

Lighting for green buildings



LCA



Influence of lighting on green certification – 28 points

LEED certification – total 110 points (40-49 LEED certified, 50-59 Silver LEED, 60-79 Gold LEED, 80-110 Platinum LEED)

1. *Sustainable sites*
2. *Energy and atmosphere*
3. *Materials and resources*
4. *Indoor comfort and quality*
5. *Innovation and design process*
6. *Product transparency*

LCA life cycle assessment

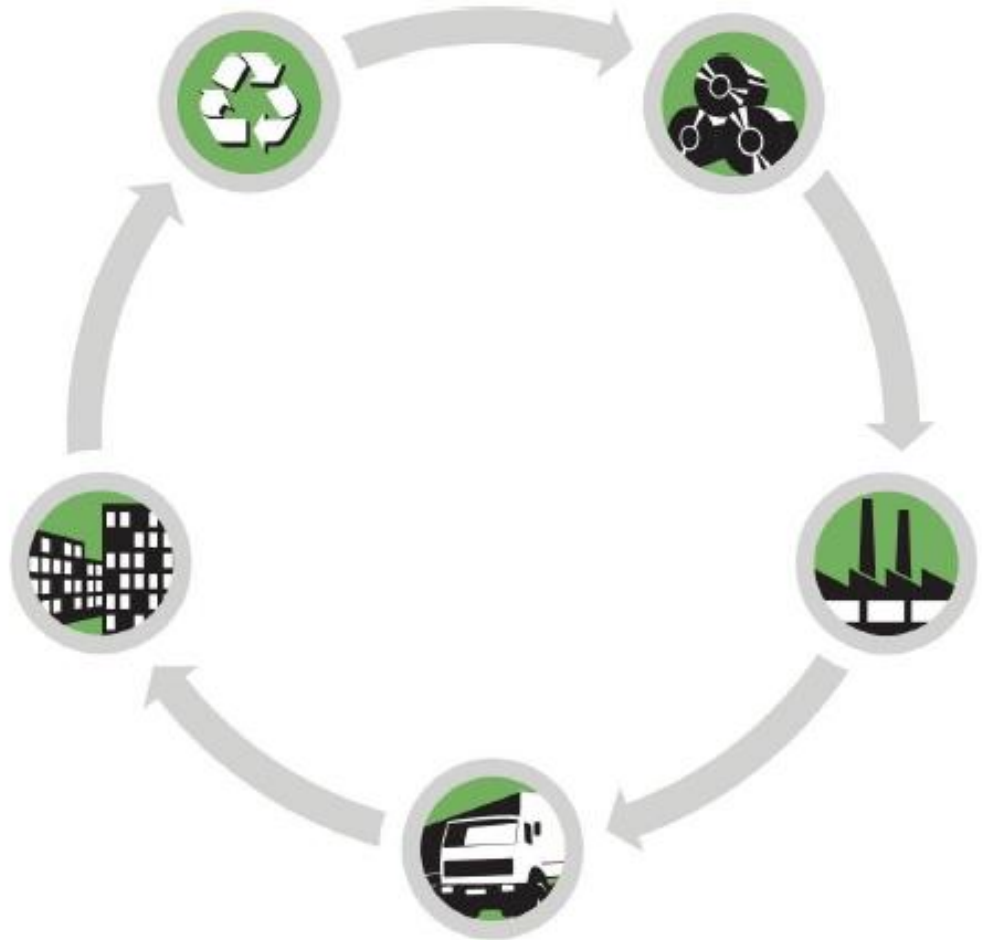
EPD environmental product declaration

Environmental Product Declaration

European Core EPD



Institute Construction
and Environment e.V.





Material composition

Materials	weight [kg]	weight [%]	Materials	weight [kg]	weight [%]
Steel	3,67E-02	2,98	Nickel	9,69E-07	0,00
Epoxy resin	2,00E-03	0,16	PC	3,41E-01	27,74
Silicon dioxide (SiO ₂)	2,00E-03	0,16	PE	1,58E-02	1,28
Silicon	5,22E-05	0,00	Copper	1,23E-01	9,96
Tin	4,67E-03	0,38	Ferrites	4,65E-02	3,78
Aluminum and alloys	6,19E-01	50,29	EPDM	2,16E-03	0,18
Aluminum Oxide (Al ₂ O ₃)	1,31E-03	0,11	Silicone	2,81E-04	0,02
Copper alloys	9,37E-04	0,08	Colophony	3,21E-05	0,00
Tetrabromobisphenol A (TBBA)	8,00E-06	0,00	TPE	3,51E-02	2,86
Tin in alloy	3,06E-04	0,02	Not Considered	0,00E+00	0,00
Gold	1,87E-06	0,00	Total Weight	1,23E+00	100,00

Manufacturing and delivery



- Manufacturing includes the extraction of raw materials, extraction of energy carriers, generation of thermal and electrical energy, production of ancillary materials or pre-products, manufacturing processes of the products and all components.
- Delivery is described as a standard model, where the distance from plant to customer is assumed to be 1500 km. The mode of delivery is by truck.

Packaging	weight [kg]	weight [%]
PE	1,00E-03	0,27
Paper	3,68E-01	99,73
Not Considered	0,00E+00	0,00
Total Weight	3,69E-01	100,00



Use-stage

- During the use-stage, consumption of electricity and potential replacement of components is taken into account.

Use-stage model	
Scenario	Office
Reference Service Lifetime [years]	15
Total active time [hours]	37 500
Total passive time [hours]	93 900
Correction factors F _{CP} /F _D /F _O for dimming/presence detection	1/0,9/1
Energy Mix	EU

The Constant Illuminance Factor F_{CP} , the Daylight Dependency Factor F_D and the Occupancy Dependency Factor F_O are considered according to EN ISO 15193.

Energy consumption in the use-stage according to the use-stage model	
Nominal Power [W]	23,0



End of life

- The product is obliged to be professionally recycled in accordance with the EU Directive 2002/96/EC on waste of electric and electronic equipment (WEEE).
- The End of Life scenario is based on a material split and respective recycling rates. In the applied scenario, all metals are assumed to be recycled, plastics are incinerated. The remaining parts are land filled.

System boundaries

- For the life cycle assessment, the following stages have been considered:

Building assessment information (x = included in LCA)																
Building life cycle information																Supplementary information beyond the building life cycle
Product Stage			Construction Process Stage		Use-stage							End-of-Life Stage			Benefits and loads beyond the system boundary	
Raw material supply	Transport	Manufacturing	Transport	Construction installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction / demolition	Transport	Waste processing	Disposal	Reuse, recovery or recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X			X	X				X		X			X	X	X	X