



## ENVIRONMENTAL PRODUCT DECLARATION

In agreement with ISO 14025:2006,  
PRODUCT CATEGORY RULES AND PCR BASIC MODULE 2012:01 Ver. 2.01.  
CONSTRUCTION PRODUCTS AND CPC division 412 PRODUCT OF IRON OR STEEL



# VÁLCOVNY TRUB CHOMUTOV

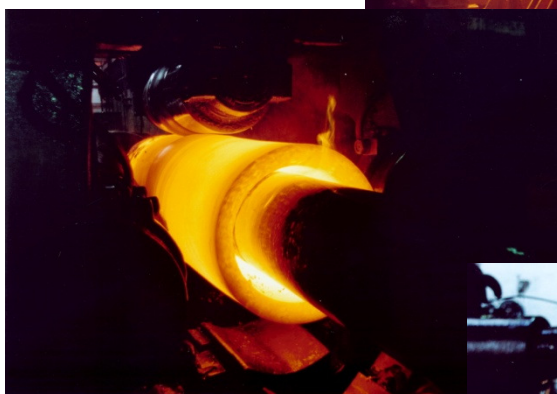


### ENVIRONMENTAL PRODUCT DECLARATION OF SEAMLESS STEEL TUBES VÁLCOVNY TRUB CHOMUTOV, A.S.

Registration Date: May 1<sup>st</sup> 2018  
Expiration Date: April 25<sup>th</sup> 2023  
EPD Registration No: S-P-01277

Organization:	Válcovny trub Chomutov, a.s.	Registration No. / VAT CZ22774645
Address	Tovární 629, 430 01 Chomutov Czech Republic	
Statutory body	Robert Hamerle	
EPD representative	Libor Kubát	
Contact	+420 724 276 466, kubat.libor@steel- holding.cz	www.steel-holding.cz/

<b>Product:</b>	Seamless steel tubes
<b>Use:</b>	Construction industry
<b>Product lifetime /years/:</b>	The products are under warranty for 5 years.
<b>Hazardous substance contents:</b>	Yes/No
<b>UN CPC:</b>	412 Products of iron or steel



## **1 PROGRAMME RELATED INFORMATION**

Programme operator for this EPD is The International EPD® system.

EPD International AB  
Box210 60 SE-100 31 Stockholm, Sweden  
E-mail: [info@environdec.com](mailto:info@environdec.com)  
WWW: [www.environdec.com](http://www.environdec.com)

### **1.1 THE REFERENCE PCR DOCUMENT**

The reference documents for this EPD are General Programme Instructions and Product Category Rules 2012:01 Version 2.01: Construction Products and Construction Services. Product Category Rules (PCR) are specified for certain information modules “cradle-to-gate”, so called core modules. The structure and aggregation level of the core modules is defined by the United Nation Statistics Division - Classification Registry CPC codes (<http://unstats.un.org>).

### **1.2 REGISTRATION NUMBER**

The registration number of this EPD is: S-P-01277

### **1.3 DATE OF PUBLICATION AND VALIDITY**

The publication date of this EPD is: May 1<sup>st</sup> 2018

This EPD is valid until: April 25<sup>th</sup> 2023

### **1.4 GEOGRAPHICAL SCOPE OF APPLICATION OF EPD**

The geographical scope of this EPD is worldwide.

### **1.5 INFORMATION ABOUT THE YEAR OR REFERENCE PERIOD OF THE UNDERLYING DATA TO THE EPD**

The reference period to this EPD is year 2017. Data shown below refers to 2017 and have been collected directly from Válcovny trub Chomutov, a.s. Other general data used were taken from the GaBi 8 and Ecoinvent database.

### **1.6 REFERENCE TO THE WEBSITE**

More information related to The International EPD® System programme is available at [www.environdec.com](http://www.environdec.com).

## **2 PRODUCT RELATED INFORMATION**

### **2.1 SPECIFICATION OF THE COMPANY**

Seamless steel tubes are produced Válcovny trub Chomutov, a.s. Tovární 629, 430 01 Chomutov, the Czech republic

Registration No. / VAT No.: CZ22774645

The company is recorded in the Company Register kept by the Country court in Ústí nad Labem Czech Republic, file number B 2228.

Certificates: EN ISO 14001: 2015

EN ISO 9001: 2015

### **2.2 TECHNICAL DESCRIPTION OF THE PRODUCT**

#### **Technical characteristics**

Materials conforming EN 10210-1.

- Steel grades:
  - S 235 JRH
  - S 275 JOH a J2H
  - S 355 JOH, J2H a K2H
  - S 275 NH a NLH
  - S 355 NH a NLH
  - S 420 NH a NLH
  - S 460 NH a NLH

#### **Product designation according to EN 10210**

- a) Amount (weight or total length)
- b) Type of length, length range or length (see EN 10210-2)
- c) Product shape information:  
HFCHS = Hot-formed circular hollow sections
- d) Steel designation according to EN 10210-1, 4.2
- e) Dimensions (see EN 10210-2)

#### **Dimensions according to EN 10210-2**

- External diameter up to 660 mm
- Wall thickness up to 76 mm

#### **Construction characteristics**

Mechanical and technological characteristics at room temperature

#### **A) Structural non-alloy steels**

(values according to EN 10210-1, Table A.3)

- Minimum yield strength (depending on nominal wall thickness)  
S 235: 195 - 235 MPa  
S 275: 225 - 275 MPa  
S 355: 295 - 355 MPa
- Tensile strength (depending on nominal wall thickness)  
S 235: 350 - 510 MPa  
S 275: 400 - 630 MPa  
S 355: 450 - 680 MPa
- Elongation, min. (depending on the nominal wall thickness)  
S 235: 22 - 26%  
S 275: 19 - 23%  
S 355: 18 - 22%
- Impact energy, min.  
JR 27 J at +20 °C  
JO 27 J at 0 °C  
J2 27 J at -20 °C  
K2 40 J at -20 °C

#### **B) Fine-grained structural steels**

(values according to EN 10210-1, Table B.3)

- Minimum yield strength (depending on nominal wall thickness)  
S 275: 255 - 275 MPa  
S 355: 335 - 355 MPa  
S 420: 390 - 420 MPa  
S 460: 430 - 460 MPa
- Tensile strength (depending on nominal wall thickness)  
S 275: 370 - 510 MPa  
S 355: 470 - 630 MPa  
S 420: 520 - 680 MPa  
S 460: 540 - 720 MPa
- Elongation, min. longitudinal / transverse  
S 275: 24/22%  
S 355: 22/20%  
S 420: 19/17%

S 460: 17/15%

- Impact energy, min.

N 40 J at -20 ° C

NL 27 J at -50 ° C

#### Physical properties

- |  |   |
|--|---|
| • Density [g/cm <sup>3</sup> ] -                             | 7.85  |
| • Modulus of elasticity [kN/mm <sup>2</sup> ] (dynamic) -    | 212   |
| • Shear modulus [kN/mm <sup>2</sup> ] -                      | 81  |
| • Thermal conductivity [W/mK] -                              | 35 - 47   |
| • True specific heat capacity [J/kgK] -                      | 461   |
| • Thermal diffusivity [10 <sup>-6</sup> m <sup>2</sup> /s] - | 9.6 - 13  |
| • Mean coefficient of thermal expansion -                    | 11.5 - 11.9   |
| • Fire Safety -  | Material Class A1,<br><br>Non-flammable according to<br>EN 13 501-1 |
| • Magnetic behaviour -                                       | magnetisable  |

#### Application field

- SMLS tubes are used in a wide range of building application:
  - Construction of industrial buildings and halls
  - Bridge construction
  - Boiler frames and support structures
  - Tribuness
  - Sports complexes
  - Exhibition Grounds
  - Airport terminals and hangars
  - Steel-glass facade constructions
  - Agricultural equipment
  - General Mechanical Engineering

### 2.3 DECLARED UNIT

According to the EN 15804 + A1 and PCR, the declared unit is 1 ton of evaluated seamless steel tubes.

### 2.4 DESCRIPTION OF UNDERLYING LCA-BASED INFORMATION

#### 2.4.1 SYSTEM BOUNDARIES

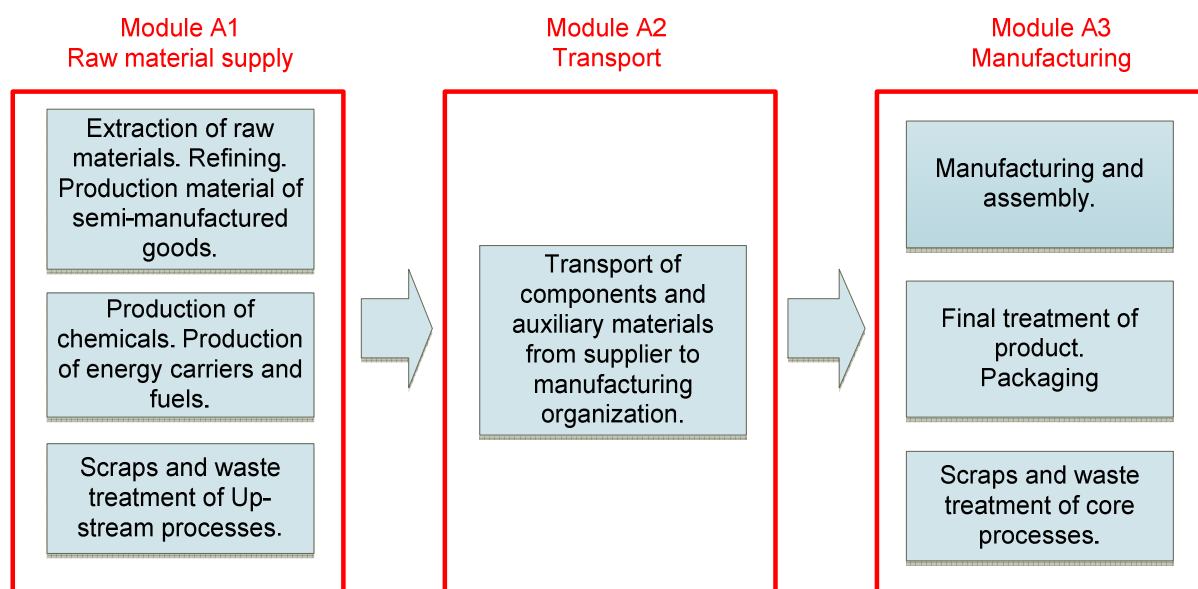
System boundaries of this EPD are cradle to gate. Based on EN 15804+A1 The International EPD® system has adopted an LCA calculations procedure which is separated into different life cycle stages, so called modules A1, A2 and A3:

- Module A1: Upstream processes including energy production
- Module A2: Transport of inputs to producer

- Module A3: Core processes including infrastructure and waste processing

Schematic description of system boundaries consisting of up-stream module processes, core processes and down-stream processes is shown on following figure.

**Figure 1 System boundaries**



Based on PCR (IES 2012) the downstream module was not included into system boundaries. Transport of final product to a customer is also excluded.

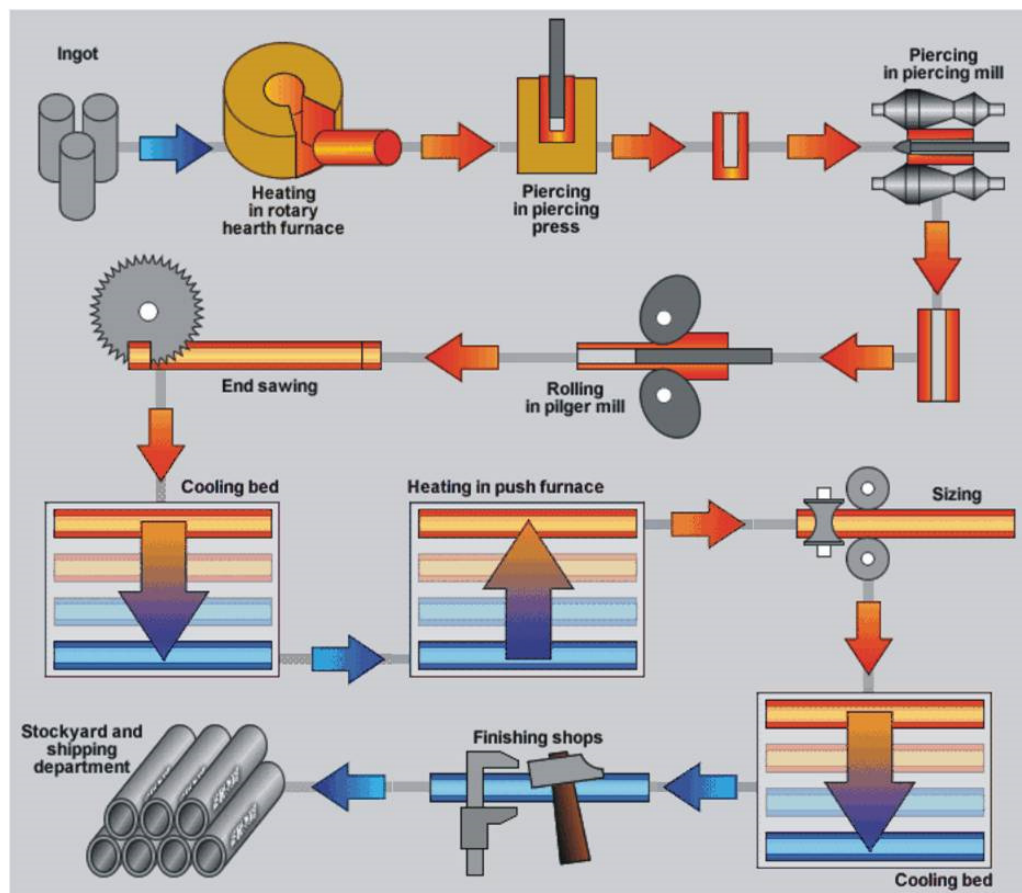
**Table 1 General description of the system boundary (X = Declared (Included in LCA); MND = Module Not Declared).**

A1 - A3 Product stage	Raw material supply	A1	x
	Transport	A2	x
	Manufacturing	A3	x
A4 - A5 Construction process	Transport from the gate to the site	A4	MND
	Assembly	A5	MND
B1 - B7 Use stage	Use	B1	MND
	Maintenance	B2	MND
	Repair	B3	MND
	Replacement	B4	MND
	Refurbishment	B5	MND
	Operational water use	B6	MND
	Operational energy use	B7	MND
C1 - C4 End of life stage	De-construction	C1	MND
	Transport	C2	MND
	Waste processing	C3	MND
	Disposal	C4	MND

D Benefits and loads beyond the system boundaries	Reuse- Recycling - Recovery Potential	D	MND
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The entire life cycle A1-C4 is not declared. Only modules A1-A3 are evaluated. Therefore there is no documentation for calculating the reference life added.

Figure 2 Production scheme



#### 2.4.2 DATA QUALITY

All relevant data are of specific quality. Data used for calculation were relevant for year 2017. Data set needed for calculation is complete.

#### 2.4.3 PRESENTATION OF THE APPLICATION OF CUT-OFF CRITERIA

Cut-off criterion was chosen based on used PCR. Although according to used PCR the data for a minimum of 95 % of total inflows shall be included, in the study only materials having in summa less than 1% of weight of product were not used in calculations. There were excluded process of internal transportation of seamless steel tubes in production. The amount of driven kilometres was only 500 km by narrow gauge diesel locomotive within the whole year 2017. In view of the fact that the whole production of SMLS was 42 529 tonne, the exclusion of these substances is in line with cut off rule. Summa of excluded transport do not exceed 1% (w/w) of potential impacts of production scheme. There are no other excluded processes from the system boundary. All relevant processes are included in the LCA study.

#### 2.4.4 PRESENTATION OF THE ALLOCATION OF RELEVANCE FOR CALCULATION

As a general allocation rule 1 ton of product was chosen. Generation of waste is depended on weight of product. Common inputs (electricity, diesel for manipulation etc.) and common outputs (waste generated, emissions) are allocated to every product, i.e. to declared unit of every product. VTCH a.s. produce only seamless steel tubes. Therefore a general allocation rule – 1 ton of the product - was used.

#### 2.4.5 LCA STUDY

The LCA calculations rules used for this declaration follow the overall requirements for The International EPD® System. These rules follow the international standards ISO 14040 and ISO 14044 with respect to EN 15804+A1. The product system for this LCA has been described by using specific data when available; generic data have been used in accordance with PCR and GPI requirements. Underlying LCA study used for this EPD was complete and covering all relevant inputs. For LCA study site specific data from producer were used. The LCA was conducted in year 2018. Underlying LCA study was elaborated by LCA studio, [www.lcastudio.cz](http://www.lcastudio.cz).

### 2.5 CONTENT OF MATERIALS AND CHEMICAL SUBSTANCES

Hot-finished hollow sections - Seamless SMLS steel tubes are made of non-alloy and fine-grained structural steels according to EN 10210-1. Base material for the production of seamless steel tubes are ingots that are made of fine grain structural steels. Ingots are only made only of steel scrap. The composition of ingots is shown in following table. The following table shows the weight percent material composition.

**Table 2 Composition of the base material for manufacturing of ingots**

Element	Content in %
C – carbon	≤ 0,20
Mn – manganese	≤ 1,70
Si – Silicon	≤ 0,50
P – phosphorus	≤ 0,025
S – sulphur	≤ 0,020
Nb – niobium	≤ 0,050
V – vanadium	≤ 0,15
Al – aluminium, min.	0,020
Ti – titanium	≤ 0,03
Cr – chromium	≤ 0,30
Ni – nickel	≤ 0,30
Mo – molybdenum	≤ 0,08
Cu – copper	≤ 0,30
N – nitrogen	≤ 0,012
Fe - iron	Rest (≤ 99,5)

### **3 ENVIRONMENTAL PERFORMANCE-RELATED INFORMATION**

All environmental performance is reported per declared unit 1 ton of seamless steel tubes.

#### **3.1 USE OF NATURAL RESOURCES**

Following tables report the main consumption of resources for seamless steel tubes. Use of resources in MJ/D.U. is expressed. All energy data are expressed as net caloric value.

Table 3 Resource (MJ), electricity and water consumption associated with 1 t of seamless steel tubes. Data are divided into three stages (A1-A3) and referred to D.U.

Parameter		Unit	Total	A1	A2	A3
Primary energy resources - Renewable	Use as energy carrier	MJ, net caloric values	3800	3600	0	200
	Used as raw materials	MJ, net caloric values	0	0	0	0
	TOTAL	MJ, net caloric values	3800	3600	0	200
Primary energy resources - Non-renewable	Use as energy carrier	MJ, net caloric values	27700	26300	100	1300
	Used as raw materials	MJ, net caloric values	0	0	0	0
	TOTAL	MJ, net caloric values	27700	26300	100	1300
Secondary material		kg	0	0	0	0
Renewable secondary fuels		MJ, net caloric values	0	0	0	0
Non-renewable secondary fuels		MJ, net caloric values	0	0	0	0
Net use of fresh water		m <sup>3</sup>	1920	1804	1	115

### 3.2 POTENTIAL ENVIRONMENTAL IMPACTS

Characterization factors are those prescribed in the CML 2001 methodology for calculating environmental impact as required by EPD® programme in GPI. The environmental impacts per declared unit are presented in following tables:

Table 4 Impact category results of environmental results of 1 t of seamless steel tubes. Data are divided into three stages (A1-A3) and referred to D.U.

Parameter		Total	A1	A2	A3
Global warming potential (GWP)[kg CO <sub>2</sub> -Equiv.]	Fossil	1430	1280	9	139
	Biogenic	720	20	0	703
	Land use and land transformation	2	2	0	0
	Total	2150	1300	9	842
Abiotic Depletion (ADP elements) [kg Sb-Equiv.]		0.012	0.012	8.52E-07	0
Abiotic Depletion (ADP fossil) [MJ]		24600	23300	140	1110
Acidification Potential (AP) [kg SO <sub>2</sub> -Equiv.]		6.42	4.55	0.052	1.82
Eutrophication Potential (EP) [kg Phosphate-Equiv.]		1.43	0.4	0.013	1.02
Ozone Layer Depletion Potential (ODP, steady state) [kg CFC-Equiv.]		2.27E-09	2.19E-09	2.81E-13	8.95E-11
Photochem. Ozone Creation Potential (POCP) [kg Ethene-Equiv.]		0.58	0.51	0	0.09
Water scarcity potential [m <sup>3</sup> eq.]		3.25	33.6	0	-30.4

### 3.3 OTHER ENVIRONMENTAL INDICATORS

The following indicators are also reported in the EPD per declared unit:

Table 5 Other environmental indicators describing waste categories of 1 t of seamless steel tubes. Data are divided into three stages (A1-A3) and referred to D.U.

Indicator	Total	A1	A2	A3
Hazardous waste disposed	0.32	0	0	0.32
Non-hazardous waste disposed	7.01	0	0	7.01
Radioactive waste disposed	1.22	1.16	0	0.06

Table 6 Other environmental indicators describing waste categories of 1 t of seamless steel tubes. Data are divided into three stages (A1-A3) and referred to D.U.

Indicator	Total	A1	A2	A3
Components for re-use	0	0	0	0
Materials for recycling	368	0	0	368
Materials for energy recovery	0	0	0	0
Exported energy, electricity [MJ]	0	0	0	0
Exported energy, thermal [MJ]	0	0	0	0

## 4 ADDITIONAL ENVIRONMENTAL INFORMATION

The main target of Chomutov Rolling Mill Division activities is to produce such products and provide such services that will, to the maximum possible extent, satisfy the requirements and needs of customers.

The high level of quality of products and services offered is ensured and continuously increased by the established quality management system in accordance with the requirements of ČSN EN ISO 9001, 14001 and API Spec. QI. This integrated management system is based on the identified processes, their management, monitoring and analysis, in order to improve constantly the quality of products and increase their utility value, taking into account the reduction of the energy production demands and reduction of the environmental burden.

Chomutov Rolling Mill Division undertakes to prevent pollution and reduce negative environmental impacts in the fields of air protection, water management and waste management. Quality and environment policy is based on a long-term development strategy that is based on established and professionally-assessed global trends in the progress of potential customers' requirements. These predicted global trends are ensured by the following strategic activities:

1. Improving product quality and product value by continual improving and replenishing technology and technological equipment without increasing the energy intensity of production and environmental burdens.
2. Ensuring satisfaction of customer's requirements for production of pipes for specific use.
3. Constantly identifying customer requirements, analyzing them systematically and regularly and reacting to them in production.

4. Preventing pollution and respecting the legal and other restrictive requirements resulting from the integrated permit, motivating employees and raising their awareness and expert knowledge of environmental protection.

In order to ensure the Quality and Environment Policy and the fulfillment of the planned objectives Chomutov Rolling Mill Division creates the necessary financial, material, personnel and, if necessary, other resources. Executive management expects from employees a responsible approach to protection of the environment and maximal application of the knowledge of this issue at their workplace.

## 5 MANDATORY STATEMENT

### 5.1 COMPARISONS OF EPDS WITHIN THIS PRODUCT CATEGORY

This EPD® refers to the International EPD® System and is available, on the website, [www.environdec.com](http://www.environdec.com).

This EPD has been developed according to the PCR Construction products and CPC division 412 Products of iron or steel and EN 15804+A1:2011.

EPDs within the same product category but from different programmes may not be comparable.

### 5.2 VERIFICATION AND REGISTRATION

PCR was prepared by: IVL Swedish Environmental Research Institute, Swedish Environmental Protection Agency, SP Trätek, Swedish Wood Preservation Institute, Swedisol, SCDA, Svenskt Limträ AB, SSAB PCR moderator: Martin Erlandsson, IVL Swedish Environmental Research Institute, Sweden, martin.erlandsson@ivl.se PCR review was conducted by: The International EPD® System Technical Committee		
Independent verification of the declaration data, according to ISO 14025:		
<input type="checkbox"/> Internal	<input checked="" type="checkbox"/> External	<input type="checkbox"/> EPD process certification
Third party verifier: Dr Hüdai Kara Metsims Sustainability Consulting 4 Clear Water Place Oxford OX2 7NL, United Kingdom Office: +44 7557 351476		



## 6 VALIDITY OF THE EPD

This EPD is valid for 5 years, i.e. until April 25<sup>th</sup> 2023. If any change in production causing increase of any environmental impact larger than +/- 5% the EPD shall be renewed.

## 7 REFERENCES

General Programme Instructions for environmental product declarations, The international EPD® System

Envirodec, PCR and PCR basic module for preparing EPD: Construction products and construction services (PCR 2012:01), 2012, The International EPD® system: Stockholm.

Ecoinvent: Ecoinvent Centre, [www.Eco-invent.org](http://www.Eco-invent.org)

Thinkstep: GaBi software version 8, 2018, Thinkstep.

ČSN EN 10210-1 (42 1051): Hot finished structural hollow sections of non-alloy and fine grain steels  
- Part 1: Technical delivery conditions

ČSN EN 10210-2 (42 1051): Hot finished structural hollow sections of non-alloy and fine grain steels  
- Part 2: Tolerances, dimensions and sectional properties

EN 15804: EN 15804:2012+A1:2013, Sustainability of construction works - Environmental Product Declarations — Core rules for the product category of construction products

ISO 14025: DIN EN ISO 14025:2009-11: Environmental labels and declarations - Type III environmental declarations — Principles and procedures

ISO 14040/44: DIN EN ISO 14040:2006-10, Environmental management - Life cycle assessment - Principles and framework (ISO 14040:2006) and Requirements and guidelines (ISO 14044:2006)

Author of this declaration: Markéta Šerešová & Vladimír Kočí



**Independent verification of the declaration and data accordance to ISO 14025:2006**
☐ internal      ☒ external

Programme:	The International EPD® System (www.environdec.com)
Programme Operator	EPD International AB
Verification procedure:	ISO 14025: 2006 Environmental labels and declarations – Type III environmental declarations – principle and procedures General Programme Instructions for Environmental Product Declarations, EPD, version 1.0
Product category rules (PCR):	PCR CONSTRUCTION PRODUCTS AND Class: 412 Products of iron or steel, version 2.2, 2012-01

Distributed to:  
No. 1 Válcovny trub Chomutov, a.s.