



Environmental Product Declaration

according to ISO 14025



**Direct Pressure
Laminate Floor Covering**

MeisterWerke Schulte GmbH

**Number of declaration
EPD-MWS-2011111-E**

**Institut Bauen und Umwelt e.V.
www.bau-umwelt.com**



**Institut Bauen
und Umwelt e.V.**



Summary
Environmental
Product-Declaration

<p>Institut Bauen und Umwelt e.V. www.bau-umwelt.com</p>  <p style="text-align: center; font-size: small;">Institut Bauen und Umwelt e.V.</p>	Program operator	
<p>MeisterWerke Schulte GmbH Zum Walde 16 59602 Rüthen-Meiste Germany</p>		Declaration holder
<p>EPD-MWS-2011111-E</p>	Declaration number	
<p>Direct Pressure Laminate Floor Covering (DPL Floor Covering)</p> <p>This declaration is an environmental product declaration according to ISO 14025 describing the environmental performances of the construction products mentioned. It shall promote the development of the sustainable and health-friendly building. In this validated declaration, all relevant environmental data are disclosed. The declaration is based on the PCR document "floor coverings", year 2008-01</p>	Declared building product	
<p>This validated declaration authorises the use of the label of Institut Bauen und Umwelt. It exclusively applies for the products mentioned, three years from date of issue. The holder of the declaration is liable for underlying data and supporting documents.</p>	Validity	
<p>The declaration is complete and furnishes details of:</p> <ul style="list-style-type: none"> - product definition and relevant building-physics-related information - raw materials and origin of the raw materials - descriptions of the product manufacture - information on product processing - information on the use stage, extraordinary influences and end-of-life stage - results of the life cycle assessment 	Content of declaration	
<p>20. Mai 2011</p>	Date of issue	
 <p>Prof. Dr.-Ing. Horst J. Bossenmayer (President of IBU)</p>		Signatures
<p>This declaration was independently verified by the advisory board (SVA), according to ISO 14025.</p>		Verification of the declaration
 <p>Prof. Dr.-Ing. Hans-Wolf Reinhardt (Chairman of the SVA)</p>	 <p>Dr. Eva Schmincke (Verifier appointed by SVA)</p>	Signatures



Summary *Environmental Product-Declaration*

<p>This Environmental Product Declaration refers to Direct Pressure Laminate (DPL) floorings produced by MeisterWerke Schulte GmbH.</p> <p>MeisterWerke laminate floorings, with a thickness of 7 - 9 mm, are hard flooring elements acc. to EN 13329 produced in a DPL procedure. The planks are consisting of several layers which are joint together durably under use of pressure and heat. On the upper side there is a highly wear resistant wear-layer and the decor-layer. The middle-layer is a HDF base board made of wood based material. The products are equipped with an impregnated counterbalance on the backside.</p>	Product description
<p>MeisterWerke laminate floor coverings are intended for domestic and commercial level of use and meet the requirements of EN 13329. Levels of use and the corresponding classes can be taken from this EPD.</p>	Range of application
<p>The Life Cycle Assessment (LCA) was carried out according to DIN ISO 14040 ff. corresponding to the requirements of the Product Category Rules (PCR) for "floor coverings". Specific data from MeisterWerke Schulte GmbH, data from the average EPD of DPL floor coverings developed by EPLF e.V. as well as data from the "GaBi 4" LCA software were used as the data base. This life cycle assessment covers the following life cycle stages:</p> <ul style="list-style-type: none"> • Production of the raw materials, production of the floor covering including the packaging • Installation • Use • End of life <p>For all stages the respective energy consumption and transport data are considered.</p>	Scope of the life cycle assessment
<p>The results are given for 1m² of laminate floor covering with a minimum thickness of 7 mm and a maximum thickness of 9 mm. Energy consumption and LCA results for the delivery, installation and use stage are described in the complete version of this EPD.</p>	Results of the life cycle assessment

Category	Unit	Production			End of Life		
		1m ² (7mm)	1m ² (8mm)	1m ² (9mm)	1m ² (7mm)	1m ² (8mm)	1m ² (9mm)
Primary energy of non renewable resources	[MJ]	118,8	138,8	148,9	-66,6	-74,5	-85,4
Primary energy of renewable resources	[MJ]	110,3	123,3	141,5	1,7	-1,9	-2,1
Global warming potential (GWP)	[kg CO ₂ -eqv.]	-2,1	-1,9	-2,9	6,3	7,1	8,1
Ozone depletion potential (ODP)	[kg R11-eqv.]	7,89E-07	9,48E-07	9,99E-07	-2,59E-07	-2,89E-07	-3,31E-07
Acidification potential (AP)	[kg SO ₂ -eqv.]	0,026	0,029	0,032	0,0112	0,0126	0,0144
Eutrophication potential (NP)	[kg PO ₄ -eqv.]	0,0060	0,0067	0,0075	0,0032	0,0036	0,0041
Photochemical oxidant formation (POCP)	[kg Ethene-eqv.]	0,0043	0,0048	0,0054	7,95E-05	8,88E-05	1,02E-04

<p>General technical approval of DIBt (Z-156.606-464) CE Marking, EC Declaration of conformity (March 1st, 2010)</p>	Evidence and verification
---	--------------------------------------



Product group, PCR: Laminate Floor Covering, Floor coverings 2008
 Declaration holder: MeisterWerkeSchulte GmbH
 Number of Declaration: EPD-MWS-2011111-E

Issued
 20-05-2011

0 Product definition

0.1 Product description This Environmental Product Declaration refers to Direct Pressure Laminate (DPL) floorings produced by MeisterWerke Schulte GmbH.



The MeisterWerke laminate floorings with a thickness of 7 - 9 mm are hard flooring elements according to EN 13329 which are produced in a DPL procedure. The planks are consisting of several layers which are joint together durably under use of pressure and heat. On the upper side there is a highly wear resistant wear-layer and the decor-layer. The middle-layer is a HDF base board made of wood based material. The products are equipped with an impregnated counterbalance on the backside.

MeisterWerke is distributing laminate floorings under the brands MEISTER (<http://www.meister.com>) or Schulte Räume (<http://www.schulte-raeume.de>).

0.2 Range of Application The laminate floor coverings described in this EPD meet the requirements of the following use classes according to /EN 13329/.

Thickness of the product	Domestic level of use	Commercial level of use
7mm		
8mm		
9mm		

0.3 Product Standard /Approval The following standards/approvals apply for the MeisterWerke laminate flooring:

- /EN 13329/ Laminate floor covering –Elements with a surface layer based on amino plastic thermosetting resins- Specifications, requirements and test methods
- /EN 685/ Resilient, textile and laminate floor coverings –Classification
- /EN 14041/ Resilient, textile and laminate floor coverings –Essential characteristics (CE - marking)
- /EN 13501-1/ Fire classification of construction products and building elements

General technical approval as a building product tested for emission according to DIBt principles (Ü-sign)



Product group, PCR: Laminate Floor Covering, Floor coverings 2008
Declaration holder: MeisterWerkeSchulte GmbH
Number of Declaration: EPD-MWS-2011111-E

Issued
20-05-2011

- 0.4 Accreditation**
- Membership European Producers of Laminate Flooring e.V. (EPLF®)
 - Factory production control with internally and externally surveillance within the scope of general technical approval (Ü-sign)
- 0.5 Delivery status** The scope of delivery conditions for MeisterWerke laminate floor coverings are described in Table 1.

Table 1: Characteristics of MeisterWerke laminate floor coverings

Characteristics	Value		Unit
	min	max	
Thickness of the element	7	9	[mm]
Length of the surface layer	500	2500	[mm]
Width of the surface layer	100	400	[mm]
Length and width of squared elements	250	650	[mm]
Density	800	1200	[kg/m ³]

1 Material content

- 1.1 Material content of the product** Table 2 describes the material content of the product in delivery condition.
- Table 2: Material content of the product**

Component	Material	mass [%]			Renewable resources	availability	origin
		7 mm	8mm	9mm			
Core	HDF	92,7	92,8	93,7	yes	abundant	Europe
Surface layer Overlay	paper	0,4	0,3	0,3	yes	abundant	Europe
	resin	1,1	1,4	1,2	no	limited	Europe
	corundum	0,3	0,4	0,4	no	abundant	global
Surface layer Decor	paper	1,0	1,0	0,8	yes	abundant	Europe
	resin	1,1	0,9	0,8	no	limited	Europe
Backing Balance paper	paper	1,4	1,4	1,2	yes	abundant	Europe
	resin	2,0	1,8	1,6	no	limited	Europe

- 1.2 Production of main materials** **HDF (high density fibreboard)**
The core board is an HDF board (density approx. 890 kg/m³ ± 3%) composed of wood fibres and a thermosetting resin, mainly MUF (melamine-urea-formaldehyde).

Paper

The renewable resource wood is the main raw material for paper production.

Resins

The used amino resins are melamine-urea-formaldehyde resins. Amino resins are thermosetting resins that are cured using heat and pressure. They are made by combining an aldehyde with a compound that contains an amino (-NH₂) group.

Corundum (Al₂O₃)

Bauxite is the mineral resource of corundum. By using Al₂O₃ the surface layer of a laminate obtains abrasion and wear resistance.



Product group, PCR: Laminate Floor Covering, Floor coverings 2008
Declaration holder: MeisterWerkeSchulte GmbH
Number of Declaration: EPD-MWS-20111111-E

Issued
20-05-2011

2 Production of the floor covering

2.1 Production process Illustration of the production process of DPL laminate floor coverings:



Figure 1: DPL production process

The main materials for the production of DPL floor coverings are paper, resins and, with a percentage of more than 90%, the HDF core board. The HDF board production is included in the LCA.

Pressing:

The resin impregnated papers (overlay, décor, backing) are pressed under heat with the wood fibre core layer in a single stage process. In this process the resin cures.

Profiling:

The pressed boards are cut to size and equipped with the tongue-and-groove assembly system.

Packaging:

Laminate floorings are generally unit-packed and edge-protected using ribbed cardboard and shrink-wrapped in foil.

2.2 Health, safety and environmental aspects during production

The constitutional valid EU regulations as well as the furthermore provisions of national law in the country of production are observed.

Water: The use of water in the laminate flooring production process is negligible. Where water is needed, it either evaporates or is re-used in the internal water loop.

Soil: There is no impact on soil.

Air: The constitutional valid regulations are observed. The emissions to air are far below the legally required thresholds.

3 Delivery and installation of the floor covering

3.1 Delivery The delivery of MeisterWerke laminate floor coverings is carried out on the road by trucks (34t - 40t truck, 85% load). The average transport distance for the delivery of DPL floor coverings to the end consumer is approx. 300 km. During storage and transportation, it is important that the packing units are not exposed to wet conditions (rain) and unnecessary exposure to wind and weather should also be avoided.

3.2 Installation MeisterWerke laminate floor coverings are generally installed floating. This means the floor covering is not fixed to the sub floor using glue, nails etc. The floor covering panels are mainly mechanically assembled glue-less by means of tongue and groove. Underlay material is needed when installing laminate floor coverings in order to achieve a levelling effect, thermal or acoustical insulation or protection against rising dampness. The following underlayment materials are generally used:



Product group, PCR: Laminate Floor Covering, Floor coverings 2008
 Declaration holder: MeisterWerkeSchulte GmbH
 Number of Declaration: EPD-MWS-20111111-E

Issued
 20-05-2011

- synthetic foams
- renewable materials
- mineral based PUR bonded materials
- others

The installation instructions of MeisterWerke laminate floor coverings can be downloaded from www.meister.com.

3.3 Health, safety, and environmental aspects during installation

Appropriate means for protection against saw dust must be taken.

3.4 Waste

Post-installation laminate floor covering waste may be recycled as wood based products (e.g. furniture, particle boards). When appropriate recycling facilities do not exist, laminate floor covering waste shall be thermally recycled.

3.5 Packaging

Packaging requirements according to /EN 13329/:

Laminate floor coverings shall be delivered in packages designed to protect the corners, edges and surfaces of the product, under normal conditions of transport and handling.

MeisterWerke laminate flooring is accordingly unit-packed and edge-protected using ribbed cardboard and shrink-wrapped in foil. These packaging materials shall be collected separately and be recycled.

Pallets that are used for the delivery can either be re-used (Euro pallets) or recycled as wood.

4 Use stage

4.1 Use of the floor covering

Laminate floor coverings described in this EPD meet the requirements of the use classes mentioned in chapter 0.2

For this area of application, a minimum reference service life of 15 years can be assumed. The technical service life of MeisterWerke laminate flooring can be longer.

4.1.1 Cleaning and maintenance

The regular cleaning of laminate floor coverings should be carried out according to the information on the Data Sheet on Cleaning provided by the association of European Producers of Laminate Flooring e.V. (www.eplf.com).

The common cleaning method for laminate floor coverings is damp mopping. Loose dirt should be removed by means of a dry mop or a vacuum cleaner.

To model the environmental impact of the use stage within the scope of sustainable buildings, the cleaning methods and frequencies described in table 3 are considered:

Table 3: Cleaning instructions

Level of use	Cleaning process	Cleaning frequency (times)	Consumption
domestic	Damp mopping	1 per week	water, surfactants
domestic	Vacuum cleaning	2 per month	electricity
commercial	Damp mopping	4 per week	water, surfactants
commercial	Vacuum cleaning	4 per month	electricity



Product group, PCR: Laminate Floor Covering, Floor coverings 2008
Declaration holder: MeisterWerkeSchulte GmbH
Number of Declaration: EPD-MWS-20111111-E

Issued
20-05-2011

4.1.2 Prevention of structural damage To prevent structural damage, it is important to choose a laminate floor covering in accordance with the intended use conditions and install it in accordance to the manufacturer's installation instructions (see also chapter 3.2).

4.2 Health aspects during usage MeisterWerke laminate floor coverings fulfil the requirements according to /EN 14041/ (CE marking)

Reaction to fire: C_{fl}-s1

Slip resistance: DS

Formaldehyde emissions: E1

Health related evaluation: approval principles of DIBt (Deutsches Institut für Bautechnik) for the Health-Related Evaluation of Construction Products are fulfilled (Z-156.606-464)

MeisterWerke Schulte GmbH laminate floorings described in this EPD are awarded by Blue Angel.

5 Singular effects

5.1 Fire Reaction to fire: C_{fl}-s1

The reaction to fire (fire classification incl. smoke development) is determined according to /EN 13501-1/ under consideration of /EN 14041/.

5.2 Water An appropriate DPM (Damp Proof Membrane) needs to be installed under laminate floor coverings in order to hold back potential rising dampness. Exposure to moisture during a longer period of time can lead to irreversible destruction of the material.

5.3 Mechanical damage Choosing the right floor covering and underlayment in accordance with application area and taking the precautions recommended by the manufacturer should prevent mechanical damage. The cleaning and maintenance instructions of the manufacturer shall be followed.

6 End of life stage

The post-consumer laminate floor covering waste can be classified according to the „European Waste Catalogue“/EWC/. The main category is: 17 construction and demolition wastes / EWC code 170201 wood.

Other classifications according to the local waste management systems are also possible.

6.1 Recycling or re-use Post-consumer laminate floor covering waste can be recycled as wood based products. When appropriate recycling facilities do not exist, laminate floor coverings shall be thermally recycled.

A reinstallation of laminate floor coverings is possible.

6.2 Disposal The laminate floor coverings should be recycled or re-used (see 6.1).

7 Life cycle assessment

7.1 General The LCA covers all life cycle stages from cradle to grave. For the production process specific data of MeisterWerke Schulte GmbH are used, the other life cycle stages are based on the average /DPL EPD/ developed by EPLF e.V.

7.2 Functional unit The functional unit is 1 m² laminate floor covering for a reference service life of 15 years.



Product group, PCR: Laminate Floor Covering, Floor coverings 2008
Declaration holder: MeisterWerkeSchulte GmbH
Number of Declaration: EPD-MWS-20111111-E

Issued
20-05-2011

- 7.3 Cut-off criteria** The cut-off criteria described in the /PCR/ are applied. Input data for energy usage and mass are sufficiently available and considered in the LCA.
- 7.4 Allocation** According to /ISO 14044/, allocation is defined as partitioning the input or output flows of a process or a product system between the product system under study and one or more other product systems. For the end of life a thermal recycling of post-consumer laminate flooring waste in a Waste Incineration Plant (WIP) is considered. The respective credit for energy substitution is based on a European electric power and steam mix.
- 7.5 Background data** The used background data are the International Reference Life Cycle Data System (ILCD) integrated in the GABI software and the /GABI 4/ background database. For thermal and electric energy average German background data are used for the foreground processes.
- 7.6 Data quality** The age of the used data is less than five years. The data of the foreground processes for the DPL production is based on input-output analyses at MeisterWerke Schulte GmbH.
- 7.7 System boundary** The LCA considers all life cycle stages from cradle to grave.
The **production stage** includes all relevant processes from “cradle to factory gate” within the cut off rules. This includes for example the extraction and manufacture of all raw materials and their delivery to the production site, the manufacturing of floor coverings from raw materials, storage and transports. Packaging is included.
The **installation** includes the delivery of the laminate floor covering to the point of installation and its fitting. For the fitting waste and the packaging material a thermal recycling in a WIP is considered. Underlayment necessary for the fitting is not included.
The **use stage** includes the cleaning of the laminate floor covering for the 15 year reference service life. The cleaning frequencies described in table 3 are considered for an average level of use (90% domestic and 10% commercial), according to the market shares of distribution.
The **end of life stage** includes the transport of the floor covering to the end of life processes. In this LCA thermal recycling of post consumer laminate flooring waste in a WIP is considered. All waste management processes are included in the calculation until final deposition, with the exception of the deposition of nuclear waste, which cannot be modelled due to its extremely long deposition times.
- 7.8 Note on use stage** The estimated service life of a floor covering depends e.g. on the type of floor covering and the area of application, the user himself and the maintenance of the product. Comparisons of different floor coverings are only allowed, if these parameters are considered in a consistent way.
In the LCA, the results are declared for a 15-year reference service life.
- 7.9 Results of the assessment** The LCA results are given in the following tables.



Product group, PCR: Laminate Floor Covering, Floor coverings 2008
Declaration holder: MeisterWerkeSchulte GmbH
Number of Declaration: EPD-MWS-20111111-E

Issued
20-05-2011

7.9.1 Production stage

Table 4: LCI and LCA results for the production stage

Parameter	Unit per m ²	Thickness of 1m ² laminate flooring		
		7 mm	8 mm	9 mm
Primary energy, non-renewable	[MJ]	118,8	138,8	148,9
Primary energy, renewable	[MJ]	110,3	123,3	141,5
Global warming potential (GWP 100)	[kg CO ₂ -eqv.]	-2,1	-1,9	-2,9
Ozone depletion potential (ODP)	[kg R11-eqv.]	7,89E-07	9,48E-07	9,99E-07
Acidification potential (AP)	[kg SO ₂ -eqv.]	0,026	0,029	0,032
Eutrophication potential (EP)	[kg PO ₄ -eqv.]	0,0060	0,0067	0,0075
Photochemical oxidation formation potential (POCP)	[kg ethylene-eqv.]	0,0043	0,0048	0,0054

7.9.2 Installation

Table 5: LCI and LCA results for delivery and installation

Parameter	Unit per m ²	Thickness of 1m ² laminate flooring		
		7 mm	8 mm	9 mm
Primary energy, non-renewable	[MJ]	0,4	0,4	0,4
Primary energy, renewable	[MJ]	-0,02	-0,02	-0,02
Global warming potential (GWP 100)	[kg CO ₂ -eqv.]	0,17	0,20	0,23
Ozone depletion potential (ODP)	[kg R11-eqv.]	-2,7E-09	-3,3E-09	-3,92E-09
Acidification potential (AP)	[kg SO ₂ -eqv.]	0,00054	0,00060	0,00069
Eutrophication potential (EP)	[kg PO ₄ -eqv.]	0,00010	0,00011	0,00013
Photochemical oxidation formation potential (POCP)	[kg ethylene-eqv.]	4,03E-05	4,46E-05	5,1E-05

7.9.3 Use stage

Table 6: LCI and LCA results for the use stage

Parameter	Unit per m ²	1m ² laminate floor covering
Primary energy, non-renewable	[MJ]	1,7
Primary energy, renewable	[MJ]	0,08
Global warming potential (GWP 100)	[kg CO ₂ -eqv.]	0,25
Ozone depletion potential (ODP)	[kg R11-eqv.]	1,24E-08
Acidification potential (AP)	[kg SO ₂ -eqv.]	0,00072
Eutrophication potential (EP)	[kg PO ₄ -eqv.]	0,00019
Photochemical oxidation formation potential (POCP)	[kg ethylene-eqv.]	4,33E-05

The values are given for a **one-year** usage. For the modelling of the whole life cycle these values have to be multiplied with the respective service life.



Product group, PCR: Laminate Floor Covering, Floor coverings 2008
 Declaration holder: MeisterWerkeSchulte GmbH
 Number of Declaration: EPD-MWS-20111111-E

Issued
 20-05-2011

7.9.4 End of life stage

Table 7: LCI and LCA results for the end of life stage

Parameter	Unit per m ²	Thickness of 1m ² laminate flooring		
		7 mm	8 mm	9 mm
Primary energy, non-renewable	[MJ]	-66,64	-74,47	-85,38
Primary energy, renewable	[MJ]	1,67	-1,87	-2,14
Global warming potential (GWP 100)	[kg CO ₂ -eqv.]	6,34	7,09	8,13
Ozone depletion potential (ODP)	[kg R11-eqv.]	-2,59E-07	-2,89E-07	-3,31E-07
Acidification potential (AP)	[kg SO ₂ -eqv.]	0,0112	0,0126	0,0144
Eutrophication potential (EP)	[kg PO ₄ -eqv.]	0,0032	0,0036	0,0041
Photochemical oxidation formation potential (POCP)	[kg ethylene-eqv.]	7,95E-05	8,88E-05	1,02E-04

7.10 Life cycle inventory analysis

The following chapters describe the LCI parameters required by the PCR floor covering for 1m² of laminate floor covering. All life cycle stages are considered for a 15-year use.

7.10.1 Primary energy

Figure 2 shows the **renewable primary energy** consumption for 1m² of laminate floor covering subdivided in the different life cycle stages: production, delivery to the point of installation, fitting, cleaning and end of life, for a 15-year reference service life.

The **renewable primary energy** mainly results from the production process. The influence of the other life cycle stages is negligible.

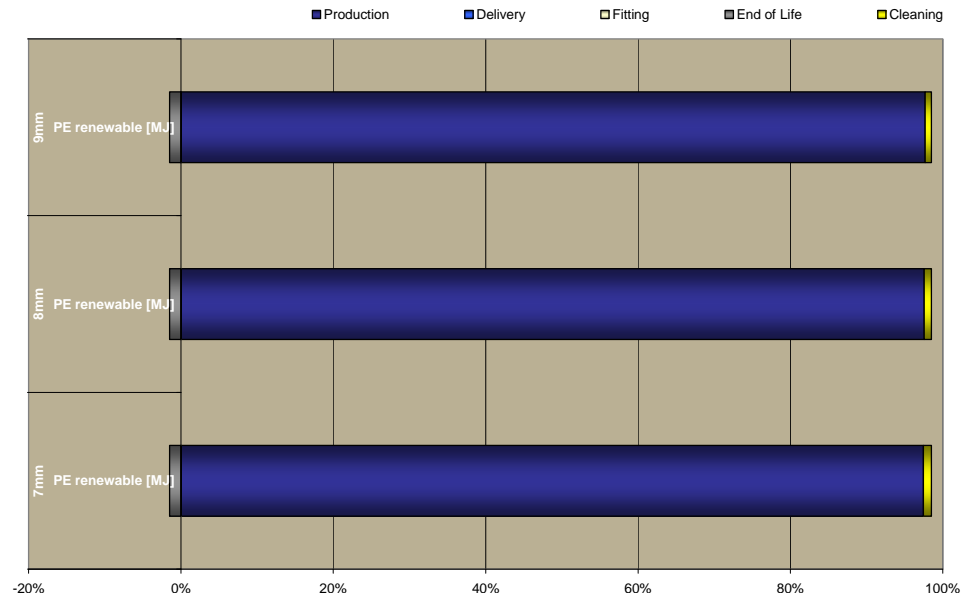


Figure 2: Consumption of renewable primary energy for the whole life cycle (15 years reference service life)

Figure 3 shows the **non-renewable primary energy** consumption for 1m² of laminate floor covering subdivided into the different life cycle stages.



Product group, PCR: Laminate Floor Covering, Floor coverings 2008
 Declaration holder: MeisterWerkeSchulte GmbH
 Number of Declaration: EPD-MWS-20111111-E

Issued
 20-05-2011

The **non-renewable primary energy** consumption is mainly determined by the production process. Delivery and fitting have only marginal effects. Cleaning per 15 years requires an amount of 26 MJ/m². The credit for the non-renewable primary energy results from thermal recycling (energy substitution) of the post consumer laminate waste.

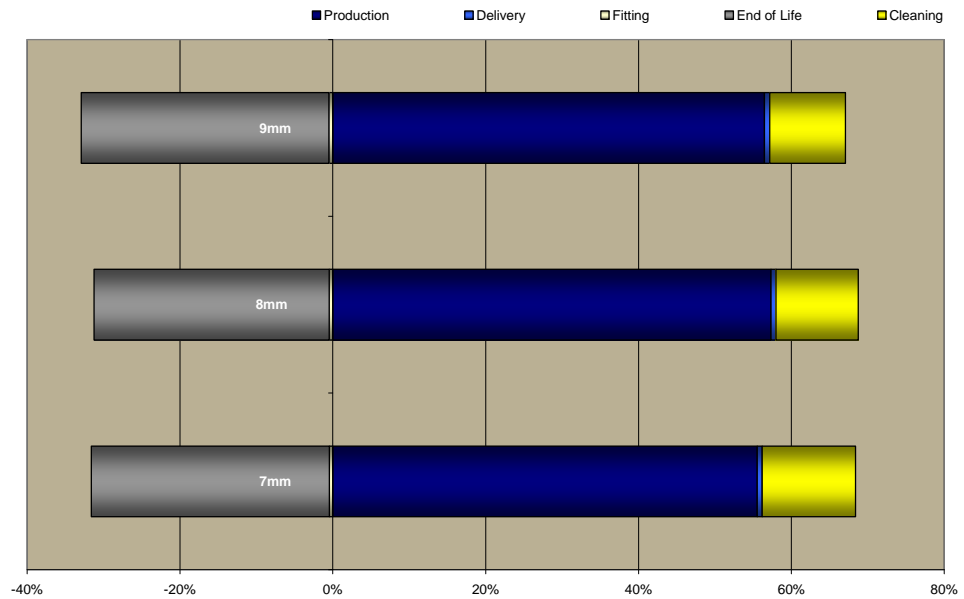


Figure 3: Consumption of non-renewable primary energy for the whole life cycle (15 years reference service life)

Figure 4 breaks down the consumption of **non-renewable** and **renewable primary energy** for the **production stage** of 1m² DPL floor covering.

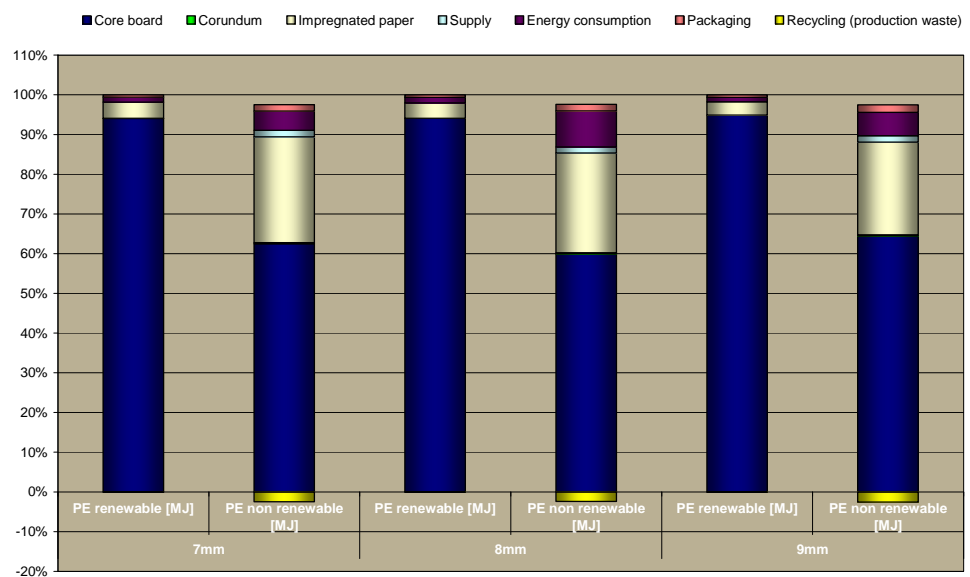


Figure 4: Contribution of production parameters to primary energy consumption



Product group, PCR: Laminate Floor Covering, Floor coverings 2008
 Declaration holder: MeisterWerkeSchulte GmbH
 Number of Declaration: EPD-MWS-20111111-E

Issued
 20-05-2011

More than 94% of **renewable primary** energy consumption results from the core board, this is mainly the sunlight energy locked into the wood by photosynthesis.

Depending on the thickness of the laminate floor covering, 63% to 68% of the **non-renewable** primary energy consumption results from the production of the core board. For the provision of impregnated paper 25% to 28% are consumed, this share is mainly determined by the resin used for the impregnation (> 80%). The production relevant energy consumption (thermal and electric) has a share of 5% to 9%. Packaging (1%-2%) and corundum (<0.5%) play a secondary role. The thermal recycling (energy substitution) of production waste results in a credit of approx. 3%.

Figure 5 specifies the **non-renewable** resources for the primary energy consumption.

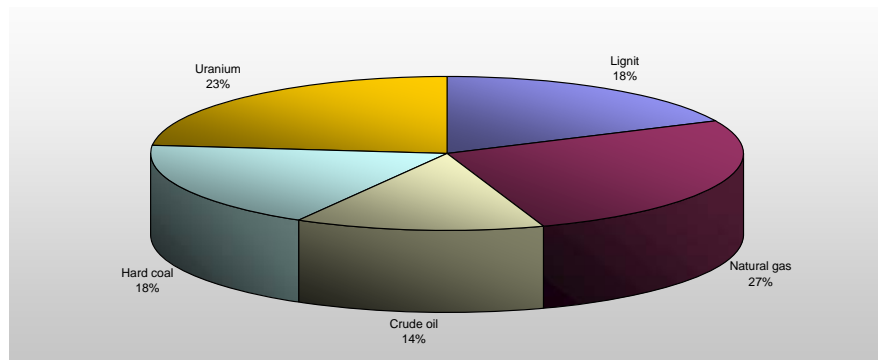


Figure 5: Breakdown of non-renewable resources (15 years reference service life)

7.10.2 Non-renewable material resources

Non renewable material resources are of fossil or mineral origin. They are either used as energy source or as raw material for the product.

The non-renewable resources used as energy source are described in chapter 7.10.1. The non-renewable mineral resources are >93% overburden, which is in general removed by mining, a background processes for energy generation.

7.10.3 Water consumption

Table 8: Water consumption

Parameter	Unit	7 mm	8 mm	9 mm
Production stage	[kg/m ²]	42,35	48,20	51,12
Delivery and installation	[kg/m ²]	0,12	0,14	0,17
Use stage	[kg/m ²]	18,06	18,06	18,06
End of life	[kg/m ²]	8,19	9,15	10,49

The water consumption is the aggregated value of input and output. Water that is used for floor cleaning (approx. 7 l/m² and year) goes back into the water cycle after wastewater treatment.



Product group, PCR: Laminate Floor Covering, Floor coverings 2008
 Declaration holder: MeisterWerkeSchulte GmbH
 Number of Declaration: EPD-MWS-20111111-E

Issued
20-05-2011

7.10.4 Waste

Table 9: Waste

Overburden/sedimentation

Parameter	Unit	7 mm	8 mm	9 mm
Production stage	[kg/m ²]	16,65	20,83	21,88
Delivery and installation	[kg/m ²]	-0,03	-0,04	-0,05
Use stage	[kg/m ²]	2,48	2,48	2,48
End of life	kg/m ²]	-2,87	-3,21	-3,68

Municipal waste

Parameter	Unit	7 mm	8 mm	9 mm
Production stage	[kg/m ²]	0,020	0,022	0,025
Delivery and installation	[kg/m ²]	2,69E-08	3,28E-08	3,91E-08
Use stage	[kg/m ²]	0,027	0,027	0,027
End of life	kg/m ²]	4,98E-05	5,56E-05	6,37E-05

Hazardous and nuclear waste

Parameter	Unit	7 mm	8 mm	9 mm
Production stage	[kg/m ²]	0,021	0,025	0,028
Delivery and installation	[kg/m ²]	0,001	0,001	0,001
Use stage	[kg/m ²]	0,002	0,002	0,002
End of life	kg/m ²]	-0,003	-0,003	-0,003

7.11 Life cycle impact assessment

The life cycle impact assessment is defined as a phase of life cycle assessment with the objective of understanding and evaluating the magnitude and significance of the potential environmental impacts for a product system throughout the life cycle of the Product /ISO 14044/. The following parameters, based on CML 2002 /CML 2002/ are considered /GABI 4/:

Global Warming Potential (GWP 100)

The Global Warming Potential, an indicator that refers to the amount of global warming caused by a substance. The GWP is the ratio of the warming caused by a substance to the warming generated by a similar mass of carbon dioxide. GWP100 translates the quantity of emission of gases into a common measure to compare their contributions - relative to carbon dioxide - to the absorption of infrared radiation in a 100 year perspective.

Acidification Potential (AP)

Acidification potential is the result of aggregating acid, expressed in SO₂ equivalents. The AP is an important environmental indicator. Acidification potential translates the quantity of emission of substances into a common measure to compare their contributions to the capacity of releasing hydrogen ions. Acidification originates from the emissions of sulphur dioxide and oxides of nitrogen. In the atmosphere, these oxides react with water vapour and form acids which subsequently fall down to earth in the form of rain or snow or as dry depositions.



Product group, PCR: Laminate Floor Covering, Floor coverings 2008
 Declaration holder: MeisterWerkeSchulte GmbH
 Number of Declaration: EPD-MWS-20111111-E

Issued
 20-05-2011

Ozone depletion potential (ODP)

The ODP is the ratio of the impact on ozone of a chemical compared to the impact of a similar mass of CFC-11. The ODP of CFC-11 itself is defined to be 1. Other ozone-depleting substances have ODPs ranging from 0,02 to 10. Ozone forms a layer in the stratosphere protecting plants and animals from much of the sun's harmful UV-radiation. The ozone levels have declined as a consequence of CFCs and halons released into the atmosphere. A depletion of the ozone layer will increase the UV-radiation at ground level.

Photochemical ozone creation potential (POCP)

Photochemical ozone or ground level ozone is formed by the reaction of volatile organic compounds and nitrogen oxides in the presence of heat and sunlight. Ground-level ozone forms readily in the atmosphere, usually during hot summer weather. Photochemical ozone creation potential translates the quantity of emission of gases into a common measure to compare their contributions - relative to ethylene - to the formation of photochemical oxidants, measured in kg C2H4- Equivalent.

Eutrophication Potential (EP)

Index used to measure nutrient enrichment (eutrophication), which may result in algal blooms, caused by the release of sulphur, nitrogen, phosphorous and degradable organic substances into the atmosphere and water courses.

Figure 6 shows the percentage of all life cycle stages of 1m² DPL floor covering related to the different impact categories.

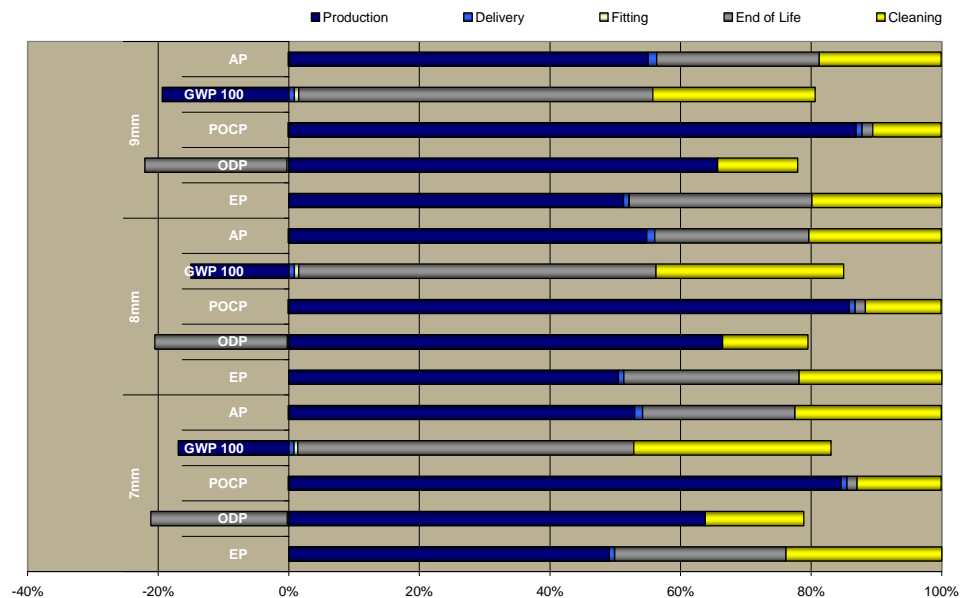


Figure 6: Breakdown of LCA impact categories for all life cycle stages

The balance shows credits for GWP 100 and ODP. The greenhouse gas carbon dioxide is locked in from the air in the course of the tree growth via photosynthesis and stored during the use stage. This carbon dioxide is not released until the end of life through thermal utilisation in e.g. a WIP. Due to the fact, that the core board of laminate flooring is wood based the CO₂ fixation results in a credit for GWP. The credit for ODP results from the thermal recycling and the respective substitution of energy generation from fossil resources. The impacts of delivery and fitting are of little importance. The contribution of cleaning over a 15-year reference service life period is more relevant.



Product group, PCR: Laminate Floor Covering, Floor coverings 2008
 Declaration holder: MeisterWerkeSchulte GmbH
 Number of Declaration: EPD-MWS-2011111-E

Issued
 20-05-2011

A closer examination of the production stage is given in figure 7. Figure 7 shows the percentage of the different production parameters on the impact categories.

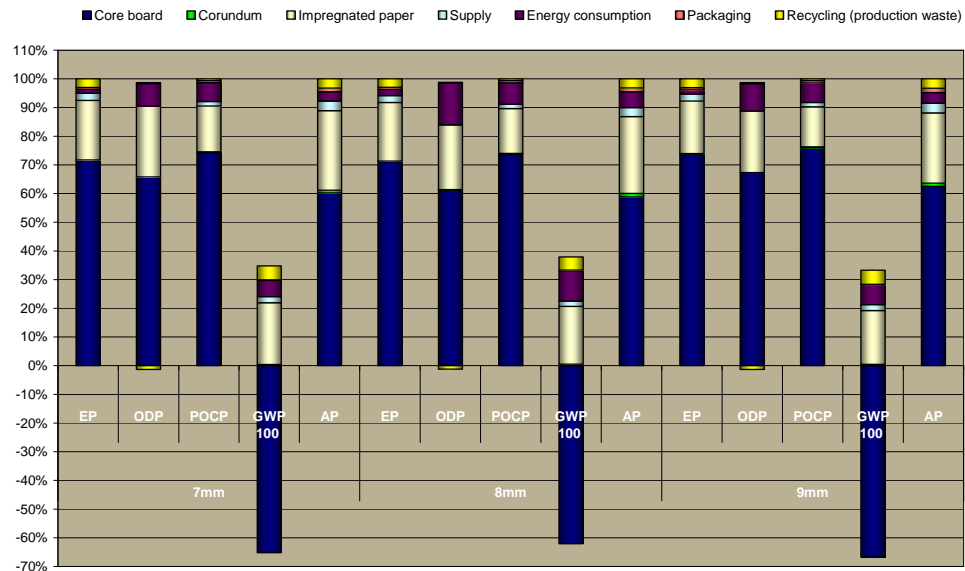


Figure 7: Percentage of production parameters for the production stage

It is obvious that the background data for the production of the core board and the resin impregnated papers determine the impact categories. For the environmental impact of the impregnated paper the used resin is mainly responsible. The production related energy consumption has a share of 2% to 14% and the recycling of production waste has a share of 1% to 5% in the different impact categories. Packaging, supply and corundum have only marginal effects on the environment.

7.12 Interpretation For the calculation of the environmental impact of installation waste the values for production (Table 5), delivery and installation (Table 6) and end of life (Table 8) have to be multiplied with the amount of waste (e.g. 3% installation waste, factor 1.03).

8 Additional information, evidence and test

- General technical approval (Z-156.606-464)
- CE Marking, EC Declaration of conformity (March 1st, 2010)



Product group, PCR: Laminate Floor Covering, Floor coverings 2008
Declaration holder: MeisterWerkeSchulte GmbH
Number of Declaration: EPD-MWS-20111111-E

Issued
20-05-2011

9 References

- /AgBB scheme/ Evaluation scheme from AgBB (Committee for Health-related Evaluation of Building Products) for VOC; health-related evaluation procedure for volatile organic compounds emissions (VOC and SVC) from building products, 2008
- /ILCD/ ILCD database v 1.0.1, <http://lca.jrc.ec.europa.eu>, May 2009
- /EN 685/ Resilient, textile and laminate floor coverings-Classification, 2007
- /EN 13329/ Laminate floor coverings - Elements with surface layer based on aminoplastic thermosetting resins-Specifications, requirements and test methods, 2009
- /EN 13501-1/ Fire classification of construction products and building elements, Part 1: Classification using data from reaction to fire tests, 2007
- /EN 14041/ Resilient, textile and laminate floor coverings-Essential Characteristics, 2008
- /EWC/ 94/3/EC Commission Decision of 20 December 1993 establishing a list of wastes pursuant to Article 1a of Council Directive 75/442/EEC on waste, 1993
- /GaBi 4/ Software-System and Databases for Life Cycle Engineering Copyright TM. Stuttgart, Echterdingen
- /ISO 14025/ Environmental labels and declarations-Type III environmental declarations-Principles and procedures, 2006
- /ISO 14040/ Environmental management-Life cycle assessment-Principles and Framework, 2006
- /ISO 14044/ Environmental management-Life cycle assessment-requirements and guidelines, 2006
- /PCR/ PCR - Floor Coverings Product category Rules, 2008
- /DPL EPD/ EPLF® European Producers of Laminate Flooring e.V.: Environmental Product Declaration according to ISO 14025 - Direct Pressure Laminate Floor Covering; Institut Bauen und Umwelt e.V., August 2009

This EPD is based on the PCR floor coverings, 2008.

PCR review, was conducted by: Advisory board IBU: Prof. Dr.-Ing. Hans-Wolf Reinhardt (Universität Stuttgart, IWB)
Independent verification of the declaration and data, according to ISO 14025: <input type="checkbox"/> internal <input checked="" type="checkbox"/> external
Third party verification: Dr. Eva Schmincke



Institut Bauen
und Umwelt e.V.

Publisher:

Institut Bauen und Umwelt e.V.
Rheinufer 108
53639 Königswinter
Tel.: 02223 296679 0
Fax: 02223 296679 1
E-Mail: info@bau-umwelt.com
Internet: www.bau-umwelt.com

Layout:

MeisterWerke Schulte GmbH
Zum Walde 16
59602 Rùthen-Meiste
Germany

Picture Credits:

MeisterWerke Schulte GmbH
Zum Walde 16
59602 Rùthen-Meiste
Germany
Internet: www.meister.com