ENVIRONMENTAL PRODUCT DECLARATION

In accordance with ISO 14025:2016 and PCR 2012:14 version 3.01 for:

1 product unit of

Natracare regular ultra pad with wings

with packaging

Bodywise (UK) Ltd

Programme	The International EPD® System www.environdec.com
Programme Operator	EPD International AB
EPD Registration Number	S-P-00135
Publication Date	2008-04-14
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An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com

PROGRAMME INFORMATION

PROGRAMME OPERATOR

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The EPD owner, Bodywise (UK) Ltd, has the sole ownership, liability, and responsibility for the EPD.

DECLARATION HOLDER

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PROGRAMME DETAILS

PCR 2011:14 version 3.01 was used as the basic PCR.	
Product category rules (PCR):	PCR 2011:14 Absorbent Hygiene Products version 3.01, UN CPC code 32193: Napkins for babies, tampons and similar household, sanitary or hospital articles
PCR review was conducted by:	Technical Committee of the International EPD® System. Chair: Maurizio Fieschi. Email: info@environdec.com
Independent third-party verification of the declaration and data, according to ISO 14025:2006:	
☐ EPD process certification (internal)	☒ EPD verification (external)
Third Party verifier:	Prof Ing Adriana Del Borghi TETIS Institute S.r.l., Via Gropallo, 4/19 16122 Genova, Italy

Approved by: The International EPD® System Technical Committee, supported by the Secretariat
Procedure for follow-up of data during EPD validity involves third party verifier:
☐ Yes ☒ No

GENERAL INFORMATION

COMPANY INFORMATION

Natracare was created in 1989 by Susie Hewson, to develop a range of 100% cotton tampons and totally chloride-fee pads and panty liners. The full range of sanitary pads and panty liners are made from totally chlorine free, natural and sustainable materials. The range includes organic cotton tampons, wipes and natural pads, dry & light incontinence pads, new mother maternity and nursing pads and a range of organic baby toiletries such as shampoo and massage oil. The Natracare 'regular ultra pad with wings' product has had an EPD since 2008 and now with the release of a new version of the PCR (3.01) an updated EPD has been produced. All Natracare products are certified as organic textiles by the Soil Association organic standards. The production of the totally chlorine free (TCF) pulp is managed using sustainable forests certified by the Finish forest certification council and also conforms to the international environmental management system standard.

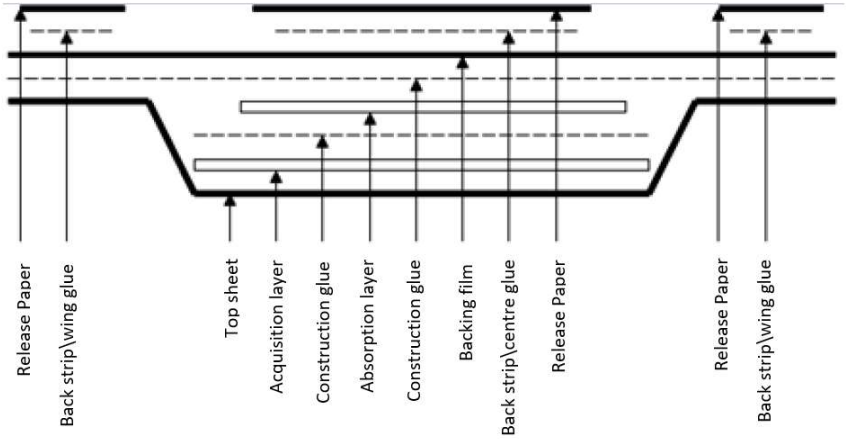
Natracare are the first to use biodegradable bioplastics that are made from starch and hypoallergenic natural absorbents, to replace commonly used, petroleum-derived synthetic materials. The bioplastics used conforms to compostable materials standards and is also certified for the 'ok compost' conformity mark.

PRODUCT INFORMATION

The Natracare regular ultra pad with wings is a feminine hygiene product which is not chlorine bleached and is free of rayon, plastics and other similar synthetic materials. The regular ultra pad differs from others in the product range as it narrows towards the middle of the pad and contains wings for added protection. Each pad consists of a cotton top sheet, an acquisition and absorption layer made from TCF pulp and tissue, and a biofilm backing film. Glue us used to hold the pad together and attach the release paper. Individual pads are contained within a biofilm/tissue pouch. They are sold in packs of 14. The primary pack is a cardboard carton, made from recycled card held together with a small amount of glue. For shipping purposes these cartons are contained in tertiary packaging consisting of larger transit cartons, shrink film and tape. The construction and material composition of the pad is shown in the diagram below and table overleaf. The weight provided in the table is based on the amount of material per pad. Therefore, the weight of the packaging shown is 1/14 of the actual packaging weight.

Product image: Carton of 14 Natracare regular natural ultra pads with wings

The construction of a Natracare regular ultra pad with wings



PRODUCT SYSTEM COMPONENTS

Product system components for 1 Natracare regular natural ultra pads with wings

Component	Production Site	Material	Function
Top sheet	India	Organic cotton	Maintains dry skin and user comfort
Acquisition and absorption layer	Germany	TCF pulp and TCF tissue	Transports, absorbs and stores liquid
Glue	Sweden	Polymer blend	Joins components, enables fastening of product to clothing
Backing film	Estonia	Starch biofilm	Prevents leakage
Release paper	Spain	TCF kraft paper	Prevents wing glue from sticking to materials / objects prior to pad use
			Pad total weight 4.952 g
Pouch	Sweden	TCF tissue paper, starch biofilm	Individually wraps each pad
Consumer Packaging	Sweden	Recycled card	Contains and protects
Transit Carton	Sweden	Recycled card	Contains for transport
Transit Stretchfilm	Sweden	Polyethylene	Contains for transport
Transit Tape	Sweden	Polypropylene	Contains for transport
Glue	Sweden	Polymer blend	Joins seams of primary carton
Corners	Sweden	Cellulose	Stabilizing
			Packaging total weight 3.666 g
			Total Pad and Packaging system weight 8.618 g

(Note: SI English notation is used for the decimal separator, with the point denoting the decimal place)

The Natracare regular ultra pad with wings is produced and packed in Sweden. It is sold worldwide. The materials and weights have only minor changes from those reported in the previous EPD (2015).

The materials and substances listed above do not contain substances hazardous to health and / or the environment and therefore are not present in such concentrations in the product and raw materials that they must be labelled on the product according to the Substances and Preparations Directive[1] [2].

Materials used in Natracare regular natural ultra pads with wings

Ingredient	Derived from	Classification
Organic cotton	Non-woven top sheet	N/A
Cellulose fibres	TCF pulp, TCF tissue, TCF kraft paper, card	N/A
Corn starch	Master-Bi biofilm, pouch	N/A
Styrene copolymer, acrylic polymer, mineral oil	Glues	N/A

[1] Council Directive 76/769/EEC of 27 July 1976 on the approximation of the laws, regulations and administrative provisions of the Member States relating to restrictions on the marketing and use of certain dangerous substances and preparations and subsequent amendments.
[2] European legislation. Other legal documents may be valid in other regions of the world.

LCA INFORMATION

GOAL OF STUDY

The goal of this study was to generate an environmental profile for Natracare regular natural ultra pads with wings to better understand the associated lifecycle environmental impacts and to allow a Type III EPD to be generated and made public via the International EPD® System. The following product system was investigated:

- Natracare regular natural ultra pads with wings and associated packaging manufactured in Sweden.

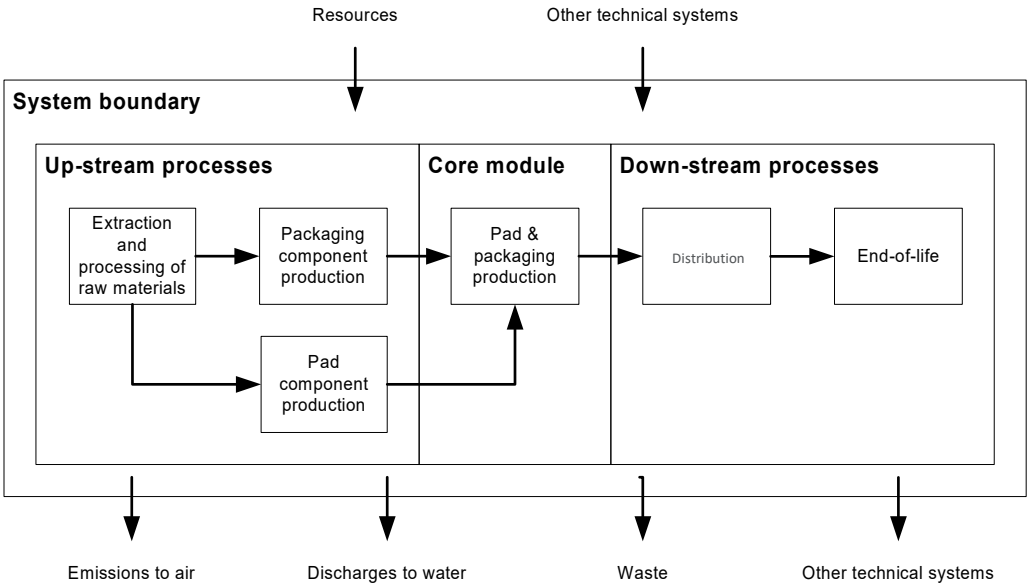
FUNCTIONAL UNIT

The functional unit for this EPD is 1 pad (including associated packaging). This is 1 Natracare regular natural ultra pad with wings, with a proportion of primary packaging and transit packaging. Since Natracare regular ultra pads are delivered to the consumer in packs of 14, the packaging contained within the functional unit represents 1/14 of a Natracare regular ultra box, plus the fraction of transit packaging associated with 1 pad.

Following PCR 2011:14 version 3.01, reference service life is not applicable for this product category.

SYSTEM BOUNDARY

The processes included in the EPD are shown in the figure below.



This includes the transportation of materials from the component suppliers to the manufacturing facility, to the consumer and to the waste management site but excludes the transportation of raw materials to the suppliers.

For the downstream phase, transport of the product to the consumer has been included. Due to a number of markets in various countries and the variation in transport distances, the transportation of one Natracare regular natural pad with wings to the consumer has been estimated to be 1000 km. This distance is representative of distanced to markets in Northern and central Europe as well as the UK.

It is assumed that the product will not be recycled or composted but will be incinerated with energy recovery or landfill. It is also assumed that the treatment of the packaging will involve some recycling. Transportation to the landfill, recycling or incineration sites has been included. This transport is assumed to be 100 km by a 21 tonne municipal waste lorry. The waste management scenario used in this study is based on the assumptions above and on UK waste statistics data from the Department for Environment, Food & Rural Affairs (DEFRA) for the most recent time period (2016), which are shown in the table below. Note that based on the assumption that the pad will not be recycled, the landfill and incineration percentages have been scaled accordingly and are shown as the unbracketed percentages in the table below.

DEFRA waste management statistics for household and packaging waste for UK (2016)

Waste Treatment	Pad	Packaging
Landfill	35% (34%)	0.05%
Incineration	65% (62.5%)	0.5%
Recycling / composting	0% (3%)	99.45%

EXCLUSIONS

The follow exclusions from the scope of the study were made:

- The construction of factory buildings and infrastructure
- Production of manufacturing equipment
- Recycled materials and material recycling
- Energy generation from Incineration
- Packaging for raw materials
- Pallets
- Personnel activities

DATA SOURCES AND QUALITY

Quantitative and qualitative data were collected for all processes within the system boundary and these data were used to compile the LCI. Specific data were sought as a preference, however, they could not be collected for upstream and downstream lifecycle stages. Specific data for all core processes were collected from Bodywise from their site in Kronosept, Sweden and represent production from the year 2019. Selected generic data were collected for the upstream and downstream lifecycle stages from the LCI database ecoinvent v3.5 (cut-off).

The LCA software SimaPro (version 9.1) was used to build a model for the product systems under investigation using specific and generic inventory data. In addition, SimaPro was used to apply characterisation models and factors from the impact assessment methods to generate results.

The table below provides details on the parameters for describing environmental impacts that were considered in this study, including the life cycle impact assessment (LCIA) method used. Characterisation models and factors from these LCIA methods were used unaltered and as provided in this LCA. In addition, environmental information describing resource use, waste and other output flows were also derived from LCI data and are presented in this EPD alongside parameters for describing environmental impacts.

Impact category	Explanation	Parameter and unit	LCIA method
Global warming [presented separately as a) fossil, b) biogenic, c) land use and land transformation, d) total]	Global warming is a long-term rise in the average temperature. Climate change is a change in global or regional climate patterns, a change apparent from the mid- to late-20th century onwards and attributed largely to the increased levels of atmospheric carbon dioxide produced using fossil fuels. a) "Fossil" refers to greenhouse gas emissions associated with carbon derived from a fossil source (e.g. crude oil) b) "Biogenic" refers to greenhouse gas emissions associated with carbon derived from a biogenic source (e.g. wood) c) "Land use and land transformation" refers to greenhouse gas emissions associated with a (positive or negative) change in carbon stock during to the occupation of transformation of land (e.g. transformation from forest to arable land) d) "Total" is the sum of a-c	Global warming potential (GWP), kg CO_2 equiv., 100 years	CML-IA baseline v4.1 / EU25
Acidification	Acidification potential refers to processes that can increase the hydrogen ion concentration ([H+]) in aquatic and soil systems, such as atmospheric deposition of sulphur, nitrogen and phosphorous compounds. Any change from the natural pH can have detrimental effects on plant and aquatic life.	Acidification potential (AP), kg SO_2 equiv.	CML-IA baseline v4.1 / EU25
Eutrophication	Eutrophication is an excessive richness of nutrients in a lake or other body of water, which causes a dense growth of plant life and results in oxygen depletion. This nutrient pollution is typically generated in aquatic environments from phosphorous or nitrogen compounds through discharges from sewage	Eutrophication potential (EP), kg $(PO_4)^{3-}$equiv.	CML-IA baseline v4.1 / EU25

Impact category	Explanation	Parameter and unit	LCIA method
	treatment works or pulp and paper mills and storm water run-off of fertilisers or manure.		
Formation of tropospheric ozone	Ozone formation (or photochemical oxidant formation, or smog) is a product of reactions that take place between NOx and volatile organic compounds (VOCs) in the presence of UV radiation. Low-level O_3 is a key photochemical oxidant of concern as it is toxic to humans. Ozone formation is a measure of the adverse effects from the formation of low-level ozone and other photo-oxidants. Models are used to calculate photochemical oxidation, and they are based on the mass of each released substance and the photochemical ozone creation potential (POCP) of the substance. This is a measure of how likely it is that the substance will contribute towards smog formation and are calculated from the change in ozone concentration in a set volume of air with the introduction of the emission of a substance relative to the change in emission of ethylene.	Formation potential of tropospheric ozone (POFP), kg NMVOC equiv.	ReCiPe 2008
Depletion of abiotic resources – elements	This impact category indicator is related to the extraction of virgin abiotic material e.g. extraction of aggregates, metal ores, minerals, earth etc. The extraction of such substances can mean that the natural carrying capacity of the earth is exceeded and make them unavailable for use by future generations. The category addresses the scarcity of the element.	Abiotic depletion potential for non-fossil resources (ADP-elements), kg Sb equiv.	CML-IA baseline v4.1 / EU25
Depletion of abiotic resources – Fossil fuels	This impact category indicator is related to the use of fossil fuels. Fossil fuels provide a valuable source of energy and feedstock for materials such as plastics. Although there are alternatives, these are only able to replace a small proportion of our current use. Fossil fuels are a finite resource and their continued consumption will make them unavailable for use by future generations.	Abiotic depletion potential for fossil resources (ADP-fossil fuels), MJ, net calorific value	CML-IA baseline v4.1 / EU25
Water scarcity	The impact category indicator is related to the extraction of water resources that	Water scarcity footprint (WSF), m^3 equiv.	Boulay et al. 2017

Impact category	Explanation	Parameter and unit	LCIA method
	are not returned subsequently to the same catchment area.		

ALLOCATION

For cases where there is more than one product in the system being studied, PCR 2011:14 version 3.01 prescribes the following procedure for the allocation of material and energy flows and environmental emissions.

- In the first instance, allocation should be avoided, by process sub-division.
- Where these methods are not applicable, the ISO 14040/44 requires that allocation reflects the physical relationships of the different products or functions. Allocation based on physical relationships such as mass or energy is a practical interpretation of this and is an approach often used in LCA.
- For some processes, allocation based on mass is not considered appropriate and, in these cases, the inputs should be allocated between the products and functions in a way that reflects other relationships between them (such as economic allocation).

In this study, allocation procedures for multi-product processes followed the ISO approach above. In terms of generic data, the main database used, ecoinvent v3.5 (cut-off), defaults to an economic allocation for most processes. However, in some cases a mass-based allocation is used, where there is a direct physical relationship. The allocation approach of specific ecoinvent modules is documented on their website and method reports (see www.ecoinvent.org).

In this study a “cut-off” method (aka recycled content or 100:0 approach) was applied to all cases of end-of-life allocation, including in the case of generic data, where the ecoinvent v3.5 with a cut-off by classification end-of-life allocation method was used. In this approach, environmental burdens and benefits of recycled / reused materials are given to the product system consuming them, rather than the system providing them and are quantified based on recycling content of the material under investigation. This is a common approach in LCA for materials where there is a loss in inherent properties during recycling, the supply of recycled material exceeds demand and recycled content of the product is independent of whether it is recycled downstream. It is in compliance with the ISO standards on LCA and is prescribed in PCR 2011:14 version 3.01.

CUT-OFF CRITERIA

In the process of building an LCI it is typical to exclude items considered to have a negligible contribution to results. In order to do this in a consistent and robust manner there must be confidence that the exclusion is fair and reasonable. To this end, cut-off criteria were defined in this study, which allow items to be neglected if they meet the criteria. In accordance with PCR 2011:14 version 3.01, exclusions could be made if they were expected to be within the below criteria:

- Environmental significance: if a flow is anticipated to be less than 1% of the declared environmental impact categories it may be excluded.

COMPARABILITY

Note that EPDs within the same product category but from different programmes may not be comparable. In addition, EPDs of plastic products may not be comparable if they do not comply with PCR 2011:14 version 3.01, even if they comply with earlier versions of PCR 2011:14.

DIFFERENCES VERSUS PREVIOUS VERSIONS

The construction of the pad is almost the same as report in the previously published EPD (EPD 135, version 7.1), but with several minor improvements (i.e. slight variation in the weight of the absorption layer, release paper , etc) which has resulted in a reduction of the product weight per pad from 5.565 grams to 4.952 grams. The supplier for the non-woven top sheet layer has also changed.

In regard to the packaging, due to minor alterations, the overall weight per pad has increased from 3.448 grams to 3.666 grams.

Looking at the downstream phase, the transportation of the Natracare regular ultra pas with wings to the consumer have been re-estimated from 1500km to 1000km. The transportation mode has been kept the same.

The waste management scenario used in this study is based on the UK waste statistics data from the Department for Environment, Food & Rural Affairs (DEFRA) for the most recently available time period (2016). Previously it was based on average European Union (EU-15) municipal waste management figures from 2008

ENVIRONMENTAL PERFORMANCE

The environmental performance of the assessed product is declared and reported using the parameters as specified in PCR 2011:14 version 3.01. These LCIA results and other environmental results are presented in the table below per declared unit to three significant figures, and broken down into upstream, core and downstream lifecycle stages.

Parameter	Unit	Upstream	Core	Downstream	Total
Parameters describing environmental impacts					
Global warming potential (GWP) – fossil	kg CO_2 equiv.	0.0193	0.0032	0.0033	0.0259
Global warming potential (GWP) - biogenic	kg CO_2 equiv.	8.52E-05	3.14E-06	1.00E-03	0.00109
Global warming potential (GWP) – land use and land transformation	kg CO_2 equiv.	$2.25*10^{-4}$	$1.33*10^{-5}$	$4.81*10^{-7}$	$2.38*10^{-4}$
Global warming potential (GWP) - total	kg CO_2 equiv.	0.0197	0.00323	0.00430	0.0272
Acidification potential (AP)	kg SO_2 equiv.	$8.77*10^{-5}$	$7.82*10^{-6}$	$5.91*10^{-6}$	$1.01*10^{-4}$
Eutrophication potential (EP)	kg $(PO_4)_3$-equiv.	$3.80*10^{-5}$	$2.57*10^{-6}$	$6.56*10^{-6}$	$4.71*10^{-5}$
Formation potential of tropospheric ozone (POFP)	kg NMVOC equiv.	$5.99*10^{-5}$	$9.61*10^{-6}$	$7.95*10^{-6}$	$7.75*10^{-5}$
Abiotic depletion potential – elements (ADPE)	kg Sb equiv.	$4.20*10^{-8}$	$6.90*10^{-9}$	$4.81*10^{-9}$	$5.37*10^{-8}$
Abiotic depletion potential – fossil (ADPF)	MJ, net calorific	0.276	0.0331	0.0250	0.334
Water scarcity footprint (WSF)	m^3 equiv.	0.0433	$5.32*10^{-4}$	$3.11*10^{-4}$	0.0441
Parameters describing use of resources					
Use of renewable primary energy resources – use as energy carrier	MJ, net calorific value	0.218	0.0102	$3.33*10^{-4}$	0.229
Use of renewable primary energy resources – use as raw materials	MJ, net calorific value	0.102	0.00129	$6.38*10^{-5}$	0.104
Use of renewable primary energy resources – total	MJ, net calorific value	0.320	0.0115	$3.971*10^{-4}$	0.332
Use of non-renewable primary energy resources – use as energy carrier	MJ, net calorific value	0.384	0.0546	0.0252	0.464
Use of non-renewable primary energy resources – use as raw materials	MJ, net calorific value	0	0	0	0

Parameter	Unit	Upstream	Core	Downstream	Total
Use of non-renewable primary energy resources – total	MJ, net calorific value	0.384	0.0546	0.0252	0.464
Use of secondary material	kg	0	0	0	0
Use of renewable secondary fuels	MJ, net calorific value	0	0	0	0
Use of non-renewable secondary fuels	MJ, net calorific value	0	0	0	0
Net use of fresh water	m^3	0.00121	$3.05*10^{-5}$	$8.12*10^{-6}$	0.00125
Parameters describing waste production					
Hazardous waste disposed	kg	$1.83*10^{-6}$	$5.91*10^{-7}$	$1.89*10^{-7}$	$2.61*10^{-6}$
Non-hazardous waste disposed	kg	0.00188	0.00207	0.00374	0.00770
Radioactive waste disposed	kg	$1.40*10^{-6}$	$5.61*10^{-7}$	$1.69*10^{-7}$	$2.13*10^{-6}$
Parameters describing outputs flows					
Components for reuse	kg	0	0	0	0
Material for recycling	kg	0	0	$3.80*10^{-3}$	$3.80*10^{-3}$
Materials for energy recovery	kg	0	0	0	0
Export energy, electricity	MJ	0	0	0	0
Export energy, thermal	MJ	0	0	0	0

Note that the LCIA results are relative expressions and do not predict impacts on category end-points, the exceeding of thresholds, safety margins or risks.

The changes in results since the last LCA and EPD are relatively small. Where changes have occurred, they are due to new data (generally showing small continuous improvements in environmental performance) and updated generic data (from Ecoinvent 3.1 to Ecoinvent 3.5). Additionally, due to the updated PCR, the characterisation factors used to derive the environmental impact indicator result have been revised since the last EPD version.

OTHER ENVIRONMENTAL INFORMATION

The Natracare regular ultra pad with wings is certified as organic textiles by the Soil Association organic standards (licence number X303).

The production of the totally chloride free (TCF) pulp is managed using sustainable forests certified by the Finnish forest certification council (certificate number 2343-01) and also confirms to the international environmental management system standard, ISO14011:2004 (certificate number 2000-HEL-AE-129).

The bioplastic used conforms to DIN EN 13432:2000-12 certification scheme for products made from compostable materials (registration number 7P0051). It is also certified for the 'ok compost' conformity mark (No O 06-096-A) and complies with the America society for testing and materials standards ASTM D6400 "standard specifications for compostable plastics".

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