



## General information

### Product:

RH Logic 200

### Owner of the declaration:

Flokk AS  
 Contact person: Atle This-Messel  
 Phone: 0047 98 25 68 30  
 e-mail: atle.messel@flokk.com

### Program operator:

The Norwegian EPD Foundation  
 Pb. 5250 Majorstuen, 0303 Oslo  
 Phone: +47 23 08 80 00  
 e-mail: [post@epd-norge.no](mailto:post@epd-norge.no)

### Manufacturer:

Flokk AS  
 Drammensveien 145, 0277 Oslo  
 Norway

### Declaration number:

### Place of production:

Flokk - Nässjö  
 Vallgatan 1 571 23 Nässjö  
 Sweden

### ECO Platform reference number:

### Management system:

ISO 14001, ISO 9001, ISO 50001(Norway, Sweden)

### This declaration is based on Product Category Rules:

CEN Standard EN 15804:2012+A1:2013 serves as core PCR  
 NPCR 026:2018 Part B for furniture

### Organisation no:

No 928 902 749

### 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:vwPG:OGOPOO

### Valid to:vwPG:OGOPOD

### Declared unit:

1 Pcs RH Logic 220

### Year of study:

2022

### Declared unit with option:

A1,A2,A3,A4

### Comparability:

EPDs from programmes other than the Norwegian EPD Foundation may not be comparable

### Functional unit:

RH Logic 220 (including knock down packaging option 1)

### Development and verification of EPD:

The declaration has been developed and verified using EPD tool lca.tools ver EPD2020.11, developed by LCA.no AS. The EPD tool is integrated into the company's environmental management system, and has been approved by EPD-Norway

### General information on verification of EPD from EPD tools:

Independent verification of data, other environmental information and the declaration according to ISO 14025:2010, § 8.1.3 and § 8.1.4. Individual third party verification of each EPD is not required when the EPD tool is i) integrated into the company's environmental management system, ii) the procedures for use of the EPD tool are approved by EPDNorway, and iii) the process is reviewed annually. See Appendix G of EPD-Norway's General Programme Instructions for further information on EPD tools.

### Developer of EPD:

Kenneth Dam Lindegaard Knudsen

### Reviewer of company-specific input data and EPD:

Fabio Fava

### Verification of EPD tool:

Independent third party verification of the EPD tool, background data and test-EPD in accordance with EPDNorway's procedures and guidelines for verification and approval of EPD tools.

### Approved:

Sign

Erik Svanes, Norsus AS

(no signature required)

Håkon Hauan, CEO EPD-Norge

Key environmental indicators	Unit	Cradle to gate A1 - A3
Global warming	kg CO2 eqv	66,41
Total energy use	MJ	935,52
Amount of recycled materials	%	59,16

## Product

### Market:

Worldwide

### Product description:

RH Logic collection is office chairs with optimal ergonomics and visual elegance, that provide comfort and enhances performance during the work day. Based on our vision of upright posture and active seating. RH Logic chairs are easily adjusted to individual needs and preferences, so that every user can find the perfect balance between movement and support.

Sustainability and environmental efficiency is a big part of RH Logic. The chair is designed to be long lasting and to make the lowest possible environmental impact throughout its life cycle – from raw material extraction to end-of-life

### Product specification

The model studied in this declaration is the RH Logic 220 including knock down packaging option 1. The model declared does not include any options such as armrests, headrest, etc.

The key environmental indicators for the other models and applicable options of the product collection are presented in a table on page 8 of this declaration.

### Technical data:

Total weight: 20,61 kg (packaging excluded)

Total weight: 24,74 kg (packaging included)

### Reference service life, product

### Reference service life, building

Materials	kg	%	Recycled share in material (kg)	Recycled share in material (%)
Others	0,02	0,07	0,00	1,24
Kraft paper unbleached	0,02	0,07	0,00	0,00
Metal - Aluminium	6,08	24,56	5,96	98,12
Metal - Steel	6,97	28,16	0,25	3,53
Textile - Polyester (PE)	0,21	0,84	0,29	141,58
Textile - Wool	0,00	0,01	0,00	0,00
Glass fibre	0,02	0,08	0,02	100,00
Packaging - Cardboard	0,80	3,24	0,00	0,00
Plastic - Polyurethane (PUR)	1,20	4,85	0,00	0,00
Plastic - Polyethylene	0,00	0,01	0,00	100,00
Plastic - Polypropylene (PP)	5,59	22,61	4,90	87,54
Plastic - Polyoxymethylene (POM)	0,33	1,35	0,00	0,00
Rubber, synthetic	0,03	0,11	0,00	0,00
Packaging - Plastic	0,04	0,15	0,00	0,00
Powder coating	0,02	0,07	0,00	0,00
Plastic - Nylon (PA)	0,10	0,41	0,00	0,00
Plastic - Polyamide with glass fibre (PAGF30)	0,07	0,28	0,00	0,00
Packaging - Paper	0,02	0,08	0,00	0,00
Textile - Felt	0,00	0,00	0,00	0,00
Packaging - Recycled cardboard	3,22	13,00	3,22	100,00
Plastic - Polyoxymethylene with glass fiber (POMGF20)	0,02	0,06	0,00	0,00
Total:	24,74		14,64	

## LCA: Calculation rules

### Declared unit:

1 Pcs RH Logic 220

### Cut-off criteria:

All major raw materials and all the essential energy is included. The production processes for raw materials and energy flows with very small amounts (less than 1%) are not included. These cut-off criteria do not apply for hazardous materials and substances.

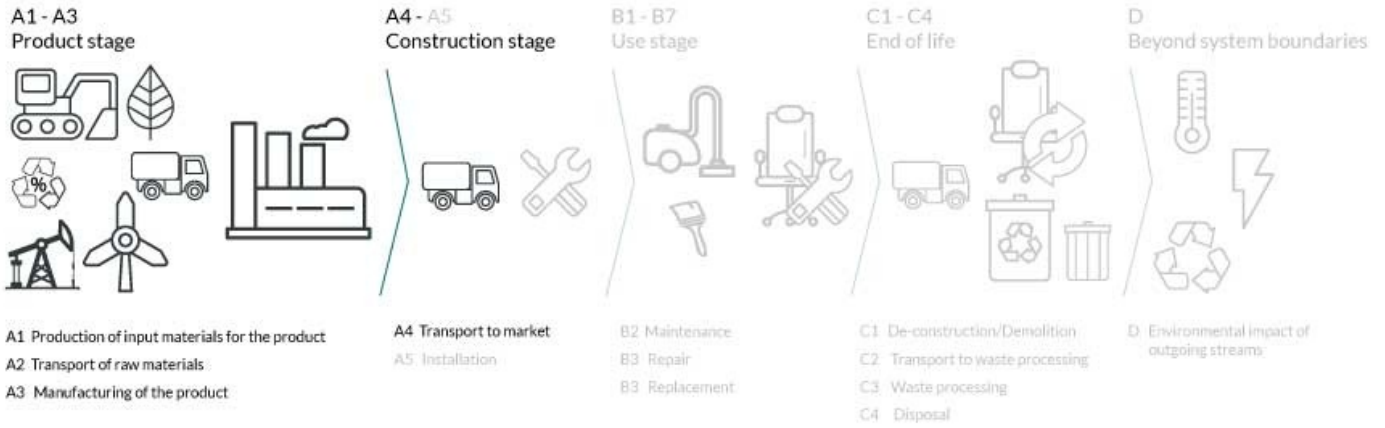
### Data quality:

Specific data for the product composition are provided by the manufacturer. They represent the production of the declared product and were collected for EPD development in the year of study. Background data is based on registered EPDs according to EN 15804, Ostfold Research databases, ecoinvent and other LCA databases. The data quality of the raw materials in A1 is presented in the table below.

### Allocation:

The allocation is made in accordance with the provisions of EN 15804. Effects of primary production of recycled materials is allocated to the main product in which the material was used. The recycling process and transportation of the material is allocated to this analysis.

**System boundary:**



**Additional technical information:**

Product specification (RH Logic 220):  
 Chair height: 406-550 mm (with standard gaslift)  
 Chair width: 442 mm  
 Chair depth: 477 mm

## LCA: Scenarios and additional technical information

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

### Transport from production place to user (A4)

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance km	Fuel/Energy consumption	Unit	Value (l/t)
Truck	55,0 %	Truck, over 32 tonnes, EURO 5	373	0,022823	l/tkm	8,51
Railway					l/tkm	
Boat					l/tkm	
Other Transportation					l/tkm	

### Assembly (A5)

.	Unit	Value
Auxiliary	kg	
Water consumption	m <sup>3</sup>	
Electricity consumption	kWh	
Other energy carriers	MJ	
Material loss	kg	
Output materials for waste treatment	kg	
Dust in the air	kg	
VOC emissions	kg	

### Use (B1)

.	Unit	Value

### Maintenance (B2)/Repair (B3)

.	Unit	Value
Maintenance cycle*		
Auxiliary		
Other resources		
Water consumption	m <sup>3</sup>	
Electricity consumption	kWh	
Other energy carriers	MJ	
Material loss	kg	
VOC emissions	kg	

### Replacement (B4)/Refurbishment (B5)

.	Unit	Value
Replacement cycle*		
Electricity consumption	kWh	
Replacement of worn parts		
* Described above if relevant		

### Operational energy (B6) and water consumption (B7)

.	Unit	Value
Water consumption	m <sup>3</sup>	
Electricity consumption	kWh	
Other energy carriers	MJ	
Power output of equipment	kW	

### End of Life (C1, C2)

.	Unit	Value
Hazardous waste disposed	kg	
Collected as mixed construction waste	kg	
Reuse	kg	
Recycling		
Energy recovery		
To 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					l/tkm	
Railway					l/tkm	
Boat					l/tkm	
Other Transportation					l/tkm	

Scenarios after A1-A4 are not included

## LCA: Results

The LCA results are presented below for the declared unit defined on page 2 of the EPD document.

### 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	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction 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	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 <sub>2</sub> -eq	6,51E+01	8,90E-01	4,13E-01	8,05E-01
ODP	kg CFC11 -eq	3,47E-06	1,72E-07	1,62E-08	1,57E-07
POCP	kg C <sub>2</sub> H <sub>4</sub> -eq	2,12E-02	1,56E-04	1,75E-04	1,30E-04
AP	kg SO <sub>2</sub> -eq	2,72E-01	3,36E-03	1,10E-03	2,62E-03
EP	kg PO <sub>4</sub> <sup>3-</sup> -eq	1,01E-01	5,22E-04	4,98E-04	4,39E-04
ADPM	kg Sb -eq	2,58E-03	1,93E-06	3,31E-06	1,82E-06
ADPE	MJ	6,76E+02	1,38E+01	1,85E+00	1,26E+01

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

Reading example: 9,0 E-03 = 9,0\*10<sup>-3</sup> = 0,009

\*INA Indicator Not Assessed

### Resource use

Parameter	Unit	A1	A2	A3	A4
RPEE	MJ	8,77E+01	2,52E-01	2,30E+01	2,28E-01
RPEM	MJ	1,28E+01	0,00E+00	0,00E+00	0,00E+00
TPE	MJ	1,01E+02	2,52E-01	2,30E+01	2,28E-01
NRPE	MJ	8,06E+02	1,42E+01	3,39E+00	1,30E+01
NRPM	MJ	7,05E+01	0,00E+00	0,00E+00	0,00E+00
TRPE	MJ	8,77E+02	1,42E+01	3,39E+00	1,30E+01
SM	kg	1,46E+01	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	5,44E-02	0,00E+00	5,19E-04	0,00E+00
NRSF	MJ	2,29E-02	0,00E+00	5,32E-01	0,00E+00
W	m <sup>3</sup>	5,92E-01	3,31E-03	1,57E-03	3,07E-03

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

Reading example: 9,0 E-03 =  $9,0 \cdot 10^{-3} = 0,009$

\*INA Indicator Not Assessed

### End of life - Waste

Parameter	Unit	A1	A2	A3	A4
HW	kg	6,44E-02	7,60E-06	7,53E-04	6,92E-06
NHW	kg	4,37E+01	1,26E+00	4,39E-01	1,18E+00
RW	kg	INA*	INA*	INA*	INA*

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

Reading example: 9,0 E-03 =  $9,0 \cdot 10^{-3} = 0,009$

\*INA Indicator Not Assessed

### End of life - Output flow

Parameter	Unit	A1	A2	A3	A4
CR	kg	2,57E-05	0,00E+00	0,00E+00	0,00E+00
MR	kg	7,98E-02	0,00E+00	6,25E-01	0,00E+00
MER	kg	2,44E-01	0,00E+00	1,63E-03	0,00E+00
EEE	MJ	INA*	INA*	INA*	INA*
ETE	MJ	INA*	INA*	INA*	INA*

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 =  $9,0 \cdot 10^{-3} = 0,009$

\*INA Indicator Not Assessed

## Additional Norwegian 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).

Electricity mix	Data source	Amount	Unit
Energy, district heating, Norwegian average (kWh)	Østfoldforskning	19,71	g CO <sub>2</sub> -ekv/kWh
Energy, electricity, Nordic average, hydro: 1 kWh	Østfoldforskning	10,19	g CO <sub>2</sub> -ekv/kWh

### Dangerous substances

The product contains no substances given by the REACH Candidate list or the Norwegian priority list.

### Indoor environment

GREENGUARD Gold certified

## Additional environmental information

Key environmental indicators for variants for this EPD: Cradle to Gate analyse from A1 to A3

Variant number	Global warming (kg CO <sub>2</sub> )	Total energy use (MJ)	Share of recycled material in product(%)
RH Logic 200 - Upholstery seat/back (Cura/Gabriel) - No packaging	59,38	841,61	54,65
RH Logic 200 Elite - Upholstery seat/back (Cura/Gabriel) - No packaging	62,28	894,24	53,37
RH Logic 220 - Upholstery seat/back (Cura/Gabriel) - No packaging	60,85	867,36	55,41
RH Logic 220 Elite - Upholstery seat/back (Cura/Gabriel) - No packaging	64,26	929,14	53,93

Key environmental indicators for options for this EPD: Cradle to Gate analyse from A1 to A3

Option number	Global warming (kg CO <sub>2</sub> )	Total energy use (MJ)	Share of recycled material in product(%)
Neckrest RH Logic 200-220 - Fabric (Cura/Gabriel)	4,58	65,76	75,31
Neckrest RH Logic 200-220 - Leather (Wollsdorf/Paloma soft)	10,20	85,40	46,38
Armrests 8L - Leather (Wollsdorf/Paloma soft)	18,14	203,21	58,16
Armrests 8L - TPU	16,07	206,37	61,02
Packaging 1 (Small box, not assembled - used in declared unit)	5,56	68,16	77,87
Packaging 2 (Large box, fully assembled)	7,44	91,40	82,50

## Bibliography

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

ISO 14044:2006 Environmental management - Life cycle assessment - Requirements and guidelines.

EN 15804:2012+A1:2013 Environmental product declaration - Core rules for the product category of construction products.

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NPCR Part A: Construction products and services. Ver. 1.0. April 2017, EPD-Norge.

NPCR 026 Part B for Furniture. Ver. 2.0 October 2018, EPD-Norge.

<p>Global Program Operator</p>	<b>Program operator and publisher</b> The Norwegian EPD Foundation Post Box 5250 Majorstuen, 0303 Oslo, Norway	Phone: +47 23 08 80 00 e-mail: post@epd-norge.no web: www.epd-norge.no
	<b>Owner of the declaration</b> Flokk AS Drammensveien 145, 0277 Oslo	Phone: 0047 98 25 68 30 e-mail: atle.messel@flok.com web: https://www.flok.com
	<b>Author of the Life Cycle Assessment</b> LCA.no AS Dokka 6B 1671 Kråkerøy	Phone: +47 916 50 916 e-mail: post@lca.no web: www.lca.no
	<b>Developer of EPD generator</b> LCA.no AS Dokka 1C 1671 Kråkerøy	Phone: +47 916 50 916 e-mail: post@lca.no web: www.lca.no