

System 400

NEWTON 403 HYDROBOND®

Externally Applied Waterproofing Membrane

Rev 5.3 - 07 November 2018

PRODUCT CODES - HB & HBGB

INTRODUCTION

Newton 403 HydroBond® is a high performance, self-healing, composite sheet membrane, available in two variants, with Newton HydroBond-GB adding ground gas resistance (in compliance with BS 8485:2015) as well as the exceptional waterproofing capabilities of the standard membrane. When fitted above the raft support or to wall formwork, the membrane locking fleece is fully encapsulated into the newly placed concrete, becoming fully-engaged to prevent water tracking. If the waterproof LDPE layer is punctured, the exposed hydrophilic coating expands, preventing water ingress, effectively sealing small holes that may be accidentally formed during fixing of the reinforcing steel or the placing and compaction of the concrete.

Newton 403 HydroBond provides a complete waterproof envelope to the structure to achieve Type A (barrier) waterproofing suitable for Grades 1, 2 and 3 as defined by BS 8102:2009, and is suitable for all below ground and earth-retained structures from domestic basements to the largest civil engineering projects. Both variants can be used as part of the HydroBond® System in conjunction with [Newton 108 HydroBond-LM](#), which is sprayed to the exposed walls of the basement after the temporary formwork is removed. Where space is tight, [Newton 109-LM](#) can be applied by roller or brush or small airless spray machine.

Newton 403 HydroBond can be used alongside other Newton products to provide a co-ordinated and combined approach to the waterproofing of the whole structure that includes protection against water ingress to the deck, through construction joints, through and around service entries and to movement joints.

Correctly protected, the Newton HydroBond System will provide, under normal service conditions, a durable waterproof barrier for the life of the building to which it is installed; the expected lifetime of the building itself should be at least 60 years. The Newton HydroBond system is supported by BDA Agrément Certificate BAB 17-031/04/A and is accepted by the NHBC as a suitable waterproofing system for Type A Waterproofing to Grades 1, 2 & 3 according to BS 8102:2009.



KEY BENEFITS

- Agrément certificated and NHBC accepted waterproofing system
- Full mechanical bond to concrete prevents water migration between membrane and structure
- Hydrophilic layer provides self-healing of punctures to the membrane
- Very flexible - Resistant to movement and fissures in substrates
- The HydroBond System completely encapsulates the structure
- Excellent resistance to the high alkalinity of concrete
- Third-party test certification for radon, carbon dioxide and hydrocarbon gases

TYPICAL APPLICATIONS

As a continuous membrane to permanent raft and wall formwork such as the raft blinding and piled walls of reinforced concrete earth-retained structures.

SUITABLE SUBSTRATE

RAFT OR SLAB

- Concrete blinding
- Compacted type 1 hardcore
- Compacted sand

The following can be placed above the blinding or hardcore prior to the installation of 403 HydroBond:

- Void former
- Clay heave board
- Closed-cell flooring grade insulation
- [Newton 410 GeoDrain](#)

WALL FORMWORK

- Existing structure
- Secant or contiguous concrete piles
- Metal sheet piles
- Diaphragm walls
- King post wall
- Sufficiently stable ground such as clay or chalk
- Temporary timber shuttering/formwork

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TECHNICAL DATA

Performance	403	403-GB	Units	
Colour	White/Dark Blue	White/Light Blue		
Material	Composite*		mm	
Width	1.00	1.50	m	
Length	20.00		m	
Area	20.00	30.00	m²	
Thickness	1.60	1.74	mm	
Density	1.215	1.410	g/m²	
Packaged weight	24.3	42.3	kg	
Shelf life	12		Months	
Application temperature	-10 to +40		°C	
Installed Performance	403	403-GB	Units	Test Method
Service temperature	-40 to +100		°C	Manufacturer test
Adhesion to concrete	0.4	0.4	N/mm²	
Elongation at break (Machine)	20	57.4 (± 3.86)	%	DIN EN 12311-2
Elongation at break (Traverse)	50	81.7 (± 7.79)	%	DIN EN 12311-2
Tensile strength (Machine)	> 250	411 (± 15)	N/50 mm	BS EN 12311-2
Tensile strength (Traverse)	> 200	695 (± 16.4)	N/50 mm	BS EN 12311-2
Resistance to static loading - 20 kg load	Watertight			BS EN 12730
Resistance to impact – AI plate - 200 mm drop	Watertight	N/A		BS EN 12310-1 - Method 1
Resistance to impact – EPS panel - 500 mm drop	Watertight	N/A		BS EN 12310-1 - Method 1
Resistance to impact – AI plate - 250 mm drop	N/A	Watertight		BS EN 12310-1
Resistance to impact – EPS panel - 1750 mm drop	N/A	Watertight		BS EN 12310-1
Joint strength - Glued seam	> 100	409	N/50 mm	BS EN 12311-2
Resistance to tearing - Nail shank – MD**	> 150	518	N	BS EN 12310-1
Resistance to tearing - Nail shank – Across	> 150	470	N	BS EN 12310-1
Resistance to fire	Euroclass E			BS EN 13501-1
Water vapour diffusion resistance – S _d value	68	1000	m	BS EN 1931 - Method B
Water vapour diffusion resistance – μ value	42500	574713	μ	Calculated from S _d value
Water vapour diffusion resistance	340	5000	MNs/g	Calculated from S _d value
Water tightness - 2 kPa for 24 h	Watertight			BS EN 1928 – Method A
Water tightness - 400 kPa for 72 h	Watertight			BS EN 1928 – Method B
Resistance against chemicals - 23°C for 12 weeks	Watertight			DIN EN 1847
Resistance against chemicals - 2 kPa for 28 days	Watertight			BS EN 1928 / DIN EN ISO 291-23/50-2
CO ₂ gas diffusion resistance	Not tested	8.38 x10 ⁻⁷	m²/s	Rilem Report 12***
CO ₂ permeability – Membrane	Not tested	1.94	ml/(m²/d/atm) ⁻¹	ISO 15105-1:2007 to BS 8485:2015
CO ₂ permeability – Joint	Not tested	251	ml/(m²/d/atm) ⁻¹	ISO 15105-1:2007 to BS 8485:2015
CO ₂ permeability – Combined Average****	Not tested	24.4	ml/(m²/d/atm) ⁻¹	ISO 15105-1:2007 to BS 8485:2015
Radon gas diffusion resistance – Membrane	Not tested	1.0 x10 ⁻¹²	m²/s	K124/02/95
Radon gas diffusion resistance – Joint	Not tested	1.5 x10 ⁻⁹	m²/s	K124/02/95
Methane permeability – Membrane	Not tested	0.44	ml/(m²/d/atm) ⁻¹	ISO 15105-1:2007 to BS 8485:2015
Methane permeability – Joint	Not tested	190	ml/(m²/d/atm) ⁻¹	ISO 15105-1:2007 to BS 8485:2015
Methane permeability – Combined Average****	Not tested	17.5	ml/(m²/d/atm) ⁻¹	ISO 15105-1:2007 to BS 8485:2015
Durability against thermal ageing - 70°C for 12 weeks	Not tested	Watertight		BS EN 1926
Durability against thermal ageing - 2 kPa for 24 hours	Watertight			DIN EN 1928 / DIN EN ISO 291-23/50-2
Compatibility with Bitumen - 70°C / 28 days	Not tested	Watertight		BS EN 1548 / BS EN 1928
Compatibility with Bitumen - 2 kPa / 24 hours	Watertight			BS EN 1928 / DIN EN ISO 291-23/50-2
Swelling capacity at 20°C - Linear	28		%	BS ISO 1817
Swelling capacity at 20°C - By volume	111		%	BS ISO 1817
Swelling capacity at 5°C - Linear	12		%	BS ISO 1817
Swelling capacity at 5°C - By volume	39		%	BS ISO 1817

*Composite of LDPE, self-healing polymer, polypropylene backing. Aluminium included within GB (gas barrier) version. **Machine Direction. ***Vinci Technology Centre UK Limited – In house Test Procedure TP950/05/13569. **** According to BS 84851 article 7.2.4 the gas resistance rate is ruled by the methane result, as stated in Note 1 to this article: A methane gas transmission rate of <40.0 ml/day/m²/atm (average) for sheet and joints (tested in accordance with the manometric method in BS ISO 15105-1) is usually considered sufficient.

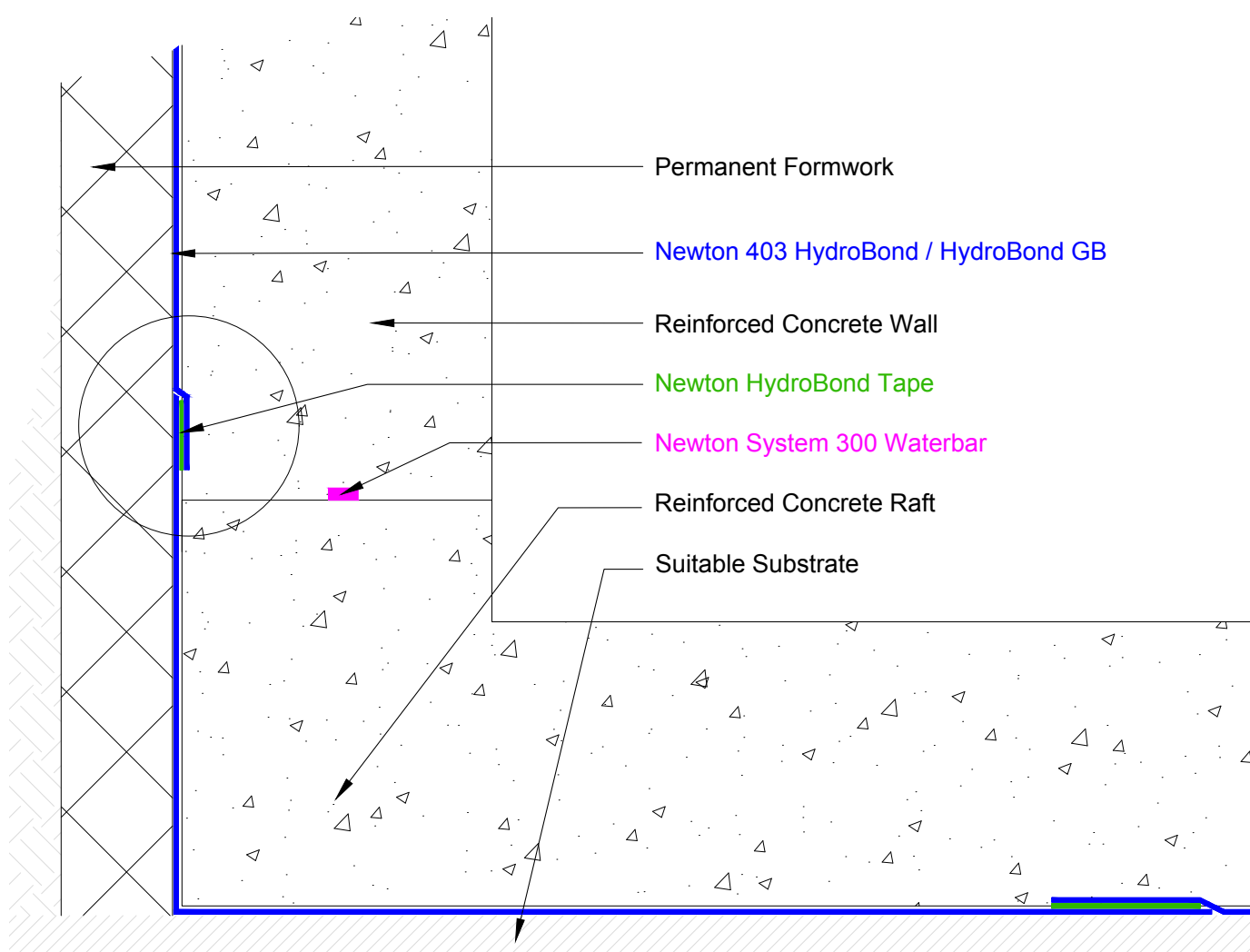
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Performance	HydroBond Tape	HydroBond Gas Tape	Units
Product code	HBT	HBGT	
Colour	White/Dark Blue	White/Light Blue	
Material	Composite		
Width	75	300	mm
Length	20.00	20.00	m
Area	1.5	6	m ²
Thickness	1.60	1.74	mm
Density	1.215	1.410	g/m ²
Packaged weight	0.5	15.6	kg
Shelf life	12		Months
Application temperature	-10 to +40		°C

TYPICAL DETAIL

Full HydroBond System showing Newton 403 HydroBond below the RC raft and between the permanent formwork and the new RC wall. The building is fully encapsulated by the membrane. If a defect occurs during application: a) the defect will heal thanks to the swelling polymer of the inner core, and b) water cannot track because the fleece inner core of the membrane is fully and monolithically adhered to the concrete.



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SPECIFICATION

Newton Waterproofing Systems are in partnership with RIBA NBS who publish details of our products and systems within their specification clause library to allow Architects ease of specification through their NBS Plus interface. NBS clauses can be accessed via the technical resources area of the web site where a live NBS Feed is available at [NBS Plus Live Feed](#)

Our website has drawings available for download in [Technical Drawings](#). A selection are also available via [FastrackCAD](#), as well as a range of BIM objects on the [NBS National BIM Library](#)

TRAINING AND COMPETENCY OF THE USER

Newton 403 HydroBond should be installed by those with an understanding of the requirement to waterproof retained structures and the knowledge and training to use the product as part of a co-ordinated approach to the waterproofing of the structure, which in many cases will require further waterproofing products so as to achieve the required habitable grade as defined by BS 8102:2009.

[Newton NSBC contractors](#) are trained by Newton Waterproofing Systems in the correct specification and installation of Newton waterproofing products and will provide the client with a meaningful insurance backed guarantee for the waterproofing system.

LIFE EXPECTANCY

Newton 403 HydroBond will provide, under normal service conditions, a durable waterproof covering for the life of the building to which it is installed. Please note that this is not the guarantee. The waterproofing guarantee is provided by the specialist waterproofing contractor who installs the product. Clauses can be accessed via the technical resources area.

PACKAGING

Newton 403 HydroBond is supplied in rolls of 1.0 m wide x 20.0 m long. Each roll weighs 24.3 kg.

Newton 403 HydroBond GB is supplied in rolls of 1.5 m wide x 20.0 m long. Each roll weighs 42.3 kg.



HYDROBOND SYSTEM PRODUCTS

- HydroBond Tape - Double-sided sealing tape
- HydroBond Gas Tape - Single sided tape used with 403 HydroBond-GB to provide gas-tight laps
- Newton 108 HydroBond-LM - Spray-applied, instant-cure, seamless, rubber waterproofing membrane for the external waterproofing of basements and foundation walls
- Newton 109-LM - Hand-applied membrane where the spraying of 108 HydroBond-LM is not possible.
- [Newton 314-BP](#) - Swelling detailing powder for use where 403 HydroBond terminates to otherwise difficult to detail building elements
- [Newton 914-RT](#) - Reinforcement tape for changes in direction and joints within 108 HydroBond-LM and Newton 109-LM
- [Newton 106 FlexProof](#) - Very flexible polymer membrane used for sealing and detailing at protrusions and where difficult joints occur, for example at the base of piled walls

ANCILLARY PRODUCTS

- Newton 410 GeoDrain - Drainage membrane to move water around the structure on sloping sites. Can also be used as protection for all externally applied membranes
- [Newton 104](#) - Crystalline waterproofing powder used for continuation detailing at piles, capping beams, etc
- [Newton 301 EasyProof](#) - Weather-tolerant metal waterbar used to immediately waterproof the raft/wall joint to kickerless design RC structures
- [Newton 315 Polymer-Waterbar](#) - High grade, polymer hydrophilic waterbar to waterproof vertical joints between RC slabs and piled walls for example
- [Newton 307 PipeSeal](#) - EDPM pipe flange
- [Newton Pipe Collar](#) - Fabric reinforcement collar for 110mm diameter pipe

LIMITATIONS

- Cannot be post-applied. Where formwork is removed to expose the concrete, use Newton 108 HydroBond-LM or Newton 109-LM and lap to the 403 HydroBond at the raft edge
- Do not apply at temperatures lower than -10°C or higher than +40°C

INSTALLATION MANUAL

The Installation Manual and MSDS can be found at the System 400 section of our website or this hyperlink: [Newton 403 HydroBond](#)

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PROTECTION OF THE MEMBRANE

Newton 403 HydroBond is pre-applied to the horizontal raft support and to permanent wall support such as a piled wall or building line and so is not exposed to potential damage to these areas.

Where the RC wall formwork is removed or where a block or ICF wall is built from the raft, the removal of the raft edge formwork exposes the 403 HydroBond. This should be protected at the same time and with the same method used to protect the liquid waterproofing membrane applied to the walls (Newton 108 HydroBond-LM or Newton 109-LM for a full HydroBond System).

Please see installation manual for further information.

Protection methods include:

- Newton drainage membrane, Newton 410 GeoDrain (to sloping sites only)
- Protection board
- Suitable closed cell insulation board

SPECIALIST TOOLS REQUIRED

No specialist tools needed.

COLOUR

- Locking fleece - White
- Outer face - 403 HydroBond - Dark Blue
- Outer face - 403 HydroBond-GB - Light Blue

STORAGE

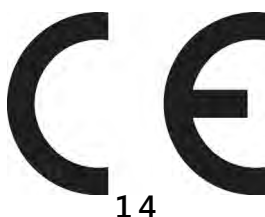


Store in dry conditions at temperatures between 5°C and 25°C. Do not expose to freezing conditions. Do not allow to freeze.

HEALTH AND SAFETY

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

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 14			Newton Waterproofing Systems Newton House 17-20 Sovereign Way Tonbridge Kent TN9 1RH	HB	BS EN 13967:2012 0761 & 1640 Flexible sheets for wa- terproofing. Plastic and rubber damp proof sheets including plastic and rub- ber basement tanking sheets
 17				HBGB	
Essential characteristics to BS EN 13967:2012	Test Standard & Conditions	Declared performance (see end for abbreviations)			
		HB	HBGB	unit of measure	
5.6 Water tightness	BS EN 1928 Method A Water pressure: 2 kPa Test period: 24 hrs Test climate: EN ISO 291-23/50-2 and BS EN 1928 Method B Water pressure: 400 kPa (4 bar) Test period: 72 hrs Test climate: EN ISO 291-23/50-2	Watertight Watertight	Watertight Watertight		
5.7 Resistance to impact	BS EN 12691	Tight at Drop Heights			
	Method A: substrate aluminium plate Method B: substrate EPS panel	250 1,250	250 1,720	mm mm	
5.12.1 Durability against thermal aging	BS EN 1296 Storage temperature: 70°C Storage period: 12 weeks	Watertight	Watertight		
Water tightness	BS EN 1928 Method A Water pressure: 2kPa Test period: 24 hrs Test climate: EN ISO 291-23/50-2				
5.8.2 Resistance against chemicals	BS EN 1847 Storage temperature: 23±2°C Storage period: 28 days Test liquid: Ca (OH) ₂	Watertight	Watertight		
Water tightness	BS EN 1928 Method A Water pressure: 2 kPa Test period: 24 hrs Test climate: EN ISO 291-23/50-2				

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5.8 Compatibility with bitumen	BS EN 1548 Storage temperature: 70°C Storage period: 28 days Test climate: EN ISO 291-23/50-2			
Water tightness	BS EN 1928 Method A Water pressure: 2 kPa Test period: 24 hrs Test climate: EN ISO 291-23/50-2	Watertight	Watertight	
5.9 Resistance to tearing (nail shank)	BS EN 12310-1 Specimen: 100mm x 200mm v = 100 mm/min Nail spacing: 50 mm Test climate: EN ISO 291-23/50-2 • Lengthwise (along roll / direction of manufacture) • Across (across roll)	Tear propagation resistance (arithmetic mean value, with standard deviation)		
		466 ±15.7 518 ±20.8	518 ±8.31 470 ±14.8	N N
5.10 Joint strength	BS EN 12317-2 Specimen: 50mm x 360mm v = 100mm/min Free clamping length: 200mm Test climate: EN 291-23/50-2	Shear resistance along glued seam: long edge (arithmetic mean value, with standard deviation)		
		393 ±9.66	409 ±14.6	N/50mm
		Shearing in the glued edge		
5.11 Water vapour permeability	BS EN 1931 Method B Climate: 23-0/75	d: 1.60 g: 6.22/10 ⁻⁹ s _D : 68	d: 1.74 g: 6.07/10 ⁻⁹ s _D : >1,000	mm kg/(m ² /s) m
5.13 Resistance to static loading	BS EN 12730 Method B Substrate: concrete	Imposed load 20kg: tight		
5.14 Tensile properties	BS EN 12311-2 Method A v = 100 mm/min Free clamping length: 120mm Test climate: EN ISO 291-23/50-2 • Lengthwise (along roll / direction of manufacture) • Across (across roll)	Maximum tensile force (N/50mm) (arithmetic mean value, with standard deviation)		
		598 ±35.8 893 ±16.9		
		Elongation at break (arithmetic mean value, with standard deviation)		
		93.4 ±13.0 104 ±5.26	57.4 ±3.96 81.7 ±7.79	
5.16 Reaction to fire	BS EN ISO 11925-2 BS EN 13501-1	Class E		