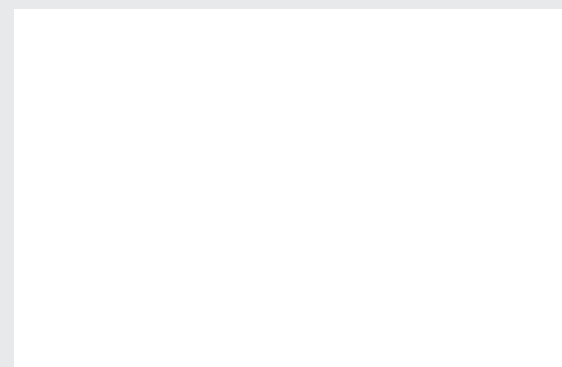


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Onduline®

SOLUTIONS GUIDE



for effective roofing

Simplicity
Reliability
Commitment



Onduline®

www.onduline.com

WORLD LEADER OF LIGHTWEIGHT ROOFING SOLUTIONS

An expertise in roofing and waterproofing materials

EXPERTISE & ACTIVITIES

Onduline is the world largest manufacturer of corrugated composite sheets made of organic fibers, bitumen and resin. Our group also developed bitumen-based products, extruded plastics, polycarbonate, PVC and GRP sheets in order to improve roofing and waterproofing systems and meet the increasing needs of its customers. Our products are available in more than 100 countries commercializing roofing products, under-roofing systems, rooflight, weather and damp proofing membranes. Lightweight, affordable and really easy to install, our roofing systems are a part of many people's daily life. Our products respond to any needs of roofers: industrial, commercial, agricultural and public buildings as well as houses. All of this makes us the world largest manufacturer of corrugated composite sheets made of natural fibers, bitumen and resin, and a leading supplier of lightweight roofing systems.



UNIQUE TECHNOLOGY

Our exclusive and patented technology allows the production of composite roofing sheets made of recycled fibers, high-grade bitumen and thermoplastic resins which cover today millions of square meters of roof surfaces all over the world. Our group takes care of a whole process, starting with its own world wide patented technology. Ofitech, Onduline's laboratory and Studies centre is a subsidiary company of the Group that is completely dedicated to R & D. Our group also puts a lot of effort into new technologies to protect the environment: we have set for example a catalytic purge system of the gaseous effluents in our factories. We also treat the water in a closed network on each one of our sites as well as we do recycle every year 200.000 tons of cellulose fibers.



A strength based on values

The development of our group is a direct result of a balanced strategy that revolves around three core values.

Simplicity

Our brand's philosophy is to offer equal service to everyone. Whatever country our customers are from, we have technological expertise that serves the cause of our customers by providing them with universal and therefore easy solutions. Our products are affordable, light and easy to install.

Reliability

A long lasting experience allows us to provide you with reliable solutions. Our products are the outcome of a unique technology. Indeed, for the past 60 years, our solutions have shown a great ability to meet the customers' needs all over the world. Today our products are used by millions of buildings in many ways and under different climates.

Commitment

We are working on building a responsible future. We are committed to be and remain our customers' number one partner. As an independent industrial company, we keep investing in R&D to come up with constantly more innovative and more eco-friendly solutions.

A UNIQUE LONG LASTING KNOW-HOW



Since its creation 60 years ago, our group has developed a unique know how around a strong and competitive industrial tool for all building projects, from fixing accessories to roofing. Since the opening of our first subsidiaries in Frankfurt and Florence in 1964, our group has kept growing around the world in every continent. Nowadays, our sales in emerging countries (such as China, Russia, Turkey, Brazil...) represent more than half of our turnover.

WORLD LEADER OF LIGHTWEIGHT ROOFING SOLUTIONS

An international expertise for Africa

ONDULINE, A WORLDWIDE GROUP

Our group employs 1300 personnel in 10 production plants and 35 commercial affiliates worldwide distributing its products in more than 100 countries.

Our diversity is the source of our strength: each one of our workers evolves into a multinational and multicultural context always with the same requirement: to provide the best advice and tailored support for assisting our customers in making the best decision when choosing a roof covering.

This way, we are able to respect the distinctive identity of each country and our employees can understand the specific needs of their own markets.

Given the technicality, the specificity and the several patents related to our business, our teams are trained to have a perfect knowledge of our products as well as a real technological expertise.

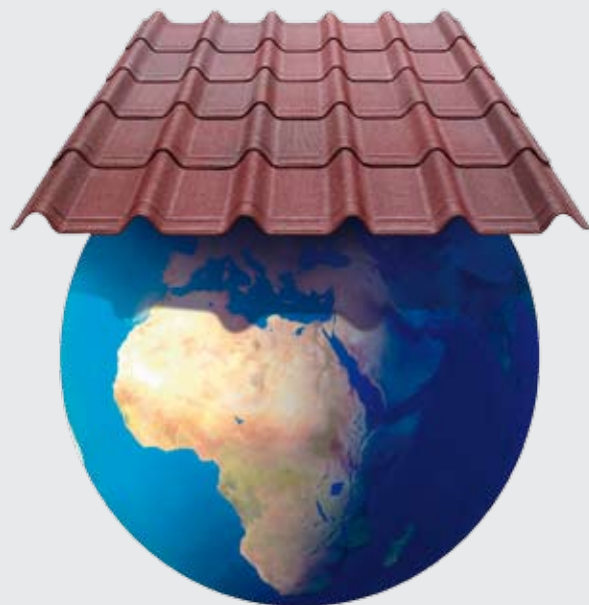


PRODUCTS ADAPTED TO ALL LOCAL CONSTRAINTS AND NEEDS

Our products are available in more than 100 countries: we are part of many people's daily life.

Our products are adapted to any local characteristics and customers needs as different as they may be, always with the constant care of offering its thousands of specifiers and its hundred of thousands of users the best services.

Thus, our group developed high-quality and high-technology products that have proven successful throughout the world. This is the reason why, our group wishes to provide African entrepreneurs these same products and build with them a long-lasting partnership.



A LOGISTIC STRENGTH

Our group has 8 production sites specializing in bitumen systems : Brazil, Spain, France, Italy, Malaysia, Poland, Russia and Turkey. They are located in the middle of the main markets of the group and the machinery and manufacturing methods are exactly the same in each of these institutions.

In addition, the Group holds 2 other factories, dedicated to the secondary businesses of our French branch (Onduclair-plastic roofing) and Spanish branch (Coverclim - sandwich panels).

This way, our group has a commercial and logistic strength that makes it possible to deliver any product, at any amount, anywhere in the world.

INTERNATIONAL ROOFING SPECIALISTS FOR AFRICA




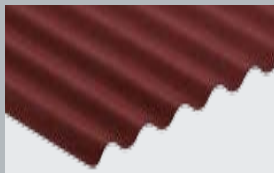
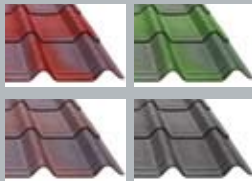
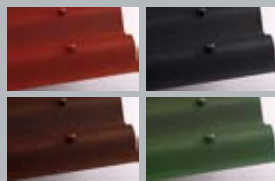
To enable Onduline to be present everywhere in the world, a team of multilingual experts is responsible for conducting dialogue among distributors. Negotiating, timing, budget, logistics ... This export committee strives to bring all necessary resources available to our affiliates to help prescribers or local governments to implement their projects.

Our group also provides a range of services to its customers. Onduline in Africa, offers training sessions on the installation of our products. We also organize conferences for building specialists which are considered as a fine expertise in the construction market. Our technical support is also available to provide by phone or by email a comprehensive technical and laboratory advice service for all applications of our products to our customers.

WORLD LEADER OF LIGHTWEIGHT ROOFING SOLUTIONS

Table of specifications



	ONDUVILLA	ONDULINE®
Systems		
Roofing	X	X
Siding		X
Oversheeting		X
Corrugation type		
		
Applications		
Residential	X	X
Public	X	X
& Commercial Agricultural		X
Industrial		X
Available colors		
		
Page		
	10	14

The worldwide experts' evidences

The reason why architects from all over the world recommend our products is because they know how hard we manhandle them within the framework of benchmarks realized by worldwide laboratories and institutes. This way, our products naturally meet the legislations and the standards of various countries.

The following tables show the nature of some of the tests taken in several countries in the world and their abbreviated results.

ASTM* test n° C177-76 (USA) and BS874 (UK)
"Excellent thermal resistance"

** American society for testing and material*

CEBTP*

test n° 2312.6.244/1
"Reverberation coefficient (max) : 0.4 to 315 Hz"
** Centre d'expertise du bâtiment et des travaux publics (France)*

Wolfson unit*

test n° 2089 1592/B1 :
"Antinoise wall with Onduline reduces the airborne noises of 7 dB"
** Southampton University(UK)*

LNE* test N° 7070916D MAT/1

"Thermal conductivity : 0.099 W/mK"
** Laboratoire national de métrologie et essai (France)*

Onduline plants follow ISO 9001: 2000 and ISO 14001 standards.

CSTB
le futur en construction

Onduline products comply with CSTB's general standards for roofing.

** French Scientific and Technical Center for Buildings*

ASTM* test n° E196
"Meets snow and frost resistance for all regions"

** American society for testing and material*

BRE*

test n° BRE / 83 / 11 / 1
"Good behaviour in wind lift conditions"
** Building Research Establishment (UK)*

Mecon*

test n° 83-I INPRES 95 & PV N° 030 DDPDU-95.
"Good resistance in cyclonic conditions"
** Ministerio de Economía (Argentina)*

DIN* test 52103 and 52104

"No mechanical damage in frost"
** Deutsches Institut für Normung*

ASTM* test n° E96 (USA)
"Performed excellently in moisture vapour transmission and showed only minimal absorption"
** American society for testing and material*

ASTM* test n° 1502-60
"Resistance to wind lift"

** American society for testing and material*

DIN* test n° 52103 (Germany)

"No effect after 16 days when immersed"
** Deutsches Institut für Normung*

BUREAU VERITAS FRANCE

Bureau Veritas France :
BTE JPD / NC 1016 / 1995
"Adequate bearing strength"

Onduline products meets BBA's requirement regarding resistance to weather and ground moisture (Agrément certificate n° 87 / 1823 / C)

Onduline products are in conformity to EN 534-2006 general performance and attitude tests.

WORLD LEADER OF LIGHTWEIGHT ROOFING SOLUTIONS

Solutions & advantages

For over 60 years, Onduline has used the qualities of bitumen to offer building professionals weatherproof building materials and thermal as well as acoustical insulation.



TOP INSULATION: FOR A UNIQUE THERMAL AND ACOUSTIC COMFORT

Thanks to its fibrous composition and its corrugations enabling air to circulate, Onduline has a very high insulation rate. As a matter of fact, Onduline has one of the best thermal coefficients and high sound absorption values ($R_w = 28$ db) for products of similar thickness. Onduline is extremely effective against rainfall noises and heat thus creating a unique living and working comfort.



ECOLOGICAL

Sustainable development is a top priority for our group. Indeed, all our factories are equipped with treatment systems for gas effluents, and do not reject liquid waste in any form. We recycle every year 200,000 tons of cellulose fibers, equivalent to the protection of thousands of trees every day. Not only our products do not contain asbestos but our solutions also help with the covering of those contaminated roofs that would, otherwise, be difficult and dangerous to remove.



WIND WITHSTANDING: THE SAFEST ROOF SYSTEM AVAILABLE IN THE MARKET

Our products withstand high wind speeds and loads providing their suitability in hurricane and earthquake conditions. This is the reason why our products are used throughout the world in any climate and latitude.



HIGH FLEXIBILITY: A REASONABLE MATERIAL FACILITATING TRANSPORT AND FIXING

Thanks to their great flexibility that makes them particularly light and resistant, our products absorb all shocks due to transport such as the irregularity of roads and do not break when fixing. Thus, our products minimize all installation and transportation costs making the whole roofing process more efficient.



As well as:

Versatile: our products are really easy to cut and shape when it comes to eaves, ridges or roof ventilators. All you need is a saw, a hammer and our recommended accessories to fix our products on roofs.

Durable: Thanks to their components and unique production process, we give our products a 15 years waterproofing warranty.

ONDUVILLA ROOFING SYSTEM

Elegant lightweight roofing tiles for premium houses

Onduvilla has been designed with a unique three tone colour finish closely resembling traditional clay roof tiles. This attractive Mediterranean colour finish combined with a traditional design results in an exclusive roof covering that bestows an elegant roof finish to any structure.



ONDUVILLA ROOFING SYSTEM

Elegant lightweight roofing tiles for premium houses



ONDUVILLA ROOFING SYSTEM

Elegant lightweight roofing tiles for premium houses



ONDUVILLA



Applications

A unique tile created for the most valuable buildings, Onduvilla combines many advantages, technical, economic and aesthetic, both for new constructions and renovation of roofs. Onduvilla is ideal for a wide variety of applications (high standard houses, condominiums, hotels, resorts, schools, government buildings...).

Advantages



ELEGANT

Onduvilla is the outcome of the unique technology which makes possible to mix three different tones at random. Since almost every tile has a different color harmonization, the roof appears like a beautiful mosaic, very human and natural.

RESISTANT

Onduvilla delivers optimum mechanical resistance and ventilation to any roof. The corrugations enable air to circulate, thereby enhancing temperature stability inside the roofspace. It is guaranteed waterproof for 15 years. Manufactured from recycled fibers, Onduvilla contains no asbestos.



EASY

Measuring 106 cm x 40 cm and weighing barely 3kg/m², Onduvilla is easy to transport and to install. All you need is a hammer to secure Onduvilla tiles to the wooden roof structure. With its double horizontal grooving, Onduvilla roofing tiles are easy to interconnect. The double groove also prevents the ingress of rising damp and improves watertightness.

Technical specifications

Length / tile	106 cm
Width / tile	40 cm
Thickness / tile	3 mm
Height of corrugation	4 cm
Weight / tile	1,27 kg
Corrugations	6 Corrugations with 5 Flats
Corrugation Depth	40 mm

Corrugation Width	96 mm
Minimum Roof Pitch	17 degrees (30 %)
Coverage Per Tile	0.31 m ² (3.23 Tiles per m ²)
Number of tiles in each pack	15
Weight Per Pack	19 kg
Surface area of one pack of tiles	4,65 m ²

Thanks to its corrugations, Onduvilla is watertight at hot and cold weather conditions and provides a great ventilation between the heat insulation and the roofing tile. Thus, Onduvilla is adapted to cold of temperature or freezing of absorbed water and also resists against wind uplift.

Available colors

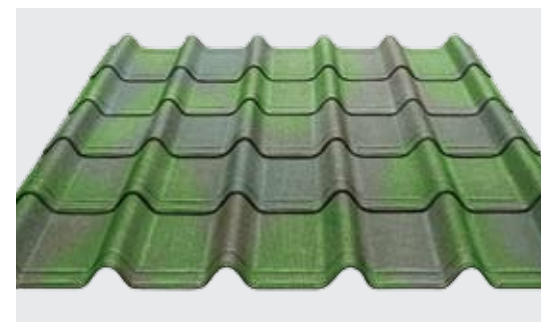
Onduvilla tiles are available in three attractive shaded colours, and in black. The tiles feature a pigmented base color with a secondary painted surface finish.



Black



Shaded red



Shaded green



Shaded brown

ONDUVILLA

Onduvilla system components

Onduvilla can be installed on the pitched roofs made of light frames as well as on full decks: Onduvilla tiles are easy to nail on any wooden supports or to screw on metallic battens.

Very simple to implement : only a hammer (or a screw driver), a saw and a meter are needed to lay the Onduvilla tiles. The special corrugations help to overlay the tiles.

If necessary the tiles can be cut to desired size with a saw or knife. The cutting of the Onduvilla sheets can be done either following the direction of the corrugation or in the perpendicular direction.

When renovating a roof made of shingles, Onduvilla can be directly fixed on it. Insulation can be incorporated into the roof structure using rigid insulation board laid in accordance with manufacturers' instructions.



System composition:

- ① Ridge
- ② Hip
- ③ Eaves corrugated or ventilated fillers
- ④ Apron flashing
- ⑤ Roof skylight

Onduvilla can be fixed either with nails or screws (depending on the type of building structure: wood, metal or concrete). These fixing components must always be put on the top of the corrugations, preventing the infiltration of rainwater through fixings' holes. They must be aligned in accordance with the necessary overlap of 8 cm between each sheet.

ONDULINE

Universal roofing and wall-cladding sheets

The purpose of a roof is to protect people and their assets in a comfortable and durable way. Onduline does it in the most efficient way. In over 100 countries, the unique and aesthetically pleasing roofing characteristics of Onduline sheets make it ideal for all kinds of constructions in any kind of climate. Indeed, Onduline roofing system withstands extreme climatic conditions, from the severe cold of the Arctic Circle to the intense humidity and heat of Equatorial Africa.



Housing

Residential housing

Onduline® is a particularly resistant corrugated sheet, even to the most extreme climatic conditions. It is available in 4 colors, that guarantees a very aesthetic result and makes the roofs match with the surrounding architectural subtleties.



Housing

Collective housing

Onduline® is adaptable to any roof shape and pitch providing roofs very aesthetic features. The simplicity of its installation and transport makes Onduline® an economical and resistant solution for economical constructions.



Professional and public buildings

Public buildings

Public buildings have to be cost effective, aesthetic, safe and resistant. Roofing with Onduline® makes it possible. Its versatility allows the adaptation to any kind of roof shape and pitch. Its easy cutting and fixing allows an extremely rapid completion of the whole roofing process for :

- Schools
- Hospitals
- Administrative offices
- Hyperstores
- Offices



Industrial and agricultural buildings

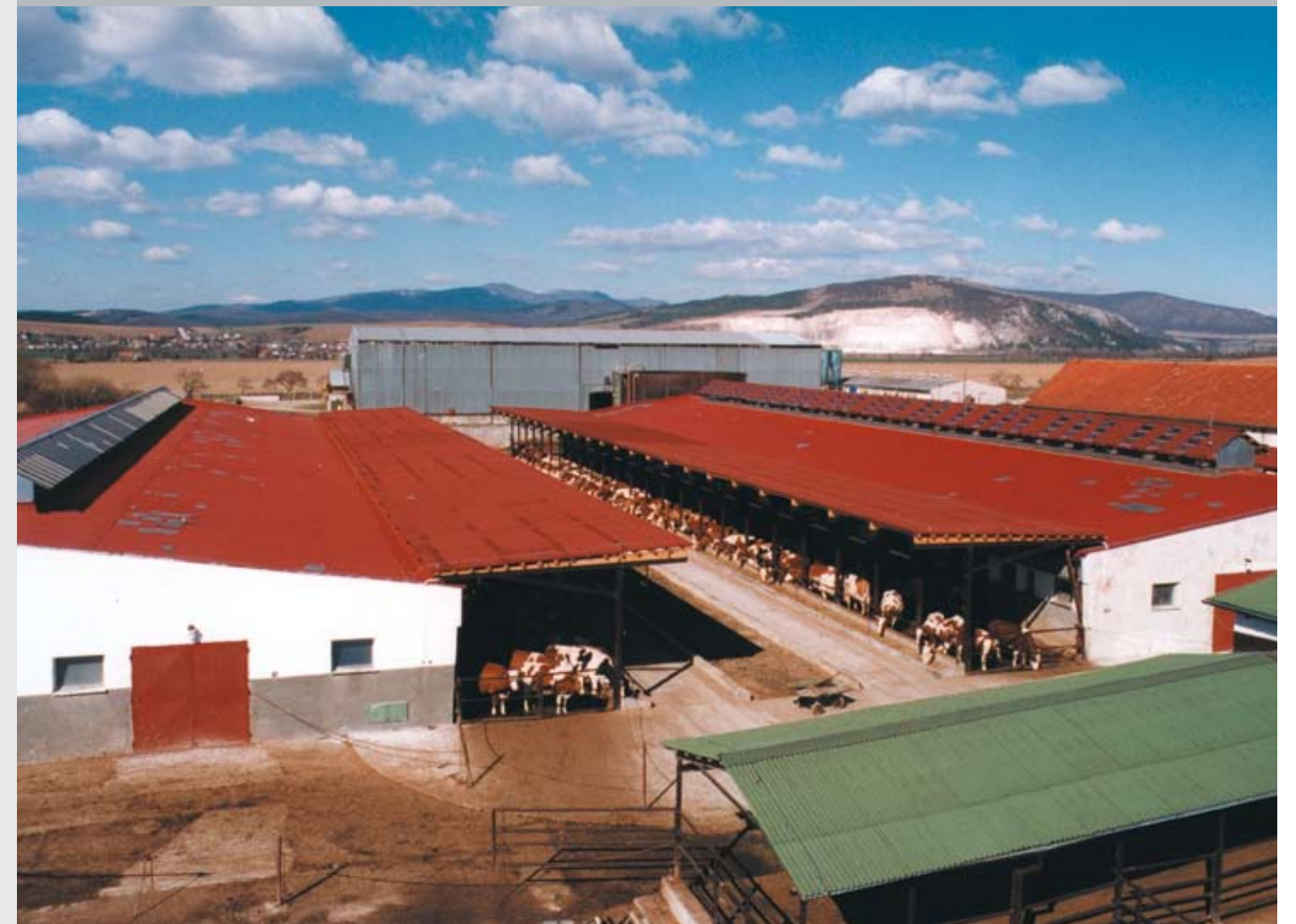
Factories

Onduline's light handling and strength make it the perfect choice for industrial constructions. No fumes, corrosion or hard climatic conditions will affect Onduline®, which will safely stay on your factory or warehouse roof for several years with very little maintenance. Onduline® also contributes to environment protection by covering or replacing asbestos made roofs effectively.



Farms

Metal based products in fact transmit sounds in their entirety as well as cold and heat which are the most critical factors that reduce productivity. To the contrary, Onduline® protects your production bringing all the benefits of its acoustical and enhanced thermal insulation properties. Thanks to its resistance to chemical environments, fungi and algae, Onduline® is used all over the world in barns, poultries, fisheries, fertilizer storages and silos.



ONDULINE



Applications

Since their invention in 1950, Onduline® sheets have continued to demonstrate their solidity all around the world. Thanks to a great mechanical flexibility, Onduline® sheets can be installed on a very diverse range of lightweight roof structures.

Advantages

Onduline® sheets have been installed on the roofs of residential, industrial and agricultural buildings in more than 100 countries because Onduline® is an extremely tough, lightweight, corrugated roofing and wall cladding material.



CONVENIENT

Weighing 3kg/m², Onduline® sheets never break while in transit. They are really practical to install: only a hammer is needed for securing the sheets and a band saw for cutting them down to size. Manufactured from recycled fibers, Onduline® sheets contain no asbestos and therefore present no health risk either in installation or when the building is in use.



AESTHETICS

The coloring of the sheet is achieved through a unique pigmentation process which ensures that the color is stained into the sheet. Unlike painted sheets, Onduline® sheets retain their color over a long period without fading and surface peeling.



RESISTANT

Manufactured through an environment friendly technology, Onduline is a flexible and cost effective product that provides weather protection, sound and thermal insulation. It is waterproof, cannot rust or become brittle and is rot and fungi resistant. It resists most chemicals and corrosion, and is very easy to handle and fix.

Technical specifications

Made from most advanced technology, Onduline® sheets have a very low heat conducting coefficients: they provide a perfect seal integrity in all climates and insulate against the noise of heavy rainfall.

Lightweight and ultra-flexible, Onduline® sheets are specified by many architects in regions of the world exposed to the risk of hurricanes.

Length / sheet	200 cm
Width / sheet	95 cm
Thickness / sheet	3 mm
Width of corrugation	95 mm

Height of corrugation	38 mm
N. of corrugations per sheet	10
Weight / sheet	6,4 kg

Colors

As the outcome of a unique technology known as “prepigmentation”, which enables a bitumen-based composite to be colored full-depth, Onduline Classic® sheets are available in 4 colors.



Black



Brown



Red

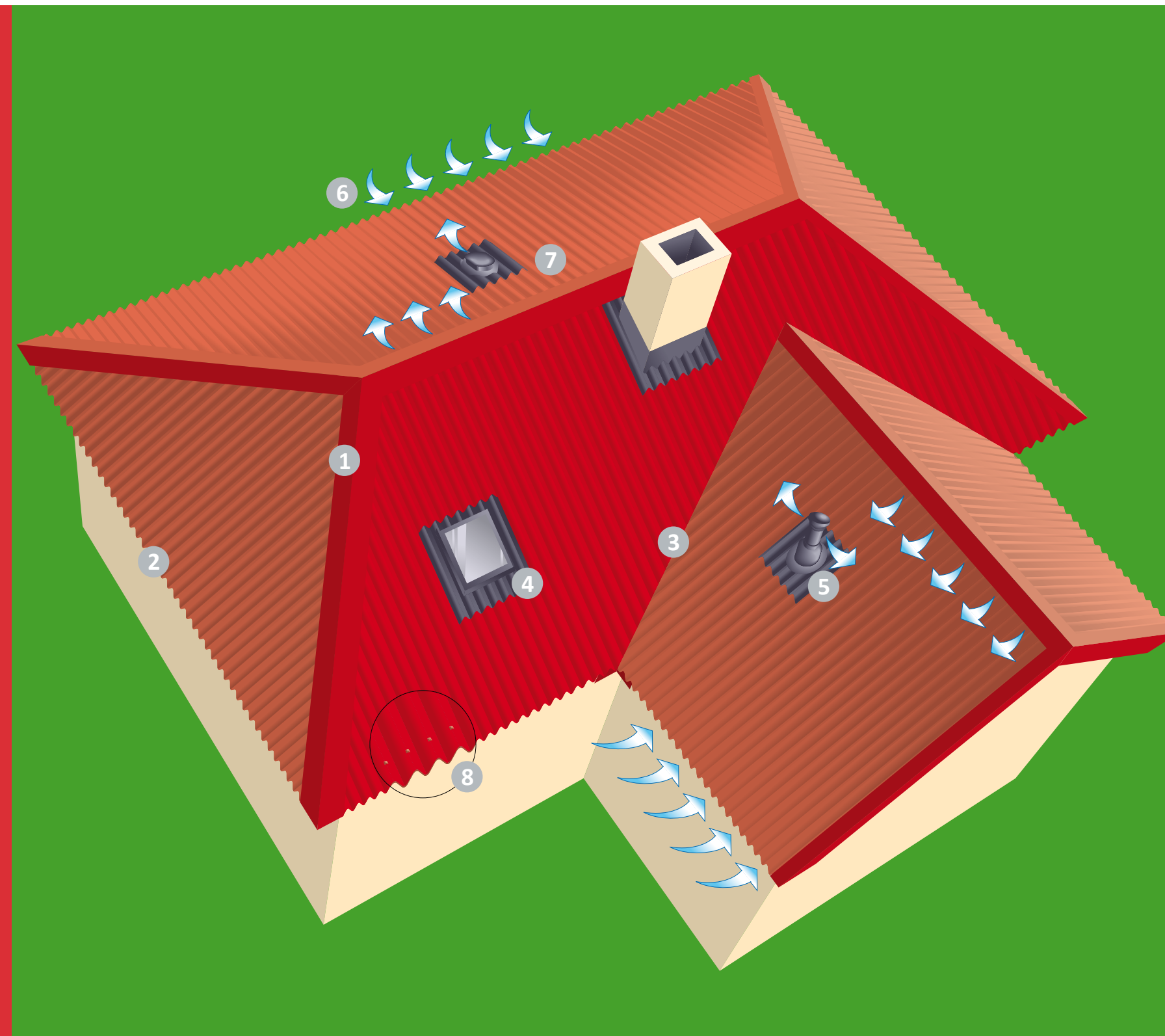


Green

ONDULINE

Onduline system components

The most common way to install Onduline is on a wooden, concrete or metal structure in both new constructions and renovations. Thus, the roof will benefit of all the advantages of the Onduline sheets effectively protecting the structures, creating a unique living comfort and aesthetics, and considerably prolonging the lifespan of the roof.



System composition:

- ① Ridge and hip
- ② Eaves corrugated or ventilated fillers
- ③ Valley
- ④ Roof skylight
- ⑤ Profiled vent pipe
- ⑥ Air flow
- ⑦ Soil vent pipe
- ⑧ Onduline nails or screws

Onduline roofing system can be fixed on to wooden or metallic frames as well as on concrete roofs. It can also be installed on curved roofs.

Roof renovation oversheeting system

Onduline offers an over-sheeting system which allows to cover old roofs such as corroded metal sheets and fiber-cement, asbestos sheets or asphalt shingles.

No need to remove the existing structure: Onduline covers the existing roof and provides the structure with waterproofing, sound/heat insulation and endurance. It also reduces drastically the installation costs by simply eliminating the removal disposal of the old roofing sheets.

This is a very economic, practical and safe solution for roof renovation.



ADVANTAGES:

Cost-effective

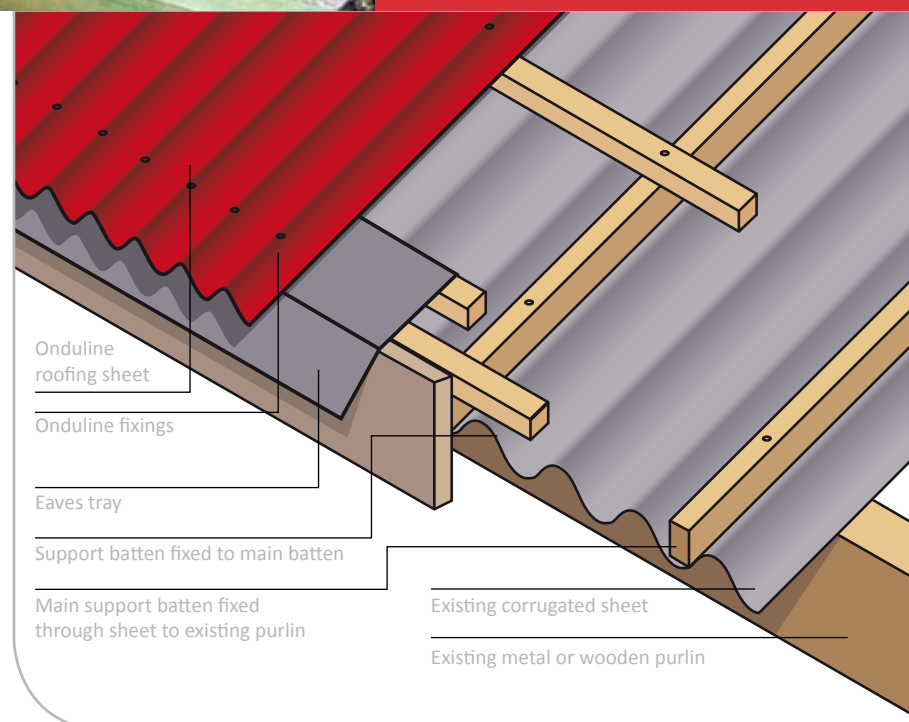
Reduced health risk : no need to handle and to dispose existing hazardous roof coverings (asbestos in particular)

Maintenance free

Improved thermal and sound insulation

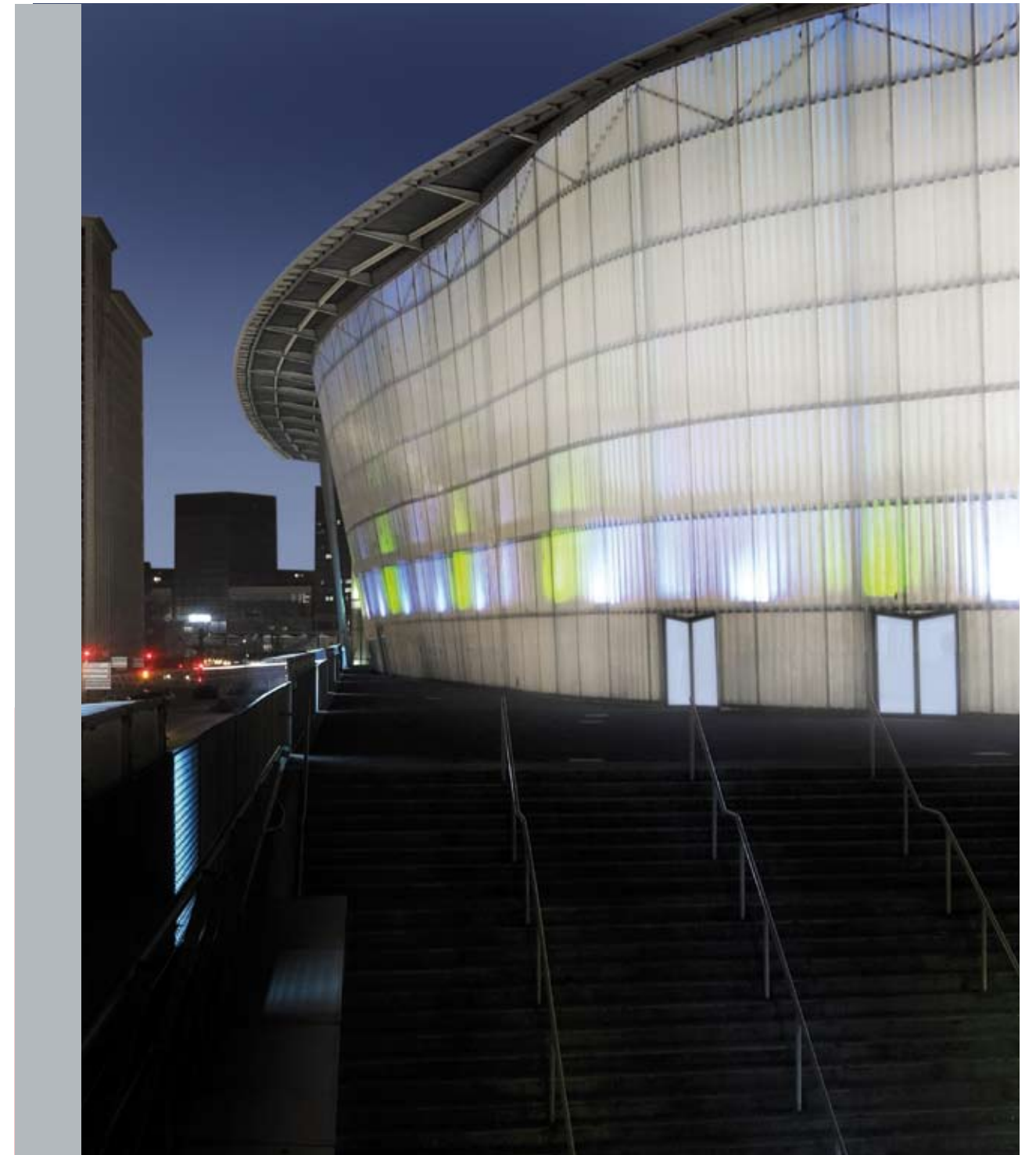
Reduced risk of condensation, improved ventilation

Allows fitting of an extra insulation layer
Simple, easy and quick installation



Other solutions for effective roofing

Our experience and knowledge of the world building material market has led us to extend our expertise to other building products.



Onduclair

Onduclair is a vast range of corrugated or ribbed roof light sheets, which cover a great deal of applications in industrial, agricultural and public buildings such as schools, train stations or sports center.

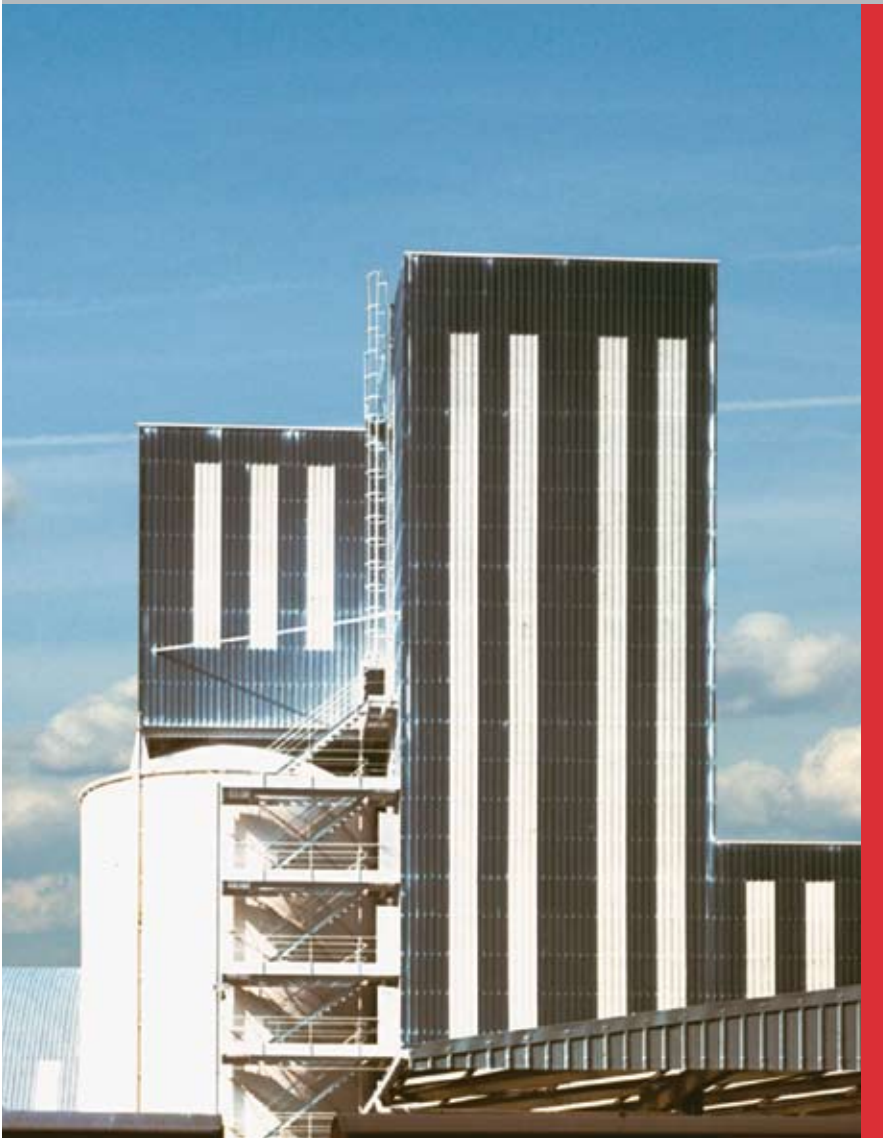
With the Onduclair range, Onduline is one of the most important producers in this field, offering at the same time the whole transparent roofing range: Polyester, PVC, and Polycarbonate. The Onduclair products are a perfect complement to the Onduline corrugated roofing range for both professional and DIY users.



Balithe

Balithe is a product specially adapted to suit the specific conditions of the industrial world; it is particularly resistant to chemical agents, to large differences in temperature and to naturally corrosive atmospheres.

PRODUCTS	MAXIMUM CONCENTRATION
Sulphuric acid	40%
Hydrochloric acid	100%
Phosphoric acid	100%
Nitric acid	30%
Formic acid	30%
Soda (sodium carbonate)	10%
Saline and salt solutions	100%
Formaldehyde	25%
Carbon tetrachloride	100%



Light grey



Blue



Off white

Fondaline

By forming a protective shield on foundation surfaces and making the walls more robust, Fondaline makes the building safer. Indeed, damp can cause serious damage to foundation materials and, as a result, to the stability of the building. Tough yet flexible, Fondaline is very easy to apply. It prevents roots from getting at walls, withstands high pressure, chemical agents which are naturally present in the ground and is effective up to a depth of 5 metres. Fondaline is a Polyethylene High Density membrane (PEHD) which, by virtue of its semi-conical contours, forms a gap between the structure and the wall.



Onduband Pro

Onduband Pro is a bitumen self-adhesive strip for the waterproofing of roof. With a great flexibility in installation, it can be fixed very quickly and without any tool. It inexpensively repairs all the damages time causes to roofs: preventive work on cracked tiles, waterproofing of roof windows and chimneys, damaged gutters... It is covered with a reinforced aluminum foil and available in a wide range of colors and textures. Its thickness of 1,50 mm assures its perfect integration to repaired roof structures. Onduband Pro offers 10 years of sealing with a good grip on most surfaces, with a perfect aesthetic look. Onduband Pro is guaranteed 5 years against UV exposure.



copper



lead



terracotta

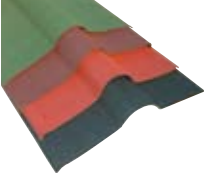







aluminum








embossed
aluminum


Roofing System Accessories

						
PRODUCT	Onduline Ridge Classic	Onduline Valley Classic	Onduline Verge Classic	Faitiere Onduvilla	Onduclair PC	Onduclair PLR
COLORS	Black, red, brown, green	Black, red, brown, green	Black, red, brown, green	Shaded red, Shaded brown, Shaded green, Black	N/A	N/A
RESIN AND PIGMENT	1 side	1 side	1 side	1 side	N/A	N/A
PACKAGING	Pack of 15 units	Pack of 15 units	Pack of 20 units	15 per box	250 pcs per pallet	250 pcs per pallet
NOMINAL WEIGHT	1.3 kg	1.2 kg	1.2 kg	1.2 kg	2.4 kg	2.1 kg
NOMINAL SIZE (± 10%)	1 m x 0,44 m 2,95 ft x 1,44 ft	1 m x 0,44 m 2,95 ft x 1,44 ft	1.10 m x 0,38 m 3,6 ft x 1,25 ft	0,90 m x 50 cm	2,00m x 0,95m x 3,8cm	2,00m x 0,95m x 3,8cm
GENERAL DESCRIPTION	Manufactured from the same material and to the same high specifications as onduline sheets. Flexible double wings allow a wide range of roof angles.		Designed to provide a neat weatherproof seal at the edge. Made from the same high specifications as Onduline sheets.	Manufactured from the same material and to the same high specifications as onduline sheets. Flexible double wings allow a wide range of roof angles.	Used to bring some natural light into the living space. Excellent light transmission (90%).	Used to bring some natural light into the living space.
USE	For ridges with all Classic products	For valleys with all products. Not commanded for shady of very rainy areas (use 3rd party metal valleys instead)	For verges with all Plus Products	For ridges with all Classic products	With Onduline profile	With Onduline profile

Fixing accessories

					
PRODUCT	Safe top washer + 70 mm nail	Self drilling screw	Nails for concrete decks	Roof ventilator	Soil vent pipe
COLORS	Black, red, brown, green	N/A	N/A	N/A	N/A
PACKAGING 1	Bag of 100 washers + bag of 100 nails	Box 400pcs	N/A	6 pcs per box, 84 pcs per pallet	4pcs per box, 56pcs per pallet
PACKAGING 2	Box of 30 + 30 bags	N/A	N/A	N/A	N/A
NOMINAL WEIGHT	0.70 g / 2 bags 22 kg / box	3,6 kg	N/A	1,2 kg	2 kg
NOMINAL SIZE	N/A	6 cm	N/A	55 cm x 36 cm x 11 cm	55 cm x 36 cm x 27 cm
GENERAL DESCRIPTION	The bonded washer is resistant to UV radiations and its weatherproof seal provides superiors resistance to wind uplift.	Used for the fixing of our sheets on metal supports. Hexagonal molded head (nut setter socket is provided with the screws : 1 adapter for 3 boxes)	Used for the fixing of our sheets on concrete decks.	Used for the natural ventilation of the roof space. Ventilation surface 12.500 mm². Includes a grille for snow and insect protection.	Used for the mechanical ventilation of the living space.
USE	For onduline products except Metaline profiles. suitable on hard wood purlins (density between 0,5 and 0,75)	With Onduline and Onduvilla	With Onduline and Onduvilla	With Onduline profile, for all colors. Can be used with Onduvilla, with an adapter.	With Onduline profiles, for all colors. Can be used with Onduvilla, with an adapter. For pitched roofs 8-50°.

External accessories

							
PRODUCT	Roof window	Apron flashing	Z Profile	Ondulair	Ventilated eaves fillers	Roof skylight	Onduvilla adapter
LENGHT	96 cm	93 cm	300 cm	5,00 m	100 cm	82,5 cm	66,5 cm
WIDTH	70,5 cm	26 cm	6 cm	0,39 cm	10 cm	66,9 cm	27,5 cm
HEIGHT	N.A.	3,8 cm	2,4 cm	N/A	N/A	N/A	3,8 cm
WEIGHT	13,7 kg	0,3 kg	N/A	3 kg	0,1 kg	3,5 kg	0,6 kg
PACKAGING	Individual packaging, pallet of 11 pcs	N/A	N/A	4 rolls per box	N/A	Individual packaging, Box of 5 pcs	5pcs per box, 500pcs per pallet
GENERAL DESCRIPTION	Dimension of opening frame 45 x 73 cm. Double glazed 3-8-3 mm. Light surface 0,29 m2. Interior wooden frame.	Designed to seal the gap between Onduline sheets and vertical wall abutment.	Used with the Apron flashing, in order to ensure airtightness at wall abutment. Needs finishing with silicone mastic.	Used to protect the ridge from dust and insects, whilst allowing ventilation of the roof space	Used to allow ventilation into the roof space, whilst preventing the infiltration of birds.	Same corrugation as Onduline profile. Allows easy access to the roof (man hole 43,2 cm x 46,8 cm). Black PE.	Designed as a connection element between Onduline accessories (roof skylight, ventilation accessories) and Onduvilla tiles
USE	Universal. For roof pitch > 27% (15°)	With Onduline profile, for all colors. Can be used with Onduvilla.	With Onduline and Onduvilla	With Onduline and Onduvilla	With Onduline profile, for all colors.	With Onduline profile, for all colors. Can be used with Onduvilla, with an adapter.	With Onduvilla tiles

General information

Please, always refer to our representative for complete installation details and check with your local dealer for your country building codes and regulations.

Site storage

Onduline is delivered to site on pallets of 150 to 420 sheets (depending on means of transport and sheet specification) shrink wrapped. It is not recommended to stack pallets. Sheets must be stored flat and covered at all times to protect against weather and dust. In hot climates Onduline must be protected from direct sunlight.

Handling

Onduline sheets and Onduvilla tiles may be stored in freezing temperatures but installation should not be attempted in these conditions. They should be lifted from the pallet, not dragged across it. The material should then be handled using conventional techniques for corrugated sheeting.

Technical services

The Onduline group provides a comprehensive technical and laboratory advice service for all applications of its products. Please always refer to our specific technical guides for complete installation details and check with our representative, your local dealer or your specifier for your country building codes and regulations.

Precautions

When using Onduline sheets or Onduvilla tiles in conditions of high internal humidity it is important to use vapour barrier and adequate ventilation on the roof space (see page 29). Always ensure high and low level ventilation channels are unrestricted. If a new concrete floor is laid condensation can result due to the high levels of moisture produced from the concrete curing process.

Maintenance

To ensure long life we recommend that the following maintenance procedures are carried out:
- Do not allow leaf debris to build up on the surface of the Onduline sheets or Onduvilla tiles, the debris will form leaf mould which can soften material and reduce the effective life of product.
- Check that branches are not in contact with the roof surface as wind generated movement can result in mechanical damage to the surface of the sheets. Clean all rainwater gutters, down-pipes and gullies regularly ensuring efficient water run-off from the roof.

Conditions of sale

The color impregnation is long lasting; but weathering effects cannot be entirely discounted and will affect Onduline products in the same way as they affect natural material roofs. The Onduline group assumes no responsibility for the effect of structural movement. Details are correct at the time of printing, but the manufacturers reserve the right to vary specifications and details at any time without notice. To avoid any possible misunderstandings, we require that a customer seeking advice on suitability or performance of goods or relating to the nature of services supplied should put such requirements to us in writing. Goods are not tested or sold as fit for any particular purpose unless so agreed in writing. There might be slight variations in size, weight, and color.

Health and safety

Working on roofs can be a hazardous operation. The photographs in this brochure are of installations in many parts of the world; building practices shown may not therefore comply with the recommended safety standards in other countries.