

Tiling tips: — No 9

Single or double lap slate choice: Part 1

The term roof slate is applied to any product that looks like, or tries to mimic, natural slate. But unlike natural slate most products called roofing slate are not laid like natural slate, as they are not double lap products.

Single and double lap

Natural slate, being thin, flat rectangles of stone, are only weather resistant when laid with a double lap giving the traditional half bond appearance. Fibre cement slates and some resin slates are also laid in the same way. The remainder of the roofing products called slates are single-lap tiles, made from either concrete, resin slate, clay or metal.

Single lap slates require far fewer units per square metre of roof than a double lap product. Between 70 to 50 percent of a roof slope covered with single lap slates has one layer, with between 50 to 30 percent with two layers at the head lap and side interlock. Natural slate has between 78 and 34 percent of the roof slope covered with two layers and between 66 and 22 percent with three layers at the head lap. This must not be confused with the weight which tends to be greater with concrete slates, due to their greater thickness.

In most instances the minimum rafter pitch for single lap slates can be as much as 5° lower than for a natural slate. The resulting reduction in rafter pitch, and material quantity, added to the cost of the base material, makes single lap slates a very cost effective roofing product.

On paper single lap slates out perform the equivalent double lap slate. But single lap slates have some limitations that should be considered before they are used in place of double lap slates.

Curved roofs

Single lap slates do not like going around any form of curve. Some can be made to do so, but in most instances it will reduce performance to rain penetration. This may result in a steeper rafter pitch being required. The ability of double lap slates to be tapered to fit and available in a wide variety of sizes makes them more ideal for curved roofs.

If the building is curved on plan, the number of slates needed on the outside of the radius will be more than on the inside of the radius. In between the two the number of slates per course will reduce. Because single lap

slates are a fixed width and rectangular, the half bond joint will drift until the interlocks line up. Some designs will not allow any interlock drift at all. Also on a large radius the shunt in the interlocks may allow a little tapering, as the radius gets smaller the slates will become impossible to lay without damaging or compromising the interlocks. Slates, being flat, will form a tangent to the curve and produce triangular gaps under the slates that will get bigger with wider slates and on tighter curves. The upshot of single lap slates being only supported at the interlocks is that interlock breakage will occur.

With a roof curve from eaves to ridge, single lap slates will either touch along the leading edge or the top edge of the lower slate. Touching on the leading edge may prevent some slate clips from fitting, as the hack is high. Touching on the top edge of the lower slate can create a gap under the leading edge, allowing wind driven rain to breach the head lap.

For all these reasons it is not advisable to use interlocking slates on any roof with a curve. A curved roof can be accommodated by dividing into a set of facets, with each facet treated separately, with hip, valleys or flashing between them.

Straight bond

To make an interlocking slate look like a natural slate, the side interlock has to be positioned below the surface of the slate. The interlock acts as a small gutter, draining away rainwater. Like all gutters they have a maximum capacity beyond which they will flood. In the case of a single-lap slate interlock, it will be onto the underlay and battens below.

At the bottom of the interlock the water drains out onto the surface of the slate below. With a broken bond the water discharges into the middle of the slate. If the interlocks are straight bonded the water will discharge directly into the next interlock. If water drains down the interlocks in this manner, it will not take many slate courses before the interlocks will reach maximum capacity during a rainstorm.

Long rafter length

A similar over capacity of the interlocks can occur with long rafter lengths. The quantity of water washing off the slates at the ridge will be added



- Forming a truncated half cone in double lap slates can be achieved with planning and quality workmanship. (Photo: Red Bank Manufacturing)

to the water falling on the lower slates. This accumulation of water builds up as it reaches the eaves. The weight of water creates a pressure that forces water through the interlocks onto the underlay and battens below. The distance down from the ridge at which this will happen depends upon the design of the interlock, roof pitch and volume of rainfall. By increasing the rafter pitch, a longer rafter can be accommodated. Unfortunately you may find that increasing the pitch will also lengthen the rafter. The safest answer would be to change to another design of interlocking slate or reduce the width of the building, which ever is the easiest/cheaper solution

Each design of single lap slate will perform differently; consequently the manufacturer should be contacted for recommendations. Major manufacturers include a table or formula in their literature. Some smaller manufacturers may not be aware of the limitation on their products as they have never undertaken any long rafter length deluge testing to replicate a typical 'once in 50 year' UK rainstorm.

Decoration

Natural slates come in a range of colours from green, through blue to black. In theory, man-made slates can be made in a much wider range of colours to allow the creation of patterns on the roof. But if a pattern is to be formed using ornamental slates, with a shaped leading edge, double lap slates will need to be used as ornamental single lap slates are not made.

Part 2 of this article deals with the fixing and detailing differences between single and double lap slates.

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