Onduline

HIGH PERFORMANCE ROOFING,
CLADDING AND FENCING

Onduline Technical Information & Installation Instructions

Contents

Technical Information & Installation Instructions

Reference must not be made to any other Onduline information supplied from Europe or elsewhere for information on use and installation in Australia and New Zealand

This Product Information must be read along with:

- BRANZ Appraisal Certificate No's 431(2002) (New Zealand) and 021024 (Australia). Copies are available from the BRANZ web site[1].
- Onduline Technical Drawings. Provides specific flashing detail for use in conjunction with both Onduline profiles.

Reference may be made to other Onduline PP information for the following:

- Material Description, Styles, Colours, and Sizes
- Accessories
- Packing, Weight, Coverage

1 Product Information

1.1 Dimensions

Onduline is a prefinished corrugated sheet roof and wall cladding and accessories manufactured from bitumen-impregnated cellulose fibre - supplied as follows:

Sheet Profile	37mm	24mm	Sheet Profile	37mm	24mm
Length	2000mm	2000mm	Width	940mm	1050mm
Corrugation depth	37mm	24mm	Corrugation pitch	94mm	48mm
Thickness	3mm	2.5mm			

Accessories	Ridge	Barge
Length	900mm	1100mm
Cover	775mm	975mm
Width (flat)	500mm	410mm
Weight	1.2kg	1.2kg

1.2 Handling and Storage

For long-term storage, stack crated pallets singly stacked under cover in a cool place. For short-term storage on site, cover sheets and store flat on timber bearers.

Lift sheets clear to avoid surface damage. Do not drag sheets across one another.

1.3 NZBC and BCA96 Compliance Information

1.3.1 General

Onduline PP is an acceptable alternative roof and wall sheet to materials called up in NZBC Acceptable Solution NZS 3604:1999 Section 11 and BCA96 Deemed-to-Satisfy Provisions F1.5 e.g., corrugated cellulose cement corrugated sheets complying with AS 2980.1, or plastic sheets complying with AS/NZS 4256.

1.3.2 Structural Provisions

Refer to BRANZ Appraisal Certificates

1.3.3 Fire Resistance and Fire Safety

Refer to BRANZ Appraisal Certificates

[1] BRANZ web address is http://www.branz.co.nz/Databases/Appraisal/431(2002).pdf

Onduline PP is a combustible cladding. Its use in New Zealand is governed by the requirements of NZBC Acceptable Solution C/AS1 and in Australia, by BCA96 Acceptable Construction Practice for Class 1 and 10 buildings. As combustible it must be protected or separated from heating appliances, fireplaces, chimneys and flues.

In New Zealand in Fire Purpose Groups SC and SC solid sarking at least 18mm thick must be used. Refer to the BRANZ Appraisal

There are a number of restrictions applying to use under BCA96. Refer to the BRANZ Appraisal and BCA96.

1.3.4 Design Information

The product is for use as a non-trafficable roof and wall cladding system for timber or steel frame buildings.

- Onduline PP is for use on buildings covered by the NZBC and BCA96 (Building Classes 1 to Class 10) up to 10m high provided that specific fire resistance rating or safety requirements do not apply to the roof or wall construction, including those required by BCA96 Territorial Amendments.
- The cladding is intended mainly for horticultural and agricultural purpose buildings, outbuildings, and ancillary structures, especially those with a range of external or internal corrosive environments (see under **Chemical and Solvent Resistance**). On housing and other similar buildings, the cladding can be used in such environments as severe marine exposures that corrode metal-based claddings.
- Minimum roof pitch is 5°. (With rigid sarking or sheathing recommended for roofs under 10°)
- The minimum radius of curvature for curved roofs or walls is 5.0m.

1.3.5 Structure

Building Construction (Refer also to Installation Information: Fasteners and Table 3)

In Australia, timber framing must be subject to a non-specific design in accordance with AS 1684 or a specific design in accordance with AS 1170 and AS 1720.

In New Zealand, timber framing must be subject to a non-specific design in accordance with NZS 3604 or a specific design in accordance with NZS 4203 and NZS 3603.

Steel framed buildings must be subject to a specific design in accordance with NZS 4203 (NZ) and AS 1170 (AUS) for loading and AS/NZS 4600 or AS3623. Steel framing support sections must have a flat exterior surface (e.g. a channel flange) for the purpose of fixing the cladding. The section designed must have a minimum thickness of 1.6mm and a minimum surface width of 50mm.

1.3.6 Support Centres for Cladding

- For specific and non-specific design (refer **Installation Information** - Tables 3a and 3b), provide timber or steel fixing supports (studs, girts, purlins or battens) at the maximum centres given below:

Profile	37mm	24mm
Walls	600mm	400mm
Roofs	300mm (pitch - 5 to 10°) 450mm (pitch - 11 to 15°) 600mm (pitch > 15°)	N/A
Curved structures	As above - maximum 600mm.	

- In areas where cyclone fasteners are required (refer to Table 1 below and Table 3b under **Installation Information**), provide timber or steel supports at 400mm maximum centres.
- Rigid sarking is recommended for roof pitches less than 10°.

1.3.7 Non-Specific Design

In New Zealand, Onduline wall and roof cladding may be used as wall or roof cladding on lined buildings that are designed and constructed in accordance with NZS 3604, or on steel framed buildings which otherwise meet the same scope as NZS 3604, in all Building Wind Zones up to and

including Very High. Fixing details are given under **Installation Information** including intermediate fixings in accordance with Table 3a.

In Australia Onduline wall and roof cladding which meets the scope of AS4055 may be designed in accordance with the non-specific design information given under **Installation Information** based on Intermediate fixings in accordance wit Table 3b.

1.3.8 Specific Design

For specific design, use information given in Table 1, for wind suction only, when 75 x 3.15 springhead nails or equivalent screws and washers are used (see **Installation Information** - **Fasteners**).

Table 1: Design deal Pressures - Resistance to Wind Uplift (kPa)

Stress	Fixing Position	Support Centres (mm)	
		450	600
Ultimate limit state	Every crest	4.1	3.0
	Alternative crests	2.4	1.8

When cyclone fasteners and cyclone washers are used (see under **Installation Information - Fasteners**), the specific design ultimate limit stress may be taken as 7.5 kPa,

Mass: Sheets weigh approximately 3.3 kg/m^2 and are classed as sheet cladding under NZS 3604 and AS 1684.

Snow :The maximum permissible snow load is 1 kPa.

1.4 Safety

1.4.1 Roofs

At all times, workmen walking on a roof must always be supported with planks, ladders, or walkways, or where otherwise unavoidable, over the battens.

Treat Onduline PP like plastic sheet roof cladding, by providing safety mesh as required by Clause 2.4.3 of AS/NZS 1562.3:1996, unless suitable wire netting is provided for the support of a pliable building membrane (roof underlay), or if exempted by Clauses 2.4.3.2(a) to (g). The Local Authority may also require other safety requirements.

In corrosive environments, where safety mesh cannot be used, batten centres must be closed up to 300mm (refer Clause 2.4.3(e) of AS/NZS 1562.3:1996)

On non-domestic buildings, permanent walkways and notices must be provided in accordance with the requirements of Clauses 2.4.4.2 and 2.4.4.3 of AS/NZS 1562:1996.

1.4.2 Walls

Ladders required for subsequent wall installation work or maintenance must have a board placed behind the end of the stiles to spread the load over the framing underneath.

1.4.3 Health and Safety

At all times, observe standard good safe roofing practices in accordance with local, state or national codes and regulations. Take special care in windy or wet conditions. Handle all hand or power tools correctly. Make sure electrical equipment is earthed or isolated.

DO NOT TAKE CHANCES

1.5 Impact Resistance

Sheets will normally only suffer deformation under soft body impacts, but will be punctured by hard body impacts. If loads are placed over supporting battens or blocking, some crushing of the sheet may occur, especially when ambient temperatures are higher.

The impact or cracking resistance will be lower in colder conditions. Impact and cracking resistance will decrease with ageing. Cracking of the sheets is possible when loads are applied over supports when sheets are very cold.

Consider and allow for the possibility of damaging impacts when used on walls.

1.6 Weathersealing

In alpine areas subject to regular snowfalls, designers must ensure that building design minimises penetration of wind-driven snow, and snow damming on roofs and at gutters.

Local authorities must also be checked for their snow design requirements in their area.

Roof pitch, sheet lapping, and weathersealing at ridges, hips, barges, upstands, and around openings must be appropriate for rain and snow exposure conditions. The designer/installer must ensure weathersealing prevents rain ingress around openings in walls.

1.7 Durability

1.7.1 Fasteners

Where significant corrosion will be caused by wind-borne salt, industrial pollutants, industrial chemical processes, or animal rearing or breeding operations use the same or larger size fixings nails and washers with durability appropriate to the service conditions and expected serviceable life, e.g., stainless steel (refer to Installation Information - Fasteners).

1.7.2 Chemical and Solvent Resistance

- Onduline PP is resistant to atmospheric corrosive pollutants, such as wind-borne salt and acidic or alkaline industrial emissions (gaseous, liquid, or solid). The product is best suited for use in atmospheric classifications C2.3 Severe Industrial and C2.4 Very Severe of AS 2728, for agricultural and industrial buildings such as animal rearing and breeding sheds (pigs, chickens, cattle etc), or for industrial processes such as the manufacture of fertiliser or other acidic and alkaline materials.
- Onduline PP will be affected by contact with petroleum-based solvents, oils, greases, and long-term exposure to solvent fumes from petroleum-based or dry-cleaning solvents etc.

1.7.3 Weathering

- Deterioration (e.g., fading) and erosion of the pigmented coating will occur. The serviceable life of Onduline PP sheets will be usefully extended if painting is carried out.

1.7.4 Maintenance

- Remove rubbish such as leaves.
- Remove lichen or other organic growth with water-based chemical treatments. Consult suppliers of roof cleaning materials or services for suitable chemical treatments.
- If painting is required to restore the appearance and extend the serviceability life, use a recommended bitumen-compatible water-based paint.
- Check and replace nail fixings regularly.
- If replacing sheets, carefully remove nails at overlap between sound and damaged sheets.

1.7.5 Serviceable Life

- In New Zealand and in coastal areas of Australia, south of the Tropic of Capricorn, Onduline PP wall and roof cladding systems can be maintained in a serviceable condition for at least 15

years. In hotter climates, where the product may age more rapidly, (with the ageing rate being faster at the highest ambient temperatures), a lesser serviceable life must be expected.

1.7.6 Water Supplies

- Onduline PP cladding sheets can be used for the collection of potable water. Other components of the cladding system, such as flashings, must also be suitable for potable water collection, e.g., lead-edged or lead-based flashings must not be used.
- Consult Local authorities for control of the collection of potable water from roofs.
- Rainwater from all types of roofs may become discoloured or contaminated by lichen, moss, fertilisers, leaves, or wind-borne dust, agricultural chemicals and deposits of bird droppings. In these circumstances, the installation of a water purifier is recommended.
- After installation, disconnect system from the storage tank until the roof is rain-washed several times. If roofing is painted, or cleaned with chemical treatments, disconnect again until the roof is adequately rain washed (three good rainfalls) or hosed down.
- It is recommended best practice where water is to be taken off the roof that both the surface be painted and an appropriate filter installed.

1.7.7 Water Vapour

- Onduline PP itself will not be affected by condensation.
- Treat Onduline PP in a similar manner to profiled metal cladding products. Use building paper, moisture absorbent sheathing materials, vapour barriers, and additional ventilation as required by BCA96 Building Class, type of wall or roof construction and the internal humidity levels generated by the use or occupancy of the building.

2 Installation Information

Installation follows conventional methods associated with the fixing of other corrugated sheet cladding products and must be in accordance with good trade practice.

Safety procedures must be followed as given under **Design Information - Safety**.

2.1 Fasteners

For maximum, ultimate limit design wind gust speeds as given in Table 3 (EC and E2C)

- Timber supports - 75 x 3.55mm hot-dipped galvanised springhead nails with a nominal 'washer head' diameter of 20mm.
- Steel supports - No.10 x 60mm zinc-coated, self-drilling pan-head screws and 20mm diameter washers complying with corrosion resistance Class 3 of AS 3566.

For cyclone areas as per Table 3b, as marked by **X(c)** and where cyclone fasteners are used in accordance with Table 1:

- Timber supports - 75 x 4mm hot-dipped galvanised spiral-grooved nails, plus 40 x 36 x 1mm curved cyclone washers and 2mm thick neoprene seal.
- Steel supports - No.12 x 60mm Class 3 zinc-coated self-drilling pan-head screws to and 40 x 36 x 1mm curved cyclone washers with a 2mm thick neoprene seal.

2.1.1 Notes

1) Fasteners specified above for steel framing assume a minimum steel gauge thickness of 1.6mm minimum. Where cladding is fixed to thinner gauge steel framing, then the designer must specify fasteners with appropriate withdrawal loads for the steel gauge when used in accordance with Tables 3a and 3b or as required by a specific design.
2) In corrosive zones such as coastal areas and in acidic or alkaline industrial environments all fixings must be stainless steel. In Australia this is where corrosion is more severe than AS 2728 Atmospheric Classification C2.1 and C2.2.

2.1.2 Sheet Overlapping

- At sheet ends make overlap over a support, with side overlaps facing away from the prevailing winds. Stagger successive rows of sheets to avoid nailing through four thicknesses.
- Ridge, hip, barge, and corner flashing, etc., must overlap the sheets by at least 130mm.
- Adjust overhang at the fascia to suit the roof pitch. Maximum overhang is 75mm.

Table 2: Minimum Sheet Overlaps (mm)

Cladding Slope	End Laps		Side Laps	
	37mm	24mm	37mm	24mm
5 – 10°	300	N/A	2 corrugations	N/A
11 – 15°	170		Severe driving rain & snow exposures: 2 corrugations. Other exposures: 1 corrugation.	
Over 15°	170			
Curved Surfaces	170			
Vertical Surfaces	100(vertical corrugation) 170(horizontal corrugation)		Applicable to all cladding slopes above 10°	2 corrugations

2.1.3 Fixing Sheets

Fix cladding across sheet to every support. Ensure head of nail is not driven home too far.

2.1.4 Fixing at Sheets Ends

- On roofs, fix across the sheet to timber or steel supports at every crest.
- On walls, fix ends across the sheet at the crest of the side lap, and then at every trough except those either side of the fixed crest.

2.1.5 Fixing at Intermediate Supports

- For buildings built to a non-specific design - fix as per Table 3a or 3b as appropriate.
- Specific design buildings - fix according to Table 3, or as advised by the designer.

2.1.6 Fixing Flashing

- Flashings at ridges, hips, barges, upstands, and corners, etc must be fixed at 200mm, maximum centres on either side or as per manufacturer's instructions.

2.1.7 Weathertightness

- As with other corrugated sheet materials, at low roof pitches, typically 5 - 15°, it may be necessary to seal overlaps at sheet ends. In severe weather exposures, side laps must be at least two corrugations wide. Low roof pitches should be avoided.
- Where roof pitches are less than 10° a rigid sarking membrane (e.g. plywood) is recommended.
- At ridges, hips, barges, and corners use proprietary flashings such as those used with corrugated plastic sheets complying with AS/NZS 4256.2 or 3. Alternatively, at ridges, hips, barges, and corners use custom-made flashings supplied.
- Use flashing at upstands as per BCA 96 Acceptable Construction Method 3.5.1, Figure 3.5.1.7. Use head flashings and sill trays as specified in BCA96 Acceptable Construction Method 3.5.3, Figure 3.5.3.4, at the top and bottom of wall openings. Air seals should be used in appropriate exposure conditions.

- At door or window jambs, seal with timber facings or proprietary mouldings with a combination of scribers, back flashings, or compressible foam strips.

Table 3a: Fixing Centres (Intermediate Supports): 37mm profile only					
Location	**NZS 3604 Wind Zone**	**Fixing Centres at the Nominated Support Centres**			
		Lined Buildings		**Unlined Buildings**	
		450	**600**	**450**	**600**
Roofs	**Low**	Fix every 2nd corrugation			
	Medium				
	High		Fix every corrugation		
	Very High				Not allowed
Walls	**Low / Medium**	Fix every 2nd corrugation			
	High		Fix every trough		
	Very High				Not allowed

Table 3b: Fixing Centres at Intermediate Supports: 37mm profile only						
Location on Building	**Ultimate Limit State Design Wind Speed (m/s)**	**Wind Classification**	**Lined Buildings**		**Unlined Buildings**	
			450	**600**	**450**	**600**
Body of Roofs	34	N1	E2C	E2C	E2C	E2C
	40	N2	E2C	E2C	E2C	E2C
	50	N3 C1	E2C	EC	E2C	EC
	61	N4 C2	EC	EC	EC	X
	74	N5 C3	EC	X	X	X
	86	N6 C4	X(c)	X	X	X
Near ridges & eaves of roof (within 0.2 x the min. width, depth of building)	34	N1	E2C	E2C	E2C	E2C
	40	N2	E2C	E2C	E2C	EC
	50	N3 C1	EC	EC	EC	X
	61	N4 C2	X(c)	X	X(c)	X
	74	N5 C3	X(c)	X	X	X
	86	N6 C4	X	X	X	X
Body of walls	34	N1	E2C	E2C	E2C	E2C
	40	N2	E2C	E2C	E2C	E2C
	50	N3 C1	E2C	E2C	E2C	E2C
	61	N4 C2	E2C	EC	E2C	EC
	74	N5 C3	EC	EC	EC	EC
	86	N6 C4	EC	EC	EC	X
Near corners of walls (within 0.2 x the min. width, depth of building)	34	N1	E2C	E2C	E2C	E2C
	40	N2	E2C	E2C	E2C	EC
	50	N3 C1	E2C	EC	EC	EC
	61	N4 C2	EC	EC	EC	X
	74	N5 C3	EC	X	X(c)	X
	86	N6 C4	X(c)	X	X	X

Key: EC: fix at every corrugation; E2C - fix at every second corrugation

X(c): timber or steel support centres must be at 400 mm maximum, and the cladding fixed with cyclone fasteners and washers on every second corrugation with the fasteners offset at each succeeding intermediate support.

X not permissible

Use compressible foam strips at eaves to minimise the entry of snow or water in severe exposures. Use similar strips at the bottom of walls to minimise the entry of moisture, powdered snow, dust, and draughts in exposed locations, and birds and vermin.

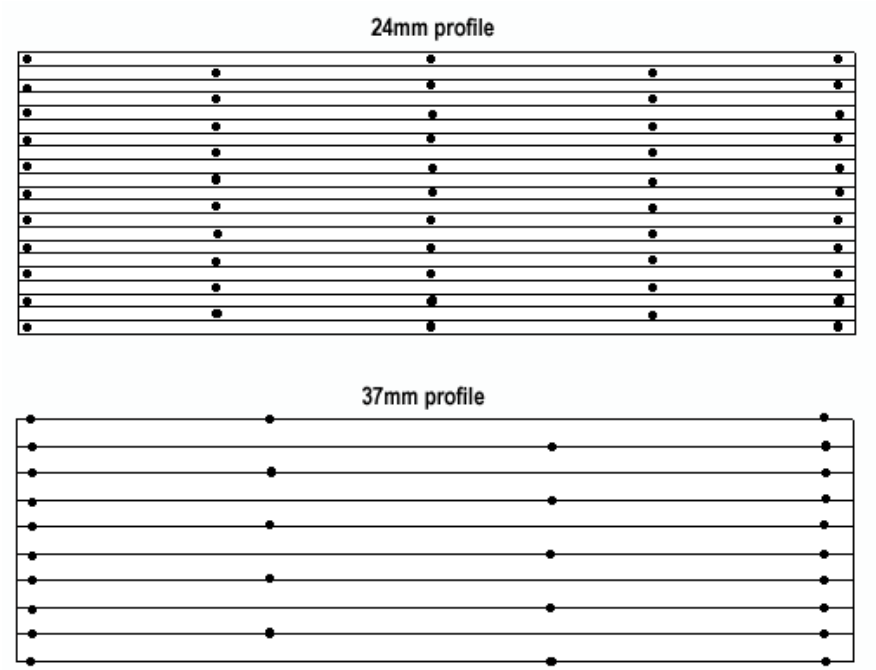
2.2 Notes For Fixing Cladding

2.2.1 Preparation

To achieve the best aesthetic result, take time to consider first the best position for joint flashings and laps. For example, ideally line up sheet edges with head flashings.

Care should be taken to ensure that the framing to which Onduline sheets are applied is flat. Where soaker flashings below apertures are used, either rebate the flashing into the framing or use a packer (eg DPC strip) to support the Onduline sheet. Flashing hems should be crushed flat to minimise flashing profiles behind the sheets.

2.2.2 Fixing



37mm profile sheet should be fixed at every corrugation on the sheet ends and at every second corrugation on intermediate supports (see tables 3a & b for specific site recommendations).

24mm profile sheet should be fixed at every second corrugation both at sheet ends and at intermediate supports.

Intermediate fixings should always be placed in a diagonal pattern to ensure the maximum sheet rigidity is achieved.

When fixing sheets vertically, fix on the corrugation crests. Horizontal cladding should be fixed in the trough except where sheets overlap when a crest fixing is required.

25mm minimum timberfix screws for use in trough fixing. 65mm timberfix screws are suitable for use on the corrugation crest.

2.2.3 Sheet Jointing

A vertical sheet jointer, which comes around the face of the sheet, is recommended when jointing horizontally laid sheet ends. This helps to gain uniformity in the sheet corrugation line, especially when the thinner 24mm profile is used (see associated Onduline drawing detail for suggested flashing designs).

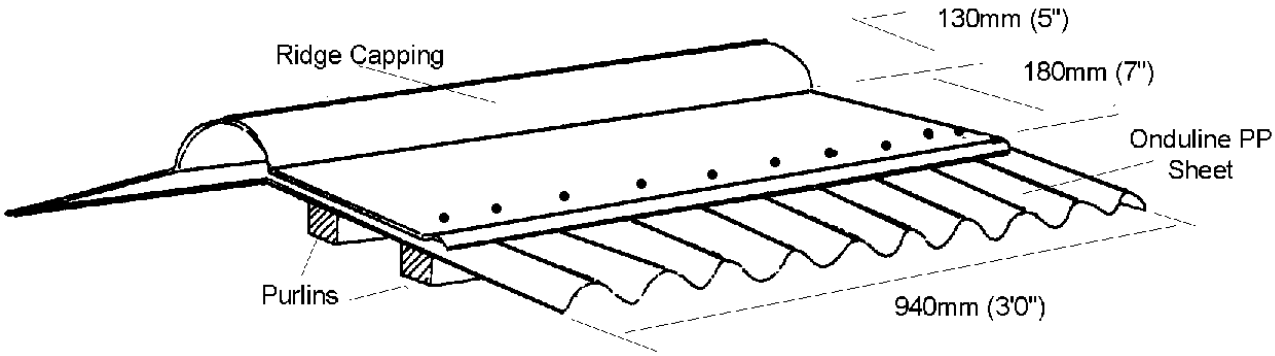
If lapping the sheets horizontally, ensure the side laps are staggered to get the best fit at sheet corners. Alternatively, cut the corner off the lower lapped sheet to reduce the thickness of the lap. In addition, use a cold-applied rubber & bitumen compound to seal the sheet joint by applying a bead on the internal side of the screw line. Always lap sheets away from the prevailing wind.

2.3 Notes For Fixing Roofing Sheets (37mm profile only)

It is important that you follow the fixing instructions below to get the best and guaranteed roof structure.

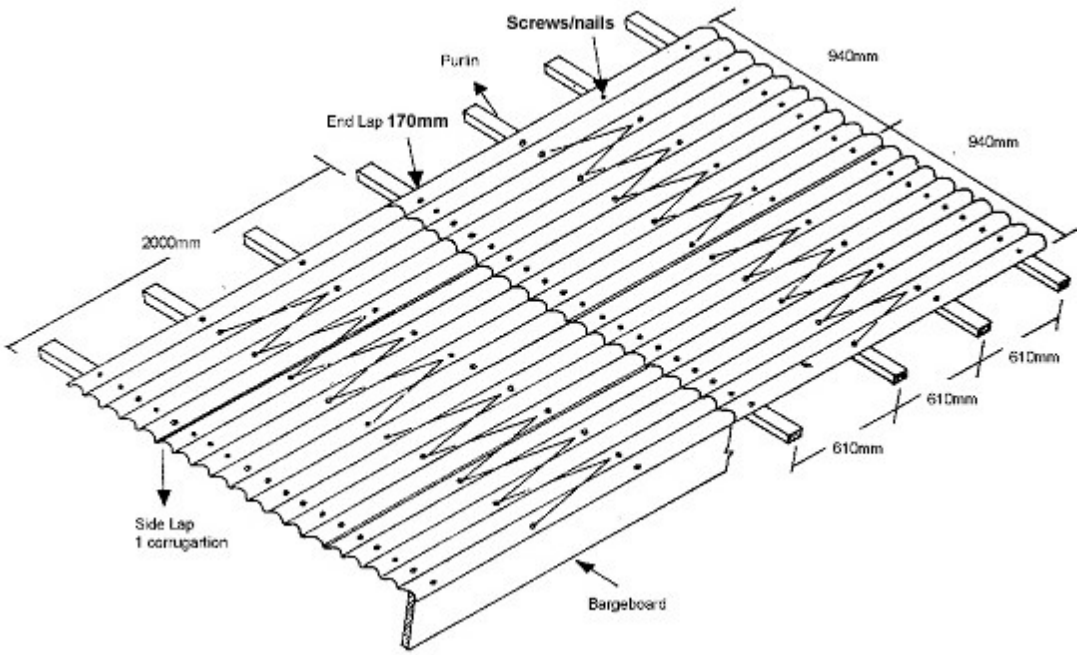
2.3.1 Ridge Fixing

End laps 130mm with 20 nails required to fix each piece.

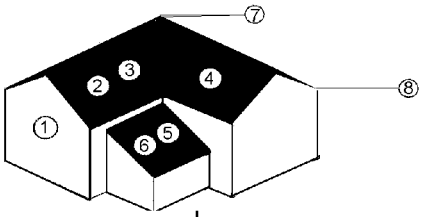


2.4 Sheet Layout & Nailing

Roof Pitch 15° and over	**Roof Pitch 10° to 15°**	**Roof Pitch 5° to 10°**
Purlin distance at 610mm	Purlin distance at 450mm	Purlin distance at 300mm or ply
End lap 170mm	End lap 200mm	End lap 300mm
Side lap 1 corrugation	Side lap 1 corrugation	Side lap 2 corrugations
20 fixings required to fix each sheet		

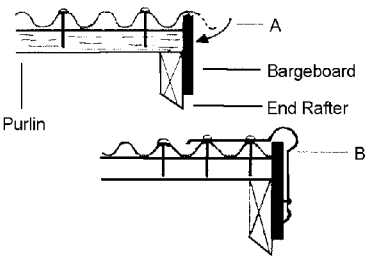


2.5 Roof Fixing Instructions (cont.)



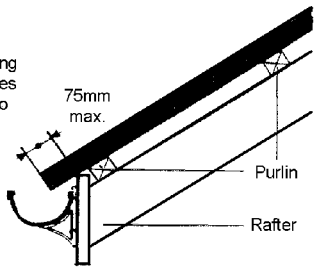
1. Verge

Fix verge trim either by 'A' forming and nailing final corrugation over raised barge board or 'B' use ridge piece to overlay verge.



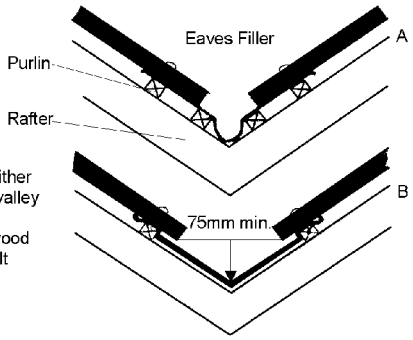
2. Eaves

Maximum overhang of material at eaves is 75mm. Eaves to seal openings.



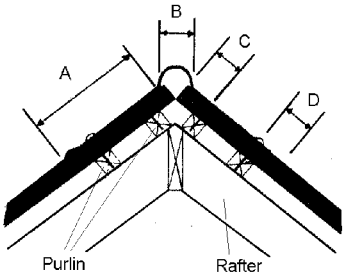
3.Valley

Valleys are formed by either using GRP valley liners (A) or lining a plywood base with felt or metal (B)



4.Ridge

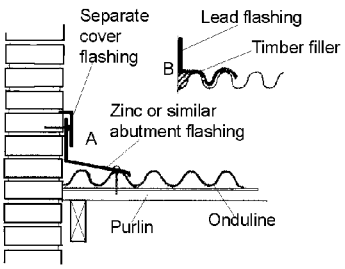
Fix ridges opposite end of roof from prevailing wind, overlap ridge sections 125mm. Fix additional ridge purlins to suit
A = 180mm
B = 140mm
C = 70mm
D = 65mm



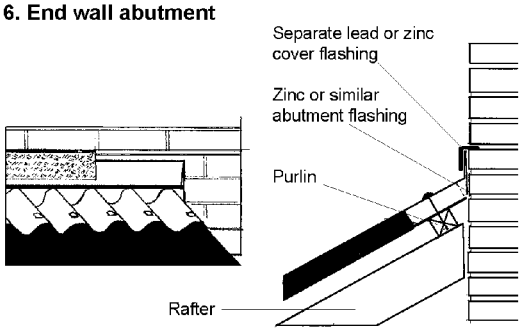
5. Side wall abutment

A. Use a preformed metal flashing with separate cover flashing to wall.

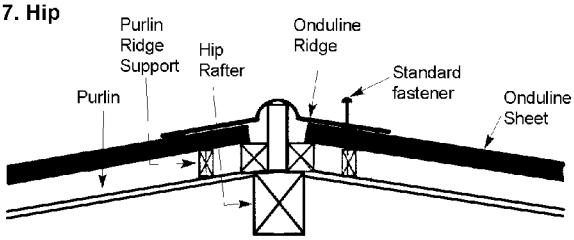
B. If a soft flashing material is used, insert a timber fillerinto first corrugation.



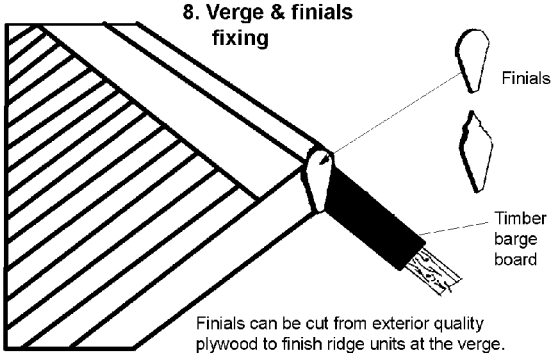
6. End wall abutment



7. Hip



8. Verge & finials fixing



Finials can be cut from exterior quality plywood to finish ridge units at the verge.

3 Fixing to Curved Roofs

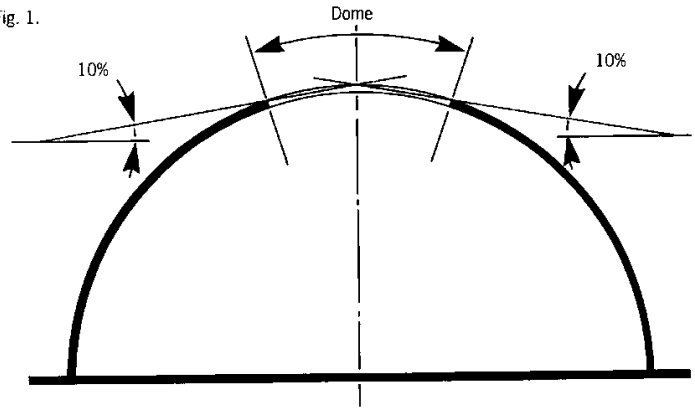
3.1 Curved Onduline roofs.

Onduline roof sheeting may be used as a curved cladding on barrel vaults and shell structures. The sheets can be contoured to a radius from 5m to 9m.

3.2 Calculation for the number of purlins required.

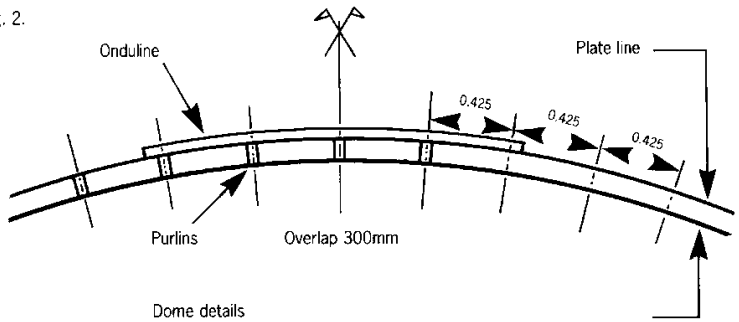
This calculation can be done either on the drawing or traced in full size on the floor. The tracing is done by drawing a secant on each side of the vertex with a 10% slope from the horizontal (fig. 1).

Fig. 1.



Within that pre-determined dome, the slope inclines between 0% and 20%. The sheet installation is done on three intermediate purlins with a purlin span of 425mm (centre to centre), and an overlap of 300mm (fig. 2).

Fig. 2.



On both sides of this dome, the sheet fixing will be carried out on two intermediate purlins, with a purlin span of 600mm (centre to centre), and an endlap of 200mm.

NB: It is imperative that the sidelap is two corrugations.

Caution: Onduline sheets must not be used for windbracing or purlin strut-bracing nor to stiffen the shells and to maintain the board's curvature over the vault.

4 Test Abstracts (37mm profile)

A series of tests carried out on the continent, where it has been used for over 50 years, has been supplemented by tests carried out in accordance with relevant British Standards and American Standards and these have indicated the total suitability of the material for roofing and cladding.

4.1 Strength and Impact Loading

Warrington Research Laboratory Test (UK) BSI81 1 and the United States Testing Co. ASTMD 1502-60. Tests showed adequate bearing strength.

4.2 Water and Weather Proofing

Tests (UK) BS1811 and ASTM D1499 (USA) showed excellent weatherproofing characteristics.

4.3 Water Absorption

Warrington Research Laboratory Test (UK) BS1 81 1.Showed minimal absorption. ASTM E96 (USA). Performed excellently in moisture vapour transmission and showed only minimal absorption. DIN 52103 (Germany) showed no effect after 16 days when immersed.

4.4 Heat Deformation.

Warrington Research Laboratory Test (UK). Tropical investigations test showed no visible effects. *Yarsley Research Centre Test (UK).* Middle East suitability tests up to 70°C proved complete suitability in severe humidity and under all foreseeable conditions.

4.5 Mechanical Strength.

Warrington Research Laboratory Tests BS4154. Showed resistance to 73lbs sheered force on fixing bolt.

4.6 Thermal Resistance (Insulation).

ASTM Cl 77-76 (USA) and BS874 M Showed excellent thermal resistance. K value 0.46 to 0.51, British Thermal Units.

4.7 Thermal Transmittance.

Warrington Research Centre. According to BS 874 the V value is 0.43 Btu/h at hot and cold face temperatures of 82°F and 55°F respectively.

4.8 Wind Lift.

Tests by Miami and Metropolitan Dade County, Florida USA test code D 70817 and Yarsley Research Centre (UK) Proved Onduline is suitable in hurricane and earthquake conditions. Tested up to 120mph. (192kph)

4.9 Hail/Frost Resistance

ASTM El 96 (USA) and DIN 52103 and 52104 (Germany). Meets snow and frost resistance for all regions. No mechanical damage in frost.

4.10 Fire Resistance

Warrington Research Laboratory Tests (UK). Show resistance to fire of up to Extl. S.AA classification BS476.3 for Onduline AA Sheets.* Inflammability tests carried out in Russia in accordance with "OTM" method have resulted in Onduline gaining Certification of accreditation GOST no. p.ru.9001.6.2.0008 for use on buildings complying with normal fire regulations.

4.11 Toxicity Tests

Yarsley Research Centre (UK). Tests carried out on water collected after catchment with Onduline sheets gives water suitable for drinking complying with World Health Organisation and EEC regulations.

These are only some of the tests in which Onduline has performed entirely satisfactorily. Full test details are available from Onduline Building Products

5 Materials Estimation (37mm Roofing)

For pitches of 15 degrees and above, with single corrugation side-lap (94mm) and 170mm end-lap.

N.B Severe driving rain and snow exposures should have a double corrugation side-lap (188mm).

Method 1.

1) From roof plan measure entire area by marking into squares.
2) Divide the area by 1.45 and this will give you the number of sheets required.
3) Measure the length of ridges and hips and divide this figure by 0.81 and this will give you the number of ridges.
4) Multiply the number of sheets by 20 and this will give you the number of nails required. Remember to round up to the nearest 300.
5) Take the ridge measurement and multiply by 2 and this is the number of metres of ridge filler or profiled seal foam required.
6) Take the hip measurements and multiply by 2 and this is the number of metres of Bitumised seal foam required.

Method 2.

1) Take the measurement from the gutter to the ridge and divide by 1.82 and this will give you the number of sheets deep.
2) Measure the length of the gutter line and divide by 0.85 and this figure will be the number of sheets wide.
3) Multiply a x b and this equals the number of sheets required for this area.

For pitches of 5 to 10 degrees, with two corrugation side-lap and 300mm end-lap.

Method 1.

1) From roof plan measure entire area by marking into squares.
2) Divide the area by 1.26 and this will give you the number of sheets required.
3) Measure the length of ridges and hips and divide this figure by 0.81 and this will give you the number of ridges.
4) Multiply the number of sheets by 20 and this will give you the number of nails required. Remember to round up to the nearest 300.
5) Take the ridge measurement and multiply by 2 and this is the number of metres of ridge filler or profiled seal foam required.
6) Take the hip measurements and multiply by 2 and this is the number of metres of Bitumised seal foam required.

Method 2.

1) Take the measurement from the gutter to the ridge and divide by 1.65 and this will give you the number of sheets deep.
2) Measure the length of the gutter line and divide by 0.762 and this figure will be the number of sheets wide.
3) Multiply a x b and this equals the number of sheets required for this area.