

System 100

NEWTON 104

Crystalline Waterproofing of Concrete



Rev 1.3 - 18 July 2017

PRODUCT CODE - 104

INTRODUCTION

Newton 104 is applied to the surface of concrete to provide in-depth protection against the movement of moisture through the capillaries and hairline cracks within the concrete. It consists of Portland cement, specially treated quartz sand and a compound of active chemicals. Newton 104 is supplied in powdered form and is either sprinkled onto fresh concrete or is mixed with water as a carrier and brush applied as a slurry for application to fully cured or older concrete or vertical surfaces.

The active chemicals within Newton 104 combine with the free lime and moisture present within the capillaries to form insoluble crystalline complexes which effectively block the capillaries and any minor shrinkage cracks to prevent any further movement of moisture to provide a totally dry surface to the concrete.

Large areas can be quickly treated with Newton 104. The speed of application and the low material application rate (1 kg/m²) makes Newton 104 a very low cost option for a large number of scenarios.

Because Newton 104 penetrates deep into the concrete, it does not leave a physical membrane to the surface of the concrete element and so is completely unaffected by loadings imposed by further elements of the build. New concrete elements are placed 'concrete to concrete' with no potential for slip or separation as is the case with physical membranes. This makes Newton 104 particularly useful as a means of isolating moisture within pile caps, ring beams and kicker joints to internal walls.

APPLICATION



PROPERTIES

H - Hardness and Durability; E - Elasticity and Flexibility; V - Vapour Resistivity; C - Curing and Drying; W - Working Time; U - UV Stability



PACKAGING



Single-component

COVERAGE



CLEANING

Clean all tools and equipment with water after use.

SUITABLE SUBSTRATE

Concrete with reinforcement to BS EN 1992 (Eurocode 2) with crack mitigation to 0.3mm.

PACKAGING

Newton 104 is supplied in 25 kg bags.

TOOLS REQUIRED

A paddle mixer is required if applied as a slurry.



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TECHNICAL DATA

Features	Result	Units				
Form – Single Component	Powder					
Colour	Grey					
Density	1.25					
Pack size	25	kg				
Shelf life	6	Months				
Application rate	1	kg/m ²				
Pot life @ 20°C & RH of 40%	N/A					
Application temperature	+5 to +35	°C				
Service temperature	-15 to +180	°C				
Odour	None					
VOC content	0	%				
Curing	5°C	10°C	15°C	20°C	25°C	Units
To not be adulterated by rain	3	3	3	3	3	Days
Ready for temporary foot traffic / protection boards	3	3	3	3	3	Hours
Initial set	6	4	2	1	*45	Hours/*Minutes
Fully cured	28	28	28	28	28	Days
Cured Performance	Result	Units	Test Method			
Colour	Grey					
Membrane thickness	N/A					
Adhesion to concrete	> 0.8	MPa	BS EN 1542			
Tensile adhesion	0.7	MPa	BS EN 1015-12			
Elongation	3 to 5	%	Manufacturer test			
Loading capability	As concrete applied to	MPa	BS 4551			
Water permeability	< 5.0 x 10 ⁻¹³		BTD/TP/02/2002			
Water penetration	< 20	mm	DIN 1048: Part 5:1991			
Fire testing – non-combustibility	Non-combustable		BS 476-4			

All technical data stated herein is based on test results carried out under laboratory conditions

NOTE: Newton 104 is not a decorative material. When applied as a slurry, the slurry residue remains on the surface of the concrete and can be unsightly. Where applied as a dry powder to green concrete and trowelled or power floated, uneven colouring or blotching may be apparent once the concrete is cured. If a decorative finish is required, other products should be considered. Please speak with Newton Waterproofing for further advice.

COVERAGE

Newton 104 is applied in one coat at a coverage rate of 1.0 kg per m². One 25 kg bag of Newton 104 will treat approximately 25 m².

STORAGE

Newton 104 should be stored at room temperature (min 10°C and max 38°C), kept dry and out of direct sunlight. If these conditions are maintained and the product packaging is unopened, then a shelf-life of up to 12 months can be expected.

HEALTH & SAFETY

Newton 104 should only be used as directed. We always recommend that the Material Safety Data Sheet (MSDS) is carefully read prior to application of the material. Our recommendations for protective equipment should be strictly adhered to for your personal protection. The MSDS is available upon request from Newton Waterproofing Systems or online via our website. Please see contact details below.

LIMITATIONS

Do not apply Newton 104 at temperatures below 5°C.

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KEY BENEFITS

- Ease of application - sprinkled onto new concrete and applied as a simple slurry to vertical and cured concrete
- Permeates deep into the concrete to form a barrier against moisture that cannot be damaged or punctured
- Loading capabilities only limited by the strength of the concrete
- No physical membrane - subsequent concrete placement is 'concrete to concrete'
- Concrete treated with Newton 104 remains vapour permeable, allowing the structure to 'breathe'
- Easy to detail and specify as the concrete surface becomes the membrane
- Very cost effective alternative to conventional physical membranes
- Sealing of cracks up to 0.3mm resulting in dry concrete with less reinforcing steel requirement

ASSOCIATED PRODUCTS

Newton 313-WP WaterPlug: For sealing of leaks prior to application of Newton 104.

Newton 203-RM: Rapid setting mortar for the repair of spalled or honeycombed concrete and surface cracks prior to the application of Newton 104. Can be used for the rapid creation of angle fillets.

POST-APPLICATION CURING

Newton 104 requires controlled curing. Once the Newton 104 begins to cure, moisten with a fine fog spray of water 2-3 times a day for three days. In hot or windy conditions water spray should be applied more frequently.

APPLICATION - DRY POWDER

The application of Newton 104 must take place prior to initial set of the concrete.

- Sieve the powder evenly onto the green concrete at 1 kg/m²
- Trowel or power float into the surface of the concrete, again prior to initial set

PROPERTIES

Concrete is a porous material with a micro structure of capillaries and fine cracks. The amount of reinforcement steel used within the concrete will control the size of the cracks by controlling the degree of shrinkage in the curing concrete. Formally BS 8007, BS 8110, and EN 1992 Eurocode 2 gives guidance as to the amount of steel required to control crack widths. Concrete for basements and other earth retained structures should have sufficient steel included to control crack widths to no more than

0.3 mm. Further steel can be included to control cracks to 0.1 mm and 0.2 mm.

Concrete to EN 1992 Eurocode 2 is resistant to water pressure and is considered to be waterproof in that physical water, identifiable as water that can form a surface tension, cannot pass through the body of the concrete itself. Water will pass through joints between sections of placed concrete, and these joints should be waterproofed with a [Newton System 300 waterbar](#).

The cracks and the capillaries do however allow for the movement of moisture by capillary action, resulting in damp concrete. Where further placements of concrete take place, moisture will move from the damp concrete element unless a barrier to the movement of moisture is included. Conventional damp proof courses (DPC) can not be used in most cases due to the loading of the new building element being too high for the physical DPC to deal with. A conventional DPC can also create a 'slip joint' where the two elements, instead of binding to each other, are separated by a physical membrane.

Newton 104 will seal the capillaries within concrete as well as cracks to 0.3 mm, producing a fully sealed, dry concrete, that will prevent the movement of moisture to other building elements and internal finishes.

CONSTRUCTION

The construction should conform with current Building Regulations, British Standards and relevant Codes of Practice. Concrete should be designed by a Structural Engineer to EN 1992 - Eurocode 2 and have a surface finish to Class of finish U3 as documented in 'General Specification for Civil Engineering Works' section 14: 'Formwork and Finishes to Concrete', namely a 'Uniform, dense and smooth surface' with float marks of no more than 3 mm. A U5 power floated finish with no float marks is also suitable but not required.

U1 (Abrupt irregularities permitted) or U2 (Tamp marks of up to 10mm) finishes are not suitable and should be avoided.

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](#)

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APPLICATION METHODS

Newton 104 seals the concrete by being absorbed to approximately 40mm into the surface via the capillaries and hairline cracks. Moisture is required for this to occur.

Green concrete

The moisture still resident in the concrete acts as the carrier, allowing the active chemicals to be fully absorbed. Newton 104 can be applied as a powder prior to the initial set of the concrete (when you walk on the concrete you leave an imprint of approximately 10mm).

Concrete cured past initial set

If the concrete is no longer green and cured beyond the initial set, Newton 104 is mixed with water to create a slurry to allow the absorption into the concrete to take place.

APPLICATION - SLURRY

The concrete surface should be dampened to nearly saturation point but not wet with standing water prior to application of Newton 104.

- Create the slurry by pouring clean water into a suitable clean mixing vessel then slowly add the Newton 104 powder into the water whilst mixing with a slow speed mixing paddle until a consistency of thick oil paint is obtained. Approximately 9-10 litres of water is required per 25kg bag of Newton 104. Mixing ratio is 5 parts Newton 104 to 2 parts water by volume
- Apply the slurry in one coat at a dry powder weight of 1kg/m² with a masonry brush

TYPICAL APPLICATIONS

Pile caps and ring beams:

Pile caps and ring beams often support ground floor slabs and structural walls which are bearing with too much force for conventional membranes to deal with. Because Newton 104 is fully absorbed into the surface of the concrete an indestructible isolating membrane is formed that prevents moisture from the pile cap or ring beam from transferring to the floor slab or structural wall; and does so without creating a potential slip surface between the two building elements.

Support plinths

Where a steel or concrete column is to be supported from a plinth, conventional membranes are often not suitable due to the point loading transmitted through the column. Newton 104 will seal deep into the surface of the concrete to produce a membrane unaffected by the loading of the column.

Sealing of concrete surfaces

Newton 104 will provide a dry surface to walls, rafts and slabs to car parks, garages and plant rooms, where a physical membrane is not suitable because of potential damage or where a physical membrane requires covering

with a finish that is not required for the intended end use of the space.

Isolation of internal walls from moisture in the kicker joint:

Newton 104 is the ideal product to prevent the migration of moisture to internal RC walls from kicker joints formed internally to the ground bearing raft. Once applied and correctly cured, Newton 104 forms a barrier to moisture within the surface of the kicker that cannot be damaged by the loading of the structural wall and one that provides a clean concrete to concrete interface of the two building elements so that slippage is not a concern.

Isolation of internal walls from moisture at the abutment with earth retained walls:

Newton 104 creates a simple to apply barrier to prevent the migration of moisture to internal walls at the interface with the retained concrete walls. Newton 104 can be easily applied around reinforcing steel and dowel bars¹⁾ to provide a continuous barrier to moisture that cannot be damaged by placement of the internal concrete wall.

¹⁾ Reinforcing steel and dowel bars should then be coated with [Newton 103-S](#), lapped to the concrete, to provide a barrier against water tracking along the steel.

TRAINING & COMPETENCY OF USER

Newton 104 should be used 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 coordinated approach to the waterproofing of the structure, which in most cases will require further waterproofing products so as to achieve the required habitable grade as defined by BS 8102:2009.

SURFACE PREPARATION

All concrete to be treated with Newton 104 must be clean and have an open capillary system. Remove laitance, loose material, dust, dirt, oil, grease, general grime and contaminants by jet washing, grit blasting or scabbling.

Where there is evidence of fungus or mould growth, a suitable fungicide should be used prior to application.

Spalled concrete should be removed back to good concrete, treated with Newton 104 and filled flush with [Newton 203-RM](#). If the reinforcing steel is exposed, abraid back to clean steel and coat with two coats of Newton 103-S to prevent the steel from further corrosion.

Honeycombed concrete should be removed back to good concrete, treated with Newton 104 and filled flush with Newton 203-RM. If the reinforcing steel is exposed, abraid back to the clean steel and coat with two coats of Newton 103-S to prevent the steel from further corrosion.

Holes and indentations in the concrete should be cut out with a dovetail cutter/router to a depth of at least 20mm. Treat with Newton 104 and fill flush with Newton 203-RM.

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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Cracks over 0.3mm should be cut out with a dovetail cutter/router to a depth of at least 20mm. Treat with Newton 104 and fill flush with Newton 203-RM. Cracks up to 0.3mm will be sealed by the Newton 104.

Leaking non-structural cracks should be cut out with a dovetail cutter/router to a depth of at least 20mm. Treat with Newton 104 and plugged with [Newton 313-WP WaterPlug](#). Structural cracks should be repaired by specialists.

Where practical, cover the application with moist hessian and plastic sheeting during the 3-day curing period.

During the curing period the surface of the concrete treated with Newton 104 must be protected from frost, rain and standing water.

Where the treated concrete is to support a poured concrete structural element such as a supporting wall and the Newton 104 was applied as a slurry and has fully cured, the slurry residue must be removed by jet washing, sand blasting or scabbling to ensure a clean interface for the subsequent concrete placement.