RESPONSIBLE PRODUCTS AND ENVIRONMENTAL PRODUCT DECLARATIONS

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16 June 2020

ABOUT BLUESCOPE

Steel manufacturer - more than 100 facilities in 18 countries, employing around 14,000 people

Australian flat steel products: slab, hot rolled coil, cold rolled coil, plate and value-added metallic coated and painted steel solutions

Port Kembla, NSW is the largest steel production facility in Australia

Colorbond®

Zincalume®

Truecore®

Deckform®

Galvaspan®

XIerplate®

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SUSTAINABILITY CONTEXT – GLOBAL MEGATRENDS

Top 10 risks in terms of **Likelihood**

1. Extreme weather
2. Climate action failure
3. Natural disasters
4. Biodiversity loss
5. Human-made environmental disasters
6. Data fraud or theft
7. Cyberattacks
8. Water crises
9. Global governance failure
10. Asset bubbles

Top 10 risks in terms of **Impact**

1. Climate action failure
2. Weapons of mass destruction
3. Biodiversity loss
4. Extreme weather
5. Water crises
6. Information infrastructure breakdown
7. Natural disasters
8. Cyberattacks
9. Human-made environmental disasters
10. Infectious diseases

Categories

- Economic
- Environmental
- Geopolitical
- Societal
- Technological

Source: World Economic Forum Global Risks Perception Survey 2019–2020.

Note: Survey respondents were asked to assess the likelihood of the individual global risk on a scale of 1 to 5, 1 representing a risk that is very unlikely to happen and 5 a risk that is very likely to occur. They also assessed the impact of each global risk on a scale of 1 to 5, 1 representing a minimal impact and 5 a catastrophic impact. To ensure legibility, the names of the global risks are abbreviated; see Appendix A for the full name and description.

United Nations Sustainable Development Goals

World Green Building Council

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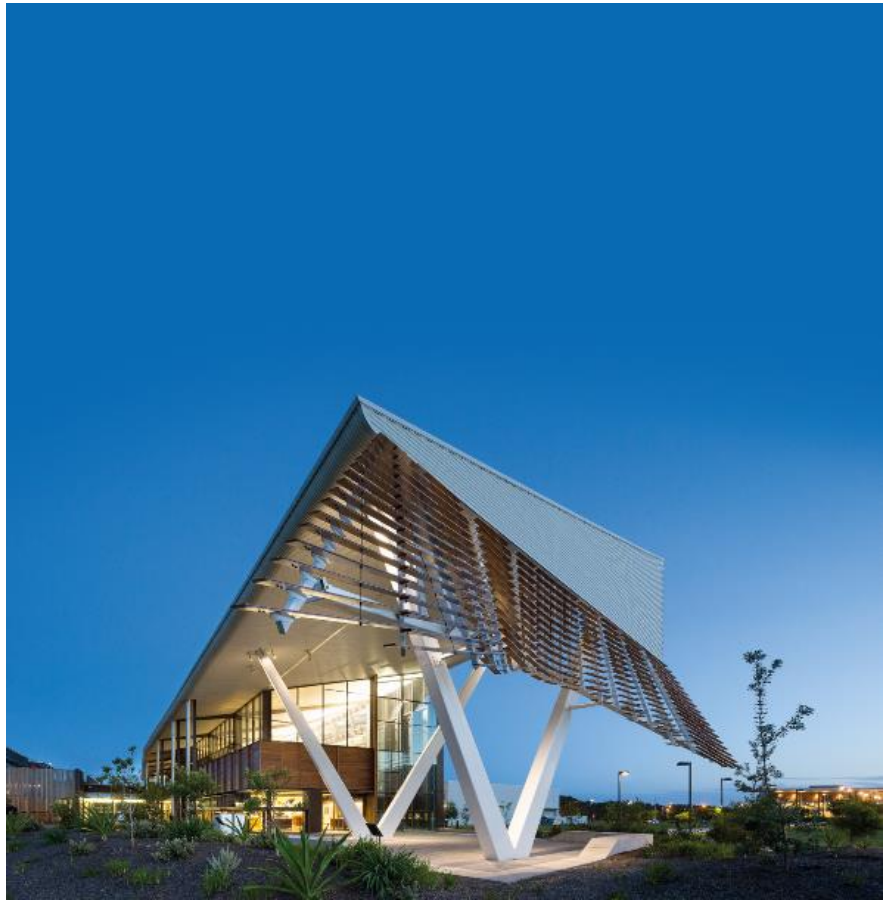
ROLE OF MANUFACTURERS

- Minimise manufacturing impact
- Promote transparency
- Demonstrate stewardship
- Anticipate and respond to market demand




How do I know your company's environmentally friendly?
The wording, the typeface, the pictures of nature in the brochure.
Wilcox

KEY ECOLABELLING TOOLS

Stewardship Schemes

- Forest Stewardship Council/PEFC
- ASI - Aluminium Stewardship Initiative
- ResponsibleSteel™

Type I Ecolabels

- Global GreenTag™
- Good Environmental Choice Australia (GECA)

Type III Ecolabels (EPDs)

- International EPD® system
- EPD Australasia

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KEY CHARACTERISTICS OF AN EPD

Holistic representation of a product's environmental impacts

- Comprehensive
- Whole of life cycle
- Multiple environmental impact categories
- For use in context of whole-of-structure assessment

Credible and trustworthy

- Transparent presentation of the facts
- Product or industry-specific
- Independently verified to comply with all relevant standards and rules

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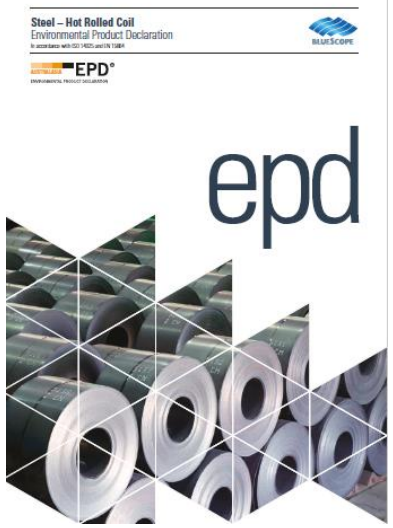
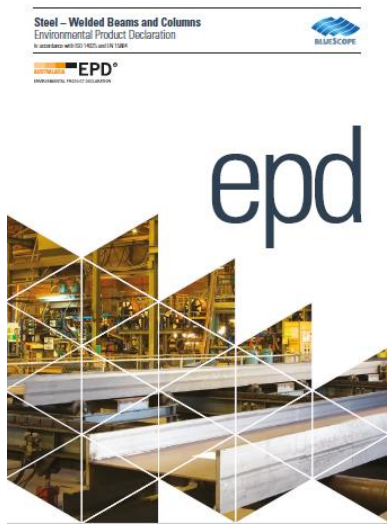
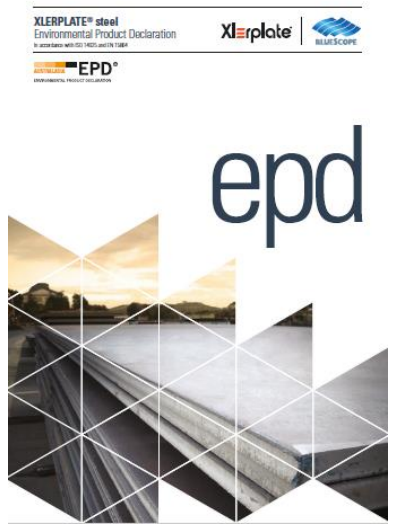
UNDERSTANDING EPD INFORMATION

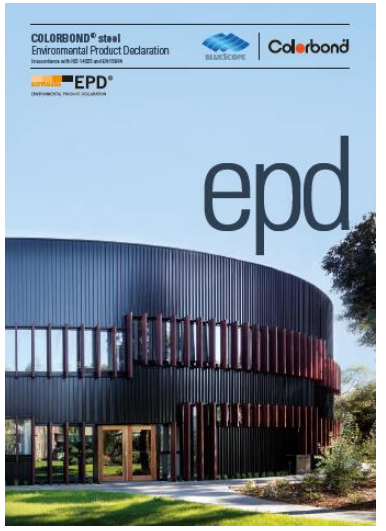
Publication of results needs:

- Compliance with ISO standards
- Independent review
- Transparency, integrity and credibility
- Full data set – nothing hidden
- Simple (relatively)
- Understandable









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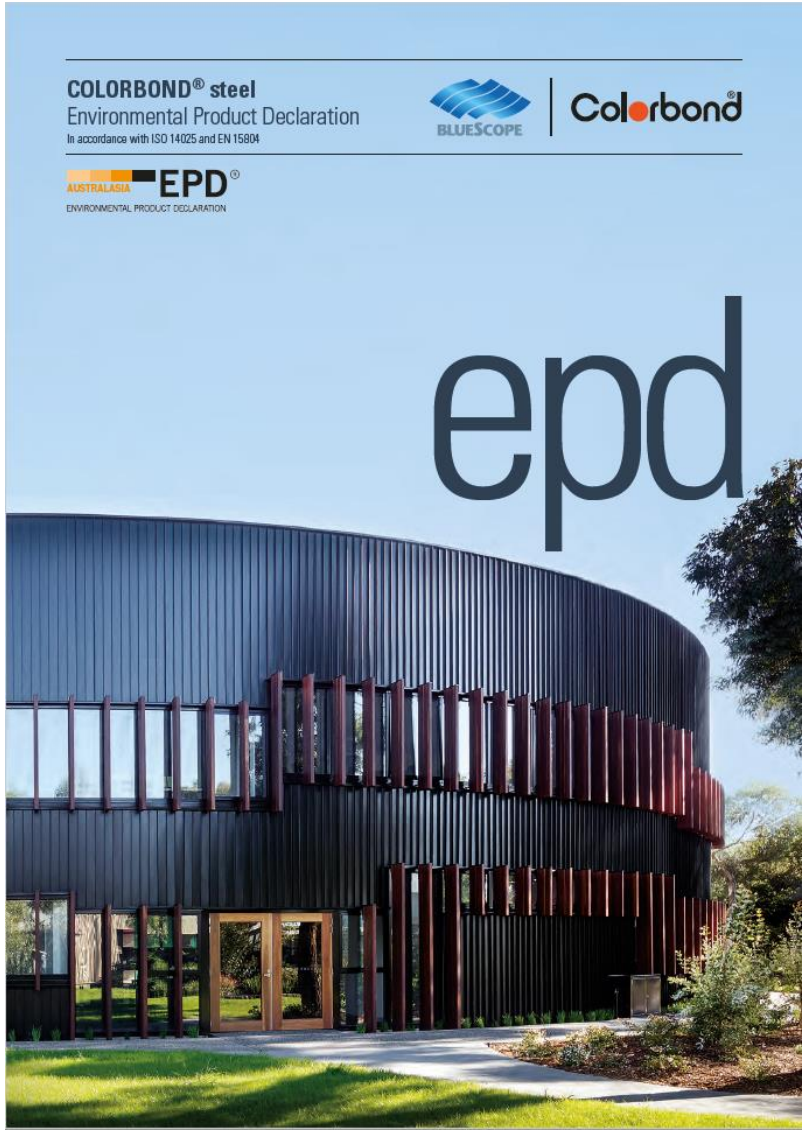
A GUIDED TOUR THROUGH THE COLORBOND® STEEL EPD



EPD FEATURES

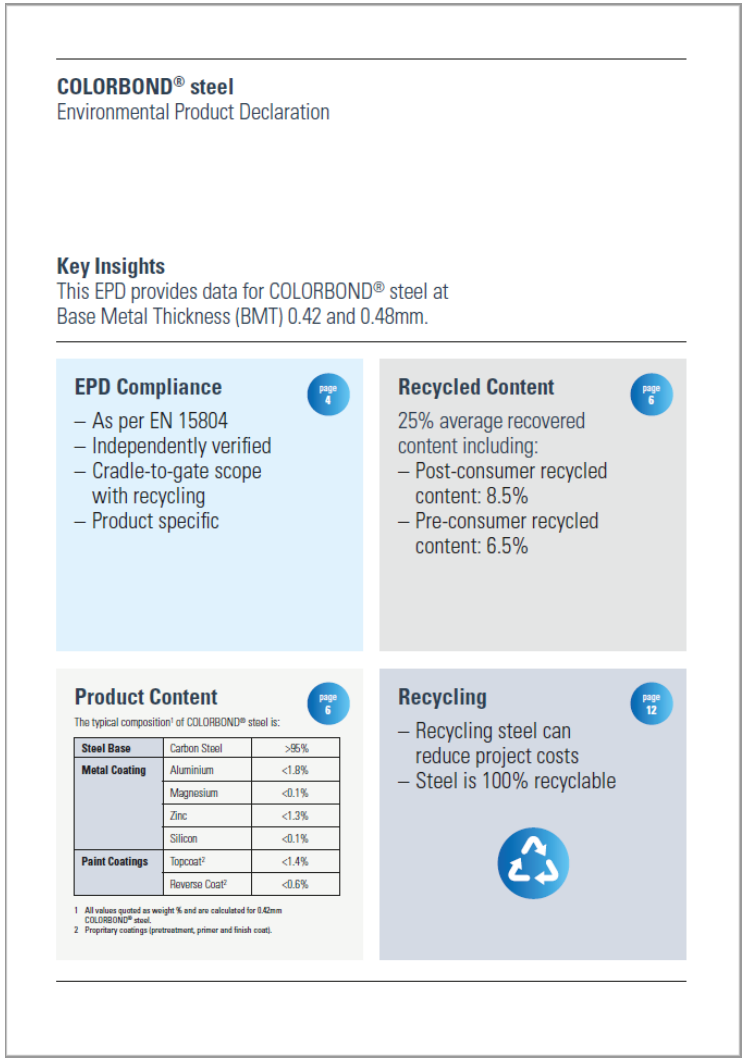
Key Insights page

Case studies and general product information (p. 1-3)

EPD Compliance information (p. 4)

Product information (p. 6)

- product details
- composition table
- recycled content
- REACH statement
- SDS reference



COLORBOND® steel
Environmental Product Declaration

Key Insights
This EPD provides data for COLORBOND® steel at Base Metal Thickness (BMT) 0.42 and 0.48mm.

EPD Compliance page 4
– As per EN 15804
– Independently verified
– Cradle-to-gate scope with recycling
– Product specific

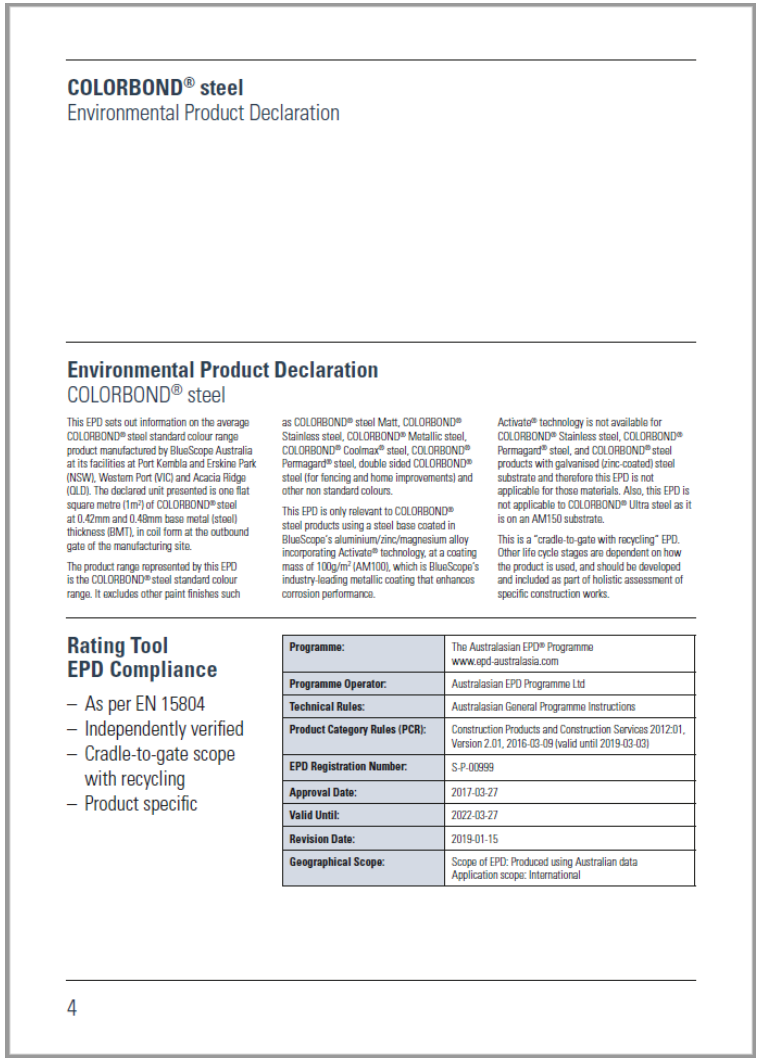
Recycled Content page 6
25% average recovered content including:
– Post-consumer recycled content: 8.5%
– Pre-consumer recycled content: 6.5%

Product Content page 6
The typical composition[1] of COLORBOND® steel is:

Steel Base	Carbon Steel	>95%
Metal Coating	Aluminium	<1.8%
	Magnesium	<0.1%
	Zinc	<1.3%
	Silicon	<0.1%
Paint Coatings	Topcoat[2]	<1.4%
	Reverse Coat[2]	<0.6%

1 All values quoted as weight % and are calculated for 0.42mm COLORBOND® steel.
2 Proprtary coatings (pretreatment, primer and finish coat).

Recycling page 12
– Recycling steel can reduce project costs
– Steel is 100% recyclable



COLORBOND® steel
Environmental Product Declaration

Environmental Product Declaration
COLORBOND® steel

This EPD sets out information on the average COLORBOND® steel standard colour range product manufactured by BlueScope Australia at its facilities at Port Kembla and Erskine Park (NSW), Western Port (VIC) and Acacia Ridge (QLD). The declared unit presented is one flat square metre (1m²) of COLORBOND® steel at 0.42mm and 0.48mm base metal (steel) thickness (BMT), in coil form at the outbound gate of the manufacturing site.

The product range represented by this EPD is the COLORBOND® steel standard colour range. It excludes other paint finishes such as COLORBOND® steel Matt, COLORBOND® Stainless steel, COLORBOND® Metallic steel, COLORBOND® Coolmax® steel, COLORBOND® Permagard® steel, double sided COLORBOND® steel (for fencing and home improvements) and other non standard colours.

This EPD is only relevant to COLORBOND® steel products using a steel base coated in BlueScope's aluminium/zinc/magnesium alloy incorporating Activate® technology, at a coating mass of 100g/m² (AM100), which is BlueScope's industry-leading metallic coating that enhances corrosion performance.

Activate® technology is not available for COLORBOND® Stainless steel, COLORBOND® Permagard® steel, and COLORBOND® steel products with galvanised (zinc-coated) steel substrate and therefore this EPD is not applicable for those materials. Also, this EPD is not applicable to COLORBOND® Ultra steel as it is on an AM150 substrate.

This is a "cradle-to-gate with recycling" EPD. Other life cycle stages are dependent on how the product is used, and should be developed and included as part of holistic assessment of specific construction works.

Rating Tool
EPD Compliance
– As per EN 15804
– Independently verified
– Cradle-to-gate scope with recycling
– Product specific

Programme:	The Australasian EPD® Programme www.epd-australasia.com
Programme Operator:	Australasian EPD Programme Ltd
Technical Rules:	Australasian General Programme Instructions
Product Category Rules (PCR):	Construction Products and Construction Services 2012:01, Version 2.01, 2016-03-09 (valid until 2019-03-03)
EPD Registration Number:	S-P-00999
Approval Date:	2017-03-27
Valid Until:	2022-03-27
Revision Date:	2019-01-15
Geographical Scope:	Scope of EPD: Produced using Australian data Application scope: International

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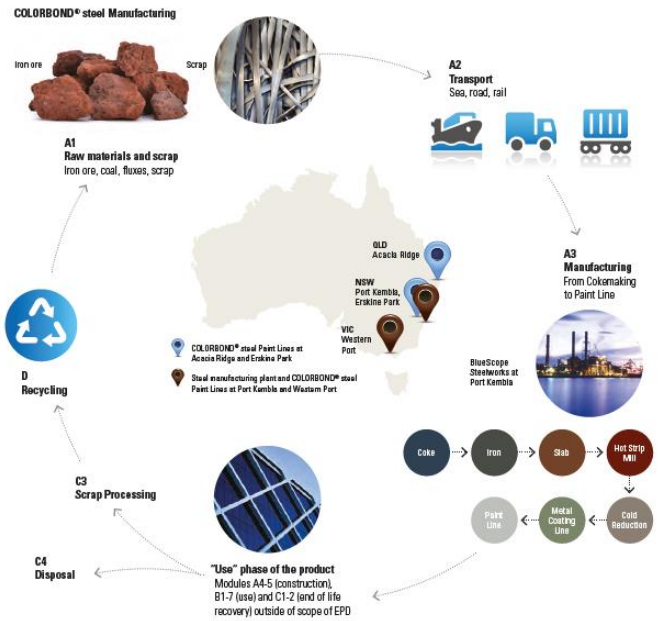
EPD FEATURES

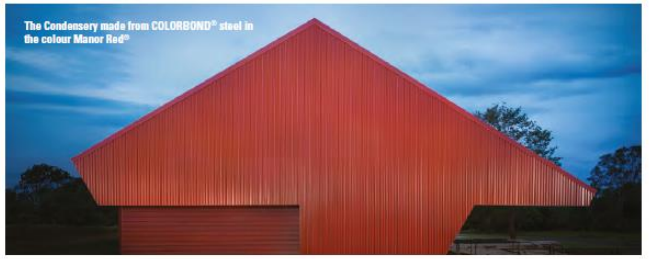
Product life cycle (p. 7-8)

- Raw materials
- Transport
- Manufacturing
- Use
- Recycling / disposal

Scope of Declaration (p. 9)

- Modules declared (life cycle stages)





Scope of Declaration

The scope of this declaration is for 1 flat square metre of COLORBOND® steel from cradle to the mill gate, including end-of-life processing and recycling: Modules A1-A3, C3-C4 and D (according to EN 15804). Modules A4-A5, B1-B7 and C1-C2 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 customers at the exit gate of the manufacturing site.

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 C3 scrap processing, C4 disposal to landfill and D recovery for recycling.

Table 1. Scope of Declaration in EPD

Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage
Raw materials	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
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	X	X	X

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

COLORBOND® steel
Environmental Product Declaration

Results of Assessment

Table 2. Life Cycle Impact Assessment Indicators

		COLORBOND® steel AM100							
Base Metal (Steel) Thickness (BMT)		**0.42mm**				**0.48mm**			
Declared Unit		**1m²**				**1m²**			
EN 15804 INDICATORS	**units**	**A1-A3**	**C3**	**C4**	**D**	**A1-A3**	**C3**	**C4**	**D**
Global warming potential	kg CO_2-eq.	11.4	0.131	0.0182	-3.72	12.7	0.149	0.0207	-4.27
Depletion potential of the stratospheric ozone layer	kg CFC11-eq.	1.18E-11	6.92E-16	4.83E-15	2.27E-08	1.26E-11	7.83E-16	5.49E-15	2.59E-08
Acidification potential of land and water	kg SO_2-eq.	0.0350	5.60E-04	5.07E-05	-0.00355	0.0386	6.34E-04	5.761E-05	-0.00409
Eutrophication potential	kg PO_4^3-eq.	0.00365	4.79E-05	6.38E-06	-0.000125	0.00403	5.42E-05	7.25E-06	-0.000147
Photochemical ozone creation potential	kg C_2H_4-eq.	0.00580	2.98E-05	4.56E-06	-0.00167	0.00645	3.37E-05	5.18E-06	-0.00191
Abiotic depletion potential for non fossil resources	kg Sb-eq.	2.99E-05	1.44E-08	1.97E-09	-3.52E-06	3.00E-05	1.63E-08	2.24E-09	-4.01E-06
Abiotic depletion potential for fossil resources	MJ	131	1.51	0.264	-37.3	144	1.71	0.300	-42.5

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EPD FEATURES – GREEN STAR ADVANTAGE

Table 5. Green Star Indicators

		COLORBOND® steel AM100							
Base Metal (Steel) Thickness (BMT)		0.42mm				0.48mm			
Declared Unit		1m²				1m²			
INDICATORS	**units**	**A1-A3**	**C3**	**C4**	**D**	**A1-A3**	**C3**	**C4**	**D**
Human toxicity cancer effects	kg 1,4 DB eq	1.70E-10				1.79E-10			
Human toxicity non-cancer effects	kg 1,4 DB eq	1.46E-11				1.58E-11			
Ionising radiation	kg U-235 eq	0.109				0.111			
Particulate matter	kg PM2.5 eq	0.00281				0.00310			
Resource depletion – water	m^3	0.0109				0.0115			
Land use midpoint	kg C deficit eq	1.30				1.41			

Additional Green Star Environmental Impact Categories

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EPD FEATURES

LCA Methodology (p.12-13)

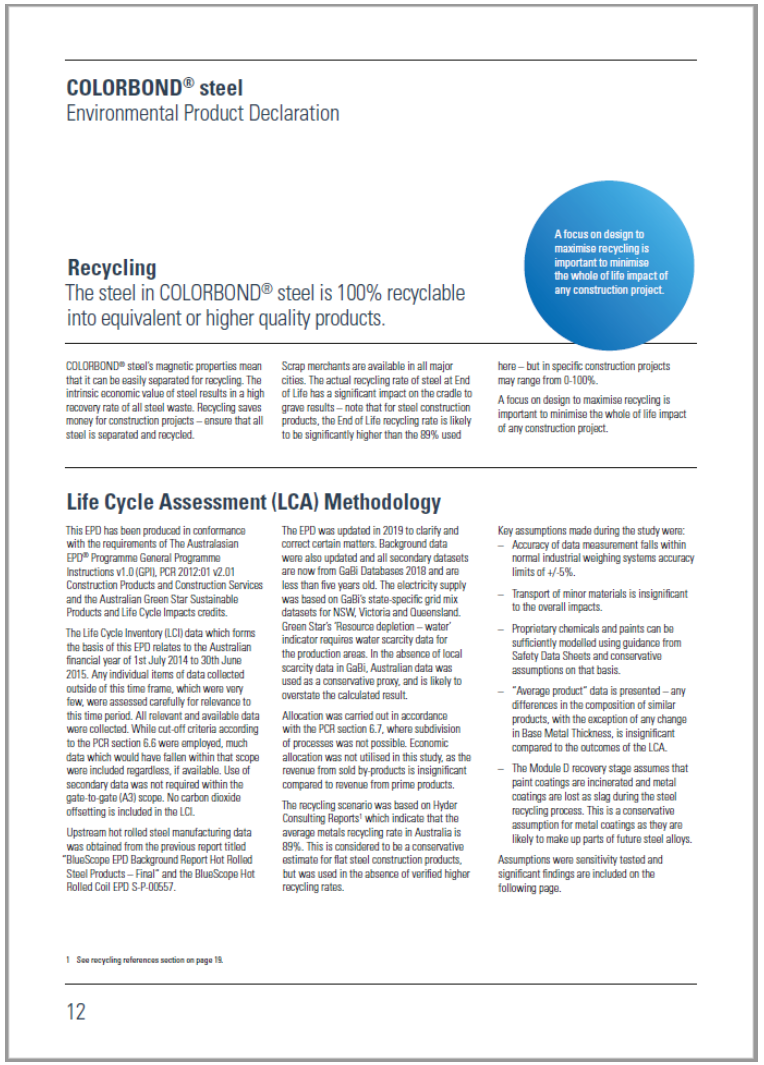
Additional product and company info (p.14-15)

- Durability and resilience
- HSE & Community at BlueScope

LCA terminology (p. 16)

Credibility evidence (p.17-18)

- Programme-related information and verification
- Mandatory statements & contact information



COLORBOND® steel
Environmental Product Declaration

Recycling

The steel in COLORBOND® steel is 100% recyclable into equivalent or higher quality products.

A focus on design to maximise recycling is important to minimise the whole of life impact of any construction project.

COLORBOND® steel's magnetic properties mean that it can be easily separated for recycling. The intrinsic economic value of steel results in a high recovery rate of all steel waste. Recycling saves money for construction projects – ensure that all steel is separated and recycled.

Scrap merchants are available in all major cities. The actual recycling rate of steel at End of Life has a significant impact on the cradle to grave results – note that for steel construction products, the End of Life recycling rate is likely to be significantly higher than the 89% used here – but in specific construction projects may range from 0-100%.

A focus on design to maximise recycling is important to minimise the whole of life impact of any construction project.

Life Cycle Assessment (LCA) Methodology

This EPD has been produced in conformance with the requirements of The Australasian EPD® Programme General Programme Instructions v1.0 (GPI), PCR 2012:01 v2.01 Construction Products and Construction Services and the Australian Green Star Sustainable Products and Life Cycle Impacts credits.

The Life Cycle Inventory (LCI) data which forms the basis of this EPD relates to the Australian financial year of 1st July 2014 to 30th June 2015. Any individual items of data collected outside of this time frame, which were very few, were assessed carefully for relevance to this time period. All relevant and available data were collected. While cut-off criteria according to the PCR section 6.6 were employed, much data which would have fallen within that scope were included regardless, if available. Use of secondary data was not required within the gate-to-gate (A3) scope. No carbon dioxide offsetting is included in the LCI.

Upstream hot rolled steel manufacturing data was obtained from the previous report titled "BlueScope EPD Background Report Hot Rolled Steel Products – Final" and the BlueScope Hot Rolled Coil EPD S-P-00557.

The EPD was updated in 2019 to clarify and correct certain matters. Background data were also updated and all secondary datasets are now from GaBi Databases 2018 and are less than five years old. The electricity supply was based on GaBi's state-specific grid mix datasets for NSW, Victoria and Queensland. Green Star's 'Resource depletion – water' indicator requires water scarcity data for the production areas. In the absence of local scarcity data in GaBi, Australian data was used as a conservative proxy, and is likely to overstate the calculated result.

Allocation was carried out in accordance with the PCR section 6.7, where subdivision of processes was not possible. Economic allocation was not utilised in this study, as the revenue from sold by-products is insignificant compared to revenue from prime products.

The recycling scenario was based on Hyder Consulting Reports[1] which indicate that the average metals recycling rate in Australia is 89%. This is considered to be a conservative estimate for flat steel construction products, but was used in the absence of verified higher recycling rates.

Key assumptions made during the study were:

- Accuracy of data measurement falls within normal industrial weighing systems accuracy limits of +/-5%.
- Transport of minor materials is insignificant to the overall impacts.
- Proprietary chemicals and paints can be sufficiently modelled using guidance from Safety Data Sheets and conservative assumptions on that basis.
- "Average product" data is presented – any differences in the composition of similar products, with the exception of any change in Base Metal Thickness, is insignificant compared to the outcomes of the LCA.
- 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 parts of future steel alloys.

Assumptions were sensitivity tested and significant findings are included on the following page.

1 See recycling references section on page 19.

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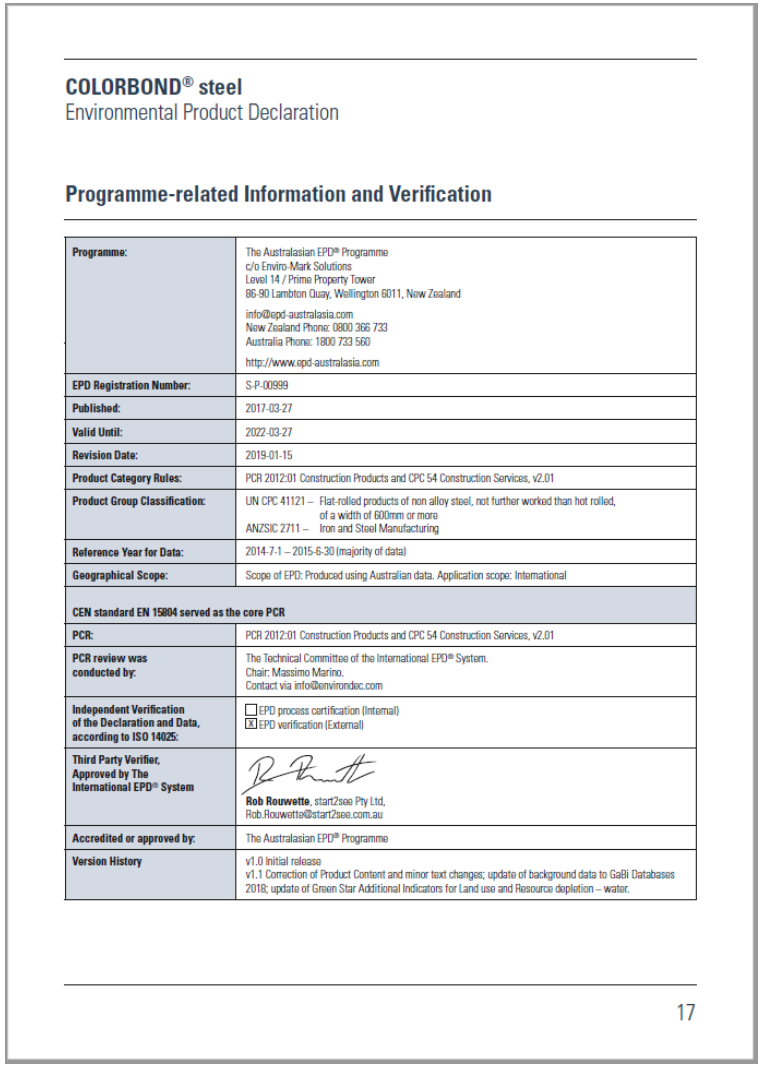

COLORBOND® steel
Environmental Product Declaration

Programme-related Information and Verification

Programme:	The Australasian EPD® Programme c/o Enviro-Mark Solutions Level 14 / Prime Property Tower 86-90 Lambton Quay, Wellington 6011, New Zealand info@epd-australasia.com New Zealand Phone: 0800 366 733 Australia Phone: 1800 733 560 http://www.epd-australasia.com
EPD Registration Number:	S-P-00999
Published:	2017-03-27
Valid Until:	2022-03-27
Revision Date:	2019-01-15
Product Category Rules:	PCR 2012:01 Construction Products and CPC 54 Construction Services, v2.01
Product Group Classification:	UN CPC 41121 – Flat-rolled products of non alloy steel, not further worked than hot rolled, of a width of 600mm or more ANZSIC 2711 – Iron and Steel Manufacturing
Reference Year for Data:	2014-7-1 – 2015-6-30 (majority of data)
Geographical Scope:	Scope of EPD: Produced using Australian data. Application scope: International
CEN standard EN 15804 served as the core PCR	
PCR:	PCR 2012:01 Construction Products and CPC 54 Construction Services, v2.01
PCR review was conducted by:	The Technical Committee of the International EPD® System. Chair: Massimo Marino. Contact via info@environdec.com
Independent Verification of the Declaration and Data, according to ISO 14025:	☐ EPD process certification (Internal) ☒ EPD verification (External)
Third Party Verifier, Approved by The International EPD® System	**Rob Rouwette**, start2see Pty Ltd, Rob.Rouwette@start2see.com.au
Accredited or approved by:	The Australasian EPD® Programme
Version History	v1.0 Initial release v1.1 Correction of Product Content and minor text changes; update of background data to GaBi Databases 2018; update of Green Star Additional Indicators for Land use and Resource depletion – water.

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HOW DO I COMPARE PRODUCTS?

Food database and calorie counter

Smith's
Salt & Vinegar Chips

Nutrition Facts	per 15 chips (27 g)
Kilojoules Calories	576 kj 138 kcal
Protein	1.9 g
Fat	8.9 g
Saturated Fat	0 g
Carbohydrate	11.8 g
Sugar	1 g
Fibre	0 g
Sodium	216 mg

Food database and calorie counter

Smith's
Plain Chips Snack Bag

Nutrition Facts	per 1 snack bag (19 g)
Kilojoules Calories	406 kj 97 kcal
Protein	1.6 g
Fat	6.1 g
Carbohydrate	8.8 g
Sodium	113 mg

Food database and calorie counter

Smith's
Classic Crinkle Cut Salt & Vin

Nutrition Facts	per 1 snack bag (19 g)
Kilojoules Calories	405 kj 97 kcal
Protein	1.3 g
Fat	6.3 g
Saturated Fat	0.6 g
Carbohydrate	8.3 g
Sugar	0.7 g
Sodium	152 mg

EPD results – think of them as nutrition facts!

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Source: http://www.fatsecret.com.au/calories-nutrition/smiths

COMPARING EPDS

- Same rules and methods
- Comparisons need expertise
- Whole of structure and whole of life is the key

Take Care When Comparing

Issues to consider when comparing EPD data include:

- Both EPDs must comply with the comparability requirements in EN 15804, eg using equivalent methodology and assumptions such as utilising the same PCR.
- LCA provides high-level scientific guidance and differences in data should be substantial to be material.
- Understanding the detail is important in comparisons. Expert analysis is required to 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.

This EPD is compliant with PCR 2012:01 Construction Products and Construction Services, Version 2.01, 2016-03-09 (valid until 2019-03-03).

Declared unit - Example

Mass of terracotta tiles vs steel, for 1m^2 of roofing:

- Terracotta 10 times as much
- Impacts per kg need to be multiplied by 10 for steel equivalent

EPDS & GREEN BUILDING CERTIFICATION

Green Star credits:

- Life Cycle Impacts – Steel
- Responsible Building Materials
- Sustainable Products
- Heat Island Effect

IS Rating credits:

- Sustainability labelled products and supply chains (Materials calculator)
- Deconstruction, disassembly, adaptability
- Resource recovery

Product-specific EPDs give confidence in the assessment of impacts

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EPDS' CONTRIBUTION TO THE BUILT ENVIRONMENT

- Their sweet spot is in the context of a building/structure
- Use product EPDs to represent the impacts as they are used in the building
- Optimise the building to lower overall impacts using hot spot analysis

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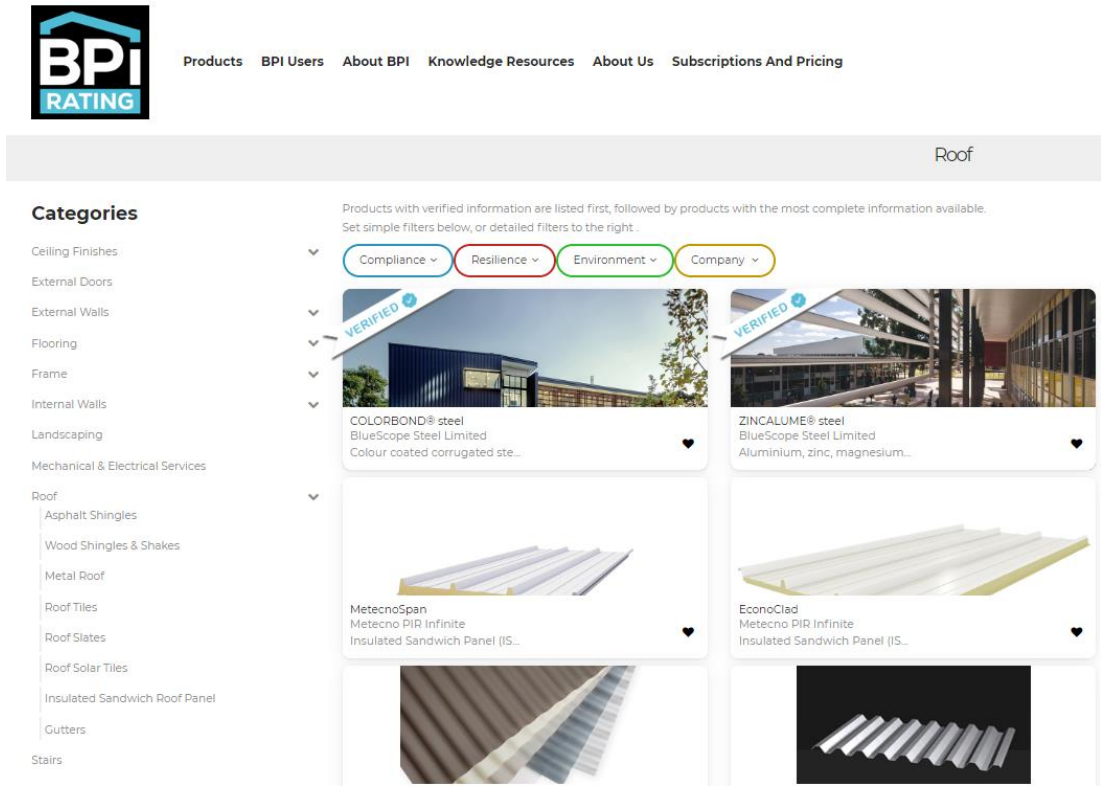
EPDS – KEY RESOURCES

- BlueScope EPDs (www.steelselect.com.au/articles/environmental-product-declarations-bluescope)
- EPD Australasia (www.epd-australasia.com)
- International EPD System (www.environdec.com)
- BPI (www.bpirating.com.au)



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Q&A

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