Environmental Product Declaration

In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for:

Fire Retardants

from

Burnblock ApS

Programme:	The International EPD® System, www.environdec.com
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General information

Programme information

Programme:	The International EPD® System
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Accountabilities for PCR, LCA and independent, third-party verification
Product Category Rules (PCR)
ISO standard ISO 21930 and CEN standard EN 15804 serves as the core Product Category Rules (PCR)
Product Category Rules (PCR): PCR 2019:14 Construction products Version 1.11
PCR review was conducted by: The Technical Committee of the International EPD® System. See www.environdec.com/TC for a list of members. Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat www.environdec.com/contact.
Life Cycle Assessment (LCA)
LCA accountability: Julie M. V. Larsen, Bureau Veritas HSE DK
Third-party verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: ☒ EPD verification by individual verifier Third-party verifier: Linda Høibye, Life Cycle Assessment Consulting    Approved by: The International EPD® System
Procedure for follow-up of data during EPD validity involves third party verifier: ☐ Yes ☒ No

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identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

Company information

EPD Owner	BURNBLOCK® **Burnblock Aps** *https://burnblock.com/* **Address: Wilders Plads 15C, 1403 Copenhagen K, Denmark** **Contact:** **Hroar Bay-Smidt** **CEO** **hbs@burnblock.com**
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Programme Operator	EPD® THE INTERNATIONAL EPD® SYSTEM **EPD International, environdec.com** **Address: Valhallavägen 81, 114 27 Stockholm, Sweden** **info@environdec.com**

Product information

Product name: JG30, MM50, DM3
UNSPSC code: 46191503, Fire resistant coatings or putties or sealants.
Production locations: Jakóba Hechlińskiego 19, 85-825 Bydgoszcz, Poland and Strandgade 35, DK-7100 Vejle, Denmark.
Geographical scope: Denmark.
EPD statement: This EPD describes 3 specific products. For JG30, the results are presented as the weighted average based on the percentage of the product produced at each location for all indicators.

Product description:
Burnblock is a highly effective and non-toxic fire retardant. Burnblock is consisting of only purely natural ingredients combined in a patented formula. Burnblock effectively prevents oxygen from reaching the treated object – and without oxygen the fire triangle is broken removing the option for fire to occur.

Product name	Description
Burnblock JG30	Fire retardant powder used for impregnation of wood products in combination with water.
Burnblock MM50	Fire retardant powder used for impregnation of wood/natural fiber products in combination with water.
Burnblock DM3	Fire retardant powder used for impregnation of wood products in combination with water.

Manufacturing Process: The production of the product is done via a very simple process, where the ammonium phosphate (AP), Citrate (C) and Sodium Benzoate (SB) raw materials are mixed directly into the final packaging. JG30 is produced both in Poland and Denmark, while MM50 and DM3 is only produced in Poland. Due to the nonhomogeneous nature of the final product all of the content has to be used at once in the application process.

Certifications: Burnblock® Fire Retardant Powder is Cradle to Cradle Certified™ at the Gold level which made our product to the very first Fire Retardant in the Cradle to Cradle Certified® Products Program. Part of the sustainability certification includes a status for Material Health. For this, Burnblock ApS has chosen to be certified according to version 4.0, which has stricter requirements than version 3.1. Despite of the stricter requirements, the certification includes a Gold status for Material Health. JG30 (GTIN 5708290100053) and MM50 (GTIN 5708290100046).

Geographical scope: Modules A1-A3 has been modelled to represent a European scenario.

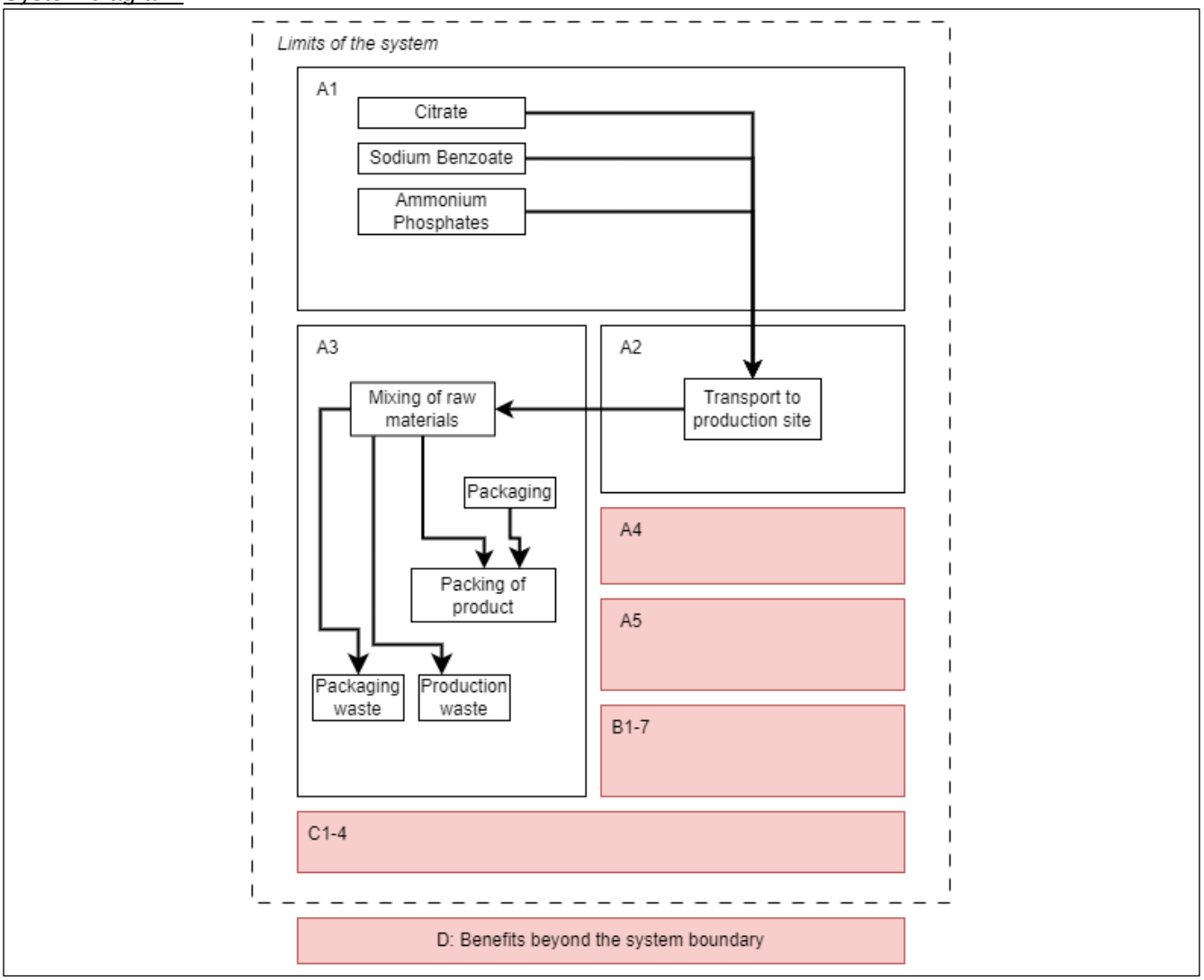
LCA information

Declared unit: 1 kg of fire retardants powder
Reference service life: N/A
Time representativeness: Data has been collected and are valid for 2021.
Database(s) and LCA software used: **Database:** EcoInvent 3.9; **LCA software:** SimaPro 3.5.
Cut-off Criteria: The general rules for cut-off of inputs and outputs follow the requirements in EN 15804, 6.3.6, where the total of neglected input flows per module shall be a maximum of 5 % of energy usage and mass and 1 % of energy usage and mass for unit processes. For renewable and non-renewable the cut-off criterion is 1%. The LCA study is based on known specific data for packaging materials and 100% product prescription. However generic data from the Ecoinvent 3.9 database are used for raw material.
Description of system boundaries:
The system boundary is cradle-to-gate (A1–A3). These boundaries can be chosen because the following requirements are met, from PCR 2019:14 Version 1.11 Section 2.2.2:

1. The product is physically integrated with other products during installation (i.e., impregnation process) so they cannot be physically separated from them at end of life.
2. The product is no longer identifiable at end of life as a result of a physical or chemical transformation process.
3. The product or material does not contain biogenic carbon.

During the production it is assumed that the total spillage is 1%.

System diagram:



Modules declared, geographical scope, share of specific data (in GWP-GHG results) and data variation (in GWP-GHG results):

	Product stage			Installation processes		Use stage							End of life 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-A3			A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
	Production of commodities, raw materials		Product manufacture														
Modules declared	X			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Geography	Global		Denmark /Poland	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Specific data used	<90%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation - products	>10%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	Manufactured in multiple sites in DK and PL			-	-	-	-	-	-	-	-	-	-	-	-	-	-

Most influencing parameters in the LCA: For the products produced in Poland the process with the highest influence is transport (39.1%-41.4%) while for the product produced in Denmark it is electricity (23.2%). For the products produced in Poland, electricity (23.8%-25.2%) is the second highest parameter.

Content information

Typically, the Burnblock ApS product variants covered by this EPD (Burnblock JG30, Burnblock MM50 and Burnblock DM3) contain the following ranges of base materials and auxillaries: Ammonium phosphates 5-95%, Citrate 5-95%, Sodium Benzoate 2-10%. Please note that MM50 contains no Sodium Benzoate. The reference unit weight is 1kg, and the percentages quoted represent concomitant proportions of that.
These ranges comprise average values and more information can be found on Burnblock product data sheets.
The products contain no post/consumer material, biogenic products or renewable material.

	Packaging materials	Weight, kg	Weight-% (versus the product)	Weight biogenic carbon, kg C/kg
JG30-DK	Polypropylene (PP)	3.96E-03	0.4%	0
	Polyethylene (PE)	2.24E-03	0.2%	0
	Wood	6.00E-04	0.1%	6.0E-05
	Paper	1.20E-04	0.01%	3.0E-04
	Total	6.92E-03	0.71%	3.6E-04
JG30-PL	Polypropylene (PP)	4.04E-03	0.4%	0
	Polyethylene (PE)	2.07E-03	0.2%	0
	Wood	6.00E-04	0.1%	3.0E-04
	Total	6.71E-03	0.7%	3.0E-04
MM50-PL	Polypropylene (PP)	5.05E-03	0.5%	0
	Polyethylene (PE)	2.59E-03	0.3%	0
	Wood	7.50E-04	0.1%	3.8E-04
	Total	8.39E-03	0.9%	3.8E-04
DM3-PL	Polypropylene (PP)	1.51E-03	0,2%	0
	Polyethylene (PE)	1.05E-03	0,1%	0
	Wood	6.25E-04	0,1%	3.8E-04
	Total	3.19E-03	0.4%	3.8E-04

Dangerous substances from the candidate list of SVHC for Authorisation	EC No.	CAS No.	Weight-% per functional or declared unit
No SVHC substances in products			

Results of the environmental performance indicators

Results for JG30.

Mandatory impact category indicators according to EN 15804

Results per functional or declared unit		
Indicator	**Unit**	**A1-A3**
GWP- total	kg CO_2 eq.	4.72E+00
GWP-fossil	kg CO_2 eq.	4.89E+00
GWP-biogenic	kg CO_2 eq.	-1.85E-01
GWP- luluc	kg CO_2 eq.	7.85E-03
ODP	kg CFC 11 eq.	6.71E-07
AP	mol H^+ eq.	3.99E-02
EP-freshwater	kg P eq.	1.17E-03
EP-marine	kg N eq.	5.84E-03
EP-terrestrial	mol N eq.	6.53E-02
POCP	kg NMVOC eq.	1.93E-02
ADP-minerals&metals*	kg Sb eq.	1.38E-04
ADP-fossil*	MJ	6.51E+01
WDP*	m^3	3.32E+00
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption	

Additional mandatory and voluntary impact category indicators

Results per functional or declared unit		
Indicator	**Unit**	**A1-A3**
GWP-GHG	kg CO_2 eq.	4.80E+00
PM	disease inc.	3.63E-07
IRP*	kBq U235 eq	3.12E-01
ETP-fw**	CTUe	1.14E+02
HTP-c**	CTUh	3.82E-09
HTP-nc**	CTUh	3.28E-08
SQP**	Dimensionless	6.90E+01
Additional voluntary indicators e.g. the voluntary indicators from EN 15804 or the global indicators according to ISO 21930:2017		

Resource use indicators

Results per functional or declared unit		
Indicator	**Unit**	**A1-A3**
PERE	MJ	4.65E+00
PERM	MJ	4.16E-02
PERT	MJ	4.69E+00
PENRE	MJ	6.92E+01
PENRM	MJ	1.70E-01
PENRT	MJ	6.93E+01
SM	kg	0.00E+00
RSF	MJ	0.00E+00
NRSF	MJ	0.00E+00
FW	m^3	3.29E+00
Acronyms	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources;	

	PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water

Waste indicators

Results per functional or declared unit		
Indicator	**Unit**	**A1-A3**
Hazardous waste disposed	kg	0.00E+00
Non-hazardous waste disposed	kg	0.00E+00
Radioactive waste disposed	kg	0.00E+00

Output flow indicators

Results per functional or declared unit		
Indicator	**Unit**	**A1-A3**
Components for re-use	kg	0.00E+00
Material for recycling	kg	8.61E-05
Materials for energy recovery	kg	0.00E+00
Exported energy, electricity	MJ	1.32E-02
Exported energy, thermal	MJ	1.26E-01

Results of the environmental performance indicators

Results for MM50-PL

Mandatory impact category indicators according to EN 15804

Results per functional or declared unit		
Indicator	**Unit**	**A1-A3**
GWP- total	kg CO_2 eq.	4.56E+00
GWP-fossil	kg CO_2 eq.	4.79E+00
GWP-biogenic	kg CO_2 eq.	-2.45E-01
GWP- luluc	kg CO_2 eq.	8.24E-03
ODP	kg CFC 11 eq.	6.46E-07
AP	mol H^+ eq.	3.61E-02
EP-freshwater	kg P eq.	1.18E-03
EP-marine	kg N eq.	6.25E-03
EP-terrestrial	mol N eq.	6.98E-02
POCP	kg NMVOC eq.	1.96E-02
ADP-minerals&metals*	kg Sb eq.	1.32E-04
ADP-fossil*	MJ	6.09E+01
WDP*	m^3	3.12E+00
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption	

Additional mandatory and voluntary impact category indicators

Results per functional or declared unit		
Indicator	**Unit**	**A1-A3**
GWP-GHG	kg CO_2 eq.	4.80E+00
PM	disease inc.	3.45E-07
IRP*	kBq U235 eq	3.02E-01
ETP-fw**	CTUe	1.14E+02
HTP-c**	CTUh	3.88E-09
HTP-nc**	CTUh	3.21E-08
SQP**	Dimensionless	6.53E+01
Additional voluntary indicators e.g. the voluntary indicators from EN 15804 or the global indicators according to ISO 21930:2017		

Resource use indicators

Results per functional or declared unit		
Indicator	**Unit**	**A1-A3**
PERE	MJ	5.37E-01
PERM	MJ	4.00E-02
PERT	MJ	5.77E-01
PENRE	MJ	8.19E+00
PENRM	MJ	1.69E-01
PENRT	MJ	8.36E+00
SM	kg	0.00E+00
RSF	MJ	0.00E+00
NRSF	MJ	0.00E+00
FW	m^3	3.09E+00
Acronyms	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water	

Waste indicators

Results per functional or declared unit		
Indicator	**Unit**	**A1-A3**
Hazardous waste disposed	kg	0.00E+00
Non-hazardous waste disposed	kg	0.00E+00
Radioactive waste disposed	kg	0.00E+00

Output flow indicators

Results per functional or declared unit		
Indicator	**Unit**	**A1-A3**
Components for re-use	kg	0.00E+00
Material for recycling	kg	0.00E+00
Materials for energy recovery	kg	0.00E+00
Exported energy, electricity	MJ	1.30E-02
Exported energy, thermal	MJ	1.25E-01

Results of the environmental performance indicators

Results for DM3-PL

Mandatory impact category indicators according to EN 15804

Results per functional or declared unit		
Indicator	**Unit**	**A1-A3**
GWP- total	kg CO_2 eq.	3.57E+00
GWP-fossil	kg CO_2 eq.	3.74E+00
GWP-biogenic	kg CO_2 eq.	-1.74E-01
GWP- luluc	kg CO_2 eq.	7.47E-03
ODP	kg CFC 11 eq.	4.89E-07
AP	mol H^+ eq.	2.90E-02
EP-freshwater	kg P eq.	7.64E-04
EP-marine	kg N eq.	6.40E-03
EP-terrestrial	mol N eq.	7.30E-02
POCP	kg NMVOC eq.	1.90E-02
ADP-minerals&metals*	kg Sb eq.	3.26E-05
ADP-fossil*	MJ	4.74E+01
WDP*	m^3	9.24E-01
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption	

Additional mandatory and voluntary impact category indicators

Results per functional or declared unit		
Indicator	**Unit**	**A1-A3**
GWP-GHG	kg CO_2 eq.	3.75E+00
PM	disease inc.	2.17E-07
IRP*	kBq U235 eq	2.31E-01
ETP-fw**	CTUe	6.92E+01
HTP-c**	CTUh	2.66E-09
HTP-nc**	CTUh	2.94E-08
SQP**	Dimensionless	2.63E+01
Additional voluntary indicators e.g. the voluntary indicators from EN 15804 or the global indicators according to ISO 21930:2017		

Resource use indicators

Results per functional or declared unit		
Indicator	**Unit**	**A1-A3**
PERE	MJ	3.87E+00
PERM	MJ	3.62E-02
PERT	MJ	3.91E+00
PENRE	MJ	5.03E+01
PENRM	MJ	1.58E-01
PENRT	MJ	5.04E+01
SM	kg	0.00E+00
RSF	MJ	0.00E+00
NRSF	MJ	0.00E+00
FW	m^3	9.08E-01
Acronyms	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water	

Waste indicators

Results per functional or declared unit		
Indicator	**Unit**	**A1-A3**
Hazardous waste disposed	kg	0.00E+00
Non-hazardous waste disposed	kg	0.00E+00
Radioactive waste disposed	kg	0.00E+00

Output flow indicators

Results per functional or declared unit		
Indicator	**Unit**	**A1-A3**
Components for re-use	kg	0.00E+00
Material for recycling	kg	0.00E+00
Materials for energy recovery	kg	0.00E+00
Exported energy, electricity	MJ	1.21E-02
Exported energy, thermal	MJ	1.17E-01

Additional Information

Burnblock ApS has tested their products with respect to their ability to protect different wood species from fire exposure. The tests are done in accordance with EN 13501-1:2007+A1:2009, EN 13501-2:2007+A1:2009, EN 13501-1:2018 and EN 13823 (SBI) and EN 14135:2004. The products have been tested on softwood, hardwood, modified wood, plywood and medium-density fiberboard (MDF). All test results can be found via the Burnblock website (https://burnblock.com/wp-content/uploads/2022/09/Burnblock_Classification_Table_220928.pdf). Below a selection of the technical results can be seen.

Wood Species	Ventilated Cavity	Reaction to Fire Classes *1	Reaction to Fire Classes *2
Softwood (Spruce)	40 mm	B-s1,d0	K1, K2, 10/B-s1,d0
Hardwood (Sapele)	40 mm	B-s1,d0	
Modified Wood (Accoya)	40 mm	B-s1,d0	
Plywood (Birch)	40 mm	B-s1,d0	K1, K2, 10/B-s1,d0
MDF		B-s1,d0	

Weighted results from multiple production sites

JG30 has two production sites. The method used to combine the results is the weighted average based on the percentage of the product produced at each location. The variation for the indicator GWP-total between JG30-DK and JG30-PL is +6.9% and -179.8% for modules A1-A3.

References

General Programme Instructions of the International EPD® System. Version 3.11.

ISO 14025:2010 Environmental labels and declarations-Type III Environmental Declarations-Principles and procedures

ISO 14040:2006 Environmental Management-Life Cycle Assessment-Principles and framework

ISO 14044:2006 Environmental Management-Life Cycle Assessment-Requirements and guidelines

PCR 2019:14 Construction products (EN 15804:A2) version 1.11

EN 15804:2012+A2:2019 Sustainability of construction works-Environmental Product Declarations-Core rules for the product category of construction products

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