FERREX



Program operator, publisher:	Rakennustietosäätiö RTS Building Information Foundation RTS Malminkatu 16 A 00100 Helsinki http://cer.rts.fi
Owner of the declaration:	Teknos Group Oy
Name of the product:	FERREX
Registration number:	RTS_222_23
Issue date:	8.5.2023
Valid to:	8.5.2028
Scope of the declaration	This environmental product declaration covers the environmental impacts of the FERREX coating. The declaration has been prepared in accordance with EN 15804:2019 and ISO 14025 standards and the additional requirements stated in the RTS PCR (English version, 26.8.2020). This declaration covers the life cycle stages from cradle to gate with options (A4 and A5), modules C1–C4, and module D. EPD of construction products may not be comparable if they do not comply with EN15804 and seen in a building context.
YMPÄRISTÖSELOSTE • RAKENNUSTIETOSÄÄTIÖ RTS • EPD	Jukka Seppänen RTS EPD Committee Secretary Laura Apilo Managing Director

Verified according to the requirements of EN 15804:2019 (product group rules)	
Independent verification of the declaration and data, according to ISO14025:2010 is	
☐ Internal	☒ External

Third party verifier:



8.5.2023

Anni Viitala, Granlund Oy

General information, goal and verification of declaration

1. Owner of the declaration, manufacturer

Teknos Group Oy,
Takkatie 3,
FI-00370 Helsinki, Finland
+358 9 506 091S

2. Product name and number

Product series	Product name	Color
FERREX	FERREX AQUA	T1326, T1380
	FERREX COMBI	White Base Paint 1Base Paint 3, Black (NCS-S9000N), Grey (NCS-S4500N)

3. Place of production

Produced in Finland: Rajamäki.

4. Additional technical information

Further information can be found at:

FERREX AQUA: https://www.teknos.com/products/ferrex-aqua/

FERREX COMBI: https://www.teknos.com/products/ferrex-combi/

5. Product Category Rules and the scope of the declaration

The declaration has been prepared in accordance with EN 15804:2019 and ISO 14025 standards and the additional requirements stated in the RTS PCR (English version, 26.8.2020). Geographical representativeness is taken into account by opting for the most representative scenarios available, Finland specifically, and Europe generally.

6. Author of the life-cycle assessment and declaration

Ecomatters B.V.
Weg der Verenigde Naties 1, 3527 KT Utrecht
tel +31 (0) 6 44836384
https://www.ecomatters.nl/.
Compiler Ecomatters.
Evaluation made according to values in 2023.

7. Verification

The declaration has been prepared in accordance with EN 15804:2019 and ISO 14025 standards and the additional requirements stated in the RTS PCR (English version, 26.8.2020). The declaration was verified by Anni Viitala, Granlund Oy, according to abovementioned standards and PCR rules.
Malminkaari 21, 00701 Helsinki
https://www.granlund.fi/
Third party verification on 8.5.2023. Verification is valid 8.5.2023

8. Declaration issue date and validity

Declaration issue date 8.5.2023. The declaration is valid 5 years, 8.5.2023-8.5.2028.

Product information

9. Product description

The declaration covers FERREX products: anticorrosive paints for exterior and interior use. For iron and steel surfaces as well as aluminum; and a water-borne tin table anticorrosive paints for priming, top coating and one-layer painting for nearly all unpainted and previously painted metal surfaces indoors and outdoors. They are manufactured in one location. This EPD represents the highest environmental impacts of the FERREX Aqua and FERREX Combi products.

10. Results of environmental information reported per kilogram

FERREX AQUA

Environmental Impact Category	Unit	A3	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Global Warming Potential total (GWP-total)	kg CO_2 ekv/kg	1.04E+00	3.28E+00	7.01E-02	4.90E-01	NR	0.00E+00	7.63E-03	0.00E+00	4.51E-01	-7.37E-02
Abiotic depletion potential for non-fossil resources (ADP-minerals&metals)	kg Sb eq./kg	6.85E-07	1.61E-05	1.61E-07	9.59E-07	NR	0.00E+00	1.76E-08	0.00E+00	2.50E-07	-4.69E-08
Abiotic depletion for fossil resources potential (ADP-fossil)	MJ. Net calorific value/kg	1.35E+01	5.65E+01	1.10E+00	2.80E+00	NR	0.00E+00	1.20E-01	0.00E+00	2.12E+00	-1.46E +00
Water (user) deprivation potential, deprivation-weighted water consumption (WDP)	M3world eq. depr-ived/kg	2.29E-01	4.62E+00	5.61E-03	4.07E-02	NR	0.00E+00	6.10E-04	0.00E+00	1.41E-02	-2.86E-02
Biogenic carbon content in product	kg C/kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NR	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of secondary material	kg/kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NR	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FERREX COMBI

Environmental Impact Category	Unit	A3	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Global Warming Potential total (GWP-total)	kg CO_2 ekv/kg	8.84E-01	4.37E+00	6.28E-02	4.41E-01	NR	0.00E+00	6.85E-03	0.00E+00	4.04E-01	-6.63E -02
Abiotic depletion potential for non-fossil resources (ADP-minerals&metals)	kg Sb eq./kg	6.04E-07	4.40E-04	1.53E-07	9.10E-07	NR	0.00E+00	1.66E-08	0.00E+00	2.36E-07	-4.46E -08
Abiotic depletion for fossil resources potential (ADP-fossil)	MJ. Net calorific value/kg	1.16E+01	7.26E+01	1.04E+00	2.65E+0 0	NR	0.00E+00	1.14E-01	0.00E+00	2.00E+00	-1.38E +00
Water (user) deprivation potential, deprivation-weighted water consumption (WDP)	M3world eq. depriv-ed/kg	2.08E-01	3.00E+00	5.30E-03	3.87E-02	NR	0.00E+00	5.78E-04	0.00E+00	1.34E-02	-2.72E -02
Biogenic carbon content in product	kg C/kg	0.00E+00	0.00E+00	0.00E+00	0.00E+0 0	NR	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of secondary material	kg/kg	0.00E+00	0.00E+00	0.00E+00	0.00E+0 0	NR	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

11. Description of product and its use



FERREX AQUA is a water-borne anticorrosive pigmented paint and adhesion primer for iron and steel surfaces and aluminium outdoors and indoors. The adhesion on zinc-coated (galvanized) surfaces and prefabrication primers is also excellent.



FERREX COMBI is a water-borne tintable anticorrosive paint for priming, top coating and one-layer painting for nearly all unpainted and previously painted metal surfaces indoors and outdoors, with excellent adhesion to metal and painted surfaces, good weather and wear resistance.

Product standards (c-PCR)

c-PCR is not used in the calculations.

12. Physical properties

FERREX is a waterborne coating for metal surfaces for indoor and outdoor use. It covers 7-8 m^2/l and is applied in 2 layers.

13. Raw materials of the product and product information

Product structure / composition / raw material	Quantity p%*	Usability			Origin of the raw materials
		Renewable	Non-renewable	Recycled	
Additives	8-10%		x		Europe/Global.
Colorants	1-2%		x		Europe/Global.
Extenders	8-10%		x		Europe/Global.
Pigments	9-12%		x		Europe/Global.
Resins	15-21%		x		Europe/Global.
Solvents	40-50%		x		Europe/Global.

*Order of magnitude, not exact composition

14. Substances under European Chemicals Agency's REACH, SVHC restrictions

http://echa.europa.eu/web/guest/candidate-list-table Compulsory CAS-number

Name	EC Number	CAS Number
Does not include	-	-

SCOPE OF LIFE CYCLE ASSESMENT (Standard 7.2.1-2)

Mark all the covered modules of the EPD with X. Mandatory modules are marked with blue in the table below. This declaration covers “cradle-to-gate with options”. Please fulfil relevant stages ”R” (relevant) and non-relevant stages ”NR”.

Product stage			**Construction process stage**		**Use stage**							**End of life stage**				**Supplementary information beyond the life cycle**		
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	D	D
☒	☒	☒	☒	☒	NR	NR	NR	NR	NR	NR	NR	☒	☒	☒	☒	☒	☒	☒
Raw material supply	Transport	Manufacturing	Transport	Construction-instsallation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling

	Mandatory modules
	Mandatory as per the RTS PCR section 6.2.1 rules and terms
	Optional modules based on scenarios

15. Functional / declared unit

The environmental performance of the paints is calculated using the declared unit “1 m^2 of paint”. This declared unit encompasses the following paint characteristics: paints coverage (m^2/l), density (kg/l) and number of layers needed in its application. Therefore, the declared unit was calculated as follows:

$$Declared\ Unit = \text{Coverage [kg/m}^2\text{] x number of layers}$$

Product serie	**kg/m²**
FERREX AQUA	3.28E-01
FERREX COMBI	3.47E-01

16. System boundary

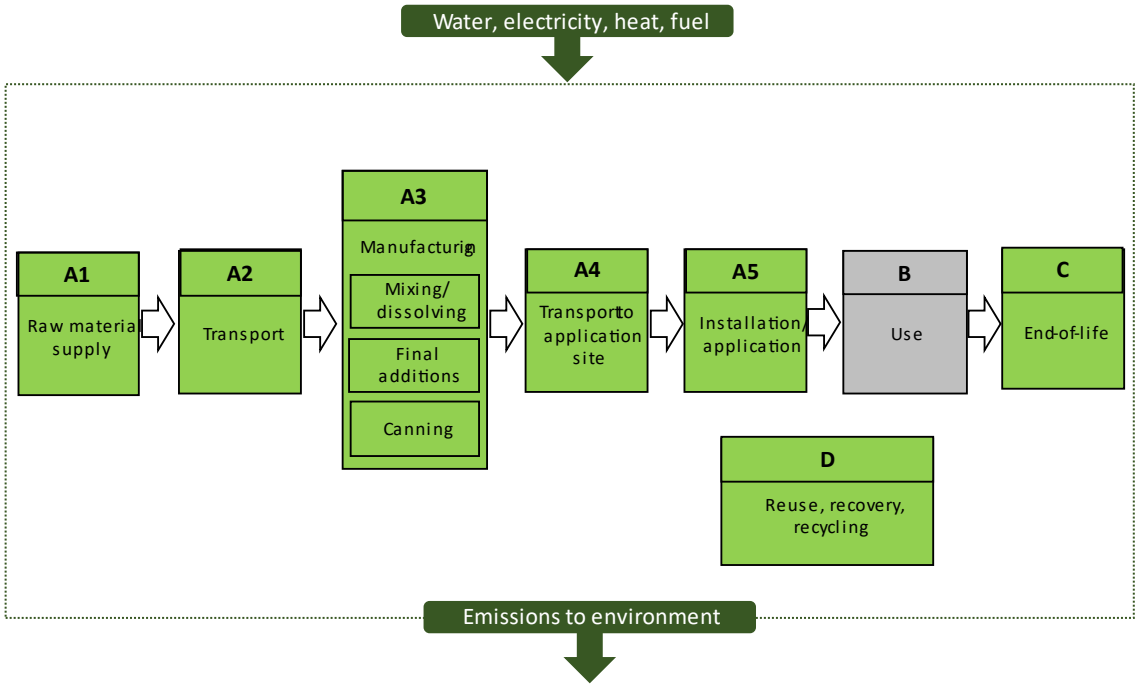
This LCA is a Cradle-to-Grave with options. All major steps, from the extraction of natural resources to the final disposal of the product, are included in the scope of the study. The life cycle stages included are A1-A5, C2 and C4 and D. The use stage, B, is not considered in this study, since no impact are associated with the use stage. C1 and C3 are excluded, because there are no dismantling or demolition activities and no waste processing steps respectively. All impacts associated with the upstream production of materials and energy are included in the system boundaries. Mining activities and controlled landfills are included in the product systems. Wastewater treatment is not considered within the technological systems since it is already included in the solid waste treatment processes. The emissions and resource extractions derived from these processes are considered elementary exchanges between the product systems and the environment.

Paint products do not consume resources and are not released into the environment during the use phase. Moreover, painted surfaces do not require maintenance, repair, replacement or refurbishment beyond their normal use, so no impact is considered for modules B1 to B7 and therefore excluded in this assessment.

Regarding the end-of-life stage, the waste processing stage (C3) is irrelevant as no further processing is required during the end-of-life of decorative paints since they are disposed together with the substrate where they are applied on and not reused or recycled. Since the efficiency rate cannot be considered higher than 60% it is not included in this assessment.

Module D is included to show the benefits and loads beyond the system boundary from the net output of recovered energy from the product system. Energy recovery values for the paint waste are taken on the default level in PEFCR for decorative paints: 1.01 MJ of electricity and 2.16 MJ of heat per kg of waste. Energy recovery values for the packaging materials waste are taken from the background documentation of the respective Ecoinvent datasets.

The allocation is made in accordance with EN15804:A2. Allocation is based on physical and production shares. Energy and water use are allocated according to production volume.



17. Cut-off criteria

There was no cut-off of raw materials or other inputs or outputs in any stage of the life cycle. Cut-offs in the background processes are according to the respective methodologies (see documentation of the relevant processes [Wernet, G. et al. 2016; https://www.ecoinvent.org/], [Dahlgren, L. et al., 2016]). Furthermore, brushes, clothes, buckets etc., used during the application process are excluded from the assessment since they are being considered capital goods.

18. Production process

The following variables have been taken into account during the production phase of the coating. Energy inputs – electricity, diesel, liquefied petroleum gas and water – production outputs – hazardous and non-hazardous waste, waste water and direct VOC emissions. After the production of the paints the produces are packaged.

A1. Raw materials supply

Life-cycle stage A1 includes the extraction and processing of raw materials which occur upstream to the FERREX manufacturing process, as well as waste processing up to the end-of-waste state.

A2. Transportation of raw materials to manufacturer

Life-cycle stage A2 includes the transport mode and distance of the raw materials to the production facility.

Raw material transport	Quantiy
Type of truck	Lorry, total weight >32t
Distance	460 km
Capacity	64%

A3. Manufacturing

Life-cycle stage A3 includes the manufacturing of the FERREX coatings and includes all processes linked to the production, for example mixing, packaging and transportation. The use of energy, electricity and fuels are taken into account too. Primary production data was obtained, regarding the inputs. For the electricity grid mix the EcoInvent 3.8 database was used. Generic data was used for upstream and downstream processes (application, use and waste processing), when no specific data was obtained. The production data was obtained for one production site, Rajamäki, Finland.

For the Paint packaging, the data for the steel tinplated was obtained from primary data for the other packaging formats default values were used from the Product Environmental Footprint Category Rules - Decorative Paints document version 1.0 published by Technical Secretariat Decorative Paints from the European Council of the Paint, Printing Ink and Artists' Colours Industry (CEPE) and reviewed in April 2018.

Packaging format	Unit	Packaging
Cardboard	kg/kg paint	0.001092
Polyethylene film	kg/kg paint	0.001236
Polypropylene	kg/kg paint	0.0487116
Polypropylene part	kg/kg paint	0.046392
Steel tinplated	kg/kg paint	paint specific
Wooden pallets	kg/kg paint	0.061824

A4. Transport of Regional Distribution Centre and customer

Life-cycle stage A4 includes the transportation downstream from the production facility. For all transportation modes and distances for all produced paint from the production facility to the RDC and final customer, default data was used.

Coating transport	Factory to RDC	RDC to PoS
Type of truck	Lorry, total weight >32t	Lorry, total weight >32t
Distance	350 km	370 km
Capacity	64%	64%

A5. Application and use

Life-cycle stage A5 includes the environmental impacts during application and use of the coating. Auxiliary materials such as brushers and rollers are not taken into account. The impact of energy to spray the coating is neglectable and therefore not considered in this study.

In the application VOC emissions are emitted and include in this life-cycle stage.

C2. Transport of waste material

Life-cycle stage C2 includes the impacts of the transportation mode and distance (one-way) to the end-of-life treatment site.

End-of-life transport	PoS to waste processing
Type of truck	Lorry, total weight >32t
Distance	80 km
Capacity	64%

C4. Disposal

Life-cycle stage C4 includes the impact of the end-of-life treatment at the disposal site. It is assumed that paint is used on both interior and exterior surfaces and that in both cases paint is lost during application. The paint that is not lost is considered applied.

D. Benefits and loads beyond the system boundaries

Module D has the impacts of benefits and loads beyond the system boundaries. It is assumed that benefits and loads arise from the potential energy recovery in the incineration of non-hazardous waste scenario including wet paint, as well as from energy collected from the waste treatment of hazardous waste and hazardous wet paint waste in stages A5 and C4. As a conservative assumption.

SCOPE OF THE LIFE-CYCLE ASSESSMENT (Standard 7.2.3–7.2.4)

19. **Environmental impacts (7.2.3, table 3)** The results of the impact assessment are relative. They do not predict the effects on the weighted values of the categories, the exceedance limits, safety margins and risks.

FERREX AQUA

Indicators	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Global Warming Potential total (GWP-total)	kg CO_2 ekv	1,51E+00	2,18E-02	1,53E-01	NR	0.00E+00	2,37E-03	0.00E+00	1,40E-01	-2,30E-02
Global Warming Potential fossil fuels (GWP-fossil)	kg CO2 ekv	1,53E+00	2,17E-02	1,34E-01	NR	0.00E+00	2,36E-03	0.00E+00	1,40E-01	-2,19E-02
Global Warming Potential biogenic (GWP-biogenic)	kg CO2 ekv	-1,45E-02	7,92E-05	1,85E-02	NR	0.00E+00	8,64E-06	0.00E+00	1,06E-04	-1,09E-03
Global Warming Potential land use and land use change (GWP-luluc)	kg CO2 ekv	8,73E-04	8,10E-06	2,42E-05	NR	0.00E+00	8,84E-07	0.00E+00	6,77E-06	-2,65E-05
Depletion potential of the stratospheric ozone layer (ODP)	kg CFC 11 ekv	1,67E-07	5,22E-09	1,62E-08	NR	0.00E+00	5,69E-10	0.00E+00	1,08E-08	-2,23E-09
Acidification potential, Accumulated Exceedance (AP)	mol H^+ eqv	7,85E-03	1,10E-04	2,29E-04	NR	0.00E+00	1,20E-05	0.00E+00	1,44E-04	-6,91E-05
Eutrophication potential, fraction of nutrients reaching freshwater end compartment (EP-freshwater)	kg PO4-ekv	3,57E-04	1,36E-06	8,29E-06	NR	0.00E+00	1,48E-07	0.00E+00	1,57E-06	-1,11E-05
Eutrophication potential, fraction of nutrients reaching marine end compartment (EP-marine)	kg N ekv.	1,38E-03	3,78E-05	4,65E-05	NR	0.00E+00	4,13E-06	0.00E+00	2,42E-05	-1,33E-05
Eutrophication potential, Accumulated Exceedance (EP-terrestrial)	mol N ekv.	1,27E-02	4,14E-04	4,68E-04	NR	0.00E+00	4,51E-05	0,00E+00	2,68E-04	-1,21E-04
Formation potential of tropospheric ozone (POCP)	kg NMVOC eq.	9,55E-03	1,24E-04	1,40E-04	NR	0.00E+00	1,35E-05	0,00E+00	8,55E-05	-3,53E-05
Abiotic depletion potential for non-fossil resources (ADP-minerals & metals)	kg Sb eq.	1,45E-04	5,01E-08	2,99E-07	NR	0.00E+00	5,47E-09	0,00E+00	7,76E-08	-1,46E-08
Abiotic depletion for fossil resources potential (ADP-fossil)	MJ. Net calorific value	2,38E+01	3,42E-01	8,71E-01	NR	0.00E+00	3,73E-02	0,00E+00	6,58E-01	-4,54E-01
Water (user) deprivation potential, deprivation-weighted water consumption (WDP)	M3world eq. deprived	9,86E-01	1,74E-03	1,27E-02	NR	0.00E+00	1,90E-04	0,00E+00	4,39E-03	-8,93E-03

FERREX COMBI

Indicators	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Global Warming Potential total (GWP-total)	kg CO_2 ekv	1.51E+00	2.18E-02	1.53E-01	NR	0.00E+00	2.37E-03	0.00E+00	1.40E-01	-2.30E-02
Global Warming Potential fossil fuels (GWP-fossil)	kg CO2 ekv	1.53E+00	2.17E-02	1.34E-01	NR	0.00E+00	2.36E-03	0.00E+00	1.40E-01	-2.19E-02
Global Warming Potential biogenic (GWP-biogenic)	kg CO2 ekv	-1.45E-02	7.92E-05	1.85E-02	NR	0.00E+00	8.64E-06	0.00E+00	1.06E-04	-1.09E-03
Global Warming Potential land use and land use change (GWP-luluc)	kg CO2 ekv	8.73E-04	8.10E-06	2.42E-05	NR	0.00E+00	8.84E-07	0.00E+00	6.77E-06	-2.65E-05
Depletion potential of the stratospheric ozone layer (ODP)	kg CFC 11 ekv	1.67E-07	5.22E-09	1.62E-08	NR	0.00E+00	5.69E-10	0.00E+00	1.08E-08	-2.23E-09
Acidification potential, Accumulated Exceedance (AP)	mol H^+ eqv	7.85E-03	1.10E-04	2.29E-04	NR	0.00E+00	1.20E-05	0.00E+00	1.44E-04	-6.91E-05
Eutrophication potential, fraction of nutrients reaching freshwater end compartment (EP-freshwater)	kg PO4-ekv	3.57E-04	1.36E-06	8.29E-06	NR	0.00E+00	1.48E-07	0.00E+00	1.57E-06	-1.11E-05
Eutrophication potential, fraction of nutrients reaching marine end compartment (EP-marine)	kg N ekv.	1.38E-03	3.78E-05	4.65E-05	NR	0.00E+00	4.13E-06	0.00E+00	2.42E-05	-1.33E-05
Eutrophication potential, Accumulated Exceedance (EP-terrestrial)	mol N ekv.	1.27E-02	4.14E-04	4.68E-04	NR	0.00E+00	4.51E-05	0.00E+00	2.68E-04	-1.21E-04
Formation potential of tropospheric ozone (POCP)	kg NMVOC eq.	9.55E-03	1.24E-04	1.40E-04	NR	0.00E+00	1.35E-05	0.00E+00	8.55E-05	-3.53E-05
Abiotic depletion potential for non-fossil resources (ADP-minerals&metals)	kg Sb eq.	1.45E-04	5.01E-08	2.99E-07	NR	0.00E+00	5.47E-09	0.00E+00	7.76E-08	-1.46E-08
Abiotic depletion for fossil resources potential (ADP-fossil)	MJ. Net calorific value	2.38E+01	3.42E-01	8.71E-01	NR	0.00E+00	3.73E-02	0.00E+00	6.58E-01	-4.54E-01
Water (user) deprivation potential, deprivation-weighted water consumption (WDP)	M3world eq. deprived	9.86E-01	1.74E-03	1.27E-02	NR	0.00E+00	1.90E-04	0.00E+00	4.39E-03	-8.93E-03

20. Standard 7.2.3.2 Additional environmental impact indicators (voluntary information).

FERREX AQUA

Indicator	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Potential incidence of disease due to PM emissions (PM)	Incidence of disease	6.96E-08	2.13E-09	2.10E-09	NR	0.00E+00	2.32E-10	0.00E+00	1.45E-09	-2.02E-10
Potential Human exposure efficiency relative to U235 (IRP)	kBq U235 eq.	1.60E-01	1.82E-03	4.99E-03	NR	0.00E+00	1.98E-04	0.00E+00	3.32E-03	-6.95E-03
Potential Comparative Toxic Unit for ecosystems (ETP-fw)	CTUh	1.92E+01	2.92E-01	3.76E+01	NR	0.00E+00	3.17E-02	0.00E+00	6.51E-01	-1.45E-01
Potential Comparative Toxic Unit for humans (HTP-c)	CTUh	8.67E-10	7.78E-12	3.30E-11	NR	0.00E+00	8.47E-13	0.00E+00	2.87E-10	-4.26E-12
Potential Comparative Toxic Unit for humans (HTP-nc)	CTUh	2.97E-08	2.67E-10	1.61E-09	NR	0.00E+00	2.91E-11	0.00E+00	5.31E-10	-1.29E-10
Potential soil quality index (SQP)	Dimensionless	1.01E+01	4.12E-01	2.46E-01	NR	0.00E+00	4.48E-02	0.00E+00	1.80E-01	-4.03E-02

FERREX COMBI

Indicator	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Potential incidence of disease due to PM emissions (PM)	Incidence of disease	8.81E-08	2.01E-09	1.98E-09	NR	0.00E+00	2.19E-10	0.00E+00	1.38E-09	-1.92E-10
Potential Human exposure efficiency relative to U235 (IRP)	kBq U235 eq.	1.79E-01	1.72E-03	4.73E-03	NR	0.00E+00	1.88E-04	0.00E+00	3.15E-03	-6.60E-03
Potential Comparative Toxic Unit for ecosystems (ETP-fw)	CTUh	4.03E+01	2.76E-01	9.59E+01	NR	0.00E+00	3.01E-02	0.00E+00	6.16E-01	-1.38E-01
Potential Comparative Toxic Unit for humans (HTP-c)	CTUh	1.32E-09	7.35E-12	3.12E-11	NR	0.00E+00	8.02E-13	0.00E+00	2.72E-10	-4.04E-12
Potential Comparative Toxic Unit for humans (HTP-nc)	CTUh	6.64E-08	2.52E-10	2.52E-09	NR	0.00E+00	2.75E-11	0.00E+00	5.03E-10	-1.22E-10
Potential soil quality index (SQP)	Dimensionless	9.66E+00	3.89E-01	2.31E-01	NR	0.00E+00	4.24E-02	0.00E+00	1.71E-01	-3.82E-02

21. Standard 7.2.4 Use of natural resources

FERREX AQUA

Use of natural resources	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ	1.57E+00	4,35E-03	1,92E-02	NR	0.00E+00	4,75E-04	0.00E+00	4,67E-03	-4,25E-02
Renewable primary energy resources used as raw materials	MJ	2.70E-02	2,03E-09	3,90E-09	NR	0.00E+00	2,21E-10	0.00E+00	2,13E-09	-1,58E-09
Total use of renewable primary energy resources	MJ	1.59E+00	4,35E-03	1,92E-02	NR	0.00E+00	4,75E-04	0.00E+00	4,67E-03	-4,25E-02
Use of non renewable primary energy excluding non renewable primary energy resources used as raw materials	MJ	2.29E+01	3,42E-01	8,71E-01	NR	0.00E+00	3,73E-02	0.00E+00	6,58E-01	-4,54E-01
Non renewable primary energy resources used as raw materials	MJ	1.22E-06	0,00E+00	0,00E+00	NR	0.00E+00	0,00E+00	0.00E+00	0,00E+00	0,00E+00
Total use of non renewable primary energy resources	MJ	2.29E+01	3,42E-01	8,71E-01	NR	0.00E+00	3,73E-02	0.00E+00	6,58E-01	-4,54E-01
Use of secondary material	kg	0.00E+00	0,00E+00	0,00E+00	NR	0.00E+00	0,00E+00	0.00E+00	0,00E+00	0,00E+00
Use of renewable secondary fuels	MJ	0.00E+00	0,00E+00	0,00E+00	NR	0.00E+00	0,00E+00	0.00E+00	0,00E+00	0,00E+00
Use of non-renewable secondary fuels	MJ	0.00E+00	0,00E+00	0,00E+00	NR	0.00E+00	0,00E+00	0.00E+00	0,00E+00	0,00E+00
Net use of fresh water (7.2.3)	m^3	1.72E-02	4,05E-05	2,96E-04	NR	0.00E+00	4,42E-06	0.00E+00	1,02E-04	-2,08E-04

FERREX COMBI

Use of natural resources	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ	1.55E+00	4.60E-03	1.42E-02	NR	0.00E+00	5.01E-04	0.00E+00	4.44E-04	-3.43E-02
Renewable primary energy resources used as raw materials	MJ	1.27E-02	2.15E-09	3.08E-09	NR	0.00E+00	2.34E-10	0.00E+00	1.06E-09	-1.27E-09
Total use of renewable primary energy resources	MJ	1.56E+00	4.60E-03	1.42E-02	NR	0.00E+00	5.01E-04	0.00E+00	4.44E-04	-3.43E-02
Use of non renewable primary energy excluding non renewable primary energy resources used as raw materials	MJ	1.86E+01	3.62E-01	6.48E-01	NR	0.00E+00	3.94E-02	0.00E+00	5.12E-02	-3.66E-01
Non renewable primary energy resources used as raw materials	MJ	1.64E-05	0.00E+00	0.00E+00	NR	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of non renewable primary energy resources	MJ	1.86E+01	3.62E-01	6.48E-01	NR	0.00E+00	3.94E-02	0.00E+00	5.13E-02	-3.66E-01
Use of secondary material	kg	0.00E+00	0.00E+00	0.00E+00	NR	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	NR	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	NR	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net use of fresh water (7.2.3)	m^3	3.54E-02	4.29E-05	2.22E-04	NR	0.00E+00	4.67E-06	0.00E+00	5.47E-05	-1.68E-04

OTHER INDICATORS (Standard 7.2.5)

22. Biogenic carbon content table 9, 7.2.5 Unit (expressed per declared unit).

FERREX AQUA

Biogenic carbon content	Unit	A3	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Biogenic carbon content in product	kg C	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NR	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Biogenic carbon content in packaging	kg C	1.04E-02	1.04E-02	0.00E+00	0.00E+00	NR	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

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Biogenic carbon content	Unit	A3	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Biogenic carbon content in product	kg C	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NR	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Biogenic carbon content in packaging	kg C	1.09E-02	1.09E-02	0.00E+00	0.00E+00	NR	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

23. End of life - Waste

FERREX AQUA

Waste categories	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Hazardous waste disposed	kg	3.64E-03	0.00E+00	6.70E-02	NR	0.00E+00	3.28E-01	0.00E+00	3.64E-03	0.00E+00
Non-hazardous waste disposed	kg	1.81E-02	0.00E+00	8.21E-02	NR	0.00E+00	0.00E+00	0.00E+00	1.81E-02	0.00E+00
Radioactive waste disposed	kg	0.00E+00	0.00E+00	0.00E+00	NR	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FERREX COMBI

Waste categories	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Hazardous waste disposed	kg	3.84E-03	0.00E+00	7.07E-02	NR	0.00E+00	3.47E-01	0.00E+00	3.84E-03	0.00E+00
Non-hazardous waste disposed	kg	1.90E-02	0.00E+00	9.24E-02	NR	0.00E+00	0.00E+00	0.00E+00	1.90E-02	0.00E+00
Radioactive waste disposed	kg	0,00E+00	0,00E+00	0,00E+00	NR	0.00E+00	0,00E+00	0.00E+00	0,00E+00	0,00E+00

24. Other environmental indicators.

FERREX AQUA

Other environmental indicators	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Components for reuse	kg	0,00E+00	0,00E+00	0,00E+00	NR	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	0,00E+00	0,00E+00	0,00E+00	NR	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	0,00E+00	NR	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy (heat)	MJ/energy source	0,00E+00	0,00E+00	0,00E+00	NR	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

FERREX COMBI

Other environmental indicators	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Components for reuse	kg	0,00E+00	0,00E+00	0,00E+00	NR	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	0,00E+00	0,00E+00	0,00E+00	NR	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	0,00E+00	NR	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy (heat)	MJ/energy source	0,00E+00	0,00E+00	0,00E+00	NR	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

SCENARIOS AND ADDITIONAL TECHNICAL INFORMATION (Standard 7.3)

25. Energy in the manufacturing phase (Standard 7.3. A3)

Parameter	Quantity	Data quality
A3 Electricity information and CO_2 emission kg CO_2 eq /kWh	**0.091**	Electricity has been calculated based on ecoinvent 3.8 database. The impacts include all upstream processes.
A3 District heating/cooling data quality and CO_2 emissions kg CO_2 eq./kWh	**0.014**	District heating has been calculated based on ecoinvent 3.8 database. The impacts include all upstream processes.
A3 Diesel CO_2 emissions kg CO_2 eq./kWh	**0.027**	Diesel has been calculated based on ecoinvent 3.8 database. The impacts include all upstream processes.
A3 Propane CO_2 emissions kg CO_2 eq./kWh	**0.025**	Propane has been calculated based on ecoinvent 3.8 database. The impacts include all upstream processes.

26. Additional technical information, transport to the building site (Standard 7.3.2, A4)

Parameter	Quantity	Data quality
Fuel type and consumption of vehicle or vehicle type used for transport e.g., long distance truck, boat etc. Litre of fuel type per distance or vehicle type, Commission Directive 2007/37/EC (European Emission Standard)		Default transportation mode and distances have been used in accordance with the PEFCR – Decorative Paint document version 1. Published by the Technical Secretariat Decorative Paints from the European Council of the Paint, Printing Ink and Artists' Colours Industry (CEPE) and reviewed in April 2018.
Distance (average distance of the transportation) km	-	Idem
Capacity utilisation % (including empty returns)	-	idem
Bulk density of transported products kg/m^3	-	idem
Volume capacity utilisation factor (factor = 1 or <1 tai ≥ 1 for compressed or nested packaged products)	-	n/a

27. End-of-life process description (7.3.4), module C

Process flow	Unit (expressed per functional unit or per declared unit of components products or materials and by type of material)	Value kg/kg Data quality
Collection process specified by type	kg collected separately	-
	kg collected with mixed construction waste	1
Recovery system specified by type	kg for re-use	-
	kg for recycling	-
	kg for energy recovery	1
Disposal specified by type	kg product or material for final deposition	-
Assumptions for scenario development, e.g., transportation	units as appropriate	-

*These values are based on current estimation on end-of-life processes

28. Other technical information

Technical information	N/mm²
Compressive strength in the direction of cause	n/a
Compressive strength in the direction of cause perpendicular to the	n/a
Tensile strength in the direction of cause	n/a
Bending strength	n/a
Modulus module	n/a
Shear	n/a
Density	n/a

29. Additional information (Standard 7.4)

Emissions to soil: The information is not available

Emissions to water: The information is not available

Emissions to indoor air: During application VOC emissions are released.

30. Product information :

FERREX products are anticorrosive paints for exterior and interior use. For iron and steel surfaces as well as aluminum; and a water-borne tin table anticorrosive paints for priming, top coating and one-layer painting for nearly all unpainted and previously painted metal surfaces indoors and outdoors. Manufactured in one location. It is sold mainly in Europe. Application method: Brush or Spray

FERREX AQUA: 0.5 l, 1 l, 3 l, 10 l.
FERREX COMBI: Base paints 1 and 3: 0.45 l, 0.9 l, 2.7 l, 9 l, 18 l. Grey and black: 0.5 l, 1 l, 3 l, 10 l, 20 l.

31. Reference of the common information

- EN 15804:2012+A2:2019 Sustainability of construction works. Environmental product declarations. Core rules for the product category of construction products, of 2019.
- ISO 14040/14044 on Life Cycle Assessments
- Product Environmental Footprint Category Rules - Decorative Paints version 1.0, 2018. Developed by the Technical Secretariat Decorative Paints of the European Council of the Paint, Printing Ink and Artists' Colours Industry.
- Sphera GaBi Software-System and Database for Life Cycle Engineering. Copyright 1992-2018 Sphera.
- Personal communication with Chloé Glotin, LCA specialist, Teknos, 2022.
- Raw materials LCI database for the European Council of the Paint, Printing Ink and Artists' Colours Industry (CEPE), version 3.0, IVL Swedish Environmental Research Institute, 2016

  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

32. Product information (volunteer, verified information)

n/a