HydroTank 315 Waterbar

Swelling Waterbar

Revision: 1.7 - 6th April 2020
Codes: 315-10, 315-5, 315-2

INTRODUCTION

Newton HydroTank 315 Waterbar is a hydrophilic, acrylate polymer waterbar, which swells when activated by moisture. It is characterised by high elasticity and high tensile strength. HydroTank 315 Waterbar can be used to seal the structure against water leaks to cast-in-place concrete construction joints.

The swelling is achieved through hydrophilic acrylate polymers, which are inseparably embedded within the butylene carrier material . This results in high elasticity and exceptional tensile strength, even when fully expanded within the joint.

Due to its high resistance to acids, alkalis and organic solutions, HydroTank 315 Waterbar can be used to seal joints where aggressive water is expected such as within sewage treatment plants, biogas plants and liquid waste holding tanks.

KEY BENEFITS

- Resistant to permanent water pressure of 2 bar
- Delayed swelling - will not swell during the installation process or during the concrete cure
- Swells up to 9 times its original size
- Very resistant to the high alkalinity of concrete
- Maintains very high elasticity and tensile strength, even when swollen
- Age resistant, no embrittlement
- Resistant to a large range of chemicals (pages 5-6)
- Retains integrity, even through many wet/dry cycles

TYPICAL APPLICATIONS - 5/10 MM PROFILE

Sealing construction joints against water leaks to:

- Concrete and steel intensive structures
- Sewage and waste water tanks
- Reservoirs
- Biogas plants
- Underpinning

TYPICAL APPLICATIONS - 2 MM PROFILE

Sealing construction joints against water leaks to:

- Pipes and sleeves
- Preformed sump chambers
- Steel columns
- Manholes

COLOUR

White.

PROFILE, PACKAGING & PURCHASE CODES

- 20 mm x 10 mm x 10 m coil - Code 315-10
- 20 mm x 5 mm x 20 m coil - Code 315-5
- 20 mm x 2 mm x 20 m coil - Code 315-2

SUITABLE JOINTS

Construction joints, day joints and shrinkage joints

- Concrete walls above a concrete kicker
- Within concrete walls
- Within concrete rafts or slabs
- Concrete slab to concrete or steel wall
- Concrete slab to brick/block wall (20 x 10 mm only)
- Joints to precast concrete elements
- Steel beams protruding through the concrete
- Ceramic or plastic waste pipe protrusions (20 x 2 mm only)
- Preformed sump chambers within new rafts or slabs (20 x 2 mm only)

For kickerless horizontal construction joints, HydroTank 301-EP Metal Waterbar should be used.

CONCRETE COVER

HydroTank 315 Waterbar swells up to 9 times its original size when in contact with water. To seal the joint, the waterbar must be confined by concrete:

- 20 mm x 10 mm waterbar - Minimum of 80 mm
- 20 mm x 5 mm waterbar - Minimum of 50 mm
- 20 mm x 2 mm waterbar - Minimum of 50 mm

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TECHNICAL DATA

Features	Result	Units
Material	TPE with hydrophilic polymers	
Colour	White	
Density/Specific gravity	1.26	
Profile	20 x 10, 20 x 5 and 20 x 2	mm
Coil length	10 and 20	Metres
Shelf life	24	Months
Hardness	Shore A	26
Melting point	110	°C
Application temperature	5 to 40	°C
Service temperature	-30 to +60	°C
Minimum required concrete cover	80 and 50	mm
VOC content	None	

Installed Performance	Result	Units	Test Method
Initial delay of swelling	7	Days	
Full swell achieved	28	Days	
Increase in mass (Neutral water - 7 pH)	900	%	MFPA*
Increase in mass (High alkaline water - 12.5 pH)	350	%	MFPA*
Increase in mass (Aggressive water - DIN 4030)	330	%	MFPA*
Max swelling pressure (confined within joint)	2.8	N/mm^2	MFPA*
Water resistance (tested)	5.0	bar	MFPA*
Working water resistance (safety factor of 2.5)	2.0	bar	MFPA*
Reaction to fire classification	B2	Euroclass	DIN 4102-1:1998-05

*Information derived from testing by MFPA. Copy available by request

SUITABLE SUBSTRATE

- Concrete
- Steel
- Brick or concrete block
- Ceramic
- Plastic

SPECIALIST TOOLS REQUIRED

No specialist tools are required.

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.

LIFE EXPECTANCY

When specified and installed in accordance with the Data Sheet, isolated from UV light and physical damage and only to those substrates confirmed within, HydroTank 315 Waterbar has a service life that can be equal to the design life of the structure.

METHOD OF INSTALLATION

HydroTank 315 Waterbar is glued to one side of the construction joint prior to the placement of the next concrete element that forms the joint with HydroTank 309 Flexible Adhesive, an adhesive with very high bond characteristics

To concrete and mortar, the application can be enhanced by the use of masonry nails at approximately 250 mm centres.

CONSUMPTION

HydroTank 309 Flexible Adhesive - 290 ml Cartridge

- 6 to 8 linear metres

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TRAINING & COMPETENCY OF USER

HydroTank 315 Waterbar 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 many cases will require further products in order to achieve the required habitable grade as defined by British Standard 8102.

CONSTRUCTION

The concrete should be designed by a Structural Engineer to EN 1992 (Formally BS 8110 & BS 8007).

Joint surfaces should 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.

CONCRETE THICKNESS

It is conventional wisdom that where the structure is designed to be water excluding or water retaining, a minimum section of 250 mm is required. BS 8102:2009 does not give specific recommendations on this, but does reference that the concrete elements of a structure that is designed to be water excluding (Type B) should be designed in accordance with the relevant parts of BS EN 1992 or BS 1993 respectfully.

NHBC Chapter 5.4 recommends minimum concrete section 250 mm, as does the Concrete Centre paper on the design of water retaining structures.

WATERPROOF CONCRETE

To be water excluding, the structural engineer will design the concrete to the relevant standards to ensure that crack widths are controlled, density is enhanced and porosity is reduced. A water resisting concrete design will include:

Reinforcement steel & designed concrete placement size
Crack widths within reinforced concrete are restricted by the size and fixing centres of the steel, together with the bay size and section thickness of the concrete. Crack widths are commonly restricted to 0.3 or 0.2 mm with concrete restricted to 0.2 mm crack width required by the NHBC for Type B water excluding structures.

Low water/cement ratio
Water that is not used by the hydration process will evaporate from the concrete, leaving behind small air spaces (capillaries). If too many of these capillaries exist, they can connect to form pathways for water. Reducing the amount of water in the concrete mix will ensure that the concrete is dense and with fewer capillaries and pathways, but simply lowering the water/cement ratio will result in a concrete that is too dry and unworkable.

To ensure the concrete is plastic enough to be workable, even with a low water/cement ratio, Plasticisers or Super Plasticisers are added to the concrete mix. This ensures a workable yet dense concrete with less capillaries and pathways to ensure that the concrete is water resisting.

Pozzolans
Pozzolans is a broad term for materials that are either naturally occurring, such as from volcanic materials, or man-made, such as fly-ash, a by-product of burning carbon based materials in power plants. As well as reducing the volume of cement by up-to 40%, their use also reduces the water ratio of the concrete. Pozzolans react with the calcium hydroxide within hydrated concrete to form calcium silicate hydrate compounds that fill and plug any remaining capillary voids to form a denser, stronger concrete that has no pathways, resulting in a fully waterproof concrete.

Correctly designed concrete is waterproof by design. Additional 'waterproofing admixtures' are not required and are not mentioned as been required within BS 8102:2009, NHBC Chapter 5.4 and the Concrete Centre Concrete Design Guide on the Design of Liquid Retaining Structures. The only 'admixtures' that the concrete needs are already in the concrete.

PREPARATION

The substrate that the waterbar is to be fixed to should be uniform and free of dirt and debris. Surface irregularities should be taken out and surface damage, cracks, holes and depressions should be made good with a suitable repair product such as HydroSeal 203-RM.

Concrete surfaces should be jet blasted to remove surface laitance and to expose the coarse aggregate in order to provide aggregate interlock as outlined in relevant standards/codes of practice.

Forming of rebates/chases is not required.

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INSTALLATION

Apply a 5mm wide bead of HydroTank 309 Flexible Adhesive to the centre of the joint.

Uncoil the waterbar and place into the adhesive, pressing slightly to displace it. Allow the adhesive to fill undulations within the concrete surface.

At changes in direction and at end joints, use simple butt joints. Do not overlap at joints. Do not stretch the waterbar to fit.

When the adhesive is cured sufficiently so that it is not displaced by pressing down on the waterbar, secure the waterbar with masonry nails at approximately 250 mm centres.

When the adhesive is cured, carefully place the concrete wall elements, being careful not to damage the waterbar during compaction vibrating.

The placement of the concrete should commence as soon as the waterbar is in position.

LIMITATIONS

HydroTank 315 Waterbar is designed to swell when in contact with water.

The swelling is retarded so, depending on the pH of the water, the initial swell will commence between 24 and 72 hours after contact, with only a partial swell occurring.

After 28 days and after the first swell cycles the product will reach its full swell.

It is important with all hydrophilic waterbars that the application should take place just before the placement of the concrete.

STORAGE

Store in dry conditions at temperatures between 5°C and 25°C with containers fully sealed. Do not expose to freezing conditions.

Avoid mechanical damage caused by pressure. If the geometrical size of the tape has been damaged by pressure, HydroTank 315 Waterbar must not be used.

If these conditions are maintained and the product packaging is unopened, the shelf life is 2 years.

HEALTH & SAFETY

Product 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 or online via our website. Please see contact details below.

CHEMICAL RESISTANCE TABLE

R = Resistant - N = Not Resistant - T = Yet To Be Tested

1. Acetaldehyde	R	73. Ethyl bromide	R	145. Vegetable oils	T
2. Acetate (low molecular weight)	R	74. Ethyl chloride	R	146. Oleic acid	R
3. Acetic acid (< 5 %)	R	75. Ethylamine	R	147. Oxalic acid	R
4. Acetic acid (> 5 %)	R	76. Ethylene chlorohydrin	R	148. Oxygen	R
5. Acetic anhydride	T	77. Ethyleendichloride	R	149. Ozone	R
6. Acetonitrile	R	78. Ethyleen glycolic	T	150. Perchloric acid	R
7. Acetone	R	79. Ethyleen oxide	R	151. Perchoric ethane	T
8. Acetyl bromide	R	80. Fatty acid	T	152. Fenol	N
9. Acetyl chloride	R	81. Iron chloride	R	153. Phosphoric acid	R
10. Air	R	82. Iron sulfate	R	154. Phthalic acid	N
11. Alcohols	T	83. Iron chloride	R	155. Mold solvents	R
12. Aliphatic hydrocarbons (C4 and >)	N	84. Iron sulfate	R	156. Poly glycol	T
13. Aluminum chloride	R	85. Tetrafluoroborate salts	R	157. Potassium carbonate	R
14. Aluminum sulphate	R	86. Tetrafluorborate acid	R	158. Calcium chlorate	R
15. Alums	R	87. Hexafluorosilicic acid	R	159. Potassium hydroxide	R
16. Ammonia	R	88. Formaldehyde	R	160. Potassium hydroxide (con.)	R
17. Ammonium acetate	R	89. Formic acid	R	161. Potassium iodide	R
18. Ammonium carbonate	R	90. Freon	T	162. Propionaldehyde	R
19. Ammonium chloride	R	91. Benzine (not aromatic)	N	163. Pyridine	R
20. Ammonium hydroxide	R	92. Benzine (aromatic)	N	164. Sea water	R
21. Ammonium nitrate	R	93. Glucose	R	165. Silicone liquid	R
22. Ammonium fosfate	R	94. Glue (waterbased)	R	166. Silicone oils	R
23. Ammonium sulfate	R	95. Glycerine	T	167. Silver nitrate	R
24. Amyl acetate	N	96. Fat	T	168. Skydrol hydraulic fluid	N
25. Amyl alcohol	N	97. Hydriodic	R	169. Soap solution	R
26. Amyl chloride	N	98. Hydrobromide	R	170. Sodium hydrogen carbonate	R
27. Aniline	T	99. Hydrochloric acid	R	171. Sodium hydrogen sulfate	R
28. Anilinium chloride	T	100. Hydrochloric acid	R	172. Sodium hydrogen sulfite	R
29. Antimony salts	R	101. Hydrochloric acid (con)	R	173. Sodium borate	R
30. Koningswater (75% HCI 25% HNO)	R	102. Hydrocyanic acid	R	174. Sodium carbonate	R
31. Aromatic hydrocarbons	N	103. Hydrofluoric acid	R	175. Sodium chlorate	R
32. Arsenic salts	R	104. Hydrogen peroxide	R	176. Sodium chloride	R
33. Barium salts	R	105. Hydrogen peroxide (con)	R	177. Sodium hexacynaferraat	R
34. Benzaldehyde	N	106. Hydrogen sulfide	T	178. Sodium hydrosulfite	R
35. Benzene	N	107. Hypochlorous	R	179. Sodium hydroxide	R
36. Benzene sulfonic acid	R	108. Iodine solutions	T	180. Sodium hydroxide	R
37. Benzoic acid	N	109. Iron salts	R	181. Sodium hydroxide	R
38. Benzyl alcohol	N	110. Isopropanol	R	182. Sodium hypochlorite (<5%)	R
39. Bleach (non aromatic)	R	111. Kerosene	N	183. Sodium hypochlorite (>5%)	R

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40. Boric acid	R	112. Ketones	R	184. Sodium citrate	R
41. Bromine	R	113. Lactic acid	R	185. Sodium silicate	R
42. Brake fluid	R	114. Paint solvents	N	186. Sodium sulfide	R
43. Butane	N	115. Lactic acid	R	187. Sodium sulfite	R
44. Butyl acetate	N	116. Lead acetate	R	188. Steam (2.7 bar / 40 psi)	T
45. Butyl alcohol	T	117. Linseed oil	N	189. Stearic acid	R
46. Butyric acid	R	118. Lithium hydroxide	R	190. Styrene	N
47. Calcium oxide	R	119. Magnesium chloride	R	191. Sulfur dichloride	R
48. Calcium salts	R	120. Magnesium sulfate	R	192. Sulfur dioxide	R
49. Carbon disulfide	N	121. Malic acid	R	193. Sulfur hexafluoride	R
50. Carbon dioxide	R	122. Manganese salts	R	194. Sulfur trioxide	R
51. Carbon tetrachloride	T	123. Mercury salts	R	195. Sulfuric acid (diluted)	R
52. Chloroacetic acid	R	124. Methane	N	196. Sulfuric acid (med.conc)	R
53. Chlorine (wet)	R	125. Methanol (<40%)	R	197. Sulfuric acid (conc.)	R
54. Chlorine (dry)	R	126. Methanol (>40%)	T	198. Hydrogen sulfide	R
55. Chlorobenzene	N	127. Methyl chloride	R	199. Pool water	R
56. Bromochloromethane	N	128. Methyl ethyl ketone (MEK)	R	200. Tannic acid	R
57. Chloroform	N	129. Methylene chloride	R	201. Tanning extracts	R
58. Chlorosulfonic acid	R	130. Milk	R	202. Tartaric acid	R
59. Chromic acid	R	131. Mix (40% sulfur – 15% nitric acid)	R	203. Tin salts	R
60. Chromic salts	R	132. Molybdenum disulfide	R	204. Titanium salts	R
61. Citric acid	R	133. Monoethanolamine	T	205. Toluene	N
62. Cooling liquid	R	134. Nafta	N	206. Trichloroacetic acid	R
63. Copper salts	R	135. Natural gas	N	207. Trichloroethene	N
64. Cresol	N	136. Nickel salts	R	208. Sodium phosphate	R
65. Cyclohexane	N	137. Nitric acid	R	209. Turpentine	N
66. Cyclohexanone	N	138. Nitric acid (med.conc.)	R	210. Urea	R
67. Diacetone alcohol	R	139. Nitric acid (conc.)	R	211. Uric acid	R
68. Dimethylformamide	R	140. Nitrobenzene	N	212. Vinyl plastisol	N
69. Etheric oils	R	141. Nitrogen oxides	R	213. Water	R
70. Ethers	N	142. Hydrogen nitrite	R	214. Water (brine)	R
71. Ethyl acetate	R	143. Animal oils	T	216. Xylene	N
72. Ethanol	T	144. Mineral oils	T	216. Zinc chloride	R

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