

**COMPANY INFORMATION**



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**FOR**

Steel construction products

**MRPI code**

9.2.00011.004

**DATE OF ISSUE**

January 8, 2013

**END OF VALIDITY**

January 8, 2018

**FUNCTIONAL UNIT**

1 ton of steel for:

- Heavy construction products (beams, columns)

**PART OF THE FUNCTIONAL UNIT**

Heavy construction products



**DESCRIPTION OF THE PRODUCTS**

Analysis unit	Semi-finished steel products (route)	Protected by:	
		Coil coating	Hot dip galvanising
Heavy construction products (beams, columns)	900 kg sections (10% BF and 90% EAF); 100 kg plate (BF)	No	No

**ENVIRONMENTAL PROFILE 1 ton**

Theme	(equivalents) Unit	Production	Transport to building site	Construction	demolition, dismantling	Waste processing
Abiotic depletion, non fuel	kg Sb eq	-1.34E-04	5.54E-05	2.78E-06	4.53E-06	9.55E-05
Abiotic depletion, fuel	Kg Sb eq	5.21E+00	1.45E-01	1.14E-01	2.56E-01	-2.72E+00
Global warming (GWP100)	kg CO <sub>2</sub> eq	9.08E+02	1.96E+01	1.70E+01	4.03E+01	-5.12E+02
Ozone layer depletion (ODP)	kg CFC-11 eq	1.55E-05	3.24E-06	2.04E-06	6.01E-06	-3.72E-06
Photochemical oxidation	kg C <sub>2</sub> H <sub>4</sub>	3.30E-01	1.68E-02	9.37E-03	2.71E-02	-1.84E-01
Acidification	kg SO <sub>2</sub> eq	3.38E+00	1.03E-01	9.34E-02	2.32E-01	-1.51E+00
Eutrophication	kg PO <sub>4</sub> <sup>---</sup> eq	3.74E-01	2.34E-02	1.93E-02	5.49E-02	-1.53E-01
Human toxicity	kg 1,4-DB eq	3.33E+01	5.64E+00	3.00E+00	7.27E+00	-8.85E+00
Aquatic ecotoxicity, fresh water	kg 1,4-DB eq	3.02E+00	2.55E-01	1.75E-01	4.58E-01	-1.87E+00
Aquatic ecotoxicity, marine water	kg 1,4-DB eq	6.34E+03	9.83E+02	8.29E+02	1.95E+03	-1.78E+03
Terrestrial ecotoxicity	kg 1,4-DB eq	4.68E-01	4.54E-02	3.36E-02	4.03E-02	-1.40E-01

**ENVIRONMENTAL RATINGS**

Theme	(equivalents) Unit	Production	Transport to building site	Construction	demolition, dismantling	Waste processing
Energy, primary (MJ)	MJ	1.36E+04	3.39E+02	2.87E+02	5.89E+02	-7.04E+03
Energy, primary, renewable (MJ)	MJ	5.28E+02	3.93E+00	7.42E+00	2.00E+00	-2.48E+02
Energy, primary, non-renewable (MJ)	MJ	1.32E+04	3.35E+02	2.80E+02	5.87E+02	-6.81E+03
Waste, hazardous (kg)	kg	8.99E+01	7.73E+00	7.78E+00	6.40E+00	-2.98E+01
Waste, non hazardous (kg)	kg	1.11E+02	4.92E+00	4.70E-01	3.13E-01	-5.11E+01
Water, fresh water use	m <sup>3</sup>	2.59E+03	2.29E+01	4.13E+01	1.11E+01	-1.22E+03



## ENVIRONMENTAL PROFILE AND RATINGS

### Typical for:

Steel construction products produced in Western-Europe and applied on the Dutch market.



## LIFE STAGES

Mining of raw materials, production of intermediates and products, transport to the building site, application (construction processes), removal from the construction (demolition, dismantling) and waste treatment at the end of the service life.

Coating processes during or after the production phase of finished products are shown as separate processes on this MRPI®-sheet.



## OTHER STAGES OF LIFE AND REQUIRED MATERIALS AND PROCESSES

Use, maintenance and replacements are exclusive of these MRPI® data.

The user has to add coating processes concerning powdercoating, painting and thermo galvanisation, if relevant. As well as leaching during use stage, if relevant.

Possible insulation material is not included in the MRPI®. The user needs to acquire and add accompanying environmental effects to the scores on this sheet.



## REMARKS

*The product groups are an (unbiased) average comprising several products. The variation between products can lead to a spread of over 20% in one or more environmental categories. This variation is supposed to be of the same magnitude as the variation between countries and production sites in Europe.*

*The applied allocation method for recycling is the Dutch output method. For steel this is the most suitable method within the MRPI® context. Often allocation has a great influence on the environmental score of products. Differences between allocation methods can affect the environmental scores of steel construction products more than 20%.*

The waste scenario at the end of the life cycle is retrieved from data from demolition companies and scrap processing companies (% recycling/% reuse/% landfill):

- Heavy construction products (beams, columns)      51 / 49 / 0

These figures are branch-averages. Deviations can occur for specific fabricators or products.

Please use the ECSC-matrix for environmental information on specific products. The ECSC-matrix can be requested at Bouwen met Staal. Bouwen met Staal grants permission for one-time use of the ECSC-matrix only, on the condition that the user expresses intended application and results of usage.



## QUALITATIVE INFORMATION

Steel is a construction material that can be made fully out of recycled material. Since the world scrap production provides only 50 % of the steel consumption, there will be a need for primary raw material in the next decades. The share of secondary materials (scrap) is, however, continuously increasing. The quality of steel is not impaired by the recycling process, in contrast with other construction materials (the so-called 'down cycling'). Owing to new production techniques, it is even possible to produce steel with a higher quality than the scrap it is made from. Steel is the first material that has closed the loop. Besides material recycling, a considerable amount of the steel products can be dismantled and re-used as a product. An example are steel sections of which approximately 50% is re-used as a section after demolition of a building. Both as to this re-use and as to the scrap value, steel products have a positive end-of-life value providing a considerable reduction of demolition costs for buildings. Besides that, steel structures offer good possibilities of sustainable usage of buildings and of adaptation of these buildings to future requirements, thereby enabling a longer economic life span of buildings. The energy required for steel production is only a fraction of the total energy needed for the whole life span of a building (production, usage and demolition).

The waste production during construction and demolition is low for industrially produced steel products.

Steel means sustainability and a reduction of the use of primary raw materials.

Impact category	(equivalents) Unit	Hot dip galvanizing, 1 kg zinc; cradle- to-gate	Powder coating 1 kg powder; cradle-to-gate	Spray painting, 1 kg paint; cradle- to-gate
Abiotic depletion, non fuel	kg Sb eq	6.5E-04	1.4E-05	1.6E-06
Abiotic depletion, fuel	Kg Sb eq	3.4E-02	1.3E-01	3.0E-02
Global warming (GWP100)	kg CO <sub>2</sub> eq	4.7E+00	1.6E+01	2.4E+00
Ozone layer depletion (ODP)	kg CFC-11 eq	4.2E-07	1.8E-06	1.4E-07
Photochemical oxidation	kg C <sub>2</sub> H <sub>4</sub>	3.4E-03	5.6E-03	1.2E-01
Acidification	kg SO <sub>2</sub> eq	4.9E-02	4.6E-02	1.4E-02
Eutrophication	kg PO <sub>4</sub> --- eq	9.6E-03	5.9E-03	1.6E-03
Human toxicity	kg 1,4-DB eq	7.4E+00	4.6E+00	5.7E+00
Aquatic ecotoxicity, fresh water	kg 1,4-DB eq	1.2E-01	7.8E-02	8.3E-01
Aquatic ecotoxicity, marine water	kg 1,4-DB eq	4.8E+02	6.8E+02	4.5E+01
Terrestrial ecotoxicity	kg 1,4-DB eq	2.0E-01	3.7E-02	3.6E-02
<b>Indicators</b>				
Energy	MJ	8.1E+01	3.0E+02	1.4E+02
Energy, primary, renewable (MJ)	MJ	7.8E+00	5.0E+00	7.2E+01
Energy, primary, non-renewable (MJ)	MJ	7.3E+01	3.0E+02	1.4E+02
Waste (Hazardous)	kg	1.7E+01	1.0E+01	2.5E+00
Waste (Non hazardous)	kg	6.7E-01	5.1E-01	1.4E+01
<b>Additional parameters for SBK national database</b>				
Water, fresh water use	m <sup>3</sup>	7.1E+01	2.1E+01	3.2E+00



#### GENERAL COMPANY INFORMATION

For more information about "Bouwen met Staal", visit our website: [www.bouwenmetstaal.nl](http://www.bouwenmetstaal.nl)

For more information about the environmental performances on this MRPI®-sheet, please refer to the accompanying LCA-report: SGS INTRON-rapport R20110677, "MRPI® van constructiestaal", January 2012 (in Dutch)

#### ACCOUNTABILITY

The data on this MRPI®-sheet are composed according to the NEN8006 and the MRPI®-Verification Protocol for NEN8006 version 2.0 (2011)



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