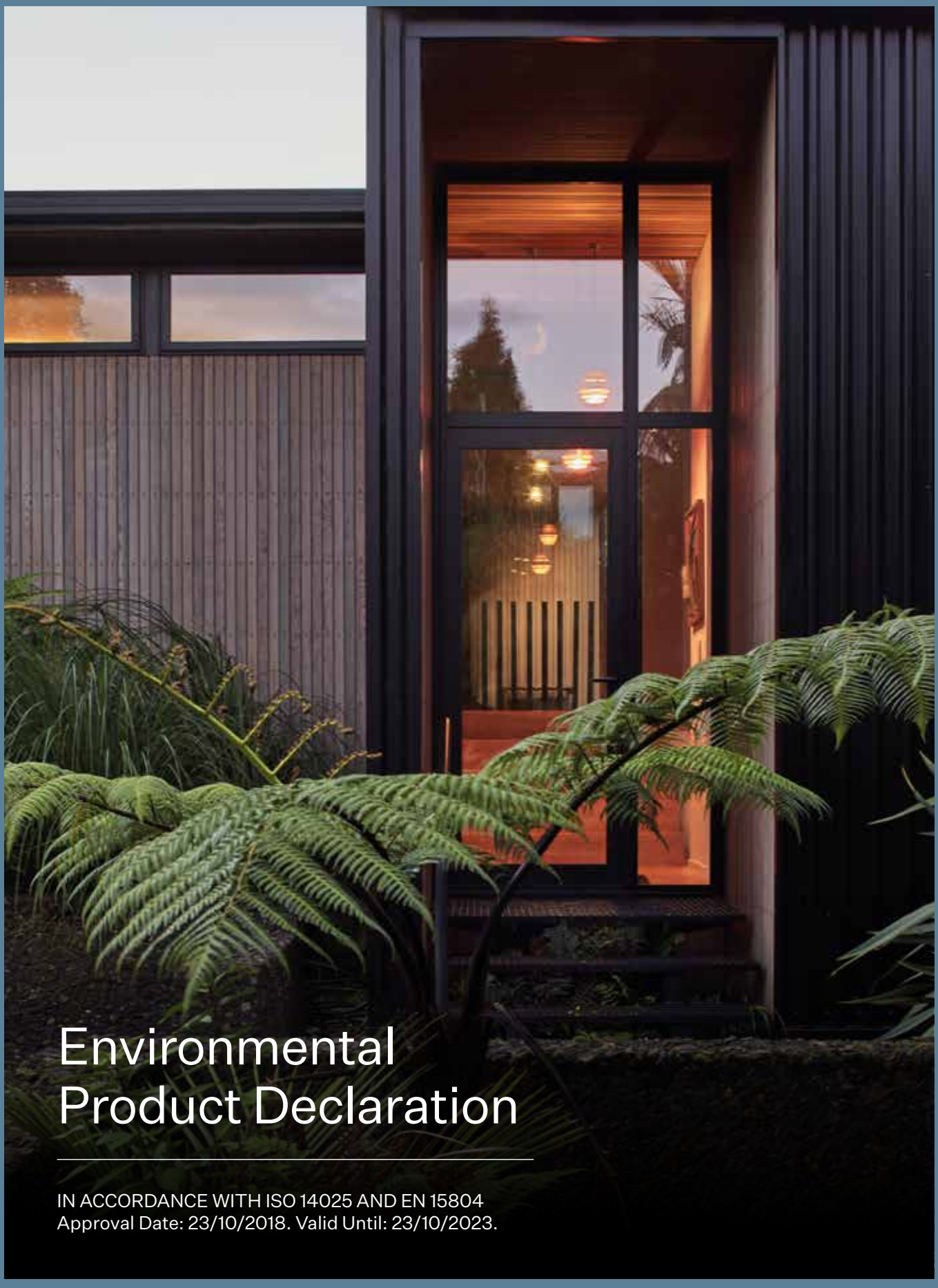
AUSTRALASIA EPD®
ENVIRONMENTAL PRODUCT DECLARATION

COLORSTEEL®



Environmental Product Declaration

IN ACCORDANCE WITH ISO 14025 AND EN 15804
Approval Date: 23/10/2018. Valid Until: 23/10/2023.

COLORSTEEL® Environmental Product Declaration

KEY INSIGHTS

Rating Tool EPD Compliance

- Follows ISO 14025 and EN 15804
- Independently verified
- Cradle-to-gate with end-of-life
- Product specific

Case Study 1

THE TATE HOME
New Zealand architect Chris Tate built his Waiheke Island pad – 'The Tent' – using elegantly fine-ribbed COLORSTEEL® ENDURA® in Ebony. Made completely from steel for stability and durability, this hideaway resembles a giant Cicada, hunched and ready to spring.

COLORSTEEL®

Since the early 80s, COLORSTEEL® has been protecting New Zealanders from the elements. The long-lasting performance and enduring success of our products is no accident. It comes down to our relentless commitment to research and development, which ensures each and every COLORSTEEL® product can stand up to New Zealand's intense weather conditions.

Not all pre-painted steel is COLORSTEEL®. Genuine COLORSTEEL® is made right here in New Zealand and is backed by comprehensive warranties and ongoing support.

We enjoy strong ties to some of the world's leading roofing paint manufacturers, drawing on their global expertise to create our range of world-class products. And we ensure every sheet of COLORSTEEL® that leaves our plant will stand the test of time by employing a rigorous research, development and testing program.

So, to make sure you're getting genuine COLORSTEEL®, look for the branded backer on the underside of every sheet. And don't forget to ask your roofer or roll former for both your warranty document and your Certificate of Authenticity.

Case Study 2

THE BRAE
When Auckland construction company Jalcon Homes were building 12 Cape Cod-style homes on the city's eastern seaboard, they needed roofing and cladding that could withstand the harsh coastal environment. So they chose COLORSTEEL® MAXX®.

The Versatility of COLORSTEEL®

COLORSTEEL® is manufactured in New Zealand by New Zealand Steel. New Zealand Steel recognises its social responsibilities and strives to continuously improve its performance in the areas of health, safety, environment and community.

The enduring success of COLORSTEEL® is no accident. It's the direct result of countless hours of research and development conducted by a team of industry-leading scientists, and an extensive global testing programme.

Our colour range has been inspired by the stunning natural environment that surrounds us here in New Zealand. Constantly evolving, it features a blend of timeless, traditional tones and trend-setting colours that suit every style and building era.

But it's not just our colour range that's constantly evolving; our production technology is too.

> "COLORSTEEL® products are lightweight and durable"

INTRODUCING COLORSTEEL'S PAINT SYSTEM

As the demands of the market change, we adapt. And the result is our most advanced paint technology system ever which boasts 8 unique layers that work in perfect harmony to provide superior corrosion resistance and protection from the effects of surface scratching. The result? Unbeatable peace of mind for homeowners right around the country.

WARRANTIES FOR PEACE OF MIND

COLORSTEEL® purchases typically come with a warranty. That warranty is backed by New Zealand Steel and ensures your investment is protected. But its validity relies on two things – choosing the right product, and then maintaining it.

By regularly washing all roofing and cladding you increase their durability by reducing attack from airborne salts and other pollutants. And by manually washing wall cladding every 3 to 12 months (depending on the local environment and paint system), you'll help prevent the build-up of dirt and debris that's not otherwise removed by the rain.

When COLORSTEEL® products are maintained as recommended and installed correctly, they will achieve at least 15 years of durability for roofs and exterior walls as required by New Zealand Building Code B2: Durability

Environmental Product Declaration – COLORSTEEL®

This EPD sets out information on COLORSTEEL® ENDURA® and COLORSTEEL® MAXX® with 0.40mm and 0.55mm base metal (steel) thickness (BMT), in coil form at the outbound gate of the manufacturing site. All products are manufactured by New Zealand Steel at its facilities at Glenbrook, Auckland. The declared unit presented is one flat square metre (1m^2) of COLORSTEEL® product.

The product range represented by this EPD is the COLORSTEEL® standard colour range. This EPD is only relevant to COLORSTEEL® products using a steel base coated in New Zealand Steel's aluminium/zinc alloy, which is New Zealand Steel's metallic coating that enhances corrosion performance.

This EPD is not applicable for galvanised based COLORSTEEL®.

This EPD is of the type "cradle-to-gate with options", where the options include recycling and landfill at end-of-life.

> "Declared Unit — This EPD is valid for a declared unit of 1m^2 of COLORSTEEL® Maxx® or COLORSTEEL® Endura® with a BMT of 0.4mm and 0.55mm"

COLORSTEEL® Product Content

The typical composition of the base steel of COLORSTEEL® product is:

Element	Typical Content
Iron	>97%
Manganese	<0.8%
Silicon	<0.05%
Chromium	<0.1%
Carbon	<0.1%
Other	<0.1% each

Steel by New Zealand Steel – Recycled Content
Pre-consumer recycled content: 5%

The above data complies with the ISO14021 definitions of recycled content.

For safe use, refer to the product Safety Data Sheet (SDS) which is available from New Zealand Steel.

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.

COLORSTEEL® ENDURA®

Created in conjunction with global leaders in both paint technology and the manufacture of pre-painted steel products, COLORSTEEL® ENDURA® represents the perfect blend of form and function.

Made in accordance with the ISO9001 quality management system, COLORSTEEL® ENDURA® is suitable for roofing and cladding applications in all our building environments, from mild and moderate inland settings to severe coastal environments.

It's available in a range of colours and profiles to suit residential, rural and commercial buildings in many parts of the country.

COLORSTEEL® MAXX®

Specifically developed to withstand higher atmospheric salt concentrations, COLORSTEEL® MAXX® is ideal in extreme building environments like New Zealand's rugged coastline.

COLORSTEEL® MAXX® is incredibly resistant to corrosion. That's thanks to the 200g/m² zinc/aluminium alloy coating on the steel substrate and the galvanic protection on the cut-edges, as well as the corrosion resistant primer and the baked-on paint finish.

It's available in a range of colours and profiles suitable for all types of buildings, in most parts of the country.

Brand	BMT (Base Metal Thickness)	Metal Coating	Minimum Coating Weight (total both surfaces)*	Minimum Coating Weight (single surface)
COLORSTEEL® ENDURA®	0.40mm	AZ150	150g/m²	60g/m²
COLORSTEEL® ENDURA®	0.55mm	AZ150	150g/m²	60g/m²
COLORSTEEL® MAXX®	0.40mm	AZ200	200g/m²	80g/m²
COLORSTEEL® MAXX®	0.55mm	AZ200	200g/m²	80g/m²

*Triple spot test.

The Strength Behind the Beauty

Manufactured right here in New Zealand, COLORSTEEL® is far more than just 'paint on steel'. We're constantly subjecting our products to extensive testing, with more than 20,000 test panels in 17 sites across the globe. That's helped make COLORSTEEL® New Zealand's favourite roof.

8 LAYERS OF PROTECTION
The performance of COLORSTEEL® comes from New Zealand Steel's toughest, most durable paint system.

Its resilience is founded on eight individual layers of protection against corrosion and the effects of surface scratching. And they work, very simply, by working together.

LAYER 1 is our toughest Topcoat ever, offering excellent colour retention and scratch resistance.

LAYER 2 is a Primer developed to protect against corrosion and enhance adhesion of the unique Topcoat.

LAYER 3 provides advanced paint adhesion to the ZINCALUME® layer.

LAYER 4 is a ZINCALUME® coating, which is an alloy of aluminium and zinc – the primary defence against corrosion.

LAYER 5 is made up of another ZINCALUME® coating, added for surface and cut edge protection.

LAYER 6 offers a pre-treatment layer which, as before, adds advanced paint adhesion to the ZINCALUME® layer.

LAYER 7 includes a reverse primer to provide corrosion resistance to the reverse of the sheet.

LAYER 8 is an ultra-tough backer coat that carries the COLORSTEEL® mark of authenticity, your assurance against inferior alternatives.

For your peace-of-mind, the COLORSTEEL® paint system is also lead-free. And both the substrate and the paint meet the most stringent environmental standards.

COLORSTEEL®
Steel Manufacturing

New Zealand Steel manufactures COLORSTEEL® from hot rolled steel coil in a three-phase process.

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 coated with New Zealand Steel's aluminium/zinc alloy.

The metal coated coil is then transferred to a paint line, where it is coated with a pre-treatment to improve paint adhesion, followed by a primer and topcoat and backing coat, prior to packaging ready for shipment.

Scope of Declaration

The scope of this declaration is for 1 flat square metre of COLORSTEEL® Endura® or COLORSTEEL® Maxx® 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 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 wastes and emissions to air, land and water. Co-products from the steelmaking process have been removed through the use of economic allocation.

Table 1. Scope of Declaration in EPD

Product stage			**Construction process stage**		**Use stage**							**End of life stage**				**Benefits and loads beyond the system boundary**
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).

Results of Assessment

Table 2. Life Cycle Impact Assessment Indicators COLORSTEEL® Endura® (Declared unit =1m²)

		COLORSTEEL® Endura® 0.4mm				COLORSTEEL® Endura® 0.55mm			
Indicator	**Unit**	**A1-A3**	**C3**	**C4**	**D**	**A1-A3**	**C3**	**C4**	**D**
Global warming potential	kg CO_2-eq.	13.5	0.0261	0.0177	-3.93	17.6	0.0352	0.0238	-5.48
Depletion potential of the stratospheric ozone layer	kg CFC11-eq.	3.97E-09	6.40E-17	4.68E-15	2.51E-08	3.94E-09	8.62E-17	6.31E-15	3.45E-08
Acidification potential of land and water	kg SO_2-eq.	0.119	8.31E-05	4.91E-05	0.00404	0.160	1.12E-04	6.63E-05	0.00519
Eutrophication potential	kg PO_4^{3-}-eq.	0.00641	1.07E-05	6.18E-06	6.63E-04	0.00844	1.44E-05	8.34E-06	8.74E-04
Photochemical ozone creation potential	kg C_2H_4-eq.	0.00690	5.90E-06	4.42E-06	-0.00140	0.00886	7.96E-06	5.96E-06	-0.00194
Abiotic depletion potential – elements	kg Sb-eq.	1.14E-04	1.41E-08	1.91E-09	-1.31E-06	1.14E-04	1.90E-08	2.58E-09	-1.80E-06
Abiotic depletion potential – fossil fuels	MJ	176	0.322	0.256	-37.9	227	0.434	0.345	-52.4

Table 3. Life Cycle Impact Assessment Indicators COLORSTEEL® Maxx® (Declared unit =1m²)

		1m² of COLORSTEEL® Maxx® 0.4mm				1m² of COLORSTEEL® Maxx® 0.55mm			
Indicator	**Unit**	**A1-A3**	**C3**	**C4**	**D**	**A1-A3**	**C3**	**C4**	**D**
Global warming potential	kg CO_2-eq.	13.8	0.0264	0.0179	-3.93	17.9	0.0355	0.0240	-5.49
Depletion potential of the stratospheric ozone layer	kg CFC11-eq.	3.98E-09	6.48E-17	4.74E-15	2.51E-08	3.95E-09	8.70E-17	6.37E-15	3.45E-08
Acidification potential of land and water	kg SO_2-eq.	0.121	8.42E-05	4.98E-05	0.00422	0.162	1.13E-04	6.69E-05	0.00535
Eutrophication potential	kg PO_4^{3-}-eq.	0.00649	1.08E-05	6.27E-06	6.82E-04	0.00856	1.45E-05	8.41E-06	8.90E-04
Photochemical ozone creation potential	kg C_2H_4-eq.	0.00704	5.98E-06	4.48E-06	-0.00139	0.00903	8.03E-06	6.01E-06	-0.00193
Abiotic depletion potential – elements	kg Sb-eq.	1.46E-04	1.43E-08	1.94E-09	-1.31E-06	1.46E-04	1.92E-08	2.60E-09	-1.80E-06
Abiotic depletion potential – fossil fuels	MJ	179	0.327	0.260	-37.8	231	0.438	0.348	-52.3

Results of Assessment continued

Table 4. Resource Indicators COLORSTEEL® Endura® (Declared unit =1m²)

		COLORSTEEL® Endura® 0.4mm				COLORSTEEL® Endura® 0.55mm			
Indicator	**Unit**	**A1-A3**	**C3**	**C4**	**D**	**A1-A3**	**C3**	**C4**	**D**
Renewable primary energy as energy carrier	MJ	30.5	0.978	0.0196	2.94	36.6	1.32	0.0265	4.03
Renewable primary energy as material utilization	MJ	0	0	0	0	0	0	0	0
Total use of renewable primary energy resources	MJ	30.5	0.978	0.0196	2.94	36.6	1.32	0.0265	4.03
Non-renewable primary energy as energy carrier	MJ	178	0.322	0.266	-35.4	229	0.435	0.358	-48.8
Non-renewable primary energy as material utilization	MJ	0.845	0	0	0	1.58	0	0	0
Total use of non-renewable primary energy resources	MJ	179	0.322	0.266	-35.4	230	0.435	0.358	-48.8
Use of secondary material	kg	0	0	0	0	0	0	0	0
Use of renewable secondary fuels	MJ	9.91E-08	0	0	0	9.84E-08	0	0	0
Use of non-renewable secondary fuels	MJ	1.18E-06	0	0	0	1.17E-06	0	0	0
Use of net fresh water	m³	0.167	0.00255	2.81E-05	0.00630	0.211	0.00343	3.79E-05	0.00853

Table 5. Resource Indicators COLORSTEEL® Maxx® (Declared unit =1m²)

		COLORSTEEL® Maxx® 0.4mm				COLORSTEEL® Maxx® 0.55mm			
Indicator	**Unit**	**A1-A3**	**C3**	**C4**	**D**	**A1-A3**	**C3**	**C4**	**D**
Renewable primary energy as energy carrier	MJ	31.9	0.992	0.0199	2.94	38.1	1.33	0.0267	4.03
Renewable primary energy as material utilization	MJ	0	0	0	0	0	0	0	0
Total use of renewable primary energy resources	MJ	31.9	0.992	0.0199	2.94	38.1	1.33	0.0267	4.03
Non-renewable primary energy as energy carrier	MJ	169	0.327	0.269	-35.3	224	0.439	0.361	-48.7
Non-renewable primary energy as material utilization	MJ	13.9	0	0	0	10.7	0	0	0
Total use of non-renewable primary energy resources	MJ	183	0.327	0.269	-35.3	235	0.439	0.361	-48.7
Use of secondary material	kg	0	0	0	0	0	0	0	0
Use of renewable secondary fuels	MJ	9.94E-08	0	0	0	9.85E-08	0	0	0
Use of non-renewable secondary fuels	MJ	1.18E-06	0	0	0	1.17E-06	0	0	0
Use of net fresh water	m³	0.172	0.00258	2.85E-05	0.00628	0.216	0.00347	3.82E-05	0.00849

Table 6. Wastes and Other Outputs COLORSTEEL® Endura® (Declared unit =1m²)

		COLORSTEEL® Endura® 0.4mm				COLORSTEEL® Endura® 0.55mm			
Waste categories and indicator flows	**Unit**	**A1-A3**	**C3**	**C4**	**D**	**A1-A3**	**C3**	**C4**	**D**
Hazardous waste indicator	kg	2.55E-07	2.76E-10	1.42E-09	-2.94E-06	2.77E-07	3.72E-10	1.91E-09	-4.04E-06
Non-hazardous waste disposed	kg	0.998	1.89E-04	0.370	0.636	1.26	2.55E-04	0.499	0.817
Radioactive waste disposed	kg	0.00113	9.91E-08	3.70E-06	1.01E-05	0.00124	1.34E-07	4.99E-06	1.27E-05
Components for re-use	kg	0	0	0	0	0	0	0	0
Materials for recycling	kg	0	2.99	0	0	0	4.03	0	0
Materials for energy recovery	kg	0	0	0	0	0	0	0	0
Exported electrical energy	MJ	0	0	0	0	0	0	0	0
Exported thermal energy	MJ	0	0	0	0	0	0	0	0

Table 7. Wastes and Other Outputs COLORSTEEL® Maxx® (Declared unit =1m²)

		COLORSTEEL® Maxx® 0.4mm				COLORSTEEL® Maxx® 0.55mm			
Waste categories and indicator flows	**Unit**	**A1-A3**	**C3**	**C4**	**D**	**A1-A3**	**C3**	**C4**	**D**
Hazardous waste indicator	kg	2.61E-07	2.79E-10	1.44E-09	-2.94E-06	2.84E-07	3.75E-10	1.93E-09	-4.04E-06
Non-hazardous waste disposed	kg	1.07	1.92E-04	0.375	0.680	1.33	2.57E-04	0.503	0.861
Radioactive waste disposed	kg	0.00136	1.00E-07	3.75E-06	1.06E-05	0.00146	1.35E-07	5.04E-06	1.30E-05
Components for re-use	KG	0	0	0	0	0	0	0	0
Materials for recycling	kg	0	3.03	0	0	0	4.06	0	0
Materials for energy recovery	kg	0	0	0	0	0	0	0	0
Exported electrical energy	kg	0	0	0	0	0	0	0	0
Exported thermal energy	MJ	0	0	0	0	0	0	0	0

Results of Assessment continued

Table 8. End of life 1m² COLORSTEEL® Endura® and Maxx®

	COLORSTEEL® Endura®			COLORSTEEL® Maxx®		
	End of life			End of life		
Parameter	**Unit**	**0.40mm**	**0.55mm**	**unit**	**0.40mm**	**0.55mm**
Steel collected separately	kg	2.99	4.03	kg	3.03	4.06
Steel collected with mixed construction waste	kg	0	0	kg	0	0
Recovery for re-use	kg	0	0	kg	0	0
Recovery for recycling	kg	2.99	4.03	kg	3.03	4.06
Recovery for energy recovery	kg	0	0	kg	0	0
Disposal to landfill	kg	0.37	0.49	kg	0.37	0.51
Assumptions for scenario						
		0.4mm COLORSTEEL® ENDURA® (AZ150) 3.36 kg/m²	0.55mm COLORSTEEL® ENDURA® (AZ150) 4.52 kg/m²		0.4mm COLORSTEEL® MAXX® (AZ200) 3.40 kg/m²	0.55mm COLORSTEEL® MAXX® (AZ200) 4.57 kg/m²

TAKE CARE WHEN COMPARING

Please note that:

- EPDs of construction products may not be comparable if they do not comply with EN 15804.
- EPDs within the same product category from different programmes may not be comparable.
- 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.

Recycling

The steel component of all New Zealand Steel products is 100% recyclable – no losses are necessary due to downgrading of recyclable material. 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 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. The recycling scenario in this EPD was based on Hyder Consulting Reports* which indicate that the average metals recycling rate in Australia is 89%. Due to a lack of reliable data for New Zealand, this same rate has been applied, with the remaining 11% assumed to go to landfill. This recycling rate is considered to be a conservative estimate for flat steel construction products, but was used in the absence of verified higher recycling rates.

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

“A focus on design to maximise recycling of steel 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 v3.0 (GPI) and PCR 2012:01 Construction Products and Construction Services V2.2.

The Life Cycle Inventory (LCI) dataset that form the basis of this EPD was based on an earlier study covering the financial year 1st July 2011 to 30th June 2012. The original dataset was updated to reflect changes in New Zealand Steel's manufacturing process using 2016 data. Specifically, new data were used for the oxygen steelmaking furnace (KOBM), ladle treatment station, slab caster and the reheat furnace of the hot strip mill. Water was also remodelled to account for all flows, including unmetered flows.

All relevant and available data was collected. While cut-off criteria according to the PCR section 7.6 was employed, much of the data which would have fallen within that scope was included regardless, if available. No carbon dioxide offsetting is included in the LCI.

The secondary data used was from GaBi Databases 2018. Most datasets have a reference year from 2014 to 2017, and all fall within the 10-year limit for secondary data specified in EN 15804. Electricity data was based on New Zealand Steel's cogeneration plants, with imported electricity based on the average New Zealand electricity grid mix from GaBi Databases 2018.

Allocation followed EN 15804 section 6.4.3.2. Allocation was performed using surface area for metal coating and painting, mass for base metal, and economic value for all saleable scrap.

KEY ASSUMPTIONS MADE DURING THE STUDY WERE:

- Accuracy of data measurement falls within normal industrial weighing systems accuracy limits of +/-5%.
- Proprietary chemicals and paints can be sufficiently modelled using guidance from Safety Data Sheets and conservative assumptions on that basis.
- Direct emissions to air from combustion of coal and coal gases were calculated based on the composition of the coal. This approach was designed to capture all emissions to air, including those not regularly monitored. The calculated emissions used in this study exceed all measurements taken by New Zealand Steel and can be considered conservative This approach may lead to overestimation of acidification potential, eutrophication potential and POCP.
- Measured data was always used where it was available, but there were some cases where flows were unmetered and had to be calculated. This was particularly true for water consumption during iron- and steel-making, where calculated flows were used to achieve a water balance.

* See recycling references section on page 18.

Interpretation of Results

COLORSTEEL® is designed to be durable and resilient to New Zealand's variable, harsh and unpredictable weather conditions.

To maximise the invested environmental value of the product, it should be used in structures which are designed for long life, resilience and flexibility, with a view to optimising the whole-of-life energy efficiency of the building.

IMPACT CATEGORY RESULTS

The impact of COLORSTEEL® across all reported impact categories follow predictable patterns based on the composition and processing of the product. The Base Metal (steel) Thickness (BMT) is influential in the areas of Global Warming Potential (GWP), Acidification Potential (AP), Eutrophication Potential (EP), Photochemical Ozone Creation Potential (POCP) and Abiotic Depletion of Fossil resources (ADPF). This illustrates the dominance of the manufacturing of steel for the substrate.

In order to control the impacts for these categories, the selection of an appropriate BMT is required. Where a thicker steel sheet does not contribute to structural integrity, the lighter weight version of COLORSTEEL® should be selected.

Impacts in the category of Ozone Depletion Potential (ODP) were driven by components found in some of the paints we use. It should be noted that the impact of our products to ozone depletion is very small.

Abiotic Depletion of Elements (ADPE), or metal resource depletion, is heavily impacted by the use of metallic coating. A combination of zinc and aluminium for corrosion protection of the steel under the visible paint layer is necessary for longevity of the product; however, this result shows the need to ensure that the metallic coating is limited to as much as necessary to ensure product durability.

While this EPD comprehensively covers the requirements for reporting in the PCR section 9, it is important to recognise that any LCA is not a complete assessment of all environmental or sustainability issues of the product system under study.

METHODOLOGY

This product-specific EPD validly represents the production process described. The cut-off criterion of 1%, in mass, energy and environmental relevance, (conforming with PCR 2012:01 V2.2 section 7.6) has resulted in a data set which is robust and all significant contributors to the LCA results have been captured in this study. Where available, data which fell within the cut-off criteria were included in the data set.

Upstream data taken from the GaBi database reflects average or generic production and therefore does not correspond to New Zealand Steel's actual suppliers.

Allocation of co-products within New Zealand Steel's plant was done using economic allocation following PCR section 7.7. Allocation for upstream materials sourced from the GaBi database primarily use physical allocation (mass, energy, etc.), as appropriate.

AVERAGE PRODUCT ASSUMPTION – SENSITIVITY OF RESULTS

The LCI model was based on measured throughput, generally by mass. Hence, the initial data output of the model was also on a mass (per kg) basis. However, sensitivity testing showed that for coated steel products such as COLORSTEEL® steel, a change in the BMT of the product made a significant difference to the impacts. This is due to changes in the fraction of steel versus coatings in the results. Hence, for comparability between products, it was determined that coated products must have impacts reported on an area (per m^2) basis. Once those area-based impacts are known for a specific BMT, the results can be converted to a mass basis if required.

Health, Safety, Environment and Community at New Zealand Steel

THE ENVIRONMENT

The production of steel at New Zealand Steel is a unique and innovative process using many of the resources found in the local environment including air, water, electricity, coal, ironsand and the land on which the mill is located.

As with any industrial or mining activity, New Zealand Steel's activities have an effect on the environment. The company takes its environmental responsibilities seriously and has demonstrated commitment to the environment by implementing a formal Environmental Management System (EMS) which aims to avoid or minimise the environmental effect of its operations.

New Zealand Steel established its first Environmental Policy and EMS in 1990, which was later certified to ISO 14001 in 2003. All New Zealand Steel business processes (manufacturing, mining and support processes) are certified to ISO 14001. Most manufacturing facilities (excluding the iron plant) are certified to ISO 9001. New Zealand Steel's central laboratories are certified by IANZ. This Environmental Product Declaration and our annual Environmental Choice audits are further evidence of New Zealand Steel's commitment to measuring and improving our environmental performance.

New Zealand's Resource Management Act (RMA) requires companies to obtain resource consents for activities which are not permitted by regional or district plans. As such, New Zealand Steel actively controls the effects of each operation, including: extracting ironsand; use of water, air and raw materials; discharge to air of gases and dust; and waste disposal.

Our most significant emissions reductions project to date was the introduction of a second cogeneration plant in 1997. This recycles surplus gas from our iron-making kilns and produced 52% of our electricity needs in 2011/12 (the reference year for our original LCA).

New Zealand Steel is a member of the New Zealand Green Building Council. Our parent company BlueScope is a member of the World Steel Association's Climate Change Action Programme.

OUR PEOPLE AND OUR COMMUNITY

The safety of our people is our number one priority at New Zealand Steel. Across the company, from our manufacturing and distribution sites to our offices, our focus is on Zero Harm. The results are very evident – we have now reached a point where the results are very evident and our efforts have lowered the likelihood of injury across New Zealand Steel's workforce.

As a New Zealand manufacturer, we are proud to contribute to local employment and economic growth, and to contribute to the wellbeing and prosperity of our community.

For more information on New Zealand Steel's commitment to sustainability, see: **www.nzsteel.co.nz/sustainability/**

References

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Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products.

ISO 9001:2008
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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

PCR 2012:01
Construction Products and Construction Services, Version 2.2, 2017-05-30

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Version 3.0 of 2017-12-11

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RECYCLING REFERENCES
"Waste and recycling in Australia 2011"
A report prepared for the Department of Sustainability, Environment, Water, Population and Communities by Hyder Consulting, 28 August 2012
www.environment.gov.au/system/files/resources/b4841c02-229b-4ff4-8b3b-ef9dd7601d34/files/waste-recycling2011.pdf

"Construction and demolition waste status report"
A report for the Department of Sustainability, Environment, Water, Population and Communities and Queensland Department of Environment and Resource Management by Hyder Consulting, 20 October 2011
www.environment.gov.au/system/files/resources/323e8f22-1a8a-4245-a09c-006644d3bd51/files/construction-waste.pdf

EPD Registration Information

EPD information:	
EPD registration number:	S-P-01001
Approval date:	2018-10-23
Revision date:	2018-10-23
Valid until:	2023-10-23
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:	1 July 2011 to 30 June 2012, as updated to reflect process changes up to 31 October 2016
Geographical scope:	New Zealand

EPD owner:	New Zealand Steel Limited Web: www.nzsteel.co.nz Email: info@colorsteel.co.nz Phone: 0800 100 523 Post: Private Bag 92121, Auckland 1142, New Zealand
EPD produced by:	thinkstep Limited Web: www.thinkstep-anz.com Email: anz@thinkstep.com
Programme operator:	The Australasian EPD® Programme Web: www.epd-australasia.com Email: info@epd-australasia.com Phone: +64 9 889 2909

PCR:	PCR 2012:01 Construction Products and Construction Services, Version 2.2, 2017-05-30
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)
EPD verifier:	Rob Rouwette, start2see Pty Ltd Web: www.start2see.com.au Email: Rob.Rouwette@start2see.com.au
Accredited or approved by:	The Australasian EPD® Programme

For more information about NEW ZEALAND STEEL products
call **0800 697 833** or visit **colorsteel.co.nz**

NOTE: Buyers and users of New Zealand Steel products and services must make their own assessment of the products for their own conditions. All queries regarding product specification, purpose or application should be directed to New Zealand Steel, phone 0800 697 833. New Zealand Steel reserves the right to modify products, techniques, equipment and statements to reflect improvements in the manufacture and application of its products. The information contained in this brochure is supplied without prejudice to New Zealand Steel's standard terms and conditions of sale. In the event of conflict between this information and the standard terms and conditions, the standard terms and conditions prevail. COLORSTEEL®, MAXX®, and ENDURA® are registered trademarks of New Zealand Steel Limited. ZINCALUME® is a registered trademark of BlueScope Steel Limited.

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