

Environmental Product Declaration



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

EROSION CONTROLS MATS

K-Mat, K-Mat RF Metal, X-Grid AM



TeMa Technologies and Materials srl

Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
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An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com

GENERAL INFORMATION

Programme information

Programme:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website:	www.environdec.com
E-mail:	info@environdec.com

CEN standard EN 15804 serves as the Core Product Category Rules (PCR)

Product category rules (PCR): PCR 2019:14 Construction Products, v1.11

PCR review was conducted by: The Technical Committee of the International EPD® System.
See www.environdec.com/TC for a list of members. Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat www.environdec.com/contact

LCA accountability:

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Via Piero Poloni,
32021, Agordo (BL)

Independent third-party verification of the declaration and data, according to ISO 14025:2006:

☒ External ☐ Internal

covering

☐ EPD process certification ☒ EPD verification

Third party verifier:

SGS Italia S.p.A. via Caldera, 21, 20153 – Milano
T +39 02 73 931 - F +39 02 70 12 46 30 / www.it.sgs.com

Accredited by: Accredia, certification n.006H

Procedure for follow-up of data during EPD validity involves third party verifier:

☒ Yes ☐ No

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but from different programs may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804. For further information about comparability, see EN 15804 and ISO 14025.

COMPANY INFORMATION

Owner of the EPD:

TeMa Technologies and Materials srl
Via dell'industria 21
31029 Vittorio Veneto (TV) - Italy

Contact:

Giovanni Viel
giovanni.viel@temacorporation.com

Description of the organisation:

TeMa - short for "Technologies and Materials" - was established in 1993, standing out for its innovation-focused approach. TeMa has developed global experience to provide solutions that sit lightly in the landscape while offering high performance in terms of protection and reinforcement, maintenance and drainage in the residential and commercial building markets and in major environmental projects. Since 2013, we have also been doing research into the construction of interiors, developing new high-performance materials for waterproofing and

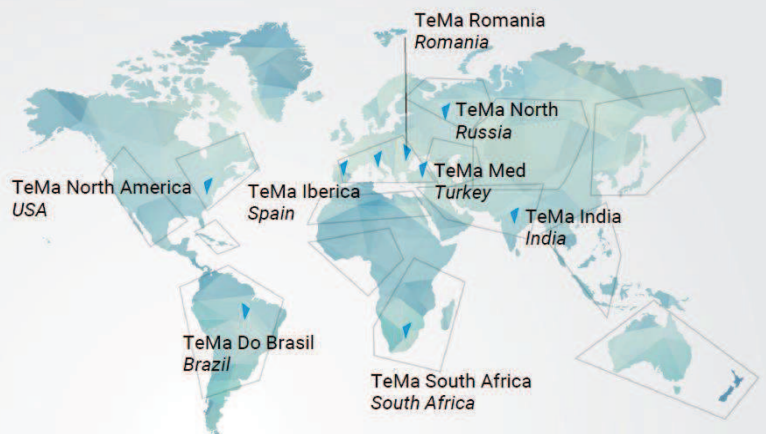
sound insulation. With a complete and articulated range of products and many other awaiting testing, we like to think of ourselves as a company whose constant innovation helps customers approach their target market with the latest tech and a never-ending stream of new solutions, also in response to direct feedback from technicians, designers and site operators. Since our inception, the path we have taken has allowed us to expand our sales offering by developing new products, making inroads into new markets and - last but not least - entering into significant business agreements with multinational companies.

These important strategic decisions have given TeMa a global reach, laying the groundwork for our internationalization. Hence our original Vittorio Veneto facility near Treviso in Italy has been joined, in succession, by: TeMa Iberica (Spain), TeMa North (Russia), TeMa Med (Turkey), TeMa Romania and TeMa North America (USA). With its sales network, TeMa is now present in 80 countries around the world.

IN THE GLOBE

OFFICES AND FACTORIES

Headquarter
TeMa
Vittorio Veneto - Italy



Product-related or management system-related certifications:

ISO 9001: 2015, Quality Management System certification (certificate n. IT04/0341, SGS Italia S.p.a)

Name and location of production site(s):

Via dell'industria, 21 – 31029, Vittorio Veneto (TV)

PRODUCT INFORMATION

Product name:

K-Mat, K-Mat RF Metal, X-Grid AM

UN CPC code:

36950

Geographical scope:

Europe

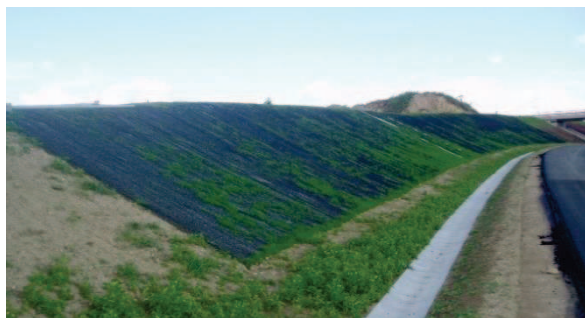
Product description:

K-Mat, K-Mat RF Metal and X-Grid AM are polymer based monofilament mats eventually bonded to a polymeric geogrid or a metal mesh to be used for erosion control and/or reinforcement mats on slopes with moderate to high inclination.

K-Mat



K-Mat® is a three-dimensional geomat obtained from extruded PP monofilaments to be used as erosion control mat. The product is available in three different thicknesses (10, 16 and 22 mm). The standard colour is black but it is also available in brown and green on request. Basing on the different thickness, several types are available from the thinnest (K-Mat F) to the Thicker (K-Mat Super L).



Installation of K-Mat

K-Mat RF Metal



K-Mat® RF Metal is a composite consisting of a hexagonal double-twist wire mesh (6x8 or 8x10) and a polymeric three-dimensional geomat, which are intermeshed and bonded during the production process. The wire mesh is in eutectic alloy Zn Al (5%) (Galfan alloy). The composite is available with a black or green geomat on request. It is as erosion control and reinforcement on slopes.



Installation of K-Mat RF Metal

X-Grid AM



X-Grid AM is a composite formed from our K-Mat extruded PP monofilament entangled mat and our Polyester X-Grid geogrids.

This product provides a reinforced geomat which is suited to use in earthworks and landfills for both the retention of inclined granular drainage layers over membranes, or the veneer stability of topsoil

layers on steep slopes or landfill capping systems.

Additionally, the use of X-Grid AM for channels and wet slopes enhances the shear resistance of the vegetated surfaces against hydraulic erosion.



Installation of X-Grid AM

The following tables show the articles included in this EPD with the main technical characteristics.

K-MAT			
Code	DESCRIPTION	AV. THICKNESS	COLOUR
501330FA	K-Mat F	10 mm	Black
501350C****0	K-Mat L	16 mm	Black
501350C****3	K-Mat L Green	16 mm	Green
501350C****6	K-Mat L LB	16 mm	Light brown
501B70C	K-Mat L HP	16 mm	Black
501330F****0	K-Mat Mini L	10 mm	Black
501330F****3	K-Mat Mini L Green	10 mm	Green
501330F****6	K-Mat Mini L LB	10 mm	Light brown
501350A***0	K-Mat Super L	22 mm	Black
501350A****3	K-Mat Super L Green	22 mm	Green
501350A****6	K-Mat Super L LB	22 mm	Light brown
501355C	K-Mat Super L J	22 mm	Black

K-MAT RF METAL				
Code	DESCRIPTION	MESH SIZE	GALFAN	PVC COATING
51B950DD	K-Mat RF Metal 68	6x8	No	No
51H950DD	K-Mat RF Metal 68 Zn Al	6x8	Yes	No
51J950DD	K Mat RF Metal 68 Zn Al PVC	6x8	Yes	Yes
51C950DD	K-Mat RF Metal 810	8x10	No	No
51I950DD	K-Mat RF Metal 810 Zn Al	8x10	Yes	No
51K950DD	K-Mat RF Metal 810 Zn Al PVC	8x10	Yes	Yes

X-GRID AM			
Code	DESCRIPTION	AV. THICKNESS	TENSILE STRENGTH (EN ISO 10319)
576140D	X-Grid PET-PVC AM 20 S	17 mm	20 kN/m
577140D	X-Grid PET-PVC AM 35 S	17 mm	35 kN/m
578140D	X-Grid PET-PVC AM 55 S	17 mm	55 kN/m
572140D	X-Grid PET-PVC AM 80 S	17 mm	80 kN/m
573140D	X-Grid PET-PVC AM 110 S	17 mm	110 kN/m
574140D	X-Grid PET-PVC AM 150 S	17 mm	150 kN/m
575140D	X-Grid PET-PVC AM 200 S	17 mm	200 kN/m

LCA INFORMATION

Declared unit:

1 kg of erosion control mat, including packaging.

The environmental performance results are presented considering three product groups: one for K-Mat, one for X-Grid and one for K-Mat RF Metal. The environmental performances for each product group were calculated as the average between the values of the product that had the greatest impact and those of the product that had the lower impact within the group for the GWP-GHG indicator in modules A1-A3. The results therefore do not refer to a specific real product. The range of variation of the impacts between the products of each group is less than 10%.

Time representativeness:

Data cover the year 2020.

Database(s) and LCA software used:

Ecoinvent 3.7.1 and SimaPro 9.2.

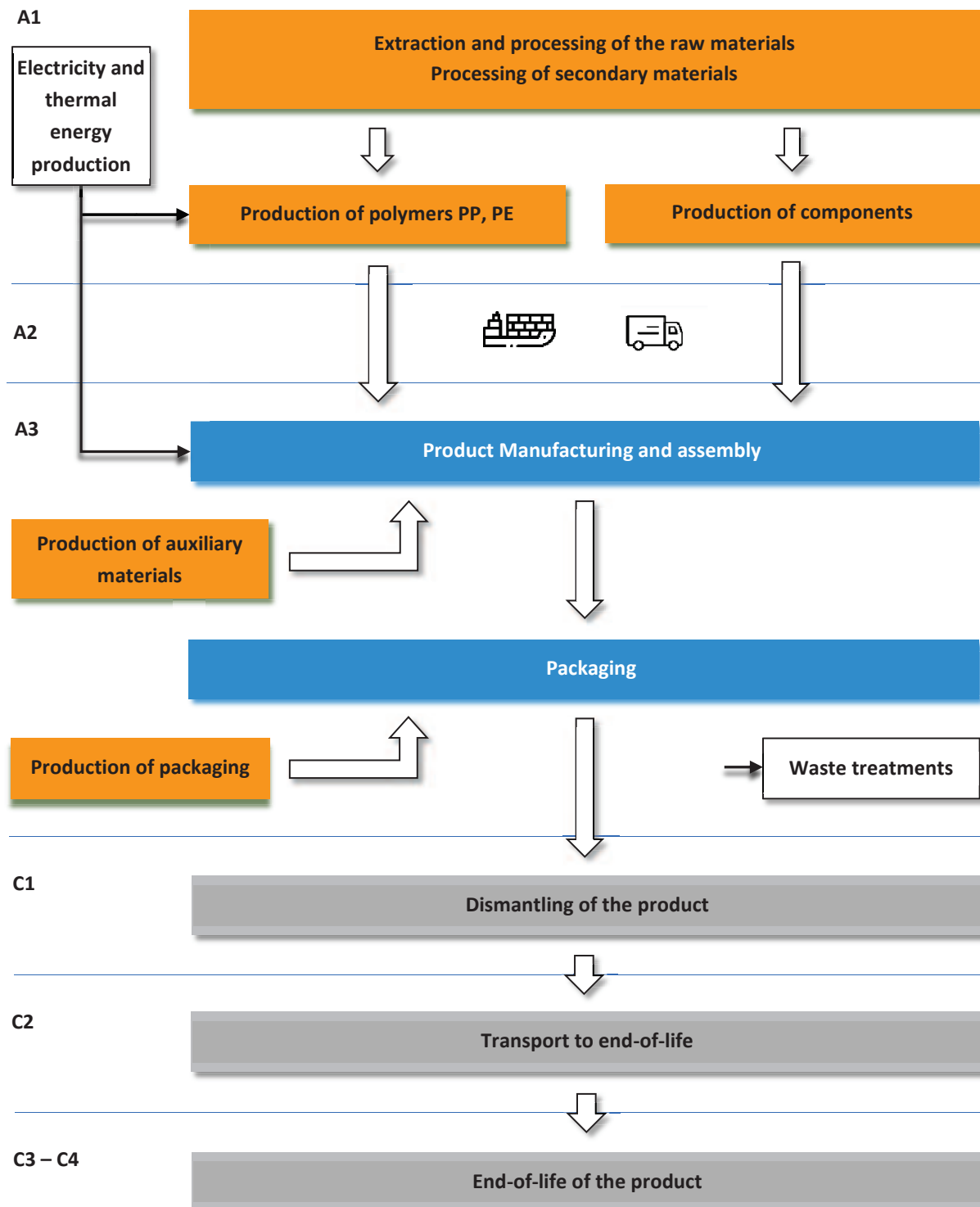
Description of system boundaries:

Cradle to gate with modules C1–C4 and module D (A1–A3 + C + D).

The following table shows the processes included in the system boundaries and the scenarios adopted for the modeling of the modules C1-C4 and D.

Module	Processes and scenarios
A1	- Extraction and processing of raw materials - Processing of secondary materials used as input for manufacturing the product - Production of polymers and components - Generation of electricity and heat from primary energy resources, also including their extraction, refining and transport
A2	Transportation up to the factory gate and internal transport
A3	- Production of ancillary materials - Extrusion and assembly of the product - Manufacturing of packaging - Waste treatment
C1	Dismantling of the product including initial on-site sorting of the materials The scenario applied for module C1 is based on the estimate of the fuel consumption required by an excavator to remove the volume of soil above the geomat. The scenario includes the conservative assumption that the environmental impacts associated with the excavation activities are fully attributed to the TeMa product.
C2	Transport of the discarded product to a recycling or final disposal site Since specific data relating to the transport distance of the discarded product to a waste treatment center are missing, a distance of 100 km by truck has been assumed.
C3 - C4	Recycling and energy recovery processes of the discarded product (C3) Disposal processes of the discarded product (C4) The end-of-life scenario was developed with reference to a European context through the statistics of the Plastic waste from B&C in EU 2018 report. In the module C3 a virtual emission of biogenic CO₂ has been added so that the uptake related to the wood pallet (packaging) and emissions of biogenic CO₂ are balanced.
D	Benefits and impacts related to material recycling as well as heat and power production from materials sent for energy recovery are part of this module. The recycling and energy recovery scenarios have been defined in accordance with the Plastic waste from B&C in EU 2018 report and with Annex C of the PEFCR Guidance v6.3.

System diagram:



Modules declared, geographical scope, share of specific data (in GWP-GHG indicator) and data variation:

LIFE CYCLE STAGE	Module		Modules declared	Geography	Specific data used	Variation – products		Variation – sites
Product stage	Raw material supply	A1	X	EU	>90%	<10%		not relevant
	Transport	A2	X	EU				
	Manufacturing	A3	X	IT				
Construction process stage	Transport	A4	N.D.					
	Construction intallation	A5	N.D.					
Use stage	Use	B1	N.D.					
	Maintenance	B2	N.D.					
	Repair	B3	N.D.					
	Replacement	B4	N.D.					
	Refurbishment	B5	N.D.					
	Operational energy use	B6	N.D.					
	Operational water use	B7	N.D.					
End of life stage	De-construction demolition	C1	X	EU				
	Transport	C2	X	EU				
	Waste processing	C3	X	EU				
	Disposal	C4	X	EU				
Resource recovery stage	Reuse-Recovery-Recycling-potential	D	X					

X=module included in EPD® / N.D.= not declared

CONTENT DECLARATION

K-MAT			
Product components	Weight, kg	Post-consumer material, weight, %	Renewable material, weight, %
Polypropylene, PP	≥ 0,99	0 - 2	0
Additives	≤ 0,01	0	0
TOTAL	1	0 - 2	0
Packaging materials	Weight, kg	Weight, % (versus the product)	
Wooden pallet	0,055	5,5	
PE film	0,020	2,0	
Thermal ribbon	0,014	1,4	
TOTAL	0,09	9,0	

K-MAT RF METAL			
Product components	Weight, kg	Post-consumer material, weight, %	Renewable material, weight, %
Polypropylene, PP	0,24 - 0,30	0,4 - 2	0
Steel	0,70 – 0,76	0	0
Additives	≤ 0,01	0	0
TOTAL	1	0,4 - 2	0
Packaging materials	Weight, kg	Weight-% (versus the product)	
Wooden pallet	0,073	7,3	
PE film	0,005	0,5	
Thermal ribbon	0,003	0,3	
TOTAL	0,081	8,1	

X-GRID AM			
Product components	Weight, kg	Post-consumer material, weight, %	Renewable material, weight, %
Polypropylene, PP	0,34 – 0,69	2	0
Polyester, PET	0,28 – 0,63	0	0
Additives and other polymers	≤ 0,03	0	0
TOTAL	1	2	0
Packaging materials	Weight, kg	Weight-% (versus the product)	
Wooden pallet	0,063	6,3	
PE film	0,014	1,4	
Thermal ribbon	0,005	0,5	
TOTAL	0,082	8,2	

No dangerous substances from the candidate list of SVHC for Authorisation are present.

ENVIRONMENTAL INFORMATION

The results below refer to the declared unit and were assessed using the characterization model and factors reported in Annex C of the standard EN 15804:2012+A2:2019.

K-Mat

Potential environmental impact – mandatory indicators according to EN 15804

Results per declared unit										
Indicator	Unit	A1	A2	A3	Tot.A1-A3	C1	C2	C3	C4	D
GWP-fossil	kg CO ₂ eq.	3,30E+00	1,36E-01	2,55E-01	3,70E+00	3,23E-01	1,65E-02	0,00E+00	3,42E-02	-1,52E+00
GWP-biogenic	kg CO ₂ eq.	9,40E-02	1,05E-04	-1,05E-01	-1,10E-02	2,53E-04	3,97E-05	1,05E-01	3,52E-05	-1,33E-02
GWP-luluc	kg CO ₂ eq.	7,92E-04	8,11E-05	9,36E-03	1,02E-02	2,55E-05	5,58E-06	0,00E+00	1,36E-06	-8,39E-04
GWP-total	kg CO ₂ eq.	3,40E+00	1,36E-01	1,59E-01	3,69E+00	3,23E-01	1,65E-02	1,05E-01	3,42E-02	-1,53E+00
ODP	kg CFC 11 eq.	1,65E-07	2,84E-08	3,00E-08	2,24E-07	6,92E-08	3,77E-09	0,00E+00	8,79E-10	-1,44E-07
AP	mol H ⁺ eq.	1,24E-02	3,36E-03	6,07E-04	1,63E-02	1,75E-03	8,25E-05	0,00E+00	2,45E-05	-3,58E-03
EP-freshwater	kg PO ₄ ³⁻ eq.	2,81E-03	3,12E-04	1,96E-04	3,32E-03	2,89E-04	1,45E-05	0,00E+00	1,20E-03	-1,38E-03
EP-freshwater	kg P eq.	6,23E-04	5,69E-06	3,72E-05	6,66E-04	9,69E-06	1,11E-06	0,00E+00	4,31E-07	-4,11E-04
EP-marine	kg N eq.	2,21E-03	8,37E-04	1,67E-04	3,22E-03	6,98E-04	2,88E-05	0,00E+00	1,10E-04	-6,58E-04
EP-terrestrial	mol N eq.	2,35E-02	9,29E-03	1,46E-03	3,43E-02	7,65E-03	3,14E-04	0,00E+00	9,14E-05	-6,67E-03
POCP	kg NMVOC eq.	9,23E-03	2,43E-03	6,05E-04	1,23E-02	2,10E-03	8,95E-05	0,00E+00	3,36E-05	-2,38E-03
ADP-minerals&metals*	kg Sb eq.	1,71E-05	2,66E-07	8,87E-07	1,82E-05	1,30E-07	5,98E-08	0,00E+00	9,52E-09	-2,51E-06
ADP-fossil*	MJ	8,88E+01	1,83E+00	3,04E+00	9,37E+01	4,41E+00	2,51E-01	0,00E+00	6,74E-02	-3,30E+01
WDP*	m ³	1,23E+00	3,60E-03	8,91E-02	1,33E+00	6,37E-03	7,14E-04	0,00E+00	2,91E-03	-2,93E-01
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									

* 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.

Potential environmental impact – additional mandatory and voluntary indicators

Results per declared unit										
Indicator	Unit	A1	A2	A3	Tot.A1-A3	C1	C2	C3	C4	D
GWP-GHG ¹	kg CO ₂ eq.	3,17E+00	1,35E-01	2,55E-01	3,56E+00	3,21E-01	1,63E-02	0,00E+00	2,78E-02	-1,48E+00

Use of resources

Results per declared unit										
Indicator	Unit	A1	A2	A3	Tot.A1-A3	C1	C2	C3	C4	D
PERE	MJ	1,97E+00	1,07E-02	7,09E-02	2,05E+00	1,72E-02	2,46E-03	0,00E+00	9,02E-04	-1,15E+00
PERM	MJ	6,24E-01	4,97E-03	1,33E+00	1,95E+00	5,61E-03	9,20E-04	0,00E+00	2,87E-04	-2,35E-01
PERT	MJ	2,59E+00	1,57E-02	1,40E+00	4,00E+00	2,28E-02	3,38E-03	0,00E+00	1,19E-03	-1,38E+00
PENRE	MJ	5,45E+01	1,94E+00	2,20E+00	5,86E+01	4,68E+00	2,66E-01	0,00E+00	7,17E-02	-2,90E+01
PENRM	MJ.	4,10E+01	0,00E+00	1,07E+00	4,20E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-6,70E+00
PENRT	MJ	9,55E+01	1,94E+00	3,27E+00	1,01E+02	4,68E+00	2,66E-01	0,00E+00	7,17E-02	-3,57E+01
SM	kg	5,21E-02	0,00E+00	0,00E+00	5,21E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	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
NRSF	MJ	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
FW	m ³	2,67E-02	1,18E-04	2,13E-03	2,89E-02	2,13E-04	2,52E-05	0,00E+00	6,97E-05	-9,55E-03
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 resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water									

¹ 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 almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

Waste production and output flows

Waste production

Results per declared unit										
Indicator	Unit	A1	A2	A3	Tot.A1-A3	C1	C2	C3	C4	D
Hazardous waste disposed	kg	2,37E-05	2,59E-06	1,69E-06	2,80E-05	1,19E-05	6,54E-07	0,00E+00	1,01E-07	-2,06E-05
Non-hazardous waste disposed	kg	1,52E-01	3,02E-02	1,99E-02	2,02E-01	5,32E-03	1,20E-02	0,00E+00	2,71E-01	-1,45E-03
Radioactive waste disposed	kg	5,17E-05	1,27E-05	4,86E-06	6,92E-05	3,07E-05	1,72E-06	0,00E+00	4,02E-07	-6,75E-05

Output flows

Results per declared unit										
Indicator	Unit	A1	A2	A3	Tot.A1-A3	C1	C2	C3	C4	D
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	2,09E-02	2,09E-02	0,00E+00	0,00E+00	2,30E-01	0,00E+00	0,00E+00
Materials for energy recovery	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,00E-01	0,00E+00	0,00E+00
Exported energy, electricity	MJ	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
Exported energy, thermal	MJ	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

Biogenic carbon content

Results per declared unit		
Indicator	Unit	
Biogenic carbon content in accompanying packaging	Kg C	2,87E-02

There is no biogenic carbon content in the product.

K-Mat RF Metal

Potential environmental impact – mandatory indicators according to EN 15804

Results per declared unit										
Indicator	Unit	A1	A2	A3	Tot.A1-A3	C1	C2	C3	C4	D
GWP-fossil	kg CO ₂ eq.	2,66E+00	1,40E-01	1,79E-01	2,98E+00	8,08E-02	1,65E-02	0,00E+00	3,70E-02	-1,54E-01
GWP-biogenic	kg CO ₂ eq.	6,43E-02	2,83E-04	-1,32E-01	-6,72E-02	6,33E-05	3,97E-05	1,32E-01	4,41E-05	-5,44E-03
GWP-luluc	kg CO ₂ eq.	7,86E-03	5,55E-05	2,10E-03	1,00E-02	6,38E-06	5,58E-06	0,00E+00	2,16E-06	1,91E-04
GWP-total	kg CO ₂ eq.	2,73E+00	1,40E-01	4,91E-02	2,92E+00	8,09E-02	1,65E-02	1,32E-01	3,70E-02	-1,59E-01
ODP	kg CFC 11 eq.	2,28E-07	3,12E-08	1,70E-08	2,76E-07	1,73E-08	3,77E-09	0,00E+00	2,09E-09	-2,77E-08
AP	mol H ⁺ eq.	1,18E-02	1,22E-03	2,67E-04	1,33E-02	4,36E-04	8,25E-05	0,00E+00	5,23E-05	1,48E-04
EP-freshwater	kg PO ₄ ³⁻ eq.	4,66E-03	1,50E-04	9,23E-05	4,90E-03	7,24E-05	1,45E-05	0,00E+00	1,19E-03	-1,37E-05
EP-freshwater	kg P eq.	1,11E-03	8,60E-06	1,65E-05	1,14E-03	2,42E-06	1,11E-06	0,00E+00	7,05E-07	-4,14E-05
EP-marine	kg N eq.	2,61E-03	3,30E-04	7,96E-05	3,02E-03	1,74E-04	2,88E-05	0,00E+00	1,19E-04	1,62E-04
EP-terrestrial	mol N eq.	2,48E-02	3,63E-03	7,63E-04	2,92E-02	1,91E-03	3,14E-04	0,00E+00	1,98E-04	4,49E-04
POCP	kg NMVOC eq.	8,98E-03	1,01E-03	3,48E-04	1,03E-02	5,24E-04	8,95E-05	0,00E+00	6,44E-05	3,40E-05
ADP-minerals&metals*	kg Sb eq.	5,14E-05	4,52E-07	4,01E-07	5,22E-05	3,24E-08	5,98E-08	0,00E+00	1,61E-08	1,15E-06
ADP-fossil*	MJ	4,40E+01	2,07E+00	1,05E+00	4,71E+01	1,10E+00	2,51E-01	0,00E+00	1,50E-01	-4,09E+00
WDP*	m ³	1,66E+00	5,50E-03	3,86E-02	1,70E+00	1,59E-03	7,14E-04	0,00E+00	6,61E-03	9,25E-02
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									

* 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.

Potential environmental impact – additional mandatory and voluntary indicators

Results per declared unit										
Indicator	Unit	A1	A2	A3	Tot.A1-A3	C1	C2	C3	C4	D
GWP-GHG ²	kg CO ₂ eq.	2,59E+00	1,39E-01	1,75E-01	2,90E+00	8,02E-02	1,63E-02	0,00E+00	3,06E-02	-1,50E-01

Use of resources

Results per declared unit										
Indicator	Unit	A1	A2	A3	Tot.A1-A3	C1	C2	C3	C4	D
PERE	MJ	2,06E+00	1,86E-02	2,86E-02	2,10E+00	4,31E-03	2,46E-03	0,00E+00	1,35E-03	-1,53E-01
PERM	MJ	7,61E-01	7,16E-03	1,60E+00	2,37E+00	1,40E-03	9,20E-04	0,00E+00	4,99E-04	-1,85E-02
PERT	MJ	2,82E+00	2,57E-02	1,63E+00	4,47E+00	5,71E-03	3,38E-03	0,00E+00	1,85E-03	-1,72E-01
PENRE	MJ	3,80E+01	2,19E+00	8,73E-01	4,11E+01	1,17E+00	2,66E-01	0,00E+00	1,59E-01	-4,45E+00
PENRM	MJ.	9,09E+00	0,00E+00	2,57E-01	9,35E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-3,67E-02
PENRT	MJ	4,71E+01	2,19E+00	1,13E+00	5,04E+01	1,17E+00	2,66E-01	0,00E+00	1,59E-01	-4,49E+00
SM	kg	6,35E-02	0,00E+00	0,00E+00	6,35E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	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
NRSF	MJ	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
FW	m ³	3,79E-02	1,92E-04	9,80E-04	3,90E-02	5,32E-05	2,52E-05	0,00E+00	1,57E-04	2,37E-03
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 resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water									

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 almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

Waste production and output flows

Waste production

Results per declared unit										
Indicator	Unit	A1	A2	A3	Tot.A1-A3	C1	C2	C3	C4	D
Hazardous waste disposed	kg	2,58E-04	4,87E-06	1,10E-06	2,64E-04	2,97E-06	6,54E-07	0,00E+00	2,22E-07	-3,26E-06
Non-hazardous waste disposed	kg	7,62E-01	8,54E-02	1,33E-02	8,60E-01	1,33E-03	1,20E-02	0,00E+00	8,32E-01	1,30E-01
Radioactive waste disposed	kg	8,85E-05	1,42E-05	2,53E-06	1,05E-04	7,68E-06	1,72E-06	0,00E+00	9,44E-07	-1,13E-05

Output flows

Results per declared unit										
Indicator	Unit	A1	A2	A3	Tot.A1-A3	C1	C2	C3	C4	D
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	2,09E-02	2,09E-02	0,00E+00	0,00E+00	2,30E-01	0,00E+00	0,00E+00
Materials for energy recovery	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,35E-01	0,00E+00	0,00E+00
Exported energy, electricity	MJ	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
Exported energy, thermal	MJ	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

Biogenic carbon content

Results per declared unit		
Indicator	Unit	
Biogenic carbon content in accompanying packaging	Kg C	3,81E-02

There is no biogenic carbon content in the product.

X-Grid AM

Potential environmental impact – mandatory indicators according to EN 15804

Results per declared unit										
Indicator	Unit	A1	A2	A3	Tot.A1-A3	C1	C2	C3	C4	D
GWP-fossil	kg CO ₂ eq.	3,94E+00	8,56E-02	2,11E-01	4,24E+00	6,46E-01	1,65E-02	0,00E+00	3,12E-02	-1,53E+00
GWP-biogenic	kg CO ₂ eq.	7,92E-02	7,78E-05	-1,15E-01	-3,60E-02	5,06E-04	3,97E-05	1,15E-01	3,56E-05	1,18E-02
GWP-luluc	kg CO ₂ eq.	2,06E-03	4,92E-05	3,43E-03	5,53E-03	5,10E-05	5,58E-06	0,00E+00	1,48E-06	-9,06E-04
GWP-total	kg CO ₂ eq.	4,02E+00	8,58E-02	9,87E-02	4,21E+00	6,47E-01	1,65E-02	1,15E-01	3,12E-02	-1,52E+00
ODP	kg CFC 11 eq.	7,99E-06	1,80E-08	1,97E-08	8,03E-06	1,38E-07	3,77E-09	0,00E+00	8,80E-10	-1,66E-06
AP	mol H ⁺ eq.	1,58E-02	1,97E-03	4,05E-04	1,81E-02	3,49E-03	8,25E-05	0,00E+00	2,49E-05	-3,78E-03
EP-freshwater	kg PO ₄ ³⁻ eq.	4,34E-03	1,85E-04	1,33E-04	4,66E-03	5,79E-04	1,45E-05	0,00E+00	1,18E-03	-1,48E-03
EP-freshwater	kg P eq.	9,82E-04	3,77E-06	2,51E-05	1,01E-03	1,94E-05	1,11E-06	0,00E+00	4,60E-07	-4,27E-04
EP-marine	kg N eq.	2,93E-03	4,91E-04	1,11E-04	3,54E-03	1,40E-03	2,88E-05	0,00E+00	3,53E-04	-7,09E-04
EP-terrestrial	mol N eq.	3,03E-02	5,45E-03	1,04E-03	3,68E-02	1,53E-02	3,14E-04	0,00E+00	9,28E-05	-7,16E-03
POCP	kg NMVOC eq.	1,08E-02	1,43E-03	4,33E-04	1,27E-02	4,19E-03	8,95E-05	0,00E+00	3,32E-05	-2,37E-03
ADP-minerals&metals*	kg Sb eq.	2,97E-05	1,79E-07	5,83E-07	3,05E-05	2,59E-07	5,98E-08	0,00E+00	9,80E-09	-4,28E-06
ADP-fossil*	MJ	8,84E+01	1,16E+00	1,92E+00	9,15E+01	8,82E+00	2,51E-01	0,00E+00	6,82E-02	-2,92E+01
WDP*	m ³	1,71E+00	2,39E-03	6,15E-02	1,77E+00	1,27E-02	7,14E-04	0,00E+00	2,92E-03	-2,37E-01
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									

* 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.

Potential environmental impact – additional mandatory and voluntary indicators

Results per declared unit										
Indicator	Unit	A1	A2	A3	Tot.A1-A3	C1	C2	C3	C4	D
GWP-GHG ³	kg CO ₂ eq.	3,81E+00	8,50E-02	2,07E-01	4,10E+00	6,41E-01	1,63E-02	0,00E+00	2,55E-02	-1,48E+00

Use of resources

Results per declared unit										
Indicator	Unit	A1	A2	A3	Tot.A1-A3	C1	C2	C3	C4	D
PERE	MJ	2,98E+00	7,27E-03	4,69E-02	3,03E+00	3,45E-02	2,46E-03	0,00E+00	9,84E-04	-1,17E+00
PERM	MJ	1,26E+00	3,27E-03	1,42E+00	2,68E+00	1,12E-02	9,20E-04	0,00E+00	2,99E-04	-2,55E-01
PERT	MJ	4,24E+00	1,05E-02	1,46E+00	5,71E+00	4,57E-02	3,38E-03	0,00E+00	1,28E-03	-1,42E+00
PENRE	MJ	6,36E+01	1,24E+00	1,41E+00	6,63E+01	9,36E+00	2,66E-01	0,00E+00	7,24E-02	-2,84E+01
PENRM	MJ.	3,13E+01	0,00E+00	6,46E-01	3,20E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-3,27E+00
PENRT	MJ	9,50E+01	1,24E+00	2,06E+00	9,83E+01	9,36E+00	2,66E-01	0,00E+00	7,24E-02	-3,17E+01
SM	kg	1,04E-01	0,00E+00	0,00E+00	1,04E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	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
NRSF	MJ	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
FW	m ³	4,22E-02	7,90E-05	1,49E-03	4,38E-02	4,26E-04	2,52E-05	0,00E+00	7,00E-05	-1,01E-02
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 resources; 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 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 almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

Waste production and output flows

Waste production

Results per declared unit										
Indicator	Unit	A1	A2	A3	Tot.A1-A3	C1	C2	C3	C4	D
Hazardous waste disposed	kg	8,54E-05	1,78E-06	1,29E-06	8,84E-05	2,38E-05	6,54E-07	0,00E+00	1,01E-07	-3,18E-05
Non-hazardous waste disposed	kg	2,63E-01	2,27E-02	1,58E-02	3,02E-01	1,06E-02	1,20E-02	0,00E+00	2,71E-01	-1,52E-02
Radioactive waste disposed	kg	1,08E-04	8,08E-06	3,35E-06	1,20E-04	6,14E-05	1,72E-06	0,00E+00	4,04E-07	-6,92E-05

Output flows

Results per declared unit										
Indicator	Unit	A1	A2	A3	Tot.A1-A3	C1	C2	C3	C4	D
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	2,09E-02	2,09E-02	0,00E+00	0,00E+00	2,30E-01	0,00E+00	0,00E+00
Materials for energy recovery	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,00E-01	0,00E+00	0,00E+00
Exported energy, electricity	MJ	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
Exported energy, thermal	MJ	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

Biogenic carbon content

Results per declared unit		
Indicator	Unit	
Biogenic carbon content in accompanying packaging	Kg C	3,28E-02

There is no biogenic carbon content in the product.

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