

# hardrow

Slate tiles with rhythm

## In tune with today's specifiers.



SOLOS



Hardrow® Forest

DUETS



HARMONIES



THE HARDROW RANGE

## forticrete

[www.forticrete.co.uk/hardrow](http://www.forticrete.co.uk/hardrow)

## The story of Hardrow and Forticrete

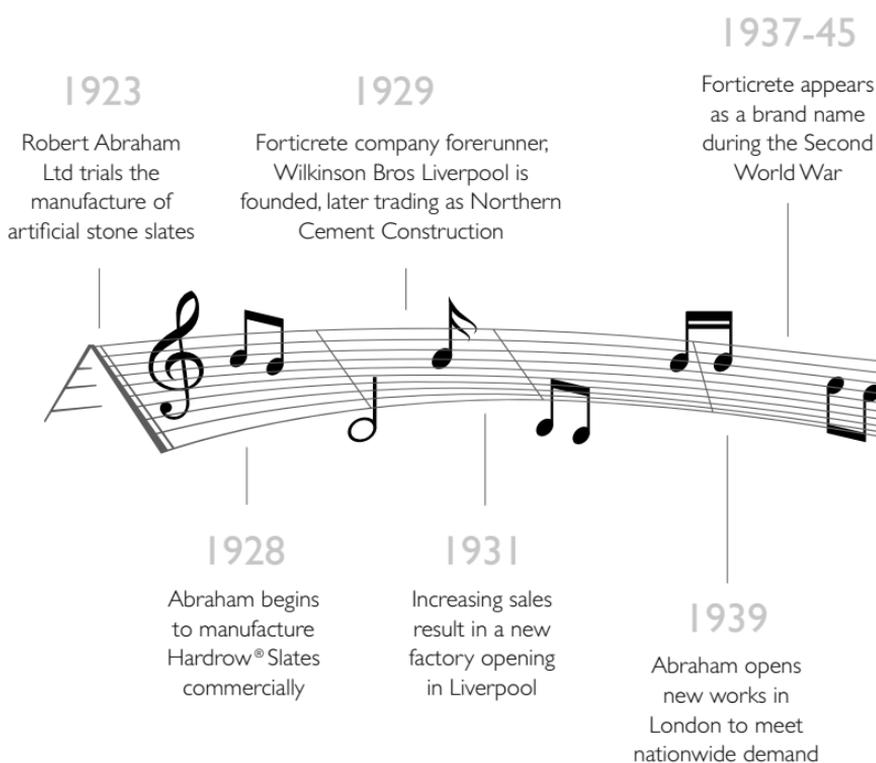
Hardrow's® story starts in the early 1920's when a civil engineer named Robert Abraham recognised that many of the oldest and most outstanding examples of Georgian and earlier architecture were roofed in large stone slates.

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.

## Timeline: Forticrete and Hardrow

The modern progressive company we know today as Forticrete began life in the early 20th century before acquiring Robert Abraham Ltd in 1981, founded by the eponymous civil engineer who began manufacturing Hardrow® Slates in West Yorkshire in the early 1920's.

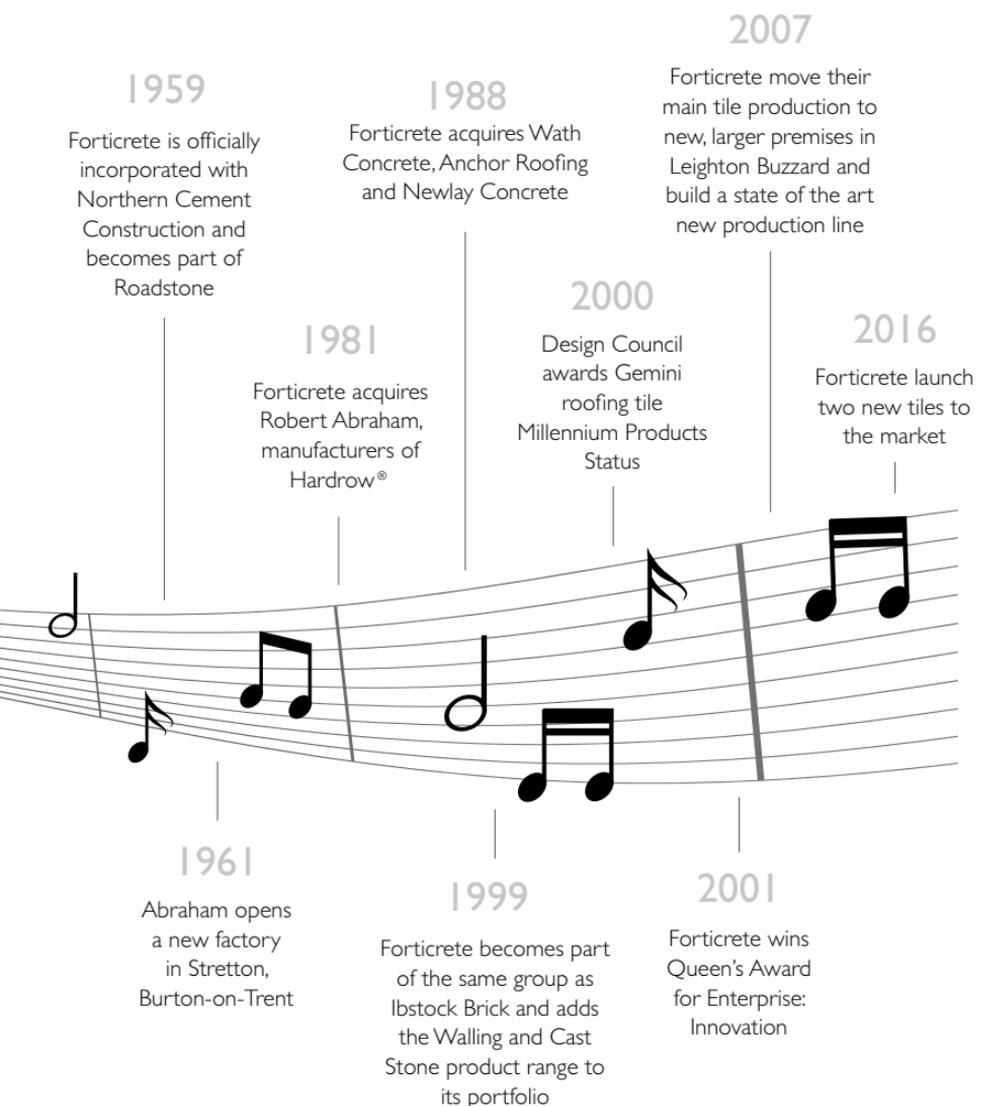


As stone slates became increasingly expensive, architects, planners and builders began to appreciate the natural qualities of Hardrow® – and in 1961 a new factory opened in Stretton, Burton on Trent, to meet this increasing demand.

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.



## Market Sectors

Versatility is undoubtedly the key feature of Hardrow® Roof Slates and this is reflected in the broad variety of roofing applications it can be used for. Since 1928 its wide range of tile sizes, purpose-made fittings and colour combinations have made Hardrow a popular, durable and cost-effective option across many market sectors nationwide.

## 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.



## Private Housing Re-Roof

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.



Hardrow® Old Stone

## 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.

## Social Housing Re-Roof

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.

## 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.

## Commercial Re-Roof

Where Hardrow® Slates were used to roof a building at first construction, it makes commercial as well as practical sense to specify 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.

**hardrow**  
Slate tiles with rhythm

Solos

## Re-orchestrating an Old Tradition

Offering practically the same architectural properties and aesthetic appeal of natural stone or slate but formed from slate, Hardrow® Solos will naturally mellow with age and can be laid in either random widths or diminishing courses for an authentic traditional appearance. Their ten subtle, natural colours are all carefully balanced to meet regional preferences.

Hardrow® Solos are not made to be uniform in appearance but are intentionally manufactured to be slightly irregular in size, thickness and shape to enhance the laid character of the roof. As with natural stone, their individual colouring varies too from slate to slate, recreating that much sought-after traditional appearance so hard to achieve within tight budgets.



Hardrow® Slates Solos™, in a mix of Yellow, Orange, Red, and Brown



## Solos Colour palette



*Brown*



*Dark Grey*



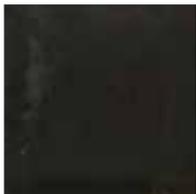
*Green*



*Light Grey*



*Moss*



*Old Stone*



*Orange*



*Red*



*Thatch*



*Yellow*

## A Chorus of Colour

With such a broad range of natural colours on hand, Hardrow® Slates present a rewarding opportunity to replicate the appearance of true 'mixed stone slate' roofs. And give you a simple way to compose unique colour schemes/patterns – either to blend in with the local vernacular or to make a bold statement in the urban environment.

Duets

## From Solos to Full Orchestra



Hardrow® Barley

Introduced in 1996, Hardrow® Slates Duets are exceptional in every way and a true innovation in roofing practice. Adopting the subtle shades of the Hardrow® Slates Solos range, Duets combine them into a single slate to create the ultimate opportunity for unbeatable random application.

With Duets all the subtle variations which have been an inherent feature of Hardrow® Slates for over 80 years are not only retained but are enhanced within a range that includes 10 blended colour options.



Hardrow® Barley



Hardrow® Twilight

## Duets Colour Palette



Barley



Dusk



Ember



Forest



Glade



Harvest



Spice



Sunset



Twilight



Wheat

From the distinctive Grey/Green of Forest to the warm Red/Thatch tones of Ember to the intense Red/Brown of Sunset, each Duet creates its own mood to add impact to your individual designs. The imposing Light and Dark Grey of Dusk is brightened with Yellow in Twilight. Marrying the shades of Moss and Orange creates the lustre of Harvest, and Dark Grey with Moss the fresh appeal of Glade, while differing combinations of Brown, Moss, Yellow and Orange create Spice, Barley and Wheat.

Harmonies

## Fine-tune your Roofscape



Hardrow® Overture

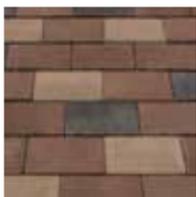
Harmonies are subtle individual blends of 'mixed colour' designs, each one unique to Hardrow® Slates and intended to simplify the specification process. They allow you to take advantage of our extensive experience and select a vibrant blend from the Hardrow® Solos range that is already proven in practice and whose beauty can be seen in place.

The ten individual colours in the Solos range can also be used to construct contrasting patterns or to showcase distinctive features across a roof elevation.

### Harmonies Range



Melody



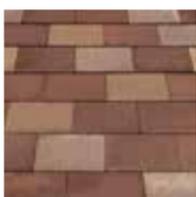
Symphony



Overture



Sonata



Concerto

# Compose your own Symphony

Hardrow® Slates can deliver a surprisingly varied range of colour mixes. Select from Concerto, an autumnal blend of Brown, Yellow and Orange shades or Sonata, a distinctively warmer mix of Red, Brown and Yellow. For a slightly cooler feel, you can design with Symphony with its predominant Brown brightened by Yellow and cooled by Light Grey. For a more muted effect, Overture is a subtle combination of Light Grey, Dark Grey and Thatch while Melody offers a beautifully balanced blend of Light Grey, Moss and Thatch.

If you are at all concerned about the feasibility of an idea or unsure precisely how to achieve a desired effect, Forticrete have a helpful technical advisory service to provide advice and guidance based on our years of experience.



## Other Popular Mixes



Dark Mix



Dark Stone



Collyweston



Cotswold



Peak Stone Mix

# Hardrow® Slates Dimensions and

## Standard roofing slates

Nominal slate size	381mm x 229mm (15" x 9")	457mm x 305mm (18" x 12")
Pitch	30° & above	25° & above
Max gauge	150mm (6")	191mm (7½")
Minimum headlap	75mm (3")	75mm (3")
Min side lap	95mm (3¾")	95mm (3¾")
Cover width	232mm	311mm
Nominal hanging length	331mm	407mm
Nominal thickness	14mm (9/16")	14mm (9/16")
Mass per 1000 slates	3.0 tonnes	4.8 tonnes
Number per m <sup>2</sup>	29.1	17.22
Weight per m <sup>2</sup>	87 kg	83 kg
Batten required lin m/m <sup>2</sup>	6.7	5.24
Verge slates	381mm x 343mm (15" x 13½")	457mm x 457mm (18" x 18")
Eaves & tops	254mm x 229mm (10" x 9")	330mm x 305mm (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.

## Standard vertical cladding slates

Nominal Slate Size		Cover Width Cw	Nominal hanging length mm	Standard Headlap		Standard Gauge		Number per m <sup>2</sup> at Standard Headlap
mm	in			mm	in	mm	in	
330 x 229	13 x 9	232	280	50	2	140	5½	31.2
*381 x 229	15 x 9	232	331	50	2	165	6½	26.5
330 x 305	13 x 12	311	280	50	2	140	5½	23.4
457 x 305	18 x 12	311	407	50	2	203	8	16.2

\*Also available 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.

## 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.

## 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.

# Specifications

457mm x 457mm (18" x 18")		610mm x 457mm (24" x 18")		
20° – 29.9°	25° & above	17.5° – 19.9°	20° – 24.9°	25° & above
178mm (7")	191mm (7½")	241mm (9½")	255mm (10")	267mm (10½")
102mm (4")	75mm (3")	127mm (5")	100mm (4")	75mm (3")
89mm (3½")	75mm (3")	121mm (4¾")	102mm (4")	107mm (4")
464mm	464mm	468mm	468mm	468mm
407mm	407mm	560mm	560mm	560mm
14mm (½")	14mm (½")	16mm (⅝")	16mm (⅝")	16mm (⅝")
7.2 tonnes	7.2 tonnes	10.6 tonnes	10.6 tonnes	10.6 tonnes
12.3	11.5	9.07	8.61	8.2
88 kg	83 kg	96 kg	91 kg	87 kg
5.62	5.24	4.15	3.92	3.75
457mm x 686mm (18" x 27")		610mm x 686mm (24" x 27")		
305mm x 457mm (12" x 18")		457mm x 457mm (18" x 18")		

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

Mass per m <sup>2</sup> at Standard Headlap kg	Mass (approx) per 1000 Slates Tonnes	Nominal Thickness		Verge Slates		Eaves & Tops	
		mm	in	mm	in	mm	in
81	2.6	14	⅜	50	2	229 x 229	9 x 9
80	3.0	14	⅜	50	2	254 x 229	10 x 9
81	3.5	14	⅜	50	2	229 x 305	9 x 12
78	4.8	14	⅜	50	2	330 x 305	13 x 12

## 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 batten. 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.

Nominal Slate Size		Designation No.
mm	in	
<b>Standard vertical cladding slates</b>		
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.

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.

## A Perfect Pitch

- Stone slate appearance
- Double lap offers flexibility of roof design
- Manufactured since 1928
- Choice of 10 Solos™, 10 Duets, 5 Harmonies blends & 5 other mixes
- Extensive pitch capability
- Purpose made fittings to suit roof detailing
- Wide range of sizes
- Through coloured
- Available in diminishing courses and random widths (for an additional charge)
- Exceptional water resistance
- Kitemarked to BS EN 490
- Mechanically fixed
- Full range of ventilation products

## Strike the Right Note

Designing with Hardrow® Slates gives specifiers great flexibility and not only from their imaginative colour range. Duets' most popular sizes range from 457mm x 305mm (min pitch 25°) right up to the imposing 610mm x 457mm which can be laid at pitches as low as 17.5°, creating a bold appearance.

There's a wide range of detailing components too, some of which are hand crafted on wooden formers to blend in perfectly with each of the Duet colour range. Duo-pitch ridges, mono-pitch ridges, stop-end ridges, hip slates, valley slates and mansards are all available as are a range of ornamental slates to create striking detailing and features on both pitched roofing and vertical cladding.

A range of purpose designed ventilating products include both Lo-Vent slates and ridges for clean air and soiled air ventilation. Splays, special mansards, pyramid caps are all achievable to give you maximum design freedom.



Hardrow® Sunset Duet

## Accreditations

- Hardrow® holds the quality Kitemark BS EN 490
- Forticrete is certified to the International Environmental Standard BS EN ISO 1400
- BES 6001 for Responsible Sourcing of Construction Products – all seven factories rated 'VERY GOOD'
- BS EN ISO 9001 for Quality Management
- A+ BREEAM Rating
- Achilles Building Confidence certified

## Ecoslate

Hardrow® Slates qualify as an ECOSLATE under Forticrete's unique marking scheme, signifying that it conforms to a specified range of environmental criteria.



Information on the complete range of Forticrete products can be found on the Internet at [www.forticrete.co.uk](http://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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