



**Environmental
Product
Declaration**

According to EN15804+A2 (+indicators A1)



This declaration is for:
CLASS6060, aluminium billet
Provided by:
E-MAX



program operator
Stichting MRPI®
publisher
Stichting MRPI®
www.mrpi.nl

MRPI® registration
1.1.00516.2024
date of first issue
12-4-2024
date of this issue
12-4-2024
expiry date
12-4-2029





COMPANY INFORMATION



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PRODUCT

CLASS6060, aluminium billet

DECLARED UNIT/FUNCTIONAL UNIT

1kg Aluminium billet

DESCRIPTION OF PRODUCT

Aluminium billet

MRPI® REGISTRATION

1.1.00516.2024

DATE OF ISSUE

12-4-2024

EXPIRY DATE

12-4-2029

VISUAL PRODUCT



SCOPE OF DECLARATION

This MRPI®-EPD certificate is verified by Gert-Jan Vroege, Eco Intelligence. The LCA study has been done by Liz Adams, Ecomatters. The certificate is based on an LCA-dossier according to EN15804+A2. It is verified according to the 'MRPI®-EPD verification protocol November 2020.v4.0'. EPD's of construction products may not be comparable if they do not comply with EN15804+A2. Declaration of SVHC that are listed on the 'Candidate list of Substances of Very High Concern for authorisation' when content exceeds the limits for registration with ECHA.

MORE INFORMATION

<https://www.e-max.eu>

PROGRAM OPERATOR

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Managing Director MRPI

DEMONSTRATION OF VERIFICATION

CEN standard EN15804 serves as the core PCR(a)

Independent verification of the declaration and data according to

EN15804+A2 (+A1 indicators)

internal:

external: x

Third party verifier: Gert-Jan Vroege, Eco Intelligence

[a] PCR = Product Category Rules

DETAILED PRODUCT DESCRIPTION

Production process: The aluminium billet is manufactured from primary and scrap aluminium, as well as some alloying materials. The process begins with scrap preparation. This is followed by melting, casting, and homogenising. The product is then packed in wooden and plastic packaging, and transported.

Dimensions and weight	
Diameter (mm)	178-203-254
Length	7000
Average weight (kg)	486-633-911
Density (kg/m3)	2,7

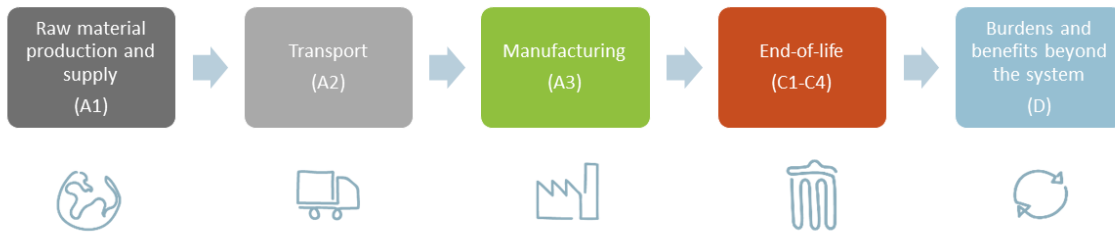
Component > 1% of total mass	(%)
Primary aluminium	32,9%
Aluminium scrap	66,8%
Alloying materials	0,3%

SCOPE AND TYPE

The aluminium billet is produced in the Netherlands. Transport to the customer and the use phase are not included within the scope of the study. Its end of life is considered to be taking place within the Netherlands. The LCA for the aluminium billet was modelled in LCA for Experts v.6.0 (Gabi Professional) using Ecoinvent v.3.9.1. to produce data for a specific EPD.

PRODUCT STAGE		CONSTRUCTION PROCESS STAGE			USER STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
Rawmaterial supply	Transport	Manufacturing	Transport gate to site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse- Recovery – Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X

X= Modules Assessed
ND= Not Declared



REPRESENTATIVENESS

n/a



ENVIRONMENT IMPACT per functional unit or declared unit (core indicators A2)

	Unit	A1	A2	A3	A1- A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP- total	kg CO2 eq.	2,49 E+00	7,66 E-02	2,65 E-01	2,84 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	1,04 E-02	2,91 E-01	3,54 E-03	-2,02 E+00
GWP- fossil	kg CO2 eq.	2,43 E+00	7,65 E-02	2,65 E-01	2,77 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	1,03 E-02	2,89 E-01	8,93 E-04	-1,96 E+00
GWP- biogenic	kg CO2 eq.	1,06 E-02	1,77 E-05	7,14 E-06	1,06 E-02	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	8,01 E-06	1,57 E-03	2,65 E-03	-1,32 E-05
GWP- luluc)	kg CO2 eq.	5,47 E-02	4,91 E-05	1,43 E-06	5,48 E-02	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	4,90 E-06	2,62 E-04	4,31 E-07	-5,70 E-02
ODP	kg CFC11 eq.	8,83 E-08	1,39 E-09	4,00 E-10	9,01 E-08	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	2,28 E-10	3,43 E-09	5,17 E-12	-6,24 E-08
AP	mol H+ eq.	1,51 E-02	1,41 E-03	1,40 E-04	1,67 E-02	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	4,29 E-05	1,17 E-03	2,87 E-06	-6,76 E-03
EP- freshwater	kg PO4 eq.	1,35 E-03	3,86 E-06	1,66 E-06	1,36 E-03	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	7,41 E-07	7,21 E-05	1,29 E-07	-7,19 E-04
EP- marine	kg N eq.	2,17 E-03	3,72 E-04	7,15 E-05	2,62 E-03	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	1,63 E-05	2,15 E-04	9,19 E-07	-1,54 E-03
EP- terrestrial	mol N eq.	1,99 E-02	4,09 E-03	7,80 E-04	2,47 E-02	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	1,74 E-04	2,34 E-03	8,79 E-06	-1,18 E-02
POCP	kg NMVOC eq.	8,63 E-03	1,16 E-03	1,86 E-04	9,98 E-03	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	6,52 E-05	7,72 E-04	2,78 E-06	-6,02 E-03
ADP-minerals & metals	kg Sb eq.	4,09 E-06	1,33 E-07	7,49 E-09	4,23 E-06	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	2,81 E-08	6,40 E-06	8,48 E-10	9,11 E-05
ADP-fossil	MJ, net calorific value	4,39 E+01	1,03 E+00	3,00 E-02	4,50 E+01	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	1,54 E-01	2,28 E+00	6,71 E-03	-3,29 E+01
WDP	m3 world eq. Deprived	4,36 E+00	5,17 E-03	8,51 E-04	4,37 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	1,03 E-03	5,07 E-02	1,66 E-04	-3,89 E+00

- GWP-total = Global Warming Potential total
- GWP-fossil = Global Warming Potential fossil fuels
- GWP-biogenic = Global Warming Potential biogenic
- GWP-luluc = Global Warming Potential land use and land use change
- ODP = Depletion potential of the stratospheric ozone layer
- AP = Acidification Potential, Accumulated Exceedence
- EP-freshwater = Eutrophication Potential, fraction of nutrients reaching freshwater end compartment
- EP-marine = Eutrophication Potential, fraction of nutrients reaching marine end compartment
- EP-terrestrial = Eutrophication Potential, Accumulated Exceedence
- POCP = Formation potential of tropospheric ozone photochemical oxidants
- ADP-minerals&metals = Abiotic Depletion Potential for non fossil resources [2]
- ADP-fossil = Abiotic Depletion for fossil resources potential [2]
- WDP = Water (user) deprivation potential, deprivation-weighted water consumption [2]

Disclaimer [2]

- The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator



ENVIRONMENT IMPACT per functional unit or declared unit (additional indicators A2)

	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PM	Disease incidence	1,60 E-07	3,91 E-09	3,68 E-10	1,64 E-07	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	8,26 E-10	1,54 E-08	4,07 E-11	- 1,36 E-07
IRP	kBq U235 eq.	6,25 E-01	8,88 E-04	1,05 E-04	6,26 E-01	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	1,92 E-04	1,71 E-02	2,49 E-05	- 6,08 E-01
ETP-fw	CTUe	9,50 E+00	4,90 E-01	9,26 E-02	1,01 E+01	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	7,22 E-02	1,48 E+00	8,31 E-02	- 3,59 E-01
HTP-c	CTUh	7,56 E-09	4,07 E-11	3,39 E-12	7,60 E-09	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	4,74 E-12	1,99 E-10	4,77 E-13	- 6,17 E-09
HTP-nc	CTUh	6,96 E-08	4,67 E-10	2,82 E-11	7,01 E-08	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	9,51 E-11	7,54 E-09	8,89 E-12	- 2,71 E-08
SQP	----	3,84 E+00	5,43 E-01	4,63 E-03	4,39 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	1,55 E-01	1,93 E+00	7,15 E-03	- 2,87 E+00

- PM = Potential incidence of disease due to PM emissions
- IRP = Potential Human exposure efficiency relative to U235 [1]
- ETP-fw = Potential Comparative Toxic Unit for ecosystems [2]
- HTP-c = Potential Comparative Toxic Unit for humans [2]
- HTP-nc = Potential Comparative Toxic Unit for humans, non-cancer [2]
- SQP = Potential soil quality index [2]

Disclaimer [1]

- This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste.

Disclaimer [2]

- The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.



OUTPUT FLOWS AND WASTE CATEGORIES per functional unit or declared unit (A1 / A2)

	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	kg	0,00 E+00	0,00 E+00	4,11 E-05	4,11 E-05	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00
NHWD	kg	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	1,02 E-02	0,00 E+00
RWD	kg	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00
CRU	kg	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	3,00 E-02	0,00 E+00	0,00 E+00
MFR	kg	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	9,61 E-01	0,00 E+00	0,00 E+00
MER	kg	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	1,98 E-03	0,00 E+00
EEE	MJ	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	3,95 E-03	0,00 E+00
ETE	MJ	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	7,87 E-03	0,00 E+00

- HWD = Hazardous Waste Disposed
- RWD = Radioactive Waste Disposed
- MFR = Materials for recycling
- EEE = Exported Electrical Energy
- NHWD = Non Hazardous Waste Disposed
- CRU = Components for reuse
- MER = Materials for energy recovery
- ETE = Exported Thermal Energy



RESOURCE USE per functional unit or declared unit (A1 / A2)

	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	1,47 E+01	1,11 E-02	1,24 E-03	1,47 E+01	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	2 E-03	2 E-01	4 E-04	-1 E+01
PERM	MJ	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00
PERT	MJ	1,47 E+01	1,11 E-02	1,24 E-03	1,47 E+01	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	2 E-03	2 E-01	4 E-04	-1 E+01
PENRE	MJ	4,39 E+01	1,03 E+00	3,00 E-02	4,50 E+01	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	2 E-01	2 E+00	7 E-03	-3 E+01
PENRM	MJ	5,40 E-04	4,12 E-05	9,07 E-07	5,82 E-04	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	5 E-06	8 E-04	3 E-07	-3 E-04
PENRT	MJ	4,39 E+01	1,03 E+00	3,00 E-02	4,50 E+01	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	2 E-01	2 E+00	7 E-03	-3 E+01
SM	kg	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00
RSF	MJ	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00
NRSF	MJ	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00
FW	m3	1,02 E-01	1,20 E-04	1,98 E-05	1,02 E-01	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	2 E-05	1 E-03	4 E-06	-9 E-02

PERE = Use of renewable energy excluding renewable primary energy resources

PERM = Use of renewable energy resources used as raw materials

PERT = Total use of renewable primary energy resources

PENRE = Use of non-renewable primary energy resources excluding non-renewable energy resources used as raw materials

PENRM = Use of non-renewable primary energy resources used as raw materials

PENRT = Total use of non-renewable primary energy resources

SM = Use of secondary materials

RSF = Use of renewable secondary fuels

NRSF = Use of non renewable secondary fuels

FW = Use of net fresh water

BIOGEEEN CARBON CONTENT per functional unit or declared unit (A1 / A2)

	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
BBCpr	kg C	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00
BCCpa	kg C	0,00 E+00	0,00 E+00	1,49 E-03	1,49 E-03	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00	0 E+00

BBCpr = Biogenic carbon content in product

BCCpa = Biogenic carbon content in packaging



CALCULATION RULES

Data quality and collection period:

Data quality requirements follow EN15804+A2:2019. Used datasets are complete according to the system boundary, and are as current as possible. Foreground data is of reference period 2023, representing 6-months and extrapolated to 1-year. Processes used in the background modelling are referring to Ecoinvent 3.9.1, the most recent version of the widely used database and are consistent with the foreground modelling in system limits and allocation procedures. The technological and geographical coverage reflects the physical reality as far as possible taking into account the technology mix, location, and representativeness of technologies, input materials, and input energies for the region. Data quality is assessed as good on average and adequate to the goal and scope of the study.

Cut-off criteria and allocation procedures:

No cut-offs or allocation procedures were intentionally applied to inputs and outputs within the system boundaries in the models. Cut-off and allocation procedures in the background processes are according to the respective methodologies and estimated to be methodologically consistent with the foreground system.

SENARIOS AND ADDITIONAL TECHNICAL INFORMATION

The product state is reported in life cycle stages A1-A3. This life cycle stage includes the extraction and processing of raw materials for the product and the packaging, their transportation to the production site, and the manufacturing process. The manufacturing stage (A3) includes all processes related to manufacturing the aluminium billet, including energy consumption and waste treatment. Electricity consumption is modelled using primary data from in-house solar panels and the Dutch residual mix. Both were represented with datasets from Ecoinvent v.3.9.1.

For the end-of-life stage (C), a scenario is used which is based on data from the European Aluminium Association and transport distances estimated using values from the PEF method. For packaging waste, an end-of-life scenario was modelled based on Eurostat data for plastic and wood packaging. For C1, there was no impact assumed. To calculate the benefits and loads beyond the system boundaries (module D), Formula D.6. from EN1504+A2 was used.

Transport of Raw Materials (Packaging materials)	Distance
Distance by truck (km)	230
Distance by train (km)	280
Distance by ship (km)	360

Transport of waste to treatment (C2)	Distance
Distance from destruction site to scrap processing plant, if waste materials are reused or recycled (km)	100
Distance from destruction site to scrap processing plant, if waste materials are incinerated or landfilled (km)	100

Waste treatment scenario (C3, C4)	Reuse	Recycling	Incineration with energy recovery	Landfill
Aluminium	3,0%	96%		1,0%
Wood (packaging)		33,5%	59,9%	6,6%
Plastic (packaging)		38,9%	46,0%	5,1%



DECLARATION OF SVHC

Currently E-MAX is not aware of any SVHC present in the aluminium billets, which fall under the scope of this LCA, exceeding the weight threshold of 0.1% as laid down in Article 33 of the EU REACH regulation.

REFERENCES

EN 15804:2012+A2:2019 Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products

Wernet, G., Bauer, C., Steubing, B., Reinhard, J., Moreno-Ruiz, E., and Weidema, B. (2016). The ecoinvent database version 3 (part I): overview and methodology. The International Journal of Life Cycle Assessment, [online]

21(9), pp.1218–1230. Available at: <<http://link.springer.com/10.1007/s11367-016-1087-8>> [Accessed 14 02 2020].

ISO 14040:2006 Environmental management — Life cycle assessment — Principles and framework

ISO 14044:2006 Environmental management — Life cycle assessment — Requirements and guidelines

REMARKS

None.