

Environmental Product Declaration



In accordance with ISO 14025 and EN 15804+A1

EgoBalance® Sustainable Yarns

Beaulieu Yarns

Programme	The International EPD® System	www.environdec.com
Programme operator	EPD International AB	
EPD registration number	S-P-01372	
Publication date	2018-08-23	
Validity date	2023-08-05	

EgoBalance®
Sustainable Yarn



General information

Beaulieu Yarns

Beaulieu Yarns is an independent entity within the Belgian family-owned business Beaulieu International Group and part of its Engineered Products Business Unit. It is a leading manufacturer of polyamide (PA) and polypropylene (PP) yarns for contract, automotive, and residential applications. Its products are supplied in the form of bulk continuous filament (BCF) and ennobled yarn (twist, heatset and frisé).



Beaulieu Yarns distinguishes itself with an entrepreneurial yet simultaneously warm-hearted partnership approach, inspired by an open, SME culture, to create a wide range of high-quality yarns and related services that are often developed in close collaboration with customers and always with due respect to man and nature. Beaulieu Yarns has two production sites in Europe – one in Belgium (Site Berry Yarns), one in France (Site Ideal Fibres & Fabrics Comines) – and one production site in China.

Member of Beaulieu International Group

Beaulieu International Group (B.I.G.) is a renowned international group with a strong position in the raw materials and semi-finished products market. Our solutions also include a wide range of finished floor coverings. Beaulieu International Group currently has 4553 employees in 25 plants, 14 sales offices and distribution centres spread across 14 countries. In 2017, the Beaulieu International Group's turnover was €1.8 billion.

Beaulieu International Group is composed of three business units: "Polymers" produces polypropylene granules for numerous applications. "Engineered Products" houses the activities Fibres, Yarns, Technical Textiles and Technical Sheets. "Flooring Solutions" is the European leader in wall-to-wall floor coverings, producing carpet, needle felt, cushion vinyl, LVT and wood. The Beaulieu International Group's entrepreneurial spirit and innovative ambitions make it a model of diversity and progress within the sector. These assets allow it to create sustainable added value for customers, employees, suppliers, shareholders, and for the society in which it operates.



From biomass to a better world

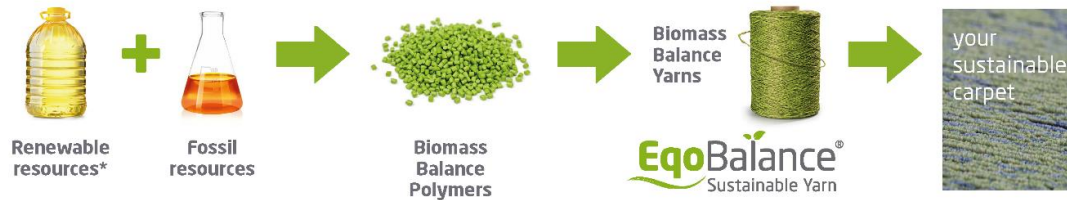


EgoBalance[®] PA6 yarns are produced using the biomass balance principle that is similar to green electricity. From the very start of the supply chain, natural renewable resources such as biogas or bio-naphtha are used along with fossil fuels to produce polymers that provide the basis for yarn production. The result is EgoBalance[®] yarns. 100% or only 25% of the fossil resources needed to manufacture EgoBalance[®] are verifiably replaced with renewable resources in the value chain.

By choosing EgoBalance[®], carpet manufacturers can contribute to a sustainable future through less use of fossil resources and reduced greenhouse gas emissions. Biomass balance is the fastest path forward and gives carpet manufacturers a fundamental new choice to step into sustainable products and contribute to a better world.



Biomass Balance model

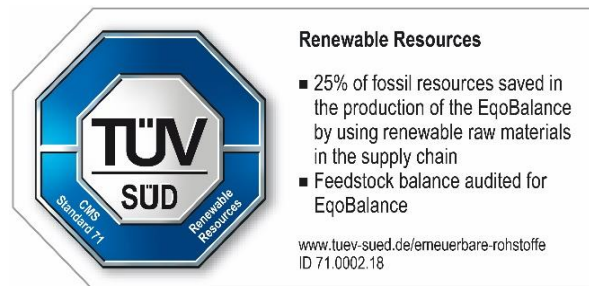
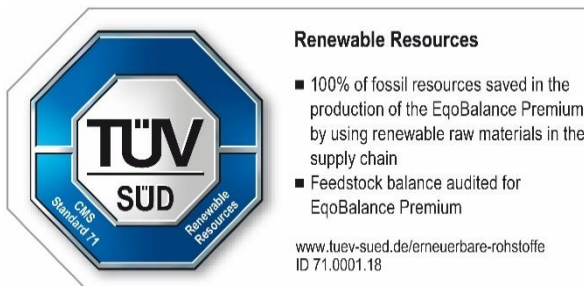


* **Certified bio-gas from waste:** Organic waste (Agricultural industry, Kitchen/Domestic, ...) + Manure

* **Certified bio-naphta:** Organic waste (Agricultural industry, Kitchen/Domestic, ...) + Animal waste fats from food industry + Waste, byproducts and residues from vegetable oil industry (Vegetable oil industry, Palm oil industry) + Vegetable oils (Rapeseed oil, Palm oil, Soybean oil, ...) + Forestry waste products

TÜV SÜD Certification of renewable resources

The sustainable yarns from Beaulieu Yarns conform the TÜV SÜD certification standard CMS 71 "Certification of the use of renewable resources", which confirms the saving in fossil resources. The potential to reduce greenhouse gas emissions as a result of the replacement of fossil use is calculated in a Life Cycle Assessment (LCA).



Product information

Product name

EgoBalance® Premium

EgoBalance®



Product Identification

Bulked Continuous Filament (BCF) PA6 yarn is used for the production of carpets for domestic, contract and automotive applications.

- EgoBalance® Premium yarn is made with mass balanced PA6. 100% of the fossil resources needed to manufacture EgoBalance® Premium are verifiably replaced with renewable resources in the value chain (TUV SÜD Certificate No. 71.001.18).
- EgoBalance® yarn is made with mass balanced PA6. 25% of the fossil resources needed to manufacture EgoBalance® are verifiably replaced with renewable resources in the value chain (TUV SÜD Certificate No. 71.002.18).

EgoBalance® is a product which saves fossil resources by using renewable raw materials in the supply chain. Certified sustainable biomass is used at the beginning of the production system and allocated to the biomass balanced PA6, which is subsequently used in the production of EgoBalance®. This shall not imply that the EgoBalance® products have physical biobased content. They shall not be named biobased according to CEN/TC 411: Biobased products definition. EgoBalance® as well as downstream products being produced from EgoBalance® yarn shall not be classified with attributes like “biobased” or “100% biomass origin” to avoid confusion with biobased products according to CEN/TC 411 definition of biobased products.

Product Specification

Technical data

Name	Value	Unit
Type of manufacture	Bulk Continuous Filament (BCF) yarn, solution dyed	-
Material	Polyamide 6	-
Yarncount¹	800 to 3600	dtex
Tenacity²	1 - 3,5	cN/dtex
Elongation at break²	25 - 75	%

¹ Internal testmethod

² Testmethod according to ISO 2062

Yarns

Content declaration

Material		Wt%
Polymer	Polyamide 6	91,25 - 94,25
	EcoBalance® Premium: 100% biomass balanced	
	EcoBalance®: 25% biomass balanced & 75% fossil	
Pigments/Additives	Several	0 - 2
Spinfinish	Lubricant, antistatic	≤1
Water	Commercial allowance according to BISFA	5,75

To the best of our knowledge, EcoBalance® Premium & EcoBalance® Yarns do not contain substances included in the Candidate List of Substances of Very High Concern for Authorisation issued by the European Chemicals Agency. Under normal storage and use conditions, these yarns can be handled with no particular precautions or special protective equipment.

EcoBalance® is produced on paper core, packaged in distribution packaging on pallets with cardboard to separate the layers, wrapped in PE film.

Geographical Scope

The products covered in this EPD are manufactured at the Site Berry Yarns in Belgium.

Beaulieu Yarns
Ideal Fibres & Fabrics Wielsbeke NV
Site Berry Yarns
Route des Ecluses 52-54
7780 Comines – Belgium

This production site is ISO 14001 certified.

This production site is certified to produce EcoBalance® Premium and EcoBalance® yarn (TUV SÜD Certificate No. 71.001.18 - 71.002.18).

Owner of the EPD

Beaulieu Yarns
Ideal Fibres & Fabrics Wielsbeke NV
Ooigemstraat 2b
8710 Wielsbeke – Belgium
Tel +32 (0)56 66 81 91
Fax +32 (0)56 67 43 00
info.ffw@bintg.com
www.beaulieuyarns.com

LCA information

Functional Unit / Declared Unit

1 kg EgoBalance® Premium BCF Carpet Yarn, packaged, with commercial weight add-on

1 kg EgoBalance® BCF Carpet Yarn, packaged, with commercial weight add-on

System boundaries

Type of EPD: cradle-to-gate

A1-A3 are reported as an aggregated number, and include production of the raw materials (biomass balanced PA6, fossil PA6, pigments and additives, ancillary materials), transport of the raw materials to the manufacturing site, energy supply and conversion of raw materials into carpet yarn, emissions in all A1-A3 stages, production and transport of packaging material to the production site, and water uptake. Because the EgoBalance® products are not part of a final building product, and hence not transported to a building site, module A4 is not declared.

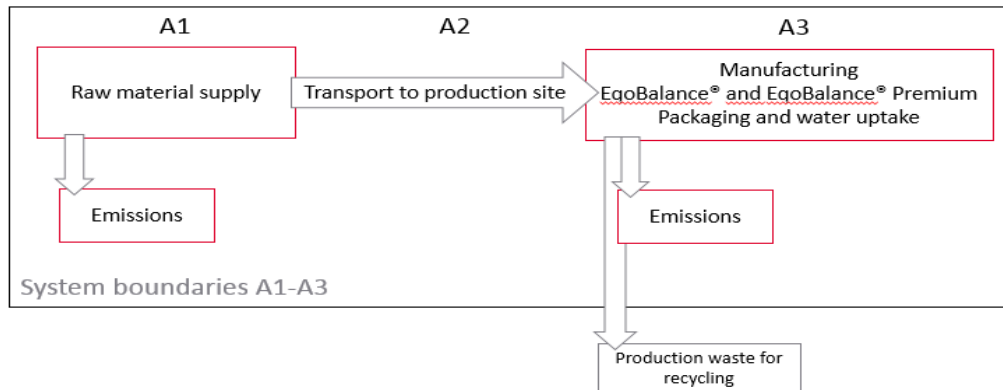
Production waste is going to be recycled and leaves the system boundaries without further processing.

Product stage			Construction process stage		Use stage							End of life stage				Benefits and loads beyond the systems boundaries
Raw material supply	Transport	Manufacturing	Transport from gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

X = Included in the LCA

MND = Module not declared

Yarns



Estimates, assumptions

For the spinnish and the amount of masterbatch and pigment in the yarn, an average is used. Since there is no LCA data available for most pigments, TiO_2 and carbon black were used as a substitute for inorganic and organic pigments. Since there is no LCA data available for spinnish, this LCI was modelled by combining LCI data of components of the product, using conservative assumptions. Due to unavailable LCI data for the water used, the alternative with the highest environmental impact was chosen. Data for masterbatch production is based on internal data and assumed to be valid for external suppliers as well. For primary energy, overall plant data was recorded and divided over the total production of PA6 and PP yarn produced in the plant. It was assumed that the production of PA6 and PP yarn requires the same amount of energy.

Above assumptions and estimates were made because of limitations in the available databases as well as to simplify. All assumptions are believed to have only a small impact on the environmental data.

Cut-off criteria

As little cut-off as possible is used in the foreground system. Some emissions and wastes contributing very little to the total (<0,1%) may have been left out of the model (e.g. emissions due to spinpack cleaning, certain wastes of scrap iron).

Taking into account the assumptions and cut-off described in the paragraphs above, it is assumed that the percentage of total environmental impact that might have been excluded does not exceed 1%.

Reference time period for data collection

All primary data of processes owned by Beaulieu International Group and its subsidiaries was collected in the year 2017.

Allocation

Food residues are used as secondary material in the supply chain of the biomass balanced polyamide. The environmental burdens associated with the production of food are allocated to the previous product system, according to the polluter pays allocation method. The EgoBalance® product system includes the recycling process for the food residues and the transportation from the recycling process to where the resulting biogas is used. The respective amounts of energy to produce PA6 and PP yarn are allocated from the annual total energy demand according to annual production volumes of both products.

Background data and method

LCA software GaBi ts was used to model the LCA. All the background data were retrieved from Gabi database – service pack 35. If an appropriate Gabi database was not found, the ecoinvent database was used instead. CML 2001, January 2016 assessment method is used for calculating impacts.

Comparability

A comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to EN 15804 and if the building context, respectively the product-specific characteristics of performance, are taken into account.

Environmental performance

Use of resources

Parameter	Unit	A1-A3 EqoBalance® Premium	A1-A3 EqoBalance®
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	[MJ]	1,34E+02	4,09E+01
Use of renewable primary energy resources used as raw materials	[MJ]	3,60E+01	8,99E+00
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	1,70E+02	4,99E+01
Use of non renewable primary energy excluding non renewable primary energy resources used as raw materials	[MJ]	6,69E+01	9,56E+01
Use of non renewable primary energy resources used as raw materials	[MJ]	0,00E+00	2,70E+01
Total use of non renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	6,69E+01	1,23E+02
Use of secondary material	[kg]	4,26E+01	1,07E+01
Use of renewable secondary fuels	[MJ]	0,00E+00	0,00E+00
Use of non renewable secondary fuels	[MJ]	0,00E+00	0,00E+00
Net fresh water consumption	[m³]	7,19E-02	6,92E-02

Potential environmental impact

Parameter	Unit	A1-A3 EqoBalance® Premium	A1-A3 EqoBalance®
Global Warming Potential (GWP 100 years)	[kg CO2 eq.]	1,98E+00	5,32E+00
Biogenic Carbon stored in products	[kg CO2 eq.]	2,45E+00	7,08E-01
Ozone Layer Depletion Potential (ODP, steady state)	[kg R11 eq.]	3,90E-08	1,51E-08
Acidification Potential (AP)	[kg SO2 eq.]	1,74E-02	1,34E-02
Eutrophication Potential (EP)	[kg Phosphate eq.]	9,45E-03	8,35E-03
Photochem. Ozone Creation Potential (POCP)	[kg Ethene eq.]	1,31E-03	2,79E-03
Abiotic Depletion (ADP elements)	[kg Sb eq.]	3,41E-06	2,03E-06
Abiotic Depletion (ADP fossil)	[MJ]	4,81E+01	1,07E+02



Waste production and output flows

Parameter	Unit	A1-A3 EqoBalance® Premium	A1-A3 EqoBalance®
Hazardous waste disposed	[kg]	1,13E-05	1,04E-05
Non-hazardous waste disposed	[kg]	3,50E-02	5,05E-02
Radioactive waste	[kg]	2,01E-04	1,58E-04

Interpretation

Use of resources

The use of biomass balance PA6 in EqoBalance® Premium and EqoBalance® products results in a higher share of renewable resources used as renewable primary energy and as raw material. The biogas produced to replace the fossil resources in the supply chain has its basis in kitchen residues, which explains the high use of secondary material.

Potential environmental impact

EqoBalance® Premium and EqoBalance® have a global warming potential of respectively 1,98 kg CO₂ eq. and 5,32 kg CO₂ eq. This value includes the biogenic carbon, which is also reported separately. A significant part of all the environmental indicators, such as the global warming potential, can be attributed to the production of polyamide 6 used in the yarn. EqoBalance® Premium, which verifiably replaces 100% of the fossil resources in the value chain, has a better global warming potential than EqoBalance®, which replaces only 25% of the fossil resources in the value chain. The same can be said for the indicators POCP and ADP fossil. Vice versa, indicators such as AP, EP and ODP show higher results for EqoBalance® Premium in comparison to EqoBalance®. This can be attributed to the conversion process of kitchen residues to biogas. When the biogas is used to replace the fossil resources in the supply chain at 100%, this results in higher indicators in comparison to a replacement of 25%.

Programme-related information and verification

Programme	The International EPD® System EPD International AB Box 210 60 SE-100 31 Stockholm Sweden www.environdec.com info@environdec.com
EPD registration number	S-P-01372
Published	2018-08-23
Valid until	2023-08-05
Product Category Rules	EN 15804+A1 PCR 2012:01 Construction products and construction services, Version 2.2 PCR 2012:01-Sub-PCR-B Synthetic carpet yarn General Programme Instructions (v3.0)
Product group classification	UN CPC 264, 355 - Synthetic carpet yarn used for building purposes
Reference year for data	2017
Geographical scope	Belgium

CEN standard EN 15804 serves as the Core Product Category Rules (PCR)

Product category rules (PCR):

PCR 2012:01 Construction products and construction services, Version 2.2

PCR 2012:01-Sub-PCR-B Synthetic carpet yarn

PCR review was conducted by:

The Technical Committee of the International EPD® System

Chair: Massimo Marino.

Contact via info@environdec.com

Independent third-party verification of the declaration and data, according to ISO 14025:2006:

EPD verification

External Third party verifier

Manfred Russ, thinkstep AG

Recognised individual verifier approved by The International EPD® System





References

General Programme Instructions of the International EPD® System, Version 3.0

EN 15804:2012+A1:2013

ISO 14025:2006



PCR 2012:01 Construction products and construction services, Version 2.2

PCR 2012:01-Sub-PCR-B Synthetic carpet yarn (construction product)

ISO 14040/14044:2006

BISFA 2000 (Editorial review 2013) Testing methods for polyamide BCF (bulked continuous filament yarns)

Contact information

<p>EPD owner LCA author</p>	<div data-bbox="557 938 839 1108">  Beaulieu International Group </div> <p>Yarns</p> <p>Beaulieu Yarns Ideal Fibres & Fabrics Wielsbeke NV Ooigemstraat 2b 8710 Wielsbeke - Belgium Tel +32 (0)56 66 81 91 Fax +32 (0)56 67 43 00 info.ffw@bintg.com www.beaulieuyarns.com</p> <p>For more information on this EPD, please contact Pieter Demeyere Pieter.Demeyere@bintg.com</p>
<p>Programme operator</p>	<div data-bbox="549 1738 956 1809">  EPD® </div> <p>EPD International AB info@environdec.com</p>

