

# A Practical Guide to Hook Fixing Slates

## Contents

Choosing the correct Hook .....	2
Setting out .....	2
Laying Method.....	3
Minimum Recommended Head laps when Hook Fixing.....	5

This guide has been written to complement the guidance set out in the BS 5534:2014 standards for Slating and Tiling for Roofing. We recommend you seek advice regarding the suitability of this fixing method for your specific installation requirements.

The use of hooks to fix slate has been widely used in Europe and is becoming increasingly popular in the UK. Hooks can be used in the most exposed locations because the slate is supported at four points, meaning the resistance to wind uplift is extremely effective. The top edge of the slate is gripped under the hook above. The shank of the hook runs down between adjacent slates in the next course, and the return grip at the bottom of the hook holds the tail of the slate. This means that each slate is held in place by four hooks; one at the head, one at the tail and one on each side.

Hooks are quicker to work with as you are only fixing one hook per slate (rather than the standard two nails per slate). Repair work is also much easier as the fixing is visible and can be removed with pliers or wire cutters.

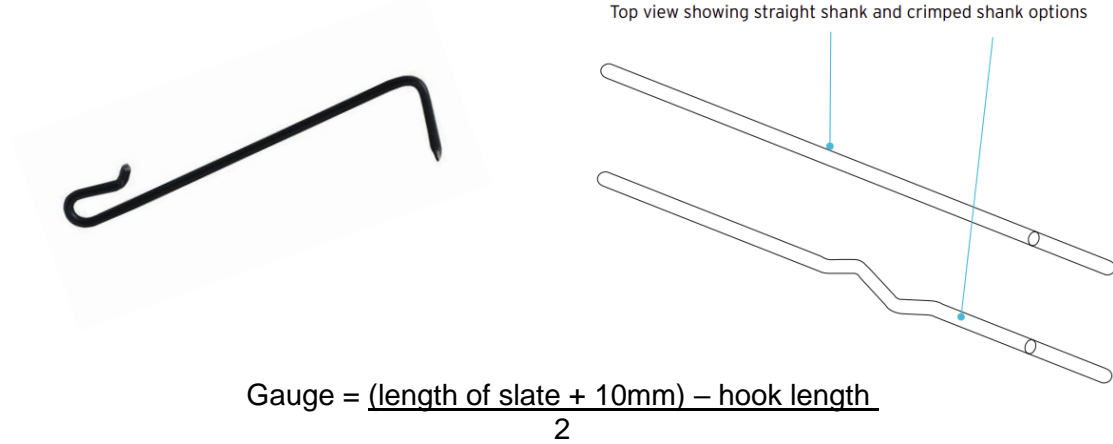
When hooks are used the slates are not tightly packed together. The hooks positioned at the side of the slate form two channels, which reduces the chance of rising capillary action of rain. In areas of high exposure or at low pitches use of a hook with a crimped/wavy shank further reduces the amount of capillary attraction.

Slates still need to be three times the head lap, but the width can be less than twice the head lap because there is less creep of water and no nail holes. The preparation for the roof carpentry is the same as laying with nails. Only the method of fixing is different. At lower roof pitches there is an increase in the chance of rising capillary action, this requires the head lap to increase and these values are set out in the tables appended to this guide.

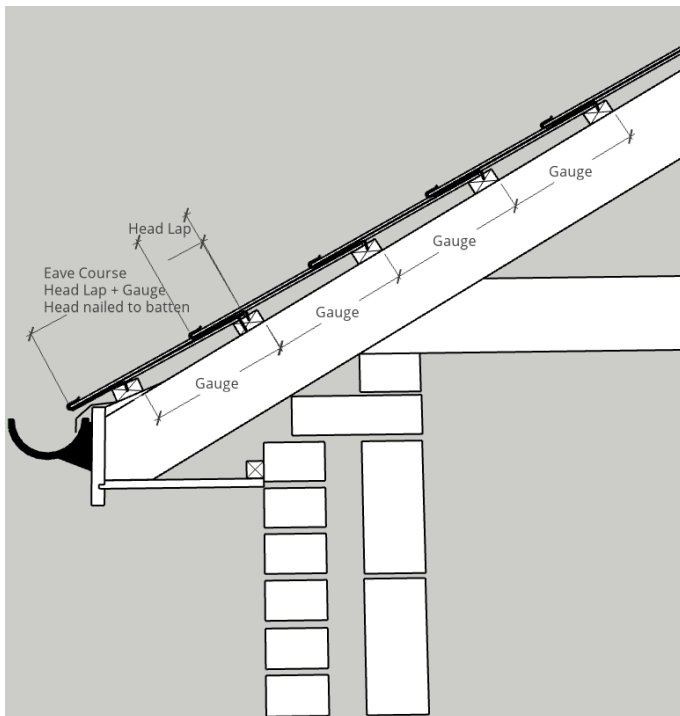
# Choosing the Correct Hook

Hooks should be made of stainless steel 316 grade or higher and can be supplied in a matt black finish or raw stainless steel.

Hook length is determined by the size of head lap required. The hook length should be 5mm longer than the head lap. Table below sets out the minimum head laps required based on roof pitch, rafter length and exposure region. The batten gauge can be calculated using the calculation below:



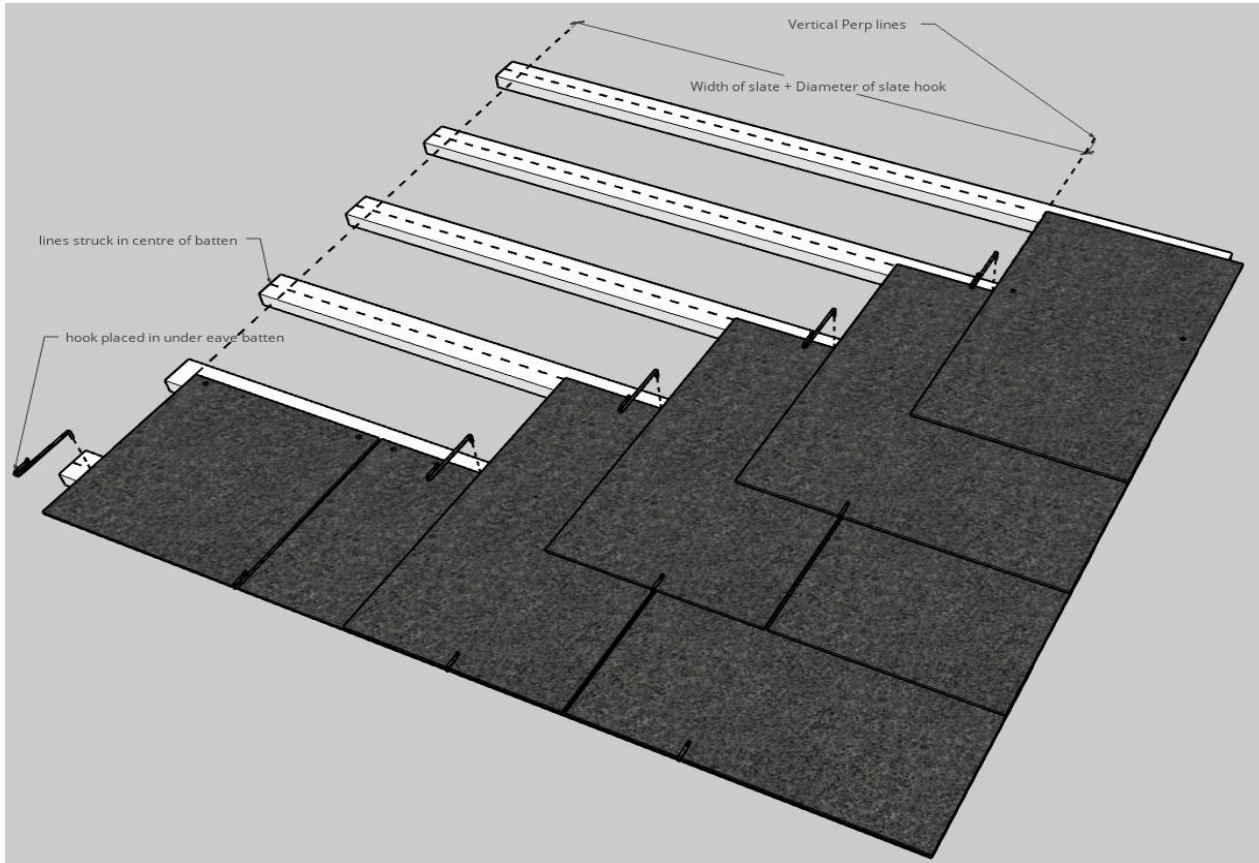
## Setting out



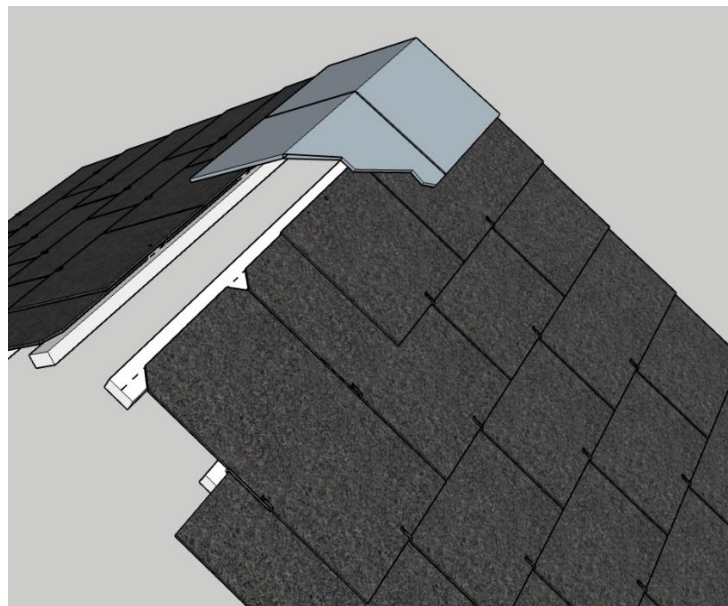
1. The slates at the eaves should overhang the fascia/ gutter line by a minimum of 50mm.
2. The first under-eave batten should be fixed to correspond with the hook length to ensure the first course of slates covers the under eaves course fully.
3. The first full course batten above the under eave batten will be fixed at a height equal to the gauge + the head lap.
4. The centre of each batten course should be marked out so that the head of each slate lays to this mark.
5. Vertical perp lines should be struck to ensure the slates stay aligned vertically. The first line should be marked exactly one slate width from the verge allowing adequate overhang. The following lines are calculated as the width of the slate + the diameter of the hook (Approx 3-5mm). Striking a line every 3 slates is a general rule of thumb.
6. The overhang at the verge should be no more than 50mm

## Laying Method

1. Under Eaves are head nailed to the first full course batten, fixing a hook between each slate into the under eave batten. It is good practice to lay these under eaves 'upside down' so the face of the slate is laid against the batten.
2. A slate and a half should be laid on the first full course. This will need to be holed and nailed to the batten with a sufficient overhang at the verge.
3. Before laying the first slate fix a hook into the batten at the chalk line mark.
4. Continue to lay slates followed by a hook alongside.
5. Work in a triangular pattern working along and up the roof checking to line up with the regular perp lines struck during setting out.



6. All slates at verges must be nail fixed
7. All slates at abutments must be nail fixed
8. At ridges it's advisable to shoulder the slates, this allows room for the top course of shorter slates to be centre nailed.
9. The last course at the ridge should have sufficient length/gauge to ensure the headlap is maintained by the ridge tiles.
10. When using a ventilated ridge fixing ensure to follow the manufacturer's instructions to maintain airflow at the ridge line.
11. Care should be taken when fitting slates to hips, Ensure the correct bond is maintained in the slates using slate and a halves



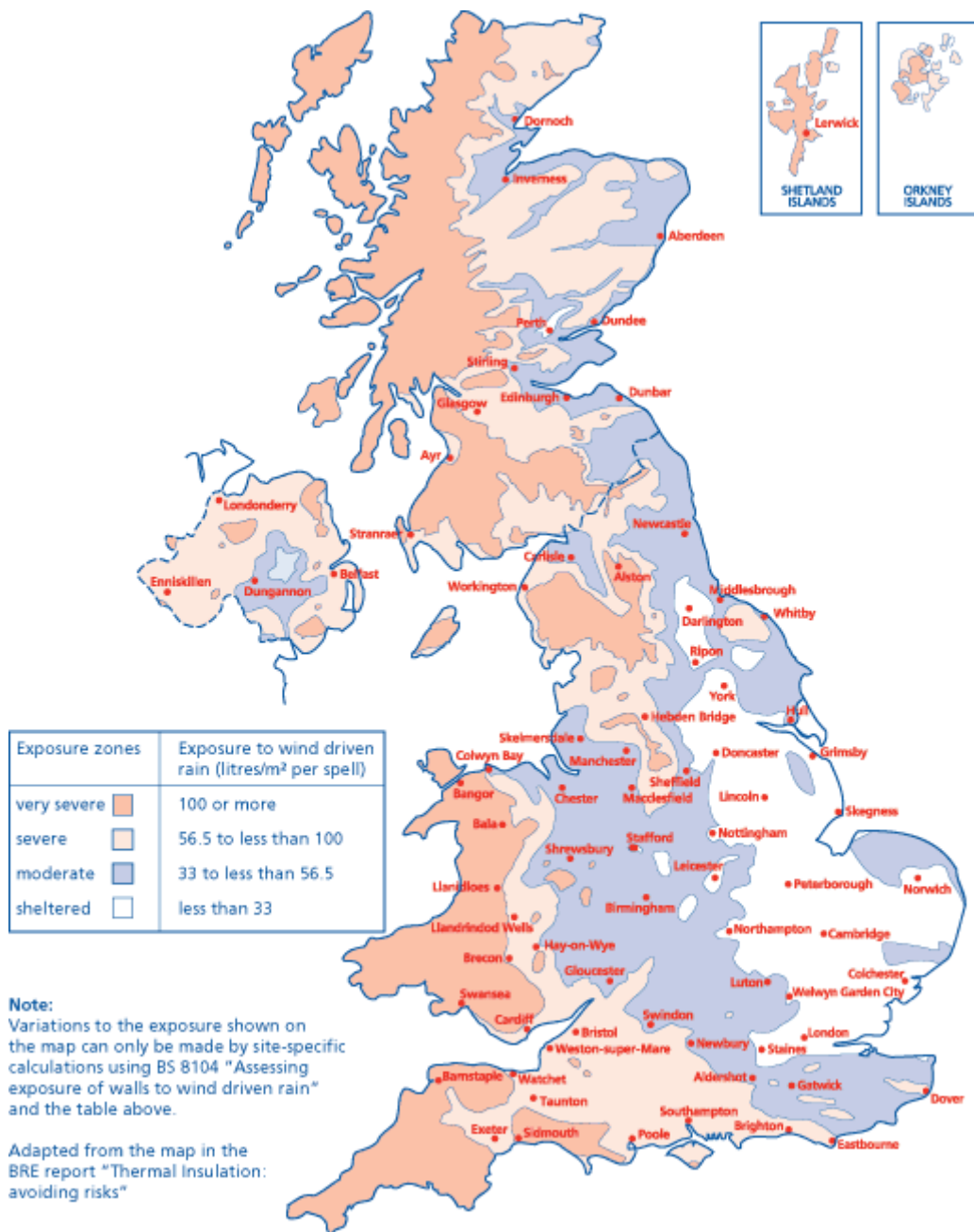
# Minimum Recommended Head Laps for Hook Fixing

Table 1

Roof Pitch		LAP in MM								
		Region 1 (Exposure less than 56.5 l/m <sup>2</sup> )			Region 2 (Exposure 56.5 to 100 l/m <sup>2</sup> )			Region 3 (Exposure more than 100 l/m <sup>2</sup> )		
Cm/m	In degrees	Horizontal Projection of Roof Slope in Metres			Horizontal Projection of Roof Slope in Metres			Horizontal Projection of Roof Slope in Metres		
		0 – 5.5	5.5 – 11	11 – 16.5	0 – 5.5	5.5 – 11	11 – 16.5	0 – 5.5	5.5 – 11	11 – 16.5
20	11.30	153								
22.5	12.66	147								
25	14.00	141	153							
27.5	15.33	136	147		153					
30	16.67	131	142	153	147					
32.5	18.00	126	136	147	141	153				
35	19.33	122	131	142	136	147		153		
37.5	20.50	118	127	137	132	142	153	147		
40	21.67	114	123	132	127	137	147	142	153	
45	24.00	107	115	124	119	128	138	133	143	153
50	26.50	102	109	117	113	121	130	126	134	142
55	29.00	97	103	111	107	115	123	119	127	135
60	31.00	92	99	106	103	109	117	113	121	128
70	35.00	86	92	98	94	101	107	104	110	117
80	38.67	80	86	91	88	94	100	97	103	108
90	42.00	76	81	87	84	89	94	92	98	102
100	45.00	73	78	83	80	85	91	88	93	97
120	50.00	69	73	78	75	80	85	82	87	91
140	54.50	65	70	74	72	77	81	79	83	87
170	59.50	62	67	71	69	73	77	75	80	84
200	63.50	61	65	69	67	71	75	73	77	81
250	68.00	59	63	67	65	69	73	71	75	79
300	71.50	58	62	66	63	68	72	70	74	78
375	75.00	58	61	65	62	67	71	69	73	76

1. The minimum laps indicated above are given for a normal site within the given region.
2. In the case of the lowest pitch for an exposed site the lap of 153 mm is a maximum. Therefore, it is advisable to increase the roof pitch.
3. For a lap greater than 110mm, the calculation given above assumes the use of a hook with a wavy shank to limit the amount of capillary attraction. '
4. The lap calculations have been arrived at by many years of observation in Europe and laboratory studies notably by the French experts Messers. Brandilly, Rochette and Sangue.
5. Hooks are available in cramp type (to clip over the battens) and nail type for use on sarking, eaves, verges

## Map Showing Categories of Exposure to Wind Driven Rain



Source: NHBC Standards 2010 based on BS 5534