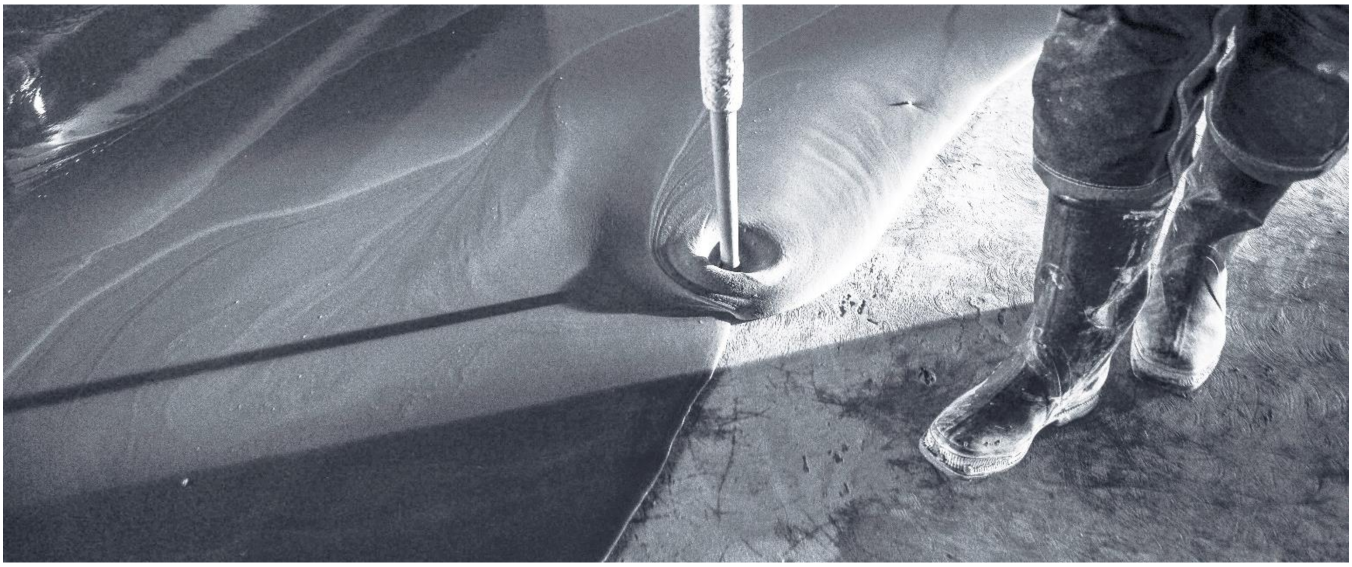


RAKENNUSTIETOSÄÄTIÖ RTS
The Building Information Foundation RTS

RTS EPD, no. RTS_75_20	**FLOOR SCREED family – TM Express K, TM Rotavjämning K, TM Industri K, TM Multi and TM Kombiflyt**
Scope of the declaration	This environmental product declaration covers the environmental impacts of A1-A4, C1-C4 and D. The declaration has been prepared in accordance with EN 15804:2012+A1:2013 and ISO 14025 standards and the additional requirements stated in the RTS PCR (English version, 18.6.2018). This declaration covers the life cycle stages from cradle-to-gate with options including transportation to installation site, deconstruction, transportation, treatment and recovery of the product at its end-of-life.
30.09.2020	Building Information Foundation RTS Malminkatu 16 A 00100 Helsinki http://cer.rts.fi

ECO EPD Ref. no. 00001345

Laura Sariola
Committee secretary

Markku Hedman
RTS General Director

1. Owner of the declaration, manufacturer

Declaration owner	Lilli Puntti, Kiilto Oy
Manufacturer	Kiilto Ab – TM Progress Contact person: Peter Forsberg Kavelvägen 7, Box 395, 89128 Örnsköldsvik, Sweden info@tmprogress.se

2. Product name and number

TM Express K; 1001 bulk
TM Rotavjämning K; 1004 bulk
TM Industi K; 1005 bulk
TM Multi; 1029 bulk
TM Kombiflyt; 1013 bulk

3. Place of production

Olbergavägen 8, 734 92 Hallstahammar, Sweden

4. Additional information

More info: www.kiilto.com, productsafety@kiilto.com

5. Product Category Rules and the scope of the declaration

This EPD has been prepared in accordance with EN 15804:2012+A1:2013 and ISO 14025 standards together with the RTS PCR (English version, 18.6.2018). Product specific category rules have not been applied in this EPD. EPD of construction materials may not be comparable if they do not comply with EN15804 and seen in a building context.

6. Author of the life-cycle assessment and declaration

Collected/registered by	Mari Borg
Internal verification by	Lilli Puntti

The EPD issuing organization is Kiilto Oy.

7. Verification

This EPD has been verified according to the requirements of ISO 14025:2010, EN 15804: 2012+A1:2013 and RTS PCR by a third party. The verification has been carried out by Anni Oviir, Rangi Maja OÜ.

8. Declaration issue date and validity

Declaration issue date: 30.9.2020. Valid from 23.9.2020 to 22.9.2025.

European standard EN 15804: 2014 A1 serves as the core PCR

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

	☐ Internal ☒ External
Third party verifier	Anni Oviir, Rangi Maja OÜ

9. Product description

This EPD represents product TM Express K, TM Rotavjämning K, TM Industri K, TM Kombiflyt and TM Multi produced in Hallstahammar, Sweden. The market area of the product is Northern Europe.

TM Express K is a normal-drying, fibre-reinforced, pumpable selflevelling compound. The product is free from casein, low-alcaline and suitable as underlayment indoors for most coverings, in new constructions as well as renovation of housing, offices and public areas without industrial load. For plane applications as well as slopes on many different substrates.

TM Rotavjämning K is a self-drying, fibre-reinforced, pumpable selflevelling compound. The product is free from casein, low-alcaline and suitable as underlayment indoors in new constructions as well as renovation of housing, offices, public areas, workshops, warehouses etc. May under certain conditions be used without surface covering. Suitable for light industry load. For plane applications as well as slopes on many different substrates.

TM Industri K is a self-drying, fibre-reinforced, pumpable selflevelling compound. The product is free from casein, low-alcaline and suitable as underlayment indoors in new constructions as well as renovation of housing, offices, public areas, workshops, warehouses etc. May under certain conditions be used without surface covering. Suitable for moderate industry load and coverings with highest demands. For plane applications as well as slopes on many different substrates. The product is freeze-thaw resistant under salt-free conditions.

TM Kombiflyt is a self-drying, fibre-reinforced, pumpable selflevelling compound. The product is free from casein, low-alcaline and suitable as underlayment for most coverings indoors, in new constructions as well as renovation of housing, offices and public areas. For plane applications as well as slopes on many different substrates.

TM Multi is a self-drying, pumpable selflevelling compound. The product is free from casein, low-alcaline and suitable as thicker base layer indoors for floating coverings or other screeds, in new constructions as well as renovation of housing, offices and public areas. Under certain conditions, surface covering may be applied directly onto the product. For plane applications on many different substrates.

10. Technical specifications

Products	Intended layer thickness (mm)	Consumption (kg/m2/mm)	Pumpable	Self levelling	Self-drying	Fiber reinforced
TM Express K	4-40	1,75	X	X	-	X
TM Rotavjämning K	2-50	1,75	X	X	X	X
TM Industri K	5-35	1,7	X	X	X	X
TM Kombiflyt	5-50	1,8	X	X	X	X
TM Multi	20-100	1,85	X	X	X	-

x = is an applicable feature to the product

11. Product standards

The product is produced according to the requirements in the standard EN 13813 Screed material and floor screeds - Screed materials

12. Physical properties

Detailed physical properties available at https://www.tmprogress.se/sv/produkter

13. Raw materials of the product

Raw materials	TM Express K	TM Rotavjämning K	TM Kombiflyt	TM Industri	TM Multi
Sand	30 – 60 %	30 – 60 %	30 – 60 %	30 – 60 %	30 – 60 %
Aluminate cement	10 – 15 %	10 – 15 %	10 – 15 %	10 – 15 %	10 – 15 %
Portland cement	5 – 10 %	5 – 10 %	5 – 10 %	5 – 10 %	5 – 10 %
$CaSO_4$	3 – 10 %	3 – 10 %	3 – 10 %	3 – 10 %	3 – 10 %
Gypsum	1 – 5 %	1 – 5 %	1 – 5 %	1 – 5 %	1 – 5 %
$CaCO_3$	20 – 35 %	20 – 35 %	20 – 35 %	20 – 35 %	20 – 35 %
Polymer	< 1 %	1 – 3 %	< 1 %	1 – 3 %	< 1 %
Additives	0,1 – 1 %	0,1 – 1 %	0,1 – 1 %	0,1 – 1 %	0,1 – 1 %

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

The product does not contain REACH SVHC substances.

15. Functional / declared unit

Declared unit is 1 kg for each floor screeds. Functional unit is not used because use stage is not considered.

16. System boundary

This EPD covers the following modules; A1 (Raw material supply), A2 (Transport), A3 (Manufacturing) and A4 (Transportation of the product to the building site) as well as C1 (Deconstruction), C2 (Transport at end-of-life), C3 (Waste processing) and C4 (Disposal). In addition, module D - benefits and loads beyond the system boundary - have been included.

MANUFACTURING AND PACKAGING (A1-A3) A1 raw material supply, A2 transportation, A3 manufacturing. All used materials, energy, packing and transportation until the end-of-waste state have been included. A1-A3 results have been provided as an aggregate.

TRANSPORT (A4) A4 transportation has been estimated to be 300 km, the return trip has not been considered.

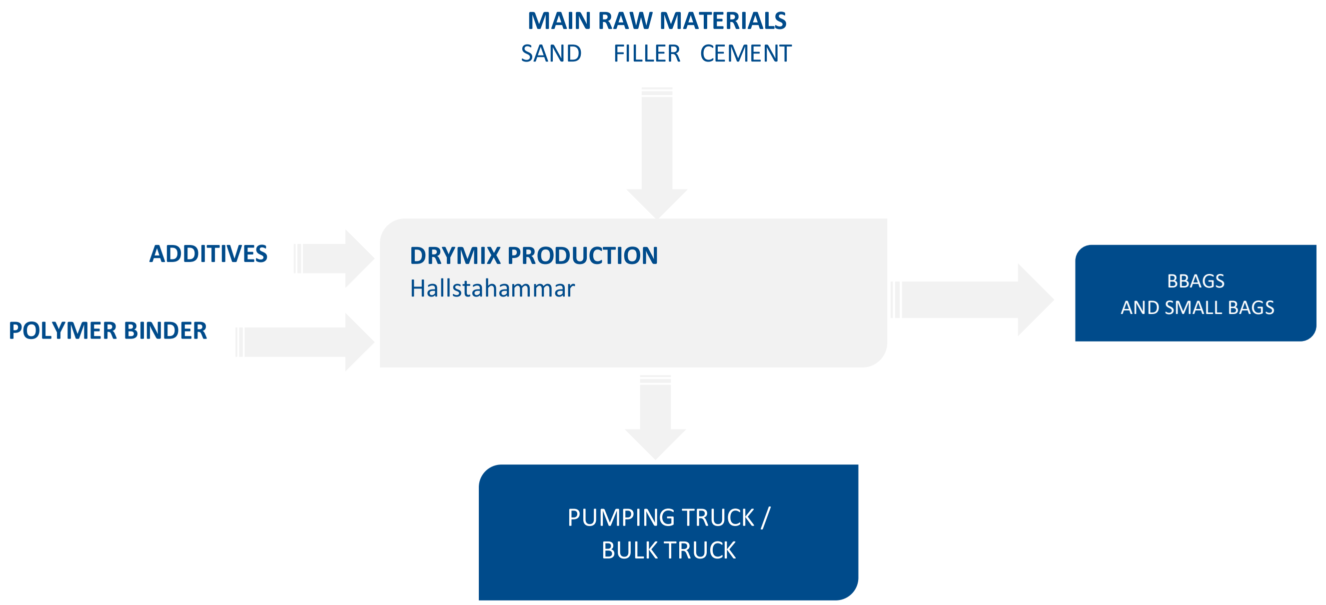
USAGE STAGE (B1-B7) Module B information has not been presented or included in the LCA calculation.

PRODUCT END OF LIFE (C1-C4, D) It is assumed that 100% of the waste is collected. Energy consumption of demolition process is on the average 10 kWh/m2 (Bozdağ, Ö & Seçer, M. 2007). Average mass of concrete building is about 1000 kg/m2. Therefore, the demolition energy consumption is 10 kWh/ 1000 kg=0,01 kWh/kg. (C1) Transportation distance to the closest disposal area is estimated as 50 km and the transportation method is assumed as lorry which is the most common. (C2) 90 % of the concrete / screed is recycled in waste handling process sites. (C3) 10% of the concrete / screed is sent to the landfill. (C4) Main use of the demolished and crushed concrete / screed is road substructures. This crushed screed (90% of end-of-life product) replaces the use of virgin gravel. A common practise is to utilize crushed material at other construction sites. About 10% of the material is mixed with any other materials or is contaminated that this is to be disposed of as waste. (D)

17. Cut-off criteria

This study follows the cut-off criteria stated in RTS PCR and EN 15804 -standard. This study does not exclude any modules or processes which represent more than 1 % of the emissions of studied life cycle stage. The study does not exclude any hazardous substances.
Additives which content are less than 0,1% from total product content has been excluded, because of environmental impact of those additives is negligible of the LCA calculations.
Packaging materials have not been included in the calculations, because of the mass of paper bags from total manufactured product kilos are negligible. The main form of the delivery is the bulk trucks. About 95% of total manufactured kilos have been delivered by bulk trucks.
Water has not been taking account, because in manufacturing or other cleaning processes does not use water. This plant is dry mix product plant. Only water what has been used in factory is sanitary water for employees' purposes.
The production of capital equipment, construction activities, and infrastructure, maintenance and operation of capital equipment, personnel-related activities, energy and water use related to company management and sales activities are excluded.

18. Production process



TM Progress plant is located in Hallstahammar, where productions happens. All raw materials are solid, and they are delivered by bulk, big bags or smaller bags from EU. Big volumes like sand, cement and other fillers have been delivered by the bulk deliveries with lorries.

All the raw materials are mixed together in big mixer. Then ready product mix has blown into storage silo. Negligible amount of products is packed in small or big bags. Main volume of the production is bulk deliveries.

Then the delivery truck will fill the tanks of the lorry and drives to building site where they add water into product and use the mass as pumpable floor screed.

Then the delivery truck will fill the tanks of the lorry and drives to building site where they add water into product and use the mass as pumpable floor screed.

Floor screed is stable in the buildings and don´t require any maintenance during use stage. In the demolition stage when the building is end of life, the whole structure will be crashed. The floor screed part is not possible to separate from concrete and that why be handle same way like concrete slab. 90% of concrete crushed stone can be recycled for use, for example, as a material for road or building foundations. 10% of the material are going in the landfill and used there for structures.

19. Scope of the Life-Cycle Assessment

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". For other fields mark MND (module not declared) or MNR (module not relevant)

Product stage			Assembly stage		Use stage							End of life stage				Beyond the system boundaries		
A1	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**	**D**	**D**
x	x	x	x	MND	MND	MND	MND	MND	MND	MND	MND	x	x	x	x	MND	MND	x
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

20. Environmental impacts

The results of a life cycle assessment are relative. They do not predict impact on category endpoints, exceeding of limit values, safety margins, or risks. The impacts are presented per declared unit, 1 kg of product. The impacts are mainly caused by the manufacturing of raw material process (A1).

Environmental impact – TM Express K

Parameter	Unit	A1–A3	A4	C1	C2	C3	C4	D
Global warming potential	kg CO2 -eqv	1,63E-1	5,01E-2	3,34E-3	6,37E-3	7,7E-3	5,35E-4	-1,67E-2
Depletion of stratospheric ozone layer	kg CFC11-eqv	1,49E-8	9,09E-9	5,99E-10	1,17E-9	1,36E-9	1,77E-10	-1,77E-9
Formation of photochemical ozone	kg C2H4 -eqv	3,71E-5	8,31E-6	6,66E-7	1,06E-6	1,73E-6	1,94E-7	-5,06E-6
Acidification	kg SO2 -eqv	6,48E-4	1,63E-4	2,52E-5	2,08E-5	4,99E-5	3,95E-6	-9,50E-5
Eutrophication	kg PO4 3--eqv	8,62E-5	2,64E-5	5,41E-6	3,37E-6	9,40E-6	6,79E-7	-1,36E-5
Abiotic depletion of non fossil resources	kg Sb-eqv	2,66E-6	4,78E-7	2,24E-9	5,6E-8	2,18E-8	1,79E-9	-3,47E-7

Abiotic depletion of fossil resources	MJ	1,00E0	7,57E-1	4,78E-2	9,74E-2	1,29E-1	1,51E-2	-2,39E-1

Environmental impact – TM Rotavjämning K

Parameter	Unit	A1–A3	A4	C1	C2	C3	C4	D
Global warming potential	kg CO2 -eqv	2,23E-1	5,01E-2	3,34E-3	6,37E-3	7,7E-3	5,35E-4	-1,67E-2
Depletion of stratospheric ozone layer	kg CFC11-eqv	1,95E-8	9,09E-9	5,99E-10	1,17E-9	1,36E-9	1,77E-10	-1,77E-9
Formation of photochemical ozone	kg C2H4 -eqv	5,56E-5	8,31E-6	6,66E-7	1,06E-6	1,73E-6	1,94E-7	-5,06E-6
Acidification	kg SO2 -eqv	9,00E-4	1,63E-4	2,52E-5	2,08E-5	4,99E-5	3,95E-6	-9,50E-5
Eutrophication	kg PO4 3--eqv	1,14E-4	2,64E-5	5,41E-6	3,37E-6	9,40E-6	6,79E-7	-1,36E-5
Abiotic depletion of non fossil resources	kg Sb-eqv	3,26E-6	4,78E-7	2,24E-9	5,6E-8	2,18E-8	1,79E-9	-3,47E-7
Abiotic depletion of fossil resources	MJ	2,27E0	7,57E-1	4,78E-2	9,74E-2	1,29E-1	1,51E-2	-2,39E-1

Environmental impact – TM Industri K

Parameter	Unit	A1–A3	A4	C1	C2	C3	C4	D
Global warming potential	kg CO2 -eqv	2,56E-1	5,01E-2	3,34E-3	6,37E-3	7,70E-3	5,35E-4	-1,67E-2
Depletion of stratospheric ozone layer	kg CFC11-eqv	2,16E-8	9,09E-9	5,99E-10	1,17E-9	1,36E-9	1,77E-10	-1,77E-9
Formation of photochemical ozone	kg C2H4 -eqv	6,57E-5	8,31E-6	6,66E-7	1,06E-6	1,73E-6	1,94E-7	-5,06E-6
Acidification	kg SO2 -eqv	1,01E-4	1,63E-4	2,52E-5	2,08E-5	4,99E-5	3,95E-6	-9,50E-5
Eutrophication	kg PO4 3--eqv	1,30E-5	2,64E-5	5,41E-6	3,37E-6	9,40E-6	6,79E-7	-1,36E-5
Abiotic depletion of non fossil resources	kg Sb-eqv	3,47E-6	4,78E-7	2,24E-9	5,6E-8	2,18E-8	1,79E-9	-3,47E-7
Abiotic depletion of fossil resources	MJ	3,33E0	7,57E-1	4,78E-2	9,74E-2	1,29E-1	1,51E-2	-2,39E-1

Environmental impact – TM Multi

Parameter	Unit	A1–A3	A4	C1	C2	C3	C4	D
Global warming potential	kg CO2 -eqv	1,71E-1	5,01E-2	3,34E-3	6,37E-3	7,70E-3	5,35E-4	-1,67E-2
Depletion of stratospheric ozone layer	kg CFC11-eqv	1,58E-8	9,09E-9	5,99E-10	1,17E-9	1,36E-9	1,77E-10	-1,77E-9
Formation of photochemical ozone	kg C2H4 -eqv	3,91E-5	8,31E-6	6,66E-7	1,06E-6	1,73E-6	1,94E-7	-5,06E-6
Acidification	kg SO2 -eqv	6,82E-4	1,63E-4	2,52E-5	2,08E-5	4,99E-5	3,95E-6	-9,50E-5

Eutrophication	kg PO4 3-- eqv	8,85E-5	2,64E-5	5,41E-6	3,37E-6	9,40E-6	6,79E-7	-1,36E-5
Abiotic depletion of non fossil resources	kg Sb-eqv	3,03E-6	4,78E-7	2,24E-9	5,6E-8	2,18E-8	1,79E-9	-3,47E-7
Abiotic depletion of fossil resources	MJ	1,03E0	7,57E-1	4,78E-2	9,74E-2	1,29E-1	1,51E-2	-2,39E-1

Environmental impact – TM Kombiflyt

Parameter	Unit	A1–A3	A4	C1	C2	C3	C4	D
Global warming potential	kg CO2 -eqv	1,78E-1	5,01E-2	3,34E-3	6,37E-3	7,70E-3	5,35E-4	-1,67E-2
Depletion of stratospheric ozone layer	kg CFC11-eqv	1,65E-8	9,09E-9	5,99E-10	1,17E-9	1,36E-9	1,77E-10	-1,77E-9
Formation of photochemical ozone	kg C2H4 -eqv	4,15E-5	8,31E-6	6,66E-7	1,06E-6	1,73E-6	1,94E-7	-5,06E-6
Acidification	kg SO2 -eqv	7,27E-4	1,63E-4	2,52E-5	2,08E-5	4,99E-5	3,95E-6	-9,50E-5
Eutrophication	kg PO4 3--eqv	9,14E-5	2,64E-5	5,41E-6	3,37E-6	9,40E-6	6,79E-7	-1,36E-5
Abiotic depletion of non fossil resources	kg Sb-eqv	3,03E-6	4,78E-7	2,24E-9	5,6E-8	2,18E-8	1,79E-9	-3,47E-7
Abiotic depletion of fossil resources	MJ	1,05E0	7,57E-1	4,78E-2	9,74E-2	1,29E-1	1,51E-2	-2,39E-1

21. Use of natural resources

Resource use -TM Express K

Parameter	Unit	A1–A3	A4	C1	C2	C3	C4	D
Renewable primary energy resources used as energy carrier	MJ	3,60E-2	9,65E-3	2,79E-4	1,35E-3	-	-	-
Renewable primary energy resources used as raw materials	MJ	3,93E-2	-	-	-	7,32E-3	3,90E-4	-1,19E-2
Total use of renewable primary energy resources	MJ	7,35E-2	9,65E-3	2,79E-4	1,35E-3	7,32E-3	3,90E-4	-1,19E-2
Nonrenewable primary energy resources used as energy carrier	MJ	4,77E-1	7,69E-1	4,82E-2	9,91E-2	-	-	-
Nonrenewable primary energy resources used as materials	MJ	7,50E-1	-	-	-	1,46E-1	1,54E-2	-2,75E-1
Total use of non-renewable primary energy resources	MJ	1,23E0	7,69E-1	4,82E-2	9,91E-2	1,46E-1	1,54E-2	-2,57E-1
Use of secondary materials	kg	9,53E-3	2,07E-4	1,49E-5	2,84E-5	-	-	-
Use of renewable secondary fuels	MJ	6,60E-3	0	0	0	0	0	0
Use of non-renewable secondary fuels	MJ	3,83E-1	1,46E-3	8,60E-5	1,85E-4	2,24E-4	1,43E-5	-6,79E-4

Use of net fresh water	m3	1,69E-3	1,42E-4	6,76E-6	1,93E-5	7,98E-5	1,75E-5	-3,58E-4

Resource use -TM Rotavjämning K

Parameter	Unit	A1–A3	A4	C1	C2	C3	C4	D
Renewable primary energy resources used as energy carrier	MJ	3,38E-2	9,65E-3	2,79E-4	1,35E-3	-	-	-
Renewable primary energy resources used as raw materials	MJ	6,28E-2	-	-	-	7,32E-3	3,90E-4	-1,19E-2
Total use of renewable primary energy resources	MJ	1,01E-1	9,65E-3	2,79E-4	1,35E-3	7,32E-3	3,90E-4	-1,19E-2
Nonrenewable primary energy resources used as energy carrier	MJ	5,59E-1	7,69E-1	4,82E-2	9,91E-2	-	-	-
Nonrenewable primary energy resources used as materials	MJ	2,03E0	-	-	-	1,46E-1	1,54E-2	-2,75E-1
Total use of non-renewable primary energy resources	MJ	2,59E0	7,69E-1	4,82E-2	9,91E-2	1,46E-1	1,54E-2	-2,57E-1
Use of secondary materials	kg	1,11E-2	2,07E-4	1,49E-5	2,84E-5	-	-	-
Use of renewable secondary fuels	MJ	6,60E-3	0	0	0	0	0	0
Use of non-renewable secondary fuels	MJ	5,05E-1	1,46E-3	8,60E-5	1,85E-4	2,24E-4	1,43E-5	-6,79E-4
Use of net fresh water	m3	2,26E-3	1,42E-4	6,76E-6	1,93E-5	7,98E-5	1,75E-5	-3,58E-4

Resource use -TM Industri K

Parameter	Unit	A1–A3	A4	C1	C2	C3	C4	D
Renewable primary energy resources used as energy carrier	MJ	3,92E-2	9,65E-3	2,79E-4	1,35E-3	-	-	-
Renewable primary energy resources used as raw materials	MJ	8,10E-2	-	-	-	7,32E-3	3,90E-4	-1,19E-2
Total use of renewable primary energy resources	MJ	1,20E-2	9,65E-3	2,79E-4	1,35E-3	7,32E-3	3,90E-4	-1,19E-2
Nonrenewable primary energy resources used as energy carrier	MJ	6,72E-1	7,69E-1	4,82E-2	9,91E-2	-	-	-
Nonrenewable primary energy resources used as materials	MJ	3,07E0	-	-	-	1,46E-1	1,54E-2	-2,75E-1
Total use of non-renewable primary energy resources	MJ	3,70E0	7,69E-1	4,82E-2	9,91E-2	1,46E-1	1,54E-2	-2,57E-1
Use of secondary materials	kg	1,15E-2	2,07E-4	1,49E-5	2,84E-5	-	-	-
Use of renewable secondary fuels	MJ	6,60E-3	0	0	0	0	0	0
Use of non-renewable secondary fuels	MJ	5,05E-1	1,46E-3	8,60E-5	1,85E-4	2,24E-4	1,43E-5	-6,79E-4
Use of net fresh water	m3	2,75E-3	1,42E-4	6,76E-6	1,93E-5	7,98E-5	1,75E-5	-3,58E-4

Resource use -TM Multi

Parameter	Unit	A1–A3	A4	C1	C2	C3	C4	D
Renewable primary energy resources used as energy carrier	MJ	3,76E-2	9,65E-3	2,79E-4	1,35E-3	-	-	-
Renewable primary energy resources used as raw materials	MJ	3,93E-2	-	-	-	7,32E-3	3,90E-4	-1,19E-2
Total use of renewable primary energy resources	MJ	7,68E-2	9,65E-3	2,79E-4	1,35E-3	7,32E-3	3,90E-4	-1,19E-2
Nonrenewable primary energy resources used as energy carrier	MJ	5,37E-1	7,69E-1	4,82E-2	9,91E-2	-	-	-
Nonrenewable primary energy resources used as materials	MJ	7,35E-1	-	-	-	1,46E-1	1,54E-2	-2,75E-1
Total use of non-renewable primary energy resources	MJ	1,27E0	7,69E-1	4,82E-2	9,91E-2	1,46E-1	1,54E-2	-2,57E-1
Use of secondary materials	kg	9,96E-3	2,07E-4	1,49E-5	2,84E-5	-	-	-
Use of renewable secondary fuels	MJ	6,60E-3	0	0	0	0	0	0
Use of non-renewable secondary fuels	MJ	4,23E-1	1,46E-3	8,60E-5	1,85E-4	2,24E-4	1,43E-5	-6,79E-4
Use of net fresh water	m3	1,69E-3	1,42E-4	6,76E-6	1,93E-5	7,98E-5	1,75E-5	-3,58E-4

Resource use -TM Kombiflyt

Parameter	Unit	A1–A3	A4	C1	C2	C3	C4	D
Renewable primary energy resources used as energy carrier	MJ	3,79E-2	9,65E-3	2,79E-4	1,35E-3	-	-	-
Renewable primary energy resources used as raw materials	MJ	4,02E-2	-	-	-	7,32E-3	3,90E-4	-1,19E-2
Total use of renewable primary energy resources	MJ	7,81E-2	9,65E-3	2,79E-4	1,35E-3	7,32E-3	3,90E-4	-1,19E-2
Nonrenewable primary energy resources used as energy carrier	MJ	5,29E-1	7,69E-1	4,82E-2	9,91E-2	-	-	-
Nonrenewable primary energy resources used as materials	MJ	7,71E-1	-	-	-	1,46E-1	1,54E-2	-2,75E-1
Total use of non-renewable primary energy resources	MJ	1,3E0	7,69E-1	4,82E-2	9,91E-2	1,46E-1	1,54E-2	-2,57E-1
Use of secondary materials	kg	1,02E-2	2,07E-4	1,49E-5	2,84E-5	-	-	-
Use of renewable secondary fuels	MJ	6,60E-3	0	0	0	0	0	0
Use of non-renewable secondary fuels	MJ	4,46E-1	1,46E-3	8,60E-5	1,85E-4	2,24E-4	1,43E-5	-6,79E-4
Use of net fresh water	m3	1,67E-3	1,42E-4	6,76E-6	1,93E-5	7,98E-5	1,75E-5	-3,58E-4

22. End of life – Waste

Waste – TM Express K

Parameter	Unit	A1–A3	A4	C1	C2	C3	C4	D
Hazardous waste	kg	1,57E-4	1,99E-5	7,64E-6	2,61E-6	1,11E-5	9,04E-7	-1,13E-5
Non-hazardous waste	kg	3,34E-2	3,55E-2	2,53E-5	6,15E-3	1,58E-1	1,00E-1	-5,84E-3
Radioactive waste	kg	8,00E-6	5,18E-6	3,38E-7	6,67E-7	9,09E-7	1,01E-7	-1,11E-6

Waste – TM Rotavjämning K

Parameter	Unit	A1–A3	A4	C1	C2	C3	C4	D
Hazardous waste	kg	2,35E-4	1,99E-5	7,64E-6	2,61E-6	1,11E-5	9,04E-7	-1,13E-5
Non-hazardous waste	kg	3,84E-2	3,55E-2	2,53E-5	6,15E-3	1,58E-1	1,00E-1	-5,84E-3
Radioactive waste	kg	1,04E-5	5,18E-6	3,38E-7	6,67E-7	9,09E-7	1,01E-7	-1,11E-6

Waste – TM Industi K

Parameter	Unit	A1–A3	A4	C1	C2	C3	C4	D
Hazardous waste	kg	2,66E-4	1,99E-5	7,64E-6	2,61E-6	1,11E-5	9,04E-7	-1,13E-5
Non-hazardous waste	kg	4,31E-2	3,55E-2	2,53E-5	6,15E-3	1,58E-1	1,00E-1	-5,84E-3
Radioactive waste	kg	1,16E-5	5,18E-6	3,38E-7	6,67E-7	9,09E-7	1,01E-7	-1,11E-6

Waste – TM Multi

Parameter	Unit	A1–A3	A4	C1	C2	C3	C4	D
Hazardous waste	kg	1,71E-4	1,99E-5	7,64E-6	2,61E-6	1,11E-5	9,04E-7	-1,13E-5
Non-hazardous waste	kg	3,47E-2	3,55E-2	2,53E-5	6,15E-3	1,58E-1	1,00E-1	-5,84E-3
Radioactive waste	kg	8,42E-6	5,18E-6	3,38E-7	6,67E-7	9,09E-7	1,01E-7	-1,11E-6

Waste – TM Kombiflyt

Parameter	Unit	A1–A3	A4	C1	C2	C3	C4	D
Hazardous waste	kg	1,86E-4	1,99E-5	7,64E-6	2,61E-6	1,11E-5	9,04E-7	-1,13E-5
Non-hazardous waste	kg	3,40E-2	3,55E-2	2,53E-5	6,15E-3	1,58E-1	1,00E-1	-5,84E-3
Radioactive waste	kg	8,73E-5	5,18E-6	3,38E-7	6,67E-7	9,09E-7	1,01E-7	-1,11E-6

23. End of life – Output flow

Output flow – TM Express K

Parameter	Unit	A1–A3	A4	C1	C2	C3	C4	D
Components for reuse	kg	0	0	0	0	0	0	0
Materials for recycling	kg	4,21E-3	4,00E-7	1,46E-8	5,36E-8	2,05E-7	1,05E-8	-1,42E-6
Materials for energy recovery	kg	1,99E-14	1,82E-14	3,45E-16	2,25E-15	2,39E-15	4,50E-16	-9,57E-15
Exported energy	MJ	1,36E-3	0	0	0	0	0	0

Output flow – TM Rotavjämning K

Parameter	Unit	A1–A3	A4	C1	C2	C3	C4	D
Components for reuse	kg	0	0	0	0	0	0	0
Materials for recycling	kg	5,62E-3	4,00E-7	1,46E-8	5,36E-8	2,05E-7	1,05E-8	-1,42E-6
Materials for energy recovery	kg	5,53E-14	1,82E-14	3,45E-16	2,25E-15	2,39E-15	4,50E-16	-9,57E-15
Exported energy	MJ	1,36E-3	0	0	0	0	0	0

Output flow – TM Industri K

Parameter	Unit	A1–A3	A4	C1	C2	C3	C4	D
Components for reuse	kg	0	0	0	0	0	0	0
Materials for recycling	kg	5,62E-3	4,00E-7	1,46E-8	5,36E-8	2,05E-7	1,05E-8	-1,42E-6
Materials for energy recovery	kg	8,59E-14	1,82E-14	3,45E-16	2,25E-15	2,39E-15	4,50E-16	-9,57E-15
Exported energy	MJ	1,36E-3	0	0	0	0	0	0

Output flow – TM Multi

Parameter	Unit	A1–A3	A4	C1	C2	C3	C4	D
Components for reuse	kg	0	0	0	0	0	0	0
Materials for recycling	kg	4,68E-3	4,00E-7	1,46E-8	5,36E-8	2,05E-7	1,05E-8	-1,42E-6
Materials for energy recovery	kg	2,02E-14	1,82E-14	3,45E-16	2,25E-15	2,39E-15	4,50E-16	-9,57E-15
Exported energy	MJ	1,36E-3	0	0	0	0	0	0

Output flow – TM Kombiflyt

Parameter	Unit	A1–A3	A4	C1	C2	C3	C4	D
Components for reuse	kg	0	0	0	0	0	0	0

Materials for recycling	kg	5,15E-3	4,00E-7	1,46E-8	5,36E-8	2,05E-7	1,05E-8	-1,42E-6
Materials for energy recovery	kg	2,02E-14	1,82E-14	3,45E-16	2,25E-15	2,39E-15	4,50E-16	-9,57E-15
Exported energy	MJ	1,36E-3	0	0	0	0	0	0

24. Electricity in the manufacturing phase

A3 data quality of electricity and CO2 emission kg CO2 eq. / kWh	0,0103	Based on country specific fuel mixes for the production year 2018 from IEA. Imported electricity has been considered. The environmental impacts of the fuels are based on ecoinvent 3.4 database. The impacts include all upstream processes as well as transmission losses.
District heat	NA	Not used in the plant

25. Transport from production place to user

Variable	**Amount**	**Data quality**
Fuel type and consumption in liters / 100 km	Diesel /Euro 5 0,132 CO2e /tkm	Data source: Ecoinvent
Transportation distance km	300	Average transportation
Transport capacity utilization %	55	Calculated average
Bulk density of transported products kg/m^3	1400-1300	Average value
Volume capacity utilisation factor (factor: =1 or <1 or ≥ 1 for compressed or nested packaged products)	1	Assumption

26. End-of-life process description

Process	**Unit** (expressed per functional unit or per declared unit of components products or materials and by type of material)	**Amount kg/kg** **Data quality**
Collection process specified by type	kg collected separately	0,9
	kg collected with mixed construction waste	0,1
Recovery system specified by type	kg for re-use	0
	kg for recycling	0,9
	kg for energy recovery	0

Disposal specified by type	kg product or material for final deposition	0,1
Assumptions for scenario development, e.g. transportation	units as appropriate	Transportation distance estimation based on average recycling facility locations; 50 km

27. Additional technical information

The properties are according to EN 312.
Biogenic carbon of studied product is calculated in accordance to NS-EN 16449:2014. Biogenic carbon content of the product is 0 kg CO_2 per declared unit.

28. Product data sheet

Product data sheets are available at https://www.tmprogress.se/sv/produkter.

29. Additional information

Air, soil and water impacts during the use phase have not been studied.

30. Bibliography

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