Environmental Product Declaration
In accordance with ISO 14025
and EN 15804:2012+A2:2019

BlueScope

COLORBOND® Intramax® steel EPD

ECO PLATFORM EPD VERIFIED

AUSTRALASIA EPD®
ENVIRONMENTAL PRODUCT DECLARATION

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Colorbond®

Programme-Related Information and Verification

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Product Category Rules (PCR):	PCR 2019:14 Construction Products, Version 1.11, 2021-02-05
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Independent verification of the declaration and data, according to ISO 14025:	☐ EPD process certification ☑ EPD verification (external)
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Verifier approved by:	**EPD Australasia Ltd**
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General Information

- EPDs within the same product category but from different programmes may not be comparable.
- EPDs of construction products may not be comparable if they do not comply with EN 15804:2012+A2:2019 or if they are produced using different Product Category Rules (PCR).
- BlueScope Steel Limited has sole ownership, liability and responsibility for this EPD.

Declared Unit

This EPD provides data for one flat square metre (1 m²) of COLORBOND® Intramax® steel (CRP) manufactured by BlueScope in Australia at Base Metal Thicknesses (BMTs) 0.40, 0.45, 0.50 and 0.60 mm.

The product range represented by this EPD is COLORBOND® Intramax® steel (CRP)[1] with a hot dipped zinc (Z275) coating. This EPD excludes all other COLORBOND® steel products, such as COLORBOND® steel for roofing and walling, COLORBOND® steel Metallic, COLORBOND® Coolmax® steel, COLORBOND® Ultra steel, COLORBOND® steel for insulated panels, COLORBOND® steel for garage doors, COLORBOND® steel for fencing and COLORBOND® steel for patios and pergolas.

1. Refer to the COLORBOND® Intramax® steel (CRP) datasheet at www.steel.com.au.

Key Insights

Note: EN 15804:2012+A1:2013 compliant results are also given in this document to assist comparability across EPDs and support use in tools such as Green Star and IS Rating.

Benefits of using this EPD

This EPD can contribute to the achievement of credit points under Green Star rating tools, the IS Rating Scheme (IS) and other leading green building rating schemes.

Green Star

Green Star registered projects can score points for using products with EPDs. BlueScope's steel products and this EPD may help obtain points in:

- Green Star – Design and As Built v1.3
  - Credit 19A – Life Cycle Assessment
  - Credit 19B.2 – Life Cycle Impacts – Steel
  - Credit 20.1 – Responsible Building Materials
  - Credit 21 – Sustainable Products
- Green Star – Buildings
  - Credits 6 to 9 – Responsible Products (Structure, Envelope, Systems or Finishes)
  - Credit 21 – Upfront Carbon Emissions
  - Credit 26 – Life Cycle Impacts
- Green Star – Communities v1.1
  - Credit 26 – Materials

IS Rating

IS projects can claim points for using products with EPDs. EPD results can also be included in the IS Materials Calculator and may help a project achieve reductions compared to a 'base case' footprint.

BlueScope's steel products and this EPD may help obtain points in:

- IS Design & As Built v1.2
  - Mat-1 Materials Life Cycle Impact Measurement and Reduction
  - Mat-2 Environmentally Labelled Products and Supply Chains
- IS Design & As Built v2.1
  - Rso-6 Materials Life Cycle Impact Measurement and Reduction
  - Rso-7 Sustainability Labelled Products and Supply Chains

BlueScope's products are also included in the Infrastructure Sustainability Council (ISC) ISupply Directory which connects products and services with projects and assets undertaking IS ratings.

This EPD also provides:

- Environmental performance information from cradle to gate (modules A1-A3), plus modules C1-C4 and module D.
- Carbon footprint data for use in Scope 3 carbon footprint calculations of your supply chain.
- A wide range of environmental metrics, such as water, energy and waste.

For more information on how BlueScope's products can help achieve more sustainable project outcomes contact BlueScope Steel Direct on 1800 800 789.

Take care when comparing

When comparing EPDs it is important to consider:

- EPDs within the same product category but from different programmes or utilising different Product Category Rules (PCRs) may not be comparable.
- The results for EN 15804:2012+A1:2013 compliant EPDs are not comparable with EN 15804:2012+A2:2019 compliant ones, as the methodologies differ. This EPD provides additional results in accordance to EN 15804:2012+A1:2013 to assist comparability across EPDs and support use in rating tools such as Green Star and IS Rating.
- EPDs of construction products from a group of manufacturers (industry-wide EPD) may not be comparable to an EPD of a similar construction product that has been generated by a single manufacturer (product-specific or manufacturer-specific EPD).
- Understanding the detail is important in comparisons. Expert analysis is often required to understand the detail and ensure data is truly comparable, to avoid unintended distortions.
- The best way to compare products and materiality of differences is to place them into the context of a structure across the whole life cycle.

If you need help interpreting the data in this EPD, please contact BlueScope Steel Direct on 1800 800 789.

BlueScope's Climate Action

Steel is an essential material for modern society and a critical enabler of sustainable development. We recognise that steelmaking is emissions-intensive and we are committed to climate action. Our climate strategy outlines our decarbonisation plans, including our goal of net zero greenhouse gas emissions across our operations by 2050[2], dependent on several enablers based around technology, renewable energy and public policy.

We have a promising innovation pipeline including collaborations with Rio Tinto and others, to explore ways to decarbonise iron and steelmaking processes. We believe these projects will help take us to the cutting edge of current technologies and demonstrate our commitment to reduce the embodied carbon of our products.

More information on BlueScope's climate action, can be found on our website: www.bluescope.com/sustainable-steel

OUR PATHWAY

SET A GOAL FOR:

NET ZERO

GHG emissions across our operations by 2050[2]

SET TARGETS FOR:

12%

GHG emission intensity reduction by 2030 for our steelmaking activities
(based on 2018 levels)

30%

GHG emission intensity reduction by 2030 for our non-steelmaking activities[3]
(based on 2018 levels)

2. Our net zero goal covers BlueScope's Scope 1 and 2 GHG emissions. Achieving the 2050 net zero goal is highly dependent on several enablers, including commerciality of emerging and breakthrough technologies, the availability of affordable and reliable renewable energy and hydrogen, availability of quality raw materials, and appropriate policy settings.
3. The Non-Steelmaking Target applies to our midstream activities that include our cold rolled, metal coating and painting lines and long and hollow products. It excludes our downstream activities.
4. Pickin J et al., National Waste Report 2020, Prepared for the Department of Agriculture, Water and the Environment; 2020, p. 39.
5. Refers to the carbon emissions, or emissions of greenhouse gases, associated with materials throughout the life cycle of a building or infrastructure, not to the carbon content in the metal alloy.
6. www.worldsteel.org/about-steel/steel-facts.html
7. www.iea.org/reports/iron-and-steel-technology-roadmap

Image courtesy of Bondor Metecno

Steel and Embodied Carbon

Steel is one of the most recycled materials in the world, with the inherent value of scrap driving its recovery. In Australia, this is evidenced by a recycling rate for metals of 90%[4]. The recyclability of steel is enabled by its magnetic properties, which mean that it can be easily separated for recycling and is less likely to end up in landfill.

The recycled content in a steel product can have a significant effect on embodied carbon. While specifying high levels of recycled content can be an effective way of minimising the embodied carbon[5] of many materials, especially those likely to be disposed of at end of life, recycled content is not necessarily a useful metric for steel in the context of reduction of carbon emissions by the steel sector. This is because despite being one of the most recycled materials in the world[6], there is not enough steel scrap available to meet the growing global demand for steel[7].

Specification of 'secondary' steel or steel products with higher levels of recycled content as a means of reducing embodied carbon, is unlikely to cause more steel to be recycled. Rather, doing so may shift the environmental burden around the value chain, and in fact increase the burden, as scrap and the final product may be transported around the globe unnecessarily.

While global demand for scrap continues to outstrip supply, the development and deployment of new low GHG emissions technologies for 'primary' steel production (using raw material inputs such as iron ore and metallurgical coal) while increasing the role of 'secondary' steelmaking (principally using scrap steel), will be key to reducing carbon emissions in the steel sector.

Responsible™ Steel | standards & certification

BlueScope is a founding member of ResponsibleSteel™, the steel industry's first global independent multi-stakeholder standard and certification program. It has been designed to ensure customers, stakeholders and consumers can be confident that the steel they use has been sourced and produced responsibly.

Initiatives, such as ResponsibleSteel™, are incorporating new methodologies to ensure that the carbon emissions of steel products are calculated on a like-for-like basis, irrespective of the input materials used and the steel production technology.

Embodied carbon and climate transition in a hard-to-abate sector

There is growing recognition from research and standard setting organisations that the percentage of recycled content in steel is not a good proxy for climate transition for the steel sector.

New methodologies, tools and guidance are being developed by organisations such as ResponsibleSteel™, to enable steel companies to set targets that align with science-based decarbonisation pathways and consider the unique context of the sector.

BlueScope is a participant in the Expert Advisory Group convened by the Science Based Targets initiative (SBTi) for the development of science-based target setting methodologies, tools and guidance in the steel sector to help meet the 1.5 °C goal of the Paris Agreement.

These initiatives build on the work of the Net Zero Steel Pathway Methodology Project (NZSPMP), which developed recommendations to identify and recognise low carbon emissions steelmaking, irrespective of the proportion of scrap or iron ore used as the primary input material. This approach would enable users to identify and reward reductions in embodied carbon and efficiencies in manufacturing practices for the steel sector, rather than simply identifying products that use more or less scrap steel, creating another° basis for downstream users of steel to contribute to the achievement of the Paris Agreement through their steel specifying and purchasing decisions, and to recognise responsible steelmakers for their own commitment.

More information: **www.sciencebasedtargets.org/sectors/steel** and **www.netzerosteelpathwayproject.com**

Achieving Sustainable Outcomes with Steel

Steel is central to a circular economy – one where resources and materials are kept in use for as long as possible and then repaired, returned or recycled. Steel can be infinitely recycled and is 100% recyclable without loss of quality.

Design considerations

Life cycle thinking. A focus on design is important to minimise the whole of life impact of any construction project. Steel is a strong, durable and versatile material. It lends itself well to structures that are designed for long life, resilience and flexibility to accommodate multiple future reuse options without reinvestment in structural alteration and refurbishment. Steel also supports designs where end of life considerations are key e.g. designing for disassembly and reuse.

Dematerialisation. BlueScope manufactures a range of standard and high strength steel grades in plate and coil form. High strength steel grades enhance the strength to weight performance in structural steel applications when the design is governed by strength; by maximising the strength grade, a reduced volume of steel would be required in these applications, e.g. columns and primary members. This in turn can result in embodied carbon savings relative to a reference building design that utilises standard steel grades.

Specification considerations

ResponsibleSteel™. ResponsibleSteel™ is the steel industry's first global independent multi-stakeholder standard and certification initiative. The ResponsibleSteel™ Standard covers a wide range of sustainability topics, including Climate Change and Greenhouse Gas Emissions, Biodiversity, Water Stewardship and Human Rights. Specifying steel from a ResponsibleSteel™ certified site supports steel manufacturers such as BlueScope who are committed to climate action and sustainability. It also supports those downstream to manage ESG (Environmental, Social and Governance) risks in the steel supply chain.

More information: www.responsiblesteel.org

EPDs and ecolabels. EPDs and ecolabels demonstrate a manufacturer's commitment to product transparency and stewardship. EPDs and ecolabels provide key sustainability information to support decision-making and the achievement of more sustainable outcomes.

Further information on the sustainability credentials of BlueScope's products: www.steel.com.au

Manufacturer commitments and investment. Understand the commitments manufacturers have made to sustainability and climate change action and consider their investment in Research & Development activities.

More information on BlueScope's commitments and activities can be found in our Climate Action Report and Sustainability Report: www.bluescope.com/sustainable-steel/reports/

Contributing to a Sustainable Future at BlueScope

BlueScope has a long-standing commitment to developing innovative, responsible products and services. You can design and specify with confidence, knowing that COLORBOND® Intramax® steel (CRP) is created with durability, performance and compliance top of mind.

Steel and the Circular Economy

Steel is strong, durable, and versatile and its inherent properties allow it to be recycled without loss of quality over and over again. In some cases, it can be reused without reprocessing, again saving on energy and resource use.

To help support a more sustainable 'circular economy', the steel manufactured by BlueScope in Australia incorporates pre- and post-consumer recycled content8. Steel is 100% recyclable and its magnetic properties mean that it can be separated for recycling and is less likely to end up in landfill.

Warranty Confidence

When you specify, purchase or install COLORBOND® Intramax® steel you are also benefiting from the support of BlueScope, one of Australia's largest manufacturers. COLORBOND® Intramax® steel is renowned for its durability, and is backed by BlueScope. BlueScope offers a warranty subject to application and eligibility criteria.[9]

Responsible Steel™
CERTIFIED SITE
RS748734

Certification of Port Kembla Steelworks

BlueScope's Port Kembla Steelworks is certified to the ResponsibleSteel™ Standard version 1.1. Australia's largest steel production facility has an annual production capacity of approximately 3 million tonnes of crude steel.

It manufactures slab, hot rolled coil and plate products. Branded products such as COLORBOND® steel, TRUECORE® steel, ZINCALUME® steel and XLERPLATE® steel are manufactured from steel produced at the Port Kembla Steelworks.

8. Across the range of steel products manufactured by BlueScope in Australia, the average recycled content (according to recycled content categories defined in ISO 14021:2016) in the steel is 17.4%, which includes pre- and post-consumer recycled materials. Scrap and iron-bearing materials generated and reclaimed from BlueScope's steelmaking, coating and painting operations represent an additional 6.8% recovered content, which is not reported as recycled content. Scrap from rollforming and fabrication processes are included as pre-consumer recycled content. The figures provided represent our best estimate at the time of publication. For more information please contact BlueScope Steel Direct on 1800 800 789.
9. Warranties subject to exclusions, application, and eligibility criteria. For full terms and conditions visit www.bluescopesteel.com.au/warranties.

Declared Unit

This EPD is valid for one flat square metre (1 m²) of COLORBOND® Intramax® steel (CRP) manufactured by BlueScope in Australia.

Image courtesy of Bondor Metecno

Product Description

COLORBOND® Intramax® steel (CRP) is a prepainted steel product specifically designed for the manufacture of coolroom panels for cold storage and other temperature-controlled environments.

This EPD sets out information on the average COLORBOND® Intramax® steel (CRP) product[10] manufactured by BlueScope in Australia, in the base metal thicknesses (BMTs) presented in the table below.

The product range represented by this EPD only includes COLORBOND® Intramax® steel (CRP) with a hot dipped zinc (Z275) coating. It excludes all other COLORBOND® steel products, such as COLORBOND® steel for roofing and walling, COLORBOND® Coolmax® steel, COLORBOND® steel Metallic, COLORBOND® Ultra steel, COLORBOND® steel for insulated panels, COLORBOND® steel for garage doors, COLORBOND® steel for fencing and COLORBOND® steel for patios and pergolas. This EPD also excludes removable films that may be applied to COLORBOND® Intramax® steel at the paint line for protection during transport and installation.

The COLORBOND® Intramax® steel products represented in this EPD consist of a low carbon[11] steel substrate that is coated with a zinc (Z275) coating to provide corrosion resistance and then further protected and enhanced with a specially developed oven-baked paint system, with the backing coat designed to facilitate adhesion to foam cores, for common foam core adhesives, when manufactured into a panel.

The metallic coated base steel (G300S strength grade), conforms to AS 1397:2021: *Continuous hot-dip metallic coated steel sheet and strip - Coatings of zinc and zinc alloyed with aluminium and magnesium.*

The paint system meets the performance requirements of AS/NZS 2728:2013: *Prefinished/pre painted sheet metal products for interior/ exterior building applications - Performance requirements.*

Product	Metallic Coating	Base Metal Thickness (BMT)	Product mass (kg/m² flat product)
COLORBOND® Intramax® steel (CRP)	AM150	0.42 mm	3.51
		0.48 mm	3.98
		0.55 mm	4.53
		0.60 mm	4.92
		0.70 mm	5.70
		0.75 mm	6.10

Manufacturing Process

In Australia, BlueScope manufactures steel from raw and recycled materials using an 'integrated steelmaking' method. This involves the use of iron ore, coal, steel scrap, fluxes (limestone and dolomite) and alloying materials to produce steel slab via the major processes of sintering, coke making, Blast Furnace/Basic Oxygen Furnace (BF-BOF) steelmaking and continuous slab casting, prior to hot rolling into hot rolled coil steel.

The hot rolled coil is then cold reduced. Cold reduction involves pickling (acid cleaning) the coil, followed by cold rolling, where the steel coil is compressed and elongated through rolls to reduce its thickness and increase the strength of the steel. Following cold reduction, the coil is annealed to the required strength, metallic coated for corrosion resistance and skin passed for improved surface finish at the continuous hot-dipped metal coating lines. The metallic coated coil is then transferred to a paint line, where pre-treatment, primer, finish and reverse coat layers are baked on to produce the COLORBOND® Intramax® steel product prior to recoiling and packaging ready for shipment to customers for processing.

Downstream processing

COLORBOND® Intramax® steel is supplied by BlueScope to downstream processors in coils. The coils are uncoiled and used in the manufacture of sandwich panels for coolrooms.

This EPD does not cover downstream processing of COLORBOND® Intramax® steel.

Product Content

The average composition[12] of one flat square metre (1 m²) of COLORBOND® Intramax® steel (CRP) is:

Product Composition		Mass (kg)	Recycled material (pre- and post-consumer)
Steel Substrate	Carbon Steel	3.14 (0.40 mm) – 4.71 (0.60 mm)	17.4% (average recycled content across the range of steel products manufactured by BlueScope in Australia)[13]
Metallic Coating (Z275)	Aluminium	<0.003	-
	Antimony	<0.001	-
	Zinc	0.278–0.292	-
Paint Coatings	Topcoat[14]	0.04	-
	Backing coat[15]	0.02	-

Packaging Materials	Mass (kg)	Packaging (as % of product mass)
Steel	0.012	0.24%-0.35%
Plastic (excl. CORSTRIP® film/strippable film[16])	0.002	0.04%-0.06%
Cardboard	0.001	0.02%-0.03%
Timber	0.007	0.14%-0.20%

COLORBOND® Intramax® steel (CRP) is compliant with the European REACH regulation[17]. For safe use and maintenance, refer to the product Safety Data Sheet (SDS) at www.steel.com.au/library.

What is an SDS?

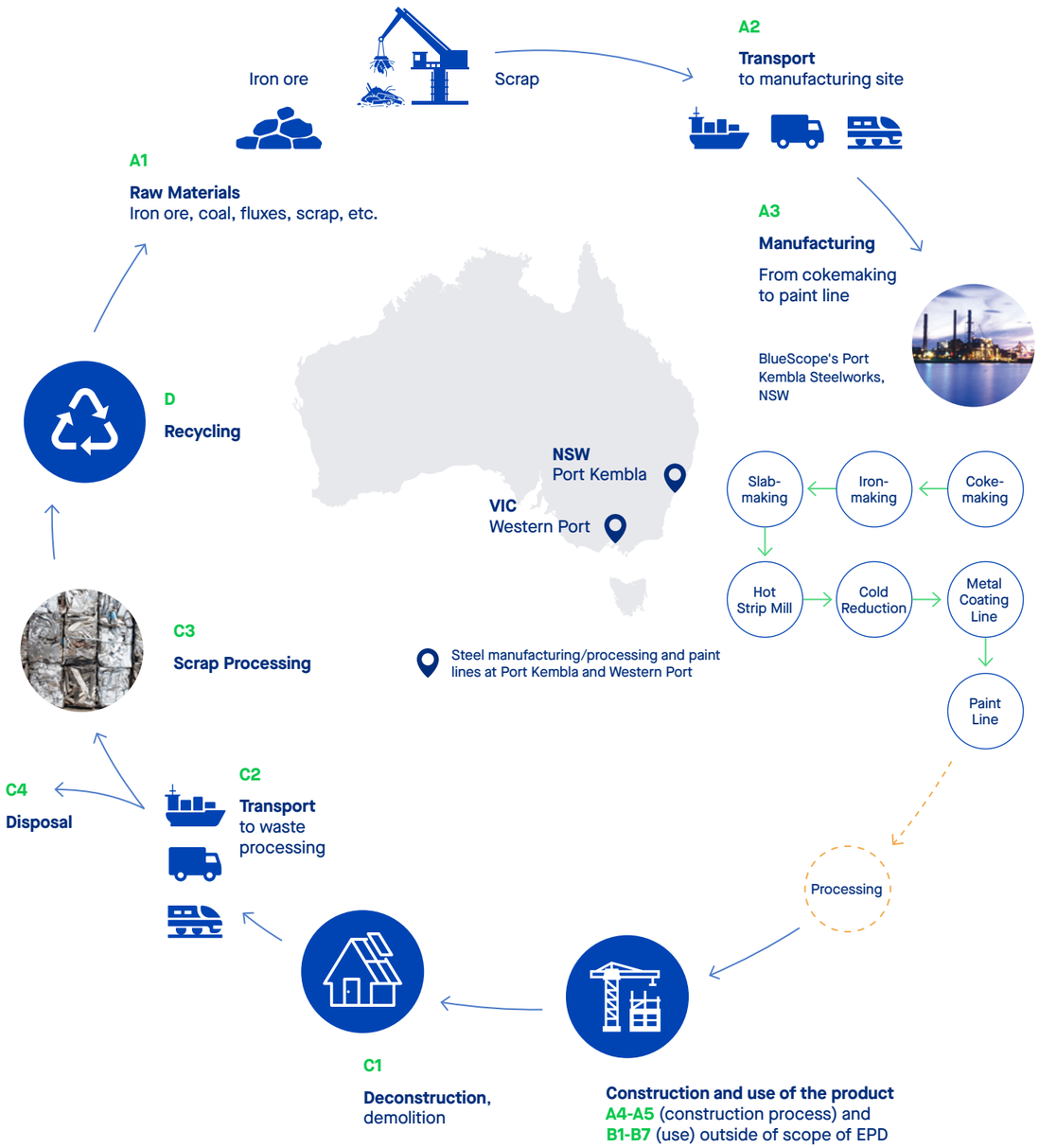
A Safety Data Sheet (SDS) is a document that describes the chemical and physical properties of a product or material and provides safe handling and use information.

Industry Classification

Product	Classification	Code	Category
COLORBOND® Intramax® steel (CRP)	UN CPC	41231	Flat-rolled products of non-alloy steel, clad, plated, coated or otherwise further worked
	ANZSIC	2110	Iron Smelting and Steel Manufacturing

10. Refer to the COLORBOND® Intramax® steel (CRP) datasheet at www.steel.com.au
11. The term 'low carbon steel' refers to the carbon content in the metal alloy (which is typically less than 0.3% carbon content), and not to the carbon dioxide (CO_2) emissions associated with the product.
12. The product composition provided is an average and variability among individual products is expected. Please note that we are constantly working to improve our products and changes to their composition may occur over time. If clarification on a particular product is needed please contact BlueScope Steel Direct on 1800 800 789.
13. Across the range of steel products manufactured by BlueScope in Australia, the average recycled content (according to recycled content categories defined in ISO 14021:2016) in the steel is 17.4%, which includes pre- and post-consumer recycled materials. Scrap and iron-bearing materials generated and reclaimed from BlueScope's steelmaking, coating and painting operations represent an additional 6.8% recovered content, which is not reported as recycled content. Scrap from rollforming and fabrication processes are included as pre-consumer recycled content. The figures provided represent our best estimate at the time of publication. For current recycled content figures please contact BlueScope Steel Direct on 1800 800 789.
14. Proprietary coatings (pre-treatment, primer and finish coat).
15. Proprietary coatings (pre-treatment, primer and reverse coat).
16. Some COLORBOND® Intramax® steel products are delivered with CORSTRIP® film to protect the product from damage during transport and installation. CORSTRIP® film is made from 100% low-density polyethylene (LDPE). Note occasionally strippable film may be supplied in lieu of CORSTRIP® film for operational reasons.
17. Regulation (EC) No. 1907/2006 of the European Parliament and of the Council of 18 December 2006 on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH).

COLORBOND® Intramax® steel Manufacturing and Processing in Australia



Scope of Declaration

This declaration is for one flat square metre (1 m²) of COLORBOND® Intramax® steel (CRP) manufactured by BlueScope in Australia[18]. The scope of this declaration is from cradle to gate (modules A1-A3), with modules C1-C4 and module D.

Modules A4-A5 (construction process) and B1-B7 (use) have not been included due to the inability to predict how the material will be used following manufacture.

The system boundary applied in this study extends from mining of raw materials such as iron ore and coal; transport to and within the manufacturing site; coke, sinter, iron and steel manufacture; ancillary service operations; hot rolling of steel products, cold reduction, metallic coating and coil painting and packaging for dispatch to direct customers at the exit gate of the paint line. Removable films that may be applied to COLORBOND® Intramax® steel at the paint line for protection during transport and installation are excluded from the scope of this EPD.

The system boundary also includes manufacture of other required input materials, transport between processing operations, the production of external services such as electricity, natural gas and water, and the production of co-product materials within the steelmaking process, which have been removed by the use of allocation techniques. Wastes and emissions to air, land and water are also included, as are modules C1-C4 (end of life stage), and module D (reuse, recovery and/or recycling potential).

	Product stage			Construction process stage		Use stage							End of life stage				Benefits and loads beyond the system boundary
	Raw material supply	Transport	Manufacturing	Transport	Construction / installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction, demolition	Transport	Waste processing	Disposal	Reuse / recovery / recycling potential
Modules	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	AU	AU	AU	–	–	–	–	–	–	–	–	–	AU	AU	AU	AU	GLO
Specific data	>90%			–	–	–	–	–	–	–	–	–	–	–	–	–	–
Variation – products	<10%			–	–	–	–	–	–	–	–	–	–	–	–	–	–
Variation – sites	<10%			–	–	–	–	–	–	–	–	–	–	–	–	–	–

X = Module declared; ND = Not declared (such a declaration shall not be regarded as an indicator of a zero result).

18. As described in the Product Description on page 11.

Life Cycle Assessment (LCA) Methodology

This EPD has been produced in conformance with the requirements of PCR 2019:14 v1.11 Construction Products, the Instructions of the Australasian EPD Programme v3.0, and the International EPD® System General Programme Instructions (GPI) v3.01.

Primary data

This study focuses on the further processing of steel beyond hot rolling to produce COLORBOND® Intramax® steel (CRP). Upstream hot rolled steel manufacturing data for low carbon[19] Hot Rolled Coil used in this study was obtained from v2.0 of the EPD for Steel – Hot Rolled Coil (S-P-00557).

Primary data were collected for all relevant BlueScope manufacturing sites in Australia, for all inputs and outputs in the production stage (A1-A3). This study is based on an annual average for the time period July 2018 to June 2019. All direct emissions data were procured from the average results reported to the National Pollution Inventory over the 3-year period 2016 to 2019.

Secondary data

The secondary data used were procured from the GaBi Life Cycle Inventory Database 2022[20]. Most datasets used have a reference year between 2018 and 2021 and all fall within the 10-year limit allowable for generic data under EN 15804.

For the modelling for BlueScope's manufacturing sites, the electricity supply was based on GaBi's state-specific 1kV-60kV grid mix datasets for NSW and VIC as relevant to each BlueScope manufacturing site.

The 2019 1kV-60kV NSW grid mix dataset is highly reliant on hard coal (77%), with imports from VIC (6.5%) and QLD (5.6%), and generation from hydro (4.1%), natural gas (3.3%), wind (2.5%) and photovoltaics (0.74%). The emission factor for the 2019 1kV-60kV NSW grid for the GWP-GHG indicator is 0.987 kg CO_2-eq/kWh (GaBi database 2022).

The 2019 1kV-60kV VIC grid mix dataset is highly reliant on lignite (80%), with generation from hydro (6.3%), wind (6.2%), and natural gas (3.2%), and imports from TAS (2.4%), NSW (1.1%) and SA (0.68%). The emission factor for the 2019 1kV-60kV VIC grid for the GWP-GHG indicator is 1.13 kg CO_2-eq/kWh (GaBi database 2022).

Water use in relation to BlueScope's manufacturing sites was modelled using the specific watershed scarcity data for each BlueScope manufacturing site.

Cut off criteria

All relevant and available data were collected. While cut-off criteria according to the Product Category Rules (PCR) section 4.4 were employed, much of the data which would have fallen within that scope were included where available, resulting in a data set which is robust and captures all significant contributors to the LCA results. Inputs knowingly excluded are the transport and packaging of minor inputs, such as lubricants and greases, which are used in very small quantities.

Personnel is excluded as per section 4.3.1 in the PCR (EPD International, 2021). thinkstep-anz consistently excludes environmental impacts from infrastructure, construction, production equipment, and tools that are not directly consumed in the production process ('capital goods'). This is because high-quality infrastructure-related data isn't always available and there is no clear cut-off for what to include. For this reason, capital goods data may be applied to LCA studies inconsistently and could lead to reduced consistency and comparability of EPDs.

Allocation

For the modelling for BlueScope's manufacturing sites, where subdivision of processes was not possible, allocation was carried out using the most relevant physical quantity, predominantly the mass of throughput (e.g. steel coil) or surface area of the coil (e.g. surface coatings). Economic allocation was not used in this study. No use of system expansion was made (excepting Module D).

End of life

The modelling for Module C1 was based on the use of a 100 kW construction excavator (fuel consumption of 0.172 kg diesel per tonne steel). The modelling for Module C2 assumed 50 km transport by truck to waste processing facility or landfill.

The recycling scenario was based on the National Waste Report 2020[21], which indicates that the average metals recycling rate in Australia is 90%. This is considered to be a conservative estimate for flat steel construction products but was used in the absence of verified higher recycling rates.

End of life allocation follows the requirements of EN 15804:2012+A2:2019 section 6.4.3.3 and generally follows the polluter pays principle. Any open scrap inputs into manufacturing remain unconnected, and so are treated as 'burden free'. At the end of life of a product, scrap is collected for recycling and is thus available to produce a recycling credit within Module D. A credit for net scrap is given in Module D based on the base metal used in the product.

Key assumptions and qualifications:

- Accuracy of data measurement falls within normal industrial weighing systems accuracy limits of +/-5%.
- Transport and packaging of minor materials is insignificant to the overall impacts.
- Nominally identical products are produced on a combination of production lines in parallel, and therefore the impacts of each product are a weighted average of the various production lines. The impact of any differences in the composition of the products, with the exception of any change in base metal thickness (BMT), is insignificant on the outcomes of the LCA.
- Proprietary chemicals and paints can be sufficiently modelled using guidance from Safety Data Sheets and conservative assumptions on that basis.
- Upstream data taken from the GaBi LCA database reflects average or generic production and therefore does not correspond to BlueScope's actual suppliers.
- The Module D recovery stage assumes that paint coatings are incinerated and metal coatings are lost as slag during the steel recycling process. This is a conservative assumption for metal coatings as they are likely to make up part of future steel alloys.

19. The term 'low carbon' steel refers to the carbon content in the metal alloy (which is typically less than 0.3% carbon content), and not to the carbon dioxide (CO_2) emissions associated with the product.
20. Sphera, GaBi LCA Database Documentation, 2022, https://www.gabi-software.com/support/gabi/gabi-database-2022-lci-documentation/
21. Pickin J et al., National Waste Report 2020, Prepared for the Department of Agriculture, Water and the Environment, 2020, p.39.

Environmental Performance

The environmental impact indicators included in this EPD are described in the table below. All the result tables from this point will contain the abbreviations only. All results reported in MJ are in net calorific value.

Indicator	Abbreviation	Units	Characterisation Method
Core Environmental Impact indicators, in accordance to EN 15804:2012+A2:2019			
Climate change – total	GWP-total	kg CO_2-eq.	EF3.0 (PEF)
Climate change – fossil	GWP-fossil	kg CO_2-eq.	EF3.0 (PEF)
Climate change – biogenic	GWP-biogenic	kg CO_2-eq.	EF3.0 (PEF)
Climate change – land use and land use change	GWP-luluc	kg CO_2-eq.	EF3.0 (PEF)
Ozone depletion	ODP	kg CFC-11-eq.	WMO 2014
Acidification	AP	mol H^+-eq.	Accumulated Exceedance
Eutrophication aquatic freshwater	EP-freshwater	kg P-eq.	EUTREND model (ReCiPe)
Eutrophication aquatic marine	EP-marine	kg N-eq.	EUTREND model (ReCiPe)
Eutrophication terrestrial	EP-terrestrial	mol N-eq.	Accumulated Exceedance
Photochemical ozone formation	POCP	kg NMVOC-eq.	LOTOS-EUROS
Depletion of abiotic resources – minerals and metals	ADP-minerals & metals	kg Sb-eq.	CML 2002a
Depletion of abiotic resources – fossil fuels	ADP-fossil	MJ	CML 2002a
Water depletion potential	WDP	m^3 world-eq. deprived	AWARE
Additional Environmental Impact indicators, in accordance to EN 15804:2012+A2:2019			
Climate change	GWP-GHG	kg CO_2-eq.	IPCC 2013 (AR5)
Particulate Matter emissions	PM	Disease incidence	SETAC-UNEP, Fantke et al. 2016
Ionising radiation – human health	IRP	kBq U-235-eq.	Human Health Effect model
Eco-toxicity – freshwater	ETP-fw	CTUe	Modified USEtox model from EC-JRC
Human toxicity potential – cancer effects	HTP-c	CTUh	Modified USEtox model from EC-JRC
Human toxicity potential – non-cancer effects	HTP-nc	CTUh	Modified USEtox model from EC-JRC
Land use related impacts / soil quality	SQP	dimensionless	Soil quality index (LANCA®)
Resource use parameters			
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	PERE	MJ	n/a
Use of renewable primary energy resources used as raw materials	PERM	MJ	n/a
Total use of renewable primary energy resources	PERT	MJ	n/a
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	PENRE	MJ	n/a
Use of non-renewable primary energy resources used as raw materials	PENRM	MJ	n/a
Total use of non-renewable primary energy resources	PENRT	MJ	n/a
Use of secondary material	SM	kg	n/a
Use of renewable secondary fuels	RSF	MJ	n/a
Use of non-renewable secondary fuels	NRSF	MJ	n/a
Net use of fresh water	FW	m^3	n/a

Waste Categories and Output Flows			
Hazardous waste disposed	HWD	kg	n/a
Non-hazardous waste disposed	NHWD	kg	n/a
Radioactive waste disposed	RWD	kg	n/a
Components for re-use	CRU	kg	n/a
Materials for recycling	MFR	kg	n/a
Materials for energy recovery	MER	kg	n/a
Exported energy – electrical	EEE	MJ	n/a
Exported energy – thermal	EET	MJ	n/a
Additional Environmental Impact indicators, in accordance to EN 15804:2012+A1:2013			
Global warming potential	GWP	kg CO_2-eq.	IPCC 2007 (AR4)
Ozone depletion potential	ODP	kg CFC-11-eq.	WMO 2003
Acidification potential	AP	kg SO_2-eq.	CML 2002b
Eutrophication potential	EP	kg PO_4^{3-}-eq.	CML 2002b
Photochemical ozone creation potential	POCP	kg C_2H_4-eq.	CML 2002b
Abiotic depletion potential for non-fossil resources	ADPE	kg Sb-eq.	CML 2002b
Abiotic depletion potential for fossil resources	ADPF	MJ	CML 2002b
Additional Green Star v1.3 indicators			
Human Toxicity – cancer effects	HTc - GS	CTUh	USEtox
Human Toxicity - non-cancer effects	HTnc - GS	CTUh	USEtox
Land use	LU - GS	kg C deficit-eq.	Soil Organic Matter method
Resource depletion – water	RDW - GS	m^3-eq.	Water Stress Indicator
Ionising radiation	IR – GS	kBq U235-eq.	Human Health Effect model
Particulate matter	PM - GS	kg PM2.5-eq.	RiskPoll

Results for 1 m² of COLORBOND® Intramax® steel in 0.40mm base metal thickness (BMT)

In accordance to EN 15804:2012+A2:2019

Product mass: 3.48 kg/m² flat

Note: The profile of the formed product will affect how many flat square metres are required to cover a given surface area.

Environmental Impacts

Indicator	Unit	A1-A3	C1	C2	C3	C4	D
GWP-total	kg CO_2-eq.	12.2	0.00217	0.0165	0.153	0.0168	-3.52
GWP-fossil	kg CO_2-eq.	12.2	0.00217	0.0165	0.153	0.0168	-3.52
GWP-biogenic	kg CO_2-eq.	-0.00498	2.15E-07	5.49E-06	1.71E-04	3.31E-05	0.00223
GWP-luluc	kg CO_2-eq.	5.64E-04	1.58E-08	1.77E-07	5.87E-06	1.01E-05	-6.86E-05
ODP	kg CFC-11-eq.	8.91E-12	1.72E-16	1.65E-15	6.80E-13	2.21E-14	9.69E-14
AP	mol H^+-eq.	0.0424	1.03E-05	4.25E-05	7.69E-04	5.30E-05	-0.00322
EP-freshwater	kg P-eq.	5.32E-06	3.81E-10	2.71E-09	8.36E-08	1.29E-08	-6.33E-07
EP-marine	kg N-eq.	0.00949	4.99E-06	1.92E-05	1.65E-04	1.29E-05	-1.73E-04
EP-terrestrial	mol N-eq.	0.106	5.46E-05	2.11E-04	0.00180	1.42E-04	0.00124
POCP	kg NMVOC-eq.	0.0319	1.40E-05	4.10E-05	4.57E-04	4.09E-05	-0.00228
ADP-minerals & metals[22]	kg Sb-eq.	3.93E-04	2.65E-11	2.97E-10	1.28E-08	1.17E-09	-1.81E-07
ADP-fossil[22]	MJ	127	0.0288	0.218	1.65	0.238	-32.6
WDP[22]	m^3 world-eq. deprived	1.13	1.61E-05	1.04E-04	0.0598	0.00114	-0.687

Additional Environmental Impacts

Indicator	Unit	A1-A3	C1	C2	C3	C4	D
GWP-GHG[23]	kg CO_2-eq.	11.9	0.00215	0.0163	0.152	0.0163	-3.39
PM	Disease incidence	5.53E-07	1.17E-10	2.79E-10	7.49E-09	5.67E-10	-3.42E-08
IRP[24]	kBq U-235-eq.	0.100	5.47E-08	5.55E-06	2.89E-05	4.24E-04	0.0856
ETP-fw[22]	CTUe	28.8	0.00724	0.0876	0.316	0.0707	-0.938
HTP-c[22]	CTUh	2.06E-09	1.22E-13	1.48E-12	1.42E-11	8.37E-12	-1.52E-09
HTP-nc[22]	CTUh	3.04E-07	7.59E-12	5.87E-11	4.71E-10	8.43E-10	-4.93E-08
SQP[22]	dimensionless	4.08	6.62E-05	6.16E-04	0.212	0.0185	0.463

Resource use

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
PERE	MJ	7.55	9.41E-05	0.00107	0.356	0.0194	2.25
PERM	MJ	0	0	0	0	0	0
PERT	MJ	7.55	9.41E-05	0.00107	0.356	0.0194	2.25
PENRE	MJ	127	0.0288	0.219	1.65	0.238	-32.6
PENRM	MJ	0.626	0	0	0	0	0
PENRT	MJ	127	0.0288	0.219	1.65	0.238	-32.6
SM	kg	0.715	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0
FW	m^3	0.0219	2.43E-07	2.08E-06	8.41E-04	3.36E-05	-0.0156

Waste Categories and Output Flows

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
HWD	kg	4.82E-09	3.13E-14	3.55E-13	5.53E-11	3.60E-11	-2.33E-10
NHWD	kg	0.101	4.12E-07	5.30E-06	5.16E-04	0.348	0.737
RWD	kg	8.46E-04	4.22E-10	4.27E-08	2.25E-07	2.87E-06	9.10E-06
CRU	kg	0	0	0	0	0	0
MFR	kg	1.42	0	0	3.13	0	0
MER	kg	0.00243	0	0	0	0	0
EEE	MJ	0	0	0	0	0	0
EET	MJ	0	0	0	0	0	0

End of Life

Parameter	Unit	Total
Steel collected separately	kg	3.13
Steel collected with mixed construction waste	kg	0.348
Recovery for re-use	kg	0
Recovery for recycling	kg	3.13
Recovery for energy recovery	kg	0
Disposal to landfill	kg	0.348
Assumptions for scenario	–	n/a

Biogenic Carbon Content

	Unit	A1-A3
Biogenic carbon content in product	kg C	0
Biogenic carbon content in packaging	kg C	0.00355

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO_2

Additional Results for 1 m² of COLORBOND® Intramax® steel in 0.40mm base metal thickness (BMT)

In accordance to EN 15804:2012+A1:2013

Environmental Impacts

Indicator	Unit	A1-A3	C1	C2	C3	C4	D
GWP	kg CO_2-eq.	11.8	0.00214	0.0163	0.151	0.0159	-3.34
ODP	kg CFC11-eq.	1.05E-11	2.03E-16	1.95E-15	8.01E-13	2.60E-14	1.13E-13
AP	kg SO_2-eq.	0.0341	7.17E-06	2.99E-05	6.29E-04	4.25E-05	-0.00300
EP	kg PO_4^{3-}-eq.	0.00342	1.67E-06	6.51E-06	5.67E-05	4.54E-06	-5.71E-05
POCP	kg ethene-eq.	0.00534	7.07E-07	-7.95E-06	3.37E-05	3.97E-06	-0.00154
ADPE	kg Sb-eq.	3.93E-04	2.65E-11	2.97E-10	1.28E-08	1.19E-09	-1.75E-07
ADPF	MJ	123	0.0288	0.218	1.65	0.230	-33.5

Additional Green Star v1.3 Indicators

Indicator	Unit	A1-A3	C1	C2	C3	C4	D
HTc - GS	CTUh	2.75E-10	3.29E-15	4.54E-14	5.48E-12	7.32E-13	6.43E-11
HTnc - GS	CTUh	1.02E-10	1.57E-15	1.02E-14	1.75E-13	1.70E-14	1.79E-12
LU - GS	kg C deficit-eq.	2.27	5.46E-06	4.23E-05	0.0172	0.00161	0.187
RDW - GS	m^3-eq.	0.0130	1.56E-07	1.32E-06	5.59E-04	1.69E-05	-0.00848
IR - GS	kBq U235-eq.	0.0996	5.47E-08	5.55E-06	2.89E-05	4.24E-04	0.0856
PM - GS	kg PM2.5-eq.	0.00286	5.15E-07	1.40E-06	4.12E-05	3.00E-06	-2.30E-04

22. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.
23. This indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide emissions and uptake and biogenic carbon stored in the product as defined by the IPCC AR5 report (IPCC 2013). As this indicator uses the same charaterisation factors as the GWP indicator required in v3.01 of the General Programme Instructions (GPI) of the International EPD® System, its inclusion creates comparability with EPDs based on other Product Category Rules (PCRs) aligned with v3.01 of the GPI, as well as comparability with other GHG reporting according ISO 14067.
24. This impact category deals mainly with the eventual impact of low dose ionizing 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 some construction materials, is also not measured by this indicator.

Results for 1 m² of COLORBOND® Intramax® steel in 0.45mm base metal thickness (BMT)

In accordance to EN 15804:2012+A2:2019

Product mass: 3.87 kg/m² flat

Note: The profile of the formed product will affect how many flat square metres are required to cover a given surface area.

Environmental Impacts

Indicator	Unit	A1-A3	C1	C2	C3	C4	D
GWP-total	kg CO_2-eq.	13.2	0.00242	0.0183	0.170	0.0187	-3.98
GWP-fossil	kg CO_2-eq.	13.2	0.00242	0.0183	0.170	0.0187	-3.98
GWP-biogenic	kg CO_2-eq.	-0.00467	2.39E-07	6.11E-06	1.90E-04	3.69E-05	0.00249
GWP-luluc	kg CO_2-eq.	5.79E-04	1.75E-08	1.97E-07	6.53E-06	1.12E-05	-7.83E-05
ODP	kg CFC-11-eq.	9.26E-12	1.92E-16	1.84E-15	7.57E-13	2.46E-14	1.03E-13
AP	mol H^+-eq.	0.0458	1.15E-05	4.73E-05	8.56E-04	5.90E-05	-0.00370
EP-freshwater	kg P-eq.	5.47E-06	4.25E-10	3.02E-09	9.30E-08	1.43E-08	-7.16E-07
EP-marine	kg N-eq.	0.0102	5.55E-06	2.14E-05	1.83E-04	1.44E-05	-2.12E-04
EP-terrestrial	mol N-eq.	0.115	6.08E-05	2.35E-04	0.00200	1.58E-04	0.00120
POCP	kg NMVOC-eq.	0.0345	1.55E-05	4.57E-05	5.09E-04	4.55E-05	-0.00262
ADP-minerals & metals[25]	kg Sb-eq.	3.93E-04	2.95E-11	3.30E-10	1.43E-08	1.30E-09	-2.05E-07
ADP-fossil[25]	MJ	137	0.0321	0.243	1.84	0.265	-36.8
WDP[25]	m^3 world-eq. deprived	1.18	1.79E-05	1.16E-04	0.0666	0.00127	-0.776

Additional Environmental Impacts

Indicator	Unit	A1-A3	C1	C2	C3	C4	D
GWP-GHG[26]	kg CO_2-eq.	12.9	0.00239	0.0182	0.169	0.0181	-3.83
PM	Disease incidence	5.98E-07	1.30E-10	3.10E-10	8.34E-09	6.31E-10	-3.96E-08
IRP[27]	kBq U-235-eq.	0.102	6.09E-08	6.17E-06	3.22E-05	4.72E-04	0.0965
ETP-fw[25]	CTUe	30.0	0.00806	0.0975	0.351	0.0786	-1.08
HTP-c[25]	CTUh	2.14E-09	1.35E-13	1.65E-12	1.57E-11	9.32E-12	-1.71E-09
HTP-nc[25]	CTUh	3.25E-07	8.44E-12	6.53E-11	5.24E-10	9.39E-10	-5.57E-08
SQP[25]	dimensionless	4.32	7.36E-05	6.86E-04	0.235	0.0206	0.519

Resource use

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
PERE	MJ	7.81	1.05E-04	0.00119	0.396	0.0216	2.53
PERM	MJ	0	0	0	0	0	0
PERT	MJ	7.81	1.05E-04	0.00119	0.396	0.0216	2.53
PENRE	MJ	137	0.0321	0.243	1.84	0.265	-36.8
PENRM	MJ	0.626	0	0	0	0	0
PENRT	MJ	137	0.0321	0.243	1.84	0.265	-36.8
SM	kg	0.791	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0
FW	m^3	0.0227	2.70E-07	2.32E-06	9.36E-04	3.73E-05	-0.0176

Waste Categories and Output Flows

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
HWD	kg	4.99E-09	3.48E-14	3.95E-13	6.15E-11	4.00E-11	-2.65E-10
NHWD	kg	0.105	4.58E-07	5.90E-06	5.74E-04	0.387	0.805
RWD	kg	8.55E-04	4.70E-10	4.75E-08	2.51E-07	3.19E-06	9.85E-06
CRU	kg	0	0	0	0	0	0
MFR	kg	1.59	0	0	3.48	0	0
MER	kg	0.00243	0	0	0	0	0
EEE	MJ	0	0	0	0	0	0
EET	MJ	0	0	0	0	0	0

End of Life

Parameter	Unit	Total
Steel collected separately	kg	3.48
Steel collected with mixed construction waste	kg	0.387
Recovery for re-use	kg	0
Recovery for recycling	kg	3.48
Recovery for energy recovery	kg	0
Disposal to landfill	kg	0.387
Assumptions for scenario	–	n/a

Biogenic Carbon Content

	Unit	A1-A3
Biogenic carbon content in product	kg C	0
Biogenic carbon content in packaging	kg C	0.00355

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO_2

Additional Results for 1 m² of COLORBOND® Intramax® steel in 0.45mm base metal thickness (BMT)

In accordance to EN 15804:2012+A1:2013

Environmental Impacts

Indicator	Unit	A1-A3	C1	C2	C3	C4	D
GWP	kg CO_2-eq.	12.8	0.00238	0.0181	0.168	0.0177	-3.78
ODP	kg CFC11-eq.	1.09E-11	2.26E-16	2.17E-15	8.92E-13	2.89E-14	1.20E-13
AP	kg SO_2-eq.	0.0369	7.98E-06	3.33E-05	7.00E-04	4.73E-05	-0.00343
EP	kg PO_4^{3-}-eq.	0.00369	1.86E-06	7.24E-06	6.31E-05	5.05E-06	-7.03E-05
POCP	kg ethene-eq.	0.00581	7.87E-07	-8.84E-06	3.75E-05	4.42E-06	-0.00174
ADPE	kg Sb-eq.	3.93E-04	2.95E-11	3.31E-10	1.43E-08	1.32E-09	-1.98E-07
ADPF	MJ	133	0.0321	0.243	1.83	0.256	-37.8

Additional Green Star v1.3 Indicators

Indicator	Unit	A1-A3	C1	C2	C3	C4	D
HTc - GS	CTUh	2.82E-10	3.66E-15	5.05E-14	6.10E-12	8.15E-13	7.24E-11
HTnc - GS	CTUh	1.06E-10	1.75E-15	1.14E-14	1.94E-13	1.90E-14	2.02E-12
LU - GS	kg C deficit-eq.	2.38	6.08E-06	4.70E-05	0.0191	0.00180	0.211
RDW - GS	m^3-eq.	0.0135	1.74E-07	1.47E-06	6.22E-04	1.88E-05	-0.00958
IR - GS	kBq U235-eq.	0.101	6.09E-08	6.17E-06	3.22E-05	4.71E-04	0.0965
PM - GS	kg PM2.5-eq.	0.00310	5.73E-07	1.56E-06	4.59E-05	3.33E-06	-2.65E-04

25. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.
26. This indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide emissions and uptake and biogenic carbon stored in the product as defined by the IPCC AR5 report (IPCC 2013). As this indicator uses the same charaterisation factors as the GWP indicator required in v3.01 of the General Programme Instructions (GPI) of the International EPD® System, its inclusion creates comparability with EPDs based on other Product Category Rules (PCRs) aligned with v3.01 of the GPI, as well as comparability with other GHG reporting according ISO 14067.
27. This impact category deals mainly with the eventual impact of low dose ionizing 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 some construction materials, is also not measured by this indicator.

Results for 1 m² of COLORBOND® Intramax® steel in 0.50mm base metal thickness (BMT)

In accordance to EN 15804:2012+A2:2019

Product mass: 4.26 kg/m² flat

Note: The profile of the formed product will affect how many flat square metres are required to cover a given surface area.

Environmental Impacts

Indicator	Unit	A1-A3	C1	C2	C3	C4	D
GWP-total	kg CO_2-eq.	14.2	0.00266	0.0202	0.188	0.0206	-4.45
GWP-fossil	kg CO_2-eq.	14.2	0.00266	0.0202	0.188	0.0206	-4.45
GWP-biogenic	kg CO_2-eq.	-0.00436	2.63E-07	6.73E-06	2.10E-04	4.06E-05	0.00275
GWP-luluc	kg CO_2-eq.	5.94E-04	1.93E-08	2.17E-07	7.20E-06	1.24E-05	-8.80E-05
ODP	kg CFC-11-eq.	9.61E-12	2.11E-16	2.03E-15	8.34E-13	2.71E-14	1.10E-13
AP	mol H^+-eq.	0.0491	1.26E-05	5.21E-05	9.43E-04	6.50E-05	-0.00417
EP-freshwater	kg P-eq.	5.62E-06	4.68E-10	3.32E-09	1.02E-07	1.58E-08	-7.99E-07
EP-marine	kg N-eq.	0.0110	6.11E-06	2.35E-05	2.02E-04	1.58E-05	-2.51E-04
EP-terrestrial	mol N-eq.	0.123	6.69E-05	2.59E-04	0.00221	1.74E-04	0.00117
POCP	kg NMVOC-eq.	0.0371	1.71E-05	5.03E-05	5.60E-04	5.01E-05	-0.00296
ADP-minerals & metals[28]	kg Sb-eq.	3.93E-04	3.25E-11	3.64E-10	1.57E-08	1.44E-09	-2.28E-07
ADP-fossil[28]	MJ	147	0.0353	0.268	2.03	0.292	-41.0
WDP[28]	m^3 world-eq. deprived	1.22	1.98E-05	1.28E-04	0.0733	0.00140	-0.865

Additional Environmental Impacts

Indicator	Unit	A1-A3	C1	C2	C3	C4	D
GWP-GHG[29]	kg CO_2-eq.	13.9	0.00263	0.0200	0.186	0.0200	-4.28
PM	Disease incidence	6.43E-07	1.43E-10	3.41E-10	9.19E-09	6.95E-10	-4.51E-08
IRP[30]	kBq U-235-eq.	0.103	6.70E-08	6.80E-06	3.54E-05	5.19E-04	0.107
ETP-fw[28]	CTUe	31.2	0.00888	0.107	0.387	0.0866	-1.22
HTP-c[28]	CTUh	2.22E-09	1.49E-13	1.81E-12	1.73E-11	1.03E-11	-1.90E-09
HTP-nc[28]	CTUh	3.46E-07	9.30E-12	7.20E-11	5.78E-10	1.03E-09	-6.21E-08
SQP[28]	dimensionless	4.57	8.11E-05	7.55E-04	0.259	0.0227	0.575

Resource use

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
PERE	MJ	8.07	1.15E-04	0.00131	0.436	0.0238	2.81
PERM	MJ	0	0	0	0	0	0
PERT	MJ	8.07	1.15E-04	0.00131	0.436	0.0238	2.81
PENRE	MJ	146	0.0353	0.268	2.03	0.292	-41.0
PENRM	MJ	0.626	0	0	0	0	0
PENRT	MJ	147	0.0353	0.268	2.03	0.292	-41.0
SM	kg	0.867	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0
FW	m^3	0.0236	2.97E-07	2.55E-06	0.00103	4.11E-05	-0.0196

Waste Categories and Output Flows

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
HWD	kg	5.17E-09	3.83E-14	4.35E-13	6.77E-11	4.41E-11	-2.98E-10
NHWD	kg	0.108	5.05E-07	6.50E-06	6.33E-04	0.427	0.872
RWD	kg	8.64E-04	5.18E-10	5.23E-08	2.76E-07	3.52E-06	1.06E-05
CRU	kg	0	0	0	0	0	0
MFR	kg	1.75	0	0	3.84	0	0
MER	kg	0.00243	0	0	0	0	0
EEE	MJ	0	0	0	0	0	0
EET	MJ	0	0	0	0	0	0

End of Life

Parameter	Unit	Total
Steel collected separately	kg	3.84
Steel collected with mixed construction waste	kg	0.426
Recovery for re-use	kg	0
Recovery for recycling	kg	3.84
Recovery for energy recovery	kg	0
Disposal to landfill	kg	0.426
Assumptions for scenario	–	n/a

Biogenic Carbon Content

	Unit	A1-A3
Biogenic carbon content in product	kg C	0
Biogenic carbon content in packaging	kg C	0.00355

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO_2

Additional Results for 1 m² of COLORBOND® Intramax® steel in 0.50mm base metal thickness (BMT)

In accordance to EN 15804:2012+A1:2013

Environmental Impacts

Indicator	Unit	A1-A3	C1	C2	C3	C4	D
GWP	kg CO_2-eq.	13.8	0.00262	0.0199	0.185	0.0195	-4.22
ODP	kg CFC11-eq.	1.13E-11	2.49E-16	2.39E-15	9.82E-13	3.19E-14	1.28E-13
AP	kg SO_2-eq.	0.0396	8.79E-06	3.67E-05	7.71E-04	5.21E-05	-0.00387
EP	kg PO_4^{3-}-eq.	0.00396	2.05E-06	7.98E-06	6.95E-05	5.56E-06	-8.34E-05
POCP	kg ethene-eq.	0.00628	8.67E-07	-9.74E-06	4.13E-05	4.87E-06	-0.00194
ADPE	kg Sb-eq.	3.93E-04	3.25E-11	3.64E-10	1.57E-08	1.46E-09	-2.20E-07
ADPF	MJ	143	0.0353	0.267	2.02	0.282	-42.1

Additional Green Star v1.3 Indicators

Indicator	Unit	A1-A3	C1	C2	C3	C4	D
HTc - GS	CTUh	2.89E-10	4.04E-15	5.56E-14	6.72E-12	8.98E-13	8.05E-11
HTnc - GS	CTUh	1.10E-10	1.93E-15	1.25E-14	2.14E-13	2.09E-14	2.24E-12
LU - GS	kg C deficit-eq.	2.49	6.70E-06	5.18E-05	0.0211	0.00198	0.234
RDW - GS	m^3-eq.	0.0139	1.91E-07	1.62E-06	6.85E-04	2.07E-05	-0.0107
IR - GS	kBq U235-eq.	0.103	6.70E-08	6.80E-06	3.54E-05	5.19E-04	0.107
PM - GS	kg PM2.5-eq.	0.00333	6.31E-07	1.72E-06	5.06E-05	3.67E-06	-2.99E-04

28. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.
29. This indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide emissions and uptake and biogenic carbon stored in the product as defined by the IPCC AR5 report (IPCC 2013). As this indicator uses the same charaterisation factors as the GWP indicator required in v3.01 of the General Programme Instructions (GPI) of the International EPD® System, its inclusion creates comparability with EPDs based on other Product Category Rules (PCRs) aligned with v3.01 of the GPI, as well as comparability with other GHG reporting according ISO 14067.
30. This impact category deals mainly with the eventual impact of low dose ionizing 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 some construction materials, is also not measured by this indicator.

Results for 1 m² of COLORBOND® Intramax® steel in 0.60mm base metal thickness (BMT)

In accordance to EN 15804:2012+A2:2019

Product mass: 5.05 kg/m² flat

Note: The profile of the formed product will affect how many flat square metres are required to cover a given surface area.

Environmental Impacts

Indicator	Unit	A1-A3	C1	C2	C3	C4	D
GWP-total	kg CO_2-eq.	16.3	0.00315	0.0239	0.222	0.0245	-5.37
GWP-fossil	kg CO_2-eq.	16.3	0.00315	0.0239	0.222	0.0244	-5.37
GWP-biogenic	kg CO_2-eq.	-0.00373	3.12E-07	7.97E-06	2.48E-04	4.81E-05	0.00328
GWP-luluc	kg CO_2-eq.	6.24E-04	2.29E-08	2.57E-07	8.52E-06	1.47E-05	-1.07E-04
ODP	kg CFC-11-eq.	1.03E-11	2.50E-16	2.40E-15	9.88E-13	3.21E-14	1.23E-13
AP	mol H^+-eq.	0.0559	1.50E-05	6.17E-05	0.00112	7.69E-05	-0.00513
EP-freshwater	kg P-eq.	5.92E-06	5.54E-10	3.93E-09	1.21E-07	1.87E-08	-9.64E-07
EP-marine	kg N-eq.	0.0125	7.24E-06	2.79E-05	2.39E-04	1.87E-05	-3.30E-04
EP-terrestrial	mol N-eq.	0.140	7.93E-05	3.07E-04	0.00261	2.06E-04	0.00110
POCP	kg NMVOC-eq.	0.0422	2.03E-05	5.96E-05	6.64E-04	5.93E-05	-0.00364
ADP-minerals & metals[31]	kg Sb-eq.	3.93E-04	3.85E-11	4.31E-10	1.86E-08	1.70E-09	-2.75E-07
ADP-fossil[31]	MJ	166	0.0418	0.317	2.40	0.346	-49.4
WDP[31]	m^3 world-eq. deprived	1.31	2.34E-05	1.51E-04	0.0868	0.00165	-1.04

Additional Environmental Impacts

Indicator	Unit	A1-A3	C1	C2	C3	C4	D
GWP-GHG[32]	kg CO_2-eq.	15.9	0.00312	0.0237	0.220	0.0237	-5.17
PM	Disease incidence	7.33E-07	1.69E-10	4.04E-10	1.09E-08	8.23E-10	-5.59E-08
IRP[33]	kBq U-235-eq.	0.106	7.94E-08	8.05E-06	4.20E-05	6.15E-04	0.129
ETP-fw[31]	CTUe	33.7	0.0105	0.127	0.458	0.103	-1.50
HTP-c[31]	CTUh	2.38E-09	1.76E-13	2.15E-12	2.05E-11	1.22E-11	-2.29E-09
HTP-nc[31]	CTUh	3.88E-07	1.10E-11	8.52E-11	6.84E-10	1.22E-09	-7.48E-08
SQP[31]	dimensionless	5.06	9.60E-05	8.95E-04	0.307	0.0269	0.687

Resource use

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
PERE	MJ	8.59	1.37E-04	0.00155	0.516	0.0282	3.38
PERM	MJ	0	0	0	0	0	0
PERT	MJ	8.59	1.37E-04	0.00155	0.516	0.0282	3.38
PENRE	MJ	166	0.0418	0.317	2.40	0.346	-49.4
PENRM	MJ	0.626	0	0	0	0	0
PENRT	MJ	167	0.0418	0.317	2.40	0.346	-49.4
SM	kg	1.02	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0
FW	m^3	0.0252	3.52E-07	3.02E-06	0.00122	4.87E-05	-0.0236

Waste Categories and Output Flows

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
HWD	kg	5.52E-09	4.54E-14	5.15E-13	8.02E-11	5.22E-11	-3.64E-10
NHWD	kg	0.116	5.98E-07	7.69E-06	7.49E-04	0.505	1.01
RWD	kg	8.82E-04	6.13E-10	6.19E-08	3.27E-07	4.17E-06	1.21E-05
CRU	kg	0	0	0	0	0	0
MFR	kg	2.08	0	0	4.54	0	0
MER	kg	0.00243	0	0	0	0	0
EEE	MJ	0	0	0	0	0	0
EET	MJ	0	0	0	0	0	0

End of Life

Parameter	Unit	Total
Steel collected separately	kg	4.54
Steel collected with mixed construction waste	kg	0.505
Recovery for re-use	kg	0
Recovery for recycling	kg	4.54
Recovery for energy recovery	kg	0
Disposal to landfill	kg	0.505
Assumptions for scenario	–	n/a

Biogenic Carbon Content

	Unit	A1-A3
Biogenic carbon content in product	kg C	0
Biogenic carbon content in packaging	kg C	0.00355

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO_2

Additional Results for 1 m² of COLORBOND® Intramax® steel in 0.60mm base metal thickness (BMT)

In accordance to EN 15804:2012+A1:2013

Environmental Impacts

Indicator	Unit	A1-A3	C1	C2	C3	C4	D
GWP	kg CO_2-eq.	15.8	0.00311	0.0236	0.219	0.0231	-5.11
ODP	kg CFC11-eq.	1.22E-11	2.95E-16	2.83E-15	1.16E-12	3.77E-14	1.42E-13
AP	kg SO_2-eq.	0.0450	1.04E-05	4.34E-05	9.13E-04	6.18E-05	-0.00474
EP	kg PO_4^{3-}-eq.	0.00450	2.42E-06	9.45E-06	8.23E-05	6.59E-06	-1.10E-04
POCP	kg ethene-eq.	0.00721	1.03E-06	-1.15E-05	4.89E-05	5.76E-06	-0.00234
ADPE	kg Sb-eq.	3.93E-04	3.85E-11	4.31E-10	1.86E-08	1.73E-09	-2.66E-07
ADPF	MJ	162	0.0418	0.316	2.39	0.334	-50.7

Additional Green Star v1.3 Indicators

Indicator	Unit	A1-A3	C1	C2	C3	C4	D
HTc - GS	CTUh	3.03E-10	4.78E-15	6.58E-14	7.95E-12	1.06E-12	9.68E-11
HTnc - GS	CTUh	1.18E-10	2.28E-15	1.48E-14	2.53E-13	2.47E-14	2.70E-12
LU - GS	kg C deficit-eq.	2.71	7.93E-06	6.13E-05	0.0250	0.00234	0.281
RDW - GS	m^3-eq.	0.0149	2.27E-07	1.92E-06	8.11E-04	2.45E-05	-0.0129
IR - GS	kBq U235-eq.	0.106	7.94E-08	8.05E-06	4.20E-05	6.15E-04	0.129
PM - GS	kg PM2.5-eq.	0.00379	7.47E-07	2.03E-06	5.99E-05	4.35E-06	-3.68E-04

31. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.
32. This indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide emissions and uptake and biogenic carbon stored in the product as defined by the IPCC AR5 report (IPCC 2013). As this indicator uses the same charaterisation factors as the GWP indicator required in v3.01 of the General Programme Instructions (GPI) of the International EPD® System, its inclusion creates comparability with EPDs based on other Product Category Rules (PCRs) aligned with v3.01 of the GPI, as well as comparability with other GHG reporting according ISO 14067.
33. This impact category deals mainly with the eventual impact of low dose ionizing 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 some construction materials, is also not measured by this indicator.

Interpretation of Results

Impact Category Results

The majority of production (A1-A3) impacts arise from the combustion of fossil fuels, either directly or in the upstream production of electricity and materials. The upstream production of Hot Rolled Coil steel substrate was the most significant contributor to most environmental impact indicators, and the base metal thickness (BMT) has significant influence on the results due to the dominance of the manufacturing of the steel substrate. This emphasises the importance of selecting the appropriate BMT for the intended application; where a thicker steel sheet does not contribute to structural integrity, a lighter-weight version of COLORBOND® Intramax® steel with a lower BMT should be considered.

The upstream production of the metal coating – a zinc coating applied to the steel substrate for corrosion protection – was the most significant contributor to ADP-minerals & metals, IRP, and SQP, and also contributed significantly to most indicators.

Assumption of average product – Sensitivity of results

When similar products are manufactured on different production lines, there is sometimes variation in results. Should production scheduling change significantly, this may be reflected in changes in the calculated impacts. The reason for these differences is the different mix of production routes that contribute to each product. Where products are preferentially made at different locations, the differences are most evident. While unlikely, should production scheduling change significantly, this may be reflected in changes in the calculated impacts. The variation in impact across production lines for COLORBOND® Intramax® steel (CRP) (flat product) is well under 10%.

Environmental Product Declaration

COLORBOND® Intramax® steel

References

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AS/NZS 2728:2013, Prefinished/pre painted sheet metal products for interior/exterior building applications – Performance requirements

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EN 15804:2012+A2:2019, Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products

General Programme Instructions for the International EPD® System, Version 3.01.

Instructions of the EPD Australasia Programme, Version 3.0.

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ISO 14021:2016, Environmental labels and declarations – Self-declared environmental claims (Type II environmental labelling)

ISO 14025:2006, Environmental labels and declarations – Type III environmental declarations – Principles and procedures

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For further reference

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Product Website	steel.com.au
BlueScope Certifications and Credentials (ISO 14001, Worldsteel Climate Action Programme)	steel.com.au/resources/articles/sustainability-certifications-and-credentials
ResponsibleSteel™ certification for Port Kembla Steelworks	bluescope.com/sustainable-steel/responsiblesteel/
BlueScope Sustainability Reporting	bluescope.com/sustainability/reports

Cover image: COLORBOND® Intramax® steel. Image courtesy of Bondor Metecno.

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