

# ENVIRONMENTAL PRODUCT DECLARATION

ISO 14025 ISO 21930 EN 15804



**epd-norge.no**  
The Norwegian EPD Foundation

Owner of the declaration

Norwegian Steel Association

Publisher

The Norwegian EPD Foundation

Declaration number

ÞÓÚÖÆG Í Ò

Issue date

EH ÆFI

Valid to

EH ÆFJ

## GENERIC EPD Hot rolled steel plates (Type 1.1)

Steel component to be used as construction material



NORSK STÅL

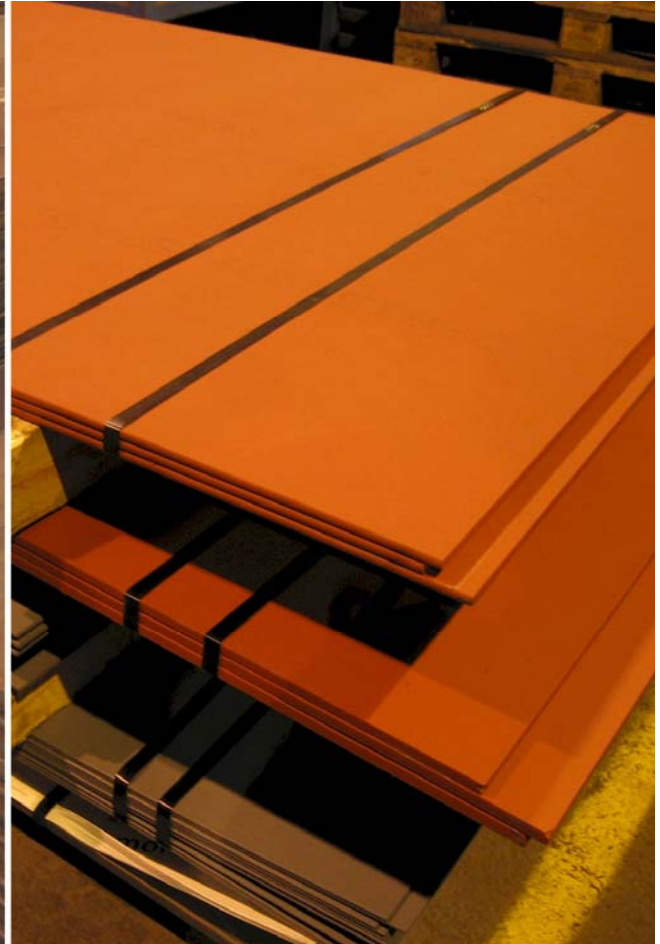


Norwegian Steel Association

Owner of the declaration

**RUUKKI**

**SMITH STÅL**



## General information

### Steel component to be used as construction material

Hot rolled steel plates (Type 1.1)

### Program holder

The Norwegian EPD Foundation  
 Post Box 5250 Majorstuen, 0303 Oslo  
 Phone: +47 23 08 80 00  
 e-mail: [post@epd-norge.no](mailto:post@epd-norge.no)

### General information

POUOÆG I O

### This declaration is based on Product Category Rules:

CEN Standard EN 15804 serve as core PCR  
 NPCR 013-Revision 1 (08 2013) on steel as a construction material

### Declared unit:

Per kg of steel

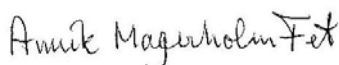
### Declared unit with option:

### Functional unit:

Per kg steel components with an expected service life of 100 years

### The EPD has been worked out by:

Annik Magerholm Fe




### Verification:

Independent verification of data, other environmental information and EPD has been carried out in accordance with ISO14025, 8.1.3 and 8.1.4

externally  internally



Christofer/Skaar, PhD

(Independent verifier approved by EPD Norway)

### Declared unit:

Per kg of steel

### Owner of the declaration

Norwegian Steel Association  
 Contact person: Kjetil Myhre  
 Phone: +47 410 21 598  
 e-mail: [post@stalforbundet.com](mailto:post@stalforbundet.com)

### Manufacturer

Norwegian steel distributors: Leif Hübert Stål AS, Stene Stål Produkter AS, Norsk Stål AS, EA Smith AS and Ruukki Norge AS

### Place of production:

Steel components are manufactured in Europe and imported to Norway

### Management system:

Norwegian Steel Association has no certified environmental management system, the other companies behind this declaration have different types of certified management systems

### Org. No:

892 021 872

### Issue date

~~EN 15804~~

### Valid to

~~EN 15804~~

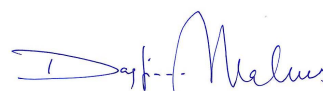
### Comparability:

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

### Year of study:

2013-14

Approved



Øst^&f i/EPD-Norway  
 (Manager Øst^&f i/EPD-Norway)

Key environmental indicators	Unit	Cradle to gate A1	Transport A2	Module D
Global warming	kg CO <sub>2</sub> -eqv	2,47E+00	7,58E-02	-1,39
Energy use	MJ	2,61E+01	1,09E+00	-14,67
Dangerous substances	*	-	-	-
Recycled material in**	%	11,3	-	-
Recycled material out ***	%	-	-	87,7

\* The product contains no substances from the REACH Candidate list or the Norwegian priority list

\*\* The fraction of recycled steel from the mill is 11.3%

The recovery rate of steel is 99% including recovered and reused products

\*\*\* Net new recycled material output presented in Module D.

## Product

### Product description:

Hot rolled steel plates used in construction works

### Technical data:

Dimensions: thickness  $t = 3 - 60\text{mm}$   
 The requirements in EN 10025 standard are applied.  
 The standard steel grade is  $\leq S355$ .

### Product specification

Plates are made by European manufacturers.

### Market:

Norway

### Reference service life:

100 years

Materials	kg	%
steel	1	100

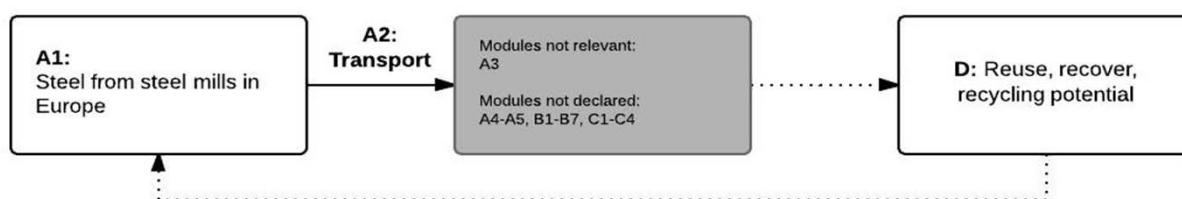
## LCA: Calculation rules

### Functional unit:

Per kg steel components with an expected service life of 100 years

### System boundary:

Cradle to gate (A1-A3) and end-of-life recycling (D)



### Data quality:

General requirements and guidelines concerning use of generic and specific data and the quality of those are as described in EN 15804: 2012, clause 6.3.6 and 6.3.7. The data is representative according to temporal, geographical and technological requirements.

Temporal: Data for use in modules A1-A2 have been collected throughout 2013. Generic data has been created or updated within the last 10 years.

Geographical: The geographic region of the production sites included in the calculation is Europe.

Technological: Data represents technology in use.

### Cut-off criteria:

All major raw materials and all the essential energy is included. The production process for raw materials and energy flows that are included with very small amounts ( $<1\%$ ) are not included. This cut-off rule does not apply for hazardous materials and substances.

### Allocation:

No allocation necessary in this study.

## LCA: Scenarios and additional technical information

Additional modules to the cradle to gate system are not declared. Therefore, no additional information is reported.

### Benefits and loads beyond the system boundaries (D)

	Unit	Value
GWP	kg CO <sub>2</sub> -eqv	-1,39E+00
ODP	kg CFC11-eqv	-5,12E-06
AP	kg SO <sub>2</sub> -eqv	-3,07E+00
EP	kg PO <sub>4</sub> <sup>-3</sup> -eqv	-4,03E-04
POCP	kg NMVOC	-2,86E+00
ADPM	kg Sb -eqv	-3,04E-04
ADPE	MJ	-1,45E+01

Module D is calculated as a scenario in which the net new steel scrap received in Module D is given an environmental burden. This burden is subtracted from this system as a credit, representing the environmental benefit from recycling the steel structure at its end of life. Including Module D will therefore show the total environmental performance of the product for the whole life cycle.

## LCA: Results

The impacts generated from the life cycle stages within the system boundaries described below are calculated using the GaBi 6 Professional LCA-software. The impact assessment methodology used is ReCiPe. Exceptions are for the ADP-elements and ADP-fossil categories, which according to NPCR 013 are derived from the CML 2001 impact assessment methodology.

### System boundaries (X=included, MND=module not declared, MNR=module not relevant)

Product stage			Construction installation stage		Use stage							End of life stage				Beyond the system boundaries	
Raw materials	Transport	Manufacturing	Transport	Construction installation stage	Use	Maintenance	Repair	Replacement	Refurbishment	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	MNR	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND		MND

\* Raw material in A1 corresponds to A1-A3 at the European steel mill, and is used as a raw material input for Norwegian steel construction manufacturers.

### Environmental impact

Parameter	Unit	A1	A2							D
GWP	kg CO2-equiv	2,47E+00	7,58E-02	-	-	-	-	-	-	-1,39E+00
ODP	kg CFC11-equiv	9,11E-09	1,29E-12	-	-	-	-	-	-	-5,12E-06
AP	kg SO2-equiv	5,46E-03	1,38E-04	-	-	-	-	-	-	-3,07E+00
EP	kg PO4-3-equiv	7,17E-07	7,59E-08	-	-	-	-	-	-	-4,03E-04
POCP	kg NMVOC	5,09E-03	1,78E-04	-	-	-	-	-	-	-2,86E+00
ADPM	kg Sb -equiv	5,40E-07	2,79E-09	-	-	-	-	-	-	-3,04E-04
ADPE	MJ	2,54E+01	1,05E+00	-	-	-	-	-	-	-1,45E+01

**GWP** Global warming potential; **ODP** Depletion potential of the stratospheric ozone layer; **POCP** Formation potential of tropospheric photochemical oxidants; **AP** Acidification potential of land and water; **EP** Eutrophication potential; **ADPM** Abiotic depletion potential for non fossil resources; **ADPE** Abiotic depletion potential for fossil resources

### Resource use

Parameter	Unit	A1	A2							D
RPEE	MJ	2,98E-01	3,89E-02	-	-	-	-	-	-	-1,74E-01
RPEM	MJ	4,17E-05	1,31E-14	-	-	-	-	-	-	-2,34E-05
TPE	MJ	2,98E-01	3,89E-02	-	-	-	-	-	-	-1,74E-01
NRPE	MJ	-	-	-	-	-	-	-	-	-
NRPM	MJ	-	-	-	-	-	-	-	-	-
TRPE	MJ	2,58E+01	1,05E+00	-	-	-	-	-	-	-1,45E+01
SM	kg	-	-	-	-	-	-	-	-	-
RSF	MJ	-	-	-	-	-	-	-	-	-
NRSF	MJ	-	-	-	-	-	-	-	-	-
W	m <sup>3</sup>	1,35E-02	4,03E-03	-	-	-	-	-	-	-1,50E+01

**RPEE** Renewable primary energy resources used as energy carrier; **RPEM** Renewable primary energy resources used as raw materials; **TPE** Total use of renewable primary energy resources; **NRPE** Non renewable primary energy resources used as energy carrier; **NRPM** Non renewable primary energy resources used as materials; **TRPE** Total use of non renewable primary energy resources; **SM** Use of secondary materials; **RSF** Use of renewable secondary fuels; **NRSF** Use of non renewable secondary fuels; **W** Use of net fresh water

### End of life - Waste

Parameter	Unit	A1	A2						D
HW	kg	-	-	-	-	-	-	-	-
NHW	kg	-	-	-	-	-	-	-	-
RW	kg	-	-	-	-	-	-	-	-

**HW** Hazardous waste disposed; **NHW** Non hazardous waste disposed; **RW** Radioactive waste disposed

### End of life - Output flow

Parameter	Unit	A1	A2						D*
CR	kg	-	-	-	-	-	-	-	0.06*
MR	kg	-	-	-	-	-	-	-	0,93
MER	kg	-	-	-	-	-	-	-	-
EEE	MJ	-	-	-	-	-	-	-	-
ETE	MJ	-	-	-	-	-	-	-	-

\* Approximately six percent is reused. This percentage together with the percentage for recycling constitutes the Recovery Rate which is a basis for calculating recycling.

**CR** Components for reuse; **MR** Materials for recycling; **MER** Materials for energy recovery; **EEE** Exported electric energy; **ETE** Exported thermal energy

Reading example: 9.0 E-03 =  $9.0 \cdot 10^{-3} = 0.009$

## Additional Norwegian requirements

### Electricity

Not relevant in this EPD as there is no manufacturing in module A3.

### Dangerous substances

\* No additional substances are added in Norway.  
 None of the following substances have been added to the product: Substances on the REACH Candidate list of substances of very high concern or substances on the Norwegian Priority list (of 01.01.2013) or substances that lead to the product being classified as hazardous waste. The chemical content of the product complies with regulatory levels as given in the Norwegian Product Regulations.

### Transport

Average transport distance from European production site to central warehouse in Norway is 1195 kilometers.

### Indoor environment




Not relevant in this EPD.

### Carbon footprint

Carbon footprint has not been worked out for the product.

## Bibliography

ISO 14025:2006	<i>Environmental labels and declarations - Type III environmental declarations - Principles and procedures</i>
ISO 14044:2006	Environmental management - Life cycle assessment - Requirements and guidelines
EN 15804:2012	<i>Sustainability of construction works - Environmental product declaration - Core rules for the product category of construction products</i>
ISO 21930:2007	<i>Sustainability in building construction - Environmental declaration of building products</i>
LCA-report Norsk Stålförbundet	Life Cycle Assessment Report, Norsk Stålförbundet, Global & Local report 1-2014
NPCR 013-2013	Product Category Rules Steel as Construction Material
Steel and metal distributors	Leif Hübert Stål AS <a href="http://www.hubert.no">www.hubert.no</a>
	Stene Stål Produkter AS <a href="http://www.stenestall.no">www.stenestall.no</a>
	Norsk Stål AS <a href="http://www.norskstall.no">www.norskstall.no</a>
	EA Smith AS <a href="http://www.smith.no">www.smith.no</a>
	Ruukki Norge AS <a href="http://www.ruukki.no">www.ruukki.no</a>

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