Environmental Product Declaration

In accordance with ISO 14025 ad EN 15804:2012+A2:2019

[*Silent Box*]

EPD registration number:	**S-P-05016**
Publication date:	**2022-01-11**
Validity date:	**2027-01-10**
Geographical scope:	**Worldwide**

1. Introduction

Kubik India Pvt Limited (Kubik) is engaged in the supply, and installation of customized modular aluminium framed office partition systems, doors & Silent Box. Silent Box details provided in Table 1. Silent Boxes are modular free standing pods for private conversation. The company offers its clients diversified & latest design products with high quality. Protecting the environment has always been the primary focus of Kubik since 2015.

Kubik has been designing and installing Silent Box in some of the most prestigious architectural projects across India with customized configurations & different configuration and sizes that are available. Kubik has serviced a high-profile clientele that includes some of the biggest international brands and brings on board an unmatched reputation for innovation and excellence. The mission of Kubik is to serve their customers with innovative & futuristic products, providing privacy, aesthetics, acoustics and value to a workplace with compassion, dedication and honesty.

This Environment Product Declaration (EPD) is for Silent Box having a single configuration.

2. General Information

2.1 EPD, PCR, LCA Information

Table 1: EPD Information

Programme	The International EPD® System, Indian Regional Hub www.environdec.com and www.envirodecindia.com
Program operator	EPD International AB Box 210 60, SE-100 31 Stockholm, Sweden.
Declaration holder	Mr. Gyan Pradhan KUBIK INDIA PVT LTD C-8/9/10, hind saurashtra industrial estate, marol naka, near mittal industrial, andheri-kurla road, andheri east, mumbai, maharashtra, india 400 059. Email: gyan@kubik.in
Product	Silent Box
CPC Code	4212 (Version 1.1)
EPD registration number	S-P-05016
Publication date	2022-01-11
Validity date	2027-01-10
Geographical scope	Worldwide
Reference standards	ISO 14025:2006, ISO 14040/44, EN 15804:2019 +A2

Table 2: PCR Information

Reference PCR	PCR CONSTRUCTION PRODUCTS' Version 1.11, 2019:14
Date of Issue	2021-02-05 (Valid until 2024-12-20)

Table 3: Verification Information

Demonstration of verification	External, independent verification
Third party verifier	Dr Hüdai Kara, Metsims Sustainability Consulting, 4 Clear Water Place, Oxford OX2 7NL, UK Email: hudai.kara@metsims.com

Table 4: LCA Information

Title	Environmental Product Declaration of Silent Box
Preparer	Dr. Rajesh Kumar Singh thinkstep Sustainability Solutions - a Sphera Company 707, Meadows, Sahar Plaza, Andheri Kurla Road, Andheri East, Mumbai - 400059, India Email: rsingh@sphera.com

2.2 Reference Period of EPD Data

The reference period for the data used within this EPD is May 2020 - June 2021.

2.3 Geographical Scope of EPD Application

The geographical scope of this EPD is Worldwide.

2.4 Additional Information about EPD

This EPD provides information for Silent Box. The EPD is in accordance with ISO 14025. The Life Cycle Assessment (LCA) study carried out for developing this EPD for Silent Box is as per ISO 14040 and ISO 14044 requirements

The PCR CONSTRUCTION PRODUCTS Version 1.11, 2019:14, being compliant with ISO 14025, ISO 14040 and ISO 14044 was used to conduct the assessment. The LCA was carried out using Cradle to Grave approach, according to the identified PCR using Sphera Solutions Inc.'s GaBi (v10) software.

3. Product Description and System Boundaries

The Silent Box product assembly is made of aluminium extrusion profile, glass, wood, steel, Silent Box hardwares and plastics. Glass may be either toughened, laminated or annealed glass. The model number, name and product image of Silent Box assembly are provided in Table 1. The range of percentage material content of the Silent Box, including product weight is provided in Table 2.

Silent Box has 100 X 100 mm corner structural profile which are factory cut and pre assembled, site works include joining of the wall panels together. Silent Box is a free standing model without any support from ceiling or sides. Ambient air circulation system is also provided. along with lights, power sockets (LAN connectivity), telephone Connectivity, & dual USB port for quick charging with universal sockets.

For glazed Panel, glazing portion is frameless glass frame in Kubik anodized aluminium glass frame with 25 mm Ceramic border of black colour on all four sides of glass. Side MDF Double walls are pre assembled in the assembly factory & infilled with rockwool.

Door panel used is STILE 35 door with 10 mm glass. The table top is made of superior birchwood which does not have termite or any defects and height of the table top can be changed as per client need. The product has an unique concealed top bottom invisible pivot. There is a lock of superior make with magnetic lock and uniquely designed handle. Smallest drop seal of Kubik make is installed according to the door width. There are options of colour shades of acoustic fabric and laminate shades

The declared unit is 1 piece of Double Glazed Silent Box Product with L x W x H : 1.2 m x 1.2 m x 2.1 m in which W x H : 900 mm x 2.1 m door opening is incorporated. The glass thickness is 6 mm + 6mm & thickness of glass for Stile 35 door opening is 10mm.

Table 1 Silent Box Model (Configuration)

Model no.	Name	Product Weight (kg)	Product Description	Product Image
Model 1	Silent Box	360.60	Kubik Silent Box available as "Silent Box 1.2 x 1.2", "Silent Box 2.5 x 2.5" & "Silent Box 3 x 3" provides a comfortable, sound-proof space for confidential phone call, private video conference, or just take a minute to quietly collect your thoughts still exist and rejuvenate or silent retreat for uninterrupted work. Kubik phone booth has no base & stands directly on the floor of your office, making it safe, quick to install and easy to relocate. A versatile, practical & dynamic phone booth that is part & parcel of a new way of conceiving the workspace.The SilentBox offers an acoustic insulation of upto 34 dB according to ASTME 596.	

Table 2 Materials by % mass for Silent Box Model

Material	% Distribution (Double Glazed)	% Recycled Content
Aluminium	20	32
Glass	27	7
Plastics	1	-
Wood	51	-
Steel	1	56
Total	100	

LCA

4.1 Information Sources and Data Quality

Kubik India Pvt. Ltd. provided primary data with a very high data quality for their Silent Box. The quality of the LCI data for modelling the life cycle stages, assessed according to ISO 14044 (2006) is judged by its precision (measured, calculated or estimated), completeness (e.g. are there unreported emissions), consistency (degree of uniformity of the methodology applied on an LCA serving as a data source) and representativeness (geographical, time period, technology). To achieve this, industry data collected directly from the producers were used wherever possible. All upstream LCA data are from the GaBi 10 Professional database from Sphera Solutions Inc.

4.2 Methodological Details

4.2.1 Declared unit

The declared unit is 1 piece of Double Glazed Silent Box with L x W x H : 1.2 m x 1.2 m x 2.1 m in which W x H : 900 mm x 2.1 m door opening is incorporated and glass thickness for double glaze fix glass is 6 mm + 6mm & Thickness of glass for Stile 35 door opening is 10mm.

4.2.2 Selection of application of LCIA categories

The environmental impact per declared unit for the following environmental impact categories were reported in the EPD according to the mentioned PCR in modular format of A-D. EN15804:2012+A2:2019 specifies 'IPCC (2013)' (AR5) as the reference for the GWP indicator. The same has been used and documented below.

Table 3 Environmental Impacts Indicators

Impact Indicator	LCIA Method	Unit
Global Warming Potential (GWP-total)	IPCC 2013	kg CO_2 equivalent
Global Warming Potential (GWP-fossil)	IPCC 2013	kg CO_2 equivalent
Global Warming Potential (GWP-biogenic)	IPCC 2013	kg CO_2 equivalent
Global Warming Potential land use and land use change (GWP-luluc)	IPCC 2013	kg CO_2 equivalent
Acidification Potential	CML	mol SO_2 equivalent
Eutrophication Potential (EP-freshwater)	CML	kg P equivalent
Photochemical Ozone Creation Potential	CML	kg ethene equivalent
Abiotic depletion potential – Elements	CML	kg Sb equivalent
Abiotic depletion potential – Fossil fuels	CML	MJ, net calorific value
Water scarcity potential	AWARE 2016	m^3 world equivalent deprived

Table 4 Resources Use Parameters

Parameter	Unit
Primary energy resources – Renewable	MJ, net calorific value
Primary energy resources – Non-Renewable	MJ, net calorific value
Secondary Material	kg
Renewable secondary fuels	MJ, net calorific value
Non-renewable secondary fuels	MJ, net calorific value
Net use of fresh water	m^3

The consumption of resources declared per function unit is reported in the EPD. Input parameters, describing resource use are shown in Table 4.

Table 5 Optional Environmental Indicators

Parameter	Unit
Human toxicity, cancer (recommended and interim)	cases
Human toxicity, non-canc. (recommended and interim)	cases
Fresh water ecotoxicity (recommended and interim)	PAF.m^3.day
Land Use	species. yr

Table 6 Waste Categories

Waste categories	Unit
Hazardous waste disposed	kg
Non-hazardous waste disposed	kg
Radioactive waste disposed/stored	kg

Table 7 Indicators describing the output flows

Parameter	Unit
Components for reuse	kg
Material for recycling	kg
Materials for energy recovery	kg
Exported energy, electricity	MJ
Exported energy, thermal	MJ

4.3 Cut-off Criteria

Input and output data have been collected through detailed questionnaires which have been developed and refined. In practice, this means that, at least, all material flows going into the production processes (inputs) higher than 1% of the total mass flow (t) or higher than 1% of the total primary energy input (MJ) are part of the system and modelled in order to calculate elementary flows. Inputs with less than 1% of mass flow and less than 1% of the total primary energy input are also considered as all these were environmentally relevant.

4.4 Allocation

No allocation has been done. As no co-products are produced, the flow of materials and energy and the associated release of substances and energy into the environment is related exclusively to the Entropy model produced. Any allocation performed in the background processes is according to the PCR.

4.5 System Boundaries

The system boundary for Silent Box represents a Cradle-to-Grave, which covers production phase, packaging phase and End of life phase. The production phase includes the raw material extraction, production of the raw materials, auxiliary material production, upstream transportation, manufacturing process of the final product and its packaging. End of life phase includes waste processing for reuse, recovery or recycling and disposal.

Table 8 Details of system boundary included in the study

EPD Module	Life Cycle Stages	Life Cycle Sub-stages	Definitions
A1	Materials	Primary raw material production	Extraction and production of raw material in the upstream
A2	Upstream Transport	-	Transport of raw material to the assembly site
A3	Manufacturing	Assembly of Silent Box	Assembly of raw material to form packed product i.e. aluminium extrusion profile, glass, steel cold rolled coil, electronic installations, fixing material screws and packing material like plastic film, plastic foil and corrugated paper
A4	Transport	-	Transport of packed Silent Box to installation site
A5	Installation	-	Separation of packaging material and installation of Silent Box
C1	Deconstruction and demolition	-	Considered to be zero as manual separation of parts of Silent Box is considered
C2	Transport	-	With a collection rate of 100%, the transports are carried out by truck over 50 km
C3	Waste Processing	Segregation	Separation of aluminium, steel, plastic and inert matter to landfill and end of life treatment
C4	Disposal	-	Material not getting recycled is considered for landfill. Thus 5% of aluminium is considered for landfill as 95% is considered for credit and 15% of steel is considered for landfill as 85% is considered for credit
D	EOL Credit	-	Aluminium and Steel is 100% recyclable material and as per World Steel Data 85% recoverability is observed while as per IAI global bench mark the recycling rate is 98.5%. Thus 85% of steel and 95% is of aluminium is considered for EOL credit

4.5.1 Geographic System Boundaries

The geographical coverage of this declaration covers the production of Silent Box in India. Wherever possible, the country specific (India) boundaries have been adapted and other datasets were chosen from EU if no Asian Countries datasets were available

4.5.2 Temporal System Boundaries

The data collection is related to one year of operation and the year of the data is indicated in the questionnaire for each data point. The majority of data was derived for the year 2020-21 (May 2020 to June 2021) and is believed to be representative of production of product Silent Box in India during this time frame.

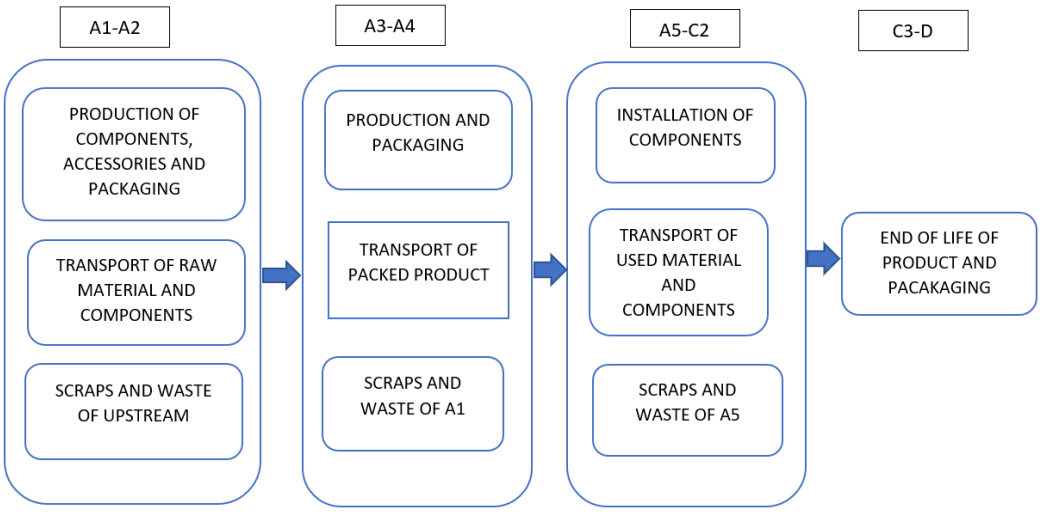

Figure 1 Details of System Boundary for Silent Box

4.5.3 Technology coverage

The exact technological configuration was used for the various process's operation of its plant for efficient performance in production and minimizing environmental impacts. It was assumed that secondary data from databases that were used for this assessment, were temporally and technologically comparable to that of primary data and within the temporal coverage already addressed.

4.6 Software and database

The LCA model was created using the GaBi 10 Software system for life cycle engineering, developed by Sphera Solutions. The GaBi database provides the life cycle inventory data for several of the raw and process materials obtained from the upstream system. Detailed database documentation for GaBi datasets can be accessed at http://www.gabi-software.com/international/support/gabi/gabi-database-2020-lci-documentation.

4.7 Comparability

According to the standards, EPDs do not compare the environmental performance of products in the sector. Any comparison of the declared environmental performance of products lies outside the scope of these standards and is suggested to be feasible only if all compared declarations follow equal standard provisions.

4.8 Results

Modules of the production life cycle included as per PCR is given in Table

Table 9 Modules of Production life cycle included (X= Declared Module; MND = Module not declared)

Production			Installation		Use Stage							End of Life				Next Product System
Raw material supply (extrac-tion, processing, recycled mate-rial)	Transport to manufacturer	Manufacturing	Transport to building site	Installation into building	Use / application	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction / demolition	Transport to EoL	Waste processing for reuse, re-covery or recycling	Disposal	Reuse, recovery or recycling po-tential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	X	X	X	X

The tables below show the life cycle environmental impacts for 1 piece of Double Glazed Silent Box with L x W x H : 1.2 m x 1.2 m x 2.1 m in which W x H : 900 mm x 2.1 m Stile 35 door opening incorporated & Glass thickness for double glaze fix glass is 6 mm + 6mm & Thickness of glass for door opening is 10 mm

4.8.1. Silent Box Model 1: The table below shows the LCIs, LCIAs Resource use, for Silent Box Model configuration.

Table 10 LCIA and LCI Result for Silent Box Model

Environmental Impact Indicators	Unit	A1-A3	A4	A5	C1	C2	C3	D
Climate Change - total	[kg CO2 eq.]	1.69E+03	2.24E+01	1.12E+00	0	2.23E+01	1.71E+02	-6.59E+02
Climate Change, fossil	[kg CO2 eq.]	1.95E+03	2.24E+01	8.82E-02	0	2.23E+01	1.49E+01	-6.57E+02
Climate Change, biogenic	[kg CO2 eq.]	-2.62E+02	1.22E-02	1.03E+00	0	1.22E-02	1.57E+02	-1.17E+00
Climate Change, land use and land use change	[kg CO2 eq.]	2.91E+00	1.17E-03	3.47E-05	0	1.17E-03	6.00E-03	-1.98E-01
Ozone depletion	[kg CFC-11 eq.]	3.52E-10	1.84E-15	2.03E-16	0	1.84E-15	3.51E-14	-1.19E-12
Acidification	[Mole of H+ eq.]	2.22E+01	1.90E-01	4.69E-04	0	1.89E-01	8.57E-02	-2.59E+00
Eutrophication, freshwater	[kg P eq.]	1.47E-03	4.74E-06	1.18E-05	0	4.72E-06	7.37E-03	-2.28E-04
Eutrophication, freshwater	[kg PO_4 eq]	4.51E-03	1.46E-05	3.62E-05	0	1.45E-05	2.26E-02	-7.00E-04
Eutrophication, marine	[kg N eq.]	2.67E+00	8.72E-02	2.09E-04	0	8.69E-02	7.35E-02	-4.29E-01
Eutrophication, terrestrial	[Mole of N eq.]	2.95E+01	9.57E-01	1.54E-03	0	9.53E-01	2.66E-01	-4.69E+00
Photochemical ozone formation, human health	[kg NMVOC eq.]	7.86E+00	1.67E-01	7.02E-04	0	1.66E-01	1.16E-01	-1.33E+00
Resource use, mineral and metals	[kg Sb eq.]	6.17E-04	2.96E-07	4.98E-09	0	2.95E-07	8.24E-07	-2.69E-04
Resource use, fossils	[MJ]	2.04E+04	2.97E+02	1.22E+00	0	2.96E+02	1.94E+02	-8.63E+03
Water use	[m^3 world equiv.]	1.71E+02	6.77E-02	2.11E-03	0	6.74E-02	4.97E-01	-5.63E+01
Disclaimer: EP-freshwater indicator has also been calculated as “kg P eq” as required in the characterization model (EUTREND model, Struijs et al., 2009b, as implemented in ReCiPe; http://eplca.jrc.ec.europa.eu/LCDN/developerEF.xhtml) in addition to “kg PO4 eq” as stated in the standard.“								

Table 11 Resource use indicators Result for Silent Box Model

Resource use indicators	Unit	A1-A3	A4	A5	C1	C2	C3	D
Use of renewable primary energy (PERE)	[MJ]	5.45E+03	9.70E-01	7.84E-02	0	9.66E-01	1.45E+01	-2.55E+03
Total use of renewable primary energy resources (PERT)	[MJ]	5.45E+03	9.70E-01	7.84E-02	0	9.66E-01	1.45E+01	-2.55E+03
Use of renewable primary energy resources used as raw materials (PERM)	[MJ]	0	0	0	0	0	0	0
Use of non-renewable primary energy (PENRE)	[MJ]	2.04E+04	2.97E+02	2.06E+01	0	2.96E+02	2.28E+02	-8.64E+03
Use of non-renewable primary energy resources used as raw materials (PENRM)	[kg]	1.12E+02	0	-1.94E+01	0	0	-3.36E+01	0
Total use of non-renewable primary energy resources (PENRT)	[MJ]	2.05E+04	2.97E+02	1.22E+00	0	2.96E+02	1.94E+02	-8.64E+03
Input of secondary material (SM)	[kg]	0	0	0	0	0	0	0
Use of renewable secondary fuels (RSF)	[m3]	0	0	0	0	0	0	0
Use of non-renewable secondary fuels (NRSF)	[MJ]	0	0	0	0	0	0	0
Use of net fresh water (FW)	[m^3]	5.98E+00	2.33E-03	9.76E-05	0	2.32E-03	1.85E-02	-5.66E+00

Table 12 Waste Categories and other indicators Result for Silent Box Model

Output flows and waste categories	Unit	A1-A3	A4	A5	C1	C2	C3	D
Hazardous waste disposed (HWD)	kg	7.15E-06	1.37E-09	1.19E-10	0	1.37E-09	1.85E-08	-6.61E-07
Non-hazardous waste disposed (NHWD)	kg	3.50E+02	5.36E-03	9.93E-01	0	5.33E-03	2.51E+02	-1.38E+02
Radioactive waste disposed (RWD)	kg	2.01E-01	6.46E-05	6.23E-06	0	6.43E-05	1.08E-03	-6.05E-01
Components for re-use (CRU)	kg	0	0	0	0	0	0	0
Materials for Recycling (MFR)	kg	0	0	0	0	0	0	0
Material for Energy Recovery (MER)	kg	0	0	0	0	0	0	0
Exported electrical energy (EEE)	MJ	0	0	0	0	0	0	0
Exported thermal energy (EET)	MJ	0	0	0	0	0	0	0
Other Indicators	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**D**
Particulate matter	Disease incidences	3.50E-04	1.26E-06	5.18E-09	0	1.25E-06	9.39E-07	-2.86E-05
Ionising radiation, human health	kBq U235 eq.	2.11E+01	6.05E-03	5.75E-04	0	6.02E-03	9.94E-02	-1.28E+02
Ecotoxicity, freshwater	CTUe	6.59E+03	1.17E+02	1.09E+00	0	1.16E+02	2.89E+02	-3.10E+03
Human toxicity, cancer	CTUh	4.28E-07	2.01E-09	4.79E-11	0	2.00E-09	9.07E-09	-2.45E-07
Human toxicity, non-cancer	CTUh	1.63E-05	9.54E-08	4.72E-09	0	9.50E-08	1.01E-06	-7.30E-06
Land Use	Pt	2.68E+04	1.29E+00	7.60E-02	0	1.28E+00	1.38E+01	-3.84E+02

4.9 Interpretation

The interpretation of impacts for Silent Box is as below:

Global Warming Potential (GWP): The GWP fossil is 1350 kg CO_2 eq., GWP biogenic is -105 CO_2 eq. and GWP land use change is 2.72 kg CO_2 eq. with major contribution from A1-A3 (1.69E+03 kg CO_2 eq.), A4 (22.4 kgCO_2 eq), A5 (1.12 kg CO_2 eq.), C2 (0.635 kgCO_2 eq), C3 (8.11 kgCO_2 eq), and D (-57. 31 kg CO_2 eq.). Considering overall impact as 100%, A1-A3 stage (product stage) contributes the highest (~80%, majorly from raw material supply)

Acidification Potential: The Acidification Potential is from A1-A3 (22.2 Mole of H^+ eq.), A4-A5 (0.19 Mole of H^+ eq), C2-C4 (2.32 Mole of H^+ eq) and D (-2.59 Mole of H^+ eq). Considering overall impacts as 100%, A1-A3 stage (product stage) contributes the highest (~80%, majorly from raw material supply).

Eutrophication freshwater: The Eutrophication freshwater is from A1-A3 (1.47E-03 kg P eq), A4-A5 (1.65E-05 kg P eq), C2-C4 (7.37E-03 kg P eq), and D (-2.28E-04 kg P eq) Considering overall impacts as 100%, A1-A3 stage (product stage) contributes the highest (~80%, majorly from raw material supply)

Eutrophication terrestrial: The Eutrophication terrestrial is from A1-A3 (2.95E+01 Mole of N eq), A4-A5 (2.75E-02 Mole of N eq.), C2-C4 (7.29E-02 Mole of N eq.) and D (-0.831 Mole of N eq). Considering over all impacts as 100%, A1-A3 stage (product stage) contributes the highest (~80%, majorly from raw material supply).

Eutrophication marine: The Eutrophication marine is from A1-A3 (2.67 kg N eq), A4-A5 (8.74E-02 kg N eq), C2-C4 (0.16 kg N eq), D (-4.29E-01 kg N eq.). Considering overall impacts as 100%, A1-A3 stage (product stage) contributes the highest (~80%, majorly from raw material supply).

Photochemical ozone formation (POCP): The POCP is from A1-A3 (7.86 kg NMVOC eq.), A4-A5 (1.68E-01 kg NMVOC eq.), C2-C4 (2.82E-01 kg NMVOC eq.) and D (-1.33 kg NMVOC eq). Considering overall impacts as 100%, A1-A3 stage (product stage) contributes the highest (~99%, majorly from raw material supply).

Resource use, minerals and metals: The Resource use, minerals and metals is from A1-A3 (2.04E-04 kg Sb eq.), A4-A5 (2.98E+02 kg Sb eq.), C2-C4 (4.90E+02 kg Sb eq.) and D (-8.63E+03 kg Sb eq.). Considering overall impacts as 100%, A1-A3 stage (product stage) contributes the highest (~98%, majorly from raw material supply).

Resource use Fossil fuels: The Resource use – Fossil fuels is from A1-A3 (2.04E+04 MJ), A4-A5 (2.98E+02 MJ), C2-C4 (4.90E+02MJ) and D (-54.81E+02). Considering overall impacts as 100%, A1-A3 stage (product stage) contributes the highest (~98%, majorly from raw material supply).

Water Use: The Water use is from A1-A3 (1.71E+02 m^3 world eq), A4-A5 (6.98E-02 m^3 world eq), C2-C4 (5.64E-01 m^3 world eq.) and D (-5.63E+01m^3 world eq). Considering overall impacts as 100%, A1-A3 stage (product stage) contributes the highest (~98%, majorly from raw material supply).

4 References

- GaBi 10_2021: Dokumentation der GaBi-Datensätze der Datenbank zur Ganzheitlichen Bilanzierung. LBP, Universität Stuttgart und Sphera Solutions Pvt Ltd GmbH
- GaBi 10_2021: Software und Datenbank zur Ganzheitlichen Bilanzierung. LBP, Universität Stuttgart und Sphera Solutions Pvt Ltd GmbH
- ISO 14020:2000 Environmental labels and declarations - General principles
- ISO 14025:2006 Environmental labels and declarations - Type III environmental declarations - Principles and procedures
- ISO 14040:2006 Environmental management- Life cycle assessment - Principles and framework
- ISO 14044:2006 Environmental management - Life cycle assessment - Requirements and guidelines.
- PCR 2019:14, Product Category Rules (PCR) for 'CONSTRUCTION PRODUCT' Version 1.11