

Shingle Installation Guidelines

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General Guidelines on installation of bitumen roofing tiles

The required roof temperature and humidity regime can only be ensured if the roof structure includes vapour insulation, thermo-insulation of adequate thickness selected according to relevant climate zone, a wind screen and a ventilated space under the roof.

Avoid the use of roofing products with different colour codes and batches with different production dates on the same roof.

A slight colour difference between shingles is not a defect; it is typical for flexible shingles of any manufacturer. To minimize a possible mismatch of colours, randomly mix the shingles from 5–6 packs during their installation.

Shingles should be laid in diagonal lines.

If the roofing works are performed in cold weather (temperature lower than +6°C), the adhesive bottom side of a shingle must be heated.

To avoid damaging of roofing, use a special board for on-site cutting of materials.

Do not stack pallets with production on top of each other; to avoid sticking of shingles inside the package, do not expose them to direct sunlight.

To loosen shingles inside the package, slightly bend a package and shake it before opening.

Warning: do not walk over the roof in hot, sunny weather, as it might damage the covering. Use special ladders for that purpose.

Materials to be used

Bitumen or modified bitumen flexible shingles - They come in a wide variety of shapes, colours, and shades.

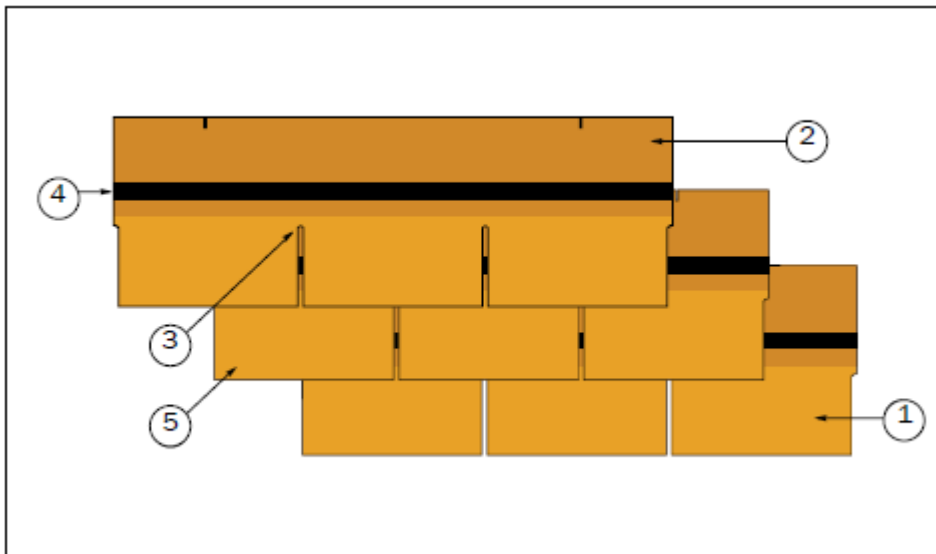
Waterproof Membrane – Fibreglass or Polyester based underlay felts are recommended to be installed under bitumen shingles in areas of ice and snow accumulation and possible leak areas: along the ridge, roof valley, slope lines, and edges of the eaves.

Special roofing nails – Galvanised Annular Ring Shank Nails (length approx 25–30 mm).

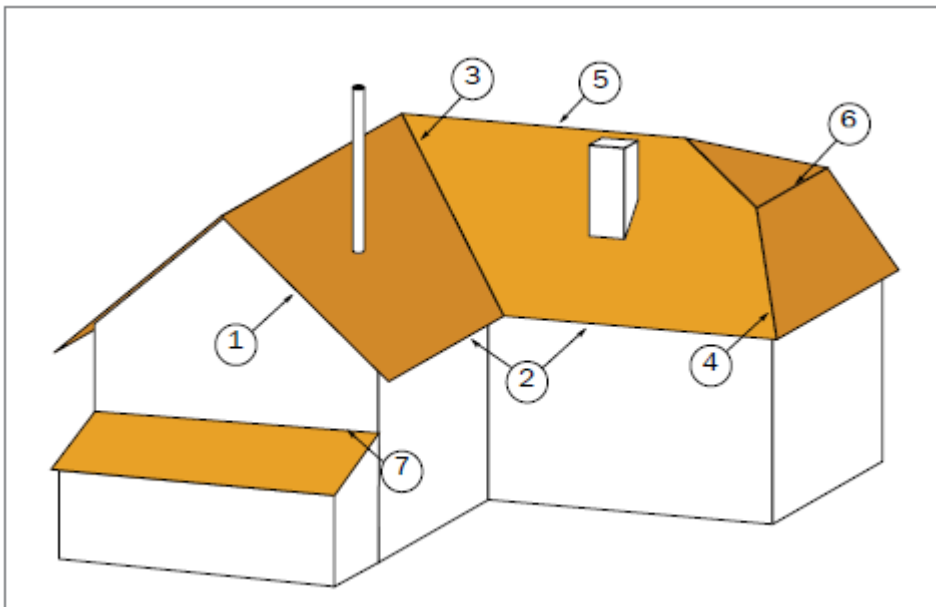
Bitumen Mastic - Cold application modified bitumen mastic

Ventilation - Roof ventilation openings and elements: ventilation funnels and ridge vents.

Key Definitions



- 1) Visible part of a shingle
- 2) Invisible (covered) part of a shingle
- 3) Cut-out
- 4) Adhesive bitumen layer
- 5) Shingle sheets



- 1) Slope eave
- 2) Cornice eaves
- 3) Roof valley
- 4) Edge
- 5) Ridge
- 6) Slope line (break point)
- 7) Slope joint to a vertical plane

Cost of roofing

Each package typically contains 3m² of shingles (including overlapping). If the pack coverage is different to this it will be clearly stated under the specification of the individual product purchased.

To calculate the required materials for the roofing, calculate the roof area in square metres and estimate how many shingles you would need depending on the complexity of the roof's shape.

Recommended Waste coefficient for the shingles (including ridge-hip shingles) is approx 10%, therefore this needs to be allowed when calculating order quantity.

Quantity of special roofing nails – approx 80 g/m².

Coverage of mastic:

Slope edges – approx 100 g/m

Roof valley – approx 400 g/m

Thickness of the applied layer of the mastic should not exceed 1 mm. Because of the solvents contained in the mastic it can result in the formation of blisters and/or marking of bitumen leaks on the finished roof if too thick of a layer of mastic is applied.

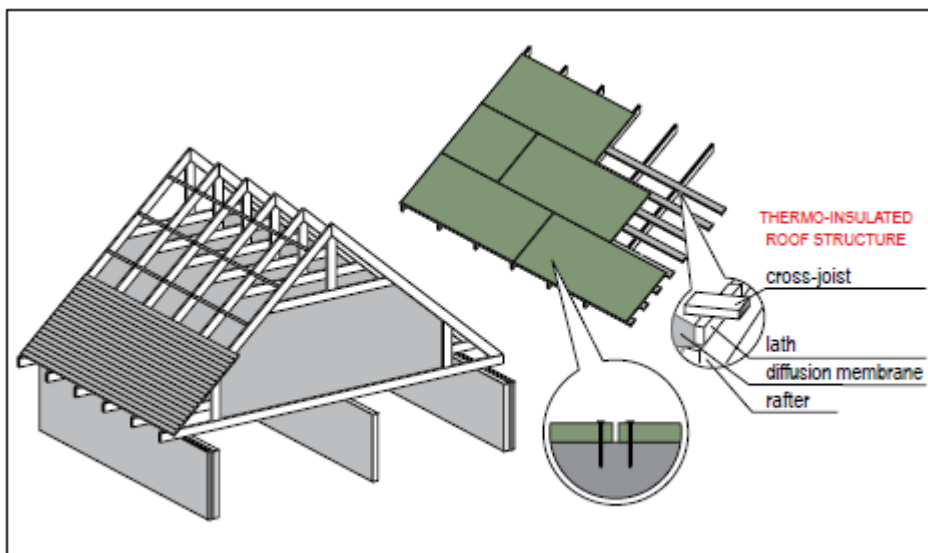
Preparation of the roofing deck

Materials used for roofing should conform to approved norms and regulations of construction standards

When laying bitumen tiles over a wooden roof structure or structures of other types, the rafter span varies between 600 and 1500 mm depending on permanent and temporary loads, as well as on the roof shape. Depending on the rafter span, a solid wooden deck of various thicknesses is used: waterproof plywood or Oriented Strand Boards (OSB-3), matchboards (Plywood) or trim boards (Board) (relative humidity not exceeding 20%).

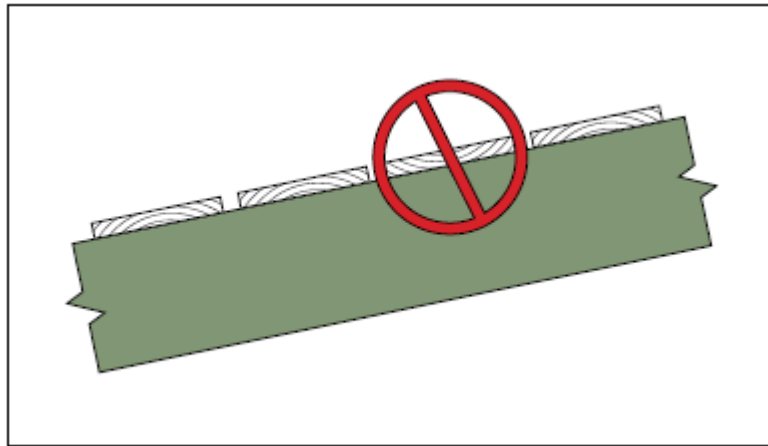
Rafter span/ extra rafter joists, mm	OSB-3 thickness in mm	Plywood thickness in mm	Board thickness, mm
600	12	12	20
900	18	18	23
1200	21	21	30
1500	27	27	37

When using trimmed board as laths, their maximum permissible span should not exceed 5 mm. When using plywood or OSB-3 boards as the deck, 3 mm spacing between the sheets should be left to counterbalance linear expansion in the summer time. The boards should be installed in a chess pattern, securing the edges with annular ring shank nails.



To extend the working life of the wooden elements of a joist structure, they should be processed with antiseptics and fire-retarding agents.

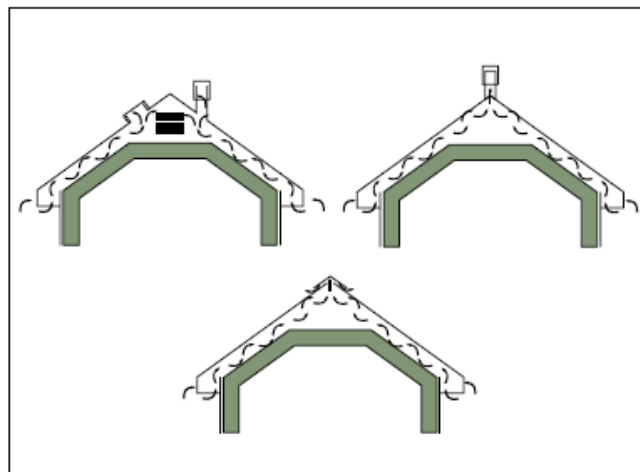
Warning: when installing the board deck, ensure that the growth rings in all boards are oriented curving upward (fig. 4).



Ventilation

Note: The following statements only apply if installation is carried out on a residential property.

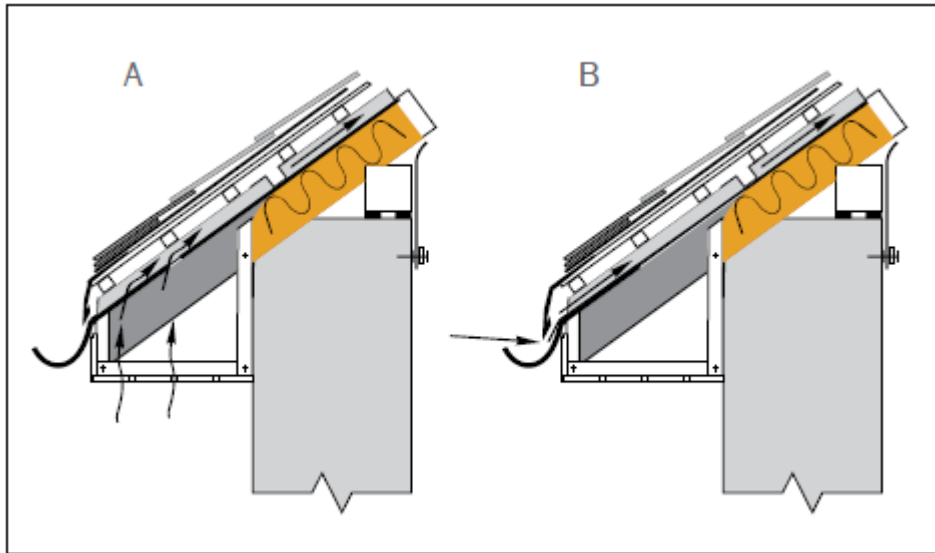
To extend the durability of a roof structure, ensure adequate ventilation of the roof, especially above an attic used for residential purposes. To ensure good ventilation of a superposed pitched roof it should have three main elements: air intake openings, air circulation passages above the thermal insulation and air exhaust openings in the upper part of the roof (see diagram below). The area of the ventilation openings in a roof structure should make up $1/300$ – $1/500$ of the attic thermal insulation area. Pressure in the attic should be lower, therefore the area of exhaust openings should exceed that of the intake ones by 10–15%. Such location of vents will ensure intensive air circulation in the entire space of the attic.



If wooden wind boards are nailed to slope edges, use special ventilation elements – soffit strips. If cladding is used to ensure ventilation spacing, two possible options are shown in the diagram below (provided that a heated rainwater draining system is installed).

Plastic cladding planks are recommended for option A, and both plastic and wooden cladding planks – for option B.

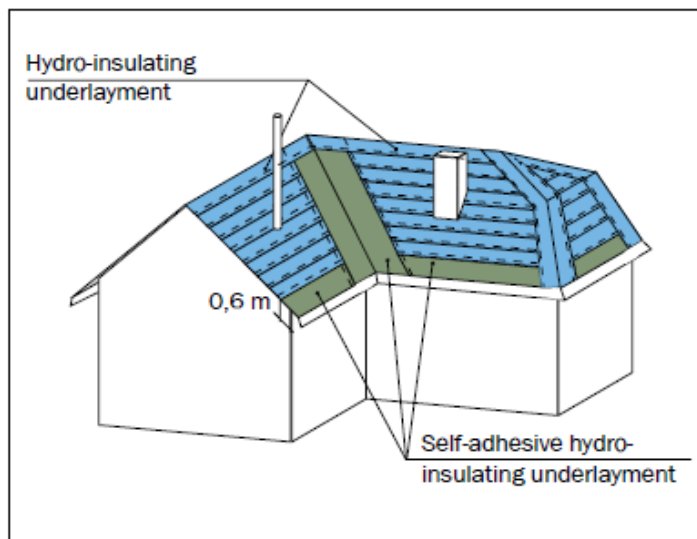
Minimum height of air circulation passages above the thermal insulation – 50 mm, at a roof pitch $> 20^\circ$. If the roof pitch is less ($< 20^\circ$), increase the ventilation spacing to 80 mm.



Warning: it is very important to ensure even spreading of the air from outside in the attic. If there are only small ventilation intakes in the corners of the roof, this condition is not satisfactory and will result in the formation of stagnant air zones.

Installation of Waterproof Membrane Layer

The installation of a Waterproof Membrane Layer (hydro-insulating underlayment) under bitumen tiles is always recommended on any roof where shingles are to be installed on. The layer should be fitted over the entire slope at any pitch of the roof.

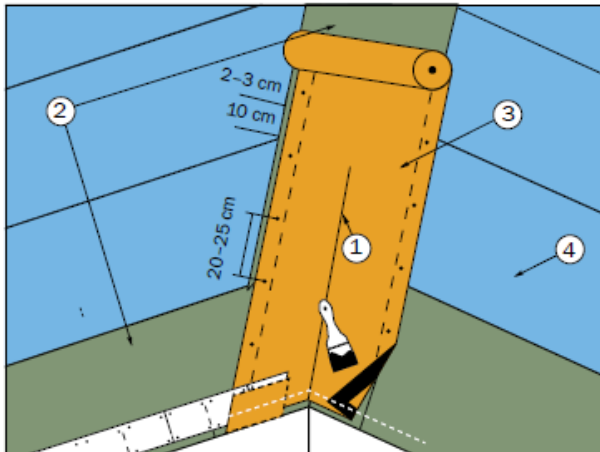


Self-adhesive Membrane (Self-adhesive hydro-insulating underlayment) is recommended to be fitted along slope valleys and cornice eaves (as per diagram above) however a non-adhesive waterproof membrane would be satisfactory.

Fasten the edge of adhesive modified bitumen flashing at 0.5–2 cm from the outer edge of the eave drip. In a valley area it is laid at 1 m width (50 cm on each slope), at a cornice – lengthwise along the whole its eave and additionally a 60 cm distance from the facade plane upwards (as per diagram above). Seamless flashing is recommended, but if seams cannot be avoided, then overlapping areas of the flashing should not be less than 30 cm and must be glued especially tightly. Simple mechanically fitted hydro-insulating underlayment can be applied over the rest of the slope, laying it from the bottom upwards, overlapping diagonally 100 mm and lengthwise 150 mm, moving the roll parallel along the cornice. The underlayment is nailed to the deck every 200–250 mm with annular ring shank nails. The bitumen is then applied over overlapping areas of the strips.

Installation of a roof valley

A roof valley can be installed in two ways: open and closed.



- 1) Roof Valley
- 2) Waterproof Bitumen Membrane – Fibreglass or Polyester
- 3) Flashing
- 4) Waterproof Bitumen Membrane – Fibreglass or Polyester

Open method

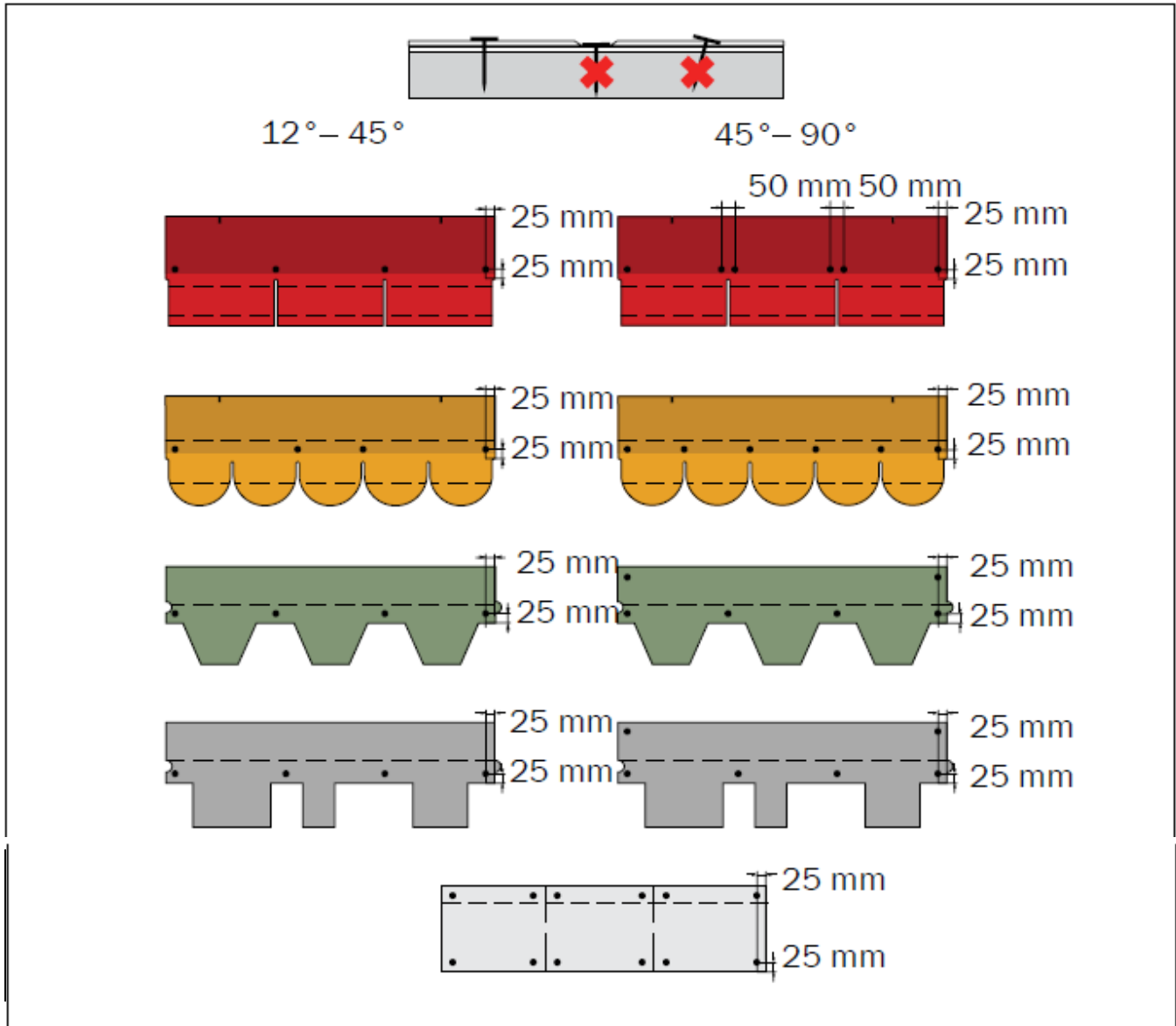
Bitumen flashing is laid lengthwise over the bitumen waterproof membrane along the roof valley axis beginning 2–3 cm from the edge of the underlayment. Nails are fastened at a distance of 2–3 cm from the edge, every 20–25 cm; apply the bitumen mastic on the bottom part of the flashing prior to nailing along entire perimeter lengthwise within a 10 cm strip. Seamless flashing is recommended, but if seams cannot be avoided, then overlapping areas of the flashing should not be less than 30 cm and must be glued especially tightly. Joints shall be made in the upper part of the roof valley.

Closed method

If this method is applied to install a roof valley, bitumen flashing is not used (see section: Installation of a closed roof valley).

Installation of Bitumen Roofing Tiles

Fastening of shingles



Nail every shingle to the roof deck with wide-head galvanized nails; the number of nails depends on the size of the slope. Correct nailing is extremely important – it should be done in such a way that a nail head is driven straight and flush with the shingle surface, but not driven too low. Nails should be nailed at a distance of 2–3 cm from the edge of shingle. Fig. 10 shows the number of nails per shingle and their location, the upper side of a shingle is shown in the picture, and the position of the bottom layer is shown by a dotted line.

Starter row (ridge-hip shingle)

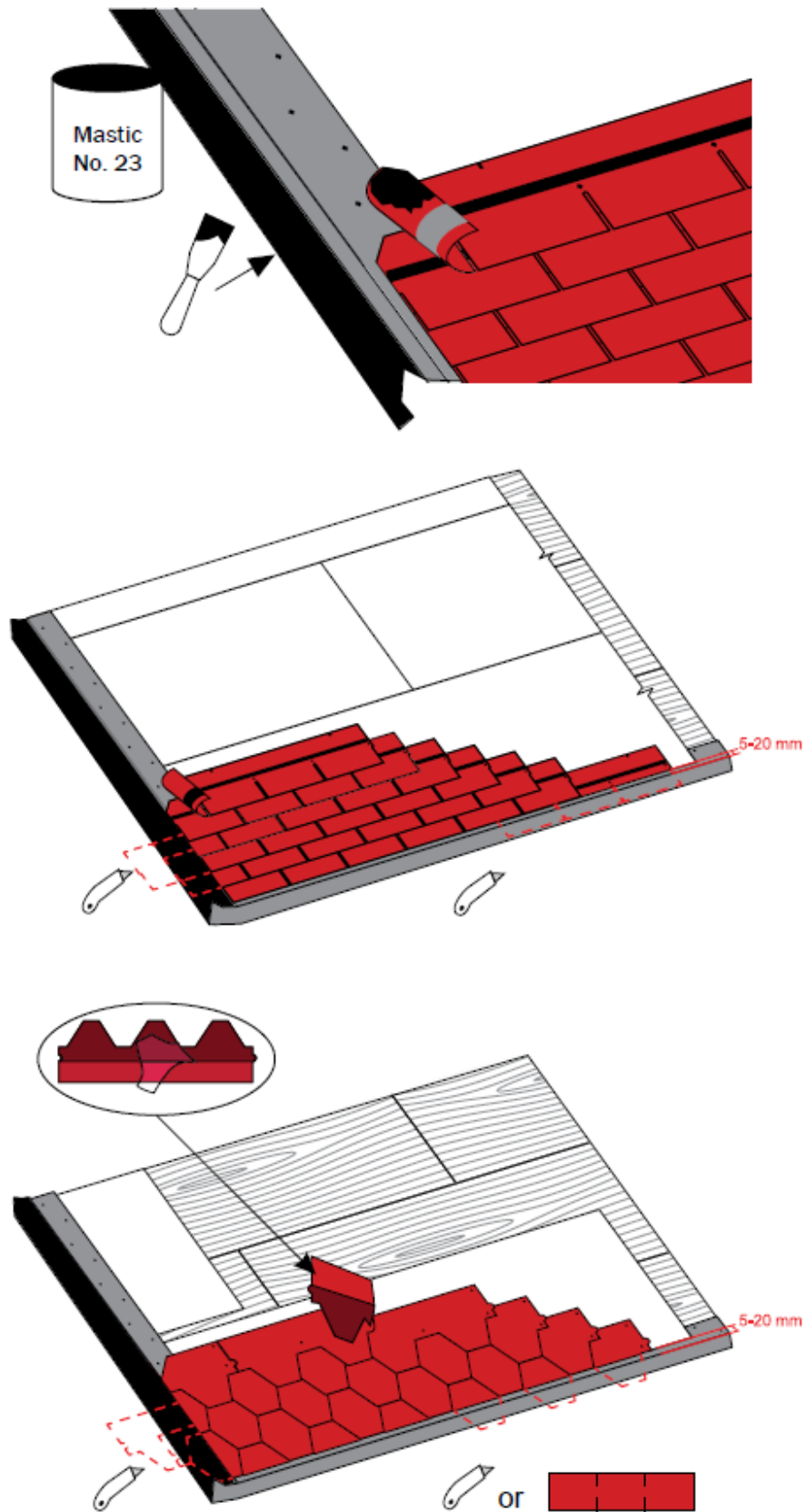
The starter row is laid using universal ridge-hip shingles or regular shingles, having cut off their tabs. These shingles are nailed on top of the waterproof membrane underlay.

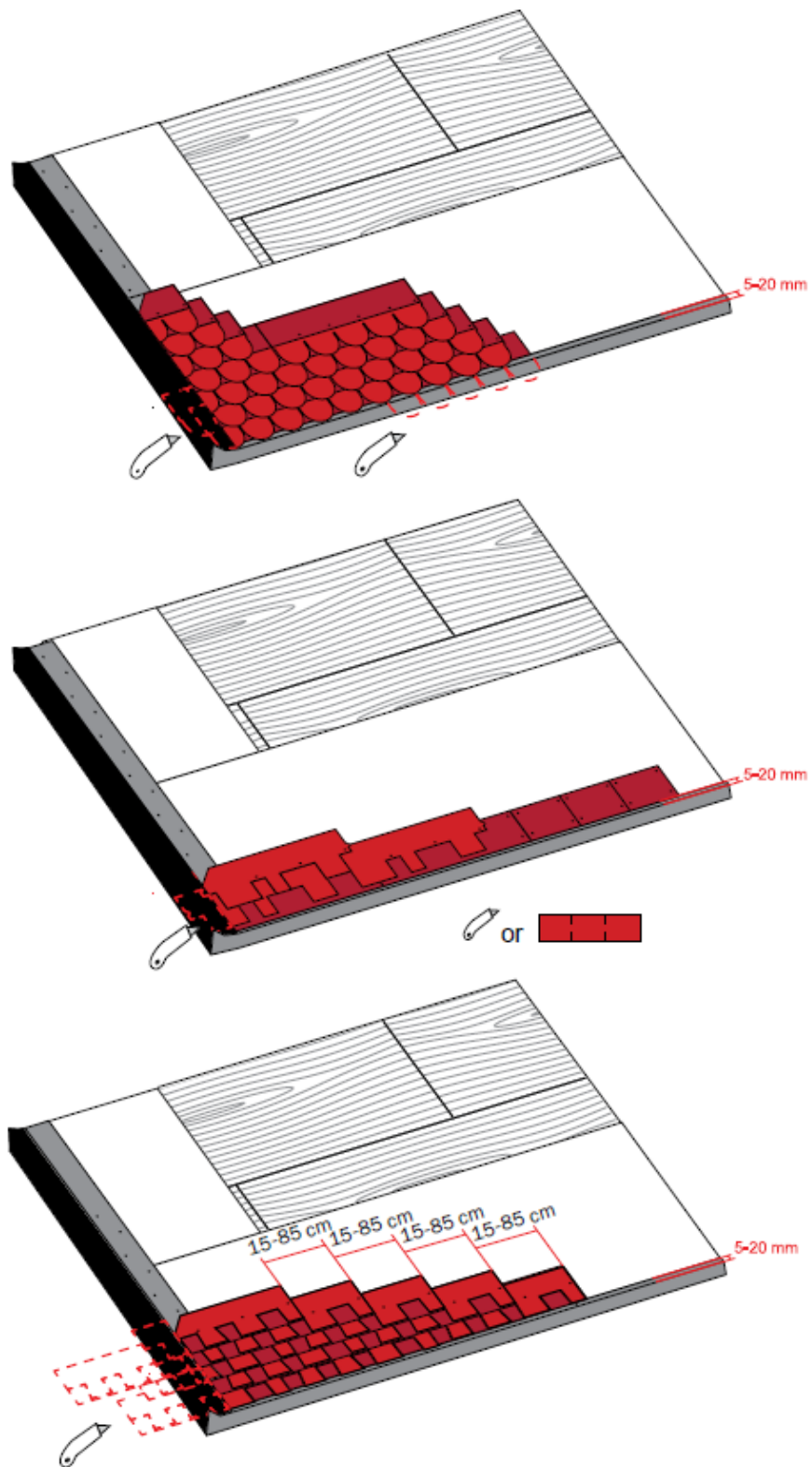
Note: many installers will spin one of the shingles 180 degrees (upside down) and use the solid top edge to form the bottom starter row. This results in not having to purchase a separate item, the ridge & hip shingles, which would, on most occasions, result in less waste material.

First row of shingles and further laying

If the slope is long, it is recommended to start laying the first row from the middle of the slope, at 0.5–2 cm from the ridge-hip tile (as per diagram below and on the following page). The distance from the edge of the roof, depends on the length and angle of the slope, i.e. the steeper and longer the slope, the bigger the distance from the edge.

The second row is laid above the first one, shifting a shingle by a half of shingle sheet to the left or to the right, aligning the shingles according to upper part of the cut outs of the first row shingles.



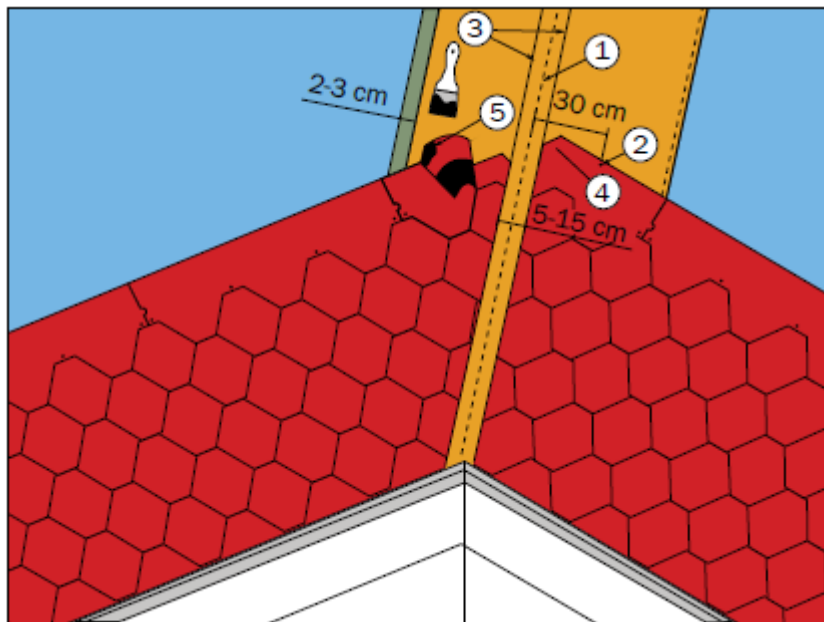


The third and the next rows are laid over the second one shifting shingles by a half of shingle sheet to the left or to the right.

The same pattern applies to installing the entire roofing. To ensure maximum protection of the roof from cross rain, apply the bitumen mastic within a 10 cm strip on the bottom side of the edge shingle. Cut the upper corners (2–3 cm) of the edge shingles abutting the metal edge of the eave (Fig. 11).

Installation of a roof valley (Open & Closed Methods)

Open Method



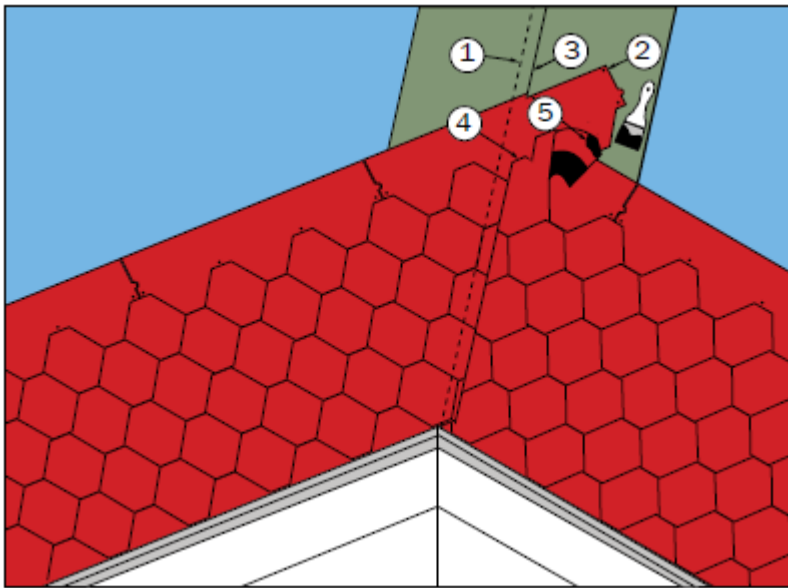
Shingles are laid towards the slope interlock axis, on the bitumen flashing (3). The edge shingle is fastened with one extra nail in the upper part (2), not closer than within a 30 cm distance from the centre axis of the valley (1). Having covered both slopes, lay aligned twines each 5–15 cm along the valley axis and chalk the lines accordingly (3). Cut tiles to fit these lines.

To avoid damaging the waterproof membrane underlay, cut shingles on a special board. To divert water flow to the valley, cut the top corners of the edge shingles (4) and apply the bitumen mastic within a 10 cm strip over their bottom side (5). If there are several different directions of water flows on the slope surface, the gutter of the valley should be oriented towards the less intense flow. The width of the gutter can vary between 5–15 cm, depending on the location and construction of a building.

Bitumen flashing is laid lengthwise over the waterproof membrane underlay along the roof valley axis beginning 2–3 cm from the edge of the underlay. Nails are fastened at a distance of 2–3 cm from the edge, every 20–25 cm; apply the bitumen mastic on the bottom part of the flashing prior to nailing along entire perimeter lengthwise within a 10 cm strip. Seamless flashing is recommended, but if seams cannot be avoided, then overlapping areas of the flashing should not be less than 30 cm and must be glued especially tightly. Joints shall be made in the upper part of the roof valley.

E.g. if a building is located in woodland, a wider gutter is required to make the removal of leaves easier.

Installation of a closed roof valley



Start installing the shingles from the lower slope moving on to the higher one not closer than 30 cm to the axis. Fasten the last shingles not closer than 25 cm from the axis of roof valley (1).

Additionally fix their corners with nails. Proceed in this way to install the lower slope of the roof. Before starting installation of shingles on the steeper slope, draw a line on the slope 7–8 cm from the axis of roof valley and cut the shingles of this slope to fit this line (3). To divert water flow to the valley, cut of the upper corners of the edge shingles (4) and apply a 10 cm wide strip of the bitumen mastic on the bottom side of the shingles (5).

The second row is laid above the first one, shifting a shingle by a half of shingle sheet to the left or to the right, aligning the shingles according to the upper part of the cut-outs of the first row shingles.

The third and the next rows are laid over the second one shifting shingles by a half of shingle sheet to the left or to the right.

The same pattern applies to installing the entire roofing.

Installation of eaves and slope ridges

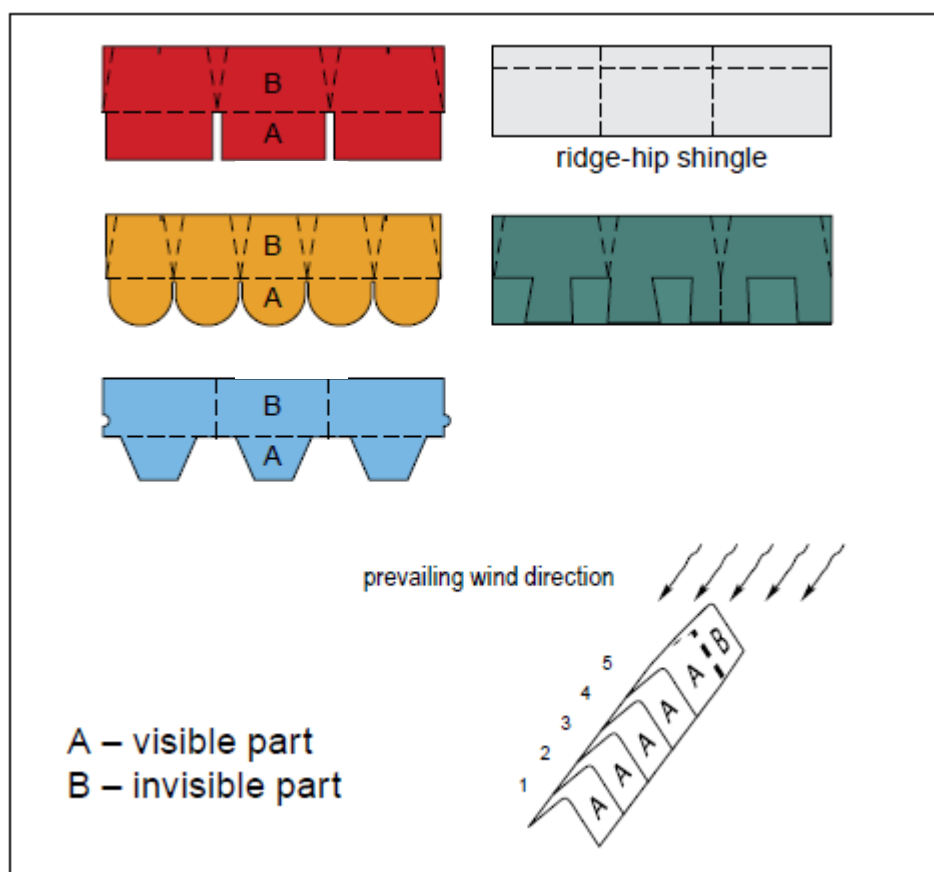
Cut the edges of shingles lengthwise to fit each particular slope edge – leaving a 0.5 cm gap between them. Then fasten a ridge-hip shingle over the gap in a straight line.

3 Tab Square, 5Tab Scallop and 3 Tab Hexagonal Shingles, ridge-hip shingles can be cut out of their regular shingles (as per diagram below). Apply bitumen mastic all-over the bottom side ridge-hip shingles before placement.

3 Tab Square, 5Tab Scallop and 3 Tab Hexagonal Shingles the invisible part is (B), the visible (A). Installed from the bottom upward.

5 Tab Scallop, 3 Tab Hexagonal and 3 Tab Jazz Shingles can be delivered with universal ridge-hip shingles. Ridge-hip tiles should be divided into 3 parts at the perforation points and laid in a straight line with a 3–5 cm overlapping, and fastened by two nails on each side of the slope. Shingles should be laid against the prevailing direction of wind (diagram below).

Warning: to avoid the breaking of shingles when installing them in cold weather (temperature lower than -6°C), it's recommended to bend ridge hip shingles on a heated pipe (diameter – 10 cm).



Recommendations for roof maintenance

1. Check the roof in the spring and autumn seasons.
2. Remove leaves, branches and other small debris only by a soft broom. Do not use any sharp tools.
3. Gather sharp objects by hand.
4. Clean gutters and rain downspouts.
5. Clean large deposits of accumulated snow using blunt wooden shovels. Not more than a 10 cm-thick snow build-up may be left on the roof.
6. Make regular preventive check-ups of the roof, however, even upon minor damage, the roof must be repaired.

Follow these instructions to install shingle roofing. Failure to comply with these instructions, approved norms and standards of construction and design, use of unauthorised completing elements or improper workmanship make the product warranty null and void. If you have any queries during installation, contact your local supplier who are always ready to give you technical support and advice.