Measuring Guide for the PRS Easy-Install™ Roofing System

Version 3.1

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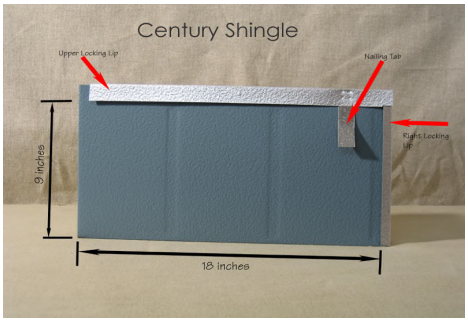
How to Measure the Material for a PRS Easy-Install™ Project

CAUTION

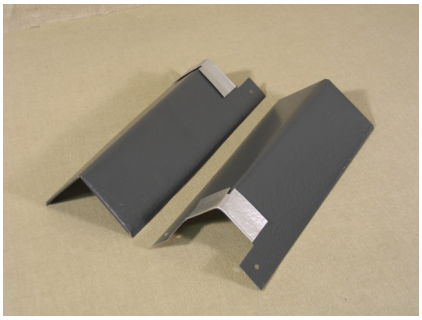
Basic rules to follow:

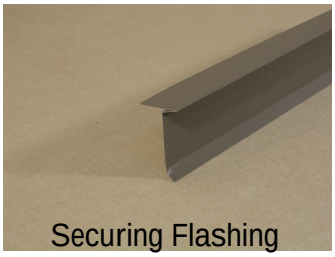
- Where-ever possible, measure from the ground – it is much safer this way.
- If you need to measure on the roof, make sure you have properly secured yourself using the appropriate fall-arrest equipment for your jurisdiction.
- Since this will be your first roof using the PRS Roofing system, you will make mistakes, so make sure you order adequate material to compensate for possible mistakes.

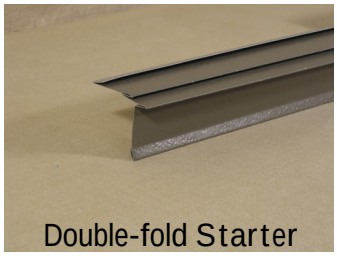
Components:

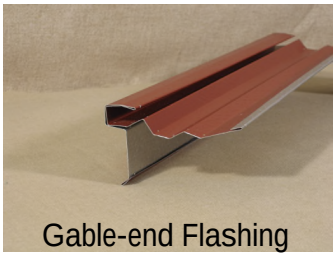


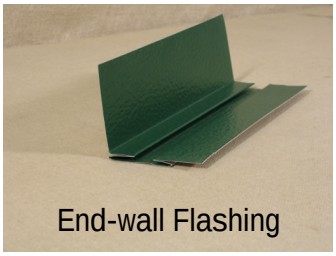
Shingle


Ridge Cap


Securing Flashing


Double-fold Starter


Gable-end Flashing


End-wall Flashing


Closed Valley Flashing


Aluminum Ring-shank Roofing Nails

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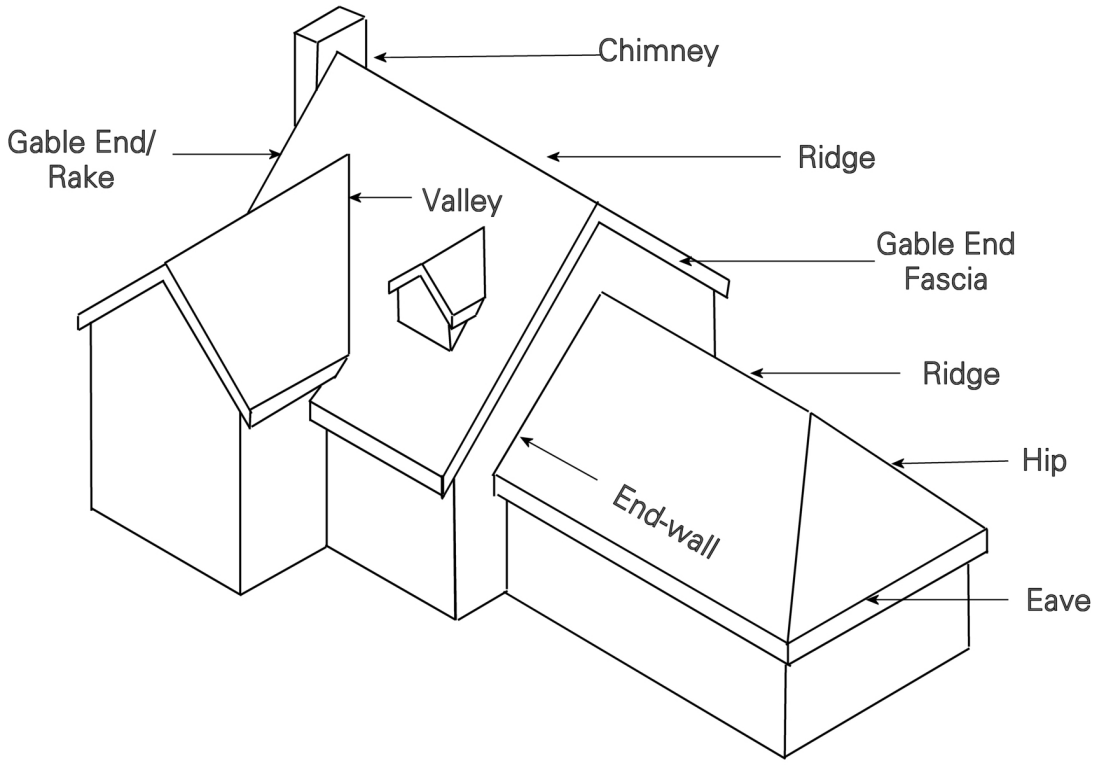

Some definitions:

Eave:

This is the roof edge which is parallel to the ground, and is the “bottom” of the roof.

Gable-end or Rake

This is the roof edge which is usually perpendicular to the eave and runs from the eave to the ridge.

End-wall:

This is the portion of the roof which joins a wall or vertical roof section.

Valley

When two adjacent roof sections meet at an angle of less than 180 degrees the joint is called a valley.

Ridge and Hip

When two adjacent roof sections meet at an angle of more than 180 degrees,

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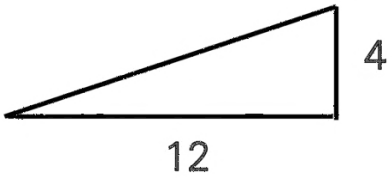
and the joint is parallel to the ground, then the joint is called a ridge. If the joint is angled relative to the ground, then it is a hip.

Dormer

A dormer is a structure that extends out of the roof surface. Dormers usually have two roof sections, joined at the top by a ridge, and jointed to the main roof with two valleys. Some dormers have a flat section on top, and join the main roof by way of a transition. These dormers are usually called rafter or shed dormers.



Slope:

Slope is usually given as 4/12 or similar, where "4" is the vertical rise and "12" is the horizontal run. A 4/12 slope means that the roof rises four inches to every 12 inches of horizontal measure.

A 12/12 slope means that it rises 12 inches for 12 inches of horizontal measure. In degrees, a 12/12 slope is 45 degrees.

Slope factor

This is a number which allows you to adjust the horizontal measure to get the actual surface measure. For example, if you have a roof section that measures 10 x 10 feet on the ground, and the slope is 12/12, then you multiply the horizontal area (10 x 10 = 100 sq.ft.) by the slope factor (1.414 for slope of 12/12) to get the surface area of 141 sq.ft.

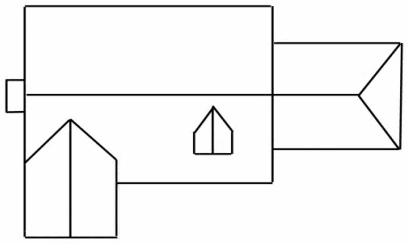
For those of you who remember trigonometry or geometry, the slope factor is the ratio of the hypothenuse to the horizontal side of a right-angle triangle.

Principles of measurement:

The materials you will need to cover the roof are measured either by area (shingles and underlay), or by length (flashings).

Area measurement.

In principle, the area measurement is very easy. You take the horizontal projection of the roof onto the ground, adjust the area by the slope factor (which gives you the



To avoid measuring mistakes, we strongly recommend that you first do a plan drawing of your roof (ie, what you would see from the air if you were looking straight down at your roof).

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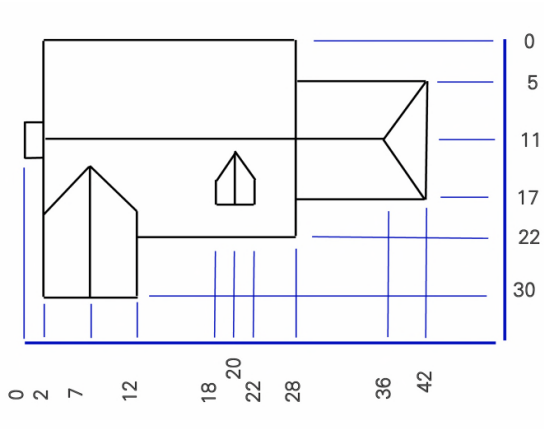
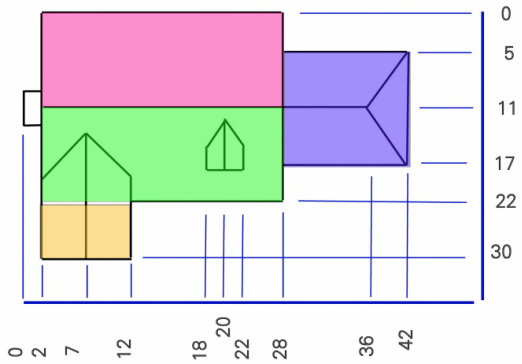


Next, designate one corner as the “zero” point (for example the left rear corner of the house), and establish two baselines which are perpendicular to each other. In the example, that means a line running along the front of your house, and another running to the back.

Measure each roof feature along the baseline, marking it on your drawing. Do this on the perpendicular baseline as well, and you will have created a grid with every roofing feature marked on it.



Once you’ve finished your drawing and measurement, you will note that your roof surface will most likely be made up of various rectangles, and triangles. To obtain the amount of material needed to cover a rectangle, you multiply the horizontal width by the horizontal length, which gives you the area projected onto the ground. You then multiply it by the slope factor to get the surface area, and then by the waste factor to get the amount of material needed for that section

For triangular sections, the process is similar. You multiply the horizontal length (the base of the triangle) by the height (the perpendicular line from the base to the opposite point of the triangle) and then divide by two. Now that you’ve got the horizontal projection, you multiply by the slope factor to get the surface area, and by the waste factor to get the amount of material needed.

Slope Factors

Slope	Factor
3-12	1.03
4-12	1.05
5-12	1.08
6-12	1.12
8-12	1.20
10-12	1.30
12-12	1.41
14-12	1.54
16-12	1.67
18-12	1.80
20-12	1.94

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Waste Factors

The degree of waste depends on several factors: the skill level of the installer, the amount of roof edge that borders the roof surface, and its angle. A roof edge which is perpendicular to the eave results in the least amount of waste. Hips and valleys contribute to more waste as the shingles on both roof surfaces adjacent to the hip or valley have to be cut. Again, more waste is generated when the angle of the hip or valley is shallow, relative to the eave. Therefore, we offer the following guidelines:

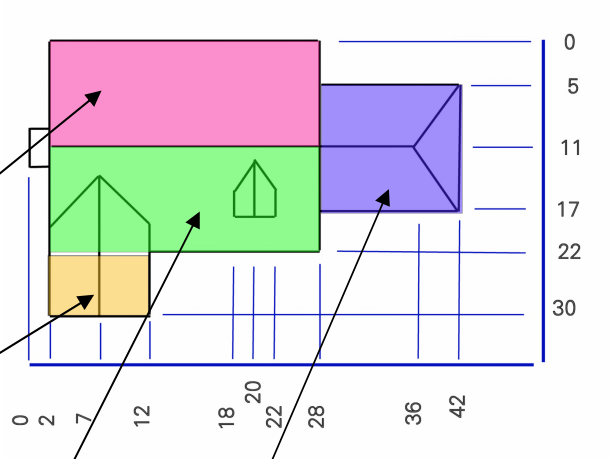
On a roof surface where the sides are perpendicular to the base, you are usually safe in allowing only 10% for waste. On hip roofs and sections with valleys, allow about 17% waste. On sections which have a large proportion of edge relative to the surface area (such as dormers), allow 25% waste.

To use the waste factor, multiply the surface area by the waste factor. For example, using our earlier example of a 10 x 10 foot section with a 12/12 slope, we have already worked out that the surface area is 141 sq. ft. Multiply this area by 1.1 (100 percent plus 10% waste) to get the material required which is 155 sq. ft.

Working out an example.

We will use the previous example to show how to carry out the calculation.

The roof can be divided into four major areas (coloured rectangles on the right).



The mauve area,
is the simplest surface, and will have a waste factor of 1.1

The beige area,
is also basically simple, and will have a waste factor of 1.1.

The purple area (the side extension featuring a hip roof)
has two diagonal lines and needs a waste factor of 1.17.

The green area is the most complex, features a dormer and two valleys, and should have a waste factor of 1.25.

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This roof has a slope of 12/12, for which the slope factor is 1.414.

Area	Length	Width	Horizonal Area	Slope Factor	Surface Area	Waste Factor	Material Required
Mauve	26	11	286	1.414	404	1.1	445
Beige	10	8	80	1.414	113	1.1	124
Purple	14	12	168	1.414	238	1.17	278
Green	26	11	286	1.414	404	1.25	505
TOTAL					1159		1352

In the above example, the surface area is 1,159 sq. ft., and the material required is 1,400 sq. ft.

Measuring on the surface

Some sections may be difficult to measure properly from the ground, and you will need to measure these on the roof. Make sure you are properly secured against possibility of falling before you go onto the roof surface. On the roof surface, measure the roof section and indicate on your roof drawing the measurements, along with an "S" to show these were measured on the surface. When doing the calculations for the roof area for these sections, skip the step where you multiply by the slope factor, as you obtained the dimensions of the surface area directly.

Adding it all up

Add up all the sections and round up to the nearest 100 sq. ft., as the product is sold in units of 100 sq. ft. In the example, we worked out that we would need 1,400 sq.ft. of shingles to cover the roof surface. Since each box has 100 sq. ft., we will need 14 boxes of shingles.

At the same time, we can also see how much underlay we need. Each roll of Triflex-30 covers 800 sq. ft., allowing for overlap. Since the surface area is 1,159 sq. ft., we divide this by 800 to get 1.45 which says we would need about 1 ½ rolls of Triflex underlay to cover the roof. Since the underlay is sold by the roll, you will need two rolls.

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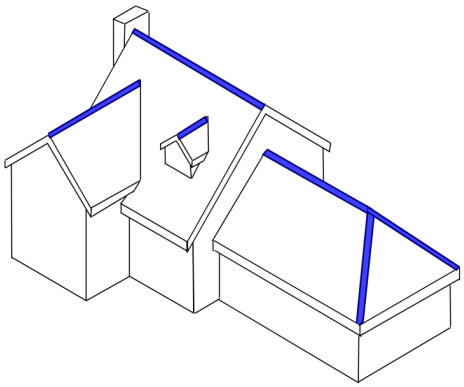
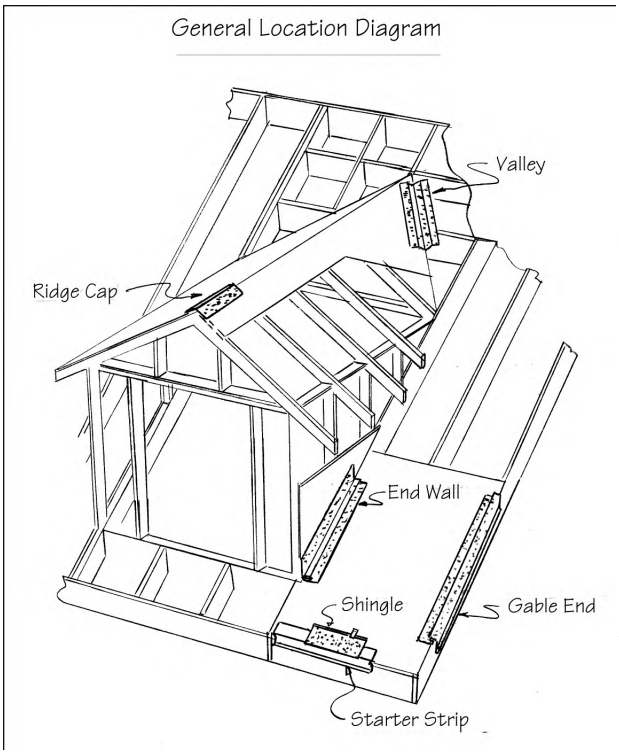
Measurement of ridges and hips.

The ridges can usually be measured from the ground, while the hips can either be estimated or measured directly. Total up the total footage for both ridges and hips and add 10% for waste. In the example, we have about 70 feet of ridge and hip. Adding 10% for waste gives us 77 lineal feet. Since each box of ridge caps covers approximately 40 lineal feet, you will need two boxes of ridge caps for the example.



In addition to the ridge caps, you will need to purchase the 90-degree elbow flashing (also known as v-strip) that comes in 10 ft. lengths. Based on the above, you will need 8 lengths of this flashing.



The other flashings:

Since in the PRS system each roof edge must be covered by an appropriate flashing, you will need to calculate the lengths needed for each of the following:

- Starter Flashing
- Gable-end Flashing
- Securing Flashing
- End-wall Flashing
- Valley Flashing
- Base-of-dormer Flashing

All the flashings come in 10-foot lengths.

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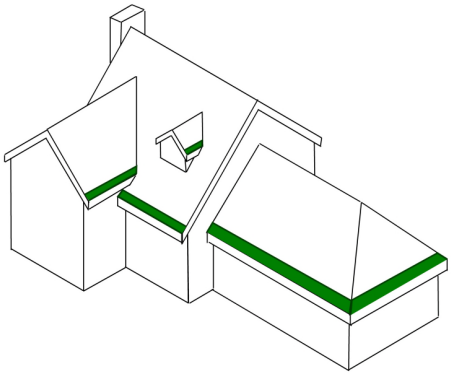
Figuring out the flashing needed:

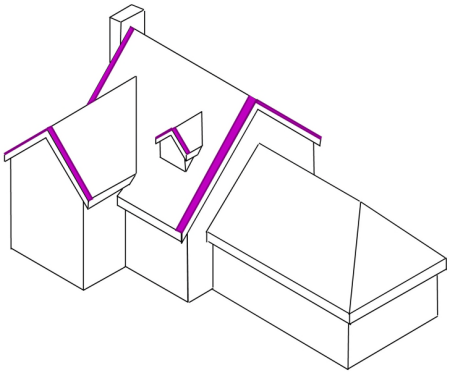
In this section, we will go over the requirements for each type of flashing and show you how to calculate the amount needed.

Starter Flashing (Secured and Unsecured)
The starter flashing can be secured using the securing flashing. If you choose this option, the length of securing flashing you will need is equal to the length of the starter flashing.



The starter flashing is placed along the eave, and is the attachment point for the shingles. Allow four inches for either end of the eave (for fitting and trimming), and four inches for overlap in the case you have two join two sections of starter flashing together. Add up all the eave exposure, add the amounts at the ends and the overlaps, and round up to the nearest 10 feet. Divide this number by 10 (since each section of flashing is 10 feet long) and you will have the number of starter strip flashings.

Gable-End Flashing (Secured and Unsecured).
The gable-end can be secured to the fascia using the securing flashing. If you choose this option, add the length of gable-end flashing to the length needed for the securing flashing for the starter.



As with the starter flashing, allow 4 inches at both ends of the gable for trimming and fitting, and about three inches for overlapping the flashing. Count up all the gable exposure, plus the amounts for the ends, and for the overlap. Round up to the nearest 10 feet and

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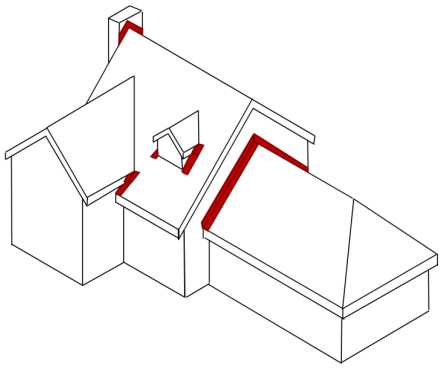
divide by 10. This gives you the number of 10-ft. lengths of gable-end flashings.

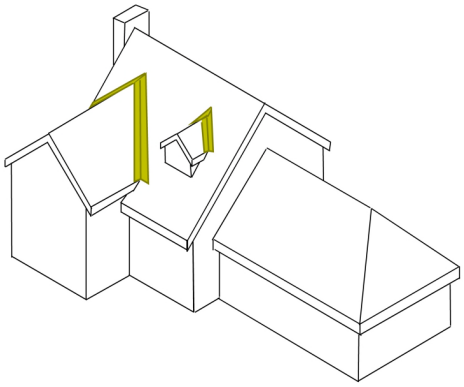


End-wall Flashing

You will need the end-wall flashing for the end-walls, flashing around skylights and chimneys. Use the same rules for calculation as for the gable-end flashing.

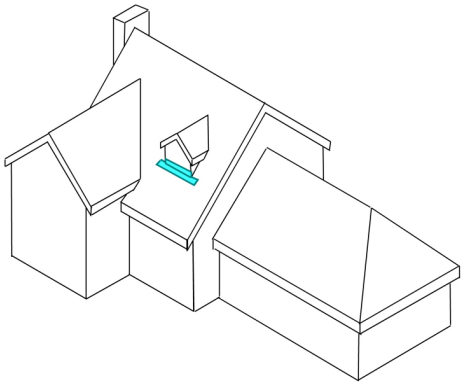
Valley Flashing

Allow about 1 foot per valley for fitting and trimming, and about 6 inches for overlap. Add up the total of the valley lengths, add the amounts for fitting and overlap, and round up to the nearest 10 feet. Divide by 10 to get the number of valley flashings you will need.



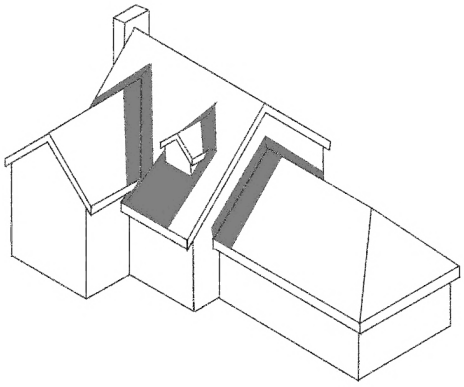
Base-of-Dormer Flashing

This flashing is used to seal off the base of dormers and any surface where the roof approaches a vertical wall (such as the base of the chimney). Measure the width of such locations and add 6 inches to each side for overlap.



Ice & Water Shield Membrane

This membrane will serve to act as a second line of defence against water infiltration. In situations where the slope is 3:12 and up, but below 4:12, you should cover the entire surface with the membrane to guard against water backup. You should also use the membrane along the eaves if there is any history of ice-damming occurring in those areas. Since the width of the membrane is about three feet long, you may need one to



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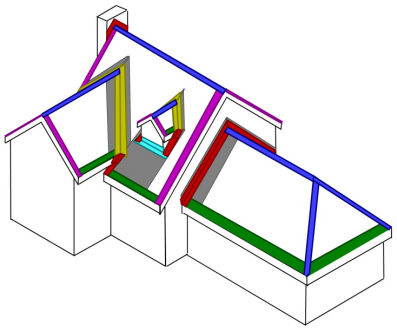
two widths of membrane to seal the eave.

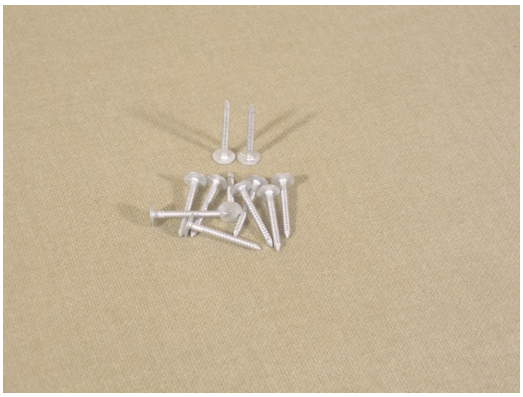
Valleys, endwalls, base-of-dormer situations, skylights, and other roof openings usually only need one width of membrane to protect them.

Once you have taken all the membrane and flashings into account, you should have excellent protection for your home.



Nails

On average, we allow 1 kg. of nails for every 5 boxes of shingles. If you are double-tabbing the shingles or using more nails in the flashing than one every six inches, you will want to order 1 kg. of nails for every 4 boxes of shingles.



Sonolastic 150 caulking.

We recommend this caulking due to its superior performance and adhesion to aluminum. On average, you will need 1 tube for each section join of valleys, 2 tubes for caulking around chimneys, 1 tube for every two air vents or vent collars.

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