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The Norwegian EPD Foundation

ENVIRONMENTAL PRODUCT DECLARATION

in accordance with ISO 14025, ISO 21930 and EN 15804

Owner of the declaration:	Flügger Norway AS
Program operator:	The Norwegian EPD Foundation
Publisher:	The Norwegian EPD Foundation
Declaration number:	NEPD-2668-1373-EN
Registration number:	NEPD-2668-1373-EN
ECO Platform reference number:	-
Issue date:	08.02.2021
Valid to:	08.02.2026

Flügger Adhesive 378 Strong™

Flügger Norway AS

Flügger

www.epd-norge.no

General information

Product:
Flügger Adhesive 378 Strong™

Owner of the declaration:
Flügger Norway AS
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Manufacturer:
Flügger Denmark A/S

Declaration number:
NEPD-2668-1373-EN

Place of production:
Vejlevej 150,
6000 Kolding, Denmark

ECO Platform reference number:

Management system:
ISO 14001:2015 (DK011198)
ISO 9001:2015 (DK0012451)

This declaration is based on PCR:
NS-EN 15804:2012+A1:2013 serves as core PCR.
Product descriptions based on "IBU PCR Part B for coatings with organic binders". This also applies to products with inorganic binders.

Org. no.:
45240118

Statement of liability:
The owner of the declaration shall be liable for the underlying information and evidence. EPD Norway shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

Issue date:
08.02.2021

Valid to:
08.02.2026

Declared unit:
1 kg Flügger Adhesive 378 Strong delivered to market

Year of study:
2019

Declared unit with option:

Comparability:
EPD of construction products may not be comparable if they do not comply with NS-EN 15804 and seen in a building context.

Functional unit:

Author of the Life Cycle Assessment:
Mafalda Silva
NORSUS

Verification:
Independent verification of data, other environmental information and the declaration according to ISO14025:2010, § 8.1.3 and § 8.1.4

☐ internal ☑ external

Third party verifier:
Erik Svanes
Erik Svanes, Senior Researcher
(Independent verifier approved by EPD Norway)

Approved
Håkon Hauan
Managing Director of EPD-Norway

Product

Product description:
Flügger Adhesive 378 Strong is a ready-mixed, transparent, extra-reinforced adhesive. For indoor use in a dry room for hanging a wall covering 130-250 g/m^2, e.g. glass felt, fibre felt, structural felt and glass fabric.

Flügger Adhesive 378 Strong is ecolabelled with the Nordic Ecolabel.

For information on Green Building Standard credits and Ecolabels, see "Additional Information" on page 4.

Product specification:
The product is only made in one colour and has no variation in composition.

The material composition of the declared product:

Materials	%
Water	60-70
Binder	15-20
Extender	10-15
Solvent	<1.0
Additive	5-10
Biocide	<0.5

Packaging	kg
Wooden packaging - pallet	4,00E-02
Plastic packaging - pallet	1,40E-03
Plastic packaging	4,19E-02

Technical data:
Density: 1,05 kg/l
Solids by volume: 25,0%

Nominal spreading rate: 3-5 m^2/l
Dilution: Should not be diluted

The product packaging is based on an average sized plastic packaging and is reported in the A1-phase.

For information on technical data, application and use of the product, see the Technical Data Sheet and FDV (*Forvaltning, Drift og Vedlikehold*) for the declared product on www.flugger.no

For safety, health and environmental conditions, see the Safety Data Sheet for the declared product on www.flugger.no.

Market:
Scandinavia and Europe

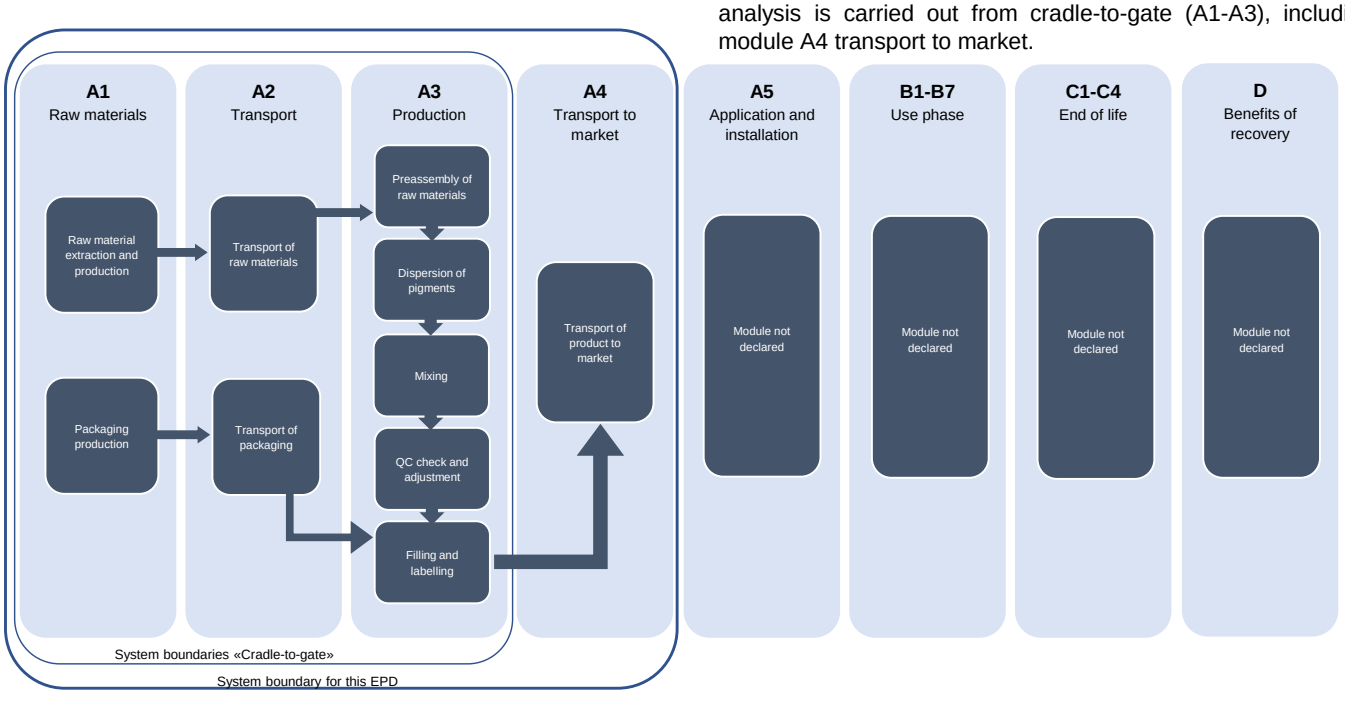
Reference service life, product
The reference service life of the product is highly dependent on the conditions of use.

Estimated service life, object
The coated object is not declared.

LCA: Calculation rules

Declared unit:
1 kg Flügger Adhesive 378 Strong delivered to market

System boundary:
The flow chart below illustrates the system boundaries for the analysis according to the module principle in NS-EN 15804. The analysis is carried out from cradle-to-gate (A1-A3), including module A4 transport to market.



Data quality:
The CEPE database is used as basis for the raw material composition. Specific data for the product composition and raw material amounts has been provided by the manufacturer and represents the production of the declared product. Production site data was collected in 2020, with 2019 as reference year. Remaining data is based on Ecoinvent v3.6, but adjusted to improve representativeness. All energy consumption in the database is assumed not to be used as raw material.

Cut-off criteria:
All major raw materials and essential energy is included. The production process for raw materials and energy flows with very small amounts (<1%), such as consumables in production and administration and employee travel, are not included. These cut-off criteria do not apply for hazardous materials and substances.

Allocation:
The allocation is made in accordance with the provisions of NS-EN 15804. Incoming energy, water and waste production in-house is primarily allocated equally among all products through volume allocation. The recycling process and transportation of the material is allocated to this analysis.

Additional information:
The declared product contributes to Green Building Standard credits by meeting the following specific requirements:

- Nordic Swan Ecolabel (3097 0008)
- Properties criteria in BASTA (2020:A2)
- Accepted according to Byggvarubedömningens Assessment Criteria 5.0 (2019)
- Class B according to SundaHus Material Data Assessment Criteria 6.1.5 (2019)

BREEAM®NOR (2016)
HEA 02: The VOC-Directive does not cover adhesives (EU Directive 2004/42/CE).
Mat 01: The product contains no substances on the Norwegian Technical Check List (A20), which exceeds the limit value for health and environment.

Additional certificates and approvals may be available on request.

LCA: Scenarios and additional technical information

The following information describe the scenarios in the different modules of the EPD.

The only declared module after the factory gate is A4 transport to market.

Transport from production place to user (A4)

Type	Capacity utilisation incl. return [%]	Type of vehicle	Distance km	Fuel/Energy consumption	Unit
Truck	53	>32t, EURO 6	537	1,92E-02	kg/tkm
Truck	53	>32t, EURO 6	338	1,92E-02	kg/tkm
Truck	26	16-32t, EURO 6	30	4,80E-02	kg/tkm

Construction/Installation (A5)

	Unit	Value
Auxiliary	kg	
Water consumption	m^3	
Electricity consumption	kWh	
Other energy carriers	MJ	
Material loss	kg	
Dust in the air	kg	
VOC emissions	kg	

Use (B1)

	Unit	Value
Relevant emissions during use	kg	

Maintenance (B2)/Repair (B3)

	Unit	Value
Maintenance cycle*		
Auxiliary	kg	
Other resources	kg	
Water consumption	m^3	
Electricity consumption	kWh	
Other energy carriers	MJ	
Material loss	kg	
VOC emissions	kg	

Replacement (B4)/Refurbishment (B5)

	Unit	Value
Replacement cycle*	pcs	
Electricity consumption	kWh	
Replacement of worn parts	0	

* Value or refence shelf-life

Operational energy (B6) and water consumption (B7)

	Unit	Value
Water consumption	m^3	
Electricity consumption	kWh	
Other energy carriers	MJ	
Power output of equipment	kW	

End of life (C1, C3, C4)

	Unit	Value
Hazardous waste disposed	kg	
Collected as mixed construction waste	kg	
Reuse	kg	
Recycling	kg	
Energy recovery	kg	
For landfill	kg	

Transport to waste processing (C2)

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance km	Fuel/Energy consumption	Unit	Value (l/t)
Truck						
Railway						
Boat						
Other						

LCA: Results

System boundaries (X=included, MND=module not declared, MNR=module not relevant)

Product stage			Construction/ installation stage		User stage							End of life stage				Beyond the system boundaries
Raw materials	Transport	Manufacturing	Transport	Construction/ installation stage	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction/ demolition	Transport	Waste processing	Waste 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	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

Environmental impact

Parameter	Unit	A1	A2	A3	A4
GWP	kg CO_2 -eq.	6,89E-01	8,63E-03	1,50E-01	8,03E-02
ODP	kg CFC11-eq.	9,54E-08	1,60E-09	9,99E-09	1,58E-08
POCP	kg C_2H_4 -eq.	2,61E-04	1,16E-06	6,79E-05	1,01E-05
AP	kg SO_2 -eq.	3,02E-03	2,79E-05	1,38E-03	2,10E-04
EP	kg PO_4^{3-}-eq.	6,77E-04	4,53E-06	1,32E-04	2,82E-05
ADPM	kg Sb -eq.	6,79E-06	2,18E-07	3,43E-05	1,49E-06
ADPE	MJ	1,72E+01	1,30E-01	1,50E+00	1,29E+00

GWP Global warming potential; ODP Depletion potential of the stratospheric ozone layer; POCP Formation potential of tropospheric photochemical oxidants; AP Acidification potential of land and water; EP Eutrophication potential; ADPM Abiotic depletion potential for non fossil resources; ADPE Abiotic depletion potential for fossil resources

Resource use

Parameter	Unit	A1	A2	A3	A4
RPEE	MJ	3,61E+00	1,89E-03	7,62E-01	1,67E-02
RPEM	MJ	0,00E+00	0,00E+00	3,19E-02	0,00E+00
TPE	MJ	3,61E+00	1,89E-03	7,94E-01	1,67E-02
NRPE	MJ	3,37E+00	1,33E-01	1,90E+00	1,31E+00
NRPM	MJ	1,51E+01	0,00E+00	0,00E+00	0,00E+00
TRPE	MJ	1,85E+01	1,33E-01	1,90E+00	1,31E+00
SM	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00
W	m^3	2,25E-02	2,52E-05	1,86E-03	2,70E-04

RPEE Renewable primary energy resources used as energy carrier; RPEM Renewable primary energy resources used as raw materials; TPE Total use of renewable primary energy resources; NRPE Non renewable primary energy resources used as energy carrier; NRPM Non renewable primary energy resources used as materials; TRPE Total use of non renewable primary energy resources; SM Use of secondary materials; RSF Use of renewable secondary fuels; NRSF Use of non renewable secondary fuels; W Use of net fresh water

End of life - Waste

Parameter	Unit	A1	A2	A3	A4
HW	kg	2,02E-05	3,39E-07	4,58E-04	3,20E-06
NHW	kg	1,85E-01	9,26E-03	2,28E-01	1,18E-01
RW	kg	3,97E-05	9,05E-07	7,55E-06	8,96E-06

HW Hazardous waste disposed; NHW Non hazardous waste disposed; RW Radioactive waste disposed

End of life - Output flow

Parameter	Unit	A1	A2	A3	A4
CR	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MR	kg	0,00E+00	0,00E+00	9,87E-03	0,00E+00
MER	kg	0,00E+00	0,00E+00	4,30E-05	0,00E+00
EEE	MJ	0,00E+00	0,00E+00	3,05E-03	0,00E+00
ETE	MJ	0,00E+00	0,00E+00	3,26E-02	0,00E+00

CR Components for reuse; MR Materials for recycling; MER Materials for energy recovery; EEE Exported electric energy; ETE Exported thermal energy

Reading example: 9,0 E-03 = 9,0*10-3 = 0,009

Additional requirements

Greenhouse gas emissions from the use of electricity in the manufacturing phase
National production mix from import, low voltage (production of transmission lines, in addition to direct emissions and losses in grid) of applied electricity for the manufacturing process (A3). Background data is presented in the table below. Characterisation factors from NS-EN 15804:2012+A1:2013 is used.

Electricity mix	Data source	Value	Unit
Electricity, Denmark (kWh)	ecoinvent 3.6	329	g CO_2-eq./kWh

Dangerous substances

- ☑ The product contains no substances given by the REACH Candidate list or the Norwegian priority list
- ☐ The product contains substances given by the REACH Candidate list <0,1 weight%
- ☐ The product contains substances given by the REACH Candidate list or the Norwegian priority list, see table above
- ☐ The product contains no substances given by the REACH Candidate list or the Norwegian priority list. The product is characterised as hazardous waste (acc. to the Waste Directive, Appendix III), se table above.

Indoor environment
The declared product is emission tested according to the ISO-16000 series (2006).

Bibliography

BASTA (2020)	Properties criteria - BASTA - in accordance with Regulation (EC) No 1272/2008 (CLP), ed. A2
BREEAM®NOR (2016)	BREEAM-NOR for new contractions 2016, SD5075NOR, version 1.1. The Norwegian Green Building Council
Byggvarubedömningen (2019)	Assessment criteria for chemical content and lifecycle aspects, version 5.0
CEPE (2016)	Raw materials LCI database for the European coatings and printing ink industries, v3.0
Ecoinvent (2019)	Ecoinvent version 3.6, Swiss Centre of Life Cycle Inventories, Dübendorf, Switzerland
EU Directive 2004/42/CE	The limitation of emissions of volatile organic compounds due to the use of organic solvents in certain paints and varnishes and vehicle refinishing products
IBU PCR Part B	Requirements on the EPD for Coatings with organic binders. v1.7, January 2019
ISO 14025:2010	Environmental labels and declarations - Type III environmental declarations - Principles and procedures
ISO 16000-series	Indoor air standards for VOCs sampling and determination, i.e. 9 (2006)
ISO 21930:2017	Sustainability in buildings and civil engineering works - Core rules for environmental product declarations of construction products and services
NS-EN 15804:2012+A1:2013	Environmental product declaration - Core rules for the product category of construction products
REACH Candidate List (2018)	Candidate List of substances of very high concern for Authorisation IAW Article 59(10) of the REACH Regulation
SundaHus (2019)	Material Data Assessment Criteria, version 6.1.5
Nordic Ecolabel	3097 0008 - Flügger Adhesive 377 Strong.
Technical Check List (A20) and Norwegian Priority List (2018)	Miljøgiftlisten, The Norwegian Environment Agency

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