ENVIRONMENTAL PRODUCT DECLARATION
according to ISO 14025 and EN 15804

Declaration owner	Fritz EGGER GmbH & Co OG Wood Materials
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Program owner	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-EHW-2012113-EN
Date of issue	July 10, 2016
Validity	July 09, 2017

EGGER OSB, EGGER OSB JAS, EGGER OS'Brace®
Fritz EGGER GmbH & Co OG Wood Materials

www.bau-umwelt.com

1 General information

Fritz EGGER GmbH & Co. OG

EGGER OSB, EGGER OSB JAS, EGGER OS'Brace®

Program owner

IBU - Institut Bauen und Umwelt e.V
Panoramastr. 1
D-10178 Berlin
Germany

Owner of the declaration

Fritz EGGER GmbH & Co OG Wood Materials
Central corporate address
Weiberndorf 20
A-6380 St. Johann in Tyrol
Austria

Declaration number

EPD-EHW-2012113-EN

Declared Product/Declared Unit

1 cubic metre OSB board

This declaration is based on the product category regulations:

Wood materials, 06-2011
(PCR tested and approved through the independent expert committee, SVA)

Extent of validity:

This document is related to OSB boards for construction purposes, which are manufactured in the following plants of the group:

Egger Wood Materials Wismar GmbH & Co. KG, Am Haffeld 1, D – 23970 Wismar

Date of issue

July 10, 2016

Valid to

July 09, 2017

Verification

The CEN standard EN 15804 serves as the core PCR

Verification of the EPD through an independent third party according to ISO 14025

☐ internal ☒ external

Prof. Dr.-Ing. Horst J. Bossenmayer
(President of the Institute for building and environment e.V.)

Prof. Dr.-Ing. Hans-Wolf Reinhardt
(Chairman of the SVA)

Dr. Frank Werner
(Independent tester appointed by SVA)

2 Product

2.1 Product description

EGGER OSB (Oriented Strand Boards) are three-layered synthetic resin-bonded wood-based panels made of side-by-side oriented strands (micro-veneers) according to DIN EN 300 "Boards made of long, thin, aligned fibres (OSB)". The orientation of the centre layer is thereby at a 90° angle to the covering layers.

EGGER OSB/2 (according to DIN EN 13986) is bonded with a MUF resin in the covering layers and a PMDI resin (Diphenyl methane-Di isocyanate) in the central layers; the latter is transformed to PUR (polyurethane) and polyuria during the production.

EGGER OSB TOP (Z-9.1-566), EGGER OSB 3 E0, OSB/3, OSB/3 FSC, EGGER OSB JAS and EGGER OS'Brace are bonded with a PMDI resin in the covering as well as in the centre layer.

2.2 Application

EGGER OSB boards can be used in all load-bearing and reinforcing structural components in the area of the utilisation class 1 and 2. Furthermore OSB boards can be used for non-load bearing applications in internal finishing work, respectively as wood packaging and concrete formwork.

2.3 Technical data

Properties	Test method	EGGER OSB 2			EGGER OSB 3 E0			EGGER OS'Brace		
Thickness range [mm]		6-10	>10<18	18-25	6-10	>10<18	18-25	6-10	>10<18	18-25
Bending strength II	DIN EN 310	22	20	18	22	20	18	22	20	18
Bending strength ⊥	DIN EN 310	11	10	9	11	10	9	11	10	9
MOE II	DIN EN 311	3500	3500	3500	4500	4500	4500	3500	3500	3500
MOE ⊥	DIN EN 312	1400	1400	1400	1800	1800	1800	1400	1400	1400
Internal bond	DIN EN 319	0,34	0,32	0,30	0,34	0,32	0,30	0,34	0,32	0,30
Internal bond after boil test	DIN EN 1087-1; DIN EN 300	/	/	/	0,15	0,13	0,12	0,15	0,13	0,12
Emission class	DIN EN 120	E1			E1			E1		
Thermal conductivity	DIN 4108-4	λ = 0,13 W/mK			λ = 0,13 W/mK			λ = 0,13 W/mK		
μ - value	DIN 52615	dry cup: 100			200/150			200/150		
moisture content	DIN EN 322	9 ± 4 %			9 ± 4 %			9 ± 4 %		
Material class	DIN 4102-1	B2			B2			B2		
Euroclass	DIN EN 13986	E; ≥12mm D-s2, d0			E; ≥9mm: D-s2, d0					
Dimensional change due to moisture	DIN EN 318	0,04 % / %			0,03 % / %			0,03 % / %		

Properties	Test method	EGGER OSB 4 TOP Z-9.1-566					EGGER OSB JAS F****
Thickness range [mm]		8-10	>10-<18	18-25	>25-30	>30-40	8 - 30
Bending strength II	DIN EN 310	36	33	31	29	25	acc. to JAS Standard Structural Panels
Bending strength ⊥	DIN EN 310	23	20	18	16	15	
MOE II	DIN EN 310	5600	5300	5200	5000	4800	
MOE ⊥	DIN EN 310	2700	2500	2300	2100	1900	
Internal bond	DIN EN 319	/	/	/	/	/	
Internal bond after boil test	DIN EN 1087-1; DIN EN 300	0,17	0,16	0,13	0,10	0,08	
Emission class	DIN EN 120	E1					E1
Thermal conductivity	DIN 4108-4	λ = 0,13 W/mK					λ = 0,13 W/mK
μ - value	DIN 52615	200/200					100/300
moisture content	DIN EN 322	9 ± 4 %					9 ± 4 %
Material class	DIN 4102-1	B2					B2
Euroclass	DIN EN 13986	≥9mm: D-s2, d0					D-s2, d0
Dimensional change due to moisture	DIN EN 318	0,03 % / %					0,03 % / %

2.4 Bringing into circulation/application regulations

OSB boards can be used in all load-bearing and reinforcing structural components, in which the general building authority approval of the respective product, respectively CE labelling:

DIN EN 13986:2005-03; Wood material for use in building construction - characteristics, assessment of the conformity and labelling; German Version EN 13986:2004

is prerequisite for its use.

2.5 Supply status

Supply formats

Panel size (mm)	EGGER OSB 2	EGGER OSB 3 E0	OSB/3 FSC	EGGER OS'Brace OS'Brace H2	EGGER OSB 4 TOP Z-9.1-566	EGGER OSB JAS F****
5000 x 2500		X			X	
5000 x 1250		X			X	
3000 x 1250						
2800 x 1250		X			X	
2650 x 1250					X	
2500 x 1250		X	X		X	
2070 x 2770	X	X				
2960 x 2500					X	on request
2960 x 2440					X	
2440 x 1200/900	X			X		
2745 x 1200/900				X		
3050 x 1200/900				X		
2500 x 1250 4N&F		X			X	
2500 x 675 4N&F		X			X	
2050 x 675 4 N&F			X			
6250 x 675 2 N&F					X	
Thickness range (for further information see www.egger.com)	6 - 25 mm	6 - 25 mm	12 - 25 mm	6 - 25 mm	8 - 40 mm	8 - 30 mm
	other sizes and thicknesses on request					
Density DIN EN 323	≥ 570 kg/m³	≥ 600 kg/m³	≥ 600 kg/m³	≥ 600 kg/m³	≥640...600 kg/m³	≥600 kg/m³
Weight by area	3,5 - 14,3 kg/m²	3,6 - 15 kg/m²		3,6 - 15 kg/m²	5,1 - 24 kg/m²	5,1 - 18 kg/m²

2.6 Raw materials/auxiliary materials

Wood mass: For the production of EGGER OSB exclusively decorticated, fresh wood from forest thinning measures is used (primarily coniferous wood of the wood type pine and spruce).

MUF – glue: Mixed resin consisting of melamine urea formaldehyde resins. The aminoplastic glue hardens fully during compression due to polycondensation.

PMDI – glue (PUR): Here MDI (Diphenyl methane – Di isocyanate), a polyuria pre-product is used, which during the OSB production is transformed into PUR (polyurethane) and polyuria. These serve the purpose of bonding the OSB strands.

Wax emulsion: A paraffin wax emulsion is added to the recipe as a water repellent (improves waterproofing).

2.7 Production

Breakdown of manufacturing process:

1) De-barking of the trunks

2) Processing of the wood to „strands“ (micro veneers), separately for covering layer and centre layer

3) Drying of the strands to approximately 3-4 % residual moisture

4) Sieving of the strand fraction of covering layer and central layer

5) Bonding of the covering layer and centre layer with resins

6) Orientation of the strands on the form belt; covering layer strands are dispersed lengthwise in the production direction, centre layer strands at a 90° angle to the covering layer.

7) Compression of the dispersed mat in a continuous through-feed press

8) Division and edging of the OSB strand to raw board formats

9) Cooling of the raw board formats in star cooling rotator

10) Piling to large stacks

11) Cutting of the raw boards to stock/customer formats, package formation and packaging with cardboard, partially PE films and steel bands

2.8 Environment and health during the production

Measures to prevent injuries to health / health encumbrances during the manufacturing process:

Due to the manufacturing conditions no measures for health protection are necessary over and above the legislative and other regulations. The MAK values (Germany) are substantially undercut at every location of the plant.

Air: The exhaust air that is created in relation to the product is purified according to the legislative regulations. Emission values are substantially below the TA Air.

Water/soil: There is no impact on water or soil. Production related waste water is reprocessed internally and reused in the production.

Noise protection measurements showed that all the values determined within and outside of the production plant were far below the minimum requirements applicable for Germany. Noise intensive plant components such as the chip removal are accordingly encapsulated through structural measures.

2.9 Product processing/installation

EGGER OSB can be sawn, milled and drilled like solid wood using conventional electrical hand tools. Hard metal-tipped tools are recommended. During the use of manually guided power tools without dust extraction by suction a breathing mask should be used.

2.10 Packaging

Underlays made of wood material strips, cardboard, steel bands and recyclable PE films are used.

2.11 Usage condition

Ingredients in utilisation state:

The component materials of EGGER OSB comply in terms of their proportions to those of the basic material composition described in no. 2.6 "Basic materials”.

2.12 Environment & health during the utilisation

There are no health hazards or effects to be expected from normal use, i.e. in accordance with the intended uses of EGGER OSB.

Hazards for water, air/atmosphere and the soil cannot result through the utilisation of EGGER OSB as designated.

2.13 Reference utilisation duration

The lifespan of the OSB boards depends on the application area within the specific construction object and can according to experience be 50 years and more.

2.14 Unusual effects

Fire

Reaction to fire: Building material class B2 "Normal flammability" according to DIN 4102-1; D-s2, d0 - according to EN 13986 euro class D, smoke class s1, drip class d0

Smoke gas formation/smoke density: according to the smoke formation and smoke density of solid wood.

Toxicity of fire gases: Through the transformation process during the combustion under certain fire conditions it can apart from the usual fire gases come to the release of hydrogen cyanide (prussic acid) from the PMDI resins contained in the boards. During the test through the University of Osnabrück these emissions were however below the detection limit.

Residues of the mentioned products may only be burned in closed plants, not however in an open fire.

Change of the aggregate state (burning drip off/fall off): Dripping by combustion is impossible because EGGER OSB boards do not liquefy when hot.

Water

Water effect: No ingredients are washed out that could be hazardous for water (see 7.9 eluate analysis, 7.7 EOX). OSB boards are not resistant against continuous water influence, damaged parts however can be locally replaced.

Mechanical destruction

Breaking behaviour: The breaking pattern of EGGER OSB displays a relatively brittle behaviour in which small smooth breaking surfaces occur on the broken edges of the boards.

2.15 Reuse phase

On renovation or discontinuation of the utilisation phase of a building OSB boards can in the event of selective demolition be easily collected separately and be reused again for the same or a different application. Exceptions to this are boards that have been bonded over their surface.

Energy utilisation (in plants approved for this purpose): With the high average calorific value of approximately 17 MJ/kg an energy utilisation for the generation of process energy and electricity (combined heat and energy power plants) from board residues from the construction site as well as from demolition measures are to be preferred over dumping.

2.16 Disposal

Residues of OSB coming from construction sites as well as those from demolition measures should primarily be utilised materially. If this is not possible they must be utilised for energy generation instead of dumping (waste material key according to European waste material catalogue: 170201/030103).

Packaging: Transport packaging; paper/card and steel strapping can be collected separately and recycled appropriately. In some cases external disposal can be arranged with the manufacturer.

2.17 Other information

Extensive information and processing recommendations are available under www.egger.com/holzbau

3 LCA: Calculation rules

3.1 Declared unit

The declaration is related to the manufacture of one cubic metre OSB board (product mix consisting of OSB/2, OSB/3 and OSB/4). The average raw density of the board is 605 kg/m³ (moisture 5 %).

The results of the life cycle inventory analysis and the effect inventory are specified as product mix, whereby the differences between the individual OSB boards are small.

3.2 System limit

Type of the EPD: Weighing station to the plant gate – with options.

The system limit of the EPD follows the modular structure according to DIN EN 15804.

The selected system limits comprise of the manufacturing of the OSB board including the derivation of the raw material, up to the completely packed product at the plant gate (cradle to gate), as well as the combustion at the end of life in a biomass power plant.

The systems and thereby comprise of the following stages according to DIN EN 15804,

Product stage (module A1-A3 according to DIN EN 15804)

Module D comprises of:

D Credits from the combustion outside of the system

3.3 Estimates and assumptions

The results of the environmental life cycle assessment are based on the following assumptions.

The transports of all raw materials, respectively auxiliary materials are calculated according to the means of transport (truck, mass goods freighter - seagoing vessel, diesel consumption at the location such as forklift truck) with data derived from the GaBi database. For the energy supply the energy carriers and energy sources used at the production location are taken into consideration. The residues that accrue during the production (edging, cutting and milling residues) are cycled back to a thermal utilization in the own power plant or back into the process.

It is assumed that chopped old wood reaches the end-of-waste status and can be used as secondary combustion fuel. As in this study combustion in a biomass plants is assumed, it may be assumed that R1>0.6, as the efficiency of biomass plants is generally greater than 0.6.

3.4 Cut-off rules

All data from the operational data acquisition were taken into account. Thereby also material flows with a proportion of less than 1 percent were included in the assessment. It may be assumed that the sum of the disregarded processes does not exceed 5% of the effective categories. Through this the cut off criteria according to ISO 14044 and DIN EN 15804 are fulfilled.

3.5 Background data

The predominant part of the data for the pre-chains is derived from industrial sources that were recorded under consistent time and methodological framework conditions. The process data and the used background data are consistent. All other relevant background data sets were acquired from the database of the software GaBi 4 /GABI 4 2010/, the age of which is below 10 years.

3.6 Data quality

The age of the used data is less than 5 years. The data recording was performed directly at the production location of the Wismar plant. All input and output data was provided by the company Egger according to the business year under examination.

3.7 Time period under examination

The utilised data is related to the actual production processes of the business year May 01, 2010 to April 30, 2011. The environmental life cycle assessment was prepared for the German area of acquisition. This has the consequence that apart from the production processes under these general framework conditions, also the preliminary stages such as electricity or energy carrier provisioning were used that are also relevant for Germany.

3.8 Allocation

The pre-chain for the forest was balanced according to Schweinle & Thoroe 2001, respectively Hasch 2002 in the updated version from Rüter and Albrecht (2007). With residual sawmill wood the forestry process and associated transport are added to the wood according to volume proportion (respectively dry mass), from the sawmill processes no encumbrances are added to the residual sawmill wood.

The adage of energy credits for electricity and thermal energy produced in the biomass power plant at the end of life is performed according to the calorific value of the input, whereby also the efficiency of the plant is taken into account. The credit for the thermal energy is calculated from the data set „EC-25: Thermal energy from natural gas PE “; the credit for the electricity from the data set „EC-25: Electricity mix PE“.

The calculation of the emissions dependent on the input (e.g. CO2, HCl, SO2 or heavy metals) at the end of life was performed according to the material composition of the introduced ranges. The technology-related emissions (e.g. CO) are calculated according to exhaust gas quantity.

The allocation of the input materials for the excess of thermal energy was allocated as follows:

- From the input side glues and pre-chains of the wood production are allocated according to money value to combustion wood and final product.
- To correct the CO_2 balance and the primary energy balance both these factors were allocated according to mass.

Waste materials were also added in the total of the production.

3.9 Comparability

As a general principle a comparison or the assessment of EPD data is only possible when all data sets to be compared were prepared according to DIN EN 15804, and the building context, respectively the product specific performance characteristics were taken into account.

The results of the life cycle inventory analysis and the effect inventory are specified as product mix, whereby the differences between the individual OSB boards are small.

EGGER

4 LCA: Scenarios and further technical information

Reuse, recuperation and recycling potential (D)

The combustion plant for the utilisation of the used boards (17 MJ/kg and 8% moisture) consists of a combustion line that is equipped with a grate as well as a steam generator. The performance ratio of the biomass power plant is 93 %.

5 LCA: Results

The following information about the environmental effects is expressed through the parameters of the effect categories of an effect estimate and application of characterisation factors:

DESCRIPTION OF THE SYSTEM BOUNDARY
(X = INCLUDED IN THE LCA; MND = MODULE NOT DECLARED)

Product stage			Construction process stage		Use stage							End-of-life stage				Benefits and loads beyond the system boundaries
Raw material supply	Transport	Manufacture	Transport	Construction-installation process	Use / Application	Maintenance	Repairs	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction	Transport	Waste treatment	Landfilling	Re-use, recovery and recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	X

LCA RESULTS – ENVIRONMENTAL IMPACT: 1 m^3 EGGER EGGER OSB

		Product stage	Benefits and loads
Parameter	**Unit**	**A1 – A3**	**D**
Global Warming Potential (GWP)	[kg CO_2 equiv.]	-931	460
Depletion Potential of the Stratospheric Ozone Layer (ODP)	[kg CFC11 equiv.]	1.60E-05	-8.38E-05
Acidification Potential of soil and water (AP)	[kg SO_2 equiv.]	0.857	-1.483
Eutrification Potential (EP)	[kg PO_4^3 equiv.]	0.163	0.098
Formation Potential of Tropospheric Ozone Photochemical Oxidants (POCP)	[kg ethene equiv.]	0.145	-0.044
Abiotic Depletion Potential non-Fossil Resources (ADPE)	[kg Sb equiv.]	9.42E-04	-4.38E-02
Abiotic Depletion Potential Fossil Resources (ADPF)	[MJ]	4,348	-8,093

LCA RESULTS – USE OF RESOURCES: 1 m^3 EGGER EGGER OSB

		Product stage	Benefits and loads
Parameter	**Unit**	**A1 – A3**	**A1 – A3**
Renewable primary energy as energy carrier (PERE)	[MJ]	4,098	-495
Renewable primary energy as material utilisation (PERM)	[MJ]	9,556	0
Total use of renewable primary energy sources (PERT)	[MJ]	13,654	-495
Non-renewable primary energy as energy carrier (PENRE)	[MJ]	3,457	-11,054
Non-renewable primary energy as material utilisation (PENRM)	[MJ]	1,303	0
Total use of non-renewable primary energy sources (PENRT)	[MJ]	4,760	-11,054
Use of secondary materials (SM)	[kg]	0	0
Renewable secondary fuels (RSF)	[MJ]	2,043	0
Non-renewable secondary fuels (NRSF)	[MJ]	0	0
Net use of fresh water (FW)	[m^3]	2,320	-0,013

LCA RESULTS – OUTPUT FLOWS AND WASTE CATEGORIES: 1 m^3 EGGER EGGER OSB

		Product stage	Benefits and loads
Parameter	**Unit**	**A1 – A3**	**A1 – A3**
Hazardous waste for disposal (HWD)	[kg]	0.66	0
Disposed of, non-hazardous waste (NHWD)	[kg]	368	-1,188
Disposed of, radioactive waste (RWD)	[kg]	0.14	-1.05
Components for re-use (CRU)	[kg]	0	0
Materials for recycling (MFR)	[kg]	0	0
Materials for energy recovery (MER)	[kg]	0	0
Exported energy (electricity)	[MJ]	0	2,089
Exported energy (thermal energy)	[MJ]	0	4,423

6 LCA: Interpretation

The environmental life cycle assessment and the effect estimate are based on the specifications of the European standard EN 15804. The effect estimate is based on the CML method of the University of Leiden (Centrum voor Milieukunde (CML), 2001-Nov 2009).

Water consumption

The water consumption for 1 m³ Egger OSB board is in the production stage 2.3 m³ of water. In stage D credits of 0.013 m³ are added.

The water consumption during the production of the OSB boards results from the water consumption during the production.

Primary energy renewable and non-renewable

The proportion of renewable energy in the examined products comes from the high use of wood (the sun energy stored in the biomass through photosynthesis).

The proportion of the non-renewable energies in the examined products comes from the utilised glueing systems.

Waste

The largest proportion of the produced waste material is disposed of and non-hazardous waste material. The disposed of radioactive waste material is created through the energy utilisation in the pre-chains of the pre-products (generation of electricity).

Global warming potential

The greenhouse potential is dominated in the production of carbon dioxide. Through the utilised wood CO_2 is bound in the regrowing raw materials that are necessary for the production.

Outside of the system under investigation all GWP relevant emissions are created through combustion. Through the credit a part of the created greenhouse gas emissions is substituted.

Ozone depletion potential

The ozone depletion potential is above all created through the utilisation of glue, as well as the utilisation of hydrophobation substances for the production of OSB boards. Through substitution of the created energy utilisation of the OSB boards at the end of life the total ozone depletion potential is decreased. Here organic emissions containing halogen in the air are responsible for the ozone depletion potential.

Acidification potential

The acidification potential is above all created through the utilisation of wood and glue and the emissions during the production of OSB boards, and through the emissions during the combustion outside of the system under examination. Here sulphur dioxide and nitrogen oxide have the highest proportion of the acidification potential.

Eutrophication potential

The eutrophication potential is above all created through the utilisation of wood and glue and the emissions during the production, as well as through the emissions during the combustion outside of the system under examination. Here nitrogen oxides have the highest proportion of the eutrophication potential.

Photochemical oxidant formation potential

The photochemical oxidant formation potential is above all created through the utilisation of wood and glue and the emissions during the production, as well as through the emissions during the combustion outside of the system under examination. Here NMVOCs, sulphur dioxide, nitrogen dioxide and carbon monoxide emissions have the highest proportion in the photochemical oxidant formation potential.

Abiotic resource consumption (fossil)

The ADP is above all created through the consumption of non-renewable fossil energy carriers such as for example natural gas and anthracite coal.

Here are above all the utilised glueing system is the contributing factor.

Abiotic resource consumption (elementary)

The ADP elementary results here above all through non-renewable material resources such as metals or rock salt.

Here above all consumable parts of the machines and the glueing system are contributing factors.

The calculation of the ecological balance follows the methodology specifications of DIN EN 15804. Over and above this there are no restrictions regarding data or methodology that restrict the interpretation.

The effect estimation results are only relative statements that do not make any statements about „end points“ of the effect categories, overshooting of limit values, safety margins or about risks.

7 Determinations

The EPD is based on the following documents/certifications:

7.1 Formaldehyde

Measurement centre: WKI Fraunhofer Wilhelm-Klauditz-Institute, testing, monitoring and certification facility, Braunschweig

Test reports, date:

OSB/2: B404/04, 06.02.2004 + B405/04, 2004

OSB 3 E0: B1727QA-20112223; QA-2011-2224

OSB 4 TOP: QA-2011-0600; QA-2011-2218

Result: The average results are as follows:

- OSB/2: 6.4 mg/100 g atro (10 mm) 6.5 mg/100 g atro (15 mm)
- OSB 3 E0: 0.5 mg/100 g atro (12 mm) +0.4 mg/100 g atro (15 mm)
- OSB TOP: 0.3 mg/100 g atro (8 mm) +0.4 mg/100 g atro (15 mm)

The emission values of EGGER OSB 4 TOP and OSB 3 E0 below 0.05 ppm formaldehyde

(= balancing concentration in the testing room) and are not hazardous to health.

7.2 MDI

Measurement centre: Wessling - Beratende Ingenieure GmbH (consulting engineers), Altenberge

Test report: Project No.: IAL-08-0437

Result: The testing of the PUR glued OSB 4 TOP boards was performed according to the specification guidelines RAL UZ 76 and NIOSH (P&CAM 142). The emissions of MDI and other isocyanides were for both board types below the detection limit of the analysis procedure (without detection limit). The requirements of RAL-UZ 76 for MDI emissions were thereby fulfilled.

7.3 Testing for pre-treatment of the applied materials

Not relevant as no old wood is used

7.4 VOC emissions

The VOC measurement is still pending as no acknowledged testing and assessment procedure exists.

7.5 Lindane, PCP

Measurement centre: WKI Fraunhofer Wilhelm-Klauditz-Institute, testing, monitoring and

certification facility, Braunschweig

Test report: QA-2011-1831

Result: According to testing method PA-C-12:2006-02 "Determination of pentachlorophenol (PCP) and _g-hexachloride-cyclohexane (lindane) in wood and wood materials" the pesticides PCP and lindane were not able to be detected (detection limit < 0.1 mg/kg).

7.6 Eluate analysis

Measurement centre: ECO – Umweltinstitut, Cologne

Test report: 415/2001

Result: The samples were analysed through total breakdown with HNO3 according to DIN 38406-E29-4. The metals and metalloid cadmium (NWG 0.2 mg/kg), cobalt, mercury (NWG 0.5 mg/kg), antimony, arsine, barium, beryllium, lead, nickel and zirconium (NWG 1.0 mg/kg) were not traced. The substantiated concentrations of boron (150 mg/kg, detection limit 50 mg/kg), chromium (13 mg/kg, detection limit 1.0 mg/kg), copper (4 mg/kg, detection limit 1.0 mg/kg) and Zinc (7 mg/kg, detection limit 1.0 mg/kg) are to be classified as harmless.

Measurement centre: University Osnabrück, Institute for chemistry

Test report: dated March 02, 2005

Result: The samples were analysed through total breakdown with HNO3 according to DIN 38406-E29-4 and EN 71-3. Measurement of the metals and metalloids: Cadmium = NWG = 0.2 mg/kg, antimony <0.05 mg/kg, arsenic >0.05 mg/kg, barium <5 mg/kg, lead = 0.25 mg/kg, chromium = 0.1 mg/kg, mercury <0.065 mg/kg, selenium <0.05 mg/kg. The limit values required according to EN 71-3 For all heavy metals were undercut.

8 Literature references

Institut Bauen und Umwelt 2011:

Institut Bauen und Umwelt e.V., Königswinter (publisher): The preparation of environmental product declarations (EPP); General principles for the EPD program of the Institute for Building und Environment e.V. (IBU), 2011-06

www.bau-umwelt.com

PCR 2011, Part A

Institut Bauen und Umwelt e.V., Königswinter (publisher): Product category rules for building products from the program for environmental product declarations of the Institute for Building and Environment (IBU) Part A: Calculation rules for the ecological balancing and requirements towards the background report. 2011-07 2011/-07

PCR 2011, Part B

Institut Bauen und Umwelt e.V., Königswinter (publisher): Product category rules for building products from the program for environmental product declarations of the Institute for Building and Environment (IBU) Part B: Wood-based materials. 2011-06

ISO 14025

DIN EN ISO 14025:2009-11, Environmental labels and declarations – Type III environmental declarations – Principles and procedures

DIN EN 15804

DIN EN 15804:2012-04, Sustainability of buildings – environmental product declarations - Basic rules for the product category building products; German Version EN 15804:2012

2000/532/EC

Decision of the committee dated May 3, 2000 for the replacement of the decision 94/3/EC about a waste material directory according to article 1 letter a) of the regulation 75/442/EEC of the Council about waste materials, and the decision 94/904/EC of the Council about a directory of hazardous waste materials in the sense of article 1 section 4 of the regulation 91/689/EEC about hazardous waste materials

Hasch 2002

Hasch, J.: Ökologische Betrachtungen von Holzspan- und Holzfaserplatten. (Ecological analyses of woodchip and wood fibreboards) Dissertation, Hamburg,

2002 - revised 2007: Rueter, S. (BFH HAMBURG; Wood technology), Albrecht, S. (Uni

Stuttgart, GaBi)

Schweinle 2001

Schweinle, J. and C. Thoroe: Comparative ecological balancing of the round wood production in different forestry operations. Notifications from the federal research Institute for forestry and wood economy, Hamburg. No. 204, 2001.

Institut Bauen und Umwelt e.V.	**Publisher** Institut Bauen und Umwelt e.V. Panoramastr. 1 D-10178 Berlin Germany Germany	 Phone Fax Email Web	 +49 (0)30 308 774 8 - 0 +49 (0)30 308 774 8 -29 info@bau-umwelt.com **www.bau-umwelt.com**
Institut Bauen und Umwelt e.V.	**Program owner** Institut Bauen und Umwelt e.V. Panoramastr. 1 D-10178 Berlin Germany	 Phone Fax Email Web	 +49 (0)30 308 774 8 - 0 +49 (0)30 308 774 8 -29 info@bau-umwelt.com **www.bau-umwelt.com**
EGGER	**Onwer of the declaration** Fritz EGGER GmbH & Co.OG Holzwerkstoffe Weiberndorf 20 A – 6380 St. Johann in Tirol Österreich	 Phone Fax: Email: Web	 +43 50 600-0 +43 50 600-10111 info-sjo@egger.com **www.egger.at**
PE INTERNATIONAL	**Author of the Life Cycle Assessment** PE CEE GmbH Hütteldorferstr. 63-65/8 1150 Wien Austria	 Phone Fax: Email: Web	 +43 (0) 1 4799724 0 +43 (0) 1 4799724 10 info@pe-international.com **www.pe-cee.com**