



## Polypipe plc

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**Agrément  
Certificate  
No 91/2673**

Designated by Government  
to issue  
European Technical  
Approvals

## POLYPIPE/PARAGON RAINWATER SYSTEMS

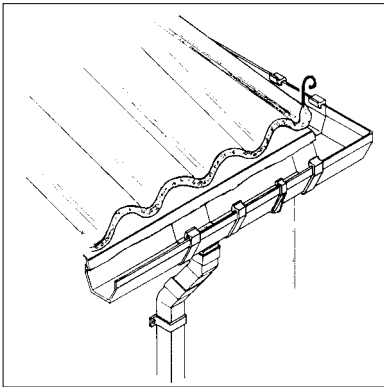
Système de gouttières de rive  
Dachrinne

### Product

• *THIS CERTIFICATE RELATES TO POLYPIPE/PARAGON RAINWATER SYSTEMS, THE COMPONENTS OF WHICH ARE REFERRED TO IN THE ACCOMPANYING DETAIL SHEETS.*

• *Polypipe/Paragon Rainwater Systems are for the collection and discharge of rainwater from roofs.*

• *In the opinion of the British Board of Agrément the products are suitable for their purpose.*



### Regulations

#### 1 The Building Regulations (England and Wales)



The Secretary of State has agreed with the British Board of Agrément the aspects of performance used by the BBA in assessing the compliance of drainage systems with the Building Regulations. In the opinion of the BBA, the position of Polypipe/Paragon Rainwater Systems under these Regulations, if used in accordance with the provisions of this Certificate, is as stated in Detail Sheet 1.

#### 2 The Building Standards (Scotland) Regulations



In the opinion of the BBA, the position of Polypipe/Paragon Rainwater Systems under these Regulations, when used in accordance with the provisions of this Certificate, is as stated in Detail Sheet 1.

#### 3 The Building Regulations (Northern Ireland)



In the opinion of the BBA, the position of Polypipe/Paragon Rainwater Systems under these Regulations, when used in accordance with the provisions of this Certificate, is as stated in Detail Sheet 1.

## Conditions of Certification

### 4 Conditions

4.1 The quality of materials and the method of manufacture have been examined and found satisfactory by the BBA and must be maintained to this standard throughout the period of validity of this Certificate. This Certificate will remain valid for an unlimited period provided that:

- (a) the specification of the products is unchanged,
- (b) the manufacturer continues to have the product checked by the BBA, and
- (c) the BSI Kitemark licensing remains valid.

4.2 Where reference is made in this Certificate to any Act of Parliament, Regulation made thereunder, Statutory Instrument, Code of Practice, British Standard, manufacturer's instruction or similar publication, it shall be construed as reference to such publication in the form in which it is in force at the date of this Certificate.

4.3 In granting this Certificate, the BBA makes no representation as to the presence or absence of patent rights subsisting in the product, and/or as to the legal right of Polypipe plc to market, install or maintain the product.

4.4 It should be noted that any recommendations relating to the safe use of this product which are contained or referred to in this Certificate are the minimum standards required to be met when the product is used. They do not purport in any way to re-state the requirements of the Health and Safety at Work etc Act 1974, or of any other statutory or Common Law duties of care, or of any duty of care which may in the future exist; nor is conformity with such recommendations to be taken as satisfying the requirements of the 1974 Act or of any other present or future statutory or Common Law duties of care. In granting this Certificate, the BBA does not accept responsibility to any person or body for any loss or damage incurred in respect of personal injury arising as a direct or indirect result of the use of this product.

## Additional Information



The management systems of Polypipe plc have been approved to BS 5750 : Part 2 : 1987 *Quality systems — Specification for production and installation*, in accordance with the terms of the Kitemark Licence No 7194 in the context of this Certificate.



In the opinion of the British Board of Agrément, Polypipe/Paragon Rainwater Systems are satisfactory if installed and used as set out in this Certificate. Certificate No 91/2673 is accordingly awarded to Polypipe plc.

On behalf of the British Board of Agrément

Date of issue: 30th July 1991

Director

Recreated in QX 12.1.01 (SM)

## Building Regulations

### 1 The Building Regulations 1985 (as amended) (England and Wales)



The Secretary of State has agreed with the British Board of Agrément the aspects of performance used by the BBA in assessing the compliance of drainage systems with the Building Regulations. In the opinion of the BBA, Polypipe/Paragon Rainwater Systems, if used in accordance with the provisions of this Certificate, will meet the relevant requirements.

Requirement:	H3	Rainwater drainage
Comments:		The systems will carry the flow of rainwater from the roof to an outfall and minimise the risk of blockage or leakage. See the marked sections of the <i>Design Data</i> parts in the accompanying Detail Sheets.
Requirement:	Regulation 7	Materials and workmanship
Comments:		The systems are acceptable.

### 2 The Building Standards (Scotland) Regulations 1990



In the opinion of the BBA, the Polypipe/Paragon Rainwater Systems, if used in accordance with the provisions of this Certificate, will satisfy the various Regulations listed below.

Regulation:	10	Fitness of materials
Standard:	B2	Selection and use of materials, fittings, components and other manufactured products
Comments:		The systems are acceptable.
Regulation:	24	Drainage and sanitary facilities
Standard:	M2	Drainage system of a building
Comments:		The systems can meet the relevant requirements of this Standard. See the marked sections of the <i>Design Data</i> parts in the accompanying Detail Sheets.

### 3 The Building Regulations (Northern Ireland) 1990 (as amended 1991)



In the opinion of the BBA, Polypipe/Paragon Rainwater Systems, if used in accordance with the provisions of this Certificate, will satisfy the various Building Regulations listed below.

Regulation:	B2	Fitness of materials and workmanship
Comments:		The systems are acceptable.
Regulation:	N7	Rain-water drainage
Comments:		The systems will contribute to meeting the relevant requirements of this Regulation. See the marked sections of the <i>Design Data</i> parts in the accompanying Detail Sheets.



On behalf of the British Board of Agrément

Date of issue: 30th July 1991

Director

Recreated in QX 15.1.01 (SM)



Polypipe plc

Certificate No 91/2673

**POLYPIPE/PARAGON RAINWATER SYSTEMS**

**DETAIL SHEET 2**

## BSI Kitemarked Components

• THIS DETAIL SHEET LISTS POLYPIPE/PARAGON RAINWATER SYSTEMS' COMPONENTS CURRENTLY COVERED BY THE BSI KITEMARK CERTIFICATION SCHEME.



• BSI Kitemark Licence No 7194 issued to

Polypipe plc  
Broomhouse Lane  
Edlington  
Doncaster DN12 1ES

• BS 4576 : Part 1 : 1989 Specification for unplasticized polyvinyl chloride (PVC-U) rainwater goods and accessories — Half-round gutters and pipes of circular cross-section.

Kitemark certified system components to BS 4576 : 1989*	Manufacturer's catalogue number	
	Polypipe code	Paragon code
<i>Nominal size (mm) — 100 half-round</i>		
Gutter — 2 metre length	RY400	240
Gutter — 4 metre length	RY401	241
Gutter — 6 metre length	—	251
Gutter union	RY402	201
Angle 90°	RY403	202
Angle 120°	—	208
Angle 135°	RY404	203
Running outlet	RY405	204
External stop end	RY407	206
Fascia bracket	RY409	207
<i>Nominal size (mm) — 112 half-round</i>		
Gutter — 2 metre length	RR100	255
Gutter — 4 metre length	RR101	253
Gutter — 6 metre length	—	249
Gutter union	RR102	201
Angle — 90°	RR103	202
Angle — 135°	RR104	203
Running outlet	RR105	204
External stop end	RR107	206
Fascia bracket	RR109	207
<i>Nominal size (mm) — 68 diameter</i>		
Downpipe — 2 metre length	—	254
Downpipe — 2.5 metre length	RR121	258
Downpipe — 4 metre length	RR123	252
Downpipe — 5.5 metre length	RR124	259
Downpipe — 6 metre length	—	256
Connector	RR125	220
Offset bend — 112.5°	RR127	223
Offset bend — 92.5°	—	224
Pipe shoe	RR128	221
Branch — 112½°	—	238
Pipe bracket	RR126	222
Round to square adaptor	RR231	063
Large hopper	RR140	231

\*Details of Kitemark certification schemes can be obtained from Certification and Assessment Service Quality Assurance Services, British Standards Institution, P O Box 375, Milton Keynes MK14 6LO, Tel: Milton Keynes (0908) 315555, Telex: 82782.



On behalf of the British Board of Agrément

Date of issue: 30th July 1991

Director

Recreated in QX 12.1.01 (SM)



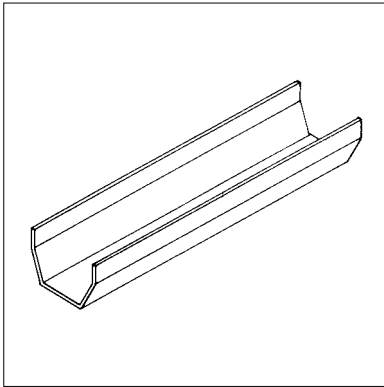
Polypipe plc

POLYPIPE/PARAGON SQUARE SECTION  
GUTTER SYSTEM

Certificate No 91/2673

DETAIL SHEET 3

## Product



- THIS DETAIL SHEET RELATES TO THE POLYPIPE/PARAGON SQUARE SECTION GUTTER SYSTEM.
- The Polypipe/Paragon Square Section Gutter System is for the collection and discharge of rainwater from roofs.
- The capacity of the gutter system can reduce the number of rainwater downpipes required to drain a roof in comparison with half-round gutter of the same nominal size.

This Detail Sheet must be read in conjunction with the Front Sheet and Detail Sheet 1 which give Conditions of Certification and the product's position regarding the Building Regulations respectively.

## Technical Specification

### 1 Description

1.1 The components of the Polypipe/Paragon Square Section Gutter System covered by this Detail Sheet are shown in Figure 1.

1.2 The gutter, downpipe and accessories are manufactured from PVC-U and are available in colours of black, grey, chestnut brown and white.

1.3 The gutter section is trapezoidal; 112 mm nominal width by approximately 60 mm depth. Each fitting incorporates flexible clips for fixing to the gutter. The joints are sealed with elastomeric gaskets.

1.4 The square section downpipe has nominal external dimensions of 65 mm and a minimum wall thickness of 1.7 mm.

1.5 By applying the square-to-round pipe adaptor to the running outlet spigots, the gutter and accessories can be used with the Kitemarked 68 mm nominal diameter downpipe and accessories (see Detail Sheet 2 of this Certificate).

1.6 Gutter section is extruded and cut to 2 metre or 4 metre lengths. Square section downpipe is extruded and cut to 2.5 metre, 4 metre or 5.5 metre lengths. Fittings for the gutter and downpipe are produced by injection moulding.

1.7 The metal rafter brackets are manufactured from carbon steel and galvanized to BS 729 : 1971(1986) Specification for hot dip galvanized coatings on iron and steel articles.

1.8 Continuous quality control is exercised during manufacture to maintain product quality. Checks include dimensional accuracy and visual examination.

### 2 Delivery and site handling

2.1 Gutters and downpipes are delivered to site in bundles of five protected by opaque polythene sleeving which should not be removed until the products are used.

2.2 Each bundle of gutters or downpipes is packed in a sleeve printed with the manufacturer's symbol and the BBA identification mark incorporating the number of this Certificate. Fittings are marked with the manufacturer's symbol and the product code. Components covered by the Kitemark licence are marked with the nominal size, the legend BS 4576, and the Kitemark symbol.

## Design Data

### 3 General

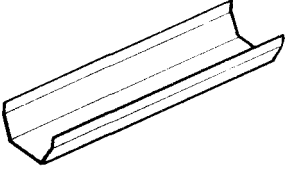
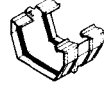
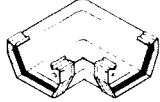
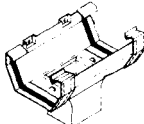



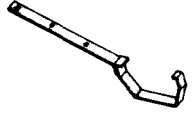
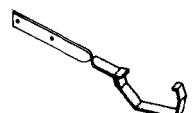
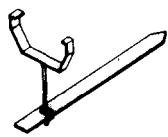
3.1 The Polypipe/Paragon Square Section Gutter System is suitable for use as eaves guttering for the collection of rainwater from roofs.

3.2 Square section downpipe and fittings are unsealed and are for external use only.

### 4 Performance of joints

4.1 Correctly made joints between gutter sections and fittings are watertight under conditions of thermal movement in excess of those expected to occur in practice.

Figure 1 Components

	gutter	Paragon Code No
	Code No	Code No
	RS200	041
	RS201	042
	union	Paragon Code No
	Code No	Code No
	RS202	043
	angle	Paragon Code No
	Code No	Code No
	RS203 90°	044
	RS204 135°	045
	running outlet	Paragon Code No
	Code No	Code No
	RS205	046
	stopend — external	Paragon Code No
	Code No	Code No
	RS207	048
	stopend — internal	Paragon Code No
	Code No	Code No
	RS208	047
	fascia bracket	Paragon Code No
	Code No	Code No
	RS209	049
	metal bracket top rafter	Paragon Code No
	Code No	Code No
	RS210	050
	metal bracket side rafter	Paragon Code No
	Code No	Code No
	RS212	051
	metal bracket rise and fall	Paragon Code No
	Code No	Code No
	RS211	052

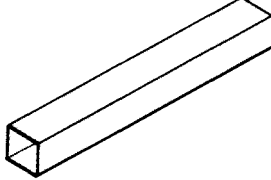

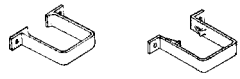
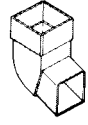
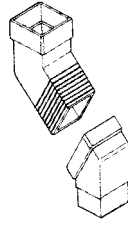
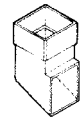
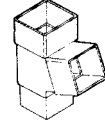

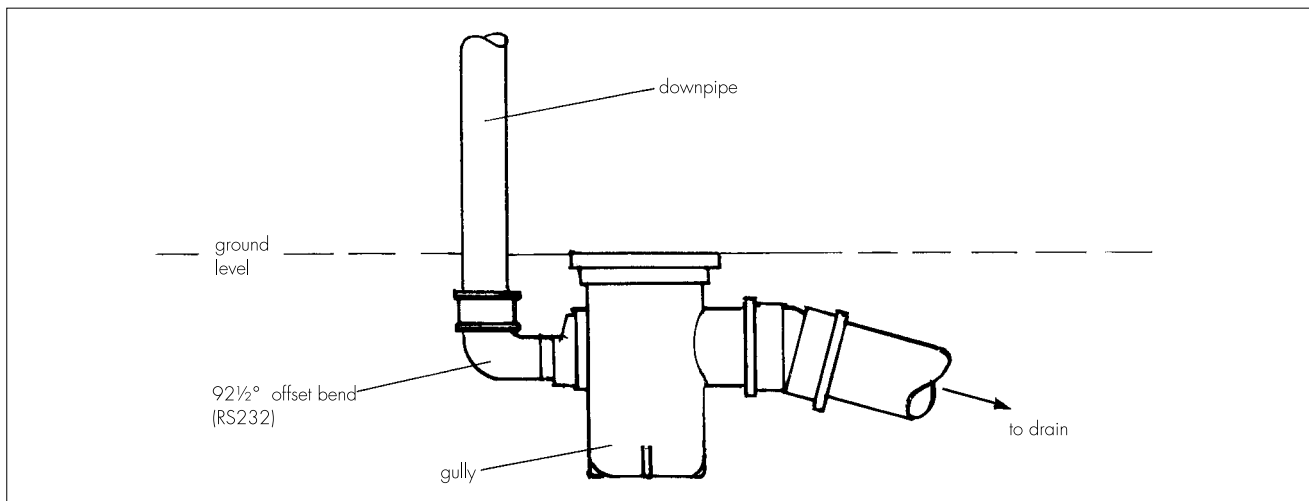
	downpipe	Paragon Code No
	Code No	Code No
	RS221	055
	RS223	056
	RS224	057
	connector	Paragon Code No
	Code No	Code No
	RS225	058
	pipe brackets	Paragon Code No
	Code No	Code No
	stand off	059
	flush to wall	065
	RS236	
	offset bend	Paragon Code No
	Code No	Code No
	RS227 112½°	060
	RS232 92½°	066*
	*The 92½° offset bend is used in the situation shown in Figure 2	
	adjustable offset	Paragon Code No
	Code No	Code No
	RS237	064
	(minimum offset = 25 mm maximum offset = 65 mm)	
	shoe	Paragon Code No
	Code No	Code No
	RS228	061
	branch 112½°	Paragon Code No
	Code No	Code No
	RS229	062
	pipe adaptor	Paragon Code No
	Code No	Code No
	RS231	063

Figure 2 Typical installation of 92½° offset bend



4.2 The fittings used with square section downpipe are unsealed and are not designed to withstand hydrostatic pressure. In the event of blockage of the downpipe, water leakage may occur at joints.

## 5 Resistance to loading

5.1 The gutter will have adequate resistance to snow loading under normal conditions. Care must be exercised in placing ladders for roof maintenance; the use of ladder stays is recommended.

5.2 If the downpipe is damaged by accidental impact it can be replaced easily.

## 6 Flow characteristics

Flow capacities associated with the Polypipe/Paragon Square Section Gutter System, when calculated in accordance with BS 6367 : 1983 *Code of practice for drainage of roofs and paved areas*, are given in Table 1.

Table 1 Flow capacities

Gutter characteristics				
Breadth (B)	Depth (Y <sub>c</sub> )	Maximum area (A)	Critical depth (Y <sub>c</sub> )	Flow capacity (Q <sub>o</sub> ) (litres per second)
(mm)	(mm)	(mm <sup>2</sup> )	(mm)	
110	57.1	5586	29.6	1.417
Outlet characteristics				
Nominal size	Effective perimeter (L <sub>w</sub> )	Cross-sectional area (A <sub>o</sub> )	Flow capacity (Q <sub>o</sub> ) (litres per second)	
(mm)	(mm)	(mm <sup>2</sup> )		
65	242	3660	1.625	
Design capacity (litres per second)				
Centre outlet level or 1:600 fall		end outlet gutter level	end outlet 1:600 fall	
1.625		1.417	1.530	
restricted by outlet capacity		restricted by gutter capacity	restricted by gutter capacity	

(1) The values must be reduced in accordance with BS 6367 : 1983 to account for bends, etc where appropriate.

Test data examined by the BBA indicate that the calculations give conservative flow rates.

## 7 Practicability of installation

Installation of the products can be carried out under normal site conditions without undue difficulty.

## 8 Maintenance

8.1 The gutter, downpipe and accessories are manufactured from self-coloured material which does not require painting. To maintain the appearance, the system may be washed periodically with water and detergent.

8.2 Damaged sections may be removed by unclipping from brackets and unions. Adjoining sections should not be damaged by this action, but unions and brackets may need to be replaced.

## 9 Durability

The gutter system is made from a conventional material as used in gutter systems conforming to BS 4576 : Part 1 : 1989 *Unplasticized polyvinyl chloride (PVC-U) rainwater goods and accessories – Half-round gutters and pipes of circular cross-section*. The material is acceptable and will have a life expectancy of at least 20 years.

## Installation

### 10 Procedure

10.1 Installation must be in accordance with the manufacturer's instructions *Polypipe Above Ground Drainage Systems* and BS 6367 : 1983 where relevant.

10.2 Brackets are secured to the fascia with three No 10, 25 mm x 5 mm, zinc plated or sherardized roundhead screws at centres of one metre (maximum).

10.3 External and internal angles should have supporting brackets fitted within 150 mm of each side.

10.4 Unions are fixed to the fascia board with one No 10, 25 mm x 5 mm, zinc plated or

standardized roundhead screw. Running outlets are fixed with two No 10 roundhead screws.

10.5 Joints are made by locating the gutter under the rear clip of the flexible clip on the fitting. The gutter is pulled forward and down until the front edge fits under the front clip and snaps into position. The elastomeric gasket in the fitting will seal the joint.

10.6 All gutter joints should incorporate a 10 mm expansion gap.

10.7 The gutter may be fixed either level on the fascia board or to a fall of 1:600. It is important that the distance between the gutter and the roof tiles is not excessive and that roofing felt is allowed to project slightly into the gutter to prevent water splash onto the fascia board behind the gutter.

10.8 Support brackets for square section downpipe and fittings must be used immediately below each fitting adjacent to the wall, and at centres of two metres (maximum).

## Technical Investigations

The following is a summary of the technical investigations carried out on the Polypipe/Paragon Square Section Gutter System.

### 11 Tests

11.1 Tests were carried out to determine:  
resistance of fascia and rafter brackets to  
deadweight loading (BS 4576 : Part 1 : 1989,  
Appendix D)

impact resistance of gutter assemblies and square section downpipe (BS 2782 : Part 11 : Method 1108A : 1987 *True impact rate (TIR) boundaries of pipes* subject to modifications detailed in BS 4576 : Part 1 : 1989)

leaktightness of joints/thermal cycling (BS 4576 : Part 1 : 1989, Appendix C)

tensile strength and elongation

Vicat softening temperature

dimensional accuracy.

11.2 An examination of data was made relating to:

flow capacity

thermal movement

efficiency of self-cleansing action

practicability of installation

durability.

### 12 Other investigations

12.1 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.

12.2 A site visit was carried out to assess the practicability of installation and the performance in use.



On behalf of the British Board of Agrément

Date of issue: 30th July 1991

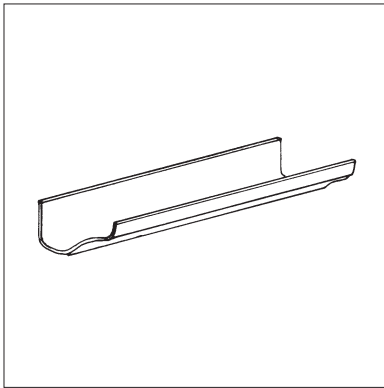
Director

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# Electronic Copy



## Product



• THIS DETAIL SHEET RELATES TO POLYPIPE/PARAGON OGEE EXTRA CAPACITY GUTTER AND ACCESSORIES.

• The Polypipe/Paragon Ogee extra capacity system is for the collection and discharge of rainwater from roofs.

• The capacity of the gutter system can reduce the number of rainwater downpipes required to drain a roof, in comparison with half-round gutter of the same nominal size.

This Detail Sheet must be read in conjunction with the Front Sheet and Detail Sheet 1, which give Conditions of Certification and the product's position regarding the Building Regulations respectively.

## Technical Specifications

### 1 Description

1.1 Polypipe/Paragon Ogee Extra Capacity Gutter and Accessories covered by this Detail Sheet are shown in Figure 1.

Figure 1 Components

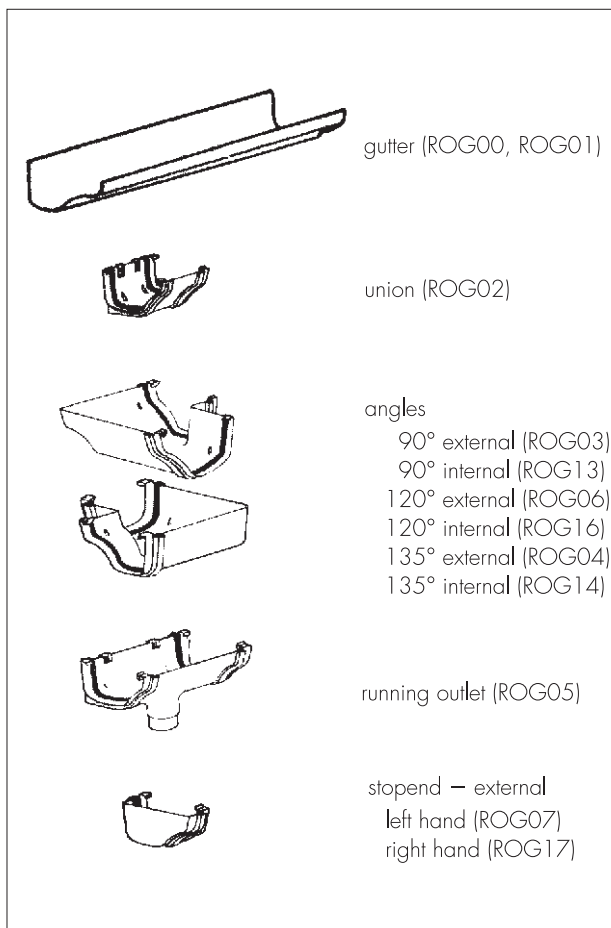
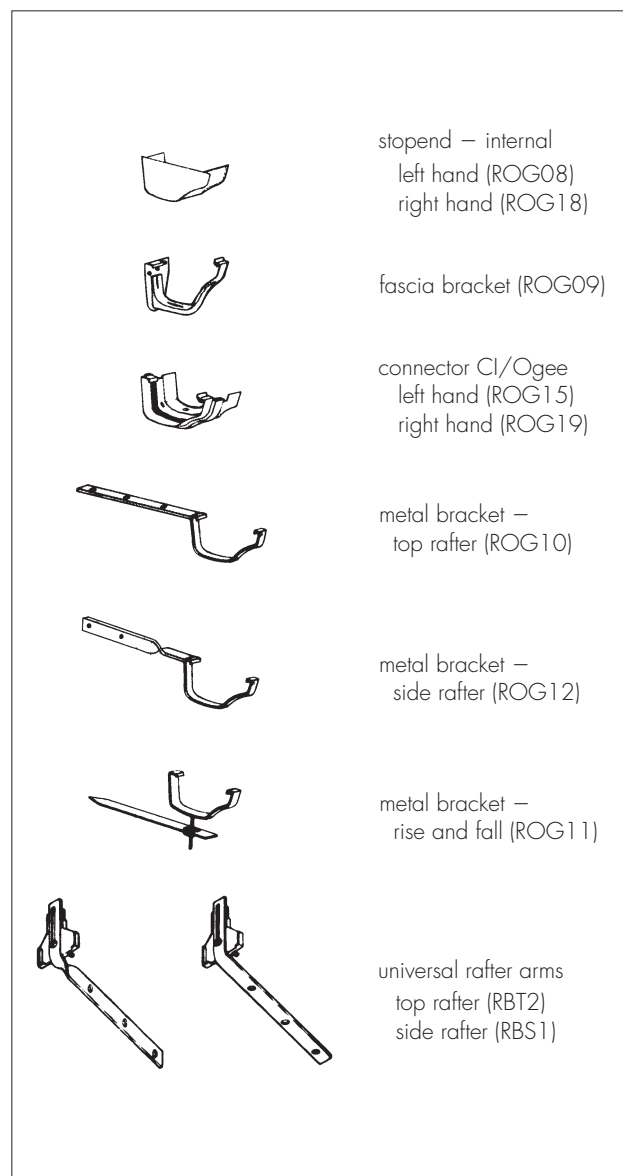


Figure 1 continued



1.2 The gutter and accessories are manufactured from PVC-U and are available in black, chestnut brown and white.

1.3 The ogee gutter section is 130 mm wide by 70 mm deep. Each fitting incorporates flexible clips for fixing to the gutter. The joints are sealed with elastomeric gaskets.

1.4 The metal rafter brackets are manufactured from carbon steel and galvanized to BS 729 : 1986 *Specification for hot dip galvanized coatings on iron and steel articles*.

1.5 The gutter and accessories are used with the Kitemarked 68 mm diameter downpipe and accessories listed in Detail Sheet 2 of this Certificate or the 65 mm square down pipe and accessories listed in Detail Sheet 3.

1.6 Gutter sections are extruded and cut to 2 metre or 4 metre lengths. Fittings are produced by injection moulding.

1.7 Continuous quality control is exercised during manufacture to maintain product quality. Checks include dimensional accuracy and visual examination.

## 2 Delivery and site handling

2.1 Gutter and downpipes are delivered to site in bundles of five protected by opaque polythene sleeving which should not be removed until the products are used.

2.2 Each bundle of gutters or downpipes is packed in a sleeve printed with the manufacturer's symbol, and the BBA identification mark incorporating the number of this Certificate. Fittings are marked with the manufacturer's symbol and the product code. Components covered by the BSI Kitemark licence are marked with the nominal size, the legend BS 4576, and the Kitemark symbol.

## Design Data

### 3 General

Polypipe/Paragon Ogee Extra Capacity Gutter and Accessories, when used in conjunction with the downpipe and accessories listed in Detail Sheet 2 of this Certificate, are suitable for use as eaves guttering for the collection of rainwater from roofs.

### 4 Performance of joints

Correctly made joints between gutter sections and fittings are watertight under conditions of thermal movement in excess of those expected to occur in practice.

### 5 Resistance to loading

The gutter will have adequate resistance to snow loading under normal conditions. Care must be

exercised in placing ladders for roof maintenance; the use of ladder stays is recommended.

## 6 Flow characteristics

Flow capacities associated with the Polypipe/Paragon Ogee Extra Capacity Gutter and Accessories, when calculated in accordance with BS 6367 : 1983 : *Code of Practice for drainage of roofs and paved areas*, are given in Table 1.

Table 1 Flow capacities

Gutter characteristics				
Breadth (B) (mm)	Depth (Y <sub>u</sub> ) (mm)	Maximum area (A) (mm <sup>2</sup> )	Critical depth (Y <sub>c</sub> ) (mm)	Flow capacity (Q <sub>u</sub> ) (litres per second)
122	63.0	5600	35.4	1.388
Outlet characteristics				
Nominal size (mm)		Internal diameter (D) (mm)	Flow capacity (Q <sub>o</sub> ) (litres per second)	
68		65	1.676	
Design capacity (litres per second)				
Centre outlet level or 1:600 fall		end outlet gutter level	end outlet 1:600 fall	
1.676		1.388	1.499	
restricted by outlet capacity		restricted by gutter capacity	restricted by gutter capacity	

(1) The values must be reduced in accordance with BS 6367 : 1983 to account for 90° bends, etc where appropriate.

Test data examined by the BBA indicate that the calculations give conservative flow rates.

## 7 Practicability of installation

Installation of the products can be carried out easily under normal site conditions.

## 8 Maintenance

8.1 The gutter and accessories are manufactured from self-coloured material which does not require painting. To maintain the appearance, the system may be washed periodically with water and detergent.

8.2 Damaged sections may be removed by unclipping from brackets and unions. Adjoining sections should not be damaged by this action, but unions and brackets may need to be replaced.

## 9 Durability

The gutter system is made from a conventional material as used in gutter systems conforming to BS 4576 : Part 1 : 1989 *Unplasticized polyvinyl chloride (PVC-U) rainwater goods and accessories — Half-round gutters and pipes of circular cross-section*. The material is acceptable and will have a life expectancy of at least 20 years.

## Installation

### 10 Procedure

10.1 Installation must be in accordance with the manufacturer's instructions, *Polypipe Above Ground Drainage Systems*, and BS 6367 : 1983 where relevant.

10.2 Brackets are secured to the fascia with three No 10, 25 mm x 5 mm, zinc plated or sherardized roundhead screws at centres of 0.6 metre (maximum).

10.3 External and internal angles should have close supporting brackets fitted each side.

10.4 Unions and running outlets are secured to the fascia with two No 10 roundhead screws.

10.5 Joints are made by locating the gutter under the rear clip of the flexible clip on the fitting. The gutter is pulled forward and down until the front edge fits under the front clip and snaps into position. The elastomeric gasket in the fitting will seal the joint.

10.6 All gutter joints should incorporate a 10 mm expansion gap.

10.7 The gutter may be fixed either level on the fascia board or to a fall of 1:600. It is important that the distance between the gutter and the roof tiles is not excessive and that roofing felt is allowed to project slightly into the gutter to prevent water splash onto the fascia board behind the gutter.

## Technical Investigations

The following is a summary of the technical investigations carried out on Polypipe/Paragon Ogee Extra Capacity Gutter and Accessories.

### 11 Tests

11.1 Tests were carried out to determine:

- resistance of fascia and rafter brackets to deadweight loading (BS 4576 : Part 1 : 1989 Appendix D)
- impact resistance of gutter assemblies (BS 2782 : Method 1108A subject to modifications detailed in BS 4576 : Part 1 : 1989)
- leaktightness of joints/thermal cycling (BS 4576 : Part 1 : 1989 Appendix C)
- tensile strength and elongation
- Vicat softening temperature
- dimensional accuracy.

11.2 An examination was made of data in relation to:

- flow capacity
- thermal movement
- efficiency of self-cleansing action
- practicability of installation
- durability.

### 12 Other investigations

12.1 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.

12.2 A site visit was carried out to assess the practicability of installation and the performance in use.



On behalf of the British Board of Agrément

Date of issue: 30th July 1991

Director

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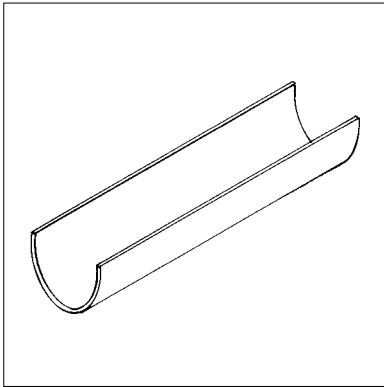
Polypipe plc

Certificate No 91/2673

## POLYPIPE/PARAGON POLYFLOW DEEP CAPACITY GUTTER AND ACCESSORIES

### DETAIL SHEET 5

## Product



- THIS DETAIL SHEET RELATES TO POLYPIPE/PARAGON POLYFLOW DEEP CAPACITY GUTTER AND ACCESSORIES.
- Polypipe/Paragon Polyflow Deep Capacity Gutter and Accessories are for the collection and discharge of rainwater from roofs in conjunction with downpipe and accessories listed in Detail Sheet 2 of this Certificate.
- The capacity of the gutter can reduce the number of rainwater downpipes required to drain a roof in comparison with half-round gutter of the same nominal size.
- The semi-elliptical shape leads to an improvement in self-cleansing action.

*This Detail Sheet must be read in conjunction with the Front Sheet and Detail Sheet 1, which give Conditions of Certification and the product's position regarding the Building Regulations respectively.*

## Technical Specification

### 1 Description

1.1 Polypipe/Paragon Polyflow Deep Capacity Gutter and Accessories covered by this Detail Sheet are shown in Figure 1.

Figure 1 Components

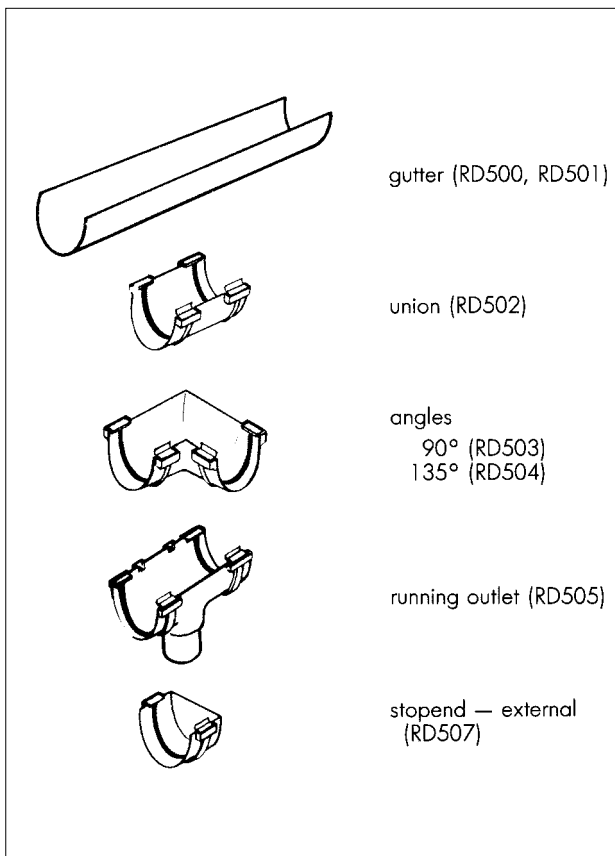
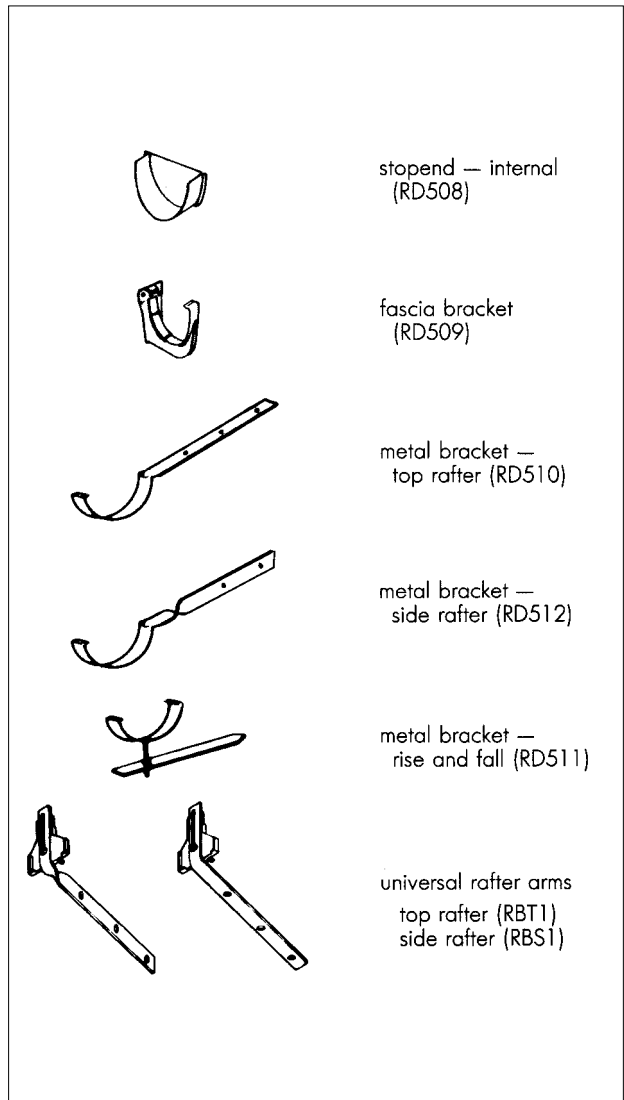


Figure 1 continued



1.2 The gutters and accessories are manufactured from PVC-U and are available in black, chestnut brown, and grey.

1.3 The gutter section is semi-elliptical, 117 mm nominal width by approximately 75 mm depth. Each fitting incorporates flexible clips for fixing to the gutter. The joints are sealed with elastomeric gaskets.

1.4 The gutters and accessories are used with the 68 mm diameter downpipes and accessories listed in Detail Sheet 2 of this Certificate.

1.5 Gutter sections are extruded and cut to 3 metre or 4 metre lengths. Fittings are produced by injection moulding.

1.6 The metal rafter brackets are manufactured from carbon steel and galvanized to BS 729 : 1971(1986) *Specification for hot dip galvanized coatings on iron and steel articles*.

1.7 Continuous quality control is exercised during manufacture to maintain product quality. Checks include dimensional accuracy and visual examination.

## 2 Delivery and site handling

2.1 Gutters are delivered to site in bundles of five protected by white polythene sleeving which should not be removed until the products are used.

2.2 Each bundle of gutters is packed in a sleeve printed with the manufacturer's symbol, and the BBA identification mark incorporating the number of this Certificate. Fittings are marked with the manufacturer's symbol and the product code. Components covered by the Kitemark licence also bear the Kitemark symbol.

## Design Data

### 3 General

Polypipe/Paragon Polyflow Deep Capacity Gutter and Accessories, when used in conjunction with the downpipe and accessories listed in Detail Sheet 2 of this Certificate, are suitable for use as eaves guttering for the collection of rainwater from roofs.

### 4 Performance of joints

Correctly made joints between gutter sections and fittings are watertight under conditions of thermal movement in excess of those expected to occur in practice.

### 5 Resistance to loading

The gutter will have adequate resistance to snow loading under normal conditions. Care must be exercised in placing ladders for roof maintenance; the use of ladder stays is recommended.

## 6 Flow characteristics

6.1 Flow capacities associated with the Polypipe/Paragon Polyflow Deep Capacity Gutter and Accessories, when calculated in accordance with BS 6367 : 1983 : *Code of practice for drainage of roofs and paved areas*, are given in Table 1.

Table 1 Flow capacities

Gutter characteristics				
Breadth (B) (mm)	Depth (Y <sub>v</sub> ) (mm)	Maximum area (A) (mm <sup>2</sup> )	Critical depth (Y <sub>c</sub> ) (mm)	Flow capacity (Q <sub>e</sub> ) (litres per second)
114	70.0	5600	40.0	1.441
Outlet characteristics				
Nominal size (mm)		Internal diameter (D) (mm)	Flow capacity (Q <sub>e</sub> ) (litres per second)	
68		65	1.782	
Design capacity (litres per second)				
Centre outlet level or 1:600 fall 1.782 restricted by outlet capacity		end outlet gutter level 1.441 restricted by gutter capacity	end outlet 1:600 fall 1.556 restricted by gutter capacity	

(1) The values must be reduced in accordance with BS 6367 : 1983 to account for 90° bends, etc where appropriate.

Test data examined by the BBA indicate that the calculations give conservative flow rates.

6.2 Under normal conditions of rainfall, where the gutter flows partially full, the depth of flow in the semi-elliptical Polyflow gutter will be greater than that of half-round section. This, with the steeply sloping gutter sides, can lead to an improvement in self-cleansing action.

## 7 Practicability of installation

Installation of the products can be carried out easily under normal site conditions.

## 8 Maintenance

8.1 The gutter and accessories are manufactured from self-coloured material which does not normally require painting. To maintain the appearance, the system may be washed periodically with water and detergent.

8.2 Any damaged sections may be removed by unclipping from brackets and unions. Adjoining sections should not be damaged by this action, but unions and brackets may need to be replaced.

## 9 Durability

The gutter and accessories are made from a conventional material as used in gutter systems conforming to BS 4576 : Part 1 : 1989

Specification for unplasticized polyvinyl chloride (PVC-U) rainwater goods and accessories — Half-round gutters and pipes of circular cross-section. The material is acceptable and will have a life expectancy of at least 20 years.

## Installation

### 10 Procedure

10.1 Installation must be in accordance with the manufacturer's instructions *Polypipe Above Ground Drainage Systems*, and BS 6367 : 1983 where relevant.

10.2 Brackets are secured to the fascia with three No 10, 25 mm x 5 mm, zinc plated or sherardized roundhead screws, at centres of 1 metre (maximum).

10.3 External and internal angles should have close supporting brackets fitted each side.

10.4 Unions do not incorporate a bracket and should have a supporting bracket fixed at the centre. Running outlets are secured to the fascia with two No 10 roundhead screws.

10.5 Joints are made by locating the gutter under the rear clip of the flexible clip on the fitting. The gutter is pulled forward and down until the front edge fits under the front clip and snaps into position. The elastomeric gasket in the fitting seals the joint.

10.6 All gutter joints should incorporate a 10 mm expansion gap.

10.7 The gutter may be fixed either level on the fascia board or to a fall of 1:600. It is important that the distance between the gutter and the roof tiles is not excessive and that roofing felt is allowed to project slightly into the gutter to prevent watersplash onto the fascia board behind the gutter.

## Technical Investigations

The following is a summary of the technical investigations carried out on Polypipe/Paragon Polyflow Deep Capacity Gutter and Accessories.

### 11 Tests

Tests were carried out to determine:

resistance of fascia and rafter brackets to deadweight loading (BS 4576 : Part 1 : 1989, Appendix D)

impact resistance of gutter assemblies (BS 2782 : Method 1108A subject to modification detailed in BS 4576 : Part 1 : 1989)

leaktightness of joints/thermal cycling (BS 4576 : Part 1 : 1989, Appendix C)

tensile strength and elongation

Vicat softening temperature

dimensional accuracy.

11.2 An examination was made of data in relation to:

flow capacity

thermal movement

efficiency of self-cleansing action

practicability of installation

durability.

### 12 Other investigations

12.1 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.

12.2 A site visit was carried out to assess practicability of installation and performance in use.



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