



ENVIRONMENTAL PRODUCT DECLARATION

ACCORDING TO THE STANDARDS EN ISO 14025:2010 AND EN 15804+A1:2013

HOT-ROLLED HEAVY PLATES

(INCLUDING HEAT TREATMENT)

ORGANIZATION

VÍTKOVICE STEEL, A. S.

PROGRAMME HOLDER

CENIA, Czech Environmental Information Agency,
executive function of the Agency NPEZ

THE DOCUMENT WAS PROCESSED BY

Technical and Test Institute for Construction Prague, SOE

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1. GENERAL INFORMATION

<p>VÍTKOVICE STEEL, a. s.</p> <hr/> <p>Program: „National Environmental Labeling Program“ - CZ</p> <p>Programme holder: CENIA, Czech Environmental Information Agency, executive function of the Agency NPEZ, Vršovická 1442/65, Praha 10, 100 10, www.cenia.cz</p> <hr/> <p>Declaration number: 7210004</p> <hr/> <p>Product category rules: EN 15804+A1:2013</p>	<p>Hot-rolled heavy plates</p> <hr/> <p>Manufacturer's name and address: VÍTKOVICE STEEL, a. s., Českosobotská 3321/46, 702 00 Ostrava - Moravská Ostrava</p> <hr/> <p>Declaration unit: 1t of products</p> <hr/> <p>Product: Hot-rolled heavy plates (including heat treatment)</p>
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VÍTKOVICE STEEL, a.s. is a leading European manufacturer of rolled steel products and the biggest manufacturer of steel plates in the Czech Republic. Its core production programme is formed by heavy plates and cut shapes which are made at sheet rolling mill and sheet piles which are made at heavy section rolling mill.

The company applies an integrated EN ISO 9001 quality management system, EN ISO 14001 environmental management system and ČSN ISO 450001 occupational health and safety management system certified by TÜV NORD CERT GmbH.

The present EPD provides quantified environmental information on a construction product on harmonized and scientifically reasoned basis. It is also intended to provide basic information on the product regarding assessment of life cycle of buildings and other structures and contribute to identification of products with a lower impact on the environment.

To enable comparison of products in the building life cycle assessment process based on their EPD which is made by determination of their contribution to the environmental properties of the building, the EPD for the concerned construction products must be drawn up in accordance with the requirements of EN 15804+A1:2013 Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products.

1.1. Product data

1.1.1. Product

Hot-rolled heavy plates

The plates are made of continuously cast slabs.
The plates are rolled to 5 – 100 mm (200 mm) thicknesses and 1 000 – 3 200 mm widths.

Condition of delivered plates (heat treatment):

AR – as rolled (without heat treatment)

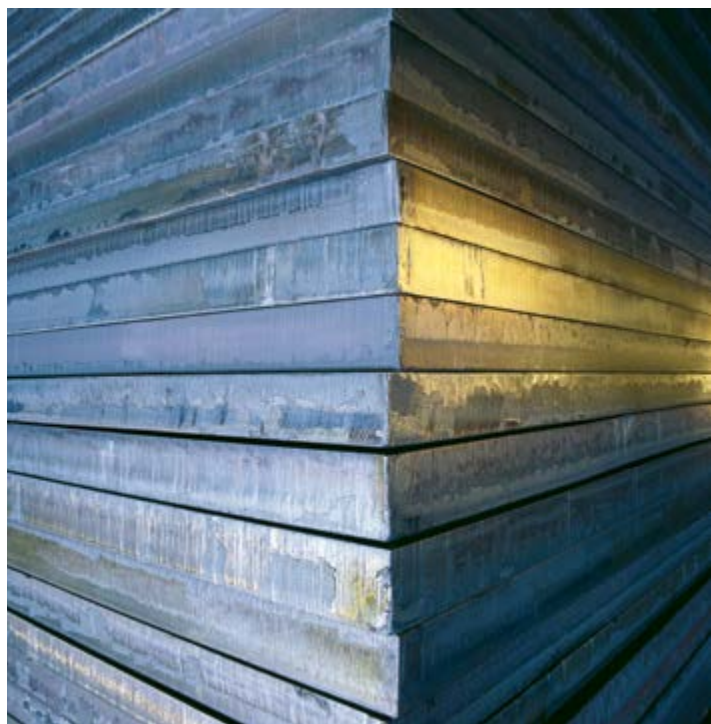
N – normalized

NT – normalized and tempered

A – spheroidized

M (TMCP) – thermomechanically rolled

For more information on the products see the PLATES - PRODUCT CATALOGUE / PRODUKTOVÝ KATALOG PLECHY / PRODUKT KATALOG BLECHE 2019.



1.1.2. Application

- Steel and bridge structures
- Ships
- Transport machines and vehicles
- Abrasion resistant plates
- Pressure vessels used at normal and high temperatures
- Special military equipment
- Plates resistant to atmospheric corrosion
- Flame-cut shapes
- Pipelines
- Offshore constructions



Plates of steels to EN 10025-2 with „CE” mark

Most commonly used structural steels with 235 MPa minimum yield strength and guaranteed weldability, designed for less demanding bridge and shop steel structures, railway and motor vehicle components, etc.

Plates of fine-grained steels to EN 10025-3 with „CE” mark

Structural steels with guaranteed fine-grained structure and low carbon equivalent. With their minimum yield strength up to 460 MPa and impact energy guaranteed at -50 °C they are suitable for demanding steel structures and their bearing members. They are suitable also for railway and motor vehicle structures.

Thermomechanically rolled plates of fine-grained steels to EN 10025-4 with „CE” mark

Thermomechanically rolled plates of structural steels with low carbon equivalent offering excellent weldability. They are used for demanding steel structures and their bearing members. The impact energy is guaranteed even at -50 °C which provides a wide range of application.

Plates of structural steels with increased resistance to atmospheric corrosion (ATMOFIX)

Unlike plates of ordinary steels, the plates of structural steels with increased resistance to atmospheric corrosion do not require costly surface treatment (coating). They are characteristic with increased resistance to effects of atmosphere containing sulphur. They are used predominantly for bridge structures but can be used also for chimney and flue duct structures.

Thermomechanically rolled plates of steels to EN 10149-2

Typical methods of processing of these plates are bending, flanging, profiling, etc. They can be delivered in a condition fit for hot-dip galvanizing if agreed. They feature excellent weldability due to low carbon equivalent.

Normalized plates of steels to EN 10149-3

Processing of the plates makes them fit for cold forming. Typical methods of processing of these plates are bending, flanging, profiling, etc. They can be delivered in a condition fit for hot-dip galvanizing upon request.



1.1.3. Product specifications

Basic properties of delivered hot-rolled heavy plates

Length (max.)	18 000 mm	Thickness	5 – 100 mm
Width	1 000 – 3 200 mm	Weight (max.)	12 500 kg

- a) All the dimensions above are approximate; actual plate dimensions depend on the combination of length, width and thickness as well as material specification. To obtain detailed data please contact VÍTKOVICE STEEL, a. s
- b) Plates in higher lengths up to 21,000 mm can be delivered if agreed
- c) Plates in higher thicknesses up to 200 mm can be delivered if agreed
- d) Plates in higher weights up to 13 000 kg can be delivered if agreed

The quality level of plates rolled on 3,5 four-high rolling mill is guaranteed by a number of certificates.

Following Regulation (EU) No. 305/2011 laying down harmonised conditions for the marketing of construction products a declaration of performance is issued for the plates made in accordance with harmonized standards EN 10025-2,-3,-4,-5 and EN 10343 confirming that the product performance conforms to the respective harmonized technical specifications (hEN). The conformity is assessed by notified body TÜV NORD Systems GmbH & Co.KG.

The company holds also other product certificates issued by inspection and certification bodies BV, DNV GL, LR, Deutsche Bahn HPQ (DBS 918 002-02) – certification for railway transport; certification documents for pressure equipment in accordance with Directive 2014/68/EU of the European Parliament and of the Council on the harmonisation of the laws of the Member States relating to the making available on the market of pressure equipment and document AD 2000-Merkblatt W1/W10, and certification documents according to Bauregelliste A, part 1 for proving of product conformity for construction purposes.

Product quality documents in accordance with EN 10204:

The Quality Management Department issues inspection document (inspection certificate) showing chemical composition of heat and results of material tests (such as ultrasonic testing, mechanical testing) in line with the order:

- Declaration of conformity with order “2.1”
- Test report “2.2”
- Inspection certificate “3.1”
- Inspection certificate “3.2”

1.1.4. Rules for Application

The products are made in accordance with the standards referred to in section 1.1.3. The products are subject to mandatory certification and declaration of conformity is issued by the manufacturer.

Environment and health during use

Under normal conditions for use the products do not any have adverse effects on health and do not release any volatile organic substances to indoor atmosphere.

Because of an extremely low release of metal from steel and low demands for maintenance no environmental impacts on water, air or soil are expected.

Recycling of Used Products (after the end of their life)

With its capability of restoring the original properties without quality loss after melting, steel is the most recycled material worldwide.

In built environment, 99 % of hot-rolled products can be reused or recycled at the end of their life. The flexibility and adaptability of steel sections enable extending the functional life of renovated and new structures.

1.1.5. Method of product delivery

The products are delivered in accordance with the standards referred to in section 1.1.3.

The product quality is secured by effective EN ISO 9001 quality management system and in accordance with technical regulations applicable to the respective product type.

Following Regulation (EU) No. 305/2011 laying down harmonised conditions for the marketing of construction products a declaration of performance is issued for the plates made in accordance with harmonized standards EN 10025-2,-3,-4,-5 and EN 10343 confirming that the product performance conforms to the respective harmonized technical specifications (hEN). The conformity is assessed by notified body TÜV NORD Systems GmbH & Co.KG.

Basic raw materials and additives

The basic material for both product groups is iron. The products are made of imported steel blanks - so-called slabs. No additives are used by the manufacturer VÍTKOVICE STEEL, a.s. The slab quality depends on the supplier's specification and manufacturer's requirements. The alloying element composition depends on the steel grade / type. No substances included in the List of Substances of Very High Concern which are subject to approval by the European Agency for Chemical Substances are contained in the steel in declarable amount.

1.1.6. Description of the production process

The products are made of imported steel blanks - so-called slabs. No additives are used by the manufacturer VÍTKOVICE STEEL, a.s. The slab quality depends on the supplier's specification and manufacturer's requirements. The alloying element composition depends on the steel grade / type. After preheating the slabs enter the rolling mill where they are rolled to 5 – 100 mm (200 mm) thick and 1 000 – 3 200 mm wide plates in several passes.

Fig.1: Production process diagram



1.1.7. Waste management

According to the current state of knowledge generally no damage to environment is caused by steel structure removal and recycling.

With its capability of restoring the original properties without quality loss after melting steel is the most recycled material worldwide.

In built environment, 99 % of hot-rolled products can be reused or recycled at the end of their life. The flexibility and adaptability of steel sections enable extending the functional life of renovated and new structures.

Any metal waste is classified into group 17.04.05 "Iron and steel".

1.2. LCA: Calculation rules

1.2.1. Declared unit

Declared unit is **1t of manufactured products – „Hot-rolled heavy plates“**.

2. PRODUCT SYSTEM AND SYSTEM BOUNDARIES

The boundary of the product life cycle study system is only the information module A1 - A3 "Production phase" in accordance with standard EN 15804 + A1: 2013. The created EPD covers the information modules A1-A3, which means from the cradle to the gate. Other modules A4 to C4 and module D, which is intended to provide additional information beyond the life cycle, have not been included in the LCA due to the difficult availability of input data and are not declared for this EPD. The reference service life of the elements is also not declared depending on the unavailability of representative data on operating conditions in the product use stage.

Information on product system boundaries is shown in Table 1.

The boundaries of the system are set to include both those processes that provide material and energy inputs to the system, and subsequent production and transportation processes up to the production gateway, and the processing of all waste resulting from these processes.

The production stage includes these modules:

A1 - raw material extraction and processing, processing of secondary material input

A2 - transport of raw materials from supplier to manufacturer, in-house transport

A3 - manufacturing (including the supply of all materials, products and energy, the treatment of waste until it reaches a state where it ceases to be waste or after the removal of the last material residues during the production stage.

The potential benefits and costs from the production stage do not exceed the selected system boundaries of the A1-A3 system.

Table 1:

Information about product system boundaries – information modules (X = included, MND = the module is not declared)																
Product stage			Construction process stage		Use stage							End of life stage				Supplementary information beyond the building life cycle
Raw material supply	Transport	Manufacturing	Transport	Construction-installation process	Use	Maintenance	Repair	Replacement	Returbishment	Operational energy use	Operational water use	De-construction, demolition	Transport	Waste processing	Disposal	Reuse-, Recovery-, Recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

The benefits and costs beyond the system are not quantified in this LCA study. The use of the generated production waste (scrap metal, scale) as the use of secondary raw materials in another assessed product system can be considered as benefits beyond the assessed product system.

The boundaries of the product system are considered to include only production processes, not administrative activities.

The reference service life of products is also not declared depending on the unavailability of representative data on operating conditions in the product use stage.

2.1. Assumptions and measures taken

The analysis did not include the processes required for the installation of production equipment and the construction of infrastructure. Administrative processes are also not included - inputs and outputs are balanced on the production stage.

All operational data concerning product recipes, energy data, diesel consumption and the distribution of annual waste production and emissions according to plant records were taken for the study. For all considered inputs and outputs, transport costs were considered or differences in transport distances were recognized.

The time range of the required specific data provided by VÍTKOVICE STEEL, a.s. for the processing of this report was set as a representative time period of the calendar year 2019. For this period, the organization was provided with all available data for their further processing.

2.2. Exclusion rules

In terms of produced waste, only those wastes that are clearly related to production activities were included in the analysis.

For some input data, due to their complexity of obtaining, alternative methods were chosen in the form of a qualified calculation based on available information. Some input data were converted to units that were needed for the selected generic process data in the environmental impact assessment calculation program.

2.3. Sources of environmental data

The necessary specific data concerning the production stage were determined on the basis of the consumed amount of input materials and outputs - production of finished products from the relevant sources of required data. Consumption of quantities of basic raw materials and other inputs was reported on the basis of data from the information system.

All inputs and outputs were entered in system units, namely:

- Material and auxiliary inputs and product outputs in kg
- Sources used as energy input (primary energy) were expressed in kWh or MJ, including renewable energy sources (hydropower, wind energy)
- Water consumption was expressed in m³ (cubic meters)
- Inputs related to transport were expressed in km (distance), tkm (material transfer) and in kg (diesel consumption, etc.)
- Time was expressed in practical units depending on the scale of assessment: minutes, hours, days, years.

The source of input data was operational data obtained from the organization registered in the information system, as well as outputs from monitoring and measuring waste production and emissions.

The following entries were performed (direct data not available):

- Distances for transport of inputs and outputs (waste) - data from GOOGLE map were taken

They were used for a complete analysis of environmental parameters:

- SimaPro computer software, version 9.01 SimaPro Analyst (Ecoinvent database version 3.6)

2.4. Data quality

The data used to calculate the EPD correspond to the following principles:

Time period: Manufacturer's data for 2019 are used for specific data (the requirement to use average data for a period of 1 year is met). Data from the Ecoinvent database version 3.6 are used for generic data.

Technological aspect: Data corresponding to the current production of the product group and corresponding to the current state of those used (product recipes, technological procedures) are used.

Completeness aspect: Most of the input data is based on consumption balances, which are accurately recorded in the information system. As part of the completeness check, the company VÍTKOVICE STEEL, a.s. and it was checked whether all used inputs / outputs are present in the records. The reliability of the source of specific data is given by the uniformity of the information system collection methodology.

Geographical aspect: The generic data used from the Ecoinvent database are used valid for the Czech Republic (eg energy inputs) and if data for the Czech Republic are not available, data valid for the EU or according to the supplier's location are used.

Consistency aspect: Uniform aspects are used throughout the report (allocation rules, data age, technological scope, time scope, geographical scope).

Credibility aspect: All important data were checked for cross-comparison of mass balances.

2.5. Assessment period

The data provided by the partial production units of VÍTKOVICE STEEL, a.s. for the period 2019.

2.6. Allocation

As part of the report, the allocation of inputs and output products was made. A uniform method based on weight fractions was used for allocation. The data converted into the declared unit 1t of produced final products were considered for the inventory and evaluation.

For the product group, according to input and output flows, the consumption of the number of inputs and the amount of produced outputs (waste, emissions) was allocated according to external sales of co-products. (external sale of by-products arising from the production process - scrap metal and scale). To calculate the consumption of sources, the share distribution of types of sources according to the data of OTE, a.s. for 2019.

2.7. Comparability

Environmental product declaration from different programs may not be comparable. Comparison or assessment of data reported in the EPD is only possible if all comparable data reported in accordance with EN 15804 + A1: 2013 have been determined according to the same rules.

2.8. Product variability

The resulting data are always given for 1 t of the average product.

2.9. LCA: Results

Information on environmental impacts is expressed in the following tables. The individual results for the given impact categories are given in Table 2-5. They are related to the declared unit (DJ) - 1t of the product.

The impact assessment was carried out using characterization factors used in the European Life Cycle Reference Database (ELCD) provided by the European Commission - Directorate-General of the Joint Research Center - Institute for Environment and Sustainability.

2.9.1. Parameters describing environmental impacts

Table 2: Parameters describing environmental impacts

Results LCA – Parameters describing environmental impacts (DJ = 1 ton of Hot-rolled heavy plates)		
Parameter	Unit	A1-A3
Global warming potential (GWP)	kg CO2 ekv.	5,89E+02
Depletion potential of the stratospheric ozone layer (ODP)	kg CFC 11 ekv.	1,09E-04
Acidification potential of soil and water (AP)	kg SO2 ekv.	9,95E+00
Eutrophication potential (EP)	kg (PO4)3- ekv.	1,74E+00
Formation potential of tropospheric ozone (POCP)	kg Ethene ekv.	2,89E-01
Abiotic depletion potential (ADP-elements) for non fossil resources	kg Sb ekv.	3,67E-03
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	MJ, v net calorific value	9,13E+03

2.9.2. Parameters describing resource use

Table 3: Parameters describing resource use

Results LCA – Parameters describing resource use (DJ = 1 ton of Hot-rolled heavy plates)		
Parameter	Unit	A1-A3
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ	12,7
Use of renewable primary energy resources used as raw materials	MJ	0
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ	12,7
Use of non renewable primary energy excluding non renewable primary energy resources used as raw materials	MJ	2890
Use of non renewable primary energy resources used as raw materials	MJ	0
Total use of non renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ	2890
Use of secondary material	kg	0
Use of renewable secondary fuels	MJ	0
Use of non renewable secondary fuels	MJ	3,25E-01
Net use of fresh water	m ³	1,99E-01

2.9.3. Other environmental information describing different waste categories and output flows

Table 4: Other environmental information describing waste categories

Results LCA – Other environmental information describing waste categories (DJ = 1 ton of Hot-rolled heavy plates)		
Parameter	Unit	A1-A3
Hazardous waste disposed	kg	1,50E-04
Non hazardous waste disposed	kg	2,13E-04
Radioactive waste disposed	kg	0,00E+00

Table 5: Other environmental information describing output flows

Results LCA – Other environmental information describing output flows (DJ = 1 ton of Hot-rolled heavy plates)		
Parameter	Unit	A1-A3
Components for re-use	kg	0,00E+00
Materials for recycling	kg	0,00E+00
Materials for energy recovery	kg	0,00E+00
Exported energy	MJ per energy carrier	0,00E+00

2.9.4. LCA: Interpretation

The impact of production on the environment is mainly influenced by the following input components:

Global warming potential (GWP) – The components including the transport of raw materials, the raw materials themselves (slabs) and energy consumption (electricity) have a decisive influence on its total amount.

Depletion potential of the stratospheric ozone layer (ODP) – The components including the transport of raw materials, the raw materials themselves (slabs) and energy consumption (natural gas) have a decisive influence on its total amount

Eutrophication potential (EP) – The components including the transport of raw materials, the raw materials themselves (slabs) and energy consumption (electricity) have a decisive influence on its total amount.

Formation potential of tropospheric ozone (POCP) – The components including the transport of raw materials, the raw materials themselves (slabs) and energy consumption (electricity) have a decisive influence on its total amount.

Acidification potential of soil and water (AP) – The components including the transport of raw materials and the raw materials themselves (slabs) have a decisive influence on its total amount.

Abiotic depletion potential (ADP-elements and ADP-fossil fuels) – The components including the transport of raw materials, the raw materials themselves (slabs) and energy consumption (natural gas) have a decisive influence on its total amount.

3. LCA: SCENARIOS AND OTHER TECHNICAL INFORMATION

Information modules A4 to C4 and D were not included in the LCA analysis.

4. LCA: Additional information

The EPD does not include additional documentation related to the declaration of supplementary information.

5. References

ČSN ISO 14025:2010 Environmental labels and declarations - Type III environmental declarations - Principles and procedures

EN 15804+A1:2013 Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products

ČSN EN ISO 14040:2006 Environmental management - Life Cycle Assessment - Principles and Framework

ČSN EN ISO 14044:2006 Environmental management - Life Cycle Assessment – Requirements and guidelines

ČSN ISO 14063:2007 Environmental management - Environmental communication - Guidelines and examples

ČSN EN 15643-1:2011 Sustainability of construction works - Sustainability assessment of buildings - Part 1: General framework

ČSN EN 15643-2:2011 Sustainability of construction works - Assessment of buildings - Part 2: Framework for the assessment of environmental performance

ČSN EN 15942:2013 Sustainability of construction works - Environmental product declarations - Communication format business-to-business

TNI CEN/TR 15941:2012 Sustainability of construction works - Environmental product declarations - Methodology for selection and use of generic data

ILCD handbook - JRC EU, 2011

Act No. 185/2001 Coll. as amended (Waste Act) - CZ

Decree No. 93/2016 Coll. Waste catalog - Waste catalog - CZ

Regulation No. 1907/2006 of the European Parliament on the Registration, Evaluation, Authorization and Restriction of Chemicals and establishing a European Chemicals Agency - REACH (Registration, Evaluation and Authorization of Chemicals)

Regulation (EC) No 1272/2008 of the European Parliament and of the Council on classification, labeling and packaging of substances and mixtures, amending and repealing Directives 67/548 / EEC and 1999/45 / EC and amending Regulation (EC) No 1907/2006 (CLP Regulation)

SimaPro LCA Package, Pré Consultants, the Netherlands , www.pre-sustainability.com

Ecoinvent Centre, www.Ecoinvent.org

Explanatory documents are available from the employee in the job position “Technical & Ecological Services Manager” of the organization VÍTKOVICE STEEL, a.s.

6. Verification EPD

Independent verification of the declaration and data, according to ČSN ISO 14025:2010

CEN standard ČSN EN 15804+A1 serves as the core PCR^a

Internal **External**

Third party verifier^b:

ezú elektrotechnický
zkušební
ústav

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Certification Body for EPD, accredited ČIA, Czech accreditation Institute, Under no. 3018

^a Product category rules

^b Optional for business-to-business communication, mandatory for business-to-consumer communication
(ISO 14025:2006, article 9.4).

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VÍTKOVICE STEEL

Mariánský bridge
in Ústí nad Labem



Railway station in
Frankfurt am Main



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