THE REDLAND GUIDE TO BS 5534

HELPING YOUR COMPANY TO GET ONE STEP AHEAD

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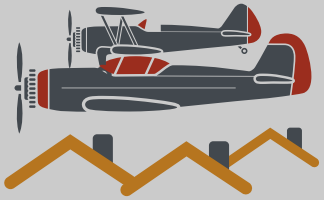
Redland



BS 5534, the Code of Practice for Slating and Tiling in the UK was first published as CP 142 in September 1942.

It sets the standards for recommended best practice for slating and tiling, covering all aspects of pitched roofing above the rafters.

Enforcement is via authorities such as the National House Building Council (NHBC) and Local Authority Building Control.

NHBC LABC

FEBRUARY 2015

Due to the significance of the changes, the old standard[3] can still be used up until February 2015 to allow the industry time to adapt. UK Government money has been provided to the National Federation of Roofing Contractors (NFRC) to provide training.

The new Code of Practice[2] was published in August 2014 and can be used immediately.

THE BASICS.

BS 8000-6

Some of these changes were published last year in the revised BS 8000-6[1], the Code of Practice for Workmanship on Building Sites dealing with slating and tiling of roofs and walls.

The new Code of Practice includes key changes that are based on developments during the past decade, including:

- **EU** — Replacement of national standards with European standards.
- Changes in building practices.
- Improved knowledge and understanding of how roofs perform.
- Changes in UK climate.

WHAT HAPPENS NOW?

Here at Redland, we're aware that any changes in industy Codes of Practice or working standards can be a big headache for businesses.

Along with the need to maintain a high quality standard for your customers there's the added problem of having to navigate increasingly complex regulations, most of which will have a significant effect on the way you price your projects, thereby affecting your ability to maintain a competitive edge.

That's why this Redland Guide to BS 5534 is so important to you.

It not only highlights the most significant elements of the new Code of Practice, explaining what impact they'll have on you and your business, but it also tells you what the Redland product solution is for each area, allowing you to get one step ahead of businesses that might be slower to react to these changes.

Breaking BS 5534 down for you will make understanding the changes as easy as 1, 2, 3…

1. **Mechanical Fixing of Ridge and Hip Tiles**
2. **Tile Fixings**
3. **Underlays**

Now read on for our guide to getting it right...

1. MECHANICAL FIXING OF RIDGE AND HIP TILES.

The use of traditional cement and sand mortars for the fixing of ridges, hips, verges and other roof fittings has a long history in the UK.

This practice is highly dependent on workmanship as the strength of cured mortar is sensitive to many variables. These include cement or sand type, additives, water content, mortar mix composition, temperature, humidity, cleanliness of surfaces, etc.

The new Code of Practice states that mortar alone cannot be used to fix ridges and hips. So, even if mortar is used, the ridges and hips must also be mechanically fixed.

This means if mortar is used then additional materials are needed including a ridge/hip batten with fixings to rafters, a damp proof membrane to protect the ridge/hip batten and mechanical fixings for securing the ridge/hip tiles to the ridge/hip batten.

While the above secures the ridge/hip tiles it does not prevent the risk of mortar failure, resulting in roof leakage and subsequent repair work. A simple way of avoiding all the hassle associated with mortar is to use modern dry-fix ridge/hip solutions instead.

BE WARNED:

The NHBC saw claims against its 10 year Buildmark warranty increase to more than £12 million in 2011. Nearly two thirds of all roofing claims against the Buildmark warranty are related to mortar failure.

Typical storm damage to hip due to reliance on mortar alone.

REDLAND SOLUTION →

REDLAND SOLUTIONS:
DRY-FIX RIDGES AND HIPS.

All Redland's dry-fix ridge and hip products include mechanical fixings that comply with the new Code of Practice.

Benefits of Redland dry-fix products:

- Mechanical fixings and all the components you need included
- Ridge packs provide high level roof space ventilation avoiding the need for ventilation tiles (helps comply with NHBC Technical Standards[4])
- Quicker to install than mortar
- Can be installed even when bad weather is forecast
- Maintenance free, unlike mortar which periodically requires repointing.

Courtesy of Right Choice Roofing, Wirral

Redland dry-fix ridges

In a conventional cold roof construction Redland's dry-fixed ventilated ridge systems remove the need for low-level roof space ventilation, when installed with Redland's Spirtech 400 2S underlay (see pages 14-15) and a well-sealed ceiling below.

In new build housing situations the elimination of the need for low-level roof space ventilation can help housebuilders overcome thermal bridging issues at the eaves, improving Part L1A SAP ratings.

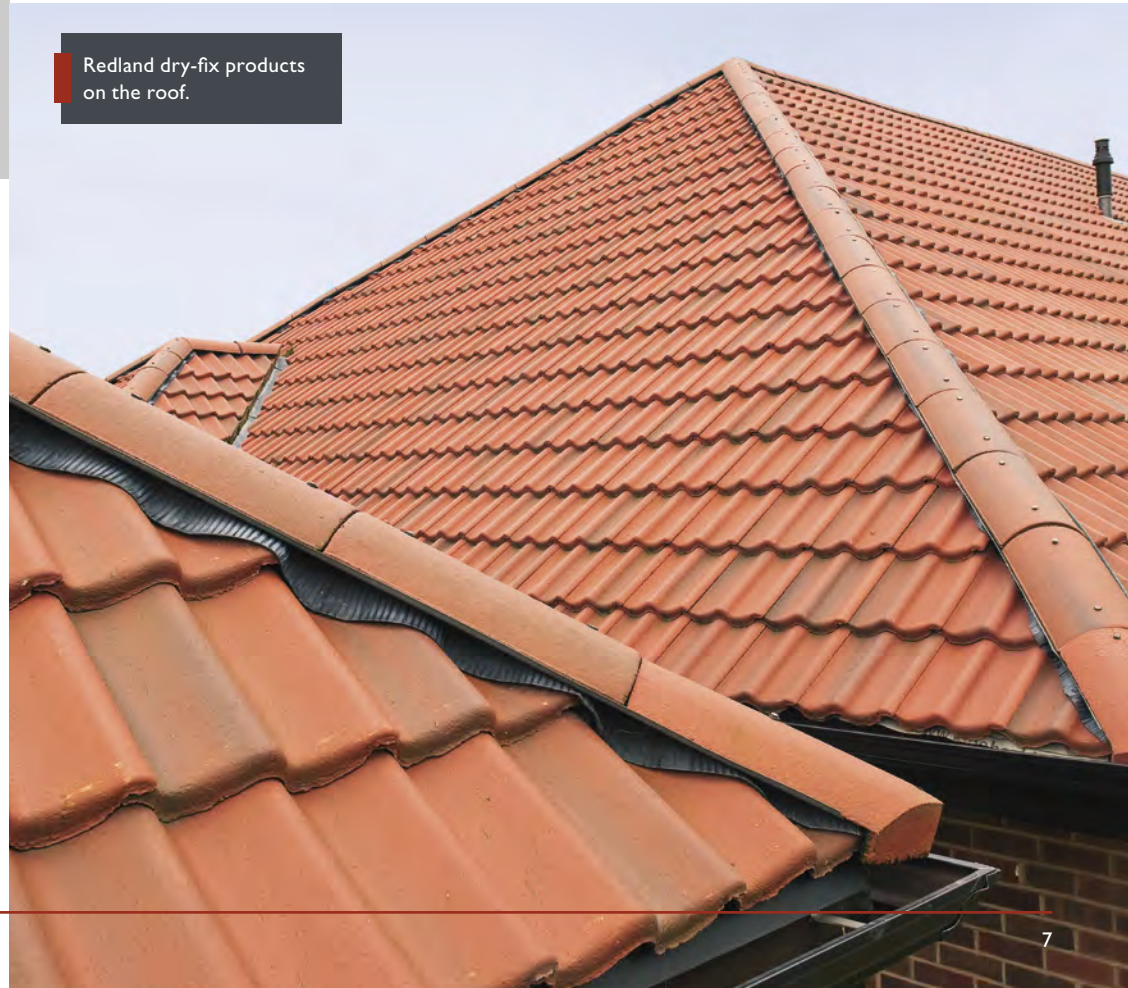
Redland Uni-Vent Rapid Ridge/Hip

Redland's Uni-Vent Rapid Ridge/Hip is a universal solution for the mechanical fixing of ridge and hip tiles.

- One cost-efficient 10m pack
- With a rollable membrane to allow ventilation of the roof space at the ridge or batten space at the hip
- Includes a universal flexi-seal which is compatible with the majority of ridge and hip tiles.

For more information on the Redland product solutions please visit our website:

www.redland.co.uk/hips
www.redland.co.uk/ridges



Redland dry-fix products on the roof.

2. TILE FIXINGS.

When the wind blows over a roof, uplift forces act on both the underlay and the tiles. The roof system has to be designed to withstand these forces for the design life of the building, typically 50 years.

Current design wind loads are based upon old national wind load standards[5]. The new Code of Practice introduces load calculations based upon the new Eurocodes[6,7], resulting in greatly increased design wind loads on traditional slated and tiled roofs.

The new Code of Practice also significantly increases the minimum fixing requirements for roof tiles. For example:

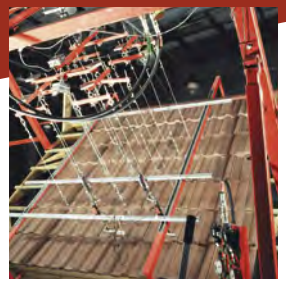
- **All single lapped tiles on a roof now need to be mechanically fixed**
- **Tiles at the perimeter must now have a minimum of two fixings.**

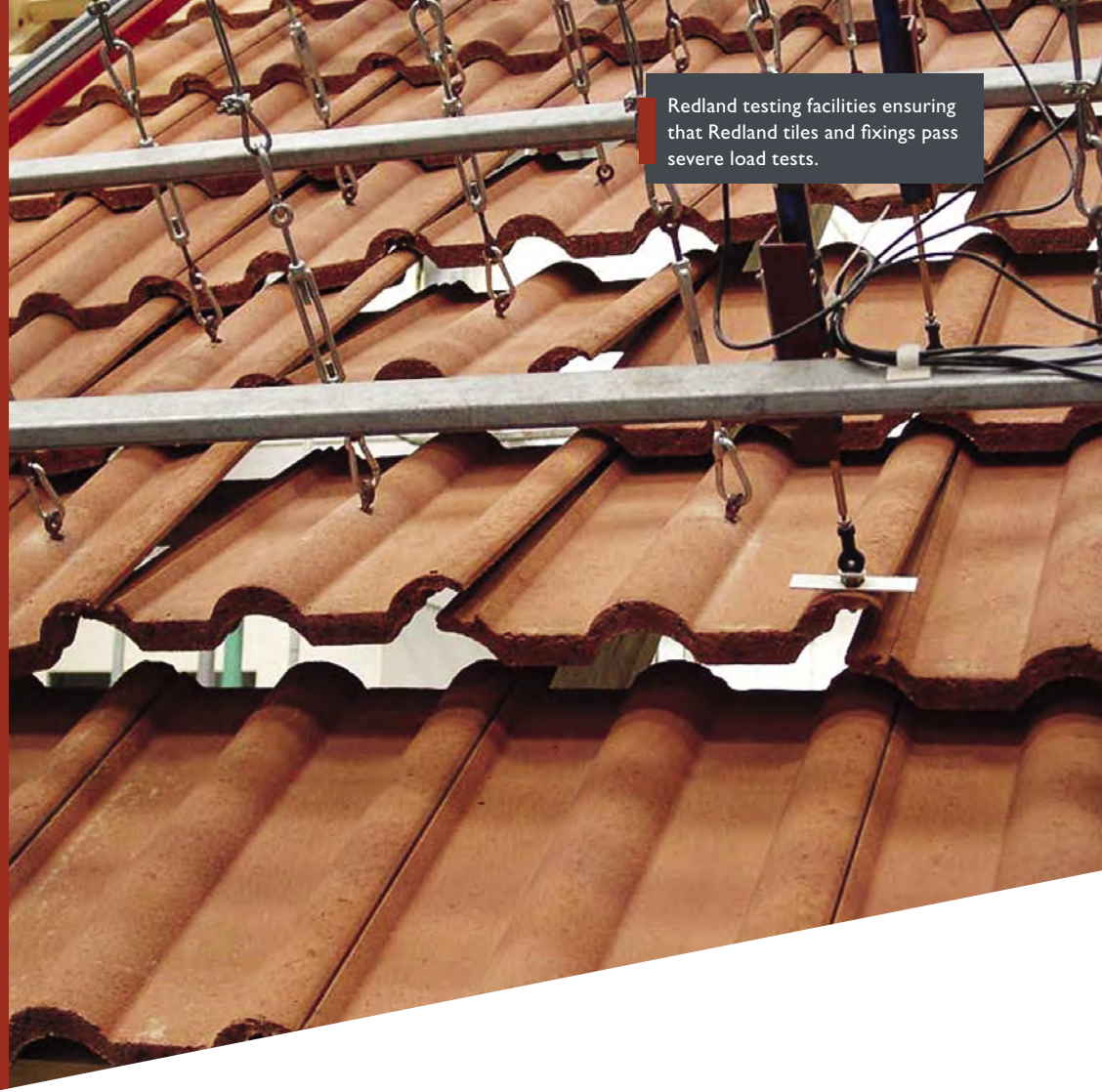
Overall the impact of the new standard for traditional slated and tiled roofs is significantly more onerous fixing specifications.

Since fixing specifications vary greatly and are based on many factors – including location and type of building – it is even more important that every roof is fixed in accordance with manufacturers recommendations, ideally with a site-specific fixing specification.

On a cautionary note contractors should not rely on historic experience and make sure they obtain an updated recommendation.

As part of our commitment to BS 5534, Redland will be updating all fixing recommendations to the new standard.





Redland testing facilities ensuring that Redland tiles and fixings pass severe load tests.

BE WARNED:
Enforcement to ensure the correct fixing of roofing systems is increasing.

REDLAND SOLUTION →

REDLAND SOLUTIONS: FIXINGS AND FIXMASTER.

Redland supply a comprehensive range of fixings for our range of tiles including nails, screws and clips. These fixings are designed specifically for Redland tiles and are manufactured from quality materials to comply with the new Code of Practice.

Redland's new online fixings calculator tool – FixMaster Online – is accessible from the Redland website or via mobile devices. It gives an instant and simple fixing specification for a site wherever you are.

The online tool can calculate a fixing specification based on both the old and new versions of BS 5534, and for any Redland tile.

For a more detailed specification, Redland's Technical Solutions team provide thousands of fixing specifications every year for contractors across the UK. Contact the Redland Technical Solutions Hotline on 08708 702595.

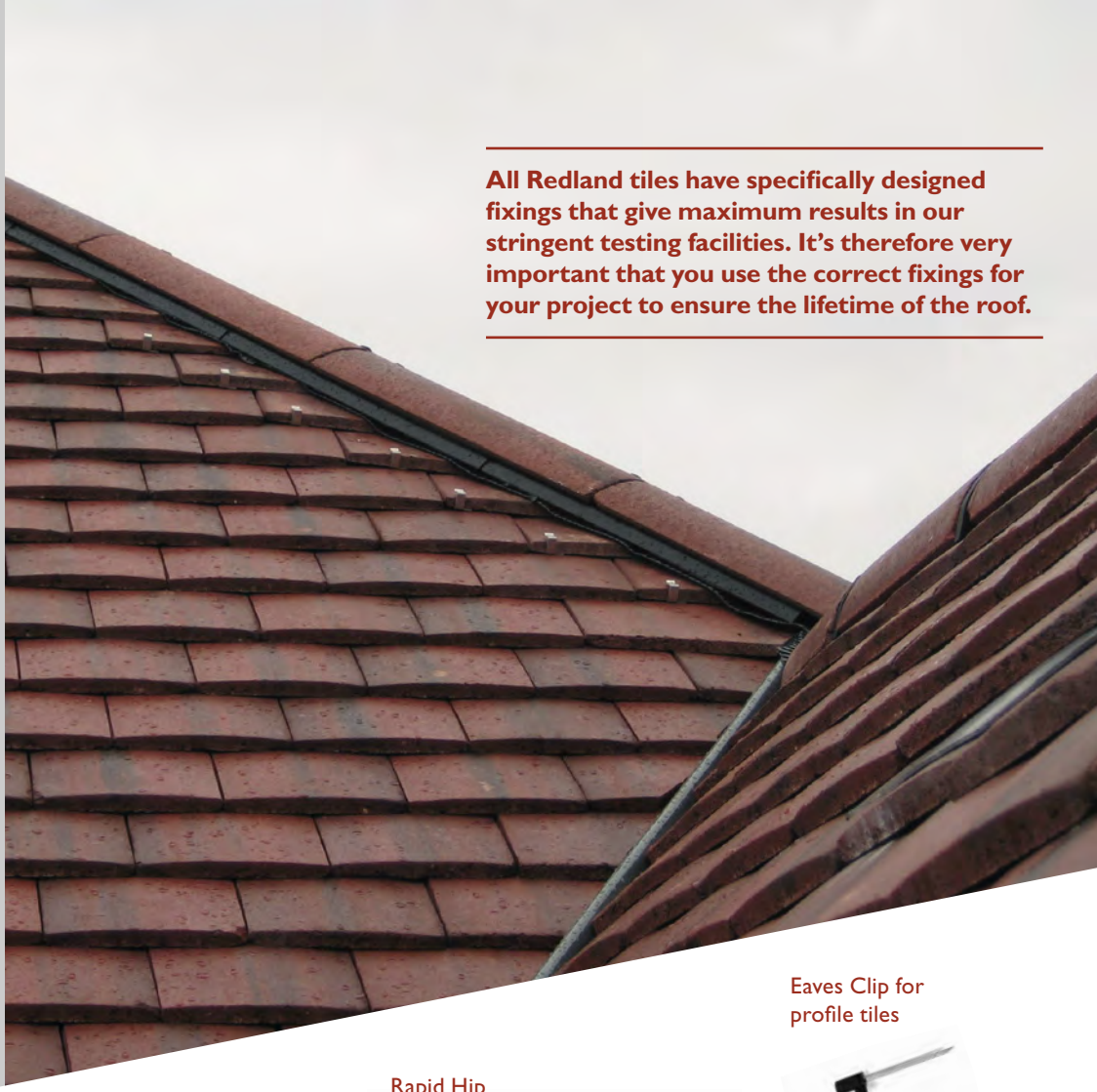
The service has been updated to the new standard providing the most economic fixing specifications available for Redland roof tiles.

www.redland.co.uk/fixmaster

FixMaster Online will provide a fixing specification to ensure your roofs are securely installed to the latest standards.

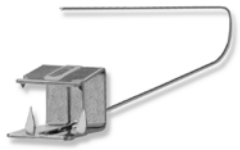
FixMaster

FixMaster Online is Redland's new free-of-charge online tool to give you an instant fixing specification for your roof. Simple to use, even on site using your mobile phone.

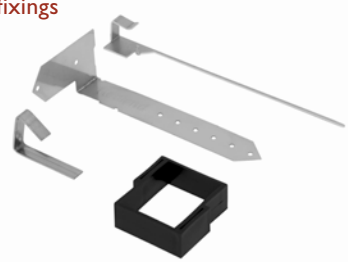


All Redland tiles have specifically designed fixings that give maximum results in our stringent testing facilities. It's therefore very important that you use the correct fixings for your project to ensure the lifetime of the roof.

Kro-Clip



Rapid Hip fixings



Eaves Clip for profile tiles

C-Clip

Examples of some of the many clips available from Redland.

For more information on the Redland product solutions please visit our website: www.redland.co.uk/tile-fixings

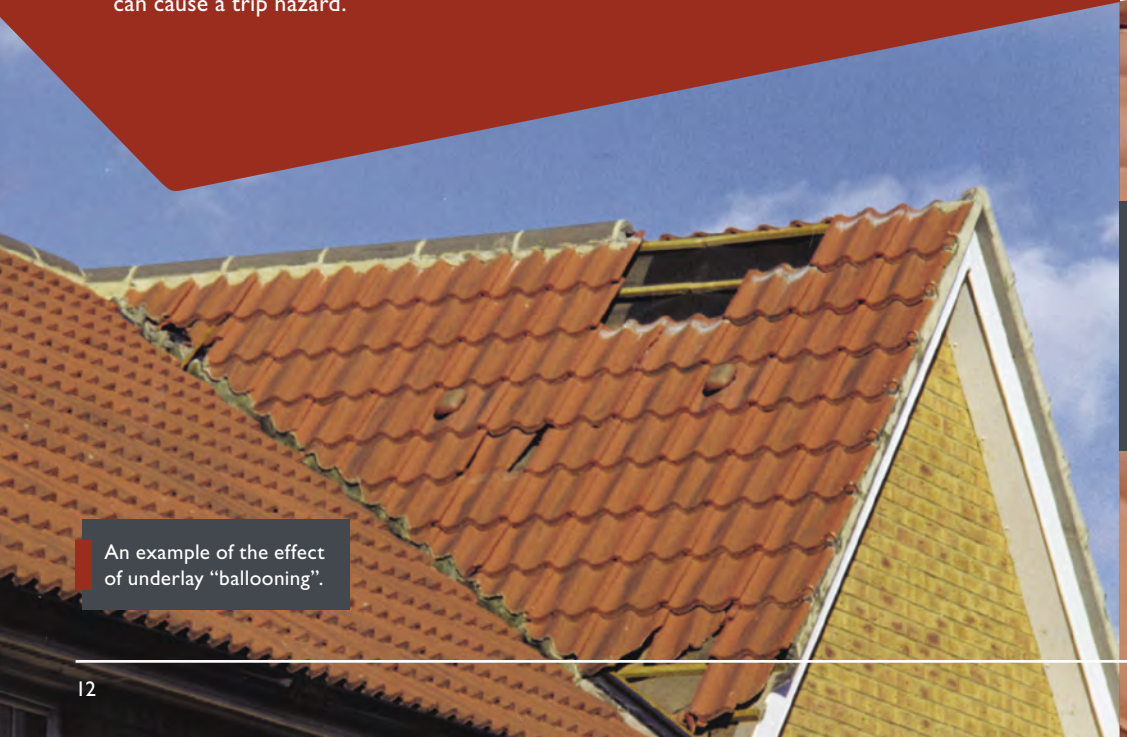
3. UNDERLAYS.

The primary purpose of a roofing underlay is to reduce the wind load acting on the roof tiles by taking a significant proportion of the wind load itself. To do this successfully, it must not stretch to the point where it can touch the underside of the roof tiles when subjected to wind pressure.

If a roofing underlay does stretch, or "balloon", so that it touches the back of the roof tiles, then it ceases to perform this primary function with the full wind load transferred onto the roof tiles.

The tile manufacturers' fixing specifications do not allow for this additional load and roof tiles can be blown off the roof even if they are nailed and clipped.

A related problem concerns the bursting open of unsealed underlay laps when subjected to wind pressure which can also cause the removal of roof tiles. Both the old and new Code of Practice recommend an additional timber batten be installed over the horizontal lap between courses of underlay to prevent the risk of this happening. While this is recommended practice many roofing contractors do not like installing these additional battens and they can cause a trip hazard.



An example of the effect of underlay "ballooning".

The European product standard for underlays[8] does not address this issue. So even if an underlay is CE marked it does not mean it necessarily complies with the new Code of Practice.

Previously, third party certification bodies, such as the BBA, used different tests to assess the wind uplift resistance of roofing underlays. The differing test results caused confusion about which underlays performed better than others.

The new Code of Practice introduces a single test for the measurement of the wind uplift resistance of underlays, which all testing bodies will follow to allow for greater transparency.

A new labelling system has also been introduced indicating where an underlay can be used for different batten gauges.

BE WARNED:
Under these new standards many current popular brands of underlay will no longer be fit for installation on UK roofs. Before you buy, ensure that your preferred manufacturer has the necessary checks and testing in place.

REDLAND SOLUTION →

REDLAND SOLUTIONS:
REDLAND SPIRTECH 400 2S UNDERLAY.

Redland's innovative new Spirtech 400 2S is an underlay with a difference. It has two integrated glue strips that seal together once the underlay is installed.

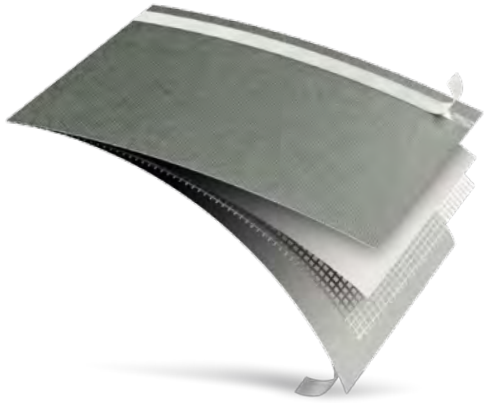
This unique system passes the new BS 5534 wind uplift test for use anywhere in the UK. This means you don't have to worry about the batten spacing when using it. The technology also eliminates the need for additional timber battens over the horizontal laps, otherwise required by other underlays on the market, improving safety on the roof while saving material costs.

It is clearly labelled for easy checking, as recommended in the new Code of Practice.

The underlay's unique combination of horizontal sealed laps (achieved via integrated double glue strips) and low vapour resistance ensures that the underlay fully resists the wind load whilst not compromising its ability to adequately control the risk of roof space condensation.

Spirtech 400 2S:

- **Eliminates the need for additional battens over the horizontal underlay lap (required by other underlays)**
- **Easy to glue laps whether the underlay is laid draped or fully supported.**



4-layer Spirtech 400 2S with integrated glue strips

Below is an example of the new easy-to-understand labelling that will be present on the packaging of every roll of Redland's new Spirtech 400 2S underlay. It shows the underlay can be used everywhere in the UK without restriction irrespective of the slate/tile batten gauges.

Product	Identification	Manufacturer	Website
Spirtech® 400 2S	Art.-no. 540042	Monier Roofing Components	www.redland.co.uk
Batten Gauge	**Declared wind uplift resistance, P_D (Pa)**	**Zone suitability**	**wind zone map**
< 345mm	>2,200	1 to 5	
< 250mm	>2,200	1 to 5	
< 100mm	>2,200	1 to 5	

NOTE: Zone suitability applies only for underlays in applications where a well-sealed ceiling is present, ridge height is not greater than 15 m, roof pitch is between 12.5° and 70°, site altitude is not greater than 100 m, and no significant site topography is present. Other applications might require underlays with greater wind uplift resistance and it is advisable to seek professional advice.

For more information on the Redland product solutions please visit our website: www.redland.co.uk/spirtech-400-2S

WHAT DOES THIS MEAN FOR YOU?

1.

Mechanical Fixing of Ridge and Hip Tiles

Ensure that all ridges and hips are mechanically fixed if mortar-bedded or alternatively use dry-fix systems.

2.

Tile Fixings

Obtain and implement updated, site-specific fixing specifications from the manufacturer of the roof tiles being used. Beware, as tile fixings (particularly clips) are designed for specific roof tiles. Not all tile fixings are equivalent as they can vary in their key mechanical properties and therefore performance.

3.

Underlays

Use a roofing underlay that has been tested to the new standard and clearly identified as being suitable for the site location and batten gauge in question. The use of underlays that are clearly labelled can easily be checked by NHBC Inspectors or Clerks of Works on site. Alternatively, the manufacturer should be contacted and evidence provided.

FAILURE TO FOLLOW THIS GUIDANCE MAY RESULT IN THE ROOF BEING STRIPPED AND RE-TILED.

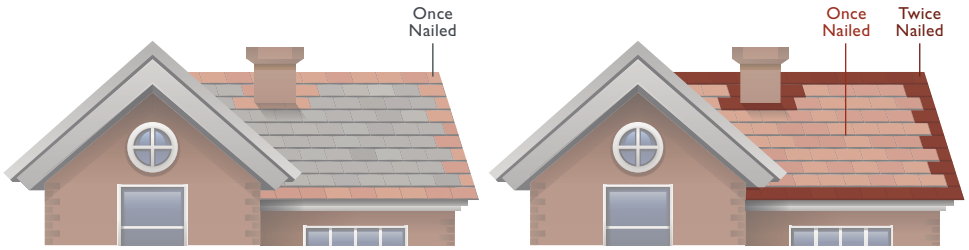
TILE FIXING, BEFORE AND AFTER.

To help understand how these changes can affect the average roof, here are some real-life examples.

4 bed detached house, Northampton

Tile: Mini Stonewold, 35° pitch, duopitch roof, 2 storey (8m ridge height).
This street is in the centre of Northampton.

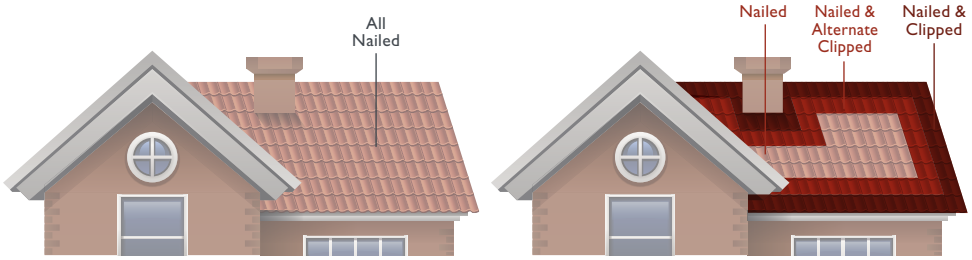
Pre BS 5534 changes	Post BS 5534 changes
All tiles at the perimeter of the roof must be once nailed in right hand nail hole using 50mm x 3.35mm aluminium alloy clout nails. No further fixing is required.	All tiles at the perimeter must be twice nailed, with all remaining tiles once nailed in the right hand nail hole using 50mm x 3.35mm aluminium alloy clout nails.



4 bed detached house, Hereford

Tile: Grovebury, 35° pitch, duopitch roof, 2 storey (8m ridge height).
This road is on the edge of Hereford.

Pre BS 5534 changes	Post BS 5534 changes
All tiles must be nailed using 70mm x 3.75mm aluminium alloy clout nails.	All tiles at the perimeter of the roof must be nailed and clipped. In addition, a band of full tiles 2 wide adjacent to the perimeters must also be clipped in an alternate diagonal pattern. All other tiles must be nailed using 70mm x 3.75mm aluminium alloy clout nails.



TRAINING AND INDUSTRY SUPPORT.

Redland has been selected as one of the NFRC-funded training course providers. The course is available to NFRC member roofing contractors and anyone with an interest in understanding the implications of the changes to BS 5534.

It will give a practical overview of the issues and a range of solutions to make sure your roofs meet the standard.

For more information and bookings please contact:

Redland Training and Resource Centre:
01285 863545
training.redland@monier.com

For further technical information on the changes to BS 5534 and the solutions available from Redland, please contact:

Redland Technical Solutions Hotline:
08708 702595
technical.redland@monier.com

See Redland website for more details:
www.redland.co.uk/bs5534

REFERENCES AND FURTHER READING.

1. BS 8000-6:2013, Workmanship on Building Sites. Code of Practice for Slating and Tiling of Roofs and Walls.
2. BS 5534:2014, Slating and Tiling for Pitched Roofs and Vertical Cladding – Code of Practice.
3. BS 5534:2003+A1:2010, Code of Practice for Slating and Tiling (including Shingles).
4. NHBC Technical Standards, Part 7 – Roofs. Chapter 7.2 Pitched Roofs.
5. BS 6399-2:1997, Loading for Buildings. Code of Practice for Wind Loads.
6. BS EN 1991-1-4:2005+A1:2010, Eurocode 1. Actions on Structures. General Actions. Wind Actions.
7. National Annex (NA) to BS EN 1991-1-4:2005+A1:2010, Eurocode 1. Actions on Structures. General Actions. Wind Actions.
8. BS EN 13859-1:2014, Flexible Sheets for Waterproofing. Definitions and Characteristics of Underlays. Underlays for Discontinuous Roofing.

The full BS 5534 can be obtained from the BSI online shop: shop.bsigroup.com

NHBC
www.nhbc.co.uk

bsi.
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For more information, please go to www.redland.co.uk/BS5534

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