Rainwater Design & System Selection

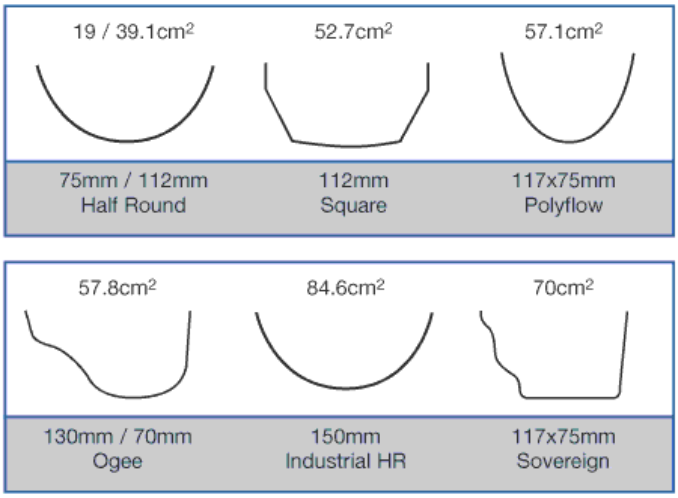
Rainwater

The choice of a rainwater system often comes down to two decisions; domestic / commercial and aesthetics. Half round and square systems are generally used for domestic properties although Ogee and Sovereign provide a more aesthetically pleasing look. The Half round system is available in 75mm for situations such as sheds or garages and 150mm for commercial applications. As well as 150mm half round, Polyflow deep capacity gutter is also available for commercial applications. Sovereign and Ogee can be used on commercial applications although flow requirements should be checked.

Gutter and Downpipe Systems

As part of our continued product development initiatives we are constantly introducing new products and updating our existing ranges, hence our rainwater range now incorporates seven different systems to cover all installations from domestic to commercial to industrial.

These seven systems provide a variety of profiles and capacities ensuring that every installation is catered for whether it is a modem streamline dwelling (Sovereign) or an industrial property (150mm half round).
A comprehensive range of fittings to provide the specifier and installer with a complete roof drainage solution accompanies each rainwater profile to give Polypipe an unrivalled product range.

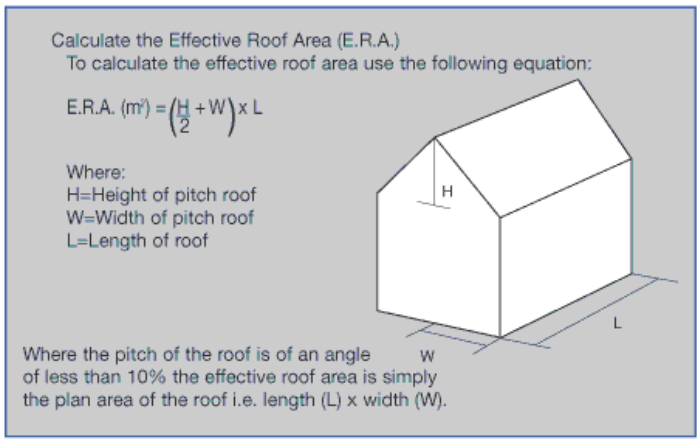


All rainwater products are manufactured from PVCu in accordance with a Quality Management System to BS EN ISO 9002 (certificate no FM00318)

Gutter Sizing

The aim of designing a rainwater system is normally to achieve a balance between the cost of the system and the frequency and consequence of possible flooding. The capacity of the gutter should be designed to provide adequate disposal of the heavy rainfall usually associated with summer thunderstorms.

A simple methodology for roof drainage design is shown below but for further information regarding roof drainage refer to BS6367:1983 "Code of practice for the drainage of roofs and paved areas".



Determine Gutter Layout

To determine the profile of gutter required it is now necessary to define three criteria:

- How many outlets are on the gutter?
- What positions these outlets are in?

The number and position of outlets is usually determined by the number of gullies / hoppers shown on the drainage layout.

- What fall is the gutter to be installed at?

Once the above criteria have been satisfied the size and / or profile of gutter to be used can be selected.

Gutter Selection

Due to the infrequency of extremely heavy rainfall in the United Kingdom, it is almost impossible to design a cost efficient rainwater system to give complete immunity from flooding and overflow.

Because of this it is generally regarded as normal practice to design rainwater systems using a rainwater intensity level of 75mm per hour. To calculate the gutter requirement, multiply the E.R.A. (m^2) by a factor of 0.0208 (75mm/hour divided by 3600 seconds/hour) to give the flow rate in litres/second (l/s).

Once a flow rate has been determined use tables 1 & 2 (below) to select the required gutter profile.

Note: If a gutter angle is introduced into the rainwater gutter run, the effective gutter capacity will be affected and an adjustment must be made to the maximum roof area which each rainwater system is capable of draining (see Code of Practice BS EN 12056-3:2000 for further details).

To calculate the revised maximum roof area which can be drained when the gutter run contains an angle the following factors must be applied to the figures in tables 1 and 2 below.

Table 1— Gutter Flow Capacity based on level fall

	Flow capacity (l/s)	Flow capacity (l/s)	Maximum Roof Area (m^2)	Maximum Roof Area (m^2)
Outlet fixed at	End	Centre	End	Centre
75mm - Half Round	0.390	0.680	18	32
112mm - Half Round	0.912	1.833	44	88
112mm - Square	1.083	2.167	52	104
Polyflow	1.800	3.600	86	172
Ogee	1.833	3.667	88	176
Sovereign	2.100	4.200	101	202
150min - Half Round	2.300	4.600	110	220

Table 2— Gutter Flow Capacity based on1:600 fall

	Flow capacity (l/s)	Flow capacity (l/s)	Maximum Roof Area (m^2)	Maximum Roof Area (m^2)
Outlet fixed at	End	Centre	End	Centre
75mm - Half Round	0.520	0.900	24	42
112mm - Half Round	1.300	2.600	62	124
112mm - Square	1.517	3.033	72	144
Polyflow	2.500	5.000	120	240
Ogee	2.567	5.133	123	246
Sovereign	2.950	5.900	142	284
150min - Half Round	3.233	6.467	154	308

Table 3— Product Compatability Chart

Gutter Size	75mm Half Round	112mm Half Round	112mm Square	117x75mm Polyflow	130x70mm Ogee	117x75mm Sovereign	150mm Half Round
Downpipe size	50mm Round	68mm Round	65mm Square	68mm Round	68mm Round 65mm Square	68mm Round 65mm Square	110mm
Hepworth	No	Yes	Yes	No	No	No	Yes
Osma (Wavin)	No	Yes	No	No	No	No	Yes
Hunter	No	Yes	Yes	No	No	No	No
Marley	Yes	Yes (Clipmaster)	No	No	No	No	Yes
Terrain	No	No	No	No	No	No	No
Brett Martin	No	Yes	Yes	No	No	No	No
Flopast	No	Yes	Yes	No	No	No	No
Marshall Tufflex	No	Yes	Yes	No	No	No	No
Freefoam	No	Yes	No	No	No	No	No

Table 2— Colour Availability

Polypipe Gutter	75mm Half Round	112mm Half Round	112mm Square	117x75mm Polyflow	130x70mm Ogee	117x75mm Sovereign	150mm Half Round
Black	No	Yes	Yes	Yes	Yes	Yes	Yes
Brown	No	Yes	Yes	Yes	Yes	Yes	Yes
Grey	Yes	Yes	Yes	Yes	No	No	Yes
White	Yes	Yes	Yes	Yes	Yes	Yes	No