

RADON WATERPROOFING CASE STUDY Treating High Radon Levels in a Basement, Derbyshire

RADON WATERPROOFING IN A LISTED BUILDING

Newton Combined Radon and Waterproofing System Used To Treat Extremely High Radon Levels

Project Details

The owner of this picturesque listed property in Derbyshire wanted to upgrade their basement into a dry habitable area. Knowing that their house was in a high risk Radon gas area, the project required gas remediation and structural waterproofing as a package to obtain habitable living.

A preliminary test for Radon showed startling results. The basement area tested over 5,000 becquerels, 4,800 above what is considered the action level for remediation in domestic properties, which is 200 bq/m. The owner contacted specialist gas remediation experts Prestige Air who recommended that the Newton PAC-500 "Positive Air Curtain" be installed to deal with the Radon but also the basement waterproofing combined.

Methodology

Prestige Air contacted Newton Specialist Basement Contractor Protectahome to perform the installation of the Newton System 500 Cavity Drain Waterproofing and Prestige Air installed the "Positive Air Curtain". To ascertain the real time Radon levels, Prestige Air installed a continuous Radon monitor to the basement which data logs Radon levels throughout the project, and to give guidance about the amount of air management required within the Newton PAC-500 System to treat the problem (see results on Page 2).

The first component of the PAC installed was an Air Duct fixed at joist height around the entire retaining aspects of the basement. The Air Duct contains pressure control bladders internally and air delivery points drilled into the bottom of the duct as a means of delivering an even air curtain down behind the Newton 508 cavity drain membrane. Newton 508 was "curtain hung" at a high level so as to have minimal penetrations. The 508 membrane is installed with Newton MultiPlugs which are sealed in this circumstance with Newton WaterSeal butyl rope. Once the membrane had been fixed to the retaining walls, all MultiPlugs were double sealed with the Newton Overtape to provide a seal to prevent gas leakage through the fixings, all membrane joints and the seal to the PAC duct. Newton Basedrain was installed on top of the slab, which guided waste water to a Titan Pro Sump and Pump installed to deal with the water removal from the basement.

With the Newton PAC-500 System now installed, Prestige Air then performed their patented gas integrity testing process to the system, which ensured that all defects in the sealing of the membrane were identified and re-sealed and re-tested. The results with the Newton PAC-500 System installed were remarkable - Radon levels were now down from 5000 bq/m to less than 100 bq/m!

NSBC Contractor: Protectahome Ltd

Gas Remediation Company: Prestige Air Ltd



This listed property in Derbyshire is in a high Radon Gas area, so full gas remediation was required.



Installation of Newton PAC System, Newton Overtape used to seal around fixings to prevent gas leakage.



Full testing of Newton PAC System - remarkable results, Radon levels down from 5000 bq/m to 100 bq/m

"Having carried out a series of Radon monitoring it was established that we had levels up to 5000bq/m within our basement of our home. In addition to this our basement was also damp. After failing to get levels down to acceptable levels by using a standard type retrospective sump, Prestige Air and Protectahome jointly installed the Newton PAC system for both Radon and waterproofing. We now enjoy a dry basement with levels of Radon less than 100bq/m."

- Mr Read, Derbyshire

Radon Waterproofing, Derbyshire Overview of Newton PAC-500 System

NEWTON PAC-500 "Positive Air Curtain" SYSTEM

Newton System 500 Cavity Drain and Prestige Air

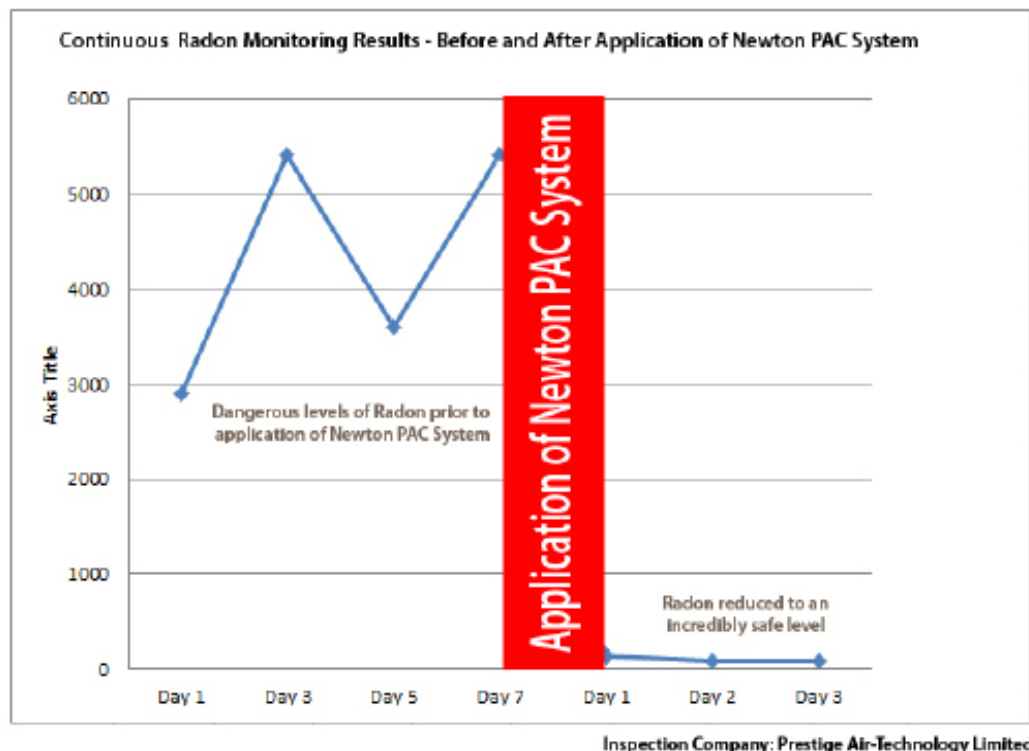
The Newton PAC-500 System offers gas remediation and structural waterproofing as a package. Newton System 500 is installed to offer full waterproofing protection, and sealed at all fixtures to ensure there are no gas leaks. An Air Duct is then installed at joist height around the entire retaining aspects. The Air Duct contains pressure control bladders internally and air delivery points drilled into the bottom of the duct as a means of delivering an even air curtain down behind the Newton membrane.

Prestige Air performs their patented gas integrity testing process to the system, incorporating a tracer gas which is diffused behind the membrane to create a pressure. The tracer gas is then detected by an electronic detector and all defects in the sealing of the membrane can be identified and re-sealed and re-tested.

Continuous Radon monitoring readings are taken throughout the process, and the results with the Newton PAC-500 System are astounding in reducing Radon levels, as seen from the chart below.



Radon Monitoring Chart (Before And After Application of Newton PAC System)



Radon Waterproofing, Derbyshire

Featured Products

NEWTON 508 (M1 & M2)

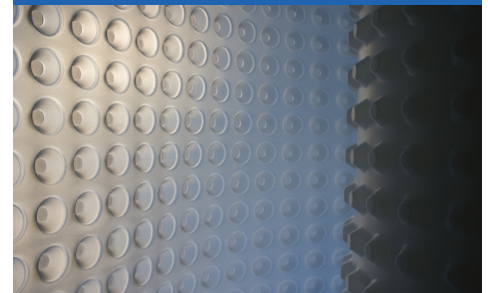
8mm Cavity Drain Membrane for Basement Walls, Floors & Vaulted Soffits

Newton 508 is our high quality BBA approved cavity drain waterproofing membrane suitable for use internally below the ground to retaining walls, vaulted soffits and floors. Newton 508 is our flagship membrane and one of the most specified cavity drain membranes in the UK. The 0.7mm thick HDPE product allows for large industrial loads to be applied and the in line studs allow for quick installation with minimal surface preparation.

Newton 508 is available in roll sizes 2.4m x 20m - 48m² (M1) and 2m x 20m - 40m² (M2)



Newton System 500 Cavity Drain Waterproofing



Newton 508 Cavity Drain Membrane

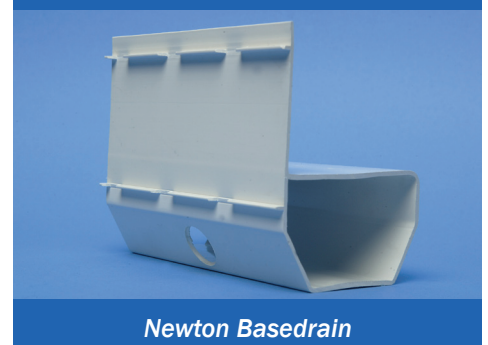
NEWTON BASEDRAIN (D1)

Drainage System

Newton Basedrain comprises a range of products that receive water ingressing at weaknesses within the structure and then discharge the collected water to a Newton Sump System or safe drainage (drainage that is below the level of the basement floor that cannot back-up or block).

Basedrain is supplied in packs of 12 linear metres (6 x 2m) lengths. Internal and external corners, T pieces, drainage connectors and access/jetting ports should be utilised with Basedrain.

Newton System 500 Cavity Drain Waterproofing



Newton Basedrain

TITAN-PRO WHITE (TPW)

The Newton Titan-Pro White is designed specifically to be used with Newton System 500. The adjustable neck allows for the sump to be installed at a fixed height relative to the slab so that the connection in from the Newton drainage system and the pump discharge line are made above the concrete.

The sump can be used with single pumps, twin pumps and twin pumps with twin discharge lines for greater pump efficiency.

The Titan-Pro White is available with the following pumps: CP250, CP400, NP400, NP400W, CP750, NP750.

The system comprises a sump chamber with 450mm x 450mm recessed lid, single or double pumps, internal pipework, one-way valves and the Newton PA50 High Water Alarm.

Chamber dimensions: 805mm high x 650mm wide

Newton Sump and Pump



Newton Titan-Pro White

Radon Waterproofing, Derbyshire

Featured Products

NEWTON MULTIPLUG (A1)

Newton MultiPlug has been engineered to give a better fix in questionable substrates. It has the added benefit of having a rubber sealing grommet supplied with the plug. In very poor substrate, a pin (supplied in bags of 100 at extra cost) is inserted into the plug that expands its outer circumference by nearly 2mm to tighten the plug into the substrate.

The Newton MultiPlug is pre-drilled to accept a size 10 (5mm) self-tapping screw for the fixing of battens or other dry-lining systems. Newton MultiPlugs are recommended in all below ground membrane applications except vaulted arches.

Note: 10mm SDS drill bit required, plugs are 57mm in length.

Newton MultiPlugs are supplied in bags of 100 (A1)

Newton Multi-Use Products



Newton MultiPlugs

NEWTON OVERTAPE (A7, A8, A9)

Newton Overtape is used to create single sided taped joints as an overtape to seal adjacent butted and overlapped membranes, or to seal above joints to the membrane created whilst shaping the membrane to fit convoluted substrate. Newton Overtape can also be used for the sealing of protrusions through the membrane.

Newton Overtape is available in rolls 150mm x 20m (A7-Black), 100mm x 20m (A8-Black, A9-White)

Newton Multi-Use Products



Newton Overtape

NEWTON WATERSEAL ROPE (A6, A6W)

Newton WaterSeal Rope is used to form a seal at the overlap of adjacent sheets of Newton membranes when neither a flange joint or stud into stud joint has been made. A bead of WaterSeal Rope is used for the sealing of penetrations through the Newton membranes.

WaterSeal Rope is also used to create a sealing ring to the base of the Newton NuSeal Plug.

WaterSeal Rope is supplied in rolls 10mm x 4.75m and is available in Black (A6) or White (A6W)

Newton Multi-Use Products



Newton WaterSeal Rope