ENVIRONMENTAL PRODUCT DECLARATION

as per /ISO 14025/ and /EN 15804/

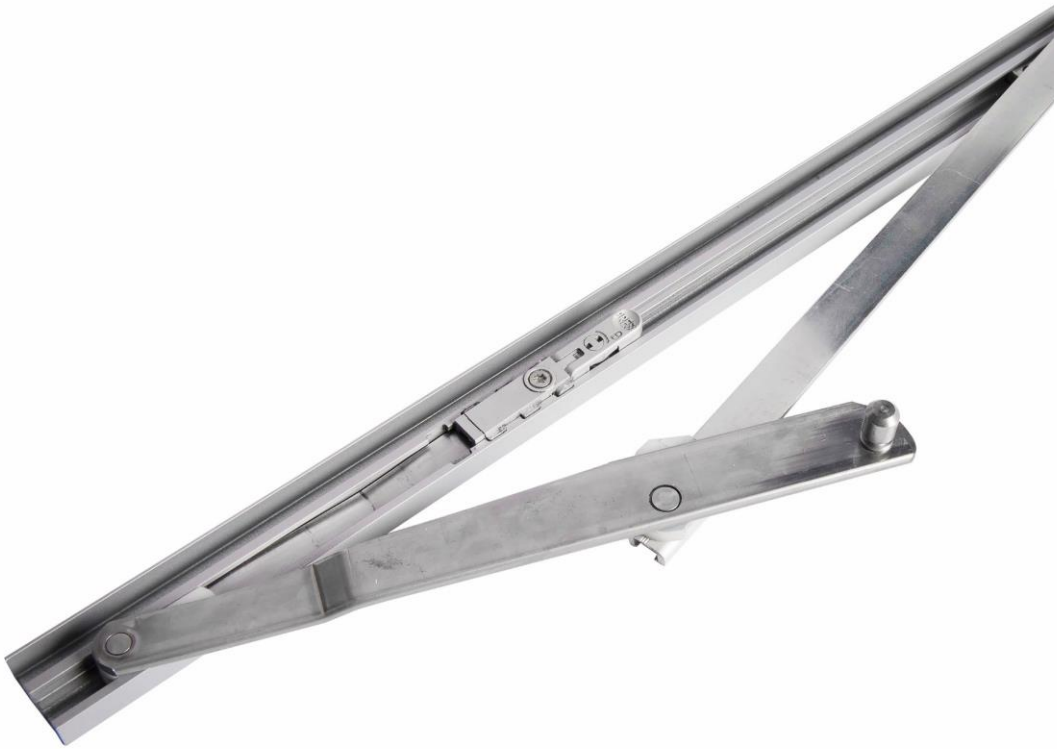
Owner of the Declaration	**YALE Door & Window Solutions**
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-ASA-20180190-IBC1-EN
Issue date	20.12.2018
Valid to	19.12.2023

Yale Revolution hinges

YALE Door & Window Solutions

Institut Bauen und Umwelt e.V.

www.ibu-epd.com / https://epd-online.com



Yale Door and Window Solutions

1. General Information

YALE Door & Window Solutions

Programme holder

IBU - Institut Bauen und Umwelt e.V.
Panoramastr. 1
10178 Berlin
Germany

Declaration number

EPD-ASA-20180190-IBC1-EN

This declaration is based on the product category rules:

Building Hardware products, 04.2017
(PCR checked and approved by the SVR)

Issue date

20.12.2018

Valid to

19.12.2023

Prof. Dr.-Ing. Horst J. Bossenmayer
(President of Institut Bauen und Umwelt e.V.)

Hans Peters
(Head of Board IBU)

Yale Revolution hinges

Owner of the declaration

YALE Door & Window Solutions
Kingsmead Ind Est, Princess Elizabeth Way,
Cheltenham Glos UK GL51 7RE

Declared product / declared unit

The declaration represents 1 pair of Fully Reversible hinges - Yale Revolution hinges consisting of the following items:

1 Left Hand hinge & 1 Right Hand hinge; 1 left hand top bracket & 1 right hand top bracket; 2 sash casting assemblies

Scope:

This declaration and the corresponding LCA study are relevant to the Yale Revolution hinges range.

The primary manufacturing processes and assembly for the Yale Revolution hinges occur at the manufacturing factory in Yale DWS Cheltenham UK. The owner of the declaration shall be liable for the underlying information and evidence; IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

Verification

The standard /EN 15804/ serves as the core PCR
Independent verification of the declaration and data according to /ISO 14025:2010/
☐ internally ☒ externally

Dr. Wolfram Trinius
(Independent verifier appointed by SVR)

2. Product

2.1 Product description / Product definition

Product name: Yale Revolution hinges

Product characteristic:

- Yale Revolution hinges set consist of 1 left hand & 1 right hand hinge to form a pair, predominantly of steel & aluminium.
- Hinges are able to provide a 100 mm restricted opening initially which can be released to a further limited ventilation position or full opening. The hinge also allows the full reversal of the vent for cleaning, with the ability to "lock out" in this position for safety.
- The hinges are assembled with a number of unique features that include a restrictor lever assembly, channel, link geometry, glider, brackets and pivot casting.
- Product is normally used in residential high-rise applications and is produced from Cold Rolled Carbon steel (Grade CS4) plated for corrosion resistance and aluminium Grade 6063-T6
- Product is capable of carrying vents up to1,790 mm high & 80 kg.
- Can provide anti-blow back or easy close operation.
- Available in 27 module sizes: M4.0, M4.5, M5.0, M5.5, M6.0, M6.5, M7.0, M7.5, M8.0, M8.5, M9.0, M9.5, M10.0, M10.5, M11.0, M11.5, M12.0, M12.5, M13.0, M13.5, M14.0, M14.5, M15.0, M15.5, M16.0, M17.0, M18.0

The products are not subject to CE marking.
The standards that can be applied to Yale Revolution hinges are:

EN 13126-11,
BS6375-1 & 2,
BS8213-1,
PAS24

2.2 Application

Revolution hinges consist of a range of hinges offered in various sizes to provide ventilation & ease of cleaning for varying domestic vents.

2.3 Technical Data

EN1935 is not relevant to these products. The products are not subject to CE marking. The standards that can be applied for hinges is EN 13126-11, BS6375-1 & 2, BS8213-1, PAS24.

There is no power consumption due to the fact that the product requires no direct power drive.

2.4 Delivery status
Revolution hinges are delivered packed by 5 sets in varying box size, with the maximum being - 1780 mm x 175 mm x 60 mm.

2.5 Base materials / Ancillary materials
The composition of the Yale Revolution hinges in percentage (%) of total mass per unit is, as follows:

Component	Percentage in mass (%)
Aluminium	21.475
Plastics	0.127
Steel	74.582
Stainless Steel	1.157
Zinc	2.660
Total	100

2.6 Manufacture
The manufacturing processes occur at YALE Door and Window Solution (DWS) factory.1) Carbon Steel processing - punching, forming & cropping of strip for links 2) Aluminium processing - punching & cropping of channel 3) impact & spin riveting of sub-assemblies 4) Final build assembly - manual assembly, riveting, checking and complete packing of product

The factory of Yale Door and Window Solution, Princess Elizabeth Way, Cheltenham, Glos GL51 7RE has a certification of Quality Management system in accordance with ISO 9001:2015 (Certificate Number FM611016).

2.7 Environment and health during manufacturing
YALE Door and Window Solution is committed to producing and distributing door opening solutions with minimal environmental impact, where health & safety is the primary focus for all employees and associates.
• Environmental operations, GHG, energy, water, waste, VOC, surface treatment and H&S are being routinely monitored. Inspections, audits, and reviews are conducted periodically to ensure that applicable standards are met, and the effectiveness of the environmental management program is evaluated.
• Code of Conduct covers human rights, labor practices and decent work. The management of YALE Door and Window Solution is aware of their environmental roles and responsibilities, providing appropriate training, supporting accountability and recognizing outstanding performance.
• Preparation and manufacturing conditions in the factory of Yale DWS do not require special health and safety measures. Standard health and safety measures (work gloves, hearing protection, safety shoes, dust mask when sanding and milling, dust extraction, etc.) are observed where appropriate.
• Water and soil contamination does not occur, and all production related waste is processed internally in the appropriate manner.
• Any waste metals during machining are separated and recycled.

2.8 Product processing/Installation
YALE Revolution hinges are distributed through and installed by trained installation technicians, such as fabricators, installation teams, etc. Adhering to local/national standards and requirements.

2.9 Packaging
YALE Revolution hinges are packed in cardboard packaging. Packaging includes two paper sheets (installation instruction and drilling template) – all of which are fully recyclable. The packaging does not return to the manufacturer meaning it stays at the site.

Material	Value (%)
Paper	100.00
Total	**100**

2.10 Condition of use
In window openings requiring to be fully reversed for cleaning. Must be installed and maintained in line with YALE DWS recommendations - cleaning of dust & debris and light lubrication with engineering oil.

2.11 Environment and health during use
There is no harmful emissive potential. No damage to health or impairment is expected under normal use corresponding to the intended use of the product.

2.12 Reference service life
Approved for 20.000 cycles under normal working conditions, 20 years depending on cycle frequency.

2.13 Extraordinary effects

Fire
YALE Revolution hinges are suitable for use in fire and smoke egress windows.

Fire protection

Name	Value
Building material class	A1
Burning droplets	d0

Water
The product does not contain any substances that could be released and have an additional environmental impact on water in case of flood.

Mechanical destruction
No danger to the environment can be anticipated during mechanical destruction of the products...

2.14 Re-use phase
It is possible to re-use the product during the reference service life as well as alter functionality and it can be moved from one application to another.

2.15 Disposal
The product can be mechanically dissembled to separate the different materials. The majority, by weight, of the components are steel, aluminium and zinc which can be recycled. The plastic components can be used for energy recovery in an incineration process. The hinges can either be sent back to Yale DWS for recycling or to a professional recycling service provider. No disposal is foreseen for the product nor for the corresponding packaging.

EWC/ 17 04 02 aluminium
EWC/ 17 02 03 plastic
EWC/ 17 04 05 iron and steel

EWC/ 15 01 01 paper and cardboard packaging

2.16 Further information
Yale DWS

Princess Elizabeth Way
Cheltenham
GL51 7RE (UK)
www.yaledoorandwindowsolutuions.co.uk

3. LCA: Calculation rules

3.1 Declared Unit

1 pair of Fully Reversible hinges - Yale Revolution hinges consisting of the following items:
1 Left Hand hinge & 1 Right Hand hinge; 1 left hand top bracket & 1 right hand top bracket; 2 sash casting assemblies.

Declared unit

Name	Value	Unit
Mass (without packaging)	4.74	kg
Mass packaging (paper)	0.37	kg
Conversion factor to 1 kg	0.211	-
Declared unit for hardware systems	1	pair

3.2 System boundary

Type of the EPD: cradle to gate - with options
The following life cycle stages were considered:

Production stage:
- A1 – Raw material extraction and processing
- A2 – Transport to the manufacturer and
- A3 – Manufacturing

Construction stage:
- A4 - Transport from the gate to the site
- A5 – Packaging waste processing

C1-C4 End-of-life stage:
- C2 – Transport to waste processing,
- C3 – Waste processing for recycling and
- C4 – Disposal (landfill, waste for incineration).

This includes provision of all materials, products and energy, packaging processing and its transport, as well as waste processing up to the end-of waste state or disposal of final residues.

Module D:
- Declaration of all benefits and loads.

3.3 Estimates and assumptions

Transportation: Data on mode of transport and distances, as reported by suppliers were used for those materials and parts contributing more than 2 % of total product mass. In case of unknown transport distances for parts and materials, contributing less than 2 % to the total product mass, transport by road over an average distance of 500 km was assumed.

Use stage:
For the use stage, it is assumed that the Revolution hinges are used within UK and Scotland.

EoL:
In the End-of-Life stage, for all the materials which can be recycled, a recycling scenario with 100% collection rate was assumed. The country where EoL takes place is EU-28 Furthermore, a transport distance by truck of 100 km has been assumed in the model.

3.4 Cut-off criteria

In the assessment, all available data from the production process are considered, i.e. all raw materials used, auxiliary materials (e.g. lubricants), and electric power consumption - including material and energy flows contributing less than 1 % of mass or energy (if available). In case a specific flow contributing less than 1% in mass or energy is not available, worst case assumption proxies are selected to represent the respective environmental impacts.

Impacts relating to the production of machines and facilities required during production are out of the scope of this assessment.

3.5 Background data

For life cycle modeling of the considered products, the GaBi 8.7.0.18 Software System for Life Cycle Engineering,
developed by thinkstep AG, is used /GaBi 8.7.0.18 2018/. The GaBi-database contains consistent and
documented datasets which are documented in the online GaBi-documentation /GaBi 8.7.0.18 2018D/.
To ensure comparability of results in the LCA, the basic data of GaBi database were used for energy, transportation and auxiliary materials.

3.6 Data quality

The requirements for data quality and background data correspond to the specifications of the /IBU PCR Part A/.
thinkstep performed a variety of tests and checks during the entire project to ensure high quality of the completed project. This obviously includes an extensive review of project-specific LCA models as well as the background data used.
The technological background of the collected data reflects the physical reality of the declared products. The datasets are complete and conform to the system boundaries and the criteria for the exclusion of inputs and outputs.
All relevant background datasets are taken from the GaBi 8.7.0.18 software database.

3.7 Period under review

The period under review is 2017/18 (12-month average).

3.8 Allocation

Regarding incineration, the software model for the waste incineration plant (WIP) is adapted according to the material composition and heating value of the combusted material. In this EPD, the following specific life cycle inventories for the WIP are considered for:

Waste incineration of plastic
Waste incineration of paper (packaging)

Regarding the recycling material of metals, the metal parts in the EoL are declared as end-of-waste status. Thus, these materials are considered in module D. Specific information on allocation within the background data is given in the GaBi dataset documentation.

3.9 Comparability

Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to /EN 15804/ and the building context, respectively the product-specific characteristics of performance, are taken into account. GaBi 6 serves as background database for the calculation.

4. LCA: Scenarios and additional technical information

The following technical scenario information is required for the declared modules or can be used for developing specific scenarios in the context of a building assessment if modules are not declared (MND).

Transport to the building site (A4)

Name	Value	Unit
Litres of fuel	39.4	l/100km
Transport distance	400	km
Capacity utilisation (including empty runs)	85-	%

Installation into the building (A5)

Name	Value	Unit
Output substances following waste treatment on site (Paper packaging)	0.37	kg

Reference service life

Name	Value	Unit
Reference service life (according to ISO 15686-1, -2, -7 and -8)	20	a

End of life (C1-C4)

Name	Value	Unit
Collected separately (Aluminum, Plastics, Stainless steel, Steel, Zinc)	4.7376	kg
Incineration of plastic parts	0.006	kg
Recycling Aluminum, Stainless steel, Steel, Zinc	4.7316-	kg

Reuse, recovery and/or recycling potentials (D), relevant scenario information

Name	Value	Unit
Collected separately waste type (including packaging)	5.11	kg
Recycling Aluminum	19.91	%
Recycling Steel	69.15	%
Recycling Stainless Steel	1.07	%
Recycling Zinc	2.46	%
Incineration of Plastic parts (not packaging)	0.12	%
Incineration of packaging (paper) (from A5)	7.29	%

5. LCA: Results

Results shown below were calculated using CML 2000 – Apr. 2013 methodology.

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE NOT DECLARED)

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction 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	X	MND	MND	MNR	MNR	MNR	MND	MND	MND	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: 1 pair of Yale Revolution hinges

Parameter	Parameter	Unit	A1 - A3	A4	A5	C2	C3	C4	D
GWP	Global warming potential	[kg CO_2-Eq.]	2.01E+01	9.72E-02	5.27E-01	2.25E-02	0.00E+00	1.50E-02	-1.59E+01
ODP	Depletion potential of the stratospheric ozone layer	[kg CFC11-Eq.]	3.44E-09	4.65E-13	2.33E-12	1.08E-13	0.00E+00	4.51E-14	4.40E-09
AP	Acidification potential of land and water	[kg SO_2-Eq.]	9.64E-02	4.45E-04	1.20E-04	1.03E-04	0.00E+00	3.82E-06	-7.97E-02
EP	Eutrophication potential	[kg $(PO_4)^{3-}$-Eq.]	6.29E-03	1.02E-04	2.09E-05	2.36E-05	0.00E+00	2.89E-07	-4.53E-03
POCP	Formation potential of tropospheric ozone photochemical oxidants	[kg ethene-Eq.]	8.73E-03	-1.43E-04	8.47E-06	-3.33E-05	0.00E+00	1.85E-07	-6.39E-03
ADPE	Abiotic depletion potential for non-fossil resources	[kg Sb-Eq.]	1.03E-03	3.66E-09	9.50E-09	8.49E-10	0.00E+00	9.90E-10	-8.50E-04
ADPF	Abiotic depletion potential for fossil resources	[MJ]	2.25E+02	1.34E+00	1.43E-01	3.11E-01	0.00E+00	6.34E-03	-1.53E+02

Caption	GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources

RESULTS OF THE LCA - RESOURCE USE: declared unit and product 1 pair of Yale Revolution hinges

Parameter	Parameter	Unit	A1 - A3	A4	A5	C2	C3	C4	D
PERE	Renewable primary energy as energy carrier	[MJ]	5.99E+01	-	-	-	-	-	-
PERM	Renewable primary energy resources as material utilization	[MJ]	0.00E+00	-	-	-	-	-	-
PERT	Total use of renewable primary energy resources	[MJ]	5.99E+01	5.29E-02	1.34E-02	1.23E-02	0.00E+00	4.64E-04	-4.25E+01
PENRE	Non-renewable primary energy as energy carrier	[MJ]	2.63E+02	-	-	-	-	-	-
PENRM	Non-renewable primary energy as material utilization	[MJ]	0.00E+00	-	-	-	-	-	-
PENRT	Total use of non-renewable primary energy resources	[MJ]	2.63E+02	1.35E+00	1.68E-01	3.12E-01	0.00E+00	7.04E-03	-1.78E+02
SM	Use of secondary material	[kg]	6.07E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	Use of renewable secondary fuels	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	Use of non-renewable secondary fuels	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	Use of net fresh water	[m^3]	1.63E-01	3.73E-05	1.53E-03	8.65E-06	0.00E+00	3.66E-05	-1.20E-01

RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES: 1 pair of Yale Revolution hinges

Parameter	Parameter	Unit	A1 - A3	A4	A5	C2	C3	C4	D
HWD	Hazardous waste disposed	[kg]	6.83E-03	3.07E-06	1.16E-05	7.11E-07	0.00E+00	4.92E-07	1.53E-03
NHWD	Non-hazardous waste disposed	[kg]	2.01E+00	1.69E-04	1.33E-02	3.92E-05	0.00E+00	1.40E-03	-1.72E+00
RWD	Radioactive waste disposed	[kg]	1.50E-02	1.76E-06	9.81E-06	4.08E-07	0.00E+00	2.81E-07	-9.86E-03
CRU	Components for re-use	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	Materials for recycling	[kg]	0.00E+00	0.00E+00	3.73E-01	0.00E+00	4.69E+00	0.00E+00	4.00E-02
MER	Materials for energy recovery	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EEE	Exported electrical energy	[MJ]	0.00E+00	0.00E+00	6.67E-01	0.00E+00	0.00E+00	2.87E-02	0.00E+00
EET	Exported thermal energy	[MJ]	0.00E+00	0.00E+00	1.88E+00	0.00E+00	0.00E+00	7.86E-02	0.00E+00

6. LCA: Interpretation

This chapter contains an interpretation of the Life Cycle Impact Assessment categories. Stated percentages in the whole interpretation are related to the overall life cycle, excluding credits (module D).

The production stage (modules A1-A3) contributes between 96,8% and 99,9% to the overall results for all the environmental impact assessment categories hereby considered; Abiotic depletion potential (ADPE), for which the contribution of the production stage (modules A1-A3) accounts for approx. 99,99% - describes the reduction of the global amount of non-fossil resources, therefore, as expected, it is mainly related with the extraction of raw materials (A1).

Within the production stage, the main contribution for all the impact categories is the production of steel mainly due to the energy consumption. Steel accounts with approx. 69% to the overall mass of the product, therefore, the impacts are in line with the mass composition of the product. The environmental impacts for the transport (A2) have a negligible impact within this stage.

The use stage (module B6), has zero contribution due to the fact that the product requires no direct power drive.

In the end-of-life stage, there are loads and benefits (module D, negative values) considered. The benefits are considered beyond the system boundaries and are declared for the recycling potential of the metals and for the credits from the incineration process (energy substitution.

7. Requisite evidence

Not applicable in this EPD.

8. References

BS6375-1 & 2 /
/BS 6375 series - Performance of windows and doors

/BS8213-1:2004 /
/Windows doors and rooflights. Design for safety in use and during cleaning of windows, including door-height windows and roof windows. Code of practice

/DIN EN 13126-11:2009-02 /
/Building hardware - Requirements and test methods for windows and doors height windows - Part 11: Top hung projecting reversible hardware; German version EN 13126-11:2008

/EN1634-1/
/Fire resistance and smoke control tests for door and shutter assemblies, openable windows and elements of building hardware. Fire resistance test for door and shutter assemblies and openable windows.

GaBi 8.7.0.18:2018
Software-System and Database for Life Cycle Engineering. Copyright, TM. Stuttgart, thinkstep AG, Echterdingen, 1992-2018

GaBi 8.7.0.18:2018b
Documentation of GaBi 6: Software-System and Database for Life Cycle Engineering. Copyright, TM. Stuttgart, thinkstep AG, Echterdingen, 1992-2013. http://documentation.gabi-software.com/

IBU PCR Part A
Institut Bauen und Umwelt e.V., Berlin (pub.): Product Category Rules for Construction Products from the range of Environmental Product Declarations of Institut Bauen und Umwelt (IBU), Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Background Report. March 2018
www.ibu-epd.de

IBU PCR Part B
IBU PCR Part B: PCR Guidance-Texts for Building-Related Products and Services. From the range of Environmental Product Declarations of Institute Construction and Environment e.V. (IBU). Part B: Requirements on the EPD for
Building Hardware products (02.2016) www.ibu-epd.com

/ISO 14025/
DIN EN /ISO 14025:2011-10/, Environmental labels and declarations — Type III environmental declarations — Principles and procedures

/ISO 9001:2015/
Quality management systems - -- Requirements with guidance for us

/OHSAS 18001:2007/
Occupational Health and Safety Assessment Series

/PAS24:2016/
Enhanced security performance requirements for doorsets and windows in the UK. Doorsets and windows intended to offer a level of security suitable for dwellings and other buildings exposed to comparable risk

9. Annex

Results shown below were calculated using TRACI Methodology.

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE NOT DECLARED)

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARYS
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement[1)]	Refurbishment[1)]	Operational energy use	Operational water use	De-construction 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	X	MND	MND	MND	MND	MND	MND	MND	MND	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: 1 pair of Yale Revolution hinges

Parameter	Parameter	Unit	A1 - A3	A4	A5	C2	C3	C4	D
GWP	Global warming potential	[kg CO_2-Eq.]	2.01E+01	9.72E-02	5.27E-01	2.25E-02	0.00E+00	1.50E-02	-1.59E+01
ODP	Depletion potential of the stratospheric ozone layer	[kg CFC11-Eq.]	3.66E-09	4.95E-13	2.48E-12	1.15E-13	0.00E+00	4.80E-14	4.68E-09
AP	Acidification potential of land and water	[kg SO_2-Eq.]	9.33E-02	5.81E-04	1.45E-04	1.35E-04	0.00E+00	4.48E-06	-7.63E-02
EP	Eutrophication potential	[kg N-eq.]	4.08E-03	4.11E-05	8.36E-06	9.52E-06	0.00E+00	1.36E-07	-2.63E-03
Smog	Ground-level smog formation potential	[kg O_3-eq.]	1.06E+00	1.20E-02	3.39E-03	2.77E-03	0.00E+00	3.52E-05	-8.06E-01
Resources	Resources – resources fossil	[MJ]	1.54E+01	1.93E-01	1.68E-02	4.47E-02	0.00E+00	6.52E-04	-8.14E+00

RESULTS OF THE LCA - RESOURCE USE: 1 pair of Yale Revolution hinges

Parameter	Parameter	Unit	A1 - A3	A4	A5	C2	C3	C4	D
PERE	Renewable primary energy as energy carrier	[MJ]	5.99E+01	-	-	-	-	-	-
PERM	Renewable primary energy resources as material utilization	[MJ]	0.00E+00	-	-	-	-	-	-
PERT	Total use of renewable primary energy resources	[MJ]	5.99E+01	5.29E-02	1.34E-02	1.23E-02	0.00E+00	4.64E-04	-4.25E+01
PENRE	Non-renewable primary energy as energy carrier	[MJ]	2.63E+02	-	-	-	-	-	-
PENRM	Non-renewable primary energy as material utilization	[MJ]	0.00E+00	-	-	-	-	-	-
PENRT	Total use of non-renewable primary energy resources	[MJ]	2.63E+02	1.35E+00	1.68E-01	3.12E-01	0.00E+00	7E-03	-1.78E+02
SM	Use of secondary material	[kg]	6.07E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	Use of renewable secondary fuels	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	Use of non-renewable secondary fuels	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	Use of net fresh water	[m^3]	1.63E-01	3.73E-05	1.53E-03	8.65E-06	0.00E+00	3.66E-05	-1.20E-01

RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES: 1 pair of Yale Revolution hinges

Parameter	Parameter	Unit	A1 - A3	A4	A5	C2	C3	C4	D
HWD	Hazardous waste disposed	[kg]	6.83E-03	3.07E-06	1.16E-05	7.11E-07	0.00E+00	4.92E-07	1.53E-03
NHWD	Non-hazardous waste disposed	[kg]	2.01E+00	1.69E-04	1.33E-02	3.92E-05	0.00E+00	1.40E-03	-1.72E+00
RWD	Radioactive waste disposed	[kg]	1.50E-02	1.76E-06	9.81E-06	4.08E-07	0.00E+00	2.81E-07	-9.86E-03
CRU	Components for re-use	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-
MFR	Materials for recycling	[kg]	0.00E+00	0.00E+00	3.73E-01	0.00E+00	4.69E+00	0.00E+00	-
MER	Materials for energy recovery	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-
EEE	Exported electrical energy	[MJ]	0.00E+00	0.00E+00	6.67E-01	0.00E+00	0.00E+00	2.87E-02	-
EET	Exported thermal energy	[MJ]	0.00E+00	0.00E+00	1.88E+00	0.00E+00	0.00E+00	7.86E-02	-

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