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## **IMERYS ROOF TILES FIXING GUIDELINES:**

### **INSTALLING IMERYS ROOF TILES**

All roofing work should be treated in a responsible and workmanlike manner in accordance with relevant Codes of Practice (BS5534: Part 1: 1997 and BS8000: Part 6: 1990), Building Regulations and Health & Safety recommendations. If in doubt seek advice from Imerys Roof Tiles.

Before starting work the following points should be fully understood: -

#### **ROOF STRUCTURE**

When re-roofing, the existing timbers may require strengthening to carry the weight of the new roofing material. All re-roofing is now subject to Building Regulations and full advice should be obtained from your Local Building Control Officer.

#### **SAFETY**

Access to roofs for tiling should be via correctly erected and supported scaffolding with boards. A safety barrier is required at eaves if the height exceeds 1.98 metres.

#### **ROOF PITCH**

Ensure that the tile profile is suitable for the pitch of the roof structure. It is important that the correct lap is maintained. With some profiles the risk of water capillary action can be prevented by increasing the headlap, but only within the specified range.

For below-pitch applications seek advice from the Imerys Technical Department.



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## TILE FIXING

Roof tiles are fixed to battens using nails or clips. The frequency of fixing is dependent on building size, location and exposure. See table below: -

ROOF PITCH	MINIMUM FIXING SPECIFICATION (see note below)
<b>INTERLOCKING TILES</b>	
17.5° - 29°	All perimeter tiles nailed, all tile in the local and general roof area should be clipped.
30° - 44°	All perimeter tiles clipped or nailed depending on exposure, every third row of tiles must be nailed.
45° - 54°	All tiles must be nailed.
55° and above	All tiles must be nailed and clipped.
<b>PLAIN TILES</b>	
35° - 59°	Two courses of tiles at eaves and top courses twice nailed. In addition, all perimeter tiles and every fifth course twice nailed.
60° and above	All tiles twice nailed.

**Note: The fixing specifications shown here are minimum requirements. Additional areas of fixing may be necessary.**

## SITE WORK

- It is good practice to dampen products prior to mortar bedding. Ensure all bedding surfaces are clean and free from harmful matter.
- Tiles requiring cutting to covered details, e.g. hips, tiles, flashings, may be cut using a hammer or pincers.
- Tiles cut to the rake or mitre in open details, e.g. valleys, external angles, should be trimmed with a disc cutter or scribed and cut using a hammer/pincers, to ensure a neat finish.



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### **MORTAR MIX**

Mortar should consist of the following mix measured by volume.

- 1 cement: 3 sharp sand. This is the only mix suitable for bedding clay tiles and accessories.

### **PREPARATION**

- Mix mortar by machine to obtain uniform consistency and colour, and use within 2 hours of preparation.
- Avoid pointing with a separate mix of mortar to that used for bedding.
- Dampen the mortar bed prior to pointing. Mortar may be coloured to match the tile colour. Pigment should not exceed 1 part in 60 of the total mix.

### **ROOF VENTILATION**

To meet the guidance in Approved Document F and consequently satisfy the requirements of the Building Regulations 1991 all new buildings are to be provided with minimum eaves-to-eave roof ventilation equivalent to a continuous opening of 10mm each side of the roof. (Roof pitches 15° and above a cold roof only). For warm roof construction where the insulation follows the rafter line you must ensure 25mm continuous air gap is maintained along eaves. High level ventilation in conjunction with low level eaves ventilation requires the equivalent to a continuous 5mm gap at the ridgeline.

Mono-pitch and lean-to-roofs and 'room in the roof' constructions are also required to have eaves-to-ridge ventilation and may exceed the requirements stated above, additional ventilation advice is available on our website: [www.imerys-rooftiles.com](http://www.imerys-rooftiles.com).

### **CONTROL OF CONDENSATION**

Condensation can occur in roofs and walls when warm humid air is cooled below its dew point. This can occur on surfaces or within a structure or system, e.g. thermal insulation, when it is known as interstitial condensation. Condensation which results in timber rot, metal corrosion, damage to insulation, furnishings, etc. is known as harmful condensation.

Information on methods available to control harmful condensation is given in BS 5250. The most effective method of controlling condensation in pitched cold roofs voids is by

### **EFFECTIVE AIR VENTILATION**



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### **EFFECTIVE AIR VENTILATION**

Effective flow of air ventilation requires an inlet and outlet, which ideally should be located at different levels. Stagnant air pockets should be avoided.

The Air ventilation flow in roof voids may be:

- a) low level to low level, e.g. eaves to eaves;
- b) eaves or low level to the ridge, or high level; using tile vents
- c) a combination of a) and b).

Ridge or high level ventilation should not be provided without adequate eaves or low level ventilation as the suction effect at ridge and high level may imbalance the ventilation system and cause warm humid air to be drawn up from the building below, thereby increasing the risk of condensation.

Vapour control layers with a high water vapour resistance may be located at the warm side of the insulation but they cannot be considered as an alternative to air ventilation.

### **BREATHABLE MEMBRANES**

If considering the use of breathable membranes, which are, used normally with vapour control barriers, counterbattens should be used to create a minimum 50mm air space within the batten cavity. Please check with manufacturers technical literature and guarantee prior to your installation

Imerys Roof Ventilation Products satisfy most requirements and further guidance can be obtained by reference to Technical Literature and the Building Regulations.

### **GROUDWORK Rafters & Fascias**

Check that all roof timbers are correctly fixed and that the rafters or trusses are aligned and at equal pitch. Fix the eaves fascia or tilting fillet at the correct height so that the eaves course of tiles is supported at the same pitch as the main roof tiles. Support the underlay behind the fascia or tilting fillet, using plywood or a propriortry Eaves Ventilation System which incorporates a felt support strip.



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## UNDERLAY

Approved reinforced roofing underlay should be laid over rafters, parallel to eaves or ridge and lapped 150mm horizontally and 150mm vertically and secured with clout head nails. Ensure the underlay is fully supported behind the fascia, to prevent possible ponding and extend into the eaves gutter.

Some underlay materials may degrade in this exposed position. It is recommended that a more durable 5U grade be used as specified in BS 747.

- Minimise the gap at the laps, resulting from different tautness between underlay courses.
- Fix underlay with extra-large head galvanised felt nails, 3.00mm diameter, keeping the number of perforations to a minimum.
- Handle and fix underlay with care to ensure no tears or punctures. Repair any tears or punctures prior to tiling.
- Ensure that the underlay does not obstruct the flow of air through ventilators located at eaves, ridge or in the main roof.
- Avoid contact between underlay and underside of tiles.

## BATTENS ROOF

- Ensure battens are minimum 1200mm in length and are supported at each end and intermediately by a total of at least 3 rafters, trusses or walls.
- Stagger butt joints over intermediate supports: - Interlocking tiles – Not more than 1 joint in any 4 consecutive battens on the same support. Plain tiles – Not more than 3 joints in any 12 consecutive battens on the same support.
- Fix the specified battens up the roof slope on top of the rafters ensuring a minimum 40mm nail penetration into the rafters.
- Nail counter battens vertically up the roof slope where boarding is used to coincide with the line of the rafters.
- Check that batten sizes comply with the relevant spans of rafters.

## WALL

- Fix the specified battens to the boarding/sheathing/sarking in line with vertical supports or to the masonry wall as specified.
- Secure the counterbattens to masonry walls by fixing cut nails into the built-in timber pads in mortar joints or by plugs and screws.



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## SETTING OUT THE ROOF

Determine the batten gauge prior to fixing, in order to avoid unequal overhangs at eaves, verges and cutting tiles at abutments.

**1<sup>st</sup> Step:** Fix the eaves course batten to ensure the eaves tiles overhangs the fascia into the centre of the gutter. (A double course of tiles is required for Plain tiles).

**2<sup>nd</sup> Step:** Fix the top course batten so that the ridge tile provides a minimum 75mm cover to the top course tile.

Divide the remaining distance between the top of the eaves batten and the top of the ridge batten by the maximum gauge for the tile. Round the figure up to give the number of courses up the slope as a whole number. Divide the measured distance by the number of courses to give the batten gauge.

Note: (a) The above applies only to a roof pitch with no features such as dormers, chimneys etc. Batten gauges between all such fixed points should be calculated individually. (b) Where the roof slopes of varying pitch intersect the batten gauge should be set to the lower or longer rafter pitch.

**3<sup>rd</sup> Step:** Set out the roof along the eaves starting with the correct overhang at the right-hand verge (maximum 50mm). The correct overhang on the left-hand verge can be achieved using full tiles by opening or closing the side lap between the tiles.

On short eaves, tiles may require cutting. Cut tiles at the verge should be at least half the width of a full tile.

Check the horizontal and perpendicular alignment using a chalk/ochre line striking at 3 tile intervals.

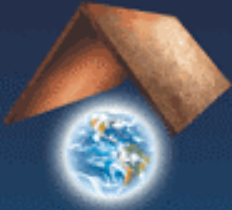
## COMPLETION OF TILING

Load out all tiles on roof evenly before commencing tiling.

Work from right to left. Leave out the third and fourth tiles from the left-hand verge and make use of the tile battens as a ladder enabling the upper part of the roof to be reached for fixing ridges. Fix the left-hand verges tiles as you descend the roof.

## ROOF DETAILS EAVES

- Check that the eaves course of tiles is at the same pitch as the main tiling.
- Nail and/or clip all eaves tiles.
- Fit a comb-eaves filler for deep profiled interlocking tiles.
- Ensure that the eaves course of tiles overhangs the fascia so that water runs into the centre of the gutter.
- Provide a minimum 10mm or equivalent continuous eaves to eaves ventilation.



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## VERGES

- Nail and/or clip all verge tiles.
- Continue underlay across wall cavity and below undercloak.
- Provide an outward tilt for fibre-cement undercloak, fitted below tiling battens, to bed verge tiles.
- Ensure all verge overhangs are equal (38-50mm).
- Cut back tiling battens to ensure they are not in mortar.
- Avoid pointing with a separate mix of mortar.
- Imerys Dry Verge and Cloak Verge Systems provide a more secure detail and are maintenance-free and easy to install.
- Use special half-tiles and tile-and-a-half (gables) in alternate courses to break bond for Imerys HP10, Beauvoise and all Plain tiles.

## RIDGES

- Overlap ridge underlay by a minimum 150mm.
- Nail and/or clip all top course tiles on either side of the ridge.
- Bed dentil slips in mortar in the pans of high profile tiles.
- Ensure 75mm cover is provided by ridge tile over top course tiles.
- Keep ridge tiles set in a true line, with continuous edge bedding on to top course tiles with solid bedding at butt joints.
- Mechanically fix the two end ridge tiles at each gable end, abutment or junction.
- The Imerys Ventilated Dry Ridge System provides total mechanical fixing of all ridge tiles and in addition satisfies the requirement for ridge ventilation equivalent to a continuous 5mm opening.

## HIPS

- To avoid the use of unsightly hip irons, mechanically fix special hip end tiles with appropriate stainless screws, rubber seals and caps.
- Close mitre roof tiles where they meet the hip and ensure each tile is nailed or clipped.
- Bed and fix all small pieces of tile.
- Mitre hip tiles at ridge junction and ensure end tile does not kick up.
- Cut the bottom hip tile to align with the eaves.
- Bed in mortar Plain tile Bonnet Hips and nail to hip rafter.
- Imerys Dry Hip System for interlocking tiles, provide a more secure and maintenance free system.



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## VALLEYS

The construction of valleys and their width can vary according to roof pitch, they should be formed using one of the following methods: -

### Interlocking Tiles

- Use GRP or Standard Code 5 Lead 450mm wide and supported on boards.

### Plain Tiles

- Purpose made valley tiles supported on boarding.
- Open metal valley formed with Code 4 Lead Sheet supported on boarding.
- Mitred Valley using tile-and-a-half tiles cut to the rake of the valley, with Code 3 lead soakers on boarding (50° pitch and above).
- Keep an open channel between cut edges of roof tiles (125mm).
- Keep interlock laps free of mortar to avoid damming.
- Do not lay underlay directly beneath a lead valley.
- Ensure that an undercloak is used to apply mortar over lead.
- Mechanically fix all tiles either side of the valley. Bed small tile pieces firmly in mortar.
- Provide support for all valley materials in the form of plywood layboards fitted between and finished level with the top of rafters.

## LEADWORK

All leadwork should conform to BS1178. The thickness for the following applications should not be less than:

- Valleys – 2.24mm Code 5
- Flashings – 1.80mm Code 4
- Soakers – 1.32mm Code 3

Untreated lead or aluminium flashings may cause run off and staining of the roof covering, a coating of patination oil on the lead surface, pre-coated or painted aluminium should avoid these unsightly stains on a newly completed roof.

## VERTICAL TILING

The following details apply to Plain and Feature tiles:-

- Lay Vertical Plain and Feature tiles to a maximum gauge of 115mm (35mm lap). Twice nail each tile with 38 x 3.00mm alloy nails  
Provide a double-course at eaves using shorter eaves tiles to break bond. Twice nail both eaves course tiles.
- Use tops tiles at all top edges and twice nail to supplementary batten. Provide lead flashing to cover top course tiles by a minimum 100mm.
- Purpose made external angles (left and right hand) are available to break bond with the main tiling. Close mitres and lead soakers should be used where angles are impractical.
- Tile-and-a-half (gables) should be used at gables and raking abutments utilising the "Winchester Cut" technique. Tile-and-a-half tiles are splay cut at the end of each course to the angle of the rake.



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#### REFERENCES

- BS 5534: Part 1 (1997) Code of Practice for Slating and Tiling.
- BS 8000: Part 6 (1990) Code of Practice for Workmanship on Building Sites.
- Approved document F2 Condensation (1990) and BS 5720.
- BS 5250 (1989) Code of Practice for the control of condensation in buildings.
- BS 6399-2 Wind loading,
- BS EN 1304 European Standard for Clay Roofing Tiles.