QUADRAFLO®

Rainwater **Guttering System Technical Guide**

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QUADRAFLO®

QUADRAFLO® Rainwater Systems

As with fascias and soffits, the guttering and downpipes on a building are amongst the last items to be fitted and, often, do not get the attention for quality that they need, considering the importance of the function they fulfil.

For many years now, gutters have been made from cast iron, which, with regular maintenance, lasts for decades. Eventually, however, the bolt holes and joints begin to rust and leaks appear.

In the 1960s, scientists, keen to find uses for this PVC product, developed a grey rainwater system, mostly in a half round profile, which can still be found on some older housing estates in Britain.

This early product, however, was brittle and its UV resistance was not great, which tended to give the concept of plastic guttering a bad name. The product has developed considerably in recent years, and colour stability in better quality products, such as QUADRAFLO®, are much better. The chemical compound has been altered to make clips and fittings less brittle.

Combining the advancement of uPVC extrusion capabilities with advanced gasket technology, we can confidently offer a QUADRAFLO® system for any application.

Common uses:

- ✓ **HALF ROUND:** A cost-effective, semicircular option for small or shallow pitched roofs.
- ✓ **SQUARE:** A stylish system for modern properties with a slightly better flow capacity than half round.
- ✓ **DEEP:** A high capacity elliptical system, suitable for areas of the country with high levels of rainfall, or properties with large roof areas.
- ✓ **CLASSIC:** A stunning, moulded profile, with a timeless elegance, suited to older, prestigious properties and new-build alike. Superb sightlines and extra high flow capacity mark this system out as special.

QUADRAFLO® : Available Syles

Half Round

Deep

Square

Classic

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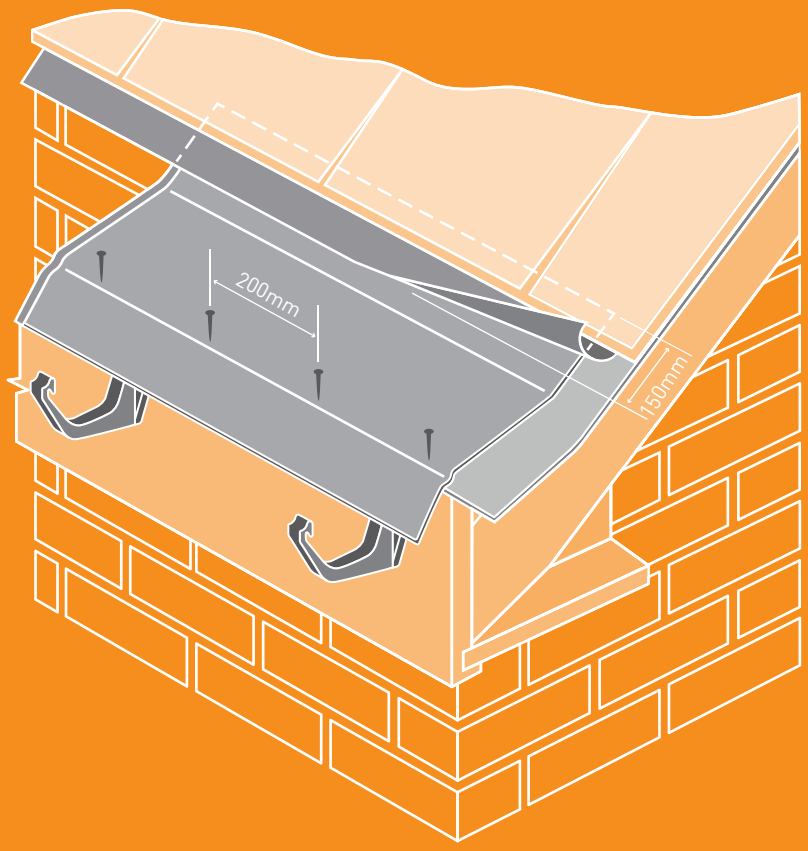
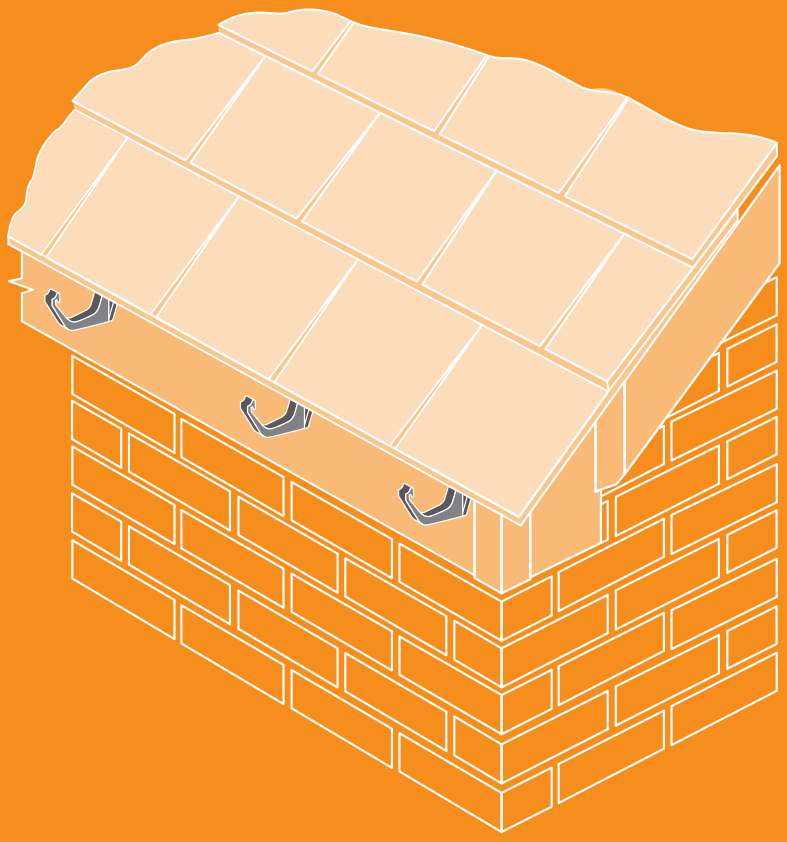
Installing Eaves Protector

1. Slide eaves protector under what remains of existing felt.
2. Ensure existing felt overlaps eaves protector by at least 150mm.
3. Ensure drip section of eaves protector will drain into gutter.
4. Overlap eaves protector on to the next by at least 50mm with a bead of LMN silicone sandwiched between the two.
5. Nail eaves protector to fascia with 30mm stainless steel cladding pins.



The Finishing Touches

1. Complete the installation of the QUADRAFLO® rainwater system, taking extra care with the clips in colder weather.
2. Make sure the gutters are inserted up to the lines marked on the inside of each joint or fitting.
3. Replace or reposition the bottom course of tiles.
4. Check installation for alignment and cleanliness.



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Flow Rates and Capacity

Any drainage system should have sufficient capacity to carry the expected flows of water at any point in the system. The actual flow in the system depends upon the area to be drained, the rainfall intensity and the position of the outlets.

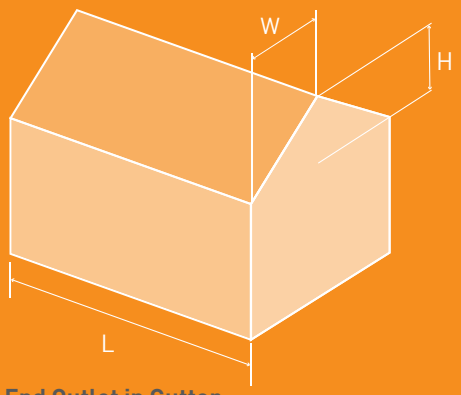
Gutter Capacity

The profile dimensions of a gutter determine the maximum flow rate (capacity), given in litres/second. The height of the gutter profile determines the maximum length of gutter run before resultant overflow at the high-point i.e. stop-end or mid-way between outlets, calculated as per BS EN12056-3:2000 as 50 x height.

It is important to consider the position and number of outlets as well as the size of gutter.

Rainfall Intensity

Rainfall and storm intensities vary between differing locations within the UK and a number of pages are devoted in BS EN12056-3:2000 to variations and safety factors, relating to various types of buildings and gutter locations. Eaves gutters should be designed using a once-a-year storm event and the intensity found from maps in BS EN12056-3:2000.



$$\text{Flow rate per outlet in Litre/second} = \frac{\text{Catchment area in m}^2 \times \text{Rainfall intensity}}{\text{Number of outlets}}$$

$$\text{Catchment Area} = L \times \frac{(W + H)}{2}$$

End Outlet in Gutter

Quadraflo System	Outlet Size (mm)	Max flow rate (L/s) to BSEN12058	Max distance to stop end (m)	Between Outlets (m)
Quadraflo Half-round	68	0.66	2.5	4.87
Quadraflo Square	65	1.18	2.8	5.62
Quadraflo Deep	68	1.29	3.5	6.9
Quadraflo Classic	68	1.66	3.7	7.3

Cente Outlet in Gutter

Quadraflo System	Outlet Size (mm)	Max flow rate (L/s) to BSEN12058	Max flow rate (L/s) to BS6367	Max distance to stop end (m)	Between Outlets (m)
Quadraflo Half-round	68	1.32	1.4	2.5	4.87
Quadraflo Square	65	1.79	2.13	2.8	5.62
Quadraflo Deep	68	2.59	3.37	3.5	6.9
Quadraflo Classic	68	2.6	3.5	3.7	7.3

Capacity and Flow Charts

Large, complex or industrial projects should be treated individually with reference to BS EN 12056-3:2000.

Due to increases in the safety factors applied, the design flow rate based on BS EN12056 is lower than that for BS6367. This does not mean that gutter flow is actually any lower. It is purely the figure used for design purposes, for this reason we have included the flow rates for BS6367 so that comparisons can be made between the two.

Gutter/outlet capacities with BS EN 12056-3:2000 are lower than with BS 6367:1983 which it replaced, as free flow must now be used for eaves gutters.

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