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The Norwegian EPD Foundation

ENVIRONMENTAL PRODUCT DECLARATION

In accordance with ISO 14025

Owner of the declaration	Fora Form AS
Program holder and publisher	The Norwegian EPD Foundation
Declaration number	NEPD-1283-413-EN
Issue date	14.03.2017
Valid to	14.03.2022

Con II - high backrest , armrest

Product

FORA FORM

Fora Form AS

Manufacturer

General information

Product

Con II - high backrest , armrest

Owner of the declaration:

Fora Form AS
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General Information

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Manufacturer

Fora Form AS

Declaration number:

NEPD-1283-413-EN

Place of production:

Mosflatevegen 6154 Ørsta Norway

This declaration is based on Product Category Rules:

PCR for seating solution,NPCR 003 extended version 2013, in accordance with recommedations by the norwegian EPD Foundation.

Management system:

NS-EN ISO 14001:2004 Certificat No.800406
NS-EN ISO 9001: 2008 Certificat No.901268

Declared unit:

One chair,upholstered with powder coated base , armrest

Org. No:

Org No 986 581 421

Declared unit with option:

No options

Issue date:

14.03.2017

Functional unit:

Production of one seating solution provided and maintained for a period of 15. years

Valid to:

14.03.2022

This EPD has been worked out by:

The declaration has been developed using Furniture EPD Tool Version 1.2.1, Approval: NEPDT04
Company specific data collected and registered by:
Kåre Sætre
Company specific data audited by:
Anders Utgård

Comparability:

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

Year of study:

2016

Verification:

Independent verification of data, other environmental information and EPD has been carried out in accordance with ISO14024, 8.1.3. and 8.1.4.

externally

Approved

Mie Vold, Senior Research Scientist
(Independent verifier approved by EPD Norway)

Håkon Hauan
Managing Director of EPD-Norway

Key environmental indicators	Unit	Cradle to Gate A1-A3
Global warming	kg CO_2	28
Total energy use	MJ	424
Amount of recycled materials	%	25 %

Product

Product Description and Application

Con is result of a mini competition where designer Lars Tornøe won. Lars Tornøe wanted the new chair series to be a simplistic contribution to Fora Forms collection. The design is inspired by Japanese armor as well as the art of saddle making. This initiative lays the foundation for a chair series with numerous opportunities to select fabric / leather, various types of base, armrests and backrest height.

Technical Data

Total Weight: 6,7 kg / without cardboard
NS-EN 16139 : 2013 approved

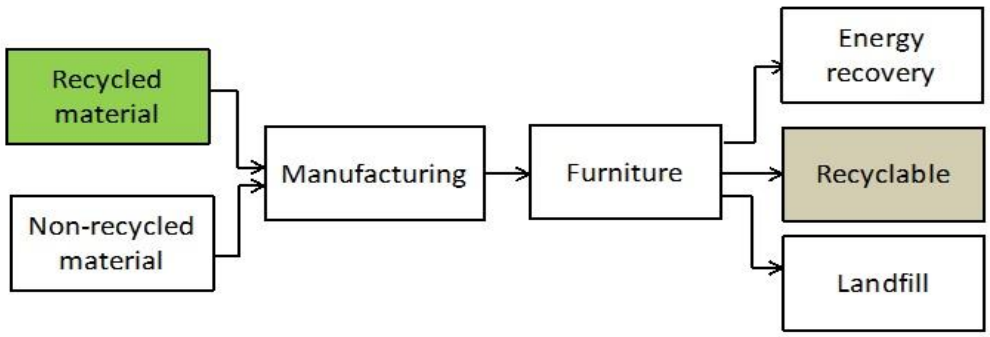
Market

Worldwide

Reference Service Life

15 years

Materials			Recycled material in manufactured product		Recyclable material at end of product life	
Unit	kg	%	%	kg	%	kg
Polypropylene	2,90	43 %	50 %	1,45	100 %	2,90
Steel	1,50	22 %	0 %	0,00	100 %	1,50
Polyurethane	1,00	15 %	0 %	0,00	100 %	1,00
Textiles	0,70	10 %	0 %	0,00	0 %	0,00
Aluminium	0,40	6 %	50 %	0,20	100 %	0,40
Polyethylene	0,20	3 %	0 %	0,00	100 %	0,20
Total	6,70		25 %		90 %	

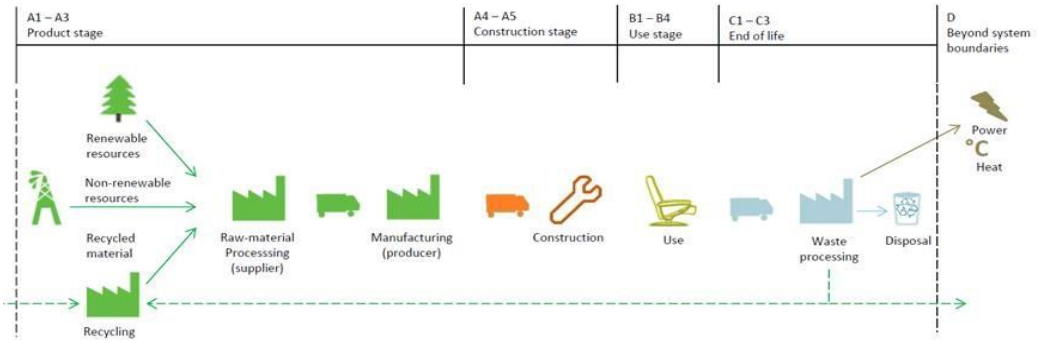


Product manufactured from 25% recycled material
At end of life product contains 90% recyclable material

LCA: Calculation rules

Declared Unit
One chair,upholstered with powder coated base , armrest

System Boundary
Life cycle stages included are described in figure and through the corresponding letter and number designations in the



Data quality
Specific manufacturing data from 2014 are used. Data from Ecoinvent 3.0.1. and Østfoldforskning databases are used as the basis for raw materials and energy carrier production. See [6].

Cut-off criteria
All major raw materials and all the essential energy is included. The production processes for raw materials and energy flows that are included with very small amounts (<1%) are not included. This cut-off rule does not apply for hazardous materials and substances

Allocation
Where virgin materials are used, emissions and energy consumption connected with extraction and production are included.
Where recycled materials are used in the product, emissions and energy consumption related to the recycling process are included.
Emissions from incineration are allocated to the product system that uses the recovered energy.
Emissions from incineration of waste are allocated to the product system that uses the recovered energy.

LCA: Scenarios and additional technical information

Transportation to an average customer in Copenhagen is 1000 km (A4: average European lorry > 32 tonnes)

The use stage (B1) is represented by a scenario and includes vacuum cleaning of textile once a month. The PCR does not provide detailed guidelines for what should be included in the use stage. In the end of life stage, the transport distance for waste to waste processing is 72 km (C1). The reuse, recovery and recycling stage is beyond the system boundaries (D). It is assumed that the solution is dismantled and the materials recycled or combusted according to general Norwegian treatment of industrial waste (see the table below). This calculation includes only CO2 emissions (GWP) in the C-modules. The transport distance to reuse, recovery or recycling varies for each material, but the average distance is 373 km. The vehicles used and associated data are described in detail in [5].

	Material recovery	Energy recovery	Disposal
Aluminium	70,1 %	0,0 %	30 %
Steel	70,1 %	0,0 %	30 %
Plastic	64,3 %	30,8 %	5 %
Cardboard	94,5 %	5,5 %	0 %

LCA: Results

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

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

Product stage			Construction stage		Use stage				End of life			Beyond the system boundaries
Raw materials	Transport	Manufacturing	Transport	Construction	Maintenance	Repair	Replacement	Operational energy use	Transport	Waste Processing	Disposal	Reuse-recovery-recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	C1	C2	C3	D
x	x	x	x	MNR	x	MNR	MNR	MNR	x	x	x	x

Environmental impact (INA = Indicator Not Assessed)

Parameter	A1	A2	A3	A1-A3	A4	B1	C1	C2	C3	C1-C3	D
GWP	19,4	0,8	7,5	27,7	0,0	0,0	0,6	10,2	6,9E-03	10,8	-5,3
ODP	5,8E-07	1,6E-07	7,5E-07	1,5E-06	0,0	0,0	INA	INA	INA	INA	-5,4E-09
POCP	5,2E-03	1,5E-04	2,2E-03	7,6E-03	0,0	0,0	INA	INA	INA	INA	-6,7E-03
AP	2,7E-02	7,3E-04	1,5E-02	4,3E-02	0,0	0,0	INA	INA	INA	INA	-2,1E-03
EP	0,1	3,4E-03	3,8E-02	0,1	0,0	0,0	INA	INA	INA	INA	-1,8E-02
ADPM*	9,8E-05	1,9E-06	1,6E-05	1,2E-04	0,0	0,0	INA	INA	INA	INA	-6,0E-06
ADPE	335,3	12,9	100,2	448,4	0,0	0,0	INA	INA	INA	INA	-167,3

GWP Global warming potential (kg CO2-eqv.); ODP Depletion potential of the stratospheric ozone layer (kg CFC11-eqv.); POCP Formation potential of tropospheric photochemical oxidants (kg C2H4-eqv.); AP Acidification potential of land and water (kg SO2-eqv.); EP Eutrophication potential (kg PO4-3-eqv.); ADPM Abiotic depletion potential for non fossil resources (kg Sb -eqv.); ADPE Abiotic depletion potential for fossil resources (MJ);

* Some processes use Ecoinvent 3.0.1. and thus data on renewable resources is omitted. The true ADPM, RPEE, RPEM and TPE may be higher than indicated. This issue will be addressed in a new version of Ecoinvent 3, data from which was not available when this declaration was prepared.

Resource use (INA = Indicator Not Assessed)

Parameter	A1	A2	A3	A1-A3	A4	B1	C1	C2	C3	C1-C3	D
RPEE*	15,0	0,2	12,6	27,8	0,0	0,0	INA	INA	INA	INA	-0,7
RPEM*	1,5	0,1	4,1	5,7	0,0	0,0	INA	INA	INA	INA	-0,5
TPE*	16,5	0,3	16,8	33,5	0,0	0,0	INA	INA	INA	INA	-1,2
NRPE	257,9	13,4	124,8	396,1	0,0	0,0	INA	INA	INA	INA	-164,7
NRPM	111,8	0,0	0,0	111,8	0,0	0,0	INA	INA	INA	INA	0,0
TNRPE	369,7	13,4	124,8	507,9	0,0	0,0	INA	INA	INA	INA	-164,7
SM	0,2	0,0	0,0	0,2	0,0	0,0	INA	INA	INA	INA	-1,1
RSF	0,0	0,0	0,0	0,0	0,0	0,0	INA	INA	INA	INA	0,0
NRSF	0,0	0,0	0,4	0,4	0,0	0,0	INA	INA	INA	INA	0,0
W	0,0	0,0	0,4	0,4	0,0	0,0	INA	INA	INA	INA	0,0

RPEE Renewable primary energy resources used as energy carrier (MJ); RPEM Renwable primary energy resources used as raw materials (MJ); TPE Total use of renewable primary energy resources (MJ); NRPE Non renewable primary energy resources used as energy carrier (MJ); NRPM Non renewable primary energy resources used as materials (MJ); TNRPE Total use of non renewable primary energy resources (MJ); SM Use of secondary materials (kg); RSF Use of renewable secondary fuels (MJ); NRSF Use of non renewable secondary fuels (MJ); W Use of net fresh water (m3);

End of life - Waste and Output flow (INA = Indicator Not Assessed)

Parameter	A1	A2	A3	A1-A3	A4	B1	C1	C2	C3	C1-C3	D
HW	1,9E-03	7,6E-06	2,7E-04	2,1E-03	0,0	0,0	INA	INA	INA	INA	0,0
NHW	6,1	1,3	3,7	11,1	0,0	0,0	INA	INA	INA	INA	-0,2
RW	0,0	0,0	0,0	0,0	0,0	0,0	INA	INA	INA	INA	0,0
CR	0,0	0,0	0,0	0,0	0,0	0,0	INA	INA	INA	INA	0,0
MR	0,0	0,0	0,0	0,0	0,0	0,0	INA	INA	INA	INA	0,0
MER	0,0	0,0	0,0	0,0	0,0	0,0	INA	INA	INA	INA	0,0
EEE	0,0	0,0	0,0	0,0	0,0	0,0	INA	INA	INA	INA	0,0
ETE	0,0	0,0	0,0	0,0	0,0	0,0	INA	INA	INA	INA	0,0

HW Hazardous waste disposed (kg); NHW Non hazardous waste disposed (kg); RW Radioactive waste disposed (kg); CR Components for reuse (kg); MR Materials for recycling (kg); MER Materials for energy recovery (kg); EEE Exported electric energy (MJ); ETE Exported thermal energy (MJ);

Specific Norwegian requirements

Electricity

The electricity consumed is Norwegian electric power

Dangerous Substances
None of the following substances have been added to the product :
Substances on the REACH Candidate list of substances of very high concern (of '16.06.2014) and substances that lead to the product being classified as hazardous waste. The chemical content of the product complies with regulatory levels as given in the Norwegian Product Regulations

Indoor Environment
Our furniture doesn't contain any substrates that affect indoor climate.

Climate Declaration

Not relevant

Bibliography

[1] NS-EN ISO 14025:2006, Environmental labels and declarations-Type III environmental declarations-Principles and procedures.

[2] NS-EN ISO 14044:2006, Environmental management - Life cycle assessment - Requirements and guidelines

[3] EN 15804:2012 + A1:2013 Sustainability of construction works - Environmental product declaration - Core rules for the product category of construction products

[4] Product category rules (PCR) for preparing an environmental product declaration for:
Product Group Seating Solution NPCR 003: 2015; Product Group Plate Furniture NPCR 021: 2012

[5] Raadal, H. L., Modahl, I. S., Lyng, K. A. (2009). Klimaregnskap for avfallshåndtering, Fase I og II. OR 18.09. ISBN : 978-82-7520-611-2, 82-7520-611-1

[6] Brekke, A., Møller, H., Baxter, J., Askham, C. (2014). Verktøy - miljødeklarasjon for møbel Dokumentasjon som grunnlag for verifisering, Ostfold Research

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