

System 500

NEWTON FIBRAN XPS 500-C

Closed-Cell Slotted Insulation Board

Rev 2.0 - 27 July 2020

PRODUCT CODE - 500C

INTRODUCTION

Newton 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, Newton Fibran XPS 500-C boards are used to form a 50 mm insulated spacer adjacent to the [Basedrain](#) and [Floordrain](#) drainage channels within the [Newton System 500](#) cavity drain waterproofing system, where it remains dimensionally stable even when fully immersed. The insulation boards have a heat hardened surface to increase point load capability below studded membranes and feature specifically designed slots to the underside of the boards, that in combination with the perimeter and spine drainage channels of Newton 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 System 100](#) liquid applied waterproofing membranes applied externally to new earth retained structures or retained walls, providing protection, insulation and drainage within one product.

KEY BENEFITS

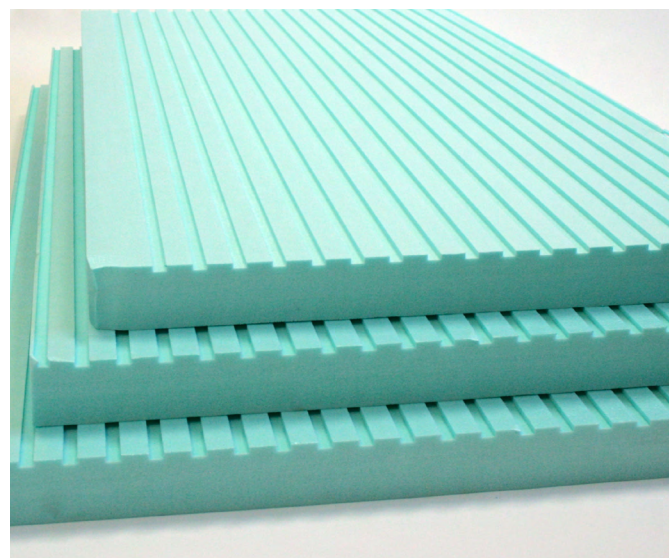
- Third-party tested to confirm the load capability for use below Newton studded, cavity drain membranes
- Excellent thermal insulation characteristics with a very low coefficient of thermal conductivity
- Closed cell structure with no connecting capillaries resulting in extremely high resistance to 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 CFCs¹, HCFC's², PBDEs³, PFOA⁴ or PFCs⁵
- 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 Newton System 500 flooring membranes
- Protection of externally applied Type A waterproofing membranes
- Insulated support below [Newton 403 HydroBond](#) 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](#).

¹Chlorofluorocarbons; ²Hydrochlorofluorocarbons; ³Polybrominated diphenyl ethers; ⁴Perfluorooctanoic acid; ⁵Perfluorinated 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 ² K/W	EN13164
Water vapour resistance	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 Basedrain and 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 of the floor 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 Newton Fibran XPS 500-C is 165 kPa, which is 16.8 metric tonnes per square metre.

Where Newton Floor membranes are placed above the XPS, as shown in the Typical Detail on page 3, the reduced lower surface area of membranes create localised point loadings, lowering the compressive load capability of the insulation board.

Newton have tested the safe load for the floor membranes when used above the 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 508 eco Floor** - 50 kPa = 5.0 tonnes/m²
- **Newton 508R** - 35 kPa = 3.5 tonnes/m²
- **Newton 520 eco** - 45 kPa = 4.5 tonnes/m²

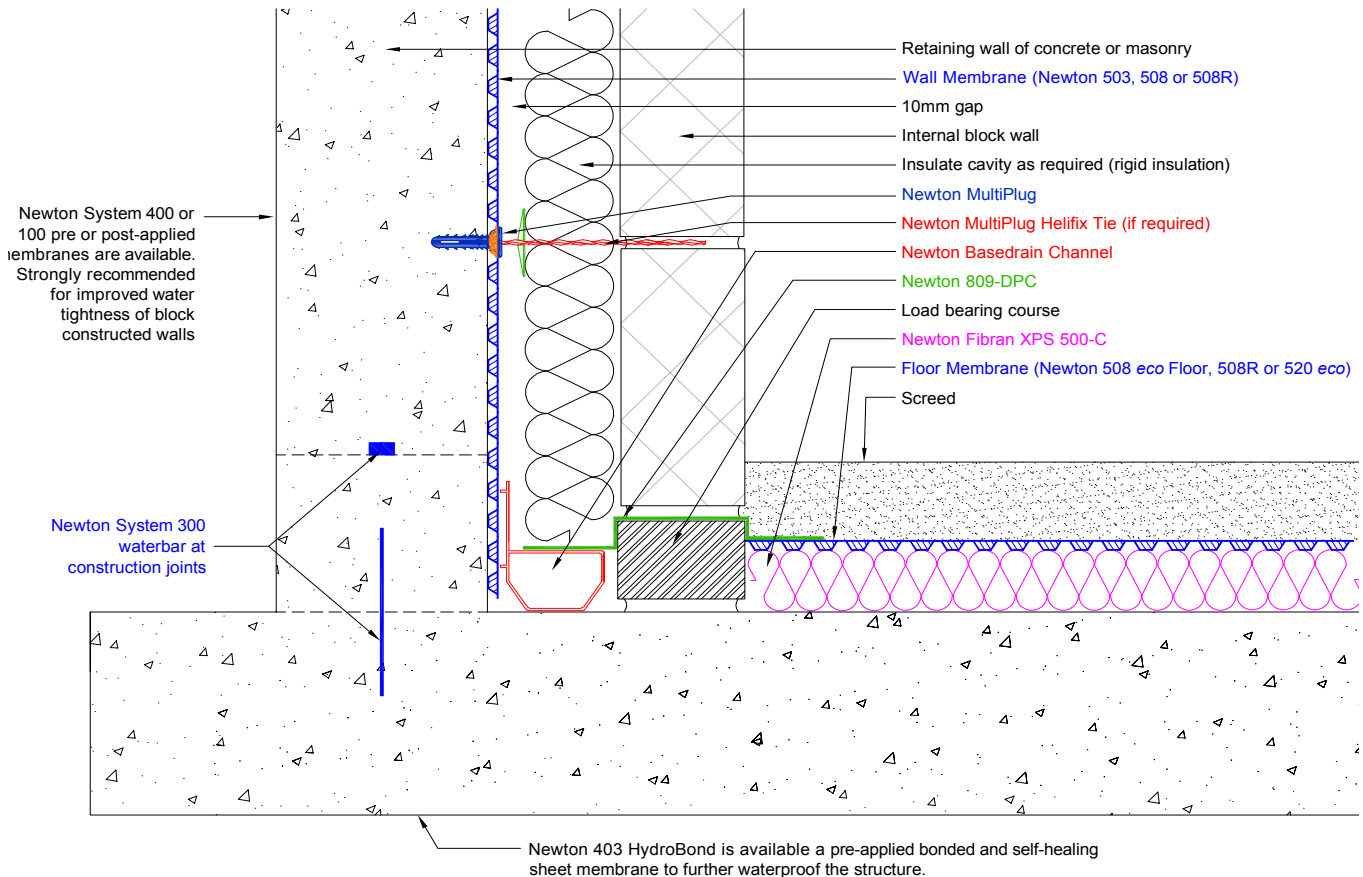
Where higher loads are required, a localised concrete plinth will need to be used to transfer the load through the slab or raft. Further information can be found [within this paper](#).

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TYPICAL DETAIL

The drawing below shows a typical Newton System 500 application where the floor membrane is supported above the Newton Fibran XPS 500-C to ensure the membrane is above the height of the Basedrain drainage 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 Newton System 500, the insulation should be installed by or under the supervision of the Newton 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 Newton 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, Newton 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 PVC waterproofing membranes

PACKAGING

- Each sheet of Newton Fibran XPS 500-C is wrapped in shrink film, and measures 50 mm x 1000 mm x 600 mm in size (0.60m²)
- One pack of Fibran XPS 500-C contains 8 sheets (4.8m²)

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STORAGE

Newton 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.

Newton Fibran XPS 500-C boards should be stored away from flammable materials, fire or other ignition sources.

The boards should not come in to contact with solvents such as gasoline, coal tar and formic acid, or gases such as methane, ethane, propane and butane.

The appearance or structure may become damaged when in 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.

	 <p>Newton Waterproofing Systems Newton House 17-20 Sovereign Way Tonbridge Kent TN9 1RH</p>	<p>Fibran XPS 500-C EN 13164:2012+A1:2015 0856 Thermal insulation products for buildings. Factory made extruded polystyrene foam (XPS) products</p>
Thickness	50 mm	
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	
Tensile strength perpendicular to faces	No performance data	
Reaction to fire (Euroclass)	Class E	
Continuous glowing combustion	No performance data	
Acoustic absorption index	No performance data	
Water permeability - long term 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	No performance data	
Durability of thermal resistance against heat, weathering, ageing/degradation	No performance data	
Durability of reaction to fire against heat, weathering, ageing/degradation	No change in reaction to fire properties for XPS products	

Newton Waterproofing Systems reserve the right to update product literature at any time. Please always refer to our [website](http://www.newtonwaterproofing.co.uk) for the latest versions.