

Rev 2.2 - 04 December 2018

PRODUCT CODE - M31

## INTRODUCTION

*Newton 420 Reservoir* is a unique drainage and water-retention membrane for use where a water reservoir is required for extensive green roofs of sedum, herbaceous plants, mosses or grass above decks and roofs.

Unlike other products of this type, Newton 420 Reservoir has a bonded geotextile that prevents intrusion of the soil into the water holding cups during back-fill and compression. This results in a permanently larger volume reservoir than any other 20 mm deep green roof membrane.

When the water holding cups are full, the large drainage holes within the HDPE core allow water to easily pass through to the drainage layer below to prevent saturation and water logging of the green roof above.

## KEY BENEFITS

- Unique bonded geotextile does not sag into the water holding cups as is the case with loose laid geotextiles
- Large drainage holes allow a much higher drainage flow through the membrane than comparative products, ensuring that when the water holding cups are full, the water drains quickly so as not to waterlog the soil
- Suspended soil particles (fines) are filtered out by the geotextile layer
- Large drainage layer created by the 20 mm HDPE core
- Tough and durable
- Quick and easy to install

## TYPICAL APPLICATIONS

As a water holding and drainage layer above a deck, flat roof or pitched roof where shallow planting is used to create an extensive green roof.

## TRAINING & COMPETENCY OF USER

Newton 420 Reservoir should always be used in conjunction with a primary waterproofing membrane as part of a designed waterproofing solution for decks, flat roofs, terraces and balconies and should therefore be installed by a competent person with responsibility for the overall design and installation of the waterproofing system.

## TOOLS REQUIRED

- Tape measure
- Shears or utility knife

## SURFACE PREPARATION

Always use above a primary waterproofing membrane. Please refer to the relevant waterproofing membrane data sheet.

## 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.

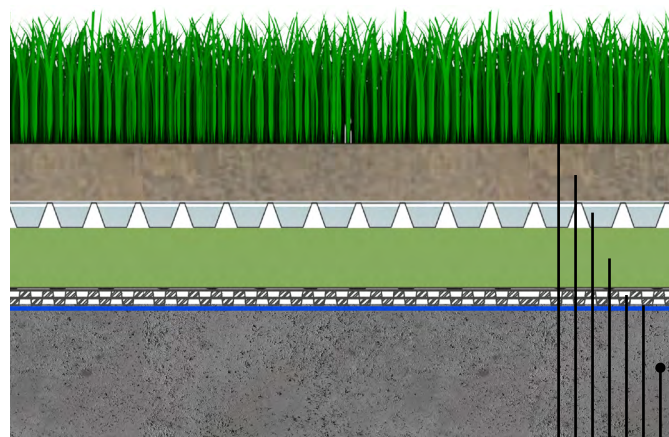
NBS Source also hosts a large selection of Newton [case studies](#), as well as product [literature and certifications](#).

A wide range of drawings are available [on our website](#).

## CONSTRUCTION & MOVEMENT JOINTS

Newton 420 Reservoir should continue over construction and movement joints and acts as a decoupling membrane preventing movement from the substrate transferring through to the surface finish.

## TYPICAL BUILD - INVERTED WARM ROOF



Vegetation - Mosses, herbaceous plants, sedum & grasses  
 Growing medium  
 Newton 420 Reservoir (shown with water in cups)  
 Roofing grade insulation  
 Newton 407 DeckDrain  
 Newton Waterproofing membrane  
 Suitable substrate - concrete shown

NOTE: Root barrier not required with Extensive Green Roof and Newton 201 or 208.

# NEWTON 420 RESERVOIR

## Extensive Green Roof Drainage Membrane

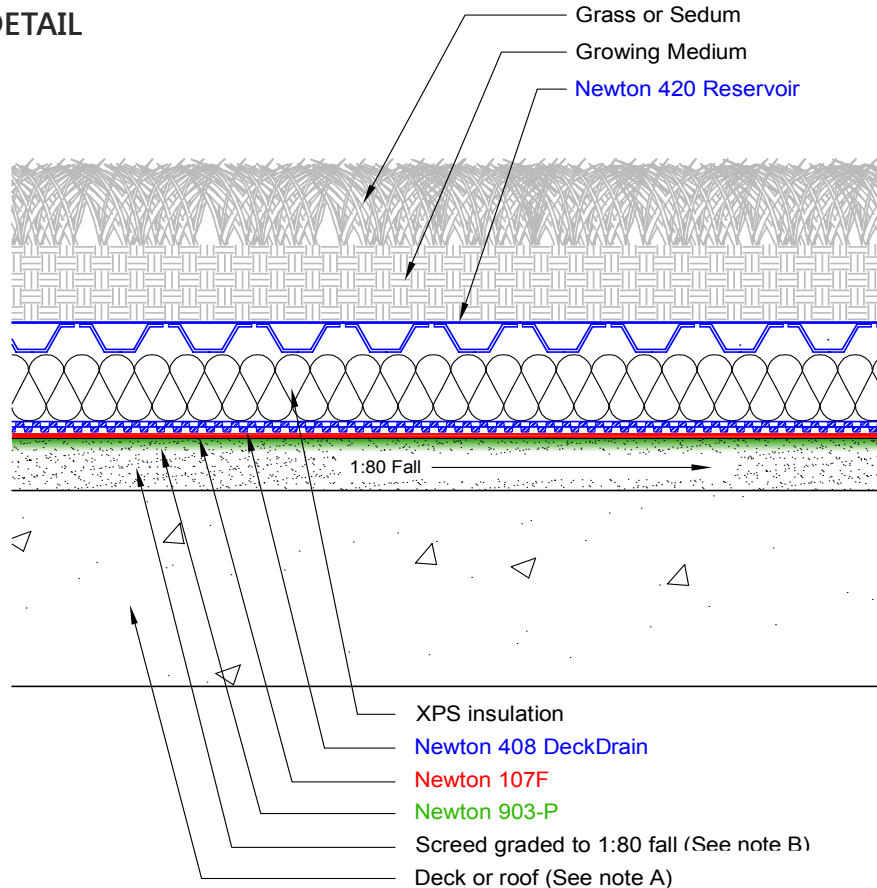
### TECHNICAL DATA

Features – Studded core	Result	Units	
Material	HDPE		
Colour	Black		
Density	620	g/m <sup>2</sup>	
Stud depth	19	mm	
Membrane height	20	mm	
Vicat softening temperature	148	°C	
Features – Geotextile	Result	Units	
Material	Polypropylene		
Colour	White		
Density/Specific gravity	0.62		
Thickness	1.2	mm	
Features – 420 Reservoir	Result	Units	
Width	0.92	m	
Length	50.00	m	
Area	46	m <sup>2</sup>	
Membrane height	21.2	mm	
Density	720	g/m <sup>2</sup>	
Packaged weight	70.00	kg	
Service temperature	-40 to +80	°C	
Installed Performance	Result	Units	Test Method
Water-flow at 20 kPa – 1:80 slope – Upper layer	0.07	l/m/s	EN ISO 12958
Water-flow at 100 kPa – 1:80 slope – Upper layer	0.04	l/m/s	EN ISO 12958
Water-flow at 200 kPa – 1:80 slope – Upper layer	0.02	l/m/s	EN ISO 12958
Compressive strength – Temporary loading	>240	kPa	ASTM D1621
Compressive strength – Permanent loading	>120	kPa	ASTM D1621
Water vapour diffusion resistance – S <sub>d</sub> value	>604	m	BS EN 1931
Water vapour diffusion resistance – μ value	>1208000	μ	Calculated from S <sub>d</sub> value
Water vapour diffusion resistance	>3020	MNs/g	Calculated from S <sub>d</sub> value
CBR puncture resistance	2800.00	N	EN ISO 12236
Tensile strength (Machine direction)	19	kN/m <sup>2</sup>	EN ISO 10319
Tensile strength (Cross direction)	10	kN/m <sup>2</sup>	
Chemical resistance	Excellent		EN 14030
Oxidation resistance	Excellent		EN ISO 13438

# NEWTON 420 RESERVOIR

## Extensive Green Roof Drainage Membrane

### TYPICAL DETAIL



### DECK & FLAT ROOF DRAINAGE DESIGN

Decks, flat roofs (and balconies functioning as roofs) should be engineer designed to provide adequate rainwater disposal to suitable drainage outlets. The design fall should be 1:40 to ensure a finished fall of at least 1:80.

With concrete construction it is preferable that the fall is created at the concrete pour. If this is not possible or the fall is to be created retrospectively, the fall should be formed with screed. With timber roofs and decks, the timber frame should be constructed to the correct design fall. Drainage falls to warm-decked roofs using tapered insulation should be designed by the insulation manufacturer, with falls of not less than 1:60. They should be laid directly onto the vapour control layer, with the primary waterproofing above.

Cross-falls should be achieved using mitred joints.

Allowance for deflection should be made in the structural design where falls are achieved using screeds, particularly on large roofs.

The size and number of outlets should be designed to meet the expected rainfall intensity in accordance with BS EN 12056-3. For flat roofs and decks bounded by parapets, at least two outlets (or one outlet plus an overflow) should be provided. Outlets should have a recessed mouth to allow the free flow of water.

### LIMITATIONS

- Should not be used as an intensive green roof membrane. Please use [Newton 408 DeckDrain](#) together with [Newton 409 RootBarrier](#)
- Do not mechanically fix through drainage layers where waterproofing beneath can be punctured.
- Sufficient load above membrane is required to prevent wind lift. Please consult specialist.

### INSTALLATION

The membrane is rolled out in the direction of the fall with the geotextile surface facing upwards. Cut lengths with a utility knife or shears to suit the dimensions of the surface area.

Subsequent lengths of membrane are placed adjacent to the previously rolled out lengths to form simple butt joints, with the extra flap of geotextile overlapping the joint. It is not necessary to overlap the dimpled cores.

Take the 420 Reservoir into the double entry drainage outlets. There is no need to seal to outlets or protrusions through the membrane.

Lap the membrane down vertical surfaces to suit either high level drainage or to joint to [Newton 410 Geodrain](#), if the drainage is to continue to below the footing of the foundation wall. There is no need to lap 420 Reservoir up vertical interfaces.

# NEWTON 420 RESERVOIR

## Extensive Green Roof Drainage Membrane

### PACKAGING

Newton 420 Reservoir is supplied in wrapped and labelled 50 m long x 920 mm wide rolls. NOTE: Rolls of Newton 420 Reservoir are VERY HEAVY, each roll weighs 70 kg. Rolls should be cut to size at ground level and pieces lifted to the work area, or full rolls should be lifted by mechanical lifting device. Do not attempt to lift full rolls, even with a two-person lift.

### STORAGE

Newton 420 Reservoir should be stored away from direct sunlight. Rolls should be stored in the upright position.

### HEALTH & SAFETY

Newton 420 Reservoir should only be used as directed within this Data Sheet. There is no legal requirement for a Material Safety Data Sheet (MSDS) for this product. PPE should be worn at all times when working on building sites including eye protection when drilling or fixing. Safety procedures should be adhered to when working at height and working within excavations for your personal protection.