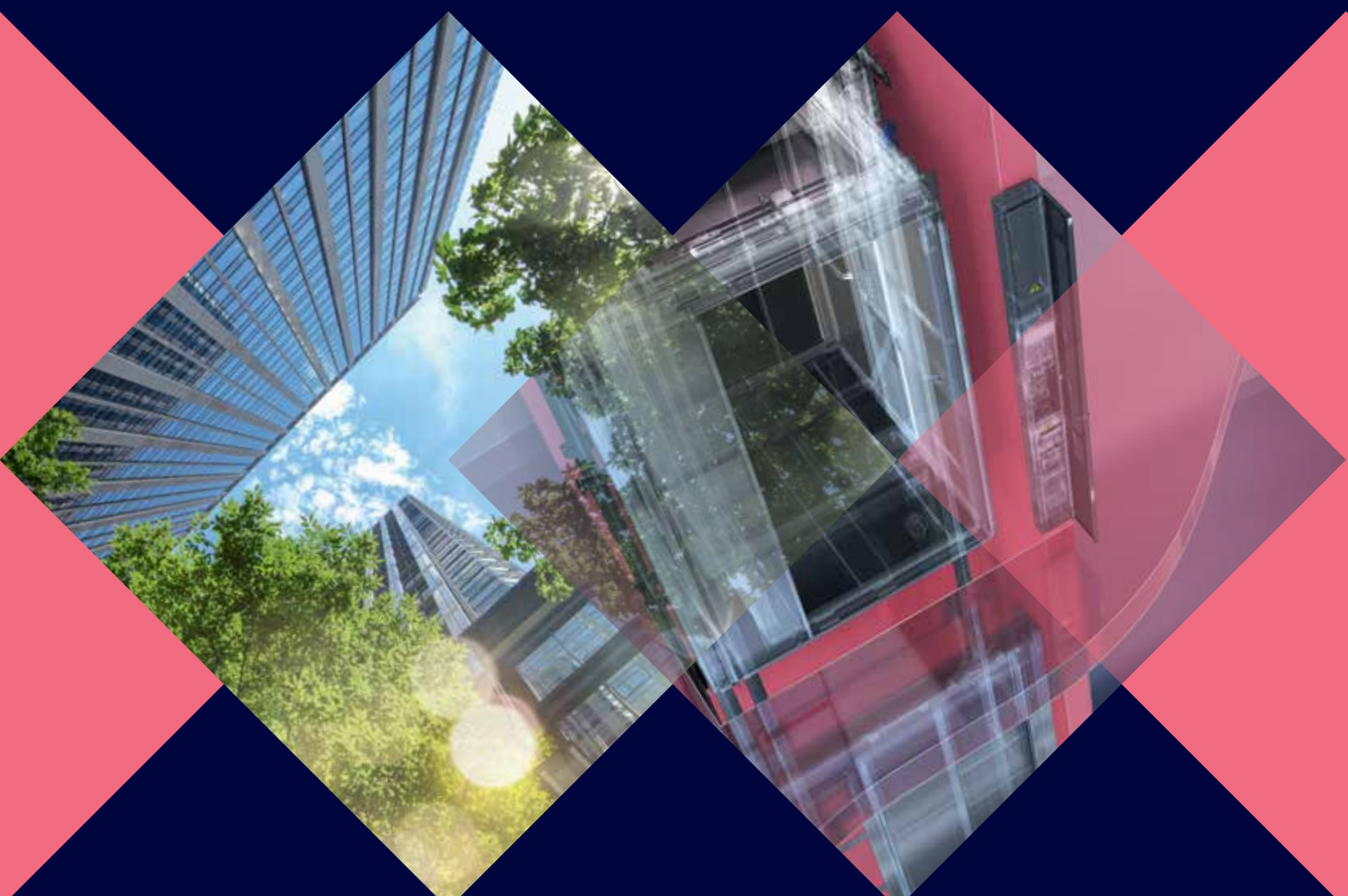


# Environmental Product Declaration



In accordance with ISO 14025:2006, and EN 15804:2012+A2:2019 for:  
**OTIS GEN360™ PLATFORM - LOW DUTY - 1M/S**  
**OTIS ELEVATOR COMPANY**



Programme:	The International EPD® System - <a href="http://www.environdec.com">www.environdec.com</a>
Programme operator:	EPD International AB
EPD registration number:	S-P-01941
Publication date:	2021-12-06
Issue date:	2021-12-06
Validity date:	2026-12-06 <i>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 <a href="http://www.environdec.com">www.environdec.com</a>.</i>
Revision date:	2024-02-07
Revision number:	1.0
Geographical scope:	Europe

# OTIS



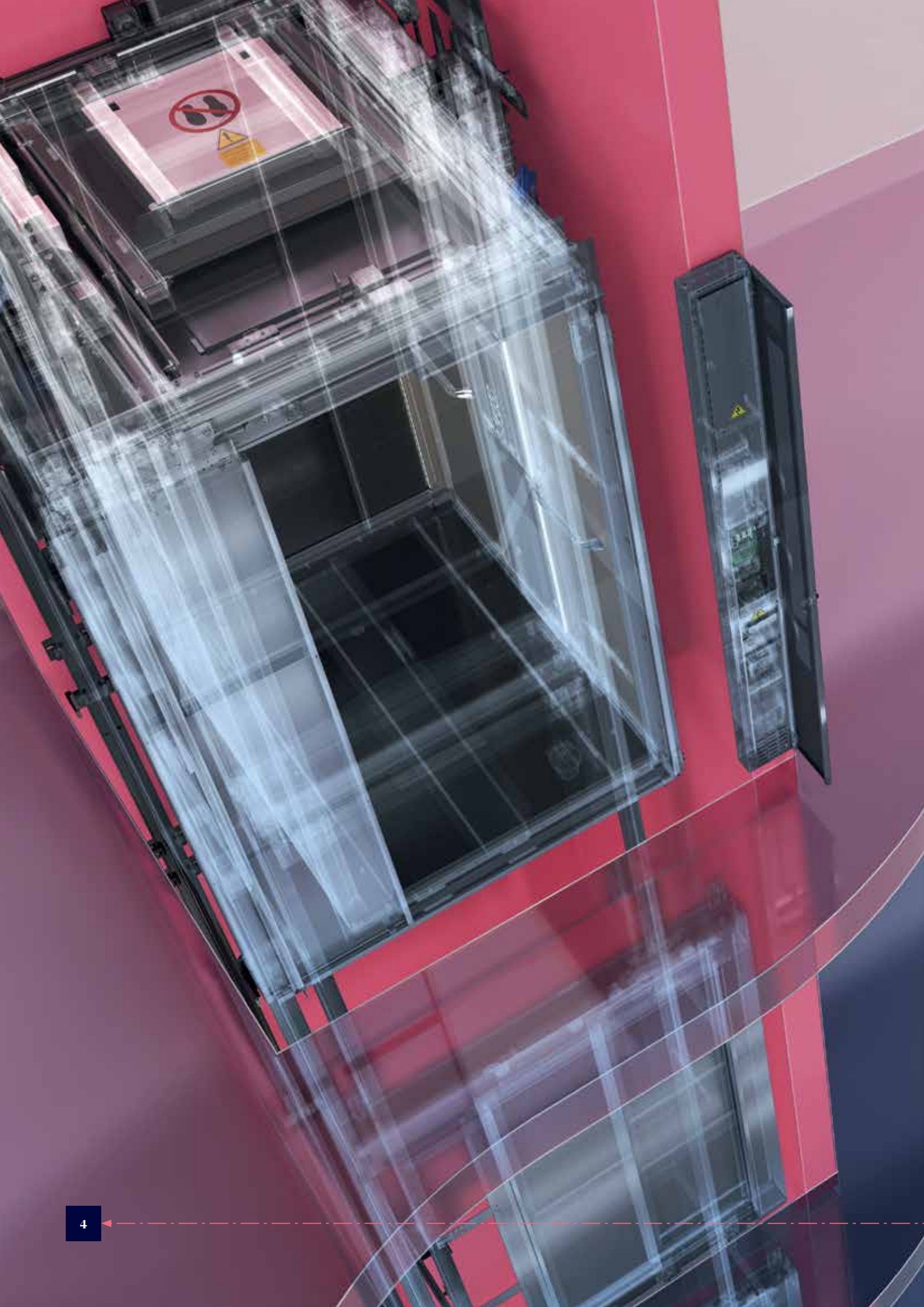
# Made to move you™



# About OTIS

Otis gives people freedom to connect and thrive in a taller, faster, smarter world. The global leader in the manufacture, installation and servicing of elevators and escalators, we move 2 billion people a day and maintain approximately 2.1 million customer units worldwide – the industry's largest Service portfolio. You'll find us in the world's most iconic structures, as well as residential and commercial buildings, transportation hubs and everywhere people are on the move. Headquartered in Connecticut, USA, Otis is 69,000 people strong, including 40,000 field professionals, all committed to meeting the diverse needs of our customers and passengers in more than 200 countries and territories.

**To learn more, visit [www.otis.com](http://www.otis.com) and follow us on LinkedIn, Instagram, Facebook and Twitter @OtisElevatorCo.**



MAIN CHARACTERISTICS OF  
GEN360™ LOW DUTY



Up to  
**700 kg**  
of duty load



Up to  
**1,0 m/s**  
of speed



Up to  
**45 m**  
of travel

# Gen360™ Completely reimagined

The Gen360™ platform is a true digital revolution. Native electronic architecture allowed us to completely reimagine every aspect of an elevator system, setting new standards for proactive digital elevator safety. We completely redesigned our hardware in order to provide you with the best service.

We have replaced many mechanical parts with electronic components. The new OtisONE™ IoT solution turns your elevator into a powerful network of sensors for real-time status updates. With 360° cameras, our experts can visually confirm, fine-tune, diagnose and solve issues remotely without even stopping the elevator, giving you unmatched stress-free reliability.

We are well acquainted with connected elevators. We pioneered remote servicing over a decade ago as part of Gen2®. With The Gen360™ platform, we've built on that proud legacy and evolved - reimagining technology for the era of smart buildings.

Gen360™ is more than just an elevator, it's a complete platform connected to the smart core of low to mid-rise residential and commercial buildings. The Gen360™ platform helps building and property managers maximize efficiency and improve tenant experience.

# Results

## Interpretation

### THE MANDATORY ENVIRONMENTAL IMPACT INDICATORS USED AND THE ASSOCIATED IMPACT METHODS LISTED IN ANNEX C OF EN 15804+A2 (CEN, 2019) (P. 60FF.) ARE DECLARED.

Optional indicators have been calculated and presented in the LCA background report, they are not published in this EPD.

- ▶ **The characterization methodology** referenced in the EN15804+A2 is used for the calculation.
- ▶ **Long-term emissions** (> 100 years) are not accounted for in the impact assessment.
- ▶ **The following table** shows the mandatory environmental impact indicators declared:

CORE ENVIRONMENTAL IMPACT INDICATORS	UNIT	REFERENCE
▶ Global Warming Potential total (GWP-total)	▶ kg CO <sub>2</sub> eq.	▶ IPCC 2013 AR5
▶ Global Warming Potential fossil fuels (GWP-fossil)	▶ kg CO <sub>2</sub> eq.	▶ IPCC 2013 AR5
▶ Global Warming Potential biogenic (GWP-biogenic)	▶ kg CO <sub>2</sub> eq.	▶ IPCC 2013 AR5
▶ Global Warming Potential land use and land use change (GWP-luluc)	▶ kg CO <sub>2</sub> eq.	▶ IPCC 2013 AR5
▶ Depletion potential of the stratospheric ozone layer (ODP)	▶ kg CFC 11 eq.	▶ WMO (2014) + integrations
▶ Acidification potential, Accumulated Exceedance (AP)	▶ mol H <sup>+</sup> eq.	▶ Seppälä et al. (2006); Posch et al. (2008)
▶ Eutrophication potential, fraction of nutrients reaching freshwater end compartment (EP-freshwater)	▶ kg PO <sub>4</sub> eq.	▶ EUTREND model (Struijs et al, 2009b) as implemented in ReCiPe 2008
▶ Eutrophication potential, fraction of nutrients reaching marine end compartment (EP-marine)	▶ kg N eq.	▶ EUTREND model (Struijs et al, 2009b) as implemented in ReCiPe 2008
▶ Eutrophication potential, accumulated Exceedance (EP-terrestrial)	▶ mol N eq.	▶ Seppälä et al. (2006); Posch et al. (2008)
▶ Formation potential of tropospheric ozone (POCP)	▶ kg NMVOC eq.	▶ LOTOS-EUROS model (Van Zelm et al, 2008) as implemented in ReCiPe 2008
▶ Abiotic depletion potential for non-fossil resources (ADP minerals&metals)	▶ kg Sb eq.	▶ van Oers et al. (2002) (based on Guinée et al. 2002)
▶ Abiotic depletion for fossil resources potential (ADP-fossil) <sup>1</sup>	▶ MJ, net calorific value	▶ van Oers et al. (2002)
▶ Water (user) deprivation potential, deprivation-weighted water consumption (WDP) <sup>1</sup>	▶ m <sup>3</sup> world eq. deprived	▶ Available WAtER REmaining (AWARE) Boulay et al. (2016)

- ▶ **The pattern of results for the Gen360™ Low Duty platform** is quite comparable to those of the previous product generation of Gen2® lifts.
- ▶ **For most impact categories**, the life cycle performance of the lift is dominated by the materials manufacturing in the upstream section (module A1).
- ▶ **Second most relevant** – and for most indicators quite balanced with module A1 – is the energy consumption from operation of the lift, as reported in module B6.
- ▶ **Only for the resource use**, mineral and metals and for the Ozone Depletion, module B6 (with a service life of 25 years) does not deliver a major share to the life cycle impacts.
- ▶ **In both cases**, the upstream module A1 (materials manufacturing) dominates the life cycle with approximately 90% for both indicators.



## IN MORE DETAIL,

### PRODUCT STAGE – MODULE A1:

#### RAW MATERIAL SUPPLY

The impacts for the Gen360™ platform are driven primarily by materials manufacturing of ferrous and electronic components, which created approx. 50% of Climate change “GWP total” and ADP of fossil “ADPF” and 50-65% of AP, EP terrestrial-marine and POCP.

### PRODUCT STAGE – MODULE A3:

#### MANUFACTURING AT OTIS FACTORY

In all impact categories, the manufacturing has a minor contribution to the impact categories.

This limited impact from the manufacturing part is widely due to the continuous efforts to reduce its environmental footprint over the year through multi-channel initiatives such as: considering reusable and recyclable package for the components, eliminating the painting and welding operations, having a positive impact on greenhouse gas emissions and wastes (1).

From year 2010 till 2020, Gien (France) and Madrid (Spain) factories did a total reduction of 10% in greenhouse gases emissions.

As well, energy consumption has been dramatically decreased by the use of LED lights and more effective boilers in Otis facilities (2).

### USE STAGE – MODULE B6:

#### OPERATIONAL ENERGY USE

The impacts are driven primarily by the electricity consumption during use stage (25 years), creating approximately 40-50% of GWP and ADP of fossil, and almost 30% of AP, EP terrestrial-marine and POCP.

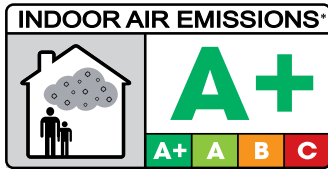
### TRANSPORT

Last, the importance of the A4 Transport from manufacturing to building site stage is minor, less than 1% of GWP and of ADP of fossil.

In terms of waste production, the amount of hazardous waste disposed is negligible and will occur during materials manufacturing.



# Additional information



\* Statement on level of emission of volatile substances in indoor air posing a toxic threat during inhaling - on a scale from A+ (very low-emission) to C (high-emission).

## SUBSTANCES AND EMISSIONS

During the development phase as well as for the industrialization, there is a high focus on **the limited use of chemicals**. Our engineers are referring to REACH, RoHS regulations to avoid substances which impact the environment and the human health (i.e. Methylene Chloride / Dichloromethane) use is eliminated at Otis facilities).

Furthermore, **the Gen360™ Low Duty platform emit no VOCs** or other harmful substances once installed. The car panels are tested for VOC emissions according to the requirements of the French legislation (order of April 2011) concerning the labelling of construction products or coverings of walls or floors and paint and varnishes on their emissions of volatile pollutants.

**Sampling, testing and evaluation** are performed according to ISO 16000 (Part 11, 9 and 3) in its latest versions. Our suppliers are delivering the testing reports justifying products VOC emission class.

The Gen360™ Low Duty platform is made possible as **halogen free** thanks to the use of specific cables and wiring.

**Hazardous substances are avoided during the design stage**, to be in accordance with EU REACH (candidate list) and ROHS requirements. Upon request Otis can provide the information about substances identified by the European Chemical Agency as candidates for Annex XIV of REACH, in a concentration above 0.1% weight by weight in articles

## ENERGY EFFICIENCY CLASS OF THE GEN360™ LOW DUTY PLATFORM

The use phase is the longest phase in the life cycle of the lift, 25 years for the Gen360™ Low Duty platform, and **the B6 Energy Consumption module** is one of the most relevant stages impacting the environment.

It's therefore important for Otis to **continuously improve the energy efficiency** of the elevators, and help our customers reduce the amount of the electricity used.

Therefore, our elevators are designed to achieve an **A-class energy efficiency** classification, according to ISO 25745 standard.

The energy consumption per day of the declared Gen360™ Low Duty platform is 1,4 kWh, corresponding to **A class efficiency** from ISO 25745-2 Table 7.

ENERGY EFFICIENCY CLASS (ISO25745)	ENERGY CONSUMPTION	
	DAILY	ANNUAL
<b>A</b>	<b>1,4 kWh</b>	<b>518 kWh</b>





OTIS

630 V & PERS  
and more up



# Product Information

## THIS ENVIRONMENTAL PRODUCT DECLARATION FOR THE GEN360™ LOW DUTY PLATFORM RANGE IS DEVELOPED ACCORDING TO THE :

- ▶ ISO 14040/44 & ISO 14025 guidelines,
- ▶ and to the calculation rules specified in the new C-PCR for Lifts "C-PCR-008 Lifts (to PCR 2019:14), thereby providing full compliance with the CEN standard EN 15804:2012 + A2:2019 (as the core PCR),
- ▶ as well as the PCR 2019:14 Construction products, version 1.1.


**The General Program Instructions of the International EPD System apply for the current EPD development too.**

We covered the whole life cycle of the Gen360™ Low Duty platform, manufactured both in Gien (France) and Madrid (Spain) Otis facilities, from the preparation of raw materials, its transport to manufacturing site and the manufacturing of the lift's components, through its installation, maintenance and use until each component end-of-life treatment.

As specified in the C-PCR, the mandatory information of the Gen360™ platform is presented in the following table. The figures correspond to a typical configuration, being the representative unit of the complete range of the Gen360™ Low Duty platform.

INDEX	VALUES	REPRESENTATIVE VALUES CHOSEN IN CASE OF DECLARATION OF RANGES
<b>COMMERCIAL NAME</b>	<b>GEN360™ LOW DUTY</b>	
▶ Segment	▶ Residential	
▶ Type of installation	▶ New generic lift	
▶ Main purpose	▶ Transport of passengers	
▶ Type of lift	▶ Electric	
▶ Type of drive system	▶ Gearless traction	
▶ Rated load (fixed or range)	▶ 450 to 700 kg	▶ 630 kg
▶ Rated speed (fixed or range)	▶ 1.0 m/s	▶ 1.0 m/s
▶ Number of stops (fixed or range)	▶ Up to 14	▶ 4
▶ Travelled height (fixed or range)	▶ Up to 45 m	▶ 16.7 m
▶ Number of operating days per year (fixed or range)	▶ 360	
▶ Applied Usage Category (UC) according to ISO 25745-2	▶ UC1 to UC6	▶ UC2
▶ Designed Reference Service Life (RSL)	▶ 25 years	

ADDITIONAL INFORMATION		
▶ Recommended application (main market)	▶ Recommended building type in Table A.1, Annex A, ISO25745-2	
▶ Building rise (typical) / Building type	Mainly dedicated to residential and small scale commercial buildings	
▶ Optional equipment	▶ List if the unit has optional equipment, different than the one listed under the commercial name in the sales catalogue	
▶ Additional requirements	▶ e.g. seismic lift, evacuation lift or similar	



The LCA was conducted for a lift with a lifetime of 25 years, without considering a modernization, installed in a 4-floors building, having a speed of 1.0 m/s and a travelling distance of 16.7 m.

The number of trips per day for a lift with Usage Category 2 is 125, which was obtained from ISO 25745-2.

The designed reference service life considered for the LCA study is a typical data. Depending on maintenance and modernization activities, the usage phase of a lift can be up to 25-30 years.

EPDs based on the c-PCR shall be based on a functional unit (FU).

According to ISO 14040:2006, LCA is a relative approach, which is structured around a FU. The FU is defined as a "quantified performance of a product system for use as a reference unit". All subsequent analyses then refer to that FU, as all inputs and outputs in the life cycle inventory (LCI) and consequently the life cycle impact assessment (LCIA) profile are related to the FU.

This reference is necessary to ensure comparability of LCA results. This is particularly critical when different systems are being assessed, to ensure that such comparisons are made on a common basis.

Comparability between EPDs based on this c-PCR-008 (to PCR 2019:14) is only achievable, if the following performance characteristics are equivalent:

- ▶ FUNCTIONAL UNIT (FU)
- ▶ REFERENCE SERVICE LIFE (RSL)
- ▶ USAGE CATEGORY (UC)
- ▶ TRAVEL HEIGHT
- ▶ NUMBER OF STOPS
- ▶ RATED LOAD
- ▶ RATED SPEED
- ▶ GEOGRAPHIC REGION

(In case of comparability, the equivalence of the geographic region is important due to the specifics of the energy mix used).

Comparability between EPDs based on this c-PCR-008 (to PCR 2019:14) and EPDs based on PCR 2015:05 is not conceivable and shall be avoided. Any comparability of this kind shall be considered as false and misleading the EPD user.

# Life Cycle Approach of Otis Gen360™ Low Duty platform

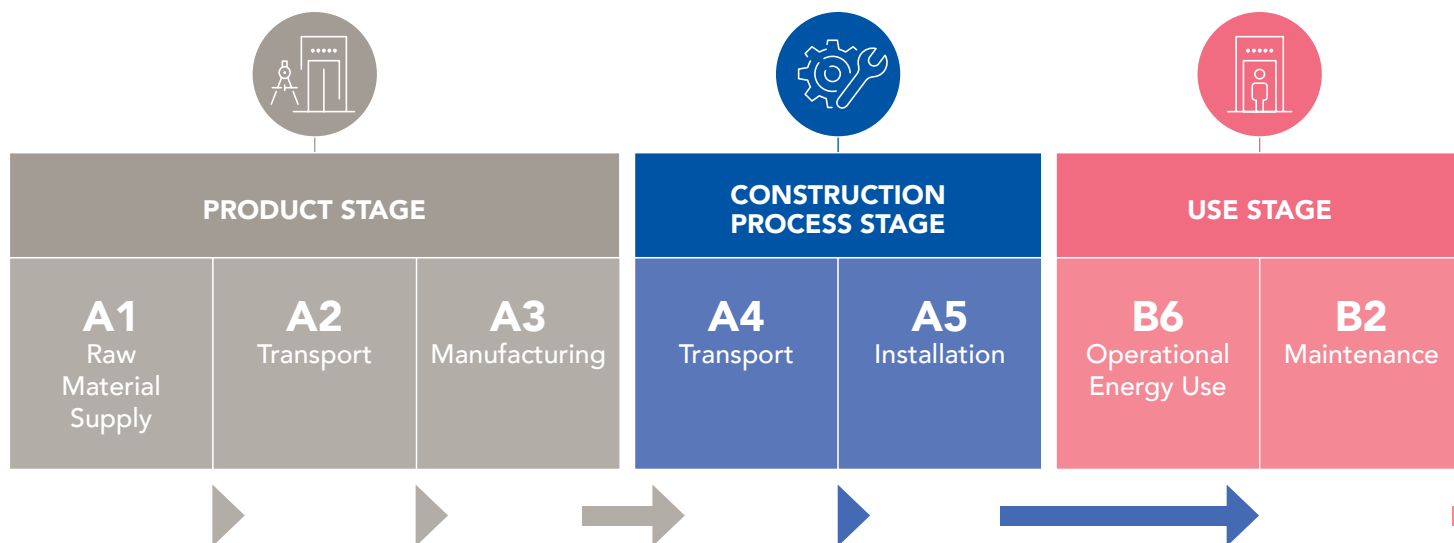
**WE DESIGN OUR ELEVATORS WITH A LIFE-CYCLE APPROACH AND ENSURE CONTINUAL IMPROVEMENTS BY REDUCING THEIR POTENTIAL ENVIRONMENTAL IMPACTS AT EACH LIFE CYCLE STAGE.**

The study scope is a typical “cradle to grave” assessment, from the raw material needed to build up the lift up to its end of life where the lift is removed and disposed.

## THE C-PCR FOCUSES ON FIVE MAIN STAGES

- ▶ **The Product stage (A1-A3)** includes the raw material extraction and production, transport to the manufacturing site, and manufacturing and assembly of components, considering the demand of energy, auxiliary and operational materials and packaging. The data collection is from year 2018.
- ▶ **The Construction process stage (A4-A5)** includes the transportation to the installation site by mainly truck and the installation, considering the energy demand and auxiliary material.
- ▶ **The Use stage (B1-B7)** includes the maintenance, considering the transportation of employees to the installation site and auxiliary materials, including preventive maintenance parts production and energy use during operation and standby. All other modules are not relevant and modernization is not part of this stage.
- ▶ **Finally, the benefits and loads beyond the system boundaries stage (D)** includes the potential for recycling by substitution of primary material and energy recovery.

The following picture summarizes the modules covered in the LCA calculation according to c-PCR 008 Lifts requirements. **This is a “cradle-to-grave” assessment plus module D (A+B+C+D)**, wherein the construction and maintenance of capital equipment and indirect activities are excluded from the system boundary:



The quality and cut-off criteria were considered, as per the EN 15804. Therefore, the total mass of the Gen360™ Low Duty platform materials considered equals the total mass of the elevator. All inflows and outflows, for which data are mandatory, are included in the LCA calculations.

Elevator components are either manufactured at Otis owned and operated sites in Germany, France and in Spain, or purchased from a Tier 1 supplier. The Gen360™ Low Duty platform are then assembled by Otis manufacturing sites, packed and sent to installation sites around Europe.

In Otis sites, it only takes place the manufacturing of components, no pure material production applies.

The Gen360™ Low Duty platform can be installed in different locations around Europe. For this reason, the European grid mix (2013) has been used to simulate the energy associated to installation and maintenance works as well as for the energy used during the 25 years of service life considered.

In order to consider a general scenario possible for the end-of-life of the elevator's components, for the calculation of the results metals have been considered as "recycled" and landfilling or incineration for the rest of the materials.

The GaBi 2019 LCI database provides the life cycle inventory data for several of the raw and process materials obtained from the background system.

LIFE CYCLE STAGE	INFORMATION MODULE	COMMENT	
<b>A1-A3*</b> Product Stage (France, Germany, Spain)	A1	Raw material supply	X
	A2	Transport	X
	A3	Manufacturing	X
<b>A4-A5</b> Construction Process (EU27)	A4	Transport	X
	A5	Installation	X
<b>B1-B7</b> Use Stage (EU27)	B1	Use	ND
	B2	Maintenance	X
	B3	Repair	ND
	B4	Replacement	ND
	B5	Refurbishment	ND
	B6	Operational energy use	X
	B7	Operational water use	ND
<b>C1-C4</b> End-of-life Stage (EU27)	C1	Deconstruction	X
	C2	Transport	X
	C3	Waste processing	X
	C4	C4 Waste disposal	X
<b>D</b> Benefits and loads beyond the system boundary (EU27)	D	Reuse, recovery, recycling, potential	X

\* The share of the GWP-GHG indicator results in A1-A3 (A1-A5 for services) is from product-specific LCI data, ">90%".



### END OF LIFE STAGE

### BENEFITS

(Benefits and loads beyond the system boundary)

**C1**

Deconstruction

**C2**

Transport

**C3**

Waste  
processing

**C4**

Waste  
disposal

**D**

Transport

# ISO Certified Otis factories

## OTIS SUSTAINABLE DEVELOPMENT AND ENVIRONMENT STRATEGY, LEADING TO MORE AND MORE ENERGY EFFICIENT ELEVATORS, INCORPORATES ALSO THE PRODUCTION.

All our manufacturing plants and facilities in Europe have taken their commitment to continuously improve their environmental performance. They are all certified ISO 14001 Environmental Management, in its latest version considering the Life Cycle approach; the design for sustainability is now part of our ISO 14001 certificate. The ISO 9001 Quality Management and more importantly the ISO 50001 Energy management Systems certifications are also part of these greatest achievements contributing to our continuous improvement strategy.

**The standard specifies the requirements for establishing, implementing,** maintaining and improving an energy management system, whose purpose is to enable an organization to follow a systematic approach in achieving continual improvement of energy performance, including energy efficiency, energy security, energy use and consumption. It establishes for Otis a more systematic and sustainable approach to continually reduce energy within the facilities, and therefore the costs and the greenhouse gases (GHG) emissions into the atmosphere.

**In the case of Madrid (Spain) factory the entire manufacturing roof area,** some 12,500 square meters is covered in solar panels which contributes more than 50% towards the energy consumed in the factory every day.

Our major customers and as importantly Governments care about how the elevators are manufactured and are becoming more conscious about the energy performance and the environmental protection. The reduction of energy consumption during in-house manufacturing through ISO 50001 is continuously supporting our energy efficiency during operations.

Within our European facilities we are also certified OHSAS 18001 Occupational Health and Safety Management Standard, to ensure our employee's health and safety, which is one of our core values at Otis.

The implementation of the standard helps us to protect our employees against possible occupational risks and to reduce the likelihood of accidents in the workplace along with improving the safety performance of our products and protect all those that are using our equipment.

The certifications are publicly available on  
[www.otis.com](http://www.otis.com)

Solar panels at the Madrid (Spain) factory.



# Functional Unit (FU) and Transportation Performance (TP)

The function of a lift is the transportation of persons, freights or both.

Based on this, the FU is defined as the transportation of a load over a distance, expressed as one tonne [t] transported over one kilometre [km], i.e. tonne-kilometre [tkm] over a vertical (or inclined) trajectory.

LCA results shall be presented per FU, i.e. per 1 tkm. To do so, first the total amount of tkm (called also transportation performance, TP for short) shall be calculated, followed by division of the respective inputs and outputs by the TP to obtain the LCA results per FU.

TP shall be calculated according to the formulas and predetermined parameters shown below. As also indicated in the C-PCR, most of the predetermined parameters used are defined in ISO 25745-2. This standard is selected as the valid reference at international level for both the estimation of the lifts' energy consumption and for the calculation of TP. It gives tables of parameters for average distance travelled and average weight transported.

## FUNCTIONAL UNIT

According to the underlying C-PCR, for the defined representative unit and a lifetime of 25 years, the TP evaluated for this study is calculated as follows: the average car load %Q [tonnes] times the distance travelled by the lift during the service life sRSL [km]

▶  $TP = \%Q \times s_{RSL}$

The average car load was calculated for the Gen360™ Low Duty platform using table 3 in ISO 25745-2:

▶  $\%Q = Q/1000 \times [\text{Percentage from Table 3 of ISO 25745 - 2}] = 4,73\%$

where **Q** is the elevator rated load, 630 [kg]

The distance travelled over the designed service life of 25 years (RSL) is:

▶  $s_{RSL} = s_{av}/1000 \times n_d \times d_{op} \times RSL = 9\,178 \text{ [km]}.$

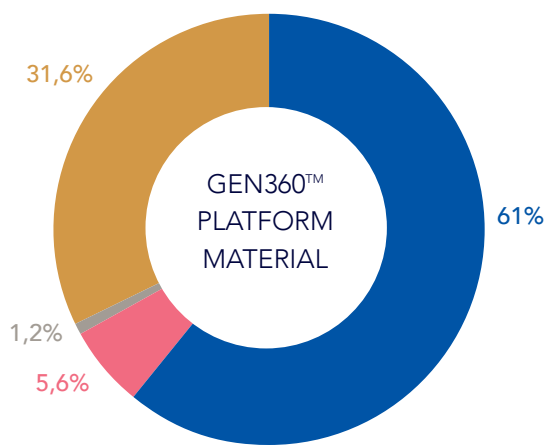
where **s<sup>av</sup>** is the one-way average travel distance, 8,16 [m], **n<sub>d</sub>** is the number of trips per day according to the selected usage category (defined in Table 1 of ISO 25745-2) and **d<sub>op</sub>** is the number of operating days per year (see Table 1).

Therefore, calculation of TP for obtaining of the results per FU is 434 tkm.

# Content declaration

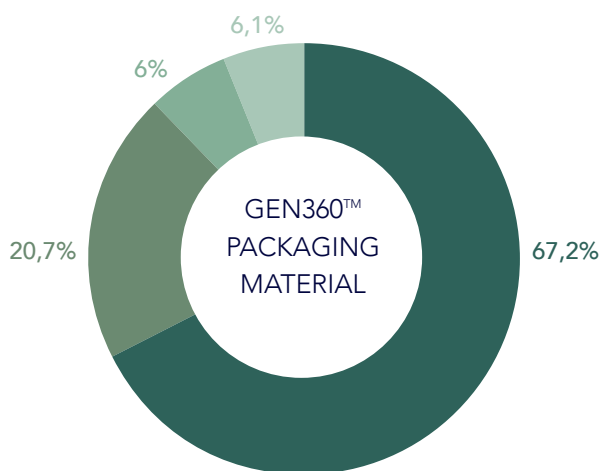
THE TABLES BELOW SHOW A MATERIAL SUMMARY OF THE GEN360™ LOW DUTY PLATFORM STUDIED AND ITS PACKAGING, AS DELIVERED AND INSTALLED IN A BUILDING.

Data are provided by Otis according to the cut-off rules described in Section 4.5 of the C-PCR.



GEN360™ PLATFORM MATERIAL	MASS (kg)	MASS (%)
Ferrous metals (zinc coated steel, stainless steel, cast iron)	1 571	61,0
Non-ferrous metals (aluminum, copper)	143	5,6
Plastics & rubbers	30	1,2
Inorganic materials (concrete, glass)	812	31,6
Organic materials (paper, wood, cardboard)	0,2	0,0
Lubricants (oils, greases), paintings, coatings, adhesives and fillers (glues)	6	0,2
Electric & Electronic Equipment	5	0,2
Batteries & accumulators	3	0,1
Other materials	2	0,09
<b>Total mass</b>	<b>2 574</b>	<b>100</b>
Mass per 1 tkm	5	

Gross weight of the Gen360™ Low Duty platform material as one unit of product



GEN360™ PACKAGING MATERIAL	MASS (kg)	MASS (%)
Cardboard	70	20,7
Plastic PE (Low-density)	20	6
Strapping (Polystyrene)	20	6,1
Wood	227	67,2
<b>Total mass</b>	<b>338</b>	<b>100</b>
Mass per 1 tkm	0,8	

Gross weight of the Gen360™ Low Duty platform packaging material for the one unit of product





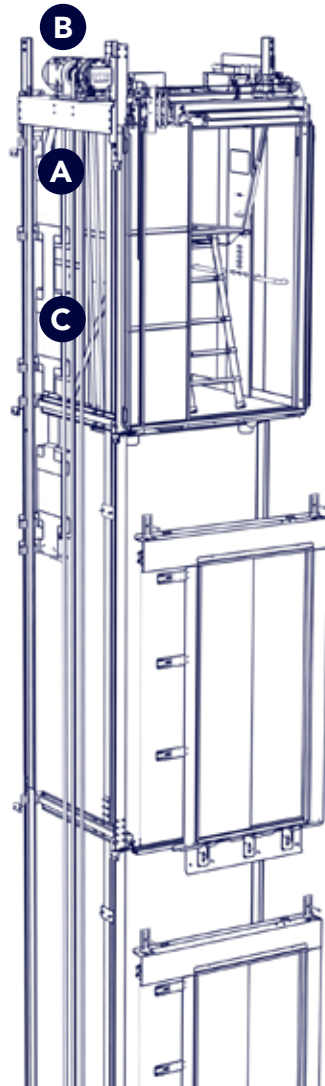
**A:** Polyurethane coated flat steel belts (no lubricant)



**B:** Gearless machine (energy efficient, no lubricant, space-saver)



**C:** Regen Drive technology (electricity generation)



**LED lighting:** Car Operating Panel



**LED lighting:** Cabine ceiling

## ALL GEN360™ LOW DUTY PLATFORM IS PACKED AND DELIVERED WITH:



▶ Cardboard boxes having **FSC labeling** (Forest stewardship Council)



▶ Wood made pallets having **PEFC certification** (Program for the Endorsement of Forest Certification)

# Environmental Indicators

## ENVIRONMENTAL INDICATORS AND INFORMATION FOR EPD GEN360™ LOW DUTY IN ACCORDANCE WITH EN 15804:2012+A2:2019

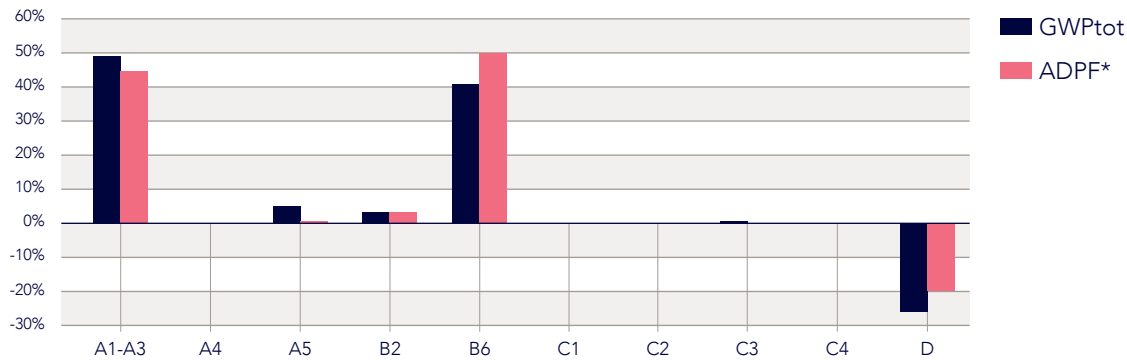
- ▶ **The results for the complete service lifetime of the Gen360™** Low Duty platform were calculated according to the C-PCR and presented per functional unit (tkm).
- ▶ **Assumptions are presented in the verified LCA Background report.**
- ▶ **The definition of the listed impact categories** are given in the Glossary section of this declaration.

### CORE ENVIRONMENTAL IMPACT INDICATORS UC2 PER TKM

EN 15804	PRODUCT STAGE	CONSTRUCTION PROCESS STAGE			USE STAGE		END-OF-LIFE STAGE				NET BENEFITS
		A1-A3	A4	A5	B2	B6	C1	C2	C3	C4	
<b>IMPACT CATEGORY</b>	<b>A1-A3</b>	<b>A4</b>	<b>A5</b>	<b>B2</b>	<b>B6</b>	<b>C1</b>	<b>C2</b>	<b>C3</b>	<b>C4</b>	<b>D</b>	
GWP - total [kg CO2 eq.]	1,46E+01	7,47E-02	1,59E00	9,14E-01	1,22E01	9,37E-02	9,14E-02	2,20E-01	2,65E-02	-7,95E00	
GWP - fossil [kg CO2 eq.]	1,54E+01	7,42E-02	5,20E-01	9,17E-01	1,22E01	9,15E-02	8,73E-02	2,20E-01	2,87E-02	-7,95E00	
GWP - biogenic [kg CO2 eq.]	-8,48E-01	0	1,06E00	-6,34E-03	4,06E-02	1,48E-03	4,07E-03	6,71E-04	0	8,49E-03	
GWP - luluc [kg CO2 eq.]	1,13E-02	5,99E-04	1,89E-03	2,53E-03	1,77E-02	7,58E-04	2,10E-06	1,02E-05	8,27E-05	-5,72E-03	
ODP [kg CFC-11 eq.]	5,72E-11	1,36E-17	8,53E-16	5,68E-12	2,68E-13	1,72E-17	9,30E-18	9,74E-17	1,07E-16	9,75E-16	
AP [Mole of H+ eq.]	7,04E-02	2,71E-04	1,33E-03	4,87E-03	2,69E-02	4,26E-04	6,69E-04	5,15E-05	2,06E-04	-3,30E-02	
EP - freshwater [kg P eq.]	1,91E-05	2,26E-07	9,11E-07	2,41E-06	3,26E-05	2,85E-07	1,88E-08	1,87E-08	4,93E-08	-3,97E-06	
EP - marine [kg N eq.]	1,10E-02	1,23E-04	5,71E-04	9,76E-04	5,98E-03	2,00E-04	3,32E-04	1,97E-05	5,30E-05	-4,79E-03	
EP - terrestrial [Mole of N eq.]	1,19E-01	1,38E-03	6,55E-03	1,06E-02	6,28E-02	2,22E-03	3,65E-03	2,64E-04	5,83E-04	-5,20E-02	
POCP [kg NMVOC eq.]	3,53E-02	2,42E-04	1,30E-03	2,58E-03	1,64E-02	4,34E-04	6,20E-04	5,27E-05	1,61E-04	-1,53E-02	
ADPF [MJ]	1,92E+02	9,88E-01	4,16E00	1,33E01	2,14E02	1,25E00	1,25E00	1,07E-01	3,77E-01	-8,46E01	
ADPE [kg Sb eq.]	5,88E-04	5,99E-09	3,04E-08	8,52E-05	3,53E-06	7,57E-09	2,64E-09	1,26E-09	2,58E-09	-2,38E-04	
WDP [m³ world equiv.]	4,53E+00	7,22E-04	1,54E-01	1,44E-01	2,66E00	9,13E-04	1,73E-04	2,76E-02	3,01E-03	-1,36E00	
<b>ADDITIONAL IMPACT</b>	<b>A1-A3</b>	<b>A4</b>	<b>A5</b>	<b>B2</b>	<b>B6</b>	<b>C1</b>	<b>C2</b>	<b>C3</b>	<b>C4</b>	<b>D</b>	
EN15804+A1 Global warming potential (GWP) [kg CO2 eq.] <small>Includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product.</small>	1,41E+01	7,28E-02	1,58E+00	8,90E-01	1,20E+01	9,15E-02	8,99E-02	2,19E-01	2,58E-02	-7,81E+00	

Caption: GWP - total = global warming potential; GWP - fossil = global warming potential (fossil fuel only); GWP - biogenic = global warming potential (biogenic); GWP - luluc = global warming potential (land use only); ODP = ozone depletion; AP = acidification terrestrial and freshwater; EP - freshwater = eutrophication potential (freshwater); EP - marine = eutrophication potential (marine); EP - terrestrial = eutrophication potential (terrestrial); POCP = photochemical ozone formation; ADPE = abiotic depletion potential (element), ADPF = abiotic depletion potential (fossil) WDP = water scarcity.

## GRAPHIC RESULTS FOR GWP AND ADPF INDICATORS



## INDICATORS DESCRIBING RESOURCE USE UC2 PER TKM

EN 15804	PRODUCT STAGE	CONSTRUCTION PROCESS STAGE			USE STAGE		END-OF-LIFE STAGE				NET BENEFITS
		A1-A3	A4	A5	B2	B6	C1	C2	C3	C4	
PERE [MJ]	2,48E+01	5,71E-02	4,31E-01	2,49E00	9,5E01	7,22E-02	3,94E-03	2,45E-02	4,94E-02	-1,74E01	
PERM [MJ]	1,01E+01			3,87E-01							
PERT [MJ]	3,50E+01	5,71E-02	4,31E-01	2,88E00	9,5E01	7,22E-02	3,94E-03	2,45E-02	4,94E-02	-1,74E01	
PENRE [MJ]	1,86E+02	9,92E-01	4,18E00	1,32E01	2,14E02	1,25E00	1,25E00	1,07E-01	3,77E-01	-8,49E01	
PENRM [MJ]	5,96E+00			1,48E-01							
PENRT [MJ]	1,92E+02	9,92E-01	4,18E00	1,34E01	2,14E02	1,25E00	1,25E00	1,07E-01	3,77E-01	-8,49E01	
SM [kg]	1,85E+00			2,32E-03							
RSF [MJ]											
NRSF [MJ]											
FW [m3]	1,37E-01	6,66E-05	3,94E-03	5,15E-03	1,1E-01	8,41E-05	7,06E-06	6,54E-04	9,50E-05	-7,29E-02	

Caption: PERE = Use of renewable primary energy excluding renewable primary energy resources 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 resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water

## ENVIRONMENTAL INFORMATION DESCRIBING WASTE CATEGORIES AND OUTPUT FLOWS

EN 15804	PRODUCT STAGE	CONSTRUCTION PROCESS STAGE			USE STAGE		END-OF-LIFE STAGE				NET BENEFITS
		A1-A3	A4	A5	B2	B6	C1	C2	C3	C4	
HWD [kg]	8,09E-07	4,59E-08	1,40E-07	1,93E-07	8,87E-08	5,80E-08	1,21E-10	4,21E-10	5,75E-09	-2,13E-07	
NHWD [kg]	1,52E+00	1,57E-04	4,78E-02	3,97E-02	1,52E-01	1,99E-04	1,28E-04	2,64E-02	1,90E00	-8,89E-01	
RWD [kg]	6,34E-03	1,83E-06	8,07E-05	9,01E-04	3,25E-02	2,31E-06	1,34E-06	4,37E-06	4,29E-06	-1,93E-03	
CRU [kg]											
MFR [kg]				2,58E-02				3,99E00			
MER [kg]				4,84E-03							
EEE [MJ]			2,06E00	6,69E-02				4,67E-01			
EET [MJ]			3,71E00	1,42E-01				8,78E-01			

Caption: HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy

# Environmental Indicators

## BIOGENIC CARBON CONTENT OF PRODUCT AND PACKAGING

EN 15804	PRODUCT STAGE	CONSTRUCTION PROCESS STAGE		USE STAGE		END-OF-LIFE STAGE				NET BENEFITS
IMPACT CATEGORY	A1-A3	A4	A5	B2	B6	C1	C2	C3	C4	D
Biog. C in packaging [kg]	0,28			0,01						
Biog. C in product [kg]										

Caption: Biog. C in packaging = Biogenic carbon content in packaging; Biog. C in product = Biogenic carbon content in product

## INDICATORS DESCRIBING RESOURCE USE UC2 PER TKM

EN 15804	PRODUCT STAGE	CONSTRUCTION PROCESS STAGE		USE STAGE		END-OF-LIFE STAGE				NET BENEFITS
IMPACT CATEGORY	A1-A3	A4	A5	B2	B6	C1	C2	C3	C4	D
IPCC AR5 GWP100, excl biogenic carbon [kg CO2 eq.]	1,51E+01	7,35E-02	5,17E-01	9,07E-01	1,21E+01	9,08E-02	8,65E-02	2,19E-01	2,84E-02	-7,86E+00

## RECYCLING AND WASTE TREATMENT DECLARATION

The modules considered for the end-of-life scenario includes waste processing (C3) and disposal (C4).

- ▶ The main materials used in the Gen360™ Low Duty platform are metals (mainly steel) and inert materials (mainly concrete).
- ▶ Due to this composition, there is a high potential of recyclability at the elevator's end of life for approximately 70% of the components. Steel and non-ferrous metals as well as the electronic equipment - contributing approximately to 70% of the elevator's composition - can all be recycled.
- ▶ For the inert materials fraction (approx. 30%) landfilling is assumed in this EPD as a realistic and conservative approach.
- ▶ Incineration is considered for the minor proportion (1%) of combustible materials (e.g. plastic parts).
- ▶ For any of these waste treatment plants European average technologies are considered.

# Programme-Related Information and verification

See PCR for detailed requirements.

▶ Program	The International EPD® System EPD International AB Box 210 60, SE-100 31 Stockholm, Sweden www.environdec.com
▶ EPD registration number	S-P-01941
▶ Published	2021-12-06
▶ Valid until	2026-12-06
▶ Revision number	1.0
▶ Revision date	2024-02-07
▶ Product Category Rules	EN15804:2012 + A2:2019 as Core PCR PCR 2019:14 Construction Products, version 1.1 C-PCR-008 Lifts (to PCR 2019:14), version 2020-10-30
▶ Product group classification	Lifts
▶ Reference year for data	2018
▶ Geographical scope	Europe

ISO standart ISO 21930 and CEN standart EN 15804 serves as the core Product Category Rules (PCR)

Product category rules (PCR):

PCR 2019:14 Construction Products, version 1.1  
C-PCR-008 Lifts (to PCR 2019:14), version 2020-10-30

PCR review was conducted by:

The Technical Committee of the International EPD® System. See [www.environdec.com/TC](http://www.environdec.com/TC) for a list of members.

Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat [www.environdec.com/contact](http://www.environdec.com/contact).

Independent third-party verification of the declaration and data, according to ISO 14025:2006:

External  Internal

covering

EPD process certification  EPD verification

Third party verifier:

Yannick Le Guern - ELYS Conseil S.A.S.U

In case of individual verifiers:

Approved by: The International EPD® System Technical Committee, supported by the Secretariat

Procedure for follow-up during EPD validity involves third party verifier:

Yes  No

The EPD owner has the sole ownership, liability and responsibility of the EPD.

EPDs of construction products may not be comparable if they do not comply with EN 15804+A2:2019.

## CONTACT INFORMATION

EPD owner:	LCA author:	Programme operator:
		
<b>OTIS Elevator Company</b> New Equipment Center Avenue des Montoires 45504, Cedex, Gien, France <a href="http://www.otis.com">www.otis.com</a>	<b>SPHERA</b> Hauptstraße 111-113 70771 Leinfelden-Echterdingen, Germany <a href="http://www.sphera.com">www.sphera.com</a>	<b>EPD International AB</b> <a href="mailto:info@environdec.com">info@environdec.com</a>

Results presented in this document do not constitute comparative assertions. EPDs within the same product category, but from different programmes may not be comparable.

However, these results can be used to compare with similar products presented in other EPDs that follow the same PCR and are according to the same functional unit and have equivalent performance characteristics (UC, travelled height, stops, load, speed and geographical region).

## SCENARIOS

The following scenarios have been considered in this EPD.  
The EN 15804:2012+A2:2019 standard requires to present this information.

TRANSPORT TO BUILDING SITE	
SCENARIO INFORMATION	UNIT (PER FU)
FUEL TYPE AND CONSUMPTION OF VEHICLE OR VEHICLE TYPE USED FOR TRANSPORT E.G. LONG DISTANCE TRUCK, BOAT ETC	Fuel type: diesel 0,015l / FU
DISTANCE	160 km
CAPACITY UTILISATION (INCLUDING EMPTY RETURNS)	85%
BULK DENSITY OF TRANSPORTED PRODUCTS	Non applicable
VOLUME CAPACITY UTILISATION COEFFICIENT	<1

Transportation of the installation team is included in module A5. The following distance is considered: 600km



## INSTALLATION OF THE PRODUCT IN THE BUILDING

SCENARIO INFORMATION	UNIT (PER FU)
ANCILLARY MATERIALS FOR INSTALLATION (SPECIFIED BY MATERIAL)	0,0002 kg of glue / FU 0,002 kg of cleaning agent / FU
WATER USE	Non applicable
OTHER RESOURCE USE	Non applicable
QUANTITATIVE DESCRIPTION OF ENERGY TYPE (REGIONAL MIX AND CONSUMPTION DURING THE INSTALLATION PROCESS)	0,08 MJ of electricity / FU
WASTE MATERIALS ON THE BUILDING SITE BEFORE WASTE PROCESSING, GENERATED BY THE PRODUCT'S INSTALLATION (SPECIFIED BY TYPE)	Packaging materials treatment (thermal treatment): 0,08 kg carboards / FU 0,26 kg pallets / FU 0,04 kg plastics / FU
OUTPUT MATERIALS (SPECIFIED BY TYPE) AS RESULT OF WASTE PROCESSING AT THE BUILDING SITE E.G. OF COLLECTION FOR RECYCLING, FOR ENERGY RECOVERY, DISPOSAL (SPECIFIED BY ROUTE)	Non applicable
DIRECT EMISSIONS TO AMBIENT AIR, SOIL AND WATER	Non applicable

## USE STAGE RELATED TO THE BUILDING FABRIC

SCENARIO INFORMATION	UNIT (PER FU)
MAINTENANCE PROCESS	Various parts are replaced within the planned maintenance of the lifts. Transportation of the maintenance team is included in module B2. The following distance is considered: 600km
MAINTENANCE CYCLE	Some parts are replaced every 5 years, 10 years or 20 years.
ANCILLARY MATERIALS FOR MAINTENANCE, E.G. CLEANING AGENT, SPECIFY MATERIALS	0,012 kg metals parts / FU / RSL 0,002 kg plastic parts / FU / RSL 0,016 kg electronic parts / FU / RSL 0,013 kg cardboard / FU / RSL For replacement part transportation (module B2), a distance of 1.000 km by truck has been assumed for all materials.
WASTE MATERIAL RESULTING FROM MAINTENANCE (SPECIFY MATERIALS)	0,03 kg of replaced parts / FU / RSL
NET FRESH WATER CONSUMPTION DURING MAINTENANCE	Non applicable
ENERGY INPUT DURING MAINTENANCE, E.G. VACUUM CLEANING, ENERGY CARRIER TYPE, E.G. ELECTRICITY, AND AMOUNT, IF APPLICABLE AND RELEVANT	1,17 MJ of electricity / FU / RSL

## SYSTAINABLE LIFE CYCLE OF THE ELEVATOR

As essential mobility enabler the elevator plays a critical role in our society. The table below shows cases the running supply of energy and water according to the EPD's requirements.

USE OF ENERGY AND USE OF WATER	
SCENARIO INFORMATION	UNIT (PER FU)
ANCILLARY MATERIALS SPECIFIED BY MATERIAL	Non applicable
NET FRESH WATER CONSUMPTION	Non applicable
TYPE OF ENERGY CARRIER (E.G. ELECTRICITY, NATURAL GAS, DISTRICT HEATING)	109 MJ of electricity / FU / RSL European grid mix considered
POWER OUTPUT OF EQUIPMENT (IDLE MODE)	0,0717 kW
CHARACTERISTIC PERFORMANCE, E.G. ENERGY EFFICIENCY, EMISSIONS, VARIATION OF PERFORMANCE WITH CAPACITY UTILISATION ETC	Assumptions according to ISO 25745
FURTHER ASSUMPTIONS FOR SCENARIO DEVELOPMENT, E.G. FREQUENCY AND PERIOD OF USE, NUMBER OF OCCUPANTS	Assumptions according to ISO 25745

After running throughout many years and being maintained over decades the elevator might be dismantled and substituted with a new elevator or modernization product. Below's table showcases the consequences.

END-OF-LIFE	
SCENARIO INFORMATION	UNIT (PER FU)
COLLECTION PROCESS SPECIFIED BY TYPE	4 kg collected separately / FU
RECOVERY SYSTEM SPECIFIED BY TYPE	2,91kg for recycling (metals) / FU 0,13 kg for energy recovery (plastics) / FU
DISPOSAL SPECIFIED BY TYPE	0,95 kg material for final deposition / FU
ASSUMPTIONS FOR SCENARIO DEVELOPMENT (E.G. TRANSPORTATION)	500 km assumed for transportation to end of life





# References

- ▶ **General Program Instructions of the International EPD® System. Version 2.5.**
- ▶ **EN 15804:2012+A2:2019 Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products**
- ▶ **PCR 2019:14 Construction Products**
- ▶ **C-PCR-008 (TO PCR 2019 :14) Lifts (Elevators)**

## **ISO 14025:2006:**

Sustainability of construction works – Environmental labels and declarations – Type III environmental declarations – Principles and procedures.

## **ISO (2006) ISO 14040:**

Environmental management – Life cycle assessment – Principles and framework.

## **ISO (2006) ISO 14044:**

Environmental management – Life cycle assessment – Requirements and guidelines.

## **ISO (2012) ISO 25745-1:**

Energy performance of lifts, escalators, and moving walks – Part 1: Energy measurement and verification.

## **ISO (2014) ISO 25745-2:**

Energy performance of lifts, escalators, and moving walks – Part 2: Energy calculation and classification for lifts (lifts).

## **ISO 16000-9:2006:**

Indoor air quality and VOC emission testing – Determination of the emission of volatile organic compounds from building products and furnishing – Emission test chamber method.

## **ISO 16000-11:2006:**

Indoor air quality and VOC emission testing – Determination of the emission of volatile organic compounds from building products and furnishing – Sampling, storage of samples and preparation of test specimens.

## **ISO 14001:2004:**

Environmental management systems – Requirements with guidance for use.

## **ISO 9001:2015:**

Quality management systems – Requirements.

## **OHSAS 18001:2007:**

Occupational Health and Safety management systems – Requirements.

## **ISO 50001:2011:**

Energy management systems – Requirements with guidance for use.

# Glossary

## **ENVIRONMENTAL PRODUCT DECLARATION (EPD)**

An EPD is a type III declaration, complying with ISO14025, which provides results about a product's environmental performance and facilitates comparison between different products with the same function (Functional Unit and Elevator's characteristics). The results are based on the Life Cycle Analysis done in accordance with ISO 14040.

## **FUNCTIONAL UNIT (FU)**

The quantified performance of a product system for use, as a reference unit. For Lifts the FU corresponds to the transportation of 1 tonne of load over a distance of 1 kilometer, expressed in [tkm]

## **ISO 25745**

ISO 25745-2:2015 specifies a method of estimating energy consumption based on measured values, calculation, or simulation on an annual basis for traction, hydraulic and positive drive lifts on a single-unit basis, and an energy classification system for new, existing, and modernized traction, hydraulic, and positive drive lifts on a single-unit basis.

## **LIFE CYCLE ASSESSMENT (LCA)**

LCA is a method that quantifies the total environment impact of products or activities over their entire life cycle and life cycle thinking. Life cycle assessment is based on ISO 14040 and ISO 14044 standards and comprises four phases: goal and scope definition, inventory data collection and analysis, environmental impact assessment, and interpretation of results. The results of LCA are used in communication and product development purposes, for example.

## **LIFE CYCLE INVENTORY (LCI)**

The phase of life cycle assessment involving the compilation and quantification of inputs and outputs for a product system throughout its life cycle.

## **LIFE CYCLE IMPACT ASSESSMENT (LCIA)**

The phase of life cycle assessment aimed at understanding and evaluating the magnitude and significance of the potential environmental impacts of a product system throughout the life cycle of the product.

## **PRODUCT CATEGORY RULES (PCR)**

Product Category Rules (PCR) defines the rules and requirements for EPDs of a certain product category. They are a key part of ISO 14025 as they enable transparency and comparability between EPDs.

## **FOREST STEWARDSHIP COUNCIL**

(FSC) International not-for-profit, multi-stakeholder organization established in 1993 to promote responsible management of the world's forests.

## **PROGRAM FOR THE ENDORSEMENT OF FOREST CERTIFICATION (PEFC)**

International, non-profit, non-governmental organization which promotes sustainable forest management through independent third party certification.

## **REACH**

Registration, Evaluation, Authorisation and restriction of Chemicals – European Union Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 that addresses the production and use of chemical substances, and their potential impacts on both human health and the environment.

## **ROHS**

Restriction of Hazardous Substances Directive - RoHS 1 Directive 2002/95/EC and RoHS 2 Directive 2011/65/EU.

## **WEEE**

Waste Electrical and Electronic Equipment Directive - European Community Directive 2012/19/EU

## **UC**

Usage Category: Defines the intensity of the elevator usage by categories, based on average number of trips per day according to ISO 25745-2.

— Otis gives people freedom to connect and thrive in a taller, faster, smarter world. The global leader in the manufacture, installation and servicing of elevators and escalators, we move 2.1 billion people a day and maintain more than 2 million customer units worldwide – the industry’s largest Service portfolio. You’ll find us in the world’s most iconic structures, as well as residential and commercial buildings, transportation hubs and everywhere people are on the move. Headquartered in Connecticut, USA, Otis is 70,000 people strong, including 40,000 field professionals, all committed to meeting the diverse needs of our customers and passengers in more than 200 countries and territories. To learn more, visit [www.otis.com](http://www.otis.com) and follow us on LinkedIn, Instagram, Facebook and Twitter @OtisElevatorCo.