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Hunter

0.00

About Hunter Plastics

Hunter Plastics has earned it's place as a UK leader in the above and below ground gravity drainage market. At Hunter we firmly believe that our customers' needs are all about service. And, that ethos has to extend throughout the three vital elements of the company's success: Processes, Products and People.

- **Brian Blanchard**, Managing Director of Hunter Plastics Ltd
- **Processes:** All of Hunter's processes are accredited to ISO 9001 with the single aim of getting it right, first time, every time.
- **Products:** We make it our business to listen to our customers and give them the products that they are asking for. We lead the market in product quality with all of our ranges meeting or exceeding all relevant UK and European standards.
- **People:** Hunter has been recognised as an 'Investor in People', acknowledging our commitment to train and develop all our staff to achieve our business objectives.

Brian Blanchard, Managing Director of Hunter Plastics Ltd

Quality Policy

The Company's Quality Policy is a declared commitment to design and manufacture of its products in a manner conforming to the relevant British/International standards or customer requirements.

FM 11001

The aim is to provide optimum customer satisfaction by maintaining an effective quality management system ensuring management, technical and production personnel are fully conversant with the Company's objectives. The Company will give full attention to the activities of design, manufacturing costs, performance reliability and personnel training which will be planned and developed in accordance with the requirements of BS EN ISO 9001: 2000.

Hunter Plastics are committed to exceeding its customer's expectations in everything that they do. Quality is designed into every product and process and is the responsibility of every employee.

All Hunter products are manufactured using a quality management system approved by BSI and conforming to BS EN ISO9001:2000. Where applicable product conforms to British and European standards.

We make it our business... to be committed to yours

Hunter commitments:

- Company-wide commitment to customer service
- Thorough quality control at every level
- Accurate on-time delivery service
- Innovative designs, offering unique product opportunities
- Comprehensive sales and after-sales support

Associate Member

BS EN 12200
BS EN 607
BS EN 1462

Certificate No.
FM 11001

Investor in People

All Hunter products are manufactured using a quality management system approved by BSI and conforming to BS EN IS0 9001: 2000. Where applicable, products are kitemarked.

Hunter has established a world-wide network of stockists and distributors

0.00 APPROVALS

Hunter Rainwater Systems

0.00 Approvals

Purpose

Hunter Plastics Rainwater Systems are suitable for most applications and types of building, including domestic, commercial and industrial.

There are complementary Soil and Waste, Underground Drainage and Sewer Systems to provide a complete solution for all drainage requirements.

STANDARDS / approvals

British Standards

BS EN ISO 9001: 2000 Quality Systems. Model for Quality Assurance in Production, Installation and Servicing. Registration No: FM1101.

BS EN 607:1996 Eaves gutters and fittings made of PVCu. Definitions, requirements and testing. Licence No: KM54350.

BS EN 1462: 1997 Gutter brackets. Classification, requirements and testing. Licence No: KM54353.

BS EN 12200: 2000 Rainwater piping systems. Specification for pipes, fittings and the system. Licence No: KM58454.

BS EN 681: Part 1 1996 Part 2: 2000 Elastomeric seals. Material requirements for pipe joint seals used in water and drainage applications.

Part 1. Vulcanized rubber
Part 2. Thermoplastic elastomers.

BS 4255: Part 1:1986 Specification for Non-cellular gaskets for buildings.

BS 4660: 2000 Ancillary fittings of nominal sizes 110mm - 160mm below ground gravity drainage and sewerage. Licence No: KM57147.

BS EN 1401-1: 1998 Plastic Pipe Systems for non-pressure underground (Hunters 110mm - 160mm standard pipe fittings). Licence No: KM57148.

BS 4514:2001 Unplasticised PVC, soil and ventilating pipes, fittings and accessories. Licence No: KM60674.

BS EN 1329-1: 2000 Plastic piping systems for soil and waste. Licence No: KM05317.

BS EN 12056-3 Gravity drainage systems inside buildings.
Part 3: Roof drainage layout and calculations.

Load Bearing

All of the Hunter gutter brackets have been subjected to simulated load bearing tests in accordance with clause 6 of BS EN 1462: 1997.

In areas where particularly high snow falls and severe icing might be expected BS EN 1462: 1997 recommend that heavy duty brackets (load bearing class H) should be fitted.

This precaution should also be considered wherever sliding snow might cause damage or injury to structures or persons below. Support brackets should be fixed at as specified in section 1.02 'Performance and Properties'.

Building regulations approved document 'H' 3

0.01 PROPERTIES AND PERFORMANCE

Hunter Rainwater Systems

0.01 Properties and Performance

PROPERTIES AND PERFORMANCE

STRUCTURAL AND MECHANICAL PROPERTIES

Hunter Plastics gutters and downpipes are highly resistant to impact breakage and easily support ladder weights.

THERMAL

The coefficient of linear thermal expansion of PVCu is 5 x 10^{-5} mm/m/ °C and all Hunter Rainwater systems have been designed to take this into account. It is important that resultant movement be provided for during installation.

COMPATIBILITY

The Surefit system will connect to most 112mm nominal half round PVCu gutter systems without the need for any special adaptor. Please refer to the Compatibility Chart.

Hunter PVCu downpipes will connect to most other manufacturer's 68mm circular and 65mm square rainwater pipes and are suitable for connection to most types of drain.

COLOUR FASTNESS

Hunter's Rainwater System is fully tested to BS EN 607, BS EN 12200 artificially ageing the product to method A of ISO/DIS 4892-2 and measuring the colour fastness to EN 20105-402.

MATERIAL PROPERTIES

Material properties determine the correct selection of a system. The main materials used are PVCu, modified PVCu and polypropylene. Polyethylene (HDPE) is used in the manufacture of snap caps to retain the ring seals. Unplasticised polyvinyl chloride, PVCu, is a very versatile material: many processing methods can be used, it can be coloured, is lightweight, and has good chemical resistance, fire performance and weatherability. PVCu can be modified to increase its resistance to higher temperature discharges. Polypropylene has excellent chemical resistance and can tolerate high temperatures.

SERVICE TEMPERATURE

PVCu has a softening point In excess of 70°C, and PVCu soil stacks can cope with short intermittent discharges with temperatures up to 90°C

Modified unplasticised polyvinyl chloride, MuPVC, has a softening point above 90°C so, in addition to the normal properties of PVCu, it can also cope with higher temperature discharges over prolonged periods.

The higher softening point of polypropylene, above 140°C, means it can cope with high temperature discharges, such as boiling water, and it is the most appropriate material for the manufacture of traps.

UV LIGHT RESISTANCE

While polypropylene has good chemical resistance, resistance to UV light is poor. Exterior applications require protection using paint or closures. PVCu can be formulated to give excellent resistance to UV light, and so is suitable for exterior uses, requiring no additional protection.

TIMBER PRESERVATIVES

Before any component is fixed to a timber surface treated with wood preservative, the preservative must be dried thoroughly. The solvent content of wet preservatives can attack and embrittle plastic materials. Allow at least 48 hours for drying.

CHEMICAL RESISTANCE

Polluted industrial atmospheres will not affect Hunters' Rainwater Systems. PVC and polypropylene are rot and vermin proof and resistant to most commonly occurring chemicals, so will not be affected by domestic effluents. Notable exceptions however are solvents, including those incorporated in most timber preservatives. Hunter PVCu Rainwater systems are self-coloured and corrosion resistant, the material therefore does not require painting. However, if painting is required, a paint specific for use with PVC should be used.

Standard gloss paint may be used if;

- The PVC surface has weathered for some time
- The gloss surface of gutter is sanded down
- Wood fascias treated with timber preservative must be allowed to dry before fixing Hunter PVCu eaves gutters.
- It is essential that fascia boards treated with creosote are left for at least 48 hours to dry before fixing commences

FIRE PERFORMANCE

PVC in almost all forms has superior fire performance to most plastic materials: this makes it a suitable choice for indoor applications. In comparison Polypropylene has poor fire performance. Interior applications of plastic pipes may require protection in compliance with Building Regulations.

BS EN 607 Requirements
Wall Thickness

Gutter

BS EN 607	Min	2.2
Hunter		2.2

Downpipe

	Min	Max
BS EN 12200	1.8	2.3
Hunter	1.80mm	2.05mm

Moulded Fittings

BS EN 607	Min	2.20
Hunter		2.25

Materials
PVCu including no re-worked material

Colour Fastness - Rainwater and Soil products
All products are artificially aged in accordance with Method A. ISO/DIS 4892-2 and tested in accordance with EN 20105-402 for colour fastness

Vicat Softening Temperature

BS EN 607/12200	Min 75°C	
Hunter	White average	82.8°C
	Grey average	84.8°C
	Brown average	82.5°C
	Black average	83.1°C

Heat Reversion of Gutters

BS EN 607	Max 3.0%
Hunter	Avge 2.0% (max 2.8%)

Heat Reversion of Downpipes

BS EN 12200	Max 3.0%
Hunter	Avge 2.0% (max 2.5%)

Impact Resistant Test

BS EN 12200	Max 10% Failure
Hunter	No Failures

Dead Weight Test of Gutter Brackets
Heavy Duty 76kg
Standard Duty 50kg
Below 80mm opening - no testing
BS EN 1462 Max 5mm deflection after test
Hunter Max 3mm achieved on tests

Leak Test

BS EN 607	No leaks
Hunter	No leaks

Further Properties

Specific Gravity	1.35-1.45
Co-efficient of Linear Expansion	7x10-5/ml°C
Water Absorption	Negligible
Oxygen Index	42%

Chemical Resistance
The material is virtually unaffected by solutions of inorganic acids, alkalis and salt and is resistant to many organic chemicals. It may be softened by some organic materials such as Ketones and aromatic compounds. It will not corrode.

Fire Resistance
Materials used in Hunter Rainwater Systems are self extinguishing

0.01 Features, Description & Performance

Rainwater Systems

The Hunter range of plastic rainwater systems offers the specifier products which are the result of over 30 years of innovative design and research. They reflect the major advances in rainwater system technology pioneered by the Company in its production of high quality PVCu products for the building industry.

Technical services

A team of qualified design engineers are available for free consultation on any aspect of plumbing and drainage installations. Specific questions or requirements concerning Hunter products can be met by contacting Hunter Plastics Limited at the address below or by Fax to Hunter Technical Design Services on (020) 8854 7446.

Availability

Hunter rainwater systems are available throughout the UK from reputable builders' merchants and other points of sale. A list of stockists is available on request.

References

Technical publications are available upon request to the Commercial Department.
Phone: (020) 8855 9851.

Export

Hunter offers a complete estimating, packing and shipping service to facilitate export orders with local assistance in many countries.

Special applications

Hunter rainwater systems are ideal for many specialist industrial, domestic and conservatory applications.
For further details, call Hunter Technical Design Services on (020) 855 9851 or
Fax on (020) 8854 7446.

Special fabrications

Hunter has the expertise and the facilities to design and fabricate non-standard components to meet the needs of special technical or architectural design requirements. Modifications to standard products are available for all the Hunter systems.
Delivery times and price will depend on the complexity of the design and the quantity required.

Standards

All Hunter products are manufactured using a quality management system approved by BSI and conforming to BS EN ISO 9001: 2000. Kitemarked product conforms to applicable BS EN standard.

PATENT NUMBERS
Gutter seal (as used in the 112mm Surefit components) -
GB Pat. No. 2281323
Mini clip gutter system - GB Pat. No. 2282160

iphe INDUSTRIAL ASSOCIATE
Associate Member
BMF Builders Merchants Federation SUPPLIER MEMBER
EN 12200 / EN 607 EN 1462
Certificate No. FM 11001
Investor in People

All Hunter products are manufactured using a quality management system approved by BSI and conforming to BS EN ISO 9001: 2000. Where applicable, products are kitemarked.

1.00 PHYSICAL & MECHANICAL PROPERTIES

Hunter Rainwater Systems

1.01 COMPOSITION
Product dimensions
Finish

1.02 PERFORMANCE AND PROPERTIES
Mechanical
Snow loading
Thermal movement
Chemical properties
Durability
Flow Characteristics
Effect of wind
Storage
Handling
Lubricants
Maintenance
Further information

1.00 Physical and Mechanical Properties

Description

1.01 COMPOSITION

All gutters, pipes and fittings, unless otherwise specified, are manufactured in unplasticised polyvinyl chloride (PVCu). All seals used within Hunter fittings are produced in a rubber material to BS EN 681: 1996 or manufactured in accordance with relevant British Standards.

The Major advantage of PVCu rainwater systems are:

- Minimal maintenance
- Self-coloured - no painting required
- Does not support combustion
- Economical and easy to fix
- Lightweight and easy to handle
- Corrosion free

Other materials used are as follows

Joint seals: Synthetic rubber
Rise and fall brackets: Galvanised steel

PRODUCT DIMENSIONS
Refer to drawings and tables on pages 9 to 23

FINISH
All PVCu products in the system have a smooth, easy to clean surface finish.

COLOURS

SYSTEM	WHITE	GREY	VAN DYKE	BLACK BROWN
HALF ROUND	●	●	●	●
SQUAREFLO	●	●	●	●
125	●	●	●	●
REGENCY	●		●	●
OGEE	●		●	●
HIGHFLO	●	●	●	●
STORMFLO		●		●

Colour samples are available on request

1.02 PERFORMANCE AND PROPERTIES

MECHANICAL
PVCu has good flexural and tensile strength characteristics, but, as with all types of gutter, ladders should be held off gutters and brackets to avoid damage.

Gutter systems must not be installed under 0°C to avoid potential breakage.

SNOW LOADING
All systems have been extensively tested to withstand heavy snow loads in accordance with BS EN 1462 & BS EN 12056-3, however, in areas subject to heavy snow fall, it is recommended that Hunter Heavy Duty Brackets are used. When fixing beneath a steeply pitched roof or in areas subject to heavy snow, it is also recommended that fixing centres of brackets are reduced to 500mm.

Consideration may also be given to fitting snow guards to eaves of pitched roofs to prevent sliding snow or ice causing damage to persons or structures below (as recommended in BS EN 12056-3).

THERMAL MOVEMENT
Gutter joints have been designed to accommodate normal thermal movement without leakage, distortion or displacement from fittings. Particular care is necessary to ensure that gutters are assembled to the insertion lines engraved inside each fitting. The coefficient of thermal expansion of PVCu is 0.05mm/metre/°C.

CHEMICAL PROPERTIES
PVCu has good resistance to most solutions of acids, alkalis and salts, and to solvents miscible with water. However, it is not resistant to aromatic and chlorinated hydrocarbons. The incorporation of high quality pigments in Hunter products affords outstanding durability and help to prevent degradation by air pollution and U.V. light.

Polluted atmospheres may affect all plastic rainwater systems.

It is essential that fascia boards treated with preservatives such as creosote are left for at least 48 hours to dry before fixing commences.

DURABILITY
Given proper maintenance, Hunter rainwater systems have a life expectancy of over 50 years. A planned cleaning programme is essential to maintain the gutters appearance. We recommend twice yearly cleaning by washing down with a solution of soapy warm water, in severe cases a non-abrasive cleaner should be used.

STORAGE
To maintain the condition of gutters and pipes we recommend storage in the manufacturers packaging but out of direct sunlight prior to installation.

All fittings are supplied in polythene bags and sacks. All fittings should be stored out of direct sunlight prior to installation.

Whilst wrapped, direct sunlight or hot unventilated places can cause the temperature of materials to rise and in extreme conditions can result in distortion.

HANDLING
Always be careful to avoid damage when handling gutter or pipe. Excessive scratching or scoring of gutter and pipe not only affects the appearance but can also affect the joint sealing.

LUBRICANTS
The use of silicone lubricant on Hunter rainwater systems will assist assembly and prevent juddering noises caused by gutter movement across dry joints.

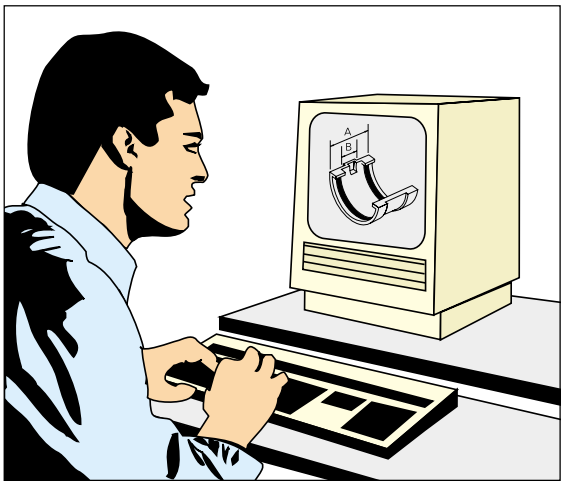
Never use washing up liquid or similar substances to lubricate gutter seals.

MAINTENANCE
Regularly clearing gutters of leaves, silt or other debris will extend the life of the gutters and ensure continuing efficient performance.

FURTHER INFORMATION
For further information on any of the above, please contact Hunter Technical Design Services on (020) 8855 9851 or Fax on (020) 8854 7446.

2.00 DESIGN GUIDE

Hunter Rainwater Systems



2.00 APPLICATION CRITERIA
Effective maximum roof area
Calculation of area to be drained
Selecting the system
Design notes
COSHH
Site precautions
Hunter and CDM

Table 1: Gutter Profile/Flow Capacity
(Adjustment for angles in gutter when calculating effective roof areas)
Worked example

Gutter profile selection and rainwater outlet siting
Compatibility Table

2.00 Design Guide

APPLICATION CRITERIA

In order to design an effective and efficient system and to select the Hunter rainwater system suitable for the application, the specifier should follow the following procedures:

1. Determine the rainwater outlet positions with regard to the underground drainage system.

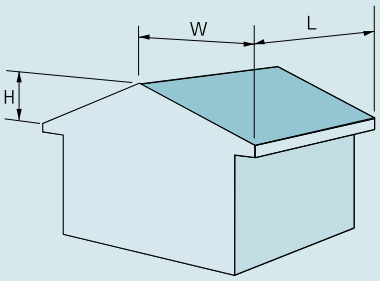
2. Calculate the effective maximum roof area (see below) to be drained.

3. Note the distance of any gutter angle from the nearest outlet.

EFFECTIVE MAX ROOF AREA (ALLOWANCE FOR WIND)

This can be calculated by using the following formula (see diagram below):

$(W + \frac{H}{2}) \times L$ (length of roof) = area in m^2



W = Horizontal span of slope

H = Height of roof pitch

L = Length of roof

The above formula is in accordance with BS EN 12056-3:2000

Note:

For flat roofs, the roof area should be regarded as the total plan area.

If the pitched roof is complex, ie has different pitches or spans, then each part should be calculated separately.

An alternative acceptable method is described in the Building Regulations, Approved Document H, which is reproduced in the table below:

CALCULATION OF AREA TO BE DRAINED

Type of surface	Design area (m^2)
1. flat roof	plan area of relevant portion
2. pitched roof at 30°	plan area of portion x 1.29
pitched roof at 45°	plan area of portion x 1.50
pitched roof at 60°	plan area of portion x 1.87
3. pitched roof over 70° or any wall	elevational area x 0.5

Note:

To calculate flow in litres/second for 75mm/hour intensity, multiply effective roof area m^2 by 0.0208.

SELECTING THE SYSTEM

Once the following facts have been determined,

a) The effective roof area (or areas)

b) The number and position of outlets

c) The angles and their distances from outlets,

The selection of a gutter system can now be approached.

To select a guttering system to suit the design criteria refer to drainage data in Table 1.

DESIGN NOTES

As can be seen from Table 1 on page 11, the gutter flow capacity and the area of roof which can be drained with a given number of outlets will increase if the gutter is laid to a fall. This is also the case if the downpipe is positioned centrally to the gutter. If it is possible therefore to incorporate these features in the layout, they will lead to a more economical system.

The recommended maximum fall is 1:350. This will considerably reduce the chance of silting and blocking of outlets by debris, leaves, etc. (Plastic gutters can be laid level).

For pitched roofs without eaves, the Hunter rise and fall brackets may be used, which have threaded adjustable stems to provide a fall in the gutter (see installation details at the end of this brochure).

NOTE:

It is important that all products in this brochure are correctly installed in accordance with BS EN 12056-3 'Code of Practice for drainage of roofs and paved areas'. Reference to BS EN 752-1996 drain and sewer systems outside buildings are also recommended.

HEALTH AND SAFETY

COSHH

The Control of Substances Hazardous to Health Regulations should be referred to where applicable. Information on pertinent COSHH Regulations is available from the Commercial Department on request.

SITE PRECAUTIONS

The relevant regulations detailed in the Health and Safety at Work Act 1974 must be adhered to on site.

When using a ladder, make sure it is securely fixed at the top and that the bottom is on level ground. If the ground is smooth or slippery, place a bag filled with sand or soil at the foot of the ladder and take care not to over reach. Take special care when removing old cast iron systems, as they can be extremely heavy and therefore dangerous.

HUNTER AND CDM

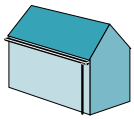
Specifiers have an obligation under the Construction (Design and Management) Regulations to identify and evaluate the health and safety implications of the products and systems their designs require. Hunter products can be specified on the basis that they do not present a risk to users at any stage of the construction process.

2.00 Design Guide

PROFILE-BASED SELECTION: Table 1 - GUTTER PROFILE/FLOW CAPACITY

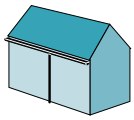
Check the performance of the chosen gutter system against your design criteria for roof area and flow rates, using the table below.

DOWNPIPE AT ONE END



		GUTTER FIXED LEVEL		GUTTER FIXED AT 1:350 FALL	
		GUTTER FLOW (Litres/sec)	ROOF AREA (m^2)	GUTTER FLOW (Litres/sec)	ROOF AREA (m^2)
HALF ROUND	76mm	0.5	24	0.6	29
	112mm	0.9	43	1.3	62
SQUAREFLO		1.6	77	2.0	96
125	68mm downpipe	2.1	101	2.4	115
	82mm downpipe	2.2	106	2.5	120
REGENCY		2.1	101	2.3	110
OGEE		1.1	53	1.5	72
HIGHFLO		2.8	136	2.9	137
STORMFLO	110mm downpipe	5.9	282	5.9	284
	160mm downpipe	6.6	318	6.7	320

DOWNPIPE AT CENTRE



		GUTTER FIXED LEVEL		GUTTER FIXED AT 1:350 FALL	
		GUTTER FLOW (Litres/sec)	ROOF AREA (m^2)	GUTTER FLOW (Litres/sec)	ROOF AREA (m^2)
HALF ROUND	76mm	0.7	34	0.8	38
	112mm	1.8	86	2.6	125
SQUAREFLO		3.2	154	3.8	182
125	68mm downpipe	3.8	182	4.6	221
	82mm downpipe	4.0	191	4.9	232
REGENCY		4.2	202	4.7	226
OGEE		2.4	115	3.0	144
HIGHFLO		5.4	258	6.0	289
STORMFLO	110mm downpipe	11.1	534	12.4	598
	160mm downpipe	12.5	601	14.0	673

ADJUSTMENT FOR ANGLES IN GUTTER WHEN CALCULATING EFFECTIVE ROOF AREAS

The calculated effective roof area figures are affected by angles in the gutter as follows:

If a length of eaves gutter includes an angle, the flow in the gutter will be impeded and its capacity reduced by 15%.

Where an angle occurs in a length of gutter served by two outlets, the reduction factor of 0.85 should only be applied to that part of the gutter in which the angle obstructs the flow.

The figures in the table are based on the average U.K rainfall intensity of 75mm/hr, roof pitch not exceeding 50^{o} and gutters running full. Refer to BS EN 12056-3 for detailed information on roof drainage.

Note: The highlighted figures on the top table relate to the worked example as follows.

2.00 Design Guide

WORKED EXAMPLE

Figure 1 shows the roof plan of a dwelling with a 30° pitched roof.

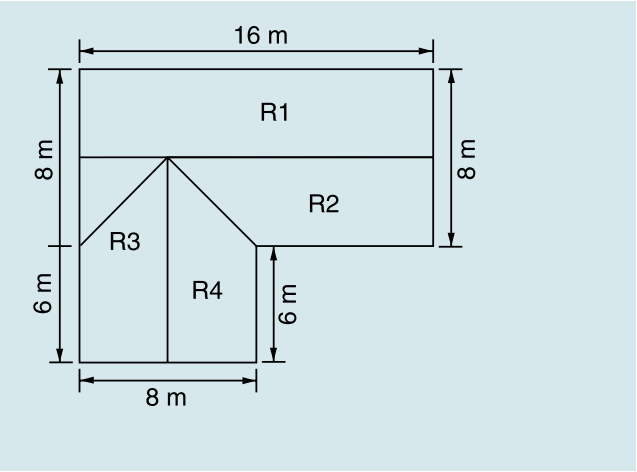
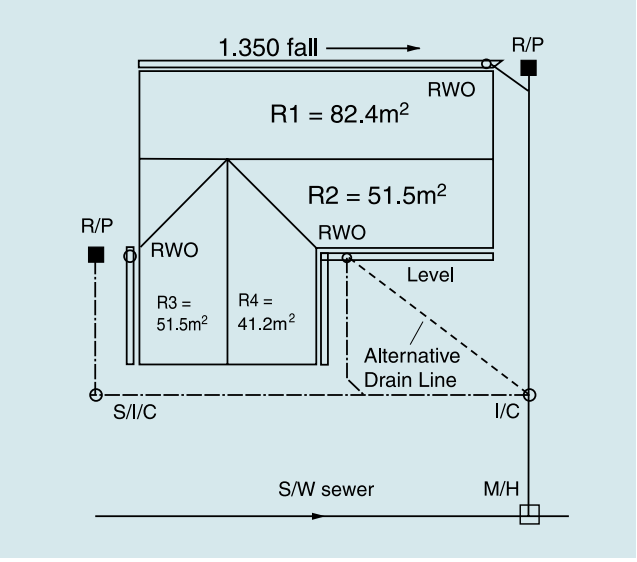


Figure 2 shows feasible outlet positions, gutter installation, roof area, and possible drainage layout.



NB. It is considered good practice to locate outlets as near to valleys as possible.

DESIGN CRITERIA

From figure 1 to the conclusion as denoted in figure 2 the following design criteria have been used.

By using the formula:

$$(W + \frac{H}{2}) \times L$$

The effective roof area can be calculated.

CALCULATION SEQUENCE

R1: $(4 + \frac{2.3}{2}) \times 16 = 82.4m^2$

R2: $(4 + \frac{2.3}{2}) \times 10 = 51.5m^2$

R3: $(4 + \frac{2.3}{2}) \times 10 = 51.5m^2$

R4: $(4 + \frac{2.3}{2}) \times 8 = 41.2m^2$

GENERAL DESIGN NOTES

1. Roofs R2, R3 and R4 are trapezoid in shape, to calculate the roof area without getting into complicated mathematics it would be apt to divide the roof into simple shaped, such as rectangles and triangles.

2. If elevations are not available but the roof pitch is known there is a simple method of finding the height of roof pitch ('H').

METHOD

Angle tangent x horizontal span of slope will give you height of roof pitch ('H'). In our worked example we have a 30° pitched roof (tangent = 0.5774).

$\therefore$ 0.5774 x 4 = 2.3m/height of roof pitch.

3. To calculate flow in litres/second in eaves gutters multiply effective roof area m^2 by a rainfall intensity of 0.0210.

EFFECT OF ANGLES

If a length of eaves gutter includes an angle, the flow in the gutter will be impeded and its capacity reduced by 15%.

Where an angle occurs in a length of gutter served by two outlets, the reduction factor of 0.85 should only be applied to that part of the gutter in which the angle obstructs the flow.

2.00 Design Guide

GUTTER PROFILE SELECTION AND RAINWATER OUTLET SITING

1. Assume that the Hunter Squareflo profile has been selected.

2. The maximum effective roof area to be drained is

R2 + R4 (51.5 + 41.2) = 92.7m^2

Consulting Table 1 it will be found that a gutter fixed level using one end outlet would give a roof area of 96m^2, but as we have a 90˚ angle at the valley we need to apply the 0.85 reduction factor, making the gutter capacity 84.15m^2. By positioning the outlet near to the valley and fixing the gutter it will drain 154m^2 x 0.85 = 130.9m^2.

3. Roof 1 has an effective roof area of 82.4m^2 to be drained, consulting Table 1 it will be found that by fixing the gutter level as for R2 and R4 we can only achieve a roof drainage area of 77m^2.

3. continued

It will therefore be necessary to fix the gutter to a fall of 1:350 which will then give us 96m^2, meeting the requirement of 82.4m^2 using one outlet.

4. Roof 3 has an effective roof area of 51.5m^2, consulting Table 1 it will be found that by fixing the gutter level and discharging to one outlet at one end the maximum roof area that can be drained will be 77m^2.

Please note that the outlet has been positioned at the valley end of the gutter.

CONCLUSION

Hunters Squareflo Rainwater System is suitable for our example design criteria but it is possible to select different gutter profiles with the adjustments to the number and positioning of outlets together with gutter falls.

PROJECT SELECTOR

Half Round 76mm	✓			
Half Round 112mm		✓	✓	
Squareflo		✓	✓	
125		✓	✓	✓
Regency		✓	✓	✓
Ogee		✓	✓	
Highflo				✓
Stormflo				✓

Sheds/Greenhouses

Conservatories

Domestic Housing

Commercial/Light Industrial

COMPATIBILITY

Hunter Half Round, Squareflo and 125 PVCu Rainwater systems are compatible with many other manufacturers' systems and with cast iron and aluminium profiles. The table alongside indicates the most commonly found manufacturers.

For further information, please contact Hunter Technical Department.

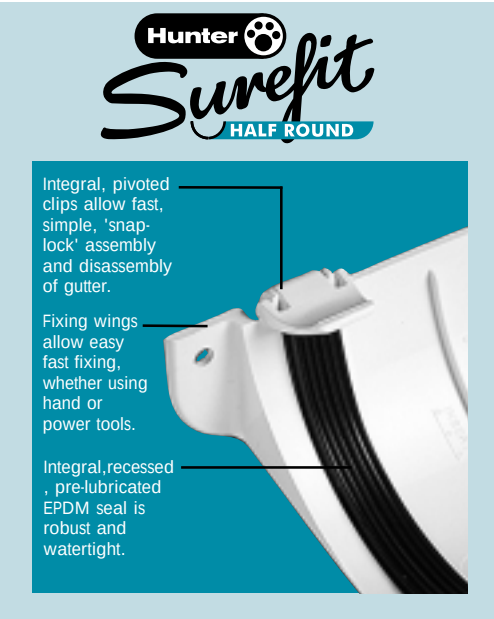
MANUFACTURER	HALF ROUND	SQUAREFLO	125*
Hepworth	Yes	Yes	Yes
Marley	Yes	No	Yes
Osma	Yes	No	Yes
Polypipe	Yes	Yes	Yes
Geberit	No	No	No
Brett	Yes	No	Yes

*Using adaptor seal - R600

3.00 PROFILES

Hunter Rainwater Systems

HALF ROUND



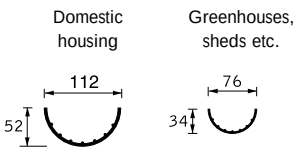
3.00 HALF ROUND GUTTER

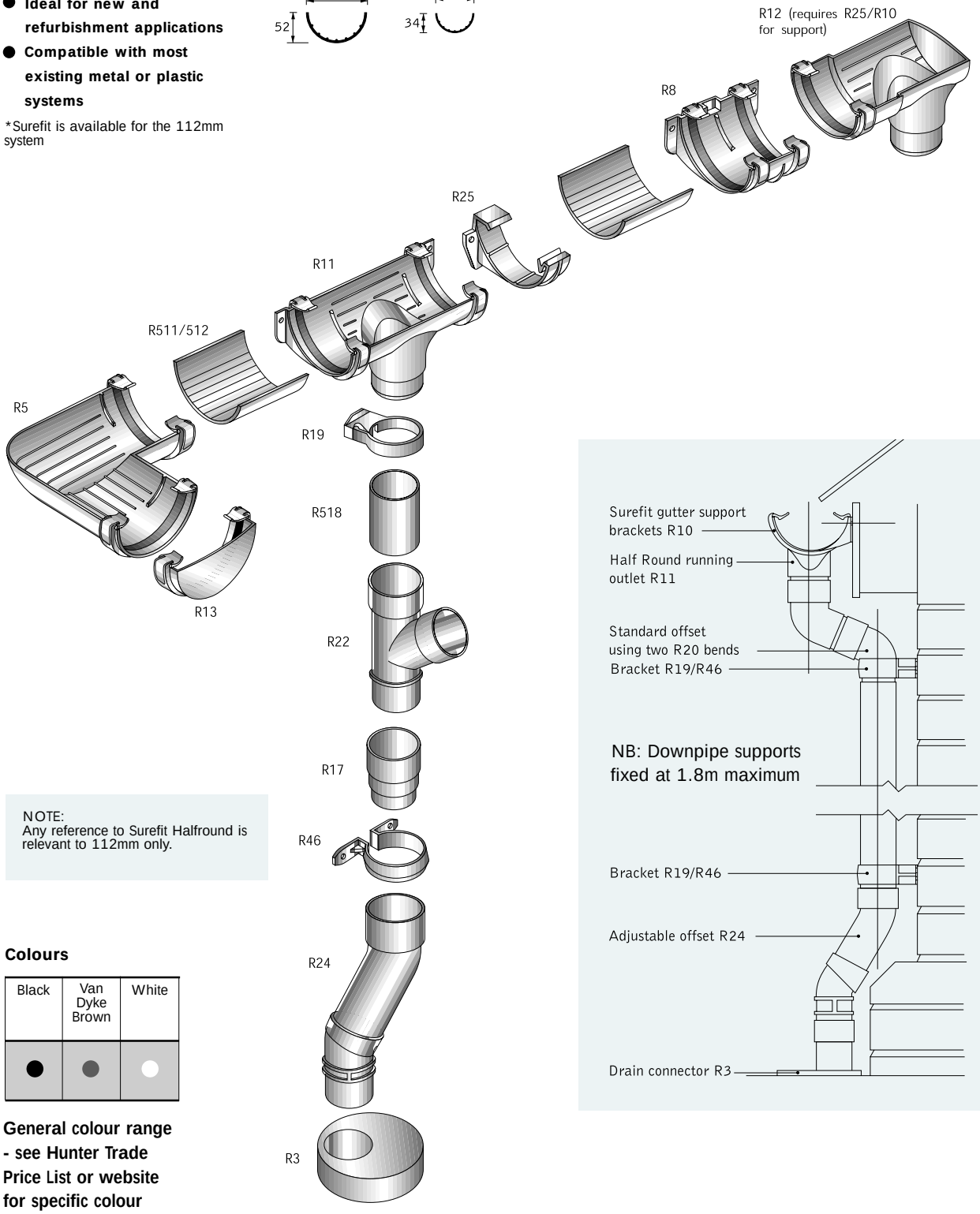
3.00 HALF ROUND

- **Efficient flow capacity**
- **Surefit clipping system for fast installation on 112mm**
- **Simple to install**
- **Ideal for new and refurbishment applications**
- **Compatible with most existing metal or plastic systems**

*Surefit is available for the 112mm system

Profile Dimensions (mm)





NOTE:
Any reference to Surefit Halfround is relevant to 112mm only.

Colours

Black	Van Dyke Brown	White
●	●	○

General colour range - see Hunter Trade Price List or website for specific colour availability.

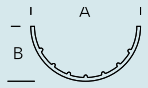
3.00 Half Round

HALF ROUND

RAINWATER SYSTEM HALF ROUND

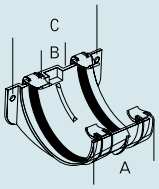
3.01 Gutter

Nominal size mm	A	B	Length m	Code
76	76	34	2	R513
112	112	52	2	R511
112			4	R512



3.02 Joint bracket

Nominal size mm	A	B	Code
76	65	15	R37
112	105	20	R8 (shown)



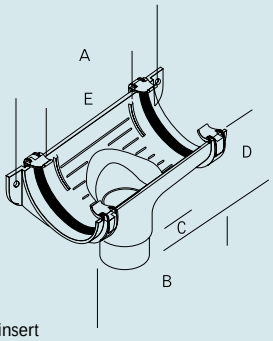
N.B. Dimension B is gutter insert to gutter insert

3.03 Outlets

Running outlet

Nominal size mm	A	B	C	D	E	Code
76	76	167	26	100	108	R32
112	260	240	41	132	155	R11

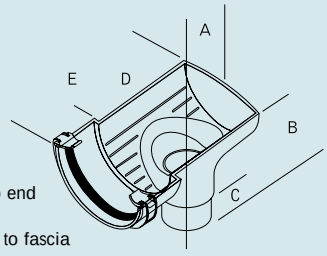
R11 (shown)



N.B. Dimension E is gutter insert to gutter insert

Stopend outlet

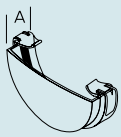
Nominal size mm	A	B	C	D	E	Code
76	38	100	26	92	122	R33
112	64	131	40	166	210	R12 (shown)



N.B. Dimension E is gutter insert to end face of stopend
The 112mm stopend outlet is fixed to fascia using a support bracket

3.04 Stopend external

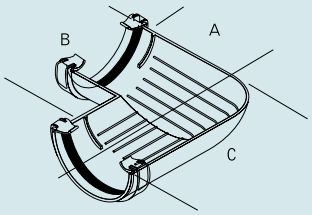
Nominal size mm	A	Code
76	32	R34
112	37	R13 (shown)



3.05 Angles

90°

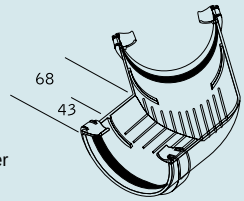
Nominal size mm	A	B	C	Code
76	65	105	127	R29
112	86	151	194	R5 (shown)



N.B. Dimension 'A' is gutter insert to centreline

120°

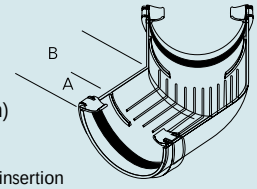
Nominal size mm	A	B	Code
112	43	68	R6



N.B. Dimension 'A' is the depth of gutter insertion (112mm only).

135°

Nominal size mm	A	B	Code
76	24	32	R31
112	43	67	R7 (shown)

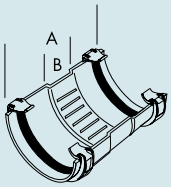


N.B. Dimension 'A' is the depth of gutter insertion (112mm only)

A full fabrication service is available for non-standard angles.
Support bracket is required at max 150mm from face of angle (112mm only).

3.06 Gutter union

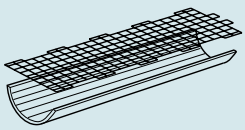
Nominal size mm	A	B	Code
112	108	56	R398



N.B. Dimension B is gutter insert to gutter insert.
Use with Support Bracket

3.07 Gutter leaf guard

Nominal size mm	Code
10 x 500	R500
5 Metre pack	



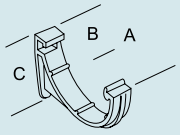
Suitable for 112mm Half Round and Squareflo - Black only

RAINWATER SYSTEM HALF ROUND

3.08 Support bracket

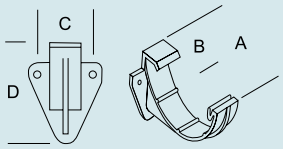
Single screw fixing

Nominal size mm	A	B	C	Code
76	83	44	45	R36
112	124	64	76	R10 (shown)



Double screw fixing bracket

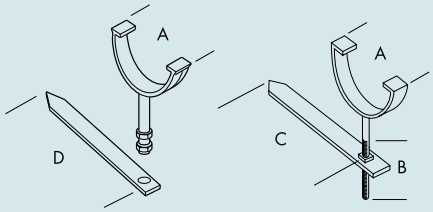
Nominal size mm	A	B	C	D	Code
112	124	65	50	89	R25



N.B. Dimension B is to centre line of gutter

3.09 Galvanised rise and fall bracket

Nominal size mm	A	B	C	D	Code
112	112	100	210	310	R9
112		R18			

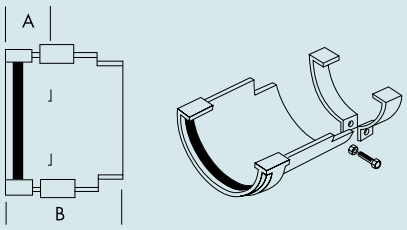


Galvanised

3.10 Connectors to other systems

Half round to cast iron half round

Nominal size mm	A	B	Code
112	33	84	R459 (for L/H or R/H connection)

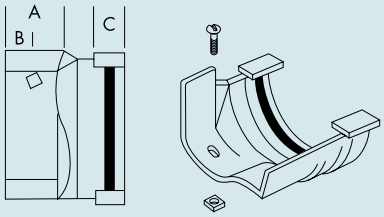


Nut and bolt supplied. N.B: depth of gutter insertion = 30mm.
Will connect to outside of 4" cast iron gutter or inside of 4½"
Joint to be made with non-bitumastic based compound

3.10 Connectors to other systems

Half round to cast iron ogee

Nominal size mm	A	B	C	Hand	Code
112	51	25	30	RH	R461
112				LH	R462 (shown)

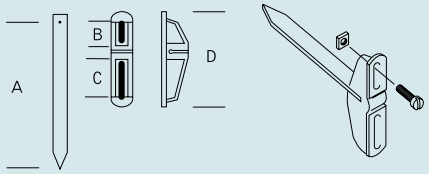


Nut and bolt supplied. N.B: Left hand shown.
Depth of gutter insertion = 30mm.
Joint to be made with non-bitumastic based compound.
Available in in black only

3.11 Universal fixing brackets

Variable rise and fall bracket Stake

size mm	A	B	C	D	Code
230	229	37	63	139	R26
300	330	37	63	139	R27

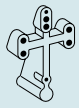


PVCu with galvanised stake. Supplied with fixing nut and bolt.
Colour black. Order gutter brackets separately. (UK patent no. 2176824).

Wedge spacer

Code

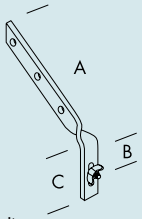
R2



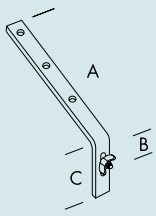
Available in grey only. For use with Half Round R8, R10, R25 and Squareflo R378, R379 and R395. For 22½° pitched roofs.

Rafter brackets

	Angle	A	B	C	Code
Side	30°	230	20-50	75	R16
Top	30°	235	20-50	70.5	R15



Side R16



Top R15

Galvanised
Supplied with wing nut and bolt
Not suitable for 170mm system or 200mm Stormflo

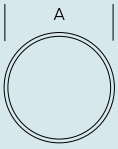
3.00 Half Round

HALF ROUND

RAINWATER SYSTEM HALF ROUND

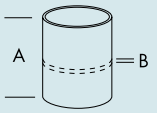
3.12 Pipe (plain ended)

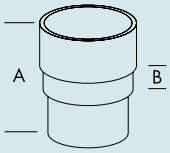
Nominal size mm	External diameter A	Length m	Code
50	50	2	R522
68	68	2	R518
68	68	2.5	R519
68	68	4	R520
68	68	5.5	R521



3.13 Pipe connector

Nominal size mm	A	B	Code
50	65	3	R38
Double socket pipe connector			
68	97	23	R17
Socket / Spigot pipe connector			

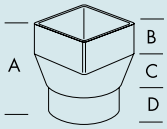




3.14 Adaptors

Square/round

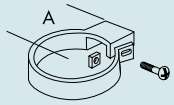
Nominal size mm	A	B	C	D	Code
65	100	40	15	45	R397



3.15 Brackets

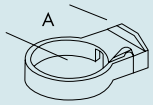
Single screw fixing

Nominal size mm	A	Code
50	55.5	R39



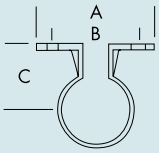
Single screw fixing/snap fit

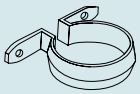
Nominal size mm	A	Code
68	65	R19



Double screw fixing

Nominal size mm	A	B	C	Code
68	107	86	65	R46





3.16 Drain leaf guard

Nominal size mm	Code
	DS500

Accepts rainwater pipes up to 110mm diameter
To cover drains up to 300mm wide x 265mm - Black only

3.00 Half Round

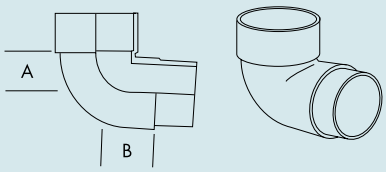
HALF ROUND

RAINWATER SYSTEM HALF ROUND

3.17 Bends

92 1/2° - 68mm

Nominal size mm	A	B	Code
68	37	55	R577

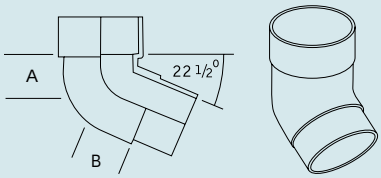


Standard offset using 2 bends = 119mm

3.18 Bends cont.

112 1/2° offset 68/50mm

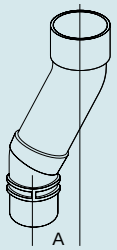
Nominal size mm	A	B	Code
50	26	22	R40
68	35	35	R20



Standard offset using 2 x 68mm bends = 87mm
Standard offset using 2 x 50mm bends = 75mm

3.19 Adjustable offset

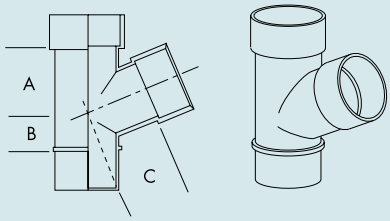
Nominal size mm	A	Code
68mm	22-80mm (Cut to suit)	R24



3.20 Branches

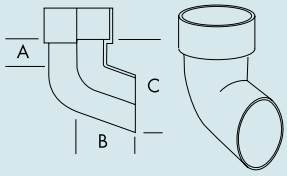
112 1/2° - 68 mm

Nominal size mm	A	B	C	Code
68	75	35	65	R22



3.21 Shoe

Nominal size mm	A	B	C	Code
50	25	40	70	R41
68	35	45	101	R21

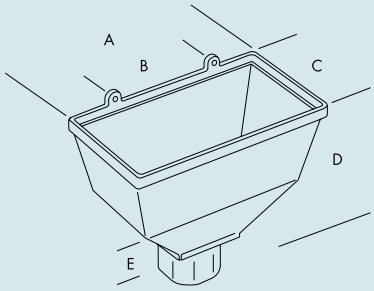


R 41
R 21

RAINWATER SYSTEM HALF ROUND

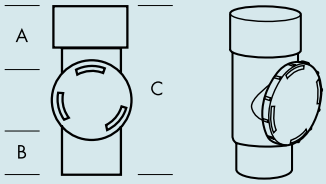
3.22 Hopper heads

Nominal size mm	A	B	C	D	E	Code
50	254	140	150	230	58	R14 + R666
68	254	140	150	230	58	R14



3.23 Access pipe

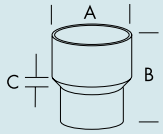
Nominal size mm	A	B	C	Code
68	45	50	185	R1



3.24 Reducers

68mm spigot/50mm spigot

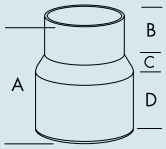
Nominal size mm	A	B	C	Code
68	68	76	9	R666



N.B. spigot fits into 50mm pipe

82 mm spigot/68mm socket

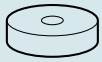
Nominal size mm	A	B	C	D	Code
82	105	33	8	64	R4



Available in grey only

3.25 Drain connector - external use only

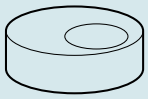
Nominal size mm	Code
50, 65, 68	DS24



Multi rainwater adaptor (Flexible)
Fits 110mm pipe or socket
Available in black only

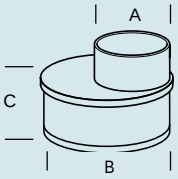
3.26 Reducer

Nominal size mm	A	B	C	Code
68				R3



110mm socket to 68mm socket
Available in black only

110	110	56	57	S264



110mm spigot x 50mm socket
Available in grey only

4.00 PROFILES

Hunter Rainwater Systems

SQUAREFLO

Hunter Surefit SQUAREFLO

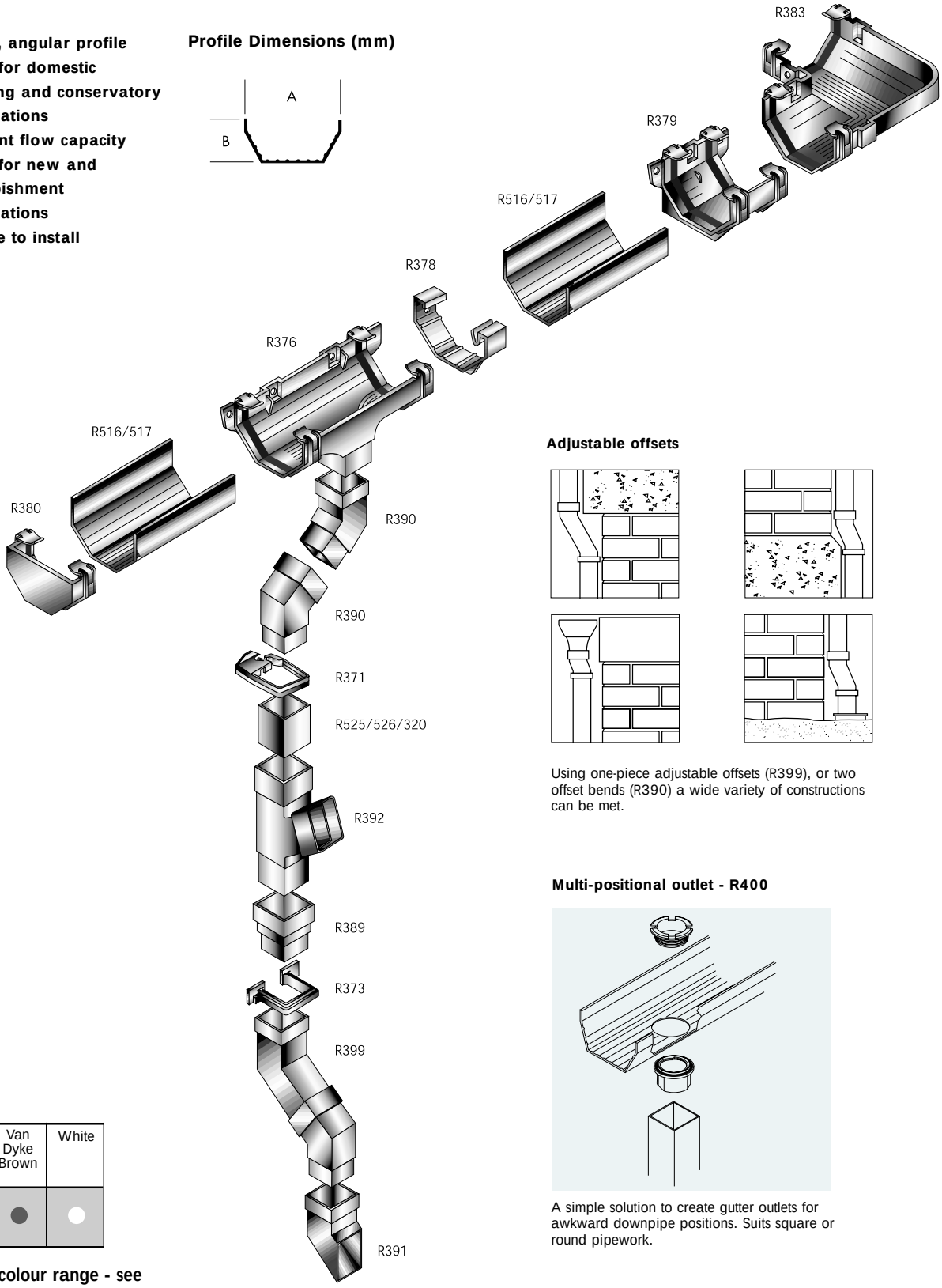
The Hunter Surefit system offers significantly reduced installation times and is integral to all Squareflo joint brackets, angles, outlets, and stopends. Simply snapping in the lengths of guttering ensures speedy, positive location at all joints saving time and money.

4.00 Squareflo

SQUAREFLO

- Clean, angular profile
- Ideal for domestic housing and conservatory applications
- Efficient flow capacity
- Ideal for new and refurbishment applications
- Simple to install

Profile Dimensions (mm)



Adjustable offsets

Using one-piece adjustable offsets (R399), or two offset bends (R390) a wide variety of constructions can be met.

Multi-positional outlet - R400

A simple solution to create gutter outlets for awkward downpipe positions. Suits square or round pipework.

Colours

Black	Van Dyke Brown	White
●	●	○

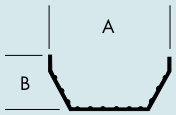
General colour range - see Hunter Trade Price List or website for specific colour availability.

SQUAREFLO

RAINWATER SYSTEM SQUAREFLO

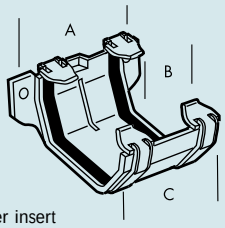
4.01 Gutter

Nominal size mm	A m	B	Length	Code
114	114	60	2	R516
114	114	60	4	R517



4.02 Joint bracket

Nominal size mm	A	B	C	Code
114	126	20	101	R379

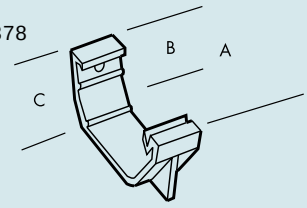


N.B. Dimension 20mm is gutter insert to gutter insert

4.03 Support bracket

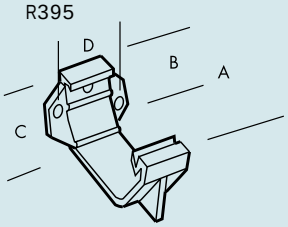
Single screw fixing

Nominal size mm	A	B	C	Code
114	127	66	79	R378



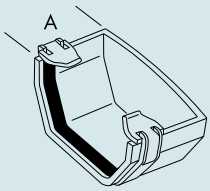
Double screw fixing

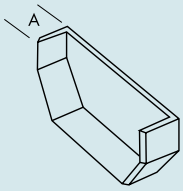
Nominal size mm	A	B	C	D	Code
114	125	64	95	50	R395



4.04 Stopend external/internal

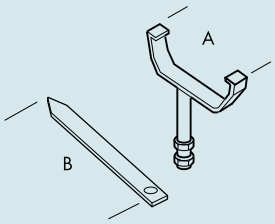
Nominal size mm	A	Code
External		
114	38	R380
Stopend Internal		
114	25	R381





4.05 Galvanised rise and fall bracket

Nominal size mm	A	B	Code
114	112	310	R377

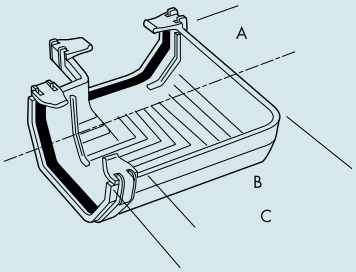


Galvanised

4.06 Angles

90°

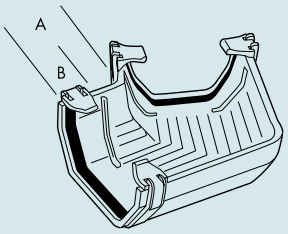
Nominal size mm	A	B	C	Code
114	84	150	194	R383



Depth of gutter insertion 42mm.
Dimension 144mm is to gutter insertion point.

120°

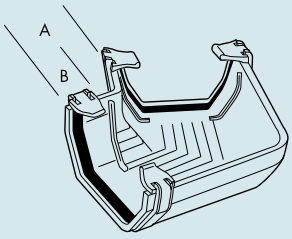
Nominal size mm	A	B	Code
114	66	42	R374



N.B. Dimension 42mm is gutter insertion depth.

135°

Nominal size mm	A	B	Code
114	66	42	R375



N.B. Dimension 42mm is gutter insertion depth

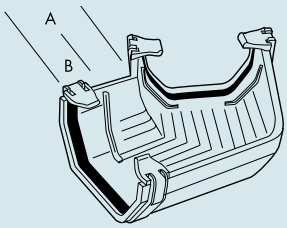
A full fabrication service is available for non-standard angles.

RAINWATER SYSTEM SQUAREFLO

Angles cont.

150°

Nominal size mm	A	B	Code
114	66	42	R370

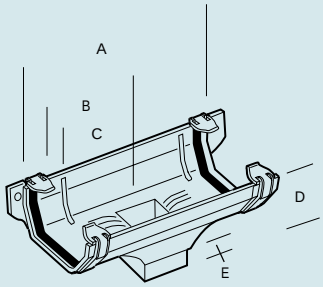


A full fabrication service is available for non-standard angles

4.07 Outlets

Running outlet

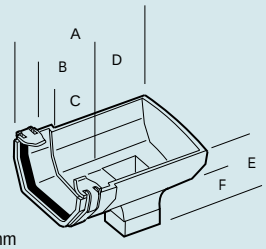
Nominal size mm	A	B	C	D	E	Code
114	274	88	74	157	40	R376



N.B: Depth of gutter insertion, 42mm

Stopend outlet

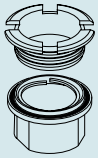
Nominal size mm	A	B	C	D	E	F	Code
114	242	110	102	86	115	42	R394

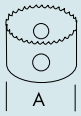


N.B: Depth of gutter insertion, 30mm

4.08 Multi-positional outlet

Suitability	Code	A	Code
65mm and 68mm downpipes	R400	60	Hole-cutter R401



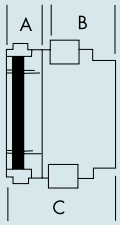


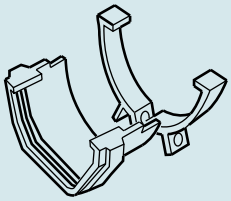
Spigot fits inside pipes. Not available in grey

4.09 Connectors to other systems

Square to cast iron half round

Nominal size mm	A	B	C	Hand	Code
114	33	50	84	L/H	R387





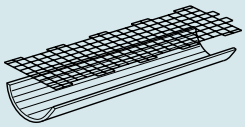
(Also suitable to connect to PVCu half round gutter)

N.B: Depth of gutter insertion, 30mm

Nut and bolt supplied

4.10 Gutter leaf guard

Nominal size mm	Code
10 x 500 5 Metre pack	R500



Suitable for 112mm Half Round and Squareflo

SQUAREFLO

RAINWATER SYSTEM SQUAREFLO

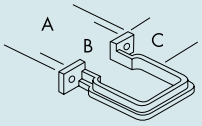
4.11 Pipe Plain Ended

Nominal size mm	A 65	B 65	Length m	Code
65			2.5	R525
			4	R526
			5.5	R320

4.12 Pipe brackets

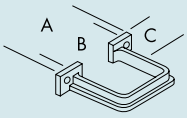
Stand off

Nominal size mm	A	B	C	Code
65	94	81	63	R388



Close to wall

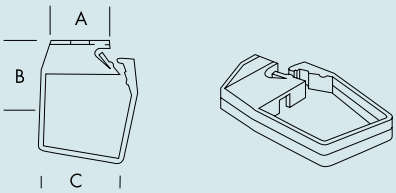
Nominal size mm	A	B	C	Code
65	100	84	37	R373



To reduce vandalism and where there is no offset projection

Snap fit clip

Nominal size mm	A	B	C	Code
65mm	52	63	72	R371

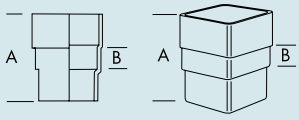


Single fixing. For use in restricted areas, e.g. on glazing bars.

RAINWATER SYSTEM SQUAREFLO

4.13 Pipe connector

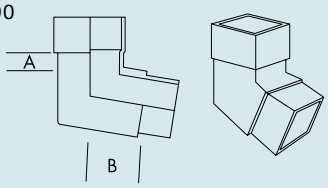
Nominal size mm	A	B	Code
65	100	16	R389



4.14 Bends

112 1/2° offset

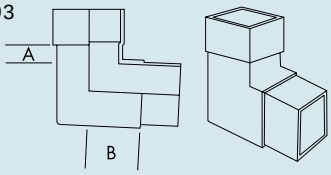
Nominal size mm	A	B	Code
65	49	49	R390



Standard offset using
2 bends 112 1/2° = 70mm

92 1/2°

Nominal size mm	A	B	Code
65	49	49	R393



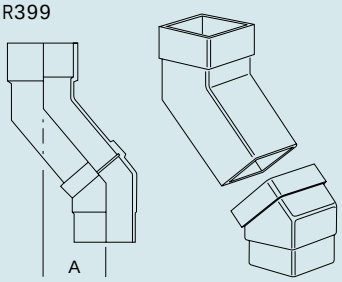
Standard offset using
2 bends 92 1/2° = 120mm

SQUAREFLO

RAINWATER SYSTEM SQUAREFLO

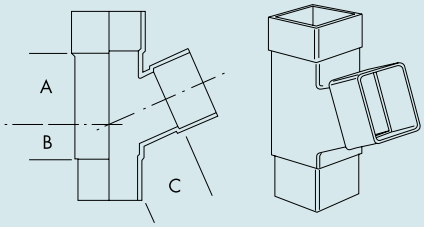
4.15 Adjustable offset

Nominal side mm	A	Code
65	25 - 65mm	R399



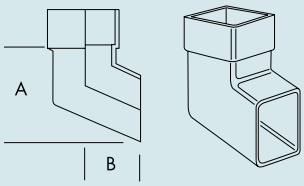
4.16 Branch 112 1/2°

Nominal size mm	A	B	C	Code
65	49	36	50	R392



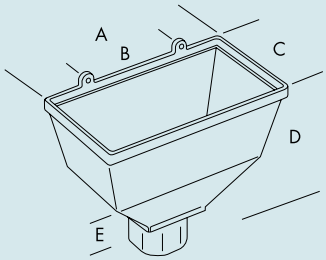
4.17 Shoe

Nominal size mm	A	B	Code
65	93	38	R391



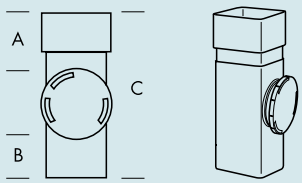
4.18 Hopper head

Nominal size mm	A	B	C	D	E	Code
65	254	140	150	230	58	R14



4.19 Access pipe

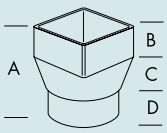
Nominal size mm	A	B	C	Code
65	75	70	216	R301



4.20 Adaptors

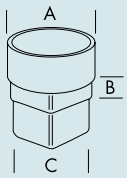
Square/round

Nominal size mm	A	B	C	D	Code
65	100	40	15	45	R397



Swivel - 82mm to square

Nominal size mm	A	B	C	Code
65	90	17	61	R396



5.00 PROFILES

Hunter Rainwater Systems

125

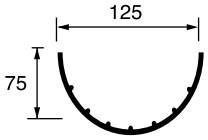
Hunter Surefit 125

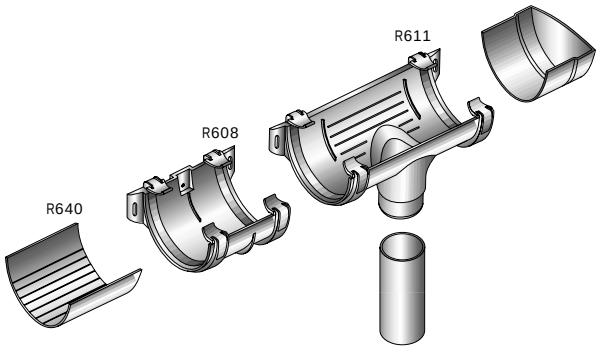
The Hunter Surefit system offers significantly reduced installation times and is integral to all 125mm joint brackets, angles, outlets, and external stop ends. Simply snapping in the lengths of guttering ensures speedy, positive location at all joints saving time and money.

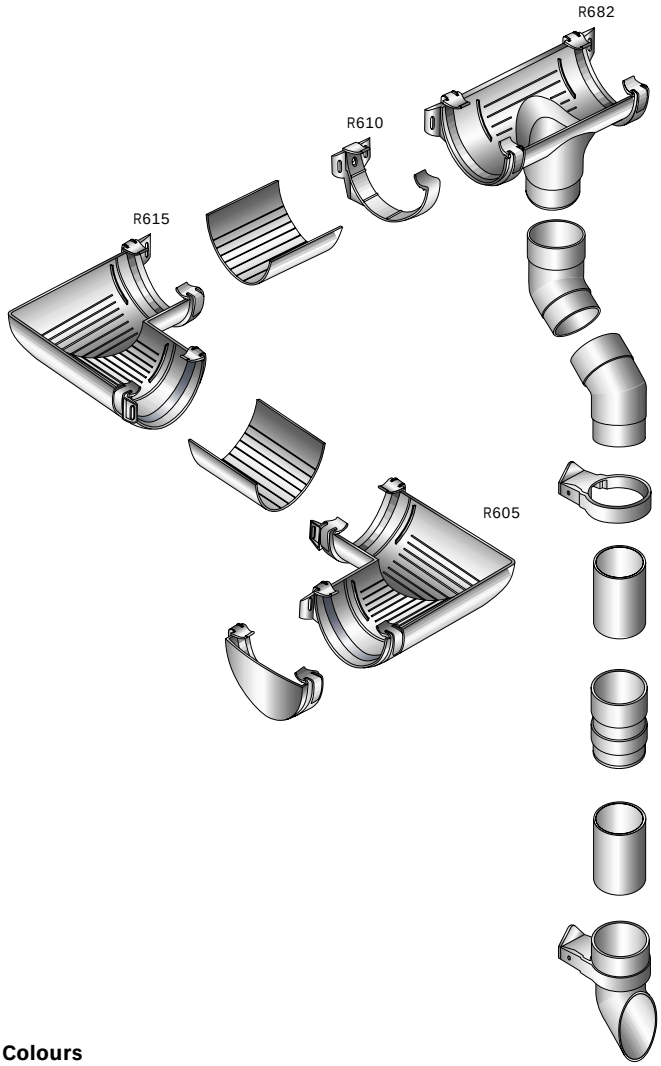
5.00 125

- **Surefit clipping system for fast installation**
- **Greater flow capacity**
- **Ideal for domestic or light commercial buildings**
- **Choice of downpipes**

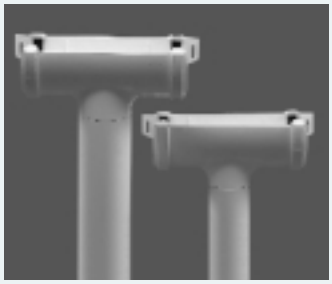
Profile Dimensions (mm)



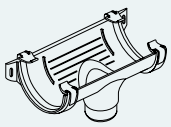




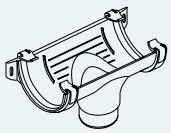
CHOICE OF DOWNPIPES



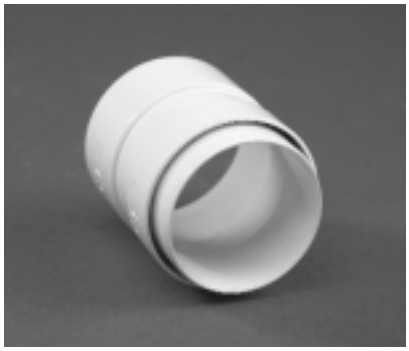
R611 - uses 68mm round downpipe
R682 - uses 82mm round downpipe



R611
68mm
outlet



R682
82mm
outlet



R611 - uses 68mm round downpipe
R682 - uses 82mm round downpipe

Colours

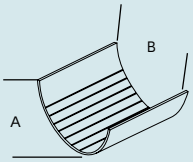
Black	Grey	Van Dyke Brown	White
●	●	●	●

General colour range - see Hunter Trade Price List or website for specific colour availability.

GUTTER AND FITTINGS 125

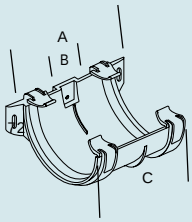
5.01 Gutter

Nominal size mm	A	B	Length m	Code
125	72	124	4	R640



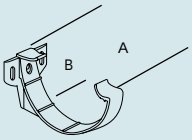
5.02 Joint bracket

Nominal size mm	A	B	C	Code
125	145	26	121	R608



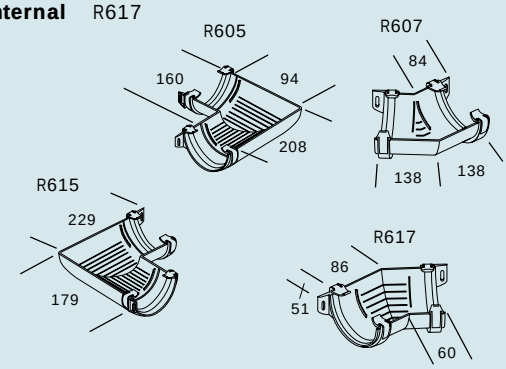
5.03 Support bracket

Nominal size mm	A	B	Code
125	139	72	R610



5.04 Angle bracket

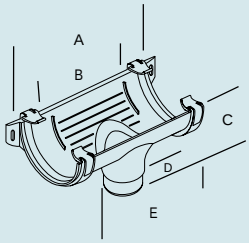
90° External	R605
90° Internal	R615
135° External	R607
135° Internal	R617



Complete with fixing wings

5.05 Running outlet

Nominal size mm	A	B	C	D	E	Code
68	275	157	159	40	251	R611
82	275	157	159	40	251	R682

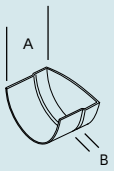


5.06 Stopend external

Nominal size mm		A	Code
125	External	42	R613

5.07 Stopend internal

Nominal size mm		A	B	Code
125	Internal	86	38	R602



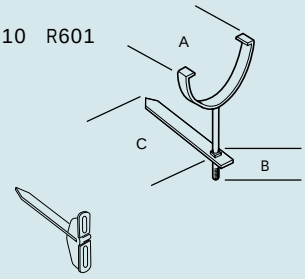
5.08 Adaptor seal

Nominal size mm	Code
125	R600

Replaces standard seal allowing connection of other deep profile gutter systems

5.09 Galvanised rise and fall bracket

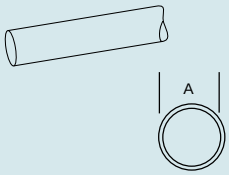
	A	B	C	Code
230mm stake	122	100	210	R601



Variable 230mm stake	R26
Variable 300mm stake	R27

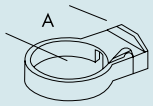
5.10 Plain ended pipe

Nominal size mm	Length m	A	Code
68	2		R518
68	2.5		R519
68	4		R520
68	5.5		R521
82	4	82	R700



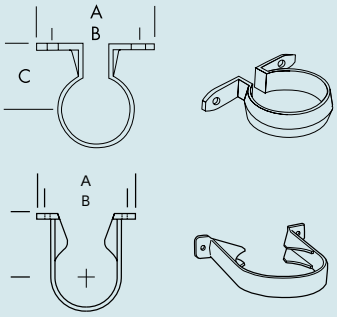
5.11 Bracket 1 screw fix

Nominal size mm		A 65	Code
68	1 screw		R19



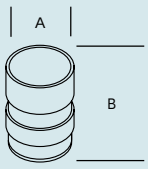
5.12 Bracket 2 screw fix

Nominal size mm		A	B	C	Code
68	2 screws	107	86	65	R46
82	2 screw	125	110	80	S612



5.13 Connector

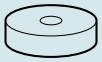
Nominal size mm		A	B	Code
68	Pipe	87	103	R17
82	Pipe	87	103	R717



5.14 Drain connector - external use only

Nominal size mm	Code
50, 65, 68	DS24

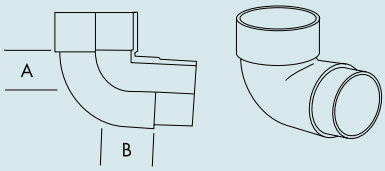
Multi rainwater adaptor (Flexible)
Fits 110mm pipe or socket
Available in black only



5.15 Bends

92 1/2° - 68mm

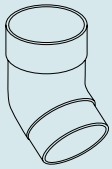
Nominal size mm	A	B	Code
68	21	93	R577

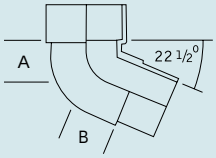


Standard offset using 2 bends = 119mm

112 1/2° offset 68/50mm

Nominal size mm	A	B	Code
68	35	35	R20
82	26	22	R720



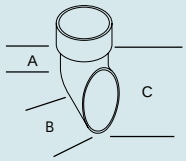


Standard offset using
2 x 68mm bends = 87mm

Standard offset using
2 x 50mm bends = 75mm

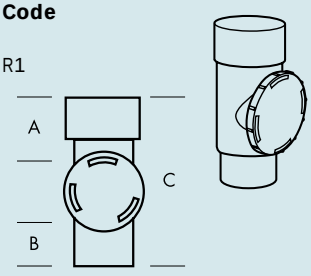
5.16 Rainwater shoe

Nominal size mm	A	B	C	Code
68	22	62	118	R21
82	22	62	118	R721



5.17 Access pipe

Nominal size mm	A	B	C	Code
68	45	50	185	R1



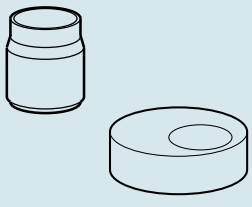
5.18 Reducer

Nominal size mm	Code
68	R4

82mm spigot to 68mm socket

68	R3

110mm socket to 68mm socket



6.00 PROFILES

Hunter Rainwater Systems

REGENCY

Hunter Surefit REGENCY

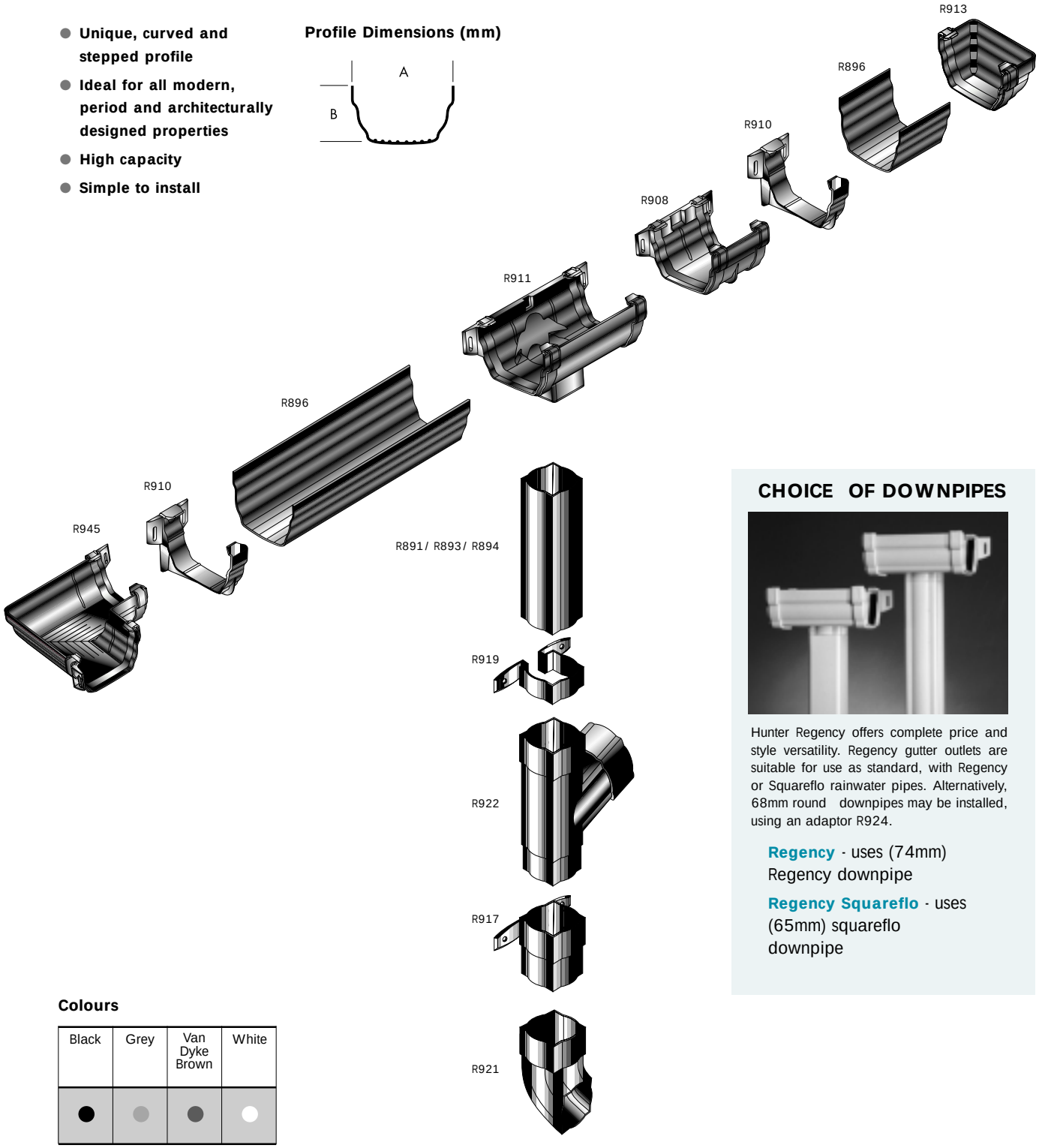
The Hunter Surefit system offers significantly reduced installation times and is integral to all Regency joint brackets, angles, outlets, and external stop ends. Simply snapping in the lengths of guttering ensures speedy, positive location at all joints saving time and money.

6.00 Regency

REGENCY

- **Unique, curved and stepped profile**
- **Ideal for all modern, period and architecturally designed properties**
- **High capacity**
- **Simple to install**

Profile Dimensions (mm)



CHOICE OF DOWNPIPES

Hunter Regency offers complete price and style versatility. Regency gutter outlets are suitable for use as standard, with Regency or Squareflo rainwater pipes. Alternatively, 68mm round downpipes may be installed, using an adaptor R924.

Regency - uses (74mm) Regency downpipe

Regency Squareflo - uses (65mm) squareflo downpipe

Colours

Black	Grey	Van Dyke Brown	White
●	●	●	●

General colour range - see Hunter Trade Price List or website for specific colour availability.

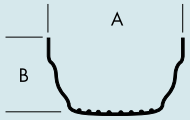
6.00 Regency

REGENCY

RAINWATER SYSTEM REGENCY

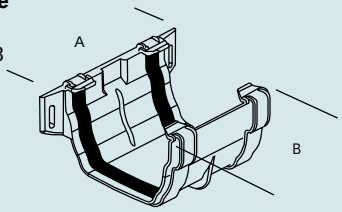
6.01 Gutter

Nominal size mm	A	B	Length m	Code
125	125	70	4	R896



6.02 Joint bracket

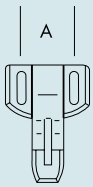
Nominal side mm	A	B	Code
125	146	121	R908

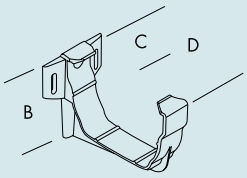


6.03 Support bracket

Double screw fixing

Nominal size mm	A	B	C	D	Code
125	54	99	80	135	R910

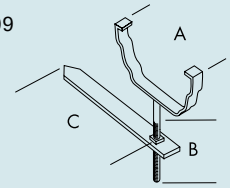




6.04 Galvanised rise and fall bracket

Nominal size mm	A	B	C	Code
125	125	100	210	R909

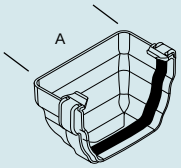
Galvanised



6.05 Stopends

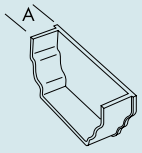
Stopend External

Nominal size mm	A	Code
125	68	R913



Stopend Internal

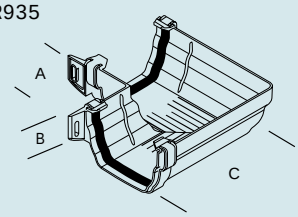
Nominal size mm	A	Code
125	28	R902



6.06 Angles

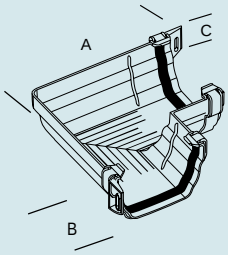
90° External

Nominal size mm	A	B	C	Code
90° 125	97	36	205	R935



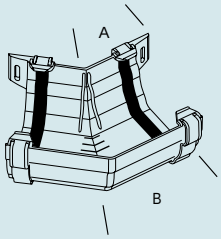
90° Internal

Nominal size mm	A	B	C	Code
90° 125	226	100	36	R945



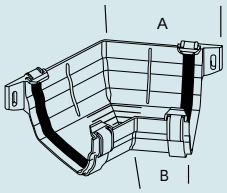
135° External

Nominal size mm	A	B	Code
90° 125	85	114	R937



135° Internal

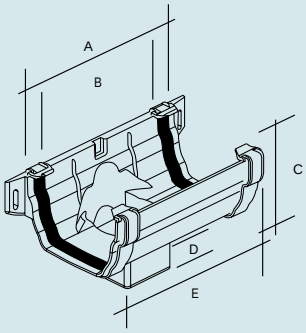
Nominal size mm	A	B	Code
90° 125	136	63	R947



6.07 Outlets

Running outlet - Regency

Nominal size mm	A	B	C	D	E	Code
125	227	116	132	38	132	R911



Suits both Square and Regency downpipes

REGENCY

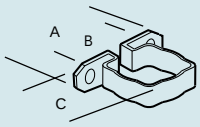
RAINWATER SYSTEM REGENCY

6.08 Pipe

Nominal size mm	A	Length	Code
75	74	2.5	R891
		4	R893
		5.5	R894

6.09 Pipe bracket

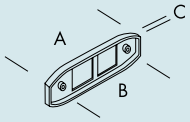
Nominal size mm	A	B	C	Code
74	130	102	88	R919



6.10 Bracket spacer

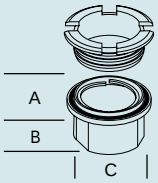
Nominal size mm	A	B	C	Code
74	140	104	5	R927

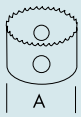
Available in Van Dyke Brown only



6.11 Multi-positional outlet

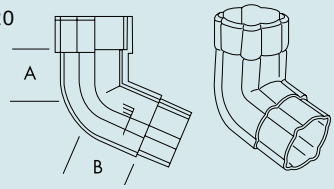
Suitability	A	B	C	Code	A	Code
65mm and 68mm downpipes	74	37	64	R400	60	R401 Hole-cutter





6.12 Bends offset 112 1/2°

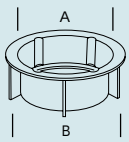
Nominal size mm	A	B	Code
74	52	53	R920



6.13 Reducer

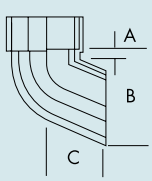
Nominal size mm	A	B	Code
110	82/74	110	R767

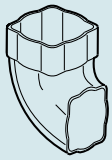
Regency, Squareflo and 82mm pipes x 110mm socket



6.14 Shoe

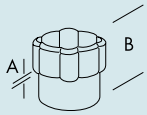
Nominal size mm	A	B	C	Code
74	10	96	56	R921





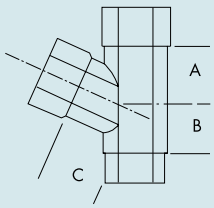
6.15 Adaptor, Regency to 68mm pipe connector

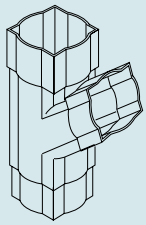
Nominal size mm	A	B	Code
74	4	82	R924



6.16 Branch 112 1/2°

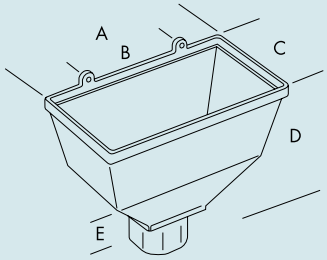
Nominal size mm	A	B	C	Code
74	66	59	63	R922





6.17 Hopper head

Nominal size mm	A	B	C	D	E	Code
65	254	140	150	230	58	R14



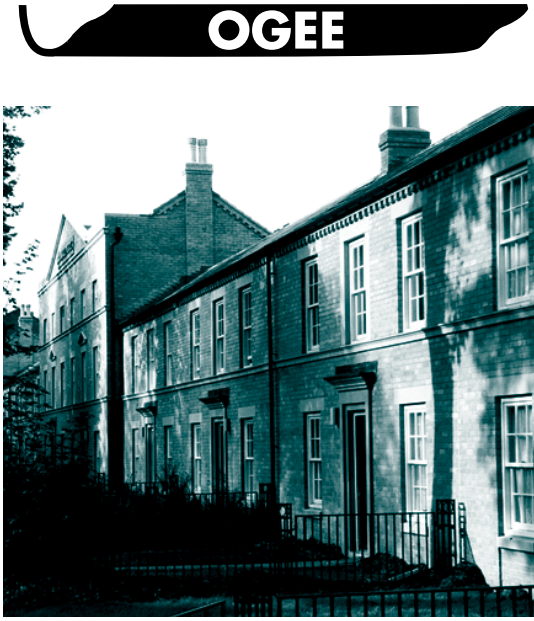
6.18 Compact rainwater gully

Nominal size mm	Code
110	DS42

110mm Inlet/Outlet
Adapts to accept Regency, Squareflo or 82mm downpipes

7.00 PROFILES

Hunter Rainwater Systems



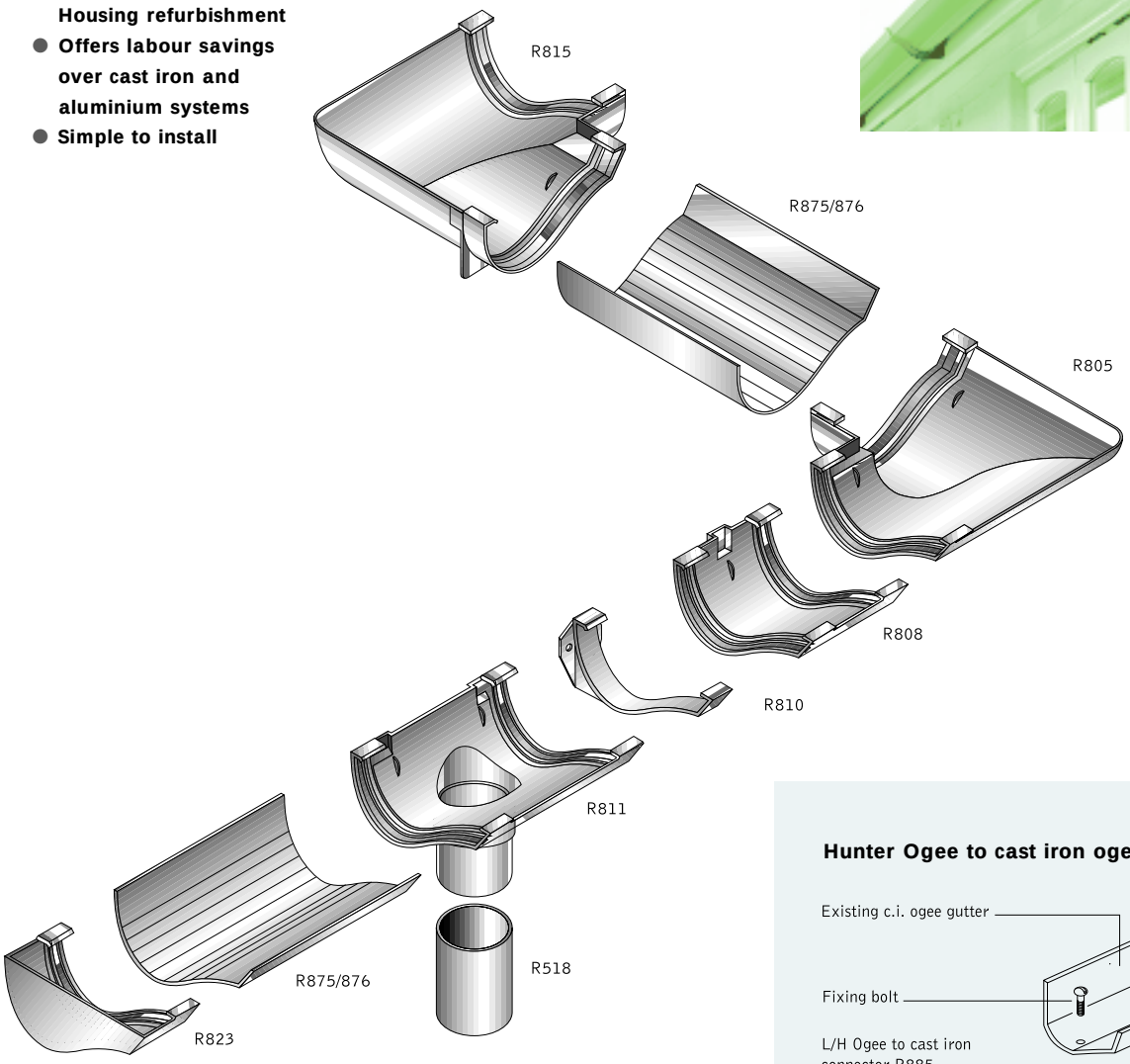
7.00 OGEE

7.00 Ogee

OGEE

- Classic ogee profile
- Compatible with cast iron ogee
- Light in weight, ideal for replacement of cast iron to maintain character
- Ideal for Local Authority Housing refurbishment
- Offers labour savings over cast iron and aluminium systems
- Simple to install

Profile Dimensions (mm)

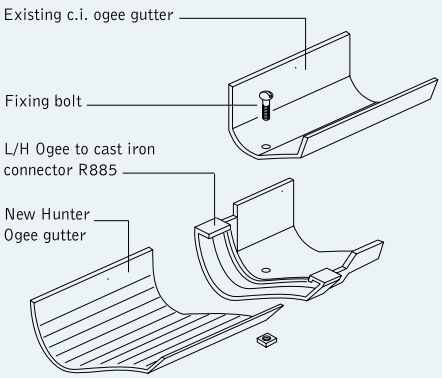


Colours

Black	White
●	○

General colour range - see Hunter Trade Price List or website for specific colour availability.

Hunter Ogee to cast iron ogee



Safety

Please take special care when removing old cast iron systems, since they can be extremely heavy and therefore dangerous.

7.00 Ogee

RAINWATER SYSTEM OGEE

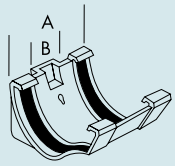
7.01 Gutter

Nominal size mm	length m	A	B	Code
130	4	130	58	R876

7.02 Joint bracket

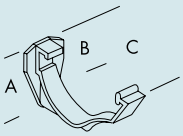
Nominal size mm	A	B	Code
130	76	20	R808

N.B. depth of gutter insertion = 28mm



7.03 Support bracket

Nominal side mm	A	B	C	Code
130	69	52	140	R810

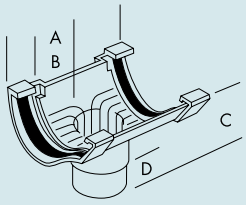


7.04 Outlets

Running outlet

Nominal size mm	A	B	C	D	Code
130	158	48	117	37	R811

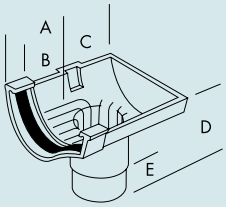
N.B: depth of gutter insertion = 32mm



Stopend outlet

Nominal size mm	A	B	C	D	E	Hand	Code
130	127	39 RH	47	119 R812 (shown)	37	LH	R822

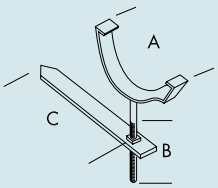
N.B: depth of gutter insertion = 29mm



7.05 Galvanised rise and fall bracket

Nominal size mm	A	B	C	Code
130	130	100	210	R818

Galvanised



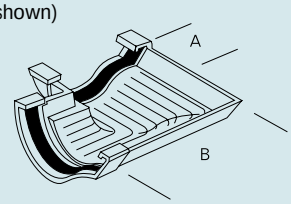
7.06 Angles

External

Nominal size mm	A	B	Code
130			
90°	94	174	R805 (shown)
120°	55	105	R806
135°	45	82	R807
150°	-	-	R809

(R809 Fabricated)

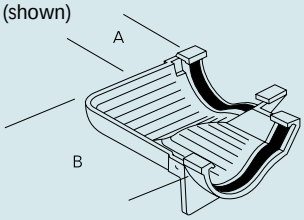
N.B. R806 and R807:
Depth of gutter insertion = 32mm



Internal

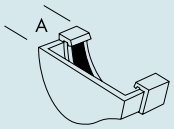
Nominal size mm	A	B	Code
130			
90°	80	176	R815 (shown)
135°	56	80	R817

N.B. R816 and R817:
Depth of gutter insertion = 32mm



7.07 Stopend External

Nominal size mm	Hand	A	Code
130	LH RH	44.5	R823 (shown) R813

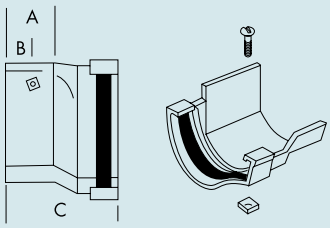


7.08 Connectors

Ogee to Cast Iron Ogee

Nominal size mm	Hand	A	B	C	Code
130	LH RH	51 R885 (shown)	25	114	R886

Available in black only

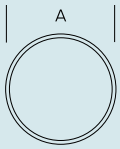


7.00 Ogee

RAINWATER SYSTEM OGEE

7.09 Pipe (plain ended)

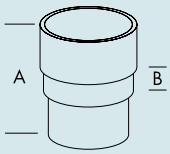
Nominal size mm	External diameter A	Length m	Code
68	68	2	R518
68	68	2.5	R519
68	68	4	R520
68	68	5.5	R521



7.10 Pipe connector

Nominal size mm	A	B	Code
68	97	23	R17

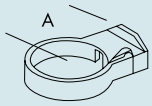
Socket / Spigot pipe connector



7.11 Brackets

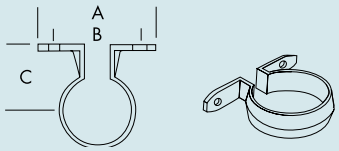
Single screw fixing/snap fit

Nominal size mm	A	Code
68	65	R19



Double screw fixing

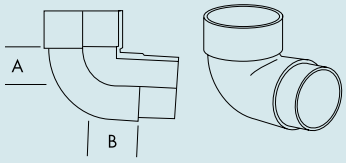
Nominal size mm	A	B	C	Code
68	107	86	65	R46



7.12 Bends

92 1/2° - 68mm

Nominal size mm	A	B	Code
68	37	55	R577

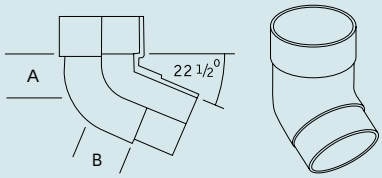


Standard offset using 2 bends = 119mm

7.13 Bends cont.

112 1/2° offset 68/50mm

Nominal size mm	A	B	Code
68	35	35	R20

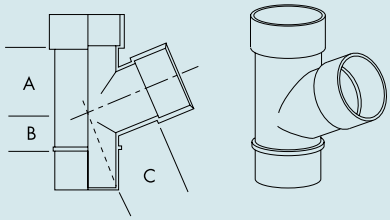


Standard offset using 2 68mm bends = 87mm
Standard offset using 2 50mm bends = 75mm

7.14 Branches

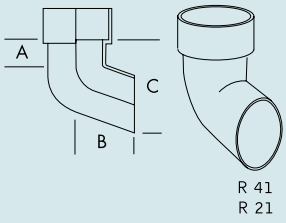
112 1/2° - 68mm

Nominal size mm	A	B	C	Code
68	75	35	65	R22



7.15 Shoe

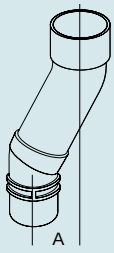
Nominal size mm	A	B	C	Code
68	35	45	101	R21



R 41
R 21

7.16 Adjustable offset

Nominal size mm	A	Code
68mm	22-80mm (Cut to suit)	R24



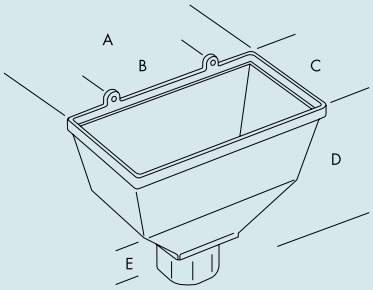
7.00 Ogee

OGEE

RAINWATER SYSTEM OGEE

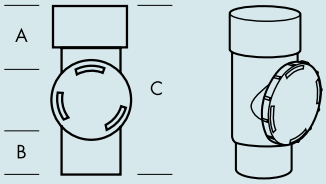
7.17 Hopper heads

Nominal size mm	A	B	C	D	E	Code
68	254	140	150	230	58	R14



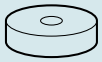
7.18 Access pipe

Nominal size mm	A	B	C	Code
68	45	50	185	R1



7.19 Drain connector - external use only

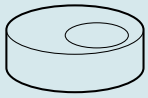
Nominal size mm	Code
50, 65, 68	DS24



Multi rainwater adaptor (Flexible)
Fits 110mm pipe or socket

7.20 Reducer

Nominal size mm	Code
68	R3



110mm socket to 68mm socket

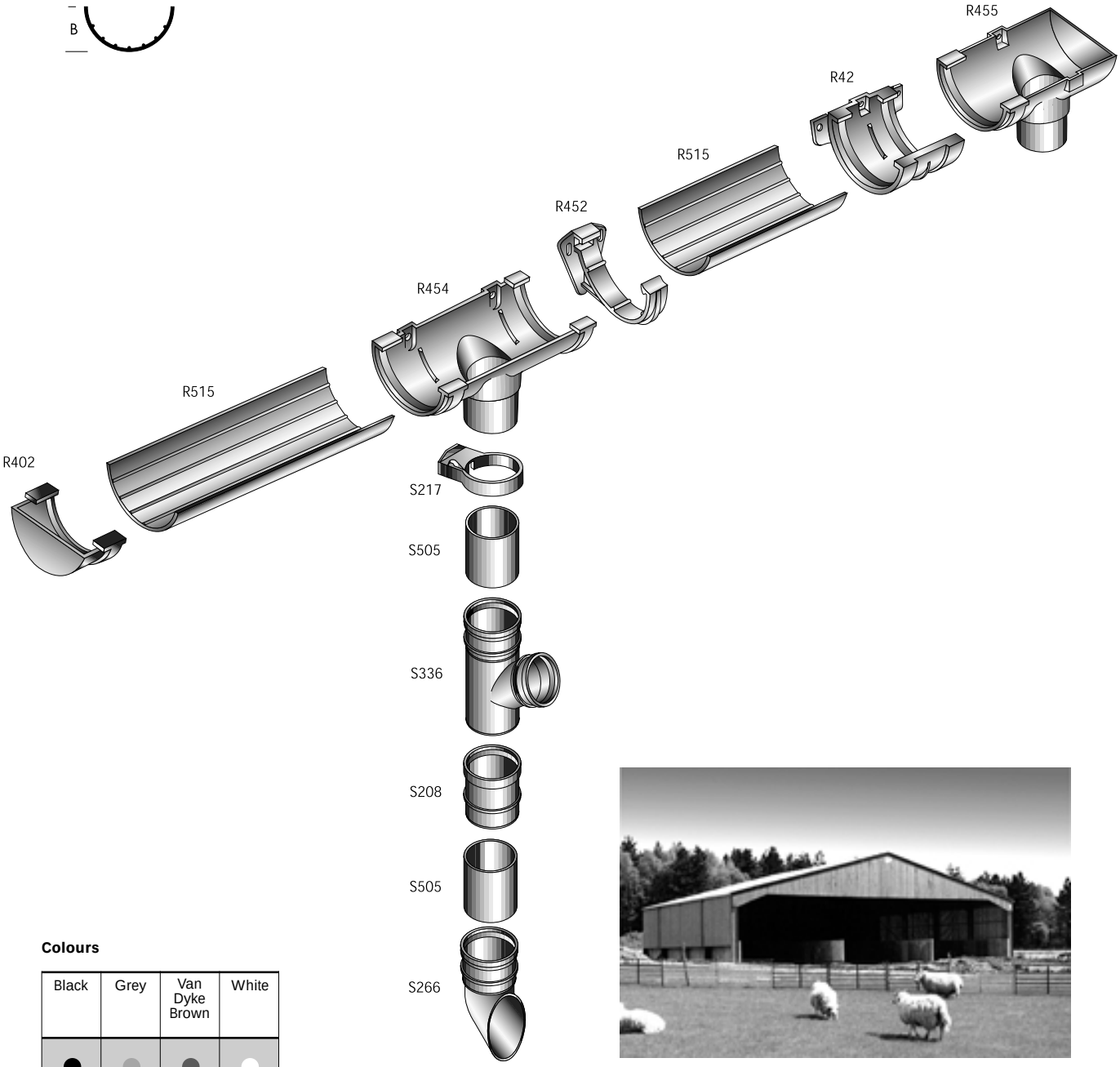
8.00 PROFILES HIGHFLO

Hunter Rainwater Systems

HIGHFLO

HIGHFLO

Profile Dimensions (mm)



Colours

Black	Grey	Van Dyke Brown	White
●	●	●	○

General colour range - see Hunter Trade Price List or website for specific colour availability.

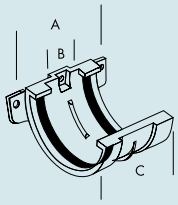
RAINWATER SYSTEM HIGHFLO

8.01 Gutter

Nominal size mm	A	B	Length m	Code
170	170	73	4	R515

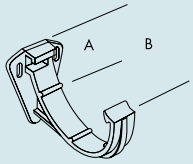
8.02 Joint bracket

Nominal size mm	A	B	C	Code
170	170	11	93	R42



8.03 Support bracket

Nominal size mm	A	B	Code
170	91	178	R452

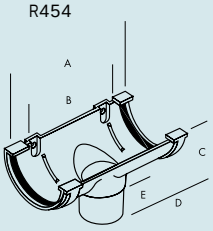


8.04 Outlets

Running outlet

Nominal size mm	A	B	C	D	E	Code
170	115	250	203	330	57	R454

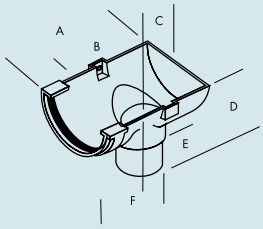
N.B. Dimension E is gutter insert to gutter insert



Stopend outlet

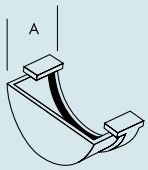
Nominal size mm	A	B	C	D	E	F	Code
170	257	218	90	200	57	102	R455

N.B. Dimension E is gutter insert to end face of stopend



8.05 Stopend external

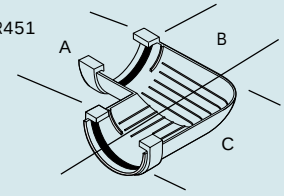
Nominal size mm	A	Code
170	53	R402



8.06 Angle

90°

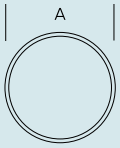
Nominal size mm	A	B	C	Code
170	199	111	245	R451

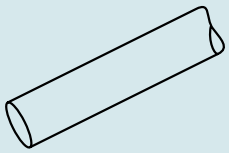


8.07 Pipe (plain ended)

Nominal size mm	External diameter A	Length m	Code
110	110	3	S505
110	110	4	S506
110	110	3	S508

NOTE: S508
Single socket

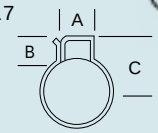




8.08 Brackets

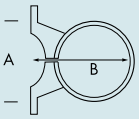
Single screw fixing

Nominal size mm	A	B	C	Code
110	50	36	90	S217



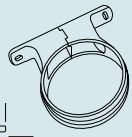
2 screw fixing

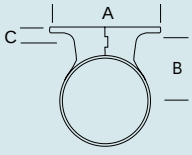
Nominal size mm	A	B	Code
110	9	150	S219



Socket

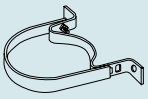
Nominal size mm	A	B	C	Code
110	158	90	31	S220

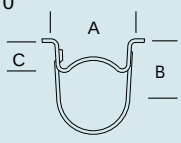




Pipe/socket Galvanised

Nominal size mm	A	B	C	Code
110	146	90	30	S570



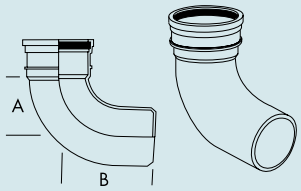


RAINWATER SYSTEM HIGHFLO

8.09 Bends

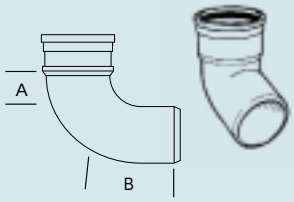
92 ½° - 110mm

Nominal size mm	A	B	Code
110	145	210	S322



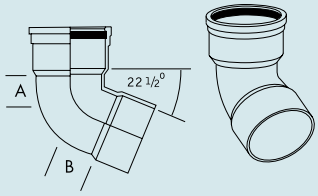
Spigot tail 135°

Nominal size mm	A	B	Code
110	38	95	S331



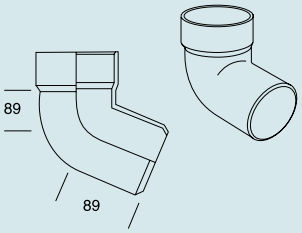
Offset 112 ½° top

Nominal size mm	A	B	Code
110	95	95	S270



Offset 112 ½° bottom

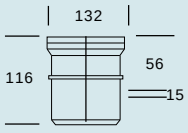
Nominal size mm	A	B	Code
110	89	89	S271



8.10 Connectors

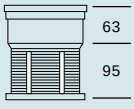
Pipe connector

Nominal size mm	A	B	C	D	Code
110	132	56	15	116	S208



Drain connector

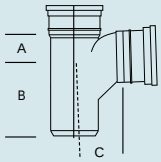
Nominal size mm	A	B	Code
110	63	95	DS349



8.11 Branch

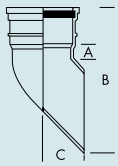
92 ½° /112½°

Nominal size mm	A	B	C	Length m	Code
110	60	155	85	4	S334
110	105	145	95	4	S336



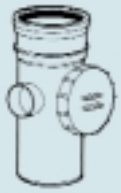
8.12 Shoe

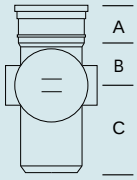
Nominal size mm	A	B	C	Length m	Code
110	24	246	57	4	S266



8.13 Access pipe

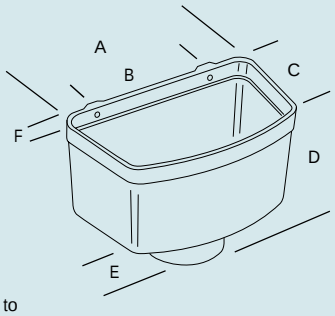
Nominal size mm	A	B	C	Code
110	68	80	155	S309





8.14 Hopper head

Nominal size mm	A	B	C	D	E	F	Code
110	316	184	203	223	45	11	R465



N.B. Dimensions from back to centre of outlet are: R465 - 92mm

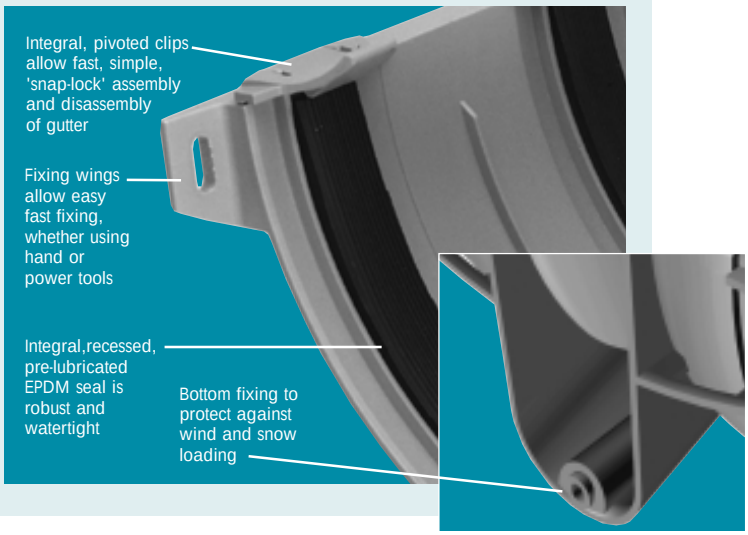
9.00 PROFILES HI-CAPACITY

Hunter Rainwater Systems

STORMFLO

Hunter Surefit STORMFLO

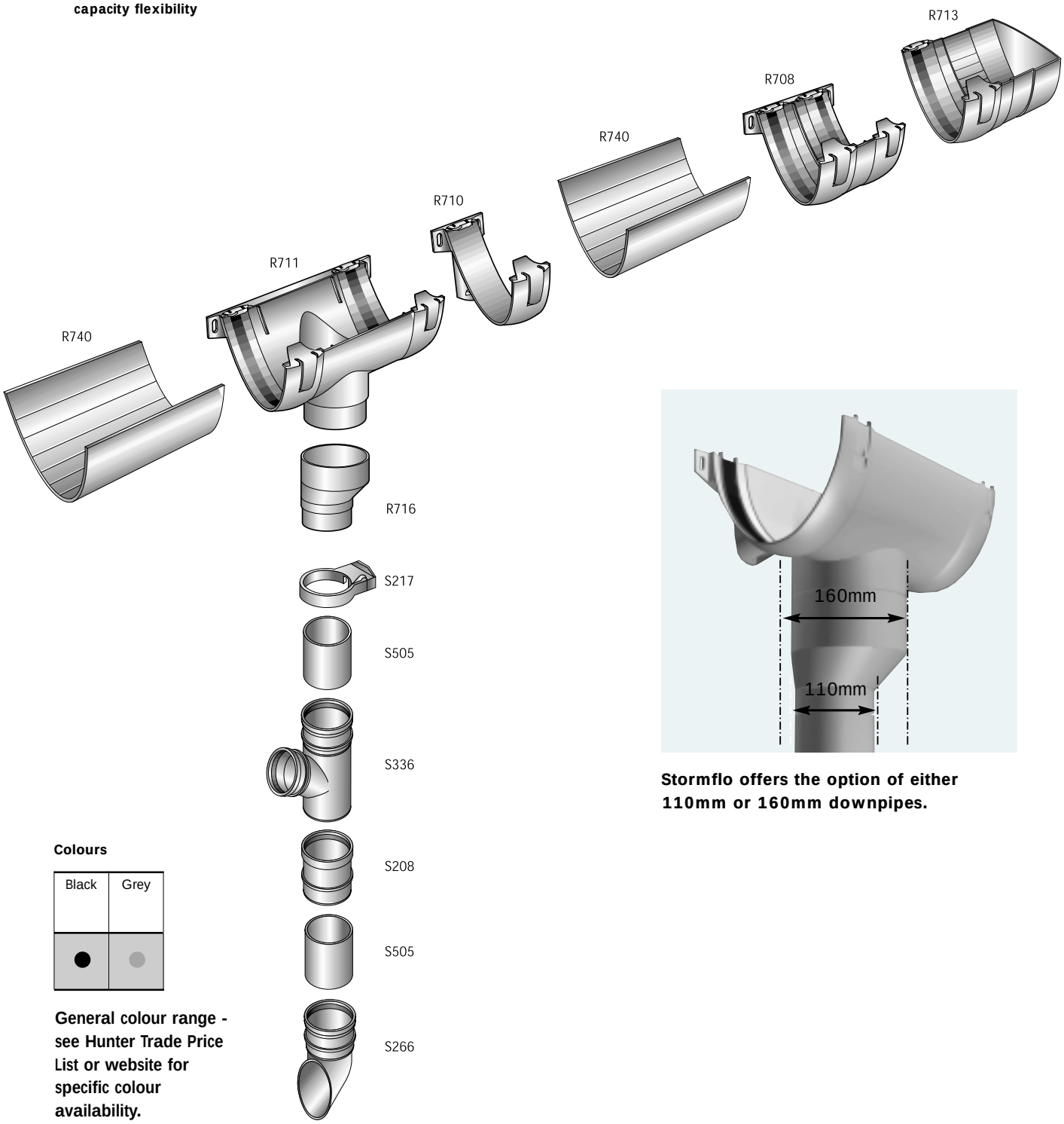
The Hunter Surefit* system offers significantly reduced installation times when compared to conventional materials. Simply snapping in the lengths of gutter ensures speedy positive location of all joints-saving time and money.



STORMFLO

- Surefit* clipping system for fast, easy installation
- Ideal for new and refurbishment applications
- Choice of 110mm or 160mm downpipes for price, style or capacity flexibility

Profile Dimensions (mm)



Stormflo offers the option of either 110mm or 160mm downpipes.

Colours

Black	Grey
●	●

General colour range - see Hunter Trade Price List or website for specific colour availability.

STORMFLO

RAINWATER SYSTEM STORMFLO

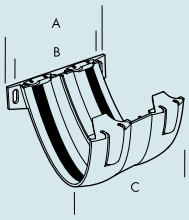
9.01 Gutter

Nominal size mm	A	B	Length m	Code
200	200	133	4	R740

9.02 Joint bracket

Nominal size mm	A	B	C	Code
200	235	211	192	R708

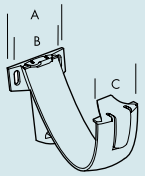
Insertion depth 80mm



9.03 Support bracket

Nominal size mm	A	B	C	Code
200	106	84	65	R710

Fix at 800mm centres



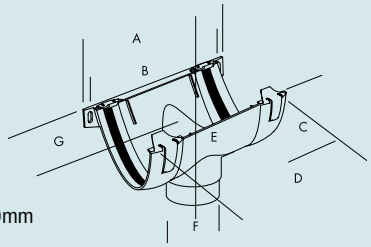
9.04 Running outlet

Nominal size mm	A	B	C	D	E	F	G	Code
200	445	424	248	405	445	152	92	R711

Outlet spigot fits 160mm pipe

Use R716 to adapt to 110mm

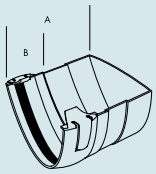
Insertion depth 80mm



9.05 Stopend external

Nominal size mm	A	B	Code
200	255	80	R713

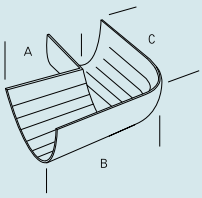
Insertion depth 80mm



9.06 Angles - Spigot Ends

90°/135°

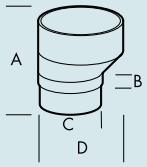
Nominal size mm	A	B	C	Code
200	170	362	358	R705 (shown)
200	86	151	194	R707



9.07 Outlet adaptor - for 110mm Highflo downpipes

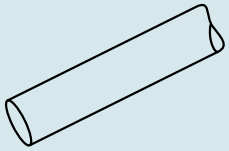
Nominal size mm	A	B	C	D	Code
200	202	30	102	160	R716

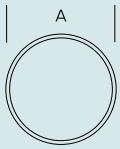
See Highflo section for 110mm pipe and fittings



9.08 Pipe (plain ended)

Nominal size mm	External diameter A	Length m	Code
160	160	3	S534
160	160	4	S535
160	160	3	S533



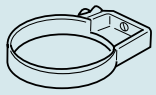


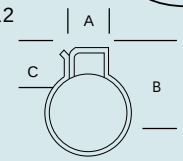
NOTE: S533 Single socket

9.09 Brackets

Single screw fixing

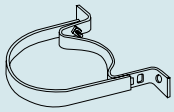
Nominal size mm	A	B	C	Code
160	83	120	38	S412

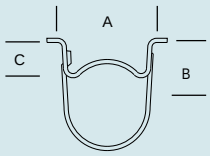




Pipe Socket fixing

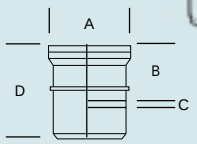
Nominal size mm	A	B	C	Code
160	200	120	27	S571





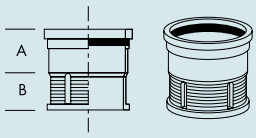
9.10 Pipe connector

Nominal size mm	A	B	C	D	Code
160	200	97	5	175	S406



Drain connector

Nominal size mm	A	B	Code
160	70	90	DS438



Fixing

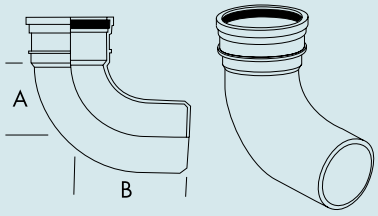
To make sure gutter systems are securely installed, ensure suitable rustproof fixings are used and that the correct length of fixing is selected. Hunter recommends No. 12 round headed screws or equivalent for Stormflo and that support brackets are fixed at maximum 800mm centres.

RAINWATER SYSTEM STORMFLO

9.11 Bends/offsets

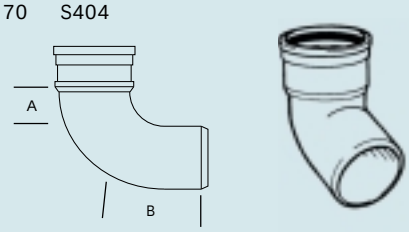
92 1/2° bend

Nominal size mm	A	B	Code
160	145	210	S403



135° bend

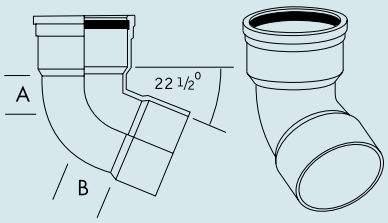
Nominal size mm	A	B	Code
160	123	70	S404



Standard offset using 2 bends = 100mm.

Top offset 112 1/2°

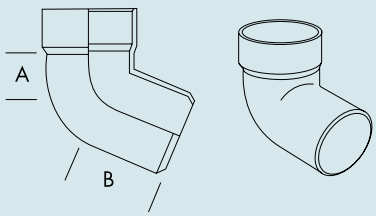
Nominal size mm	A	B	Code
160	95	95	S424



Standard offset using 2 bends = 168mm

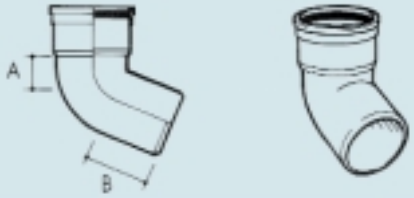
Bottom offset 112 1/2°

Nominal size mm	A	B	Code
160	95	165	S425



9.11 continued Top offset - 112 1/2° spigot tail

Nominal size mm	A	B	Code
160	178	88	S436

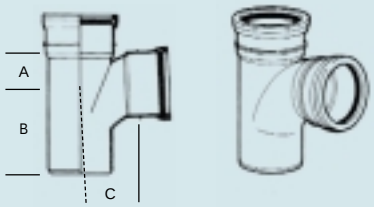


Also used as a rainwater shoe

9.12 Branch

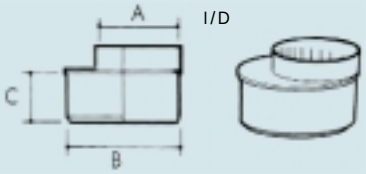
92 1/2°

Nominal size mm	A	B	C	Code
160	85	265	155	S4277



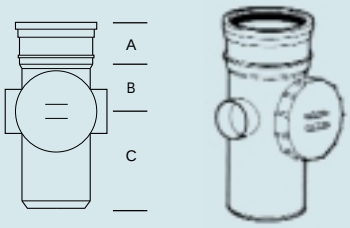
9.13 Reducer

Nominal size mm	A	B	C	Code
160	110	160	68	S420



9.14 Access pipe

Nominal size mm	A	B	C	Code
160	105	55	140	S472



9.00

9.15 R410 UNI-FIT OUTLET

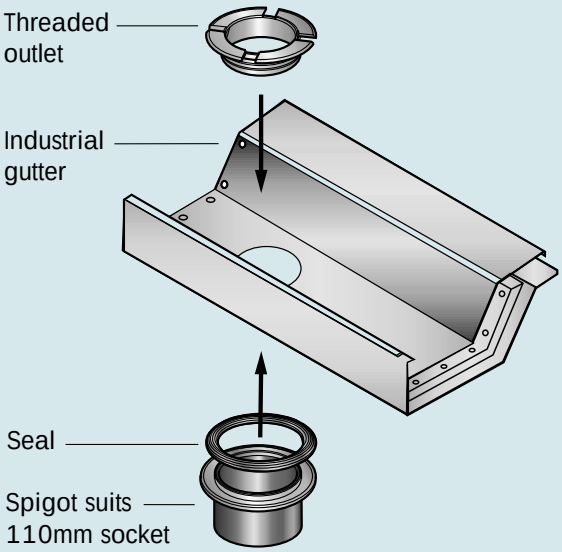
Hunter's 110mm Uni-Fit outlet is particularly suited to large capacity fibre cement, plastic or metal gutters with a thickness of between 1mm and 15mm. Once a hole has been cut into the gutter, the threaded sections screw together to form a secure watertight joint. No need for messy mastics, sealants or rivets. Uni-Fit can be pre-installed and should always arrive on-site in pristine condition, unlike alternative outlets, which need to be fabricated in-situ because they are easily broken in transit.

Hunter's 65/68mm Uni-Fit outlet is suitable for use with PVCu, pressed steel, cast aluminium and GRP domestic square section gutter systems. The outlet can solve capacity problems by preventing 'localised' gutter over-spill and is easily installed anywhere within the gutter run. The outlet spigot is designed to accept 68m round or 65m square downpipes.

The Uni-Fit domestic outlet is particularly useful when installed on a conservatory where a normal gutter outlet may obstruct a window opening, or fall below the fascia sight-line. No offsets are required, simply site the outlet so that the connecting pipework is adjacent to a glazing bar. When fitted on a corner Uni-Fit converts an angle to a running outlet.

Both the 110mm high capacity and 65/68mm domestic Uni-Fit outlets are designed to save valuable on-site time and money. They may be fitted on new or existing systems and can usually be inserted after the guttering is installed.

Typical 110mm installation



The outlet is suitable for use with flat bottom gutters, with a thickness of between 1mm - 15mm.

Product Guide	110mm	
Description	Colour	Code
UNI-FIT OUTLET		
For Agricultural, Industrial & Commercial applications		
Spigot fits 110mm socket	G	R410

- **Quick and easy to install**
- **No need for costly 'formed' outlets**
- **High capacity outlet for agricultural, commercial and industrial uses**
- **Maintenance free**

10.00 INSTALLATION PROCEDURES / DETAILS

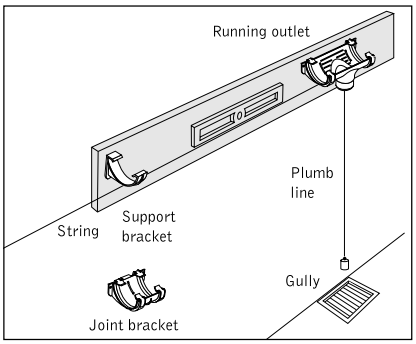
Hunter Rainwater Systems

10.00 INSTALLATION PROCEDURES

- Position outlet
- Establish fall
- Fix support and joint bracket
- Buildings with fascias
- Fixing corner angles
- Install gutter and downpipe
- Gutter positioning
- Fault finding tips
- Gutter to gutter connections
- Rise and fall brackets
- Rainwater hopper heads
- Downpipe installation
- Downpipe offsets
- Downpipe brackets
- Internal and external Rainwater pipes
- Connecting downpipes to drain (Surface water only)
- Connecting downpipes to gullies (Combined systems)
- Repair and replacement
- Connecting PVCu Half round /Squareflo to C.I. Half round gutter
- Connecting to spigot
- Connecting PVCU Half round to C.I. Ogee gutter
- Pipe cutting, gutter cleaning and maintenance
- Safety

10.00 Installation Procedures

POSITION OUTLET



Before starting work, check that fascia boards are level and straight; crooked fascias can produce the appearance of a wavy gutter.

Use a plumb line centred over any gully or drain connection to establish the position of the outlet.

Using 25mm (1") x No 10 sheradised round head screws, fix the outlet to the section of fascia board at the appropriate height for level gutter or gutter with falls. Screws should be located through the moulded lugs. Where moulded lugs are not pierced, fittings may be drilled (running outlets must always be fixed with two screws).

Note: Use 38mm (1½") x No 12 sheradised round head screws for Stormflo - or screw length to suit fixings.

ESTABLISH FALL

Fix a support bracket at the end of the fascia board furthest from the outlet. Position the bracket towards the top of the fascia board, to create a fall to the outlet not steeper than 1:350 (BS EN 12056 - Part 3).

N.B: Excessive gap between lowest edge of roof and top of gutter must be avoided.

FIX SUPPORT AND JOINT BRACKET

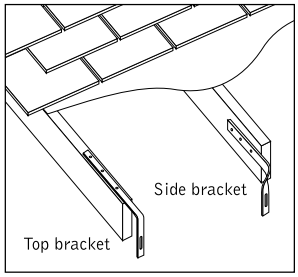
A string secured tautly between the outlet and the furthest bracket will assist in installing the gutter in a level line.

For gutters that are to be fixed level, a spirit level should be used against the string (see diagram above).

Support or joint brackets are fixed at a maximum of 1 metre centres, (800mm for Stormflo and Ogee profiles). For fixing recommendations in areas subject to heavy snow and for steeply pitched roofs, see 'Snow loads' on page 4. More detailed information is provided in BS EN 12056 - Part 3.

BUILDINGS WITHOUT FASCIAS

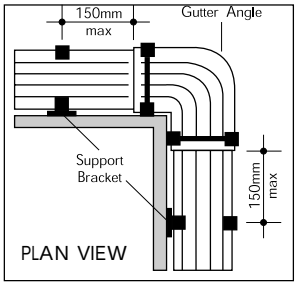
On older properties not having fascia boards, Hunter side or top rafter brackets are used, suitable for use with all Hunter rainwater systems except 170mm Half round and 200mm Stormflo. The brackets are screwed to exposed rafters and come complete with fixing nuts and bolts for securing outlets and brackets. The installation procedure is as above. On buildings without projecting eaves, and no fascia board, use Hunter variable rise and fall brackets, supplied with fixing stake for brickwork.



FIXING CORNER ANGLES

Except for the Surefit system, internal and external angles are provided with moulded lugs which can be drilled for fixing direct to the fascia. The next gutter support may then be fixed up to 1 metre away.

It is recommended that corner angles should be fixed to the fascia. Where this is not possible, support brackets should be fixed not more than 150mm from each end of the fitting.



INSTALL GUTTER AND DOWNPIPE

To ease installation and reduce thermal movement noise factor after installation, lubricate the seals in joint brackets, outlets and angles with either Hunter liquid lubricant (SC960-3ml/SC966-250ml) or Hunter silicone spray (SC967-300ml).

NB: Washing-up liquid should not be used as a lubricant

There are two methods of fitting guttering together:

For 112mm Half round and 114mm Squareflo

NOTE: For installation to PVCu fascia contact the board manufacturer for recommended fixings

The unique 'Surefit' system allows simple fixing as follows.

A. Insert the rear gutter edge under the back retaining lip of the snap lock clip.

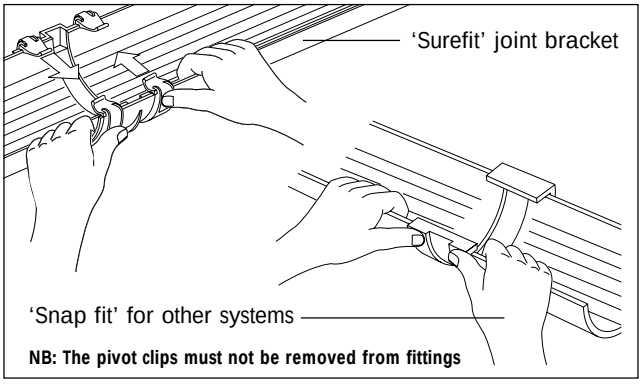
B. Ensure that it is fully home.

C. With all fingers over the front edge of the gutter, pull down, while pushing up on the fitting with your thumbs until the gutter snaps into position.

Gutter seals are pre-lubricated, however additional silicone lubricate may aid installation.

Lifting the clips allows simple removal of the gutter.

NB: Always ensure seals are free from dirt and grit



NB: The pivot clips must not be removed from fittings

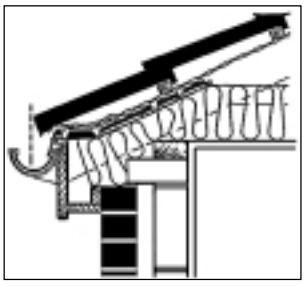
For all other systems

'Snap fit' the guttering by inserting the rear gutter edge under the back retaining lip of the bracket. Ensure that it is fully home, then pull the front of the gutter down to engage in the front lip. This is done by exerting pressure with the thumb and forefinger of both hands until the gutter 'clicks' into place (see diagram). The top edge of the gutter must not be cut, filed or notched in any way.

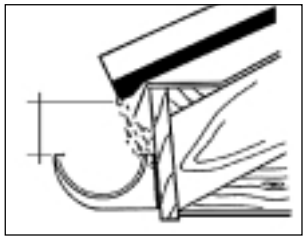
Gutter ends must be clear of any swarf, burrs, dirt or sharp matter which may damage the seals.

Downpipe lengths are then jointed by means of pipe connectors and secured by pipe brackets fixed at max. of 1.8 metre centres.

GUTTER POSITIONING



The gutter should, where practicable, be fixed centrally under the roof edge and close beneath it, particularly where roof edges that give a wide spread of water are used.



If a fall is required, although plastic guttering can be fixed level, a recommended rate of fall is 1:350. Too steep a fall should be avoided, as this leads to an excessive gap between the lowest edge of the roof and the top of the gutter. Any roof felt or eaves ventilator tray skirt should be extended to just below the top of the gutter edge, to prevent wind blowing water behind the gutter.

FAULT FINDING TIPS

1. **Fittings not screwed to the fascia**. This causes the gutter to pull out of the fittings, as there is no restriction on movement.
2. **Gutter cut short between fittings.** This causes it to ride over the sealing rubbers. All Hunter fittings are marked with an "insert to here" line to assist the installer.
3. **Recommended spacing of gutter clips exceeded.** This causes guttering to sag in hot weather, thereby restricting thermal movement.
4. **The roof tiles overhanging the centre of the gutter.** Causes the rainwater to overshoot the gutter. The correct position for the gutter is fixed centrally under the roof tile end.
5. **An excessive gap between the lowest edge of the roof and the top of the gutter.** Causes the rainwater to overshoot the gutter.
6. **No roofing felt, or felt cut short.** In all cases, roofing felt should be extended to just below the top edge of the gutter to prevent wind blowing water behind the gutter.
7. **No silicone lubricant used when installed.** This may lead to irritating juddering noises caused by the restriction of natural expansion and contraction of the gutter.

NOTE: It is essential that fascia boards treated with creosote are left for at least 48 hours to dry before fixing commences

10.00 Installation Details

RAIN WATER PIPES

Support:

All rainwater pipe connectors, shoes and bottom-offset bends should be supported to prevent the pipe slipping out of position. All other brackets are to be spaced at:

Dia	Vertical	Horizontal
50 - 74mm	2m	1m
75 - 110mm	2m	1m
160mm	2m	1.2m

Offset pipe:

The pipe from the eaves gutter outlet to the face of the wall should be offset using 2 no. 112 degree bends. Smaller offsets, between 22 - 80mm (R24) and 25 - 65mm (R399), are made with the Surefit Half Round or Squareflo 'Adjustable offset'. Rainwater pipe bends not manufactured as stock items are to be fabricated by Hunter Plastics Ltd. fabrication service department.

Horizontal pipes:

The joints on horizontal pipes should be sealed and when fixed internally, they should be tested as for internal rainwater pipes.

Internal rainwater pipes:

To compensate for thermal movement only pipes and fittings with ring seal joints must be used within a building. Internal rainwater pipes should be tested to withstand a constant air pressure of 38mm water gauge for three minutes (England, Wales and Northern Ireland) and 50mm water gauge for five minutes (Scotland). When rainwater pipe from eaves guttering is to be run within a building the transition from the smaller diameter pipe to the larger diameter, should e done in the shortest distance and with the minimum number of joints. All joints should be watertight. To connect 68mm diameter rainwater pipe to 82mm pipe use Hunter reducer (R4). To connect 68mm diameter rainwater pipe to 110mm pipe use hunter reducer (R3).

Access to Pipes

All parts of the pipework system should be accessible to hand held rodding equipment with adequate number of points for removal of debris from the system.

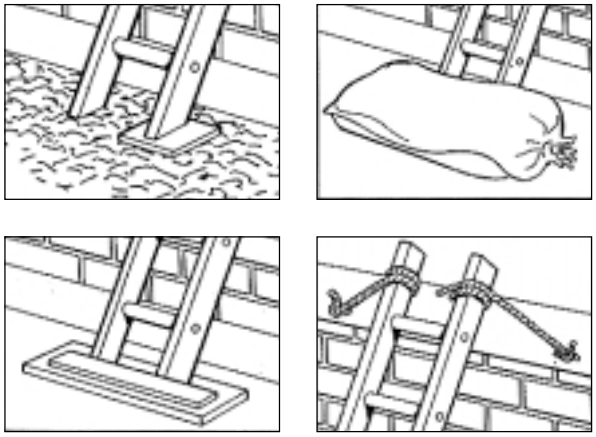
Warning Pipes

Internal rainwater pipes must be able to withstand the head of water likely to build up if a blockage occurs. However, to indicate that the pipe is in danger of being filled to the roof level warning pipes should be provided above the point where a blockage is likely to occur, e.g at the base of the stack and at changes of direction. It is important to note that flexible joints on all types of modern pipe systems are able to withstand an approximate head of 0.5 bar or 5 metre head of water. On plastic pipe systems warning pipes can be made using waste pipe or overflow pipe.

Sealed Joints:

Small diameter joints (50 74mm) should be cleaned with solvent cleaner and sealed with solvent cement. The larger diameter ring seal joints (82mm plus) should have the end of the pipe cut square, chamfered and lubricated before insertion into the ring seal socket.

SAFETY TIPS



When using a ladder, make sure it is securely fixed and on level ground. If the ground is smooth or slippery, place a bag filled with sand or soil at the foot of the ladder. Take care not to over-reach, Take special care when removing old cast iron systems, as they can be extremely heavy and therefore dangerous.

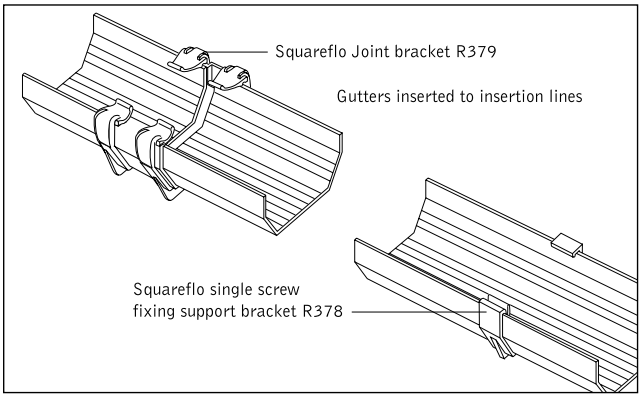
10.00 Installation Details

GUTTER TO GUTTER CONNECTIONS

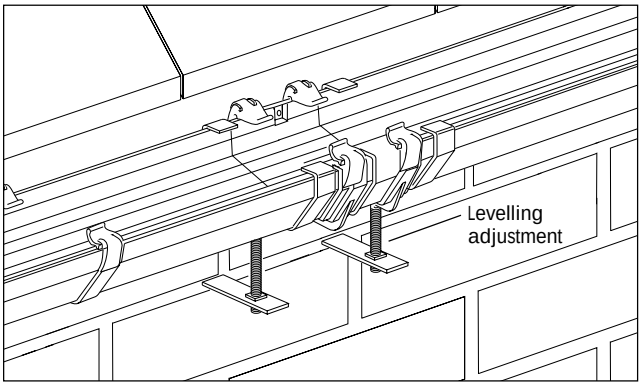
Gutter to gutter connections are made using joint brackets (these have 2 rubber seals). Markings on the inside front face indicate the gap that must be left to accommodate thermal movement. To allow for consistent thermal movement of each section of gutter, joint brackets must always be securely fixed.

Alternatively with half round systems gutters may be joined by means of a gutter union which must be secured in position by a support bracket.

NB: Every effort should be made to ensure that unsecured lengths exceeding 1 metre are not installed adjacent to external Stopends.



RISE AND FALL BRACKETS



For buildings without fascias, galvanised rise and fall brackets are available for most of the Hunter range of gutter profiles as an alternative to top or side fixing rafter brackets. These may be built in to the brickwork as work proceeds, or driven in after construction. When installing, all gutter unions and ends of gutters should be supported by a bracket, with intermediate brackets at not greater than 1 metre centres (800mm for Ogee). Running outlets should be supported by a bracket at both ends.

RAINWATER HOPPER HEAD

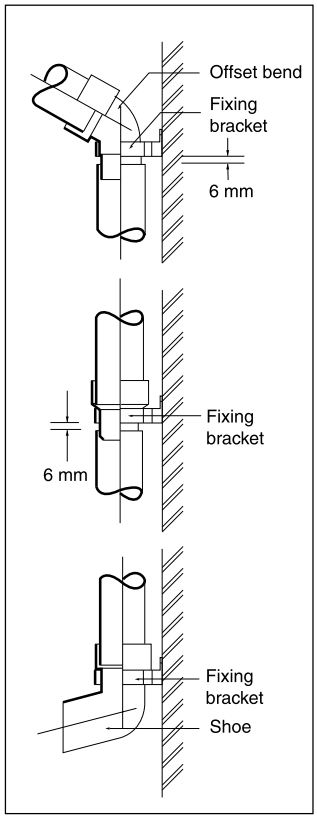
Rainwater hopper heads are available to collect discharging water from flat roofs or from adjacent rainwater downpipes, to suit Half Round and Squareflo profiles. Two styles and outlet sizes are available. They are provided with two fixing lugs. See pages 14 and 18 for details and dimensions.

DOWNPIPE INSTALLATION

1. Allowance for expansion must be made on external rainwater downpipes, by leaving a gap of approximately 6mm between spigot connections.
2. Fix each subsequent length of pipe in a similar manner, securing at the lower end with pipe connector and pipe bracket and ensuring 6mm gap is allowed at each joint.
3. Fix additional pipe brackets as required to provide support for pipes, not further apart than 1.8 metre centres.
4. A bracket must be fitted around the shoe, to support the bottom section of pipe.

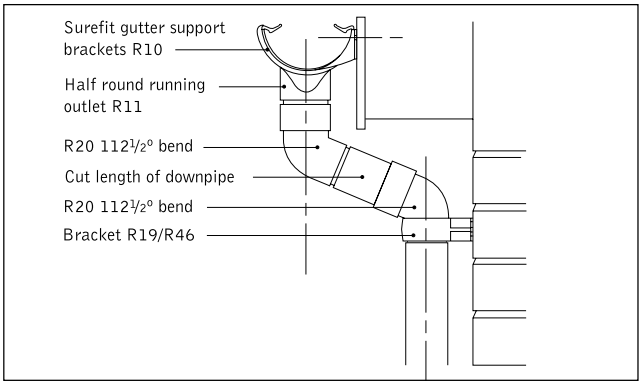
38mm ($1\frac{1}{2}$") x No.12 sheradised round head screws are recommended for rainwater pipe bracket fixings.

5. Joints on external vertical rainwater pipes are to be left unsealed.



OFFSET PIPE

The pipe from the eaves gutter outlet to the face of the wall should be offset using 2 no. 112 degree bends. Smaller offsets, between 22 - 80mm (R24) and 25 - 65mm (R399), are made with the Surefit Half Round or Squareflo 'Adjustable offset'. Rainwater pipe bends not manufactured as stock items are to be fabricated by Hunter Plastics Ltd. fabrication service department.



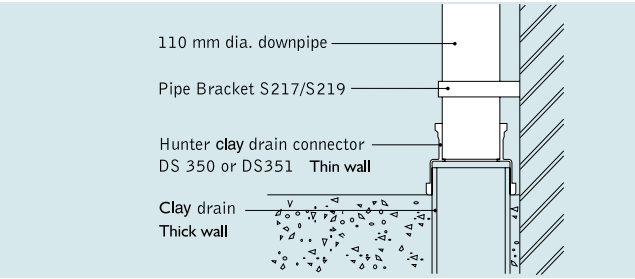
DOWNPIPE BRACKETS

There is a wide choice of downpipe bracket for use with any of the downpipe profiles, including single screw, single screw/snap fit, double screw and socket fixing types. The Regency system includes a bracket spacer, giving scope for minor offset adjustments.

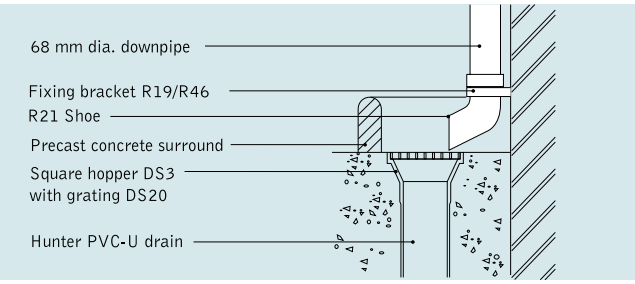
10.00 Installation Details

CONNECTING DOWNPIPES TO DRAIN (SURFACE WATER ONLY)

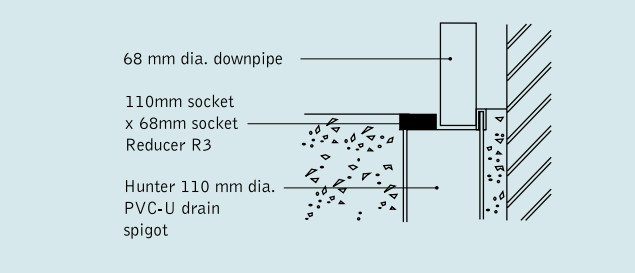
Illustrated are three common methods of connecting rainwater pipes to a surface water drainage system. For further details, refer to the Hunter Underground Technical Handbook (UGT).



Connection to vitrified clay spigot with DS 350/351



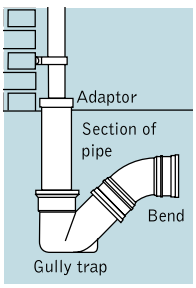
Shoe discharging to vertical PVCu hopper

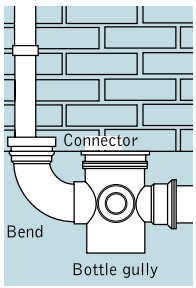


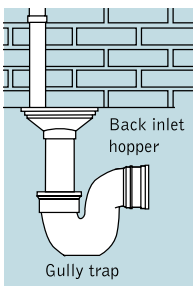
Connection to vertical PVCu drain using R3 reducer

CONNECTING DOWNPIPES TO GULLIES (COMBINED SYSTEMS)

Illustrated are three common methods of connecting rainwater pipes to a combined underground drainage system. In a separate (surface water only) drainage system, trapped gullies are not normally required, but the Local Authority should be consulted. For further details, refer to the Hunter Underground Web site pages.







NOTE:

The pipe assembly sequence is reversed when the downpipe is to be connected to a drain or back inlet gully already in position.

Assembly commences at the drain connection and proceeds upwards.

REPAIR AND REPLACEMENT

Existing systems can be repaired or replaced with the use of the appropriate Hunter gutter connector. This enables compatible systems to be connected (eg Hunter Half round to half-round) or for the profile to be changed (eg Squareflo to half-round, Half round to Ogee). It also enables Hunter PVCu systems to be connected to existing asbestos cement, cast iron, or PVCu systems.

CONNECTING PVCU HALF ROUND/SQUAREFLO TO C.I. HALF ROUND GUTTER (SEE DETAIL BELOW, LEFT)

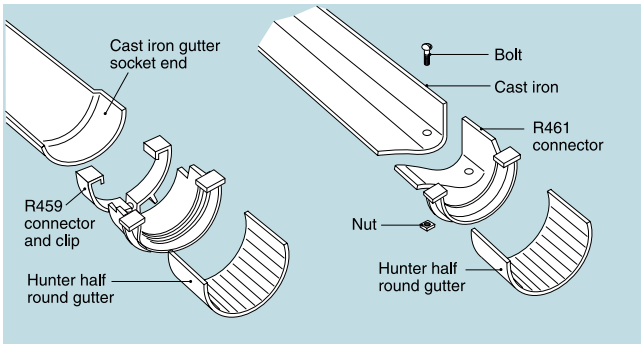
Connection is simpler if the existing half round gutter can be dismantled at the nearest suitable joint. With cast iron or asbestos cement systems this can be achieved by removing the gutter bolt. If this proves difficult because of rust or paint, the nut may be cut off with a hacksaw. Whichever the case, the gutter or joint must be thoroughly cleaned with a wire brush.

In the case of existing PVCu guttering, the gutter should be dismantled at the nearest joint or cut through with a saw.

The new length of Hunter gutter should be measured to allow sufficient length at each end for an expansion joint.

CONNECTING TO SPIGOT

Sawing through the gutter will leave a spigot for connection. When connecting to cast iron or asbestos cement guttering, which both exist in a variety of sizes, experiment with the connector by positioning inside or outside the gutter to obtain the best fit. Place the connector inside existing 100mm gutter and outside 110mm gutter. Locate clip over appropriate level and tighten nut and bolt to suitable stress. Snap new length of Hunter gutter into position. The joint should be made with a suitable jointing compound.



CONNECTING PVCU HALF ROUND TO C.I. OGEE GUTTER (RIGHT ABOVE) AND C.I. HALF ROUND GUTTER (LEFT ABOVE)

Either dismantle gutter at a suitable point or cut with hacksaw and drill new hole to align with hole in the Hunter Ogee connector. Thoroughly clean gutter and spread inside liberally with non-bitumastic based compound. Position the appropriate connector (left hand or right hand) firmly onto compound. Push the gutter bolt through both holes and tighten nut until compound begins to squeeze from joint. Do not overtighten. Finally, snap Hunter gutter length into position.

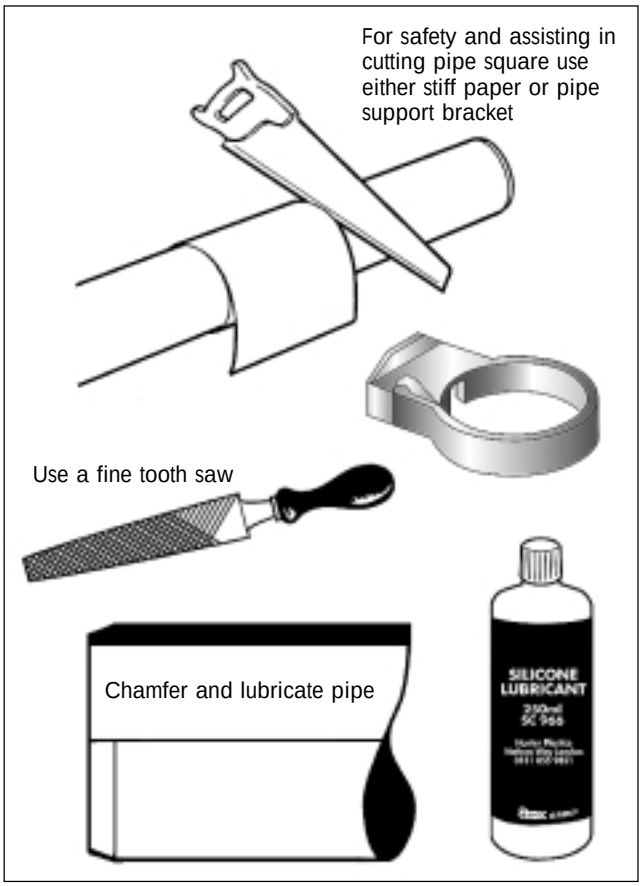
10.00 Installation Details

PIPE CUTTING

When cutting gutter or pipe on-site Hunter recommend it to be;

- clean cut at right angles to its axis
- cut end then deburred with a scraper
- if cut end of pipe is inserted into a push-fit or solvent weld joint then the spigot end must be chamfered to ensure that the glue or sealing ring is not displaced during insertion

Safety
The relevant regulations are outlined in the Health and Safety At Work Act 1974 and should be followed. Hazard sheets, dealing with potential hazards of working with solvent cement and silicone lubricant are available from Hunter Plastics.



PVCu gutter cleaning and maintenance

Although PVCu gutters fare considered to be relatively maintenance-free it is important to clear rainwater goods of fallen leaves and other debris at least once a year. More frequent inspections may be necessary in areas of high pollution and where there are trees in the vicinity. Inspection of the gutter and supports is also advisable during and after periods of ice formation in the guttering system.

In some cases our lighter coloured gutter system may require cleaning. We recommend the plastic is washed down with a solution of soapy warm water, in severe cases a non-abrasive kitchen cream cleaner should be used.

Should the instance arise where the gutter requires painting, we suggest the system be cleaned with a degreasing agent such as sugar soap. After cleaning paint with two coats of a good quality topcoat paint. Scoring or roughening the surface of the plastic to form a key for the paint will affect the overall finish and is not recommended.

11.00 HANDLING AND STORAGE

Hunter Rainwater Systems

11.00 HANDLING AND STORAGE

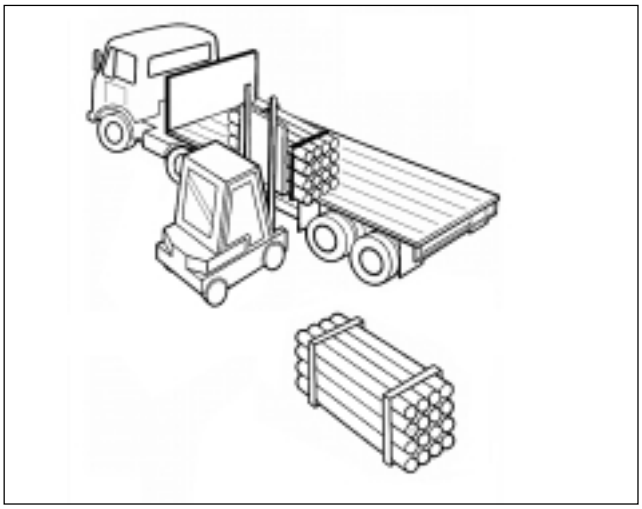
Handling
Storage
Loose pipe
Spigot and socketed pipe
Fittings
Safety Tips

11.00 Handling and Storage

HANDLING

PVCu pipes are very strong, but having said that care should be taken when handling to avoid damage, such as scratching or scoring. Not only does this affect the look of pipework but can also affect the jointing of the push-fit or solvent weld fittings. In extreme cold conditions extra care should be taken, because extreme conditions reduce the impact strength of most plastics.

Pipes should be loaded by hand if possible, but if mechanical means are used then protected slings are recommended. In addition, when unloading block bundles use nylon belt type slings or fork lift trucks with smooth forks (metal hooks, slings or chains must not come into contact with the pipes).



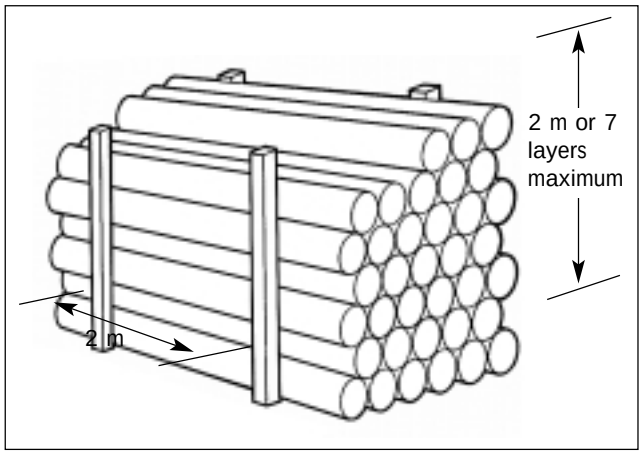
Handling block bundles

STORAGE OF PIPE 110mm DIA AND LARGER

For on-site storage, lay pipes on flat ground, free from large or sharp objects - or preferably on timber battens not less than 75mm wide spaced at a maximum of 1 m centres. In addition, side support should also be provided at intervals of not more than 1.5 m. Block bundles can be stored up to three high without extra side supports or bearers. Extra care should be taken when removing pipe from bundles as the straps are under extreme tension and may move erratically when cut.

LOOSE PIPE 110mm DIA AND LARGER

Different sized pipe should be stacked separately. If this is not possible we recommend that larger sized diameter pipe should be stacked at the bottom, not more than seven layers high or to a maximum height of 2 m.



Loose pipe storage on the ground

SPIGOT AND SOCKETED PIPE

Spigot and socket pipes should be stacked with sockets protruding and at alternate ends to ensure even support along their length.

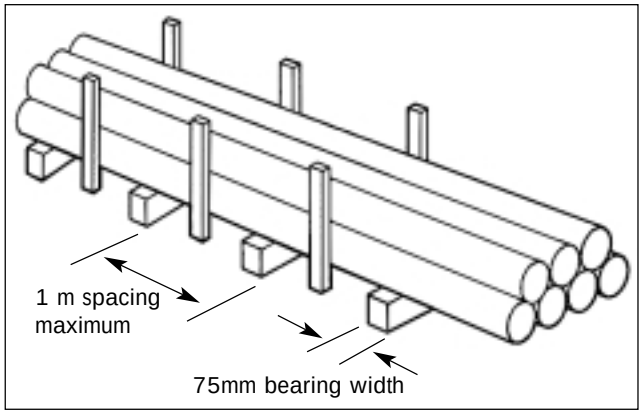
SPIGOT AND SOCKETED PIPE

Spigot and socket pipes should be stacked with sockets protruding and at alternate ends to ensure even support along their length.

STORAGE OF GUTTER FITTINGS

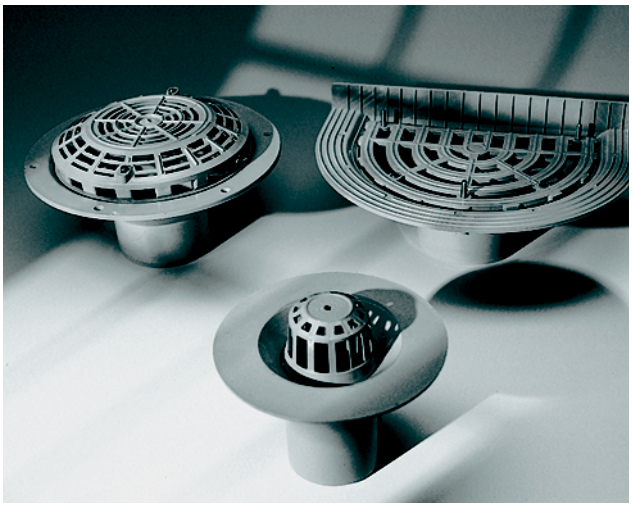
Eaves gutters and small diameter rainwater pipe must be laid on a continuous smooth and level base. Stacks of gutter ad pipe must not exceed 1.25 metres in height.

Bags of fittings or wrapped bundles of gutter and pipe must never be stored in direct sunlight or unventilated space but must be stored in a cool, dry place. Whilst wrapped, direct sunlight or hot unventilated places can cause the temperature of materials to rise and in extreme conditions can result in distortion.



12.00 FLAT ROOF OUTLETS

Hunter Rainwater Systems



12.00 FLAT ROOF OUTLETS

Introduction
Roof outlet drainage data
Installation procedures
Profiles
Typical site work detail

12.00 Flat Roof Outlets

INTRODUCTION

Hunter roof outlets are three-piece components manufactured in PVCu and consist of a funnel shaped body, clamping ring and grille. Hunter flat roof outlets are a natural choice when considering roof drainage in commercial, domestic and industrial applications: they are easy to install and compatible with most types of roofing materials – including hot asphalt, bituminous felt and PVCu roof membrane.

The outlet features an integral, ribbed clamping ring and a pre-drilled flange for quick, secure anchorage.
The grille design offers efficient filtering and is easily removed for cleaning and maintenance.

The range of spigot and socket tails, box gutter and balcony outlets are durable, lightweight and offer highly efficient flat roof drainage. Working on the national average rainfall intensity of 75mm per hour, a single 82mm Spigot Tail outlet, for example, can drain a roof area of up to 310m^2 (6.45 litres per second) and a single 160mm size outlet can drain up to 515m^2 (10.72 litres per second).

The depth of water that can be allowed upon a flat roof during a storm depends upon the method of construction, its inherent strength, and upon the height of the upstand and other features that project through the roof. However, water depths of up to 35mm around the flat roof outlets are acceptable if these considerations are met.

Benefits

- Compatible with most flat roofing materials, including hot asphalt, bituminous felt and PVCu roof membranes
- Comprehensive range of sizes available
- Quick and easy to install
- Non corrosive and maintenance free
- Replacement components available

ROOF OUTLET DRAINAGE DATA

Maximum roof area that can be drained by one outlet(with or without box gutter)

Nominal outlet and pipe size Maximum depth of flow at edge of outlet	82mm m^2	110mm m^2	160mm m^2
35mm (1 3/8")	310	380	515
32mm (1 1/4")	210	330	440
25mm (1")	145	230	310
19mm (3/4")	115	150	200
13mm (1/2")	80	85	95

Note: These values are based upon:

- Rainfall intensity of 75mm(3") per hour
- Absence of abutting vertical walls rising above roof level
- NB. Reduce the above figures by 20% when using balcony outlets

12.00 Flat Roof Outlets

INSTALLATION PROCEDURES

Hot Asphalt

1. The roof construction should have an appropriate size hole. To give support to the sloping sides of the roof outlet, the roof screed should be dished. All roof outlets must be securely fixed to the roof structure.
2. Roof outlet is now placed in position, making sure that the spigot is truly vertical and then giving a sound push-fit connection into the rainwater pipe.
3. Remove grating and clamping ring. Hot asphalt is applied to the roof in layers. The first layer should be allowed to flow into the roof outlet.
4. The clamping ring is now secured by the brass wingnuts down onto the hot asphalt. Although the outlet flange will soften from the effect of the hot asphalt, there will be no distortion providing the correct support is given.
5. Finish the second asphalt coat to the outlet opening edge and cover with a dusting of fine sand.
6. Fix the grating in position with the bolts.

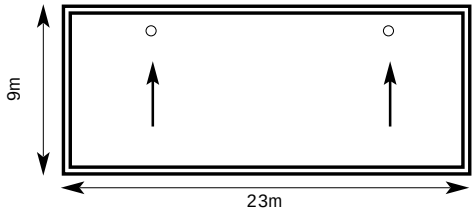
Bituminous Felt Roofing

1. The hole in the roof should be as in 1 above.
2. Set the flange on the roof outlet into a recess in the roofboarding to give a level finish.
3. When applying the liquid bitumen to the roof, allow it to cover the outlet flange and the sloping part of the outlet.
4. Then when bonding the felt onto the roof with the liquid bitumen, the felt should be taken over the outlet top flange.
5. Cut the part of the felt over the hole of the outlet.
6. Using a blow lamp form the felt down onto the sloping edge and retain with the clamping ring and wing nuts.
7. With the bolts, fit the grating into position.

PVC Roofing

1. The hole in the roof should be as in 1. above.
2. Apply recommended adhesive to flange and sloping part of the outlet.
3. Lay plastic material into flange and dress into outlet.
4. Retain with clamping ring.
5. fix grating into position with bolts.

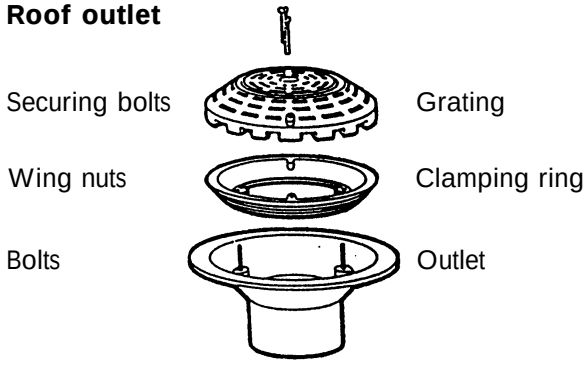
Roof outlet and downpipe sizes for flat roofs. The following example illustrates the use of the drainage data table



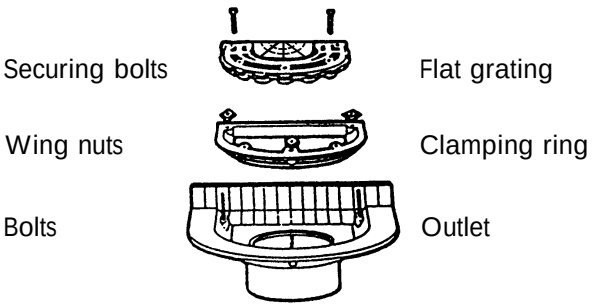
ROOF PLAN

1. Determine outlet positions:
   Underground drainage schemes will permit two downpipes to be used.
2. Determine design requirements:
   Constructional factors require depth of water at edge of outlet to be limited to 19mm.
3. Calculate roof area: 23 x 9 = 207 sq. m.
4. Consult table and select outlet size appropriate to roof area and any limitations on depth of flow at edge of outlet: A single 110mm outlet would drain 230 sq. m. That is more than the whole of this roof area if a depth of flow at edge of outlet of up to 25m was acceptable and is satisfactory falls to the roof could be provided. However, with the depth of flow at edge of outlet limited to 19mm, two 82mm outlets will drain 2 x 115 = 230 sq. m. and will, therefore, drain this roof with a reasonable margin, assuming a rainfall intensity of 75mm per hour.
5. Downpipe size will be the same as nominal size of outlet: 82mm.
6. Further guidance on selecting an acceptable rainfall intensity can be found in the National Annex of BS EN 12056: 3: 2000.

Roof outlet



Balcony outlet

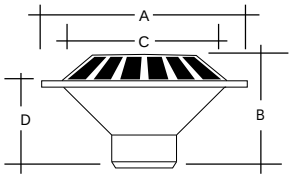


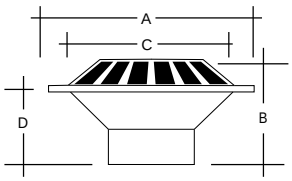
12.00 Flat Roof Outlets

RAINWATER SYSTEM ROOF OUTLET

Spigot Tail

Size	Code	Colours	A	B	C	D
82mm	RV637	G	280	157	214	130
110mm	RV369	G	280	157	214	122
160mm	RV482	G	380	170	250	148



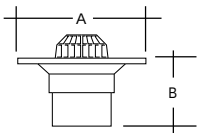


Socket Tail

Size	Code	Colours	A	B	C	D
110mm	RV372	G	280	157	214	110

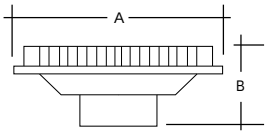
Box Gutter - Straight Spigot Tail, Pre-fabricated

Size	Code	Colours	A	B
82mm	RV491	G	190	125



Balcony - Full Flat Grating, Solvent Socket Tail

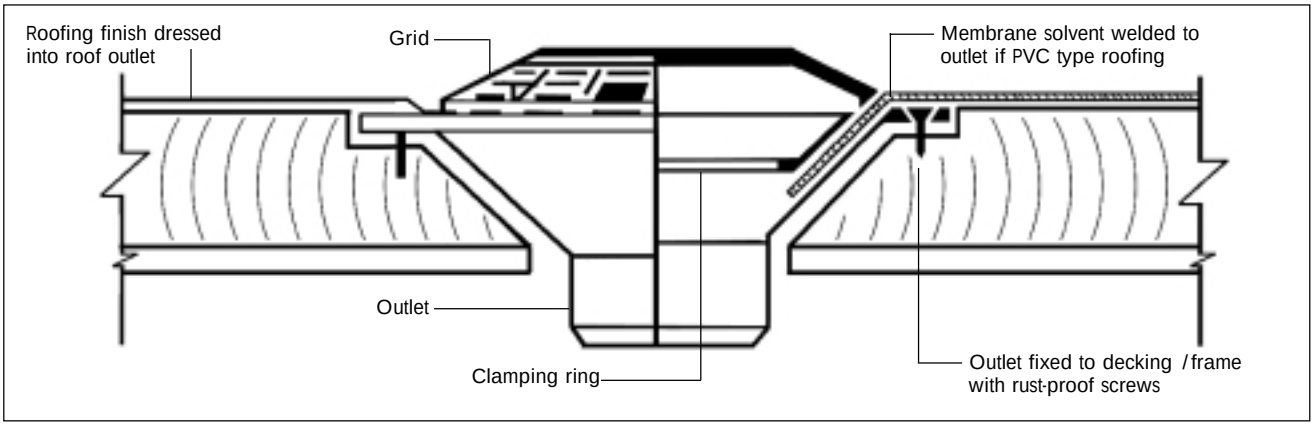
Size	Code	Colours	A	B
82mm	RV195	G	355	165
110mm	RV196	G	335	140



G = Grey B = Black V = Van dyke brown W = White
Galv = Galvanised metal

NB: It may be necessary to provide a warning pipe to indicate blockage on internal rainwater systems. For more details refer to - NE.2.11 - BS EN 12056 - 3: 2000.

TYPICAL SITE WORK DETAIL



NB: It is important to prevent upthrust on the vertical rainwater pipe due to thermal movement from breaking the joint between the outlet and roof finish. Thermal movement can be accommodated by anchoring a push-fit socket with a socket bracket and allowing a 10mm expansion gap between spigot end and socket depth. A maximum of 4m between expansion joints should be allowed for.

I may be necessary to provide a warning pipe to indicate blockage on internal rainwater systems. For more details refer to BS EN 12056 - 3

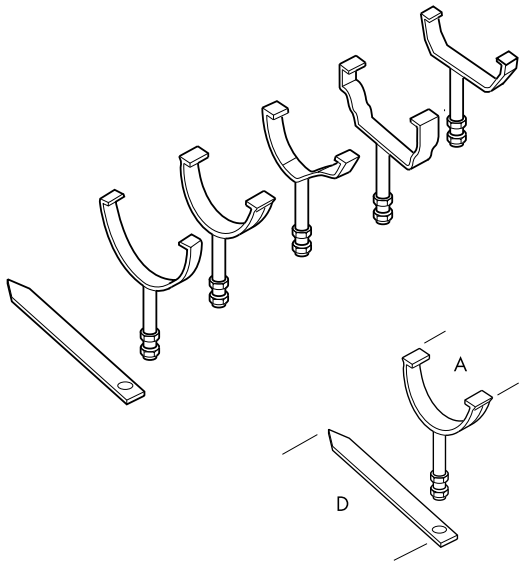
12.01 Fixing Brackets

Additional fixing brackets for Hunter Domestic Gutter Systems

RAINWATER SYSTEM FIXING BRACKETS

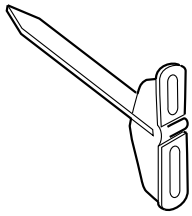
Rise and Fall Bracket

Code	Colours	Profile
R377	Galv	Squareflo
R909	Galv	Regency
R818	Galv	Ogee
R18	Galv	Half Round 112
R601	Galv	125
		All Supplied with 230mm stake
R9	Galv	Half Round 112
		Supplied with 300mm stake



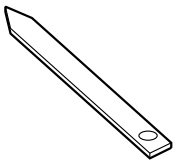
Variable Rise and Fall Bracket

Code	Colours	Size
R26	Black	230mm
R27	Black	300mm
		Including galvanised stake, order gutter bracket separately. Supplied with fixing nuts and bolts.



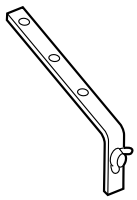
Galvanised Stake

Code	Colours	Size
R9A	Galv	300mm
R18A	Galv	230mm



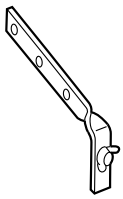
Top Rafter Bracket

Code	Colours	
R15	Galv	Supplied with wing nut and bolt. Not for use with 170mm or 200mm gutter.



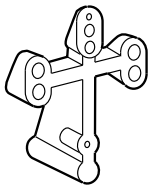
Side Rafter Bracket

Code	Colours	
R16	Galv	Supplied with wing nut and bolt. Not for use with 170mm or 200mm gutter.



Wedge Spacer

Code	Colours	
R2	Grey	Use with 112mm Half Round & Squareflo support brackets.



13.00 FABRICATION SERVICE

Hunter Rainwater Systems

13.00 HUNTER FABRICATION SERVICE

13.00 Fabrication Service

HUNTER FABRICATION SERVICE

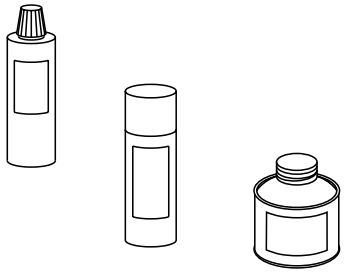
Hunters fabrication department can provide the right solution to even the most demanding problem.We have helped contractors and specifiers overcome problems on site and at the design stage of your project.

Hunters Fabrication team work very closely with the Technical department and pride themselves on providing the most innovative and technically advances service available.

From our existing range we can mould or re-shape any of our products to your exact requirement. Sheet PVCu is used for the more unusual designs. In addition, slight modifications can be made to existing Hunter products to suit regularly occurring problems such as special gutter angles for conservatories and bay windows etc.

We can advise you on design possibilities and respond complete with part numbers and prices for your approval.

You place the order from your local merchant stating the unique product number and price and we take care of the rest.

14.00 Ancillaries and Spares

ANCILLARIES AND SPARES	
Description	**Code**
30ml Lubricant	SC960
250ml Lubricant	SC966
300ml Silicone spray	SC967
125ml Solvent cleaner	SC950
125ml Solvent cement BS6209 for PVC	SC953
250ml Solvent cement BS6209 for PVC	SC954
Rainwater Seal Half Round 76mm	3SR7600
Rainwater Seal Half Round 112mm	3SSi200
Rainwater Seal Squareflo	3SSi140
Rainwater Seal 125	3SRi125
Rainwater Seal Regency	3SRi122A
Rainwater Seal Ogee	3SR1300