
## Product information for the building certification scheme LEED v4® (Leadership in Energy and Environmental Design)

The intention of this document is to support project teams pursuing LEED v4 certification by providing an overview of how your products contribute to LEED v4 credits. Basis of this information is LEED v4 credit library (2014 -07)[1]

# Brucha panels for facade - Polyurethane

## General Information

| | |
|---|---|
| Company name: | Brucha Gesellschaft m. b. H. |
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| Homepage: | www.brucha.at |
| Date: | 21.08.2015 |

## Product information

### Product description

The sandwich panels for facades – BRUCHAPaneel PU facade panels – FP consist of a supporting core made of polyurethane rigid foam (PUR) connected to colour-coated metal covers in a resistant manner. The metal face sheets are protected against corrosion by means of zinc plating and organic coating. These are pre-fabricated double skin steel faced sandwich panels used for load-bearing, self-supporting and non-supporting application in facade structures.

### Application

To be used as construction element in facade structures for mainly static loads. The sandwich panel assumes building-physics related tasks in the facade structure. The panel ensures protection against noise, heat and humidity and simultaneously assumes the air-tightness function of the building envelope. Both even and profiled steel sheets are used as faces.

### Technical data

The elements are manufactured with an overall width of up to 1,100 mm and a thickness from 60 to 160 mm. Technical specifications can be found in DIN EN 14509, DIN EN 13165 and the general building authority approvals for sandwich panels of the respective manufacturer.

[1] http://www.usgbc.org/credits (7/2014)

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| Description | Value | Unit |
|---|---|---|
| Density of insulation layer | 43 | kg/m³ |
| Thickness of elements | 60 - 160 | mm |
| Thickness of inner sheet cover | 0.6 | mm |
| Thickness of outer sheet cover | 0.5 | mm |
| Thermal conductivity of insulating material | 0.0221 | W/(mK) |
| Thermal transmission coefficient according to DIN EN 14509 (FP 60) incl. connection loss | 0.360 | W/(m²K) |
| Thermal transmission coefficient according to DIN EN 14509 (FP 160) incl. connection loss | 0.140 | W/(m²K) |
| Sound reduction index according to EN ISO 140-3 | 25 | dB |
| Sound absorption coefficient test according to EN ISO 354 | 0.15 | % |

## Materials and Resources (MR)

*Summary*
Materials and Resources credits encourage using sustainable building materials and reducing waste. Indoor environmental quality credits promote better indoor air quality and access to daylight and views.

### Building product disclosure and optimization - environmental product declarations

*Intent of this credit*
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. To reward project teams for selecting products from manufacturers who have verified improved environmental life-cycle impacts.

Product information for the declared product within this credit:

| Item | Value |
|---|---|
| Critically reviewed LCA acc. to ISO 14044? | yes |
| Author of the LCA | thinkstep AG (formerly PE International) |
| Reviewer | Matthias Schulz |
| Download link of the document/study | http://www.brucha.at/opmodule/user/brucha-neu/?kat=9&dok_id=27184&lang=en |
| Product specific EPD (Type III, including external verification)? | yes |
| EPD program operator | Institute Construction and Environment (IBU - Institut Bauen und Umwelt e.V.), Berlin |
| EPD program operator country | Germany |
| EPD number | EPD-BRU-20130194-IBC1-DE |
| Declared unit | 1 m² |

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## Results of the LCA – ENVIRONMENTAL IMPACTS:

| Declared unit: 1 m² of Brucha facade panel PU with a representative thickness of 110 mm (15.2 kg) | | | |
|---|---|---|---|
| Life cycle stages | PRODUCT STAGE | END OF LIFE STAGE | BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARYS |
| Declared life cycle stages (standard DIN EN 15804) | A1-A3 | C4 | D |
| GWP [kg $CO_2$-eq.] | 4,16E+01 | 1,00E+01 | -2,11E+01 |
| ODP [kg CFC11-eq.] | 2,13E-05 | 1,01E-10 | -6,28E-10 |
| AP [kg $SO_2$-eq.] | 1,26E-01 | 4,15E-03 | -7,41E-02 |
| EP [kg $PO_4^{3-}$-eq.] | 1,23E-02 | 1,03E-03 | -6,00E-03 |
| POCP [kg ethene-eq.] | 1,83E-02 | 2,77E-04 | -1,03E-02 |
| ADPE [kg Sb-eq.] | 2,30E-03 | 7,01E-08 | -8,23E-07 |
| ADPF [MJ] | 6,48E+02 | 2,48E+00 | -2,20E+02 |
| Caption | GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources | | |

## Results of the LCA – RESOURCE USE:

| Declared unit: 1 m² of Brucha facade panel PU with a representative thickness of 110 mm (15.2 kg) | | | |
|---|---|---|---|
| Life cycle stages | PRODUCT STAGE | END OF LIFE STAGE | BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARYS |
| Declared life cycle stages (standard DIN EN 15804) | A1-A3 | C4 | D |
| **PE total [MJ]** | 7.02E+02 | 3.00E+00 | -2.28E+02 |
| PERE [MJ] | 2.49E+01 | - | - |
| PERM [MJ] | 0.00E+00 | - | - |
| **PERT [MJ]** | 2.49E+01 | 2.00E-01 | -3.50E+00 |
| PENRE [MJ] | 5.53E+02 | - | - |
| PENRM [MJ] | 1.23E+02 | - | - |
| **PENRT [MJ]** | 6.77E+02 | 2.80E+00 | -2.24E+02 |
| SM [kg] | 0.00E+00 | - | - |
| RSF [MJ] | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| NRSF [MJ] | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| FW [m³] | - | - | - |
| Caption | PE total = Total use of primary energy resources (=PERT+PENRT); PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water | | |

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**Results of the LCA – OUTPUT FLOWS AND WASTE CATEGORIES:**

| Declared unit: 1 m² of Brucha facade panel PU with a representative thickness of 110 mm (15.2 kg) | | | |
|---|---|---|---|
| Life cycle stages | PRODUCT STAGE | END OF LIFE STAGE | BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARYS |
| Declared life cycle stages (standard DIN EN 15804) | A1-A3 | C4 | D |
| HWD [kg] | - | - | - |
| NHWD [kg] | - | - | - |
| RWD [kg] | - | - | - |
| CRU [kg] | 0 | - | 0 |
| MFR [kg] | 0 | - | 9.35 |
| MER [kg] | 0 | - | 4.55 |
| EEE [MJ] | 0 | 14.8 | |
| EET [MJ] | 0 | 40.8 | |
| Caption | HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EE = Exported energy per energy carrier: EEE = Exported energy, electric energy, EET = Exported energy, thermal energy | | |

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## Building product disclosure and optimization – sourcing of raw materials

*Intent of this credit*
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. To reward project teams for selecting products verified to have been extracted or sourced in a responsible manner.

Product information for the declared product within this credit:

| **Option 1. raw material source and extraction reporting (1 point)** | | Description / Unit |
|---|---|---|
| Third-party verified corporate sustainability report (CSR)? | no | |
| Link to download the report | - | |
| **Option 2. leadership extraction practices (1 point)** | | Description / Unit |
| Participation in an extended producer responsibility program? | yes | Brucha has a corporate waste management concept, which includes a take-back system for construction waste The document can be downloaded: http://www.brucha.at/opmodule/user/brucha-neu/dokumente/en_Abfallwirtschaftskonzept.pdf |
| Bio-based products meet the Sustainable Agriculture Network's Sustainable Agriculture Standard? | No | |
| Wood products certified by the Forest Stewardship Council or USGBC-approved equivalent? | No | |
| Materials reuse | Yes | In-house recycling of polystyrene and polyurethane. Brucha uses steel from recycled material |
| Recycled content: | Variable | |
| Postconsumer recycled content of polystyrene and polyurethane | 0 | % |
| Preconsumer recycled content of polystyrene and polyurethane | 3 | % |
| Postconsumer recycled content of steel | 100 | % |
| Preconsumer recycled content of steel | < 10 | % |

## Building product disclosure and optimization – material ingredients

*Intent of this credit*
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. To reward project teams for selecting products for which the chemical ingredients in the product are inventoried using an accepted methodology and for selecting products verified to minimize the use and generation of harmful substances. To reward raw material manufacturers who produce products verified to have improved life-cycle impacts.

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Product information for the declared product within this credit:

| Type of reporting | Certification program (e.g. Green screen, cradle to cradle version/level, REACH) | Value/Comment |
|---|---|---|
| Option 1: material ingredient reporting | Health Product Declaration | Food grade certificate (Fraunhofer Institut; Report No. BR 0605-350) |
| | Manufacturer Inventory | no |
| Option 2: Material ingredient optimization | GreenScreen v1.2 Benchmark | no |
| | Cradle to Cradle Certified | no |
| | International Alternative Compliance Path – REACH Optimization | The formulation is checked according to the current REACH candidate list. The formulation does not contain any substances of very high concern. Please see the statement of the European Association for Panels and Profiles regarding the safe use of diisocyanates. http://www.ppa-europe.eu/Reach-documents.html |
| | USGBC approved program | no |

## Indoor Environmental Quality (IEQ)

*Summary*
Indoor environmental quality credits promote better indoor air quality and thermal, visual, and acoustic comfort.

### Acoustic performance

*Intent of this credit*
To provide workspaces and classrooms that promote occupants' well-being, productivity, and communications through effective acoustic design.

Product information for the declared product within this credit:

| HVAC Product | Sound reduction index Rw(C;Ctr) | Test Standard |
|---|---|---|
| BRUCHAPaneel PU facade FP | 25 dB | EN ISO 140-3 |

| Product | Sound absorption rate (100 - 5000Hz) | Test Standard |
|---|---|---|
| BRUCHAPaneel PU facade FP | 0,15 % | EN ISO 354 |