

# ENVIRONMENTAL PRODUCT DECLARATION

According to ISO 14025 and EN 15804

Registered under the scope of mutual recognition between  
The International EPD® System and  
Institut Bauen und Umwelt e.V. (IBU)

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EPD Norge: NEPD-3667-2612-EN

Isola Tyvek® UV Facade Isola  
as, N-3946 Porsgrunn

ISOLA as

 **EPD**®  
ENVIRONMENTAL PRODUCT DECLARATION






 **epd-norway**  
Global Program Operator



Photo courtesy of DuPont™ Tyvek®

## 1. General Information

|  |   |  |  |  |  |                                     |  |
|--|---|--|--|--|--|-------------------------------------|--|
| <p><b>Isola as</b></p> <hr/> <p><b>Programme holder</b><br/>         IBU – Institut Bauen und Umwelt e.V.<br/>         Panoramastr. 1<br/>         10178 Berlin<br/>         Germany</p> <hr/> <p><b>Declaration number</b><br/>         EPD-DUP-20210187-IBC1-EN</p> <hr/> <p><b>This declaration is based on the product category rules:</b><br/>         False ceiling and underlay sheeting, 11.2017<br/>         (PCR checked and approved by the SVR)</p> <hr/> <p><b>Issue date</b><br/>         30.11.2021</p> <hr/> <p><b>Valid to</b><br/>         29.11.2026</p> <hr/> <p><br/>         Dipl. Ing. Hans Peters<br/>         (chairman of Institut Bauen und Umwelt e.V.)</p> <hr/> <p><br/>         Dr. Alexander Röder<br/>         (Managing Director Institut Bauen und Umwelt e.V.)</p> | <p><b>Isola Tyvek® UV Facade</b></p> <hr/> <p><b>Owner of the declaration</b><br/>         Isola as<br/>         Prestemoen 9<br/>         N- 3946 Porsgrunn</p> <hr/> <p><b>Declared product / declared unit</b><br/>         1 m<sup>2</sup> Isola Tyvek® UV Facade</p> <hr/> <p><b>Scope:</b><br/>         This document applies to Isola Tyvek® UV Facade, a laminated high density polyethylene (HDPE) membrane manufactured by DuPont in L-2984 Contern and laminated as well as printed in Germany, with a declared unit weight of 195 g/m<sup>2</sup>. The LCA data were compiled using production data from the year 2019 by DuPont. The declaration holder is responsible for the underlying data and its verification. The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences. The EPD was created according to the specifications of EN 15804 +A2. In the following, the standard will be simplified as EN 15804.</p> <hr/> <p><b>Verification</b></p> <table border="1"> <tr> <td colspan="2">The standard EN 15804 serves as the core PCR</td> </tr> <tr> <td colspan="2">Independent verification of the declaration and data according to ISO 14025:2010</td> </tr> <tr> <td><input type="checkbox"/> internally</td> <td><input checked="" type="checkbox"/> externally</td> </tr> </table> <hr/> <p><br/>         Vito D'Incognito<br/>         (Independent verifier)</p> | The standard EN 15804 serves as the core PCR |  | Independent verification of the declaration and data according to ISO 14025:2010 |  | <input type="checkbox"/> internally | <input checked="" type="checkbox"/> externally |
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| <input type="checkbox"/> internally  | <input checked="" type="checkbox"/> externally  |  |  |  |  |                                     |  |

## 2. Product

### 2.1 Product description/Product definition

Isola Tyvek® is a nonwoven material made of HDPE, which is diffusion open but watertight. It is used as a roof and wall underlay.

For the placing on the market of the product in the European Union/European Free Trade Association (EU/EFTA) (with the exception of Switzerland) Regulation (EU) No. 305/2011 (CPR) applies. The product needs a declaration of performance taking into consideration EN 13859-1:2010 Flexible sheets for waterproofing - Definitions and characteristics of underlays - Part 1: Underlays for discontinuous roofing and EN 13859-2:2010 Flexible sheets for waterproofing - Definitions and characteristics of underlays - Part 2 Underlays for walls and the CE-marking. For the application and use the respective national provisions apply.

### 2.2 Application

Tyvek® underlays are used in roofs and walls. They constitute the second water shedding layer and at the same time protect the insulation from trapped moisture, wind penetration, dust and insects. Insulation

installed below Tyvek® is kept dry and performs as designed.

### 2.3 Technical Data

The following chapter comprises technical data for the characteristics listed in the Declaration of Performance according to the harmonized technical specifications EN 13859-1 and EN 13859-2.

#### Technical Data

| Name  | Value         | Unit              |
|---|---------------|-------------------|
| Length acc. to EN 1848-2  | 50m standard  | m                 |
| Width acc. to EN 1848-2   | 1.5m standard | m                 |
| Grammage acc. to EN 1849-2  | 0.195         | kg/m <sup>2</sup> |
| Resistance to water penetration acc. to EN 1928 (class)                   | W1            | -                 |
| Water vapor diffusion equivalent air layer thickness acc. to EN ISO 12572 | 0.035         | m                 |

|   |         |        |
|---|---------|--------|
| Maximum tensile force acc. to EN 12311-1                                      | 390/320 | N/50mm |
| Elongation acc. to EN 12311-1   | 13/19   | %      |
| Resistance to water penetration after ageing acc. to EN 1297, EN 1928 (class) | W1      | -      |
| Tear resistance (nail) acc. to EN 12310-1                                     | 310/370 | N      |

Performance data of the product in accordance with the declaration of performance with respect to its essential characteristics according to *EN 13859-1:2010 Flexible sheets for waterproofing - Definitions and characteristics of underlays - Part 1: Underlays for discontinuous roofing and EN 13859-2:2010 Flexible sheets for waterproofing - Definitions and characteristics of underlays - Part 2 Underlays for walls*

#### 2.4 Delivery status

The single selling unit is a roll of up to 3 m width and a length of up to 100 m. Usually several rolls are strapped and piled on a wooden pallet. The order unit is square meter [m<sup>2</sup>].

#### 2.5 Base materials/Ancillary materials

Isola Tyvek® UV Facade is a laminate of a high density polyethylene (HDPE) nonwoven (functional layer) and a polypropylene (PP) spunbond. Both materials are glued during the lamination process. Both the PP and the HDPE are UV stabilized with hindered amine light stabilizers (HALS). Concentrations:

|                      |       |
|----------------------|-------|
|                      | 2524B |
| Tyvek® HDPE nonwoven | 42 %  |
| Spunbond PP          | 51 %  |
| Adhesive             | < 7 % |
| HALS                 | < 1 % |

#### 2.6 Manufacture

Tyvek® underlays are produced on semi-continuously operating production facilities in different countries. Process steps include:

1. Spinning of thin HDPE filaments.
2. Bonding of filament sheet.
3. Laminating of a spunbond onto the Tyvek® sheet.
4. Printing, slitting and packaging of the finished roll goods.

#### 2.7 Environment and health during manufacturing

Some of the manufacturing facilities employed in the production of Tyvek® are *ISO 14001* certified. All facilities comply with local regulations and DuPont internal standards.

Particular care is taken to ensure the safety of anyone involved in the Tyvek® supply chain in line with the DuPont safety culture: all injuries can be prevented (goal is ZERO).

#### 2.8 Product processing/Installation

Tyvek® membranes for walls and roofs can be either installed on the construction site or in manufacturing facilities in case of pre-fabricated buildings. In both instances the material is usually installed by manually unwinding the sheet from the roll and placing it onto the designated surface. Tools required are usually a knife or scissors to cut the sheet as well as a stapler to

fix it to the construction. Refer to Tyvek® installation guidelines for more information.

#### 2.9 Packaging

Tyvek® is wound onto carton cores. Each roll comes with a paper insert sheet. Rolls are individually wrapped in foil (LDPE: low density PE) and stacked on wooden pallets which are also wrapped in LDPE stretch film. Vertical sides of the pallets are protected with a carton profile.

All packaging materials can be reused (e.g. pallets), recycled or valorised through energy recovery.

#### 2.10 Condition of use

Materials are not expected to change or react during the period of use. Tyvek® is intended to be installed on the cold side of the building envelope and is designed to withstand substantial temperature changes during service life.

#### 2.11 Environment and health during use

Tyvek® membranes are usually concealed below roof decking or facade cladding. They do not require maintenance and will not produce emissions. There are no environmental or health concerns to be expected from the use of the material.

#### 2.12 Reference service life

The documentation of the RSL is not required for this EPD since not the entire life cycle is declared (without modules B1-B7). Nevertheless, the product is assumed to have a reference service life of 30 years, corresponding to the average roof lifetime (*BNB Nutzungsdauerliste*). But this assumption could not be verified because the Tyvek® envelopes have only been sold for 25 years.

#### 2.13 Extraordinary effects

##### Fire

##### Fire protection

| Name                                      | Value |
|---|-------|
| Building material class acc. to EN13501-1 | E     |

##### Water

Tyvek® membranes are inherently waterproof. No part of the product will dissolve in water nor will the product release any toxic substances to water.

##### Mechanical destruction

No possible impacts on the environment following unforeseeable mechanical destruction are known.

#### 2.14 Re-use phase

The material is not intended to be re-used or recycled. Energy recovery is possible.

#### 2.15 Disposal

Disposal of the material should be made according to national legislation. Incineration is the preferred way of disposal. *European Waste Codes* (Commission decision 2014/955/EU) for mixed construction and demolition waste is 17 09 04.



### 2.16 Further information

Additional information about product properties and use can be found at [www.building.dupont.com](http://www.building.dupont.com). Safety Data Sheets (SDS) or Article Information Sheets (AIS) of the products can be found at [www.dupont.com](http://www.dupont.com).

## 3. LCA: Calculation rules

### 3.1 Declared Unit

This declaration applies to 1 m<sup>2</sup> of Isola Tyvek® UV Facade, with a declared unit weight of 195 g/m<sup>2</sup>.

#### Declared Unit

| Name          | Value | Unit              |
|---------------|-------|-------------------|
| Declared unit | 1     | m <sup>2</sup>    |
| Grammage      | 0.195 | kg/m <sup>2</sup> |

### 3.2 System boundary

Type of EPD: Cradle-to-gate (with options)

The system boundaries of the EPD follow the modular construction system as described by *EN 15804*. The LCA takes into account the following modules:

- A1-A3: Manufacturing of pre-products, packaging, ancillary materials, transport to the factory, production including energy supply and waste handling
- A4: Transport to the construction site
- A5: Installation into the building (disposal of packaging)
- C4: Waste disposal (incineration)
- D: Potential for reuse, recovery and/or recycling (benefits for incineration and recovery of packaging materials from module A5 and envelopes incineration from module C4).

### 3.3 Estimates and assumptions

The spunbond polypropylene (SBPP) production was modelled considering the consumption of polypropylene granulates and the following assumptions:

- material loss of 5% during the bonding process (1.05 kg of granulates are finally used to produce 1 kg of SBPP);
- consumption of electricity based on supplier data (1-1.2 kWh per kg of produced nonwoven) which has been adapted to account for the older technology (1.5 kWh per kg of SBPP).

The polypropylene (PP) loss of 0.05 kg per 1 kg of SBPP was assumed to be incinerated.

The colour paste used in the finishing process was valued with a general composition of water-based colour paste (conservative approach).

### 3.4 Cut-off criteria

All data were taken into consideration (recipe constituents, process water, electricity used). In case

of missing data, a cut-off criteria of 1 % of the total input mass was applied for unit processes and 5% for the entire modules (as recommended by *EN 15804*, section 6.3.5) and therefore some inputs were excluded: tape and spiking agent for monolayer production (sum < 0.04 % of total input mass for monolayer production), paper ink, hotmelt, paper, tape and detergent for finishing process (sum < 0.2 % of total input mass for finishing process). Transports were considered for all inputs and outputs. Manufacturing of the production machines and systems and associated infrastructure were not taken into account in the life cycle assessment (LCA). Regarding possible off-cuts during installation, the amount is lower than 5 % and therefore also neglected.

### 3.5 Background data

All background data for the LCA model were taken from the database of *GaBi 10.5.0.78*.

### 3.6 Data quality

To simulate the product stage, data recorded by DuPont Luxembourg s.à r.l. and the lamination and the converting plants in Germany from the production year 2019 were used.

*Eurostat* data for the years 2018-2019 were used to model the modules A4 (freight transport modal split) and A5 (packaging disposal routes).

Regarding background processes, the Luxembourg and German electricity grid mix were applied to the production plants in these countries (A1-A3). Other background data were specific to Germany or the European average, and were not older than 10 years. The representativeness can be classified as very good for all the foreground data, and most of the background data.

### 3.7 Period under review

The period of study encompasses the year 2019.

### 3.8 Allocation

Mass allocation was applied for production. At the DuPont site in Luxembourg, Tyvek® waste materials are sold and transformed externally. The further use of the valorized HDPE granulates was cut-off from the system boundaries, as for the packaging materials sent for recycling. The Tyvek® final waste material sent to incineration is modelled through the combustion process of the specific material and the avoided conventional energy production is considered in module D. The potential benefit in module D will be possible only if the Tyvek® will be separate and incinerated.

### 3.9 Comparability

Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to *EN 15804* and the building context, respectively the product-specific characteristics of performance, are taken into account.



GaBi 10.5.0.78 was used to model background data.

## 4. LCA: Scenarios and additional technical information

### Characteristic product properties

#### Information on biogenic Carbon

The product does not contain biogenic carbon.

#### Information on describing the biogenic Carbon

##### Content at factory gate

| Name  | Value  | Unit |
|---|--------|------|
| Biogenic Carbon Content in product                | 0      | kg C |
| Biogenic Carbon Content in accompanying packaging | 0.0037 | kg C |

The following technical information serves as a basis for the declared modules or can be used for the development of specific scenarios in the context of a building assessment.

#### Transport from the gate to the construction site (A4)

| Name                                  | Value    | Unit |
|---------------------------------------|----------|------|
| Transport distance (weighted average) | 3064     | km   |
| Transport (train)                     | 4.76E-02 | tkm  |
| Transport (road)                      | 2.07E-01 | tkm  |
| Transport (water)                     | 3.83E-01 | tkm  |

#### Installation of the product into the building (A5)

| Name                            | Value    | Unit |
|---------------------------------|----------|------|
| Wood waste to landfill          | 2.97E-04 | kg   |
| Wood waste to incineration      | 1.78E-04 | kg   |
| Cardboard waste to landfill     | 2.96E-04 | kg   |
| Cardboard waste to incineration | 2.26E-04 | kg   |
| Plastic waste to landfill       | 2.66E-05 | kg   |
| Plastic waste to incineration   | 3.63E-05 | kg   |

#### End-of-life stage (C1-C4)

| Name                              | Value | Unit |
|-----------------------------------|-------|------|
| Collected separately Tyvek® waste | 0.195 | kg   |
| Energy recovery                   | 100   | %    |
| R1 value                          | < 0.6 |      |

## 5. LCA: Results

The results displayed below apply to 1 m<sup>2</sup> of Isola Tyvek® UV Facade, with a declared unit weight of 195 g/m<sup>2</sup>.  
Disclaimers:

Potential Human exposure efficiency relative to U235: This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

Abiotic depletion potential for non-fossil resources; Abiotic depletion potential for fossil resources; Water (user) deprivation potential, deprivation-weighted water consumption: The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

Disclaimer:

EP-freshwater: This indicator has been calculated as "kg P eq" as required in the characterization model (EUTREND model, Struijs et al., 2009b, as implemented in ReCiPe; <http://eplca.jrc.ec.europa.eu/LCDN/developerEF.xhtml>).

### DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; ND = MODULE OR INDICATOR NOT DECLARED; MNR = MODULE NOT RELEVANT)

| PRODUCT STAGE       |           |               |                                     |          | CONSTRUCTION PROCESS STAGE | USE STAGE   |        |             |               |                        |                       |                            | END OF LIFE STAGE |                  |          |                                    | BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES |
|---------------------|-----------|---------------|-------------------------------------|----------|----------------------------|-------------|--------|-------------|---------------|------------------------|-----------------------|----------------------------|-------------------|------------------|----------|------------------------------------|---|
| Raw material supply | Transport | Manufacturing | Transport from the gate to the site | Assembly | Use                        | Maintenance | Repair | Replacement | Refurbishment | Operational energy use | Operational water use | De-construction demolition | Transport         | Waste processing | Disposal | Reuse-Recovery-Recycling-potential |   |
| A1                  | A2        | A3            | A4                                  | A5       | B1                         | B2          | B3     | B4          | B5            | B6                     | B7                    | C1                         | C2                | C3               | C4       | D                                  |   |
| X                   | X         | X             | X                                   | X        | ND                         | ND          | MNR    | MNR         | MNR           | ND                     | ND                    | ND                         | ND                | ND               | X        | X                                  |   |

### RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 m<sup>2</sup> Isola Tyvek® UV Facade

| Core Indicator   | Unit                               | A1-A3    | A4       | A5       | C4       | D         |
|--|------------------------------------|----------|----------|----------|----------|-----------|
| Global warming potential - total   | [kg CO <sub>2</sub> -Eq.]          | 7.37E-1  | 2.03E-2  | 1.85E-3  | 6.32E-1  | -3.81E-1  |
| Global warming potential - fossil fuels  | [kg CO <sub>2</sub> -Eq.]          | 7.38E-1  | 1.99E-2  | 1.50E-4  | 6.32E-1  | -3.79E-1  |
| Global warming potential - biogenic  | [kg CO <sub>2</sub> -Eq.]          | -1.06E-3 | 2.82E-4  | 1.70E-3  | -3.74E-5 | -1.43E-3  |
| GWP from land use and land use change  | [kg CO <sub>2</sub> -Eq.]          | 6.33E-4  | 1.37E-4  | 4.91E-8  | 0.00E+0  | -1.65E-4  |
| Depletion potential of the stratospheric ozone layer                             | [kg CFC11-Eq.]                     | 1.33E-11 | 1.63E-17 | 2.39E-19 | 4.16E-10 | -2.65E-15 |
| Acidification potential, accumulated exceedance                                  | [mol H <sup>+</sup> -Eq.]          | 2.50E-3  | 2.14E-4  | 3.89E-7  | 8.33E-5  | -3.90E-4  |
| Eutrophication, fraction of nutrients reaching freshwater end compartment        | [kg P-Eq.]                         | 1.11E-5  | 5.17E-8  | 3.68E-9  | 1.51E-9  | -3.12E-7  |
| Eutrophication, fraction of nutrients reaching marine end compartment            | [kg N-Eq.]                         | 4.66E-4  | 7.90E-5  | 1.70E-7  | 1.42E-5  | -1.24E-4  |
| Eutrophication, accumulated exceedance   | [mol N-Eq.]                        | 5.03E-3  | 8.70E-4  | 1.58E-6  | 3.33E-4  | -1.34E-3  |
| Formation potential of tropospheric ozone photochemical oxidants                 | [kg NMVOC-Eq.]                     | 1.47E-3  | 1.77E-4  | 6.85E-7  | 4.17E-5  | -3.55E-4  |
| Abiotic depletion potential for non-fossil resources                             | [kg Sb-Eq.]                        | 9.76E-8  | 1.53E-9  | 5.04E-12 | 8.89E-15 | -4.58E-8  |
| Abiotic depletion potential for fossil resources                                 | [MJ]                               | 1.85E+1  | 2.70E-1  | 8.54E-4  | 1.19E-1  | -6.51E+0  |
| Water (user) deprivation potential, deprivation-weighted water consumption (WDP) | [m <sup>3</sup> world-Eq deprived] | 2.15E-1  | 2.42E-4  | 8.61E-5  | 5.56E-2  | -1.76E-2  |

### RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 m<sup>2</sup> Isola Tyvek® UV Facade

| Indicator  | Unit              | A1-A3   | A4        | A5        | C4       | D        |
|--|-------------------|---------|-----------|-----------|----------|----------|
| Renewable primary energy as energy carrier                 | [MJ]              | 1.66E+0 | 1.72E-2   | 8.75E-5   | 3.08E-3  | -9.12E-1 |
| Renewable primary energy resources as material utilization | [MJ]              | 1.12E-3 | -3.19E-14 | -1.22E-16 | 3.65E-6  | 2.06E-12 |
| Total use of renewable primary energy resources            | [MJ]              | 1.66E+0 | 1.72E-2   | 8.75E-5   | 3.09E-3  | -9.12E-1 |
| Non-renewable primary energy as energy carrier             | [MJ]              | 1.85E+1 | 2.70E-1   | 8.54E-4   | 1.19E-1  | -6.51E+0 |
| Non-renewable primary energy as material utilization       | [MJ]              | 4.28E-4 | 8.79E-6   | 1.67E-8   | 3.51E-10 | -1.44E-4 |
| Total use of non-renewable primary energy resources        | [MJ]              | 1.85E+1 | 2.70E-1   | 8.54E-4   | 1.19E-1  | -6.51E+0 |
| Use of secondary material                                  | [kg]              | 3.82E-3 | 0.00E+0   | 0.00E+0   | 0.00E+0  | 0.00E+0  |
| Use of renewable secondary fuels                           | [MJ]              | 1.82E-6 | 0.00E+0   | 0.00E+0   | 0.00E+0  | 0.00E+0  |
| Use of non-renewable secondary fuels                       | [MJ]              | 1.97E-5 | 0.00E+0   | 0.00E+0   | 0.00E+0  | 0.00E+0  |
| Use of net fresh water                                     | [m <sup>3</sup> ] | 8.70E-3 | 1.90E-5   | 2.05E-6   | 1.29E-3  | -8.91E-4 |

### RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: 1 m<sup>2</sup> Isola Tyvek® UV Facade

| Indicator                     | Unit | A1-A3   | A4       | A5       | C4      | D        |
|-------------------------------|------|---------|----------|----------|---------|----------|
| Hazardous waste disposed      | [kg] | 3.73E-8 | 1.42E-11 | 1.54E-13 | 0.00E+0 | -1.37E-9 |
| Non-hazardous waste disposed  | [kg] | 4.86E-3 | 4.41E-5  | 4.46E-4  | 0.00E+0 | -2.41E-3 |
| Radioactive waste disposed    | [kg] | 2.08E-4 | 1.84E-6  | 1.79E-8  | 6.75E-6 | -2.90E-4 |
| Components for re-use         | [kg] | 0.00    | 0.00     | 0.00     | 0.00    | 0.00     |
| Materials for recycling       | [kg] | 0.00    | 0.00     | 0.00     | 0.00    | 0.00     |
| Materials for energy recovery | [kg] | 0.00    | 0.00     | 0.00     | 0.00    | 0.00     |
| Exported electrical energy    | [MJ] | 0.00E+0 | 0.00E+0  | 1.46E-3  | 1.03E+0 | 0.00E+0  |
| Exported thermal energy       | [MJ] | 0.00E+0 | 0.00E+0  | 2.08E-3  | 3.40E+0 | 0.00E+0  |

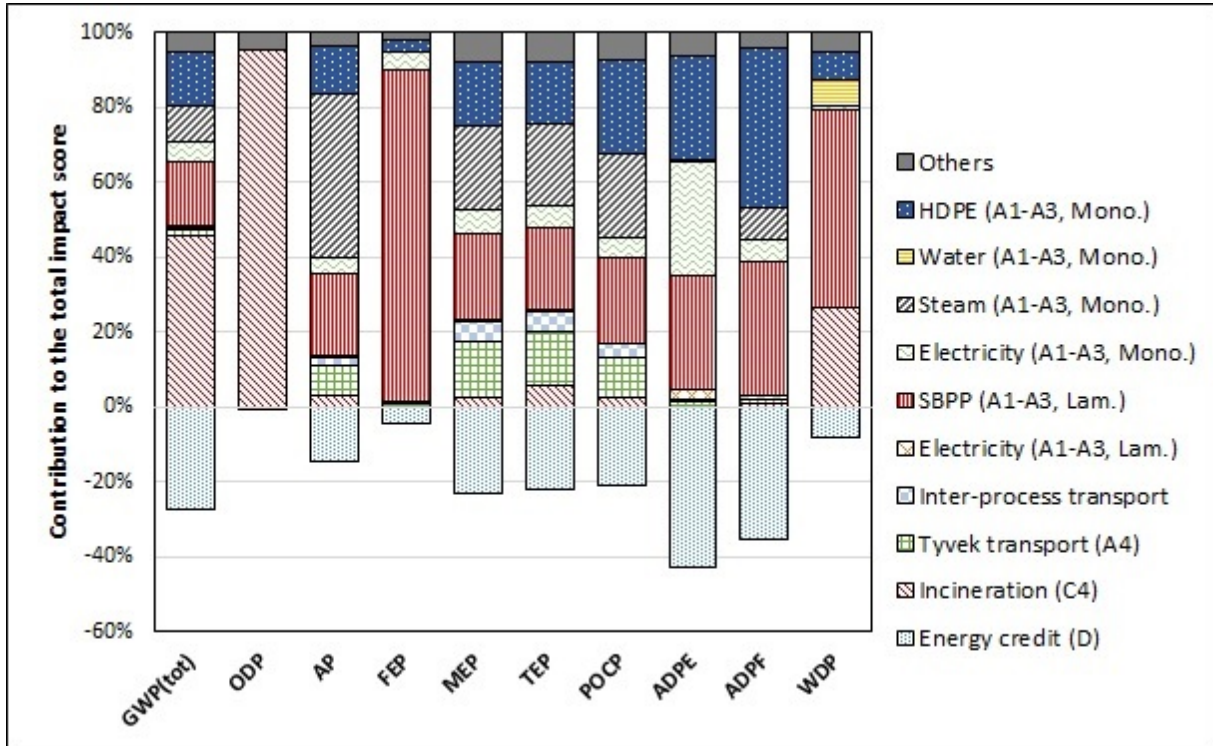
**RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional:  
1 m2 Isola Tyvek® UV Facade**

| Indicator  | Unit                | A1-A3 | A4 | A5 | C4 | D  |
|--|---------------------|-------|----|----|----|----|
| Potential incidence of disease due to PM emissions             | [Disease Incidence] | ND    | ND | ND | ND | ND |
| Potential Human exposure efficiency relative to U235           | [kBq U235-Eq.]      | ND    | ND | ND | ND | ND |
| Potential comparative toxic unit for ecosystems                | [CTUe]              | ND    | ND | ND | ND | ND |
| Potential comparative toxic unit for humans - cancerogenic     | [CTUh]              | ND    | ND | ND | ND | ND |
| Potential comparative toxic unit for humans - not cancerogenic | [CTUh]              | ND    | ND | ND | ND | ND |
| Potential soil quality index                                   | [-]                 | ND    | ND | ND | ND | ND |



## 6. LCA: Interpretation

The following chart shows the relative contributions of the different modules to the various LCA categories in a dominance analysis.



For most of the impact categories, more than 70 % of the impact is dominated by the functional layer (HDPE granulates and steam supply mainly) and lamination (SBPP supply mainly) production steps; except for **ODP** which is dominated by the incineration of the product after its use.

The production phase represents 53 % of the **GWPP**, which is also highly influenced by the final production incineration (46 % of the generated impact), due to carbon dioxide emissions.

This outcome is coherent with the results for the monolayers and with the fact that a large amount of SBPP is used for the laminates. The avoided energy production thanks to waste incineration leads to significant benefits, which are mostly around 20 % of the impact results (a bit higher than for monolayer thanks to higher product weight). The module „EU-28: Waste incineration of plastics (PE, PP, PS, PB)“ used for the end-of-life of laminate dominates the **ODP** score.

### Glossary:

- ADPE:** Abiotic depletion potential for non-fossil resources
- ADPF:** Abiotic depletion potential for fossil resources
- FEP:** Eutrophication, fraction of nutrients reaching freshwater end compartment
- GWP:** Global Warming Potential
- HDPE:** High-Density Polyethylene
- Lam.:** Lamination process
- LCA:** Life Cycle Assessment
- MEP:** Eutrophication, fraction of nutrients reaching marine end compartment
- Mono:** Monolayer production
- Nat. gas:** Natural gas
- ODP:** Depletion potential of the stratospheric ozone layer
- POCP:** Formation potential of tropospheric ozone photochemical oxidant
- SBPP:** Spunbond Polypropylene
- TEP:** Eutrophication, accumulated exceedance
- WDP:** Water (user) deprivation potential, deprivation-weighted water consumption

## 7. Requisite evidence

No requisite evidence is required for DuPont™ Tyvek® 2524B laminate membranes.

## 8. References

### EN 12310-1

EN 12310-1:1999, Flexible sheets for waterproofing - Part 1: Bitumen sheets for roof waterproofing; determination of resistance to tearing (nail shank)

### EN 12311-1

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# ANNEX 1

## ANNEX 1: Self declaration from EPD owner

### Specific Norwegian requirements

#### 1 Applied electricity data set used in the manufacturing phase

The electricity mix for the electricity used in manufacturing (A3) is the electricity grid mix  
1500 g CO<sub>2</sub> eqv/MJ (477 g CO<sub>2</sub> eqv/kW/h (enova))

#### 2 Content of dangerous substances

- X The product contains no substances given by the REACH Candidate list or the Norwegian priority list.
- The product contains substances that are less than 0.1% by weight given by the REACH Candidate or the Norwegian priority list.
- The product contains dangerous substances more than 0.1% by weight given in the REACH candidate list or the [Norwegian Priority List](#), concentrations is given in the EPD:

| Dangerous substances from the REACH candidate list or the Norwegian Priority List | CAS No. | Quantity (concentration, wt%/FU(DU)). |
|---|---------|---------------------------------------|
| Substance 1   |         |                                       |
| Substance n   |         |                                       |

#### 3 Transport from the place of manufacture to a central warehouse

Transport distance, and CO<sub>2</sub>-eqv./DU from transport of the product from factory gate to central warehouse in Oslo shall be given. The following table shall be included in the EPD:

| Type    | Capacity utilisation (incl. return) % | Type of vehicle | Distance km | Fuel/Energy use | Unit  | Value (l/t) | Kg CO <sub>2</sub> -eqv./DU |
|---------|---------------------------------------|-----------------|-------------|-----------------|-------|-------------|-----------------------------|
| Boat    |                                       |                 |             |                 |       |             |                             |
| Truck   | 50                                    | Truck 16 tonn   | 1000        | 0,019914        | l/tkm | 19,91       |                             |
| Railway |                                       |                 |             |                 |       |             |                             |
| Rail    |                                       |                 |             |                 |       |             |                             |
| Air     |                                       |                 |             |                 |       |             |                             |
| Total   |                                       |                 |             |                 |       |             |                             |

#### 4 Impact on the indoor environment

- Indoor air emission testing has been performed; specify test method and reference; M1, \_\_\_\_\_
- No test has being performed
- X Not relevant; specify **\_Product is used for outdoors applications**