

TATA STEEL



Tata Steel Norway Byggsystemer AS perforated steel structural
deep deck with Colorcoat® PE15 or PE25

Environmental Product Declaration



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Tata Steel Norway Byggsystemer AS perforated steel structural deep deck with Colorcoat® PE15 or PE25
Environmental Product Declaration
(in accordance with ISO 14025 and EN 15804)

This EPD is representative and valid for the specified (named) product

Declaration Number: EPD-TS-2026-014
Issue date: 3rd March 2026
Valid until: 30th July 2030

Owner of the Declaration: Tata Steel Norway Byggsystemer AS
Programme Operator: Tata Steel UK Limited, 18 Grosvenor Place, London, SW1X 7HS

The CEN standard EN 15804:2012+A2:2019 serves as the core Product Category Rules (PCR)
supported by Tata Steel's EN 15804 verified EPD PCR documents

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

Internal External

Author of the Life Cycle Assessment: Tata Steel UK
Third party verifier: Chris Foster, Eugeos Ltd.

1 General information

Owner of EPD	Tata Steel Norway Byggsystemer AS
Product & module	Perforated steel structural deep deck with Colorcoat® PE15 or PE25
Manufacturer	Tata Steel Norway Byggsystemer AS
Manufacturing sites	Ijmuiden and Skien
Product applications	Construction
Declared unit	1kg of galvanised and perforated steel structural deep deck
Date of issue	3 rd March 2026
Valid until	30 th July 2030



This Environmental Product Declaration (EPD) is for Tata Steel Norway Byggsystemer's perforated steel structural deep deck manufactured by Tata Steel in Norway, using Colorcoat® PE15 or PE25 pre-finished steel. The environmental indicators are for products manufactured at Skien in Norway, with feedstock supplied from Ijmuiden, NL.

The information in the Environmental Product Declaration is based on production data from 2021, 2022, and 2023.

EN 15804 serves as the core PCR, supported by Tata Steel's EN 15804 verified EPD programme Product Category Rules documents, and the LCA model supporting this declaration has been independently verified according to ISO 14025 ^[1,2,3,4,5,6,7].

Third party verifier

Chris Foster, Eugeos Ltd, Suite 11, The Old Fuel Depot,

Twemlow Lane, Twemlow, CW4 8GJ, UK

2 Product information

2.1 Product description

Tata Steel Norway Byggsystemer AS has two coated deep deck profile products with different technical characteristics which can be used for many different construction projects and most types of buildings. Deep deck 128R.930 (shown in Figure 1) has a cover width of 930mm and a profile depth of 128mm, to meet the designers' needs for efficiency, aesthetics, and structural performance. Deep deck 200R.856 has a cover width of 856mm and a profile depth of 200mm. The deep deck range are manufactured from metallic coated steel with an organic coating, with a guaranteed minimum yield stress of 350N/mm², and have a fire rating of Class A1 to EN 13501-1^[8].

The perforated deep deck features perforated webs to help provide excellent sound absorption. An example of the product (128R.930) is shown in Figure 1.

Our dedicated and experienced technical team are available to help develop a specification for your project and assist with project specific advice to ensure that all design aspects of the chosen deck system meet your project requirements.

Figure 1 Deep deck 128.930



2.2 Manufacturing

The manufacturing sites included in the EPD are listed in Table 1 below.

Table 1 Participating sites

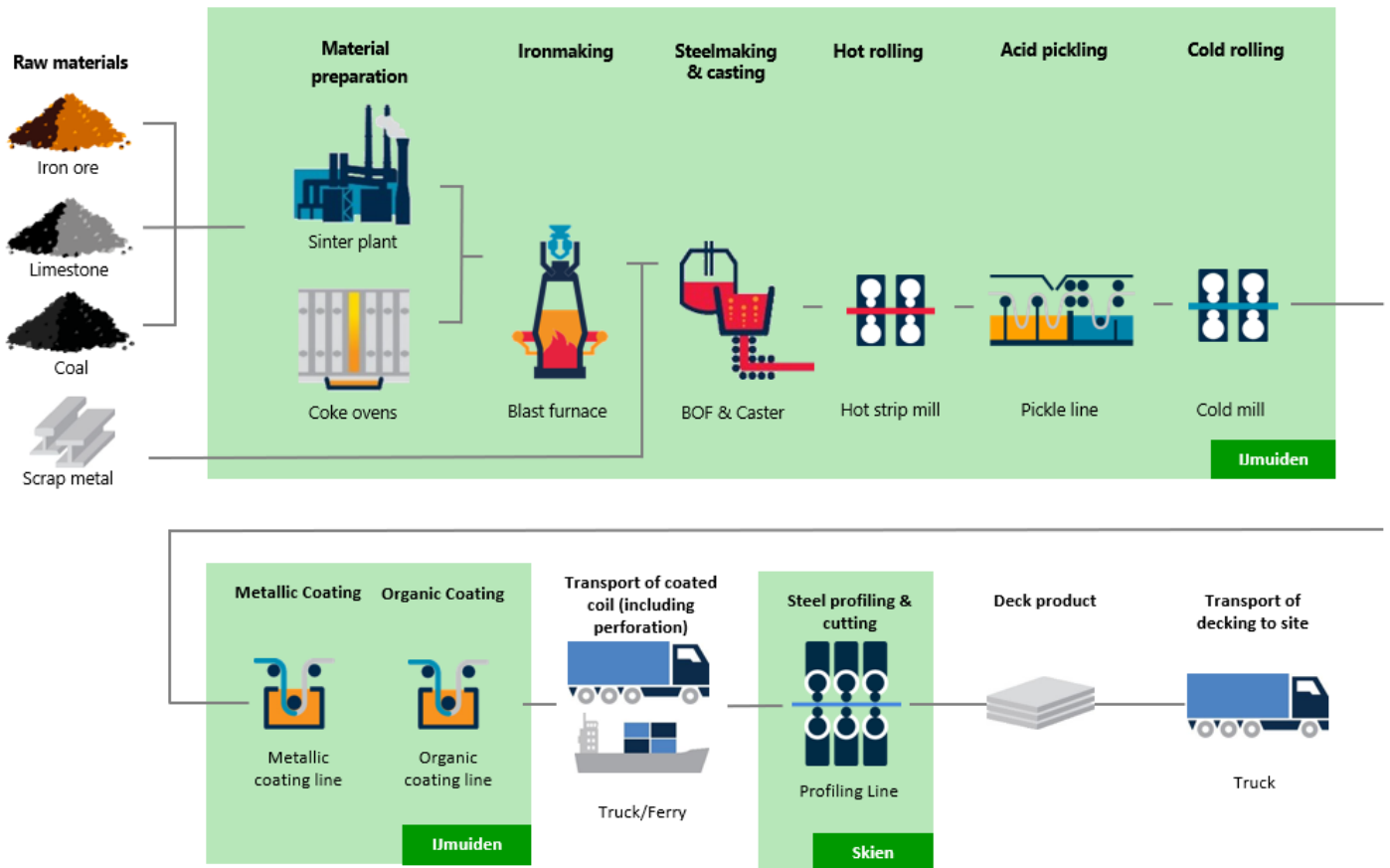
Site name	Product	Manufacturer	Country
Ijmuiden	Hot rolled coil	Tata Steel	NL
Ijmuiden	Cold rolled coil	Tata Steel	NL
Ijmuiden	Hot dip galvanised coil	Tata Steel	NL
Skien	Deep deck	Tata Steel	NO

The process of steel coil manufacture begins with sinter being produced from iron ore and limestone, and together with coke from coal, reduced in a blast furnace to produce iron. Steel scrap is then added to the liquid iron and oxygen is blown through the mixture to convert it into liquid steel in the basic oxygen furnace. The liquid steel is continuously cast into discrete slabs, which can be reheated and rolled in a hot strip mill to produce steel coil. The hot rolled coils are pickled and cold rolled, metallic and organic coated, all on the Ijmuiden site.

Pre-finished steel comprises a number of paint layers and treatments which are applied to the steel in an automated and carefully controlled process with each layer of the product having a particular function. It is the combined effect of all these layers that give the product its overall performance and ensures a material that is robust and offers the specifier a choice of colour and effect. During the organic coating process, a zinc based metallic coating is first applied to the steel coil. A pre-treatment is applied and the a primer, before adding the final top coat layer in the form of liquid paint. This topcoat is applied on the top surface only, while the reverse or back side of the strip is produced with a high performing backing coat. These are cured at elevated temperatures before being recoiled.

The coated coils are transported to the deep deck manufacturing facility at Skien in Norway by road and roll-on-roll-off ferry. The coils are transported by road to be perforated before being taken back to Skien to be profiled and cut into suitable lengths on a dedicated process line. An overview of the process from raw materials to production of the steel deep deck product, is shown in Figure 2.

Figure 2 Process overview from raw materials to deep deck product



Process data for the manufacture of hot and cold rolled coil and metallic coated coil at IJmuiden, were gathered as part of the latest worldsteel data collection. For organic coating, also at IJmuiden, the data collection was not only organised by site, but also by each process line within the site. In this way it was possible to attribute resource use and emissions to each process line, and using processed tonnage data for that line, also attribute resources and emissions to specific products. For the manufacture of the deep deck, process data was collected site wide.

2.3 Technical data and specifications

The general properties of the decking system are shown in Table 2, the technical specifications and certifications for the coatings are presented in Table 3, and the specific products included in this EPD are listed in Table 3.

Note that the profile weights shown in Table 4 are the conversion factors by which the EPD results must be multiplied, to determine impacts per m² for the specific perforated deep deck products listed.

Table 2 General characteristics and specification of the deep deck

Norway Byggsystemer galvanised steel deep deck	
Thickness of deck (mm)	0.70 to 1.50
Cover width (mm)	856 or 930
Steel grade	S350
Profile weight (kg/m ²)	8.41 to 19.48
CE marking	DOP spec to EN 1090-1 ^[9]

Table 3 Technical specification for Colorcoat® PE15 and PE25

Norway Byggsystemer galvanised steel deep deck	
Metallic coating	Colorcoat® PE15 and PE25 are supplied with a MagiZinc® metallic coating which conforms to EN10346:2015 ^[10]
Organic coating	Colorcoat® PE15 and PE25 Fully REACH ^[11] compliant and chromate free
Certifications	Certifications applicable to Tata Steel's IJmuiden site are: ISO9001 ^[12] , ISO14001 ^[13] , BES6001 ^[14]

Table 4 Specific deep deck products included in EPD

Product Name	Steel Gauge (mm)	Profile Weight (kg/m ²) & Conversion
128.930	0.7	8.41
	0.8	9.60
	0.9	10.79
	1.0	11.98
	1.2	14.36
	1.5	17.93
200.856	0.7	9.13
	0.8	10.43
	0.9	11.72
	1.0	13.01
	1.2	15.60
	1.5	19.48

2.4 Packaging

The perforated deep deck profiles are packaged using wood base supports, plastic strapping, and plastic film in order to protect them during delivery to site and prior to installation.

Plastic packaging: 6.68E-03 kg/m²

Timber packaging: 8.21-02 kg/m²

2.5 Reference service life

A reference service life for structural deck is not declared because the steel profiles are part of a composite roofing system that also comprises an insulating roofing material such as slate or tiles, or felt, and the final construction application of the composite deep deck is not defined. To determine the full service life of steel structural deck, all factors would need to be included such as the type of roof material used, and the location and environment.

The indicative design working life of a structure is classed in accordance with EN 1990^[15] clause 2.3. The design life ranges from category 1 at 10 years, to category 5 at 100 years. Common building structures are classed as category 4 at 50 years. In accordance with EN 1994-1-1^[16], clause 4.2, the exposed surface of the steel decking shall be adequately protected to resist the particular atmospheric conditions. A zinc coating mass of 275g/m² (including both sides) is sufficient for the internal roofs in a non-aggressive environment. Under 'normal' conditions, steel deck would not need to be replaced over the life of the building and structure.

2.6 Biogenic Carbon content

There are no materials containing biogenic carbon in deep deck products. Timber is used to package the profile products and comprises a measurable mass of the total packaging as shown in Table 3 below.

Table 3 Biogenic carbon content at the factory gate

	Deep deck
Biogenic carbon content (product) (kg)	0
Biogenic carbon content (packaging) (kg)	0.035

Note: 1kg biogenic carbon is equivalent to 44/12 kg of CO₂

3 LCA methodology

3.1 Declared unit

The unit being declared is 1kg of galvanised and perforated structural deep deck

3.2 Scope

This EPD can be regarded as Cradle-to-Grave and the modules considered in the LCA are;

A1-A3: Production stage (Raw material supply, transport to production site, manufacturing)

A4 & A5: Production stage (Transport to the construction site and installation)

B1-B7: Use stage (related to the building fabric including maintenance, repair, replacement)

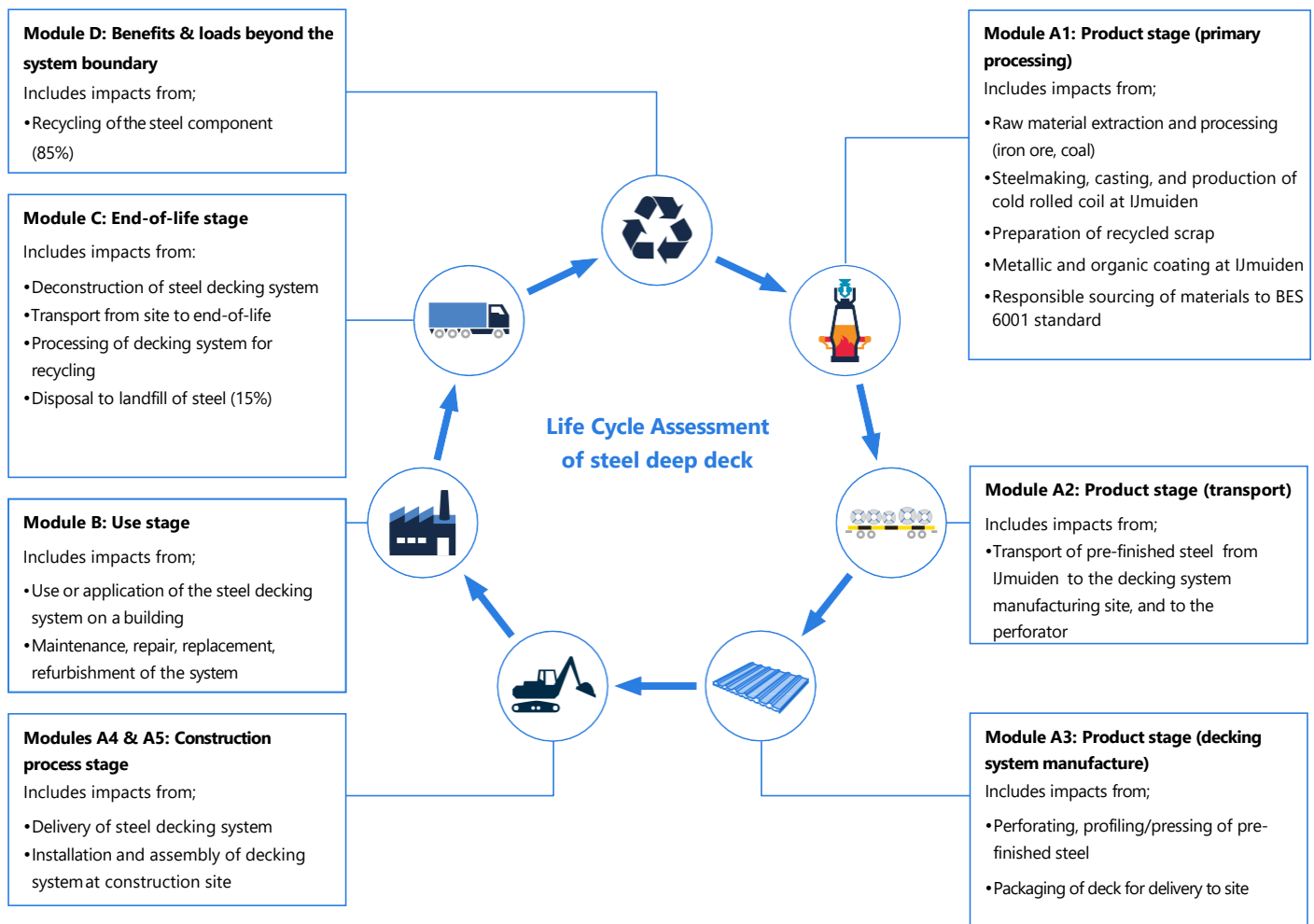
C1-C4: End-of-life (Deconstruction, transport, processing for recycling and disposal)

D: Reuse, recycling and recovery

3.3 Cut-off criteria

All information from the data collection process has been considered, covering all used and registered materials, and all fuel and energy consumption. On-site emissions were measured, and those emissions have been considered. Data for all relevant sites were thoroughly checked and also cross-checked with one another to identify potential data gaps. No processes, materials or emissions that are known to make a significant contribution to the environmental impact of the decking system have been omitted. On this basis, there is no evidence to suggest that input or outputs contributing more than 1% to the overall mass or energy of the system, or that are environmentally significant, have been omitted. It is estimated that the sum of any excluded flows contribute less than 5% to the impact assessment categories. The manufacturing of required machinery and other infrastructure is not considered in the LCA.

Figure 3 Life Cycle Assessment of steel deep deck



3.4 Background data

For life cycle modelling of the decking system, the Sphera LCA for Experts Software System for Life Cycle Engineering (formerly GaBi) is used^[17]. The LCAfE database contains consistent and documented datasets which can be viewed in the online Managed LCA Content (MLC) documentation^[18].

Where possible, specific data derived from Tata Steel's own production processes were the first choice to use where available. Data were also obtained directly from the relevant suppliers. The steel substrate was modelled using the worldsteel global average dataset

To ensure comparability of results in the LCA, the basic data of the Sphera MLC were used for energy, transportation and auxiliary materials.

3.5 Data quality

The data from Tata Steel's own production processes are from 2021, 2022, and 2023, and the technologies on which these processes were based during that period, are those used at the date of publication of this EPD. All relevant background datasets are taken from the Sphera MLC, and the last revision of all but three of these data sets took place less than 10 years ago. However, the contribution to impacts of these three datasets is of low significance, and therefore, the study is considered to be based on good quality data.

3.6 Allocation

The primary steel supply is modelled using the worldsteel global average dataset for BF/BOS steel slab, available in LCAfE. As a consequence, it is not possible to apply a methodology to assign impacts to the production of slag and hot metal from the blast furnace, be that physical and chemical partitioning of the manufacturing process, or economic allocation. Therefore, no allocation was applied to the primary steel production processes in this study.

Where there is site wide material and energy usage, these have been allocated to the relevant products in this study by mass.

End-of-life assumptions for recovered steel and steel recycling are accounted for as per the current methodology from the World Steel Association 2017 Life Cycle Assessment methodology report^[19]. A net scrap approach is used to avoid double accounting, and the net impacts are reported as benefits and loads beyond the system boundary (Module D).

3.7 Additional technical information

The main scenario assumptions used in the LCA are detailed below in Table 4. The end of life percentages are based on the results of a survey carried out by the Steel Construction Institute in 2000^[20].

For all indicators the characterisation factors from the EC-JRC are applied, identified by the name EN_15804, and based upon the EF Reference Package 3.1^[21]. In LCAfE, the corresponding impact assessment is used, denoted by EN 15804 +A2.

3.8 Comparability

Care must be taken when comparing EPDs from different sources. EPDs may not be comparable if they do not have the same functional unit or scope (for example, whether they include installation allowances in the building), or if they do not follow the same standard such as EN 15804. The use of different generic data sets for upstream or downstream processes that form part of the product system may also mean that EPDs are not comparable.

Comparisons should ideally be integrated into a whole building assessment, in order to capture any differences in other aspects of the building design that may result from specifying different products. For example, a more durable product would require less maintenance and reduce the number of replacements and associated impacts over the life of the building.

Table 4 Main scenario assumptions

Module	Scenario assumptions
A1 to A3 – Product stage	Manufacturing data from Tata Steel’s sites at IJmuiden and Skien are used.
A2 – Transport to the decking manufacturing site	The deep deck manufacturing facility is located on the Skien site. Transport to Skien includes truck transport of 271km and ship transport of 1030km. Utilisation factors for the truck and ship of 45% and 48% respectively were assumed, accounting for empty returns. The perforation is carried out by a third party and the coils are taken from Skien, 394km by road, and the same for the return of the perforated coils back to Skien. The utilisation for this journey is assumed to be 90% given that there are no empty returns.
A4 – Transport to construction site	A transport distance of 250km by road on a 25 tonne capacity truck was considered representative of a typical installation. Utilisation factor of 30% was assumed to account for empty returns
A5 – Installation at construction site	Energy consumption estimated based upon published data for the erection of steel constructions in Germany ^[22] .
B1 to B7 – Use stage	This stage includes any maintenance or repair, replacement or refurbishment of the decking over the life cycle. This is not required over the life of the decking system under normal conditions.
C1 – Deconstruction & demolition	Energy consumption estimated based upon published data for the dismantling of steel constructions in Germany ^[22]
C2 – Transport for recycling, reuse, and disposal	A transport distance of 100km to landfill or to a recycling site is assumed.. Transport is on a 25 tonne load capacity lorry with 30% utilisation to account for empty returns
C3 – Waste processing for reuse, recovery and/or recycling	The recycled decking is processed in a shredder.
C4 - Disposal	At end-of-life, 15% of the steel deck is disposed on landfill
D – Reuse, recycling, and energy recovery	At end-of-life, 85% of the steel is recycled

Please note that in the LCAfE software, an empty return journey is accounted for by halving the load capacity utilisation of the outbound journey.

4 Results of the LCA

Description of the system boundary

Product stage			Construction stage		Use stage							End-of-life stage				Benefits and loads beyond the system boundary
Raw material supply	Transport	Manufacturing	Transport	Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse Recovery Recycling
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

X = Included in LCA; MND = module not declared

Environmental impact:

1kg of Colorcoat PE15 or PE25 coated and perforated steel structural deep deck

Parameter	Unit	A1 – A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
GWP-total	kg CO ₂ eq	2.91E+00	3.19E-02	1.15E-02	0.00E+00	6.79E-02	9.66E-03	1.01E-02	2.30E-03	-1.55E+00
GWP-fossil	kg CO ₂ eq	2.92E+00	3.03E-02	1.10E-02	0.00E+00	6.78E-02	9.78E-03	1.02E-02	2.30E-03	-1.55E+00
GWP-biogenic	kg CO ₂ eq	-2.88E-02	1.57E-03	2.75E-02	0.00E+00	4.93E-05	-2.17E-04	-1.05E-04	-7.45E-06	9.14E-03
GWP-luluc	kg CO ₂ eq	3.95E-03	0.00E+00	2.12E-04	0.00E+00	1.42E-05	1.00E-04	4.89E-05	9.42E-06	-2.06E-04
ODP	kg CFC11 eq	7.27E-09	0.00E+00	5.91E-15	0.00E+00	4.20E-15	1.62E-15	2.34E-13	6.40E-15	2.08E-12
AP	mol H ⁺ eq	7.10E-03	2.97E-05	1.38E-05	0.00E+00	7.32E-05	1.64E-05	3.32E-05	1.63E-05	-3.79E-03
EP-freshwater	kg P eq	1.50E-05	0.00E+00	2.37E-09	0.00E+00	2.25E-08	2.63E-08	3.58E-08	3.41E-09	-3.62E-07
EP-marine	kg N eq	1.72E-03	1.48E-05	5.63E-06	0.00E+00	2.61E-05	6.84E-06	6.16E-06	4.25E-06	-6.09E-04
EP-terrestrial	mol N eq	1.88E-02	1.68E-04	6.23E-05	0.00E+00	2.89E-04	7.30E-05	6.59E-05	4.63E-05	-5.46E-03
POCP	kg NMVOC eq	5.23E-03	2.86E-05	1.56E-05	0.00E+00	8.23E-05	1.49E-05	1.77E-05	1.27E-05	-2.47E-03
ADP-minerals&metals	kg Sb eq	7.51E-05	0.00E+00	4.06E-10	0.00E+00	1.01E-09	6.48E-10	3.71E-09	1.43E-10	-8.78E-06
ADP-fossil	MJ net calorific value	2.95E+01	0.00E+00	1.57E-01	0.00E+00	9.39E-01	1.25E-01	2.09E-01	3.01E-02	-1.55E+01
WDP	m ³ world eq deprived	1.87E+00	0.00E+00	1.18E-04	0.00E+00	1.44E-04	4.46E-05	2.01E-03	2.49E-04	-1.05E-01
PM	Disease incidence	ND	ND	ND	ND	ND	ND	ND	ND	ND
IRP	kBq U235 eq	ND	ND	ND	ND	ND	ND	ND	ND	ND
ETP-fw	CTUe	ND	ND	ND	ND	ND	ND	ND	ND	ND
HTP-c	CTUh	ND	ND	ND	ND	ND	ND	ND	ND	ND
HTP-nc	CTUh	ND	ND	ND	ND	ND	ND	ND	ND	ND
SQP		ND	ND	ND	ND	ND	ND	ND	ND	ND

GWP-total = Global Warming Potential total

GWP-fossil = Global Warming Potential fossil fuels

GWP-biogenic = Global Warming Potential biogenic

GWP-luluc = Global Warming Potential land use and land use change

ODP = Depletion potential of stratospheric ozone layer

AP = Acidification potential, Accumulated Exceedance

EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment

EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment

EP-terrestrial = Eutrophication potential, Accumulated Exceedance

POCP = Formation potential of tropospheric ozone

ADPE = Abiotic depletion potential for non-fossil resources

ADPF = Abiotic depletion potential for fossil resources

WDP = Water (user) deprivation potential, deprivation-weighted water consumption

PM = Potential incidence of disease due to PM emissions

IRP = Potential Human exposure efficiency relative to U235

ETP-fw = Potential Comparative Toxic Unit for ecosystems

HTP-c = Potential Comparative Toxic Unit for humans

HTP-nc = Potential Comparative Toxic Unit for humans

SQP = Potential soil quality index

The following indicators should be used with care as the uncertainties on these results are high or as there is limited experience with the indicator : ADP-minerals&metals, ADP-fossil, and WDP.

Resource use:

1kg of Colorcoat PE15 or PE25 coated and perforated steel structural deep deck

Parameter	Unit	A1 – A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
PERE	MJ	2.87E+01	0.00E+00	5.94E-01	0.00E+00	5.49E-02	7.92E-02	5.01E-01	4.89E-02	5.12E+00
PERM	MJ	2.53E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	3.12E+01	0.00E+00	5.94E-01	0.00E+00	5.49E-02	7.92E-02	5.01E-01	4.89E-02	5.12E+00
PENRE	MJ	2.48E+02	0.00E+00	1.32E+00	0.00E+00	7.89E+00	1.05E+00	1.76E+00	2.53E-01	-1.30E+02
PENRM	MJ	1.85E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ	2.48E+02	0.00E+00	1.32E+00	0.00E+00	7.89E+00	1.05E+00	1.76E+00	2.53E-01	-1.30E+02
SM	kg	-3.43E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m ³	3.89E-01	0.00E+00	7.83E-04	0.00E+00	8.31E-05	3.91E-05	7.21E-04	6.12E-05	-1.32E+00

PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials

PERM = Use of renewable primary energy resources used as raw materials

PERT = Total use of renewable primary energy resources

PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials

PENRM = Use of non-renewable primary energy resources used as raw materials

PENRT = Total use of non-renewable primary energy resources

SM = Use of secondary material

RSF = Use of renewable secondary fuels

NRSF = Use of non-renewable secondary fuels

FW = Use of net fresh water

Output flows and waste categories:

1kg of Colorcoat PE15 or PE25 coated and perforated steel structural deep deck

Parameter	Unit	A1 – A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
HWD	kg	6.51E-03	0.00E+00	5.00E-10	0.00E+00	1.64E-10	4.21E-11	1.61E-08	5.55E-11	-9.69E-07
NHWD	kg	1.06E+00	0.00E+00	3.74E-04	0.00E+00	1.23E-03	1.47E-04	9.62E-04	2.53E+00	1.57E+00
RWD	kg	2.48E-03	0.00E+00	5.61E-06	0.00E+00	4.62E-06	1.98E-06	2.22E-04	2.69E-06	1.42E-05
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	1.90E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.50E+00
MER	kg	3.30E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EEE	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EET	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

HWD = Hazardous waste disposed

NHWD = Non-hazardous waste disposed

RWD = Radioactive waste disposed

CRU = Components for reuse

MFR = Materials for recycling

MER = Materials for energy recovery

EEE = Exported electrical energy

EET = Exported thermal energy

5 Interpretation of results

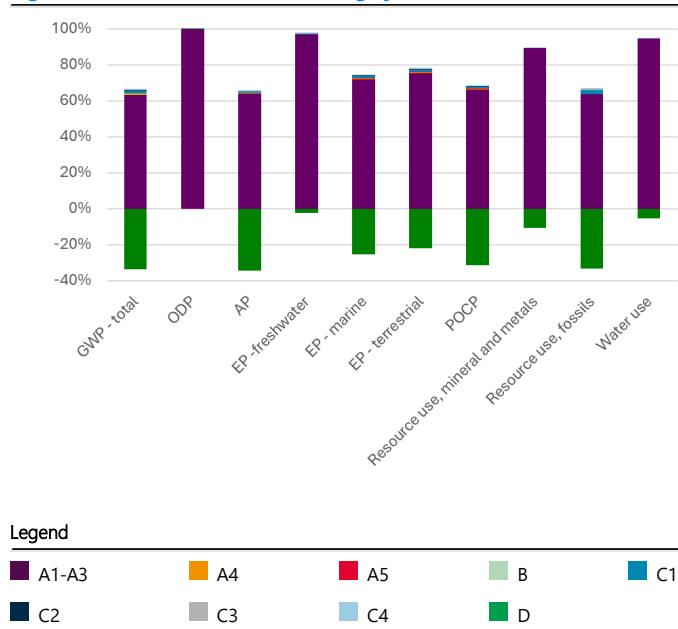
Figure 4 shows the relative contribution per life cycle stage for selected environmental impact categories for 1kg of Tata Steel's and perforated steel structural deep deck. Each column represents 100% of the total impact score, which is why all the columns have been set with the same length. A burden is shown as positive (above the 0% axis) and a benefit is shown as negative (below the 0% axis). The main contributors across all impact categories are A1-A3 (burdens) and D (benefits beyond the system boundary).

The manufacture of the cold rolled coil during stage A1-A3 is responsible for around 65-80% of each impact in most of the categories, specifically, the conversion of iron ore into liquid steel which is the most energy intensive part of the deck manufacturing process.

The majority of emissions come from the process of making crude steel, in the use of coal and coke in the blast furnace, and from the injection of oxygen into the basic oxygen furnace, as well as combustion of the process gases. These processes, give rise to emissions of CO₂ which contribute around 95% of the Global Warming Potential (GWP), and sulphur oxides, which are responsible for 53% of the impact in the Acidification Potential (AP) category. In addition, oxides of nitrogen are emitted which contribute 43% of the A1-A3 Acidification Potential, and the vast majority of the Eutrophication Potential (EP-marine and EP-terrestrial). Freshwater Eutrophication potential is contributed mostly by Phosphate (74%). The combined emissions of nitrogen oxides, carbon monoxide, and sulphur oxides, together contribute 90% of the Photochemical Ozone indicator (POCP).

Figure 4 clearly indicates the relatively small contribution to each impact from the other life cycle stages considered. Of these stages, the most significant contribution is from stage C1(deconstruction) in GWP, eutrophication marine and terrestrial, Fossil Resource Use indicator, AP, and POCP, which comes mostly from the use of diesel fuel.

Figure 4 LCA results for the decking system



Module D values are largely derived using worldsteel's value of scrap methodology which is based upon many steel plants worldwide, including both BF/BOF and EAF steel production routes. At end-of-life, the recovered steel decking is modelled with a credit given as if it were re-melted in an Electric Arc Furnace and substituted by the same amount of steel produced in a Blast Furnace^[19]. The specific emissions that represent the burden in A1-A3, are essentially the same as those responsible for the impact benefits in Module D. It is important that the life cycle of the steel product is considered here, because in most cases, the Module D credit provides significant benefits in terms of reducing the whole life environmental impacts.

Referring to the LCA results, the impact in Module D for ODP and the Use of Renewable Primary Energy indicator (PERT) are different to other impact categories, being a burden or load rather than a benefit. For ODP, this is because there is greater use of electricity in recycling steel compared to manufacturing it through the BF/BOF route, leading to larger ODP impacts. This also applies to the use of renewable energy, hence why PERT is positive in module D as well.

6 References and product standards

1. Tata Steel's EN 15804 verified EPD programme, General programme instructions, V2 January 2022
2. Tata Steel's EN 15804 verified EPD programme, Product Category Rules Part 1, V2 January 2022
3. Tata Steel's EN 15804 verified EPD programme, Product Category Rules Part 2 – Steel Structural Deck, V2 June 2022
4. ISO 14044:2006+A2:2020, Environmental management - Life Cycle Assessment – Requirements and guidelines
5. ISO 14025:2006, Environmental labels and declarations - Type III environmental declarations - Principles and procedures
6. ISO 14040:2006+ A1:2020, Environmental management - Life Cycle Assessment - Principles and framework
7. EN 15804:2012+A2:2019/AC:2021, Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products
8. EN 13501-1:2018, Fire classification of construction products and building element
9. EN 1090-1:2009+A1:2011, Requirements for conformity assessment for structural components
10. EN 10346:2015, Continuously hot-dip coated steel flat products for cold forming
11. REACH, EU regulation for Registration, evaluation, authorisation and restriction of chemicals
12. ISO 9001:2015, Quality management systems
13. ISO 14001:2015, Environmental management systems
14. BES6001, Responsible sourcing of construction products
15. EN 1990:2002, Eurocode. Basis of structural design
16. EN 1994-1-1:2004, Eurocode 4. Design of composite steel and concrete structures. General rules and rules for buildings
17. Sphera; LCAfE: Software-System and Database for Life Cycle Engineering. Copyright, TM. Stuttgart, Echterdingen, 1992-2025
18. Documentation of LCAfE: Software-System and Database for Life Cycle Engineering. Copyright, TM. Stuttgart, Echterdingen, 1992-2025
19. World Steel Association: Life Cycle Assessment methodology report, 2017
20. Steel Construction Institute (SCI), Survey of recycling and reuse rates for UK demolition contractors, European Commission funded research project on LCA for steel construction, Sansom M and Meijer J, 2000
21. EC -JRC, EN 15804 Reference Package, <https://eplca.jrc.ec.europa.eu/LCDN/EN15804.xhtml>
22. Siebers R. (2021), Dissertation: Development of sustainability key figures for the value chain stages – erection and dismantling – in steel construction, Bergische Universität Wuppertal

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