

# ONDULINE ROOFING SOLUTION SPECIALIST

*We've got you covered!*



Bulgaria Home Award

[www.onduline.com.my](http://www.onduline.com.my)

**Onduline**<sup>®</sup>  
LIGHTWEIGHT ROOFING SHEETS

# “MORE THAN 100 COUNTRIES ACROSS THE GLOBE”



Penang production plant and warehouse at Perai, Penang.

📍 SALES OFFICES   ● IMPORTANTS / DISTRIBUTORS   🏰 PLANTS

## ONDULINE® COVERS THE WORLD

ONDULINE® was founded in 1950 to manufacture and market the now famous corrugated roofing sheets. The outstanding growth and success of ONDULINE® in the last 60 years has seen the company become the world's largest manufacturer of corrugated composite sheets made of recycled cellulose fibres, bitumen and resins and a leading supplier of lightweight roofing systems. The growth is based on our commitment to customer requirements, supported by ongoing product and roofing system development to provide assured cost effective roofing solutions.

The ONDULINE® group employs 1300 people in its 11 production plants and 40 sales offices across the world. Its products are distributed in more than 100 countries. ONDULINE® does its utmost to serve

its 15000 clients, dealers in building materials, its tens of thousands of product consultants, as well as hundreds of thousands of users.

Our exclusive and patented technology allows the production of composite roofing sheets made of recycled cellulose, high-grade bitumen and thermo-plastic resins which today cover millions of square meters of roof surfaces all over the world. The ONDULINE® group has also pursued a diversification strategy by developing other bitumen-based products, extruded plastics, polycarbonate, PVC and polyester sheets in order to improve its range of roofing and weatherproofing systems and meet the increasing needs of its customers.

ONDULINE® has always paid particular attention to specific country regulations and harmonized standards. Our products are subjected to the most rigorous performance tests in laboratories and research institutes all over the world and conform to:

- General tests and technical agreements
- Strength and Impact Loading
- Thermal Resistance (Insulation)
- Toxicity and Resistance to Chemicals Test
- Mechanical Strength
- Water Absorbption
- Heat Deformation
- Water and Weather Proofing
- Wind Lift
- Hail/Frost Resistance
- Acoustical Insulation



*\*Subject to technical requirements.*



## THE HIGHEST STANDARDS DELIVERED!

Developed by the world leader in composite roofing sheets, with a powerful global presence in more than 100 countries, ONDULINE® solutions are ISO 9001- certified and comply with the strictest standards and regulations.



www.citybuild.bg  
Bulgaria Home Award



**SEAL SMART™ TECHNOLOGY**



**THERMAL-RESISTANT**



**ECO-RESPONSIBLE**



**WATERTIGHT**



**ACOUSTIC-FRIENDLY**



**SAFE**



**HIGH WIND RESISTANCE**



**LIGHTWEIGHT**



**SIMPLE**

## ECO RESPONSIBILITY

You can count on total regulatory compliance with building codes. And when it comes to meeting high standards, our solutions work just as hard as the environment...

- ONDULINE® has achieved a low carbon footprint and recycles some 200,000 tons of material each year.
- Natural pigments are used for coloration
- Products contain no traces of asbestos
- Materials composed of recycled fibres, verified by a third party (ICC\_ES), whose certificates can help for LEED
- Ecological life cycle performance





# SPECIFICATIONS

Material	Cellulose Bitumen	Material	Cellulose Bitumen
Length	2000mm	Height of corrugation	38mm
Width	950mm	Number of corrugation per sheet	10
Area per sheet	1.9m <sup>2</sup>	Weight	6.5kg (3.42kg per m <sup>2</sup> )
Thickness	3mm	Colour	Black, Brown, Red and Green
Width of corrugation	95mm		



BLACK



BROWN



RED



GREEN

## ONDULINE® ROOFING ACCESSORIES



### SPEEDY SCREW

Dimensions:  
68mm x 4.2mm



### ONDUBAND

Dimensions:  
300mm x 10m



### ONDULINE SOIL PIPE

Dimensions:  
400mm x 480mm



### UNIVERSAL VENTILATED FILTER

Dimensions:  
900mm(w) (incl. hatchel) x 1000mm(L)





### **SKYLIGHT - ONDUCLAIR**

Dimensions:  
2000mm x 950mm x 0.8mm

---



### **RIDGE**

Dimensions:  
1000mm x 485mm

---



### **ONDULINE APRON FLASHING**



### **CORRUGATED EAVES FILLERS**

Dimensions:  
950mm(L) x 23mm(w) x 40mm(h)

---

## RESIDENTIAL

The purpose of a roof is to protect people and their assets. In over 100 countries across the world, ONDULINE® sheets perform this task efficiently-aesthetically pleasing, our sheets withstand all weather and climactic conditions. ONDULINE® sheets provide guaranteed waterproofing to buildings and enhance

the beauty of the building through their wide range of long lasting colours. Furthermore, ONDULINE® sheets are easy to install and withstand wind speeds up to 190km/h. ONDULINE® sheets ensures protection above all!





## RESORTS

Roof for resorts need to be able to withstand the elements, especially when located by the seaside. The salt and humidity will slowly corrode away the tiles. With ONDULINE® sheets, this will not happen. Lightweight and easy to install, the

sheets offer non-corrosive properties and superb heat and sound insulation, allowing guests to enjoy a comfortable and serene stay.





# INDUSTRIAL

The extremely lightweight nature of ONDULINE® sheets ensures that the structural weight of the building can be reduced. ONDULINE® ensures significant dead load reduction when compared to traditional sheets. The silence ensured by ONDULINE®

during rainy season is a key factor for choice as a roofing material in industrial applications and warehousing. ONDULINE® sheets are quick to install and play an efficient role in chemically active environments.



## EXTENSIONS

ONDULINE® roofing helps you generate valuable spacing over your terraces and balconies which can be put to good use. In warm climates, the sheets offer impressive thermal insulation when compared to conventional roofing. During rainy

days, they ensure that the noise is dampened significantly thereby offering great interior comfort.

- Car parks
- Balconies
- Terrace coverings



## OTHER APPLICATIONS

ONDULINE® sheets are extensively used in educational and religious institutions. Besides their lightweight nature, ONDULINE® sheets offer excellent sound dampening capabilities, thereby enhancing the utilization of class rooms during the rainy seasons. This is equally important in religious institutions where a silent environment is desired

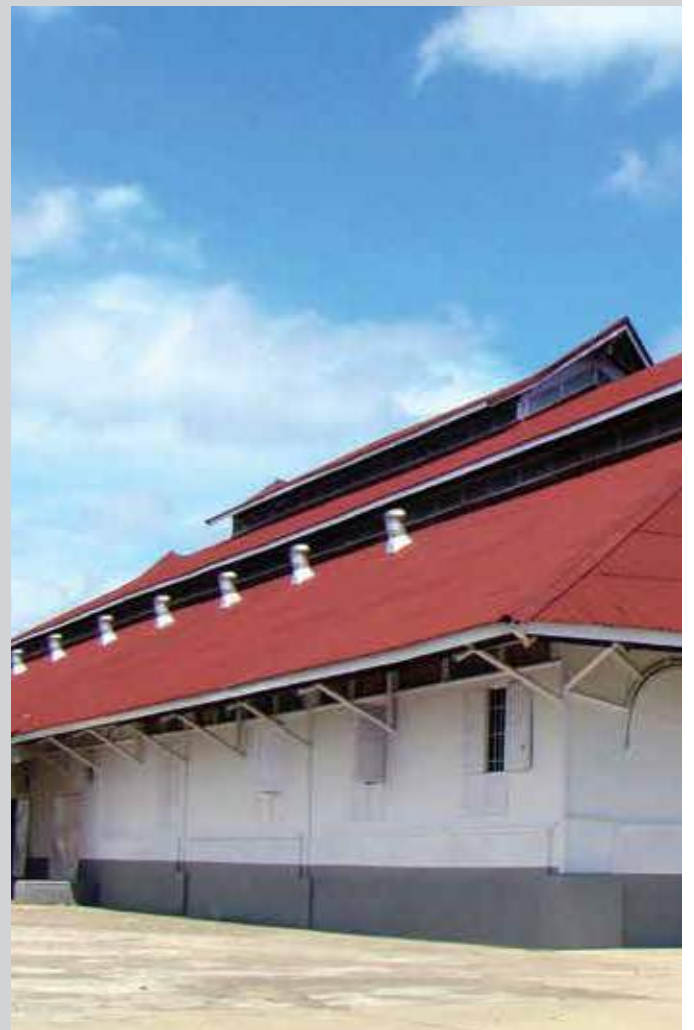
during rain. The high wind resistance and enhanced thermal insulation properties only add to the attributes of ONDULINE® roofing sheets.

- Educational institutions
- Commercial buildings
- Public buildings, Religious institutions
- Club houses

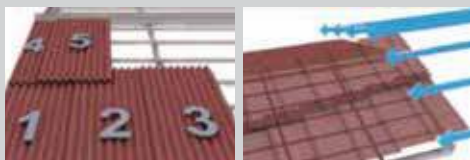








## 1 SHEET LAYOUT



- Start fixing sheets at the opposite end of the roof from prevailing winds.
- Cut a sheet in half vertically, and lay sheet courses in a broken bond pattern.
- Using a broken bond pattern reduces the overall thickness of the structure. Follow this for every alternate row.

## 2 OVERLAPPING RULES

Following the overlapping rules is important to ensure a total waterproofing over time. side and end overlapping vary according to the roof pitches

\*Nails/Screws should be hammered/drilled at each corrugation at the end overlap and side overlap.

\*As Onduline is a flexible material, it is important to follow the nailing/screwing fixing order and pattern.

Roof Pitches	Maximum Purlin Distance	Overhang at eaves	Minimum end Overlap	Minimum side overlap
>15° (over 27%)	610mm 	70mm 	170mm 	1 corrugation 

### WOOD FRAME WITH ROOF PITCHES OVER 15° (> 27%)



#### FRAME

For roof pitches over 15 degrees, ONDULINE sheet shall be supported by purlins with maximum width distance of **610 mm**.

In particularly high conditions of temperature and humidity please ask our technical service.

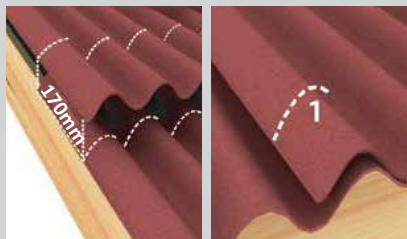


#### FIXING

**19 nails** should be hammered per sheet.

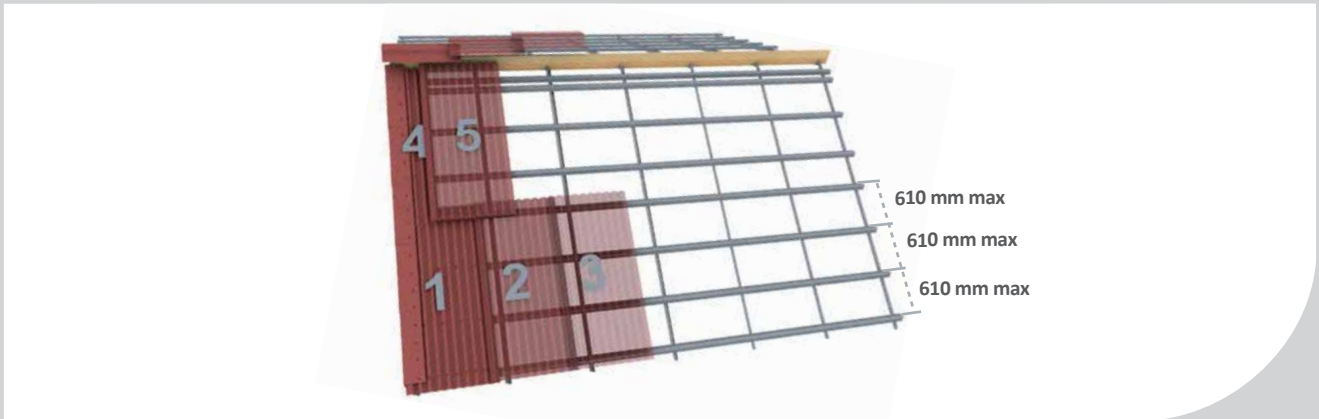
- Every corrugation should be nailed at eaves, overlaps and ridges.
- 1 corrugation out of 2 should be nailed at 2nd and 3rd intermediate purlin

To have a longlasting and garanted roof, it is mandatory to follow the nailing order and pattern.



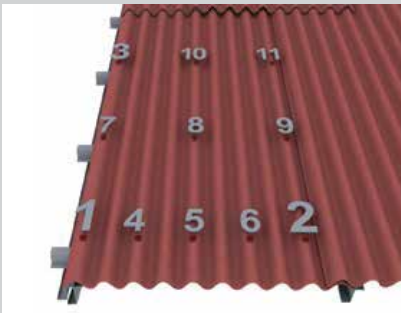
#### OVERLAP

- For the end overlap, use minimum **170 mm**.
- For the side overlap, use minimum **1 corrugation**.



### FRAME

For roof pitches over 15 degrees, ONDULINE sheet shall be supported by purlins with maximum width distance of **610 mm**. In particularly high conditions of temperature and humidity please ask our technical service.



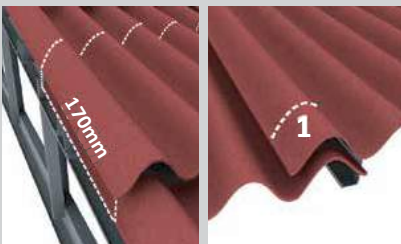
### FIXING

**11 screws** should be drilled per sheet

- 5 screws at each corrugation at the end overlap or eaves.
- 3 screws at first intermediate purlin of the sheet.
- 3 screws at second intermediate purlin of the sheet.

Screws should be drilled at each corrugation at the end overlap and side overlap.

To have a longlasting and garanted roof, it is mandatory to follow the nailing order and pattern.


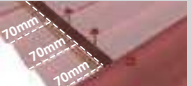




### OVERLAP

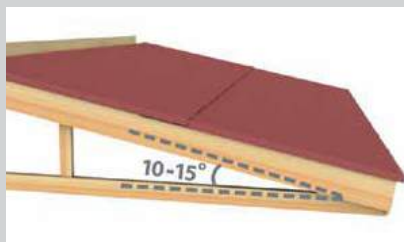
- For the end overlap, use minimum **170 mm**.
- For the side overlap, use minimum **1 corrugation**.



# INSTALLATION PROCEDURE

Roof Pitches	Maximum Purlin Distance	Overhang at eaves	Minimum end Overlap	Minimum side overlap
10° - 15° ( 17% - 27% )	450mm 	70mm 	200mm 	1 corrugation 

## WOOD FRAME WITH ROOF PITCHES 10° - 15° (17% - 27%)



### FRAME

For roof pitches 10 to 15 degrees, ONDULINE sheet shall be supported by purlins with maximum width distance of **450 mm**.



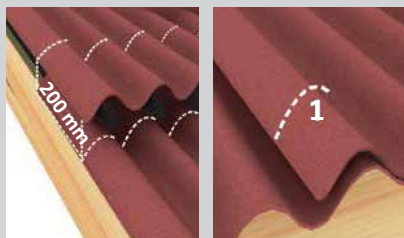
### FIXING

**18 nails** should be hammered per sheet.

- 9 nails at each corrugation at the end overlap or eaves.
- 3 nails at first intermediate purlin of the sheet.
- 3 nails at second intermediate purlin of the sheet.
- 3 nails at third intermediate purlin of the sheet.

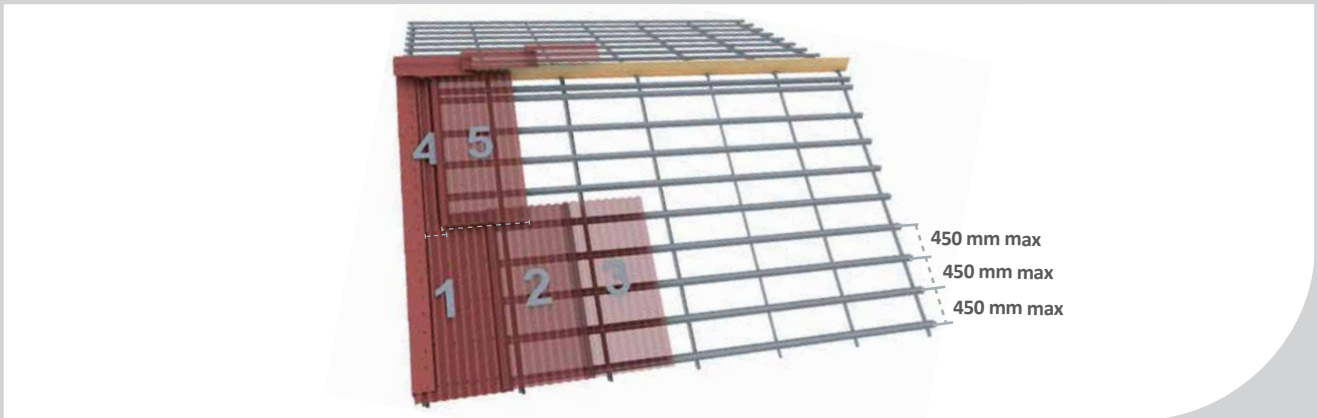
Nails should be hammered at each corrugation at the end overlap and side overlap.

To have a longlasting and garanted roof, it is mandatory to follow the nailing order and pattern.



### OVERLAP

- For the end overlap, use minimum **200 mm**.
- For the side overlap, use minimum **1 corrugation**.



### FRAME

For roof pitches 10 to 15 degrees, ONDULINE sheet shall be supported by purlins with maximum width distance of 450 mm.



### FIXING

14 screws should be drilled per sheet.

- 5 screws at each corrugation at the end overlap or eaves.
- 3 screws at first intermediate purlin of the sheet.
- 3 screws at second intermediate purlin of the sheet.
- 3 screws at third intermediate purlin of the sheet.

Screws should be drilled at each corrugation at the end overlap and side overlap.

To have a longlasting and garanted roof, it is mandatory to follow the nailing order and pattern.



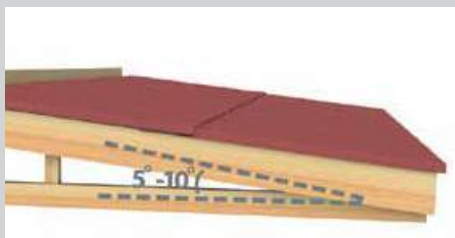
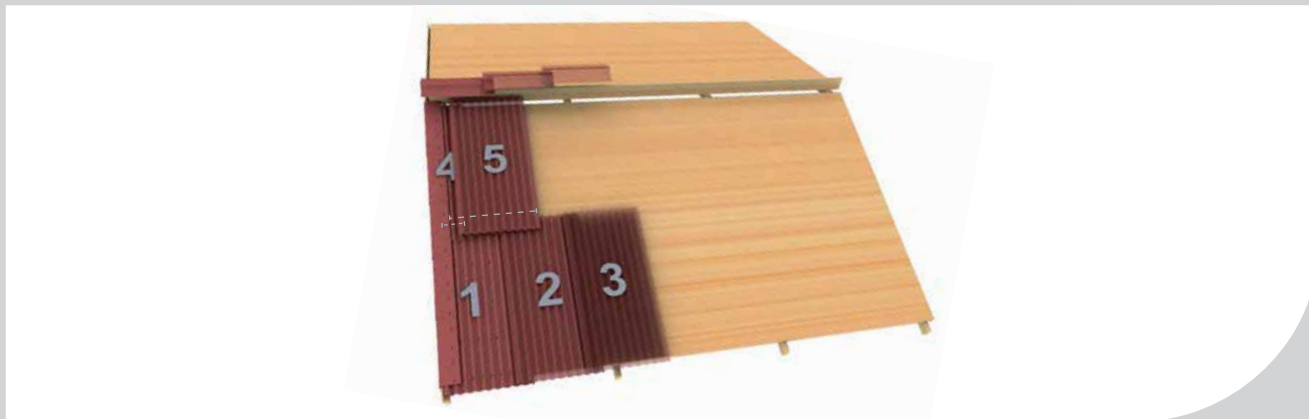
### OVERLAP

- For the end overlap, use minimum **200 mm**.
- For the side overlap, use minimum **1 corrugation**.

# INSTALLATION PROCEDURE

Roof Pitches	Maximum Purlin Distance	Overhang at eaves	Minimum end Overlap	Minimum side overlap
5° - 10° ( 9% - 17% )	Full deck or close batten 	70mm 	300mm 	2 corrugation 

## WOOD FRAME WITH ROOF PITCHES 5° - 10° (9% - 17% )



### FRAME

For roof pitches 5 to 10 degrees, ONDULINE sheet shall be supported by **full deck frame or close battening**.



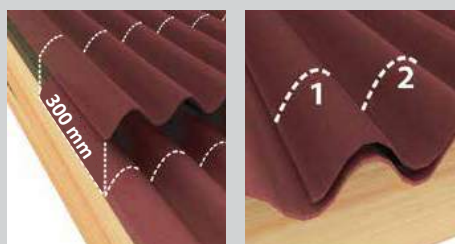
### FIXING

**16 nails** should be hammered per sheet.

- 8 nails at each corrugation at the end overlap or eaves.
- 2 intermediate rows of 4 nails.

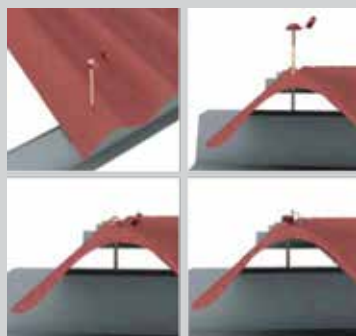
Nails should be hammered at each corrugation at the end overlap and side overlap.

To have a longlasting and garanted roof, it is mandatory to follow the nailing order and pattern.



### OVERLAP

- For the end overlap, use minimum **300 mm**
- For the side overlap, use minimum **2 corrugations**.

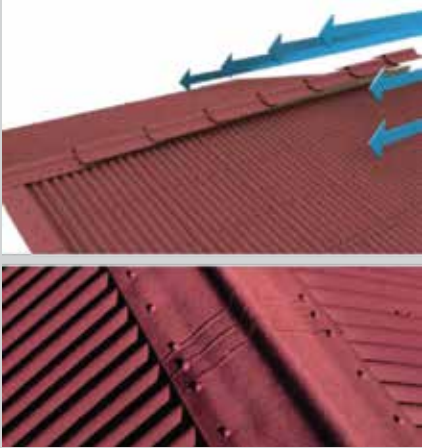


## 3 SHEET FIXING

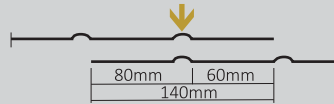
- Select the correct type of drill screw to suit purlin type. Place the head of the drill screw in the socket of the drive tool. Align the top side of the corrugation with the centre of the purlin.
- Drive the drill screw through the top of the corrugation and the purlin until the corrugation is correctly stressed.
- The use of the drill with an adjustable torque setting is recommended to avoid over compressing the corrugation.
- Always use ONDULINE® fasteners for sheet fixing.



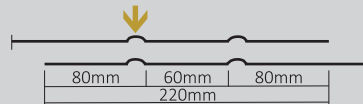
## 4 RIDGE FIXING



- Add extra purlin when necessary if the distance between the last purlin and the ridge is greater than 15cm.
- Start fixing the ridge at opposite end of the roof from prevailing winds.
- For normal sites on roof pitches of 15 degrees and over: Lay ridges with a single groove lap (forming a nominal end lap of 140mm)



- For exposed sites, or on roof pitches below 15 degrees: Lay ridges with a double groove lap (forming a nominal end lap of 220mm)

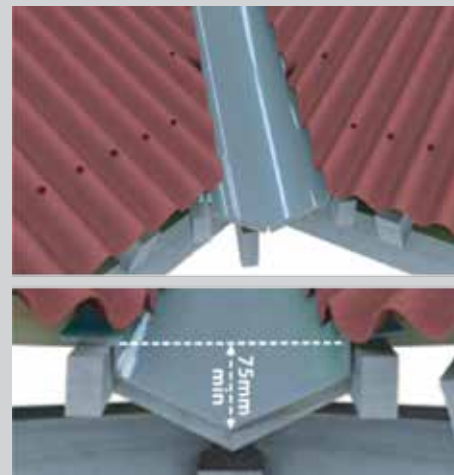


## 5 HIPS



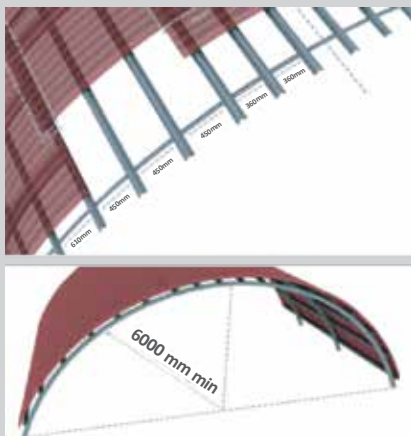
- Fix the hip before the ridge.
- Fasten the ridge to the purlins.
- Overlay and clean the ridges if necessary.

## 6 VALLEYS



- The vertical valley depth should be 7.5 cm.
- The sheets are cut across (parallel to the valley line). The overhang is 4cm.
- Valleys could be either metal or ONDULINE® supplied.

## 7 CURVED ROOFS




When the frame design is established, continuously setup the lines courses to get the right position of purlins.

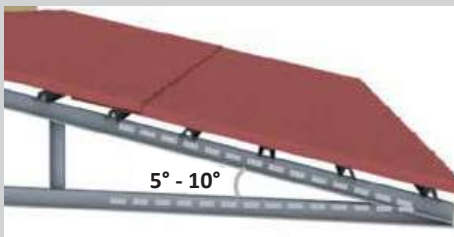
ONDULINE® sheets are recommended for curved structures with minimum radius of 6m.

\*For detailed technical fixing guidelines, please contact our technical department.

# INSTALLATION PROCEDURE

Roof Pitches	Maximum Purlin Distance	Overhang at eaves	Minimum end Overlap	Minimum side overlap
5° - 10° ( 9% - 17% )	Full deck or close batten 	70mm 	300mm 	2 corrugation 

## METAL FRAME WITH ROOF PITCHES 5° - 10° (9% - 17%)



### FRAME

For roof pitches 5 to 10 degrees, ONDULINE sheet shall be supported by **purlins with maximum width distance of 30 cm.**



### FIXING

**16 screws** should be drilled per sheet.

- 8 screws at each corrugation at the end overlap of eaves.
- 4 screws at first intermediate purlin of the sheet.
- 4 screws at second intermediate purlin of the sheet.
- 4 screws at third intermediate purlin of the sheet.

screws should be drilled at each corrugation at the end overlap and side overlap.

to have a long lasting and garanted roof, it is mandatory to follow the nailing order and pattern.

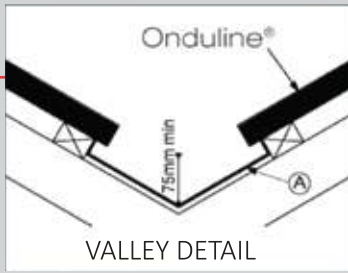


### OVERLAP

- For the end overlap, use minimum **300mm**.
- For the side overlap, use minimum **2 corrugation**

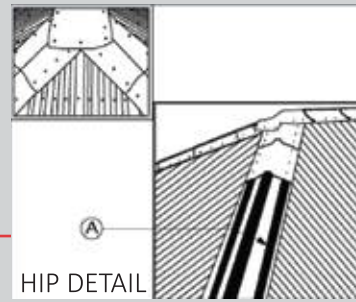


# TECHNICAL DRAWINGS (MAIN ROOF APPLICATION)



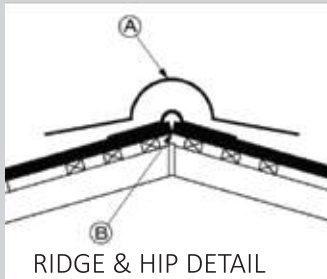
VALLEY DETAIL

(A) Valley gutter



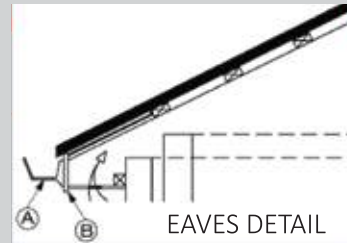
HIP DETAIL

(A) Purlin



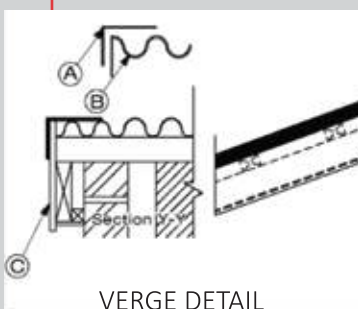
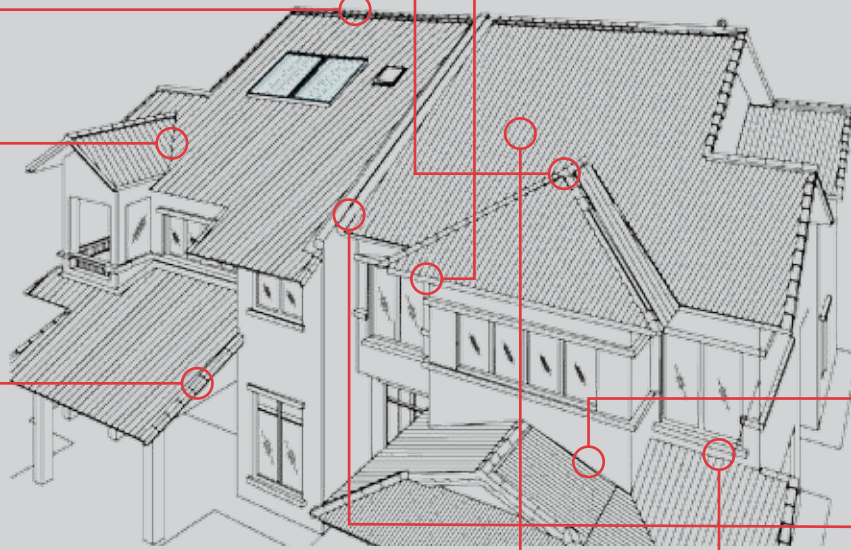
RIDGE & HIP DETAIL

(A) Onduline® ridge capping  
(B) Onduband



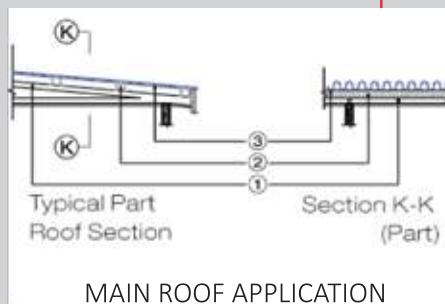
EAVES DETAIL

(A) Gutter  
(B) Facial board



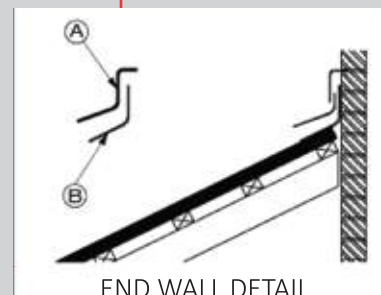
VERGE DETAIL

(A) Flashing  
(B) Onduband  
(C) Facial board



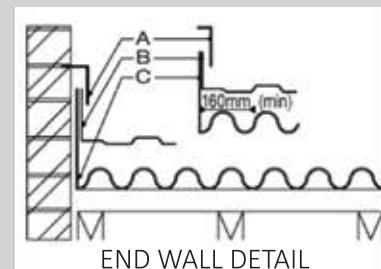
MAIN ROOF APPLICATION

- 1) Roof trusses to manufacturer's details.
- 2) Purlin spacing distance at full decking or close battening (roof pitch 5–10) / 45cm (roof pitch 11–22) / 60cm (roof pitch >22).
- 3) Onduline® roofing sheets & accessories to manufacturer's details



END WALL DETAIL

(A) Flashing/Apron flashing (B) Onduband

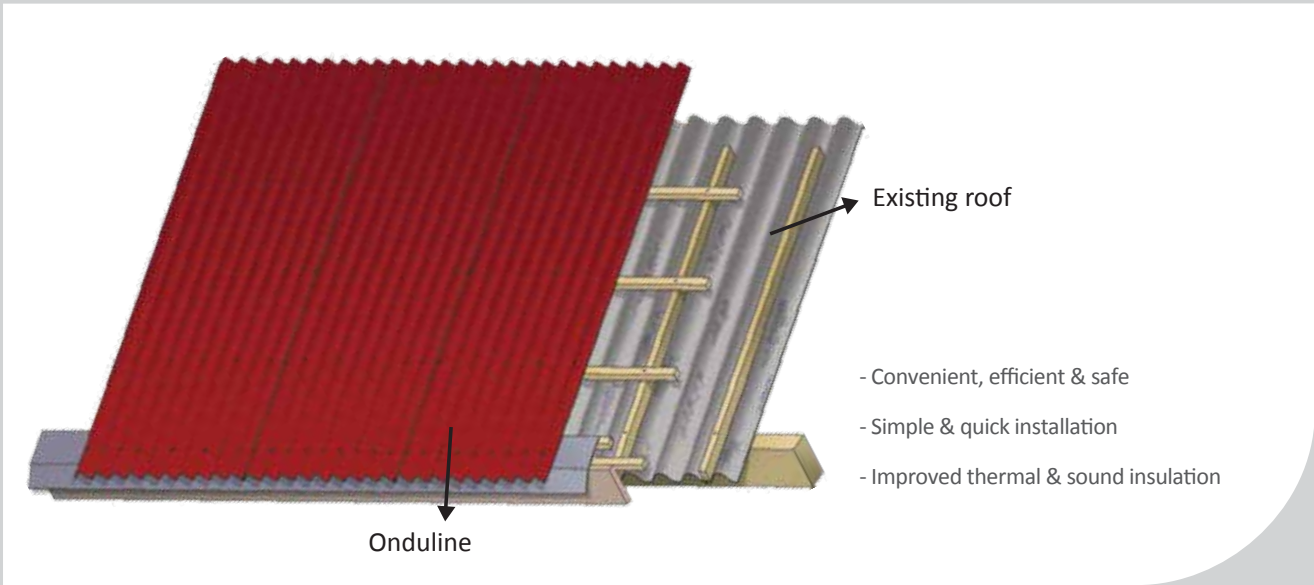


END WALL DETAIL

(A) Z-profile aluminium (B) Flashing (C) Onduband

# ONDULINE® OVERSHEETING APPLICATION

Best solution to leakage, re-roofing & repair of OLD roofs.



## RENOVATION & REPAIR

### OVERSHEETING AND UNDER-ROOFING

ONDULINE® is used extensively as an over-sheeting system over existing deteriorated roof coverings. This is a very economical, practical and safe solution for roof renovation. The main advantage of such a system is that there is minimum disruption to the building and it improves thermal and vapour control characteristics of the structure.

ONDULINE® can also be used as an under-roofing system providing a secondary weatherproof roof below the primary roof. This is especially useful in very low pitched roofs. ONDULINE® also provides

enhanced sound and thermal insulation to the roof. (Please refer to [Isoline Under-Roofing system for details](#))

### WALL CLADDING

ONDULINE® is also suitable for exterior wall cladding. ONDULINE® acts as a real finishing coat especially for industrial or commercial buildings, bringing to walls its various advantages; weather protection, sound and thermal insulation, durability and lightweight. On account of its flexibility, it can be used on curved surfaces as well.



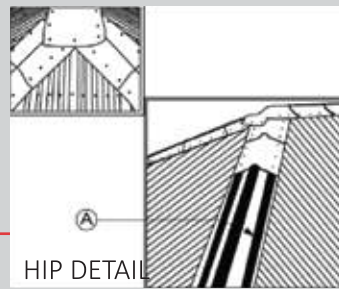


# TECHNICAL DRAWINGS (OVERSHEETING)



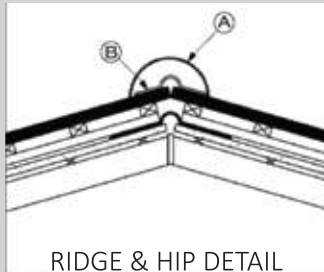
VALLEY DETAIL

(A) Valley gutter



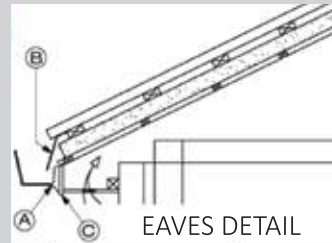
HIP DETAIL

(A) Purlin



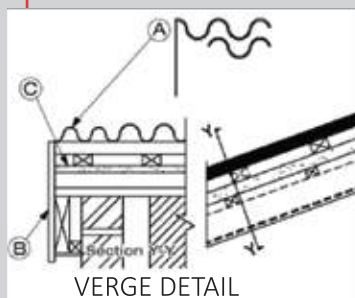
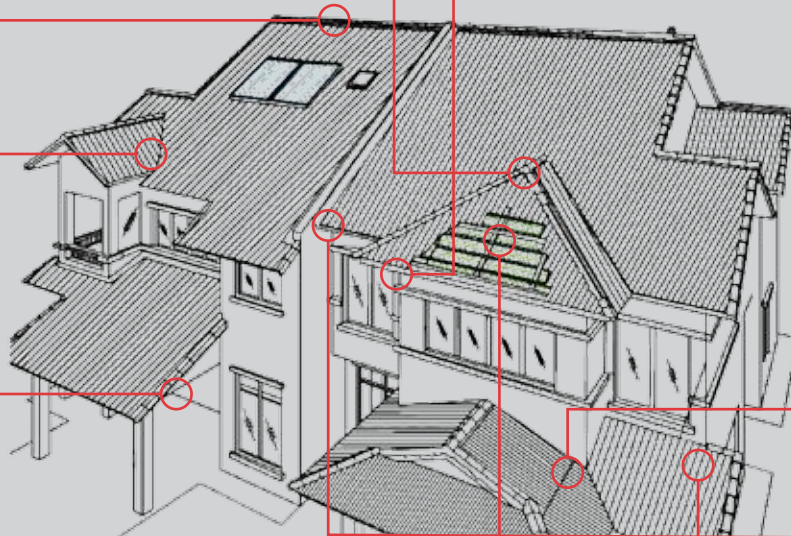
RIDGE & HIP DETAIL

(A) Onduline® ridge capping  
(B) Onduband



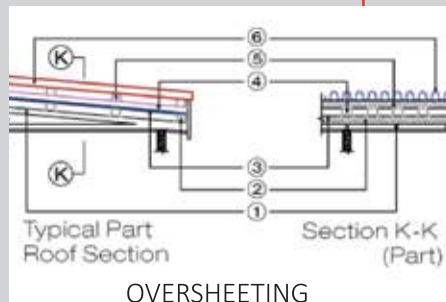
EAVES DETAIL

(A) Gutter  
(B) Flashing  
(C) Facial board



VERGE DETAIL

(A) Onduband  
(B) Facial board  
(C) Verge sheets/tiles



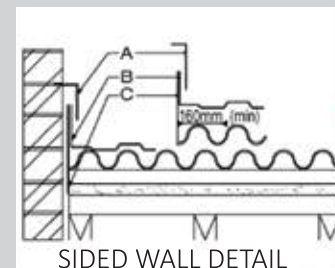
OVERSHEETING

- 1) Existing roof trusses.
- 2) Existing purlin/batten.
- 3) Existing metal roofing sheets/tiles.
- 4) New counter purlin/batten.
- 5) Purlin spacing distance at full decking or close battening (roof pitch 5-10) / 45cm (roof pitch 11-22) / 60cm (roof pitch > 22)
- 6) Onduline® roofing sheets & accessories to manufacturer's details.



END WALL DETAIL

(A) Z-profile aluminium (B) Flashing  
(C) Onduband/Apron flashing



SIDED WALL DETAIL

(A) Z-profile aluminium (B) Flashing (C) Onduband

\*For detailed technical fixing guidelines, please contact our technical department.

# GENERAL INFORMATION

ONDULINE® is stored on shrink wrapped pallets of 300 sheets. It is not recommended to stack pallets. Sheets must be stored flat and covered at all times to prevent against weather and dust. The sheets should always be lifted from the pallet and not dragged across. While using ONDULINE® sheets in conditions of high internal humidity, it is important to use a vapour barrier and provide adequate ventilation on the roof.

## MAINTENANCE

To ensure long life of roofing sheets, we recommend the following maintenance procedures

- Do not allow leaf debris to build up on the surface of the corrugated roofing as leaf mould would soften the material and reduce the effective life of the product.
- Ensure that tree branches are not in direct contact with the roof as it can result in mechanical damage to the sheet surface.
- Clean all rainwater gutters regularly to ensure efficient water run-off from the roof.

## HEALTH & SAFETY

Roofing is a specialized job and needs skilled and trained personnel. While on the roof, workmen should ensure that their legs are always placed on purlins to prevent damage to the sheets. During installation, workmen should walk/sit on the wooden planks to distribute their load. Safety devices are compulsory during any roofing work.

## CONDITIONS OF SALE

The specifications and details mentioned in this book are correct at the time of printing. The manufacturer reserves the right to alter specifications and details at any time without notice. It is recommended to seek written advice from the company on the suitability or performance of goods for different applications.

# CERTIFICATES

## GENERAL TESTS AND TECHNICAL AGREEMENTS



- CSTB (France). AT 5/04/1779. AT 5/03/1690. AT 5/9 1424
- CSTC / Ubatc (Belgium): ATG 01/1938
- BBA (UK): A.C. 87/1823 C
- ITB (Poland): 500 / 02 AT 1 2145 / 2002
- BRANZ (Australia): AC 02/2004
- BRANZ (New Zealand): AC 432 (2002)
- Conformity to EN 534 general performance and attitude test
- ISO 9001:2000
- ISO 14001





### Strength and Impact Loading

Warrington Research Laboratory Test (UK) BS1811.  
 United States Testing Co. ASTM D 1502-60  
 CEBTP (France): Report no 2342.7.098  
 Bureau Veritas (France): BTE JPD / NC 1016 / 1995  
 CSTB: NO GM/92-20  
 Test showed adequate bearing strength, impact resistance and resistance to wind lift



### Mechanical Strength

Warrington Research Laboratory Test (UK) BS4154.  
 Showed resistance to 731bs sheered force on fixing bolt.



### Water Absorption

Warrington Research Laboratory Test (UK) BS1811.  
 Showed minimal absorption  
 ASTM E96 (USA). Performed excellently in moisture vapour transmission and showed only minimal absorption.  
 DIN 52103 (Germany) Showed no effects after 16 days when immersed.



### Heat Deformation

Warrington Research Laboratory Test (UK).  
 Tropical investigation test showed no visible effects.  
 Yarsley Research Centre Test (UK)  
 Middle east suitability in severe humidity and under all foreseeable conditions.



### Thermal Resistance (Insulation)

ASTM C1776-76 (USA) and BS874 (UK).  
 Showed excellent thermal resistance K value 0.46 to 0.51 British Thermal Unit  
 LNE (France): Certificate NO 7070916 D MAT/1  
 Thermal conductivity: 0.099W/mK



### Water and Weather Proofing

Test (UK) BS1811 and ASTM D1499 (USA).  
 UIDIEM (Chile): Certificate NO 150 385  
 Test showed excellent weather-proofing characteristic



### Wind Lift

Yarsley Research Centre (UK). Proved Onduline suitable in hurricane and earthquake conditions.  
 Tested up to 120mph (192kph)  
 Buiding Research Establishment (UK): NO BRE/83/11/1  
 Good behavior in wind lift conditions  
 Wood Technology Division (New Zealand): NO WTX 1468/1  
 Good behaviour in cydonic conditions  
 Minister of Economic (Argentina): NO 83-1  
 INPRES 95 & PV NO 030 DPU-95



### Hail/ Frost Resistance

ASTM E196 (USA) and DIN 52103 dan 52104 (Germany).  
 Meets snow and frost resistance for all regions  
 No mechanical damage in frost.



### Toxicity and resistance to chemicals Test

Yarsley Research Centre (UK)  
 Tested carried out on water collected after catchments with Onduline sheels give water suitable for drinking complying with World Health Organization and EEC regulations.  
 CSTB (France): NO SM/98 0062  
 Good behaviour under exposure to acids, alkalis and salts.



### Acoustical Insulation

CEBTP No 2312.6.244/1  
 Reverberation coefficient (max): 0.4 to 315 Hz  
 CSTB C/95/CL/1896/1  
 Sound attenuation coefficient (max)Rw = 28 dB  
 Wolfson unit Southampton University (UK).  
 NO 2089 1592/B1 : Antenoise wall with Onduline reduces the airborne noises of 7dB

**Onduline Building Materials (M) Sdn. Bhd.**

A-3A-2 Sunway Giza Mall,  
No 2, Jalan PJU 5/14,  
PJU 5, Kota Damansara,  
47810, Petaling Jaya, Selangor, Malaysia.

Telephone: +603 6732 3188

Fax: +603 6150 5288

Email: [info@onduline.com.my](mailto:info@onduline.com.my)

**Factory Address**

2715, Mukim 1,  
Tingkat Perusahaan Enam,  
Kawasan Perusahaan Perai,  
13600 Perai, Pulau Pinang,  
Malaysia.



Download  
**Onduline Roofing Design App**  
now for **FREE!**

