDM System application where the floor membrane is supported above the CDM Fibran XPS 500-C to ensure the membrane is above the height of the CDM Basedrain channel sited within the cavity.



COLOUR

Green

ANCILLARIES

Newton Insulation Fixings - Box of 200 - Code IF90

TOOLS REQUIRED

Saw, knife or hot wire device.

TRAINING AND COMPETENCY OF THE USER

When used as the spacer within CDM System, the insulation should be installed by or under the supervision of the NSBC registered contractor who is installing the waterproofing system.

Other applications do not need specialist training.

INSTALLATION

- The shrink film should be removed immediately before application of CDM Fibran XPS 500-C
- Stagger boards
- Cut to size with a saw, knife or hot wire device

LIFE EXPECTANCY

When specified, installed and protected in accordance with the Data Sheet, fully and permanently isolated from UV light and physical damage or wearing, and only to those substrates confirmed within this Data Sheet, CDM Fibran XPS 500-C has a service life that can be equal to the design life of the structure (estimated 50 years).

LIMITATIONS

- Sensitive to materials containing solvents
- Possible incompatibility with some adhered PVC waterproofing membranes - please test prior to application

PACKAGING

- Each sheet of CDM Fibran XPS 500-C is wrapped in shrink film, and measures 50 mm x 1000 mm x 600 mm in size (0.60m^2)
- One pack of Fibran XPS 500-C contains 8 sheets (4.8m^2)

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STORAGE

CDM Fibran XPS 500-C boards can be stored outdoors, on a clean and smooth surface, or in an enclosed, ventilated space. They are insensitive to rainwater and snow, but not to ultraviolet radiation. The shrink film is UV resistant for up to 6 months. After this period the boards should be protected against UV with a protective blanket.

CDM Fibran XPS 500-C boards should be stored away from flammable materials, fire or other ignition sources. The boards should not come into direct contact with high concentrations of solvents such as gasoline, coal tar and formic acid, or gases such as methane, ethane, propane and butane.

NOTE: When installed, the boards are unaffected by diluted solvents within contaminated ground water or naturally occurring ground gasses. The appearance or structure may become damaged when stored in direct contact with mineral and vegetable oils, paraffin, phenol, and fats.

SHELF LIFE

The product has an unlimited shelf life if stored internally or protected against contact with UV light by a tarpaulin or similar. If stored externally, without UV protection, the shelf life is six months.

HEALTH & SAFETY

Use appropriate PPE for the environment the system is installed within. Use products only as stated within this Data Sheet and the MSDS.

During the cutting of boards, always use respiratory protective masks and eye protection.

CE 15

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FIBRAN XPS 500-C
EN 13164:2012+A1:2015
0856
Thermal insulation products for buildings. Factory made extruded polystyrene foam (XPS) products

Essential characteristics to BD EN 13164:2012+A1:2015	Test Standard & Conditions	Result	Unit of Measure	Harmonised Technical Specification
Thickness		50	mm	EN 13164:2012+A1:2015 :2012+A1:2015
Declared Compressive Strength at 10% deformation		500		
Compressive Creep over 50 years at < 2% deformation		165		
Declared thermal conductivity λD (after 25 years) - 50 mm		0.035		
Declared thermal resistance RD (after 25 years) - 50 mm		1.29	$(M^2/K)/W$	
Dimensional tolerances		1 mm	mm	
Tensile strength perpendicular to faces		NPD		
Reaction to fire (Euroclass)		Class E		
Continuous glowing combustion		NPD		
Acoustic absorption index		NPD		
Water permeability - longterm water absorption - by immersion		0.7	%	
Water permeability - long term water absorption - by diffusion		5	%	
Water vapour diffusion resistance		80	μ	
Durability of compressive strength against ageing / degradation - compressive creep		NPD		
Durability of thermal resistance against heat, weathering, ageing / degradation		NPD		
Durability of rection to fire against heat, weathering, aging / degradation		No Change in reaction to fire properties for 500 C		

Any specification/advice provided is only valid if used with products supplied by John Newton and Company Ltd (trading as Newton Waterproofing Systems). Newton Waterproofing Systems reserve the right to update product literature at any time. Please always refer to our website for the latest versions.

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