# EVA/EBA WATERPROOF FLEXIBLE SHEETS

## RENOLIT Belgium NV

**Product family**

**ALKORTEC A, ALKORTEC A SK, ALKORTEC F**

**Thermoplastic sheet based on EVA/EBA**

**UNIT ELEMENTS: ROOF ELEMENTS, WATERPROOFING**

# WATERPROOF FLEXIBLE SHEETS

## RENOLIT Belgium NV

## EVA/EBA WATERPROOF FLEXIBLE SHEETS

**Product family**

RENOLIT ALKORPLAN

**Description**

RENOLIT ALKORTEC is a plastic multilayer waterproof flexible sheet based on polyvinyl chloride (PVC), ethyl vinyl acetate (EVA) and ethyl butylacrylate (EBA)

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**Summary table: Environmental parameters in which the material has a specific contribution.** Detailed in the sheets of the respective environmental certifications VERDE, LEED and BREEAM

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| ***Suport documents*** | | ***Cartificates :*** | *EPD, CSR, REACH* | | | ***Self-declarations*** | | ***Potential*** | |
| **Plot Movility** | | Solar reflectance index SRI | Rainfall management | External lighting control. | … | | | | |
| **Energy Atmosphere** | | Embeded energy | Global warming gases | Energy demand reduction | Equipment efficency | Other polluting gases | Renewable energy | Energy management | … |
| **Materials** | | Acredited location | Pre-consumer recycling | Post-consumer recycling | Reuse potential | Certified wood | Work waste | Chemmical composition | … |
| Water | | Consumption < reference | Water manegement | … | | | | | |
| Indoor confort | | Low VOC emission | Low formaldehyde emmision | Confort control | Lighting control | Acustic control | Air quality | … | |
| Innovation | | Innovative design | … | | | | | | |

**NOTES:**

1. The information contained in this document according to the compliment of the credits of the selected environmental certification systems (VERDE, LEED or BREEAM) is based on the information provided by the company. To ensure the possibility of each credit compliment during any of the seal processes it will be necessary to verify the validity of the information provided.
2. This document doesn´t neither constitute a product certification nor guarantee the compliment of current local regulations.
3. The conclusions of this analysis are only applied to the products mentioned on this report and depend on the invariability of the technical conditions of the product.
4. The validity of this document is subject to the expiration of the support files or the variation of the regulation and versions of each environmental certification seal.
5. This document informs about the possible contribution of the studied products to obtain VERDE, LEED or BREEAM certifications. However, the final decision on whether a product meets or not the requirements of LEED certification is exclusive to the GBCI (Green Business Certification Inc.)

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## VERDE

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- P&S 08, Heat island effect

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- NR 10, Construction materials impact
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### Environmental categories VERDE

Plot and Site | Energy and Atmosphere | Natural Resources | Interior environmental quality | Quality concept | Social and Economic Aspects | Innovation

### Certification standards VERDE

| | |
|---|---|
| **Ω Residential** | Omega Residential |
| **Ω Equipment** | Omega Equipment |

| | |
|---|---|
| DU P | Urban polygon development |

# CREDIT SHEET
VERDE

## CATEGORY
## PLOT AND SITE

### P&S 08, Heat island effect
**(Ω Equipment -Ω Res** Can cotribute up to 1.63% of total score in Ω Residential and up to 1.65% in Ω Equipment**)**

**Aim**

Reduce heat island effect in urban areas through the use of wooded green spaces and the installation of shading elements and solar protection on accumulative surfaces.

**Comply data**

In case the waterproofing sheets are the last layer of the roof, this material can be considered for this credit by the use of its Solar Reflection Index (SRI).
To comply with the requirements, SRI must be higher than 50% in more than 15% sloped roofs and higher than 70% in cases of less than 15% sloped roofs.
RENOLIT has the SRI tests of the following products according to their color.

| PRODUCT | S |
|---|---|
| Alcortec Bright white | 110.5% |

Alcortec Bright White contributes in the fulfillment of this credit if it is used even in less than 15% slopped roofs or in more than 15% slopped roofs.

**Test process**

The test process of the building through this credit is established by the calculation of the plot surface, roof and facades E-S-W that meet the following requirements:

- Landscape surfaces with a topsoil thickness of at least 20cm.
- Surfaces with permeable floor. In case of open grid floor it must be at list 50% permeable.
- Surfaces shaded by elements of high reflectivity
- Surfaces covered with materials of high reflectivity.

Percentage of these surfaces with respect to the total surface of roof and facade might oscillate between 40% and 70% to be well valued.

**Analysis example**

*NA*

**Support Files**

***Test ASTM E1980-11 Alcortec Bright White***

**Baseline**

*NA*

# CATEGORY
# NATURAL RESOURCES

## RN05, Use of recycled materials

**(Ω Equipment - Ω Res,** Can contribute up to 1.57% of total score in Ω Equipments and up to 2.48% in Ω Residential**)**

**Aim**

Encourage the election of high levels of pre-consumer and post-consumer recycled materials to reduce the depletion of raw materials and the environmental impacts associated to their extraction.

**Comply Data**

Alkortec sheets contain recycled material, always from pre-consumer origin and in a variable percentage according to the product characteristics.
RENOLIT provides self-declarations with the recycled content.

| PRODUCT | RECYCLED CONTENT | |
|---|---|---|
| | Pre-cons | Post-cons |
| Alkortec A grey* | 9.41% | 0% |
| Alkortec F grey* | 10.4% | 0% |

*EVA/EBA accounts for 90.4% of Alkortec F and it's the only component containing recycled components. Previous values are already calculated over the total.

**Test process**

The test process of the building through this credit is established by the calculation of post-consumer recycled material mass plus 50% of the pre-consumer recycled material mass with respect to the total material mass in the project.
Percentage might be between 10% and 30% to be well valued.

Ω Residential calculation is established by taking on the one hand arid and stones (assessing that the percentages oscillates between 40% and 100%) and on the other hand the rest of the materials (assessing that the percentage oscillates between 10% and 30%).

**Analysis example**

*NA*

**Support files**

***Recycled material content self-declaration***

**Baseline**

*NA*

# CATEGORY
# NATURAL RESOURCES

## RN06, Use of materials obtained from sustainable resources

**(Ω Equipments - Ω Res,** Can contribute up to 1.26% of total score in Ω Equipments and up to 1.24% in Ω Residential**)**

**Aim**

Encourage the use of materials obtained from recognized social and environmental standards. The objective is to protect forests, avoid childhood exploitation and respect the environment in the extraction of natural stone.

**Comply Data**

Renolit sheets are delivered in pallets and wooden packaging from Embalajes del Valles S.L. which has ISO 9001:2015 certifications that specifies the provision of a control system for the chain of custody of forest products.
Besides, Renolit requires all the raw material distributors to comply the basic rights of their workers, including child labor and environmental respect for protected areas of high ecological value.

**Test process**

The test process of the building through this credit is established by the calculation of the mass percentage of woods and materials containing woods used in the project that provide a chain custody certification. All woods used during the construction must be considered, including those used provisionally such as concrete formworks and pallets.
Percentage might be between 5% and 50% to be well valued.

**Analysis example**

*NA*

**Support files**

***ISO9001 – PEFC – Embalajes del Vallés***
***Business policy***

**Baseline**

*NA*

# CATEGORY
# NATURAL RESOURCES

## RN07, Use of local materials

**(Ω Equipmets and Ω Res,** Can contrubute up to 2.51% of total score in Ω Equipments and up to 2.48% in Ω Residential**)**

**Aim**

Encourage the use of local materials to promote local economy and reduce impacts caused by transport.

**Comply data**

The production centre of all ALKORTEC products is located at Carretera de Montnegre, s/n – 08470 Sant Celoni - Spain

**Test process**

The test process of the building through this credit is established by the calculation of the mass percentage of the local materials over the total material used for the project. Local materials are considered to be those which production plant is located inside a 200/400km radius from the plot.

All materials should be considered, including mechanical, electrical or plumbing components and special elements such as elevators or other equipments.

Materials produced from 0 to 200km to the center of the plot compute 100%.
Materials produced from 200 to 400km to the center of the plot compute according to a lined scale in which materials distanced 200km compute 100% and those distanced 400km compute 0%.
Materials produced at more than 400km from the center of the plot aren't considered positively.

**Analysis example**

*NA*

**Support files**

***Environmental Product Declaration (EPD)***
***Location declaration***

**Baseline**

*NA*

# CATEGORY
# NATURAL RESOURCES

## RN08, Selective demolition strategy planning

**(Ω Equipment - Ω Res,** Can contribute up to 1.57% of total score in Ω Equipments and up to 1.55% in Ω Residential**)**

**Aim**

Encourage designs including a selective demolition plan at the end of the life cycle of the building that allows reusing the maximum of the materials and recycling the rest of them.

**Comply data**

Alkortec A y Alkortec A SK are adhered sheets and are not easily removed from the roof, and are therefore difficult to recycle during the waste treatment. For these sheets a generic scenario was used, with 10% recycling, 45% incineration and 45% landfill.
Otherwise, Alkortec F is a mechanically fastened sheet and can be easily removed so its relatively straightforward to recycle during the waste treatment stage (100% recyclable) It is however assumed that 10% of the sheet is lost during the granulation process. This 10% is transported to a landfill.

| PRODUCT | % REUSABLE MATERIAL | % RECYCLABLE MATERIAL |
|---|---|---|
| Alkortec A | 0 % | 10% |
| Alkortec A SK | 0% | 10% |
| Alkortec F | 0% | 90% |

**Test process**

The test process of the building through this credit is established by the existence of a selective demolition plan according to certain requirements that ensures the reuse of materials and facilitates the recycling of the rest.

To comply the credit target, the Selective Demolition Plan must meet the following requirements:

- Ensure the reuse of al least 10% of the total mass materials.
- Ensure the revaluation of the rest of the materials guaranteeing the recycling of at least an 80%.
-

**Analysis example**

*NA*

**Support files**

***Environmental Product Declaration (EPD)***
***Selective Demolition Plan***

**Baseline**

*NA*

# CATEGORY
# NATURAL RESOURCES

## RN09, Construction waste management

**(Ω Equipment - Ω Res,** Can contribute up to 1.26% of total score in Ω Equipments and up to 1.24% in Ω Residential**)**

**Aim**

Reduce construction waste by using prefabricated and industrial materials and using controlled work processes that minimize waste production. Only waste produced during construction or rehabilitation phase is considered.
Mass of the revalued waste might be between 50% and 75% of total construction waste to be well valued.

**Comply data**

Together with the installation losses, packaging materials are for 100% collected and processed for energy recovery.
Waste generated in kg/m2 by each product is specified on the next table.

| PRODUCT | WASTE GENERATED |
|---|---|
| Alkortec A | 0.26 kg/m2 (1.5mm thickness) |
| Alkortec A SK | 0.26 kg/m2 (1.5mm thickness) |
| Alkortec F | 0.40 kg/m2 (1.5mm thickness) |

**Test process**

Test process of the building through this credit is specified by the existence, in project instance, of a Construction Waste Management Plan according to current regulations. This plan must be written during the previous phase of the intervention according to the previous study.
All the waste produced is considered for rehabilitation works, including possible demolitions.

**Analysis example**

*NA*

**Support files**

***Environmental Product Declaration (EPD) of each product (3.2.2 A5)***

**Baseline**

*NA*

# CATEGORY
# NATURAL RESOURCES

## RN10, Construction materials impact

**(Ω Equipment - Ω Res,** Can contribute up to 6.92% of total score in Ω Equipments and up to 6.83% in Ω Residential**)**

**Aim**

Reduce impacts associated to material production by using low impact materials during product stage together with reused and recycled materials.

**Comply data**

Renolit provides EPD of all ALKOTEC products.
Impacts reflected in the LCA results of these EDPs are shown on the next table. These results can be used to calculate the LCA of the building.

| IMPACT FROM CRADLE TO GATE | Climate change | Depletion of the stratospheric ozone layer | Acidification | Eutrophication | Formation of tropospheric ozone photochemical | Use of non-renewable primary energy |
|---|---|---|---|---|---|---|
| **Indicator** | Kg CO2-Eq/uf | Kg CFC11-Eq/uf | KgSO2-Eq/uf | Kg (PO4)3-Eq/uf | KGEthen - Eq/uf | MJ/uf |
| Alkortec A | 14.9 | 1.51E-06 | 4.34E-02 | 1.06E-02 | 3.50E-03 | 337 |
| Alkortec A SK | 14.2 | 1.44E-06 | 3.99E-02 | 9.18E-03 | 3.16E-03 | 328 |
| Alkortec F | 11.9 | 1.21E-06 | 3.48E-02 | 8.64E-03 | 2.82E-03 | 268 |

**Test Process**

Test process of the building through this credit is established by the comparison of impacts associated to construction materials with an established baseline.
The scope of study of this credit is limited to materials used for the enclosure and interior partitions considering as such the following constructive elements: roof, facade, interior, horizontal and vertical partitions, floors in contact with the ground, basement walls and dividing walls.
It has been decided not to include the structure for the credit calculation, however, it could be included if the definition of a baseline structure for the particular case is justified.

**Analysis example**

*NA*

**Support files**

***Environmental Product Declaration (EPD)***

**Baseline**

*NA*

# CATEGORY
# NATURAL RESOURCES

## RN11, Product eco-labelling

**(Ω Equipment y Ω Res,** Can contribute up to 2.51% of total score in Ω Equipments and up to 2.48% in Ω Residential**)**

| | |
|---|---|
| **Aim** | Encourage the use of products with eco-labels Type I or Type III. |
| **Comply data** | ALKORTEC A, ALKORTEC A SK y ALKORTEC F has their own EPD so these products can contribute for this credit. |
| **Test process** | The test process of the building through this credit is established by a list of materials that have an eco-label type I or Type III (EPD)<br>To obtain the maximum score:<br>• Mass percentage of materials with eco-label type I should range between 10% and 20%.<br>• Mass percentage of materials with EDP should range between 10% and 20% and include at least the following families: Structural elements, insulation and coatings. |
| **Analysis example** | *NA* |
| **Support files** | ***Environmental Product Declaration (EPD)*** |
| **Baseline** | *NA* |

# CREDIT SUMMARY
## LEED v4

### SUSTAINABLE SITES (SS)

- SSc5, Heat Island Reduction

### MATERIALS AND RESOURCES (MR)

- MRp2 y MRc5, Construction and Demolition Waste Management Planning
- MRc1, Building Life-Cycle Impact Reduction
- MRc2, Building Product Disclosure and Optimization – Environmental Product Declarations (EPD)
- MRc3, Building Product Disclosure and Optimization – Sourcing of Raw Materials

**Environmental categories LEED**

(LT) Locations & Transportation | (SS) Sustainable Sites | (WE) Water Efficiency | (EA) Energy and Atmosphere | (MR) Materials & Resources | (IEQ) Indoor Environmental Quality | (ID) Innovation | (RP) Regional Priority

**LEED certification standards (v4)**

| | | | | | |
|---|---|---|---|---|---|
| **EB** | Existing Building | **RNC** | Retail New Construction | **DCNC** | Data Centre NC |
| **NC** | New Construction | **REB** | Retail Existing Building | **DCEB** | Data Centre EB |
| **CI** | Commercial Interiors | **RCI** | Retail Commercial Interiors | **WNC** | Warehouse NC |
| **CS** | Core & Shell | **HC** | Healthcare | **WEB** | Warehouse EB |
| **SNC** | School New Construction | **HNC** | Hospitality-New Constr. | **NDP** | Neighborhood Devel. Plan |
| **SEB** | School Existing Building | **HEB** | Hospitality-Existing Building | **ND** | Neighborhood Develop. |
| **MRB** | Mid Rise Buildings | **HCI** | Hospitality-Commercial Int. | | |

# CREDIT SHEET
LEED v4

## CATEGORY
## SUSTAINABLE SITES (SS)

### SSc5, Heat Island Reduction
**(LEED BDC: NC, CS, SNC, RNC, HC, HNC, DCNC, WNC)**

**Aim**

To minimize effects on microclimates and human and wildlife habitats by reducing heat islands.

**Comply data**

In case the waterproofing sheets are the last layer of the roof, this material can be considered for this credit by the use of its Solar Reflection Index (SRI). RENOLIT has the SRI test of the following products, according ASTM E1980-11

| PRODUCT | SRI (initial) |
|---|---|
| Alcortec Bright White | 110.5% |

** The LEED guide proposes ASTM E903 E892 as a reference. The manufacturer provides values according to ASTEM 1980-11. According to the accredited laboratories (CRRC Label and EELab) the difference does not exceed 1.5% in any case. The most restrictive value is taken*

**Test process**

**Option 1. Nonroof and roof**

1. Nonroof:
   - Use materials with a three-year aged solar reflectance (SR) value of at least 28%, or 33% of initial SR.
   - Provide shade with vegetated structures or energy generation systems.
   - Provide shade or paving materials with vegetal elements.
   - Use an open-grid pavement system (at least 50% unbound).

$$\frac{\text{Area of Nonroof Measures}}{0.5} + \frac{\text{Area of High-Reflectance Roof}}{0.75} + \frac{\text{Area of Vegetated Roof}}{0.75} \geq \text{Total Site Paving Area} + \text{Total Roof Area}$$

2. Roof:
   - Use of roofing materials that have an SRI equal or greater than:
     Steep-sloped roof: 39% initial and 32% three-year aged
     Low-sloped roof: 82& initial and 64% three-year aged
     at 75% of the roof
   - Vegetated Roof
   - A combination of both:

$$\frac{\text{Area of High-Reflectance Roof}}{0.75} + \frac{\text{Area of Vegetated Roof}}{0.5} \geq \text{Total Roof Area}$$

> Roof installations and skylights are excluded from the calculation.

**Option 2. Parking under cover**

Place a minimum of 75% of parking spaces under cover. Any roof used to shade or cover park must (1) have a three-year aged SRI of at least 32% (if three-year aged value information is not available), (2) be a vegetated roof, or (3) be covered by energy generation systems.

| | |
|---|---|
| **Analysis example** | *NA* |
| **Support Files** | Test ASTM E1980-11 Alcortec Bright White SRI Validation for LEED.pdf |
| **Baseline** | *ASTM Standards E903 i E892: astm.org*<br>*Cool Roof Rating Council Standard (CRRC-1): coolroofs.org* |

CATEGORY
# MATERIALS & RESOURCES (MR)

## MRp2 y MRc5, Construction and Demolition Waste Management Planning
**(LEED BDC: NC, CS, SNC, RNC, HC, HNC, DCNC, WNC)**

**Aim**

To reduce construction and demolition waste disposed of in landfills and incineration facilities by recovering, reusing and recycling materials.

**Comply data**

Together with the installation losses, packaging materials are for 100% collected and processed for energy recovery.
Waste generated in kg/m2 by each product is specified on the next table.

| PRODUCT | WASTE GENERATED |
|---|---|
| Alkortec A | 0.26 kg/m2 (1.5mm thickness) |
| Alkortec A SK | 0.26 kg/m2 (1.5mm thickness) |
| Alkortec | 0.40 kg/m2 (1.5mm thickness) |

Alkortec A and Alkortec A SK products, due to their adhesion system, are not easy to remove products, making their recycling very complicated. It is considered that 10% of the material will be recycled, 45% incinerated and 45% deposited in a landfill.
However, Alkortec F, thanks to the mechanical anchor, is 100% recyclable, although it is considered a 10% loss during the removal process. This 10% is transported to a landfill.

| PRODUCT | % REUSABLE MATERIAL | % RECYCLABLE MATERIAL |
|---|---|---|
| Alkortec A | 0 % | 10% |
| Alkortec A SK | 0% | 10% |
| Alkortec F | 0% | 90% |

**Test process**

Implement and follow up a Waste Management Plan where % recovery and / or recycling are incorporated.
Detail the place and procedure of management and revaluation of each material.

Option 1.
Divert at least 50% or 75% of the total construction and demolition material (at least 3 and 4 material streams).

Option 2.
Reduce the total amount of waste generated in the construction work, below 12,2 kg/m2.

**Analysis example**

*NA*

**Support Files**

***Environmental Product Declaration (EPD)***

**Baseline**

*NA*

# CATEGORY
# MATERIALS & RESOURCES (MR)

## MRc1, Building Life-Cycle Impact Reduction
**(LEED BDC: NC, CS, SNC, RNC, HC, HNC, DCNC, WNC)**

**Aim**

To encourage adaptive reuse and optimize the environmental performance of products and materials.
Extend the lifespan of the building, preserve resources and cultural heritage.
Reduce waste and environmental impacts of the construction process.

**Comply data**

Renolit provides EPD of all ALKOTEC products.
Impacts reflected in the LCA results of these EDPs are shown on the next table. These results can be used to calculate the LCA of the building.

| IMPACT FROM CRADLE TO GATE | Climate change | Depletion of the stratospheric ozone layer | Acidification | Eutrophication | Formation of tropospheric ozone photochemical | Use of non-renewable primary energy resources |
|---|---|---|---|---|---|---|
| **Indicator** | Kg CO2-Eq/uf | Kg CFC11-Eq/uf | KgSO2-Eq/uf | Kg (PO4)3-Eq/uf | KGEthen - Eq/uf | MJ/uf |
| Alkortec A | 14.9 | 1.51E-06 | 4.34E-02 | 1.06E-02 | 3.50E-03 | 337 |
| Alkortec A SK | 14.2 | 1.44E-06 | 3.99E-02 | 9.18E-03 | 3.16E-03 | 328 |
| Alkortec F | 11.9 | 1.21E-06 | 3.48E-02 | 8.64E-03 | 2.82E-03 | 268 |

**Test Process**

In case of new construction, only these two options are feasible:

Option 3. Material reuse
The permanent elements are included in the calculation scope: structure, envelope, interior distribution, etc. (25-50-75% of the material with respect to the total surface of the materials)

Option 4. Analysis of the life cycle of the building
Carry out an analysis of the life cycle of the building (structure and envelope) that demonstrates a minimum of 10% reduction in the impact of the life cycle with respect to the reference building. Any category can't have an impact greater than 5% of the baseline.
The baseline and the project must consider a life cycle of 60 years, with the same use.

Select at least three of the following impact categories for reduction:
- global warming potential (greenhouse gases) en CO2 e
- depletion of the stratospheric ozone layer, in kg CFC-11
- acidification of land and water sources, in moles H+ o kg SO2
- eutrophication, in kg nitrogen or kg phosphate
- formation of tropospheric ozone, in kg NOx, kg O3 eq, or kg ethene
- depletion of nonrenewable energy resources, in MJ

**Analysis example**

*NA*

**Support Files**

***Environmental Product Declaration (EPD)***

**Baseline**

*NA*

CATEGORY
# MATERIALS & RESOURCES (MR)

## MRc2, Building Product Disclosure and Optimization – Environmental Product Declarations (EPD)
**(LEED BDC: NC, CS, SNC, RNC, HC, HNC, DCNC, WNC)**

**Aim**

To encourage the use of products and materials for which life-cycle information is available and that have environmentally, economically, and socially preferable life-cycle impacts.

**Comply data**

ALKORTEC A, ALKORTEC A SK y ALKORTEC F has their respective EPD, so that this range of products contributes to the obtaining of option 1 of this credit.

**Test process**

Option 1: Provide Environmental Product Declarations (EPD) of a minimum of 20 products, from 5 different suppliers, that meet any of the following criteria:

- Products with a publicly available, critically reviewed life-cycle assessment conforming to ISO 14044, that have at least a cradle to gate scope (Valued ¼)
- EPD which conform to ISO 14025, 14040, 14044 y EN 15804 o ISO 21930, and have at least a cradle to gate scope.
  - EPD, industry-wide (generic) (Valued ½)
  - EPD, product-specific Type III (Valued 1)

**Analysis example**

*NA*

**Support files**

***Environmental Product Declaration (DAP)***

**Baseline**

- *International Standard ISO 14021–1999, Environmental labels and declarations—Self Declared Claims (Type II Environmental Labeling): iso.org*
- *International Standard ISO 14025–2006, Environmental labels and declarations (Type III Environmental Declarations—Principles and Procedures): iso.org*
- *International Standard ISO 14040–2006, Environmental management, Life cycle assessment principles, and frameworks: iso.org*
- *International Standard ISO 14044–2006, Environmental management, Life cycle assessment requirements, and guidelines: iso.org*
- *CEN Comité Européen de Normalisation (European Committee for Standardization) EN 15804—2012 Sustainability of construction works, Environmental product declarations, Core rules for the product category of construction products: cen.eu*
- *International Standard ISO 21930–2007 Sustainability in building construction—Environmental declaration of building products: iso.org*
- *Federal Trade Commission, Guides for the Use of Environmental Marketing Claims, 16 CFR 260.7 (e): ftc.gov/bcp/grnrule/guides980427.htm*

CATEGORY
# MATERIALS & RESOURCES (MR)

## SSc3, Building Product Disclosure and Optimization – Sourcing of Raw Materials
**(LEED BDC: NC, CS, SNC, RNC, HC, HNC, DCNC, WNC)**

**Aim**

Promote the use of materials that have information on the life cycle and the environmental, economic and social impacts.
Reward the materials extracted in a responsible manner.

**Comply data**

The production plant for all ALKORTEC products is located in Carretera de Montnegre, s / n - 08470 San Celoni - Spain.
However, the raw material has an origin more distant to 160 km.

The Alkortec sheets contain recycled material, always of Pre-Consumption origin and in a variable percentage according to the characteristics of the product.
RENOLIT provides self-declarations with the recycled content.

| PRODUCT | % RECYCLED MATERIAL POST-CONSUMER | % RECYCLED MATERIAL PRE-CONSUMER |
|---|---|---|
| Alkortec A * | 0 % | 9,41 % |
| Alkortec A SK | 0% | 10,4 % |
| Alkortec F* | 0% | 10,4 % |

** EVA / EBA represent 90.4% of Alkotec A and Alkortec F and is the only component that incorporates recycled content. The previous values are calculated on the total*

**Test process**

**Option 1.** ***Raw material source and extraction reporting***
Use a minimum of 20 materials (from 5 different suppliers), which have verifiable information on their extraction process and commitment to the environment.
They must comply with any of the following programs and requirements;
- Third-party verified Corporate Sustainability Reports (CSR):
- GRI Sustainability report, OECD guidelines for Multinational Enterprises, UN Global Compact, ISO 26000...
- Manufacturers self-declared reports (Valued 1/2)

**Option 2.** ***Leadership extraction practices***
Use products that meet at least one of the responsible extraction criteria below for at least 25%, by cost, of the total value of permanently installed building products in the project.
Bio-based materials, FSC and CoC certified wood, reused materials, recycled content.
The materials extracted and manufactured at less than 160 km from the construction work, will be valued at 200%.

**Analysis example**

*NA*

**Support files**

***Recycled material content self-declaration***

**Baseline**

*International Standards ISO 14021–1999, Environmental Labels and Declarations—Self Declared Environmental Claims (Type II Environmental Labeling): iso.org/iso/catalogue_detail.htm?csnumber=23146)*

# CREDIT SUMMARY

## BREEAM

### MANAGEMENT

- GST 3 Construction site impacts. Criteria 6, 7 and 8 (BREEAM ES New Construction 2015). Criteria 4 and item b (BREEAM ES Home 2011)
- GST 5 Life cycle cost and service life planning (BREEAM ES New Construction 2015)

### MATERIALS

- MAT 1 Life cycle impacts (BREEAM ES New Construction 2015)
- MAT 8 Materials of low environmental impact (BREEAM ES Home 2011)
- MAT 3 Responsible sourcing of materials (BREEAM ES New Construction 2015)
- MAT 9 Responsible sourcing of materials – basic elements of the building (BREEAM ES Home 2011)

### WASTE

- RSD 1, Construction waste management (BREEAM ES New Construction 2015 and BREEAM ES Home 2011)

**Environmental categories BREEAM ES**

Manage-ment | Health and Wellbeing | Energy | Transport | Water | Materials | Waste | Land Use and Ecology | Pollution | Innovation

**Certification Standards BREEAM ES**

| | | | | | |
|---|---|---|---|---|---|
| **UR** | BREEAM ES town planning | **VIV** | BREEAM ES Home | **USO** | BREEAM ES In Use |
| **NC** | BREEAM ES New Construction | | | | |

# CREDIT SHEET
BREEAM ES

## CATEGORY
## MANAGEMENT

### GST 3 Construction site impacts
### (BREEAM ES NEW CONSTRUCTION 2015 y BREEAM ES HOMES 2011)

**Aim**

To recognize and encourage construction sites managed in an environmentally sound manner in terms of resource use, energy consumption and pollution. Criteria that affect;
- Transport of construction materials and waste
- Timber procurement

**Comply data**

In relation to transportation, the production centre of all ALKORTEC products is located at Carretera de Montnegre, s/n – 08470 Sant Celoni - Spain

In relation to the supply of ALKORTEC products, the company RENOLIT uses wood material supplied by Embalajes del Vallès S.L. which has a program for the Endorsement of Forest Certification Nº: PEFC / 14-35-00391. Certificate valid until 04.05.2022.

**Test process**

Transport of construction materials and waste (one point)
The evaluation of the building through this criteria is established by stating in a report separately, the total fuel consumption (liters), the total carbon dioxide emissions (kgCO2 eq) associated to the transport and the total distance traveled (km) to the building.

Timber procurement (one point)
The evaluation of the building through this criteria is provided by the confirmation that all the wood used for palletizing the product is "used and legally marketed wood" or, that it has a recognized certification system (FSC, PEFC) or its approved schemes (SFI , etc.). If they do not have the stamp of the certification system, the supplier must confirm by a letter that the wood used has been legally obtained and marketed.

**Analysis example**

The calculation of the transport criterion should be carried out in each case according to the location of the building, intermediate storage and its distribution.

**Support files**

***Location declaration provided by the manufacturer***
***Certificate ISO9001 - PEFC - Embalajes del Vallés***

**Baseline**

- National Inventory of Atmospheric Emissions (Netcen, 2005) based on DTI data combined with TRL factors as functions of the average speed of the vehicles, derived from data from tests carried out in real test cycles.
- UK Energy Statistics Summary DTI 2004 and carbon factors for UKPIA fuels (2004).
- Guidelines for Corporate Information on Emissions of Greenhouse Gases, DEFRA, Continuous Survey of Transportation of Goods by Road 2001.

# CATEGORY
# MANAGEMENT

## GST 5 Life cycle cost and service life planning (BREEAM ES NEW CONSTRUCTION 2015)

| | |
|---|---|
| **Aim** | To recognize and encourage life cycle costing and service life planning in order to improve design, specification and through-life maintenance and operation. |
| **Comply data** | Check the price of the product with RENOLIT (Juan Carlos Giralt – juan-carlos.giralt@renolit.com).<br>In relation to maintenance, no specific action will be necessary during the use of the building that involves the maintenance of these materials, except for those indicated for the roofs of the buildings in accordance with the current standard. |
| **Test process** | Carry out a Life Cycle Cost (LCC) analysis based on the proposals developed during the concept design or design development in accordance with the standard UNE-EN 15643-4: 2012, using a study period of, at least, 40 years and, ideally, 60 years. The results must be shown in real and discounted cash flow terms with the following phases and uses:<br>i. Construction: includes investment costs.<br>ii. Operation: includes, as a minimum, utilities, cleaning and management costs.<br>iii. Maintenance: as a minimum, planned maintenance, replacements and repairs costs. |
| **Analysis example** | NA |
| **Support files** | ***Selective Demolition Plan provided by the manufacturer*** |
| **Baseline** | • UNE-EN 15643-4:2012 Sustainability in construction. Evaluation of the sustainability of buildings. Part 4: Framework for the evaluation of economic behaviour.<br>• UNE-EN 15978:2012 Sustainability in construction. Evaluation of the environmental behavior of buildings. Calculation method |

# CATEGORY
# MATERIALS

- **MAT1 – Life cycle impacts (BREEAM ES NEW CONSTRUCTION 2015)**
- **MAT8 – Materials of low environmental impact (BREEAM ES HOME 2011)**

**Aim**

To recognize and encourage the use of robust and adequate tools for the Life Cycle Analysis and, therefore, the specification of construction materials with a low environmental impact (also in terms of carbon incorporated) throughout the life cycle of the building.

**Comply data**

**Environmental labels Type I, II and III:**
Renolit provides Environmental Product Declaration (EPD), of all ALKORTEC products (Label Type III), valid until 21.12.2022. The data of the EDPs comply with the UNE EN ISO 14025 and are verified according to the UNE EN 15804 standard.

**Life Cycle Analysis:**
Impacts reflected in the EDP can be used for the LCA, contributing to the fulfillment of option 2. The impacts reflected in the EDPs of each product that can be used to calculate the LCA of the building are reflected below.

| IMPACT FROM CRADLE TO GATE | Climate change | Depletion of the stratospheric ozone layer | Acidification | Eutrophication | Formation of tropospheric ozone photochemical | Use of non-renewable primary energy resources |
|---|---|---|---|---|---|---|
| **Indicator** | Kg CO2-Eq/uf | Kg CFC11-Eq/uf | KgSO2-Eq/uf | Kg (PO4)3-Eq/uf | KGEthen - Eq/uf | MJ/uf |
| Alkortec A | 14.9 | 1.51E-06 | 4.34E-02 | 1.06E-02 | 3.50E-03 | 337 |
| Alkortec A SK | 14.2 | 1.44E-06 | 3.99E-02 | 9.18E-03 | 3.16E-03 | 328 |
| Alkortec F | 11.9 | 1.21E-06 | 3.48E-02 | 8.64E-03 | 2.82E-03 | 268 |

**Test process**

**Environmental labels Type I, II and III:**
- BREEAM ES Home: specify products with ecological labels Type I, II or III.
- BREEAM ES New Construction: specify products with Environmental Product Declarations (EDP) (Type III Label).

**Life Cycle Analysis (LCA):**
The project uses a life cycle analysis (LCA) tool that complies with the BREEAM specifications, to measure the environmental impact of the life cycle of the building elements.

**Exemplary level criteria (1 extra point):**
- BREEAM ES Home: as a result of the LCA, materials with less environmental impacts have been chosen in at least 6 elements of the building.
- BREEAM ES New Construction: rigorous LCAs have been carried out in which most of the elements of the building are included.

| | |
|---|---|
| **Analysis example** | *NA* |
| **Support files** | ***Environmental Product Declaration (EPD)*** |

**Baseline**

- *UNE-EN ISO 14025:2010. Environmental labels and declarations. Environmental declarations type III. Principles and procedures. (ISO 14025: 2006)*
- *UNE-EN 15804:2012. Sustainability in construction. Environmental product declarations. Basic product category rules for construction products.*
- *UNE-EN 15978:2012. Sustainability of the construction. Evaluation of the environmental behavior of buildings. Calculation methods*

# CATEGORY
# MATERIALS

- **MAT3 – Responsible sourcing of materials (BREEAM ES NEW CONSTRUCTION 2015)**
- **MAT9 – Responsible sourcing of materials – basic elements of the building (BREEAM ES HOME 2011)**

**Aim**

To recognize and encourage the specification of responsibly sourced materials for key building elements, whose provisioning has been made responsibly.

**Comply data**

The production plant of all ALKORTEC products is located at Carretera de Montnegre, s / n - 08470 Sant Celoni - Spain and has an environmental management system (EMS) certified by a third party for the manufacture of the products (Environmental Management System certified for the key process phase).

Alkortec sheets contain recycled material, always from pre-consumer origin and in a variable percentage according to the product characteristics.
RENOLIT provides self-declarations with the recycled content.

| PRODUCT | % RECYCLED CONTENT POST-CONS | % RECYCLED CONTENT PRE-CONS |
|---|---|---|
| Alkortec A* | 0 % | 9,41 % |
| Alkortec A SK* | 0% | 10,4 % |
| Alkortec F* | 0% | 10,4 % |

*EVA/EBA accounts for 90.4% of Alkortec F and its the only component containing recycled components. Previous values are already calculated over the total.

In **BREEAM EN New Construction 2015** the Environmental Management System certificate (EMS) for the key process phase corresponds to 3rd level of responsible procurement certification and, as the material have recycled content, it is assigned 2nd level.

In **BREEAM ES Home 2011** the Environmental Management System certificate (EMS) for the key process phase corresponds to 4th level certification of responsible procurement certification and, as the material has recycled content, it is assigned 3rd level.

**Test process**

**Pre-requirement only in BREEAM ES New Construction:**
Confirmation that all timber used on the project is "legally harvested and commercialized timber".

**Requirement:**
The number of BREEAM points achieved is determined with compliance with the requirements of responsible procurement by the main construction elements. To justify compliance, each product must be certified in accordance with any of the responsible supply systems approved by BREEAM.

Each of the materials is assigned to the level of certification of responsible provisioning with its corresponding score. The certification level is determined based on the rigor of the responsible supply that has been made to the suppliers / suppliers of each material / element (through the responsible supply certification systems). The responsible supply certification systems are those that are detailed below;

- BRE Global, BES6001 Product certification (or equivalent)
- Canadian Standards Association (CSA) Chain of Custody Schema (CoC) (endorsed by the PEFC) for chain of custody (CoC) certification
- Environmental management system (EMS) (certified) for the key process and supply chain extraction process
- Environmental management system (EMS) (certified) for the key process
- Wood with FLEGT license
- Forest Stewardship Council (FSC)
- Recycled materials with Certified EMS for key process.
- Re-used materials
- Malaysian Timber Certification Council (MTCC) with chain of custody certification (CoC)
- Program for the Endorsement of Forest Certification (PEFC) with chain of custody certification (CoC)
- Sustainable Forest Initiative (SFI) (endorsed by the PEFC) with chain of custody certification (CoC) with a declaration of 70% certified material.

**Exemplary level criteria only in en BREEAM ES New Construction:**
Where 70% of the available responsible sourcing points have been achieved.

**Analysis example**

*NA*

**Support files**

***ISO Certification 14001 (2017-2020)***
***Recycled material content self-declaration***
***Location declaration provided by the manufacturer***

**Baseline**

- To consult a list of products approved under the BES6001 standard, as well as for additional information, visit: www.greenbooklive.com/
- Document to determine the validity of the FSC and PEFC certificates. http://www.pefc.org/index.php/certification-services/find-certified
- Databases to search certificate holders obtained in accordance with individual certification systems: http://info.fsc.org/ http://www.pefc.es
- UNE-EN ISO 14006: 2011. Environmental management systems. Guidelines for the incorporation of eco-design.
- ISO 14001 standard

# CATEGORY
# WASTE

## RSD1 – Construction waste management (BREEAM ES NEW CONSTRUCTION 2015 and BREEAM ES HOME 2011)

**Aim**

To promote resource efficiency via the effective management and reduction of construction waste.

**Comply data**

Together with the installation losses, packaging materials are for 100% collected and processed for energy recovery.
Waste generated in kg/m2 by each product is specified on the next table

| PRODUCT | WASTE GENERATED |
|---|---|
| Alkortec A | 0.26 kg/m2 (1.5mm thickness) |
| Alkortec A SK | 0.26 kg/m2 (1.5mm thickness) |
| Alkortec F | 0.40 kg/m2 (1.5mm thickness) |

**Test process**

The **BREEAM ES New Construction 2015** requirements for the efficiency of construction resources and the diversion of resources from landfill are;

One point: Compliance with criteria 1-6 is justified by means of a Site Waste Management Plan for Construction or Demolition (SWMP) that meets certain requirements that ensure the minimization of hazardous and non-hazardous waste produced.

One point: Compliance with criteria 7-8 is justified through the implementation of procedures for classification, reuse and recycling of construction waste of at least the fractions of waste identified in the current legislation, inside or outside the emplacement through an authorized external waste manager. Each type of waste must be specified by its code and associated with a waste manager with accredited capacity for waste management and recovery.

One point: Compliance with criteria 9-11 is justified by reports / controls that confirm the total waste produced and it must be demonstrated that a significant amount of demolition waste (where applicable) and non-hazardous construction generated in the project have been diverted from the landfill by at least 80%.

The **BREEAM ES Home 2011** requirements are;

First point: The fulfillment of criteria 1-3 is justified by the completion of the Site Waste Management of Construction or Demolition Study (SWMS) with the minimum content established in the applicable legislation and its transfer to the Site Waste Management Plan for Construction or Demolition (SWMP) that meets certain requirements that ensure the minimization of hazardous and non-hazardous waste produced.

Second point: Compliance with criteria 4-6 is justified by reports / controls that confirm the total waste produced and it must be demonstrated that a significant amount of demolition waste (where applicable) and non-hazardous construction generated in the project have been diverted from the landfill by at least 70%.

Third point: Compliance with criteria 7-9 justifies the amount of demolition waste (where applicable) and non-hazardous construction generated in the project has been diverted from the landfill by at least 80%.

**Exemplary performance:** When the amount of non-hazardous demolition waste (where applicable) and construction generated in the project has been diverted from the landfill by a minimum of 95%.

**Analysis example** *NA*

**Support files** ***Environmental Product Declaration (EPD) of each product (3.2.2 A5)***

**Baseline** *NA*

# CATEGORY
# INNOVATION

## INNOVATION
### (BREEAM ES NEW CONSTRUCTION 2015, BREEAM ES HOME 2011)

**Aim**

To support innovation within the construction industry through the recognition of sustainability related benefits which are not rewarded by standard BREEAM issues.

**Comply data**

ALKORTEC products can contribute to the fulfillment criteria of exemplary performance in the next requirements:

- MAT1, Life cycle impacts
- MAT3, Responsible sourcing of materials
- RSD1, Construction waste management

NOTE: See criteria of exemplary performance in the corresponding requirement.

**Test process**

Up to 10 innovation points can be obtained by a combination of the following options:

**Exemplary performance in existing Requirements**
Some BREEAM credits give the option to obtain extra score for demonstrating an exemplary efficiency through the achievement of the exemplary performance criteria defined there.

**Approved innovations**
An extraordinary point may be obtained for each Request for Innovation Approved by BREEAM ES provided that the criteria defined in an approved innovation application form are met.

**Analysis example**

*NA*

**Support files**

*See corresponding requirements*

**Baseline**

*See corresponding requirements*