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Agrément Certificate

10/H151

Product Sheet 1

ULTRARIB GRAVITY DRAINAGE AND SEWERAGE SYSTEM

WAVIN ULTRARIB 150 mm, 225 mm AND 300 mm INTERNAL DIAMETER PIPES AND FITTINGS

This Certificate is issued under the Highway Authorities' Product Approval Scheme (HAPAS) by the British Board of Agrément (BBA) in conjunction with the Highways Agency (HA) (acting on behalf of the overseeing organisations of the Department for Transport; the Scottish Executive; the Welsh Assembly Government; the Department for Regional Development, Northern Ireland), the County Surveyors' Society, the Local Government Technical Advisers' Group, and industry bodies. HAPAS Agrément Certificates are normally each subject to a review every five years.

PRODUCT SCOPE AND SUMMARY OF CERTIFICATE

This Certificate relates to Wavin UltraRib 150 mm, 225 mm and 300 mm Internal Diameter Pipes and Fittings, for use in foul and surface water drains and are suitable for use where pipes and fittings included in Table 5/1 of the HA Manual of Contract Documents for Highway Works (MCHW), Volume 1, are normally used.

AGRÉMENT CERTIFICATION INCLUDES:

- factors relating to compliance with HAPAS requirements
- factors relating to compliance with Regulations where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal five-yearly review.

KEY FACTORS ASSESSED

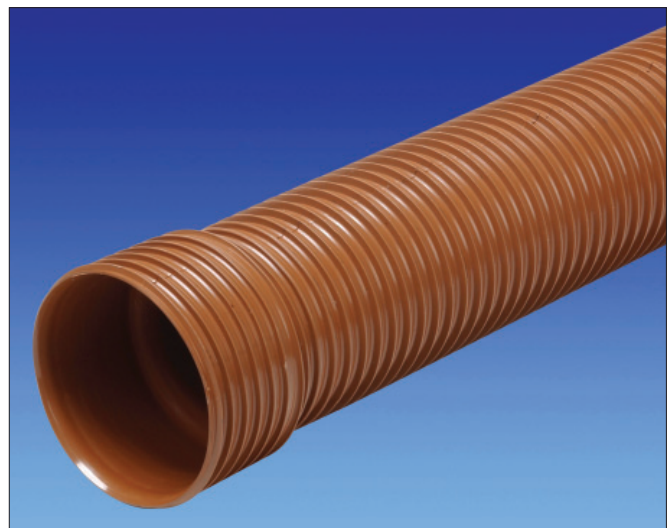
Strength — the products have adequate strength to resist loads associated with installation and subsequent use (see section 5).

Performance of joints — the joints remain watertight when subjected to deflection and distortion (see section 6).

Flow characteristics — the products will have normal flow characteristics (see section 7).

Resistance to chemicals — the products have adequate resistance to the type of chemicals likely to be found in domestic sewage (see section 8).

Durability — the material from which the products are manufactured will not significantly deteriorate and the anticipated life of the products will be in excess of 50 years (see section 11).



The BBA has awarded this Agrément Certificate to the company named above for the products described herein. These products have been assessed by the BBA as being fit for their intended use provided they are installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément



Brian Chamberlain

Head of Approvals — Engineering



Greg Cooper

Chief Executive

Date of First issue: 19 April 2010

Originally certificated on 25 September 1989

The BBA is a UKAS accredited certification body — Number 113. The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at www.bbacerts.co.uk

Readers are advised to check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA direct.

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HAPAS Requirements

Requirements

- 1.1 The general requirements for drains and sewers are contained in the Highways Agency (HA) Manual of Contract Documents for Highway Works (MCHW), Volume 1.
- 1.2 Further information and guidance is given in the MCHW, Volume 2 and Volume 3.
- 1.3 Additional site requirements may be included on particular contracts.

Regulations

Construction (Design and Management) Regulations 2007

Construction (Design and Management) Regulations (Northern Ireland) 2007

Information in this Certificate may assist the client, CDM co-ordinator, designer and contractors to address their obligations under these Regulations.

See section: *2 Delivery and site handling (2.1) and 12 General of this Certificate.*

General

This Certificate relates to Wavin UltraRib 150 mm, 225 mm and 300 mm Internal Diameter Pipes and Fittings. They are for use in foul and surface water drains and are suitable for use where pipes and fittings included in Table 5/1 of the Manual of Contract Documents for Highway Works (MCHW), Volume 1, are normally used.

The design and construction of sewerage systems must be in accordance with the requirements of the Highways Agency (HA); acting on behalf of the overseeing organisations of the Department for Transport; the Scottish Executive; the Welsh Assembly Government; the Department for Regional Development, Northern Ireland; and the conditions set out in the *Design Considerations* and *Installation* parts of this Certificate.

Components of the system can be used individually or in combination as described in this Certificate.

This Certificate does not cover the use of the products for untreated trade effluents.

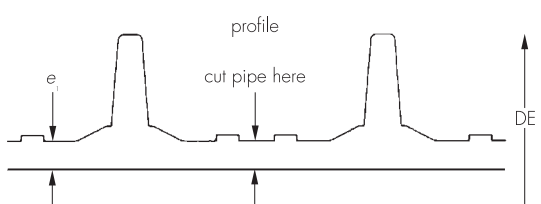
Technical Specification

1 Description

1.1 UltraRib pipes have a solid wall and a repeating pattern of radial ribs perpendicular to the axis of the pipe. The ribs provide a housing for type WC elastomeric ring seals to BS EN 681-1 : 1996.

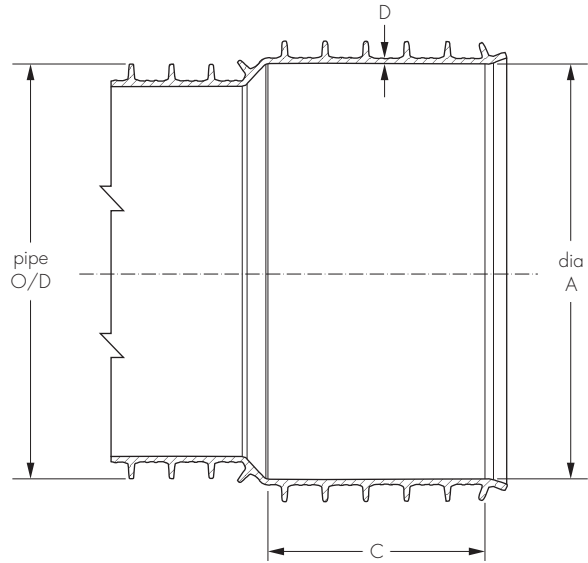
1.2 The pipes, brown in colour, are extruded in PVC-U and produced in three diameters with either plain ends (spigot x spigot) or with one end socketed (socket x spigot). The pipes are Kitemarked to WIS 4-35-01 and BS EN 13476-3 : 2007. Dimensions of the pipe and pipe sockets are given in Tables 1 and 2.

Table 1 Pipe dimensions



Nominal size (DN/ID)	Outside dia (DE) (mm)	Mean bore (mm)	Effective length (m)	Thickness (e ₁)		Mean weight (kg·m ⁻¹)
				nominal (mm)	min (mm)	
150	170	152.0	3 to 6	1.9	1.5	2.1
225	250	226.0	3 to 6	2.3	1.9	4.5
300	335	301.0	3 to 6	2.9	2.3	7.0

Table 2 Pipe socket dimensions



Nominal size (DN/ID)	Nominal pipe O/D (mm)	Socket inside dia A (mm)		Socket depth C (mm) min	Min wall thickness D (mm)
		max	min		
150	170	170.5	171.6	83	1.3
225	250	250.8	252.0	100	1.6
300	335	336.1	337.6	110	1.9

1.3 UltraRib fittings are brown in colour and are either injection moulded in PVC-U or polypropylene (PP), or thermomoulded in PVC-U. The sockets of each fitting are not ribbed. The body of the fittings is ribbed where appropriate. The range of fittings covered by this Certificate is shown in Table 3.

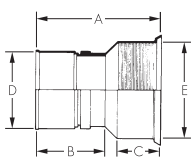
1.4 The screw-fitted access covers are brown in colour and are injection moulded in PVC-U in two parts. The caps incorporate a type WC ring seal to BS EN 681-1 : 1996.

1.5 Continuous quality control is exercised during manufacture to maintain product quality and includes checks for dimensional accuracy, impact resistance and weight of the pipes and for dimensional accuracy, and stress relief where applicable on the fittings.

1.6 Each pipe length and fitting is engraved, marked or labelled with the Certificate holder's name, internal diameter, product code (fittings only) and the BBA identification mark and/or Certificate number.

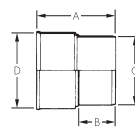
Table 3 Fittings⁽¹⁾

S/S adaptor (to cast iron and clay spigot)



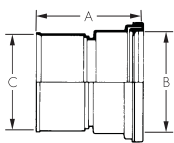
Product code	Nominal size	Dimensions (mm)				
		A	B	C	D	E
6UR128	150	310	185	95	185	215

S/S adaptor (150 mm socket x 160 mm BS EN 1401-1 spigot)



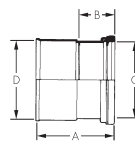
Product code	Nominal size	Dimensions (mm)			
		A	B	C	D
6UR141	150	180	85	160	185

D/S adaptor (to thinwall clay spigot)



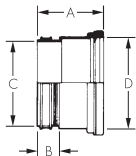
Product code	Nominal size	Dimensions (mm)		
		A	B	C
6UR129	150	195	180	185

D/S adaptor (150 mm socket x 160 mm BS EN 1401-1 socket)



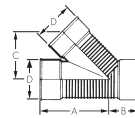
Product code	Nominal size	Dimensions (mm)			
		A	B	C	D
6UR142	150	175	85	160	185

S/S adaptor (150 mm spigot x 160 mm BS EN 1401-1 socket)



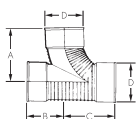
Product code	Nominal size	Dimensions (mm)			
		A	B	C	D
6UR143	150	120	40	160	160

D/S equal junctions 45°



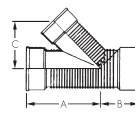
Product code	Nominal size	Dimensions (mm)			
		A	B	C	D
6UR213	150	185	145	230	185
9UR213	225	480	195	330	275
12UR213	300	590	280	405	365

D/S equal junction 87½° (to UltraRib spigot)



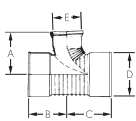
Product code	Nominal size	Dimensions (mm)			
		A	B	C	D
6UR193	150	245	180	230	185

D/S unequal junctions 45°



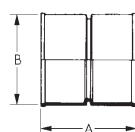
Product code	Nominal size	Dimensions (mm)		
		A	B	C
6UR219	150 x 110	265	80	175
9UR224	225 x 110	400	145	245
9UR227	225 x 150	430	110	285
9UR226	225 x 160	415	225	270
12UR236	300 x 160	490	155	300
12UR237	300 x 150	470	175	300
12UR240	300 x 225	590	280	530

D/S unequal junction 87½° (to BS EN 14001-1 spigot)



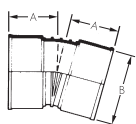
Product code	Nominal size	Dimensions (mm)				
		A	B	C	D	E
6UR199	150 x 110	180	175	160	185	130

D/S pipe couplers with central register



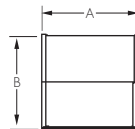
Product code	Nominal size	Dimensions (mm)	
		A	B
6UR205	150	185	185
9UR205	225	232	280
12UR205	300	315	375

D/S short radius bends 15°



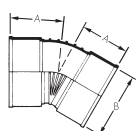
Product code	Nominal size	Dimensions (mm)	
		A	B
6UR567	150	110	185
9UR567	225	140	275
12UR567	300	195	365

D/S slip couplers



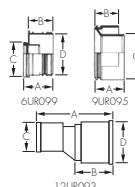
Product code	Nominal size	Dimensions (mm)	
		A	B
6UR105	150	185	185
9UR105	225	270	275
12UR105	300	325	365

D/S short radius bends 30°



Product code	Nominal size	Dimensions (mm)	
		A	B
6UR566	150	120	185
9UR566	225	155	275
12UR566	300	215	365

S/S reducers level invert

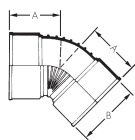


Product code	Nominal size	Dimensions (mm)			
		A	B	C	D
6UR099	150 x 110	115	95	130	170
9UR095	225 x 150	142	120	180	-
12UR093	300 x 225	400	205	275	365

continued

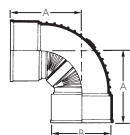
Table 3 Fittings⁽¹⁾ (continued)

D/S short radius bends 45°



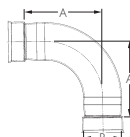
Product code	Nominal size	Dimensions (mm)	
		A	B
6UR563	150	135	185
9UR563	225	165	275
12UR563	300	230	365

D/S short radius bends 87½°



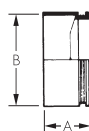
Product code	Nominal size	Dimensions (mm)	
		A	B
6UR561	150	260	185

D/S long radius bends 87½°



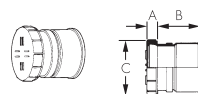
Product code	Nominal size	Dimensions (mm)	
		A	B
9UR561	225	500	275
12UR561	300	530	365

Socket plugs



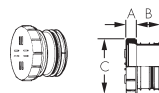
Product code	Nominal size	Dimensions (mm)	
		A	B
6UR296 ⁽²⁾	150	195	195
9UR296 ⁽²⁾	225	105	245
12UR296 ⁽²⁾	300	170	340

S/S screwed access cover



Product code	Nominal size	Dimensions (mm)		
		A	B	C
6UR290	150	41	153	196

P/E screwed access cover



Product code	Nominal size	Dimensions (mm)		
		A	B	C
6UR292	150	41	87	196

(1) Dimensions are for guidance only, with a tolerance of ±5 mm.

(2) Polypropylene (PP) fittings (all others are PVC).

2 Delivery and site handling

2.1 Handling, storage and transportation should be in accordance with BS 8000-14 : 1989 and BS EN 1610 : 1988.

2.2 When long-term storage is envisaged, the pipe and fittings must be protected from direct sunlight.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Wavin UltraRib 150 mm, 225 mm and 300 mm Internal Diameter Pipes and Fittings.

Design Considerations

3 General

The UltraRib pipes and fittings are for use in highway drainage for the conveyance, by combined or separate systems, of surface water and sewage as is permitted to be discharged into public sewers by the Water Industry Act 1991, Chapter 56, and surface water and sewage as is permitted and defined by the Sewerage (Scotland) Act 1968 and the Water and Sewerage Services (Northern Ireland) Order 1973.

4 Practicability of installation

The products are designed to be installed by a competent contractor experienced with this type of product.

5 Strength

5.1 The pipe can be used as an alternative to the plastics pipe for foul and surface water drains in Table 5/1 of the MCHW, Volume 1.

5.2 For the determination of safe bedding depth to Highways Agency Standards HA 40/01, pipe may be assumed to have a standard dimension ratio (SDR) equivalent of not greater than 41.

5.3 Nominal short-term stiffness of pipe and fittings is not less than 8 kN·m⁻² and creep ratio ≤ 2.5.

6 Performance of joints

6.1 Performance of correctly assembled joints will not be adversely affected by thermal expansion or contraction.

6.2 Joints in the pipeline remain watertight under conditions of pipeline movement in excess of those expected to occur in normal good drainage practice and comply with the MCHW, Volume 1, Clause 504.3.

7 Flow characteristics

7.1 The products will have normal flow characteristics associated with PVC-U underground sewerage systems.

7.2 Full bore discharges and velocities are available from H R Wallingford and D I H Barr *Table for Hydraulic Design of Pipes, Sewers and Channels*, Volume 2, 8th edition. The values are based on the Colebrook-White equation.

8 Resistance to chemicals

The products are suitable for use where pipes and fittings included in the MCHW, Volume 1, Table 5/1, are normally used. They have adequate resistance to the type and quantities of chemicals likely to be found in surface water.

9 Rodding

9.1 Drains incorporating the product can be rodded easily using conventional flexible drain rods. Toothed root cutters, as used with some mechanical cleaning systems, could damage the pipes and fittings and these should not be used.

9.2 The system has adequate resistance to water cleansing using pressure jetting equipment. It is recommended that low-pressure, high-volume systems are utilised in accordance with the MCHW, Volume 1, Clause 520.

10 Maintenance

As the products are confined within the soil and have suitable durability (see section 11), maintenance is not required.

11 Durability

In the opinion of the BBA, when used in the context of this Certificate, no significant deterioration of the product will take place and installations will have a life in excess of 50 years.

Installation

12 General

Installation must be in accordance with the Certificate holder's *Below Ground Drainage System Installation Guide*, the general requirements and any additional specific site requirements (see *HAPAS Requirements* of this Certificate).

13 Procedure

13.1 The pipe is cut midway between the small ribs as shown in Figure 1.

13.2 Swarf is removed from the pipe end; a chamfer is not required.

13.3 Pipe spigots and sockets are cleaned and the sealing ring checked to ensure that it is correctly seated (not twisted) between the second and third ribs of the pipe end.

13.4 The manufacturer's lubricant is applied generously to the whole inside area of the socket, ensuring that it does not subsequently become contaminated with dirt.

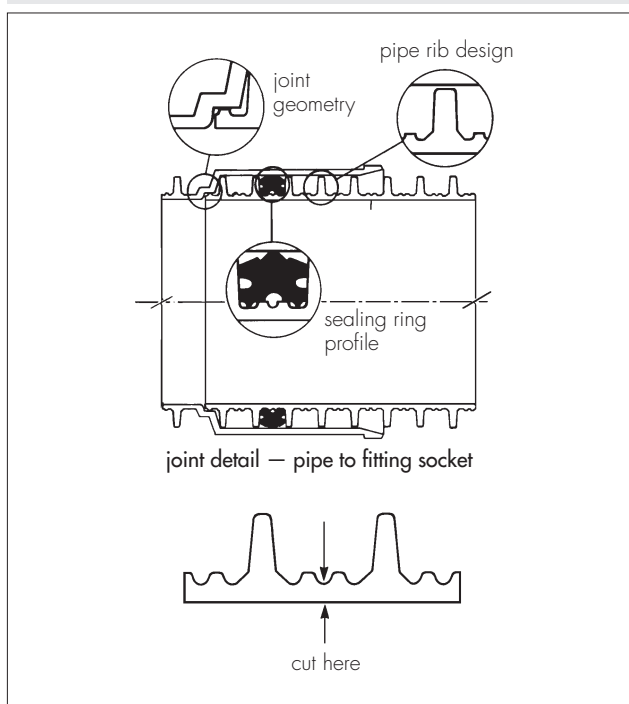
13.5 The pipe is offered to the socket, aligned and pushed fully home.

13.6 Jointing to other materials (clay or concrete pipe) must be carried out in accordance with the Certificate holder's *Below Ground Drainage System Installation Guide*.

13.7 Pipes and fittings must have adequate protection against damage from site traffic.

13.8 Screw-fitted access covers are for use in backdrop manholes.

Figure 1 Joint details



14 Tests

14.1 Tests were carried out on pipe and couplers to determine:

- flexibility and pipe ring stiffness to WIS/IGN No 4-31-05, Appendix E
- effect of combined temperature and external load to WIS/IGN No 4-31-05, Appendix F
- long-term stiffness to WIS/IGN No 4-31-05, Appendix D
- short-term stiffness to WIS/IGN No 4-31-05, Appendix B
- heat reversion to BS 5481 : 1977, Appendix A
- impact to WIS/IGN No 4-31-05, Appendix A
- dimensional accuracy to BS ISO 11922-1 : 1997
- stress rupture to BS 4728 : 1971
- resistance to penetration by simulated sharp aggregate
- Vicat softening temperature to BS 2782-1.120B : 1976
- impact resistance at 0°C to the MCHW, Volume 1, Series 500, Section 518
- longitudinal bending to the MCHW, Volume 1, Series 500, Section 518.
- resistance to water jetting to WIS 4-35-01, Issue 2 : 2008

14.2 Pipe, socketed pipe and couplers are Kitemarked to WIS 4-35-01 and BS EN 13476-3 : 2007.

14.3 Tests were carried out on joints between pipe and fittings to determine:

- combined temperature and external load to WIS 4-35-01, Appendix A
- leaktightness whilst under angular deflection and diametric distortion to BS EN 1277 : 1996, Methods 4C and 4D
- ease of jointing
- dimensional accuracy to BS ISO 11922-1 : 1997
- rodding resistance to the MCHW, Volume 1, Clause 518.12
- short-term stiffness to ISO 13967 : 1998
- drop test (fabricated fittings) to BS EN 12061 : 1999
- mechanical strength and flexibility (fabricated fittings) to BS EN 12256 : 1998.

15 Investigations

15.1 An evaluation of data was made to assess:

- practicability of installation
- chemical resistance
- design method
- flow capacities.

15.2 The manufacturing process was examined, including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used.

Bibliography

- BS 2782-1.120B : 1976 *Methods of testing plastics — Thermal properties — Determination of Vicat softening temperature of thermoplastics*
- BS 4728 : 1971 *Method for determination of the resistance to constant internal pressure of thermoplastics pipe*
- BS 5481 : 1977 *Specification for unplasticized PVC pipe and fittings for gravity sewers*
- BS 8000-14 : 1989 *Workmanship on building sites — Code of practice for below ground drainage*
- BS EN 681-1 : 1996 *Elastomeric seals — Material requirements for pipe joint seals used in water and drainage applications — Vulcanized rubber*
- BS EN 1277 : 1996 *Methods of testing plastics — Thermoplastics pipes, fittings and valves — Plastics piping systems — Thermoplastics piping systems for buried non-pressure applications — Test methods for leaktightness of elastomeric sealing ring type joints*
- BS EN 1610 : 1998 *Construction and testing of drains and sewers*
- BS EN 12061 : 1999 *Plastics piping systems — Thermoplastics fittings — Test method for impact resistance*
- BS EN 12256 : 1998 *Plastics piping systems — Thermoplastics fittings — Test method for mechanical strength or flexibility of fabricated fittings*
- BS EN 13476-3 : 2007 *Plastics piping systems for non-pressure underground drainage and sewerage — Structured-wall piping systems of unplasticized poly (vinyl chloride) (PVC-U), polypropylene (PP) — Specifications for pipes and fittings with smooth internal and profiled external surface and the system, Type B*
- BS ISO 11922-1 : 1997 *Thermoplastics pipes for the conveyance of fluids — Dimensions and tolerances — Metric series*
- HA 40/01 *Design Manual for Roads and Bridges : Volume 4, Geotechnics and Drainage : Section 2, Drainage : Part 5, Determination of Pipe and Bedding Combinations for Drainage Works*
- ISO 13967 : 1998 *Thermoplastic fittings — Determination of ring stiffness*
- Manual of Contract Documents for Highway Works, Volume 1 *Specification for Highway Works*, August 1998 (as amended)
- Manual of Contract Documents for Highway Works, Volume 2 *Notes for Guidance on the Specification for Highway Works*, August 1998 (as amended)
- Manual of Contract Documents for Highway Works, Volume 3 *Highway Construction Details*, March 1998 (as amended)
- WIS4-35-01, Issue 1 : 2000 *Specification for thermoplastic structured wall pipes, joints and couplers with a smooth bore for gravity sewers for the size range 150 to 900 inclusive*
- WIS4-35-01, Issue 2 : 2008 *Specification for thermoplastics structured wall pipes — Supplementary test requirements*
- WIS/IGN No 4-31-05 *Specification for solid wall concentric external rib-reinforced uPVC sewer pipe*

16 Conditions

16.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is granted only to the company, firm or person named on the front page — no other company, firm or person may hold or claim any entitlement to this Certificate
- is valid only within the UK
- has to be read, considered and used as a whole document — it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English law.

16.2 Publications and documents referred to in this Certificate are those that the BBA deems to be relevant at the date of issue or re-issue of this Certificate and include any: Act of Parliament; Statutory Instrument; Directive; Regulation; British, European or International Standard; Code of Practice; manufacturers' instructions; or any other publication or document similar or related to the aforementioned.

16.3 This Certificate will remain valid for an unlimited period provided that the product/system and the manufacture and/or fabrication including all related and relevant processes thereof:

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
- are reviewed by the BBA as and when it considers appropriate.
- remain in accordance with the requirements of Highway Authorities' Product Approval Scheme.

16.4 In granting this Certificate, the BBA is not responsible for:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product/system or any other product/system
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product/system
- individual installations of the product/system, including the nature, design, methods and workmanship of or related to the installation
- the actual works in which the product/system is installed, used and maintained, including the nature, design, methods and workmanship of such works.

16.5 Any information relating to the manufacture, supply, installation, use and maintenance of this product/system which is contained or referred to in this Certificate is the minimum required to be met when the product/system is manufactured, supplied, installed, used and maintained. It does not purport in any way to restate the requirements of the Health & Safety at Work etc Act 1974, or of any other statutory, common law or other duty which may exist at the date of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care. In granting this Certificate, the BBA does not accept responsibility to any person or body for any loss or damage, including personal injury, arising as a direct or indirect result of the manufacture, supply, installation, use and maintenance of this product/system.