ONDULINE® Technical Data

Classic Onduline® bitumen corrugated sheet roofing system

Test data, certificates and Guarantee terms & conditions

Highest quality standards
Environmental production
Ethical employment policies

www.onduline.co.uk
TEST DATA AND CERTIFICATES

Onduline has always paid particular attention to specific country regulations and harmonized standards, that is why our products are subjected to the most rigorous performance tests in laboratories and research institutes all over the world.

The following table illustrates the scope of just some of the product and performance testing Onduline is subjected too with their abbreviated results.

### General Tests & Technical agreements:

- CSTB (France): AT 5/10/2094.
- CSTB: AT 5/06/1877 (French tile secondary roof systems).
- BBA (UK): A.C. 87/1823 C
- ITB (Poland): 500/02 AT 1 21145/2002
- Conformity to EN 534:2010 - Corrugated bitumen sheets general performance and attitude tests.
- EN 14964:2006 Rigid underlays for discontinuous roofing.
- ISO 14001: 2004 Environmental Management Standard

### Ecological

Onduline is manufactured from 48% recycled cellulose fibre material, it is produced in environmentally efficient manufacturing plants which utilise industry leading technology to both recycle production energy and eliminate both airbourne and water polution.

Onduline contains no asbestos and presents no known health risk in handling, fixing or in service. It can be disposed of in landfill and will decompose naturally to its constituent elements without presenting a hazardous contamination risk.

### Insulation and Condensation

Onduline has excellent thermal insulation properties; however any single thickness roofing material is at risk of condensation forming during the winter months.

Water vapour can also freeze on the underside of the sheets at night, melting the following morning as the roof warms forming water droplets, these can be discoloured by mixing with production and handling residue on the surface of the newly laid sheets these droplets are non-hazardous and can be cleaned from underlining surfaces using proprietary cleaners.

Generally high and low ventilation provision will reduce the risk of condensation, alternatively in buildings with high moisture content (Animal housing, car ports etc.) the provision of a decked roof and Ondutiss vapour permeable underlay laid below the sheets will significantly reduce the risk of condensation formation.
Strength and Impact Loading
Warrington Research Laboratory Test (UK) BS1 811
United States Testing Co.ASTM D1502-60
CEBTP (France): Report No 2342.7.098
Bureau Veritas (France): BTE JPD/NC 1016/1995
CSTB: No GM/92-20
Tests showed adequate bearing strength, impact resistance and resistance to wind lift.

Mechanical Strength
Warrington Research Laboratory Test (UK) BS4 154. Provided resistance to 33kg [73lbs] sheered force on fixing bolt.

Water And Weather Proofing
Tests (UK) BS1811 and ASTM D1499(USA)
UIDIEM (Chile): Certification No 150 385
Results showed excellent weather-proofing characteristics.

Water Absorption
Warrington Research Laboratory Test (UK) BS1 811
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 emerged.

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

Toxicity and resistance to chemicals tests
Yarsley Research Centre Test (UK). Tests carried out on water collected after catchments with Onduline sheets gives water suitable for drinking complying with World Health Organisation and EEC regulations.
CSTB (France): No SM/98-0062 - stable under exposure to acids, alkalis and salts.
Note: Although safe to use Onduline do not recommend rainwater collection from roofs for human or animal consumption. This is due to the high incidence of airborne pollutants and possible algae formation in water storage systems. If the rainwater is used for this purpose the roof, gutters and collection system must be cleaned and purified regularly. It is recommended that only proprietary water collection storage systems are used which incorporate water filters at the point of delivery.

Wind Lift
Yarsley Research Centre (UK). Proved Onduline suitable in hurricane and earthquake conditions.
Tested up to 120mph (192kph).
Building Research Establishment (UK): no BRE/83/11/1 – good behaviour in wind lift conditions
Wood Technology Division (New Zealand):
No WTC 1468/2 – good resistance in cyclonic conditions.
Minister of Economy (Argentina):
No 83-1 INPRES 95 & PV No 030 DPDU-95.

Hail/Frost Resistance
ASTM E196 (USA) and DIN 52103 and 52104 (Germany). Meets snow and frost resistance for all regions. No mechanical damage in frost.
For roofs on exposed sites or at high altitude with high annual snow fall, Onduline Roofing Sheets should be laid on fully supporting roof decking.
In areas prone to significant hail proprietary protective netting should be laid over the Onduline corrugations.

Fire Resistance
Onduline pre pigment classic sheets are not classified to External S.AA fire rating as required in UK Building Regulations for some classes of building such as housing. In these cases the sheets must be fixed on a suitable fully supporting roof deck and the sheets coated with a proprietary AA surface paint treatment, [as used for bituminous felted flat roofing] or insurmescent varnish, applied in accordance with the paint manufacturers instructions. Contact your local Building Control office for further details relating to your project.

Thermal Resistance
ASTM C177-76 (USA) and BS874 (UK).
Provided excellent thermal resistance.
K value 0.46 to 0.51 British Thermal Units.
LNE (France): Certification No 7070916D MAT/1
Thermal conductivity: 0.099 W/mK

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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: Rw = 28db
Wolfson unit Southampton University (UK).
No 2089 1592/B1: antinoise wall with Onduline reduces the airborne noices of 7db

Maintenance
Onduline Roofing Sheets are extremely durable for long service. The following maintenance procedures should be undertaken; Leaf debris should be removed as any build up will form a leaf mould which can soften the Onduline sheets and reduce its effective life. Tree and shrub branches in contact with the sheets can, through wind generated movement, cause damage and should be trimmed accordingly.
Health and Safety Data

The covering of new and existing roofs is a specialised occupation and should be carried out with due regard to Health and Safety regulations. Site access and working provision must be in strict accordance with the regulations for site safety and roof work detailed in HSE33.

Working on Onduline Roofs:
Onduline sheets should be regarded as providing a ‘fragile’ roof covering, work should be conducted using roof access platforms and ladders or crawling boards as detailed Health and Safety regulations as set out in HSG33 (Roof work). These should be positioned with reasonable care to avoid damaging the sheets surface. If access to the roof is required for some purpose other than occasional maintenance of sheets, a permanent access platform should be provided.

Toxicity and Odour:
Onduline sheets in the construction of a rainwater catchment systems give water suitable for drinking in compliance with the World Health Organisation and EEC regulations (Report Yarsley Technical Centre).

During storage or when first fixed an odour may emit from the sheet as a result of the production process within the sheet at the time of production process. It is not harmful and will dissipate with normal ventilation provision. Condensation can form on newly fixed sheets as a result of the drying out of building materials. This moisture can absorb dust from the atmosphere and mix with bitumen production residue on the sheet surface. The resulting discoloured water droplets can fall on underlying surfaces. It can be easily removed using proprietary cleaning agents.

Storage of Onduline Products
Onduline sheets should be protected from the elements and stored internally, if stored externally cover with a tarpaulin. It is advisable to store the sheets on the delivery pallets to avoid any possibility of sheet deformation due to flattening of the corrugations. Care should be exercised with Onduline PVC sheets which must be protected from UV radiation at all times to avoid distortion and discolouration damage to the sheets.

Consideration of Fire Risk
Onduline sheets do not emit significant amounts of combustible gases during storage or use, and therefore require no special storage provision, although we recommend the material is stored in a normally ventilated area to ensure any moisture present can dissipate. The composition of the sheet will burn only if ignited by an intense independent heat source. A fire can be tackled using normal fire fighting procedures with due precautions taken in respect of radiated heat and fumes. Normal water based fire extinguishers are suitable for this use.

Constituent Materials

Table of Constituent Materials
The following materials are present in Onduline and related products

<table>
<thead>
<tr>
<th>Bitumen</th>
<th>Organic Fibre</th>
<th>Pre Pigmented Colour</th>
<th>Emulsion paint finish</th>
<th>Polyethylene/foam</th>
<th>Polypropylene</th>
<th>PVC</th>
<th>ABS Copolymer</th>
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<tbody>
<tr>
<td>Onduline pre pigmented corrugated roofing sheets</td>
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<td>Plastic headed Monobloc &amp; Safe-top Nails caps (steel shanks)</td>
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<td>Multi-purpose Ventilator Strips</td>
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<td>Roof Ventilators</td>
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<td>Roof Light Sheets</td>
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<td>Apron Flashings</td>
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Maintenence and handling notes:

Leaf debris:
Do not allow leaf debris to build up on the surface of the corrugated roofing sheets. Left unattended the debris will form leaf mould which by holding moisture in the corrugation bases will soften the Onduline sheet and ultimately reduce the effective life of the product.

Tree and shrub branches:
Check that overhanging branches are not in contact with the surface of the sheets, as wind generated movement can result in mechanical damage to the surface of the Onduline sheets.

Gutters:
Clean all gutters, down-pipes and gullies regularly. If water collection systems are used, filter and circulate water in accordance with the instructions of the system manufacturer. Note: Whilst rainwater run off from Onduline roofs is non-hazardous, we do not recommend its use for human consumption due to the inherent risk of air born pollutants being introduced into the water collection system.

Condensation:
Always ensure high and low level ventilation flow is unrestricted. If a new concrete floor is laid prior to fixing the roof sheets condensation can result due to the high levels of moisture produced from the concrete curing process.

Health and Safety:
Working on roofs can be a hazardous operation. All work must be carried out with due regard to health and safety regulations as set out in HSG33 (Roof work).

Product Support:
If you require further information on our products or services we will be pleased to assist, just call our sales office or access our web site at: www.onduline.co.uk

Handling Materials
Onduline sheets contain no asbestos and present no known health hazard in handling or in use. It is not fragile and is without sharp edges requiring specialist protective clothing. Finally its light weight and modular size make it safe and easy to handle using established methods.

Product Guarantee and terms and conditions

Guarantee
Onduline roofing sheets are guaranteed to remain weatherproof for fifteen years under normal usage and conditions; they must be fixed and maintained in strict accordance with the fixing instructions. Proof of purchase is required and the guarantee is non-transferable further the guarantee does not cover the aesthetic quality of the material. The guarantee after five years’ service is limited to the pro-rata replacement value of the Onduline materials set against the service life measured in annual increments; The terms of the guarantee do not encompass labour, related construction; or third party costs. To process a claim a completed enquiry form (available from the sales office) with supporting photographs should be submitted; the roof must also be available for inspection if required.

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