

Rev 1.0 - 14 March 2019

PRODUCT CODE - 321

INTRODUCTION

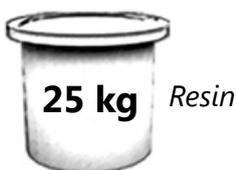
Newton 321-FSP is a single-part, medium to low-viscosity, MDI-based injection resin that reacts with water, without the need for a catalyst, in order to form a flexible, closed-cell foam, or where no water is present forms a flexible polyurethane to seal water leaks through voids and non-structural cracks. Newton 321-FSP is one of a range of injection resins that form the [Newton ReSeal System](#) for the sealing of water leaks and to seal voids and cracks to prevent water leaks.

The resin can be used for the sealing of both pressurised and non-pressurised leaks and water penetrations in the walls and floors of concrete structures, masonry, tunnels, and sewer pipes. The flexible nature of the cured foam also makes Newton 321-FSP ideal for cracks and joints where future movement is expected.

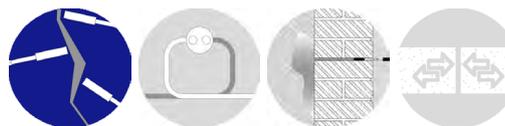
Newton 321-FSP can be injected either as a pure resin in order to seal voids and cracks where water is already present, or injected into dry substrate, either mixed at a ratio of 1:1 with water to form a foam, or as a resin only to form a non-foaming flexible polyurethane seal which does not require further sealing with [Newton 322-SP](#) or [Newton 323-SA](#).

Newton 321-FSP is a specialist product that should only be applied by trained waterproofing professionals and is injected using a standard single-component pump or a standard two-component pump where water is used as the foaming agent.

PACKAGING



APPLICATION



SEALING STAGES*



PROPERTIES

E - Expansion; F - Flexibility; V - Viscosity; A - Adhesion; - R - Reaction Time



Green is longer or greater, red is less or lower

ATTRIBUTES

- When in contact with water, a dense, closed-cell polyurethane foam expands to fill the crack or void
- Where no water is present, Newton 321-FSP penetrates deep into the crack or void and cures to form a flexible, polyurethane seal
- Fast, uncontrolled reaction in contact with water
- Medium to low viscosity
- Flexible with low strength
- Stable with no further shrinkage or expansion

KEY BENEFITS

- Absorbs movement within the crack or joint
- Penetrates deep into fine cracks
- Does not require an additional catalyst where water is present
- Exhibits high levels of chemical resistance
- Good adhesion to mineral construction materials such as concrete, masonry and mortar

*See page 4 for explanation.



NEWTON 321-FSP

Flexible Foaming & Sealing Injection Resin

NEWTON RESEAL SYSTEM - TECHNICAL DATA

PROPERTIES	320-FP	321-FSP	322-SP	323-SA	324-SR
MAIN USE	Stage 1 stemming of high flow water leaks	Stage 1 stemming and Stage 2 sealing of water leaks	Stage 2 sealing of water leaks & Injection Hoses	Stage 2 sealing of water leaks, Injection Hoses & Curtain Injection	Where movement or settlement is expected. Movement joints.
Material	Polyurethane	Polyurethane	Polyurethane	Acrylic	Acrylic Rubber
Foaming	Yes - with water	Yes - with water	Yes - with water	No	No
Sealing	No	No	Yes - No water	Yes	Yes
Parts	2	1	2	4 (one being water)	5
Catalyst	Yes	No	No	Yes	Yes
Pack size - kg	25 + 2.3	25	12 + 13.2	25 + 1.25 + 0.06	See pages 1 & 3
Part A	Polyurethane	Polyurethane	Polyurethane - A	Acrylic resin	Acrylic resin
Part B	Catalyst	N/A	Polyurethane - B	Catalyst	Additive
Part C	N/A	N/A	N/A	Initiator	Catalyst
Part D	N/A	N/A	N/A	Water	Strengtheners
Part E	N/A	N/A	N/A	N/A	Initiator
Viscosity at 20°C	111 mPa/s	280 mPa/s	103 mPa/s	60 mPa/s	25 mPa/s
Viscosity Category	Low	Medium - low	Low	Very low	Very low
Is water required	Yes - to foam	Yes - to foam	No - Yes to foam	No - hydrophilic	No
Water source	Within substrate	Within substrate or added	Within substrate	Added	N/A
Controlled reaction	Yes - by catalyst	No	No	Yes - by initiator	Yes - by initiator
Final form	Rigid open cell foam	Flexible closed cell foam	Flexible closed cell foam or resin	Flexible & elastic hydrophilic resin	Very flexible & elastic rubber gel
Final performance	Stable	Stable	Stable	Swells with water	Stable
Shrinkage	No	No	No	Slight	Slight
Flexibility	None	Some	Good	Very good	Extremely good
Working time	Use immediately	Use immediately	60 mins	Working day	Working day
Reaction time	15 sec to 4 min	2 minutes	6 hours to 5 days	44 sec to 20 min	18 sec to 18 min
Rate of expansion	1700-2200%	300%	10%	290%	120%
Adhesion	Good	Good	High	High	Very high
SUBSTRATES	320-FP	321-FSP	322-SP	323-SA	324-SR
Concrete	Yes	Yes	Yes	Yes	Yes
Steel	Yes	Yes	Yes	Yes	Yes
Mortar	No	Yes	Yes	Yes	Yes
USES	320-FP	321-FSP	322-SP	323-SA	324-SR
Running water	Stage 1	Stage 1 & 2	Stage 2	Stage 2	Stage 2
Large dry cracks	No	Yes*	Yes	No	Yes
Fine wet cracks	No	Stage 1 & 2	Stages 1 & 2	Yes	Yes
Fine dry cracks	No	Stage 1 & 2	Yes	Yes	Yes
Voids/porosity - wet	Stage 1	Stage 1 & 2	Stage 2	No	No
Voids/porosity - dry	No	Stage 1 & 2	Yes	Yes	Yes
Injection hoses	No	No	Yes	Yes	No
Curtain injection	No	No	No	Yes	Yes*
Penetrations - wet	Yes	Yes	Yes	Yes	Yes
Penetrations - dry	No	Yes*	Yes	Yes	Yes
Structural repair	No	No	No	No	No
Movement expected	No	Yes*	Yes	Yes	Yes
Movement joints	No	No	No	No	Yes

The above data, even if carried out according to regulated tests are indicative and they may change when specific site conditions vary. *Better options available.

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Flexible Foaming & Sealing Injection Resin

Features	Result	Units
Colour	Yellow/Pale Brown	
Free expansion	±300	%
Expansion ratio mixed 1:1 with water	±3	V
Density	1.132	g/cm ³
Viscosity at 5°C	635	mPas
Viscosity at 10°C	443	mPas
Viscosity at 15°C	375	mPas
Viscosity at 20°C	310	mPas
Viscosity at 25°C	280	mPas
Viscosity at 30°C	230	mPas
Application temperature range	5 - 30	°C

Reaction Times at 20°C		
Ratio of Newton 321-FSP : Water	Reaction begins after	Reaction ends after
65 : 65	20 seconds	2 minutes
65 : 12	22 seconds	2 minutes 20 seconds
65 : 2.5	50 seconds	7 minutes

SUITABLE SUBSTRATE

- Concrete
- Masonry
- Mortar

TYPICAL APPLICATIONS

- Stage-1 stemming of water flow through joints, cracks, voids and defects within concrete structures and steel piled walls
- Stage 2 sealing of dry cracks, voids and defects after Stage 1 has been carried out

PACKAGING

Resin - 25 kg container

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, Newton 321-FSP has a service life that can be equal to the design life of the structure.

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 a wide choice of downloadable [Technical Drawings](#), and a large selection are also available either via [FastrackCAD](#), or as BIM objects on the [National BIM Library](#) and/or [BIMObject.com](#)

CHOOSING THE CORRECT RESIN

Ensure you use the correct resin for the desired application. Some problems can be solved only by using a combination of products. To determine what product should be used in which situation, please consult the matrix on page two.

METHOD OF APPLICATION

Pressure injected by pump into packers secured into holes drilled into the substrate.

TRAINING & COMPETENCY OF USER

Newton 321-FSP should only 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. In many cases this approach will also require further waterproofing products so as to achieve the desired internal environmental grade as defined within BS 8102:2009.

Newton 321-FSP is a highly specialist injection waterproofing product that should only be installed by experienced and fully trained resin injection specialist companies.

SPECIALIST TOOLS REQUIRED

- Hammer drill
- Drill bits for the size of the packers to be used and of sufficient length to reach just past the crack or void
- Single and two-component polyurethane pumps

NEWTON 321-FSP

Flexible Foaming & Sealing Injection Resin

ACCESSORIES

- Newton steel packers, Nipple-Head & Pan-Head in various sizes held in stock - Special sizes by request
- [Newton 340 EcoClean](#) - Injection pump flushing agent for the cleaning of non-cured resin within PU injection pumps during and directly after the injection operation and for leaving within the hose and hopper after final cleaning with Newton 341 PU Cleaner
- [Newton 341 PU Cleaner](#) - Cleaning agent for the removal of cured resin after the flushing through with Newton 340 EcoClean

CONSTRUCTION

Although Newton 321-FSP is designed to seal leaks within large cracks and voids, it is not a repair product.

If the concrete is subject to spalling or is structurally not sound, it must be repaired so that the injected resin is confined, to allow the expansion of the resin to seal the water leaks.

The concrete must have the ability to withstand the forces exerted due to the very high swelling properties of the expanding foam.

INSTALLATION TECHNIQUES

Ensure that the correct resin for the desired application is used. Some leaks can only be solved by using a combination of products. To determine the correct product or combination of products for each situation, please consult the relevant [Data Sheets](#).

Sealing of active leaks is usually a two stage process:

STAGE 1

Newton 321-FSP reacts as soon as it is in contact with water, sealing cracks and voids and blocking water seepage

STAGE 2

Once the water flow has been stemmed/stopped, Stage 2 sealing is carried out to permanently seal the leak.

In the absence of water, Newton 321-FSP, does not expand and continues to penetrate deep into the cracks and voids. The humidity and moisture within the substrate is sufficient for the resin to slowly cure into a flexible, polyurethane seal.



PREPARATION

Remove all obstructions so that the area to be treated can be clearly seen and accessed so that the drilling patterns for the injection holes can be determined.

Clean the surface to remove dirt, debris and loose and friable material. Make repairs using [Newton 203-RM](#) as required.



DRILLING

- Locate the rebar if possible and plan the pattern to minimize damage to the drill bit during drilling
- Drill with an angle of approximately 45° or less to the surface and towards the crack
- Ensure that the depth of the hole intersecting the crack passes close to and past the centre of the crack
- The distance of the drilled holes varies from 100 mm to 250 mm, according to the width of the crack (the wider the crack, the further apart the drill holes)

INSTALL PACKERS

Place the packers in the holes so that the top of the rubber sleeve is below the concrete surface. Tighten the packer with a wrench or spanner to ensure that the packer is tightly fitted.

MIXING & STIRRING

Newton 321-FSP is a single part product. For sealing wet, non-structural cracks, the resin must be injected as a one-component system. For sealing dry, non-structural cracks, Newton 321-FSP must be injected as a two-component system with, for example, a 1/1 ratio with water.

In either case, no mixing or stirring is required.

FLUSHING OF THE PUMP

Flush the hopper pump and lines to remove the Newton 340 EcoClean that is within the pump from the previous cleaning. Dispose of in accordance with local waste regulations

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INJECTION OF THE RESIN

- Begin the injection at the lowest point on a vertical crack and the narrowest area on a horizontal surface
- Holding the pressure line allows the operator to feel the pump pulsations. If a pressure gauge is available, the pressure should be monitored and kept in a range suitable enough to allow a good flow of material
- If resin is directly emerging from the crack when starting to inject the first packer, pause for a few minutes so the resin can react with the water. The reacted resin will form a surface seal and will allow the injected resin to penetrate fully into the crack
- If the resin still emerges freely after the pause, stop pumping and apply a surface seal over the crack with rapid setting cement
- Proceed pumping until the resins emerges from the hole of the next packer
- Stop pumping, disconnect pressure line and proceed to the next packer
- Continue the procedure until the crack is completely filled

POT LIFE & FURTHER USE

Once the container has been opened, the resin must be used as soon as possible as it is affected by air moisture.

REMOVING THE PACKERS

- Wait until all resin has reacted
- Remove packers according to standard procedure
- Close the drill hole with a fast setting mortar
- Overflowing resin can be easily removed by scraping off once cured

CLEANING

Clean the pump and equipment every time there is a stop of more than 15 minutes using Newton 340 Ecoclean, or whenever necessary.

Once all works have been completed, the pump should be flushed with Newton 341 PU Cleaner in order to remove any cured product. Do not leave 341 PU Cleaner in the pump for long as it can damage the seals. Flushing as soon as possible with Newton 340 Ecoclean is therefore recommended, leaving some of the Newton 340 Ecoclean in the pump, hose and the hopper.

Dispose of in accordance with local waste regulations.

STORAGE

Store in dry conditions with temperatures between +10°C and +30°C. Do not expose to freezing conditions.

SHELF LIFE

12 months after production date in original, unopened and undamaged packaging.

Once opened, the shelf life is greatly diminished and the product should be used as soon as possible.

HEALTH & SAFETY

Use appropriate PPE for the environment the system is installed within. Use products only as stated within this Data Sheet and the [Safety Data Sheet](#) which is available upon request from Newton Waterproofing Systems or via our website or mobile app. Please see contact details below.

- Avoid contact of Newton 321-FSP with the skin and eyes
- Wear safety glasses, gloves and overalls
- In case of contact with the eyes: wash with lots of water and seek medical attention
- In case of contact with the skin: wash with lots of water
- Absorb spilled product with sand and dispose of according to the local regulations
- Reacts with water. If contaminated by moisture, this may form CO₂ gas pressure when contained.

Warning: If work is being carried out in a confined space a risk assessment must be carried out to ensure operative safety.

NEWTON 321-FSP

Flexible Foaming & Sealing Injection Resin

		Newton Waterproofing Systems Newton House 17-20 Sovereign Way Tonbridge Kent TN9 1RH	PC Hydrogel 6880 Newton product: 321-FSP EN 1504-5:2004 0749 Concrete injection product in accordance with EN 1504-5:2004, category S, U(S1)W(8)(3)(5/30)	
Essential characteristics	Declared Performance		Test Standard	Harmonised Technical Standard
Watertightness	$\geq 2 \times 10^5$ Pa		EN 14068	BS EN 1504-5:2004
Workability - percent of the crack which is filled	> 95%		EN ISO 3219	
Corrosion behaviour	NPD			
Expansion ratio and evolution with water retention	$\pm 8.66\%$		EN 14498	
Durability - sensitivity to water	The expansion reaches a constant level		EN 14498	
Durability - sensitivity to wet / dry cycles	No change in the expansion ratio		EN 14498	
Durability - compatibility to concrete	Successful		EN 12637-1, 6.2 & 7.3.1	
Dangerous substances	In accordance with 5.4 of EN 1504-5:2004			
NPD: No Performance Declared				

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