

Slating & Tiling

TIPS 90

Chattering tiles and slates

PITCHED ROOFING

According to the British Standard for slating and tiling BS5534 it is not until a tile or slate is sucked off the roof that it has failed. However before a tile or slate reaches that point, it can rattle and chatter, especially if the tile or slate is nailed or clipped, and this is a nuisance to the building occupier, but is not a measurable failure.

Cause

During windy weather a tile or slate will be subject to wind uplift forces caused by the wind blowing over the roof and creating vortices as it passes over the edges. Long before the wind force is strong enough to rip the tile off the roof it will be lifted and dropped with each wind gust, making an impact noise, which may result in breakage.

Effect

With a tile that is not nailed or clipped it is the dead weight of the tile that is holding it down. Once the wind uplift force is just greater than the force generated by the dead weight, the tile will be sucked up and off the tile batten, and will slide off down the roof.

If the tile is head nailed, once the wind uplift force is just greater than the force generated by the dead weight, the tile will be sucked up until the slack in the nail fixing is taken up and the tile will not rise any higher, and will drop back into position making an impact noise. There will always be a small amount of slack in a nail fixing as the battens deflect when the nail is punched in and the nail shank will bend before it takes the full strain. The wind uplift force may be enough to raise the tile just a few millimetres, but this is enough to make the noise. If the wind gets stronger the wind uplift force will increase and the amount a tile lifts will increase. There will be a point at which the leverage on the surface of the tile will raise the tile to the point where it will either pull the head off the nail or pull the nail out of the batten. The same principle will also apply to head and centre nailed slates.

The next level of tile fixing for interlocking tiles is to clip the bottom left hand corner of the tile. A tile clip is a very efficient fixing as it is so far away from the batten about which the tile will try and rotate. Tile clips come in many shapes and materials and only the very best will hold the two tiles together tightly and secure them to the batten below. If there is any slack in the clip, or the clip has an ability to rotate or flex, then there is the risk that the tile will be able to lift, even a few millimetres, and drop back down making an impact noise. A tile that is head nailed and clipped will be less vulnerable to the tile lifting even a small

amount, but again it will be dependent upon the design of the tile clip and how it is installed. With fibre cement slates that are tail riveted the same thing applies. It is the installation of the rivet that is critical and needs to be installed correctly and tightly to stop any movement.

Solutions

In many instances it is not until the roof has been installed and a year or more of weather has been experienced that the problems of tiles or slates chattering are discovered, and chattering may only happen on certain properties and certain parts of a property, on a big development. It is difficult to predict exactly where chattering will occur; often this results in an over specification of the fixings for the total development.

Firstly small heavy roof tiles or slates are less affected by rattling. This explains why plain tiles and small thick slates survive in some windy parts of Scotland while large and relatively light roof tiles or slates present a problem. Local traditions should not be ignored without a good understanding of the materials being used.

Secondly screw fixing tiles or slates in place will allow the tiler or slater to control and reduce the amount of slack in the fixing. This is especially true of vertical plain tiles which are prone to rattling at the corners.

Thirdly look at the clip fixings for the interlocking tiles and choose one with a clip that is both a tile to tile clip and has a straight pull down between the interlock hook and the fixing to the batten. The greater the sideways distance, the lower the resistance to movement.

Fourthly flat tiles are more vulnerable to wind suction but are more resistant to overturning about a tile clip than a single pantile, which can roll sideways along the batten.

Last resort

If having followed all the guidelines you can end up with some tiles that just refuse to play ball, there are two options. The first is to inject a blob of silicone mastic in under the two bottom corners of each tile to act as a shock absorber (not an adhesive) to cushion the tile dropping, such that it does not make any impact noise on the lower tile. The other is to drill through the lower edge of the tile that is lifting and making the noise, and screw the tile down into the batten below. This is not as easy as it



Light weight concrete interlocking tiles should always be head nailed and tail clipped, unlike these tiles that were chattering in the wind

sounds, as you must not break the tile in the process, and you need to do it directly above the nail hole of the tile below (if it has one) so that the screw passes easily through the tile below and into the batten. It is always better to position the screw on the right hand side of the tile as often there will be a clip on the left hand side. The screw hole will need to be protected with a sealing washer and sealed cap. Also the screw should not be over tightened otherwise this could result in the interlock breaking.

Conclusion

In windy conditions, as soon as the wind uplift force is greater than the dead weight resistance the tile will start to lift until it is restrained by a nail or clip. Once the wind gust has passed, the tile drops and makes an impact noise on the tile below. The more secure the tile fixing and the less slack in the fixings, the less lift can be achieved and so the less impact when it drops. Lightweight, large format tiles or slates will be more vulnerable to rattling and chattering than small heavy tiles or slates. There is no substitute for the correct specification of materials and good workmanship to overcome the problems before they become an issue. Whatever you do, do not glue and fix everything down so tight that there is no movement in the roof covering, as this will result in cracked tiles and slates, due to the natural thermal movement of the roof structure taking place and affecting the weakest element.

Tips

- Avoid large format interlocking tiles and slates, especially if they are light in weight, in windy locations.
- Choose a screw fixing in place of a nail fixing for plain tiles and natural slates in windy locations.
- Choose an interlocking tile with a very secure clipping system that has no slack or flexing in the clip in windy locations.



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