Statement of Verification

BREG EN EPD No: 000736 Issue: 01

This is to verify that the Environmental Product Declaration provided by:

Teknion Furniture Systems (M) Sdn Bhd

are in accordance with the requirements of:

EN 15804:2012+A2:2019

and

BRE Global Scheme Document SD207

This declaration is for:
hiSpace Worldwide height-adjustable desk using electronic mechanism for 4-person, with dimensions of 1400 mm (depth) × 3000 mm (width) and a total weight of 210 kg. Service life of 5 years

Company Address

Teknion Furniture Systems (M) Sdn Bhd
Lot 761, Jalan Haji Sirat,
Off Jalan Meru,
42100 Klang,
Selangor

teknion

Signed for BRE Global Limited — Emma Baker, Operator

17 October 2025	17 October 2025	16 October 2030
Date of this Issue	Date of First Issue	Expiry Date

BRE Global Ltd., Garston, Watford WD25 9XX
T: +44 (0)333 321 8811 F: +44 (0)1923 664603 E: Enquiries@breglobal.com

Environmental Product Declaration

EPD Number: 000736

General Information

EPD Programme Operator	Applicable Product Category Rules
BRE Global Watford, Herts WD25 9XX United Kingdom	BRE Environmental Profiles 2023 Product Category Rules for Type III environmental product declaration of construction products to EN 15804+A2 PN 514 Rev 3.1
Commissioner of LCA study	**LCA consultant/Tool**
Teknion Furniture Systems (M) Sdn Bhd Lot 761, Jalan Haji Sirat, Off Jalan Meru, 42100 Klang, Selangor	LCA consultant: Grace Ong LCA Tool: BRE LINA A2
Declared/Functional Unit	**Applicability/Coverage**
hiSpace Worldwide height-adjustable desk using electronic mechanism for 4-person, with dimensions of 1400 mm (depth) × 3000 mm (width) and a total weight of 210 kg. Service life of 5 years	Other (please specify). Product specific
EPD Type	**Background database**
Cradle to Grave	Ecoinvent 3.8

Demonstration of Verification
CEN standard EN 15804 serves as the core PCR [a]
Independent verification of the declaration and data according to EN ISO 14025:2010 ☐Internal ☒ External
(Where appropriate [b]) Third party verifier: Flavie Lowers
a: Product category rules b: Optional for business-to-business communication; mandatory for business-to-consumer communication (see EN ISO 14025:2010, 9.4)

Comparability
Environmental product declarations from different programmes may not be comparable if not compliant with EN 15804:2012+A2:2019. Comparability is further dependent on the specific product category rules, system boundaries and allocations, and background data sources. See Clause 5.3 of EN 15804:2012+A2:2019 for further guidance

Information modules covered

Product			Construction		Use stage							End-of-life					Benefits and loads beyond the system boundary
					Related to the building fabric					Related to the building							
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4		D
Raw materials supply	Transport	Manufacturing	Transport to site	Construction – Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction demolition	Transport	Waste processing	Disposal		Reuse, Recovery and/or Recycling potential
☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑		☑

Note: Ticks indicate the Information Modules declared.

Manufacturing site(s)

Teknion Malaysia
Teknion Furniture Systems (M) Sdn Bhd
Lot 761, Jalan Haji Sirat, Off Jalan Meru,
42100 Klang,
Selangor

Teknion India
No. 8, 2nd Main, 9th Cross,
Indiranagar 1st Stage,
Bangalore – 560038,
India

Construction Product:

Product Description

Designed to promote well-being in the workplace, the hiSpace Worldwide height-adjustable table is thoughtfully designed for the posture demands of each individual user. This dynamic height adjustable solution optimises the way users work, offering a fluid and interconnected work environment.

The hiSpace Worldwide collection comes with many components, create highly flexible and efficient workspaces while supporting multiple planning styles with height adjustability, clean cable management and advanced design. A contemporary and functional screen system provides privacy and the option of injecting colour into the office environment.

The hiSpace Worldwide height-adjustable table is available in worksurface widths ranging from 800mm, 1200mm, 1400mm, 1500mm, 1600mm, and 1800mm with varying depths from 600mm, 700mm, and 800mm. Height adjustment is available via either electric or crank mechanisms. For this analysis, the electrical mechanisms have been used.

The hiSpace desks are designed with multiple options like it can be used by the single person, two, three, and four etc. For this analysis, the hiSpace Worldwide height-adjustable desk for 4-person has been selected and the seating (chair) is not included in the analysis.

In this analysis, a four-person hiSpace Worldwide height-adjustable desk configuration has been modelled. The configuration includes a metal under-structure, height-adjustable legs, worksurfaces, fabric screens, cable trays, wire risers, and gables. The modelled unit has dimensions of 1400mm × 3000mm and a total weight of 210 kg.

For more information: hiSpace Worldwide height-adjustable desks

Technical Information

Value, Unit
Environmental Certifications:
Indoor Advantage™ Gold - Registration: SCS-IAQ-05339

Note: The modelled configuration is hiSpace Worldwide desk for 4-person. The analysis does not include chairs, bag drops on desk power modules, table lamps and storage rack.

Main Product Contents

Like many commercial furniture products, hiSpace Worldwide is available in a wide range of configurations. For the purposes of this study, a representative configuration was selected. The composition of this configuration is detailed in the table below.

The total product weight is 210kg.

Material/Chemical Input	%
Steel	52.99%
MDF / Particle board	38.53%
Fabric	1.26%
Polypropylene	2.91%
Aluminium	1.35%
Polyamide 6	0.47%
PET	0.47%
ABS	0.03%
Other	1.04%
Electronics parts	0.95%

Manufacturing Process

Metal parts undergo several processes, including cutting, punching, deburring, bending, welding, grinding, and buffing, followed by powder coating. Worksurfaces, sub assembly components and metal components are assembled and packed ready for delivery.

Process flow diagram

Construction Installation

hiSpace Worldwide height-adjustable desks require no specific maintenance and are expected to outlast their intended lifespan, provided they are maintained according to the recommended care procedures.

Use Information

hiSpace Worldwide height-adjustable desks support dynamic, multi-functional spaces that can easily adapt to evolving needs, enabling users to adjust the tables to suit the task at hand. Height adjustability allows for both seated and standing work, promoting a healthy variety of postures throughout the day. Designed to enhance workplace wellness, hiSpace Worldwide offers two switch options that provide customisable settings and intuitive operation: a digital display switch with three memory settings, and a toggle switch with two memory settings.

Once installed, the table is easy to operate using a simple button or lever to adjust the height. But in this analysis, the electrical mechanism is used. It is not expected that users will adjust the height frequently, with an estimated usage of approximately a second per working day. As a result, the table typically remains in standby mode for most of the time. Power consumption occurs both during height adjustments and while in standby mode.

Operational energy use	kWh
Electricity (Operation – 5 years)	0.34
Electricity (standby mode – 5 years)	30

End of Life

At the end of the product's life, hiSpace Worldwide will undergo manual dismantling, with a material separation process involved. Energy consumption is minimal due to manual dismantling with no involvement of machinery or power. It is assumed that 100% of the product is recovered at the demolition and sent to the waste processing facility for waste treatment.

Life Cycle Assessment Calculation Rules

Declared / Functional unit description

hiSpace Worldwide height-adjustable desk using electronic mechanism for 4-person, with dimensions of 1400 mm (depth) × 3000 mm (width) and a total weight of 210 kg. Service life of 5 years.

System boundary

This is a Cradle-to-Grave EPD, reporting the upstream processing stages A1 to A3, Construction and Installation (A4-A5), Use stages (B1 to B7), end-of-life stages (C1 to C4) and Module D in accordance with EN15804:2012+A2:2019 and BRE 2023 Product Category Rules (PN 514 Rev 3.1).

Data sources, quality and allocation

For the Life Cycle Assessment (LCA) and Environmental Product Declaration (EPD), Teknion utilised specific primary data extracted from its production operations at Teknion Malaysia and India factory, modelled using the LINA A2 LCA and the Ecoinvent 3.8 database. In accordance with the requirements of EN15804:2012 + A2:2019, the most current available data has been used. Manufacturer-specific data has been used for the LCA analysis. The data represents one unit of the hiSpace Worldwide height-adjustable desk, based on production period between 01/12/2023 and 30/11/2024 from Teknion Malaysia and India factories. A production quantity of one unit was used, as the data was sourced directly from the ERP system.

The primary production figures are taken from the manufacturers ERP system, and the secondary datasets are derived from Ecoinvent v3.8, and the LCA tool used was BRE LINA A2. The LCA analysis is conducted for the **hiSpace Worldwide height-adjustable desk using electronic mechanism for 4-person, with dimensions of 1400 mm (depth) × 3000 mm (width) and a total weight of 210 kg.** Since the production process and raw material inputs are the same across both factories, the weighted average results have been included in the analysis. For the production process, both the facilities use the national grid consumption mix for the production.

In addition to the hiSpace Worldwide height adjustable desk**,** other products are manufactured in both the factories. Therefore, the allocation of electricity, fuel, water consumption, and discharge are required. There are multiple configurations and combinations of products produced on the production line (in terms of size, screen type, accessories, etc.). Therefore, allocating energy consumption, water, and wastewater based on mass would assign higher values to certain products. Instead, using the sales revenue of the product line relative to the total revenue is both more accurate. Therefore, Energy, water, and wastewater leaving the factory has been allocated based on the % revenue of the product line over the total revenue. This allocation has been done according to the provisions of BRE PCR PN514 and EN 15804, using the unit production quantity. Actual usage figures were employed for raw materials, ancillary materials, and packaging. All waste from production is recycled and quantities are directly taken from the ERP system, in addition, the water used for the powder coating (paint line) was taken directly from the ERP system.

No proxy dataset has been used for the analysis though for the hiSpace Worldwide height adjustable desk involve the electronics controller for height adjusting purpose, thus the electrical drive/control unit dataset from Ecoinvent 3.8 database is taken as a suitable proxy for this LCA modelling.

Upon data review, it was noted that the mass balance is within the acceptable range, and no data uplift has been performed. In addition, no proxy dataset was used for the LCA modelling.

Secondary data has been obtained for all other upstream and downstream processes that are beyond the control of the manufacturer (i.e. raw material production) from the Ecoinvent 3.8 database. All Ecoinvent datasets are complete within the context used and conform to the system boundary and the criteria for the exclusion of inputs and outputs, according to the requirements specified in EN 15804:2012+A2:2019.

ISO14044 guidance. Quality Level	Geographical representativeness	Technical representativeness	Time representativeness
Very Good	Data from area under study.	Data from processes and products under study. Same state of technology applied as defined in goal and scope (i.e., identical technology).	There is approximately 1-2 years between the Ecoinvent LCI reference year, and the time period for which the LCA was undertaken.

Manufacturer country specific datasets have been selected from the Ecoinvent LCI for this LCA. Teknion Malaysia and India manufacturer uses national grid electricity and natural gas for production, so therefore the national grid electricity dataset has been used for the LCA modelling (Ecoinvent 3.8). The GWP carbon footprint for using 1 kWh of electricity, Malaysia is 0.840 kgCO2e/kWh and for using 1 kWh of electricity, India Southern grid is 1.30 kgCO2eq/kWh. The GWP carbon footprint for using 1 kWh of Natural gas (RoW) is 0.256 kgCO2e/kWh.

The quality level of time representativeness is also Very Good as the background LCI datasets are based on Ecoinvent v3.8 which was compiled in 2021. Therefore, there is less than 5 years between the Ecoinvent LCI reference year and the time period for which the LCA was undertaken.

Cut-off criteria

In both the manufacturing sites, all raw materials and energy inputs to the manufacturing process have been included, except for direct emissions to air, water, and soil, which are not measured at either manufacturing facility.

In the Teknion Malaysia LCA inventory process, all data related to raw materials, packaging materials, and consumable items are included in the modelling.
In the Teknion India LCA inventory process, all data related to raw materials and packaging materials are included in the modelling, whereas non-production waste and consumables are not included in the analysis.

LCA Results

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

Parameters describing environmental impacts									
			GWP-total	GWP-fossil	GWP-biogenic	GWP-luluc	ODP	AP	EP-freshwater
			kg CO_2 eq	kg CO_2 eq	kg CO_2 eq	kg CO_2 eq	kg CFC11 eq	mol H^+ eq	kg $(PO_4)^{3-}$ eq
Product stage	Raw material supply	A1	3.70E+02	4.85E+02	-1.15E+02	5.18E-01	7.14E-05	2.71E+00	2.59E-01
	Transport	A2	5.98E+00	5.97E+00	8.41E-04	3.97E-03	1.22E-06	1.49E-01	2.66E-04
	Manufacturing	A3	4.15E+01	4.12E+01	1.06E-01	1.69E-01	8.81E-06	1.54E-01	1.29E-02
	Total (Consumption grid)	A1-3	4.18E+02	5.32E+02	-1.15E+02	6.91E-01	8.14E-05	3.01E+00	2.72E-01
Construction process stage	Transport	A4	2.77E+01	2.76E+01	1.08E-02	1.53E-02	5.97E-06	4.85E-01	1.37E-03
	Construction	A5	1.56E+00	1.56E+00	2.36E-04	4.98E-05	5.51E-08	1.68E-03	1.15E-05
Use stage	Use stage	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	2.55E+01	2.51E+01	1.77E-01	1.55E-01	7.24E-07	1.23E-01	1.13E-02
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	2.29E+01	2.28E+01	1.13E-02	1.41E-02	4.64E-06	9.15E-02	2.30E-03
	Waste processing	C3	1.65E+02	3.49E+01	1.30E+02	3.39E-03	1.68E-06	1.05E-01	1.47E-03
	Disposal	C4	1.85E-01	1.85E-01	2.11E-04	4.71E-05	1.63E-08	4.22E-04	5.11E-05
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-2.14E+02	-3.02E+02	8.95E+01	-2.71E-01	-1.90E-05	-1.66E+00	-1.45E-01

GWP-total = Global warming potential, total;
GWP-fossil = Global warming potential, fossil;
GWP-biogenic = Global warming potential, biogenic;
GWP-luluc = Global warming potential, land use and land use change;

ODP = Depletion potential of the stratospheric ozone layer;
AP = Acidification potential, accumulated exceedance; and
EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment

LCA Results (continued)

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

Parameters describing environmental impacts

			EP-marine	EP-terrestrial	POCP	ADP-mineral& metals	ADP-fossil	WDP	PM
			kg N eq	mol N eq	kg NMVOC eq	kg Sb eq	MJ, net calorific value	m^3 world eq deprived	disease incidence
Product stage	Raw material supply	A1	5.69E-01	5.85E+00	2.15E+00	2.81E-02	6.45E+03	2.69E+02	4.05E-05
	Transport	A2	3.69E-02	4.10E-01	1.07E-01	1.34E-05	7.97E+01	2.53E-01	2.53E-07
	Manufacturing	A3	2.98E-02	2.53E-01	7.43E-02	3.83E-05	5.43E+02	1.08E+01	5.78E-07
	Total (Consumption grid)	A1-3	6.36E-01	6.52E+00	2.33E+00	2.82E-02	7.07E+03	2.80E+02	4.13E-05
Construction process stage	Transport	A4	1.23E-01	1.36E+00	3.61E-01	6.85E-05	3.88E+02	1.38E+00	1.66E-06
	Construction	A5	7.14E-04	7.48E-03	2.48E-03	4.03E-07	3.15E+00	3.21E-02	3.23E-08
Use stage	Use stage	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	1.79E-02	1.73E-01	4.99E-02	2.66E-05	2.81E+02	8.44E+00	3.03E-07
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	2.44E-02	2.66E-01	8.24E-02	1.35E-04	3.26E+02	1.83E+00	1.46E-06
	Waste processing	C3	4.69E-02	5.04E-01	1.36E-01	4.60E-05	1.13E+02	3.01E+00	2.07E-06
	Disposal	C4	5.11E-03	1.56E-03	4.82E-04	1.23E-07	1.19E+00	5.32E-02	8.25E-09
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-3.50E-01	-3.90E+00	-1.41E+00	-1.16E-02	-3.85E+03	-1.31E+02	-2.36E-05

EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment;
EP-terrestrial = Eutrophication potential, accumulated exceedance;
POCP = Formation potential of tropospheric ozone;
ADP-mineral&metals = Abiotic depletion potential for non-fossil resources;
ADP-fossil = Depletion potential of the stratospheric ozone layer;
WDP = Water (user) deprivation potential, deprivation-weighted water consumption; and
PM = Particulate matter.

LCA Results (continued)

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

Parameters describing environmental impacts

			IRP	ETP-fw	HTP-c	HTP-nc	SQP
			kBq U^{235} eq	CTUe	CTUh	CTUh	dimensionless
Product stage	Raw material supply	A1	3.46E+01	1.80E+04	2.88E-06	1.44E-05	7.20E+03
	Transport	A2	3.77E-01	5.40E+01	3.36E-09	4.17E-08	2.12E+01
	Manufacturing	A3	3.56E-01	3.86E+02	7.38E-09	2.73E-07	6.64E+01
	Total (Consumption grid)	A1-3	3.53E+01	1.84E+04	2.89E-06	1.47E-05	7.29E+03
Construction process stage	Transport	A4	1.89E+00	2.74E+02	1.34E-08	2.46E-07	1.74E+02
	Construction	A5	1.51E-02	5.26E+00	2.98E-10	3.61E-09	5.81E-01
Use Stage	Use stage	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	7.62E-02	2.50E+02	4.31E-09	2.05E-07	3.90E+01
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	1.49E+00	3.28E+02	1.21E-08	2.91E-07	1.58E+02
	Waste processing	C3	7.27E-01	1.64E+02	3.45E-08	1.96E-07	2.20E+01
	Disposal	C4	5.49E-03	8.86E+01	3.19E-11	9.38E-10	2.51E+00
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-2.09E+01	-1.02E+04	-1.37E-06	-6.56E-06	-6.87E+03

IRP = Potential human exposure efficiency relative to U235;
ETP-fw = Potential comparative toxic unit for ecosystems;
HTP-c = Potential comparative toxic unit for humans;
HTP-nc = Potential comparative toxic unit for humans; and
SQP = Potential soil quality index.

LCA Results (continued)

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

Parameters describing resource use, primary energy

			PERE	PERM	PERT	PENRE	PENRM	PENRT
			MJ	MJ	MJ	MJ	MJ	MJ
Product stage	Raw material supply	A1	9.73E+02	1.18E+03	2.16E+03	5.89E+03	5.06E+02	6.40E+03
	Transport	A2	3.78E-01	0.00E+00	3.78E-01	5.51E+01	0.00E+00	5.51E+01
	Manufacturing	A3	2.49E+01	5.83E+00	3.08E+01	5.22E+02	1.73E+01	5.40E+02
	Total (Consumption grid)	A1-3	9.99E+02	1.19E+03	2.19E+03	6.47E+03	5.23E+02	6.99E+03
Construction process stage	Transport	A4	4.23E+00	0.00E+00	4.23E+00	3.80E+02	0.00E+00	3.80E+02
	Construction	A5	-8.86E+01	8.88E+01	1.46E-01	3.89E+00	0.00E+00	3.89E+00
Use stage	Use stage	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	2.32E+01	0.00E+00	2.32E+01	2.79E+02	0.00E+00	2.79E+02
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Waste processing	C3	-1.13E+03	1.13E+03	1.33E+00	9.88E+01	0.00E+00	9.88E+01
	Disposal	C4	1.75E-02	0.00E+00	1.75E-02	-3.71E+01	3.83E+01	1.17E+00
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-5.69E+01	-1.22E+03	-1.28E+03	-3.68E+03	-1.61E+02	-3.84E+03

PERE = Use of renewable primary energy excluding renewable primary energy used as raw materials;
PERM = Use of renewable primary energy resources used as raw materials;
PERT = Total use of renewable primary energy resources;
PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials;
PENRM = Use of non-renewable primary energy resources used as raw materials;
PENRT = Total use of non-renewable primary energy resource

LCA Results (continued)

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

Parameters describing resource use, secondary materials and fuels, use of water						
			SM	RSF	NRSF	FW
			kg	MJ net calorific value	MJ net calorific value	m^3
Product stage	Raw material supply	A1	4.70E+01	0.00E+00	0.00E+00	6.57E+00
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	6.26E-03
	Manufacturing	A3	4.32E-01	0.00E+00	0.00E+00	2.59E-01
	Total (Consumption grid)	A1-3	4.74E+01	0.00E+00	0.00E+00	6.83E+00
Construction process stage	Transport	A4	0.00E+00	0.00E+00	0.00E+00	3.43E-02
	Construction	A5	0.00E+00	0.00E+00	0.00E+00	7.67E-04
Use stage	Use stage	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00	2.02E-01
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	0.00E+00	0.00E+00	0.00E+00	4.52E-02
	Waste processing	C3	0.00E+00	0.00E+00	0.00E+00	7.18E-02
	Disposal	C4	0.00E+00	0.00E+00	0.00E+00	1.25E-03
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0.00E+00	0.00E+00	0.00E+00	-3.15E+00

SM = Use of secondary material;
RSF = Use of renewable secondary fuels;
NRSF = Use of non-renewable secondary fuels;
FW = Net use of fresh water

LCA Results (continued)

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

Other environmental information describing waste categories					
			HWD	NHWD	RWD
			kg	kg	kg
Product stage	Raw material supply	A1	3.57E+02	6.22E+03	2.23E-01
	Transport	A2	7.51E-02	6.11E-01	3.90E-04
	Manufacturing	A3	2.95E+00	6.00E+01	2.73E-04
	Total (Consumption grid)	A1-3	3.60E+02	6.28E+03	2.23E-01
Construction process stage	Transport	A4	4.67E-01	6.13E+00	2.65E-03
	Construction	A5	1.71E-02	3.51E-01	2.54E-05
Use stage	Use stage	B1	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	2.65E+00	5.34E+01	6.86E-05
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	0.00E+00	0.00E+00	0.00E+00
	Waste processing	C3	6.64E-01	8.50E+01	6.27E-04
	Disposal	C4	3.56E-03	1.73E-01	7.43E-06
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-3.10E+01	-5.92E+02	-8.11E-03

HWD = Hazardous waste disposed;
NHWD = Non-hazardous waste disposed;
RWD = Radioactive waste disposed

LCA Results (continued)

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

Other environmental information describing output flows – at end of life								
			CRU	MFR	MER	EE	Biogenic carbon (product)	Biogenic carbon (packaging)
			kg	kg	kg	MJ per energy carrier	kg C	kg C
Product stage	Raw material supply	A1	0.00E+00	2.13E-01	3.53E-04	0.00E+00	4.49E-02	0.00E+00
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Manufacturing	A3	0.00E+00	4.45E-02	1.14E-09	0.00E+00	-1.75E-01	0.00E+00
	Total (Consumption grid)	A1-3	0.00E+00	2.58E-01	3.53E-04	0.00E+00	-1.30E-01	0.00E+00
Construction process stage	Transport	A4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Construction	A5	0.00E+00	1.23E+01	2.09E-07	0.00E+00	0.00E+00	2.82E+00
Use stage	Use stage	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Waste processing	C3	0.00E+00	7.49E-01	3.38E-08	0.00E+00	1.77E+01	0.00E+00
	Disposal	C4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

CRU = Components for reuse;
MFR = Materials for recycling

MER = Materials for energy recovery;
EE = Exported Energy

Scenarios and additional technical information

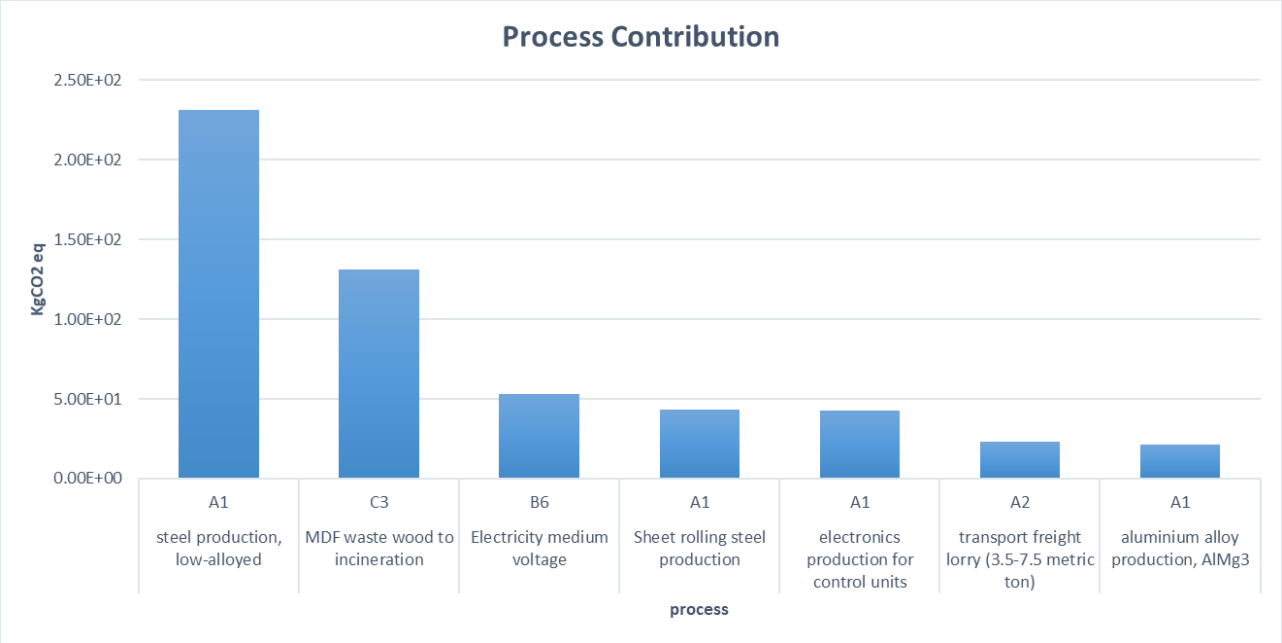
Scenarios and additional technical information			
Scenario	Parameter	Units	Results
A4 – Transport to the building site	Products manufactured in Malaysia are distributed both domestically within Malaysia and internationally across the Asia region, Australia, and the Middle East. In the context of the Life Cycle Assessment (LCA), the longest road distance (417km) and longest sea distance (6625km) based on delivery order are considered in the transportation modelling (Malaysia to Australia) to ensure a conservative and comprehensive evaluation of the transportation-related environmental impacts.		
Transport 1	Road transport –16-32 metric ton lorry	km	417
	Fuel consumption	l/km	0.227
	Capacity utilisation (incl. empty returns)	%	26
Transport 2	Water transport – for transoceanic freight ship	km	6,625
	Fuel consumption	g/tkm	2.50
	Capacity utilisation (incl. empty returns)	%	61
A5 – Installation in the building	The product is installed manually using basic hand tools, requiring minimal energy input. Therefore, no product waste is generated during installation, and only packaging waste is produced.		
Installation waste	Installation wastage rate	%	0
	Packaging waste – Cardboard waste to recycling	kg	6.29
	Packaging waste – Plastic waste to incineration	kg	0.575
B1 – Use stage	Once installed, no emission to air, water, and soil throughout the service life of the product.		
B2 - Maintenance	Once installed, the product is ready for use. Throughout its 10-years reference service life, this product requires no maintenance, repair, replacement, refurbishment during its 5-year reference service life		
B3 - Repair			
B4 - Replacement			
B5 - Refurbishment			

Scenarios and additional technical information			
Scenario	Parameter	Units	Results
B6 - Operational energy use	The table is easy to operate with simple button or lever to adjust the height. It is not anticipated that users will frequently adjust the height, assuming the adjustment of height is 1sec per working day. Thus, the table will typically remain in standby mode for the majority of the time. There will be power consumption applicable while adjusting the table height (operation) and in standby mode. In use for 8 hours a day, 5 days a week, 50 weeks a year, for 5 years. The energy required for 5 years will be 0.34 kwh (lifting up the table) and 30kwh (in standby mode). This LCA modelling here is based on the assumption of operation in Malaysia and the emission factor for Malaysian grid is 0.840 $kgCO_2e/kwh$.		
	Operational energy use: Electricity (Operation – 5 years)	kWh	0.34
	Operational energy use: Electricity (standby mode – 5 years)	kWh	30
B7 - Operational water use	This height-adjustable table, equipped with an electronic mechanism, needs electrical power to operate but no operational water is required		
Reference service life	5 years		
Design Application Parameters	Use as indicated in product brochure, user instruction and warranty		
C1 – Deconstruction	At the end of the product's life, hiSpace Worldwide is dismantled, and materials are separated. Energy consumption is minimal due to manual dismantling with no involvement of machinery or power. It is assumed that 100% of the product is recovered at the demolition and sent to the waste processing facility for waste treatment.		
C2 – Transportation	Distance from the dismantling site to a disposal site will be no more than 200km. The transport mode is a 3.5-7.5-ton truck.		
	Road transport by Lorry 3.5 -7.5 metric ton	km	200
C3 – waste processing	hiSpace Worldwide table is made up of 54% steel, 39% MDF, 3% polypropylene, 1.5% aluminium and the remaining percentage is made up of fabric, polyamide 6, PET, ABS and powder coating. According to the BRE PCR EN15804+A2, the following end of life scenarios will be applied to the materials: • Metal components such as steel, and aluminium, will be 95% recycled and reused while 5% may end up in landfill. Steel and aluminium recycling will involve a process of collecting, separating, compacting, shredding, heating, refining, and solidifying. The powder coating cannot be separated out from the final waste so it is assumed that this will end up in landfill. • 45% of the particle boards will be incinerated for the energy recovery and 55% will be recycled • Mixed plastic components will be incinerated for energy recovery (e.g. heat, electricity.)		
	Steel waste to recycle - 95%	kg	108.38
	Aluminium waste to recycle - 95%	kg	2.75
	MDF wood waste to recycle - 55%	kg	44.55
	MDF wood waste to incinerate - 45%	kg	36.45
	Electronic waste to recycle – 45%	kg	0.90

Scenarios and additional technical information			
Scenario	Parameter	Units	Results
	Plastic waste to incinerate- 100%	kg	11.23
C4 – Disposal	Some materials cannot be recycled during waste processing process and may end up in landfill.		
	Steel waste to landfill (with powder coating waste) – 5%	kg	5.70
	Aluminium waste to landfill – 5%	kg	0.14
	Electronic waste to landfill – 55%	kg	1.10
Module D	The hiSpace Worldwide is made up of post-consumer and virgin materials. When calculating the benefits of recycling steel and aluminium, the pre-existing recycled content has been removed, and the benefits have been calculated only for virgin steel and aluminium. The pre-existing recycled content in the Ecoinvent 3.8 Steel dataset is 36.4%; therefore, the benefits have been calculated by excluding the recycled content. That is, the benefits are calculated based solely on the virgin steel content. Benefits due to recycling of virgin steel = 72.56 kg The pre-existing recycled content in the Ecoinvent 3.8 aluminium alloy dataset is 25.9%; therefore, the benefits have been calculated by excluding the recycled content. That is, the benefits are calculated based solely on the virgin aluminium content. Benefits due to recycling of virgin aluminium = 2.14 kg Benefits due to recycling of MDF board = 44.55 kg Benefits due to recycling of electronics = 0.90 kg Yield is assumed to be 100% during the recycling process. The incineration benefits have been calculated for plastic mixture and MDF waste. The waste plastic is a mix of polyamide 6, and ABS; therefore, polypropylene, MDF, textile waste and plastic mixture dataset has been used for the analysis. The incinerated energy and heat will replace the European average mix. Benefits due to incineration of plastic mixture = 11.23 kg Benefits due to incineration of MDF board = 36.45 kg		

Interpretation of results

The bulk of the environmental impacts and primary energy demand are attributed to the manufacturing phase, covered by information modules A1-A3 of EN15804:2012+A2:2019. The process contribution analysis reveals that the highest carbon emissions are associated with steel production (low-alloyed) contributes approximately 36% of the overall impact, while MDF waste management processes such as recycling and incineration each contributing significantly to the overall environmental impact around 20%, followed by operational electricity usage (for 10 years' assumption) accounts for around 8%. Other notable sources include Electronics production for control unit, transportation via lorries (3.5–7.5 tons) & sea freight show comparatively lower impacts. This indicates that raw material processing, especially steel and MDF waste treatment, are the most critical areas for carbon reduction efforts.



References

BSI. Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products. BS EN 15804:2012+A2:2019. London, BSI, 2019.

BSI. Environmental labels and declarations – Type III Environmental declarations – Principles and procedures. BS EN ISO 14025:2010 (exactly identical to ISO 14025:2006). London, BSI, 2010.

BSI. Environmental management – Life cycle assessment – Principles and framework.
BS EN ISO 14040:2006. London, BSI, 2006.

BSI. Environmental management – Life cycle assessment – requirements and guidelines.
BS EN ISO 14044:2006. London, BSI, 2006.

Indoor Advantage™ Gold - certifies products for low emissions and good indoor air quality