ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH:
EN 15804+A2, EN 16757 & ISO 14025

Product name:
Ductile Cast Iron parts manufactured from EN GJS 500-7

EPD holder:

Odlewnie Polskie S.A.

Issued on 31 December 2025
Valid until 31 December 2030

GENERAL INFORMATION

EPD OWNER

Manufacturer / EPD Holder	Odlewnie Polskie S.A.
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Contact details	Phone +48 41 275 86 00 e-mail: aneta.kwilosz@odlewniepolskie.pl
Website	https://odlewniepolskie.pl/

PRODUCT IDENTIFICATION

Product name	Ductile Cast Iron parts manufactured from EN GJS 500-7
Place(s) of production	Poland

EPD INFORMATION

EPD Polska program operator	Multicert Sp. z o.o. Ul. Mydlarska 47, 04-690 Warszawa, Poland www.epd.org.pl, epd@epd.org.pl
EPD standards	This EPD is in accordance with EN 15804+A2 and ISO 14025 standards.
Product category rules	The CEN standards EN 16757 and EN 15804+A2 serve as the core PCR.
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐Internal certification ☒ External verification
EPD verifier	Izabela Sztamberek-Sochan, Ph.D.
EPD number	EPD-P 07.12.2025
Registration:	EPD Polska www.epd.org.pl
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EPD valid until	31 December 2030
Reasons for performing LCA	B2B
Accountability	The EPD Holder is responsible for the information provided and evidence. Multicert Sp. z o.o. does not hold responsibility for the manufacturer information, life cycle assessment data nor supporting evidence.

EPDs of construction products may not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.

COMPANY INFORMATION

HOLDER OF THE EPD

Odlewnie Polskie S.A.
ul. inż. Władysława Rogowskiego 22
27-200 Starachowice

Company Overview:

Odlewnie Polskie S.A. is a Polish manufacturer of iron castings, specialising in the production of components made of ductile cast iron for industrial applications. The company operates based on long-standing experience in the foundry industry and supplies serial and customised castings to both domestic and international customers.

Strategy and Development:

The strategy of Odlewnie Polskie S.A. is based on long-term sustainable growth, high product quality and continuous improvement of technological and organisational processes. Since its registration in 1993, the company has implemented a consistent modernisation programme focused on automation, digitalisation of production and development of in-house R&D competences. The objective is to maintain strong competitiveness on the European market while meeting increasing environmental, quality and technological requirements.

Quality and Reliability:

Odlewnie Polskie S.A. manufactures ductile iron, grey iron, ADI and SiMo castings exclusively to customer order. Ductile iron castings account for over 80% of total production, confirming the advanced technological level of the foundry. The company operates an integrated management system compliant with ISO 9001 and ISO 14001, supported by comprehensive quality control and specialised testing laboratories.

Environment:

Environmental protection is a core element of the company's development strategy. Odlewnie Polskie S.A. implements technologies aimed at reducing energy and raw material consumption, limiting emissions and minimising the environmental impact of its operations. All activities are carried out in line with regulatory requirements and the objectives of the European Green Deal, with continuous improvement of environmental performance.

Flexibility and Customer Cooperation:

The company provides high production flexibility – from prototypes and small batches to large-scale production – and comprehensive services including engineering support, technology design, tooling manufacture, machining, surface protection and delivery logistics. More than 85% of production is exported, and a diversified customer base ensures long-term stability.

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PRODUCT INFORMATION

PRODUCT DESCRIPTION

The product covered by this Environmental Product Declaration (EPD) comprises ductile cast iron parts made from EN-GJS-500-7, manufactured by Odlewnie Polskie S.A. for PEGOL AB. The declaration covers a defined group of cast components produced from this material grade, differing in geometry, mass and specific function, but manufactured using comparable raw materials, production technologies and quality control procedures.

The scope of this EPD includes the specific product articles listed in Table A.1 below. All listed products are manufactured from ductile cast iron EN-GJS-500-7 and are considered environmentally representative for the declared product group. Environmental impacts are declared per unit of mass and are applicable to all listed articles.

Table A.1 – Product articles included in the scope of the EPD

Article name	Drawing / Reference	Article name	Drawing / Reference
0418004 tube 27mm	3-516858 REV B	Ovre Knuthalva - 801 900 0418066 - Pt.1	1-514 970 ISSUE A
0418091-SET-093+094	803629 A	Pipe conector 0418045	3-512668D
Bartradsgaffel 0418080	801902	Pipe conector 0418059	3-507154 E
Bottenklamma For Provisorisk 0450089	803 214 / 803 218	Rorhallare 0418093	803213
Faste-0418067 drwg 805756	805756	Rorhallare 0418044	3-512667 G
FASTKLACK 0414064	3-516836 B	Rorhallare 0418093 - drwg-803213	803213
FASTKLACK 0414065	3-516687 B	Rorhallare 0418095	2-512 671 D
Forhojningslank 0418300	800 013 REV. B	Rorknut i Utliggare - SET 0418066	801 900 ISSUE A
Gaffelled 0413320	4-515938 B	Rorlank 0418005	3-516859 C
Hallare 0418023	3-512 662 ISSUE D	Rorlank 0418094	803220
Hallare 0418038	3-516867 ISSUE D	Stoppring 0418050	802902
Hallare for tillsatsror 0418039	803241	Handle 0413089	3-515939C
KILKLAMMA 0415001	3-516 694 ISSUE E	Handle 0413092	UCHWYT (092)
Knut for vertikalror 0418092	803242	Handle 0418076	3-516873A
Konsol 0413086	2-516796 A	Handle 0418090	2-515944 B
Konsol 0413087	2-514772 B	Rope handle 58895	3-516899 B
Konsol 0413088	2-516717 D	Underdel 0424022/25	803249
LANK Fi 42 mm 0418003	3-512660 ISSUE E	Underdel-803249	803249
Led for uteliggare	2-516 682 ISSUE A	Wire Wheel D400 mm 0415167	2-516721 C
Nedre Knuthalva 0418066 - Pt.2	801 899 ISSUE B (801	Wedge clamp 0415001-2	3-516694 E
Clamp (036) 0418036	3-512666 D	Rope connector 0418007	3-512368 B

PRODUCT APPLICATION

The ductile cast iron parts covered by this EPD are intended for use in equipment for railway applications. Depending on their design and function, the components may be used as structural, mechanical or functional elements within railway infrastructure and rolling stock systems. The products are designed for industrial applications requiring high mechanical strength, durability and resistance to dynamic loads.

PRODUCT STANDARDS

The ductile cast iron parts are manufactured in accordance with the following product standard:

- EN 1563 – Founding – Spheroidal graphite cast irons

The material grade EN-GJS-500-7 is defined and controlled in compliance with the requirements of this standard.

PRODUCT RAW MATERIAL COMPOSITION

The declared products are manufactured primarily from ductile cast iron EN-GJS-500-7. In addition, the components are hot-dip galvanised, resulting in a zinc coating applied to the surface of the cast iron parts in order to provide corrosion protection.

The products therefore consist mainly of:

- ductile cast iron EN-GJS-500-7, and
- a zinc coating applied during the galvanising process.

The hot-dip galvanising process results in a zinc coating with typical thickness min 115 μm, representing approximately 1-3% of the total product mass depending on component geometry. The coating provides corrosion protection throughout the product's service life and does not impair end-of-life recyclability.

Secondary material input (SM = 0.376 kg/kg) represents externally sourced scrap used in the metallic charge. Internal foundry returns are excluded from SM, as they constitute closed-loop recycling within the production system.

Minor quantities of process-related materials used during casting and galvanising (e.g. alloying additions, fluxes and auxiliary substances) may be present but are not part of the final product. The thickness and mass share of the zinc coating may vary depending on product geometry and functional requirements.

SUBSTANCES, REACH - VERY HIGH CONCERN

The declared product group is not expected to contain substances of very high concern (SVHC) listed under REACH in concentrations above 0.1% by weight. The products are inert in use and do not require chemical treatments during the service life.

PRODUCT LIFE-CYCLE

RAW MATERIAL SUPPLY (A1)

Module A1 covers the procurement of raw materials and auxiliary materials used for the production of ductile cast iron parts made from EN-GJS-500-7 manufactured by Odlewnie Polskie S.A.

The main raw material input is the metallic charge used for melting and casting, which consists primarily of steel and cast iron scrap. The metallic charge is supplemented with special low-sulphur pig iron and internal foundry returns, such as ingates and risers generated during the casting process, which are reintroduced into the melting cycle.

To achieve the required chemical composition and mechanical properties of ductile cast iron, alloying and metallurgical additives are used. These include copper (Cu) as an alloying element, synthetic graphite used as a carburiser, and materials for spheroidisation and inoculation such as FeSiMg (ferrosilicon with magnesium and rare earth elements) and FeSi (approximately 75% ferrosilicon).

Module A1 also includes materials used for mould and core production. Moulding materials comprise new moulding sand, bentonite and water, added to compensate for process losses and maintain required moulding properties. Core production materials include core sand, resins, amines and/or hardeners, and water, depending on the core-making technology applied.

Packaging and handling materials required for internal logistics and product delivery are included in Module A1. These materials comprise wooden pallets, spacers and stacking elements, fibreboard sheets and corrugated cardboard interlayers. Waste streams generated during production, including cast iron scrap in the form of ingates and risers, are managed within the foundry system and, where applicable, returned to the melting process.

TRANSPORT OF RAW MATERIALS (A2)

Module A2 covers the transport of raw materials and auxiliary materials from suppliers to the Odlewnie Polskie S.A. manufacturing facility located in Starachowice, Poland.

Transport of metallic charge materials, alloying additives, moulding and core materials, as well as packaging materials, is primarily carried out by road using diesel-powered trucks, typically with a payload capacity above 16 tonnes and compliant with EURO 6 emission standards. The transport modelling is based on representative transport distances reflecting typical supply chains for the declared raw materials. Where specific supplier distances are not available, average transport distances are applied to ensure a realistic and conservative transport scenario.

MANUFACTURING (A3)

Module A3 covers the manufacturing processes carried out at the Odlewnie Polskie S.A. production facility located in Starachowice, Poland, including mould and core preparation, melting and casting of ductile cast iron, finishing operations and internal transport.

Mould preparation involves the use of moulding sand, with the addition of new sand, bentonite and water to compensate for process losses and to maintain the required moulding properties. Electrical energy is consumed by moulding lines, sand preparation and reclamation systems. Waste streams generated at this stage consist mainly of losses of moulding sand.

Core preparation includes the use of core sand, resins, amines and/or hardeners, and water, depending on the applied core-making technology. Electrical energy is consumed by core production lines. Waste streams generated during this stage include spent cores.

Melting and casting of ductile cast iron are carried out using electrically powered melting furnaces, followed by forming, pouring and shake-out operations performed on automated moulding lines. Electrical energy consumption associated with melting and casting is included in Module A3. Slag generated during the melting process is treated as a production waste.

Finishing and machining operations include shot blasting, machining and other final processing steps required to achieve the specified geometry and surface quality of the castings. Materials used at this stage include shot blasting media, cutting fluids and cutting tools. Electrical energy is consumed by finishing equipment and machining centres. Waste streams generated during finishing include metal chips, spent blasting media and used cooling fluids.

Hot-dip galvanising of the cast components is performed by an external service provider. The galvanising process is included within the system boundary of Module A3 as an outsourced manufacturing operation.

Internal transport and handling within the production facility are carried out using overhead cranes and forklift trucks powered by electricity and conventional fuels. Energy consumption and waste streams associated with internal transport are included in Module A3.

Emissions to air, water and soil generated during mould and core preparation, melting, casting, shake-out, finishing, galvanising and internal transport processes are included in the life cycle assessment (LCA) model.

TRANSPORT TO CONSTRUCTION SITE & INSTALLATION (A4, A5)

Modules A4 (Transport to construction site) and A5 (Installation) are not declared in this Environmental Product Declaration. The declared product group consists of ductile cast iron components supplied to industrial customers, and the transport to the construction site as well as installation processes depend on the specific project, application and logistics arrangements, which are outside the control of the manufacturer.

USE STAGE (B1-B7)

Modules B1 to B7 are declared with zero environmental impact. The ductile cast iron components covered by this EPD are passive products that do not consume energy or water during the use stage and do not require maintenance, repair, replacement or refurbishment. No operational emissions occur during the use phase.

END OF LIFE STAGE (C1, C2, C3, C4)

The end-of-life scenario is modelled based on standardized recovery practices for ductile cast iron, assuming a high efficiency of material circularity.

- Deconstruction / Demolition (C1): The components are assumed to be removed by selective mechanical dismantling. The associated environmental loads are considered low compared to upstream life cycle stages and are modelled accordingly.
- Transport (C2): Transport of end-of-life material to treatment facilities is modelled as 100 km by heavy-duty trucks (>16 t), consistent with the transport modelling used in the upstream stages.
- Waste processing (C3): A recycling rate of 95% is assumed, corresponding to 950 kg of material per 1 t declared unit sent to sorting and preparation processes until the end-of-waste state is reached.
- Disposal (C4): The remaining 5% of the mass (50 kg per 1 t declared unit), representing fractions that cannot be recycled, is assumed to be disposed of in a non-hazardous waste landfill.

BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY (D)

Module D is calculated using the net-scrap approach for metals to reflect the environmental benefits of material recovery.

- Benefits are reported for the net amount of secondary material that leaves the system boundary.
- The net scrap quantity is determined by subtracting the purchased scrap used as input in Module A1 from the amount of scrap generated at the end-of-life.
- For this product, the net scrap exported for recycling equals 0.5737 t per 1 t declared unit.
- These results represent the avoided environmental burdens achieved by substituting primary iron production with recycled material.

LIFE-CYCLE ASSESSMENT

LIFE-CYCLE ASSESSMENT INFORMATION

Period for data	2024

DECLARED AND FUNCTIONAL UNIT

Declared Unit	1 kg
Mass per Declared Unit	1 kg

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in the product, kg C:	0,00
Biogenic carbon content in the packaging, kg C:	0,05

Note: The biogenic carbon is present in wood-based packaging materials (pallets and cardboard). This carbon is temporarily stored during the product life cycle and accounted as negative emissions in Module A1 (uptake during tree growth) and positive emissions in Module C4 (release at end-of-life), resulting in climate neutrality over the full life cycle.

SYSTEM BOUNDARY

The EPD scope is "cradle-to-gate with options" in accordance with EN 15804. The study covers the product stage A1–A3 and additionally includes selected optional life-cycle modules: C1–C4 (end-of-life: deconstruction, waste transport, waste processing and disposal), and D (benefits and loads beyond the system boundary from material recovery / avoided burdens). Modules A4 and A5 are marked as MND (Module Not Declared) because the products have various applications depending on specific construction projects. Modules B1–B7 are marked as MNR (Module Not Relevant) as the products are passive and do not require energy, water, or maintenance during the use stage.

Product stage			Assembly stage		Use stage							End of life stage				Beyond the system boundaries
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	MND	MND	MNR	MNR	MNR	MNR	MNR	MNR	MNR	X	X	X	X	X
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deinstallation/Demolition	Transport	Waste processing	Disposal	Reuse / Recycling

X – module included/declared
MND – Module Not Declared
MNR – Module Not Relevant

CUT-OFF CRITERIA

The study fully covers all mandatory EN 15804:2012+A2:2019 modules and processes. No hazardous materials or substances have been omitted from the system boundary.

All major raw material and energy inputs are included. All inputs and outputs from unit processes for which data are available are taken into account in the calculations. No single neglected unit process exceeds 1% of the total mass or energy flows. The total of all neglected input and output flows does not exceed 5% of the total mass or energy use.

The production of capital goods (equipment), construction of infrastructure, and the maintenance and operation of capital equipment are excluded. Personnel-related activities, as well as energy and water use associated with company management and sales/administrative activities, are also excluded.

ESTIMATES AND ASSUMPTIONS

The life cycle assessment (LCA) underlying this Environmental Product Declaration (EPD) was carried out in accordance with EN 15804:2012+A2:2019, utilizing established rules for system boundaries, allocation, cut-off criteria, and data quality.

The declared product represents an averaged group of ductile cast iron components made from EN-GJS-500-7, manufactured by Odlewnie Polskie S.A. at their facility in Starachowice, Poland for PEGOL AB. Environmental impacts are reported per 1 kg of declared product and are applicable to all product articles included in the scope of this EPD, ranging from small industrial components to custom castings.

The LCA model is based on a combination of product-specific data and site-level operational data. Product-specific data were available for key material inputs directly related to the declared product, in particular the metallic charge consisting primarily of steel and cast iron scrap supplemented with special low-sulphur pig iron. Site-level data representative of overall foundry operations were used for supporting processes, including energy consumption for melting and finishing, and surface protection (hot-dip galvanizing). Where site-level data were applied, mass-based allocation was used to ensure representativeness of the declared product.

Where supplier- or process-specific information was not available, representative industry-average assumptions were applied. For transport modeling (Module A2), representative distances were used, assuming road transport via EURO 6 compliant diesel-powered trucks with a payload capacity above 16 tonnes.

The declared products are passive components with no energy or water consumption during the use stage. Consequently, the use stage (modules B1–B7) is reported as MNR (Module Not Relevant) in the results table.

End-of-life modelling is based on a standardized recycling-oriented scenario for ductile cast iron, assuming a 95% material recovery rate (MFR). This assumption reflects the established practices of European industrial and infrastructure sectors, where cast iron components are systematically dismantled and managed by specialized contractors under formal asset management and regulatory frameworks. Unlike municipal waste streams, end-of-life cast iron components are treated as high-value secondary raw materials, typically inventoried and collected directly at the dismantling site, minimizing material losses.

The magnetic properties of cast iron facilitate efficient separation during waste sorting processes, resulting in high recovery efficiency in practice. The assumed end-of-life recycling rate of 95% represents a conservative and realistic reference scenario for ferrous materials, aligned with documented European waste management practices and consistent with current sector-specific LCA methodologies. Environmental benefits beyond the system boundary (Module D) are calculated using a net-scrap substitution approach.

ALLOCATION

Allocation was carried out in accordance with EN 15804+A2. The life cycle assessment model utilizes a combination of product-specific data and site-level operational data. Primary production data were collected for the Odlewnie Polskie S.A. facility located in Starachowice, Poland.

Product-specific allocation was applied to the metallic charge used for melting and to packaging materials (e.g. wooden pallets, cardboard), which are directly attributable to the ductile cast iron components covered by this EPD.

For supporting processes and general foundry operations shared across the entire production portfolio (such as total energy consumption, water use and waste management), mass-based allocation was applied to determine the share attributable to the declared unit of 1 kg of averaged ductile cast iron product. This allocation approach is considered appropriate and representative for the purpose of this EPD.

DATA QUALITY

The LCA is based on high-quality foreground data collected by Odlewnie Polskie S.A. for the reference period covering the full year 2024. Product-specific primary data are available for the metallic charge (steel and cast iron scrap, pig iron) and for packaging materials. Site-level operational data are used for processes that are common to the overall foundry operations and are representative of the production of EN-GJS-500-7 castings covered by this EPD.

Upstream data for alloying elements and auxiliary materials were sourced from industry-average datasets aligned with EN 15804+A2 requirements. Background datasets, including those for energy supply, transport and raw material extraction, were derived from the ecoinvent v3.9.1 database.

Electricity consumption in Module A3 is modelled using the national electricity mix for Poland, reflecting current emission factors. The overall data quality is considered appropriate for the intended use of this EPD. All major material and energy inputs are included, and no single excluded process exceeds 1% of total mass or energy flows, with the cumulative contribution of excluded processes remaining below 5%, in accordance with the applied cut-off criteria.

GEOGRAPHIC REPRESENTATIVENESS

The product system is manufactured and managed in Poland (Europe).

ENVIRONMENTAL IMPACT DATA

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2 – [DU=1kg]

Impact category	Unit	A1	A2	A3	A4-A5	B1-B7	C1	C2	C3	C4	D
GWP-Total	kg CO2 eq.	2,07E+00	1,22E-01	1,13E+00	MND	MNR	8,51E-03	1,02E-02	6,43E-02	1,19E-01	-9,05E-01
GWP-fossil	kg CO2 eq.	2,18E+00	1,22E-01	1,12E+00	MND	MNR	8,46E-03	1,02E-02	6,46E-02	3,04E-04	-9,06E-01
GWP-biogenic	kg CO2 eq.	-1,17E-01	5,90E-05	6,13E-03	MND	MNR	4,71E-05	3,86E-06	-4,67E-04	1,18E-01	1,66E-03
GWP – LULUC	kg CO2 eq.	2,19E-03	6,41E-05	3,35E-04	MND	MNR	2,52E-06	5,21E-06	1,57E-04	1,80E-07	-4,72E-04
ODP	kg CFC-11 eq.	5,48E-08	2,19E-09	5,69E-09	MND	MNR	3,87E-11	1,73E-10	9,57E-10	8,80E-12	-1,68E-08
AP	mol H+ eq.	1,53E-02	3,17E-04	7,86E-03	MND	MNR	6,08E-05	2,78E-05	5,47E-04	2,29E-06	-3,99E-03
EP-freshwater	kg P eq.	1,28E-03	1,02E-05	1,30E-03	MND	MNR	1,02E-05	8,50E-07	1,80E-05	2,53E-08	-4,06E-04
EP-marine	kg N eq.	2,67E-03	8,19E-05	1,17E-03	MND	MNR	8,75E-06	7,32E-06	1,58E-04	8,80E-07	-9,28E-04
EP-terrestrial	mol N eq.	2,81E-02	8,44E-04	1,03E-02	MND	MNR	7,62E-05	7,58E-05	1,72E-03	9,42E-06	-9,41E-03
POCP	kg NMVOC eq.	1,18E-02	4,59E-04	3,03E-03	MND	MNR	2,20E-05	4,01E-05	5,28E-04	3,28E-06	-4,81E-03
ADPE (disc.2)	kg Sb eq.	1,16E-04	2,70E-07	4,20E-07	MND	MNR	2,60E-09	1,96E-08	5,90E-07	2,29E-10	-2,85E-06
ADPF (disc.2)	MJ, (NCV)	2,75E+01	1,82E+00	1,29E+01	MND	MNR	9,67E-02	1,55E-01	8,49E-01	7,63E-03	-8,80E+00
WDP (disc.2)	m3 World eq.	5,64E-01	9,37E-03	2,33E-01	MND	MNR	1,82E-03	7,75E-04	9,72E-03	2,37E-05	-3,93E-01
Acronyms	GWP-total – Climate change, total global warming potential; GWP-fossil – Climate change, fossil fuels; GWP-biogenic – Climate change, biogenic carbon; GWP-luluc – Climate change, land use and land use change; ODP – Ozone layer depletion; AP – Acidification of terrestrial and freshwater environments; EP-freshwater – Eutrophication, freshwater; EP-marine – Eutrophication, marine; EP-terrestrial – Eutrophication, terrestrial; POCP – Photochemical ozone formation (smog formation); ADPE – Abiotic depletion, minerals and metals; ADPF – Abiotic depletion, fossil fuels; WDP – Water scarcity (water use deprivation potential); NCV - net calorific value.										
Disclaimer 2	The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.										

ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF – [DU=1kg]

Impact category	Unit	A1	A2	A3	A4-A5	B1-B7	C1	C2	C3	C4	D
PM	Disease Incidence	6,50E-07	8,35E-09	1,58E-08	MND	MNR	9,88E-11	7,65E-10	7,14E-09	4,90E-11	-6,96E-08
IRP (disc.1)	kBq U235 eq.	1,38E-01	2,04E-03	3,59E-02	MND	MNR	2,78E-04	1,41E-04	1,75E-03	4,80E-06	3,38E-02
ETP-fw (disc.2)	CTUe	3,98E+01	9,57E-01	4,19E+00	MND	MNR	2,51E-02	8,12E-02	6,24E-01	3,55E-03	-3,46E+00
HTP-c (disc.2)	CTUh	1,06E-08	5,45E-11	7,15E-09	MND	MNR	2,58E-12	4,43E-12	5,67E-11	1,28E-13	5,48E-09
HTP-nc (disc.2)	CTUh	7,16E-08	1,13E-09	1,27E-08	MND	MNR	9,45E-11	9,62E-11	1,76E-09	1,45E-12	-1,67E-08
SQP (disc.2)	Dimensionless	2,02E+01	1,62E+00	2,97E+00	MND	MNR	2,06E-02	1,55E-01	9,74E-01	1,50E-02	-2,53E+00
Acronyms	PM – Particulate matter emissions (potential incidence of disease);IRP – Ionising radiation, human health exposure potential; ETP-fw – Ecotoxicity, freshwater; HTP-c – Human toxicity, cancer effects; HTP-nc – Human toxicity, non-cancer effects; SQP – Land use related impacts, soil quality.										
Disclaimer 1	This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possibe nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.										
Disclaimer 2	The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.										

USE OF NATURAL RESOURCES – [DU=1kg]

Impact category	Unit	A1	A2	A3	A4-A5	B1-B7	C1	C2	C3	C4	D
PERE	MJ, (NCV)	4,01E+00	2,61E-02	1,14E+00	MND	MNR	8,94E-03	1,94E-03	5,56E-02	6,41E-05	-5,31E-01
PERM	MJ, (NCV)	0,00E+00	0,00E+00	0,00E+00	MND	MNR	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ, (NCV)	4,01E+00	2,61E-02	1,14E+00	MND	MNR	8,94E-03	1,94E-03	5,56E-02	6,41E-05	-5,31E-01
PENRE	MJ, (NCV)	2,75E+01	1,82E+00	1,29E+01	MND	MNR	9,67E-02	1,55E-01	8,50E-01	7,63E-03	-8,80E+00
PENRM	MJ, (NCV)	0,00E+00	0,00E+00	0,00E+00	MND	MNR	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ, (NCV)	2,75E+01	1,82E+00	1,29E+01	MND	MNR	9,67E-02	1,55E-01	8,50E-01	7,63E-03	-8,80E+00
SM	kg	3,76E-01	0,00E+00	0,00E+00	MND	MNR	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ, (NCV)	0,00E+00	0,00E+00	0,00E+00	MND	MNR	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ, (NCV)	0,00E+00	0,00E+00	0,00E+00	MND	MNR	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m3	1,88E-02	3,44E-04	3,47E-02	MND	MNR	2,59E-04	2,91E-05	3,33E-04	8,25E-06	-1,06E-02
Acronyms	PERE – Use of renewable primary energy as energy carriers; PERM – Use of renewable primary energy resources as raw materials; PERT – Total use of renewable primary energy resources (PERE + PERM); PENRE – Use of non-renewable primary energy as energy carriers; PENRM – Use of non-renewable primary energy resources as raw materials; PENRT – Total use of non-renewable primary energy resources (PENRE + PENRM); SM – Use of secondary material; RSF – Use of renewable secondary fuels; NRSF – Use of non-renewable secondary fuels; FW – Net use of fresh water; NCV - net calorific value.										

OUTPUT FLOWS – [DU=1kg]

Impact category	Unit	A1	A2	A3	A4-A5	B1-B7	C1	C2	C3	C4	D
CRU	kg	0,00E+00	0,00E+00	0,00E+00	MND	MNR	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	0,00E+00	0,00E+00	0,00E+00	MND	MNR	0,00E+00	0,00E+00	9,50E-01	0,00E+00	0,00E+00
MER	kg	0,00E+00	0,00E+00	0,00E+00	MND	MNR	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EEE	MJ	0,00E+00	0,00E+00	0,00E+00	MND	MNR	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EET	MJ	0,00E+00	0,00E+00	0,00E+00	MND	MNR	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Acronyms	CRU – Components for re-use; MFR – Materials for recycling; MER – Materials for energy recovery; EEE – Exported electrical energy; EET – Exported thermal energy.										

WASTE – [DU=1kg]

Impact category	Unit	A1	A2	A3	A4-A5	B1-B7	C1	C2	C3	C4	D
HWD	kg	7,68E-04	1,15E-05	1,04E-05	MND	MNR	5,78E-08	9,70E-07	4,98E-06	4,02E-08	-8,10E-05
NHWD	kg	1,34E-03	4,44E-05	6,97E-01	MND	MNR	1,44E-06	3,31E-06	3,79E-05	5,00E-02	-1,06E-02
RWD	kg	4,94E-05	4,90E-07	8,81E-06	MND	MNR	6,82E-08	3,35E-08	4,30E-07	1,12E-09	8,95E-06
Acronyms	HWD – Hazardous waste disposed; NHWD – Non-hazardous waste disposed; RWD – Radioactive waste disposed.										

SCENARIO DOCUMENTATION

Manufacturing energy scenario documentation

Scenario parameter	Value
Source and quality of electricity data	Emission Factors for Electricity in Poland reported in December 2024 by KOBiZE - the National Centre for Emissions Management in Poland
Electricity CO_2 / kWh	0.701 kg CO_2e / kWh

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EPD VERIFICATION:

The verification procedure of this Environmental Product Declaration (EPD) was carried out in accordance with ISO 14025. The EPD is valid for five years from the date of publication and may be updated earlier in case of significant changes. Renewal of validity requires review and, if necessary, updating.

EPD CONTRIBUTORS

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EPD verifier	Izabela Sztamberek-Sochan, Ph.D.

Note: The sole ownership, liability, and liability of this declaration are with the owner. Construction product declarations may not be comparable if they do not comply with EN 15804. For detailed information on comparability, please refer to EN 15804 and ISO 14025.

EPD POLSKA CERTIFICATE

Program EPD Polska
Operator: MULTICERT Sp. z o.o.

ODLEWNIE POLSKIE S.A.

CERTIFICATE

TYPE III EPD DECLARATION

(ENVIRONMENTAL PRODUCT DECLARATION)

Reg. No. EPD-P 07.12.2025

EPD Environmental Product Declaration
EPD VERIFIED
EPD POLAND

This document confirms that the Environmental Product Declaration developed by **Odlewnie Polskie S.A.** for

DUCTILE CAST IRON PARTS MANUFACTURED FROM EN GJS 500-7

manufactured in accordance with **EN 1563** standard meets the requirements of standards **EN 15804:2012+A2:2019** and **ISO 14025**, and that the data contained therein has been prepared correctly.

The Declaration was published on December 31, 2025 and is valid until December 31, 2030, or until it is deregistered or its publication on the website www.epd.org.pl is discontinued.

Authenticity of this certificate can be confirmed in.
the public register at www.epd.org.pl

Izabela Sztamberek-Sochan, Ph.D.
EPD Polska Verifier

MULTICERT JEDNOSTKA CERTYFIKACYJNA

Grzegorz Suwara
CEO Multicert Sp. z o.o.

Warsaw, December 31, 2025