Environmental Product Declaration

In accordance with ISO 14025 for:

Alf: tables

from

markproduct.com

Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	S-P-04308
Publication date:	2021-07-01
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Programme information

Programme:	The International EPD® System EPD International AB Box 210 60 SE-100 31 Stockholm Sweden www.environdec.com info@environdec.com

Product category rules (PCR): 2012-19 Furniture, except seats and mattresses. Valid until: 2023-06-17.
PCR review was conducted by: Leo Breedveld, 2B Srl, breedveld@to-be.it
Independent third-party verification of the declaration and data, according to ISO 14025:2006: ☐ EPD process certification ☒ EPD verification
Third party verifier: Dr. Hudai Kara, Metsims Sustainability Consulting [www.metsims.com] Approved by: The International EPD® System
Procedure for follow-up of data during EPD validity involves third party verifier: ☐ Yes ☒ No

The EPD owner has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programmes may not be comparable.

Company information

MARK Product (Hart Miller Design Ltd)

MARK Product is led by its founders, Anna Hart and John Miller, who met in Cornwall in 2007 through a shared passion for furniture, design and a belief in British manufacturing craft.

We launched MARK a year later with the aim to design and manufacture in a more sustainable way. Our mission is to Do Net Good – by people and the planet, and we aim to honestly share our journey – the highs and the lows. We are aiming for a truly circular model of production, working within the UN Sustainable Development Goals and following the Science Based Targets Initiative towards global net carbon zero. We have commissioned this EPD as part of this journey.

MARK blends different but complementary approaches; craft skill with digital production techniques, personal service with high-volume capacity, interior design with product engineering, and Cornish and urban perspectives. Drawing on diverse talent from across Cornwall and the UK, skilled people from the creative, manufacturing and sustainability worlds bring the MARK vision to life.

Name and location of production site:

Rosemanowes Quarry, Herniss, Penryn, Cornwall, TR10 9DU
enquiries@markproduct.com | 01209 860 133

Product information

Product: Alf tables

Product identification:

Alf Table with timber top, or laminated top (900 mm diameter).

Product description:
Inclusive of chair, table and stool the stacking Alf range brings great personality to both eating and meeting spaces indoors and out. Made in an innovative way using high-tech 3D laser machinery. Tubes are laser-cut in three dimensions, hand-folded into their final shape and welded. These elements resemble letters of the alphabet giving Alf its name. The chair and stool have a separate EPD (S-P-03293).

UN CPC code:
3812 (other furniture, of a kind used in offices).

Other codes for product classification:

square table ALST
round table ALRT

Geographical scope: Europe

LCA information

Functional unit / declared unit:

One Alf table.

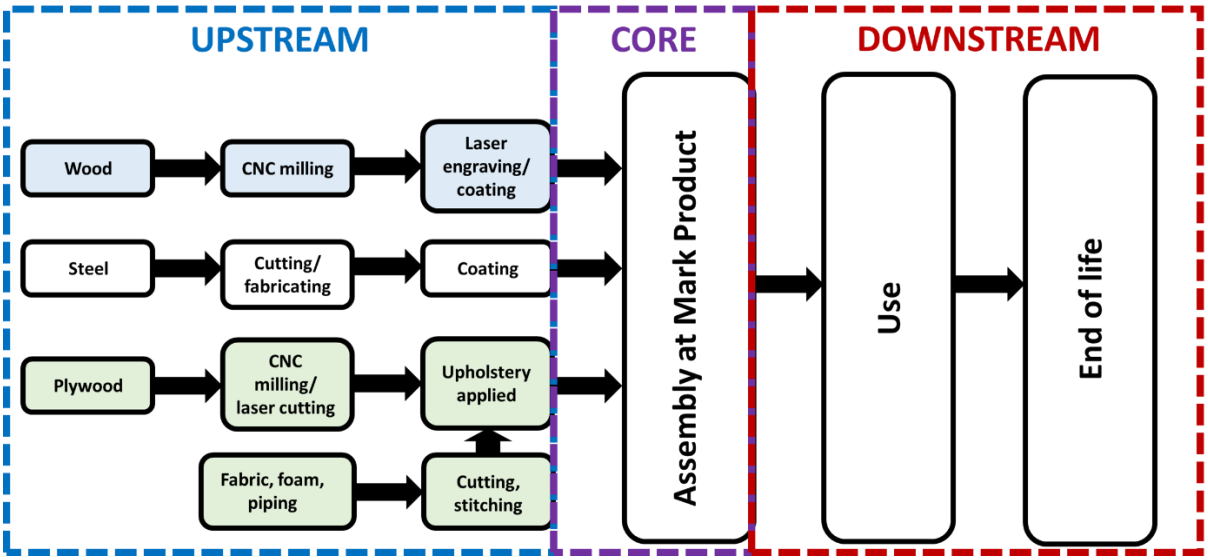
Reference service life:

A default reference service life of 15 years has been assumed, in line with the PCR for furniture. MARK Product warrants the products manufactured by it to be free from defects in material and workmanship for a period of ten (10) years. Service life is expected to be considerably longer than this.

Time representativeness: 2019

Database(s) and LCA software used: Ecoinvent 3.7 with Simapro 9.1.0.7.

System diagram:



Note: Inputs in white are for both product ranges, inputs in blue are for solid tops, inputs in green for upholstered tops.

Description of system boundaries: Cradle to grave.
Excluded lifecycle stages: None
More information: For further information see: http://www.markproduct.com/
Name and contact: John Miller (john@markproduct.com)

This EPD is based upon an underlying LCA of the MARK product manufacturing process, with operational data obtained for 2019.

The underlying LCA was conducted by Dr Callum Hill, senior consultant at Renuables Ltd (http://renuables.co.uk/). All relevant inputs and outputs have been considered in the LCA. A standard GB electricity grid mix was used.

For indicator values: CML baseline for the GWP, AP, EP, ADP-elements, ADP-fossil resources, ReCiPe for POCP, CED for Primary energy resources renewable/non-renewable used as energy carrier, AWARE for water scarcity potential, USEtox for human toxicity and ecotoxicity, ReCiPe for land use.

Higher heating value was used for all calculations involving primary energy resources (see www.environdec.com for more information).

The energy content of biogenic materials (wood, plywood, feathers, wool), was calculated with corrections made for a moisture content of 10%. These data were obtained from the Phyllis 2 database. Cut-off criteria were based upon input flows being less than 1% of the total individually, subject to the sum of all flows being less than 5% of the total, and subject to verification that the impacts associated with such flows were not of a magnitude to affect the reported data significantly (less than 5% in total). Losses due to CNC milling of wood and plywood and cutting of metals and upholstery were assumed to be 5% by mass, with the waste going for incineration (no energy recovery was assumed). Losses of upholstery material during processing were assumed to be 5% by mass, with the waste going for incineration (no energy recovery).

Emissions of biogenic carbon due to incineration of wastes were accounted for in the Upstream stage. Losses due to cutting of steel were assumed to be 5% by mass, with the waste material going for recycling. No losses for cutting of the steel tubing were assumed.

No maintenance is required for the use phase.

Manufacture of cardboard packaging (where used) is included in the Upstream process and disposal of packaging in the Downstream. Burdens associated with electricity use in the MARK Product production facility were by economic allocation for each of the products.

Transport

Delivery from the MARK Product factory in Cornwall to central London was assumed as typical, in the Downstream part of the lifecycle.

Packaging

Tables are blanket-wrapped and the blankets re-used.

End of Life

Although the furniture is designed for a long life and a buy-back scheme is in operation, a generic loss of materials during the Downstream phase was assumed within a 15-year reference service life. This is considered a worst-case scenario, since recycling is more likely.

Biogenic carbon content of natural materials was calculated using the methodolody described in EN 16485, assuming a moisture content of 10% by weight and a carbon content of 50% by weight for wood-based products and 48% for proteinaceous products (wool, feathers). No substance included in the Candidate List of Substances of Very High Concern for authorisation under the REACH Regulations is present in the furniture.

The carbon stored in the biogenic materials used in the furniture is counted as a negative emission (a flow from the atmosphere into the analysed system).

Product	Stored atmospheric carbon (kg CO_2 eq)
Alf table – oak top	-13.60
Alf table – laminated ply top	-15.92

Content declaration

Product (weight in kg)

Product	Steel	Polymer	Wood	Nat fibre	TOTAL
Alf table – oak top	6.69	0.07	8.24	0.00	**15.00**
Alf table – laminated ply top	6.69	0.07	9.65	0.00	**16.41**

Packaging

Distribution packaging: Tables are blanket-wrapped and the blankets are re-used.

Recycled material

Provenance of recycled materials (pre-consumer or post-consumer) in the product: N/A. The use of recycled material was not considered in the analysis. However, at end of life, furniture can be recovered and refurbished (see additional information section).

Environmental indicators

This EPD contains information about environmental impact, use of resources and waste production in the form of quantitative indicators. The following abbreviations have been used in the tables which quantify environmental performance:

Indicator	Abbreviation
Global warming potential (Fossil, biogenic, land use and transformation (LUT))	GWP
Depletion potential of the stratospheric ozone layer	ODP
Acidification potential	AP
Eutrophication potential	EP
Formation potential of tropospheric ozone	POCP
Abiotic depletion potential – Elements	ADPE
Abiotic depletion potential – Fossil resources	ADPF
Water scarcity potential	WSP
Primary energy resources – Renewable (use as energy carrier)	PERE
Primary energy resources – Renewable (use raw materials)	PERM
Primary energy resources – Renewable (total)	PERT
Primary energy resources – Non-renewable (use as energy carrier)	PENRE
Primary energy resources – Non-renewable (use raw materials)	PENRM
Primary energy resources – Non-renewable (total)	PENRT
Secondary material	SM
Renewable secondary fuels	RSF
Non-renewable secondary fuels	NRSF
Net use of fresh water	NUFW
Hazardous waste disposed	HWD
Non-hazardous waste disposed	NHWD
Radioactive waste disposed	RWD
Components for re-use	CFR
Material for recycling	MFR
Materials for energy recovery	MFER
Exported energy, electricity	EE-E
Exported energy, thermal	EE-T
Human toxicity (cancer)	H. Tox-C
Human toxicity (non-cancer)	H. Tox-NC
Ecotoxicity	E. Tox
Land use	LU

Environmental performance

Potential environmental impact-Alf table

Alf table (900 mm dia)			Timber top (ALRTW)				Laminated top (ALRTL)			
Parameter		Unit	Upstream	Core	Downstream	TOTAL	Upstream	Core	Downstream	TOTAL
GWP	Fossil	kg CO_2 eq.	3.54E+01	3.69E+00	1.07E+00	4.01E+01	3.88E+01	3.62E+00	1.16E+00	4.36E+01
	Biogenic	kg CO_2 eq.	-5.06E+00	2.10E-04	3.30E+00	-1.76E+00	-1.76E+01	8.38E-05	3.30E+00	-1.43E+01
	LUT	kg CO_2 eq.	8.86E-02	3.39E-04	4.38E-04	8.94E-02	1.01E-01	1.44E-04	4.74E-04	1.02E-01
	TOTAL	kg CO_2 eq.	1.68E+01	3.69E+00	4.37E+00	2.49E+01	2.14E+01	3.62E+00	4.46E+00	2.95E+01
ODP		kg CFC 11 eq.	2.99E-06	5.72E-07	2.03E-07	3.77E-06	3.51E-06	5.65E-07	2.20E-07	4.30E-06
AP		kg SO_2 eq.	1.64E-01	2.08E-02	5.53E-03	1.90E-01	1.95E-01	2.07E-02	5.98E-03	2.22E-01
EP		kg PO_4^{3-} eq.	6.17E-02	1.40E-03	1.28E-03	6.44E-02	7.05E-02	1.29E-03	1.39E-03	7.32E-02
POCP		kg NMVOC eq.	1.53E-01	1.02E-02	3.88E-02	2.02E-01	1.73E-01	1.05E-02	4.11E-02	2.25E-01
ADPE		kg Sb eq.	9.81E-05	1.55E-06	2.74E-06	1.02E-04	1.14E-04	9.43E-07	2.97E-06	1.18E-04
ADPF		MJ*	3.66E+02	4.31E+01	1.65E+01	4.25E+02	4.26E+02	4.24E+01	1.78E+01	4.86E+02
WSP		m^3 eq.	9.80E+00	3.86E-01	1.36E-01	1.03E+01	1.59E+01	3.71E-01	1.46E-01	1.64E+01

*****net calorific value*

Use of resources

Alf table (900 mm dia)		Timber top (ALRTW)				Laminated top (ALRTL)			
Parameter	Unit	Upstream	Core	Downstream	TOTAL	Upstream	Core	Downstream	TOTAL
PERE	MJ*	4.19E+02	1.04E+00	2.44E-01	4.20E+02	5.35E+02	9.59E-01	2.64E-01	5.37E+02
PERM	MJ*	2.00E+02	0.00E+00	0.00E+00	2.00E+02	1.87E+02	0.00E+00	0.00E+00	1.87E+02
PERT	MJ*	6.18E+02	1.04E+00	2.44E-01	6.19E+02	7.23E+02	9.59E-01	2.64E-01	7.24E+02
PENRE	MJ*	4.26E+02	4.67E+01	1.78E+01	4.91E+02	5.09E+02	4.58E+01	1.93E+01	5.74E+02
PENRM	MJ*	1.10E+00	0.00E+00	0.00E+00	1.10E+00	1.10E+00	0.00E+00	0.00E+00	1.10E+00
PENRT	MJ*	4.28E+02	4.67E+01	1.78E+01	4.92E+02	5.10E+02	4.58E+01	1.93E+01	5.75E+02
SM	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	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	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NUFW	m^3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

**net calorific value*

Waste production and output flows

Waste production

Alf table (900 mm dia)		Timber top (ALRTW)				Laminated top (ALRTL)			
Parameter	Unit	Upstream	Core	Downstream	TOTAL	Upstream	Core	Downstream	TOTAL
HWD	kg	2.60E-03	1.01E-04	9.74E-06	2.72E-03	2.55E-03	3.49E-06	1.05E-05	2.56E-03
NHWD	kg	7.55E+00	1.75E-01	6.34E+00	1.41E+01	7.15E+00	3.20E-01	6.70E+00	1.42E+01
RWD	kg	1.65E-03	4.02E-05	1.15E-04	1.80E-03	1.92E-03	3.71E-05	1.24E-04	2.08E-03

Output flows

Alf table (900 mm dia)		Timber top (ALRTW)				Laminated top (ALRTL)			
Parameter	Unit	Upstream	Core	Downstream	TOTAL	Upstream	Core	Downstream	TOTAL
CFR	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFER	kg	4.12E-01	0.00E+00	0.00E+00	4.12E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE-E	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE-T	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Other environmental indicators

Alf table		Timber top (ALRTW)				Upholstered top (ALRTU)			
Parameter	Unit	Upstream	Core	Downstream	TOTAL	Upstream	Core	Downstream	TOTAL
H. Tox-C	CTUh	2.91E-09	2.91E-09	2.91E-09	2.91E-09	2.83E-06	3.44E-10	2.92E-10	2.83E-06
H. Tox-NC	CTUh	2.91E-09	2.91E-09	2.91E-09	2.91E-09	2.52E-06	9.89E-10	3.15E-09	2.52E-06
E. Tox	CTUe	2.91E-09	2.91E-09	2.91E-09	2.91E-09	7.70E+01	1.37E-03	3.18E-03	7.70E+01
LU	Species.yr	2.91E-09	2.91E-09	2.91E-09	2.91E-09	1.92E-07	1.68E-10	5.86E-10	1.92E-07

Additional information

We have developed our design principles to support a circular model of manufacture, consumption, and re-manufacture. Firstly, all our products have a design lifetime of 30 years plus. This means that ease of repair and refurbishment are factored in at the design stage. We design to allow spare part replacement and pledge to manufacture spare parts indefinitely. A broken leg or a missing cushion can be easily replaced using simple tools - return to the factory is not necessary. We also offer MARK Renew - a take-back, repair and renew service - metal can be recoated, soft seating can be reupholstered and wood finishes can be restored.

At ultimate end-of-life, the same design approach allows easy disassembly into different waste streams for recycling or repurposing.

In addition to the above, the furniture industry has an established second-hand market, and in recent years a number of community 'upcycling' social enterprise projects have developed working with redundant furniture. Furniture is generally suitable for these routes if it avoids composites such as chipboard, and is easy to disassemble.

References

General Programme Instructions of the International EPD® System. Version 3.0.

PCR Basic Module, CPC Division 38 Furniture and other transportable goods, version 3.02

PCR 2012:19, version 2.01. Furniture, except seats and mattresses. Valid until: 2023-06-17.

EN 16449:2014 Wood and wood-based products. Calculation of the biogenic carbon content of wood and conversion to carbon dioxide.

ISO 14040: 2006 Environmental management - Life cycle assessment – Principles and Framework

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

ISO 14025: 2005 Environmental labels and declarations - Type III environmental declarations - Principles and procedures

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