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Agrément Certificate
No 07/4438

PRODUCT SHEET 1 — UV-SYSTEM FOR ROOF DRAINAGE

PRODUCT SCOPE AND SUMMARY OF CERTIFICATE

This Certificate relates to the UV-System for Roof Drainage on all building types.

THIS CERTIFICATE INCLUDES:

- factors relating to compliance with UK Building Regulations where applicable
- factors relating to additional non-regulatory information where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal three-yearly review.



KEY FACTORS ASSESSED

System design and dimensioning — the UV-System software allows the system to be designed to deal with anticipated rainfall. A trained system designer is responsible for this work (see section 4).

Flow characteristics — the performance of the outlets running at normal and peak rainfall intensities has been assessed (see section 5).

Strength — the outlets have sufficient strength to resist the loads that may reasonably be expected to occur during installation and service (see section 7).

Durability — under normal service conditions, the outlets will have a service life comparable to or in excess of the gutter or roof into which they are installed (see section 14).

The BBA has awarded this Agrément Certificate for the UV-System for Roof Drainage to Sommerhein AB as fit for its intended use provided it is installed, used and maintained as set out in this Agrément Certificate.

On behalf of the British Board of Agrément

Greg Cooper: Chief Executive

Date of First issue: 4 October 2007

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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Regulations

In the opinion of the BBA, the UV-System for Roof Drainage, if used in accordance with the provisions of this Certificate, will meet or contribute to meeting the relevant requirements of the following Building Regulations:



The Building Regulations 2000 (as amended) (England and Wales)

Requirement:	C2(b)	Resistance to moisture
Comment:		The joints between the roof outlet and the roof will adequately resist the passage of moisture to the inside of the building. See section 6.2 of this Certificate.
Requirement:	H3(1)	Rainwater drainage
Comment:		The roof outlets will contribute to carrying the flow of rainwater from the roof to an outfall, thus minimising the risk of blockage or leakage. See sections 6.1 and 10 of this Certificate.
Requirement:	Regulation 7	Materials and workmanship
Comment:		The system is acceptable. See section 14 of this Certificate.



The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8	Fitness and durability of materials and workmanship
Regulation:	8(1)	Fitness and durability of materials and workmanship
Comment:		The system can contribute to a construction satisfying this Regulation. See section 14 and the <i>Installation</i> part of this Certificate.
Regulation:	9	Building standards – construction
Standard:	3.6(a)	Surface water drainage
Comment:		The roof outlets will contribute to carrying the flow of rainwater from the roof to an outfall, thus minimising the risk of blockage or leakage and, therefore, meeting the requirements of this Standard, with reference to clause 3.6.1 ⁽¹⁾⁽²⁾ . See sections 6.1 and 10 of this Certificate.
Standard:	3.10	Precipitation
Comment:		The joints between the roof outlet and the roof will adequately resist the passage of moisture to the inside of the building and, therefore, the system meets the relevant requirement of this Standard, with reference to clause 3.10.7 ⁽¹⁾⁽²⁾ . See section 6.2 of this Certificate. (1) Technical Handbook (Domestic). (2) Technical Handbook (Non-Domestic).



The Building Regulations (Northern Ireland) 2000 (as amended)

Regulation:	B2	Fitness of materials and workmanship
Comment:		The system is acceptable. See section 14 of this Certificate.
Regulation:	C4	Resistance to ground moisture and weather
Comment:		The system meets the relevant requirements of this Regulation. See section 6.2 of this Certificate.
Regulation:	N5	Rain-water drainage
Comment:		The system meets the relevant requirements of this Regulation. See sections 6.1 and 10 of this Certificate.

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 sections: 2 *Delivery and site handling* (2.2) and 15 *General* (15.4).

Non-regulatory Information

NHBC Standards 2007

In the opinion of the BBA, the use of the UV-System for Roof Drainage, in relation to this Certificate is not subject to the requirements of these Standards.

Zurich Building Guarantee Technical Manual 2007

In the opinion of the BBA, the use of the UV-System for Roof Drainage, in relation to this Certificate, is not subject to the requirements of this Technical Manual.

General

This Certificate relates to the UV-System for Roof Drainage, comprising full bore flow components and the UV-System software used in design. The products are for use with conventional pressure-rated pipe systems.

The system is for use in installations designed in accordance with BS EN 12056-1 : 2000 and BS EN 12056-3 : 2000 for the conveyance of surface water as is permitted to be discharged into public sewers by The Water Industry Act 1991, Chapter 56 and surface water as is permitted and defined by the Sewerage (Scotland) Act 1968 and the Water and Sewerage Services (Northern Ireland) Order 1973.

It is essential that the system is installed precisely in accordance with the computed design.

Collecting pipes are installed horizontally at any level in the building, reducing the number of downpipes and the associated underground work and drainage.

Components of the system are used individually or in conjunction with conventional pressure-rated pipes and fittings which comply with performance specification denoted in the *UV-System Technical Manual*.

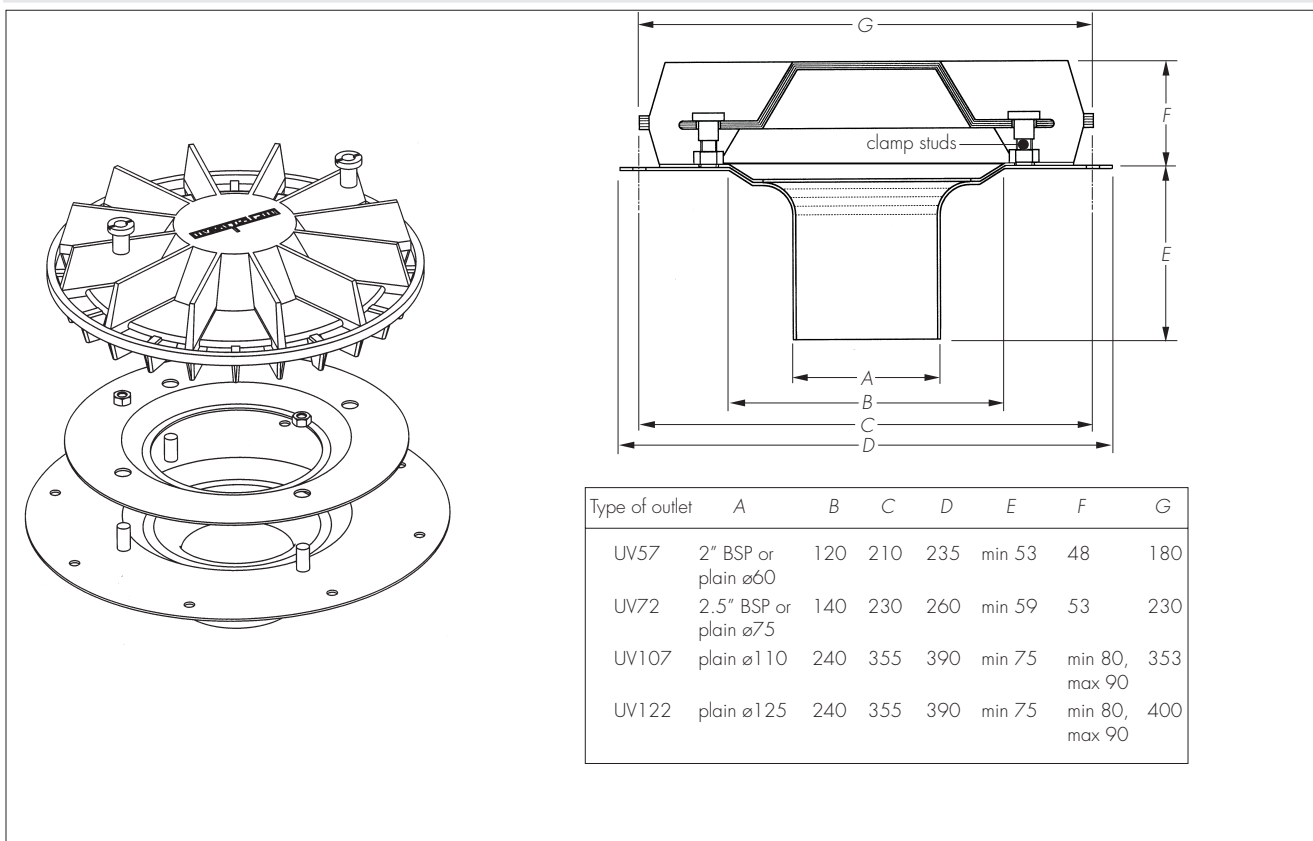
Technical Specification

1 Description

1.1 The UV-System for Roof Drainage consists of four sizes of roof outlets (denoted UV57, UV72, UV107 and UV122), technical specifications and computer software to design the pipework for each installation.

1.2 The roof outlets are available with plain spigots (60 mm, 75 mm, 110 mm or 125 mm diameter). UV57 and UV72 outlets are also available with threaded spigots of 2" and 2½" BSP respectively. The components and the respective material types are shown in Figure 1.

Figure 1 Roof outlet — exploded and cross-section views (all dimensions in mm)



1.3 Stainless steel orifice plates from 57 mm to 122 mm in diameter with holes from 15 mm to 110 mm in diameter are available to vary the hydraulic resistance of the roof outlet.

1.4 The roof outlets are for use with the pipes and fittings covered by the performance specification given in section 3. Pipework should be independently certificated for compliance with the declared specification.

1.5 Suitable pipes and fittings are available in the following materials:

- cast iron
- galvanized steel
- PVC-U
- ABS
- stainless steel
- copper
- PE
- PP.

1.6 Factory production control is exercised during manufacture including checks for conformity to the specification of the raw materials, and checks on dimensions, thickness and visual appearance. Weld integrity of the studs and airtightness checks on the outlet bowl are carried out on each unit.

2 Delivery and site handling

2.1 Each outlet carries the product code, the manufacturer's logo and the BBA identification mark. The BBA identification mark including the number of this Certificate is incorporated in the company's technical literature. The products are delivered to site either on pallets or in single boxes depending on the quantity.

2.2 Care should be taken when handling the products, in order to avoid damage and ensure the safety of site operatives.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on the UV-System for Roof Drainage.

Design Considerations

3 Use

3.1 When designed, installed and used in accordance with the provisions of this Certificate, the UV-System for Roof Drainage will convey rainwater from the roof to a below-ground drainage system outside the building.

3.2 Further advice on designing full bore flow roof drainage systems is given in the *UV-System Technical Manual*.

3.3 Gutters should be designed in accordance with BS EN 12056-3 : 2000. In case of deviation in calculated water depths between BS EN 12056-3 : 2000 and the *UV-System Technical Manual*, the most conservative value should be used.

3.4 Pipes and fittings must meet the performance specification fully detailed in the *UV-System Technical Manual*. The key characteristics include:

- pipework must withstand both negative and positive pressure; negative pressures to -0.9 bar and positive pressures according to the design specification, which must not exceed the rating of the pipe
- joints must be capable of either resisting longitudinal forces without sliding apart or must be restrained to prevent relative movement
- bends in excess of 45° deviation from straight flow should be smooth radius
- eccentric reducers are recommended for use in horizontal flows with the crown of the pipe level.

3.5 The underground gravity drainage system must be capable of accepting without surcharge the rate of flow of water discharged by the UV-System in addition to other discharges which may be received. If the underground system is part of the UV-System, no other connections may be made upstream of the UV-System discharge.

4 System design and dimensioning

4.1 Each system must be designed by a person trained to use UV-System computer software and familiar with hydraulic and roof drainage design procedures.

4.2 The system is designed to flow at maximum capacity when rainfall is at the design intensity. A system using the pipe dimensions obtained from the design will ensure sufficient capacity to transport the water from the roof to the discharge point.

4.3 Information required to enable a design to be carried out includes:

- design rainfall intensity (normally selected or calculated from BS EN 12056-3 : 2000, or other appropriate guidance documents)
- geometric layout of the roof and outlets including the height of the building and its location and plan location
- position of underground connection.

4.4 Use of the computer program ensures the most economic and effective design is achieved. Critical conditions to be achieved in any design include:

- (a) minimum water velocity must be 0.7 ms^{-1} at the design flow intensity to achieve a self-cleansing velocity
- (b) computed flow⁽¹⁾ from an individual outlet must not exceed the specified maximum for each outlet size
- (c) in systems with more than one roof outlet, the balance in the system should not exceed the smallest of 0.1 m multiplied by the disposable head or 0.5 m .

(1) The computation of the ultimate capacity under full-bore flow has been verified by testing.

4.5 The designer may vary the pipework sizing, layout, or flow to each outlet, or incorporate orifice plates to achieve an acceptable installation.

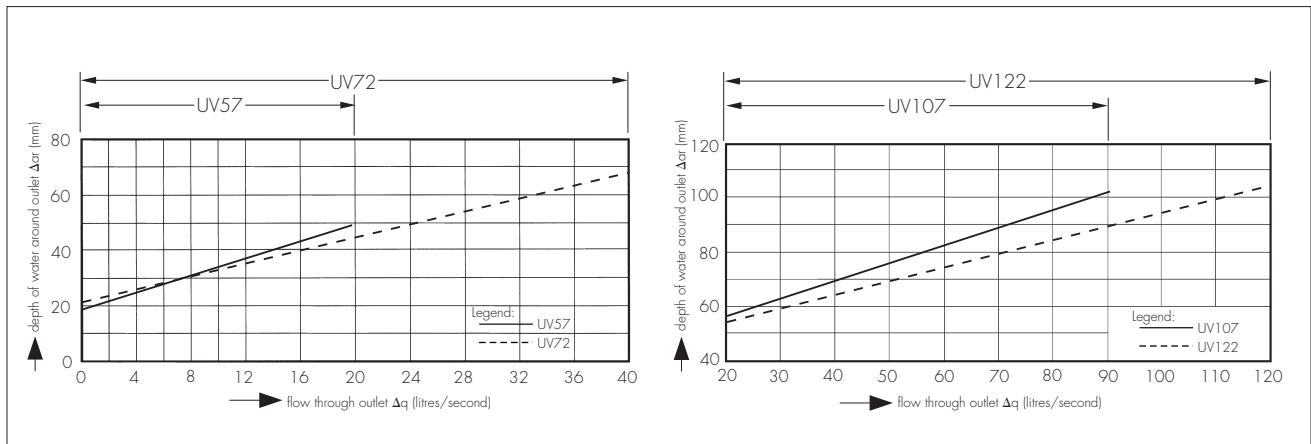
4.6 An approximate indication of the pipe sizes required can be made using a manual dimensioning procedure detailed in the *UV-System Technical Manual*.

4.7 The maximum permitted flow through an outlet is 20, 40, 90 and 120 litres per second for UV57, UV72, UV107 and UV122 outlets respectively.

5 Flow characteristics

When the system is operating at its design intensity, the high velocity of the water will ensure the system is self-cleansing. Self-cleansing can also occur at rainfalls as low as 25% of the design intensity. At rainfalls less than this, the system will operate under vented gravity flow conditions. The flow characteristics of the outlets are shown in Figure 2.

Figure 2 Flow against depth of water at the outlet (at full bore flow)⁽¹⁾



6 Performance of joints



6.1 The performance of the joint to the pipework system is dependent on the pipework system adopted. Conventional jointing techniques using independently approved products should provide satisfactory performance (see section 1.4).

6.2 The performance of the joint between the outlet and the roof material is dependent on the installation. Conventional jointing techniques for roofs constructed of similar materials applied correctly should give satisfactory performance.

7 Strength

The roof outlets have adequate strength to resist loads associated with installation and subsequent use. The standard gratings comply with BS EN 1253-1 : 2003 Class H1.5 and the flattopped UV72 grating complies with BS EN 1253-1 : 2003 Class K3.

8 Roof/gutter design

8.1 The roof must be designed to allow rainwater to flow freely to the outlets.

8.2 The water depth around the outlet when the system is operating at its maximum flow rate (full bore flow) may be estimated from Figure 2.

8.3 The maximum water depth on the roof or in the gutter must be estimated in accordance with BS EN 12056-3 : 2000. Where calculated water depths differ between the *UV-System Technical Manual* and BS 12056-3 : 2000, the most conservative values should be used.

8.4 The water loading on the roof caused by the water depth calculated must not exceed the allowable roof loading.

8.5 It is recommended that in accordance with BS EN 12056-3 : 2000 the roof and/or gutter design incorporate a built-in overflow facility. The roof must be designed to hold water up to this level should the design rainfall be exceeded or unexpected blockages occur.

9 Resistance to chemicals

The performance of the roof outlets will be unaffected by the types and quantities of chemicals associated with rainwater.

10 Resistance to blockage



The high velocities at which the water flows through the pipework, together with the design of the roof outlets, reduce the risk of blockages [see also sections 4.4 (a), 8 and 13].

11 Behaviour in relation to fire

The bodies of the roof outlets will not affect the overall fire resistance of the roof in which they are installed.

12 Thermal insulation

Outlets can be supplied with moulded, foamed polyethylene insulation fitted to the underside. It may be desirable in some situations to provide additional insulation and to insulate the pipework to prevent condensation. This will depend on the relative humidity and the temperature. It is the responsibility of the building designer to ensure the positioning of the outlets and pipework does not compromise the integrity of the insulation of the buildings and that relevant building regulations are complied with.

13 Maintenance

Periodic inspection in accordance with BS EN 12056-3 : 2000 Clause NE 5.1, should be carried out to ensure that the outlets are free from gravel, leaves and other debris which could impair the performance of the system. Maintenance is the responsibility of the owner.

14 Durability



The materials used for the manufacture of the outlets are highly durable and when installed correctly will have an effective life equivalent to, or in excess of, the roof or gutter in which they are installed.

Installation

15 General

15.1 The design of the layout of the roof outlets in the UV-System for Roof Drainage should be in accordance with the recommendations given in BS EN 12056-3 : 2000.

15.2 The roof outlets should be placed at the roof low points to allow efficient flow of water to the outlets.

15.3 The system must be installed in strict accordance with the design. Small differences to pipework length/diameter can significantly affect the performance of the system.

15.4 Appropriate safety measures should be taken during installation, particularly to protect personnel working at height and to prevent hazards from falling objects.

16 Procedure

16.1 An appropriately sized hole must be formed or cut in the roof structure or gutter to accommodate the outlet. The outlet must be secured to the roof structure (see Figure 3).

16.2 The BBA has not assessed individual installation details since they will depend on the roof construction.

16.3 Typical installation details not assessed by the BBA but suggested by Sommerhein AB are shown in the *UV-System Installation Manual* (see also Figure 3).

Technical Investigations

The following is a summary of the technical investigations carried out on the UV-System for Roof Drainage.

17 Tests

Tests were carried out to determine:

- dimensional accuracy
- maximum flow capacities
- watertightness
- resistance to loading.

18 Investigations

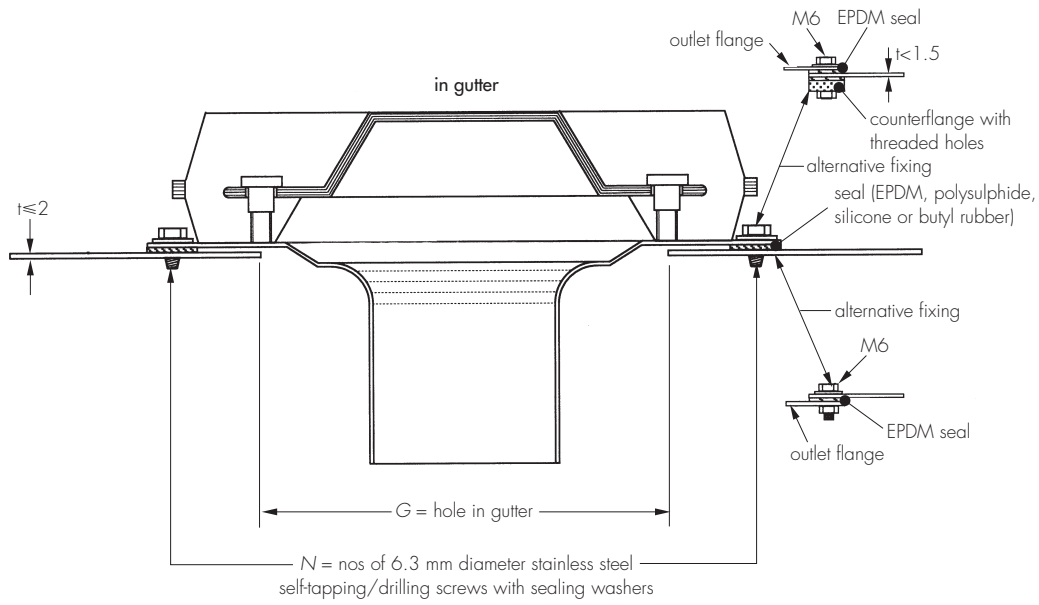
18.1 An evaluation of existing data was made to assess:

- resistance to chemicals
- suitability of materials
- durability
- ease of jointing to pipework
- practicability of installation.

18.2 An investigation was carried out to verify the scientific basis and the correlation with full-scale testing of the computer software used to design the installations.

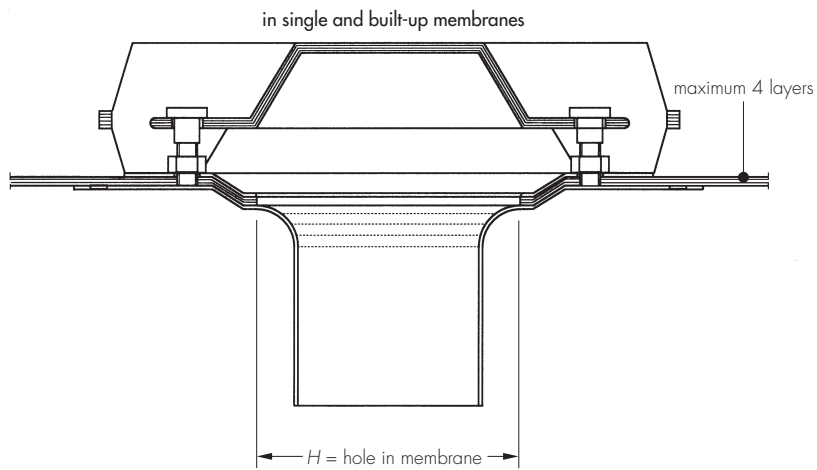
18.3 The manufacturing processes were examined, including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used.

Figure 3 Roof outlets (all dimensions in mm)

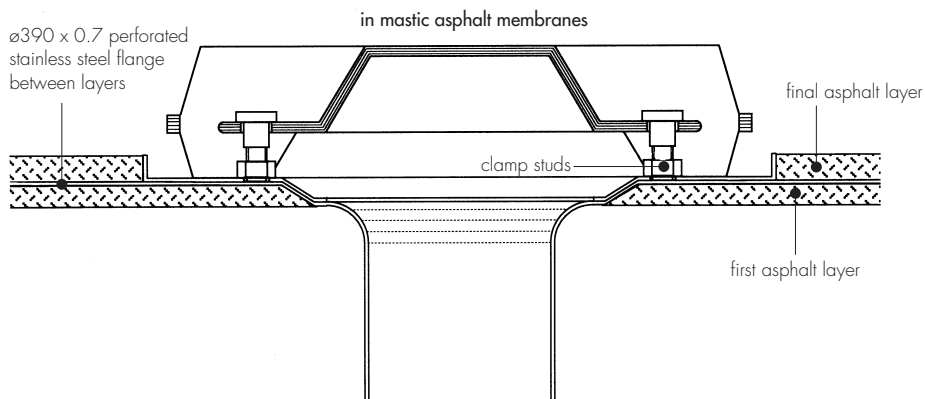


Type of outlet	G	N
UV57	min 120, max 190	8
UV72	min 140, max 210	8
UV107	min 240, max 330	12
UV122	min 240, max 330	12

installing the outlet by welding is an alternative solution provided the gutter sole is made of a material compatible with the outlet



Type of outlet	H
UV57	82
UV72	102
UV107	160
UV122	160



Bibliography

BS EN 1253-1 : 2003 *Gullies for buildings — Requirements*

BS EN 12056-1 : 2000 *Gravity Drainage Systems inside Buildings — General and performance requirements*

BS EN 12056-3 : 2000 *Gravity Drainage Systems inside Buildings — Roof drainage, layout and calculation*

Conditions of Certification

19 Conditions

19.1 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.

19.2 References in this Certificate to any Act of Parliament, Statutory Instrument, Directive or Regulation of the European Union, British, European or International Standard, Code of Practice, manufacturers' instructions or similar publication, are references to such publication in the form in which it was current at the date of this Certificate.

19.3 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.

19.4 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.

19.5 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.