CHOOSING YOUR GUTTER

Once you have chosen whether you want half round, ogee or box section guttering it is important that you determine the correct size of gutter and downpipe needed for your property.

There are several variables that need to be considered.
1. The area of the roof that is to be fitted with guttering.
2. The rate of water flow through the chosen gutter profile.
3. The number, size and position of the downpipes.

A. Effective roof area being fitted with guttering.

To work out the water run off from your roof measure the length of the roof ridge in metres together with half the horizontal width of the roof ridge in metres. Multiply together and then multiply by the roof pitch factor (shown below) to give the effective roof area to be fitted with guttering.

Where a roof has a hipped end the effective roof area will be computed by dividing the roof into a rectangle and two triangles and adjusting each for the roof pitch multiplication factor which may be different for the hips compared to the main pitch of the roof. Similarly on a pyramid roof the area of each of the 4 triangles has to be calculated and if this pyramid roof is shown on plan then the area of the 4 triangles must be adjusted by the roof pitch multiplication factor.

The roof pitch multiplication factor RPMF.

Roof Pitch	Factor	Roof Pitch	Factor	Roof Pitch	Factor	Roof Pitch	Factor
10 Degrees	**1.088**	20 Degrees	**1.182**	30 Degrees	**1.288**	40 Degrees	**1.419**
15 Degrees	**1.134**	25 Degrees	**1.233**	35 Degrees	**1.350**	45 Degrees	**1.500**

For roofs of 50 degrees pitch and above use the factor as 1.600.

To calculate the maximum rainfall off a particular roof calculate its effective area in square metres and multiply this figure by 0.02 to give the number of litres per second coming off it. Compare this volume of rainwater run-off with the capacity of the gutter to handle it (shown below) and from this it is possible to see the size of gutter that can be used and the number and position of downpipes that would be needed.

Copper Gutter Profile	Sectional Area of Profile	Capacity (Litres/Metre)	Minimum Flow Rate
Standard Half Round	6200sq mm	5.6 litres / metre	2.0 litres / second
Large Half Round	12000sq mm	12.7 litres / metre	3.6 litres / second
Standard Ogee	9000sq mm	6.4 litres / metre	2.7 litres / second
Large Ogee	12700sq mm	12.7 litres / metre	4.0 litres / second
Standard Box	5525sq mm	5.5 litres / metre	1.5 litres / second
Large Box	0350sq mm	10.3 litres / metre	3.2 litres / second

B. Rate of water flow through the gutter profile chosen.

It should be noted that the positioning of the outlets/downpipes on a run of guttering can be very important. A downpipe in the middle of a straight run of gutter can normally handle twice the flow *(coming from both sides)* compared to a downpipe positioned at one end of a gutter run.

C. The number, size and position of downpipes.

It is possible to plan where to put the downpipe outlets. For instance if there is 8 litres per second coming off a section of roof fitted with Coppa Gutta's standard half round guttering which can handle a flow rate into the downpipe of 2 litres/ second when positioned at an end of a gutter run, then this section of guttering would need either 3 downpipes (1 at each end and 1 in the middle of the run) or alternatively 2 downpipes spaced 1/3rd and 2/3rds of the way along the gutter run in order to dispose of the 8 litres per second of rainwater.

D. Other factors.

All the flow rate calculations are based on the assumption that the guttering is completely level and clear of any debris or other obstructions. If the rainwater has to flow around a corner before arriving at a downpipe the capacity of the gutter flow can be reduced by as much as 40% and should be considered in any gutter system design.

E. Snow loading

In areas where particularly high snow falls and severe icing might be expected, it is recommended that snow boards be fitted to the eaves of the pitched roofs. This precaution should also be considered wherever sliding snow might cause damage or injury to gutters, structures or persons below.