

Salford Smooth Red

FIND OUT MORE ABOUT OUR BRICK RANGE

T: 0161 641 3579

W: www.manchesterbrick.com



PRODUCT TECHNICAL INFORMATION

MANCHESTER BRICK CODE	MBS02530 MBS02640
MANUFACTURED TO	BS EN 771-1
CONFIGURATION	Vertically Perforated Voids
COLOUR	Red
APPEARANCE	Smooth
SIZE	
Metric	215mm x 102.5mm x 65mm 215mm x 102.5mm x 73mm
PACK SIZE	520 440
INDIVIDUAL DRY BRICK WEIGHT	2.1kg 2.24kg

TECHNICAL PROPERTIES TO BS EN 771-1

TYPE	Wirecut
GROSS DRY DENSITY (KG/M ³ /TOLERANCE)	2200 ±10%
ACTIVE SOLUBLE SALTS	S2
COMPRESSIVE STRENGTH	≥75N/mm ²
THERMAL CONDUCTIVITY*	0.36 W/m.k
SIZE TOLERANCE (MEAN/RANGE)	T2/R2
DURABILITY DESIGNATION	F2
WATER ABSORPTION	<7%
INITIAL RATE OF WATER ABSORPTION (KG/(M ² MIN))	≤0.8
REACTION TO FIRE	A1



Technical data correct at time of issue. Individual dry brick weights can vary and are for guidance only. Any questions regarding this data should be referred to the Manchester Brick Technical Department. Due to the limitations of screen and print colour representation of product images it is advised that brick samples are viewed prior to ordering.

Sedex Member



UK
CA





ROOF TILE PRODUCTS - DECLARATION OF PERFORMANCE

DOP Reference: Concrete Roof Tile Products and Fittings

1. Unique Identification code of Product type:

Mannok Roof Tile Products - including Western Slate range, Locherne range, Devenish range, and Rathmore interlocking concrete roofing tiles range; Universal angle and Half Round concrete ridge tiles.

2. Type, Batch or Serial Number or any other Element allowing identification of the Product:

See Point 1.

3. Intended use or uses of the product, in accordance with the applicable harmonised technical specification:

Concrete roofing tiles and fittings for pitched roof coverings and wall cladding.

4. Name and registered address of manufacturer:

Mannok Ltd,
235 Ballyconnell Road, Derrylin,
Co. Fermanagh, Northern Ireland, BT92 9GP

5. Where applicable, name and contact address of the authorised representative whose mandate cover's tasks specified in Article 12(2):

Not Applicable

6. System or systems of assessment and verification of constancy of performance of the construction product as set out in CPR, Annex V:

System 4

7. In case of the declaration of performance concerning a construction product covered by a harmonised standard:

Not Applicable.

8. Declared Performance

Refer to table attached.



9. Declared Performances

Mannok Build Ltd. 187 Ballyconnell Road, Derrylin, Co. Fermanagh, Northern Ireland, BT92 9GP		
EN 490:2011 Concrete Roofing Tiles and Fittings for roof covering and wall cladding – Product Specifications 13		
Essential Characteristics	Declared Performance	Harmonised Technical Specification
Mechanical Resistance	Complies	EN 490:2011
Water Impermeability	Complies	
Dimensional Variation	Complies	
Durability (Freeze Thaw)	Complies	
External Fire Performance	BROOF	
Reaction to Fire	A1	
Release of Dangerous Substances	No Performance Determined	

10. The performance of the product identified in points 1 & 2 is in conformity with the declared performance in point 9. This declaration of performance is issued under the sole responsibility of the manufacturer identified in point 4. Name and position held by the person empowered to sign the declaration on behalf of the manufacturer.



Liam McCaffery
CEO

8th January 2021



ROOF TILES PRODUCTS CE MARK



Mannok Build Ltd.
187 Ballyconnell Road, Derrylin,
Co. Fermanagh, Northern Ireland, BT92 9GP

EN 490:2011
Concrete Roofing Tiles and Fittings for roof covering and wall cladding - Product Specifications
13

Essential Characteristics	Declared Performance	Harmonised Technical Specification
Mechanical Resistance	Complies	EN 490:2011
Water Impermeability	Complies	
Dimensional Variation	Complies	
Durability (Freeze Thaw)	Complies	
External Fire Performance	BROOF	
Reaction to Fire	A1	
Release of Dangerous Substances	No Performance Determined	

Kitemark™ Certificate

This is to certify that:

Mannok Build Limited
187 Ballyconnell Road
Derrylin
Co. Fermanagh
BT92 9GP
United Kingdom

Holds Certificate Number:

KM 31833

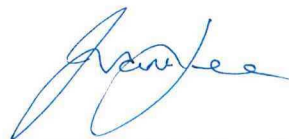
In respect of:

BS EN 490

Concrete roofing tiles and fittings for roof covering and wall cladding

This issues the right and licence to use the Kitemark in accordance with the Kitemark Terms and Conditions governing the use of the Kitemark, as may be updated from time to time by BSI Assurance UK Ltd (the "Conditions"). All defined terms in this Certificate shall have the same meaning as in the Conditions.

The use of the Kitemark is authorized in respect of the Product(s) detailed on this Certificate provided at or from the above address.



For and on behalf of BSI:

Frank Lee, Product Certification Technical and Compliance Director

First Issued: 1995-07-04

Effective Date: 2022-08-10

Latest Issue: 2022-08-10

Expiry Date: 2025-08-09

Page: 1 of 2



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Kitemark™ Certificate

No. KM 31833

BS EN 490:2011+A1: 2017 - Concrete roofing tiles and fittings for roof covering and wall cladding

Products

Western slate	T	-	EN 490	-	IL	-	0	-	RF	-	300	-/-/-	400	-	5.3
Lock Erne	T	-	EN 490	-	IL	-	27	-	RF	-	300	-/-/-	400	-	5.1
Rathmore / Prestige	T	-	EN 490	-	IL	-	0	-	RF	-	300	-/-/-	400	-	4.8
Devenish	T	-	EN 490	-	IL	-	0	-	RF	-	300	-/-/-	400	-	4.8

Complementary Fittings

Angle Ridge Tiles
Half Round Ridge Tiles

First Issued: 1995-07-04
Latest Issue: 2022-08-10

Effective Date: 2022-08-10
Expiry Date: 2025-08-09

Page: 2 of 2

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To check its validity telephone +44 (0) 345 080 9000. An electronic certificate can be authenticated [online](#).

BSI Assurance UK Limited, registered in England under number 7805321 at 389 Chiswick High Road, London W4 4AL, UK.
A member of BSI Group of Companies.

Certificate of Registration

QUALITY MANAGEMENT SYSTEM - ISO 9001:2015

This is to certify that:

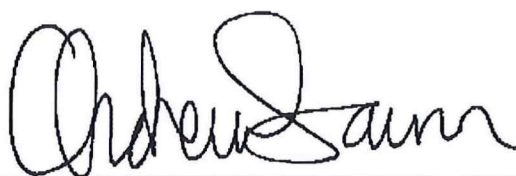
Mannok Build Limited
235 Ballyconnell Road
Derrylin, Enniskillen
Co. Fermanagh
BT92 9GP
United Kingdom

Holds Certificate Number:

FS 737560

and operates a Quality Management System which complies with the requirements of ISO 9001:2015 for the following scope:

The manufacture and supply of a range of building products including concrete roof tiles, precast concrete, autoclaved aerated concrete blocks, bituminous materials.



For and on behalf of BSI:

Andrew Launn, EMEA Systems Certification Director

Original Registration Date: 2021-05-12

Effective Date: 2021-05-12

Latest Revision Date: 2021-08-05

Expiry Date: 2024-05-11



Page: 1 of 2

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BSI Assurance UK Limited, registered in England under number 7805321 at 389 Chiswick High Road, London W4 4AL, UK.
A Member of the BSI Group of Companies.

Certificate No: FS 737560

Location	Registered Activities
Mannok Build Limited Tarmac 235 Ballyconnell Road Derrylin, Enniskillen Co. Fermanagh BT92 9GP United Kingdom	The manufacture and supply of bituminous materials.
Mannok Build Limited Roof Tiles 169 Ballyconnell Road Derrylin, Enniskillen Co. Fermanagh BT92 9AQ United Kingdom	The manufacture and supply of concrete roof tiles.
Mannok Build Limited PreCast 235 Ballyconnell Road Derrylin, Enniskillen Co. Fermanagh BT92 9GP United Kingdom	The manufacture and supply of precast concrete products.
Mannok Build Limited Aircrete 184 Ballyconnell Road Derrylin, Enniskillen Co. Fermanagh BT92 9EL United Kingdom	The manufacture and supply of autoclaved aerated concrete blocks.

Original Registration Date: 2021-05-12

Effective Date: 2021-05-12

Latest Revision Date: 2021-08-05

Expiry Date: 2024-05-11

Page: 2 of 2

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A Member of the BSI Group of Companies.

Certificate of Registration

ENVIRONMENTAL MANAGEMENT SYSTEM - ISO 14001:2015

This is to certify that:

Mannok Build Limited
187 Ballyconnell Road
Derrylin
Enniskillen
BT92 9GP
United Kingdom

Holds Certificate Number:

EMS 552208

and operates an Environmental Management System which complies with the requirements of ISO 14001:2015 for the following scope:

The manufacture of aerated concrete block, pre stressed concrete, roof tiles, the supply of concrete decorative mouldings, the production of concrete blocks, the production of readymix concrete and the production and laying of tarmac.



For and on behalf of BSI:

Matt Page, Managing Director Assurance - UK & Ireland

Original Registration Date: 2010-03-05

Latest Revision Date: 2022-02-13

Effective Date: 2022-03-06

Expiry Date: 2025-03-05

Page: 1 of 2



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Certificate No: EMS 552208

Location	Registered Activities
Mannok Build Limited 187 Ballyconnell Road Derrylin Enniskillen BT92 9GP United Kingdom	The manufacture of aerated concrete block, pre stressed concrete, roof tiles, the supply of concrete decorative mouldings, the production of concrete blocks, the production of readymix concrete and the production and laying of tarmac.
Mannok Build Limited 187 Ballyconnell Road Derrylin Enniskillen BT92 9GP United Kingdom	The production of concrete blocks.
Mannok Build Limited 187 Ballyconnell Road Derrylin, Enniskillen BT92 9GP United Kingdom	The production of ready-mix concrete
Mannok Build Limited 235a Ballyconnell Road Derrylin, Gortmullan Enniskillen BT92 9GP United Kingdom	The production and laying of tarmac.

Original Registration Date: 2010-03-05

Effective Date: 2022-03-06

Latest Revision Date: 2022-02-13

Expiry Date: 2025-03-05

Page: 2 of 2

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Printed copies can be validated at www.bsigroup.com/ClientDirectory

Information and Contact: BSI, Kitemark Court, Davy Avenue, Knowlhill, Milton Keynes MK5 8PP. Tel: + 44 345 080 9000
BSI Assurance UK Limited, registered in England under number 7805321 at 389 Chiswick High Road, London W4 4AL, UK.
A Member of the BSI Group of Companies.

General Information

Service

If you have any questions regarding Cembrit Jutland, Moorland & Westerland slates, our well-trained staff will be ready to assist you with advice and guidance

Warranty

Warranty conditions can be commissioned at your nearest Cembrit office

Disclaimer

The information contained in this publication and otherwise supplied to users of Cembrit's products is based on Cembrit's general experience, best knowledge and belief. However, because of factors that fall beyond Cembrit's knowledge and control, which can affect the use of the products, no warranty is given or implied with respect to such information

Cembrit's policy is one of continuous improvement. Cembrit therefore reserves the right to alter specifications at any time and without notice

Colours and textures may vary according to light and weather conditions. Owing to this and limitations of the printing process, colours in this brochure may vary

Please, ensure that you have the latest version of this publication by checking that the publication date corresponds with the downloadable version from our website www.cembrit.co.uk. In case of doubt, please contact your local Cembrit representative

About Cembrit

Cembrit is among the leading players within fibre-cement based building materials, and the second largest in Europe. Cembrit employs more than 1100 people in 18 European countries and offers a wide range of products and solutions for roofs and facings, internal cladding and lining of ceilings and walls. Cembrit is headquartered in Aalborg, Denmark. The manufacturing facilities are situated in Finland, Czech Republic, Poland and Hungary. These factories are all specialized in fibre cement based productions, drawing on the know-how of the Group, which is based on more than 80 years of experience

CENBRIT

www.cembrit.co.uk

Declaration of Performance

No. 018/DoP

In accordance with Regulation (EU) No 305/2011 of the European Parliament and of the Council laying down harmonised conditions for the marketing of construction products (CPR EU 305/2011)

1. Unique identification code of product-type:

Fibre-cement flat sheets

Type, batch or serial number or any other element allowing identification of the construction product as required pursuant to Article 11 (4).

Cembrit Slates

(Německý čtverec, Česká šablona, Dánský obdélník, Anglický obdélník, Bobrovka, Betternit, Dominant, Horal, Rhombus, Rhombus šablona, Berona, Jutland, Zeeland, Moorland, Westerland, Diamond Slate, Skifre 40/40, Skifre 30/60, Skifre 60/60, Dolmen, Bravan, Cembrit Quadra)

2. Intended use or uses of the construction product, in accordance with the applicable harmonised technical specification, as foreseen by the manufacturer:

Roofing (roof coverings) or cladding (internal and external wall finishes)

3. Name, registered trade name or registered trade mark and contact address of the manufacturer as required pursuant to Article 11 (5) :

Cembrit Holding A/S
Gasværksvej 24
DK-9000 Aalborg, Denmark
Email: info@cembrit.com

4. Where applicable, name and contact address of the authorised representative whose mandate covers the tasks specified in Article 12 (2):

Not applicable

5. System or system of assessment and verification of constancy of performance of the construction product as out in Annex V:

System 3

- 6a. Name and identification number of the notified body (in case of the declaration of performance concerning a construction product covered by a harmonised standard).

**Technical and Testing Institute of Construction Prague, s. p.,
Notified body No. 1020
Branch 0700– Ostrava, U Studia 14,
700 30, Ostrava-Zábřeh, Czech Republic**

Performed the Initial Type Test and classification under system 3, according EN 492 Issued protocol on the initial type test No.1020-CPD-070029628 as of 29th June 2006, No 1020-CPD-070034977 as of 15th August 2008, and No 1020-CPD-070045585 as of 28th June 2013

**PAVUS, a.s.
Notified body No. 1391
Prosecká 412/74, 190 00 PRAHA 9
Prosek, Czech Republic**

Performed reaction to fire testing and classification according EN 13501-1 Test report No PKI-01-13-097-A-0, dated 26th June 2013 and test report No PKI-01-06-059-E-1 dated 15th June 2018

- 6b. Name and identification number of the Technical Assessment Body (in case of the declaration of performance concerning a construction product for which a European Technical Assessment has been issued):

Not applicable

7. Declared performance:

Essential characteristics	Performance		Harmonised technical specification
Type of sheets	NT		EN 492:2012+A2:2018 Fibre-cement profiled sheets and fittings – Product specification and test methods
Mechanical resistance	h / mm	Bending moment	
<i>h</i> - dimension of the fibre-cement slate measured perpendicular to the line of fixing which is at or nearest to the horizontal plane of the roof	$h \leq 350$ $350 < h \leq 450$ $450 < h \leq 600$ $600 < h \leq 850$	30 Nm/m 40 Nm/m 45 Nm/m 55 Nm/m	
Apparent density	min 1 600 kg/m ³		
External fire performance	B _{ROOF} (deemed to satisfy)		
Reaction to fire	4 mm slates	A1	
	5.2 mm slates	A2-s1, d0	
Water impermeability	No water drops		
Dimensional variations	± 3 mm $+25\%$ -10% nominal value		
Length, Width			
Thickness			
Release of dangerous substance	No performance determined		
Durability against warm water	R _L ≥ 0.75		
Durability against soak/dry	R _L ≥ 0.75		
Durability against freeze-thaw	R _L ≥ 0.75		
Durability against heat-rain	Comply		

8. Appropriate Technical Documentation and/or Specific Technical Documentation:

EN 492:2012+A2:2018
Fibre-cement profiled sheets and fittings
Product specification and test methods

The performance of the product identified in points 1 and 2 is in conformity with the declared performance in point 7. This declaration of performance is issued under the sole responsibility of the manufacturer identified in point 3.

Signed for and on behalf of the manufacturer by:

Esben Moos, Group Technical Manager
Aalborg, April 11th, 2022


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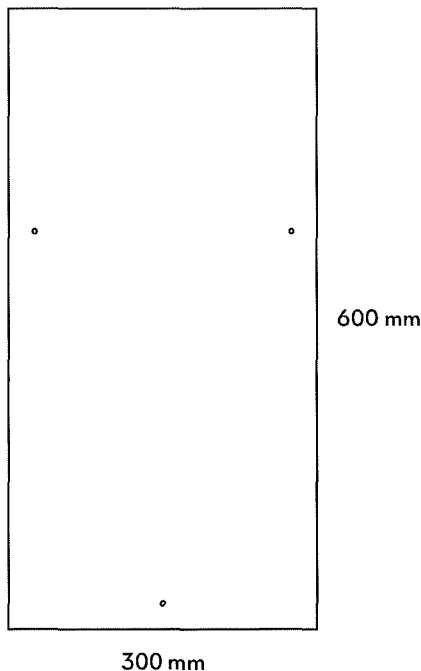
CEMBRIT

Cembrit Jutland

Roofing

The Cembrit group has been manufacturing and developing fibre cement products including slates for over 90 years. Cembrit slates are lightweight roof tiles that offer distinctive aesthetics ideal for both roof and facade. The slates are easy to handle and install which make them ideal for all types of projects.

Cembrit prides itself on manufacturing fibre cement slates which achieve the highest approvals from local, national and international agencies in the fields of product quality and sustainability. The Cembrit range of Cembrit Jutland slates carry the CE mark and are manufactured in accordance with the requirements of the European Norm EN 492. They have achieved Class B, the highest class, for structural stability in accordance with EN 492.



The slates are manufactured using Portland cement together with a non-asbestos formulation of superior blended synthetic and cellulose fibres. The slates are pigmented during production and are fully compressed. They are finished with a high quality, semi-matt acrylic coloured coating to the top face and edges and a tinted or transparent, high performance binder to the back face. Cembrit slates are complemented by a wide range of fibre cement accessories.

Cembrit slates are manufactured in accordance with a quality assurance system to ISO 9001. Furthermore, our production unit complies with the requirements of ISO 14001. Cembrit slates are manufactured in accordance with the requirements of ISO 14001.

Environmental Product Declaration number EPD-CEM-20160113-IAD1-EN.

CEMBRIT JUTLAND

Cembrit Jutland slates are rectangular with a smooth surface and straight edges. These slates are finished with a semi-matt acrylic Blue-Black, Graphite, Red or Brown coloured coating. Cembrit Jutland slates are lightweight, pre-holed, easy to handle and install.

www.cembrit.co.uk
Please visit cembrit.co.uk for contact details and further information.

CEMBRIT

Cembrit Jutland

Dimension		
Width	mm	300
Length	mm	600
Thickness	mm	40
Physical properties		
Density, dry (EN 492)	Kg/m ³	1820
Weight	Kg/pcs	1.31
Mechanical properties		
Class (EN 492)		B
Bending moment min (EN 492)	Nm/m	50
Thermal properties		
Coefficient of thermal expansion	mm/m °C	0.008
Tolerances		
Thickness	mm	+1/-0.4
Length	mm	±3.0
Width	mm	±3.0
Other properties		
Fire rating (EN 13501)		A2,S1-d0
Fire category		B _{roof}
Minimum pitch		25
Installed weight	kg/m ²	20.4

www.cembrit.co.uk
Please visit cembrit.co.uk for contact
details and further information

CEMBRIT

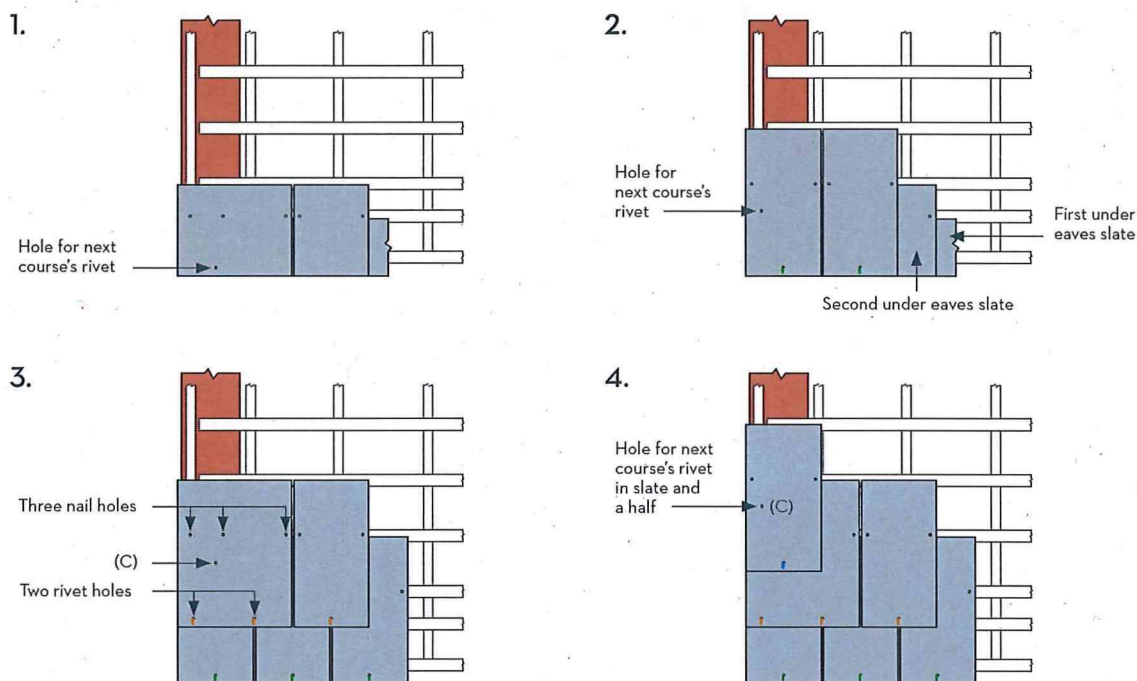
Fibre Cement Slate Fixing Guide

Conventional Fixing

Installation

The underlay should be fully supported behind the fascia to prevent sagging between the rafter feet. This is generally achieved with a tilting fillet. The underlay should finish by hanging into the gutter so that any moisture on the underlay will drain into the gutter. Eaves should not be sprocketed as this will affect fitting of the disc rivet at the tail of the eaves course.

Three courses of slates are required at eaves. The first undereaves course is cut and drilled so that it can be head nailed to the first batten. This first course acts as a base to support the tail rivet for the first full slate course.



Rivet Colour Code: ■ First layer of slates ■ Second layer of slates ■ Third layer of slates

- (1) The first undereaves course is cut to the length of the batten guage. Eaves overhang should be 50-55mm for 100mm gutters or to the centre line of the gutter if larger diameter gutters are used. Locate the centre point of the eaves and centre the first undereaves slate here.

The first full slate will be laid over the top of this undereaves slate, this will mean that the slates on both verges will be cut to the same width. Work towards both verges with remaining undereaves slates.

The second undereaves course is cut from the same slate as the first undereaves course and its length will be the batten guage plus the slate headlap. This 2nd under eaves slate provides the double lap for the next but one full course of slates.

It is installed to cover 1/2 the width of the first undereaves slate, allowing the shank of the tail rivet (which rests on the first undereaves slate) for the first full course of slates to pass between adjacent 2nd under eaves slates. The second under eaves slate also oversails the fascia 50-55mm.

- (2) The first full course of slates is nailed to the second batten (this batten also supports the head of the 2nd under eaves slate) and is arranged so that the tail rivet passing between the two 2nd under eaves slates protrudes through the hole in the tail of the full slate. The first full course of slates also oversails the gutter 50-55mm. The tails of all three courses of slate align and overhang the gutter.

- (3) In order to provide the correct bond the verge slate on alternate courses should be a slate and a half width cut from a double slate. These verge slates require pre drilled holes for three nail and two rivet fixings in addition to an extra hole to allow the tail rivet for the course above to pass through the slate and a half.

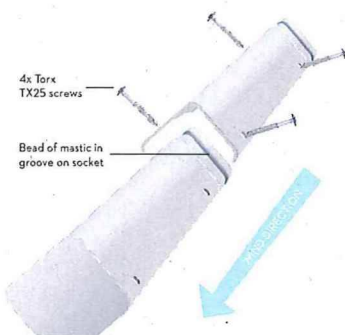
The next single verge slate will also require an additional hole for the tail rivet of the subsequent slate and a half. Tail rivets should always pass between two adjacent slates and through a hole in the tail of the slate they are holding. The protruding shank of the rivet is then bent down the slope.

CEMBRIT

Dry fixed fibre cement ridge

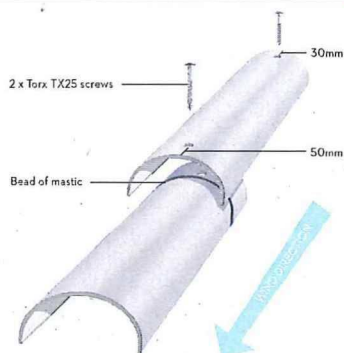
to BS Code of Practice 5534 and BS Code of Practice 8000:6
for use with fibre cement slates.

Continuously ventilated/Universal/plain angle ridge



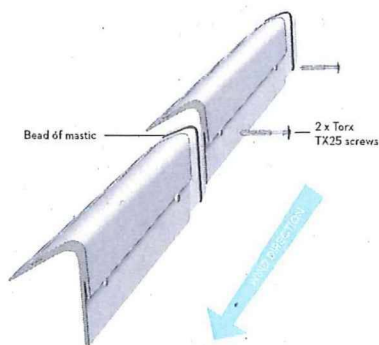
Screw holes should be pre-drilled 2mm larger than the diameter of the Torx screw. 4 fixings are used per ridge, 2 per wing, located 70-90mm from ends of ridge, 110mm from lower edge for continuously ventilated ridge and 75mm from the bottom edge and 130mm from end of the wing. The open end of the ridge overlays the socket. It is advisable to seal this joint by applying a bead of mastic to the groove in the socket particularly in exposed locations.

Half round/conic ridges



Screw holes should be pre-drilled 2mm larger than the diameter of the Torx screw. 2 fixings are used per ridge, each fixing through 2 thicknesses of ridge. It is advisable to seal the overlap in front of the fixing holes with a bead of mastic particularly in exposed locations. Large profile suitable for hip cappings and roof pitches up to 30 degree. Baby profile suitable for dormers and bays.

Continuously ventilated monopitch ridge



Screw holes should be pre-drilled 2mm larger than the diameter of the Torx screw. 2 fixings are used on the vertical wing of each ridge, one fixing through 2 thicknesses of ridge. It is advisable to seal the joint with a bead of mastic on the socket, particularly in exposed locations.

Specifications:

Cembrit fibre-cement ridges are manufactured to BS EN 492:2004 product specification for fibre-cement slates and their fittings. The factory operates a quality management system complying with ISO EN 9001:2015 and an environmental management system to ISO EN 14001:2015.

CEMBRIT

Cembrit Slate Range

Cembrit Jutland, Cembrit Moorland & Cembrit Westerland

Installation

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Cembrit Slate Range

Cembrit Jutland, Cembril Moorland & Cembril Westerland
- the perfect solution for a successful roofing project.
For decades, the durable and largely maintenance-free Cembril
slates have adorned UK roofs.

Cembrit slates are thoroughly tested and comply with the following
standards:

- BS EN 492:2004
- ISO 9001 (Quality Management System)
- ISO 14001 (Environmental Management System)

The Cembril group is one of Europe's largest
producers of fibre cement products and has
been manufacturing and developing fibre cement
products, including slates, for over 80 years.

Cembrit prides itself on manufacturing fibre cement
slates which achieve the highest approvals from
local, national and international agencies in the fields
of product quality and sustainability. Cembril fibre
cement slates are complemented by a range of fibre
cement ridges which can be found on all types of
roofs across UK.

Life-cycle assessment (LCA)

Cembit's Czech produced fibre cement slates
have been awarded an Environmental Profile
Certificate by BRE Global

Ecopoint scores from cradle to grave for m^2 of the
Cembit range of slates over a 60 year life range from
0.34 to 0.51 depending on the element specified.

Quality assurance

The Cembril range of slates are manufactured in
accordance with a quality assurance system ISO
9001 and to the requirements of BS EN 492:2004
product specification for fibre cement slates and
their fittings.

Environmental Management

The Cembril range of slates are manufactured in a
factory which complies with the requirements of
ISO 14001:2004 and has been awarded certificate
number E0394C/14.

Warranty

General Performance Warranty

Cembit Jutland, Moorland & Westerland slates are subject to a
30-year performance warranty as regards integrity, impermeability
and frost resistance - provided that the installation complies with
BS5534:2014 and the instructions given in this Manual. In the event
that the products, contrary to expectations, do not live up to the
performance requirements listed in the general Warranty during
the warranty period, the affected slates will be replaced
by Cembril.

Colour Performance Warranty

Cembit Jutland, Moorland & Westerland slates are surfaced by
a colour coating - following a colour concept that incorporates
water-based coatings and binders ensuring a strong and highly
durable surface.

Cembit Jutland

The Cembril Jutland colour concept is covered by a 10-year war-
ranty from the date of manufacture.

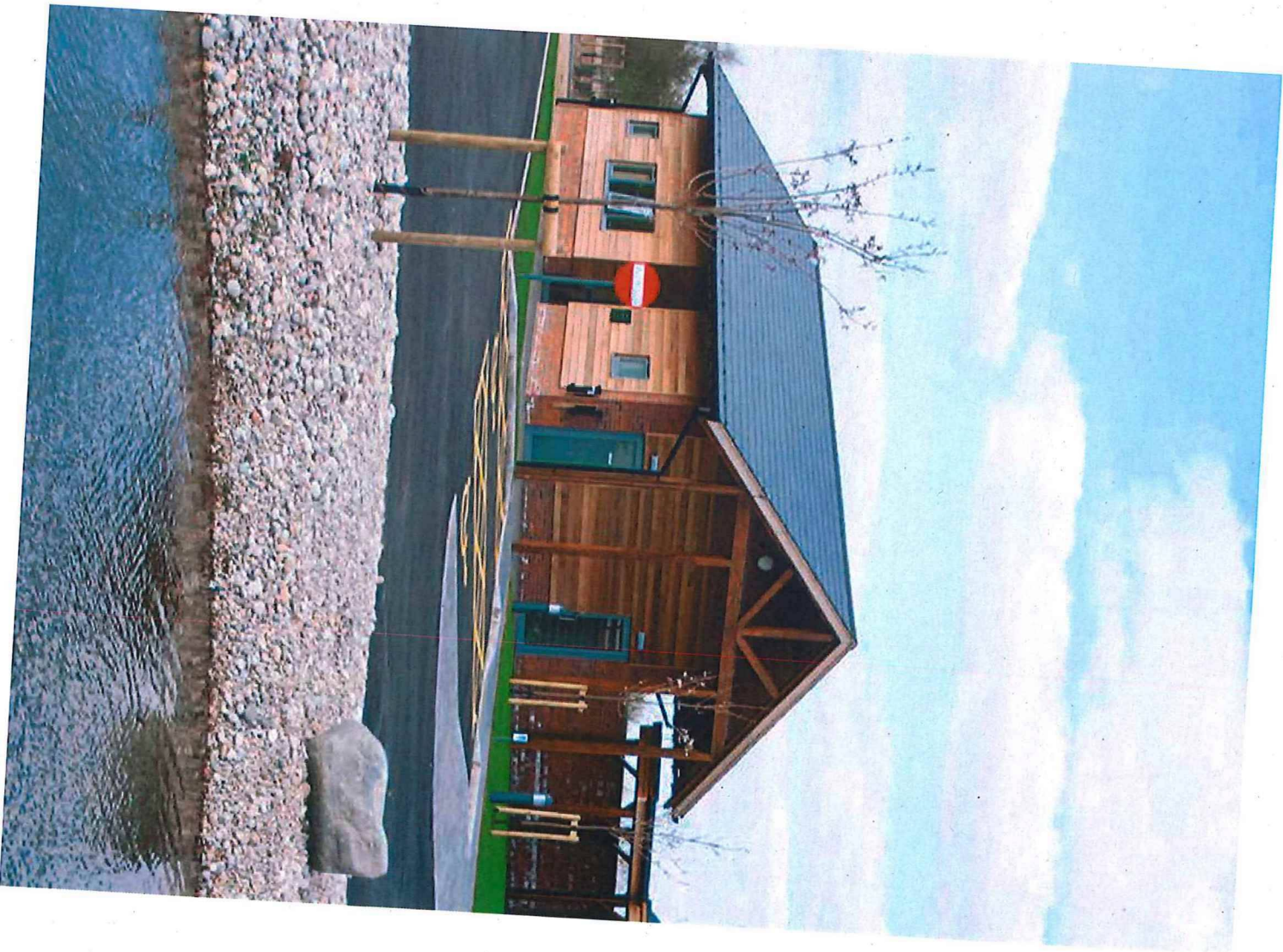
Cembit Moorland & Westerland

The Cembril Moorland & Westerland colour concept is covered by
a 20-year warranty from the date of manufacture.

Over time, Cembril Jutland, Moorland & Westerland slates will
be subject to wear and tear and will be patinated to some extent.
However, Cembril guarantees that the generic colour of the
products will remain and appear homogenous when viewed from a
reasonable distance.
In the event that the Cembril Jutland, Moorland & Westerland
slates, contrary to expectations, should not live up to the Colour
Performance Warranty, on-site treatment of the affected slates will
be effected.

Weather Exposure

When exposed to tough weather conditions, the slates will un-
dergo some extent of fading resulting in a somewhat more matt
appearance. The degree of fading depends upon factors such as:
site location, pitch of roof, durations of exposure, etc. Any such
weathering effects shall not affect the performance and durability
characteristics of the slates as described above.



Datasheet

Apparent Density	Kg/m3	1600	EN 492, 7.3.1
Bending moment min	Nm/m	50	EN 492
Coeff of thermal expansion	mm/m °C	0.008	
Thermal conductivity	W/m °C	0.35	
Frost resistance	Cycles	>100	EN 492, 7.4.1
Tolerances			
Length	mm	+/- 3.0mm	EN 492
Width	mm	+/- 3.0mm	EN 492
Thickness	mm	+1.0 - -0.4 mm	EN 492

Cembrit Jutland			
60x30	smooth surface & square edges		
Colours	Blue Black		Slate Graphite
BS EN 492	✓		✓
Thickness	4 mm		4 mm
N° per pallet	1,000		1,000
Gross weight kg/pallet	1553		1553
N° slates per m² - headlap 110mm	13,6		13,6
Ridges 75° 90° 105° 120° 135°	✓		✓

Cembrit Moorland			
60x30	smooth surface & dressed edges		
Colours		Blue Black	
BS EN 492		✓	
Thickness		4 mm	
N° per pallet		1,000	
Gross weight kg/pallet		1553	
N° slates per m² - headlap 110mm		13,6	
Ridges 75° 90° 105° 120° 135°		✓	

Cembrit Westerland			
60x30	structured surface & dressed edges		
Colours	Slate Graphite	Blue Black	
BS EN 492	✓	✓	
Thickness	4 mm	4 mm	
N° per pallet	1,000	1,000	
Gross weight kg/pallet	1534	1534	
N° slates per m² - headlap 110mm	13.6	13,6	
Ridges 75° 90° 105° 120° 135°	✓		✓

Cembrit Westerland 50			
500x242	structured surface & dressed edges		
Colours		Slate Graphite	
BS EN 492		✓	
Thickness		4 mm	
N° per pallet		1320	
Gross weight kg/pallet		1388	
N° slates per m² - headlap 110mm		21.3	
Ridges 75° 90° 105° 120° 135°		✓	

Product Compatibility

The Cembrit range of slates are compatible with most common building materials, except those vulnerable to alkaline attack. When materials such as aluminum are used as flashings or gutters they should be protected and maintained with bituminous paint. If they are to be subject to water run off from the slates

Fire Resistance

Cembrit Jutland, Moorland & Westerland slates hold the following ratings
BS 476 Part 2 1989 and BS 476 Part 7 1987
Fire Propagation Index (I) of 0.9, a sub-index (II) of 0.5 and a Class 1 surface Class 0 surface - as defined in the national Building Regulations
BS 476 Part 3 1958 EXT SMA BS 476 Part 3 2004 Class P60
Please note that slight curling may occur in newly laid slates as a result of climatic conditions. However such curling will wear over time and does not compromise the weather resistance of the products.

Dry Rot Resistance

The acrylic coating enables the Cembrit Jutland, Moorland & Westerland slates to resist dry rot attacks as well as reduce the potential growth of other vegetation such as moss and lichen

Effects of chemicals

During tests the range of Cembrit slates have been found to have a good resistance to chemical attack however it should be noted that prolonged exposure will cause surface degradation. In areas where this may be excessive please consult Cembrit Ltd for further advice

Tolerances

The Cembrit range of slates are made to the following dimensional tolerances in accordance with BS EN 492 2004. Length or width +/-3.0 mm Thickness 4mm +1.0mm - 0.4mm

Strength

The Cembrit range of slates exceed the requirements of BS EN 492 2004 giving an average bending moment greater than 50 Nm/m

Apparent Density

The Cembrit range of slates have an apparent density of 1600 Kg/m³ when tested to BS EN 492 2004 section 7.3.1

Identifying the Slates

Approximately 25% of the slates are equipped with an identification number on the underside using the following format BIO4206N1B2

- The first character denotes the factory of origin
- The first six figures denote the shift and year of manufacture
- The characters "N°" denote the application of non-asbestos technology, and
- The final two characters denote the production and painting lines used for manufacture

Small vs. Large Roofs

This installation Manual applying to Cembit Jutland Moorland & Westerland slates is based upon the advice and guidelines provided by the British code of practice for slating and tiling (BS5534 2014). However, please be aware that the size of a roof affects it's behaviour

Thus the minimum recommendations in BS5534 as well as in the Installation Manual apply only for roofs with a roof slope (measured by horizontal projection) not exceeding 6 metres. This corresponds to a rafter length of approx. 6.5 metres at 25° pitch or 8.5 metres at 45°

With roofing areas exceeding the above size additional weather resting provisions (e.g. increased slate head laps, counter battens, superior roofing underlay and boarding out) must be considered. Ensure that your method complies with the UK Building Regulation

Capillary Action
Capillary action: the force that causes liquids to rise between close fitting materials

Capillary action can often be seen in slated roofs as liquids rise between the overlapping slates to a vertical level of about 2g mm

- Elements that can increase the extent of capillary action are
 - Roof pitch: the lower the pitch the greater the capillary action
 - Dust particles between the slates
 - Site exposure (See 'Climatic Influences' below)

It is possible to calculate an approx. water level between the overlapping slates of any roof taking into consideration the above elements. Please contact our well trained staff who will be ready to assist you in this process.



Climatic Influences

The UK counts among the windiest countries in Europe with a medium to high rainfall rating with a significantly higher rating from east to west and from low to high locations. These factors must be taken into consideration when building in UK

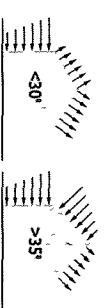
Rainfall Effect
The rainfall effect from wind-driven rain cannot be controlled but during the design phase of a house it is possible to take some precautions to limit this effect. Such precautions might be, pitch rafter length, size of slates, head lap or a sub-construction fitted for the purpose

When designing your house, the map opposite can serve as a guide to how exposed your site is and can thus help you to make important decisions concerning the design of your new house. Please be aware that the map is merely an indicator as other factors may impact the degree of exposure to wind-driven rain, e.g. proximity to coastal areas, near river valleys or on hillslopes

Wind Effect
The wind effect is generally highest in coastal and urban areas compared to rural areas with towns and cities. However, the tougher the landscape, the lower the wind speed. Wind speed is reduced by frictional resistance that occurs e.g. when in contact with a rough landscape. Just as with wind-driven rain, wind speed cannot be controlled but limited through the design of a house. As illustrated, the design pitch of a house can either increase or reduce the effect of wind and wind-driven rain upon a house

Due to frictional resistance, the wind is slowed down when hitting the face of the house and at the same time, an amount of pressure is created. Some of the wind also deflects around corners and walls and roof tops, thereby creating negative pressure, i.e. suction. The degree of suction depends on wind speed and height of roof pitch

- Pitch <30° windward slopes can be subjected to severe suction
- Pitch >35° windward slopes are subjected to positive pressure, although areas near the ridge may still be subject to a degree of suction
- Leeward slopes are always subjected to suction
- Suction is always highest at the perimeters of the roof as well as other areas interrupting the roof surface such as ridges, eaves, verges, hips, abutments and valleys etc.



When affected by high wind speed (pressure/suction), underlay overlaps may start to work/move creating wholes and cracks through which the wind can enter the roof space. Such air rushing through the roof space may cause a serious increase of the water rise by capillary action on the slates

Climatic Influences

For UK and Northern Ireland locations, the latest version of BS 5554 will indicate the expected degree of exposure. Wind driven rain ratings less than 56.5 l/m² per spell are described as 'moderate' (see table 1) and those above 56.5 l/m² per spell are described as 'severe' (see table 2).

Detailed guidance on wind load calculations is given in the latest versions of BS5554:2014 and BS EN1991-1-4:2005 and 1991-3:2003. To calculate the wind action (design and snow loads) on a roof it will be necessary for the designer to use two documents at the same time; the Eurocode standard BS EN 1991 Part 1-4, and the associated National Annex. The authors of the National Annex have advised that reference should also be made to PD 6688:1-2001. In locations where abnormal conditions may be anticipated such as elevated sites, coastal locations, areas of heavy snowfall etc., the recommendation for 'severe' should be followed. For buildings above 12m in height, the influence of increased windspeed can be determined using BS EN 1991-4.

Where the location or construction might make a lower rather pitch acceptable, designers are asked to seek advice



Exposure Zone
Approximate volume of wind-driven rain (litres/m²) per spell

less than 56.5
more than 56.5
Highlands and Islands

Note: from BS 8219

Table 1
Moderate exposure less than 56.5 l/m² per spell

- In general, the recommendations below apply to rafter lengths of not more than 9m.
The specifier should also take account of any abnormal local conditions that might apply.

Pitch deg	Slate Size	Minimum headlap mm	Slates no/m ²	Batten gauge mm	Average weight kg/m ²
45°	600x300	90	13.07	255	19.61
40°	600x300	90	13.07	255	19.61
35°	600x300	90	13.07	255	19.61
30°	600x300	90	13.07	255	19.61
27.5°	600x300	100	13.33	250	20.00
25°	600x300	100	13.33	250	20.00
22.5°	600x300	100	13.33	250	20.00
20°	600x300	110	13.61	245	20.41

An allowance should be made for cutting and wastage for all exposures.

Table 2
Severe exposure

- In general, the recommendations below apply to rafter lengths of not more than 6m.
The specifier should also take account of any abnormal local conditions that might apply.

Pitch deg	Slate Size	Minimum headlap mm	Slates no/m ²	Batten gauge mm	Average weight kg/m ²
45°	600x300	90	13.07	255	19.61
40°	600x300	90	13.07	255	19.61
35°	600x300	90	13.07	255	19.61
30°	600x300	100	13.33	250	20.00
27.5°	600x300	100	13.33	250	20.00
25°	600x300	110	13.61	245	20.41
22.5°	600x300	110	13.61	245	20.41
20°	600x300	110	13.61	245	20.41

Health and Safety

Health and Safety Guide 33 (HS33)

Before commencing work on any project reference should be made to HS33 – the guide to Health & Safety in roof work. This guide details working at height, handling, protecting the public, risk assessment and CDM (Construction Design & Management) guidance recommendations.

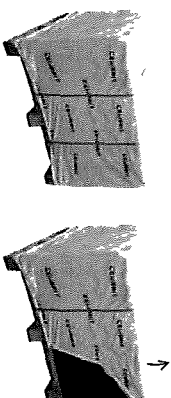
Storing and Handling

Cembrit slates are delivered on pallets with a polythene cover. Ideally, the pallets should be stored indoors or under cover until they are to be used. However, the slates can be stored outdoors for a short period of time. If this is the case, the polythene cover which is for dust protection only, should be removed from the Cembrit slates upon arrival at the building site. Carefully stack the slates on their longer edges separated by timber bearers, battens or boards with the lowest layer on a flat and dry level surface. Care should be taken to ensure this area free of running water during rain and no ponding can occur. Slates MUST NOT be allowed to become wet when in packs or banded together as efflorescence and staining can occur. Keep the pallets under a roof or covered by a tarpaulin leaving the possibility of ventilation around the slates and avoiding water accumulation between the slates surfaces, as this may cause efflorescent staining on the slates. Lift the slates off the pallet and do not draw over the next slates, as this will cause scratches and damages to the surface.

Processing

Safety
As with all other building materials, safety precautions must be taken into account and local laws and regulations must be observed. Cutting and drilling are subject to dust development, and proper precautions must be taken. Dust from fibre-cement boards is characterised as mineral dust and a prolonged exposure to this may cause lung disease.

NOTE! For large building projects, it is recommended to schedule material delivery from the merchant as required, thereby avoiding the storage of large quantities.



Drilling
Holes are drilled from the front side with a sharp, pencil point, 4.5 mm steel drill bit. Ensure to keep the bit sharp throughout the drilling to extend the life of the drill bit. Always put an underlay eg a woodchipboard under the Cembrit slates in order to achieve neat drilling holes. In order to save time it is possible to hole blank slates in stack, bundles of 10 at a time.
After drilling, ensure to immediately remove all excessive dust development from the slates to avoid cement staining of the slates when exposed to rainfall.

Cutting

Cembrit slates can easily be cut to fit the desired size.

Cembrit recommend one of the following methods:

- Using a scribing tool, score the face of the slate and break the slate over a straight edge, or
- Using a slate guillotine, place the slate face up and cut. This method leaves the slates with a straight, chamfered cut edge, bevelled away from the face of the slate, or
- Using hand scissors/punch, cut the slates to the desired size. When applying this method, dust extraction is necessary, or
- Using a bench saw with a diamond dusted blade, cut the slates to the desired size. This method can be applied when cutting large quantities of slates.

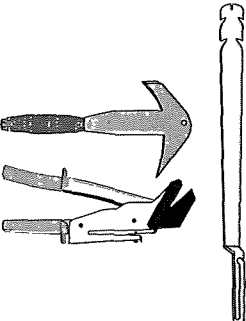
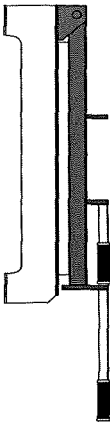
Pre-Installation

Before you set out to install the slates, it is important to carefully inspect the area to be roofed in order to plan the roofing process leaving minimum work for you and minimum cutting and drilling of slates.

- Ensure that
 - All horizontal lines of the layers are regular and correct.
 - All perpendicular lines of the slates are correctly aligned.
 - All battens are fixed according to the recommended gauge.
 - All battens x1200mm are fixed to each rafter or supported in straight lines, parallel with the ridge/top layer/right angles to the line of drainage.
 - All joints between battens are square-cut and butted in the middle of the support.
 - All batten ends are splay-nailed.
 - All valley boards are correctly levelled.
 - All valleys are appropriately sized.
 - All underlay overlaps are correctly dimensioned and secured.
 - Underlay is properly supported around eaves.
 - Trussed-rafter roofs with batten gauge >200mm: max one joint per four consecutive battens on the same support.
 - Trussed-rafter roofs with batten gauge >200mm: max three joints in any twelve consecutive battens on the same support.
 - In the event of penetrations to the underlay, including tears or punctures, these must be securely sealed or repaired prior to roofing. Penetrations can be closed with sealing tapes or an underlay cover patch.

NOTE! We do not recommend angle grinders for cutting of the slates as this causes high dust development. After cutting of the slates, additional fixing holes must be drilled. Holes must not be placed less than 20 mm from the edge of the slate.

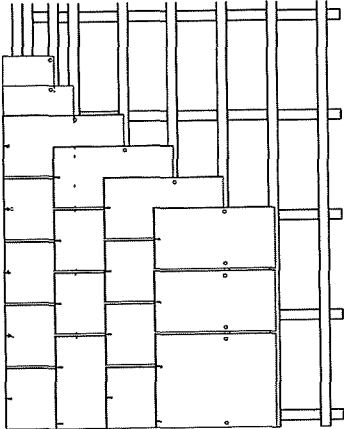
Makes sure to immediately remove all excessive dust development from the slates to avoid cement staining of the slates when exposed to rainfall.



Place necessary sealing tape or cover patch as follows beneath the underlay lap above by at least a head lap distance covering the rafters on both sides of the penetrated area, lower edge extending beyond the penetrated areas by at least a head lap distance, secured under a batten.

Installation

Cembert recommend the installation of their range of slates as follows



- Setting out**
1. Batten out roof starting at the eaves according to specified head lap for the particular slates. Ensure that the batten gauge is half the difference between the length of the slate and the head lap
 2. Place the first batten ensuring a 50 mm eaves slates overhang of the gutter
 3. After calculating the desired verge overhang accurately mark out the width of each slate and chalk the perpend onto the battens, ensuring a 4 mm gap between the slates
 4. Cut and head nail the slate under eaves along the entire length of the eaves
 5. Centre nail the second layer of slate under eaves. Ensure that these slates are cut to the same batten, using slate-and-a-half as the verges. Holes must be drilled in the slates-and-a-half half a slate-width in from the verge and 20 mm up from the tail. Place the stem of the copper crampton in the hole to restrain the tail of the verge slate in the first full-length layer of slates
 6. Fix the third layer of slates – i.e. the first full-length layer – by driving two nails for each slate firmly but not too tightly, into the batten
 7. Place a crampton at the tail of each slate with the disc secured between and below the edges of the two slates in the below layer. Ensure that the stem of the crampton peeps out through the hole in the tail of the slate in the next layer

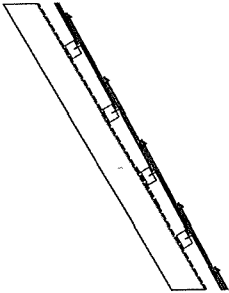
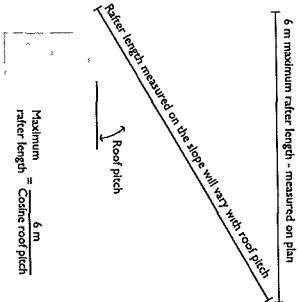
8. Bend the stem of the crampton 90° down the slope of the roof to restrain the tail of the slate
9. At the verge of this layer install the first full-length slate-and-a-half. This requires drilling three nail holes on the batten line and two additional holes for crampions. Drill the holes 50 mm in from the verge and 20 mm plus the gauge up from the bottom edge of the slate
10. Fix the next layers of slates trimming to verges hips valleys and ridges as necessary

Note! The remaining slate-and-a-halfs, to be used require a third hole to be drilled for the crampton of the single-width verge slate in the next layer. Drill this third hole a slate width in from the verge and 20 mm plus the gauge up from the bottom edge of the slate

If you need any guidance in slating your roof, please contact our well trained staff who will be ready with good advice

Installation Details

The installation details in this Installation Manual for Cembert slates apply only to standard roofs as described above under Small vs. Large Roofs.
For installation of Cembert slates on non standard roofs, please consult the latest version of BS5534



Pitches & Laps

When roofing two types of laps exist

Headlap The distance by which the head of the slate is overlapped by the slate 2 courses above it

Side lap The side distance by which the slate overlaps the slate in the next layer below - generally half the width of the slate

As described under 'Climatic Influences' the exposure of the

Normal exposure - Minimum pitches and laps				
Slate	25°-30°	30°-35°	> 35°	
600 x 300 mm	110 mm	100 mm	90 mm	
500 x 240 mm	110 mm	100 mm	100 mm	

Severe exposure - Minimum pitches and laps				
Slate	25°-30°	30°-35°	> 35°	
600 x 300 mm	110 mm*	110 mm	100 mm	
500 x 240 mm	110 mm	110 mm	100 mm	

* The use of high-performance roofing underlay is recommended

Standard double lap fibre-cement slates should generally be laid at pitches greater than or equal to 25°
Some double lap fibre-cement slates may be laid at pitches less than 25° Contact Cembert for further details

* The use of high-performance roofing underlay is recommended

site to wind-driven rain and wind must be taken into account when roofing. Below you will find recommendations for minimum pitches and laps for standard roofs, but please be aware that some circumstances (see 'Climatic Influences') may cause a normal exposure to become a severe exposure and the minimum recommendations for pitches and laps may not ensure full weather protection of your house. Ensure that the dimension of the head lap is never less than the minimum value specified in the tables

Coverage

When determining how many slates are required to cover a particular roofing area, please be aware that this depends on size of slate, length of specified head lap and pitch (lower pitch equals smaller roof slope area)

Quantity per square metre			
Headlap	600 x 300 mm	500 x 242mm	
90 mm		13.1	N/A
100 mm		13.4	20.8
110 mm		13.6	21.3
150 mm		14.8	N/A

Approx weights in kilograms					
Slate	Weight per slate	Per m ² laid at 90 mm lap	Per m ² laid at 100 mm lap	Per m ² laid at 110 mm lap	Per m ² laid at 150 mm lap
600 x 300 mm	1.5	19.65	20.10	20.40	22.20
500 x 242mm	1.01	N/A	21.1	21.6	N/A

Ventilation

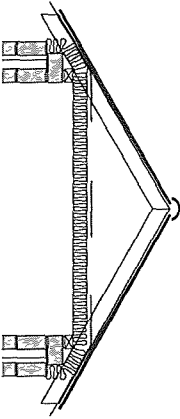
As stated in the Building Regulations roof constructions must be sufficiently ventilated in order to avoid harmful condensation of the insulation, timber, metal parts, etc. The Building Regulations divide roofs into the following categories with corresponding ventilation requirements:

- Standard duo pitch roof
- Mono pitch/lean-to roof
- Non-standard duo pitch roof
- Duo pitch roof with cathedral ceiling, and
- Mansard roof

Find the ventilation requirements for your roof below

Standard Duo Pitch Roof

Limitations
Roof pitches 15°-33° and eaves-to-eaves distance less than 10 m
Where the roof pitch is 25° or less please contact your local merchant or Cambri before specifying slate vents



Requirement
10 000 mm²/m run of eaves is required at eaves, or low level corresponding to a continuous 10 mm opening

Vent Solutions
For low-level solutions, select either over fascia soffit or slate ventilator solution

Mono-Pitch/Lean-To Roof

Limitations
Roof pitches 15°- Where the roof pitch is 25° or less please contact your dealer or the slate importer before specifying slate vents

Requirement
10 000 mm²/m run of eaves is required at eaves or low level, corresponding to a continuous 10 mm opening 5 000 mm²/m run of ridge or abutment is required at ridge, abutment or high level
This corresponds to a continuous 5 mm opening

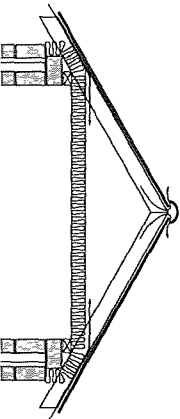
Vent Solutions
For low level ventilation select either over fascia soffit or slate ventilator solution, as described for standard duo pitch roof. For high level ventilation select either slate ventilator or ridge or abutment solution

Non-Standard Duo Pitch Roof

Limitations
Roof pitches greater than 33° or eaves-to-eaves distance greater than 10 m. In certain circumstances even where pitch and size limitations do not apply, the provision of eaves-to-eaves ventilation alone may not be adequate. By incorporating high level ventilation, the effectiveness of natural ventilation of the roof space is increased

Requirement
10 000 mm²/m run of eaves is required at eaves or low level. This is equivalent to a continuous 10 mm opening 5 000 mm²/m run of ridge is required at ridge or high level. This corresponds to a continuous 5 mm opening

Vent Solutions
For low level ventilation, select either over fascia soffit or slate ventilator solution, as described for standard duo pitch roof. For high level ventilation, select either slate ventilator or ridge solution



The roof space and/or batten cavity must be ventilated in accordance with the latest version of BS 5250:2011 Annex H of BS 5250:2011 gives guidance on the application of design principles. Sections H.3.5 - H.6 detail various roof constructions. Fibre cement slates should be considered an impermeable external covering

Duo Pitch Roof with Cathedral Ceiling

Limitations
All roof pitches with insulation following the line of the rafters incl pitches with a void at the apex and/or the eaves. Please note that if there is no void at the apex, slate ventilators cannot be used to provide high level ventilation

Requirement
25 000 mm²/m run of eaves is required at eaves or low level, corresponding to a continuous 25 mm opening 5 000 mm²/m run of ridge is required at ridge or high level, corresponding to a continuous 5 mm opening. Free airspace between insulation and underlay must be at least 50 mm

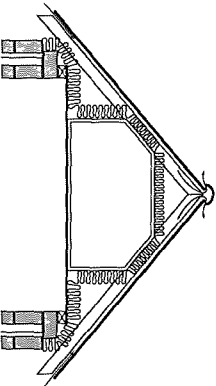
Vent Solutions
For low level ventilation select either over fascia or soffit solution. For high level ventilation select either slate ventilator or ridge solution, as described for non standard duo pitch roof

Mansard Roof

Limitations
All roof pitches with insulation following the line of the rafters incl pitches with a void at the apex and/or the eaves. Please note that if there is no void at the apex, slate ventilators cannot be used to provide high level ventilation

Requirement
25 000 mm²/m run of eaves is required at eaves or low level corresponding to a continuous 25 mm opening 5 000 mm²/m run of ridge is required at ridge or high level corresponding to a continuous 5 mm opening. Free airspace between insulation and underlay must be at least 50 mm

Vent Solutions
For low level ventilation, select either over fascia or soffit solution, as described for the duo pitch roof with cathedral ceiling. For high level ventilation select either slate ventilator or ridge solution as described for duo pitch roof with cathedral ceiling



In cold roof construction the loft space must always be ventilated. If an LR breather underlay is used, the batten space must be ventilated. In warm roof construction with an HR underlay a ventilated void between the insulation and the underlay must be provided. If an LR breather underlay is used, the underlay and the batten space above must be ventilated in addition an AVCL (impermeable membrane) must be provided between the insulation and the internal finish. The most effective way to achieve this batten space ventilation is through eaves to ridge ventilation

Underlay

A solid underlay such as boarding or decking provides added structural stability, especially for long roofs and roofs with low pitches. Furthermore, according to BS5534, a roofing underlay whether flexible or solid, has two functions:

- 1 The underlay acts as a barrier to prevent wind-driven rain, snow or dust from entering the roof space and transports any rainwater which may penetrate the joints of the slating safely away and into the roof drainage system
- 2 The underlay reduces suction on the slates generated by wind gust

BS5534 recommends the following minimum head laps for roofing underlay:

Pitch	Not fully supported	Fully supported
Below 22.5°	225 mm	150 mm
22.5°-35°	150 mm	100 mm
35° and over	100 mm	75 mm

NOTE

Cembrit fibre cement slates are classed as a 'close fitting' roof covering. When installed with vapour permeable underlays, counter battens must be used to ensure 50mm continuous ventilation into the batten cavity along with 25.000mm²/m ventilation at the eaves and 5.000mm²/m on either side of the ridge or at high level. Always apply counter battens, running from eaves to ridge in order to lift slating battens clear of a solid underlay and its vapour-permeable membrane covering. Locate side laps of flexible underlay over a rafter. Side laps must not be less than 100mm. Where underlay is unsupported (i.e. draped over rafters), minimise the gap at the head laps resulting from tautness between the underlay sheets.

Provide approximately 10-15 mm clearance between the underside of the battens and the underlay (measured at the mid-point of each draped), ensuring sufficient clearance to permit free drainage of moisture, but not so great as to permit contact with the underside of the slating when the underlay is subjected to wind uplift loads. Where underlay overlaps do not coincide with a batten, consider either including an extra batten to secure the overlap or increasing the overlap to coincide with the next batten.

	Rafter centres up to 400 mm	Rafter centres 400-600 mm
Battens	47x22mm	47x35mm
	50x25mm	50x35mm

One of the biggest issues with slate battens is under-sizing. To avoid this, there are clear tolerance limits for the minimum depth of the slate batten which is 3mm/0mm. Also, slate battens cannot be less than 25mm deep and where the span between supports exceeds 600mm, calculations must be completed to determine their correct dimensions for structural integrity.

All slate battens must conform to requirements set out in BS5534 and must be checked prior to installation.

The length of the battens must be minimum 1200 mm and supported by at least three rafters, trusses or walls. If the distance between any two rafter centres exceeds 400 mm, either insert an additional rafter to support the battens or apply battens capable of spanning 600 mm. The batten gauge can be calculated as follows:

$$\text{Batten gauge} = \frac{\text{Slate length} - \text{Head lap}}{2}$$

Counter Battens

Counter battens are battens that run from eaves to ridge. Please follow the instructions below when installing counter battens:

- 1 Ensure that the width of the counter batten is the same as the supporting rafter and that it, where fully supported, has a depth not less than 22 mm.
- 2 Fix counter battens at centres coinciding with rafters/trusses marking positions of later at top edges and eaves before laying underlay.
- 3 Fix counter battens through underlay into rafters/trusses at centres not more than 300 mm apart.
- 4 Where rigid thermal insulation is located on rafters, ensure that the required structural fixing of counter battens is achieved.

Installing Battens

Please follow the instructions below when installing battens:

- 1 Fix battens in a straight, horizontal line aligned on adjacent areas and fixed to each support, with splay fixing at joints.
- 2 Place only one joint in any group of four battens on any one support and ensure that each joint is square-cut and butted centrally on supports.
- 3 Add an extra batten where an unsecured lap in the underlay occurs between battens.
- 4 When using headless fixings such as helical nails, make sure to comply with the manufacturer's recommendations as to the thickness of the members to be fixed and the adequacy of withdrawal resistance.
- 5 When applying sawn softwood, please comply with the requirements set out in BS5534. Permissible characteristics and defects must not exceed the limits given in BS5534.
- 6 Ensure that the moisture content does not exceed 22% at time of fixing.
- 7 Treating battens with preservative is not essential, but should be considered where timber members are at risk of attack by wood-rotting fungi – i.e. where the moisture content of the battens is likely to remain above 20% for longer periods of time. Please, be aware of the risk of chemical attack by certain types of preservative treatments on certain roofing underlay metal fittings and fasteners. Please follow one of the following methods: CCA vacuum pressure or organic solvent double vacuum to British Wood Preserving and Damp Proofing Association Commodity Specification C9. Additional information on preservative treatment is provided by BS 5268 Part 5.

Flashing & Weathering

When installing Cembrit slates, please ensure to flash the slates with equally durable metals, preferably lead or copper sheets, fixed in compliance with the recommendations given by The Lead Sheet Association or The Copper Development Association.

In order to avoid undesired patination of your roof as a consequence of lead carbonate caused by the combination of lead sheets and rain water, all lead elements should be treated with patination oil before the rain occurs and not later than the day of

fixing. The patination oil covers the lead elements with a semi-permeable protective membrane which permits moisture and atmospheric gases to percolate gradually through to the surface of the sheet, allowing the formation of an adherent natural grey patina over a period of time. Cembrit recommend the application of pre-coated or painted aluminium flashings to avoid run-off staining of the slates, which may occur when applying untreated aluminium flashings.

NOTE! In the event of lead staining any attempts to remove such staining from the slates may void the warranty of the product.

Installing Slates

Please follow the instructions below when installing slates:

Use only

Copper, stainless steel or siliconised bronze nails that comply with the requirements of BS 1202-2.

Avoid applying galvanised nails

• Length: 30 mm

Shank diameter: 2.65 mm

Copper crampions

Stem length: 19 mm

Stem diameter: 2 mm

Base thickness: 0.5 mm

• Base diameter: 19 mm

- 1 Fix each layer of slates with tails aligned to a half-lap bond ensuring no more than 4 mm gaps between the slates.
- 2 Fix extra-wide slates at the ends of the layer to keep the bond leaving cut slates as large as possible. Ensure that the cut slates are not less than half the width of a full slate.
- 3 Fix slates with two copper nails and one copper crampion. Ensure that slates wider than slate-and-a-third are fixed with three nails and two crampions.
- 4 Drill all additional holes on site before fixing.

Battens

The below table offers you maximum dimensions for rafter centres according to BS5534

Eaves

Apply a triangular tilting fillet at the eaves to fully support the underlay and prevent moisture from developing behind the fascia

Install the tilting fillet as follows

- 1 Apply materials such as a continuous timber, shaped to suit (not recommended where over fascia ventilation is proposed)
- b 6mm board material (such as exterior grade plywood) or plastic underlay support tray

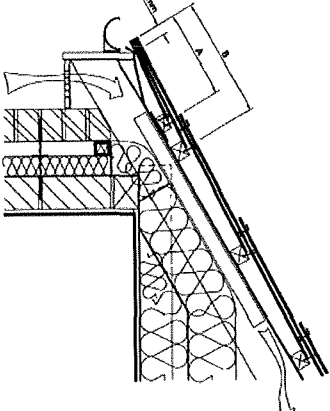
Underlay

Eaves Support

In order to prevent water development at the eaves and to ensure that the surface moisture is securely discharged into the gutter it is important to support the roofing underlay at the eaves. Please follow the instruction in BRE Defect Action Sheet 9, published by the Building Research Establishment Housing Defects Prevention Unit to ensure sufficient underlay support

Eaves Reinforcement

Some underlay materials are not resistant towards UV degradation e.g. Type 3F felt to BS 747 or JS 36. In such circumstance, a



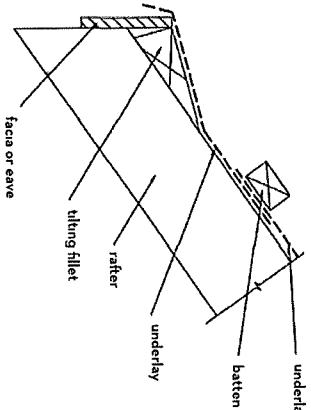
Standard eaves with soft ventilation

- 2 Ensure that the tilting fillet falls outwards to the gutter by approx. 10°.
- 3 Be aware that placing a batten beneath the underlay does not provide the necessary eaves support
- 4 Raise the tails of under eaves and eaves slates slightly above the plane of the battens to ensure that finished slates fit correctly
- 5 Tilt the slates 8-15 mm above the plane of the battens

UV resistant material such as Type 5U felt or an underlay support tray can be used as eaves reinforcement. Install the eaves reinforcement material between the eaves support and the underlay. It is important to ensure compatibility between the materials used as reinforcement and the underlay

Eaves Batten

For all slates apply that the positioning of the first batten depends on the length of slate and head lap specified



Eaves Structure and underlay

Slates

Eaves Slate Layers

When installing the slates, two under eaves layers are installed

- 1 The first under eaves layer
 - a equal in length to the gauge
 - b head nailed
 - c supports the lowest crampion and stabilises the eaves
- 2 The second under eaves layer
 - a equal in length to the gauge plus the head lap
 - b centre nailed
 - c laid in a broken bond over the first under eaves layer

In order to cut as few slates as possible, the under eaves slates can be cut from one full slate as the sum of the lengths of the under eaves layers is equivalent to the head lap plus twice the gauge

Turn the under eaves slate 'upside down', allowing the riven or dressed edge of each slate to narrow in towards the other before being head nailed. This installation method creates a strong, sharp line at the eaves. Both the under eaves layers and the first full layer of slates must overhang the gutter by approx. 50 mm, measured horizontally from the face of the fascia

String Under Eaves slate Layers			
Slate size (mm)	Lap (mm)	1 st under eaves slate length (mm) A	2 nd under eaves slate length (mm) B
600 x 300	110	245	355
600 x 300	100	250	350
600 x 300	90	255	345
500 x 242	100	200	300
500 x 242	90	205	295

Ventilation Accessories
Ventilation of the eaves can be established by means of soffit or over-fascia ventilators

Soffit Ventilators

Ventilation Insert soffit grilles into the soffit, running parallel to the eaves to achieve the required airflow rating
Underlay support Fix an underlay support tray or a continuous timber tilting fillet to the rafters to provide continuous support for underlay at eaves and to prevent water development
Ventilator trays Fix a rafter tray to the rafter to ensure free air passage between the soffit and the roof space
Place insulation over wall plate

- When using a timber tilting fillet, fix a strip of JS 36, Type 5U felt or a similar durable underlay as eaves reinforcement to under lap first full layer of roof underlay
- Dress roof underlay and eaves reinforcement down into gutter
- Fix eaves slates with tails projecting 50 mm over the gutter or to the centre of the gutter, whichever dimension is the lowest
- Ensure that the first under eaves slate layer corresponds in length to the batten gauge
- Ensure that the second under eaves slate layer corresponds in length to the batten gauge plus the slate head lap

Verge

Roofs are often exposed to high wind pressure sometimes causing spiralling turbulence around the verges. In order to avoid damage to your roof it is important to adequately secure all edge slates. Verge slates may be finished either with an under cloak, a mortar-pointed system or a dry-fixed verge

Cavity

Close off the top of the cavity wall construction with a fibre-cement cavity closer strip

Underlay

When installing the roofing underlay, ensure that all underlays extends over the outer edge of any verge underlay for dry verge lap onto the outer leaf of the wall or with overhanging verge onto the flying rafter and extends approx 20 mm beyond the bargeboard

Underlay used with overhanging verges to be under cloak and pointed lap under the under cloak and extends approx 20 mm beyond the bargeboard or the face of the wall

Battens

When installing the battens ensure that they overlap the wall or under cloak by not less than 50 mm. With overhanging verges the batten end must be securely supported by a flying rafter. Note that all slate batten ends must be mechanically secured

Dry-Fixed Verges

In the UK one of the most common verges applied is the plain overhanging verge i.e. the slates overhanging the bargeboard or gable by between 30 mm and 50 mm. Using a dry fixed verge trim for this purpose can easily and significantly improve the performance of the roof

Trim designs

- One for overhanging verges
- One for flush verges

One for refurbishment work or fitting after completed slating

Fixing trims

- 1 Bed the cavity closer of the Cembit slate on a mortar mixture level with the underside of the slate battens
- 2 Carry the roof underlay over the cavity closer across the verge ladder frame and project 20 mm over the top of the bargeboard
- 3 Carry battens to back of barge board
- 4 Ensure an overhang of the finished verge
- 5 Ensure that trims are overlapped by 50 mm at joints

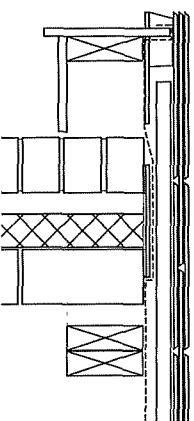
Slates

When installing Cembit slates begin alternate layers at the verges with a cut double-width slate or a cut slate

Fixing of slates

Fix slates wider than one-and-one-third times the specified slate width with three nails and two crampions

As previously mentioned never apply cut slates less than half the width of a full slate



Ridge

When installing Cembit slates, Cembit recommend the application of ridge cappings of fibre-cement, clay or concrete

Underlay

Duo-pitch roofs not requiring ridge ventilation
Carry underlay on one slope of the roof over the ridge to overlap the underlay on the other slope by not less than 225 mm

Mono-pitch roofs not requiring ridge ventilation

Carry underlay over the mono ridge to extend vertically by not less than 100 mm

Ridges requiring ventilation

Cut underlay and turn upwards to form a continuous 5 mm gap on either side of the ridge board. Secure the turned-back felt by tacking to the back of the slating battens nearest to the ridge

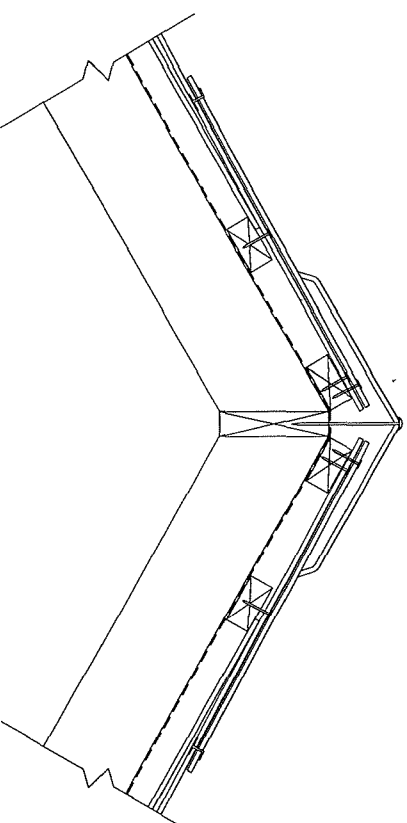
Battens

In order to achieve a neat and uniform finish towards the roof slope it is possible to increase (never decrease) the head lap of the final layers of slates up to the ridge. Be aware that batten positions may need to be adjusted accordingly. Use slating battens or an extra-wide batten along each side of the ridge to easily position and fix both slates and dry-fix ridge cappings

Slates

When installing slates up to the ridge ensure that

- An approx. 10 mm gap remains between the slated surface on opposing slopes of the roof
- The specified minimum head lap is provided in the area around the ridge - It may not always be possible to achieve this using full length slates laid to standard gauge
- The minimum head lap of the ridge capping over the penultimate layer of slates is achieved - this can be done by installing shortened slates in the top two layers on either side of the ridge
- Areas of severe exposure are additionally secured e.g. by a continuous UV resistant material such as a dpc strip placed over the apex as a soaker between the last two slate layers on each slope



Ridge Cappings

Dry-fixed Ridge

When installing dry-fix ridge cappings please follow the below procedure

- 1 Place and fix the top slating battens or additional battens, facilitating mechanical fixing of the ridge cappings
- 2 Place the cappings with the internal spigot joints facing towards or the external socket joints facing away from the wind
- 3 Place top layer of the underlay from one side of the ridge over the apex to overlap underlay at the other side by at least 225 mm
- 4 Place and fix top slating battens to suit fixing of ridge cappings apply double or extra-wide battens
- 5 Fix ridge cappings to slating battens with 50 mm no 10 gauge brass or stainless steel screws with washers and caps One fixing on each side of capping positioned 50 mm up from the edge of the capping wing and centred on the socket
- 6 Seal joints with a butyl rubber bead sealant strip
- 7 Ensure that end ridge cappings are always full length units
- 8 Finish the slating with a head-nailed short layer of slates to maintain the gauge

Alternatively you can secure the ridge cappings by fixing a long drive screw through the apex or crown of the capping into the ridge board This alternative fixing method is acceptable provided that

Cappings are predrilled with holes oversized by 2 mm prior to fixing and
Drive screws are not over-nailed so as to fracture the capping

Selecting Correct Ridge Capping		
Roof Pitch	Fibre Cement Ridge Capping	Clay Ridge Capping
25°	135°	125°
30°	120°	115°
35°	105°	105°
40°	90°	90°
45°	90°	90°
60°	62°	particular

Hip

The true angle of the hip pitch is always lower than the rafter pitch making the hip more sensitive towards exposure of wind and wind-driven rain When roofing with Cembrit slates Cembrit recommend the use of fibre cement or clay hip cappings The exposure of the site combined with the angle of the roof pitch determines whether specifying a close-mitted hip should be considered

Underlay

When installing the underlay of a roof slope neighbouring a hip ensure that the underlay

- Overlaps the line of the hip
- Is carried across the neighbouring roof slope by minimum 150 mm, and
- That an additional minimum 600 mm underlay is rolled out along the line of the hip - from eaves to ridge

Battens

Install extra wide hip or raking battens on roof slopes neighbouring a hip Ensure that these battens are the same height as the slating battens and fixed to either side of the hip - from eaves to ridge These hip battens are to receive the dry fix hip cappings and to serve as extra support of the cut slates making up the edge of the roof The hip battens can also serve as fixing point for the slating battens, cut to the rake of the hip Thus, the slating battens can be nailed directly into the hip battens from their lower side i.e. closest to the eaves

Slates

When installing roof slopes neighbouring a hip and hip cappings are to be used, ensure to rake-cut slates to the hip line with an approx. 10 mm gap between the two slate layers Install double-blank slates, whenever the width of the tapered head of a standard slate is below 50 mm

NOTE! Never apply small triangular-cut slates

Cappings

Dry-fixed Hip

When installing dry fix hip cappings, please follow the below procedure

- 1 Place the hip cappings with the internal spigot joints facing uplope or the external socket joints facing downslope
- 2 Place the underlay over the hip, ensuring minimum a 150 mm overlap
- 3 Place a 600 mm continuous underlay strip from eaves to ridge over the main roof underlay

- 4 Place and fix hip slating battens running from eaves to ridge on either side of the hip line to suit fixing of hip cappings apply double or extra-wide battens
- 5 Cut slates in the relevant sizes and fix closely at roof slope junctions
- 6 Fix metal saddle under hip and ridge cappings junctions
- 7 Angle dry hip cappings to suit the roof
- 8 Fix hip cappings to slating battens with 50 mm no 10 gauge brass or stainless steel screws with Sela M6 washers and caps One fixing on each side of capping positioned 50 mm up from the edge of the capping wing and centred on the socket
- 9 Seal joints with a butyl rubber bead sealant strip
- 10 Neatly cut first hip capping in order to align with eaves
- 11 Ensure that end hip cappings are always full length units

Alternatively you can secure the hip cappings by fixing a long drive screw through the apex or crown of the capping into the ridge board This alternative fixing method is acceptable provided that

Cappings are predrilled with holes oversized by 2 mm prior to fixing, and the drive screws are not over-nailed so as to fracture the capping

- In junctions between a ridge and cappings cut to a close mitre Underlap the junction with a concealed metal flashing saddle After fixing the cappings trim the underlapping metal flashing saddle

Fit a bead of butyl rubber tape in the mitre joints

Close-Mitred Hips

Close-mitred hips are applied only when the roof pitch exceeds 30°

Install the close-mitred as follows

1. Rake cut slates on opposite roof slopes in order to create a close mitre at the hip
2. Ensure that the width of each tapered slate head is minimum 50 mm
3. Place cut soakers with each layer extended approx. 150 mm on each side of the hip line
4. Ensure a minimum soaker length as follows

Soaker length = raking gauge + head lap + 30 mm

NOTE! For sites with severe exposure or with roof pitches

exceeding 45° external tail fittings such as slate hooks or screws with washers and caps may be necessary to secure the roof against high wind loads

Selecting Correct Hip Capping		
Roof Pitch	Hip Pitch	Fibre-Cement Hip Capping Required
25°	18.2°	145°
30°	22.2°	135°
35°	26.3°	135°
40°	30.7°	120°
45°	35.3°	120°
60°	50.8°	90°

Valley

One of the areas of a roof which is highly exposed to wind and wind-driven rain is the valley. Therefore, you have to carefully consider the design and construction of the roof before you start building. The following items are important to consider

- Expected exposure to wind-driven rain
- Size and pitch of roof slopes draining into valley gutter
- Length and required capacity of valley gutter
- Height of valley lining boards compared to slating battens
- Material used for valley gutter
- Joining of valley gutter

The design possibilities of valley gutters are many, e.g. as proprietary performed valley gutters or as close-mitred valleys etc. However, Cembit recommends the use of open valleys with sheet metal linings and thus this Installation Manual describes only this method

Structure

The true angle of the valley pitch is always lower than that of the neighbouring roof slopes. Install the valley as follows

1. Ensure a minimum open width of the gutter of 125 mm by extending the valley boards at least 225 mm to each side of the centre of the valley
2. Place the top of the triangular tiling fillet on each side of the gutter approx. in level with the tops of the battens
3. Ensure that the triangular tiling fillets are placed 150 mm from the centre of the valley - measured along the slope
4. Ensure that valley boards are at least 19 mm and recessed in order for their tops to level with the rafter tops
 - a. Cut-rafter roof notch the tops of the rafters
 - b. Pre-fabricated trussed-rafter roof. Do not reduce rafter depth!

Cut valley boards into section and place them flush between the rafter tops supported on bearers fixed to the sides of the rafters. Place a 4 mm flat sheet across the tops of the valley boards and rafters, providing a smooth surface to receive the metal lining

NOTE! According to the BS5534, valley boards may be supported on the tops of the rafters, provided that the length of the valley gutter (measured along the valley slope) does not exceed 6 m

Water Run-off

The expected water run off of a roof is important to consider when designing the roof and the valleys hereof. The assumed design maximum rainfall rate is 225 mm/h/m². Please, consider the following

- Where two roof slopes with different pitches meet at a valley, carefully detail the valley gutter substrate and lining, preventing water run-off from the steeper slope from surcharging the gutter and spilling onto the underlay of the lower slope
- Where length of valley gutter (measured along the valley slope) exceeds 6 m and roof pitch is <50°, widen the valley gutter to avoid surcharging the lower end during heavy rain or wind

For further guidance on rainfall and expected discharges, please contact our well trained staff or turn to the BS EN 12056-3:2000

Underlay

Place the roof slope underlay with a 25 mm overhang of the tiling piece on the side of the valley board and dress into the valley - gutter

NOTE! If the risk of adhesion exists, e.g. when using bituminous felts, do not place metal valley materials directly onto the underlay. Adhesion may cause reduced performance of the valley material when this is cooled down following periods of warm weather

Battens

Ensure that batten ends are fully supported

Slates

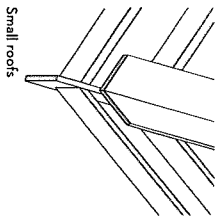
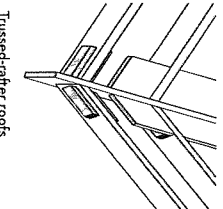
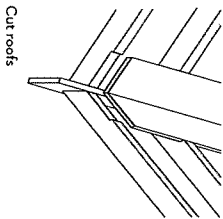
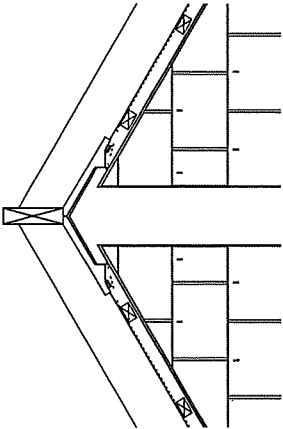
When installing slates neighbouring the valleys, please follow the below instructions

1. Apply double-blank slates on both sides of a valley
2. Place slates into the valley
3. Rake-cut slates to overhang the tiling fillet, providing the required open channel
4. Ensure a minimum slate tail width of 100 mm
5. Cut extra-wide slates neatly and fix, centred on valley, ensuring a minimum gap of 125 mm

NOTE! Do not bed slates in mortar

Roof Pitch	True Pitch of Valley (Between Roofs of Equal Pitch Meeting at a Right Angle)
25°	18.2°
30°	22.2°
35°	26.3°
40°	30.7°
45°	35.3°
60°	50.8°

Sheet metal valley



Abutments

Abutments

Areas where the plane roof slope is interrupted, e.g. by a wall, chimney or dormer window, are particularly exposed to water development. Therefore, it is important to take special precautions around these areas. Usually such areas are weathered with flexible metal flashing e.g. lead

Structure

When installing slates around abutments, please follow the below instructions

1. Leave a 50 mm gap between masonry walls and timber rafters at side abutments
2. Design tilting fillets applied at back gutter the same way as tilting fillets at eaves

Underlay

When installing underlay around abutments, please follow the below instructions

1. Carry underlay up the vertical plan of the abutment and place by approx. 100 mm at top and side abutments
2. When possible, secure and seal underlay, creating a weather tight junction and preventing underlay from sagging over time
3. Support underlay at back gutters (as with eaves), ensuring a minimum overlap of the back gutter material of 100 mm
4. Prevent the development of water on the underlay

Battens

At top edges, place battens allowing an apron flashing to overlap the top slate layer(s), thereby maintaining the required head lap. At side abutments, place battens 10-25 mm back from the face of the abutment and ensure sufficient support of the battens

Slates

When installing the slates around abutments, please follow the below instructions

1. Apply cut slates with a minimum width of half the width of a full slate
2. Maintain the slate head lap by the flashing at top abutments
3. Carry slates to 10-15 mm of the wall, preventing lead flashings from forming a cavity allowing water development
4. Head-nail the top layer of slates into the batten without drilling the slates below
5. When forming a back gutter, place slates similarly to the eaves. However, length and number of under eaves layers depended on the slate layer on the neighbouring roofing area
6. When installation of two under eaves layers is not possible, drill slate tails and tie with copper wire or hook fix

Weathering Abutments

Top Abutment

Weathering of top abutments can be achieved either by a one-piece metal apron or by a combined apron-and-cover flashing. Please follow the below instruction when weathering the top abutment

1. Ensure that the apron is clipped. The distance between restraining clips depends upon site exposure
2. Turn underlay minimum 100 mm up from abutment
3. Finish slating with a head nailed slate layer in order to maintain gauge
4. Fix slates close to abutment to allow installation of a metal apron flashing ensuring a weather tight junction

Side Abutment

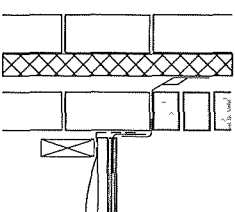
Weathering side abutments can be achieved by a combination of interlaved soakers and a cover flashing. Please follow the below instructions, when weathering the side abutment

1. Place a soaker between each slate layer and head nail to batten
2. Ensure a soaker length as follows

Soaker length + gauge + head lap + 25-30 mm

3. Turn underlay minimum 100 mm up from abutment
4. Cut slates as required and interleave with metal soakers
5. Fix soakers by turning down over the head of each batten
6. Fix slates close to abutment to allow installation of a metal apron flashing ensuring a weather tight junction

NOTE! Where there is a risk of water penetration of the soakers, an alternative method of weathering is to construct either an open or hidden secret gutter



Back Abutment

Back abutments or back gutters must be open or tapering gutters. Weathering of such back abutments or back gutters can be achieved by a lead sheet either banded or cut and lead welded to the appropriate profile and protected at the wall by a cover flashing

Maintenance

In order to ensure a long lifespan of your roof, please inspect the roof at least twice a year – end autumn after leaf fall, and late-spring after heavy rain and snow fall is over – and otherwise when the weather conditions have been exceptional

Inspection Guide

- ✓ Ensure that there is no evidence of water penetration in internal roof space
- ✓ Clear any blocking of ventilators, especially near eaves, to avoid condensation
- ✓ Clear eaves gutters of leaves and other plants
- ✓ Ensure that the joints in the gutters are tight - metal-lined valley gutters should be examined for deterioration, creep cracking etc.
- ✓ Ensure free-flow of water to outlets
- ✓ Remove growth of algae, mosses and lichens by gently spraying the roof with an appropriate herbicide
- ✓ The use of a pressure washer is not recommended when cleaning fibre cement slates
- ✓ Examine the ridges and hip cappings and replace, bed and re-point where needed
- ✓ Examine metal flashings and pointings at abutments
- ✓ Examine the roof for damaged, slipped or missing slates – if several slates have slipped, the entire roof should be examined by a professional

NOTE! Never walk on a slated roof as this does not provide a safe and non-slip surface which may lead to a fall causing serious injury and may also damage the slates

Replacing Damaged Slates

If during the inspection of your roof you encounter any damaged slates, you need to evaluate the degree of the damage. Is it a minor damage such as a chipped corner or a more severe damage? More severe damages to the slates are important to repair or replace as the weathering function of the roof might be affected

Advice

Cembrit recommend that any cover flashing, rendering or painting of areas projecting above a slated roof be completed before roofing begins to avoid damage to or staining of the slates. Clean the roofing underlay of any mortar droppings before slating begins

Unfortunately, the installation method applied when roofing with slates does not allow you to easily remove one slate and replace this by a new one. To ensure proper and sustainable replacement of the damaged slates, follow the below procedure

You will need the following tools

- Hammer
- "Slater's ripper"
- Stainless steel hook
- Copper nails (if more slates are to be replaced)

Do as follows

1. Place the slater's ripper underneath the damaged slate
2. Bend up the crampion stems in the area around the damaged slate
3. Cut or pull out the nails one by one by placing the 'slater's ripper' around the shank of a nail. Then hammer downward on the upstand handle of the ripper, parallel to the pitch of the slope
4. Carefully remove the slate as well as any small pieces of slate and nail
5. Insert the stainless steel hook into the batten above the head of the slate. The length of the stainless steel hook must be length of head lap + 10 mm
6. Bend the hook back slightly
7. Use the slater's ripper to carefully lift the existing slates lying over the head and concealed margin of the new slate
8. Slide in the new slate with its head resting on a batten
9. Tighten the hook back into position by sliding the slate down into the hook

The replaced slate relies solely on the hook, but the surrounding well-fixed slates help to prevent movement to the sides and upwards. If you need to replace an area of damaged slates, carefully remove the slates in a 'V'-formation with the damaged slate as the base



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Aquacel
Plastic Building Products

AQUACEL GENERAL SPECIFICATION

AQUACEL roofline and cladding profiles are made from cellular PVC-ue (unplasticised expanded cellular polyvinyl chloride) foam, co-extruded as a durable PVC-u skin with a rigid closed cell core.

They contain no CFCs (chlorofluorocarbons) or lead and are therefore formulated to be completely non-hazardous to health.





STANDARDS

AQUACEL roofline and cladding products are manufactured in accordance with two recognised standards:

The Foam Profiles

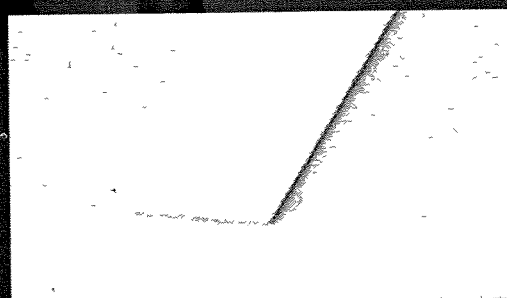
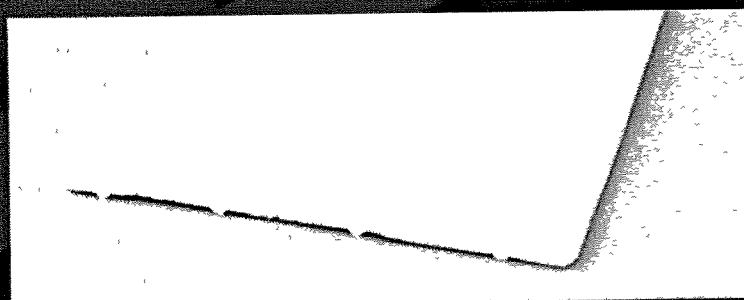
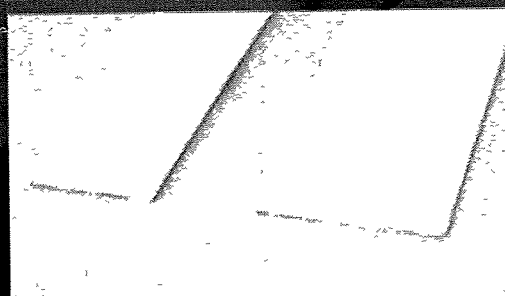
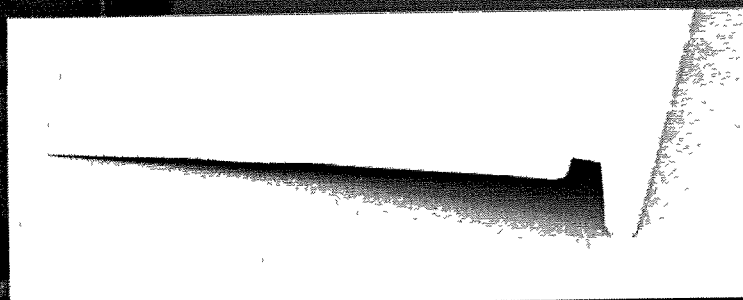
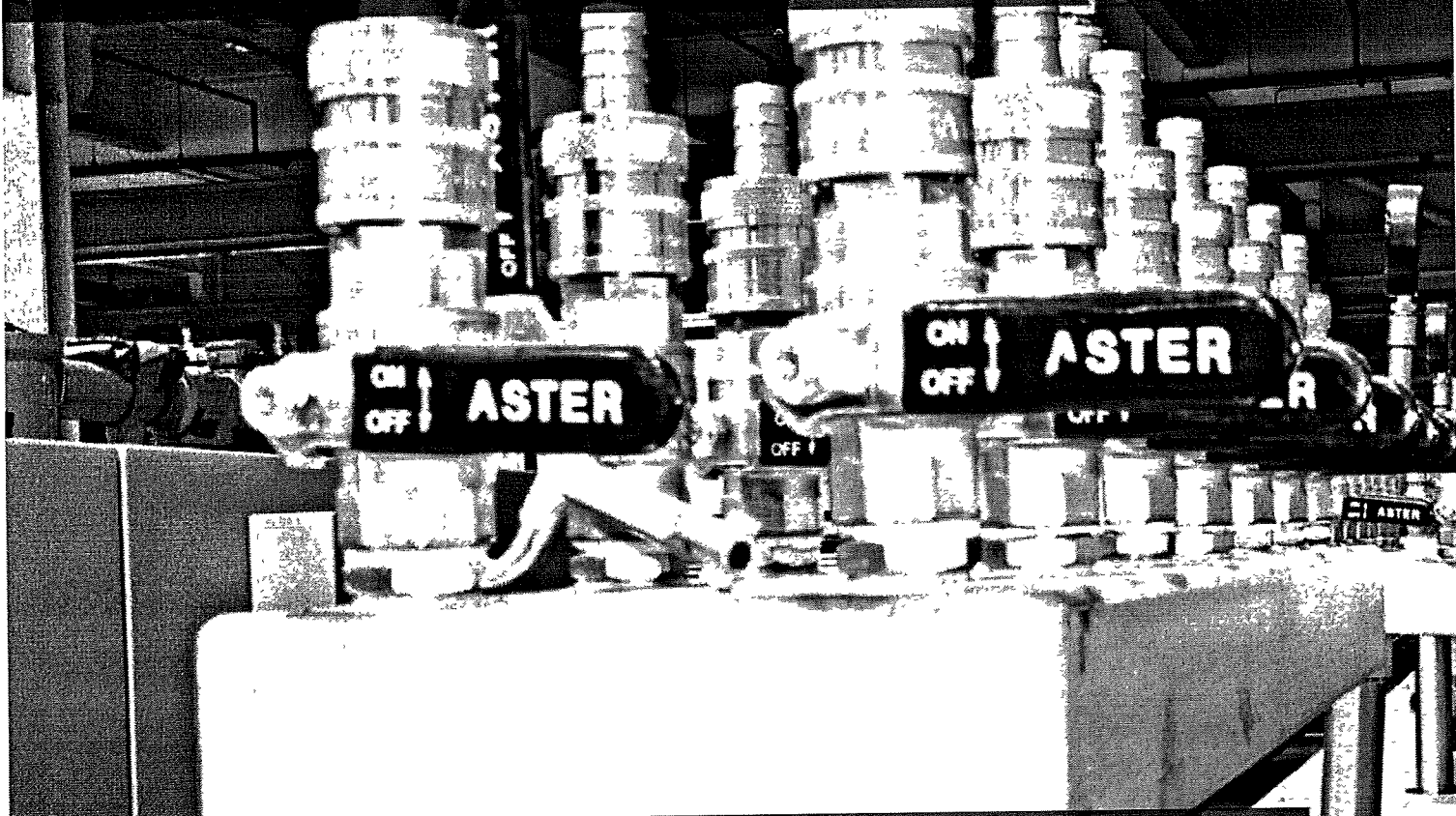
British Standard specification BS 7619: 1993.

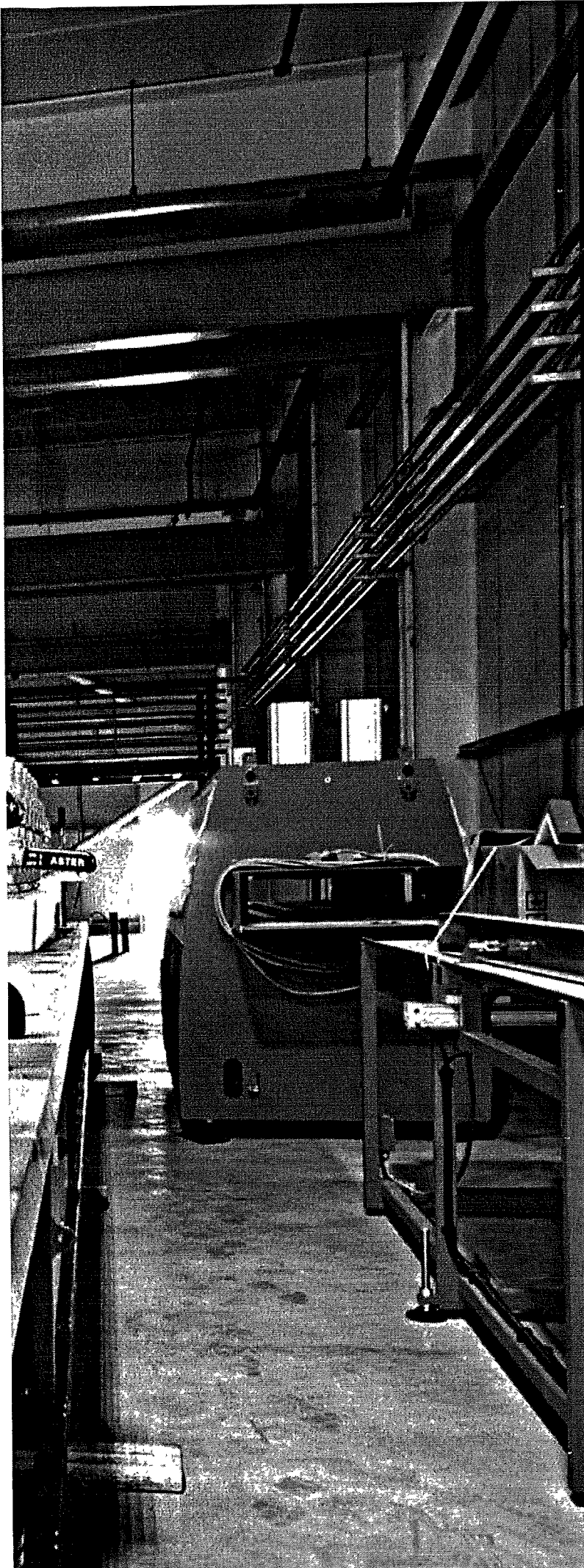
Specification for extruded cellular unplasticised PVC profiles.

The Manufacturing Process

The international standard for Quality Assurance.

BS EN ISO 9002: 1994 (BS 5750: Pt. 2).





DENSITY

The thickness of profiles varies, which affects the proportions of outer skin and inner core, so there can be no single value for density but, in general, profiles are between 450 and 600 kg/m³.

STABILITY

Stability in this context is resistance to chemical and/or biological reaction.

Cellular PVC-ue is not affected by liquids or other substances in everyday use, and is resistant to attack by acids and alkalis. It is generally described as being resistant to attack by wood-boring insects. It is not attacked by termites or woodworm. It does not support the growth of fungus or bacteria. It may be subject to damage by a range of chemicals, generically known as esters, ketones and solvents.

COLOUR FASTNESS

The methods of test for colour fastness contained in British Standard specification BS 1006: A03: 1978 include gradings down to a minimum value for colour change of Grade 8 – AQUACEL white profiles all achieve either Grade 7 or 8, meaning that any fading or change in whiteness over a minimum 20 years will be within an acceptable range.

AQUACEL white profiles have demonstrated, in test conditions, excellent resistance to discolouration, and also to a degradation known as "pinking", which is generally believed to be related to processes involving Titanium Dioxide and Lead stabilisers. AQUACEL coextrusions instead use an advanced technology lead-free stabiliser which has superior resistance to discolouration.

Coloured profiles and associated products use organic pigments, chosen for their colourfast properties. Any fading experienced will be gradual and uniform – only detectable when compared with new materials.

DURABILITY The denseness of the outer skin ensures adequate resistance to impact, thus ensuring a highly durable surface.

FIRE RESISTANCE

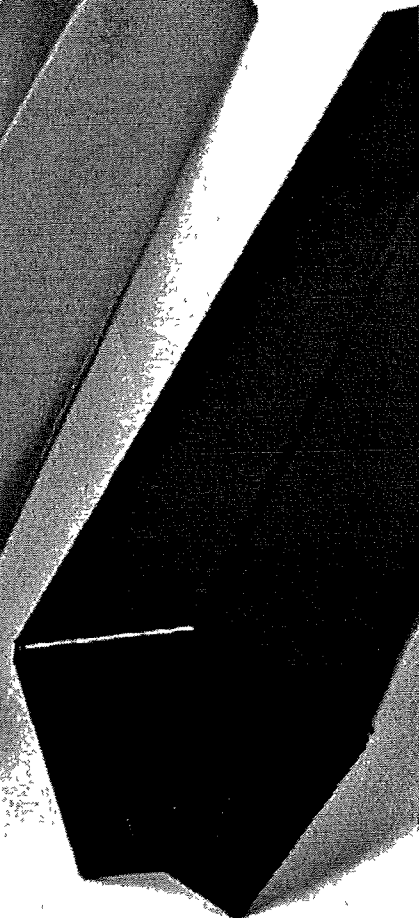
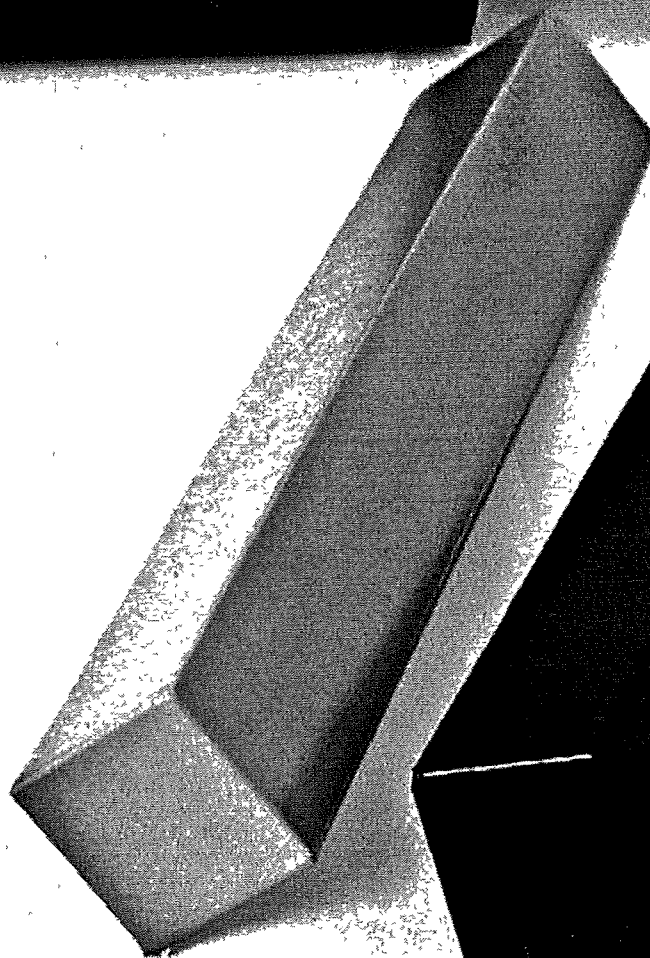
Resistance to the spread of fire can only apply to a completed assembly but not to its components.

Profiles have been tested for compliance with the Flame Retardance requirements of British Standard BS 476: BS 476 Pt 5: 1979 Ignitability Test - self-extinguishing.
Pt 6: 1989 Resistance to Fire Propagation - Class 1.
Pt 7: 1987 Resistance to Spread of Flame - Class 1Y.

STOCKIST NETWORK

All Kalsi Group products are easily available from a network of stockists throughout the UK and Ireland.

A dedicated and flexible delivery fleet guarantees every item arrives on time and in pristine condition, catering for all customers, from the single stockist to multi-branch operations.



STRENGTH

The strength of AQUACEL profiles and associated products cannot be measured as such, because strength is a characteristic of an assembly.

Thus the resistance to wind loads is entirely dependent on variable factors such as profile configuration/thickness and the spacing of fixings. When fixed in accordance at the recommended spacings, the roofline and cladding systems have adequate resistance to wind loadings.

Up to two storeys height, fixing spacings should not exceed 600mm centres, and from two storeys to a maximum of five storeys, 400mm centres.

THERMAL INSULATION

Thermal resistivity is normally referred to in terms of a U-Value.

AQUACEL profiles, due to the composition of their cellular inner core, offer thermal performance far superior to timber or other natural building products.

Due to the varying nature of the profiles in terms of configuration and thickness, thermal performance can only be generalised to between 0.06 and 0.1 w/mK. THERMAL MOVEMENT Expressed as the coefficient of linear expansion, AQUACEL profiles vary between 5 and 6 x 10⁻⁵ per degree Celsius.

When fixed in accordance with the manufacturer's recommendations, and in the British Isles, they perform satisfactorily. They should not be installed where ambient temperatures are likely to exceed 40 degrees, such as in close proximity to boiler flues. They should only be installed when the external air temperature is between 0 and 30 degrees. The thermal movement that occurs between day and night, sun and cloud, winter and summer should be allowed for as described in the installation recommendations.

WEATHER RESISTANCE

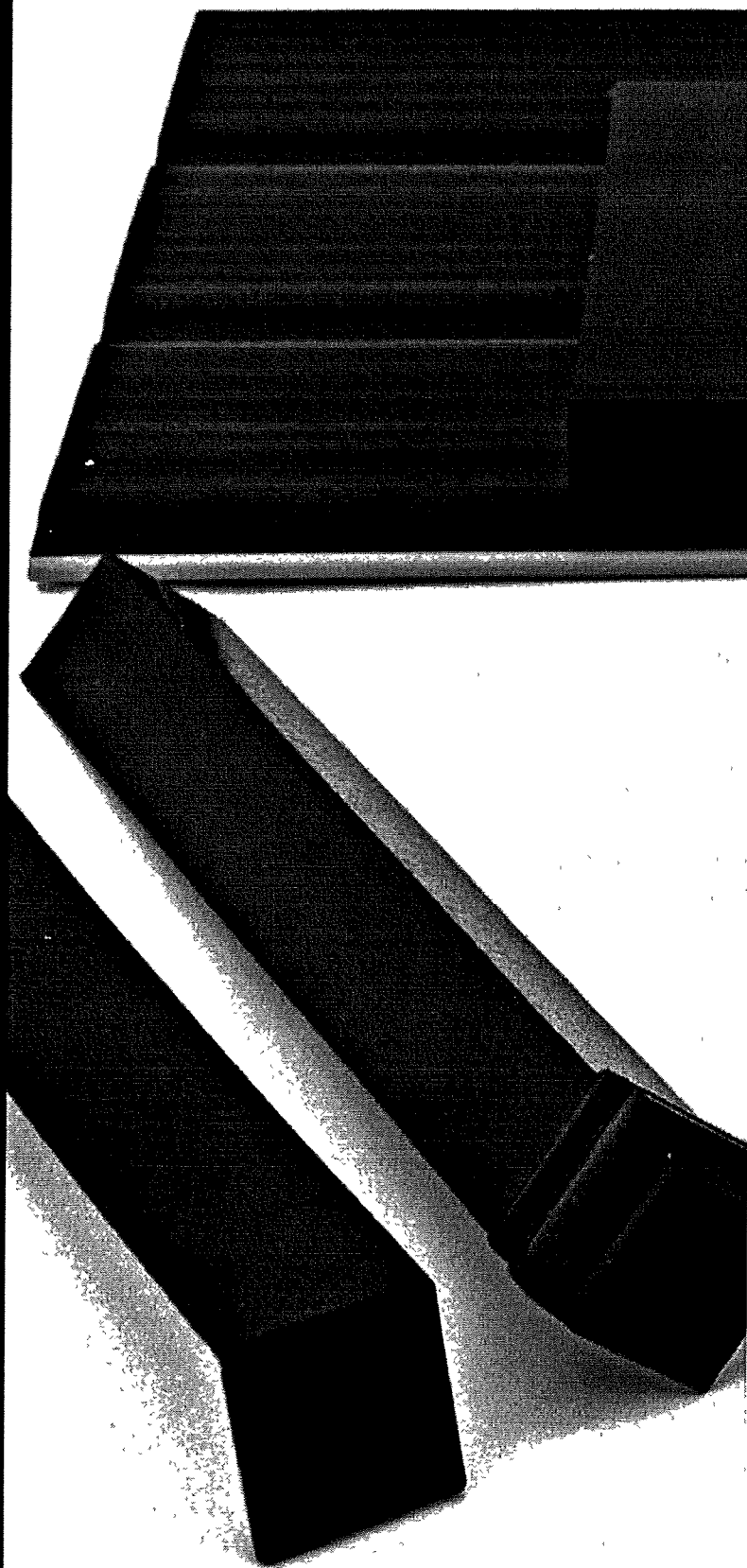
The impermeable external skin and closed cell structure of the core material makes AQUACEL roofline profiles resistant to water and the elements.

WORKABILITY

AQUACEL profiles are easily worked with conventional woodworking tools.

They can be sawn, shaped, cut, drilled, routed, nailed, screwed and glued.

Saws must have fine-toothed blades, and power saws should be set at their highest speed level, with carbide-tipped blades.





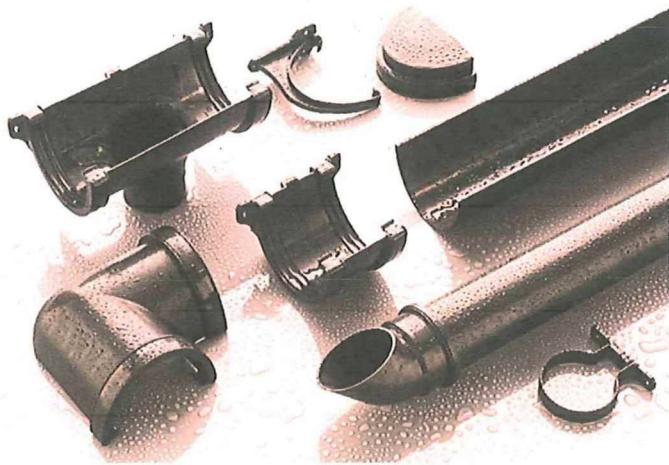
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ISO: 9001/2008





Deepstyle Rainwater Systems

Brett Martin Deepstyle systems are high performance rainwater systems offering increased drainage capacity for commercial projects, factories, warehouses, farm buildings and domestic buildings with larger roof areas such as apartments.

Manufactured from PVC, they are lightweight, quick and easy to handle, transport and install. They offer huge efficiencies in product, installation and site costs compared to other more traditional materials making working at height in large commercial and agricultural buildings easier and safer.

The Deepstyle systems are available in 170mm and 115mm sizes and complimented by a full range of compatible downpipes and fittings.

BENEFITS

- Safe to handle and easy to install
 - Strong and durable lightweight plastic
 - Exceptional long term reliability
 - UV stabilised to prevent discoloration
 - Manufactured to relevant standards
 - 10 year warranty
-
- High performance industrial system with greater drainage capacity
 - Advance factory fitted unique CLIP & SEAL technology for ease of install and superior sealing
 - Available in black and grey
 - Compatible with 110mm downpipes and fittings

FEATURES

- Semi-elliptical gutter profile
- Gloss finish
- Available in up to 6 colours
- Fully tested for accelerated ageing in accordance with BS EN 607
- Loading capabilities tested to BS EN 1462



- High capacity domestic system for larger roof areas
- Can reduce number of downpipes required saving costs and improving appearance
- Available in 6 colours: Black, Brown, Grey, Anthracite Grey, Arctic White and White
- Compatible with 68mm downpipe and fittings

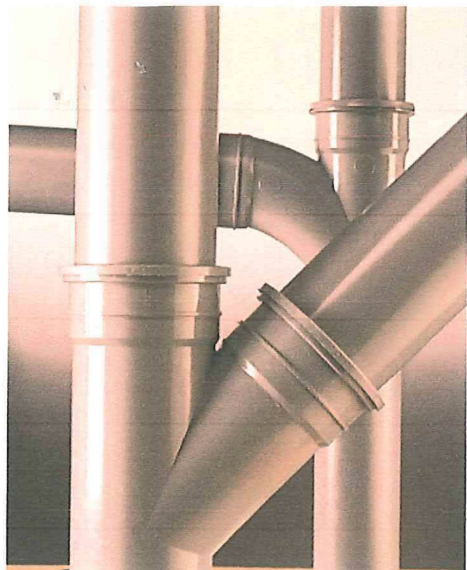


PVCu downpipes and fittings for Deepstyle are available in the following sizes:

> 170mm Deepstyle: 110mm downpipes

> 115m Deepstyle: 68mm downpipes

- 160mm and 200m industrial downpipe systems are also available
- High gloss UV protected gutter and downpipes look better and last longer



U VALUE CALCULATION



REHAU

Unlimited Polymer Solutions

REHAU Total 70c 07/06/2023

Proj Title / Co. Name TYPE L & M

Project Ref 266

System REHAU Total 70c

Frame Type Large (72mm)

Sash Type T Sash (75mm)

Mullion

Reinforcement Type 5 Chamber 72mm O/F Fully Reinforced

Glazing Manufacturer Custom Ug Value

Glazing Unit Centre Pane = 1.0

Spacer Bar Swiss Spacer U + any sealant

Centre Pane U 1.00

Air Leakage (Based On Testing To BS6375) 0.92

Thermal Transmittance 1.47

U VALUE

TYPE L & M
266

07/06/2023

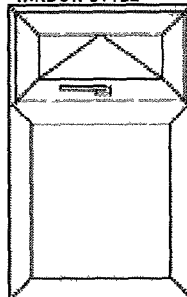
FRAME SUMMARY

REHAU Total 70c
Large (72mm)
T Sash (75mm)

GLASS SUMMARY

Centre Pane = 1.0

WINDOW STYLE



OVERALL WINDOW SIZE

WIDTH =
435

HEIGHT =
435

THERMAL TRANSMITTANCE

U VALUE
(W/m²K)

1.47



This U Value Calculation has been carried out in accordance with BS EN 10077-1:2006, and in accordance with Building Regulations Part L 1b 2010 Section 4.20

Revised: 07/06/2023

The REHAU Total 70c window system is a high performance, multi-chambered, reinforced, thermally broken, double glazed unit. It is designed to provide a high level of thermal insulation and is suitable for use in a wide range of applications. The unit is constructed from high quality materials and is designed to provide a long service life.

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12345

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Approved Calculation



Building Solutions

Automotive
Industry