

Environmental Product Declaration

In accordance with ISO 14025 and EN 15804 +A2

A specific EPD for TEKNOSAFE FLAME PROTECT 2458-00 BASE 1



The Norwegian
EPD Foundation

Owner of the declaration:
Teknos Group Oy

Program holder and publisher: The Norwegian EPD foundation

Declaration number:
NEPD-3810-2769-EN

Registration number:
NEPD-3810-2769-EN

Issue date: 13.10.2022
Valid to: 13.10.2027

Product name

TEKNOSAFE FLAME
PROTECT 2458-00 BASE 1

Manufacturer
Teknos Group Oy

General information

Product:

TEKNOSAFE FLAME PROTECT 2458-00 BASE 1

Program Operator:

The Norwegian EPD Foundation
Post Box 5250 Majorstuen, 0303 Oslo, Norway
Tlf: +47 23 08 80 00
e-mail: post@epd-norge.no

Declaration Number:

NEPD-3810-2769-EN

This declaration is based on Product

Category Rules:

CEN Standard EN 15804:2012+A2:2019 serves as core PCR. NPCR PART A: Construction products and services. IBU PCR Part B for coatings with organic binders

Statements:

The owner of the declaration shall be liable for the underlying information and evidence. EPD Norway shall not be liable with respect to manufacturer, life cycle assessment data and evidences.

Declared unit:

1 kg TEKNOSAFE FLAME PROTECT 2458-00 BASE 1

Declared unit with option:

A1, A2, A3, A4, C1, C2, C3, C4, D

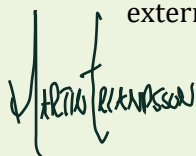
Functional unit:

-

Verification:

Independent verification of the declaration and data, according to ISO14025:2010

internal external



Martin Erlandsson, IVL

Independent verifier approved by EPD Norway

Owner of the declaration:

Teknos Group Oy
Contact person: Chloé Glotin
Phone: +358 45 78201 482
e-mail: chloe.glotin@teknos.com

Manufacturer:

Teknos Group Oy
Takkatie 3, PL 107, 00371 Helsinki, Finland
Phone: +358 9 506 091

Place of production:

Teknos A/S, Industrivej 19, Koldingvej 2, 6580 Vamdrup, Denmark

Management system:

ISO 9001, ISO 14001

Organisation no:

FI22100424

Issue date:

13.10.2022

Valid to:

13.10.2027

Year of study:

2022

Comparability:

EPDs from other programmes than EPD Norway may not be comparable.

The EPD has been worked out by:

Chloé Glotin





Approved (Manager of EPD Norway)

Product

Product description:

TEKNOSAFE FLAME PROTECT 2458-00 is a water-borne fire-retardant topcoat for interior solid wood panelling and cladding, and wood-based panels. It is used as an industrial fire-retardant topcoat as part of a system called Teknos FR Panel with TEKNOSAFEFLAME GUARD 2457-10 to improve “reaction to fire” (EN 13501-1) of interior wooden surfaces. Substrate: Solid wood or wood-based panels with thickness >8mm and density $\geq 338\text{kg/m}^3$ when taken in conjunction with the relevant fire classification report.

Product specification:

The material composition of the declared product is given below.

Materials	%
Additives	9
Solvents	19
Pigments	15
Resins	57

Technical data:

The properties of the declared product are given below.

Name	Value	Unit
Density	1180	kg/m ³
Solid content	45,95	% w/w
Theoretical spreading rate	The classification is made with $\geq 250\text{ g/m}^2$ TEKNOSAFE 2457-10 with or without $\leq 100\text{ g/m}^2$ TEKNOSAFE FLAME PROTECT 2458-00	g/m ²
Colour range	White	/

Market:

Europe.

Reference service life, product:

The reference service life of the product is highly dependent on the conditions of use.

Reference service life, building:

The coated building is not declared.

LCA: Calculation rules

Declared unit:

1 kg TEKNOSAFE FLAME PROTECT 2458-00 BASE 1

Data quality:

The CEPE database was used as a basis for the paint raw materials. Specific data for the product composition and raw material amounts has been provided by the manufacturer. Production site data was collected in 2022 is of reference year 2021. Representative data from ecoinvent v3.8 and GaBi Professional 2022.2 was used for other processes.

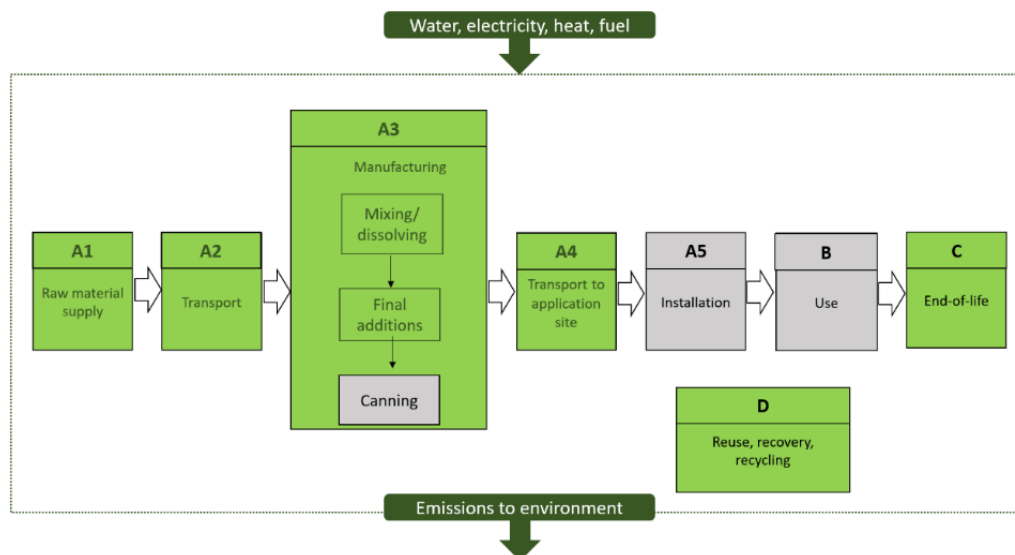
Name	Source	Reference year
Raw materials	Mainly CEPE RM Database v3.0	2016
Energy	GaBi Professional 2022.2	2018
Waste	ecoinvent 3.8	2000-2012
Transport	ecoinvent 3.8	2013

Allocation:

The allocation is made in accordance with the provisions of EN 15804:A2. Incoming energy and water and waste production in-house is allocated equally among all products based on economic value of the product.

System boundary:

The flowchart in the figure below illustrates the system boundaries for the analysis, in accordance with the modular principle on EN 15804+A2. The analysis is a cradle-to-gate with options, modules C1-C4 and D. Module A4 has been added as required by the NPCR PART A for Construction products and services. In the foreground system, a choice has been made by Teknos Group Oy to consider only the production of paint itself. All processes related to the packaging (primary, secondary and tertiary) are not included. Capital goods are not included.



Cut-off criteria:

All main flows of production materials, waste and energy have been included. No cut-offs were applied to inputs and outputs within the system boundaries in the models. Cut-offs in the background processes are according to the respective methodologies described in the documentation of the relevant processes.

LCA: Scenarios and additional technical information

The scenario modelling the end-of-life of the paint is based on the PEFCR for decorative paints, according to the table below.

Parameter	Description
Collection process	The product is collected mixed with wood waste and transported with an articulated lorry of capacity >32t
Recovery system	There is no recycling or reuse
Disposal	100% incinerated with energy recovery Ashes from incineration are landfilled

Transport from production place to assembly/user (A4)

The stage A4 includes transport of the paint from the production site to the application site, as well as storage and wastage of the products along the distribution chain. Transport distance is estimated based on the distances between the warehouse and the delivery address of the different customers. Distances are then weighted per sales to obtain an average value. The product is transported by lorry. Lorry specifications are described in the table below.

Name	Value	Unit
Capacity	>32	t
Litres of fuel	31,1	l/100 km
Capacity utilisation	64	%
Bulk density of transported products*	1180	kg/m ³

* Estimated with product density

Deconstruction/demolition (C1)

The deconstruction and/or demolition of the paint is part of the demolition of the entire building. All the paint waste is gathered as a part of another product and is generally not separated from it at the end of life. The consumption of energy and natural resources is negligible for disassembling of the end-of-life product. Therefore, the environmental impact is assumed to be very small and has been neglected.

Transport to waste processing (C2)

The model used for the transportation in module A4 was applied for module C2. The distance to the waste facility is assumed to be 80 km.

Waste processing for reuse, recovery and/or recycling (C3)

Dried paint films are currently not recycled or reused. Module C3 impacts are zero as the product is considered to be 100 % collected for incineration.

Disposal (C4)

The dried paint film is treated together with the substrate as construction materials. Exterior/interior wood has an energy content and is assumed to be incinerated with energy recovery, with a thermal efficiency less than 60%, and thereby does not fulfil the end-of-waste criteria.

Benefits and loads beyond the system boundaries (D)

This product has not considerable benefits or loads resulting from reusable products or recyclable materials leaving the product system. Loads and benefits related to the export of energy as a result of waste incineration was calculated according to the Annex D of EN15804+A2. The exported energy is in the form of heat and electricity.

Additional technical information

See Technical Data Sheet:

https://www.teknos.com/document/tds/TEKNOSAFE%20FLAME%20PROTECT%202458-00_2458-00_TDS_en.pdf

Fire-retardant performance has been classified according to B-s1, d0 EN 13501-1 (SBI test) as part of the Teknos FR panel system. Durability classes of reaction to fire performance, of fire-retardant wood-based product in end use applications according to EN 16755 - DRF class INT1 and INT2.

LCA: Results

The LCA results have been calculated using the Gabi 10.6.2.9 software, developed by Sphera (Thinkstep).

System boundaries (X=included, MND= module not declared, MNR=module not relevant)

Product stage			Assembly stage		Use stage							End of life stage				Benefits & loads beyond system boundary
Raw materials	Transport	Manufacturing	Transport	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	X	MND	MND	MND	MNR	MNR	MNR	MND	MND	X	X	X	X	X

Core environmental impact indicators

Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
GWP-total	kg CO2 eq.	2,69E+00	6,49E-02	0,00E+00	3,31E-03	0,00E+00	1,11E+00	1,04E+00
GWP-fossil	kg CO2 eq.	2,65E+00	5,73E-02	0,00E+00	3,30E-03	0,00E+00	1,10E+00	1,04E+00
GWP-biogenic	kg CO2 eq.	3,32E-02	7,63E-03	0,00E+00	6,99E-06	0,00E+00	4,75E-03	4,73E-03
GWP-LULUC	kg CO2 eq.	3,08E-03	1,53E-05	0,00E+00	9,67E-07	0,00E+00	2,06E-06	3,50E-07
ODP	kg CFC11 eq.	2,71E-07	1,24E-08	0,00E+00	7,82E-10	0,00E+00	9,80E-10	9,80E-10
AP	mol H ⁺ eq.	1,72E-02	2,66E-04	0,00E+00	1,67E-05	0,00E+00	9,50E-05	7,62E-05
EP-freshwater	kg P eq.	5,83E-04	3,81E-06	0,00E+00	2,17E-07	0,00E+00	1,48E-06	1,47E-06
EP-marine	kg N eq.	2,34E-03	9,29E-05	0,00E+00	5,79E-06	0,00E+00	4,35E-05	3,60E-05
EP-terrestrial	mol N eq.	2,33E-02	1,01E-03	0,00E+00	6,32E-05	0,00E+00	4,77E-04	3,93E-04
POCP	kg NMVOC eq.	2,48E-02	3,01E-04	0,00E+00	1,89E-05	0,00E+00	1,17E-04	9,54E-05
ADP-M&M	kg Sb eq.	8,86E-06	1,24E-07	0,00E+00	7,81E-09	0,00E+00	2,76E-08	2,40E-08
ADP-fossil	MJ	4,19E+01	8,25E-01	0,00E+00	5,21E-02	0,00E+00	1,01E-01	-9,49E-01
WDP	m ³	5,64E+01	4,58E-03	0,00E+00	2,59E-04	0,00E+00	3,67E-03	2,65E-03

GWP-total: Global Warming Potential; **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; See "additional Norwegian requirements" for indicator given as PO4 eq. **EP-marine:** Eutrophication potential, fraction of nutrients reaching freshwater end compartment; **EP-terrestrial:** Eutrophication potential, Accumulated Exceedance; **POCP:** Formation potential of tropospheric ozone; **ADP-M&M:** Abiotic depletion potential for non-fossil resources (minerals and metals); **ADP-fossil:** Abiotic depletion potential for fossil resources; **WDP:** Water deprivation potential, deprivation weighted water consumption

Additional environmental impact indicators

Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
PM	Disease incidence	2,47E-07	4,86E-09	0,00E+00	3,06E-10	0,00E+00	7,27E-10	5,88E-10
IRP	kBq U235 eq.	2,37E-01	4,21E-03	0,00E+00	2,66E-04	0,00E+00	3,22E-04	-6,71E-04
ETP-fw	CTUe	1,73E+02	6,79E-01	0,00E+00	4,13E-02	0,00E+00	2,91E-01	2,73E-01
HTP-c	CTUh	3,18E-09	2,10E-11	0,00E+00	1,23E-12	0,00E+00	1,41E-09	1,40E-09
HTP-nc	CTUh	2,11E-07	6,35E-10	0,00E+00	3,68E-11	0,00E+00	4,30E-09	4,25E-09
SQP	Dimensionless	1,03E+01	9,39E-01	0,00E+00	5,95E-02	0,00E+00	3,84E-02	1,11E-02

PM: Particulate matter emissions; **IRP:** Ionising radiation, human health; **ETP-fw:** Ecotoxicity (freshwater); **ETP-c:** Human toxicity, cancer effects; **HTP-nc:** Human toxicity, non-cancer effects; **SQP:** Land use related impacts / soil quality

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	Acidification 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
	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
<p>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.</p>		
<p>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</p>		

Resource use

Parameter	Unit	A1-A3	A4	C1	C2	C3	C4	D
RPEE	MJ	2,85E+00	1,01E-02	0,00E+00	6,34E-04	0,00E+00	2,54E-03	-6,12E-01
*RPEM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
TPE	MJ	2,85E+00	1,01E-02	0,00E+00	6,34E-04	0,00E+00	2,54E-03	-6,12E-01
NRPE	MJ	4,19E+01	8,25E-01	0,00E+00	5,21E-02	0,00E+00	8,52E+00	7,47E+00
NRPM	MJ	8,42E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-8,42E+00	0,00E+00
TRPE	MJ	5,03E+01	8,25E-01	0,00E+00	5,21E-02	0,00E+00	1,01E-01	7,47E+00
SM	kg	0,00E+00	0,00E+00	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
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
W	m ³	1,31E+00	1,07E-04	0,00E+00	6,03E-06	0,00E+00	8,54E-05	-8,17E-04

RPEE: Renewable primary energy resources used as energy carrier; **RPEM:** Renewable primary energy resources used as raw materials; **TPE:** Total use of renewable primary energy resources; **NRPE:** Non renewable primary energy resources used as energy carrier; **NRPM:** Non renewable primary energy resources used as materials; **TRPE:** 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; **W:** Use of net fresh water

* The paint includes minor part of renewable materials (<5%) but reported as RPEE.

End of life - Waste

Parameter	Unit	A1-A3	A4	C1	C2	C3	C4	D
HW	KG	1,94E-10	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-7,03E-11
NHW	KG	2,46E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-3,95E-04
RW	KG	5,60E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-8,58E-06

HW: Hazardous waste disposed; **NHW:** Non hazardous waste disposed; **RW:** Radioactive waste disposed

End of life – output flow

Parameter	Unit	A1-A3	A4	C1	C2	C3	C4	D
CR	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MR	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EEE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,69E-01	0,00E+00
ETE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,71E-01	0,00E+00

CR: Components for reuse; **MR:** Materials for recycling; **MER:** Materials for energy recovery; **EEE:** Exported electric energy; **ETE:** Exported thermal energy

Information describing the biogenic carbon content at the factory gate

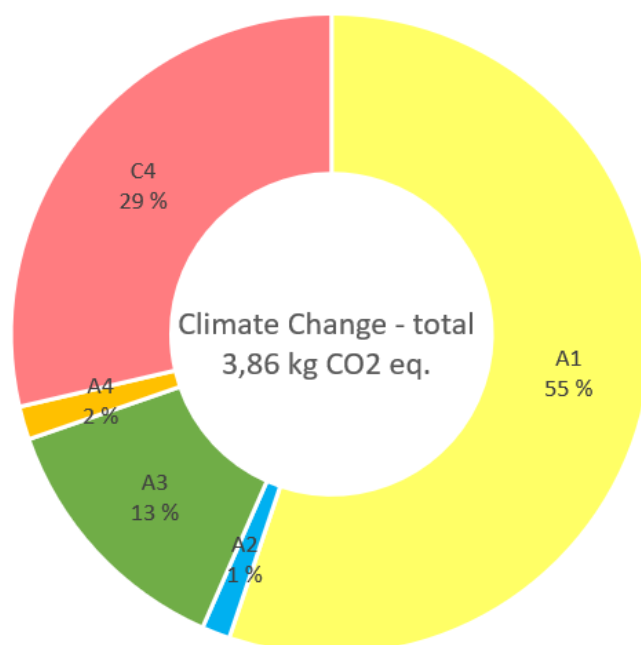
Biogenic carbon content	Unit	Value
*Biogenic carbon content in product	kg C	0
Biogenic carbon content in the accompanying packaging	kg C	Not considered

*The paint includes minor part of renewable materials (<5%) but reported as RPEE.

LCA: Interpretation

The results of a life cycle assessment are relative. For almost all the impact categories, the impacts are mainly caused by the raw materials production processes (A1). The key impact categories are Climate change, Particulate matter, Acidification, Photochemical ozone formation and Resource use.

By way of example, the contribution of the various life cycle stages to Global Warming Potential-total (GWP-total) is reported in the figure below.



Additional Norwegian requirements

Greenhouse gas emission from the use of electricity in the manufacturing phase

National electricity grid	Value	Unit
Electricity grid mix 1kV-60kV (DK)	0,25	kg CO2 - eq/kWh

Additional environmental impact indicators required in NPCR Part A for construction products

Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
GWP-IOBC	kg CO2 eq.	2,66E+00	5,73E-02	0,00E+00	3,30E-03	0,00E+00	1,10E+00	1,04E+00

GWP-IOBC Global warming potential calculated according to the principle of instantaneous oxidation

Hazardous substances

- The product contains no substances given by the REACH Candidate list or the Norwegian priority list.
- The product contains substances given by the REACH Candidate list or the Norwegian priority list that are less than 0,1 % by weight.
- The product contain dangerous substances, more then 0,1% by weight, given by the REACH Candidate List or the Norwegian Priority list, see table.
- The product contains no substances given by the REACH Candidate list or the Norwegian priority list. The product is classified as hazardous waste (Avfallsforskiten, Annex III), see table.

Indoor environment






M1 classification, A+ Émissions l'air intérieur: When used in an industrial.

Carbon footprint

Carbon footprint has not been worked out for the product.

Bibliography

ISO 14025:2010	Environmental labels and declarations - Type III environmental declarations - Principles and procedures
ISO 14044:2006	Environmental management - Life cycle assessment - Requirements and guidelines
EN 15804:2012+A2:2019	Sustainability of construction works - Environmental product declaration - Core rules for the product category of construction products
ISO 21930:2007	Sustainability in building construction - Environmental declaration of building products
ecoinvent v3.7.1	Swiss Centre of Life Cycle Inventories
CEPE v3.0	Raw materials LCI database for the European coatings and printing ink industries, 2016. CEPE
PEFCR – Decorative Paints	Product Environmental Footprint Category Rules - Decorative Paints, 2018. CEPE
GaBi Professional 2021.2	Sphera
NPCR PART A	NPCR PART A: Construction products and services, 2021. EPD-Norge
PCR PART B	PCR Part B for coatings with organic binders, 2019. IBU
LCA Report	LCI/LCA Report 14.09.2022 (confidential LCA report), 2022. Teknos Group Oy

 epd-norway <small>Global Program Operator</small>	Program Operator	tlf	+47 23 08 80 00
	The Norwegian EPD Foundation Post Box 5250 Majorstuen, 0303 Oslo Norway	e-post: web	post@epd-norge.no www.epd-norge.no
 epd-norway <small>Global Program Operator</small>	Publisher	tlf	+47 23 08 80 00
	The Norwegian EPD Foundation Post Box 5250 Majorstuen, 0303 Oslo Norway	e-post: web	post@epd-norge.no www.epd-norge.no
 TEKNOS	Owner of the declaration	tlf	+358 9 506 091
	Teknos Group Oy Takkatie 3, PL 107, 00371 Helsinki Finland	e-post: web	 www.teknos.com
 TEKNOS	Author of the life cycle assessment	tlf	+358 45 78201 482
	Chloé Glotin Takkatie 3, P.O. Box 107, 00371 Helsinki Finland	e-post:	chloe.glotin@teknos.com
	ECO platform	tlf	+46 (0) 10-788 65 00
	ECO platform	web	www.eco-platform.org

EPD for the best environmental decision



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