

Slating & Tiling

TIPS 70

weather bars and interlocks

The designers of roof tiles/slates that are manufactured using a mould or similar process can create features that modify and control the flow of water and wind between the tiles/slates, which will enhance the overall performance of the roof covering. Two such features are weather-bars and interlocks.

Generally speaking, weather-bars are horizontal and interlocks are vertical, but, as is often the case, this is not a hard and fast rule and they can be diagonal. So what is the difference?

Weather-bars Weather-bars are raised or depressed features on the surface of the tile, in the head lap or sidelap portion of the tile/slate, on either the upper or lower surface. The position and shape of the features will define their function.

Weather-bars that are moulded into the underside of the leading edge of an interlocking tile perform two functions. Firstly, they produce horizontal points of contact with the head of the tile below. The greater the surface contact, the easier water travels up the surface of the tile by capillarity between the upper and lower tile surface.

Secondly, the voids between the weather-bars reduce the wind force blowing up between the tiles. By forcing the wind to blow through a very small gap between the tiles (less than 1mm) into a large void (up to 10mm high) the wind speed and force is reduced. If done two or three times, this can reduce the wind speed down to the point where it is unable to blow rain up the surface of the tile/slate within the head-lap.

However, unless the weather bars run the full width of the tile there is the risk that the wind-driven rain will drive in under areas like the interlock where there is insufficient depth to mould in a large void behind the weather-bar. It is much easier to form features in the underside of a tile, as this is created by the mould/pallet.

Depressions in the top surface

of a tile/slate will help to attract capillary water on the surface and may delay the onset of water tracking down a nail hole. However, this will never be as effective at keeping out water as an upstand on the surface, as this acts as a small wall.

Locating one upstand weather-bar below the nail hole, and one at the head of the tile, provides the maximum protection to stop water penetrating the head lap. A weather-bar across the head of the side interlock of a tile/slate prevents water blown up the side interlock from draining over the head of the tile.

Unfortunately with tiles manufactured using an extruded process, horizontal or diagonal features on the top surface are difficult to achieve, as a smooth profile needs to be formed up the length of the unit as it passes through the extrusion stage of manufacture. Any depressions or upstand ribs have to be formed as a secondary operation.

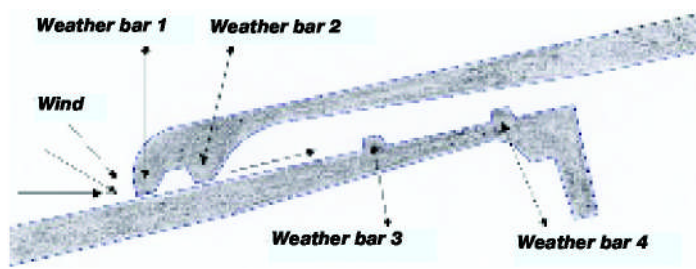
With moulded and pressed tiles, such as resin slates, it is easy to incorporate all of the features in the top and underside surface in one operation.

Interlocks

If the weather-bar ribs and depressions on the upper and lower surface of the tiles/slates are designed to locate one with the other, they are termed interlocks. Introducing interlocks with upstand ribs close to each other will restrict the amount of shunt between the tiles.

The side interlock shunt of concrete interlocks is maximum 6mm from full open to full close, while the variable head-lap for a concrete interlocking tile can be up to 50mm.

While there are some clay interlocking tiles that have variable headlamps, most designs have a fixed head lap and tend to have weather-bars that interlock. This makes the tile designs very efficient at keeping out water, but they have to cope with the variations in the clay from being fired in a kiln, which is not an issue



Wind-driven rain blown between the two slates will slow down twice before it reaches weather-bar 3. Only under very extreme conditions will weather-bar 4 ever have to do any work.

with concrete tiles or resin slate. Vertical side interlocks also act as gutters to drain water away, unlike horizontal weather-bars. The relative height of the interlock with the general surface of the tile will determine the anticipated vulnerability and water capacity of the side interlock.

The interlock of a flat concrete interlocking tile will inevitably be below the general surface of the tiles, while a similar design with clay pantiles will result in the interlock being at the same level as the remainder of the tile, while some high profile tiles have the interlock appreciably above the general surface of the tile. The higher the interlock position, the better the performance.

Some interlocks have two channels and two ribs that interlock, while others only have one with a larger void between them, increasing the overall capacity of the drainage channel. The design of the side interlock channel is critical, as the side lap distance is only 30-40mm while the head lap can be between 50mm and 125mm. It is probable that the first mode of failure of a tile system will be through the side interlock, before failure through the head lap.

Conclusion

Weather-bars moulded into the surface of a tile can greatly enhance the weather resistance performance of a clay, concrete, or resin slate roof covering. However, the method of manufacturing the tile will restrict where

the weather-bars can be installed. Interlocks are weather-bars that locate with features on an adjacent tile to make them interlock. Quite often, tiles of the same profile from different manufacturers will not interlock and are therefore not compatible.

Similarly, plastic ventilation tiles that are sold as fitting a range of tiles may not perform as well as the tiles they fit with, as the design of the weather-bars will be a compromise to allow them to be fitted to a range of manufacturers' products and therefore will not be as tight a fit as they should be.

Tips

- Never mix tiles from different manufacturers together.
- Never stretch the horizontal coverage or head lap of a tile, as it may result in weather-bars riding up on each other, causing a local stress point and breakage.
- Tiles should always lay in the same plane to ensure the weather-bars on the underside of the tiles are in close proximity to the tile below, allowing it to do its job correctly.
- Depressions in the top surface of a tile are not as effective as an upstand rib undertaking the same function in the same locality.

*Compiled by Chris Thomas FIoR
The Tiled Roofing Consultancy
2 Ridlands Grove, Limpsfield Chart,
Oxted, Surrey, RH8 0ST
tel: 01883 724 774*

*Email:
chris.thomas@thetiledroofingconsultancy.com*

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