EPD®

THE INTERNATIONAL EPD® SYSTEM

This EPD conforms with ISO 14025

Programme: The International EPD® System
www.environdec.com

Programme operator: EPD International AB

Connect3 Workstation With Screens

Environmental Product Declaration

An EPD should provide current information and may be updated if conditions change.
The stated validity is therefore subject to the continued registration and publication at www.environdec.com

EPD registration number: S-P-02069
Date of publication: 2020-06-12
Date of validity: 2025-06-03

VERIFICATION
Third Party Verifier:
Chris Foster, EuGeos Limit

Introduction

This Environmental Product Declaration (EPD) is for the KI (Krueger International, Inc) KI's Connect3 Workstation - four-person bench with two L series screens. The total bench area is 1600 X 3200mm. This is a cradle to grave EPD based upon production information and data collected by KI from their producers in 2020.

KI has the sole ownership, liability and responsibility of this EPD.
This EPD was modelled in SimaPro 9.0.0.24 using data from Ecoinvent version 3.5 and World Steel data for the EU sourced steel.

"EPDs within the same product category but from different programmes may not be comparable."

Programme Information

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Product category rule: Furniture, except seats and mattresses. Product category classification: UN CPC 3812/3813/3814. Version 2.0. Valid until: 2023-06-17.

PCR reviewed by: Arper SpA, 2B Srl

EPD registration number: S-P-02069

CPC code: 3812

Type of EPD: Cradle to grave
EPD geographical scope: Europe
Product Codes: CN3/1632/CT/2/4
Declared unit: One item Connect3 Workstation - four-person bench with two L series screens in use for 15 years.

Third Party Verifier: Chris Foster, EuGeos Limited

Approved by: The International EPD® System
Independent third-party verification of the declaration and data, according to ISO 14025:2006:
☐ EPD process certification ☑ EPD verification

Life Cycle Assessment (LCA) conducted by: Giraffe Innovation Ltd.
www.giraffeinnovation.com

Company Profile

KI's furniture helps the world's leading organisations create happy, healthy, high performing working and learning environments for their people. Bringing together good design, advanced engineering and sustainable resources, KI's products are durable, flexible and offer excellent value.

Founded in 1941, KI has grown to become one of the world's largest, most respected furniture manufacturing groups. KI's EMEA headquarters in London is supported by an established network of manufacturing facilities and distribution partners across the region. For more information, visit: www.kieurope.com

Product Description

The Connect3 bench Workstation shown in this EPD is available in 5 steel frame colours and 12 worktop finishes. There are many further length and width options. The L series screens are 374mm high above the desk surface.

This EPD applies to Connect3 4-person Workstation 1600 X 3200mm with two particle board L series screens covered in Cara fabric which are edged in PVC and weighs approximately 182kg. The product was manufactured for KI in Kirkbymoorside, North Yorkshire and Tiptree, Essex UK.

KI's Connect3 is of modular platform featuring an innovative leg-to-rail connection, consisting of a goalpost leg frame and single traverse rail design with KI-branded end caps, it ensures clear, unencumbered space both above and below the worksurface.

All the products framework is manufactured from cold rolled European sheet steel which is cut to size and formed into the main body parts. These are then powder coated and assembled together.

The work surface is made from melamine faced chipboard (MFB) with PVC edging.

For distribution each completed unit is placed on a pallet and covered in LDPE film and strapped into place. They are generally supplied to the customer via a warehouse. The average delivery distance to a customer is 500km using a 18t Euro 5 lorry and the pallets have a typical lifespan of 10 uses[1]

The product carries a 25-year warranty.

Apart from regular cleaning, KI workstations are considered to be maintenance free. Work tops are easy to maintain, simply use a damp cloth and a mild detergent solution or non-abrasive cleaner to keep the surface clean and hygienic.

At the end of life, the products can be reused, recycled or disposed of. This EPD is calculated on the basis that 15% of the products are reused and 85% recycled. It is assumed that the product packaging is either recycled, incinerated or landfilled and the percentage of each is dependent upon the different types of material. The recycling rates of the packaging is shown below (Table 1)[2].

Material	% Recovery/Recycling rate
Paper and cardboard	79%
Polymers	46.2%
Wood	31.4%

Table 1: Packaging material recovery and recycling rates

The average distance the units and packaging travel for recycling, reuse or disposal is 50Km

[1] https://circulareconomy.europa.eu/platform/en/good-practices/reuse-and-recycling-loading-pallets

[2] Defra UK statistics on waste March 2019.

Materials

The steel used in the KI products is sourced from Europe and has 56% recycled content[3].

The powder coating process lines use water-based cleaning systems prior to powder painting to clean parts as opposed to solvent-based cleaning systems. Powder coatings are baked onto the metal components using natural gas fired ovens. The powder coatings contain negligible VOC and Hazardous Air pollutant (HAP) contents. Add-on pollution control equipment is not necessary given the very low levels of pollutants.

The carton board is assumed to contain 75% recycled content as defined in the Ecoinvent dataset.

The MFB contains 75% recycled wood content.

A breakdown of the product materials and packaging is given below (Table 2):

Material	% of mass
MFB	62%
Metal	23%
Wood	7%
Carton board	3%
Other	2%
Polymers	2%
Textile	1%

Table 2: Material by % mass

[3] World Steel Association LCI report in 2012

EPD Scope

This is a cradle to grave EPD which is broken down as required into the following processes:

- Upstream processes (cradle to gate) - material and parts production;
- Core processes (gate to gate) - forming of steel sheet, coating, product assembly, packaging and waste treatment of scrap steel;
- Downstream process (gate to gate) distribution, use and end of life waste treatment

The inputs and outputs and travel are captured in each process as shown in Figure 1.

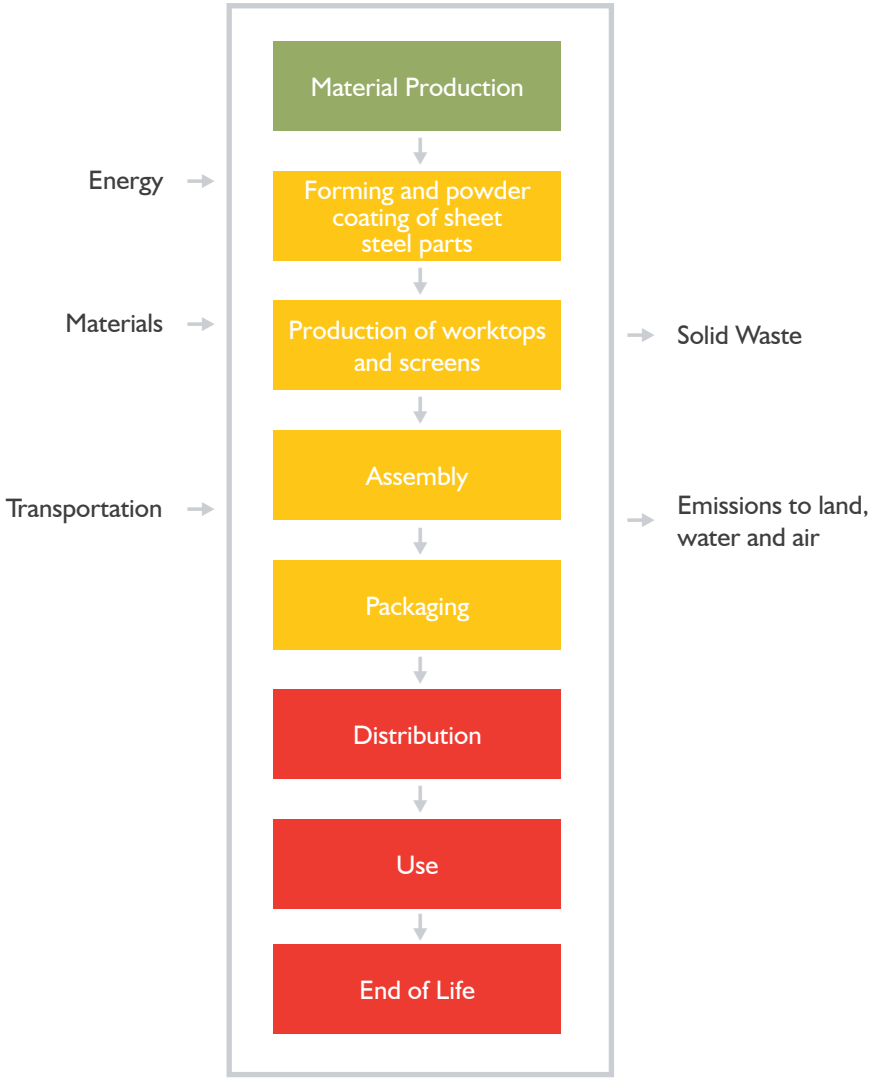

Figure 1: Product life cycle and boundary

Functional Unit

The functional unit is for a 4-person Connect3 Workstation 1600 X 3200mm with two particle board L series screens covered in Cara fabric including use and maintenance for 15 years. The expected lifetime is approx. 25 years.

Data Source and Data Quality

The analysis conforms to ISO 14044 series standard which acknowledges the life cycle assessment requirements of key phases beginning with goal and scope definition, inventory, analysis, impact assessment, and interpretation. Each of these phases, along with their associated databases and models, can have associated uncertainties. It is important to acknowledge these uncertainties in decisions regarding design development and improvement, strategic planning, public policy making, or product marketing.

The key sources of data used for the LCA were as follows:

- Primary data was supplied by KI and manufacturing contractors; and
- Ecoinvent v3.5 database (2018), standard data sets on energy, environmental impacts of moulding processes, material production, waste disposal and recycling
- Data on materials and material sourcing, production energy use, waste, logistic, use etc was collected from KI based upon 2019 and 2020 production

Exclusions and Cut-Off Criteria

When building a life cycle inventory, it is typical to exclude items considered to have a negligible contribution to results. To do this in a robust manner there must be confidence that the exclusion is fair and reasonable. Therefore, cut-off criteria are defined, which allow items to be neglected if they meet the criteria. In this study exclusions could be made if they were expected to be within the below criteria:

- Mass: if a flow is anticipated to be less than 1% of the mass of the product it may be neglected;
- Energy: if a flow is anticipated to be less than 1% of the cumulative energy it may be neglected; and
- Environmental significance: if a flow is anticipated to be less than 1% of the key impact categories it may be excluded

If an item meets one of the criteria but is expected to be significant to one of the other criteria it may not be neglected. For example, if a chemical is small in mass but is expected to have a notable contribution to the environmental results then it may not be excluded.

Life cycle stages that have been omitted from the scope of the study include the following:

- Human energy inputs to processes;
- Infrastructure and capital goods; and
- Transport of employees to and from their normal place of work

Allocation

Ecoinvent default allocation was applied to all processes, except for secondary material use, were cut off allocation is applied.

Assumptions and Estimates

The following assumptions were made:

- Indicative transport modes including lorry and ship type used for the transportation of the materials;
- Production losses through all the processes and these have been based upon supplied data;
- Primary energy used as materials was calculated based upon the gross calorific values of materials;.
- Primary energy used as fuel was calculated by deducting the energy used as materials from the primary energy demand; and
- Secondary materials used including the recycled steel, carton board recycled content and the used pallets.

Environmental Results

The results of the environmental analysis in accordance with the Product Category Rules (PCR) are shown in the following tables:

Parameter		Unit	Upstream	Core	Downstream	Total
Global Warming Potential (GWP)	Fossil kg CO_2 eq.	kg CO_2 eq.	1.35E+02	4.51E+01	2.90E+01	2.09E+02
	Biogenic kg CO_2 eq.	kg CO_2 eq.	1.87E+01	7.68E+00	1.14E+02	1.40E+02
	Land use and land transformation	kg CO_2 eq.	5.94E-01	3.15E-02	3.63E-02	6.62E-01
	TOTAL	kg CO_2 eq.	1.55E+02	5.28E+01	1.43E+02	3.50E+02
Acidification potential (AP)		kg SO_2 eq.	1.02E+00	1.13E-01	1.03E-01	1.24E+00
Eutrophication potential (EP)		kg PO_4^3 eq.	2.58E-01	2.84E-02	3.62E-01	6.48E-01
Formation potential of tropospheric ozone (POCP)		kg NMVOC eq.	5.61E-01	1.10E-01	1.28E-01	7.98E-01
Abiotic depletion potential – Elements (ADPE)		kg Sb eq.	1.42E-03	4.88E-05	6.24E-05	1.53E-03
Abiotic depletion potential – Fossil fuels (ADPF)		MJ, net calorific value	1.64E+03	6.65E+02	3.51E+02	2.66E+03
Water scarcity potential		m^3 eq.	8.74E+01	4.88E+00	2.59E+00	9.49E+01

Table 3: Environmental impacts

Parameter		Unit	Upstream	Core	Downstream	Total
Primary energy resources - Renewable	Use as energy carrier (PERE)	MJ, net calorific value	-1.22E+03	9.42E+01	5.12E+00	-1.12E+03
	Use as raw material (PERM)	MJ, net calorific value	2.29E+03	0.00E+00	0.00E+00	2.29E+03
	Total (PERT)	MJ, net calorific value	1.07E+03	9.42E+01	5.12E+00	1.17E+03
Primary energy resources - Non-renewable	Use as energy carrier (PENRE)	MJ, net calorific value	1.63E+03	8.90E+02	3.80E+02	2.90E+03
	Use as raw material (PENRM)	MJ, net calorific value	3.06E+02	0.00E+00	0.00E+00	3.06E+02
	Total (PENRT)	MJ, net calorific value	1.94E+03	8.90E+02	3.80E+02	3.21E+03
Secondary material (SM)		kg	1.22E+02	0.00E+00	0.00E+00	1.22E+02
Renewable secondary fuels (RSF)		MJ, net calorific value	0.00E+00	9.57E+01	0.00E+00	9.57E+01
Non-renewable secondary fuels (NRSF)		MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net use of fresh water (FW)		m^3	2.38E+00	1.23E-01	7.71E-02	2.58E+00

Table 4: Use of resources

Parameter	Unit	Upstream	Core	Downstream	Total
Hazardous waste disposed (HWD)	kg	7.51E-03	7.01E-04	1.78E-04	**8.39E-03**
Non-hazardous waste disposed (NHWD)	kg	3.52E+01	2.90E+01	4.42E+01	**1.08E+02**
Radioactive waste disposed (RWD)	kg	8.29E-03	4.55E-03	2.05E-03	**1.49E-02**

Table 5: Waste production

Parameter	Unit	Upstream	Core	Downstream	Total
Components for reuse (CRU)	kg	0.00E+00	5.98E+00	2.44E+01	**3.03E+01**
Material for recycling (MFR)	kg	1.54E+01	2.05E+00	1.32E+02	**1.50E+02**
Materials for energy recovery (MER)	kg	0.00E+00	5.98E+00	1.17E+01	**1.77E+01**
Exported energy, electricity (EEE)	MJ	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
Exported energy, thermal (EET)	MJ	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**

Table 6: Output flows

Parameter	Unit	Upstream	Core	Downstream	Total
Human toxicity, cancer impacts cases	Cases	3.36E-05	9.50E-07	1.11E-06	**3.56E-05**
Human toxicity, non-cancer impacts cases	Cases	3.83E-05	5.06E-06	8.94E-06	**5.23E-05**
Fresh water ecotoxicity	PAF.m3.day	1.01E+06	9.75E+04	3.55E+05	**1.47E+06**
Land use	Species.yr	3.09E-07	3.85E-08	1.75E-02	**1.75E-02**

Table 7: Other environmental impacts

References

Product category rule: Furniture, except seats and mattresses. Product category classification: UN CPC 3812/3813/3814. Version 2.0. Valid until: 2023-06-17.

General Programme Instructions for The International EPD® System Version 3.01. 2019-09-18.

Ecoinvent v3.5 database (2018).

ISO 14025:2006, Environmental labels and declarations – Type III Environmental declarations – Principles and procedures

ISO/TS 14027 Environmental labels and declarations -- Development of product category rules

ISO 14040 Environmental management – Life cycle assessment – Principles and framework

ISO 14044 Environmental management – Life cycle assessment – Requirements and guidelines

ISO 14046:2014, Environmental management – Water footprint – Principles, requirements and guidelines

ISO 19011 Guidelines for Auditing Management Systems

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