



BILLERUDKORSNÄS

CrownBoard **Craft**TM

Environmental Product Declaration



www.billerudkorsnas.com



THE INTERNATIONAL EPD® SYSTEM

BillerudKorsnäs

BillerudKorsnäs focuses on offering the packaging market sustainable materials (world-leading paper and board material) and new solutions that increase customers' profitability while at the same time reducing the overall environmental impact.

BillerudKorsnäs is driven by sustainability as a natural and integral part of the whole business and value chain. The raw material comes from responsibly managed forests and manufacturing takes place in resource-efficient production units that are constantly improved to minimize their environmental impact. BillerudKorsnäs has 8 production sites in Sweden, Finland and the UK. Production capacity is close to 3,500 ktonnes. The range of products includes liquid packaging board, cartonboard, liners, fluting, sack- and kraft paper, speciality paper and pulp.

Through our products and solutions, we aim to be part of the response to the world's current major challenges.





THE INTERNATIONAL EPD® SYSTEM

BillerudKorsnäs' operations for production in Sweden, Finland and the UK are fully certified in accordance with

- ISO 9001:2008 Quality Management System
- ISO 14001:2015 Environmental Management System
- PEFC™ Chain of Custody, license code PEFC/05-33-114
- FSC® Chain of Custody, license code FSC-C004906

In addition, certifications for food safety management systems, in accordance with ISO 22000/FSSC 22000, are in place where products are aimed for food contact.

This is an Environmental Product Declaration for CrownBoard Craft, registered in the International EPD System (www.environdec.com). The declaration has been developed based on the results of a Life Cycle Assessment (LCA) and the Product Category Rules for Processed paper and paperboard 2010:14 version 2.11 of 2020-01-29 (UN CPC 3214). Information and data given in this EPD can be used as upstream data by a customer who will perform a new EPD within the system boundaries given in a related PCR.

PRODUCTION SITE – FRÖVI MILL



DECLARATION OF CONTENTS

Fully coated top side
 Top: Bleached chemical pulp
 Middle: CTMP
 Bottom: Unbleached chemical pulp

CrownBoard Craft	Distribution
Unbleached chemical pulp	32%
Bleached chemical pulp	25%
CTMP	30%
Coating/fillers	13%

CROWNBOARD CRAFT

A light and very strong, coated cartonboard made of 100% primary fibres. Extremely durable, it has high compression strength, bending stiffness, and tearing resistance. The coated surface provides excellent printing results. Craft meets strict hygiene requirements and is approved for direct contact with certain food. For certification of specific food types, contact BillerudKorsnäs. Highly versatile, Craft is well suited for dry, chilled and frozen food; multipacks and displays, luxury beverages, and heavy products. Available in grammages from 245 to 460 gsm (14.4–29.3 pt / 365–745 µm).

* The PT stands for point, while gsm means grams per square metre. PT is a measure of the thickness of material (paper/card/other packaging material). Thickness is also expressed in microns (µm), one thousandth of a millimetre.

PRODUCT SAFETY

To the best of our knowledge, no SVHC substances listed in the current "Candidate list of substances of very high concern" are present in products from BillerudKorsnäs Skog & industri AB mill Frövi.



SYSTEM BOUNDARIES

The international EPD system is a hierarchic approach based on the international standards:

- ISO 9001, Quality management system
- ISO 14001, Environmental management system
- ISO 14025, Type III environmental declarations
- ISO 14044, LCA – Requirements and guidelines

EXCLUDED LIFECYCLE STAGES:

The following activities have not been included in the system boundaries:

- Business travel of personnel
- Travel to and from work by personnel
- The manufacturing of production equipment, buildings and other capital goods. For upstream processes, such as electricity production, these activities are however included
- Processing at the average converter, transportation to the customers and use of final product, as well as waste management of the final product

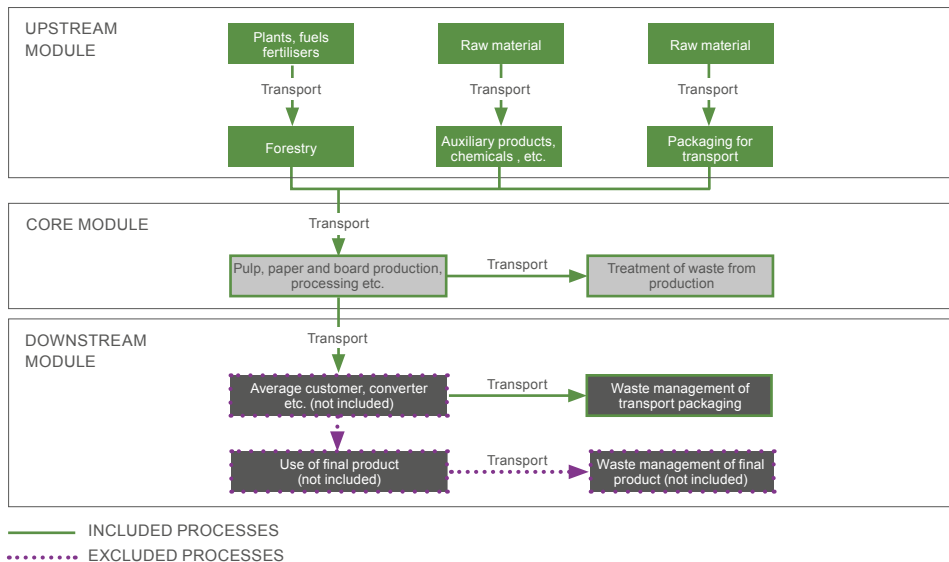
The systems are divided into three life cycle stages:

UPSTREAM: Forestry, production of fertilisers, energy wares and chemicals, auxiliary products and other raw materials, transport packaging.

CORE: Transportation of all materials (including wood) to the core processes,

production of internal and external pulp, production of paper and paperboard, cutting and packing of the products and treatment of waste generated from the production processes.

DOWNSTREAM: Distribution of the product to the customer and waste management of transport packaging.



ENVIRONMENTAL PERFORMANCE

The environmental impact of three selected grammages representing low, medium and high grammages within the product range are presented in the graph and tables below.

The declared unit is one tonne (1,000 kg) of the product delivered at the gate of an average converter/customer in Europe.

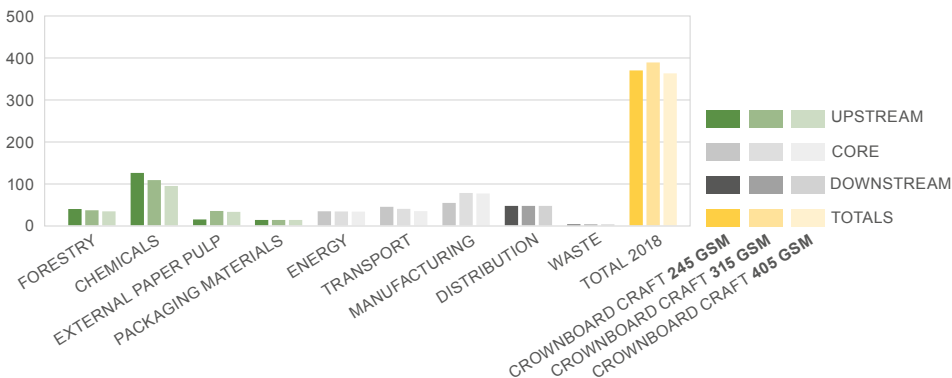
The carbon footprint (greenhouse gas emissions over the life cycle) is presented

for the two grammages covered in the following graph as global warming potential 100 years (GWP100) in kg CO₂ equivalents per tonne product. As an additional result, the environmental impact is presented also per 1,000 m² (as shown in the tables below).

The environmental impact of the different types of products may not be directly compared since the results are calculated per tonne of product and are not related to the same functional unit.

GREENHOUSE GAS EMISSIONS (EXCLUDING BIOGENIC CARBON), CROWNBOARD CRAFT 2018

kg CO₂eq/TONNE





POTENTIAL ENVIRONMENTAL IMPACT CROWNBOARD CRAFT

The table presents the potential environmental impact per declared unit as defined by the product category rules for processed paper and paper-board (CPC 3214). Data for the calculation is taken from the actual production during 2018, without any corrections for production irregularities between grammages.

CROWNBOARD CRAFT 245 GSM / 365 µM / 14.4 PT	UPSTREAM kg/tonne	CORE kg/tonne	DOWNSTREAM kg/tonne	TOTAL kg/tonne	TOTAL kg/1,000 m ²
Acidification potential (kg SO ₂ eq.)	1.22	1.49	0.11	2.82	0.69
Eutrophication potential (kg PO ₄ ³⁻ eq.)	0.35	0.72	0.20	1.27	0.31
Global warming potential (100 years) incl biogenic carbon (kg CO ₂ eq.)	-1251.81	1429.00	51.20	228.39	55.96
Global warming potential (100 years) excl biogenic carbon (kg CO ₂ eq.)	190.18	130.67	48.37	369.00	90.41
Photochemical oxidant formation (kg NMVOC eq.)	0.94	1.96	0.07	2.97	0.73

CROWNBOARD CRAFT 315 GSM / 480 µM / 18.9 PT	UPSTREAM kg/tonne	CORE kg/tonne	DOWNSTREAM kg/tonne	TOTAL kg/tonne	TOTAL kg/1,000 m ²
Acidification potential (kg SO ₂ eq.)	1.24	1.44	0.11	2.79	0.88
Eutrophication potential (kg PO ₄ ³⁻ eq.)	0.38	0.83	0.20	1.41	0.44
Global warming potential (100 years) incl biogenic carbon (kg CO ₂ eq.)	-1252.36	1541.90	51.20	340.74	107.33
Global warming potential (100 years) excl biogenic carbon (kg CO ₂ eq.)	190.30	149.01	48.37	388.00	122.22
Photochemical oxidant formation (kg NMVOC eq.)	0.92	1.95	0.07	2.94	0.93

CROWNBOARD CRAFT 405 GSM / 630 µM / 24.8 PT	UPSTREAM kg/tonne	CORE kg/tonne	DOWNSTREAM kg/tonne	TOTAL kg/tonne	TOTAL kg/1,000 m ²
Acidification potential (kg SO ₂ eq.)	1.13	1.28	0.11	2.53	1.02
Eutrophication potential (kg PO ₄ ³⁻ eq.)	0.35	0.81	0.20	1.36	0.55
Global warming potential (100 years) incl biogenic carbon (kg CO ₂ eq.)	-1272.76	1435.14	51.20	213.58	86.50
Global warming potential (100 years) excl biogenic carbon (kg CO ₂ eq.)	171.63	142.04	48.37	362.00	146.61
Photochemical oxidant formation (kg NMVOC eq.)	0.84	1.77	0.07	2.67	1.08

USE OF RESOURCES

The following tables present the total resources used in the upstream, core and downstream stages for three selected grammages representing low, medium and high grammages within the product range. Data for the calculation is taken from the actual production during 2018, without any corrections for production irregularities between grammages.

CROWNBOARD CRAFT 245 GSM / 365 µM / 14.4 PT	UPSTREAM kg/tonne	CORE kg/tonne	DOWNSTREAM kg/tonne	TOTAL kg/tonne	UNIT
Material resources, renewable					
Biomass	1294.34			1294.34	kg/tonne
Other	180.30	21.27	8.70	210.27	kg/tonne
Material resources, non-renewable					
Gravel	39.87	45.09	2.58	87.54	kg/tonne
Inert rock	64.54	0.20	0.06	64.80	kg/tonne
Limestone (calcium carbonate)	150.19	0.45	0.01	150.65	kg/tonne
Sodium chloride (rock salt)	17.42	0.03	0.01	17.47	kg/tonne
Other	11.56	21.52	0.54	33.62	kg/tonne
Energy resources, renewable					
Energy from biomass	346.39	14048.87	30.61	14425.87	MJ/tonne
Energy from hydropower	122.93	4028.36	37.79	4189.08	MJ/tonne
Other	36.05	24.52	19.35	79.91	MJ/tonne
Energy resources, non-renewable					
Crude oil (resource)	1597.13	1425.32	310.22	3332.66	MJ/tonne
Hard coal (resource)	342.72	40.51	91.77	475.00	MJ/tonne
Natural gas (resource)	1200.59	65.65	57.36	1323.60	MJ/tonne
Uranium (resource)	436.40	290.49	161.56	888.45	MJ/tonne
Other	131.53	6.76	113.51	251.80	MJ/tonne
Secondary resources					
Electricity use at manufacturing		941.39		941.39	kWh/tonne
Water use					
Total water use	26.67	74.43	0.18	101.27	m ³ /tonne
Water use at manufacturing		43.30		43.30	m ³ /tonne



CROWNBOARD CRAFT 315 GSM / 480 µM / 18.9 PT	UPSTREAM	CORE	DOWNSTREAM	TOTAL	UNIT
Material resources, renewable					
Biomass	1339.06			1339.06	kg/tonne
Other	173.65	36.98	8.70	219.34	kg/tonne
Material resources, non-renewable					
Gravel	42.38	61.07	2.58	106.03	kg/tonne
Inert rock	54.99	0.38	0.06	55.42	kg/tonne
Limestone (calcium carbonate)	118.81	0.49	0.01	119.31	kg/tonne
Sodium chloride (rock salt)	20.13	0.04	0.01	20.19	kg/tonne
Other	13.16	22.87	0.54	36.56	kg/tonne
Energy resources, renewable					
Energy from biomass	339.18	15072.12	30.61	15441.90	MJ/tonne
Energy from hydropower	134.24	4234.69	37.79	4406.73	MJ/tonne
Other	39.17	43.02	19.35	101.53	MJ/tonne
Energy resources, non-renewable					
Crude oil (resource)	1513.69	1636.81	310.22	3460.71	MJ/tonne
Hard coal (resource)	376.93	56.59	91.77	525.29	MJ/tonne
Natural gas (resource)	1075.90	81.30	57.36	1214.56	MJ/tonne
Uranium (resource)	504.45	504.28	161.56	1170.29	MJ/tonne
Other	155.43	9.55	113.51	278.50	MJ/tonne
Secondary resources					
Electricity use at manufacturing		968.06		968.06	kWh/tonne
Water use					
Total water use	21.49	76.91	0.18	98.58	m³/tonne
Water use at manufacturing		40.70		40.70	m³/tonne

CROWNBOARD CRAFT 405 GSM / 630 µM / 24.8 PT	UPSTREAM	CORE	DOWNSTREAM	TOTAL	UNIT
Material resources, renewable					
Biomass	1224.82			1224.82	kg/tonne
Other	162.73	37.97	8.70	209.40	kg/tonne
Material resources, non-renewable					
Gravel	39.99	60.36	2.58	102.93	kg/tonne
Inert rock	47.42	0.38	0.06	47.86	kg/tonne
Limestone (calcium carbonate)	94.16	0.50	0.01	94.66	kg/tonne
Sodium chloride (rock salt)	18.55	0.04	0.01	18.61	kg/tonne
Other	12.03	23.26	0.54	35.82	kg/tonne
Energy resources, renewable					
Energy from biomass	320.44	13992.32	30.61	14343.38	MJ/tonne
Energy from hydropower	124.89	4329.16	37.79	4491.84	MJ/tonne
Other	35.30	44.01	19.35	98.66	MJ/tonne
Energy resources, non-renewable					
Crude oil (resource)	1353.79	1547.88	310.22	3211.89	MJ/tonne
Hard coal (resource)	349.03	55.27	91.77	496.06	MJ/tonne
Natural gas (resource)	924.06	77.89	57.36	1059.30	MJ/tonne
Uranium (resource)	462.28	515.11	161.56	1138.95	MJ/tonne
Other	141.30	9.26	113.51	264.07	MJ/tonne
Secondary resources					
Electricity use at manufacturing		988.33		988.33	kWh/tonne
Water use					
Total water use	17.34	74.56	0.18	92.08	m³/tonne
Water use at manufacturing		38.50		38.50	m³/tonne

	CROWNBOARD CRAFT 245 GSM / 365 µM / 14.4 PT	CROWNBOARD CRAFT 315 GSM / 480 µM / 18.9 PT	CROWNBOARD CRAFT 405 GSM / 630 µM / 24.8 PT	UNIT
WASTE				
Hazardous waste	0.14	0.14	0.14	kg/tonne
Other waste	212.95	167.80	132.31	kg/tonne



ADDITIONAL ENVIRONMENTAL INFORMATION: POTENTIAL ENVIRONMENTAL GAIN

Sustainable forestry

Swedish and European laws and regulations for forestry constitute the minimal level of requirements for BillerudKorsnäs. The company's production units are certified according to FSC® Chain of Custody and PEFC™, which both demonstrate traceability. In Sweden, the forest growth rate is higher than the harvest rate, leading to a net removal of CO₂ from the atmosphere. The high growth rate is a result of long-term sustainable forest management practices.

Recyclability and recovery

CrownBoard Craft is recoverable through material recycling and energy recovery in accordance with the material requirements in EN 13430:2004 and EN 13431:2004. In many countries, paper and board is one of the most recycled materials.

Waste handling

All board and paper products produced by BillerudKorsnäs meet the targets specified in the EU's waste management hierarchy within the EU Waste Framework Directive 2008/98/EC as well as the essential requirements of the EU Packaging Waste Directive 94/62/EC.

Biodegradability

BillerudKorsnäs products are based on pulp consisting of cellulose, hemicellulose and some lignin which will be degraded by microorganisms in nature. The decomposition time required depends on several factors such as temperature, humidity, microbiological activity, and pH. For a product to be classified as biodegradable, at least 90% shall be biodegraded under aerobic conditions, according to the standard EN 13432:2000. As this varies between products and grammages, more information is provided by BillerudKorsnäs upon request.

Product waste minimisation

All products produced are based on primary fibres with high strength properties. Strong packaging protection keeps product damage and food waste to a minimum in demanding supply chains.

Substitution effect

Using BillerudKorsnäs' paper and board products means that products based on higher use of fossil energy are replaced, or substituted. While not a part of official climate reporting, the climate effect from substitution is important as it means that the substituted fossil energy sources stay underground.

BILLERUDKORSNÄS' CLIMATE TARGETS

BillerudKorsnäs is actively pursuing improvement to minimise the environmental impact from all parts of the operations. It is BillerudKorsnäs' vision to entirely phase out fossil fuels from the production. To this end, the company replaces fossil fuels with bioenergy and continually invests in process optimisation to decrease the use of resources and increase energy efficiency.

BillerudKorsnäs' climate targets are aligned with the Paris Agreement and approved by the Science Based Targets initiative. The approval scientifically ensures that the company contributes to the global work to minimise greenhouse gas emissions and to combat global warming. Updated information on the targets is found in BillerudKorsnäs' Annual and Sustainability Report.

DEFINITIONS

Acidification

Decrease of the pH value in terrestrial and water systems.

CTMP and BCTMP

CTMP, chemi-thermomechanical pulp, is a reinforced pulp with a unique combination of flexibility, strength, and stiffness. B stands for bleached.

Eutrophication

Eutrophication is the disturbance of the nutritional balance in the soil and waters due to an added amount of nutrition. In aquatic systems, this leads to increased production of biomass, which may lead to oxygen deficiency and fewer living organisms.

Global warming potential

Global warming is caused by increases in the atmospheric concentration of carbon dioxide (CO₂) and other greenhouse gases, such as methane and nitrous oxide, that absorb and reflect heat. The global warming potential (GWP) is declared as CO₂ equivalents. The amount of biogenic carbon (CO₂.eq.) presented is captured from the atmosphere by forest growth during the upstream phase and stored in the specific product as carbon until it is released again during later stages. Carbon is still stored in the product when it reaches the customer.

Hazardous waste

Wastes such as chemical waste, used oil, soot and radioactive waste from the production of nuclear power are classified as hazardous.

Photochemical oxidant formation

Hydrocarbons and volatile organic carbons (VOCs) contribute to ground level ozone formation, which has toxic effects on humans and vegetation.

PCR

Product Category Rules specify Environmental Product Declaration requirements for a specified sector or product category. See www.environdec.com



Uptake of carbon dioxide in growing forests

In photosynthesis, carbon dioxide from the atmosphere is removed and stored in the growing biomass. In Sweden, the forest growth rate is higher than the harvest rate in forest land, leading to a net removal of CO₂ from the atmosphere.

Waste

Waste generated along the whole life cycle production chains shall be treated following the technical specifications described in the General Programme Instructions of the PCR (CPC 3214).

Water use

Water use in upstream, core, and downstream stages is the total amount of water used for all processes related to the product during the whole life cycle production chain. Water use at manufacturing (core process) is the total amount of water used for cooling and the production process at the board and paper mill.

REFERENCES

Swedish Environmental Protection Agency National Inventory Report Sweden 2017, Greenhouse Gas Emission Inventories 1990–2015
The International EPD® System 2020. PCR 2010:14 Processed paper and paperboard: UN CPC Class 3214, version 2.11 of 2020.01.29, valid until 2020-02-23

IVL report: Life cycle assessment of BillerudKorsnäs virgin fibre-based packaging materials, December 2017

IVL report: Life cycle assessment of BillerudKorsnäs virgin fibre-based packaging materials for 2018, February 2020

Generic database: Ecolnvent, version 3. Thinkstep AG 2019, SP 36, DB version 8.7. Calculations: Thinkstep AG (2019), GaBi Software System and database for Life Cycle Engineering, 1992-2019, version 9. General Programme Instructions for the International EPD® system, version 3.01, 2019-09-18

VERIFICATIONS

EPD Program: The International EPD® System

Note: EPDs from different programs may not be comparable

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Production of CTMP–2018

Product Category Rules (PCR) review was conducted by: The Technical Committee of the International EPD® System. Chair: Massimo Marino
Contact via info@environdec.com.

PCR moderator: Lucia Rigamonti.

PCR: Product category rules for processed paper and paperboard (CPC 3214), Version 2.11, 2020-01-29

Independent verification of the data according to ISO14025 (external): Carl-Otto Neven

(carlotto.neven@bredband.net): 2020-02-21

EPD owned by: BillerudKorsnäs Skog & Industri AB

Accredited or approved by:

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We challenge
conventional packaging
for a sustainable future

