Environmental Product Declaration

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

Acriflex Rapido, Acriflex X-Pro, Acriflex Fybro (A+B), Acriflex Pro, Oriplast Reflex, O.R.A. Eco Anti-rain, Ultragum, Ultrabit, BKK Eco, WATstop (A+B+C)

From ***DIASEN SRL***

Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	S-P-06903
Publication date:	2022-09-05
Valid until:	2027-09-05

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, Version 1.1*
PCR review was conducted by: *<name and organisation of the review chair, and information on how to contact the chair through the programme operator>*
Independent third-party verification of the declaration and data, according to ISO 14025:2006: ☐ EPD process certification ☑ EPD verification
Third party verifier: Certiquality S.r.l. Via Gaetano Giardino, 4 20123 - Milano Tel. +39 02 806 9171 www.certiquality.it *Accredited* by: Accredia *Approved by*: Il sistema internazionale EPD®
Procedure for follow-up of data during EPD validity involves third party verifier: ☐ Yes ☑ No

DIASEN ITALIA, as EPD owner, has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but from different programmes 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: Diasen Srl

Contact: Davide Tomassoni

Description of the organisation:
Diasen is an Italian company operating in the ecological building sector, which oriented its production target towards innovative, low environmental impact, high technological content and quality products. For the purpose, the company provides high performance and green solutions in terms of thermal and acoustic insulating systems, waterproofing systems, coatings and coverings for the public, private and sport building sector. The respect of the legislation, regulations and prescriptions applicable to the environmental protection, as well as to the reduction and control of environmental impacts, are the basic principles that characterize each single project. Since 2007 Diasen has carried out a certified Environmental Management System in compliance with the standard EN ISO 14001. Moreover, **LEED mapping** for 14 key products has been pursued. Specific attention is paid to the reduction of waste production through a careful and effective activity of monitoring and control, by favouring, when possible, the production of recoverable waste. Research and Development activity, is focused on the possibility of using raw materials deriving from manufacturing waste or from recoverable waste. The planning phases is oriented to thermo-insulating products to reduce the energy use and consumption inside the house.

Product-related or management system-related certifications: ISO 9001:2015 - EN ISO 14001:2015

Name and location of production site(s): DIASEN SRL - Zona Ind. Berbentina, 5 - 60041 Sassoferrato (AN) - Italy

Manufacturing

The manufacturing process starts from raw materials storage as received from suppliers. At this purpose, some raw material arrives in plastic and metal buckets, some other in kraft paper and plastic bags or without any packages. The latter ones are stored inside specific silos. These materials are automatically or by hand fed in the (liquid) production mixer. Materials arriving in their package (as mentioned) and are stored in the warehouse. Subsequently are sent to the mixer by mean of an electric forklift or fed to the mixer. The production is a discontinuous process, in which all the components are mechanically mixed in batches. The product is then packaged in buckets, put on wooden pallets, protected by a hooding polymer film and stored in the Finished Products' warehouse.
The quality of final product is controlled during the production phase and also before the sale. This manufacturing process involves the use of water and it is almost a close-loop process, without scraps.
Water (from aqueduct) is used to clean the mixer between the production of different kinds of materials and it is dismantled as wastewater.

Product information

1. Product name: ACRIFLEX RAPIDO
   Product identification: see table 1
   Product description: Flexible and tough waterproofing liquid based on elastomeric resins;
   UN CPC code: 54530 – Waterproofing service;
   DIASEN PRODUCT CODE: 1850505;

2. Product name: ACRIFLEX X-PRO
   Product identification: see table 2
   Product description: Mono-component, water based, fibre-reinforced and walkable waterproofing. It is characterised by a high weather and UV resistance;
   UN CPC code: 54530 - Waterproofing service;
   DIASEN PRODUCT CODE: 1648401;

***Table 1**: Acriflex Rapido.*

Property	Value	Test methodology
Water permeability	No permeability	EOTA TR 003
Resistance to washing away (min)	20	Proprietary Methodology
Elongation at break (%)	160 ± 10	ISO 527 (1-3)
Tensile Strength (N/mm^2)	1,4 ± 0,5	ISO 527 (1)
Adhesion test on concrete – Tensile mode (N/mm^2)	0,536 Failure typology A/B	UNI EN 1542
Accelerated weathering test (hours/years)	1680 hr (10 yr)	UNI EN ISO 11507
Hazardous substances	Ammonium Hydroxide; Isoproturon; Acetic Acid; Iodopropynyl-butyl-carbamate; 1,2-benzisothiazol-3(2H)-one	CE Regulation 1272/2008

***Table 2**: Acriflex X-Pro.*

Property	Value	Test methodology
Water permeability	No permeability	EOTA TR 003
Flexibility - cold conditions (°C)	-25	Proprietary Methodology
Elongation at break (%)	90 ± 10	ISO 527 (1-3)
Tensile Strength (N/mm^2)	4 ± 0,5	ISO 527 (1)
Adhesion test on concrete – Tensile mode (N/mm^2)	0,50 Failure typology A/B	UNI EN 1542
Accelerated weathering test (hours/years)	1680 hr (10 yr)	UNI EN ISO 11507
Hazardous substances	Isoproturon; Iodopropynyl-butyl-carbamate; 1,2-benzisothiazol-3(2H)-one	CE Regulation 1272/2008

***Table 3**: Oriplast Reflex.*

Property	Value	Test methodology
Impermeability to water	Pressure of 7 atm	EOTA TR 003
Elongation at break (%)	327	ISO 527 (1-3)
Tensile Strength (N/mm^2)	1,20	ISO 527 (1)
Adhesion test on concrete – Tensile mode (N/mm^2)	0,78 Failure typology A/B	UNI EN 1542
Accelerated weathering test (hours/years)	3000 hr (> 17 yr)	UNI EN ISO 11507
Fire reaction	Classe B S2, d0	UNI EN 13501-1
Hazardous substances	1,2-benzisothiazol-3(2H)-one	CE Regulation 1272/2008

3. <u>Product name:</u> ORIPLAST REFLEX
   <u>Product identification:</u> see table 3
   <u>Product description:</u> Ultra-reflective, resistant to stagnation and flexible at cold waterproofing. It is able to decrease the temperature of the support on which it is applied;
   <u>UN CPC code:</u> 54530 - Waterproofing service;

4. <u>DIASEN PRODUCT CODE</u>: 1735217;
   <u>Product name:</u> ULTRAGUM
   <u>Product identification:</u> see table 4
   <u>Product description:</u> Mono-component elastic-bituminous waterproofing in aqueous emulsion. It holds high flexibility also at low temperatures;
   <u>UN CPC code:</u> 54530 - Waterproofing service;
   <u>DIASEN PRODUCT CODE</u>: 1940015;

***Table 4**: Ultragum.*

Property	Value	Test methodology
Resistance to washing away (min)	30	Proprietary Methodology

Elongation at break (%)	336 ± 67		ISO 527 (1-3)
Tensile Strength (N/mm^2)	1 ± 0,3		ISO 527 (1)
Adhesion test on concrete – Tensile mode (N/mm^2)	0,53	Failure typology A/B	UNI EN 1542
Accelerated weathering test (hours/years)	100 days (> 180°Cr)		UNI EN ISO 11507
Hazardous substances	Ammonium Hydroxide; Isoproturon; Acetic Acid; Iodopropynyl-butyl-carbamate; 1,2-benzisothiazol-3(2H)-one		CE Regulation 1272/2008

5. <u>Product name:</u> O.R.A. ECO ANTI-RAIN
   <u>Product identification:</u> see table 5
   <u>Product description:</u> Transparent, Water-based waterproofing. It is characterised by an easy and quick application;
   <u>UN CPC code:</u> 54530 - Waterproofing service;
   <u>DIASEN PRODUCT CODE</u>: 20501004;

***Table 5**: O.R.A. Eco Anti-Rain.*

Property	**Value**	**Test methodology**
Water Vapour Permeability	1941	UNI EN ISO 7783
Hazardous substances	1,2-benzisothiazol-3(2H)-one	CE Regulation 1272/2008

6. <u>Product name:</u> ULTRABIT
   <u>Product identification:</u> see table 6
   <u>Product description:</u> Water-based Mono-component bituminous waterproofing paste, filled with polystyrene microspheres;
   <u>UN CPC code:</u> 54530 - Waterproofing service;
   <u>DIASEN PRODUCT CODE</u>: 1851302;

***Table 6**: Ultrabit.*

Property	**Value**		**Test methodology**
Resistance to washing away (min)	30		Proprietary Methodology
Elongation at break (%)	94,1 ± 19,9		ISO 527 (1-3)
Tensile Strength (N/mm^2)	0,42 ± 0,08		ISO 527 (1)
Adhesion test on concrete – Tensile mode (N/mm^2)	0,11	Failure typology B	UNI EN 1542
Hazardous substances	Ammonium Hydroxide; Acetic Acid; 1,2-benzisothiazol-3(2H)-one		CE Regulation 1272/2008

***Table 7**: BKK ECO.*

Property	**Value**	**Test methodology**
Accelerated weathering test (hours(years)	1680 hours (10 Years)	UNI EN ISO 11507
Hazardous substances	1,2-benzisothiazol-3(2H)-one	CE Regulation 1272/2008

***Table 8**: WATstop.*

Property	**Value**	**Test methodology**
Water Permeability	9,50	UNI EN ISO 12390-8
Water Vapor permeability	13361	UNI EN ISO 7783
Adhesion Strength to several support (N/mm^2)	Cementitious - 2.50 Tuff blocks - 3.00 Pav. Grit and PUR Panels - 1.50 Expanded PS - 1.25	UNI EN ISO 4624
Hazardous substances	1,2-benzisothiazol-3(2H)-one	CE Regulation 1272/2008

7. <u>Product name:</u> BKK ECO
   <u>Product identification:</u> see table 7
   <u>Product description:</u> Water-repellent, breathable and colourless water-based waterproofing product for exposed surfaces;
   <u>UN CPC code:</u> 54530 - Waterproofing service;
   <u>DIASEN PRODUCT CODE</u>: 1334502;

8. <u>Product name:</u> WATSTOP A+B+C
   <u>Product identification:</u> see table 8
   <u>Product description:</u> Three-component epoxy resin for encapsulation of rising moisture and barrier to vapor;
   <u>UN CPC code:</u> 1334502 - Waterproofing service;
   <u>DIASEN PRODUCT CODE</u>: 1334502;

Table 9: *Acriflex Fybro A+B.*

Property	Value	Test methodology
Water Permeability	9,40	EOTA TR 003
Flexibility at low temperatures (°C)	- 26,00	Proprietary method
Elongation at break (%)	149,33	ISO 527(1-3)
Tensile Strength (N/mm^2)	2,37	ISO 527 (1)
Fire Resistance	Class C – S2, d0	UNI EN 1542
Hazardous substances	Ammonium Hydroxide; Isoproturon; Acetic Acid; Iodopropynyl-butyl-carbamate; 1,2-benzisothiazol-3(2H)-one	CE Regulation 1272/2008

Table 10: *Acriflex Pro.*

Property	Value	Test methodology
Water Permeability	succeeded	UNI EN 12390-8 EN 14891
Elongation at break (%)	200 ± 10	ISO 527(1-3)
Tensile Strength (N/mm^2)	1,50 ± 0,50	ISO 527 (1)
Adhesion test on concretes – Tensile mode (N/mm^2)	0,50	UNI EN 1542
Hazardous substances	Ammonium Hydroxide; Isoproturon; Acetic Acid; Iodopropynyl-butyl-carbamate; 1,2-benzisothiazol-3(2H)-one	CE Regulation 1272/2008

9. <u>Product name:</u> ACRIFLEX PRO
   <u>Product identification:</u> see table 10
   <u>Product description:</u> Ready to use and flexible (also at low temperatures) liquid waterproofing in an aqueous emulsion, elastomeric resins and nanometric fillers. It is characterised by a high weather and UV resistance;
   <u>UN CPC code:</u> 54530 - Waterproofing service;
   <u>DIASEN PRODUCT CODE</u>: 21031306;

10. <u>Product name:</u> ACRIFLEX FYBRO A+B
    <u>Product identification:</u> see table 9
    <u>Product description:</u> Water bases, fibre reinforced waterproofing. It can be applied without the use of armour, thanks to the presence of the fibres;
    <u>UN CPC code:</u> 54530 – Waterproofing service;
    <u>DIASEN PRODUCT CODE</u>: 1626120;

Properties summarized in tables from 1 to 10 can be collected from TDS (Technical Data Sheet) related to each product. These can be downloaded directly in the Diasen website: www.diasen.com

Characterisation tests have been carried out both in external laboratories and in Diasen's in-house laboratory, all in accordance with Regulation 305/11. The products *Acriflex Rapido*, *Acriflex X-Pro*, *Oriplast Reflex* and *Ultragum* are supplied in plastic buckets containing an amount of product of 20 kg. The product *Ultrabit* is supplied in plastic buckets containing an amount of product of 25 lt. The products *O.R.A. Eco Anti-rain* and *BKK Eco* are supplied in plastic buckets containing an amount of product of 5 lt. Finally, product *WATstop* is supplied in plastic buckets containing an amount of product of 5 kg. Generally, 84 buckets are piled over a single euro-pallet (total amount of 420 kg).

Content information

Table 11: *Content declaration and substances list for the system Acriflex Rapido.*

Components	Weight (%)	EC No.	CAS No.	Recycled material (%)	Renewable material (%)
Water	6,00 ÷ 10,00	-	-	0	-
Quartz	20,00 ÷ 28,00	238-878-4	14808-60-7	0	-
Acrylic Resin	40,00 ÷ 50,00	-	9063-87-0	0	-
Talc	15,00 ÷ 24,00	238-877-9	14807-96-6	0	-
Organic Additives	1,00 ÷ 2,00	284-660-7	84691-70-6	0	-
Inorganic Additives	1,10 ÷ 1,90	215-168-2	1309-37-1	0	-

Table 12: *Content declaration and substances list for the system Acriflex X-Pro.*

Components	Weight (%)	EC No.	CAS No.	Recycled material (%)	Renewable material (%)
Water	7,00 ÷ 13,00	-	-	0	-
Quartz	20,00 ÷ 28,00	238-878-4	14808-60-7	0	-
Acrylic Resin	40,00 ÷ 50,00	-	9063-87-0	0	-
Talc	14,00 ÷ 24,00	238-877-9	14807-96-6	0	-
Organic Additives	0,70 ÷ 1,40	284-660-7	84691-70-6	0	-
Inorganic Additives	0,75 ÷ 1,33	215-168-2	1309-37-1	0	-
Polypropylene Fibers	1,75 ÷ 2,35	-	9003-07-0	0	-

Table 13: *Content declaration and substances list for the system Oriplast Reflex.*

Components	Weight (%)	EC No.	CAS No.	Recycled material (%)	Renewable material (%)
Water	7,00 ÷ 13,00	-	-	0	-
Quartz	21,00 ÷ 25,00	238-878-4	14808-60-7	0	-
Acrylic Resin	40,00 ÷ 48,00	-	9063-87-0	0	-
Talc	15,00 ÷ 25,00	238-877-9	14807-96-6	0	-
Organic Additives	0,05 ÷ 0,25	284-660-7	84691-70-6	0	-
Inorganic Additives	2,50 ÷ 3,15	236-675-5	13463-67-7	0	-

Table 14: *Content declaration and substances list for the system Ultragum.*

Components	Weight (%)	EC No.	CAS No.	Recycled material (%)	Renewable material (%)
Water	7,00 ÷ 13,00	-	-	0	-
Quartz	24,00 ÷ 32,00	238-878-4	14808-60-7	0	-
Acrylic Resin	28,00 ÷ 36,00	-	9063-87-0	0	-
Talc	15,00 ÷ 23,00	238-877-9	14807-96-6	0	-
Organic Additives	1,20 ÷ 1,80	284-660-7	84691-70-6	0	-
Inorganic Additives	0,20 ÷ 0,80	236-675-5	13463-67-7	0	-
Bituminous Emulsion	7,00 ÷ 13,00	-	9072-35-9	60,00 (post Industrial)	-

Table 15: *Content declaration and substances list for the system O.R.A. Eco Anti-rain.*

Components	Weight (%)	EC No.	CAS No.	Recycled material (%)	Renewable material (%)
Water	50,00 ÷ 60,00	-	-	0	-

Acrylic Resin	35,00 ÷ 45,00	-	9063-87-0	0	-
Organic Additives	4,20 ÷ 4,80	284-660-7	84691-70-6	0	-
Inorganic Additives	0,20 ÷ 0,80	215-721-8	1345-25-1	0	-

Table 16: *Content declaration and substances list for the system BKK Eco.*

Components	Weight (%)	EC No.	CAS No.	Recycled material (%)	Renewable material (%)
Water	40,00 ÷ 46,00	-	-	0	-
Organic Additives	0,50 ÷ 1,50	284-660-7	84691-70-6	0	-
Siloxanes Emulsion	52,00 ÷ 60,00	-	-	0	-

Table 17: *Content declaration and substances list for the system Ultrabit.*

Components	Weight (%)	EC No.	CAS No.	Recycled material (%)	Renewable material (%)
Water	3,00 ÷ 10,00	-	-	0	-
Quartz	20,00 ÷ 30,00	238-878-4	14808-60-7	0	-
Acrylic Resin	30,00 ÷ 40,00	-	9063-87-0	0	-
Talc	17,00 ÷ 23,00	238-877-9	14807-96-6	0	-
Organic Additives	1,80 ÷ 2,21	284-660-7	84691-70-6	0	-
Inorganic Additives	0,80 ÷ 1,18	220-120-9	2634-33-5	0	-
Bituminous Emulsion	7,00 ÷ 13,00	-	9072-35-9	60,00 (post Industrial)	-

Table 18: *Content declaration and substances list for the system WATstop.*

Components	Weight (%)	EC No.	CAS No.	Recycled material (%)	Renewable material (%)
Water	7,00 ÷ 13,00	-	-	0	-
Quartz	22,00 ÷ 24,00	238-878-4	14808-60-7	0	-
Epoxy Resin	12,00 ÷ 20,00	500-006-8	9003-36-5	0	-
Aliphatic Diammine	8,00 ÷ 12,00	500-191-5	68082-29-1	0	-
Cement	35,00 ÷ 45,00	266-043-4	65997-15-1	0	-
Organic Additives	0,70 ÷ 0,90	284-660-7	84691-70-6	0	-
Inorganic Additives	0,01 ÷ 0,03	236-675-5	13463-67-7	0	-

Table 19: *Content declaration and substances list for the system Acriflex Fybro.*

Components	Weight (%)	EC No.	CAS No.	Recycled material (%)	Renewable material (%)
Water	6,00 – 10,00		-	0	-
Quartz	12,00 ÷ 16,00	238-878-4	14808-60-7	0	-
Acrylic Resin	25,00 ÷ 35,00	-	9063-87-0	0	-
Talc	10,00 ÷ 14,00	238-877-9	14807-96-6	0	-
Organic Additives	0,40 ÷ 0,90	284-660-7	84691-70-6	0	-
Inorganic Additives	0,40 ÷ 0,90	215-168-2	1309-37-1	0	-
Polypropylene Fibres	1,00 ÷ 1,70	-	9003-07-0	0	-

Table 20: *Content declaration and substances list for the system Acriflex Pro.*

Components	Weight (%)	EC No.	CAS No.	Recycled material (%)	Renewable material (%)
Water	8,00 ÷ 12,00	-	-	0	-
Quartz	20,00 ÷ 26,00	238-878-4	14808-60-7	0	-
Acrylic Resin	40,00 ÷ 48,00	-	9063-87-0	0	-
Talc	16,00 ÷ 24,00	238-877-9	14807-96-6	0	-
Organic Additives	1,20 ÷ 2,00	284-660-7	84691-70-6	0	-
Inorganic Additives	1,00 ÷ 1,70	215-168-2	1309-37-1	0	-

Table 21*: Raw materials used in the family of Waterproofing products.*

Material	Hazard Phrase	Function
Water	-	Solvent
Quartz	H317, H318	Filler
Talc	-	Filler
Acrylic Resin	H210; H208	Binder

Organic Additives	-	Antifoaming and working-ability
Inorganic Additives	H210; H208	Pigment
Polypropylene Fibres	-	Flexural and cracking Strength
Siloxane Emulsion	H412	Waterproofing and substrate penetration
Bituminous Emulsion	H319	Adhesion to substrate
Portland Cement	H317, H318	Binder
Epoxy Resin	H315, H317, H319, H411	Binder
Aliphatic Diammine	H314, H317, H412	Curing Agent for Epoxy resin

The product dealt with in this document are not classified as hazardous or dangerous for the environment in accordance with Directives 67/548/EEC and 1999/45/EC. There are not substances included in the Authorisation List (Attachment XIV) or the Candidate List of Substances of Very High Concern for Authorisation issued by the European Chemicals Agency, nor do they contain such substances. Under normal storage and use conditions, these products can be handled with no particular precautions or special protective equipment

LCA information

Product environmental performance was assessed using the Life Cycle Assessment (LCA) method, in accordance with the EN ISO 14044:2006 standard, and the Life Cycle Impact assessment (LCIA) method, in accordance with standard UNI EN 15804:2014+A2:2019, served as the core PCR. On this regards**,** Product Category Rules (PCR) - Construction Products PCR 2019:14 - Version 1.11 have been taken into account as another reference document. The results of the estimated environmental impacts are only relative statements which do not indicate the end points of the impact categories, exceeding threshold values, safety margins or risks. The field of application of the different products is quite the same, despite the related properties are different. Any products could perform several functionalities inside a building component (also different performances), thus the definition of a single and specific functionality for each product is quite difficult. For this reason, a declared unit has been taken into account instead of a functional unit, as recommended by the used standardisation. It can be introduced that for any products considered for the EPD the declared unit deals with the 1,00 kg of product, ready to be sold and transported towards the end user (builder), together with the related packaging (buckets), already covered with related quote part of plastic film and laid out over the euro pallet it is transported by (also in this case the related quote part). It has to be pointed out that the production of the investigated systems takes place inside the Diasen Manufacturing Plant in Sassoferrato (AN) – Italy.

Declared unit and Reference service life:
The Declared Unit (DU) is 1 kg of product (product mix). The environmental impact of 1 kg of product (packaging included) for each products involved is described. According to the system boundary of this EPD, a Reference Service Life has not been provided.

Time representativeness: Data are referred to the production carried out in 2020 and have been provided by Diasen Srl. Moreover, data regarding the geographic origin of any raw materials, packaging materials etc. have been provided, as well as the transportation media.

Database and LCA software used: Ecoinvent 3.8 used as a database and SimaPrò. Version 9.3.0 as a software

Description of system boundaries:
Cradle to gate (A1–A3).

In the declared modules the following activities have been considered:

- Phase A1: raw materials (i.e resins and binders) together with the related packaging, in some cases PP fibers (plastic bags), additives, inert (talc and quartz) powders (inside kraft paper bags), or with no packages if returned to the producers have been considered. Also, energies of production (powder mixing) and related to the company utilities (mainly compressed air) have been included in this module;

- Phase A2: Transports of raw materials (and packages if existing) and packages used to purchase the investigated products. Also produced waste transport to treatment plants has been included;
- Phase A3: emissions (powder collected by scrubbers and abatement systems), wastes related to auxiliary packages the used raw materials are provided with. The latter kinds have been considered being sent to the appropriate collecting systems;

Table 22: *Reporting table for Waterproofing products.*

	Product stage		Construction process stage			Use stage							End of life stage				Resource recovery stage
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	**A1**	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Modules declared	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Geography	IT	IT	IT	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Specific data						-	-	-	-	-	-	-	-	-	-	-	-
Variation - Products						-	-	-	-	-	-	-	-	-	-	-	-
Variation - Sites						-	-	-	-	-	-	-	-	-	-	-	-

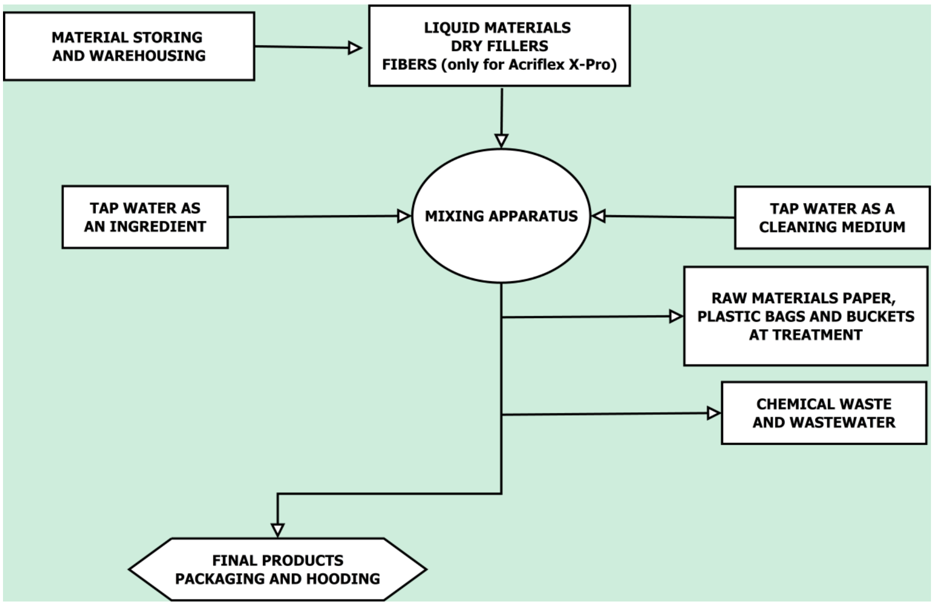
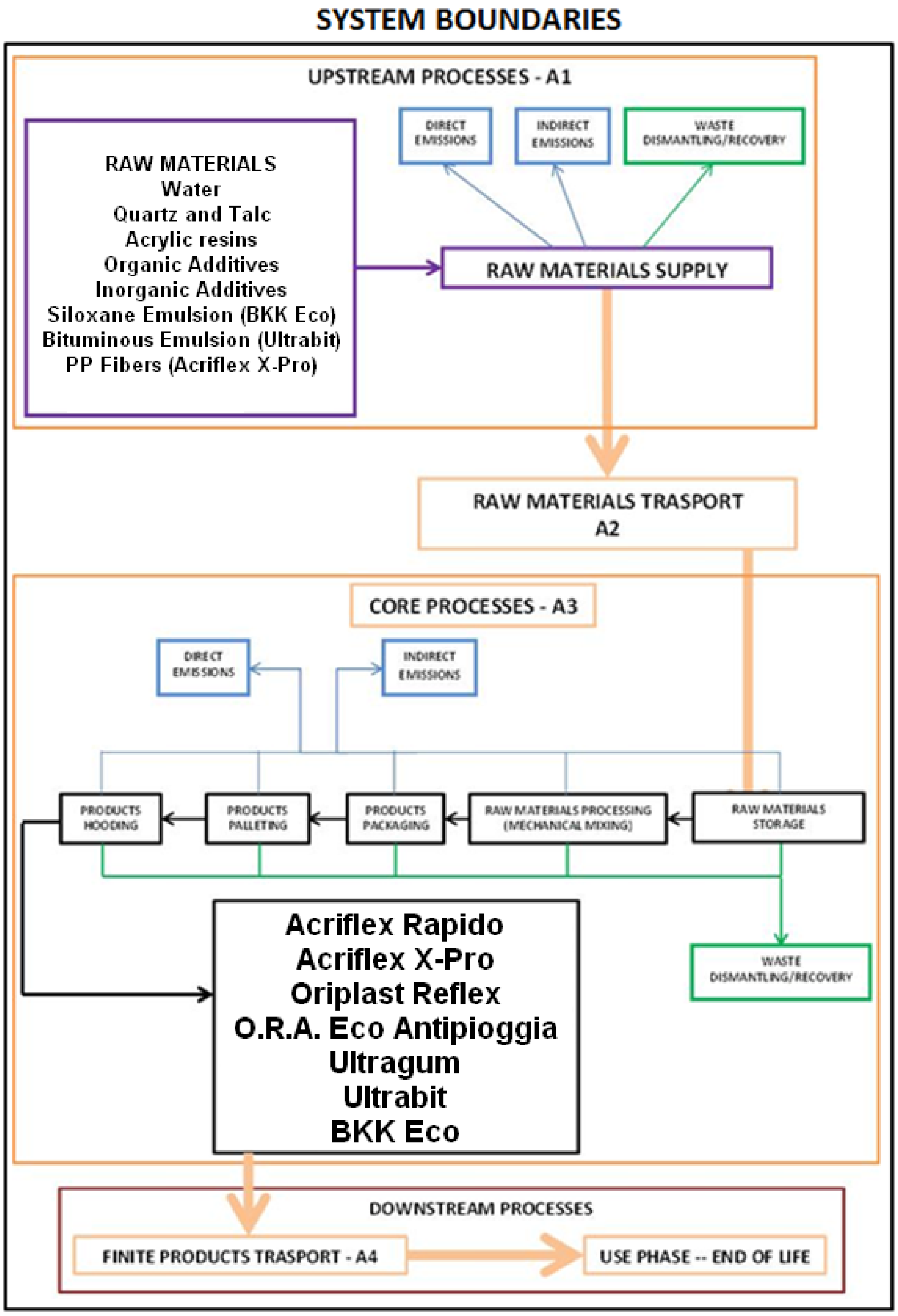


Figure 1*: Preliminary scheme of the Waterproofing Production phase.*

More information:
Name and contact information of the organisation carrying out the underlying LCA study: University of Perugia – Strada di Pentima, 4 – 05100 –Terni (Italy).

System diagram:



Assumption and Estimation:
In accordance with the General Programme Instructions for the International EPD® System (2015) and the reference PCR.

For secondary materials following approach has to be adopted:

- The environmental impacts related to the “previous life cycle” have not been considered;
- Secondary materials do not need to be processed before the new use;
- Transports to the factory gate have been considered;

About the used additives both the organic and the inorganic counterpart, the related composition has been modelled according to information contained in the related technical and safety data sheet, provided by the related provider, but also by mean of information collected from literature references[11-18] (patents, databases, reports, etc.). Raw materials and packaging transports to Diasen Processing plant have been carried out by mean EURO4 lorries.

***Table 23**: Recycled materials used in the production process of Diasen Products*

Material	Fraction by weight in various products (%)	Recycled content (%)	Definition
Bituminous emulsion (*)	10,00	6,00	Recycled material: generated by households or commercial, industrial or institutional installations in their role as end-users of the product, which cannot be used for its intended purpose. This includes material returned from the distribution chain.
(*) Bitumen emulsion is only contained in some products, according to the diagram below:			
Ultragum		6,00	
Ultrabit		6,00	

This data represents the Italian road Transport system average framework. Data regarding the energy exploitation have been provided in aggregate manner by the producer and are concerned with the whole processing cycle of any products dealt with in this document: (Italy Residual Mix or German one in the case of raw material specifically produced by German suppliers). Those energy consumption data have been periodically measured by the company.
About the packaging, it is strongly connected with the product and it has been summarized in table 24:

***Table 24**: Packages for the waterproofing products series.*

Product	Acriflex Rapido	Acriflex X-Pro	Acriflex Fybro	Acriflex Pro	Oriplast Reflex	Ultragum	O.R.A. Eco Anti-rain	BKK Eco	Ultrabit	WATStop
Weight (kg/bucket)	20,00	20,00	25,00	20,00	20,00	20,00	5,25 (5 lt)	5,00 (5,00 lt)	21,25 (25 lt)	58,00
Buckets/Pallett (n°)	48,00	48,00	48,00	48,00	48,00	48,00	80,00	80,00	32,00	84,00
Bucket (kg/kg product)	$4,24*10^{-2}$	$4,24*10^{-2}$	$4,38*10^{-2}$	$4,24*10^{-2}$	$4,24*10^{-2}$	$4,24*10^{-2}$	$9,13*10^{-2}$	$9,59*10^{-2}$	$5,91*10^{-2}$	$8,33*10^{-2}$
Film PE (kg/kg product)	$4,17*10^{-4}$	$4,17*10^{-4}$	$3,33*10^{-4}$	$4,17*10^{-4}$	$4,17*10^{-4}$	$4,17*10^{-4}$	$9,52*10^{-4}$	$8,33*10^{-4}$	$5,88*10^{-4}$	$8,33*10^{-4}$
Europallet (unit/kg product)	$1,04*10^{-3}$	$1,04*10^{-3}$	$8,33*10^{-4}$	$1,04*10^{-3}$	$1,04*10^{-3}$	$1,04*10^{-3}$	$2,38*10^{-3}$	$2,08*10^{-3}$	$1,47*10^{-3}$	$2,08*10^{-3}$
Cardboard (kg/kg product)	ND	ND	ND	ND	ND	ND	$4,50*10^{-2}$	$4,50*10^{-2}$	ND	ND

Cut-off criteria:
The consumption of raw materials and energy related to ordinary and extraordinary maintenance operations was not included, as it has been verified their very low relevance to environmental impact.

Allocation criteria:
Any product is subjected to batch model production (not continuous production) also at regime, thus, at the end of each single production stage only one product is produced inside the manufacturing facility. After a simple cleaning stage, a completely different material con be processed in the same device.
For this reason, data collected from Ecoinvent the allocation criteria used by this database has been taken into account.

Data quality:
As introduced, the background data used in this EPD were retrieved from the Ecoinvent 3.8 databank. For inventory modelling, SimaPro 9.3 software was used. The geographical reference was Italy, or, to the greatest extent, Central, while the time period spanned the last 5 years. Data collection included the analysis of internal production and environmental data from Diasen S.r.l. production site, the acquisition of relevant data (site specific data) for all the production processes included in the LCA (Use of Italian Residual Mix[8]). About the raw materials, the most relevant data are

European or specific from supplier. Finally, the reference time period for the LCA (product composition, transport, production rates, etc.) are referred to 2021.

Data comparability:
All the data and results related to these products were collected and obtained based on the EN 15804 standard, in the context of their final use in the building manufacturing system. Thus, the environmental impacts associated with the investigated products are comparable with the environmental impacts of other similar products calculated according to the same UNI EN 15804 standard.

Environmental Information

In this section environmental profiles of the products covered by this EPD using the LCA method have been reported. As introduced, a “Cradle-to-gate” approach has been carried out and, phases A1-A3 have been included within the system boundaries. Different calculation tools have been used, as recommended by the EPD regulation.

Potential environmental impact – mandatory indicators according to EN 15804

- **Global Warming Potential (GWP):** It is directly linked to Climate Change**,** as a measure of greenhouse gas emissions, such as carbon dioxide and methane. These emissions increase absorption of radiation emitted by the earth, intensifying the natural greenhouse effect;
- **Abiotic Depletion Potential (ADP):** It directly regards the consumption of resources in relation to the corresponding source current availability. The exploitation of non-renewable resources leads to a decrease in the future availability of the related performed functions. This impact category can be shared in depletion of mineral resource elements (ADPE) and non-renewable fossil energy resources (ADPF). In the report these are reported separately;
- **Ozone Depletion Potential (ODP):** This indicator directly regards the increase in the tropospheric zone hole. It is another measure of the emissions of greenhouses gasses, as they increase the absorption of radiation emitted by the earth, which increases also the natural greenhouse effect;
- **Photochemical Ozone Creation Potential (POCP):** Photochemical Smog**.** It is a measure of precursors emissions contributing to ground level smog formation (mainly ozone O_3), produced by the reaction of volatile organic compounds (VOCs) and carbon monoxide in the presence of nitrogen oxides under the influence of UV light. Ground level ozone can be harmful for human and ecosystem health and may also damage agriculture;
- **Acidifcation Potential (AP):** It is related to the Acid Rains. It is a measure of emissions leading to acidifying effects on the environment. From a technical base point, the involved indicator is a measure of the capacity of a given molecule or chemical species to increase the hydrogen ion (H+) concentration in the water (lakes, rivers, etc.), thus decreasing the related pH value. Moreover, potential effects include forest and building materials deterioration;
- **Eutrophication Potential (EP):** It regards the Algal Blooms. It is a measure of nutrient enrichment that can lead to an undesirable shift in species composition and elevated biomass production in terrestrial and aquatic ecosystems. It includes potential impacts of excessively high levels of nitrogen and phosphorus macronutrients;

Table 25: *Impact indicators for the system Acriflex Rapido.*

Results per Declared Unit – 1,00 kg					
Indicator	**Unit**	**A1**	**A2**	**A3**	**Total**
Global Warming Potential – GWP Total	kg_CO_2_eq.	1,15	$5,10 \cdot 10^{-2}$	0,159	1,36
Global Warming Potential – GWP fossil	kg_CO_2_eq.	1,11	$5,06 \cdot 10^{-2}$	0,153	1,31
Global Warming Potential – GWP biogenic	kg_CO_2_eq.	$4,33 \cdot 10^{-2}$	$3,58 \cdot 10^{-4}$	$5,37 \cdot 10^{-3}$	$4,91 \cdot 10^{-2}$
Global Warming Potential – GWP Luluc	kg_CO_2_eq.	$5,10 \cdot 10^{-4}$	$1,97 \cdot 10^{-5}$	$1,84 \cdot 10^{-4}$	$7,14 \cdot 10^{-4}$
Ozone Depletion Potential - ODP	kg_CFC-11_eq.	$2,20 \cdot 10^{-7}$	$9,54 \cdot 10^{-9}$	$6,36 \cdot 10^{-9}$	$2,36 \cdot 10^{-7}$
Acidification Potential - AP	mol H+_eq.	$5,02 \cdot 10^{-3}$	$2,59 \cdot 10^{-4}$	$6,85 \cdot 10^{-4}$	$5,96 \cdot 10^{-3}$
	Kg_SO_2_eq	$4,19 \cdot 10^{-3}$	$2,30 \cdot 10^{-4}$	$5,94 \cdot 10^{-4}$	$5,01 \cdot 10^{-3}$

Eutrophication Aquatic Freshwater	kg_ P_eq.	2,45*10^{-4}	3,27*10^{-6}	4,26*10^{-5}	2,91*10^{-4}
	kg_ PO_4_eq.	7,52*10^{-4}	1,00*10^{-5}	1,31*10^{-4}	8,93*10^{-4}
Eutrophication Aquatic Marine	kg_ N_eq.	3,16*10^{-5}	2,98*10^{-7}	4,53*10^{-6}	3,64*10^{-5}
Eutrophication Terrestrial	mole N_eq.	8,61*10^{-3}	9,74*10^{-4}	1,39*10^{-3}	1,10*10^{-2}
Photoch. Ozone Formation Potential - PCOF	kg_NMVOC	3,48*10^{-3}	2,78*10^{-4}	5,08*10^{-4}	4,27*10^{-3}
Abiotic Resources Depletion Potential Minerals and Metals - ADPE (*)	kg_ Sb_eq.	1,22*10^{-5}	1,57*10^{-7}	8,13*10^{-7}	1,32*10^{-5}
Abiotic Resources Depletion Potential – Fossil - ADPF (*)	MJ_eq.	24,30	0,77	3,74	28,80
Water Use (*)	m^{3}world eq.	0,457	2,44*10^{-3}	6,14*10^{-2}	0,521
GWP - GHG	kg_CO_2_eq.	1,11	5,07*10^{-2}	0,156	1,32

***Table 26** Impact indicators for the system Acriflex X-Pro.*

Results per Declared Unit – 1,00 kg					
Indicator	**Unit**	**A1**	**A2**	**A3**	**Total**
Global Warming Potential – GWP Total	kg_CO_2_eq.	1,16	4,83*10^{-2}	0,159	1,37
Global Warming Potential – GWP fossil	kg_CO_2_eq.	1,11	0,153	0,153	1,32
Global Warming Potential – GWP biogenic	kg_CO_2_eq.	4,48*10^{-2}	3,38*10^{-4}	5,45*10^{-3}	5,06*10^{-2}
Global Warming Potential – GWP Luluc	kg_CO_2_eq.	4,98*10^{-4}	1,86*10^{-5}	1,84*10^{-4}	7,01*10^{-4}
Ozone Depletion Potential - ODP	kg_CFC-11_eq.	1,75*10^{-7}	9,03*10^{-9}	6,36*10^{-9}	1,90*10^{-7}
Acidification Potential - AP	mol H+_eq.	4,84*10^{-3}	2,45*10^{-4}	6,85*10^{-4}	5,77*10^{-3}
	Kg_SO_2_eq	4,06*10^{-3}	2,17*10^{-4}	5,94*10^{-4}	4,87*10^{-3}
Eutrophication Aquatic Freshwater	kg_ P_eq.	2,39*10^{-4}	3,10*10^{-6}	4,26*10^{-5}	2,85*10^{-4}
	kg_ PO_4_eq.	7,35*10^{-4}	9,50*10^{-6}	1,31*10^{-4}	8,76*10^{-4}
Eutrophication Aquatic Marine	kg_ N_eq.	2,74*10^{-5}	2,82*10^{-7}	4,49*10^{-6}	3,22*10^{-5}
Eutrophication Terrestrial	mole N_eq.	8,49*10^{-3}	9,22*10^{-4}	1,39*10^{-3}	1,08*10^{-2}
Photoch. Ozone Formation Potential - PCOF	kg_NMVOC	3,44*10^{-3}	2,64*10^{-4}	5,08*10^{-4}	4,21*10^{-3}
Abiotic Resources Depletion Potential Minerals and Metals - ADPE (*)	kg_ Sb_eq.	1,02*10^{-5}	1,48*10^{-7}	8,13*10^{-7}	1,12*10^{-5}
Abiotic Resources Depletion Potential – Fossil - ADPF (*)	MJ_eq.	24,60	0,729	3,74	29,10
Water Use (*)	m^{3}world eq.	0,479	2,31*10^{-3}	6,16*10^{-2}	0,516
GWP - GHG	kg_CO_2_eq.	1,12	4,79*10^{-2}	0,155	1,32

***Table 27**: Impact indicators for the system Oriplast Reflex.*

Results per Declared Unit – 1,00 kg					
Indicator	**Unit**	**A1**	**A2**	**A3**	**Total**
Global Warming Potential – GWP Total	kg_CO_2_eq.	1,27	4,92*10^{-2}	0,159	1,48
Global Warming Potential – GWP fossil	kg_CO_2_eq.	1,22	4,88*10^{-2}	0,153	1,42
Global Warming Potential – GWP biogenic	kg_CO_2_eq.	5,15*10^{-2}	3,44*10^{-4}	5,40*10^{-3}	5,72*10^{-2}
Global Warming Potential – GWP Luluc	kg_CO_2_eq.	6,32*10^{-4}	1,90*10^{-5}	1,84*10^{-4}	8,35*10^{-4}
Ozone Depletion Potential - ODP	kg_CFC-11_eq.	2,89*10^{-7}	9,19*10^{-9}	6,37*10^{-9}	3,05*10^{-7}
Acidification Potential - AP	mol H+_eq.	6,29*10^{-3}	2,50*10^{-4}	6,83*10^{-4}	7,22*10^{-3}
	Kg_SO_2_eq	5,51*10^{-3}	2,21*10^{-4}	5,93*10^{-4}	6,32*10^{-3}
Eutrophication Aquatic Freshwater	kg_ P_eq.	2,94*10^{-4}	3,15*10^{-6}	4,25*10^{-5}	3,40*10^{-4}
	kg_ PO_4_eq.	9,02*10^{-4}	9,68*10^{-6}	1,31*10^{-4}	1,04*10^{-3}
Eutrophication Aquatic Marine	kg_ N_eq.	4,50*10^{-5}	2,87*10^{-7}	4,52*10^{-6}	4,98*10^{-5}
Eutrophication Terrestrial	mole N_eq.	1,01*10^{-2}	9,39*10^{-4}	1,39*10^{-3}	1,24*10^{-2}
Photoch. Ozone Formation Potential - PCOF	kg_NMVOC	3,85*10^{-3}	2,68*10^{-4}	5,06*10^{-4}	4,62*10^{-3}
Abiotic Resources Depletion Potential Minerals and Metals - ADPE (*)	kg_ Sb_eq.	1,71*10^{-5}	1,51*10^{-7}	8,09*10^{-7}	1,81*10^{-5}
Abiotic Resources Depletion Potential – Fossil - ADPF (*)	MJ_eq.	24,50	0,743	3,72	29,00
Water Use (*)	m^{3}world eq.	0,433	0,534	6,13*10^{-2}	0,597
GWP - GHG	kg_CO_2_eq.	1,22	4,88*10^{-2}	0,155	1,42

Table 28*: Impact indicators for the system O.R.A. Eco Anti-rain.*

Results per Declared Unit – 1,00 kg					
Indicator	**Unit**	**A1**	**A2**	**A3**	**Total**
Global Warming Potential – GWP Total	kg_CO_2_eq.	1,03	$2{,}59*10^{-2}$	0,442	1,50
Global Warming Potential – GWP fossil	kg_CO_2_eq.	1,00	$2{,}57*10^{-2}$	0,399	1,43
Global Warming Potential – GWP biogenic	kg_CO_2_eq.	$2{,}60*10^{-2}$	$1{,}74*10^{-4}$	$4{,}17*10^{-2}$	$6{,}79*10^{-2}$
Global Warming Potential – GWP Luluc	kg_CO_2_eq.	$4{,}10*10^{-4}$	$9{,}77*10^{-6}$	$1{,}32*10^{-3}$	$1{,}74*10^{-3}$
Ozone Depletion Potential - ODP	kg_CFC-11_eq.	$1{,}06*10^{-7}$	$4{,}88*10^{-9}$	$1{,}98*10^{-8}$	$1{,}31*10^{-7}$
Acidification Potential - AP	mol H+_eq.	$4{,}23*10^{-3}$	$1{,}31*10^{-4}$	$1{,}79*10^{-3}$	$6{,}15*10^{-3}$
	Kg_SO_2_eq	$3{,}58*10^{-3}$	$1{,}16*10^{-4}$	$1{,}54*10^{-3}$	$5{,}24*10^{-3}$
Eutrophication Aquatic Freshwater	kg_ P_eq.	$2{,}05*10^{-4}$	$1{,}65*10^{-6}$	$1{,}26*10^{-4}$	$3{,}33*10^{-4}$
	kg_ PO_4_eq.	$6{,}29*10^{-4}$	$5{,}05*10^{-6}$	$3{,}88*10^{-4}$	$1{,}02*10^{-3}$
Eutrophication Aquatic Marine	kg_ N_eq.	$1{,}92*10^{-5}$	$1{,}49*10^{-7}$	$3{,}13*10^{-5}$	$4{,}98*10^{-5}$
Eutrophication Terrestrial	mole N_eq.	$7{,}22*10^{-3}$	$4{,}93*10^{-4}$	$3{,}95*10^{-3}$	$1{,}17*10^{-2}$
Photoch. Ozone Formation Potential - PCOF	kg_NMVOC	$3{,}01*10^{-3}$	$1{,}43*10^{-4}$	$1{,}33*10^{-3}$	$4{,}48*10^{-3}$
Abiotic Resources Depletion Potential Minerals and Metals - ADPE (*)	kg_ Sb_eq.	$6{,}98*10^{-6}$	$7{,}11*10^{-5}$	$2{,}31*10^{-6}$	$9{,}36*10^{-6}$
Abiotic Resources Depletion Potential – Fossil - ADPF (*)	MJ_eq.	31,80	0,394	8,67	40,90
Water Use (*)	m^3world eq.	0,456	$1{,}30*10^{-3}$	0,203	0,66
GWP - GHG	kg_CO_2_eq.	1,00	$2{,}57*10^{-2}$	0,406	1,43

Table 29*: Impact indicators for the system Ultrabit.*

Results per Declared Unit – 1,00 kg					
Indicator	**Unit**	**A1**	**A2**	**A3**	**Total**
Global Warming Potential – GWP Total	kg_CO_2_eq.	1,07	$5{,}58*10^{-2}$	0,215	1,34
Global Warming Potential – GWP fossil	kg_CO_2_eq.	1,02	$5{,}54*10^{-2}$	0,207	1,29
Global Warming Potential – GWP biogenic	kg_CO_2_eq.	$4{,}47*10^{-2}$	$3{,}97*10^{-4}$	$7{,}72*10^{-3}$	$5{,}28*10^{-2}$
Global Warming Potential – GWP Luluc	kg_CO_2_eq.	$8{,}36*10^{-4}$	$2{,}17*10^{-5}$	$2{,}19*10^{-4}$	$1{,}08*10^{-3}$
Ozone Depletion Potential - ODP	kg_CFC-11_eq.	$2{,}27*10^{-7}$	$1{,}04*10^{-8}$	$8{,}46*10^{-9}$	$2{,}46*10^{-7}$
Acidification Potential - AP	mol H+_eq.	$4{,}67*10^{-3}$	$2{,}83*10^{-4}$	$9{,}24*10^{-4}$	$5{,}88*10^{-3}$
	Kg_SO_2_eq	$3{,}90*10^{-3}$	$2{,}51*10^{-4}$	$8{,}02*10^{-4}$	$4{,}95*10^{-3}$
Eutrophication Aquatic Freshwater	kg_ P_eq.	$2{,}13*10^{-4}$	$3{,}59*10^{-6}$	$5{,}53*10^{-5}$	$2{,}72*10^{-4}$
	kg_ PO_4_eq.	$6{,}54*10^{-4}$	$1{,}10*10^{-5}$	$1{,}70*10^{-4}$	$8{,}35*10^{-4}$
Eutrophication Aquatic Marine	kg_ N_eq.	$2{,}98*10^{-5}$	$3{,}29*10^{-7}$	$5{,}56*10^{-6}$	$3{,}57*10^{-5}$
Eutrophication Terrestrial	mole N_eq.	$7{,}99*10^{-3}$	$1{,}07*10^{-3}$	$1{,}87*10^{-3}$	$1{,}09*10^{-2}$
Photoch. Ozone Formation Potential - PCOF	kg_NMVOC	$3{,}15*10^{-3}$	$3{,}03*10^{-4}$	$6{,}80*10^{-4}$	$4{,}13*10^{-3}$
Abiotic Resources Depletion Potential Minerals and Metals - ADPE (*)	kg_ Sb_eq.	$1{,}15*10^{-5}$	$1{,}78*10^{-7}$	$1{,}03*10^{-6}$	$1{,}27*10^{-5}$
Abiotic Resources Depletion Potential – Fossil - ADPF (*)	MJ_eq.	22,70	0,84	5,20	28,70
Water Use (*)	m^3world eq.	0,419	$2{,}62*10^{-3}$	$8{,}28*10^{-2}$	0,504
GWP - GHG	kg_CO_2_eq.	1,03	$5{,}54*10^{-2}$	0,21	1,30

Table 30*: Impact indicators for the system Ultragum.*

Results per Declared Unit – 1,00 kg					
Indicator	**Unit**	**A1**	**A2**	**A3**	**Total**
Global Warming Potential – GWP Total	kg_CO_2_eq.	0,96	$5{,}40*10^{-2}$	0,159	1,17
Global Warming Potential – GWP fossil	kg_CO_2_eq.	0,915	$5{,}36*10^{-2}$	0,153	1,12
Global Warming Potential – GWP biogenic	kg_CO_2_eq.	$4{,}40*10^{-2}$	$3{,}78*10^{-4}$	$5{,}35*10^{-3}$	$4{,}97*10^{-2}$
Global Warming Potential – GWP Luluc	kg_CO_2_eq.	$7{,}93*10^{-4}$	$2{,}13*10^{-5}$	$1{,}84*10^{-4}$	$9{,}98*10^{-4}$
Ozone Depletion Potential - ODP	kg_CFC-11_eq.	$1{,}26*10^{-7}$	$9{,}96*10^{-9}$	$6{,}35*10^{-9}$	$1{,}42*10^{-7}$
Acidification Potential - AP	mol H+_eq.	$4{,}10*10^{-3}$	$2{,}74*10^{-4}$	$6{,}86*10^{-4}$	$5{,}06*10^{-3}$
	Kg_SO_2_eq	$3{,}48*10^{-3}$	$2{,}43*10^{-4}$	$5{,}95*10^{-4}$	$4{,}32*10^{-3}$
Eutrophication Aquatic Freshwater	kg_ P_eq.	$1{,}94*10^{-4}$	$3{,}56*10^{-6}$	$4{,}27*10^{-5}$	$2{,}40*10^{-4}$
	kg_ PO_4_eq.	$5{,}95*10^{-4}$	$1{,}09*10^{-5}$	$1{,}31*10^{-4}$	$7{,}37*10^{-4}$
Eutrophication Aquatic Marine	kg_ N_eq.	$2{,}01*10^{-5}$	$3{,}23*10^{-7}$	$4{,}52*10^{-6}$	$2{,}49*10^{-5}$

Eutrophication Terrestrial	mole N_eq.	$7,24*10^{-3}$	$1,03*10^{-3}$	$1,39*10^{-3}$	$9,66*10^{-3}$
Photoch. Ozone Formation Potential - PCOF	kg_NMVOC	$2,87*10^{-3}$	$2,92*10^{-4}$	$5,09*10^{-4}$	$3,67*10^{-3}$
Abiotic Resources Depletion Potential Minerals and Metals - ADPE (*)	kg_ Sb_eq.	$7,03*10^{-6}$	$1,73*10^{-7}$	$8,16*10^{-7}$	$8,02*10^{-6}$
Abiotic Resources Depletion Potential – Fossil - ADPF (*)	MJ_eq.	20,80	0,81	3,75	24,40
Water Use (*)	m^3world eq.	0,403	$2,58*10^{-3}$	$6,18*10^{-2}$	0,467
GWP - GHG	kg_CO_2_eq.	0,92	$5,36*10^{-2}$	0,16	1,13

***Table 31**: Impact indicators for the system BKK Eco.*

Results per Declared Unit – 1,00 kg					
Indicator	**Unit**	**A1**	**A2**	**A3**	**Total**
Global Warming Potential – GWP Total	kg_CO_2_eq.	2,34	$4,59*10^{-2}$	0,457	2,84
Global Warming Potential – GWP fossil	kg_CO_2_eq.	2,14	$4,56*10^{-2}$	0,414	2,60
Global Warming Potential – GWP biogenic	kg_CO_2_eq.	0,185	$2,97*10^{-4}$	$4,12*10^{-2}$	0,227
Global Warming Potential – GWP Luluc	kg_CO_2_eq.	$1,15*10^{-2}$	$1,70*10^{-5}$	$1,36*10^{-3}$	$1,29*10^{-2}$
Ozone Depletion Potential - ODP	kg_CFC-11_eq.	$2,39*10^{-4}$	$8,71*10^{-9}$	$2,02*10^{-8}$	$2,39*10^{-4}$
Acidification Potential - AP	mol H+_eq.	$1,27*10^{-2}$	$2,33*10^{-4}$	$1,85*10^{-3}$	$1,48*10^{-2}$
	Kg_SO_2_eq	$1,08*10^{-2}$	$2,07*10^{-4}$	$1,60*10^{-3}$	$1,26*10^{-2}$
Eutrophication Aquatic Freshwater	kg_ P_eq.	$4,19*10^{-4}$	$2,90*10^{-6}$	$1,31*10^{-4}$	$5,53*10^{-4}$
	kg_ PO_4_eq.	$1,29*10^{-3}$	$8,90*10^{-6}$	$4,03*10^{-4}$	$1,70*10^{-3}$
Eutrophication Aquatic Marine	kg_ N_eq.	$5,13*10^{-5}$	$2,60*10^{-7}$	$3,16*10^{-5}$	$8,32*10^{-5}$
Eutrophication Terrestrial	mole N_eq.	$1,01*10^{-2}$	$2,56*10^{-4}$	$1,39*10^{-3}$	$1,24*10^{-2}$
Photoch. Ozone Formation Potential - PCOF	kg_NMVOC	$8,00*10^{-3}$	$2,56*10^{-4}$	$1,37*10^{-3}$	$9,63*10^{-3}$
Abiotic Resources Depletion Potential Minerals and Metals - ADPE (*)	kg_ Sb_eq.	$9,69*10^{-6}$	$1,14*10^{-7}$	$2,40*10^{-6}$	$1,22*10^{-5}$
Abiotic Resources Depletion Potential – Fossil - ADPF (*)	MJ_eq.	23,50	0,704	9,07	33,30
Water Use (*)	m^3world eq.	0,354	$2,39*10^{-3}$	0,213	0,569
GWP - GHG	kg_CO_2_eq.	2,10	$4,56*10^{-2}$	0,422	2,57

***Table 32**: Impact indicators for the system WATstop.*

Results per Declared Unit – 1,00 kg					
Indicator	**Unit**	**A1**	**A2**	**A3**	**Total**
Global Warming Potential – GWP Total	kg_CO_2_eq.	2,30	$5,00*10^{-2}$	0,486	2,84
Global Warming Potential – GWP fossil	kg_CO_2_eq.	2,04	$4,96*10^{-2}$	0,469	2,56
Global Warming Potential – GWP biogenic	kg_CO_2_eq.	$9,66*10^{-2}$	$3,68*10^{-4}$	$1,61*10^{-2}$	0,113
Global Warming Potential – GWP Luluc	kg_CO_2_eq.	0,162	$1,98*10^{-5}$	$5,18*10^{-4}$	0,163
Ozone Depletion Potential - ODP	kg_CFC-11_eq.	$2,83*10^{-7}$	$9,23*10^{-9}$	$1,84*10^{-8}$	$3,11*10^{-7}$
Acidification Potential - AP	mol H+_eq.	$9,31*10^{-3}$	$2,53*10^{-4}$	$2,09*10^{-3}$	$9,89*10^{-3}$
	Kg_SO_2_eq	$7,86*10^{-3}$	$2,25*10^{-4}$	$1,81*10^{-3}$	$1,20*10^{-2}$
Eutrophication Aquatic Freshwater	kg_ P_eq.	$4,89*10^{-4}$	$3,23*10^{-6}$	$1,01*10^{-4}$	$5,92*10^{-4}$
	kg_ PO_4_eq.	$1,50*10^{-3}$	$9,92*10^{-6}$	$3,94*10^{-4}$	$1,90*10^{-3}$
Eutrophication Aquatic Marine	kg_ N_eq.	$3,64*10^{-4}$	$2,97*10^{-7}$	$1,23*10^{-5}$	$3,77*10^{-4}$
Eutrophication Terrestrial	mole N_eq.	$1,99*10^{-2}$	$9,56*10^{-4}$	$4,20*10^{-3}$	$2,51*10^{-2}$
Photoch. Ozone Formation Potential - PCOF	kg_NMVOC	$6,03*10^{-4}$	$2,69*10^{-4}$	$1,55*10^{-3}$	$7,85*10^{-3}$
Abiotic Resources Depletion Potential Minerals and Metals - ADPE (*)	kg_ Sb_eq.	$1,39*10^{-5}$	$1,74*10^{-7}$	$2,43*10^{-6}$	$1,65*10^{-5}$
Abiotic Resources Depletion Potential – Fossil - ADPF (*)	MJ_eq.	26,20	0,745	11,60	38,50
Water Use (*)	m^3world eq.	0,572	$2,23*10^{-3}$	0,193	0,767
GWP - GHG	kg_CO_2_eq.	2,21	$4,96*10^{-2}$	0,471	2,73

***Table 33**: Impact indicators for the system Acriflex Fybro.*

Results per Declared Unit – 1,00 kg					
Indicator	**Unit**	**A1**	**A2**	**A3**	**Total**
Global Warming Potential – GWP Total	kg_CO_2_eq.	1,11	$4,52*10^{-2}$	0,164	1,32
Global Warming Potential – GWP fossil	kg_CO_2_eq.	1,07	$4,49*10^{-2}$	0,158	1,28

Global Warming Potential – GWP biogenic	kg_CO_2_eq.	$3,57*10^{-2}$	$3,14*10^{-4}$	$5,42*10^{-3}$	$4,14*10^{-2}$
Global Warming Potential – GWP Luluc	kg_CO_2_eq.	$3,67*10^{-4}$	$1,86*10^{-5}$	$1,80*10^{-4}$	$5,66*10^{-4}$
Ozone Depletion Potential - ODP	kg_CFC-11_eq.	$1,12*10^{-7}$	$8,07*10^{-9}$	$6,43*10^{-9}$	$1,27*10^{-7}$
Acidification Potential - AP	mol H+_eq.	$4,03*10^{-3}$	$2,29*10^{-4}$	$6,85*10^{-4}$	$4,94*10^{-3}$
	Kg_SO_2_eq	$3,45*10^{-3}$	$2,04*10^{-4}$	$6,11*10^{-4}$	$4,27*10^{-3}$
Eutrophication Aquatic Freshwater	kg_ P_eq.	$1,90*10^{-4}$	$3,17*10^{-6}$	$4,35*10^{-5}$	$2,37*10^{-4}$
	kg_ PO_4_eq.	$5,80*10^{-4}$	$9,73*10^{-6}$	$1,33*10^{-4}$	$7,23*10^{-4}$
Eutrophication Aquatic Marine	kg_ N_eq.	$1,99*10^{-5}$	$2,83*10^{-7}$	$4,35*10^{-6}$	$2,45*10^{-5}$
Eutrophication Terrestrial	mole N_eq.	$7,92*10^{-3}$	$8,56*10^{-4}$	$1,42*10^{-3}$	$3,61*10^{-3}$
Photoch. Ozone Formation Potential - PCOF	kg_NMVOC	$2,85*10^{-3}$	$2,40*10^{-4}$	$5,19*10^{-4}$	$3,61*10^{-3}$
Abiotic Resources Depletion Potential Minerals and Metals - ADPE (*)	kg_ Sb_eq.	$6,70*10^{-6}$	$1,57*10^{-7}$	$8,23*10^{-7}$	$7,68*10^{-6}$
Abiotic Resources Depletion Potential – Fossil - ADPF (*)	MJ_eq.	17,50	0,67	3,89	22,10
Water Use (*)	m^3world eq.	0,336	$2,16*10^{-3}$	$6,32*10^{-2}$	0,401
GWP - GHG	kg_CO_2_eq.	1,07	0,449	0,16	1,28

***Table 34**: Impact indicators for the system Acriflex Pro.*

Results per Declared Unit – 1,00 kg					
Indicator	**Unit**	**A1**	**A2**	**A3**	**Total**
Global Warming Potential – GWP Total	kg_CO_2_eq.	1,09	$6,64*10^{-2}$	0,161	1,32
Global Warming Potential – GWP fossil	kg_CO_2_eq.	1,05	$6,59*10^{-2}$	0,154	1,27
Global Warming Potential – GWP biogenic	kg_CO_2_eq.	$4,22*10^{-2}$	$4,60*10^{-4}$	$6,54*10^{-3}$	$4,92*10^{-2}$
Global Warming Potential – GWP Luluc	kg_CO_2_eq.	$3,67*10^{-4}$	$1,86*10^{-5}$	$1,80*10^{-4}$	$5,66*10^{-4}$
Ozone Depletion Potential - ODP	kg_CFC-11_eq.	$2,06*10^{-7}$	$1,18*10^{-8}$	$6,37*10^{-9}$	$2,24*10^{-7}$
Acidification Potential - AP	mol H+_eq.	$4,75*10^{-3}$	$3,37*10^{-4}$	$6,88*10^{-4}$	$5,78*10^{-3}$
	Kg_SO_2_eq	$3,97*10^{-3}$	$3,00*10^{-4}$	$5,96*10^{-4}$	$4,87*10^{-3}$
Eutrophication Aquatic Freshwater	kg_ P_eq.	$2,32*10^{-4}$	$4,67*10^{-6}$	$4,27*10^{-5}$	$2,79*10^{-4}$
	kg_ PO_4_eq.	$7,13*10^{-4}$	$1,43*10^{-5}$	$1,31*10^{-4}$	$8,58*10^{-4}$
Eutrophication Aquatic Marine	kg_ N_eq.	$2,99*10^{-5}$	$4,16*10^{-7}$	$4,52*10^{-6}$	$3,48*10^{-5}$
Eutrophication Terrestrial	mole N_eq.	$8,17*10^{-3}$	$1,26*10^{-3}$	$1,40*10^{-3}$	$1,08*10^{-3}$
Photoch. Ozone Formation Potential - PCOF	kg_NMVOC	$3,30*10^{-3}$	$3,53*10^{-4}$	$5,11*10^{-4}$	$4,16*10^{-3}$
Abiotic Resources Depletion Potential Minerals and Metals - ADPE (*)	kg_ Sb_eq.	$1,15*10^{-6}$	$2,30*10^{-7}$	$8,17*10^{-7}$	$1,25*10^{-5}$
Abiotic Resources Depletion Potential – Fossil - ADPF (*)	MJ_eq.	23,10	0,98	3,75	27,80
Water Use (*)	m^3world eq.	0,436	$3,18*10^{-3}$	$6,26*10^{-2}$	0,502
GWP - GHG	kg_CO_2_eq.	1,05	0,157	0,16	1,27

(*) Disclaimer: 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 experience with the indicator.

Use of resources

***Table 35:** Use of resources for the system Acriflex Rapido.*

Results per Declared Unit – 1,00 kg					
Indicator	**Unit**	**A1**	**A2**	**A3**	**Total**
Use of Renewable primary energy resources - No raw materials	MJ	0,865	$1,07*10^{-2}$	0,616	1,49
Use of Renewable primary energy resources - Raw materials	MJ	0,334	$1,74*10^{-3}$	0,435	0,77
Total use of Renewable primary energy	**MJ**	1,20	$1,24*10^{-2}$	1,05	2,26
Use of non-Renewable primary energy resources -No raw materials	MJ	27,71	0,835	4,27	32,82
Use of non-Renewable primary energy resources -Raw materials	MJ	$1,75*10^{-5}$	0	$1,70*10^{-3}$	$1,72*10^{-3}$
Total use of non-Renewable primary energy	**MJ**	27,71	0,835	4,27	32,82
Use of secondary materials	kg	0	0	0	0
Use of Renewable secondary fuels	MJ	0,865	$1,07*10^{-2}$	0,616	1,49

Use of Non-Renewable secondary fuels	MJ	9,20*10^{-4}	3,43*10^{-5}	2,34*10^{-4}	1,19*10^{-3}
Use of net fresh water	m^3	1,19*10^{-2}	8,36*10^{-5}	1,54*10^{-3}	1,35*10^{-2}

Table 36: *Use of resources for the system Acriflex X-Pro.*

Results per Declared Unit – 1,00 kg					
Indicator	**Unit**	**A1**	**A2**	**A3**	**Total**
Use of Renewable primary energy resources - No raw materials	MJ	0,827	1,01*10^{-2}	0,622	1,46
Use of Renewable primary energy resources - Raw materials	MJ	0,312	1,64*10^{-3}	0,44	0,75
Total use of Renewable primary energy	**MJ**	1,14	1,17*10^{-2}	1,06	2,21
Use of non-Renewable primary energy resources - No raw materials	MJ	28,25	0,79	4,27	33,31
Use of non-Renewable primary energy resources - Raw materials	MJ	9,21*10^{-4}	0	1,70*10^{-3}	2,62*10^{-3}
Total use of non-Renewable primary energy	**MJ**	28,25	0,79	4,27	33,31
Use of secondary materials	kg	0	0	0	0
Use of Renewable secondary fuels	MJ	0,827	1,01*10^{-2}	0,622	1,46
Use of Non-Renewable secondary fuels	MJ	9,36*10^{-4}	3,25*10^{-5}	2,35*10^{-5}	1,20*10^{-3}
Use of net fresh water	m^3	1,17*10^{-2}	7,92*10^{-4}	1,55*10^{-3}	1,33*10^{-2}

Table 37: *Use of resources for the system Oriplast Reflex.*

Results per Declared Unit – 1,00 kg					
Indicator	**Unit**	**A1**	**A2**	**A3**	**Total**
Use of Renewable primary energy resources - No raw materials	MJ	0,971	1,03*10^{-2}	0,619	1,60
Use of Renewable primary energy resources - Raw materials	MJ	0,365	1,67*10^{-3}	0,438	0,80
Total use of Renewable primary energy	**MJ**	1,34	1,20*10^{-2}	1,06	2,40
Use of non-Renewable primary energy resources - No raw materials	MJ	27,96	0,804	4,25	33,01
Use of non-Renewable primary energy resources - Raw materials	MJ	3,66*10^{-5}	0	1,55*10^{-3}	1,59*10^{-3}
Total use of non-Renewable primary energy	**MJ**	27,96	0,804	4,25	33,01
Use of secondary materials	kg	0	0	0	0
Use of Renewable secondary fuels	MJ	0,971	1,03*10^{-2}	0,619	1,60
Use of Non-Renewable secondary fuels	MJ	1,09*10^{-3}	3,31*10^{-5}	2,34*10^{-4}	1,36*10^{-3}
Use of net fresh water	m^3	1,36*10^{-2}	8,06*10^{-5}	1,55*10^{-3}	1,52*10^{-2}

Table 38: *Use of resources for the system O.R.A. Eco Anti-Rain.*

Results per Declared Unit – 1,00 kg					
Indicator	**Unit**	**A1**	**A2**	**A3**	**Total**
Use of Renewable primary energy resources - No raw materials	MJ	0,85	1,18*10^{-2}	0,892	1,75
Use of Renewable primary energy resources - Raw materials	MJ	0,358	1,94*10^{-3}	0,64	1,00
Total use of Renewable primary energy	**MJ**	1,21	1,37*10^{-2}	1,53	2,75
Use of non-Renewable primary energy resources - No raw materials	MJ	25,76	0,91	5,94	32,61
Use of non-Renewable primary energy resources - Raw materials	MJ	1,70*10^{-5}	0	2,41*10^{-3}	2,43*10^{-3}
Total use of non-Renewable primary energy	**MJ**	25,76	0,91	5,94	32,61
Use of secondary materials	kg	0	0	0	0
Use of Renewable secondary fuels	MJ	0,85	1,18*10^{-2}	0,892	1,75
Use of Non-Renewable secondary fuels	MJ	8,12*10^{-4}	3,69*10^{-5}	2,73*10^{-4}	1,12*10^{-3}
Use of net fresh water	m^3	1,70*10^{-2}	4,34*10^{-5}	5,23*10^{-3}	2,23*10^{-2}

Table 39: *Use of resources for the system Ultrabit.*

Results per Declared Unit – 1,00 kg					
Indicator	**Unit**	**A1**	**A2**	**A3**	**Total**
Use of Renewable primary energy resources - No raw materials	MJ	0,527	$5,31*10^{-3}$	2,01	2,54
Use of Renewable primary energy resources - Raw materials	MJ	0,11	$8,37*10^{-4}$	1,38	1,49
Total use of Renewable primary energy	**MJ**	0,64	$6,14*10^{-3}$	3,39	4,03
Use of non-Renewable primary energy resources - No raw materials	MJ	25,84	0,427	9,95	36,32
Use of non-Renewable primary energy resources - Raw materials	MJ	$5,90*10^{-6}$	0	$3,58*10^{-3}$	$3,59*10^{-3}$
Total use of non-Renewable primary energy	**MJ**	25,84	0,427	9,95	36,32
Use of secondary materials	kg	0	0	0	0
Use of Renewable secondary fuels	MJ	0,527	$5,31*10^{-3}$	2,01	2,54
Use of Non-Renewable secondary fuels	MJ	$7,86*10^{-4}$	$1,82*10^{-5}$	$1,61*10^{-3}$	$2,41*10^{-3}$
Use of net fresh water	m^3	$1,09*10^{-2}$	$9,07*10^{-5}$	$2,06*10^{-3}$	$1,31*10^{-2}$

Table 40: *Use of resources for the system Ultragum.*

Results per Declared Unit – 1,00 kg					
Indicator	**Unit**	**A1**	**A2**	**A3**	**Total**
Use of Renewable primary energy resources - No raw materials	MJ	0,78	$1,10*10^{-2}$	0,615	1,40
Use of Renewable primary energy resources - Raw materials	MJ	0,34	$1,85*10^{-3}$	0,434	0,77
Total use of Renewable primary energy	**MJ**	1,12	$1,29*10^{-2}$	1,05	2,18
Use of non-Renewable primary energy resources - No raw materials	MJ	23,58	0,878	4,28	28,74
Use of non-Renewable primary energy resources - Raw materials	MJ	$5,90*10^{-6}$	0	$1,71*10^{-3}$	$1,72*10^{-3}$
Total use of non-Renewable primary energy	**MJ**	23,58	0,878	4,28	28,74
Use of secondary materials	kg	0	0	0	0
Use of Renewable secondary fuels	MJ	0,78	$1,10*10^{-2}$	0,615	1,40
Use of Non-Renewable secondary fuels	MJ	$7,56*10^{-4}$	$3,58*10^{-5}$	$2,34*10^{-4}$	$1,03*10^{-3}$
Use of net fresh water	m^3	$1,20*10^{-2}$	$1,04*10^{-2}$	$1,55*10^{-3}$	$2,06*10^{-2}$

Table 41: *Use of resources for the system BKK Eco.*

Results per Declared Unit – 1,00 kg					
Indicator	**Unit**	**A1**	**A2**	**A3**	**Total**
Use of Renewable primary energy resources - No raw materials	MJ	3,22	$9,28*10^{-3}$	1,87	5,10
Use of Renewable primary energy resources - Raw materials	MJ	0,862	$1,42*10^{-3}$	1,25	2,11
Total use of Renewable primary energy	**MJ**	4,08	$1,07*10^{-2}$	3,12	7,21
Use of non-Renewable primary energy resources - No raw materials	MJ	28,59	0,762	10,41	39,76
Use of non-Renewable primary energy resources - Raw materials	MJ	0	0	$3,78*10^{-3}$	$3,78*10^{-3}$
Total use of non-Renewable primary energy	**MJ**	28,59	0,762	10,41	39,76
Use of secondary materials	kg	0	0	0	0
Use of Renewable secondary fuels	MJ	3,22	$9,28*10^{-3}$	1,87	5,10
Use of Non-Renewable secondary fuels	MJ	$1,40*10^{-2}$	$3,34*10^{-5}$	$1,66*10^{-3}$	$1,57*10^{-2}$
Use of net fresh water	m^3	$1,48*10^{-2}$	$7,86*10^{-5}$	$5,45*10^{-3}$	$2,03*10^{-2}$

Table 42: *Use of resources for the system WATstop.*

Results per Declared Unit – 1,00 kg					
Indicator	**Unit**	**A1**	**A2**	**A3**	**Total**
Use of Renewable primary energy resources - No raw materials	MJ	1,23	$1,07*10^{-2}$	1,52	2,76
Use of Renewable primary energy resources - Raw materials	MJ	0,286	$1,81*10^{-3}$	1,02	1,31
Total use of Renewable primary energy	**MJ**	1,52	$1,25*10^{-2}$	2,54	4,07
Use of non-Renewable primary energy resources - No raw materials	MJ	30,14	0,81	13,24	44,19
Use of non-Renewable primary energy resources - Raw materials	MJ	$1,89*10^{-8}$	0	$5,40*10^{-3}$	$5,40*10^{-3}$
Total use of non-Renewable primary energy	**MJ**	30,14	0,81	13,24	44,19
Use of secondary materials	kg	0	0	0	0
Use of Renewable secondary fuels	MJ	1,23	$1,07*10^{-2}$	1,52	2,76
Use of Non-Renewable secondary fuels	MJ	0,19	$3,14*10^{-5}$	$6,59*10^{-4}$	0,191
Use of net fresh water	m^3	$1,89*10^{-2}$	$7,90*10^{-5}$	$4,76*10^{-3}$	$2,37*10^{-2}$

Table 43: *Use of resources for the system Acriflex Fybro.*

Results per Declared Unit – 1,00 kg					
Indicator	**Unit**	**A1**	**A2**	**A3**	**Total**
Use of Renewable primary energy resources - No raw materials	MJ	0,614	$8,71*10^{-3}$	0,571	1,19
Use of Renewable primary energy resources - Raw materials	MJ	0,228	$1,55*10^{-3}$	0,393	0,62
Total use of Renewable primary energy	**MJ**	0,84	$1,03*10^{-2}$	0,96	1,81
Use of non-Renewable primary energy resources - No raw materials	MJ	20,00	0,72	4,44	25,16
Use of non-Renewable primary energy resources - Raw materials	MJ	$6,08*10^{-4}$	0	$1,79*10^{-3}$	$2,40*10^{-3}$
Total use of non-Renewable primary energy	**MJ**	20,00	0,72	4,44	25,16
Use of secondary materials	kg	0	0	0	0
Use of Renewable secondary fuels	MJ	0,614	$8,71*10^{-3}$	0,571	1,19
Use of Non-Renewable secondary fuels	MJ	$6,86*10^{-4}$	$2,91*10^{-5}$	$2,29*10^{-4}$	$9,44*10^{-4}$
Use of net fresh water	m^3	$8,64*10^{-3}$	$7,04*10^{-5}$	$1,58*10^{-3}$	0,103

Table 44: *Use of resources for the system Acriflex Pro.*

Results per Declared Unit – 1,00 kg					
Indicator	**Unit**	**A1**	**A2**	**A3**	**Total**
Use of Renewable primary energy resources - No raw materials	MJ	0,835	$1,24*10^{-2}$	0,64	1,49
Use of Renewable primary energy resources - Raw materials	MJ	0,329	$2,27*10^{-3}$	0,455	0,79
Total use of Renewable primary energy	**MJ**	0,16	$1,47*10^{-2}$	1,10	2,27
Use of non-Renewable primary energy resources - No raw materials	MJ	26,33	1,06	4,28	31,67
Use of non-Renewable primary energy resources - Raw materials	MJ	$1,28*10^{-6}$	0	$1,71*10^{-3}$	$1,71*10^{-3}$
Total use of non-Renewable primary energy	**MJ**	26,33	1,06	4,28	31,67
Use of secondary materials	kg	0	0	0	0
Use of Renewable secondary fuels	MJ	0,835	$1,24*10^{-2}$	0,64	1,49
Use of Non-Renewable secondary fuels	MJ	$8,78*10^{-4}$	$4,13*10^{-5}$	$2,35*10^{-4}$	$1,16*10^{-3}$
Use of net fresh water	m^3	$1,14*10^{-2}$	$1,03*10^{-4}$	$1,57*10^{-3}$	$1,31*10^{-2}$

Additional Impact Indicators

***Table 45**: Additional indicators for the system Acriflex Rapido.*

Results per Declared Unit – 1,00 kg					
Indicator	**Unit**	**A1**	**A2**	**A3**	**Total**
Particulate matter emission	kg PM2.5 eq.	$6{,}15 \cdot 10^{-4}$	$2{,}39 \cdot 10^{-5}$	$9{,}00 \cdot 10^{-5}$	$7{,}29 \cdot 10^{-4}$
Ionizing radiation, human health (*)	kBq U235 eq.	$7{,}08 \cdot 10^{-2}$	$4{,}02 \cdot 10^{-3}$	$1{,}15 \cdot 10^{-2}$	$8{,}63 \cdot 10^{-2}$
Eco-toxicity (freshwater) (**)	CTUe	8,97	0,382	1,60	11,00
Human Toxicity, carcinogenic effects (**)	CTUh	$5{,}44 \cdot 10^{-8}$	$2{,}79 \cdot 10^{-9}$	$2{,}37 \cdot 10^{-9}$	$5{,}96 \cdot 10^{-8}$
Human Toxicity, non-carcinogenic effects (**)	CTUh	$1{,}66 \cdot 10^{-7}$	$1{,}12 \cdot 10^{-8}$	$2{,}65 \cdot 10^{-8}$	$2{,}04 \cdot 10^{-7}$
Land Use (**)	kg C Deficit	1,06	0,216	0,328	1,60

***Table 46**: Additional indicators for the system Acriflex X-Pro.*

Results per Declared Unit – 1,00 kg					
Indicator	**Unit**	**A1**	**A2**	**A3**	**Total**
Particulate matter emission	kg PM2.5 eq.	$5{,}97 \cdot 10^{-4}$	$2{,}27 \cdot 10^{-5}$	$9{,}00 \cdot 10^{-5}$	$7{,}10 \cdot 10^{-4}$
Ionizing radiation, human health (*)	kBq U235 eq.	$6{,}94 \cdot 10^{-2}$	$3{,}80 \cdot 10^{-3}$	$1{,}16 \cdot 10^{-2}$	$8{,}48 \cdot 10^{-2}$
Eco-toxicity (freshwater) (**)	CTUe	8,69	0,362	1,60	10,70
Human Toxicity, carcinogenic effects (**)	CTUh	$5{,}36 \cdot 10^{-8}$	$2{,}63 \cdot 10^{-9}$	$2{,}37 \cdot 10^{-9}$	$5{,}86 \cdot 10^{-8}$
Human Toxicity, non-carcinogenic effects (**)	CTUh	$1{,}62 \cdot 10^{-7}$	$1{,}06 \cdot 10^{-8}$	$2{,}65 \cdot 10^{-8}$	$1{,}99 \cdot 10^{-7}$
Land Use (**)	kg C Deficit	1,03	0,205	0,331	1,57

***Table 47**: Additional indicators for the system Oriplast Reflex.*

Results per Declared Unit – 1,00 kg					
Indicator	**Unit**	**A1**	**A2**	**A3**	**Total**
Particulate matter emission	kg PM2.5 eq.	$7{,}60 \cdot 10^{-4}$	$2{,}31 \cdot 10^{-5}$	$8{,}98 \cdot 10^{-5}$	$8{,}73 \cdot 10^{-4}$
Ionizing radiation, human health (*)	kBq U235 eq.	$9{,}35 \cdot 10^{-2}$	$3{,}87 \cdot 10^{-3}$	$1{,}15 \cdot 10^{-2}$	0,109
Eco-toxicity (freshwater) (**)	CTUe	12,30	0,368	1,60	14,30
Human Toxicity, carcinogenic effects (**)	CTUh	$8{,}37 \cdot 10^{-8}$	$2{,}69 \cdot 10^{-9}$	$2{,}37 \cdot 10^{-9}$	$8{,}88 \cdot 10^{-8}$
Human Toxicity, non-carcinogenic effects (**)	CTUh	$2{,}21 \cdot 10^{-7}$	$1{,}08 \cdot 10^{-8}$	$2{,}65 \cdot 10^{-8}$	$2{,}58 \cdot 10^{-7}$
Land Use (**)	kg C Deficit	1,45	0,208	0,329	1,99

***Table 48**: Additional indicators for the system O.R.A. Eco Anti-rain.*

Results per Declared Unit – 1,00 kg					
Indicator	**Unit**	**A1**	**A2**	**A3**	**Total**
Particulate matter emission	kg PM2.5 eq.	$5{,}36 \cdot 10^{-4}$	$1{,}27 \cdot 10^{-5}$	$2{,}36 \cdot 10^{-4}$	$7{,}85 \cdot 10^{-4}$
Ionizing radiation, human health (*)	kBq U235 eq.	$5{,}97 \cdot 10^{-2}$	$2{,}04 \cdot 10^{-3}$	$3{,}09 \cdot 10^{-2}$	$9{,}26 \cdot 10^{-2}$
Eco-toxicity (freshwater) (**)	CTUe	7,46	0,191	5,00	12,70
Human Toxicity, carcinogenic effects (**)	CTUh	$4{,}95 \cdot 10^{-8}$	$1{,}35 \cdot 10^{-9}$	$9{,}59 \cdot 10^{-8}$	$1{,}47 \cdot 10^{-7}$
Human Toxicity, non-carcinogenic effects (**)	CTUh	$1{,}42 \cdot 10^{-7}$	$7{,}59 \cdot 10^{-9}$	$7{,}57 \cdot 10^{-8}$	$2{,}23 \cdot 10^{-7}$
Land Use (**)	kg C Deficit	0,676	0,118	1,03	1,82

***Table 49**: Additional indicators for the system Ultrabit.*

Results per Declared Unit – 1,00 kg					
Indicator	**Unit**	**A1**	**A2**	**A3**	**Total**
Particulate matter emission	kg PM2.5 eq.	$5{,}43 \cdot 10^{-4}$	$2{,}56 \cdot 10^{-5}$	$1{,}18 \cdot 10^{-4}$	$6{,}87 \cdot 10^{-4}$
Ionizing radiation, human health (*)	kBq U235 eq.	$7{,}52 \cdot 10^{-2}$	$4{,}39 \cdot 10^{-3}$	$1{,}59 \cdot 10^{-2}$	$9{,}551 \cdot 10^{-2}$
Eco-toxicity (freshwater) (**)	CTUe	8,20	0,421	1,74	10,40
Human Toxicity, carcinogenic effects (**)	CTUh	$4{,}94 \cdot 10^{-8}$	$3{,}10 \cdot 10^{-9}$	$1{,}38 \cdot 10^{-8}$	$6{,}63 \cdot 10^{-8}$
Human Toxicity, non-carcinogenic effects (**)	CTUh	$1{,}50 \cdot 10^{-7}$	$1{,}22 \cdot 10^{-8}$	$3{,}32 \cdot 10^{-8}$	$1{,}95 \cdot 10^{-7}$
Land Use (**)	kg C Deficit	1,33	0,229	0,464	2,02

__Table 50__: Additional indicators for the system Ultragum.

Results per Declared Unit – 1,00 kg					
Indicator	**Unit**	**A1**	**A2**	**A3**	**Total**
Particulate matter emission	kg PM2.5 eq.	$4,96*10^{-4}$	$2,50*10^{-5}$	$9,01*10^{-5}$	$6,11*10^{-4}$
Ionizing radiation, human health (*)	kBq U235 eq.	$6,51*10^{-2}$	$4,17*10^{-3}$	$1,16*10^{-2}$	$8,09*10^{-2}$
Eco-toxicity (freshwater) (**)	CTUe	7,44	0,41	1,59	9,44
Human Toxicity, carcinogenic effects (**)	CTUh	$4,85*10^{-8}$	$3,00*10^{-9}$	$2,37*10^{-8}$	$7,52*10^{-8}$
Human Toxicity, non-carcinogenic effects (**)	CTUh	$1,78*10^{-7}$	$1,18*10^{-8}$	$2,65*10^{-8}$	$2,16*10^{-7}$
Land Use (**)	kg C Deficit	1,86	0,22	0,327	1,31

__Table 51__: Additional indicators for the system BKK Eco.

Results per Declared Unit – 1,00 kg					
Indicator	**Unit**	**A1**	**A2**	**A3**	**Total**
Particulate matter emission	kg PM2.5 eq.	$2,08*10^{-3}$	$2,35*10^{-5}$	$2,45*10^{-4}$	$2,35*10^{-3}$
Ionizing radiation, human health (*)	kBq U235 eq.	0,121	$3,64*10^{-3}$	$3,19*10^{-2}$	0,157
Eco-toxicity (freshwater) (**)	CTUe	14,10	0,335	5,16	19,60
Human Toxicity, carcinogenic effects (**)	CTUh	$1,02*10^{-7}$	$2,32*10^{-9}$	$1,00*10^{-7}$	$2,04*10^{-7}$
Human Toxicity, non-carcinogenic effects (**)	CTUh	$3,51*10^{-7}$	$1,04*10^{-8}$	$7,80*10^{-8}$	$4,39*10^{-7}$
Land Use (**)	kg C Deficit	1,92	0,221	0,983	3,12

__Table 52__: Additional indicators for the system WATstop.

Results per Declared Unit – 1,00 kg					
Indicator	**Unit**	**A1**	**A2**	**A3**	**Total**
Particulate matter emission	kg PM2.5 eq.	$1,27*10^{-3}$	$2,21*10^{-5}$	$2,73*10^{-4}$	$1,57*10^{-3}$
Ionizing radiation, human health (*)	kBq U235 eq.	0,113	$3,91*10^{-3}$	$3,51*10^{-2}$	0,152
Eco-toxicity (freshwater) (**)	CTUe	22,60	0,38	4,48	27,50
Human Toxicity, carcinogenic effects (**)	CTUh	$2,09*10^{-7}$	$2,88*10^{-9}$	$5,70*10^{-8}$	$2,69*10^{-7}$
Human Toxicity, non-carcinogenic effects (**)	CTUh	$3,53*10^{-7}$	$1,07*10^{-8}$	$7,78*10^{-8}$	$4,42*10^{-7}$
Land Use (**)	kg C Deficit	2,94	0,189	0,847	3,98

__Table 53__: Additional indicators for the system Acriflex Fybro.

Results per Declared Unit – 1,00 kg					
Indicator	**Unit**	**A1**	**A2**	**A3**	**Total**
Particulate matter emission	kg PM2.5 eq.	$4,51*10^{-4}$	$2,03*10^{-5}$	$9,21*10^{-5}$	$5,63*10^{-4}$
Ionizing radiation, human health (*)	kBq U235 eq.	$5,678*10^{-2}$	$3,31*10^{-3}$	$1,19*10^{-2}$	$7,19*10^{-2}$
Eco-toxicity (freshwater) (**)	CTUe	6,72	0,343	1,56	8,62
Human Toxicity, carcinogenic effects (**)	CTUh	$4,60*10^{-8}$	$2,61*10^{-9}$	$2,11*10^{-8}$	$6,97*10^{-8}$
Human Toxicity, non-carcinogenic effects (**)	CTUh	$1,38*10^{-7}$	$9,71*10^{-9}$	$2,66*10^{-8}$	$1,74*10^{-7}$
Land Use (**)	kg C Deficit	0,906	0,167	0,311	1,38

__Table 54__: Additional indicators for the system Acriflex Pro.

Results per Declared Unit – 1,00 kg					
Indicator	**Unit**	**A1**	**A2**	**A3**	**Total**
Particulate matter emission	kg PM2.5 eq.	$5,82*10^{-4}$	$2,98*10^{-5}$	$9,04*10^{-5}$	$7,02*10^{-4}$
Ionizing radiation, human health (*)	kBq U235 eq.	$6,74*10^{-2}$	$4,85*10^{-3}$	$1,16*10^{-2}$	$8,39*10^{-2}$
Eco-toxicity (freshwater) (**)	CTUe	8,48	0,504	1,59	10,60
Human Toxicity, carcinogenic effects (**)	CTUh	$5,16*10^{-8}$	$3,83*10^{-9}$	$2,38*10^{-8}$	$7,92*10^{-8}$
Human Toxicity, non-carcinogenic effects (**)	CTUh	$1,57*10^{-7}$	$1,43*10^{-8}$	$2,65*10^{-8}$	$1,98*10^{-7}$
Land Use (**)	kg C Deficit	1,01	0,245	0,338	1,59

(*) Disclaimer: 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.

(**) Disclaimer: 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 experience with the indicator.

Waste production and output flows

Waste production

***Table 55**: Flows in final products for the waterproofing systems.*

Results per Declared Unit – 1,00 kg											
Indicator	**Unit**	**Acriflex Rapido**	**Acriflex X-Pro**	**Acriflex Fybro**	**Acriflex Pro**	**Oriplast Reflex**	**O.R.A. Eco ANTRAIN**	**Ultrabit**	**Ultragum**	**BKK Eco**	**WATstop**
Non-Hazardous Waste disposed	Kg/DU	$1{,}91 \cdot 10^{-3}$	$4{,}07 \cdot 10^{-3}$	$1{,}85 \cdot 10^{-3}$	$1{,}61 \cdot 10^{-3}$	$2{,}28 \cdot 10^{-3}$	$1{,}81 \cdot 10^{-3}$	$8{,}78 \cdot 10^{-3}$	$1{,}64 \cdot 10^{-3}$	0	$7{,}74 \cdot 10^{-4}$
Radioactive Waste disposed	Kg/DU	$1{,}26 \cdot 10^{-5}$	$3{,}74 \cdot 10^{-5}$	$3{,}34 \cdot 10^{-5}$	$3{,}82 \cdot 10^{-5}$	$5{,}20 \cdot 10^{-5}$	$1{,}57 \cdot 10^{-5}$	$5{,}05 \cdot 10^{-5}$	$2{,}88 \cdot 10^{-4}$	$5{,}20 \cdot 10^{-5}$	$6{,}76 \cdot 10^{-5}$
Hazardous waste disposed	Kg/DU	0	0	0	0	0	0	0	0	0	0

Output flows

***Table 56:** Use of resources for the waterproofing systems.*

Results per Declared Unit – 1,00 kg											
Indicator	**Unit**	**Acriflex Rapido**	**Acriflex X-Pro**	**Acriflex Fybro**	**Acriflex Pro**	**Oriplast Reflex**	**O.R.A. Eco ANTRAIN**	**Ultrabit**	**Ultragum**	**BKK Eco**	**WATstop**
Component for Reuse	Kg/DU	0	0	0	0	0	0	0	0	0	0
Material for Energy recovery	Kg/DU	0	0	0	0	0	0	0	0	0	0
Material for Recycling	Kg/DU	0	0	0	0	0	0	0	0	0	0
Exported energy	kWh/DU	0	0	0	0	0	0	0	0	0	0

NOTE: It has to be specified that Diasen claimed: at the end of the service life of any product dealt with in this document, the products themselves can potentially recycled as inert materials;

Information on biogenic carbon content

***Table 57:** Biogenic carbon content for the Waterproofing products.*

Biogenic Carbon	**Unit**	**Acriflex Rapido**	**Acriflex X-Pro**	**Acriflex Fybro**	**Acriflex Pro**	**Oriplast Reflex**	**O.R.A. Eco ANTRAIN**	**Ultrabit**	**Ultragum**	**BKK Eco**	**WATstop**
Product	Kg C	0	$1{,}11 \cdot 10^{-2}$	0	0	0	0	0	0	0	0
Packaging	Kg C	$6{,}69 \cdot 10^{-2}$	$6{,}36 \cdot 10^{-2}$	$4{,}82 \cdot 10^{-2}$	$7{,}01 \cdot 10^{-2}$	$6{,}51 \cdot 10^{-2}$	0,153	$7{,}70 \cdot 10^{-2}$	$8{,}22 \cdot 10^{-2}$	0,151	$7{,}01 \cdot 10^{-2}$
NOTA: 1 kg of biogenic carbon is equal to a 44/12 of a single kg of CO_2											

Additional information

- The company Diasen is certificated ISO 9001, ISO 14001. Moreover, a wide amount of its product obtained other specific certification, as Avis Technique (French lab CSTB) and ITF for Sport Flooring system. It is associated to A.N.I.T (*Associazione Nazionale Isolamento Termo-Acustico*), to the Green Building Council Italia and N.R.C.A - National Roofing Contractors Association.

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