ENVIRONMENTAL PRODUCT DECLARATION

in accordance with ISO 14025:2006

Foundry coke of the company OKK Koksovny, a.s.

General information

This environmental statement provides a quantitative and verified description of the environmental profile of the foundry coke produced by the joint-stock company OKK Koksovny, a.s.. The product was assessed in terms of the life cycle and scope of the product system from the cradle to gate.

EPD program operator	National Environmental Labeling Program Ministry of the Environment Vršovická 1442/65 100 10 Prag 10 +420 267 121 111 info@mzp.cz
Reference documents	ČSN ISO 14025:2006 Environmental labels and declarations - Type III environmental declaration - Principles and procedures National Environmental Statement Program Rules
Product Category Rule (PCR)	ČSN EN 15804+A2 Sustainability of buildings - Environmental product declaration - Basic rules for the product category of construction products Basic chemicals 2021:03, Version 1.1.1 UN CPC Group: 342 – Basic inorganic chemicals
The EPD was prepared	Ing. Jana Kodymová, Ph.D. VŠB - TUO 17. listopadu 15 100 10 Ostrava - Poruba Jana.kodymova@vsb.cz
EPD registration number	3015-EPD-030066839
Prohlášení vydáno	Date: 30. 7. 2024 Valid until: 29. 7. 2029
Independent assessment of the declaration according to EN ISO 14025:2006	internal ☐ external ☒
The assessment has been carried out	Ing. Lenka Vrbová The Technical and Test Institute for Construction Prague Zahradní 15 326 00 Plzeň vrbova@tzus.cz Vrbová TECHNICKÝ A ZKUŠEBNÍ ÚSTAV STAVEBNÍ PRAHA s.p. Akreditovaný ZÚS Certifikační orgán č. 3015 The certification body is accredited: by the Czech Institute for Accreditation, o.p.s., Certificate No. 458/2023

The EPD owner has sole ownership, responsibility and liability for the EPD. EPDs within the same product category but from different programs may not be comparable. See ISO 14025 for more information on comparability.

Product information

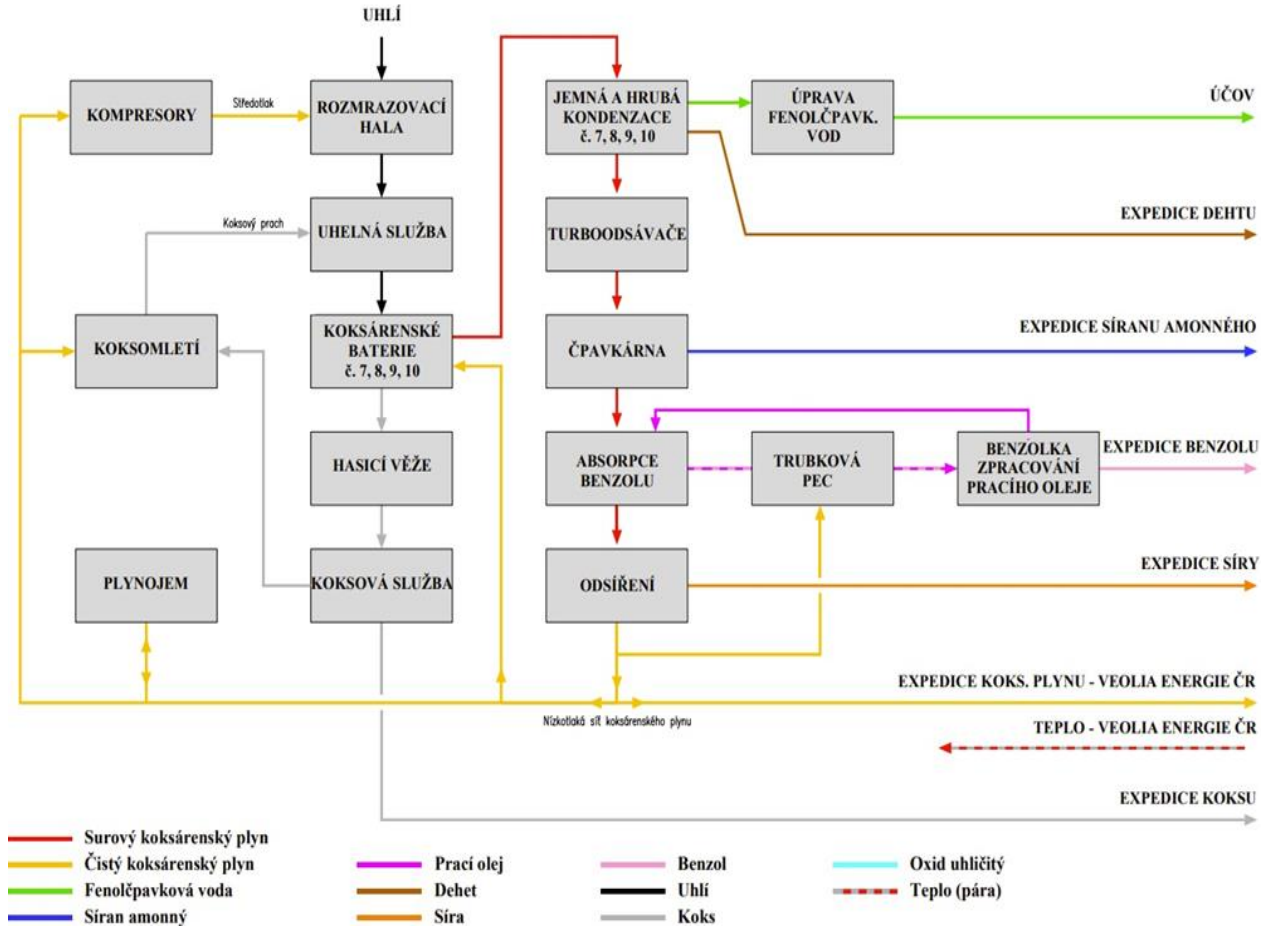
Information about the company

Company identification	OKK Koksovna, a.s., Koksární 1112, Přívoz, 702 24 Ostrava, Czech Republic, Jindřich Vaněk (spokesperson) +420 725 952 912 (media@koksovny.cz)
Description of the organization	The main production program of OKK Koksovny, a.s. is the production of coke - raw materials necessary for the production of cast iron, mineral stone wool, iron, but also for a whole range of other industries, including sugar industry. The production of coke produces by-products such as tar, benzene, sulphur, ammonium sulfate and coke oven gas, which, among other things, serves as a source of heat for about a third of the consumption points in Ostrava. Coke is produced from high-quality coal suitable for coking. The company specializes in the production of foundry coke, which is subjected to the highest quality requirements of customers. Today, OKK's operations are among the most modern coking plants in Europe with an emphasis on minimizing its impact on the environment in its surroundings. The company annually improves measures to reduce the production of harmful substances and carries out careful maintenance of production technology.
The place of business and its address	OKK Koksovna, a.s., Koksární 1112, Přívoz, 702 24 Ostrava, Czech Republic,
Valid organization certifications	ISO 14001(valid until 2024/6/12)
Contact person	Ing. Pavel Balán (pavel.balan@koksovny.cz, mobil: +420 722 952 696)

Popis produktu a jeho použití

Trade name of the product	Foundry coke
Product identification	Foundry coke with the following characteristics (water content (2.5-10% ash content in dry matter 9.5 – 10.3 %, calorific value of coke 26.70 – 29.39 MJ/kg)
UN CPC code	UN CPC Group: 884 - Petroleum, chemical and pharmaceutical products manufacturing services, class 8841
Product manufacturing description	The production of coke is the carbonization of coal, when finely ground high-quality black coking coal is heated in a non-oxidizing atmosphere (without access to oxygen) with the formation of gases, liquids and solid residues. During this process, the so-called coal charge is heated to temperatures above 1,000 °C. Depending on the required production volume, this process usually takes 32 to 48 hours. Then the coke is extruded, cooled and modified according to the customer's requirements. See inset diagram.
Intended use of the product	The company is the largest producer of foundry coke in Europe – the produced coke is exported to dozens of European countries and the USA. Foundry coke from

	our company has long been a top quality product. Chemical by-products (tar, benzene, sulfur and ammonium sulfate) accompanying the production of coke are important raw materials for the chemical, pharmaceutical and agricultural industries. Due to its technological properties, foundry coke must ensure the conditions for the production of cast iron and insulating materials based on basalt. A major part of the production is intended for customers for the production of mineral stone wool, which serves as an insulating material, among other things, for reducing the energy demand of buildings and operations. Another significant part of the production is directed to the foundry sector to produce cast iron for e.g. the automotive industry or engineering.



Obr. č. 1: schéma výrobního procesu

Product life cycle assessment (LCA)

Basic information

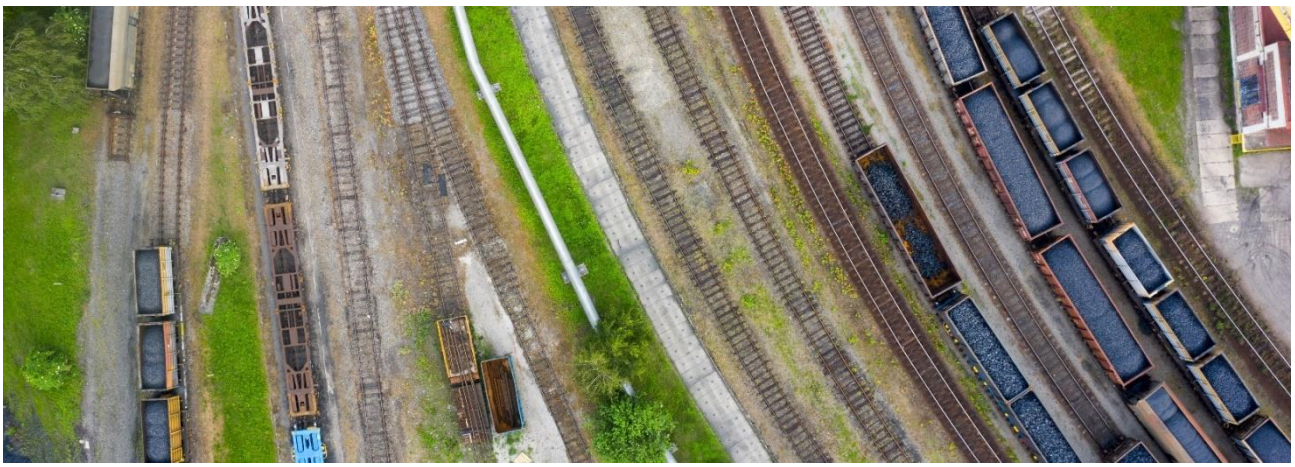
declared unit	1 kg of foundry coke with the following characteristics (water content 2.5-10%, ash content in dry matter 9.5-10.3 %, calorific value of coke 26.70-29.39 MJ/kg)
reference lifetime (RSL)	Cannot be used for this product.
reporting period	Aggregated data representing the year 2023 for generation and energy mix data.
geographic location	The geographic scope of this EPD is global. Applies to the product manufactured at OKK Koksovny as. race (Czech Republic)
database and LCA software used	Ecoinvent 3 database, SimaPro v. 9.1.0.11.
environmental impact assessment methodology	Potential environmental impacts are calculated according to EN 15804:2012 +A2:2019. Characterization models and factors correspond to the latest update of the default list (EF 3.1), referred to as version 2.0.
allocation	Mass distribution: Inputs to the production process (raw materials and energy) were divided among all products in the company (foundry coke, nut, coke dust, etc.) in terms of their share in total production. A different distribution was not possible, because the ratio of raw materials is variable depending on the specific production program and also depends on the qualitative and quantitative parameters of the supply of raw materials, which change variably over time.
the quality of the data used	The data quality assessment was performed based on the product environmental category rules through an arithmetic mean and found that the data quality is good.
Comparison of EPDs within a product category	Since this is the extent of the system being assessed from mining to gate, not including lifetime and material quality, EPDs may not be comparable.
cut-off rule	Data were included for elemental flows into and out of the product system that contribute to at least 99% of the declared environmental impact.
system boundaries	**From the cradle to the gate** Upstream processes include raw materials and production of consumables. The main processes include: transportation of raw materials, consumables for the plant and production, and energy consumption in the production of the product. CO2 emissions released during the processing of raw materials and consumables are part of this study. Downstream processes are not part of this study because the range of sub-contractors is wide and changes significantly over time.

life cycle stages that were included in the calculation	The product meets the requirement to exclude use and end of product life. In practice, according to the PCR conditions, the phase of use and disposal at the end of the product's life can be excluded if the product meets the conditions listed below: • the product is physically integrated with other products in the downstream process of the life cycle, so they cannot be physically separated • the product or material is no longer identifiable at the end of the year due to physical or chemical transformation • EPDs must not be used for business-to-consumer communications Foundry coke is a B-to-B intermediate product whose life cycle and disposal is largely dependent on further processing. In fact, foundry coke must ensure the conditions for the production of cast iron and insulating materials based on basalt or glass fibers with its technological properties.
inventory analysis	The results of the inventory analysis were collected according to modules A1 - A3. modules A1-A1 (upstream process) and module A3 (core process). Due to the confidentiality of the data, in accordance with ČSN EN ISO 14025, they were not used in this document.

Description of the boundaries of the assessed system (X = included in LCA, MNA = module not assessed)

	product manufacturing			sale		phase of use							product disposal			
	Consumption of raw materials	transport	Production	transport	sale	use	maintenance	repair	exchange	renovation	energy consumption during use	water consumption during use	dissolution	transport	waste management	disposal
modul	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
model inclusion	x	x	x	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA
location	GLO	EU	EU	-	-	-	-	-	-	-	-	-	-	-	-	-

tab. No. 1: Boundaries of the system under consideration



Content of materials and chemicals (statement of content)

Coke is one of the materials exempted from registration under REACH. The reasons for this exception are as follows:

- Exception for substances from natural sources:
    - Coke is considered a substance obtained from natural sources that is only heated. Such substances are generally considered to be less risky and are therefore exempt from registration.
- Specific production processes:
    - The process of producing coke (coking) involves converting coal in closed furnaces at high temperatures without access to air. This process is considered a specific manufacturing process that qualifies for an exemption from registration.
    - Substances falling under Regulation 1907/2006 (REACH) Annex IV and V:
- REACH Regulation in Annexes IV and V lists substances that are exempted from registration because their use and characteristics do not pose a significant risk to health and the environment. Coke falls under these appendices.
    - Compositional stability and predictability:
- Coke has a relatively stable and predictable chemical composition, which means that its potential risks are well known and controllable

Thanks to these factors, coke is exempted from the obligation to register under the REACH regulation. This does not mean that it is not subjected to any regulation, but that its risks are considered low enough that it does not require detailed registration and evaluation, as is the case with other chemicals. For the same reasons, no safety data sheet has been prepared for coke.

The developer of this study bears no responsibility for the correct classification of the product, this is fully within the competence of OKK Koksovny a.s.

Inclusion of the recycling process of materials and raw materials within the assessed system

The process produces a large amount of coke oven gas and coke oven dust, both of which are reused within the assessed system. For that reason, there is no need to allocate them separately. In the case of energy (mainly thermal), the amount of energy produced in the form of coke oven gas was subtracted from the total amount of energy consumed. The coke oven dust is then mixed with other inputs and used as part of the charge to the coke oven.

Results of LCA analysis

The specific data was provided by the plant and the generic data came from the SimaPro and Ecoinvent 3 databases. All emissions to air, water and land and all materials and energy used were included.

The results of the LCA data are detailed in the following tables and refer to a declared unit of 1 kg of foundry coke of the above specified properties.

The assessment was carried out in accordance with the requirements of PCR Basic Chemicals 2021:03, version 1.1.1.

Estimated impact results are only relative data that do not indicate impact category endpoints, thresholds exceeded, safety margins or risks.

Impact category indicators

Tab. no. 2: Basic environmental impact indicators

impact category	unit	upstream processes	core process	total
Climate change	kg CO2 eq	3.92E-01	3.35E-01	7.27E-01
Climate Change - Fossil	kg CO2 eq	4.00E-01	3.34E-01	7.34E-01
Ozone depletion	kg CFC11 eq	2.89E-08	4.57E-09	3.35E-08
Formation of photochemical smog	kg NMVOC eq	3.14E-03	4.74E-04	3.61E-03
Acidification	mol H+ eq	4.03E-03	2.72E-01	2.76E-01
Eutrophication, freshwater	kg P eq	1.50E-03	1.39E-06	1.50E-03
Eutrophication, marine	kg N eq	1.34E-03	2.88E-04	1.63E-03
Eutrophication, terrestrial	mol N eq	1.29E-02	1.33E-03	1.42E-02
Water use	m3 depriv.	3.00E-02	2.59E-02	5.59E-02
Resource use, fossils	MJ	3.09E+01	8.93E-01	3.18E+01
Resource use, minerals and metals	kg Sb eq	8.46E-07	1.92E-08	8.65E-07

Tab. č. 3: Doplňující environmentální indikátory dopadu

impact category	unit	core process	upstream process	total
Particulate matter	disease inc.	1.69E-08	4.85E-09	2.17E-08
Ionising radiation	kBq U-235 eq	1.65E-02	9.78E-05	1.66E-02
Ecotoxicity, freshwater	CTUe	5.58E+01	1.98E+00	5.78E+01
Ecotoxicity, freshwater - organics	CTUe	1.08E-01	1.65E+00	1.76E+00
Ecotoxicity, freshwater - inorganics	CTUe	1.89E+00	8.44E-02	1.98E+00
Ecotoxicity, freshwater - metals	CTUe	5.38E+01	2.38E-01	5.40E+01
Human toxicity, non-cancer	CTUh	8.52E-09	1.82E-10	8.70E-09
Human toxicity, cancer	CTUh	2.84E-10	1.21E-11	2.96E-10
Human toxicity, non-cancer - organics	CTUh	3.31E-10	2.27E-11	3.54E-10
Human toxicity, non-cancer - inorganics	CTUh	1.13E-09	3.10E-11	1.16E-09
Human toxicity, non-cancer - metals	CTUh	7.34E-09	1.31E-10	7.47E-09

Human toxicity, cancer - organics	CTUh	1.13E-10	9.50E-12	1.23E-10
Human toxicity, cancer - inorganics	CTUh	0.00E+00	0.00E+00	0.00E+00
Human toxicity, cancer - metals	CTUh	1.71E-10	2.57E-12	1.73E-10
Land use	Pt	4.85E+00	7.28E-01	5.58E+00

Tab. č. 4.: Parametry popisující spotřebu zdrojů podle metodiky Cumulative Energy Demand V1.11

Kategorie dopadu	jednotka	core process	upstream process	celkem
Non renewable, fossil	MJ	9.63E-01	3.40E+01	3.49E+01
Non renewable, nuclear	MJ	-1.22E-03	1.87E-01	1.86E-01
Non renewable, biomass	MJ	6.42E-06	1.59E-04	1.65E-04
Renewable , biomass	MJ	1.53E-01	3.37E-01	4.90E-01
Renewable – kinetic, solar, geotermal	MJ	1.39E-02	9.38E-02	1.08E-01
Renewable, water	MJ	5.74E-03	5.22E-02	5.79E-02
Water scarcity	m3 eq	2.59E-02	3.86E-02	6.46E-02

Tab. č. 5.: Produkce odpadů

Kategorie dopadu	jednotka	core process	upstream process	celkem
Hazardous waste removed	mg	-2.24E+02	3.26E-01	-2.23E+02
Removed other waste	mg	7.57E+02	2.25E-03	7.57E+02
Radioactive waste removed	mg	-3.69E+02	3.30E-01	-3.69E+02

Tab. č. 6.: Kategorie biogenního uhlíku a LULUC

Kategorie dopadu	jednotka	core process	upstream process	celkem
Climate change - Biogenic	kg CO2 eq	-8.19E-03	7.46E-03	-7.23E-04
Climate change - Land use and LU change	kg CO2 eq	2.46E-04	3.54E-05	2.82E-04

reference

- ČSN EN ISO 14040:2006 Environmental management - Life cycle assessment - Principles and outline
- ČSN EN ISO 14044:2006 Environmental management - Life cycle assessment - Requirements and guidelines
- ČSN ISO/TR 14047:2005 Environmental management - Life cycle assessment - Application examples ISO 14042
- ČSN P ISO TS 14048:2003 Environmental management - Life cycle assessment - Data documentation format
- Ecoinvent 3 database, SimaPro v. 9.1.0.11.
- *Assessment of environmental impacts of technologies*. Online, script. Praha: VŠCHT, 2006. Available from: https://uchop.vscht.cz/files/uzel/0011054/HEDT2006.pdf?redirected. [cit. 2024-06-30].

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