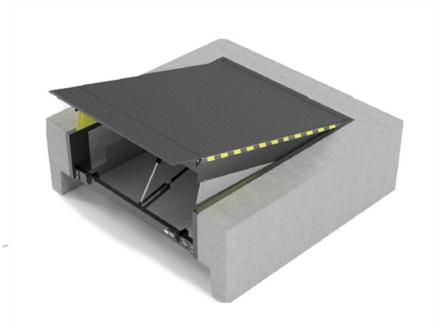






Issuance date: 15.05.2023 Validity date: 15.05.2028

DOCK LEVELLERS: AMTRK PRO, AMTRV-CD, AMTRV-ESS, AMTRV-PRO



Owner of the EPD:

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Platform for EPD program operators and LCA practitioner <u>www.eco-platform.org</u>

ITB is the verified member of The European

Basic information

This declaration is the Type III Environmental Product Declaration (EPD) based on EN 15804+A2 and verified according to ISO 14025 by an external auditor. It contains the information on the impacts of the declared construction materials on the environment and their aspects verified by the independent party according to ISO 14025. Basically, comparison or evaluation of EPD data is possible only if all the compared data were created according to EN 15804+A2. The intended use of an EPD is to communicate scientifically based environmental information for product, for the purpose of assessing the environmental performance of buildings.

Life cycle analysis (LCA): A1-A5, B6, C1-C4 and D modules in accordance with EN 15804

The year of preparing the EPD: 2023

Product standards: EN 1398; EN 61000-6-2; EN 61000-6-3; EN 60204-1

Service Life: Reference service life of 15 years

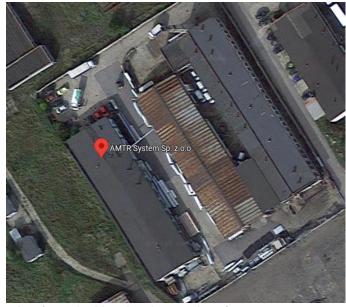
PCR: ITB-PCR A v1.6

Declared unit: 1 unit (per 15 years) **Reasons for performing LCA:** B2B

Representativeness: Polish, European, 2021

MANUFACTURER

The main subject of the AMTR company's activity is the production of docking systems adapted to both the given facility and logistic needs. Company enrich them appropriate accessories that optimize the work of people responsible for reloading products, thanks to which the entire process efficiently runs quickly, and safelv. Manufacturing plant is located at Kamieniec Zabkowicki (Poland). The dock leveller safely bridges the gap between the ramp and the truck bed. It connects the building with the vehicle to enable a safe and efficient process for loading and unloading. In order to meet the needs of customers, apart from standard



ramps AMTR makes "custom-made" ramps, made of steel with a load capacity of up to 12 tons.

PRODUCTS DESCRIPTION AND APPLICATION

The dock leveller consists of five main components: electrical installation, hydraulic system, control box, swing lip in the straight version, steel platform varnished, CE declaration of conformity. EPD No 452 covers 4 types of devices with slightly different solutions:

AMTRK-PRO dock leveller with swing lip. The swing lip dock leveller is designed for pallet handling by forklift trucks of articulated lorries. The dock leveller is equipped with a stable hinged lip to ensure fast and safe loading. The access platform is made of 6/8 mm thick chequered steel plate. It is integrated into the service support and connected at the rear of the dock leveller frame by means of hinges. Full safety of use is ensured by the



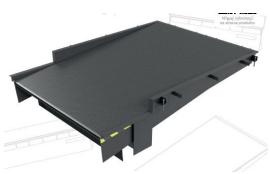
anti-slip surface, foot protection along the entire length of the platform and full range of dock leveller lifting. Different ways of embedding the platforms in the foundation are possible. The AMTRK-PRO dock leveller lip is made of high-quality, 12 mm thick tread metal sheet and features a reliable hinge system that works even when heavily contaminated. In addition, the lip is chamfered to 40 mm, which prevents damage to the wheels on loading equipment.

AMTRV-CD variable capacity dock leveller is designed to ensure the smooth loading and unloading of both lorries and delivery trucks using the same loading platform. The telescopic lip in the AMTRV-CD dock leveller is manufactured from high quality 12 mm (12/14) corrugated sheet metal and fitted with a special, durable, contamination-resistant and maintenance-free pull-out mechanism. A system of simple, highly durable slides ensures its quiet and trouble-free operation. The AMTRV-CD dock leveler lip



has a segmented design, allowing the operation of vehicles of different types, depending on the selected operating mode

AMTRV ESS system, an ideal solution to ensure the safety of the docking process, the safety of the goods and the driver who does not have to leave the vehicle directly in front of the bay to open the rear of the trailer. An additional advantage of the system is the significant reduction in costs associated with the loss of energy needed to heat or cool warehouses during loading, as the door opens after the vehicle is docked and sealed. The



AMTRV-ESS dock leveller is not only used for internal loading docks, but also for specially developed external loading bays with doors and air seals, ideally suited to solutions applied in freezers. When at standstill, the platform is lowered from level 0 to allow the doors of the articulated lorry trailer to be opened when docked. The lip of the AMTRV-ESS is manufactured from 12 mm (12/14 mm) high quality corrugated sheet metal with a robust, reliable and maintenance-free pull-out mechanism. The pull-out lip of the platform can be manufactured in two different shapes: a straight lip and a diagonal lip.

AMTRV-PRO Dock leveller with pull-out lip. The pull-out lip dock leveller is designed for pallet handling by forklift trucks for articulated lorries. Its characteristic feature is an extending lip guided on bearing rollers. The dock leveller is CE marked. The access platform is made of 8/10 mm thick chequered plate. It is integrated into the service safety device and connected at the rear of the dock leveller frame by means of hinges. Full safety of use



is ensured by the and-slip surface, foot protection along the entire length of the platform and full range of dock leveller lifting. Different ways of embedding the platforms in the foundation are possible. The lip of the AMTRV-PRO is manufactured from 12 mm (12/14 mm) high quality tread sheet metal with a robust, reliable and maintenance-free pull-out mechanism. The pull-out lip of the platform can be manufactured in two different shapes: a straight lip and a diagonal lip.

The average composition for AMTR dock leveller is as following Table 1.

Table 1. Average material composition of the AMTR dock levellers (in %)

Component	Percentage in mass (%)
Electronics	0.2
Plastics	2.0
Steel (in accordance with EN 59220)	95.0
Electro mechanics	2.0
Others (mostly hydraulic oil)	0.8
Total	100.0

LIFE CYCLE ASSESSMENT (LCA) – general rules applied

Unit

The declared unit is 1 unit of representative installed leveler AMTRK-PRO 25 (width 2140, length 3000, height 370, approx. Weight 700 kg, power 1.1 kW, with RSL 15 years).

Note: The results presented in the LCA (Tables 5-8) are presented for a leveller unit with the representative weight of 700 kg. To convert the impacts on other units with different weights, use a conversion factor equal the ratio of the weight of the unit under assessment to the weight of the representative unit. For example, if the leveler unit weighs 1000 kg, a conversion factor of 1.43 (1000/700) should be applied.

System boundary

This EPD is based on a cradle-to-gate with options LCA and covers the life cycle modules A1-A3, A4-A5, B6, C1-C4, and D, in which 100 % weight of the product has been accounted in accordance with EN 15804+A2 and ITB PCR A (cradle to grave). Energy and water consumption, emissions as well as information on generated wastes were inventoried and were included in the calculation. It can be assumed that the total sum of omitted processes does not exceed 5% of all impact categories. In accordance with EN 15804+A2, machines and facilities (capital goods) required for the production as well as transportation of employees were not included in LCA. The boundaries of the system are shown in Table 4.

Allocation

The allocation rules used for this EPD are based on general ITB's document PCR A 1.6 (2023). In the modules A1-A3, material losses in the assembly of the products in the factory are defined on the averaged specific values for the site. Input and output data from the production is inventoried and allocated to the levellers production on the mass basis. The declaration covers a range of products (averaged). Their production resources and processing stages are basically similar, so it is possible to average the production by product volume.

System limits

All data obtained from the survey at the solar glass supplier and module manufacturer were taken into consideration, all available data from production have been considered, i.e. all raw materials/elements used as per assembly process, utilized thermal energy, and electric power consumption. Thus, material and energy flows contributing less than 1 % of mass or energy have been considered. It can be assumed that the total sum of neglected processes does not exceed 5 % of energy usage and mass per module A, B, C or D. Machines and facilities required during production are neglected. The production of etiquettes, tape and glue was also not considered. The weight of the platform due to the accessories may vary plus or minus 2%.

Modules A1 and A2: Raw materials supply and transport

The modules A1 and A2 represent the extraction and processing of raw materials and components and transport to the production site. The mass dominant input material (approx. 95%) is high quality steel from local suppliers. Other input elements are plastic, electronics, and electromechanics and oil. For A2 module (transport) European averages for fuel data are applied and specific transport data (verified) is provided by the manufacturer in LCI questionnaire.

Module A3: Production

The dock levellers production process in Kamieniec Ząbkowicki is composed of cutting, bending, folding, stamping, CNC, welding, surface treatment and anti-corrosion painting. The final assembly is composed of fixing the electrical installation, hydraulic system, control box and the cylinders to the steel construction as well as a functional test of a full sequence (see Figure 1).

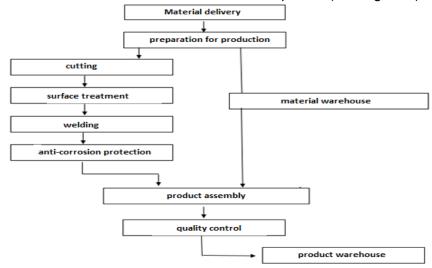


Fig. 1. A basic scheme of the dock levellers manufacturing process

Module A4-A5: Transport and installation

The transportation distance between production plant (Poland) and the final site is assumed as 500 km (lorry 10t, Euro 5). The dock leveler is delivered as one compact unit ready for installation. With the help of lifting equipment like a forklift or a crane, the complete unit is lifted and put in right place in the concrete pit. The frame of the dock leveler is screwed to connection points in the pit; all concrete works to connect the dock leveler to the building is outside assessment. It was assumed a certain amount of energy necessary for power tools during installation A5 (up to 20 kWh).

Module B6: Use stage

Total energy consumed during the product life was calculated using following formula (1):

Electricity consumption (kWh)= (Enactive*h_active+E_idle*h_idle)*Life_ span*days *n (1)

where:

- E_active Energy consumption in active mode in W
- h_active Operation time in active mode in hours
- E_idle Energy consumption in idle mode in W
- h_idle Operation time in idle mode in hours
- days Operation days per year
- n- conversion factor
- Life_span RSL in years

Table 2. Values used for energy consumption calculations for the B6 module

Name	Value	Unit
Calculated Electricity consumption – 15 years	26532	kWh
Days per year in use (for 15 years)	220	days
Hours per day in on mode	7	h
Hours per day in idle mode	17	h
Power consumption in specific mode	1100	W

Power consumption in specific mode	20	W
Lifespan (RSL)	15	years
Conversion factor (kW to kWh)	0.001	-

Modules C1-C4 and D: End-of-life (EOL)

The deconstruction of the products covered by this study is assumed to be done with specific electromechanical tools. 100% collection rate was assumed. All materials are directed to either a recycling or an incineration unit to be separated and processed in. In the adapted end-of-life scenario, the deconstructed products are transported to recycling plant on the distance 200 km with > 10t lorry, EURO 5. The recycling potential of recovered materials is presented in Table 3. Steel and plastic elements and materials used in the leveller have potential benefits and load beyond the system boundary. These include the following: steel (new steel production), municipal plastics incineration (heat). Electricity generated through the waste incineration at the CHP plant is assumed to replace the average Polish electricity mix, while thermal energy is utilized as district heating in Poland. The recyclability of metals and plastics allows the producers a credit for the net scrap that is produced at the end of a product's life. The benefits from recycling of net scrap are described in formula from EN 15804:2012+A2:2019. Substitution of heat and electricity generated by the incineration with energy recovery of plastic insulation and other parts is also calculated in module D.

Table 3. End-of-life scenario for the product components

Material	Recycling/Reuse %	Landfilling %	Energy recovery %
Plastics	5	5	90
Steel	98	2	0
Electronics/mechanics	95	5	-
Other	0	100	0

Electricity at end-of-life (module C and D) has been modelled using an average Polish electricity mix as the location where the product reaches end-of-life is unknown.

Data collection period

The data for manufacture of the declared products refer to period between 01.01.2021 – 31.12.2021 (1 year). The life cycle assessments were prepared for Poland and Europe as reference area.

Data quality

The data selected for LCA originate from ITB-LCI questionnaires completed by AMTR System. No specific data collected is older than five years and no generic datasets used are older than ten years. The representativeness, completeness, reliability, and consistency are judged as good. The database, Ecoinvent 3.9 is utilized for the background system (plastics, electro-mechanics, oil, packaging, energy carriers). For steel input data the specific EPDs from suppliers were used. As a result, both upstream and downstream activities are based on average supply mixes for the specific region depending on the given dataset and KOBiZE data is used (Polish electricity mix and combustion factors for fuels). Specific (LCI) data quality analysis was a part of the input data verification. The time related quality of the data used is valid (5 years).

Assumptions and estimates

The impact of the representative products were aggregated using weighted average. Amounts of energy and material flows used at the manufacturing of the declared product were allocated by dividing the annual amounts with the specific production volume.

Calculation rules

LCA was performed using ITB-LCA tool developed in accordance with EN 15804+A2. Emission of greenhouse gases was calculated using the IPCC 2013 GWP method with a 100-year horizon. Emission of acidifying substances, Emission of substances to water contributing to oxygen depletion, Emission of gases that contribute to the creation of ground-level ozone, Abiotic depletion, and ozone depletion emissions where all calculated with the CML-IA baseline method

Additional information

Polish electricity emission factor is 0.698 kg CO₂/kWh (KOBiZE 2021). European electricity mix used is 0.430kg CO₂/kWh (Ecoinvent v3.9, RER). 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. The EPD does not give information on release of dangerous substances to indoor air and release of dangerous substances to soil and water because the horizontal standards on measurement of release of regulated dangerous substances from construction products using harmonised test methods according to the provisions of the respective technical committees for European product standards are not available.

LIFE CYCLE ASSESSMENT (LCA) - Results

Declared unit

The declaration refers to declared unit (DU) -1 unit of the dock leveller produced by AMTR. The following life cycle modules (Table 4) were included in the analysis.

Table	4. System bound	daries for the	environmental characteristic of dock leveller u	nit
	Environmenta	l assessment ir	nformation (MD – Module Declared, MND – Module Not D	eclare

E	nviron	menta	l assess	sment ir	nformati	on (MD -	- Module	Declare	ed, MND	– Mod	ule Not [Declare	d, INA – In	dicator I	Not Ass	essed)
Pro	duct sta	age	Consti prod		Use stage End of life						Benefits and loads beyond the system boundary					
Raw material supply	Transport	Manufacturing	Transport to construction site	Construction-installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction demolition	Transport	Waste processing	Disposal	Reuse-recovery-recycling potential
A1	A2	А3	A4	A5	B1	B2	В3	В4	В5	В6	В7	C1	C2	C3	C4	D
MD	MD	MD	MD	MD	MND	MND	MND	MND	MND	MD	MND	MD	MD	MD	MD	MD

The method of converting the environmental impact for a specific product

The results presented in the impacts Table 5-8 are provided for unit AMTRK-PRO 25 (700 kg, 1.1 kW; 15 years). The results presented in the LCA (Tables 5-8) are presented for a unit with the representative weight of 700 kg. To convert the impacts on other units with different weights, use a conversion factor equal the ratio of the weight of the unit under assessment to the weight of the representative unit.

For example, if the leveler unit weighs 1000 kg, a conversion factor of 1.43 (1000/700) should be applied.

Table 5. Life cycle assessment (LCA) results for AMTRK-PRO 25 (700 kg)— environmental impacts (DU: 1 unit; 1.1 kW; 15 years)

Indicator	Unit	A1-A3	A4	A5	В6	C1	C2	C3	C4	D
Global Warming Potential	eq. kg CO ₂	1.52E+03	5.83E+01	2.44E+01	1.85E+04	2.44E+01	4.95E+01	3.61E+01	7.42E-02	-1.07E+03
Greenhouse potential - fossil	eq. kg CO ₂	1.35E+03	5.82E+01	2.40E+01	1.82E+04	2.40E+01	4.93E+01	3.65E+01	7.37E-02	-1.07E+03
Greenhouse potential - biogenic	eq. kg CO ₂	3.27E+01	1.54E-01	7.00E-01	5.31E+02	7.00E-01	1.69E-01	7.42E-06	4.66E-04	-2.59E+00
Global warming potential - land use and land use change	eq. kg CO ₂	1.03E+01	2.28E-02	8.40E-03	6.37E+00	8.40E-03	1.94E-02	9.52E-06	7.21E-05	-1.04E-01
Stratospheric ozone depletion potential	eq. kg CFC 11	7.93E-05	1.35E-05	4.90E-07	3.71E-04	4.90E-07	1.14E-05	3.78E-08	2.61E-08	-4.00E-05
Soil and water acidification potential	eq. mol H+	2.56E+01	2.36E-01	2.66E-01	2.02E+02	2.66E-01	2.00E-01	8.14E-01	6.57E-04	-4.21E+00
Eutrophication potential - freshwater	eq. kg P	1.64E+00	3.75E-03	4.55E-02	3.45E+01	4.55E-02	3.32E-03	8.86E-06	1.41E-05	-4.55E-01
Eutrophication potential - seawater	eq. kg N	2.21E+00	7.12E-02	3.85E-02	2.92E+01	3.85E-02	6.04E-02	4.10E-01	2.28E-04	-9.24E-01
Eutrophication potential - terrestrial	eq. mol N	7.86E+01	7.77E-01	3.26E-01	2.47E+02	3.26E-01	6.59E-01	4.49E+00	2.49E-03	-1.01E+01
Potential for photochemical ozone synthesis	eq. kg NMVOC	5.51E+00	2.38E-01	9.10E-02	6.90E+01	9.10E-02	2.02E-01	1.11E+00	7.21E-04	-5.27E+00
Potential for depletion of abiotic resources - non-fossil resources	eq. kg Sb	4.96E-02	2.07E-04	1.17E-04	8.86E-02	1.17E-04	1.75E-04	1.40E-07	2.09E-07	-2.06E-02
Abiotic depletion potential - fossil fuels	MJ	2.13E+04	8.63E+02	4.06E+02	3.08E+05	4.06E+02	7.32E+02	6.86E-01	1.86E+00	-9.08E+03
Water deprivation potential	eq. m ³	4.54E+02	3.96E+00	8.40E+00	6.37E+03	8.40E+00	3.39E+00	6.59E-01	8.15E-03	-1.69E+02

Table 6. Life cycle assessment (LCA) results for AMTRK-PRO 25 (700 kg) – additional impacts indicators (DU: 1 unit; 1.1 kW; 15 years)

Indicator	Unit	A1-A3	В6	C1	C2	C3	C4	D
Particulate matter	disease incidence	INA	INA	INA	INA	INA	INA	INA
Potential human exposure efficiency relative to U235	eg. kBq U235	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for ecosystems	CTUe	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for humans (cancer effects)	CTUh	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for humans (non-cancer effects)	CTUh	INA	INA	INA	INA	INA	INA	INA
Potential soil quality index	dimensionless	INA	INA	INA	INA	INA	INA	INA

Table 7. Life cycle assessment (LCA) results for AMTRK-PRO 25 (700 kg) - the resource use (DU: 1 unit; 1,1 kW; 15 years)

Indicator	Unit	A1-A3	A4	A5	B6	C1	C2	C3	C4	D
Consumption of renewable primary energy - excluding renewable energy sources used as raw materials	MJ	INA								
Consumption of renewable primary energy resources used as raw ,aterials	MJ	INA								
Total consumption of renewable primary energy resources	MJ	1.27E+03	1.24E+01	3.01E+01	2.28E+04	3.01E+01	1.05E+01	1.06E-02	2.37E-02	-7.39E+02
Consumption of non-renewable primary energy - excluding renewable primary energy used as raw materials	MJ	INA								
Consumption of non-renewable primary energy resources used as raw materials	MJ	INA								
Total consumption of non-renewable primary energy resources	MJ	2.22E+04	9.34E+02	4.07E+02	3.09E+05	4.07E+02	7.32E+02	6.86E-01	1.93E+00	-8.80E+03
Consumption of secondary materials	kg	7.66E+02	0.00E+00	3.71E-02	2.81E+01	3.71E-02	2.45E-01	9.10E-05	2.12E-04	-1.37E+02
Consumption of renew. secondary fuels	MJ	3.44E+03	0.00E+00	2.07E-04	1.57E-01	2.07E-04	2.71E-03	2.38E-06	5.55E-06	-1.75E-01
Consumption of non-renewable secondary fuels	MJ	4.81E+00	0.00E+00	3.29E-01	2.49E+02	3.29E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net consumption of freshwater	m³	1.47E+01	4.30E-02	1.10E-01	8.36E+01	1.10E-01	9.21E-02	5.60E-03	1.24E-03	-7.95E+00

Table 8. Life cycle assessment (LCA) results for AMTRK-PRO 25 (700 kg) - waste categories (DU: 1 unit; 1,1 kW; 15 years)

Indicator	Unit	A1-A3	A4	A5	В6	C1	C2	C3	C4	D
Hazardous waste	kg	1.46E+00	2.30E-03	4.20E-03	3.18E+00	4.20E-03	8.22E-01	1.40E-02	1.08E-03	-1.25E-01
Non-hazardous waste	kg	3.38E+01	4.52E+01	2.18E-01	1.66E+02	2.18E-01	1.46E+01	3.78E-02	3.52E+00	-1.30E+02
Radioactive waste	kg	2.30E-02	5.95E-03	3.05E-04	2.31E-01	3.05E-04	5.47E-05	2.80E-08	1.19E-05	-1.45E-02
Components for re-use	kg	0.00E+00								
Materials for recycling	kg	4.96E+01	0.00E+00	4.20E-04	3.18E-01	4.20E-04	2.27E-03	1.12E-06	2.02E-06	-8.89E-04
Materials for energy recovery	kg	2.41E-01	0.00E+00	3.68E-06	2.79E-03	3.68E-06	1.83E-05	1.37E-07	2.40E-08	-2.36E-06
Exported Energy	MJ	8.11E+01	0.00E+00	1.21E+00	9.18E+02	1.21E+00	0.00E+00	2.24E-04	0.00E+00	-1.54E-01

Verification

The process of verification of this EPD is in accordance with ISO 14025 and ISO 21930. After verification, this EPD is valid for a 5-year-period. EPD does not have to be recalculated after 5 years, if the underlying data have not changed significantly.

The basis for LCA analysis was EN 15804 and ITB PCR A
Independent verification corresponding to ISO 14025 (sub clause 8.1.3.)
External verification of EPD: Halina Prejzner, PhD. Eng. LCA, LCI audit and input data verification: Michał Piasecki, PhD., D.Sc., Eng. EPD verification: Halina Prejzner, PhD. Eng.

Note: The declaration owner has the sole ownership, liability, and responsibility for the declaration. Declarations within the same product category but from different programmes may not be comparable. Declarations of construction products may not be comparable if they do not comply with EN 15804. For further information about comparability, see EN 15804 and ISO 14025.

Normative references

- ITB PCR A v 1.6. (2023) General Product Category Rules for Construction Products
- EN 1398 Dock levelers Safety requirements
- EN 14846:2008 Building hardware Locks and latches Electromechanically operated locks and striking plates Requirements and test methods
- Ecoinvent 3.9 data set, https://ecoinvent.org/
- ISO 14025:2006, Environmental labels and declarations Type III environmental declarations Principles and procedures
- ISO 21930:2017 Sustainability in buildings and civil engineering works Core rules for environmental product declarations of construction products and services
- ISO 14044:2006 Environmental management Life cycle assessment Requirements and guidelines
- ISO 15686-1:2011 Buildings and constructed assets Service life planning Part 1: General principles and framework
- ISO 15686-8:2008 Buildings and constructed assets Service life planning Part 8: Reference service life and service-life estimation
- EN 15804:2012+A2:2019 Sustainability of construction works Environmental product declarations – Core rules for the product category of construction products
- ISO 14067:2018 Greenhouse gases Carbon footprint of products Requirements and guidelines for quantification
- PN-EN 15942:2012 Sustainability of construction works Environmental product declarations – Communication format business-to-business
- KOBiZE Wskaźniki emisyjności CO₂, SO₂, NO_x, CO i pyłu całkowitego dla energii elektrycznej. Grudzień 2021





Thermal Physics, Acoustics and Environment Department
02-656 Warsaw, Ksawerów 21

CERTIFICATE № 452/2023 of TYPE III ENVIRONMENTAL DECLARATION

Products:

AMTRK-PRO, AMTRV-PRO, AMTRV-CD and AMTRV-ESS dock levellers

Manufacturer:

AMTR SYSTEM Sp. z o.o.

ul. Kolejowa 44, 57-240 Kamieniec Ząbkowicki, Poland

confirms the correctness of the data included in the development of Type III Environmental Declaration and accordance with the requirements of the standard

EN 15804+A2

Sustainability of construction works.

Environmental product declarations.

Core rules for the product category of construction products.

This certificate, issued on 15° May 2023 is valid for 5 years or until amendment of mentioned Environmental Declaration

Head of the Thermal Physic, Acoustics / and Environment Department

gnieszka Winkler-Skalna, PhD

THE CHNIK! BUDOWLA

Deputy Director for Research and Innovation

Krzysztof Kuczyński, PhD

Warsaw, May 2023