NEUMANN STEEL
REINFORCING

Environmental Product Declaration

In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021

REINFORCING MESH

EPD of multiple products, based on a weighted average of reinforcing mesh production, covering Mesh 2 Go, Standard Mesh, Heavy Mesh, Trench Mesh, Galvanised Mesh, Z Cages and Footings.
See a full list of included products on page 7.

Programme:	The International EPD® System, www.environdec.com	**EPD registration number:**	EPD-IES-0017796
Regional Programme:	EPD Australasia www.epd-australasia.com	**Publication date:**	2025/02/14
		Valid until:	2030/02/14

An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com

PROGRAMME INFORMATION

NEUMANN STEEL
REINFORCING

Declaration Owner		
NEUMANN STEEL REINFORCING	Neumann Steel PTY Ltd	Neumann Steel Australia Pty Ltd neumannsteel.com.au Email: info@neumann.com.au Phone: 07 5589 9280

EPD Programme Operator		
EPD® THE INTERNATIONAL EPD® SYSTEM	The International EPD System	EPD International AB www.environdec.com Email: info@environdec.com Box 210 60 SE-100 31 Stockholm, Sweden

Regional Programme Operator		
EPD® AUSTRALASIA ENVIRONMENTAL PRODUCT DECLARATION	EPD Australasia	315a Hardy Street, Nelson 7010 New Zealand Website: www.epd-australasia.com Phone: +642 8005 8206 Email: info@epd-australasia.com

EPD Developer		
Lifecycles	Life Cycle Strategies Pty Ltd (Lifecycles)	LCA accountability: Paul-Antoine Bontinck, Life Cycle Strategies Pty Ltd (Lifecycles) 2/398 Smith Street, Collingwood VIC 3066, Australia Website: www.lifecycles.com.au Phone: +61 03 9417 1190 Email: info@lifecycles.com.au

PCR and Verifier Information	
Product category rules (PCR)	Product Category Rules (PCR): PCR 2019: Construction Products, Version 1.3.4, 2024-03-30, (valid until 2025-06-20)
PCR review was conducted by	The Technical Committee of the International EPD(R) System. See www.environdec.com for a list of members. Most recent review chair: Claudia A. Peña, PINDA LCT SpA, Chile. The review panel may be contacted via the Secretariat www.environdec.com/contact.

Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:
EPD verification by individual verifier

Third-party verifier: Claudia A. Peña, PINDA LCT Spa
Approved by: EPD Australasia

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

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COMPANY INFORMATION

Owner of the EPD: Neumann Steel, Pty Ltd

Contact: info@neumann.com.au

DESCRIPTION OF THE ORGANISATION:

Neumann Steel is a leading provider of high-quality steel products, catering to diverse industrial and construction needs. With a commitment to excellence, innovation, and sustainability, we have established ourselves as a trusted name in the steel industry.

At Neumann Steel, we specialise in manufacturing and supplying a wide range of ACRS-certified steel products, including reinforcement mesh, reinforcing bar, and a wide range of accessories. Our state-of-the-art facilities, coupled with a team of skilled professionals, enable us to deliver products that meet industry standards.

As an environmentally conscious company, which is certified by Steel Sustainability Australia (SSA) we are committed to reducing our carbon footprint and promoting sustainable practices throughout our operations. From sourcing raw materials responsibly to optimising energy efficiency in production and using recycled plastics in our injection Moulding facility, we prioritise sustainability at every stage of our business.

PRODUCT-RELATED OR MANAGEMENT SYSTEM-RELATED CERTIFICATIONS:

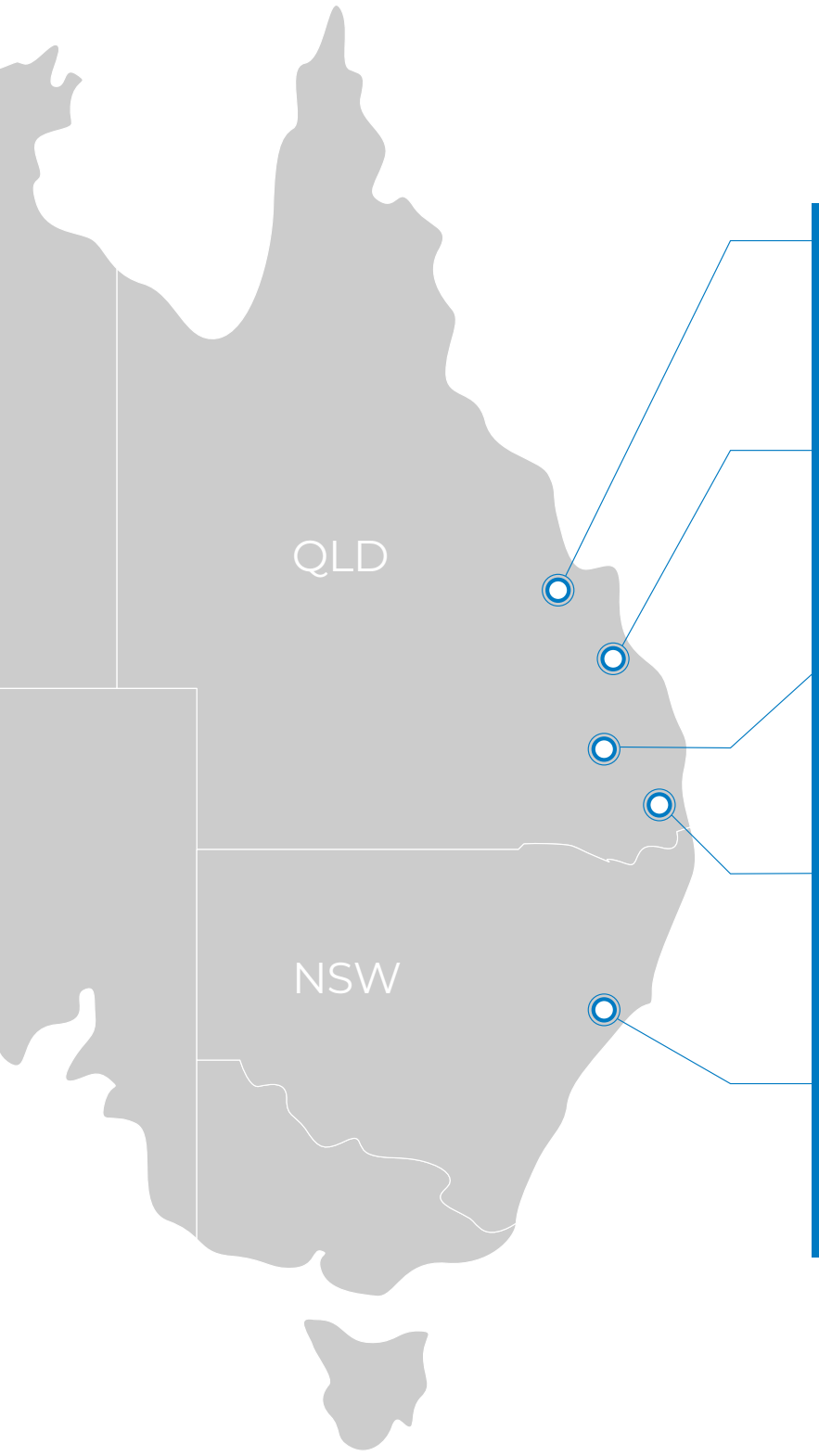
Certified by Compass in ISO 9001, ISO 4501, ISO 14001 with certificate n° 5266-2156-01, ACRS (Reinforcing Bar, Mesh and Wire) and Steel Sustainability Australia (SSA) certification.

NAME AND LOCATION OF PRODUCTION SITE(S):

The production data used in this EPD represent the manufacture of reinforced steel mesh by Neumann Steel Currumbin.

Neumann Steel Currumbin
13 Nuban Street
Currumbin, Gold Coast, QLD- 4223
Australia

NEUMANN STEEL LOCATIONS



FRASER COAST
2-4 Industrial Avenue
DUNDOWRAN QLD 4655
07 4124 2920
steel.herveybay@neumann.com.au

SUNSHINE COAST
17 Enterprise Street
CALOUNDRA WEST QLD 4551
07 5436 4500
caloundrasc@neumann.com.au

BRISBANE
8 Neumann Road
CAPALABA QLD 4157
07 3245 1144
capalabasc@neumann.com.au

GOLD COAST / NORTHERN NSW
13 Nuban Street
CURRUMBIN QLD 4223
07 5589 9224
steel-currumbinSCusers@neumann.com.au

HUNTER REGION
62 Glenwood Drive
THORNTON NSW 2322
02 4966 8866
steel.thornton@neumann.com.au

PRODUCT INFORMATION

PRODUCT NAME: Reinforcing Steel Mesh

PRODUCT IDENTIFICATION:

Reinforcing steel electro-welded mesh, Steel for concrete reinforcement, weldable steel for reinforced concrete reinforcement, general.

PRODUCT DESCRIPTION:

Reinforcing mesh is manufactured in sheets by welding ribbed steel wires at right angles, forming gaps that can be square or rectangular. The meshes differ in both the diameter of the wire used and the spacing between the longitudinal and cross wires. Additionally, the size of the mesh sheets can be customised for specific applications, such as trenches or to simplify transport.

UNDER THE UNITED NATIONS CENTRAL PRODUCT CLASSIFICATION (UN CPC), NEUMANN STEEL REINFORCING STEEL MESH PRODUCTS FALL INTO TWO CATEGORIES:

- UN CPC 4124: Bars and rods, hot-rolled, or iron and steel
- UN CPC 4126: Bars, rods, angles, shapes and sections, cold-processed or further worked, of iron or steel; angles, shapes and sections, hot-rolled, hot-drawn or extruded, of alloy steel; steel wire

GEOGRAPHICAL SCOPE:

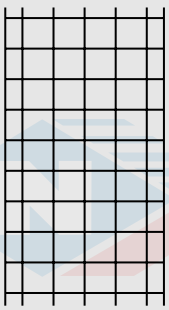
Steel production is modelled to represent Australia (~90% of steel input), as well as Poland, Vietnam, Italy and Malaysia (module A1-A3). All other steps are modelled to represent Australian conditions.

REINFORCING MESH PRODUCT LIST AND PHYSICAL CHARACTERISTICS

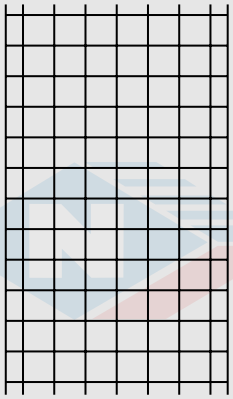
Sub-category	Product code	Dimensions (mm)	Mass per unit (kg)
Mesh 2 Go	M2G72	3 900 x 2 000	22
Standard Mesh	NF72	5 900 x 2 400	39
	NF82	5 900 x 2 400	52
	NF92	5 900 x 2 400	66
	NF102	5 900 x 2 400	80
Heavy Mesh	NF81	5 900 x 2 400	105
	NF818	5 900 x 2 400	79
	NF918	5 900 x 2 400	93
	NF1018	5 900 x 2 400	109
	NF1218	5 900 x 2 400	157
Trench Mesh	NF8TM3	200 x 5 900	7
	NF8TM4	300 x 5 900	9
	NF11TM3	200 x 5 900	13
	NF11TM4	300 x 5 900	18
	NF12TM3	200 x 5 900	16
	NF12TM4	300 x 5 900	22
	NF12TM5	400 x 5 900	27
	NF16TM3	200 x 5 900	29.9
Galvanised Mesh	NF72G	5 900 x 2 400	23.32
	NF81G	5 900 x 2 400	111.3
	NF82G	5 900 x 2 400	55.12
	NF92G	5 900 x 2 400	69.96
Z Cages and Footing	NZ1222	200 x 200 x 6 000	26.2
	NZ1233	200 x 300 x 6 000	37.6
	NZ1234	200 x 400 x 6 000	38.2
	NZ1235	200 x 500 x 6 000	38.7
	NZ1242	300 x 200 x 6 000	50.1
	NZ1243	300 x 300 x 6 000	50.4
	NZ1244	300 x 400 x 6 000	50.8
	NS16	200 x 500 x 6 000	60

Neumann Steel's reinforcing products are certified in Australia by the Australasian Certification Authority for Reinforcing and Structural Steels. Reinforcing mesh holds certification 31105 for 'Steel reinforcing mesh manufacture to AS/NZS 4671:2019'.

REINFORCING MESH PRODUCT SCHEMATICS

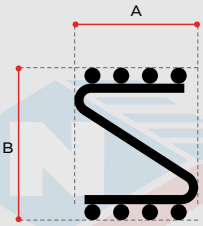


Mesh 2 Go



Standard Mesh
Heavy Mesh
Galvanised Mesh

Trench Mesh



Z Cages and
Footings

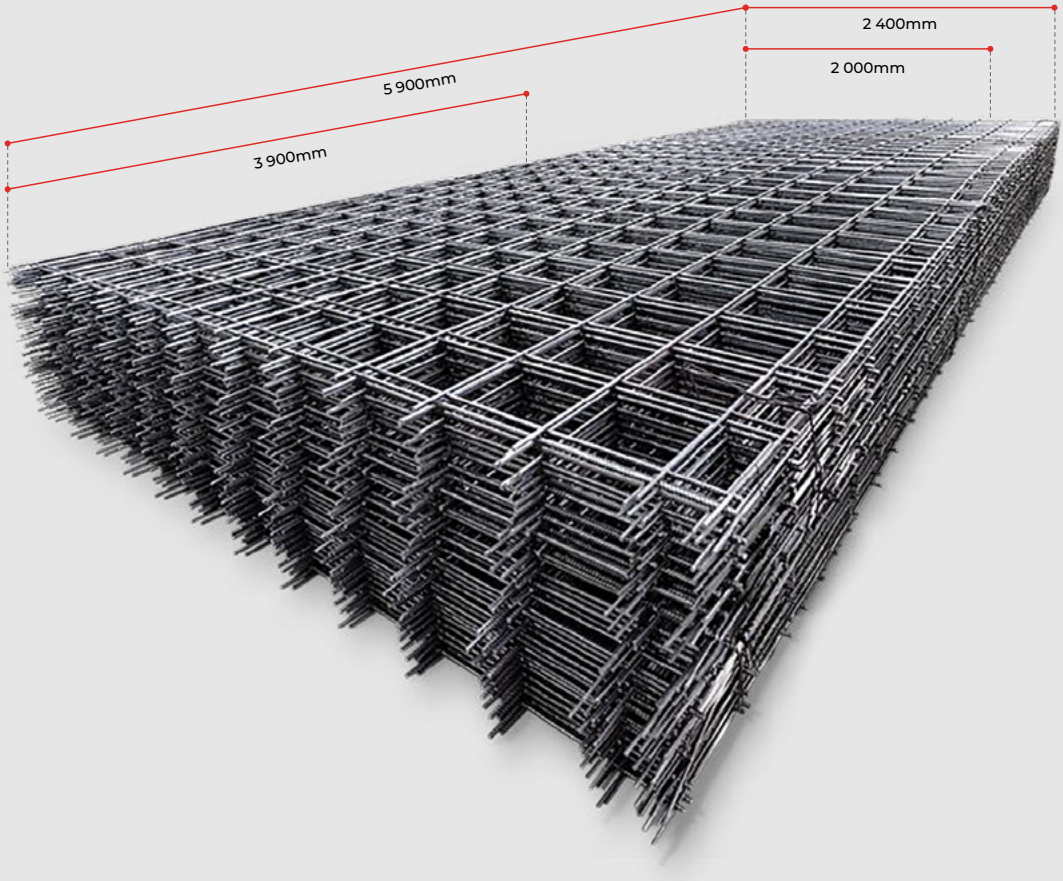
SIZE GUIDE

STANDARD

5 900mm Length
2 400mm Width

MESH 2 GO

3 900mm Length
2 000mm Width



CERTIFICATIONS

ISO 14001

Neumann Steel is ISO 14001 certified complying with an international standard that outlines the requirements for an effective Environmental Management System (EMS), assisting the company in managing and controlling their environmental impact while ensuring regulatory compliance.

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STEEL SUSTAINABILITY AUSTRALIA

Neumann Steel's manufacturing facilities is certified under the Steel Sustainability Australia (SSA) program, reflecting our ongoing commitment to environmental responsibility and sustainable steel production.

The SSA program aims to identify sustainable steel suppliers by evaluating the environmental and social impacts of their steel manufacturing and processing operations. This certification acknowledges our compliance with rigorous environmental standards, emphasising emission reduction, waste minimisation, and efficient resource utilisation.

The SSA Program is an established initiative under the Green Building Council of Australia's (GBCA) Responsible Products Framework (RPF). Each level of certification within the SSA Program is associated with corresponding Responsible Product Values (RPVs). These values satisfy the criteria for the four Green Star Responsible Products Credits under the 'Responsible' category in the Green Star Buildings rating tool.

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SYSTEM DIAGRAM

A CIRCULAR ECONOMY

A1 | RAW MATERIALS Include impacts from raw materials extraction/ processing/ production.

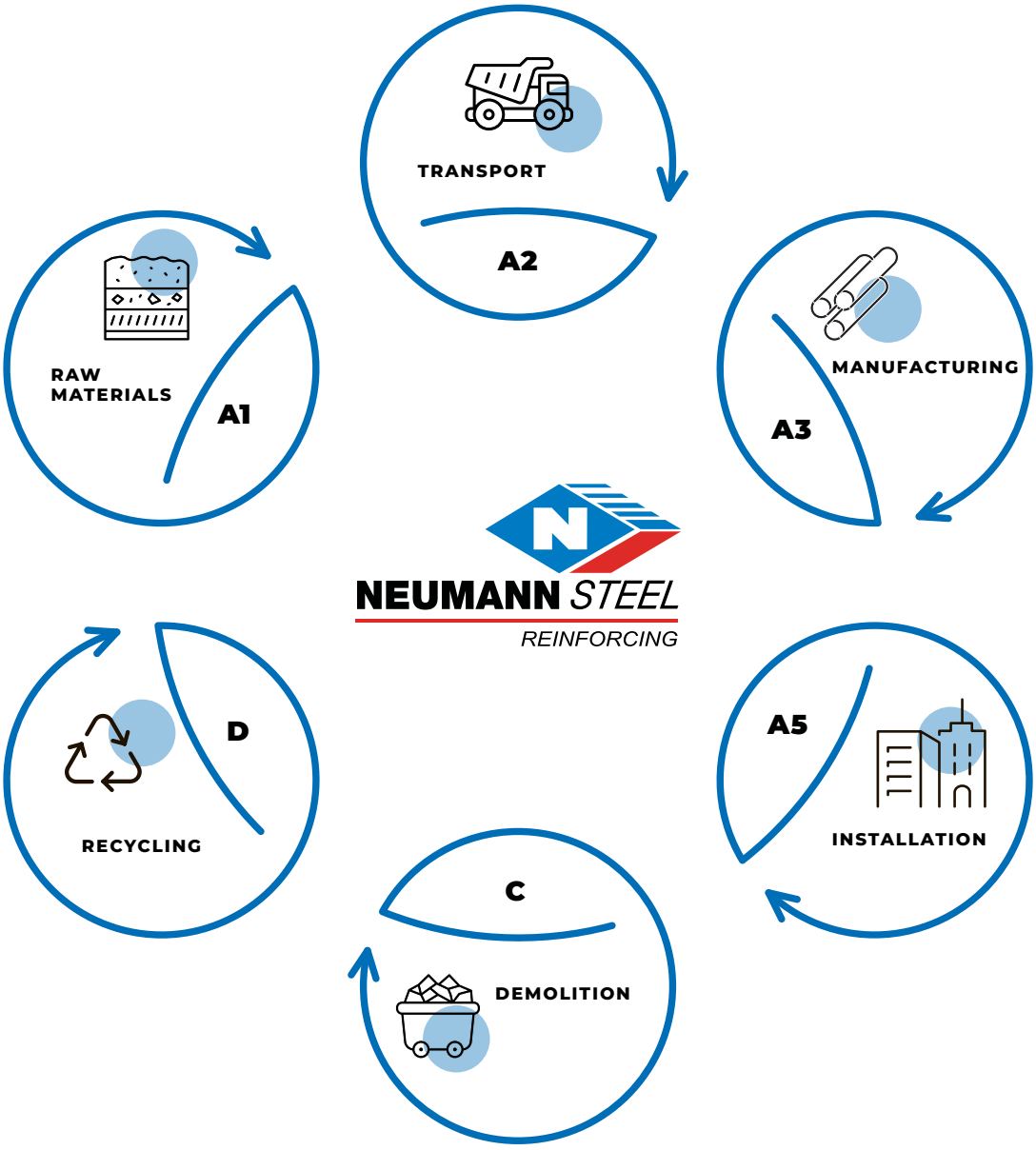
A2 | TRANSPORT Include impacts from transport of raw materials (coil) to Neumann Steel.

A3 | MANUFACTURING Include impacts from manufacturing the reinforcing steel mesh and packaging.

A5 | INSTALLATION Include impacts from end-of-life processes for packaging.

C | DEMOLITION Include impacts from deconstruction, recycling/disposal.

D | RECYCLING Include impacts from product reuse and recycling components, as well as potential benefits and loads of recycling beyond the product system.



LCA INFORMATION

DECLARED UNIT:

1 000kg (1 tonne) of Neumann Steel reinforcing steel mesh.

TIME REPRESENTATIVENESS:

Specific data was collected and provided by Neumann Steel for the year 1 July 2022 – 30 June 2023 (financial year 2023).

DATABASE(S) AND LCA SOFTWARE USED:

SimaPro® LCA software v10.0.0.26 was used for the LCA modelling and calculation of impacts. All global background data are taken from Ecoinvent v3.10, allocation recycling cut-off, EN 15804 model (Weidema, Bauer et al. 2023). Australian energy use and waste treatment processes are based on a new version of the AusLCI database (ALCAS 2024) developed for compliance against EN 15804. Both databases include resource, waste and output flows as required under EN 15804. Background data is less than 10 years old or has been updated within this time frame.

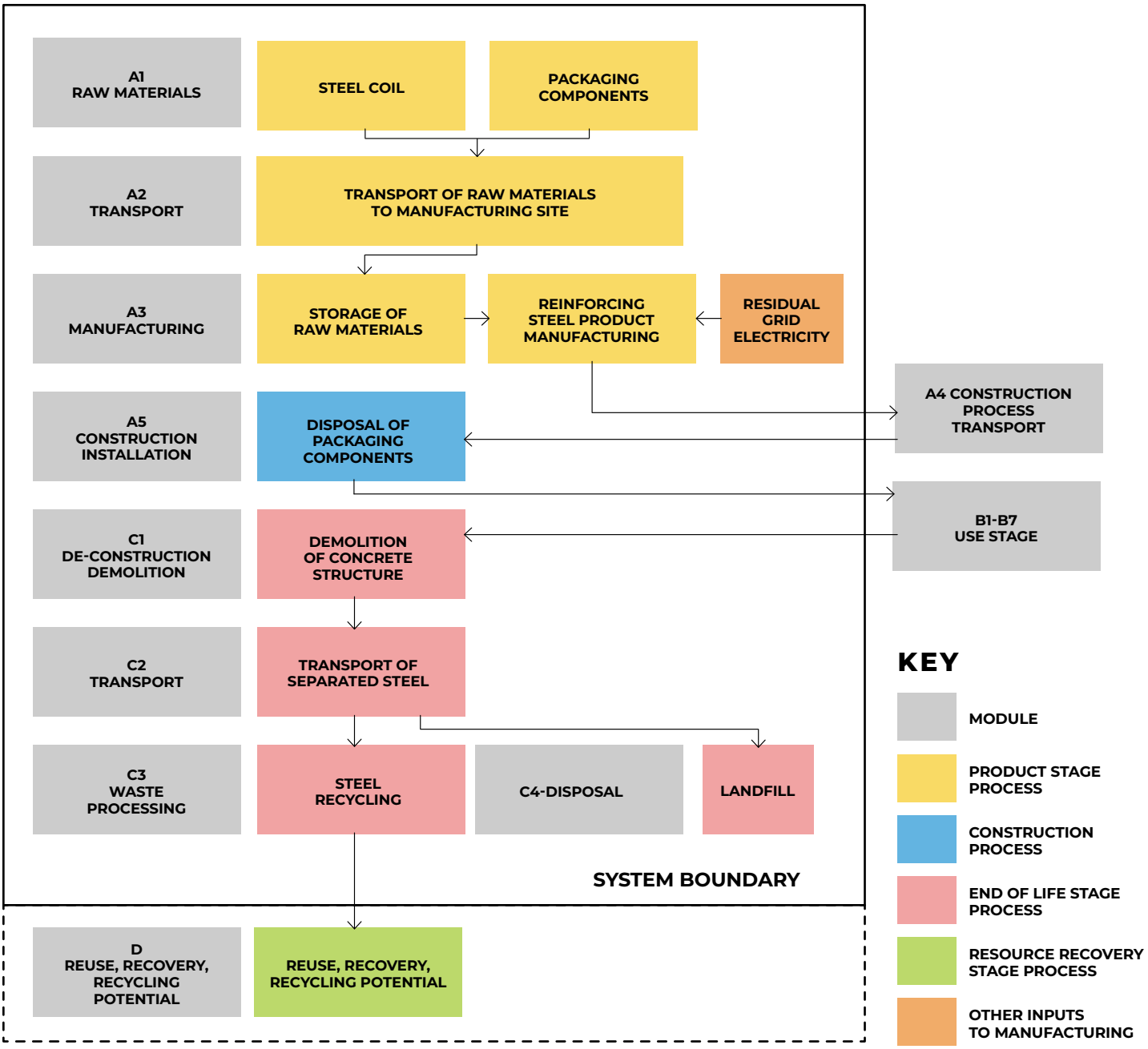
DESCRIPTION OF SYSTEM BOUNDARIES:

This EPD covers the cradle-to-gate with options plus end-of-life stages (modules A1-A3, A5,C1-C4, D). Modules A4, B1-B7 are also excluded from this study as these modules are best modelled at the final construction/building project level.

THE SYSTEM BOUNDARY INCLUDES:

- **Module A1:** Production/extraction of raw materials used to manufacture the reinforcing steel products and packaging. This includes iron ore and post-consumer steel waste used for steel production, timber used in the production of gluts and pallets and crude oil for the production of polyethylene terephthalate strapping.
- **Module A2:** Transport of each material to the three factories operated by Neumann Steel.
- **Module A3:** Includes the electricity (subnational residual grid mix - state specific) required to cut, shape, mark and electric arc welding. Waste generated from the manufacturing process includes steel scrap, which is considered a co-product (as discussed under Allocation).
- **Module A5:** End-of-life processes for packaging, including the release of any stored biogenic carbon. All packaging components are assumed to be sent to a landfill at the construction site.
- **Module C:** Demolition of the construction at the end of life of the reinforced concrete element (C1), transportation of separated steel (C2), waste processing (recycling – C3) and disposal (landfilling – C4).
  - The end-of-life modules are represented using a generic scenario, whereby steel is either collected for recycling or goes to landfill. In accordance with the requirements of the Construction PCR, the proportion of material to recycling was determined using the R2 ratio from the Product Environment Footprint. This resulted in an estimated 85% of end-of-life reinforcing bar being recycled.
  - Module C1 was modelled using the upper value of 0.05 MJ/kg of waste from the range reported by Rakesh and Keshava (2019).
  - Module C2 is modelled using an estimated average distance of 50 km between the demolition site and the landfill or recycling site.
  - Module C3 represents the processes required for the reinforcing steel waste to reach the end-of-waste state. In this case, it include the separation and processing, required for it to become an input for a steel mill. This was modelled using existing models available in AusLCI.
  - C4 was represented using available Rest-of-World ecoinvent sanitary landfill waste treatment process.
- **Module D:** Reuse-recovery-recycling potential. This module declares the benefit/impact of recycling the reinforced steel product at its end of life.

SYSTEM DIAGRAM

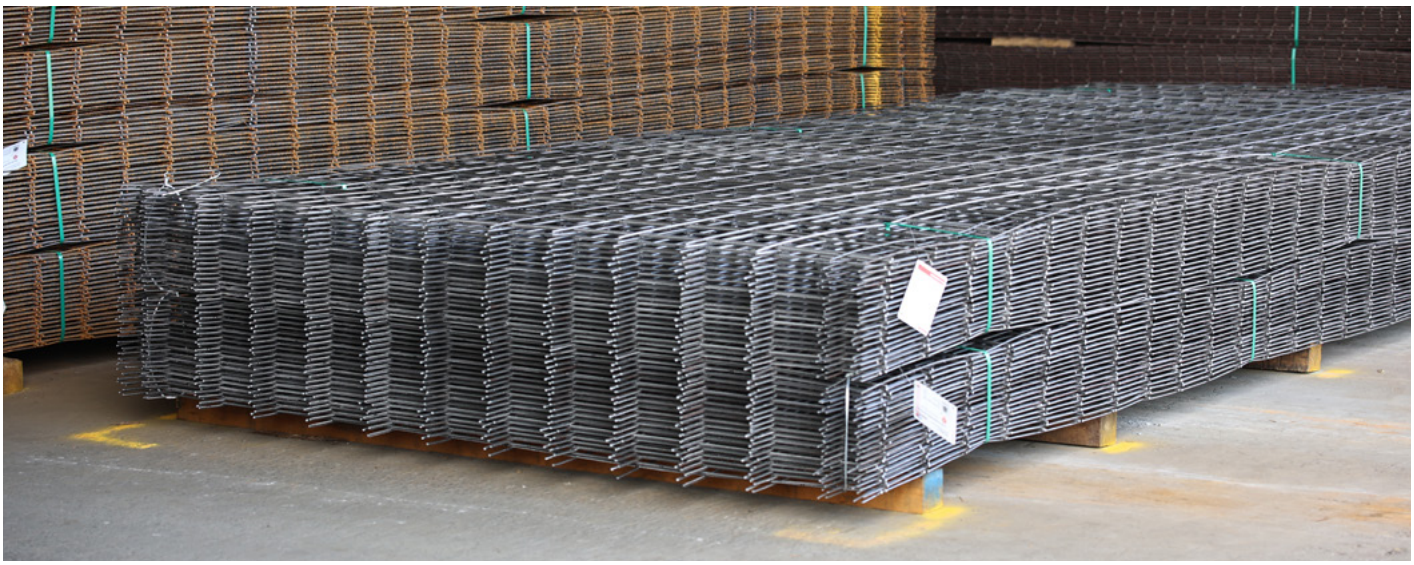


ELECTRICITY MODELLING:

The electricity used at Neumann Steel facilities (module A3) is modelled as subnational residual market mix. Reinforcing bars are produced at sites in Queensland and New South Wales. The two residual market mixes are modelled using AusLCI v2.44. The modelled residual mix results in a climate change impact of 1.00 kg CO_2-eq/kWh (GWP-GHG) for New South Wales and 0.97 kg CO_2-eq/kWh (GWP-GHG) for Queensland.

CUT-OFF CRITERIA:

The cut-off threshold for the LCA study was flows contributing less than 1% of any impact category included in the LCA. No flows were deliberately excluded due to this threshold, however particularly minor inputs expected to be well below this threshold were not considered. Infrastructure, production equipment, and personnel related activities are non-attributable and excluded from the system boundary.



ALLOCATION:

In this LCA the main allocation issue relates to the allocation of products and co-products at the manufacturing site. Neumann Steel's Currumbin site produces both reinforcing bars and reinforcing mesh, while the other two sites considered (Hervey Bay and Thornton) only produce reinforcing bar. A mass allocation was applied at Neumann Steel's Currumbin site to allocate electricity consumption to reinforcing bars and mesh. This resulted in 39% of electricity consumed at Currumbin to be allocated to bar manufacturing, and 61% to mesh.

Additionally, a significant volume of scrap is used by the steel manufacturers supplying Neumann Steel. In line with the requirements of the PCR, these inputs are represented using the polluter-pays principle, whereby the boundary of Neumann Steel's reinforcing steel bar starts once the steel scrap has reached the End-of-Waste state.

STEEL PRODUCTION:

Close to 90% of the steel supplied to Neumann Steel is sourced from Infrabuild. The two products purchased by Neumann Steel are covered by an EPD (registration number: S-P-00855 Version 1.3). In theory, it would have been possible to use the results of this EPD as they are published to represent the production of steel. However, it was not possible to do so as the EPD was published using a now outdated version of EN 15804 (EN 15804:2012+A1:2013). The analysis aligned a pre-existing background model from ecoinvent as closely as possible from the original results of the EPD. This was deemed the most appropriate method to remain as closely aligned with Neumann Steel's supply chain as possible.

TREATMENT OF PACKAGING WASTE AT CONSTRUCTION INSTALLATION (MODULE A5):

All packaging components are assumed to go to landfills during the construction stage. This is considered a conservative approach. Indeed, the decomposition of timber products in landfills will result in methane emissions that would not occur with other end-of-life scenarios such as composting, thus resulting in larger impacts on indicators such as Global Warming.

DETERMINATION OF THE NET FLOW:

Modelling of module D relies on the estimated net flows of recovered materials or energyware. Within the scope of this analysis, the only net flow leaving the product system declared in module D is associated with secondary material (scrap steel).

Under Module A1-3, the quantity of scrap steel input is reported as 715 kg per tonne of reinforcing steel mesh, based on the provenance of steel and the proportion secondary materials reported by suppliers.

The ratio of output flow to recycling was estimated as 0.85, based on the R2 factor provided via the European Commission (2018) Product Environmental Footprint Category Rules Guidance, version 6.3.. The model assumes a yield of 95%, as per the AusLCI model of reference. Thus, the net flow of secondary material was calculated using equation 1 below:

$$\text{NET FLOW} = \sum Y \times (\text{MROUT} - \text{MRIN}) \quad (1)$$

WITH:

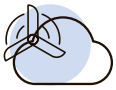
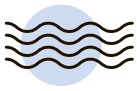
- **Y:** the material yield, between the point of end-of-waste and point of substitution, which is estimated to be 0.95, as per the AusLCI model 'recycling steel/AU U'.
- **MRout:** the amount of material exiting the system that will be recovered in a subsequent system. It is equal to the output flow of materials to recycling reported previously (850 kg / tonne, European Commission 2018).
- **MRin:** the amount of input material to the product system that has been recovered from a previous system. This was reported by Neumann Steel's suppliers and amounted to 715 kg per tonne of reinforcing steel mesh.

Based on this, the net flow was calculated as 128 kg per tonne of reinforcing steel mesh.

ENVIRONMENTAL PERFORMANCE INDICATORS

The environmental indicators for the impact categories described in this EPD are summarised in the tables below. Abbreviations for each indicator are used in the result tables for simplicity.

MANDATORY POTENTIAL ENVIRONMENTAL IMPACT INDICATORS ACCORDING TO EN 15804:2012+A2:2019 - EF3.1 REFERENCE PACKAGE

	**Global Warming Potential (GWP)** **GWPF (fossil) / GWPB (biogenic) / GWPL (land use) / GWPT (total)** This is governed by the increased concentration of gases in the atmosphere that trap heat and lead to increasing global temperatures, principally carbon dioxide, methane and nitrous oxide.	**kg CO_2 eq**
	**Ozone Depletion Potential (ODP)** This calculates the destructive effects in the stratospheric ozone layer over a time horizon of 100 years.	**kg CFC 11 eq**
	**Acidification Potential (AP)** This assesses the change in critical load exceedance of the sensitive area in terrestrial and main freshwater ecosystems, to which acidifying substances deposit.	**mol H+ eq**
	**Eutrophication Potential – Freshwater (EPF)** Expresses the degree to which the emitted nutrients reach the freshwater end compartment.	**kg P eq**
	**Eutrophication Potential – Marine (EPM)** Expresses the degree to which the emitted nutrients reach the marine end compartment.	**kg P eq**
	**Eutrophication Potential – Terrestrial (EPT)** This expresses the degree to which nutrients reach sensitive terrestrial environments, resulting in changes in species composition, such as increased invasive species, reed growth, and dieback in tree species.	**mol N eq**
	**Photochemical Ozone Creation Potential (POCP)** This measures harmful air pollutant creation by primary pollutants such as nitrous oxides and volatile organic compounds when they interact under the influence of the sun and form chemicals toxic to humans and ecosystems, including ozone.	**kg MNVOC eq**
	**Abiotic Depletion Potential – Minerals & Metals (ADPE)** This measures the depletion of minerals based on the concentration of currently economic reserves and rate of de-accumulation.	**kg Sb eq**
	**Abiotic Depletion Potential – Fossil Fuels (ADPF)** This measures the depletion of fossil fuels based on energy content.	**MJ NCV**
	**Water Deprivation Potential (WDP)** This quantifies the relative available water remaining per area once the demand of humans and aquatic systems has been met.	**m^3 H2O eq**

*Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of the results are high and as there is limited experience with the indicator.

ADDITIONAL MANDATORY AND VOLUNTARY INDICATORS

Global Warming Potential – excluding biogenic uptake, emissions, and storage (GWP-GHG)	**kg CO_2 eq.**
Particulate Matter Emissions (PM)	**Disease incidence**
Ionising Radiation – Human Health (IRP)	**kBq U-235-eq.**
Eco-Toxicity – Freshwater (ETPF)	**CTUe**
Human Toxicity – Cancer (HTPC)	**CTUh**
Human Toxicity – Non-Cancer (HTPNC)	**CTUh**
Land Use Related Impacts / Soil Quality (SQP)	**Dimensionless**

USE OF RESOURCES, WASTE PRODUCTION AND OUTPUT FLOWS

Indicator	Abbreviation	Unit
RESOURCE USE		
Primary energy resources – Renewable	Use as energy carrier	PERE
	Used as raw materials	PERM
	Total	PERT
Primary energy resources – Non-renewable	Use as energy carrier	PENRE
	Used as raw materials	PENRM
	Total	PENRT
Use of secondary materials	SM	kg
se of renewable secondary fuels	RSF	MJ, net calorific value
Use of non-renewable secondary fuels	NRSF	MJ, net calorific value
Net use of fresh water	FW	m^3
WASTE PRODUCTION		
Hazardous waste disposed	HWD	kg
Non-hazardous waste disposed	NHWD	kg
Radioactive waste disposed	RWD	kg
OUTPUT FLOWS		
Components for reuse	CRU	kg
Material for recycling	MFR	kg
Materials for energy recovery	MER	kg
Exported energy – electrical	EEE	MJ per energy carrier
Exported energy – thermal	EET	MJ per energy carrier
Use of secondary materials	SM	kg

EN 15804:2012+A1 IMPACT CATEGORIES

INDICATOR	ABBREVIATION	UNIT	CHARACTERISATION MODEL
Global warming potential	GWP	kg CO_2 eq.	IPCC model based on 100-year time frame based on IPCC 2007
Ozone depletion potential	ODP	kg CFC 11 eq.	CML-IA V4.1
Acidification potential	AP	kg SO_2 eq.	CML-IA V4.1
Eutrophication potential	EP	kg PO_4^{3-} eq.	CML-IA V4.1
Photochemical ozone creation potential	POCP	kg C_2H_4 eq.	CML-IA V4.1
Abiotic depletion potential –minerals & metals	ADPE	kg Sb eq.	CML-IA V4.1
Abiotic depletion potential – fossil fuels	ADPF	MJ (NCV)	CML-IA V4.1

The results are also declared for the indicators from EN 15804:2012+A1:2013 (i.e. the EF 3.0 reference package). Note: while indicators and characterisation factors from EN 15804:2012+A1:2013 are reported on, all other LCA methodological rules are according to EN 15804:2012+A2:2019. The results reported for these indicators are therefore not claimed to be fully compliant with EN 15804:2012+A1:2013.

MODULES DECLARED, GEOGRAPHICAL SCOPE, SHARE OF SPECIFIC DATA (IN GWP-GHG RESULTS) AND DATA VARIATION (IN GWP-GHG RESULTS):

	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage
	Raw material supply	Transport	Manufac-turing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbish-ment	Operational energy use	Operational water use	Decon-struction/ demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	X	X	X	ND	X	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	AU/ GLO	AU/ GLO	AU	-	AU	-	-	-	-	-	-	-	AU	AU	AU	AU	AU
Specific data used	The percentage of specific data is assumed to be larger than 60%, but it cannot be proved since the EPDs used as data source lacks information on the percentage of specific data used*					-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	0%					-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	0%					-	-	-	-	-	-	-	-	-	-	-	-

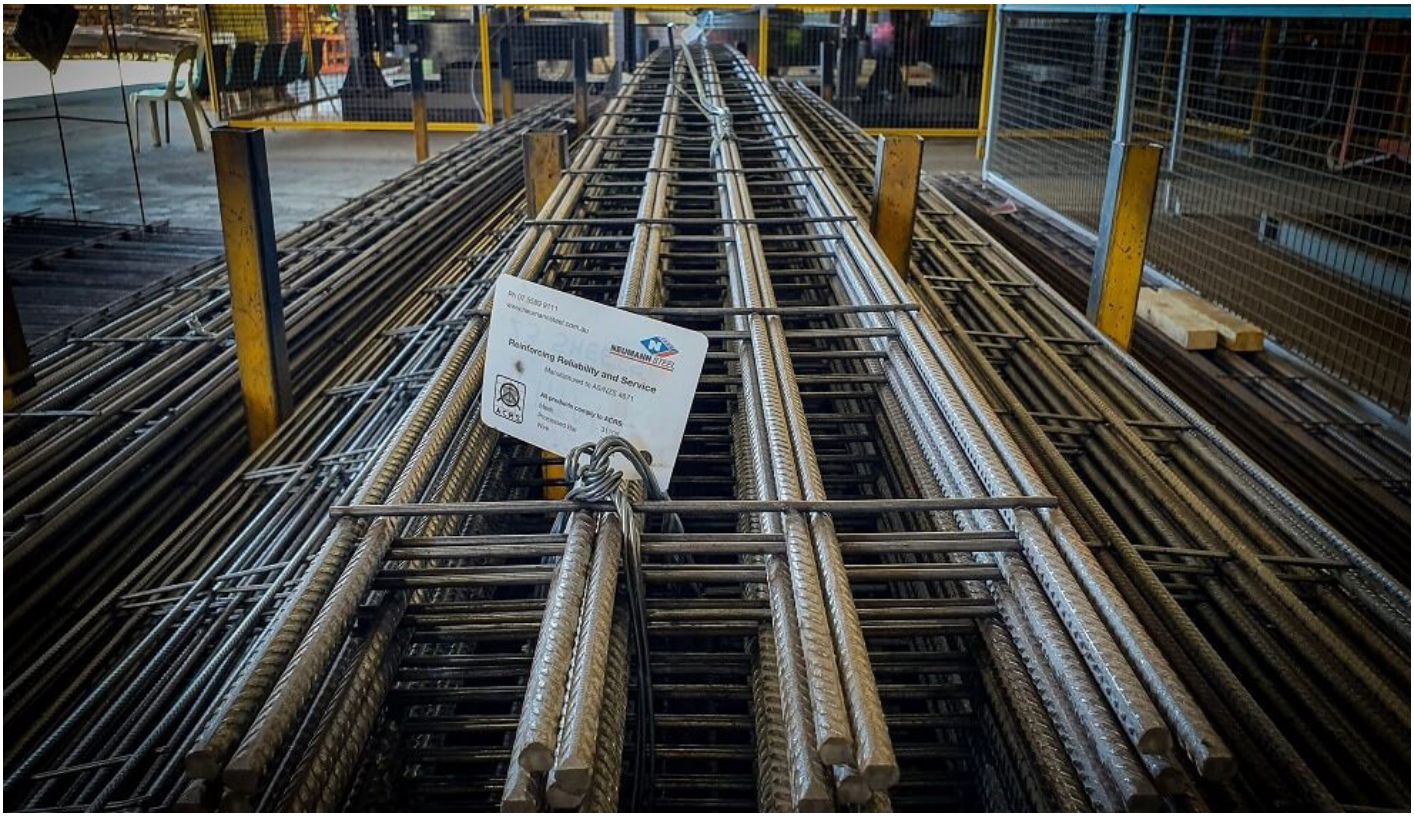
*Disclaimer: The input of steel from Infrabuild is covered by EPD (S-P-00855 Version 1.3), which represent 85% of the overall results for GWP-GHG. The Infrabuild EPD does not provide the fraction of specific data used, however Infrabuild is a steel manufacturer, operating both Blast Furnace and Electric Arc Furnaces. The operation of these facilities will be the main driver of emissions, from coke and other energy use in the case of a blast furnace and electricity use for an electric arc furnace. We assumed at least 70% of data used by Infrabuild would be specific, which in turn would mean that at least 61% of the Neumann Steel data is considered specific from that EPD alone.

CONTENT DECLARATION OF REINFORCING STEEL MESH AND ITS PACKAGING FOR ONE TONNE OF STEEL

The material breakdown of the reinforcing steel products and its packaging, including recycled components and biogenic material.

Product Component	Weight (kg)	Post-consumer recycled material, (weight %)	Biogenic material (weight % and kg C/tonne)
Steel, reinforcing bar	1 000	72.0%	0%, 0
Steel, reinforcing mesh	1 000	71.5%	0%, 0
Packaging Material	**Weight (kg)**	**Weight-% (versus the product)**	**Weight biogenic carbon (kg C/tonne)**
Steel wire	0.86	<1%	0
PET strap	0.31	<1%	0
Timber gluts, 100x100	0.34	<1%	494
Timber gluts, 75x50	0.30	<1%	494
Pallet	0.11	<1%	487

Neumann Steel's reinforcing bar and mesh does not contain substances in the Candidate List of Substances of Very High Concern in the European Chemicals Agency in concentrations >0.1% of the weight of the product.



RESULTS OF THE ENVIRONMENTAL PERFORMANCE INDICATORS - PER DECLARED UNIT

Mandatory impact category indicators according to EN 15804:2012+A2:2019

*Disclaimer: The use of the results of module A1-A3 without considering the results of module C is discouraged. The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

INDICATOR	UNIT	A1-A3	A5	C1	C2	C3	C4	D
GWP-fossil	kg CO_2 eq.	1.99E+03	1.15E-02	4.69E+00	7.72E+00	1.79E+02	4.07E-01	-2.21E+02
GWP-biogenic	kg CO_2 eq.	3.19E+01	6.43E-02	2.61E-03	2.61E-03	3.31E+00	2.25E-03	-4.86E-01
GWP-luluc	kg CO_2 eq.	4.08E+00	4.04E-06	1.63E-04	2.28E-04	5.98E-01	2.03E-05	-4.14E-02
GWP-total	kg CO_2 eq.	2.03E+03	7.58E-02	4.70E+00	7.73E+00	1.83E+02	4.10E-01	-2.21E+02
ODP	kg CFC 11 eq.	4.34E-06	2.70E-10	7.38E-08	1.04E-07	7.38E-07	6.03E-09	-5.42E-07
AP	mol H+ eq.	1.06E+01	8.86E-05	4.39E-02	4.38E-02	1.06E+00	3.70E-03	-7.42E-01
EP-freshwater	kg P eq.	6.40E-01	6.90E-06	3.83E-05	1.59E-04	5.98E-03	1.23E-05	-5.88E-02
EP-marine	kg N eq.	2.53E+00	3.16E-04	2.06E-02	1.96E-02	1.68E-01	1.68E-03	-1.70E-01
EP-terrestrial	mol N eq.	2.48E+01	3.98E-04	2.26E-01	2.15E-01	1.80E+00	1.84E-02	-1.82E+00
POCP	kg NMVOC eq.	9.50E+00	1.48E-04	6.72E-02	6.39E-02	5.29E-01	5.57E-03	-6.19E-01
ADP-minerals&metals*	kg Sb eq.	1.65E-03	3.26E-09	1.96E-07	4.63E-07	7.90E-06	1.61E-08	-3.11E-05
ADP-fossil*	MJ	2.16E+04	2.32E-01	6.18E+01	1.04E+02	1.32E+03	5.23E+00	-2.12E+03
WDP*	m^3	1.09E+03	8.58E-03	8.05E-02	1.46E-01	4.30E+01	7.46E-03	-1.75E+01

Acronyms
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 the 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;
ADP-minerals & metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption.

**Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.

ADDITIONAL MANDATORY AND VOLUNTARY IMPACT CATEGORY INDICATORS

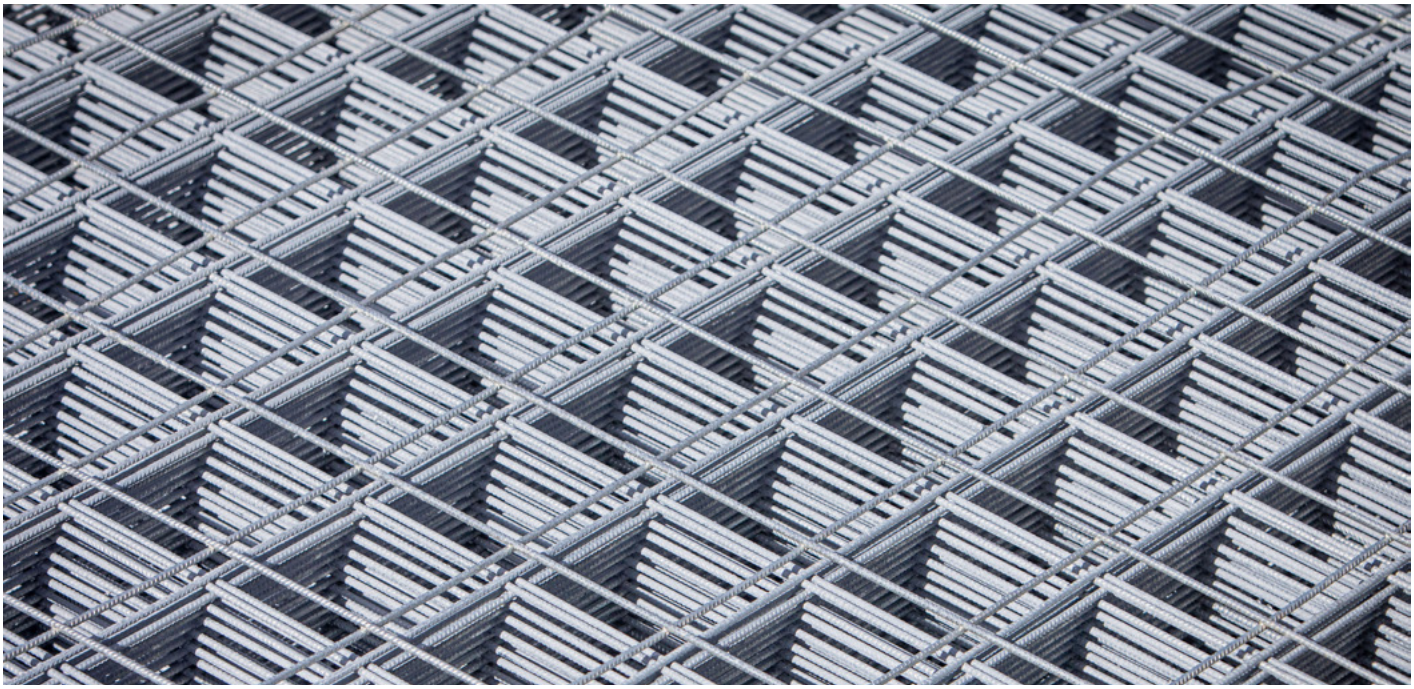
- RESULTS PER DECLARED UNIT

INDICATOR	UNIT	A1-A3	A5	C1	C2	C3	C4	D
GWP-GHG[1]	kg CO_2 eq.	2.00E+03	5.74E-02	4.70E+00	7.72E+00	1.80E+02	4.07E-01	-2.21E+02
PM	Disease incidence	1.93E-04	2.19E-09	1.26E-06	7.84E-07	9.28E-06	1.04E-07	-1.99E-05
IRP**	kBq U-235 eq.	8.21E+00	1.58E-04	1.31E-02	1.58E-02	1.37E+00	1.33E-03	-1.39E+00
ETPF*	CTUe	3.92E+04	9.53E-02	2.14E+00	6.92E+00	1.44E+02	2.46E-01	-8.80E+03
HTPC*	CTUh	9.03E-05	9.83E-12	3.30E-10	2.67E-09	8.44E-08	8.91E-11	-2.62E-05
HTPNC*	CTUh	7.39E-05	2.04E-10	4.70E-09	7.45E-08	5.60E-07	5.56E-10	-1.85E-06
SQP*	Dimensionless	3.80E+03	5.01E-01	1.31E-01	4.26E-01	4.03E+02	6.18E+00	-2.33E+02

* Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of the results are high and as there is limited experience with the indicator.

** Disclaimer: This impact category deals mainly with the eventual impact of low dose ionising radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

*** Disclaimer: Additional voluntary indicators e.g. the voluntary indicators from EN 15804 or the global indicators according to ISO 21930:2017



RESOURCE USE INDICATORS

RESULTS PER DECLARED UNIT								
Indicator	Unit	A1-A3	A5	C1	C2	C3	C4	D
PERE	MJ	1.24E+03	2.10E-03	1.38E-01	1.70E-01	3.30E+02	2.47E-02	-2.27E+01
PERM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	1.24E+03	2.10E-03	1.38E-01	1.70E-01	3.30E+02	2.47E-02	-2.27E+01
PENRE	MJ	2.42E+04	2.32E-01	6.18E+01	1.04E+02	2.16E+03	5.23E+00	-2.12E+03
PENRM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ	2.42E+04	2.32E-01	6.18E+01	1.04E+02	2.16E+03	5.23E+00	-2.12E+03
SM	kg	7.04E+02	1.11E-05	1.11E-04	7.75E-05	2.17E-03	1.06E-05	-2.32E-02
RSF	MJ	1.73E-02	9.76E-07	2.21E-05	7.13E-06	3.15E-04	2.01E-06	-3.13E-03
NRSF	MJ	4.17E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	8.92E+00	2.01E-04	1.94E-03	3.50E-03	8.58E-01	1.81E-04	-4.20E-01

Acronyms
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 re-sources;
SM = Use of secondary material; RSF = Use of renewable secondary fuels;
NRSF = Use of non-renewable secondary fuels;
FW = Use of net fresh water

WASTE INDICATORS

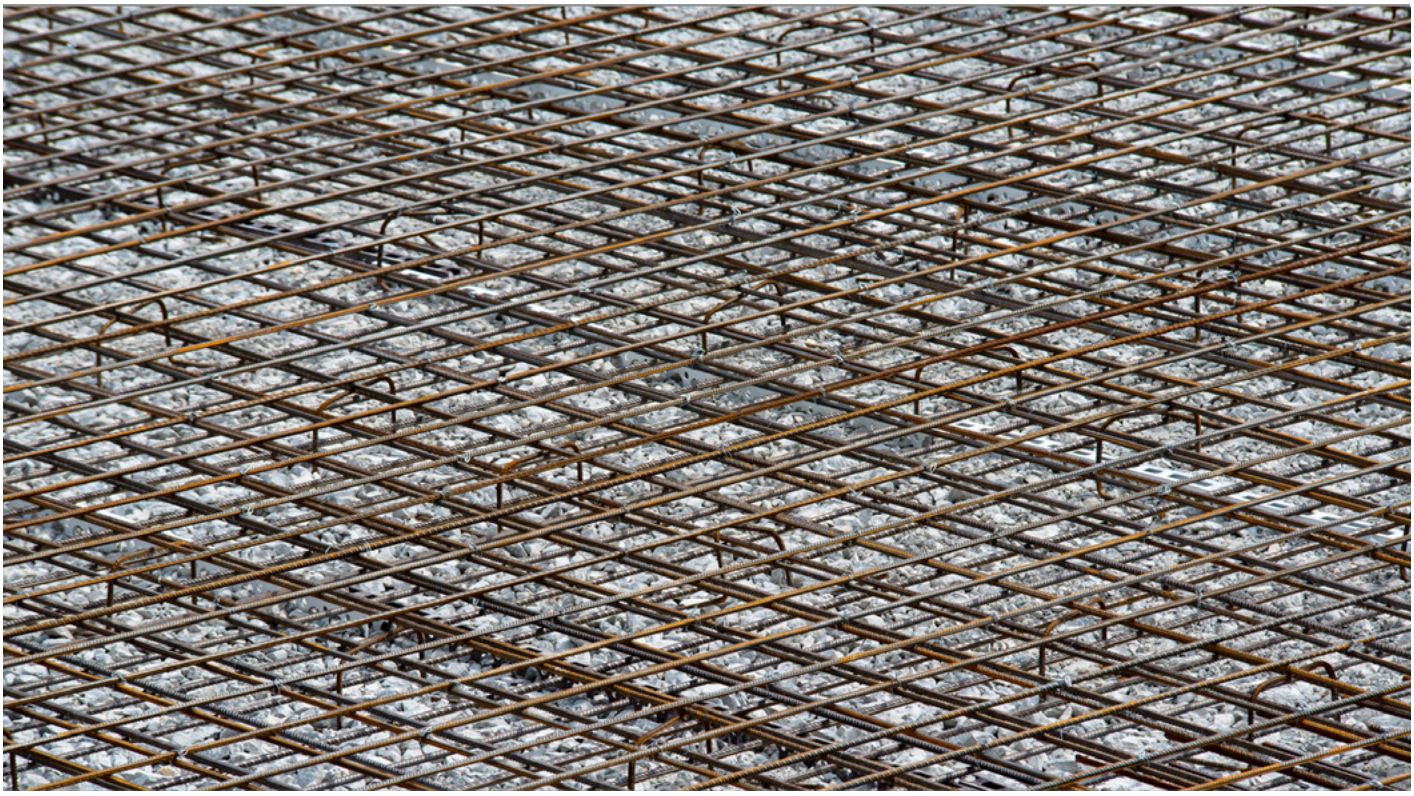
RESULTS PER DECLARED UNIT								
Indicator	Unit	A1-A3	A5	C1	C2	C3	C4	D
Hazardous waste disposed	kg	8.10E+01	1.74E-04	6.68E-03	3.31E-02	1.52E+00	2.51E-03	-1.70E+01
Non-hazardous waste disposed	kg	9.74E+02	4.11E+00	2.25E-01	8.34E-01	9.01E+01	6.23E-02	-4.04E+02
Radioactive waste disposed	kg	3.67E-02	3.84E-08	3.16E-06	3.75E-06	3.58E-04	3.20E-07	-3.38E-04

OUTPUT FLOW INDICATORS

RESULTS PER DECLARED UNIT								
Indicator	Unit	A1-A3	A5	C1	C2	C3	C4	D
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Material for recycling	kg	6.39E+01	2.31E-06	1.58E-06	2.88E-06	1.00E-04	1.48E-07	-2.36E-03
Materials for energy recovery	kg	4.57E-01	1.04E-08	8.75E-08	1.19E-07	1.84E-05	1.83E-08	-5.91E-05
Exported energy, electricity	MJ	9.37E-01	1.51E-05	4.67E-04	5.39E-04	6.56E-02	4.33E-05	-7.85E-02
Exported energy, thermal	MJ	6.58E-01	1.45E-05	1.16E-03	8.83E-04	1.11E-01	1.15E-04	-9.86E-02

EN 15804:2012+A1 IMPACT CATEGORIES

RESULTS PER DECLARED UNIT								
Indicator	**Unit**	**A1-A3**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
GWP	kg CO_2 eq.	1.97E+03	5.38E-02	4.64E+00	7.62E+00	1.79E+02	4.02E-01	-2.16E+02
ODP	kg CFC 11 eq.	2.76E-06	2.14E-10	5.83E-08	8.25E-08	5.98E-07	4.76E-09	-5.20E-07
AP	kg SO_2 eq.	6.44E+00	6.43E-05	3.07E-02	3.11E-02	2.70E-01	2.62E-03	-5.98E-01
EP	kg PO_4^{3-} eq.	1.05E+00	1.52E-04	7.07E-03	7.08E-03	7.79E-02	6.05E-04	-2.40E-01
POCP	kg C_2H_4 eq.	1.41E+00	1.30E-05	7.86E-04	1.10E-03	7.57E-03	1.18E-04	-9.47E-02
ADPE	kg Sb eq.	1.65E-03	3.26E-09	1.96E-07	4.63E-07	7.90E-06	1.61E-08	-3.11E-05
ADPF	MJ (NCV)	2.41E+04	2.29E-01	6.16E+01	1.04E+02	2.14E+03	5.21E+00	-2.10E+03



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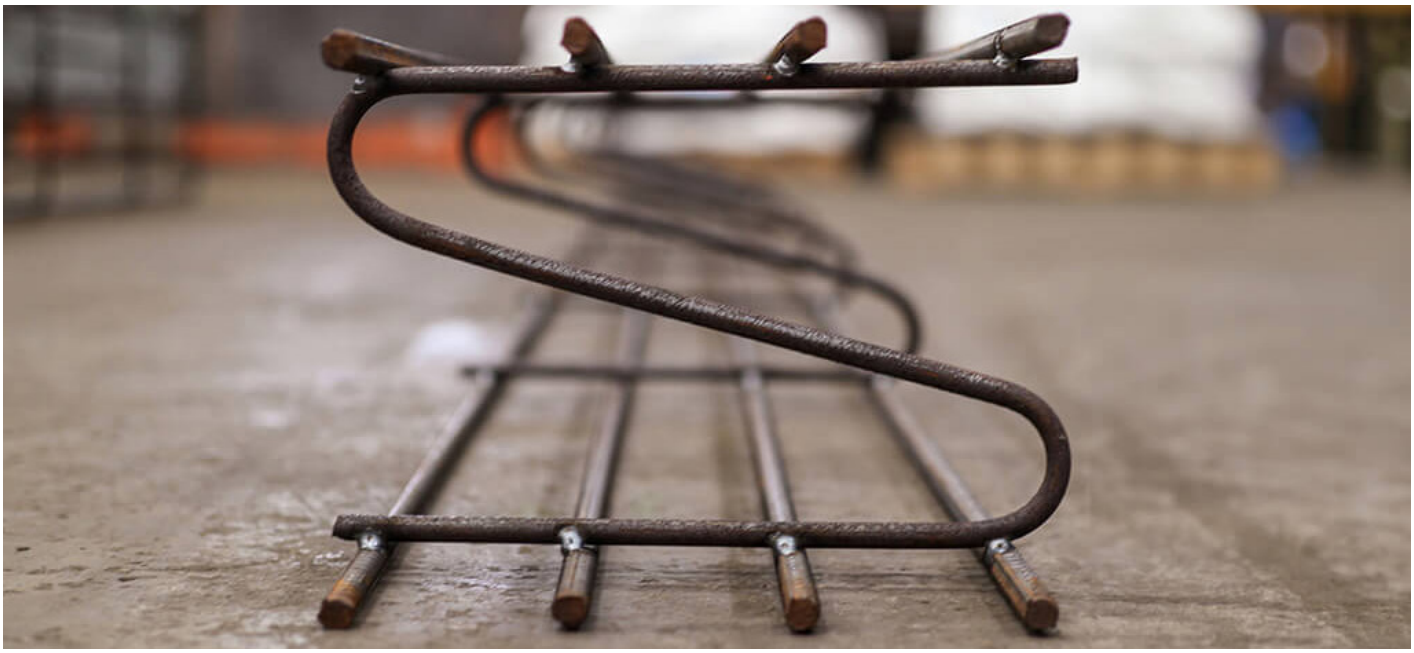

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