Result summary

Fibre glass reinforcement - Repra B.V. (2023)

Repra B.V.

Calculation number:	ReTHiNK-72946
Generation on:	22-05-2024
Issue date:	22-05-2024
Valid until:	22-05-2029
Status:	verified

R<THiNK

Repra

1 General information

1.1 PRODUCT

Fibre glass reinforcement - Repra B.V. (2023)

1.2 VALIDITY

Issue date: 22-05-2024
Valid until: 22-05-2029

1.3 OWNER OF THE DECLARATION

Manufacturer: Repra B.V.
Address: Veldstraat 25b, 5473 AH Heeswijk-Dinther
E-mail: info@repra.nl
Website: www.repra.nl
Production location: Kote Union

Address production location: Nova 1L, 52064 Sursko-Lytovske, Dnipropetrovsk region

1.4 VERIFICATION OF THE DECLARATION

The independent verification is in accordance with the ISO 14025:2011. The LCA is in compliance with ISO 14040:2006 and ISO 14044:2006. The EN 15804:2012+A2:2019 serves as the core PCR.

☐ Internal ☐ External

Msc. P.F. Stadhouders, EcoReview NL B.V.

1.5 PRODUCT CATEGORY RULES

NMD Determination method Environmental performance Construction works v1.1 March 2022

1.6 DECLARED UNIT

1 kg of fibre glass reinforcement

The production and delivery of 1 kg of fibre glass reinforcement used in concrete structures, including end of life scenario.

reference_unit: kilogram (kg)

1.7 CONVERSION FACTORS

Description	Value	Unit
reference_unit	1	kg

1 General information

Description	Value	Unit
Conversion factor to 1 kg	0.989120	kg

1.8 SCOPE OF DECLARATION AND SYSTEM BOUNDARIES

This is a Cradle to gate with options LCA. The life cycle stages included are as shown below:

(X = module included, ND = module not declared)

A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X

The modules of the EN15804 contain the following:

Module A1 = Raw material supply	Module B5 = Refurbishment
Module A2 = Transport	Module B6 = Operational energy use
Module A3 = Manufacturing	Module B7 = Operational water use
Module A4 = Transport	Module C1 = De-construction / Demolition
Module A5 = Construction - Installation process	Module C2 = Transport
Module B1 = Use	Module C3 = Waste Processing
Module B2 = Maintenance	Module C4 = Disposal
Module B3 = Repair	Module D = Benefits and loads beyond the product system boundaries
Module B4 = Replacement	

1.9 COMPARABILITY

In principle, a comparison or assessment of the environmental impacts of different products is only possible if they have been prepared in accordance with EN 15804. For the evaluation of the comparability, the following aspects have to be considered in particular: PCR used, functional or declared unit, geographical reference, the definition of the system boundary, declared modules, data selection (primary or secondary data, background database, data quality), scenarios used for use and disposal phases, and the life cycle inventory (data collection, calculation methods, allocations, validity period). PCRs and general program instructions of different EPDs programs may differ. Comparability needs to be evaluated. For further guidance, see EN 15804+A2 (5.3 Comparability of EPD for construction products) and ISO 14025 (6.7.2 Requirements for comparability).

2 Product

2.1 PRODUCT DESCRIPTION

Glass Fiber Reinforced Polymer (GFRP) products are construction materials that are composed of high-strength glass fibers embedded in a polymer matrix. Glass fibre reinforcements intended use is for structural or non-structural use as concrete reinforcements, applicable as bars and meshes and bent elements. The glass fibre is enhanced with a polymer binder based on epoxy, resulting in rods with a special physical and mechanical property.

The rods are covered on the surface with fibreglass ribs impregnated with epoxy resin. The ribs increase the adhesion of the bars to concrete (plays a similar role as ribs in steel reinforcing bars). The use of composite reinforcement significantly increases durability in concrete structures exposed to aggressive environments, where increased risk of corrosion of steel reinforcement is present. The glass fibre reinforcement is not intended for use in structures constantly subjected to increased heat or fire.

The reinforcement is applicable in two ways: as bars and meshes and as (shredded) fibre mixed along with concrete. This LCA only considers the production of bars, meshes and bent elements.

Technical information

Material density: 1900 kg/m3
Tensile strength: 1100-1200 N/mm2
Elongation, not more than, 2.2 %
Electrical conductivity - non-conductive
Resistance to aggressive environment - high resistance
Melting point: from 1200 to 1500°C
Acid and Alkali resistance: resistant

The product comes in different sizes and diameters. The recommended amount of glass fiber to add to concrete per cubic meter may vary depending on the specific project, the type of glass fiber, and the required properties of the concrete. The general recipe is equal in all different types of bars and meshes, thus in this LCA the functional unit is set on 1 kg. The results can be multiplied by the amount that is required for the specific value of the project. Hence, users of the LCA can determine for their respective project what the value must be, and find their sources accordingly.

The bars come in a diameter ranging from 4 mm to 32 mm and have a density of 23 gr/m1 to 1580 gr/m1 respectively.

The mesh comes in the following sizes: 50x50 mm, 100x100 mm, 150x150 mm, 200x200 mm, with a density between 66 gr/m1 to 2200 gr/m1 and a diameter of 2 to 12 mm.

2.2 DESCRIPTION PRODUCTION PROCESS

The production of GFRP (Glass Fiber Reinforced Polymer) rebar typically involves various manufacturing processes, such as resin formulation, fiber reinforcement, and curing. These processes may require energy for machinery, heating, and curing, depending on the specific manufacturing methods used.

The technological process of manufacturing glass fibre reinforcement is continuous. The essence of the process consists of a step-by-step procedure to be carried out, involving a polymerisation furnace and different spools to get the signature twist on the outside of the fibre glass rods.

2.3 CONSTRUCTION DESCRIPTION

Application method in the workplace: In this process, bars and mesh are positioned within a mold, and concrete is subsequently poured into the mold to create reinforced concrete structures.

Essential equipment: No specialized equipment is needed for this application.

Required energy consumption: not applicable, as it is placed manually in the mold.

The amount of time that is required to use the concrete mixer and the amount of concrete should be added separately when the specific value of the project is known, and are left outside the scope of this LCA. Hence, users of the LCA can determine for their respective project what the value must be, and find their sources accordingly.

Therefore, phase A5 is not relevant and not declared in this LCA, but should be added when the LCA is used in a specific product.

3 Results

3.1 ENVIRONMENTAL IMPACT INDICATORS PER KILOGRAM

CORE ENVIRONMENTAL IMPACT INDICATORS EN15804+A2

Abbr.	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D	Total
AP	mol H+ eqv.	1.84E-2	6.52E-3	2.84E-3	2.78E-2	2.42E-4	8.49E-4	0.00E+0	8.31E-5	3.10E-5	4.55E-5	-1.01E-4	2.89E-2
GWP-total	kg CO2 eqv.	2.68E+0	5.85E-1	2.94E-1	3.56E+0	4.18E-2	1.20E-1	0.00E+0	1.43E-2	1.29E-1	4.80E-3	-1.23E-1	3.74E+0
GWP-b	kg CO2 eqv.	3.49E-3	1.80E-4	-8.79E-4	2.79E-3	1.93E-5	2.37E-3	0.00E+0	6.61E-6	7.60E-2	9.46E-6	-3.32E-5	8.12E-2
GWP-f	kg CO2 eqv.	2.67E+0	5.84E-1	2.95E-1	3.55E+0	4.17E-2	1.17E-1	0.00E+0	1.43E-2	5.26E-2	4.79E-3	-1.23E-1	3.66E+0
GWP-luluc	kg CO2 eqv.	2.71E-3	2.52E-4	2.83E-4	3.24E-3	1.53E-5	9.85E-5	0.00E+0	5.25E-6	7.91E-7	1.34E-6	-3.55E-6	3.36E-3
EP-m	kg N eqv.	3.51E-3	1.89E-3	4.30E-4	5.83E-3	8.53E-5	1.80E-4	0.00E+0	2.93E-5	1.34E-5	1.57E-5	-3.03E-5	6.12E-3
EP-fw	kg P eqv.	7.92E-5	5.19E-6	1.54E-5	9.98E-5	4.21E-7	3.04E-6	0.00E+0	1.45E-7	5.49E-8	5.37E-8	-1.36E-7	1.03E-4
EP-T	mol N eqv.	3.90E-2	2.09E-2	4.79E-3	6.47E-2	9.40E-4	2.00E-3	0.00E+0	3.23E-4	1.39E-4	1.73E-4	-3.33E-4	6.80E-2
ODP	kg CFC 11 eqv.	1.83E-7	1.27E-7	9.38E-9	3.19E-7	9.21E-9	1.02E-8	0.00E+0	3.16E-9	4.24E-10	1.97E-9	-1.60E-8	3.28E-7
POCP	kg NMVOC eqv.	1.06E-2	5.70E-3	1.84E-2	3.47E-2	2.68E-4	1.06E-3	0.00E+0	9.22E-5	3.44E-5	5.01E-5	-1.10E-4	3.61E-2
ADP-f	MJ	3.97E+1	8.54E+0	7.29E+0	5.55E+1	6.29E-1	1.71E+0	0.00E+0	2.16E-1	3.29E-2	1.34E-1	-2.06E+0	5.62E+1
ADP-mm	kg Sb-eqv.	3.67E-5	1.27E-5	1.87E-6	5.12E-5	1.06E-6	1.59E-6	0.00E+0	3.63E-7	2.93E-8	4.39E-8	-3.44E-8	5.43E-5
WDP	m3 world eqv.	7.98E-1	2.74E-2	8.58E-2	9.11E-1	2.25E-3	2.82E-2	0.00E+0	7.73E-4	6.90E-3	6.00E-3	-9.10E-3	9.46E-1

AP=Acidification (AP) | **GWP-total**=Global warming potential (GWP-total) | **GWP-b**=Global warming potential - Biogenic (GWP-b) | **GWP-f**=Global warming potential - Fossil (GWP-f) | **GWP-luluc**=Global warming potential - Land use and land use change (GWP-luluc) | **EP-m**=Eutrophication marine (EP-m) | **EP-fw**=Eutrophication, freshwater (EP-fw) | **EP-T**=Eutrophication, terrestrial (EP-T) | **ODP**=Ozone depletion (ODP) | **POCP**=Photochemical ozone formation - human health (POCP) | **ADP-f**=Resource use, fossils (ADP-f) | **ADP-mm**=Resource use, minerals and metals (ADP-mm) | **WDP**=Water use (WDP)

3 Results

ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS EN15084+A2

Abbr.	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D	Total
ETP-fw	CTUe	5.67E+1	7.25E+0	5.84E+0	6.98E+1	5.61E-1	2.22E+0	0.00E+0	1.93E-1	2.65E-1	8.69E-2	-1.20E-1	7.30E+1
PM	disease incidence	1.43E-7	4.56E-8	4.91E-9	1.94E-7	3.75E-9	6.02E-9	0.00E+0	1.29E-9	2.62E-10	8.84E-10	-2.91E-10	2.06E-7
HTP-c	CTUh	2.79E-9	2.70E-10	1.11E-10	3.17E-9	1.82E-11	9.78E-11	0.00E+0	6.25E-12	1.46E-11	2.01E-12	-7.80E-12	3.30E-9
HTP-nc	CTUh	1.22E-7	7.64E-9	4.40E-9	1.34E-7	6.14E-10	4.08E-9	0.00E+0	2.11E-10	5.54E-10	6.18E-11	-1.11E-10	1.39E-7
IR	kBq U235 eqv.	6.93E-2	3.59E-2	6.47E-2	1.70E-1	2.64E-3	5.25E-3	0.00E+0	9.05E-4	8.54E-5	5.50E-4	-6.66E-4	1.79E-1
SQP	Pt	7.66E+0	6.31E+0	5.68E-1	1.45E+1	5.46E-1	4.70E-1	0.00E+0	1.87E-1	1.98E-2	2.81E-1	-2.98E-2	1.60E+1

ETP-fw=Ecotoxicity, freshwater (ETP-fw) | **PM**=Particulate Matter (PM) | **HTP-c**=Human toxicity, cancer (HTP-c) | **HTP-nc**=Human toxicity, non-cancer (HTP-nc) | **IR**=Ionising radiation, human health (IR) | **SQP**=Land use (SQP)

CLASSIFICATION OF DISCLAIMERS TO THE DECLARATION OF CORE AND ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS

ILCD classification	Indicator	Disclaimer
ILCD type / level 1	Global warming potential (GWP)	None
	Depletion potential of the stratospheric ozone layer (ODP)	None
	Potential incidence of disease due to PM emissions (PM)	None
ILCD type / level 2	AAcidification potential, Accumulated Exceedance (AP)	None
	Eutrophication potential, Fraction of nutrients reaching freshwater end compartment (EP-freshwater)	None
	Eutrophication potential, Fraction of nutrients reaching marine end compartment (EP-marine)	None
	Eutrophication potential, Accumulated Exceedance (EP-terrestrial)	None
	Formation potential of tropospheric ozone (POCP)	None
	Potential Human exposure efficiency relative to U235 (IRP)	1
ILCD type / level 3	Abiotic depletion potential for non-fossil resources (ADP-minerals&metals)	2
	Abiotic depletion potential for fossil resources (ADP-fossil)	2
	Water (user) deprivation potential, deprivation-weighted water consumption (WDP)	2

3 Results

ILCD classification	Indicator	Disclaimer
	Potential Comparative Toxic Unit for ecosystems (ETP-fw)	2
	Potential Comparative Toxic Unit for humans (HTP-c)	2
	Potential Comparative Toxic Unit for humans (HTP-nc)	2
	Potential Soil quality index (SQP)	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 disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

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.

CORE ENVIRONMENTAL IMPACT INDICATORS EN15804+A1

Abbr.	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D	Total
ADPE	Kg Sb	3.67E-5	1.27E-5	1.87E-6	5.12E-5	1.06E-6	1.59E-6	0.00E+0	3.63E-7	2.93E-8	4.39E-8	-3.44E-8	5.43E-5
GWP	Kg CO2 Equiv.	2.60E+0	5.80E-1	2.90E-1	3.47E+0	4.14E-2	1.15E-1	0.00E+0	1.42E-2	5.24E-2	4.70E-3	-1.22E-1	3.58E+0
ODP	Kg CFC-11 Equiv.	1.64E-7	1.01E-7	8.16E-9	2.73E-7	7.34E-9	8.77E-9	0.00E+0	2.52E-9	3.74E-10	1.57E-9	-1.41E-8	2.79E-7
POCP	Kg Ethene Equiv.	1.04E-3	4.35E-4	1.02E-2	1.17E-2	2.50E-5	3.52E-4	0.00E+0	8.57E-6	1.37E-6	5.01E-6	-1.73E-5	1.21E-2
AP	Kg SO2 Equiv.	1.52E-2	5.08E-3	2.40E-3	2.27E-2	1.82E-4	6.92E-4	0.00E+0	6.25E-5	2.25E-5	3.44E-5	-7.88E-5	2.36E-2
EP	Kg PO43- Equiv.	1.55E-3	7.34E-4	1.97E-4	2.48E-3	3.58E-5	7.67E-5	0.00E+0	1.23E-5	8.28E-6	6.63E-6	-1.14E-5	2.61E-3

ADPE=Depletion of abiotic resources-elements | **GWP**=Global warming | **ODP**=Ozone layer depletion | **POCP**=Photochemical oxidants creation | **AP**=Acidification of soil and water | **EP**=Eutrophication

3 Results

NATIONAL ANNEX NMD

Abbr.	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D	Total
ADPF	Kg Sb	2.14E-2	4.12E-3	2.21E-3	2.77E-2	3.04E-4	8.52E-4	0.00E+0	1.04E-4	1.71E-5	6.41E-5	-1.11E-3	2.80E-2
HTP	kg 1.4 DB	2.35E+0	2.61E-1	8.10E-2	2.70E+0	1.74E-2	8.25E-2	0.00E+0	5.98E-3	9.17E-3	2.13E-3	-6.31E-3	2.81E+0
FAETP	kg 1.4 DB	1.28E-1	6.76E-3	2.25E-3	1.37E-1	5.09E-4	4.24E-3	0.00E+0	1.75E-4	2.87E-3	5.04E-5	-6.39E-5	1.44E-1
MAETP	kg 1.4 DB	1.16E+2	2.55E+1	9.52E+0	1.51E+2	1.83E+0	5.18E+0	0.00E+0	6.28E-1	1.67E+1	1.80E-1	-2.85E-1	1.75E+2
TETP	kg 1.4 DB	3.90E-3	8.80E-4	1.63E-3	6.41E-3	6.16E-5	1.98E-4	0.00E+0	2.11E-5	5.83E-5	5.34E-6	-1.98E-5	6.73E-3

ADPF=Depletion of abiotic resources-fossil fuels | **HTP**=Human toxicity | **FAETP**=Ecotoxicity. fresh water | **MAETP**=Ecotoxicity. marine water (MAETP) | **TETP**=Ecotoxicity. terrestric

3.2 INDICATORS DESCRIBING RESOURCE USE AND ENVIRONMENTAL INFORMATION BASED ON LIFE CYCLE INVENTORY (LCI)

PARAMETERS DESCRIBING RESOURCE USE

Abbr.	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D	Total
PERE	MJ	2.03E+0	9.83E-2	2.37E-1	2.37E+0	7.88E-3	7.20E-2	0.00E+0	2.70E-3	1.09E-3	1.08E-3	-4.49E-3	2.45E+0
PERM	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PERT	MJ	2.03E+0	9.83E-2	2.37E-1	2.37E+0	7.88E-3	7.20E-2	0.00E+0	2.70E-3	1.09E-3	1.08E-3	-4.49E-3	2.45E+0
PENRE	MJ	4.24E+1	9.07E+0	7.38E+0	5.89E+1	6.68E-1	1.81E+0	0.00E+0	2.29E-1	3.55E-2	1.42E-1	-2.28E+0	5.95E+1
PENRM	MJ	3.61E-1	0.00E+0	1.18E-1	4.78E-1	0.00E+0	1.43E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	-4.40E-3	4.88E-1
PENRT	MJ	4.28E+1	9.07E+0	7.50E+0	5.94E+1	6.68E-1	1.82E+0	0.00E+0	2.29E-1	3.55E-2	1.42E-1	-2.29E+0	6.00E+1
SM	Kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
RSF	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
NRSF	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
FW	M3	2.04E-2	9.36E-4	2.34E-3	2.37E-2	7.67E-5	7.32E-4	0.00E+0	2.63E-5	1.17E-4	1.43E-4	-1.21E-4	2.47E-2

PERE=renewable primary energy ex. raw materials | **PERM**=renewable primary energy used as raw materials | **PERT**=renewable primary energy total | **PENRE**=non-renewable primary energy ex. raw materials | **PENRM**=non-renewable primary energy used as raw materials | **PENRT**=non-renewable primary energy total | **SM**=use of secondary material | **RSF**=use of renewable secondary fuels | **NRSF**=use of non-renewable secondary fuels | **FW**=use of net fresh water

3 Results

OTHER ENVIRONMENTAL INFORMATION DESCRIBING WASTE CATEGORIES

Abbr.	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D	Total
HWD	Kg	3.84E-5	1.92E-5	1.96E-6	5.96E-5	1.60E-6	1.88E-6	0.00E+0	5.48E-7	1.05E-7	2.00E-7	-2.60E-6	6.14E-5
NHWD	Kg	2.83E-1	4.51E-1	2.64E-2	7.59E-1	3.99E-2	5.23E-2	0.00E+0	1.37E-2	5.52E-3	9.10E-1	-8.32E-4	1.78E+0
RWD	Kg	5.50E-5	5.67E-5	5.36E-5	1.65E-4	4.13E-6	5.18E-6	0.00E+0	1.42E-6	1.14E-7	8.80E-7	-9.86E-7	1.76E-4

HWD=hazardous waste disposed | **NHWD**=non hazardous waste disposed | **RWD**=radioactive waste disposed

ENVIRONMENTAL INFORMATION DESCRIBING OUTPUT FLOWS

Abbr.	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D	Total
CRU	Kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
MFR	Kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.54E-4	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.54E-4
MER	Kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
EE	MJ	0.00E+0	0.00E+0	6.00E-2	6.00E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.44E+0	1.50E+0
EET	MJ	0.00E+0	0.00E+0	3.80E-2	3.80E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	9.14E-1	9.52E-1
EEE	MJ	0.00E+0	0.00E+0	2.20E-2	2.20E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	5.31E-1	5.53E-1

CRU=Components for re-use | **MFR**=Materials for recycling | **MER**=Materials for energy recovery | **EE**=Exported energy | **EET**=Exported Energy Thermic | **EEE**=Exported Energy Electric

3 Results

3.3 INFORMATION ON BIOGENIC CARBON CONTENT PER KILOGRAM

BIOGENIC CARBON CONTENT

The following Information describes the biogenic carbon content in (the main parts of) the product at the factory gate per kilogram:

Biogenic carbon content	Amount	Unit
Biogenic carbon content in the product	0	kg C
Biogenic carbon content in accompanying packaging	0	kg C

3 Results

3.4 ENVIRONMENTAL COST INDICATOR NL PER KILOGRAM

Using the environmental cost indicator (ECI) method, which is presented in the NMD Determination Method (2020), the results are aggregated to the single-point score. The ECI is a relevant valuation method, especially in the Dutch construction sector. In the Netherlands, it is a prerequisite for public tenders. The aim of the indicator is to show the shadow price for environmental impacts of a product or project. The application of single-point scores is an additional assessment tool for eco-balance results. However, it must be pointed out that weightings are always based on a value maintenance and not on a scientific basis (EN 14040). The ECI results are shown in the following table.

Module EN15804	ECI NL	Share in total (%)
A1 Raw Materials Supply	€ 0.44	73,0 %
A2 Transport	€ 0.08	13,9 %
A3 Manufacturing	€ 0.06	9,2 %
A4 Transport from the gate to the site	€ 0.00	0,8 %
A5 Construction - Installation process	€ 0.02	3,0 %
C1 De-construction / demolition	€ 0.00	0,0 %
C2 Transport	€ 0.00	0,3 %
C3 Waste processing	€ 0.01	0,9 %
C4 Disposal	€ 0.00	0,1 %
D Benefits and loads beyond the product system boundary	€ -0.01	-1,2 %
ECI NL per functional unit	**€ 0.60**	

4 Contact information

Publisher	Operator	Owner of declaration
Repra B.V. Veldstraat 25b 5473 AH Heeswijk-Dinther, NL	**Stichting NMD** Visseringlaan 22b 2288 ER Rijswijk, NL	**Repra B.V.** Veldstraat 25b 5473 AH Heeswijk-Dinther, NL
E-mail: info@repra.nl **Website:** www.repra.nl	**E-mail:** info@milieudatabase.nl **Website:** www.milieudatabase.nl	**E-mail:** info@repra.nl **Website:** www.repra.nl