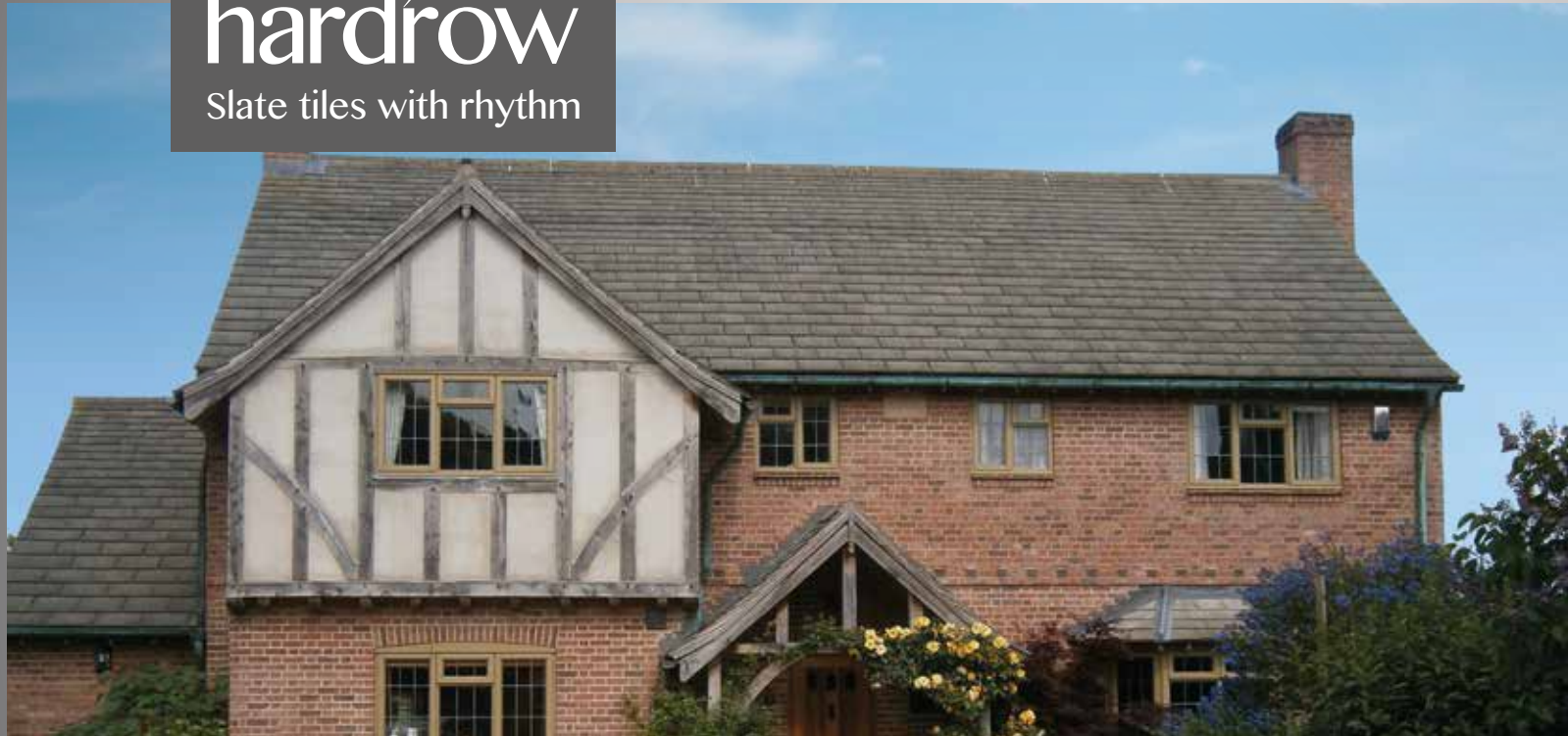


hardrow
Slate tiles with rhythm



Here's how we are
bringing the roofs
of Britain to life...

THE HARDROW LOOK BOOK

SOLOS



DUETS



HARMONIES



Forticrete

The story of Hardrow and Forticrete

Hardrow's® story starts in the early 1920's when a civil engineer, named Robert Abraham, recognised that many of the oldest and most outstanding examples of Georgian and earlier architecture were roofed in large stone slates.

Being both enterprising and inventive, he saw an opportunity to manufacture a product that matched all of the qualities of natural slate. And, at Hawes in West Yorkshire he started to manufacture the first Hardrow® slates. The first roof he slated, that of a barn, still stands today, having weathered nearly ninety years of moorland winters.

Robert Abraham continually improved his manufacturing plant, opening a new works in Liverpool some years later from where Hardrow® slates were sent in large quantities to the Peak District and used extensively on large housing projects throughout Liverpool.

As stone slates became increasingly expensive, architects, planners and builders began to appreciate the natural qualities of Hardrow® - and in 1961 a new factory opened in Stretton, Burton on Trent, to meet this increasing demand.

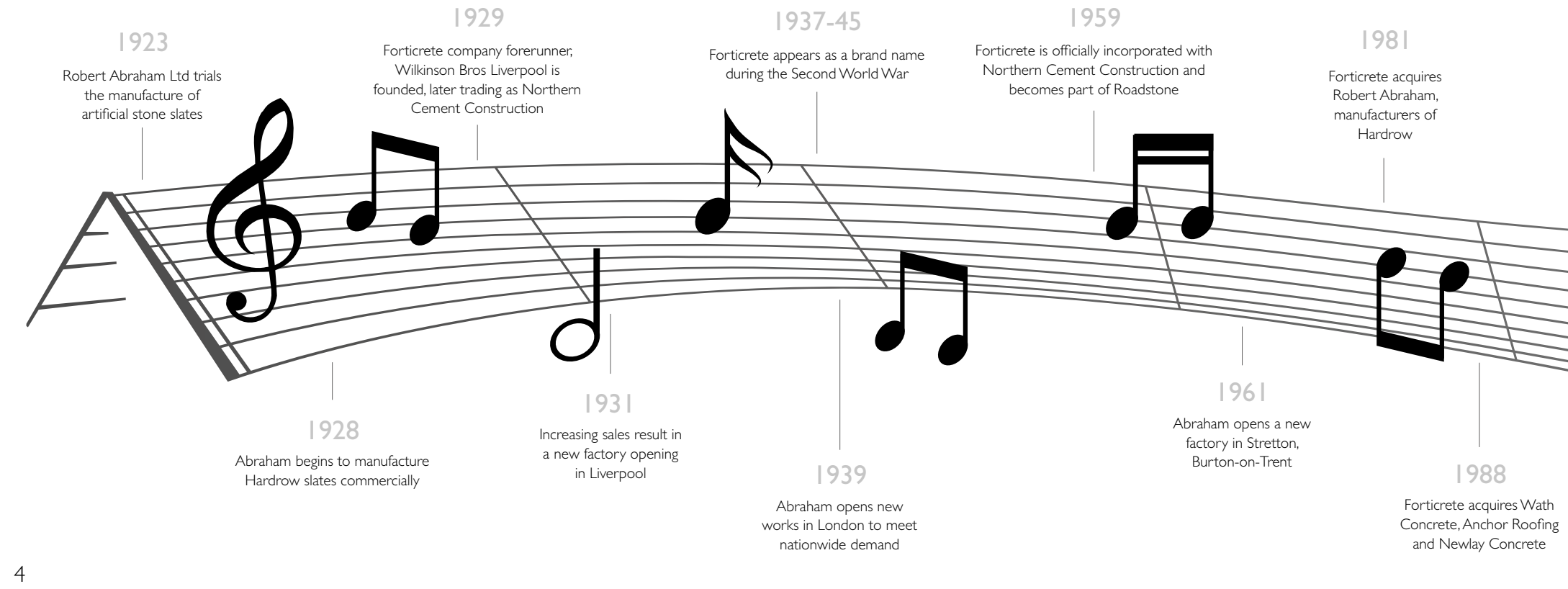
Meanwhile Forticrete came into being as Wilkinson Brothers of Liverpool in the late 1920s, manufacturing bricks, pipes, tiles and terracotta and expanding into ornamental precast concrete and flagstones.

Sharing a similar innovative approach, both companies were quick to recognise that concrete could be used to manufacture highly-effective alternative products to natural stone. And this inevitably led to the acquisition of one by the other in 1981.

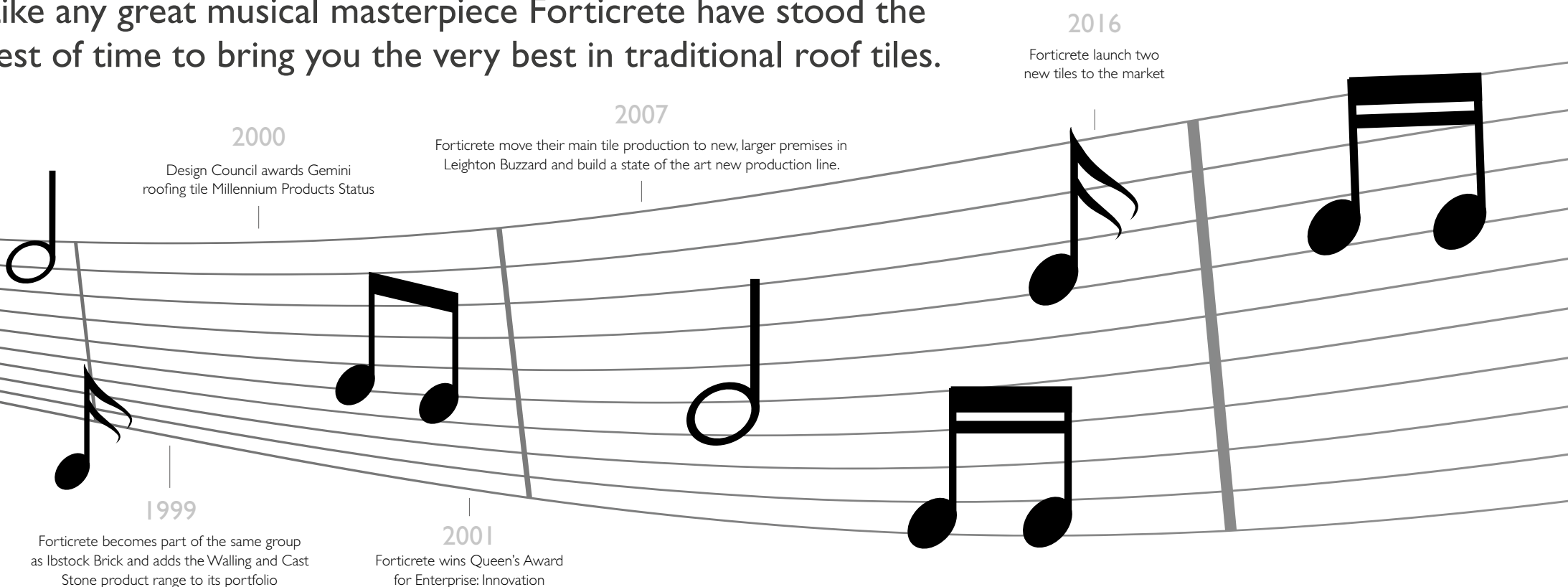
The resulting dynamic fusion of people, technology and services have enabled Forticrete together with the spirit of Robert Abraham, to continue driving forward product and service boundaries and remain to this day Innovators in Concrete.

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Like any great musical masterpiece Forticrete have stood the test of time to bring you the very best in traditional roof tiles.



Private Housing New Build

As Hardrow Slates offer a chorus of colours, there is no lack of choice available to complement any new build private housing scheme. Additionally, thanks to a matching range of purpose-designed, mechanically-fixed fittings, mortar is not needed to bed in the slates to create a well-finished roof.



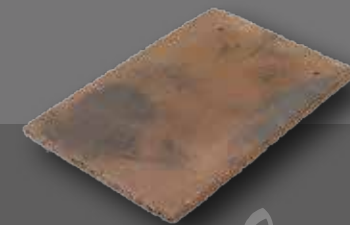
Project/Location:
William Davis Homes,
Morledge, Derbyshire

Tile:
Hardrow Overture



Project/Location:
Elton Homes

Tile:
Hardrow Barley



Project/Location:
Crosby Homes, Prestbury

Tile:
Hardrow Twilight



Project/Location:
Westlands

Tile:
Hardrow Dusk



Private Housing ReRoof

When re-roofing a home, owners can take full advantage of the Hardrow range to achieve a natural stone slate appearance. The attractive range of colour options allows more than sufficient variety for homeowners to create a point of difference with an individual choice of roofscape.



Project/Location:
Uffington

Tile:
Hardrow Barley



Project/Location:
Morcott

Tile:
Hardrow Barley



Project/Location:
Leeds

Tile:
Hardrow Harvest



Project/Location:
Guiseley

Tile:
Hardrow Brown



Social Housing New Build

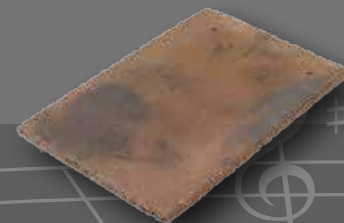
As social housing scheme budgets are often more strictly defined, Hardrow Slates can be safely specified as a cost-effective solution particularly in conservation areas where they ensure the new build will blend harmoniously with existing natural stone roofscapes.



Project/Location:
Ribble Valley, Lancashire

Tile:
Hardrow Barley

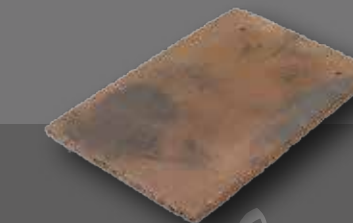
Overview:
Built by Homes and
Communities Agency for
Ribble Valley Homes in
a conservation area near
Clitheroe.



Project/Location:
Ribble Valley, Lancashire

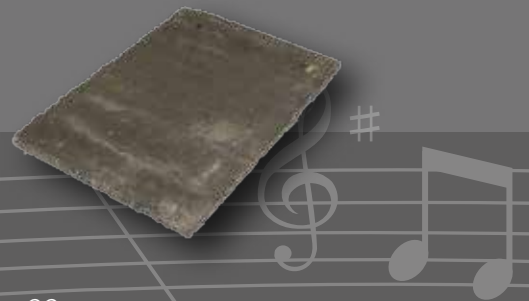
Tile:
Hardrow Barley

Overview:
Built by Homes and
Communities Agency for
Ribble Valley Homes in
a conservation area near
Clitheroe.



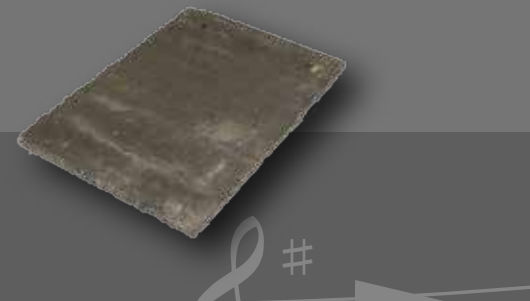
Project/Location:
Yorkshire Housing,
Normanton, West Yorkshire

Tile:
Hardrow Dusk



Project/Location:
Yorkshire Housing,
Normanton, West Yorkshire

Tile:
Hardrow Dusk



Social Housing ReRoof

Hardrow Slates have been used extensively in the past for social housing re-roofing. Their colour range and weathered finish enable properties to echo the local vernacular without disturbing the roofscape. Thanks to the continuity of supply and availability of purpose-made fittings, one complex scheme was completed on schedule despite problematic property access and the contract's winter timing.



Project/Location:
Harrogate Borough Council

Tile:
Hardrow Brown



Project/Location:
Rotherham Borough Council,
Wentworth, South Yorkshire

Tile:
Hardrow Glade

Overview:
Situating in a conservation area,
achieving the perfect roof finish to
complement the surroundings was
very important



Project/Location:
Armathwaite, Cumbria

Tile:
Hardrow Light Grey

Overview:
This was done for Eden housing in a conservation area in Penrith.



Project/Location:
West Lancashire

Tile:
Hardrow Twilight

Overview:
West Lancashire District Council.
Conservation area.



Commercial New Build

Our ability to maintain continuity of supply even for larger commercial projects is always appreciated. This has been rewarded with a high number of such projects particularly where walling stone has been used as the materials clearly complement one another.



Project/Location:
Hinckley, Leicestershire

Tile:
Hardrow Glade



Project/Location:
Holiday Chalet

Tile:
Hardrow Old Stone



Project/Location:
Farington, Lancashire

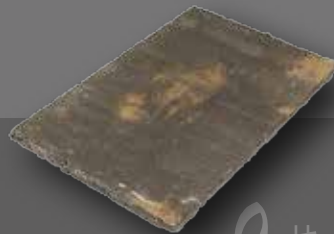
Tile:
Hardrow Overture

Overview:
Children's Respite Centre.
Lancashire County Council.



Project/Location:
Holmfirth, West Yorkshire

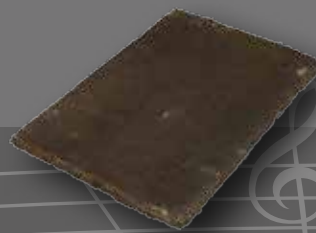
Tile:
Hardrow Twilight



Project/Location:
Tenants Auction House

Tile:
Hardrow Old Stone

Overview:
£8m extension to the
existing building



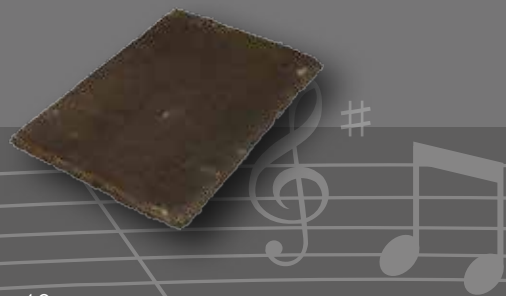
Commercial ReRoof

Where Hardrow Slates were used to roof a building at first construction, it makes commercial as well as practical sense to use them again when they eventually reach the end of their useful life. As the roof's structural integrity is based on the weight of the existing Hardrow tiles, re-using Hardrow will ensure no additional lift is experienced or strapping required.



Project/Location:
Goole Old Grammar School

Tile:
Hardrow Old Stone





Technical Content

Standard roofing slates

| Nominal slate size | 381mm x 229mm (15" x 9") | 457mm x 305mm (18" x 12") | 457mm x 457mm (18" x 18") | | 610mm x 457mm (24" x 18") | | |
|--------------------------|----------------------------|---------------------------|---------------------------|-------------|---------------------------|-------------|--------------|
| Pitch | 30° & above | 25° & above | 20° – 29.9° | 25° & above | 17.5° – 19.9° | 20° – 24.9° | 25° & above |
| Max gauge | 150mm (6") | 191mm (7½") | 178mm (7") | 191mm (7½") | 241mm (9½") | 255mm (10") | 267mm (10½") |
| Minimum headlap | 75mm (3") | 75mm (3") | 102mm (4") | 75mm (3") | 127mm (5") | 100mm (4") | 75mm (3") |
| Min side lap | 95mm (3¾") | 95mm (3¾") | 89mm (3½") | 75mm (3") | 121mm (4¾") | 102mm (4") | 107mm (4") |
| Cover width | 232mm | 311mm | 464mm | 464mm | 468mm | 468mm | 468mm |
| Nominal hanging length | 331mm | 407mm | 407mm | 407mm | 560mm | 560mm | 560mm |
| Nominal thickness | 14mm (⅝") | 14mm (⅝") | 14mm (⅝") | 14mm (⅝") | 16mm (⅝") | 16mm (⅝") | 16mm (⅝") |
| Mass per 1000 slates | 3.0 tonnes | 4.8 tonnes | 7.2 tonnes | 7.2 tonnes | 10.6 tonnes | 10.6 tonnes | 10.6 tonnes |
| Number per m² | 29.1 | 17.22 | 12.3 | 11.5 | 9.07 | 8.61 | 8.2 |
| Weight per m² | 87 kg | 83 kg | 88 kg | 83 kg | 96 kg | 91 kg | 87 kg |
| Batten required lin m/m² | 6.7 | 5.24 | 5.62 | 5.24 | 4.15 | 3.92 | 3.75 |
| Verge slates | 381mm x 343mm (15" x 13½") | 457mm x 457mm (18" x 18") | 457mm x 686mm (18" x 27") | | 610mm x 686mm (24" x 27") | | |
| Eaves & tops | 254mm x 229mm (10" x 9") | 330mm x 305mm (13" x 12") | 305mm x 457mm (12" x 18") | | 457mm x 457mm (18" x 18") | | |

Standard vertical cladding slates

| Nominal Slate Size | | Cover Width | Nominal hanging length | Standard Headlap | | Standard Gauge | | Number per m² at Standard Headlap | Mass per m² at Standard Headlap | Mass (approx) per 1000 Slates | Nominal Thickness | | Verge Slates | | Eaves & Tops | |
|--------------------|---------|-------------|------------------------|------------------|----|----------------|----|-----------------------------------|---------------------------------|-------------------------------|-------------------|----|--------------|----|--------------|---------|
| mm | in | Cw | mm | mm | in | mm | in | | kg | Tonnes | mm | in | mm | in | mm | in |
| 330 x 229 | 13 x 9 | 232 | 280 | 50 | 2 | 140 | 5½ | 31.2 | 81 | 2.6 | 14 | ⅝ | 50 | 2 | 229 x 229 | 9 x 9 |
| *381 x 229 | 15 x 9 | 232 | 331 | 50 | 2 | 165 | 6½ | 26.5 | 80 | 3.0 | 14 | ⅝ | 50 | 2 | 254 x 229 | 10 x 9 |
| 330 x 305 | 13 x 12 | 311 | 280 | 50 | 2 | 140 | 5½ | 23.4 | 81 | 3.5 | 14 | ⅝ | 50 | 2 | 229 x 305 | 9 x 12 |
| 457 x 305 | 18 x 12 | 311 | 407 | 50 | 2 | 203 | 8 | 16.2 | 78 | 4.8 | 14 | ⅝ | 50 | 2 | 330 x 305 | 13 x 12 |

Note: The minimum pitch is based on a maximum rafter length of 9m. For rafter lengths greater than this, please contact the Forticrete Technical Department.

Batten size: 50mm x 25mm for all rafter centres up to 600mm graded timber in accordance with the current British Standard BS 5534.

*Also availbale to order as ornamental slates.

Diminishing courses

Slates are available in the following sizes: (length x width):
381 x 457mm; 457 x 457mm; 533 x 457mm; 610 x 457mm

Note: Slate and a half slates are supplied for all these sizes:
Under Eave: 457 x 457mm Tops: 305 x 457mm

Number of courses of each size of slate – The percentage number of different length slates on the rafter is dependant on the rafter length. Where the size of slate changes the gauge should be gradually diminished, so it blends into the next size of slate with the reduced gauge.

Number and weights of diminishing slates per square metre at 75mm (3in) head lap

| Length x width | Gauge mm | Number | Weight kg |
|-----------------------|----------|--------|-----------|
| 381 x 457 152 14.4 86 | 13 x 9 | 232 | 280 |
| 457 x 457 190 11.5 83 | 15 x 9 | 232 | 331 |
| 533 x 457 229 9.6 81 | 13 x 12 | 311 | 280 |
| 610 x 457 267 8.2 87 | 18 x 12 | 311 | 407 |

Roof pitch – Minimum Roof Pitch 30 degrees. Maximum Roof Pitch 47 degrees.

Random width slates

Slates are available in the following sizes: (l x w): 457 x 305mm; 457 x 381mm; 457 x 457mm

Verge slates: 457 x 686mm
Under Eaves: 305 x 457mm
Top Course: 330 x 305mm
Numbers per size: Random a third of each size.
Minimum pitch: 25°

Headlap: All sizes 75mm. Gauge common to all sizes 191mm maximum.
Side lap: Never less than 100mm.
Weight of random slates: 83kg per square metre.
Hips and valleys: Purpose made to pitch.

Tile fixing

Each slate must be secured with two 40mm x 3.35mm aluminium nails. For the 610 x 457 slate, above 30° the nail should be 40mm x 4mm. At roof pitches below 40° depending upon the site exposure, it may be possible to hang slates over the battren. The nail hole diameter is approximately 5mm with the holes being positioned c. 50mm from the head and edge of the slate. Nail specification may alter for marine environments, and you should seek advice from the Roofing Technical Department.

Tile Hanging on a sloping elevation

If hanging slates over the battens, an additional batten should be fixed above all parent batten spanning over at least two rafters to provide a mechanical fixing at the verge. Depending on the span of the gable overhang, secondary battening may be required to add additional strength to carry the weight of the slates. If hanging the slates under eaves, 1st course and last course of main slates must be nailed into the batten. Top tile clips are available for fixing the top slates to the adjacent main slates. CURVED ROOFS – please contact the Roofing Technical Department for specification advice.

Designation of standard slates

| Nominal Slate Size | | Designation No. |
|-------------------------|---------|---|
| mm | in | |
| Standard roofing slates | | |
| 381 x 229 | 15 x 9 | T - EN 490 – NL – 0 – IF – 232 -/-/ (331) – 3,00 |
| 457 x 305 | 18 x 12 | T - EN 490 – NL – 0 – IF – 311 -/-/ (407) – 4,80 |
| 457 x 457 | 18 x 18 | T - EN 490 – NL – 0 – IF – 464 -/-/ (407) – 7,20 |
| 610 x 457 | 24 x 18 | T - EN 490 – NL – 0 – IF – 468 -/-/ (560) – 10,60 |

Standard fittings – Hips, valleys and mansard slates are available to order to cover the full range of roof pitches.

| Nominal Slate Size | | Designation No. |
|-----------------------------------|---------|--|
| mm | in | |
| Standard vertical cladding slates | | |
| 330 x 229 | 13 x 9 | T - EN 490 – NL – 0 – IF – 232 -/-/ (280) – 2,60 |
| 381 x 229 | 15 x 9 | T - EN 490 – NL – 0 – IF – 232 -/-/ (331) – 3,00 |
| 330 x 305 | 13 x 12 | T - EN 490 – NL – 0 – IF – 311 -/-/ (280) – 3,50 |
| 457 x 305 | 18 x 12 | T - EN 490 – NL – 0 – IF – 311 -/-/ (407) – 4,80 |

Non-standard fittings – Non standard fittings can be made to order to suit special applications. Please consult our Roofing Technical Department for help and advice.

Working procedures, safety & general precautions

Slates should be fixed in accordance with BS 5534. Forticrete recommend that fixers of all slates regard the products as fragile as stated in BS8000:Pt6: Section 5. During installation of the products, the correct setting out and working procedures should be employed to avoid walking directly on to products which have been fixed or are on any completed area of a roof. Should it be necessary to gain access via the roof where battens of adequate strength cannot be used as footholds, this should not be attempted without the use of adequate protection to the tiles or slates including the required number of bolstered crawling boards, ladders and cat ladders.

Please note that where there is a change of pitch, packing may be required between crawling boards, cat ladders and the surface of the tiles or slates to avoid damage to the product. Fixers should note that Forticrete do not recommend the practice of cutting tiles or slates in-situ. Other information can be obtained from the Health and Safety in Roof Work publication HSG33 and in the 'Working on Roofs' publication INDG284. When unpacking the slates from the pallets, please cut the shrink wrap as instructed and maintain even distribution of the slates on the pallet to avoid tipping.

Reference should also be made to the Forticrete Technical Literature and Fixing Instructions.

Complementary Products

For walling, detailing & masonry





Anstone® Brown Old Weathered Pitched and Cast Stone dressings at Whitehouse Loan, Edinburgh

Anstone® and Shearstone® walling stone

Forticrete Walling Stone has a history that cannot be replicated by any manufacturer in the UK, having provided a cost-effective, readily available alternative to natural stone since 1926. Today, it provides a unique, single-source solution to recreating the tradition of Britain's most enduring architectural heritage.

Tel: 01909 775000 Fax: 01909 775043 E-mail: walling@forticrete.com



Cast Stone dressings on Alpha Homes, Kibworth Beauchamp.

Cast Stone dressings

To complement the Walling Stone products, Forticrete create a broad range of Standard Cast Stone Dressings in a variety of profiles and these are available either ex-stock, as Stone In Stock™ or cast from standard moulds, to shorten lead times. Forticrete also have the capability to create purpose-made dressings to precise specifications and these options are detailed in separate literature, which is available on request from the sales office.

Tel: 01909 775000 Fax: 01909 773549 E-mail: caststone@forticrete.com



Arsenal's Emirates Stadium, Islington, Greater London

Masonry

Forticrete supplies a broad range of economical Standard Masonry Products and purposedesigned foundation blocks to local markets and further afield. With Forticrete, you can be assured of quality borne out by our commitment to work in accordance with BS EN 9001:2000, the international standard for quality based on third-party assessment. All our manufacturing plants have achieved certification to ISO 14001 – the international environmental management standard

Tel: 01429 838001 Fax: 01429 836206 E-mail: masonry@forticrete.com



Product samples

The colours reproduced within this brochure are as accurate as the photographic and printing processes will allow. Where colour matching is critical, you are advised to view actual product samples.

These are readily available by calling **01525 244900** or the sample request area of our website – **www.forticrete.co.uk**. For larger projects, sample panels can be provided.

Roofing Systems & Technical enquiries:

Forticrete Limited,

Boss Avenue, off Grovebury Road,
Leighton Buzzard, Beds LU7 4SD

Tel: 01525 244900

Fax: 01525 850432

E-mail: roofing@forticrete.com

Information on the complete range of Forticrete products can be found on the Internet at www.forticrete.co.uk

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In order to maintain its position as a market leader, Forticrete operates a policy of continuous product development and therefore reserves the right to alter specifications without notice.

Guarantee: The colour of Hardrow® Slates will change with natural weathering and the integrity of the slate carries a 40-year guarantee from date of supply, subject to the company's normal terms. Forticrete Roofing Products' policy is one of continuous improvement and the Company reserves the right to change specifications and designs at any time without notice. Please note, the colour swatches in this literature are for illustrative purposes only. Where exact colour match is required you are advised to view actual tile samples.

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