Environmental performance

Potential environmental impacts: 1m² of Glass Mineral Wool UNIFIT 037, TI 140 W with a thickness of 50mm and the R value of 1.35 m²K/W.

ENVIRONMENTAL IMPACTS										
Parameter	**Unit**	**A1-3**	**A4**	**A5**	**B1-B7**	**C1**	**C2**	**C3**	**C4**	**D****
GWP-fossil	kg CO_2 eq.	1.02E+00	6.50E-02	4.48E-02	0.00E+00	0.00E+00	2.94E-03	0.00E+00	1.23E-02	-3.40E-02
GWP-biogenic	kg CO_2 eq.	-1.46E-01	-7.71E-05	3.56E-02	0.00E+00	0.00E+00	-3.48E-06	0.00E+00	1.25E-01	2.48E-02
GWP-luluc	kg CO_2 eq.	5.48E-03	5.29E-04	1.27E-04	0.00E+00	0.00E+00	2.39E-05	0.00E+00	5.26E-05	-2.46E-05
GWP-total	kg CO_2 eq.	8.78E-01	6.54E-02	8.05E-02	0.00E+00	0.00E+00	2.96E-03	0.00E+00	1.37E-01	-9.26E-03
ODP	kg CFC 11 eq.	2.73E-14	1.28E-17	7.35E-16	0.00E+00	0.00E+00	5.77E-19	0.00E+00	6.92E-15	-2.07E-14
AP	mol H^+ eq.	5.95E-03	6.73E-05	1.35E-04	0.00E+00	0.00E+00	2.94E-06	0.00E+00	8.97E-05	-4.93E-05
EP-freshwater	kg PO_4^{3-} eq.	3.37E-05	5.88E-07	7.81E-07	0.00E+00	0.00E+00	2.66E-08	0.00E+00	7.91E-07	-3.52E-07
EP-freshwater [1]	kg P eq.	1.10E-05	1.92E-07	2.55E-07	0.00E+00	0.00E+00	8.69E-09	0.00E+00	2.58E-07	-1.15E-07
EP-marine	kg N eq.	1.10E-03	2.11E-05	2.66E-05	0.00E+00	0.00E+00	9.04E-07	0.00E+00	2.47E-05	-1.44E-05
EP-terrestrial	mol N eq.	2.18E-02	2.52E-04	5.00E-04	0.00E+00	0.00E+00	1.08E-05	0.00E+00	2.63E-04	-1.54E-04
POCP	kg NMVOC eq.	2.37E-03	6.62E-05	6.01E-05	0.00E+00	0.00E+00	2.85E-06	0.00E+00	7.21E-05	-4.20E-05
ADP-minerals&metals*	kg Sb eq.	3.00E-07	5.74E-09	6.78E-09	0.00E+00	0.00E+00	2.59E-10	0.00E+00	1.27E-09	-5.88E-09
ADP-fossil*	MJ	1.56E+01	8.62E-01	3.83E-01	0.00E+00	0.00E+00	3.90E-02	0.00E+00	1.62E-01	-7.45E-01
WDP	m^3	3.54E-02	6.01E-04	6.87E-03	0.00E+00	0.00E+00	2.71E-05	0.00E+00	9.27E-04	-1.65E-03
Acronyms	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 Exceedance; 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 Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption									

**: *[Life Cycle D stage covers benefits and loads beyond the system boundary stage (reuse, recovery and recycling potential) therefore, when summing up results, this stage should be considered separately].*

** Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.*

[1] EN 15804:2012+A2:2019 specifies that the unit for the indicator for Eutrophication aquatic freshwater shall be kg PO4 eq, although the reference given ("EUTREND model, Struijs et al., 2009b, as implemented in ReCiPe") uses the unit kg P eq, until this has been corrected, results shall be given in both kg PO4 eq and kg P eq. in the EPD.

Potential environmental impact – additional mandatory and voluntary indicators

Indicator	Unit	Tot.A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
GWP-GHG [2]	kg CO_2 eq.	1.02E+00	6.51E-02	4.49E-02	0.00E+00	0.00E+00	2.94E-03	0.00E+00	1.22E-02	-3.41E-02

[2] The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

Additional environmental impact indicators like PM [Disease incidences], IR [kBq U235 eq.], ETF-fw [CTUe], HTP-c [CTUh], HTP-nc [CTUh] and SQP [Pt] are not declared (ND) but were calculated and can be provided on request.

Use of resources: 1m² of Glass Mineral Wool UNIFIT 037, TI 140 W with a thickness of 50mm and the R value of 1.35 m²K/W.

RESOURCES USE										
Parameter	**Unit**	**A1-3**	**A4**	**A5**	**B1-B7**	**C1**	**C2**	**C3**	**C4**	**D***
PERE [MJ]	MJ	2.16E+00	4.96E-02	6.86E-02	0.00E+00	0.00E+00	2.24E-03	0.00E+00	1.89E-02	-2.36E-01
PERM [MJ]	MJ	1.78E+00	0.00E+00	2.56E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT [MJ]	MJ	3.94E+00	4.96E-02	9.42E-02	0.00E+00	0.00E+00	2.24E-03	0.00E+00	1.89E-02	-2.36E-01
PENRE [MJ]	MJ	1.51E+01	8.66E-01	3.84E-01	0.00E+00	0.00E+00	3.91E-02	0.00E+00	1.62E-01	-7.45E-01
PENRM [MJ]	MJ.	5.56E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT [MJ]	MJ	1.56E+01	8.66E-01	3.84E-01	0.00E+00	0.00E+00	3.91E-02	0.00E+00	1.62E-01	-7.45E-01
SM	kg	5.40E-01	0.00E+00	1.10E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ	7.95E-23	0.00E+00	1.62E-24	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ	9.34E-22	0.00E+00	1.91E-23	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.77E-03	5.68E-05	2.27E-04	0.00E+00	0.00E+00	2.57E-06	0.00E+00	3.08E-05	-1.27E-04
Acronyms	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary 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 re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water									

**: [Life Cycle D stage covers benefits and loads beyond the system boundary stage (reuse, recovery and recycling potential) therefore, when summing up results, this stage should be considered separately].*

Waste production and output flows: 1m² of Glass Mineral Wool UNIFIT 037, TI 140 W with a thickness of 50mm and the R value of 1.35 m^2K/W.

OUTPUT FLOWS AND WASTE CATEGORIES										
Parameter	**Unit**	**A1-3**	**A4**	**A5**	**B1-B7**	**C1**	**C2**	**C3**	**C4**	**D***
Hazardous waste disposed	kg	1.12E-08	4.56E-11	2.91E-10	0.00E+00	0.00E+00	2.06E-12	0.00E+00	2.56E-09	-1.89E-10
Non-hazardous waste disposed	kg	3.45E-02	1.36E-04	1.88E-02	0.00E+00	0.00E+00	6.13E-06	0.00E+00	7.51E-01	-2.65E-04
Radioactive waste disposed	kg	7.84E-04	1.57E-06	1.98E-05	0.00E+00	0.00E+00	7.09E-08	0.00E+00	2.21E-06	-3.12E-05
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Material for recycling	kg	0.00E+00	0.00E+00	1.89E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	kg	0.00E+00	0.00E+00	2.83E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, electricity	MJ	0.00E+00	0.00E+00	9.73E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, thermal	MJ	0.00E+00	0.00E+00	1.75E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

**: [Life Cycle D stage covers benefits and loads beyond the system boundary stage (reuse, recovery and recycling potential) therefore, when summing up results, this stage should be considered separately].*

Information on biogenic carbon content

Results per functional or declared unit		
BIOGENIC CARBON CONTENT	**Unit**	**QUANTITY**
Biogenic carbon content in product	**kg C**	4.80E-05
Biogenic carbon content in packaging	**kg C**	1.67E-02

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO_2.

LCA interpretation

ENVIRONMENTAL IMPACTS

All impact categories except the ADPE and the ODP are dominated by the production. This is mainly due to the consumption of energy (electricity and natural gas) during the production of glass mineral wool.

The Global Warming Potential (GWP) is clearly dominated by the production, mostly due to energy consumption (electricity and natural gas).

The Ozone layer Depletion Potential (ODP) seems highly influenced by the production.

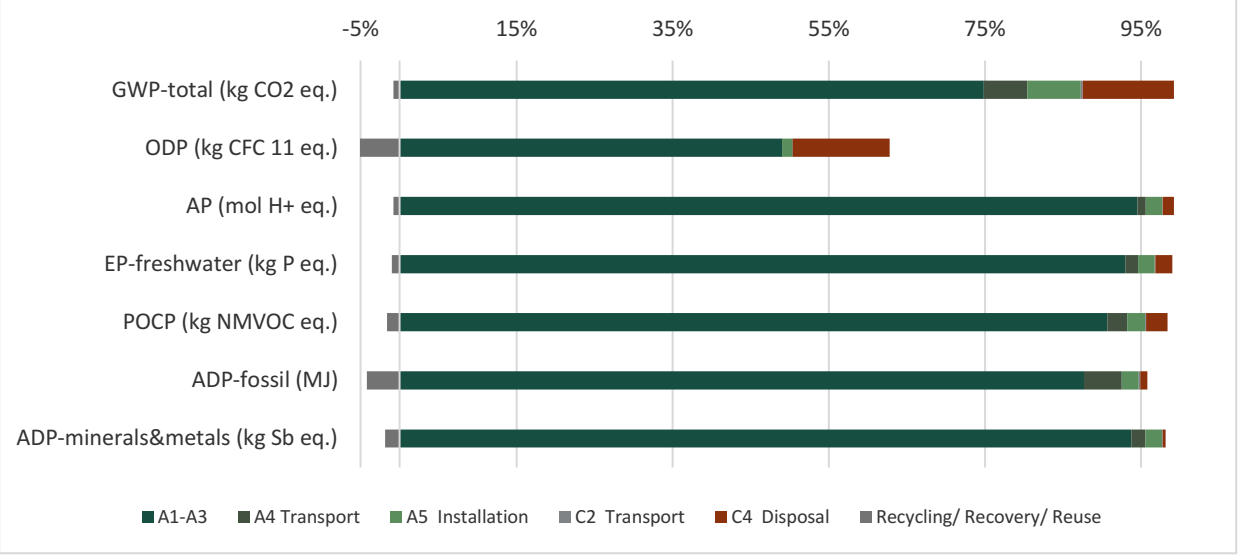
The Acidification Potential (AP) is also dominated by the production due to the process's emissions and the electricity consumption. Most of impact is by emissions of sulphur dioxide, ammonia, and nitrogen oxides.

The Eutrophication Potential (EP) is significantly influenced by production due to emissions from curing oven, furnace, and other unit processes. The glucose for the binder production also has an impact because of crops fertilizers use.

The Photochemical Ozone Creation Potential (POCP) is dominated by the production due to emissions in the curing oven and in other unit processes but also energy consumption.

The Abiotic Depletion Potential Element (ADPe) is dominated by the raw materials production.

The Abiotic Depletion Potential Fossil (ADPf) is dominated by natural gas use and the electricity consumption for the production. The packaging and the binder have also a non-negligible impact. The installation stage has a "positive" contribution thanks to energy recovery from incineration of a percentage of plastic packaging and the avoidance production of new plastic production thanks to a percentage of recycling plastic packaging.



RESOURCES USE

Total Use of Non-Renewable Primary Energy Resources (PENRT) is dominated by the production of glass mineral wool products (especially due to the energy consumption) and with the little influence of raw materials, binder, and packaging.

Total Use of Renewable Primary Energy Resources (PERT) is dominated by the binder (bio-based), the production, (electricity mix) and the packaging (wooden pallets).

For the Use of Secondary Material (SM), there is a lot of external cullet used into the batch process (recycled glass from windows and bottles) up to 80% depending on plants.

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