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Valid until: 8th April 2024

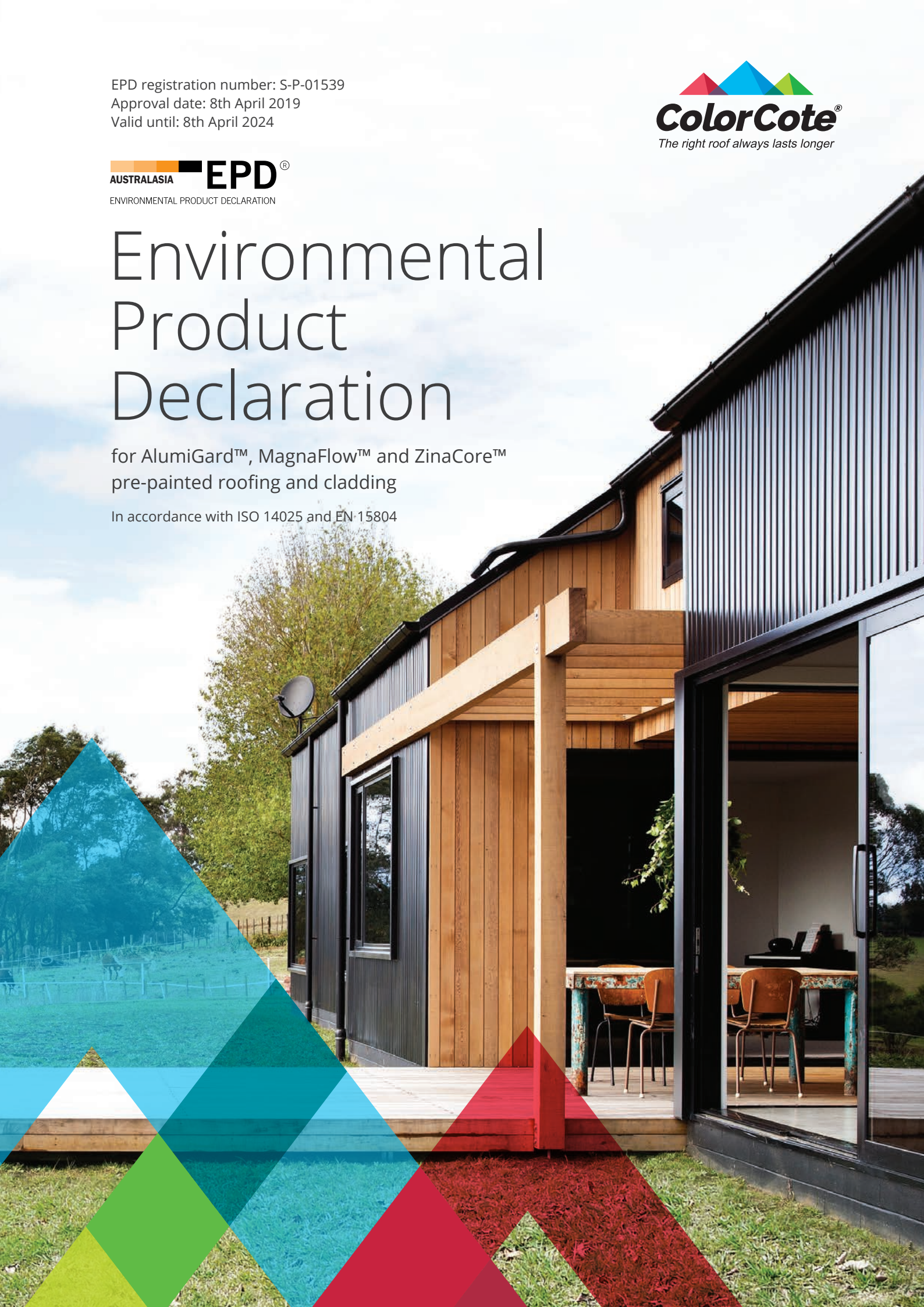
ColorCote®
The right roof always lasts longer

AUSTRALASIA EPD®
ENVIRONMENTAL PRODUCT DECLARATION

Environmental Product Declaration

for AlumiGard™, MagnaFlow™ and ZinaCore™ pre-painted roofing and cladding

In accordance with ISO 14025 and EN 15804



Key Insights

Sustainability and our Environment

Pacific Coilcoaters has achieved a 80% decrease in water usage. Water is used in the pre-cleaning process of the metal substrate prior to painting.

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Mist Green

Technical Information

This EPD is valid for a declared unit of 1m2 coated metal formed sheet in New Zealand.

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Sandstone Grey

System Boundaries

Production, end-of-life and recycling processes.

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EPD results for 1m² of ColorCote® ZinaCore™ and MagnaFlow™ 0.40mm and 0.55mm, and AlumiGard™ 0.70mm and 0.90mm.

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Titania

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Our values

At Fletcher Building, sustainability is about how we do business. So as part of the Fletcher Building Group, the sustainability of our business is built on:

- Maintaining transparency with stakeholders through annual reports on performance and sustainability initiatives
- Providing opportunities for development within the workplace with the goal of high engagement and high performance
- Managing health and safety risks across the scope of the business
- Facilitating employment and training opportunities for youth through collaboration with government stakeholders and partners
- Investing back in the communities in which we operate
- Reducing the environmental impact associated with manufacturing, construction and extraction operations
- Collaborating with our staff and partners to minimise environmental impact
- Continually focusing on sustainability and the environment to deliver value to our shareholders

Be Bold: We innovate and take calculated risks to drive business for our shareholders, customers, communities and employees.

Play Fair: We are honest and respectful in our relationships with fellow employees, customers and the community.

Better Every day: We seize opportunities to improve regardless of how big or small they may seem.

Customer Leading: Without customers and clients, we don't have a business – it's as simple as that. Customer leading is about being ahead of the game for our customers, every single day.

Better Together: We harness our diversity, collaborate and share. We think and act as Fletcher Building teams.

Sustainability and Our Environment

Walking the Talk

At Pacific Coilcoaters we place a major focus on caring for the environment. We are proud to incorporate sustainability into our everyday business practices.

Using metal for roofing and cladding provides long-lasting, durable, and recyclable energy-efficient products. Our job includes making sure that we look after the environment while producing these materials.

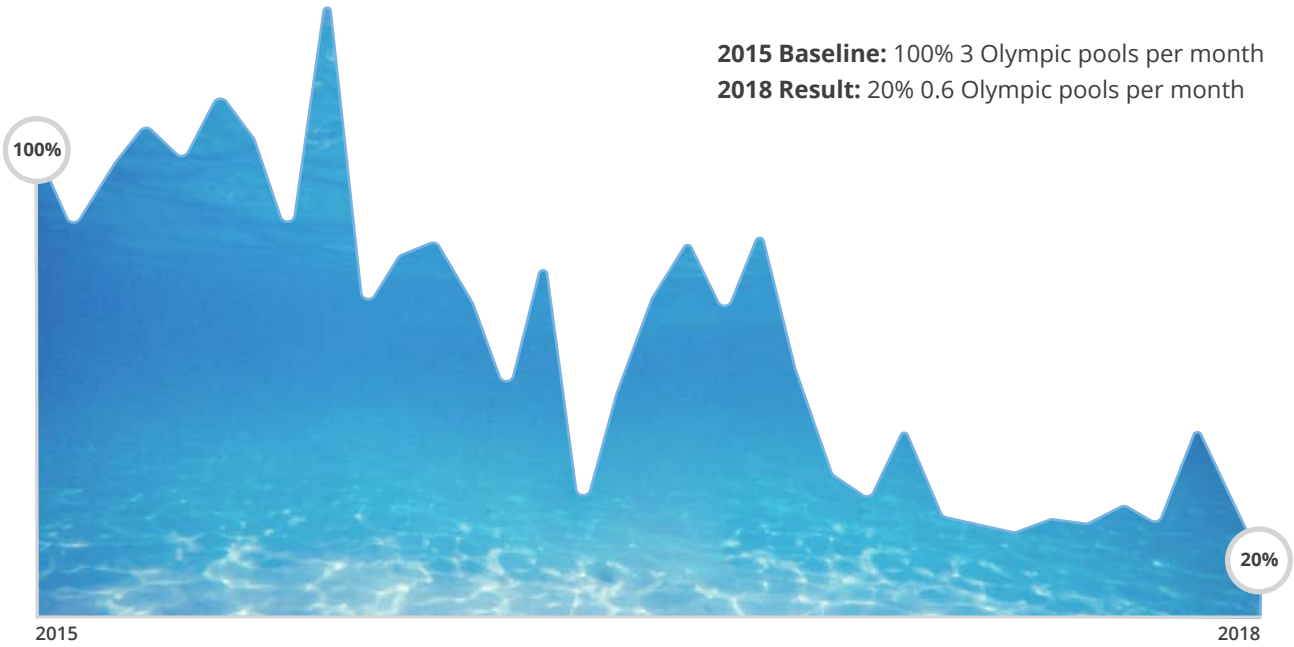
Preparing metal substrate for painting uses an immense amount of water. The metal substrate is pre-cleaned and rinsed, and then cooled once it leaves the oven. In 2015, this process used about 3 Olympic-sized swimming pools of water per month. A major engineering project in 2017 focused on improvements to reticulation. The result?

Continuous improvements meant that by 2018, our water usage had decreased to approximately one half of an Olympic sized swimming pool per month, yielding massive water savings and reduction in expense.

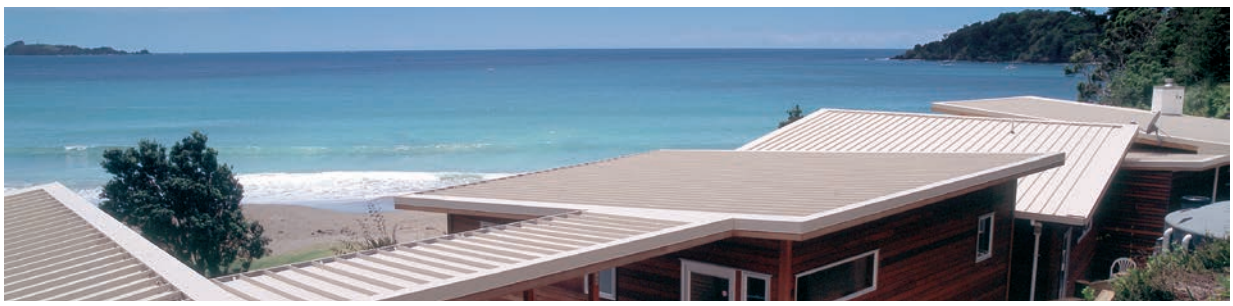
Furthermore, the decrease in water usage means that we now have the ability to look to source all the water needed through rain water harvesting, putting us on track to becoming completely water self-sufficient.

This is just one example of the steps we consistently take in assessing our products and procedures from an environmental standpoint. An ongoing commitment to the environment is reflected in continuous improvements to systems and sustainability.

Water consumption (kL) per month



2015 Baseline: 100% 3 Olympic pools per month
2018 Result: 20% 0.6 Olympic pools per month



Pacific Coilcoaters, Makers of ColorCote®

Established in the mid 1930s as a manufacturer of aluminium venetian style blinds, Pacific Coilcoaters is now regarded as one of the leading innovators and producers of pre-painted long run metal roofing substrates.

Following its purchase by Hunter Douglas in the 1960s and the commissioning of a then state-of-the art continuous paint line capable of pre-painting steel 400mm wide, the business expanded into supplying long run roofing and cladding for the commercial market, with one of its first projects being the supply of material to the Huntly Power Station.

1982 saw the launch of the ColorCote® brand, a brand synonymous with quality and innovation and one that remains today.

In 1988 the business was purchased by then Fletcher Challenge who saw the value in owning a long term business asset that would support the New Zealand building industry. This ownership remains today via the Fletcher Building group of companies.

Since its inception, Pacific Coilcoaters and the ColorCote® range of products have focused on delivering innovation and market leading technology that deliver value to its customers with initiatives such as:

- The introduction of Zinc / Aluminium / Magnesium based substrates that give longer lasting protection in environments that are close to the coast.
- Being a market leader in the introduction of water-borne paint technology that delivers a more environmentally friendly and sustainable product to the market.

With a long and proud history in establishing itself as being a company that is first to market with a number of paint and substrate technologies and initiatives, Pacific Coilcoaters looks forward to continuing this proud heritage as we look toward helping build a more environmentally better future for us all.

ColorCote® Products

Only ColorCote® has a three-tier range of pre-painted metal roofing and cladding products – all using the latest paint technology – to suit any environment.

We can recommend the best product for your build from one of our three substrate types, to ensure your roof or cladding is perfect for the environment it is designed for – from moderate inland to the harshest coastal, industrial or geo-thermal conditions.

Top right image courtesy of Trends Publishing New Zealand Ltd.
Bottom image courtesy of Matt Hunt.

AlumiGard™

For the harshest conditions

We use a marine grade aluminium alloy substrate, painted with a polyester primer, and add a water-borne acrylic or polyester baked on top coat. AlumiGard™ is designed for use in very severe marine environments, right up to the waterline, or for acidic exposure in geothermal areas.

Technical

ColorCote® AlumiGard™
Conforms to AS/NZS2728:2013
Suitable for ISO9223:2012
Atmospheric Classifications C1 – C6

Substrate

Aluminium alloy type 5005 or 5052 marine grade, H34 or H36 temper.

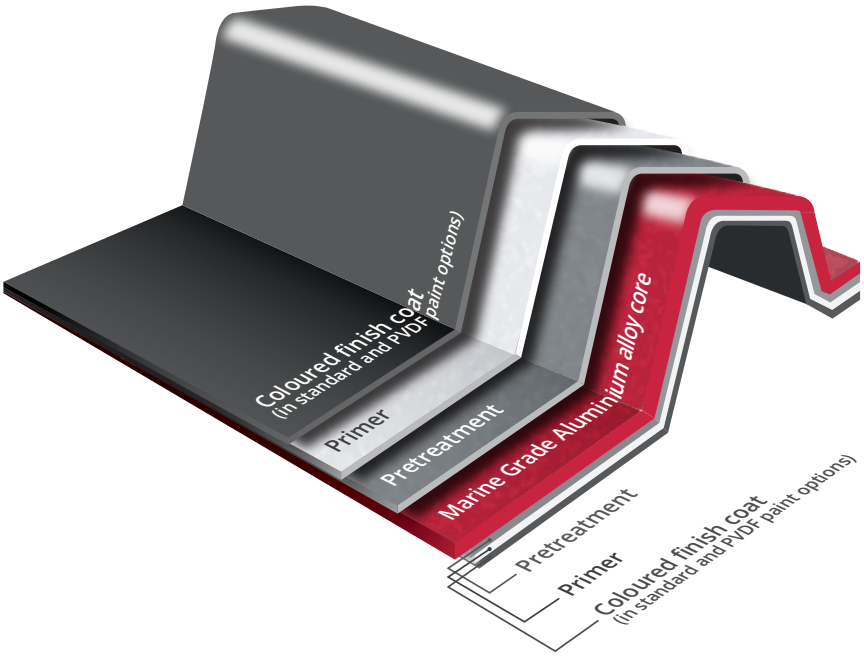


Image courtesy of Patrick Reynolds Photography.

MagnaFlow™

For that extra protection

A steel roof is most susceptible to corrosion along cut edges, however the magnesium in the coating of MagnaFlow™ helps it to 'self heal' by helping zinc to flow over the edge and create a seal against further corrosion.

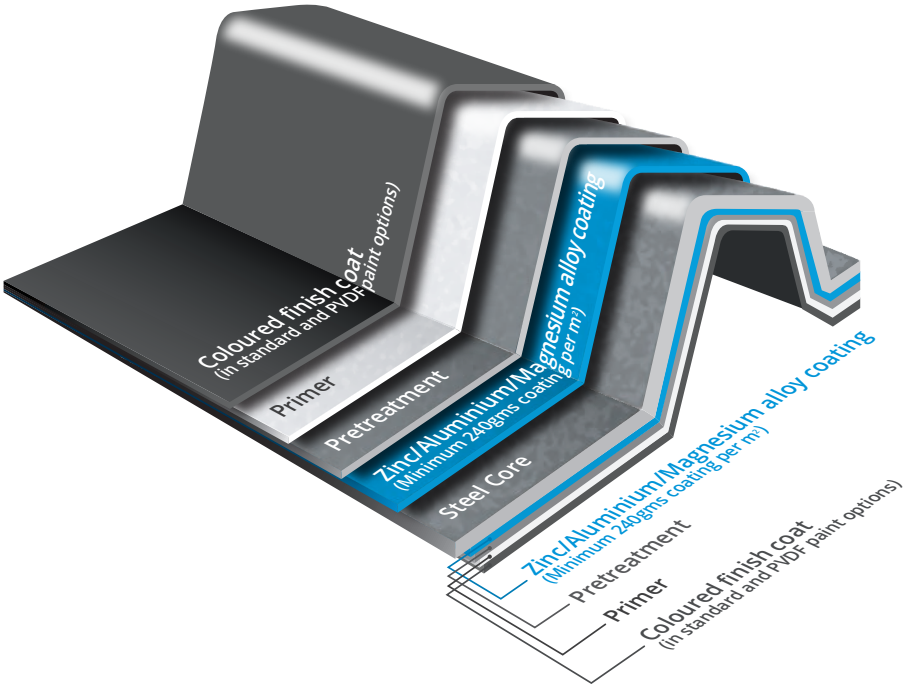
With superior corrosion resistance, MagnaFlow™ is the ideal choice for demanding environments such as houses close to the coast. This substrate has a water-borne or polyester top coat baked on a polyester primer, ensuring excellent colour retention and gloss for many years to come.

Technical

ColorCote® MagnaFlow™
Conforms to AS/NZS2728:2013
Suitable for ISO9223:2012
Atmospheric Classifications C1 – C4

Substrate

Hot-dipped zinc/aluminium/magnesium alloy coated steel coil, nominal 240gms/m² coating weight.



ZinaCore™

Durability and value

Suitable for moderate climatic environments, ZinaCore™ has a hot-dipped aluminium/zinc alloy coated steel substrate. It has a water-borne or polyester top coat baked on a polyester primer, giving an extremely durable paint system that resists UV damage and provides excellent gloss and colour retention.

Technical

ColorCote® ZinaCore™
Conforms to AS/NZS2728:2013
Suitable for ISO9223:2012
Atmospheric Classifications C1 – C3

Substrate

Hot-dipped aluminium/zinc alloy coated steel coil, nominal 150gms/m^2 coating weight.

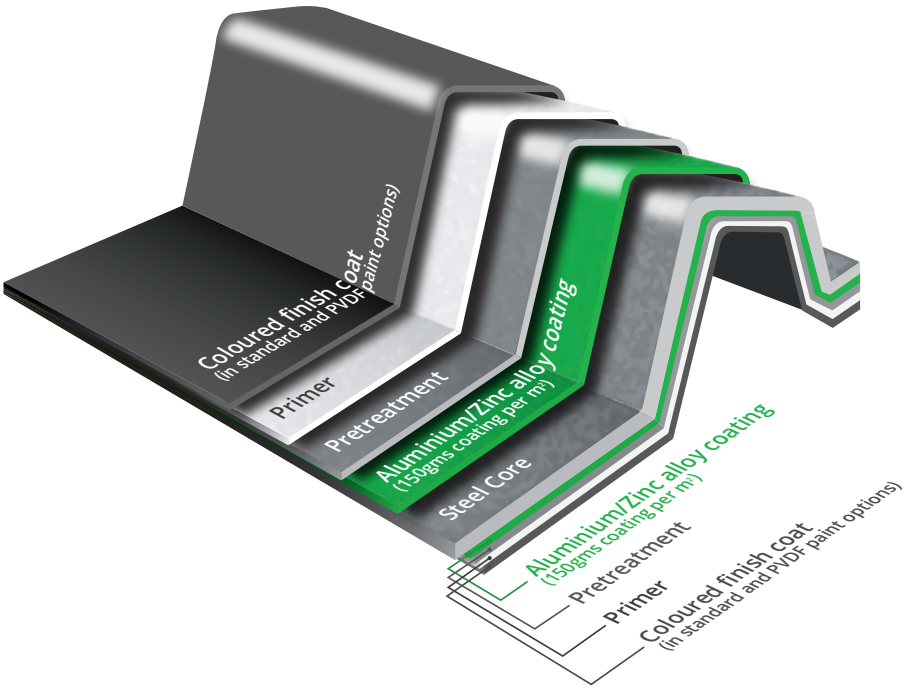


Image courtesy of Larnie Nicolson Photography.

Technical Information

Declared Unit

This EPD is valid for a declared unit of 1m^2 coated metal sheet as specified in the table below, formed into shape, packaged and ready for despatch to a customer.

Table 1: Roofing and cladding products included in this EPD

Product type	Base metal thickness (BMT)
*ZinaCore™	0.40mm & 0.55mm
*MagnaFlow™	0.40mm & 0.55mm
*AlumiGard™	0.70mm & 0.90mm

*Results shown in the table of results cover both the primary product brand and the X sub brand.

System Boundaries

As shown in Table 2, this EPD is of the 'cradle-to-gate' type with options. The options include end-of-life processing (Modules C3-C4) and recycling potential (Module D).

Other life cycle stages (Modules A4-A5, B1-B7 and C1-C2) are dependent on particular scenarios and best modelled at the building level.

Table 2: Modules included in the scope of the EPD

Product stage			Construction process stage		Use stage							End-of-life stage				Benefits and loads beyond the system boundary
Raw material supply	Transport of raw materials	Manufacturing	Transport to customer	Construction / Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction / demolition	Transport to waste processing	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 = included in the EPD; MND = Module Not Declared (such a declaration shall not be regarded as an indicator result of zero)

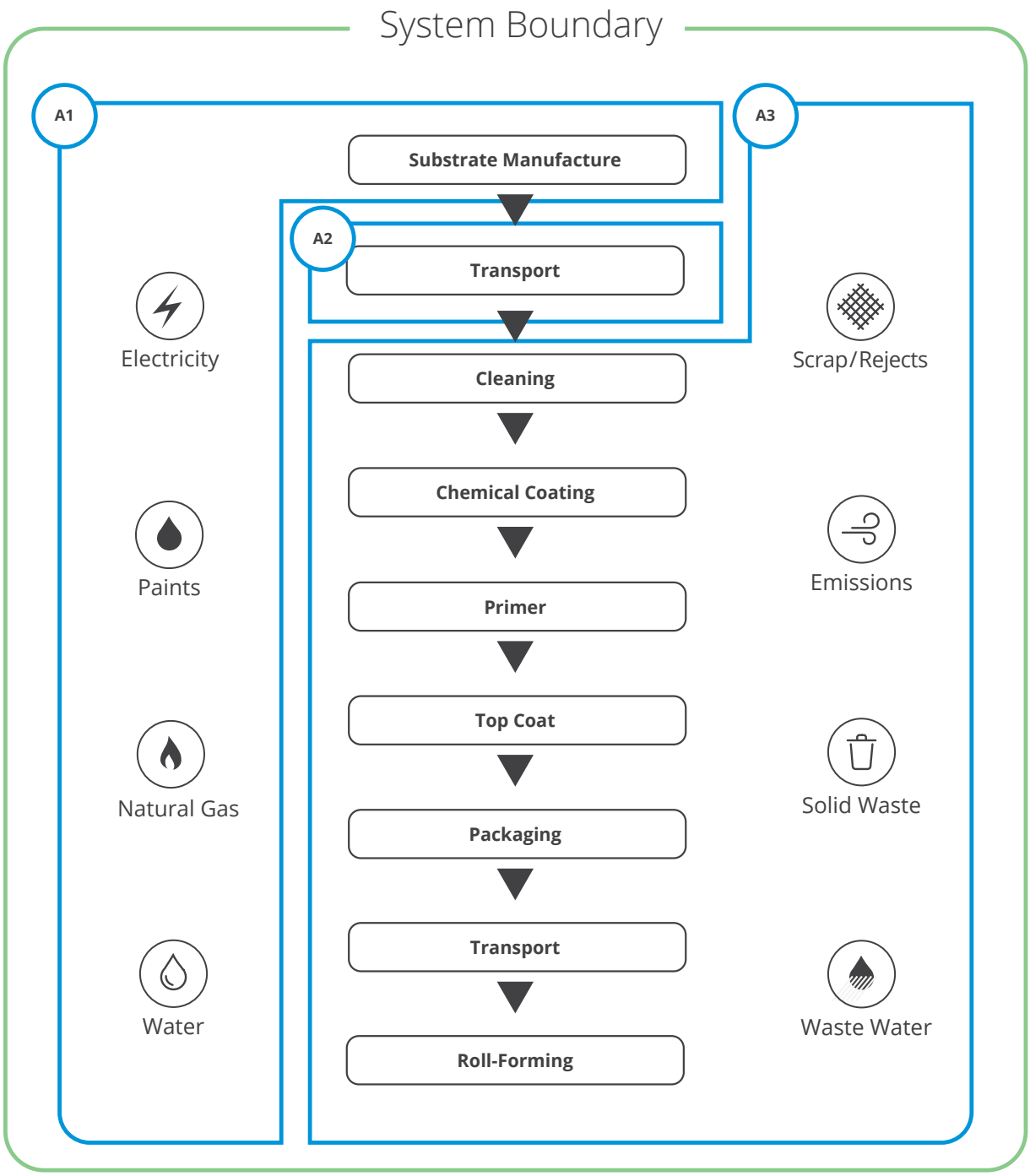
Production

(Modules A1-A3)

As shown in Figure 1, ColorCote® products are manufactured in the following way:

1. The unpainted substrate is manufactured by our suppliers are delivered in coil form to our manufacturing site in Auckland, New Zealand.
2. The substrate is uncoiled, cleaned and dried.
3. Pre-treatment with a corrosion inhibitor is applied.
4. Topside and reverse primer are applied, followed by drying and cooling.
5. The top coat is applied, followed by drying and cooling.
6. The product is re-coiled, packaged and then sent to a roll-former for shaping.
7. The roll-former uncoils the painted substrate, roll forms it to the desired shape for use in roofing or cladding or forms it into the required rainwater good, cuts it to a specific length, and then packages it on a pallet or in a wooden crate, ready for delivery to site.

Figure 1: Pre-painted steel substrate manufacturing process



End-of-life

(Modules C3-C4)

At the end of its useful life, a ColorCote® roofing/cladding/rainwater product is removed from the building and transported to a recycling centre.

ColorCote® products have a relatively high value at end-of-life (owing to their high metal content) and are easily separable from other materials (given that they are long-run, located on the outside of the building, and can be easily removed by hand). However, the actual rate of recycling at end-of-life could range from 0 - 100%. The recycling scenario is based on Hyder Consulting Reports, which indicate that the average metals recycling rate in Australia is 89%. This is considered to be a conservative estimate for ColorCote® products, but is used in the absence of verified higher recycling rates.

This EPD includes shredding and bailing of the product (module C3), ready to be shipped to the final recycler. It also includes waste disposal in landfill (module C4) for the 11% of product not recycled under the recycling scenario.

Modules C1 (demolition) and C2 (transport to waste processing) are not declared in this EPD. They should be modelled at the building level given that demolition practices vary and that the distance to the recycling centre depends on the building's location.

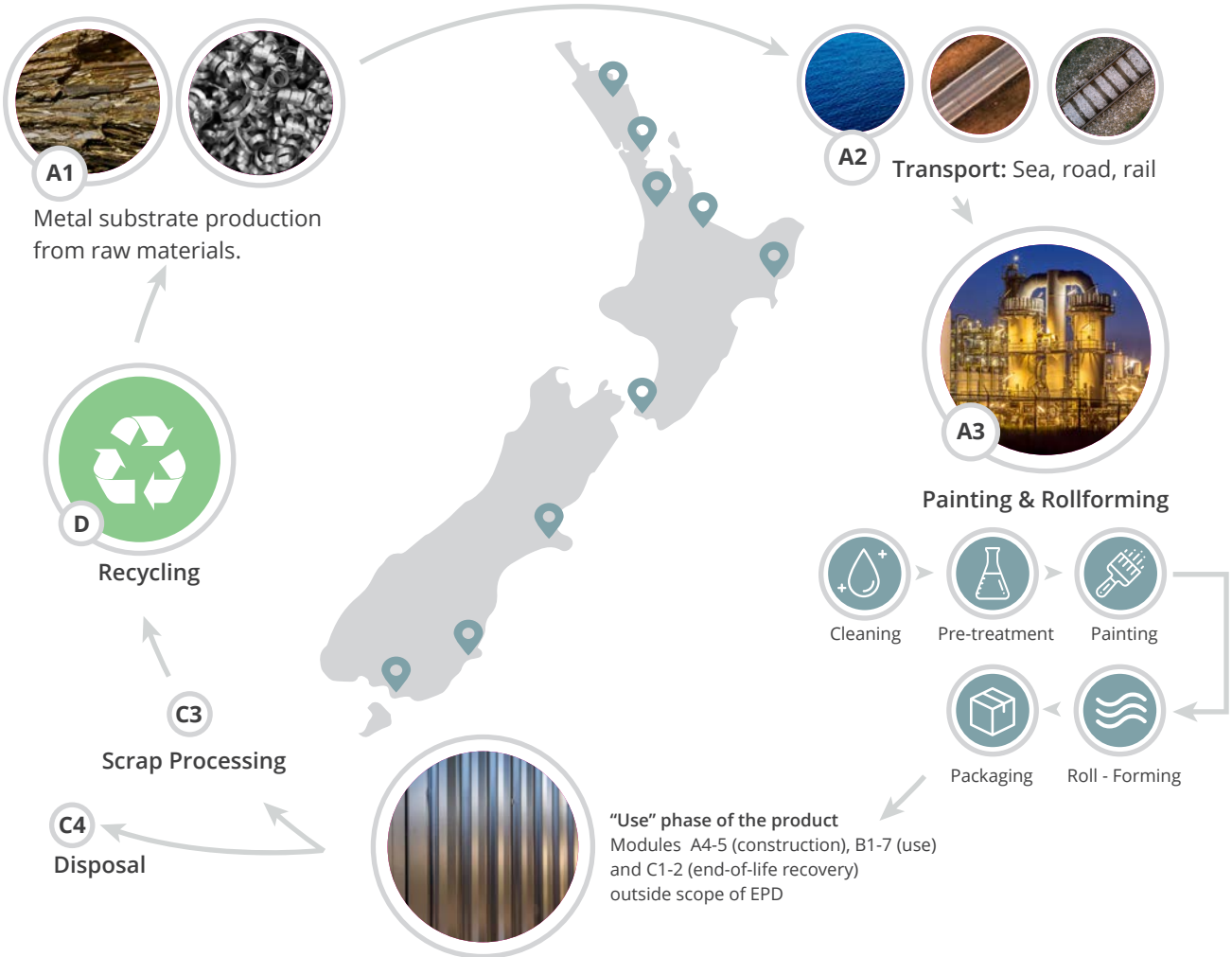
Recycling potential

(Module D)

Module D accounts for the benefits of post-consumer recycling. A recycling rate of 89% is assumed, as discussed in the previous section. If a lower recycling rate is more applicable for a given building type the Module D results can be pro-rated down to the correct recycling rate.

Credits are only awarded for the base metal, not for recycling of the metal coatings or for energy generated during combustion of the paint. Nonetheless, differences in data sets may result in benefits from recycling (in Module D) that are larger than the impacts from production (Modules A1-A3).

ColorCote® manufacturing



Life Cycle Inventory (LCI) Data

Primary data were used for all manufacturing operations up to the factory gate. Data for all energy inputs, transport processes and raw materials (except ZINCALUME® steel) are from GaBi Databases 2018 (thinkstep 2018). Most secondary datasets have a reference year between 2014 and 2017 and all fall within the 10 year limit allowable for generic data under EN 15804.

Key assumptions

Substrates

ZINCALUME® steel is based on specific data supplied by New Zealand Steel. Zinc/aluminium/magnesium steel substrate is based on generic data for average Japanese primary steel combined with metal plating using a zinc/aluminium/magnesium alloy.

Aluminium is based on generic data for virgin aluminium produced in Bahrain. All datasets correctly reflect the country of origin and process type for the three substrates declared in this EPD.

Energy

Energy quantities are based on primary data from Pacific Coilcoaters and from a single, nationwide roll-former.

Upstream emissions from electricity and thermal energy are based on New Zealand averages from the GaBi Databases 2018 (thinkstep 2018).

Paints and chemicals

Composition is based on a combination of the Safety Data Sheet and expert knowledge, as exact formulations could not be obtained from suppliers.

Recycling

The credit for recycling in module D is calculated as the difference between average global primary and average global secondary steelmaking following worldsteel's "value of scrap" methodology (thinkstep 2018).

The credit for the aluminium product is calculated as the difference between global average primary aluminium production and European secondary aluminium production.

Credits are only awarded for the base metal, not for recycling of the metal coatings or for energy generated during combustion of the paint.

Cut off criteria

Environmental impacts relating to personnel, infrastructure, and production equipment not directly consumed in the process are excluded from the system boundary as per the PCR (PCR 2012:01, section 7.5.4). Packaging of input materials is negligible and has been excluded from the EPD. All other reported data were incorporated and modelled using the best available life cycle inventory data.

Allocation

Electricity for Pacific Coilcoaters and for roll-forming is allocated per square metre of product. Thermal energy for drying is allocated per square metre of product. Allocation between the primary product and scrap is done by economic value following EN 15804 section 6.4.3.2. Upstream allocation is documented within the GaBi Databases 2017 (thinkstep 2017). No secondary materials are used in PCC's processes. Allocation for input materials that contain secondary material (such as steel) occurs in the upstream datasets.

Interpretation of Data

The results in the next section of this EPD are presented per square metre of ColorCote® product. However, it is important to keep in mind that each product has a different expected design life under the same environmental conditions, as shown in Figure 2. It is important to note that real product life is influenced by a range of other factors, such as proximity to the sea and maintenance schedule.

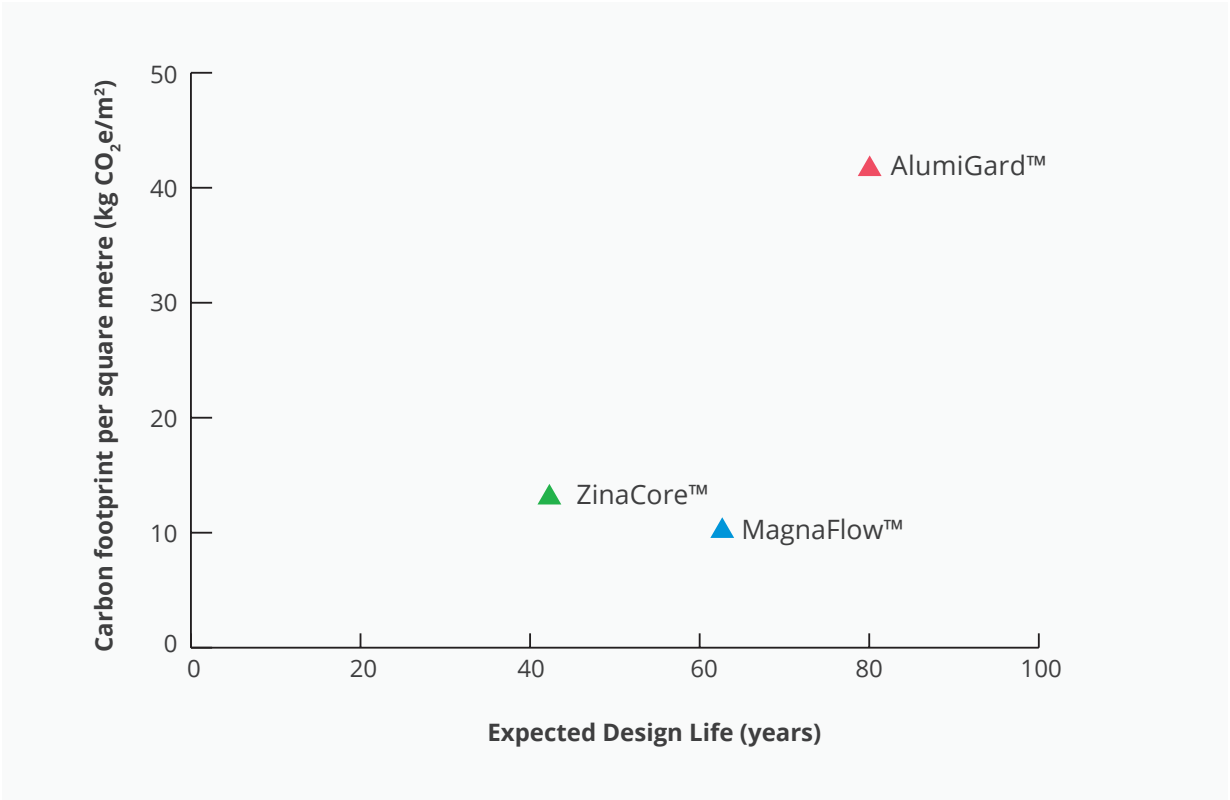


Figure 2: Carbon footprint vs. expected design lifetime in an inland ISO3 category (0.40mm BMT steel; 0.90mm BMT aluminium)

Introduction to Indicators

We are committed to working with industry and regulatory bodies to protect the environment by reducing the environmental impacts associated with our manufacturing, construction and extraction operations, and the distribution and use of our building materials. A description of each indicator is provided below.

Environmental impact indicators

	Description	Unit
GWP	Global warming potential. Potential of greenhouse gases – such as carbon dioxide – to increase absorption of heat reaching Earth's atmosphere, intensifying the natural greenhouse effect.	kg carbon dioxide
ODP	Ozone depletion potential. Potential of emissions that contribute to the reduction of the stratospheric ozone layer.	kg CFC-11
AP	Acidification potential. Potential of emissions to cause acidifying effects in the environment, typically due to acid rain. Potential downstream effects include fish mortality, forest decline and the deterioration of building materials.	kg sulphur dioxide
EP	Eutrophication potential. Potential of emissions – such as nitrogen and phosphorus – to increase nutrient levels in both aquatic and terrestrial ecosystems, which can cause undesirable shifts in species composition and elevated biomass production (e.g. algal blooms).	kg phosphate
POCP	Photochemical ozone creation potential. Potential of emissions to contribute to air pollution (ground-level smog - mainly ozone), which can be harmful to human and ecosystem health and can also damage crops.	kg ethylene
ADPE	Abiotic depletion potential for non-fossil resources. Decrease of the availability of non-renewable material resources.	kg antimony
ADPF	Abiotic depletion potential for fossil resources. Decrease of the availability of non-renewable fossil fuel resources.	MJ net calorific value

Resource indicators

PERE	Use of renewable primary energy excluding renewable primary energy resources used as raw materials.	PENRT	Total use of non-renewable primary energy resources
PERM	Use of renewable primary energy resources used as raw materials.	SM	Use of secondary material
PERT	Total use of renewable primary energy resources.	RSF	Use of renewable secondary fuels
PENRE	Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials.	NRSF	Use of non-renewable secondary fuels
PENRM	Use of non-renewable primary energy resources used as raw materials.	FW	Net use of fresh water

Wastes and other outputs

HWD	Hazardous waste disposed	MFR	Materials for recycling
NHWD	Non-hazardous waste disposed	MER	Materials for energy recovery
RWD	Radioactive waste disposed	EEE	Exported electrical energy
CRU	Components for reuse	EET	Exported thermal energy

EPD Results for 1m² of ColorCote® used in New Zealand

ZinaCore™ 0.40mm

		Production	End-of-life		Mod D
Environmental impact	**Unit**	**A1-A3**	**C3**	**C4**	**D**
Global warming potential (total)	kg CO2-eq.	13.9	0.0274	0.0177	-3.88
Depletion potential of the stratospheric ozone layer	kg CFC11-eq.	2.36E-11	6.72E-17	4.69E-15	2.51E-08
Acidification potential of land and water	kg SO2-eq.	0.123	8.73E-05	4.92E-05	0.00552
Eutrophication potential	kg PO43-- eq.	0.00672	1.12E-05	6.19E-06	8.16E-04
Photochemical ozone creation potential	kg C2H4-eq.	0.00641	6.20E-06	4.43E-06	-0.00132
Abiotic depletion potential – elements	kg Sb-eq.	1.18E-04	1.48E-08	1.91E-09	-1.36E-06
Abiotic depletion potential – fossil fuels	MJ	181	0.339	0.256	-37.4

Resource use	**Unit**	**A1-A3**	**C3**	**C4**	**D**
Renewable primary energy as energy carrier	MJ	33.3	1.03	0.0197	2.94
Renewable primary energy resources as material utilisation	MJ	0	0	0	0
Total use of renewable primary energy resources	MJ	33.3	1.03	0.0197	2.94
Non-renewable primary energy as energy carrier	MJ	184	0.339	0.266	-38.0
Non-renewable primary energy as material utilisation	MJ	0	0	0	0
Total use of non-renewable primary energy resources	MJ	184	0.339	0.266	-38.0
Use of secondary material	kg	0	0	0	0
Use of renewable secondary fuels	MJ	2.33E-10	0	1.50E-24	2.04E-23
Use of non-renewable secondary fuels	MJ	2.74E-09	0	1.77E-23	2.39E-22
Use of net fresh water	m3	0.170	0.00268	2.81E-05	0.00637

Waste categories and output flows	**Unit**	**A1-A3**	**C3**	**C4**	**D**
Hazardous waste disposed	kg	1.07E-07	2.90E-10	1.42E-09	-2.94E-06
Non-hazardous waste disposed	kg	1.04	1.99E-04	0.371	0.646
Radioactive waste disposed	kg	0.00126	1.04E-07	3.71E-06	5.50E-06
Components for re-use	kg	0	0	0	0
Materials for recycling	kg	0.0875	2.99	0	0
Materials for energy recovery	kg	0	0	0	0
Exported electrical energy	MJ	0	0	0	0
Exported thermal energy	MJ	0	0	0	0

Green Star	**Unit**	**A1-A3**	**C3**	**C4**	**D**
Human Toxicity cancer effects	CTUh	7.85E-10	3.66E-12	7.03E-13	1.85E-09
Human Toxicity non-cancer effects	CTUh	3.76E-11	7.90E-14	2.22E-14	-1.04E-12
Land use	kg C deficit eq.	5.24	0.0147	0.00263	0.211
Resource depletion - water	m3 equiv	0.0591	2.15E-04	1.30E-05	0.00382
Ionising Radiation	kBq U235 eq	0.195	1.63E-05	4.81E-04	0.0605
Particulate Matter	kg PM2,5-Equiv.	0.00693	4.27E-06	3.44E-06	-2.93E-04

EPD Results for 1m² of ColorCote® used in New Zealand

ZinaCore™ 0.55mm

		Production	End-of-life		Mod D
Environmental impact	**Unit**	**A1-A3**	**C3**	**C4**	**D**
Global warming potential (total)	kg CO2-eq.	18.1	0.037	0.0238	-5.38
Depletion potential of the stratospheric ozone layer	kg CFC11-eq.	2.49E-11	9.07E-17	6.32E-15	3.44E-08
Acidification potential of land and water	kg SO2-eq.	0.165	1.18E-04	6.64E-05	0.00722
Eutrophication potential	kg PO43-- eq.	0.00884	1.51E-05	8.35E-06	0.00108
Photochemical ozone creation potential	kg C2H4-eq.	0.00842	8.37E-06	5.97E-06	-0.00184
Abiotic depletion potential – elements	kg Sb-eq.	1.18E-04	2.00E-08	2.58E-09	-1.87E-06
Abiotic depletion potential – fossil fuels	MJ	234	0.457	0.346	-51.6

Resource use	**Unit**	**A1-A3**	**C3**	**C4**	**D**
Renewable primary energy as energy carrier	MJ	39.6	1.39	0.0265	4.03
Renewable primary energy resources as material utilisation	MJ	0	0	0	0
Total use of renewable primary energy resources	MJ	39.6	1.39	0.0265	4.03
Non-renewable primary energy as energy carrier	MJ	237	0.457	0.359	-52.4
Non-renewable primary energy as material utilisation	MJ	0	0	0	0
Total use of non-renewable primary energy resources	MJ	237	0.457	0.359	-52.4
Use of secondary material	kg	0	0	0	0
Use of renewable secondary fuels	MJ	2.44E-10	0	2.03E-24	2.04E-23
Use of non-renewable secondary fuels	MJ	2.87E-09	0	2.38E-23	2.39E-22
Use of net fresh water	m3	0.216	0.00361	3.79E-05	0.00865

Waste categories and output flows	**Unit**	**A1-A3**	**C3**	**C4**	**D**
Hazardous waste disposed	kg	1.32E-07	3.91E-10	1.92E-09	-4.03E-06
Non-hazardous waste disposed	kg	1.31	2.68E-04	0.500	0.826
Radioactive waste disposed	kg	0.00137	1.40E-07	5.00E-06	6.08E-06
Components for re-use	kg	0	0	0	0
Materials for recycling	kg	0.0875	4.04	0	0
Materials for energy recovery	kg	0	0	0	0
Exported electrical energy	MJ	0	0	0	0
Exported thermal energy	MJ	0	0	0	0

Green Star	**Unit**	**A1-A3**	**C3**	**C4**	**D**
Human Toxicity cancer effects	CTUh	9.74E-10	4.94E-12	9.49E-13	2.54E-09
Human Toxicity non-cancer effects	CTUh	4.84E-11	1.07E-13	3.00E-14	-1.44E-12
Land use	kg C deficit eq.	6.57	0.0198	0.00354	0.289
Resource depletion - water	m3 equiv	0.0770	2.90E-04	1.75E-05	0.00518
Ionising Radiation	kBq U235 eq	0.208	2.20E-05	6.49E-04	0.0829
Particulate Matter	kg PM2,5-Equiv.	0.00908	5.76E-06	4.64E-06	-4.23E-04

EPD Results for 1m² of ColorCote® used in New Zealand

MagnaFlow™ 0.40mm

		Production	End-of-life		Mod D
Environmental impact	**Unit**	**A1-A3**	**C3**	**C4**	**D**
Global warming potential (total)	kg CO2-eq.	11.2	0.0308	0.0198	-4.23
Depletion potential of the stratospheric ozone layer	kg CFC11-eq.	1.41E-12	7.54E-17	5.26E-15	2.74E-08
Acidification potential of land and water	kg SO2-eq.	0.0486	9.79E-05	5.52E-05	0.00647
Eutrophication potential	kg PO43-- eq.	0.00458	1.26E-05	6.95E-06	9.37E-04
Photochemical ozone creation potential	kg C2H4-eq.	0.00605	6.96E-06	4.97E-06	-0.00142
Abiotic depletion potential – elements	kg Sb-eq.	1.49E-04	1.66E-08	2.15E-09	-3.00E-07
Abiotic depletion potential – fossil fuels	MJ	121	0.380	0.288	-40.6

Resource use	**Unit**	**A1-A3**	**C3**	**C4**	**D**
Renewable primary energy as energy carrier	MJ	11.2	1.15	0.0221	3.22
Renewable primary energy resources as material utilisation	MJ	0	0	0	0
Total use of renewable primary energy resources	MJ	11.2	1.15	0.0221	3.22
Non-renewable primary energy as energy carrier	MJ	124	0.380	0.298	-41.0
Non-renewable primary energy as material utilisation	MJ	0	0	0	0
Total use of non-renewable primary energy resources	MJ	124	0.380	0.298	-41.0
Use of secondary material	kg	0	0	0	0
Use of renewable secondary fuels	MJ	2.04E-10	0	1.69E-24	2.08E-23
Use of non-renewable secondary fuels	MJ	9.63E-08	0	1.98E-23	2.44E-22
Use of net fresh water	m3	0.0309	0.00300	3.15E-05	0.00695

Waste categories and output flows	**Unit**	**A1-A3**	**C3**	**C4**	**D**
Hazardous waste disposed	kg	8.82E-08	3.25E-10	1.60E-09	-3.21E-06
Non-hazardous waste disposed	kg	0.251	2.23E-04	0.416	0.797
Radioactive waste disposed	kg	0.00102	1.17E-07	4.16E-06	6.72E-06
Components for re-use	kg	0	0	0	0
Materials for recycling	kg	0.0875	3.36	0	0
Materials for energy recovery	kg	0	0	0	0
Exported electrical energy	MJ	0	0	0	0
Exported thermal energy	MJ	0	0	0	0

Green Star	**Unit**	**A1-A3**	**C3**	**C4**	**D**
Human Toxicity cancer effects	CTUh	4.08E-10	4.11E-12	7.89E-13	2.02E-09
Human Toxicity non-cancer effects	CTUh	2.44E-11	8.86E-14	2.49E-14	-1.13E-12
Land use	kg C deficit eq.	2.07	0.0165	0.00295	0.231
Resource depletion - water	m3 equiv	0.0120	2.41E-04	1.46E-05	0.00416
Ionising Radiation	kBq U235 eq	0.0998	1.83E-05	5.40E-04	0.0662
Particulate Matter	kg PM2,5-Equiv.	0.00388	4.79E-06	3.86E-06	-2.96E-04

EPD Results for 1m² of ColorCote® used in New Zealand

MagnaFlow™ 0.55mm

		Production	End-of-life		Mod D
Environmental impact	**Unit**	**A1-A3**	**C3**	**C4**	**D**
Global warming potential (total)	kg CO2-eq.	14.6	0.0403	0.0260	-5.73
Depletion potential of the stratospheric ozone layer	kg CFC11-eq.	1.81E-12	9.89E-17	6.89E-15	3.67E-08
Acidification potential of land and water	kg SO2-eq.	0.0642	1.28E-04	7.24E-05	0.00817
Eutrophication potential	kg PO43-- eq.	0.00594	1.65E-05	9.11E-06	0.00120
Photochemical ozone creation potential	kg C2H4-eq.	0.00798	9.13E-06	6.51E-06	-0.00194
Abiotic depletion potential – elements	kg Sb-eq.	1.98E-04	2.18E-08	2.81E-09	-4.04E-07
Abiotic depletion potential – fossil fuels	MJ	155	0.498	0.377	-54.8

Resource use	**Unit**	**A1-A3**	**C3**	**C4**	**D**
Renewable primary energy as energy carrier	MJ	13.4	1.51	0.0289	4.31
Renewable primary energy resources as material utilisation	MJ	0	0	0	0
Total use of renewable primary energy resources	MJ	13.4	1.51	0.0289	4.31
Non-renewable primary energy as energy carrier	MJ	159	0.498	0.391	-55.3
Non-renewable primary energy as material utilisation	MJ	0	0	0	0
Total use of non-renewable primary energy resources	MJ	159	0.498	0.391	-55.3
Use of secondary material	kg	0	0	0	0
Use of renewable secondary fuels	MJ	2.04E-10	0	2.21E-24	2.08E-23
Use of non-renewable secondary fuels	MJ	1.28E-07	0	2.60E-23	2.44E-22
Use of net fresh water	m3	0.0370	0.00394	4.14E-05	0.00922

Waste categories and output flows	**Unit**	**A1-A3**	**C3**	**C4**	**D**
Hazardous waste disposed	kg	1.13E-07	4.26E-10	2.09E-09	-4.31E-06
Non-hazardous waste disposed	kg	0.317	2.92E-04	0.545	0.978
Radioactive waste disposed	kg	0.00131	1.53E-07	5.45E-06	7.30E-06
Components for re-use	kg	0	0	0	0
Materials for recycling	kg	0.0875	4.40	0	0
Materials for energy recovery	kg	0	0	0	0
Exported electrical energy	MJ	0	0	0	0
Exported thermal energy	MJ	0	0	0	0

Green Star	**Unit**	**A1-A3**	**C3**	**C4**	**D**
Human Toxicity cancer effects	CTUh	4.86E-10	5.39E-12	1.03E-12	2.71E-09
Human Toxicity non-cancer effects	CTUh	3.16E-11	1.16E-13	3.27E-14	-1.53E-12
Land use	kg C deficit eq.	2.33	0.0216	0.00386	0.309
Resource depletion - water	m3 equiv	0.0149	3.16E-04	1.91E-05	0.00553
Ionising Radiation	kBq U235 eq	0.127	2.40E-05	7.07E-04	0.0886
Particulate Matter	kg PM2,5-Equiv.	0.00514	6.28E-06	5.05E-06	-4.25E-04

EPD Results for 1m² of ColorCote® used in New Zealand

AlumiGard™ 0.70mm

		Production	End-of-life		Mod D
Environmental impact	**Unit**	**A1-A3**	**C3**	**C4**	**D**
Global warming potential (total)	kg CO2-eq.	33	0.0155	0.0100	-24.8
Depletion potential of the stratospheric ozone layer	kg CFC11-eq.	1.58E-12	3.81E-17	2.65E-15	-1.97E-12
Acidification potential of land and water	kg SO2-eq.	0.108	4.94E-05	2.79E-05	-0.134
Eutrophication potential	kg PO43-- eq.	0.0114	6.36E-06	3.51E-06	-0.00816
Photochemical ozone creation potential	kg C2H4-eq.	0.00719	3.51E-06	2.51E-06	-0.00949
Abiotic depletion potential – elements	kg Sb-eq.	1.74E-05	8.40E-09	1.08E-09	-2.01E-06
Abiotic depletion potential – fossil fuels	MJ	489	0.192	0.145	-234

Resource use	**Unit**	**A1-A3**	**C3**	**C4**	**D**
Renewable primary energy as energy carrier	MJ	10.7	0.582	0.0111	-28.9
Renewable primary energy resources as material utilisation	MJ	0	0	0	0
Total use of renewable primary energy resources	MJ	10.7	0.582	0.0111	-28.9
Non-renewable primary energy as energy carrier	MJ	493	0.192	0.151	-238
Non-renewable primary energy as material utilisation	MJ	0	0	0	0
Total use of non-renewable primary energy resources	MJ	493	0.192	0.151	-238
Use of secondary material	kg	0	0	0	0
Use of renewable secondary fuels	MJ	3.69E-10	0	8.51E-25	-2.38E-17
Use of non-renewable secondary fuels	MJ	4.33E-09	0	1.00E-23	-8.33E-06
Use of net fresh water	m3	0.0503	0.00152	1.59E-05	-0.137

Waste categories and output flows	**Unit**	**A1-A3**	**C3**	**C4**	**D**
Hazardous waste disposed	kg	1.59E-07	1.64E-10	8.06E-10	-1.99E-07
Non-hazardous waste disposed	kg	5.69	1.13E-04	0.210	-6.03
Radioactive waste disposed	kg	0.00137	5.90E-08	2.10E-06	-0.00137
Components for re-use	kg	0	0	0	0
Materials for recycling	kg	0.280	1.69	0	0
Materials for energy recovery	kg	0	0	0	0
Exported electrical energy	MJ	0	0	0	0
Exported thermal energy	MJ	0	0	0	0

Green Star	**Unit**	**A1-A3**	**C3**	**C4**	**D**
Human Toxicity cancer effects	CTUh	5.31E-09	2.08E-12	3.98E-13	-1.86E-09
Human Toxicity non-cancer effects	CTUh	8.81E-11	4.47E-14	1.26E-14	-2.16E-10
Land use	kg C deficit eq.	2.70	0.00833	0.00149	-0.322
Resource depletion - water	m3 equiv	0.0240	1.22E-04	7.36E-06	-0.0882
Ionising Radiation	kBq U235 eq	0.183	9.23E-06	2.72E-04	-0.302
Particulate Matter	kg PM2,5-Equiv.	0.00582	2.42E-06	1.95E-06	-0.0187

EPD Results for 1m² of ColorCote® used in New Zealand

AlumiGard™ 0.90mm

		Production	End-of-life		Mod D
Environmental impact	**Unit**	**A1-A3**	**C3**	**C4**	**D**
Global warming potential (total)	kg CO2-eq.	42.6	0.0201	0.0130	-32.3
Depletion potential of the stratospheric ozone layer	kg CFC11-eq.	1.98E-12	4.93E-17	3.44E-15	-2.56E-12
Acidification potential of land and water	kg SO2-eq.	0.139	6.40E-05	3.61E-05	-0.174
Eutrophication potential	kg PO43-- eq.	0.0147	8.23E-06	4.54E-06	-0.0106
Photochemical ozone creation potential	kg C2H4-eq.	0.00922	4.55E-06	3.25E-06	-0.0124
Abiotic depletion potential – elements	kg Sb-eq.	2.16E-05	1.09E-08	1.40E-09	-2.61E-06
Abiotic depletion potential – fossil fuels	MJ	630	0.248	0.188	-305

Resource use	**Unit**	**A1-A3**	**C3**	**C4**	**D**
Renewable primary energy as energy carrier	MJ	12.3	0.754	0.0144	-37.6
Renewable primary energy resources as material utilisation	MJ	0	0	0	0
Total use of renewable primary energy resources	MJ	12.3	0.754	0.0144	-37.6
Non-renewable primary energy as energy carrier	MJ	635	0.248	0.195	-309
Non-renewable primary energy as material utilisation	MJ	0	0	0	0
Total use of non-renewable primary energy resources	MJ	635	0.248	0.195	-309
Use of secondary material	kg	0	0	0	0
Use of renewable secondary fuels	MJ	4.18E-10	0	1.10E-24	-3.10E-17
Use of non-renewable secondary fuels	MJ	4.91E-09	0	1.29E-23	-1.08E-05
Use of net fresh water	m3	0.0614	0.00196	2.06E-05	-0.179

Waste categories and output flows	**Unit**	**A1-A3**	**C3**	**C4**	**D**
Hazardous waste disposed	kg	2.01E-07	2.12E-10	1.04E-09	-2.60E-07
Non-hazardous waste disposed	kg	7.39	1.46E-04	0.272	-7.86
Radioactive waste disposed	kg	0.00174	7.63E-08	2.72E-06	-0.00179
Components for re-use	kg	0	0	0	0
Materials for recycling	kg	0.280	2.19	0	0
Materials for energy recovery	kg	0	0	0	0
Exported electrical energy	MJ	0	0	0	0
Exported thermal energy	MJ	0	0	0	0

Green Star	**Unit**	**A1-A3**	**C3**	**C4**	**D**
Human Toxicity cancer effects	CTUh	6.86E-09	2.69E-12	5.16E-13	-2.42E-09
Human Toxicity non-cancer effects	CTUh	1.14E-10	5.79E-14	1.63E-14	-2.81E-10
Land use	kg C deficit eq.	2.91	0.0108	0.00193	-0.420
Resource depletion - water	m3 equiv	0.0302	1.57E-04	9.53E-06	-0.115
Ionising Radiation	kBq U235 eq	0.232	1.19E-05	3.53E-04	-0.393
Particulate Matter	kg PM2,5-Equiv.	0.00748	3.13E-06	2.52E-06	-0.0243

Additional Information

All products produced by Pacific Coilcoaters under the ColorCote® brand conform with the Australia / New Zealand Standard; AS/NZ 2728:2013- Prefinished / pre-painted sheet metal products for interior/exterior building applications – Performance requirements.

The products ZinaCore and MagnaFlow do not exceed the limits as defined in the European REACH regulations for registration of substances of very high concern.

AlumiGard does contain chromium at a concentration of >0.1% weight/weight as defined in the European REACH regulations for registration of substances of very high concern. This does not affect the use of AlumiGard as a means to collect potable water as the chromium is encased beneath the painted surface.

Pacific Coilcoaters is an active member of the New Zealand Metal Roofing Manufacturers Association (NZMRM) www.metalroofing.org.nz

Pacific Coilcoaters supports and promotes the activities of The Roofing Association of New Zealand (RANZ) www.ranz.co.nz

For further product specific information including warranty enquiries, colour charts, or technical bulletins please visit our website www.colorcote.co.nz

Image courtesy of Larnie Nicolson Photography.

Glossary

Life Cycle Inventory (LCI)

“Phase of life cycle assessment involving the compilation and quantification of inputs and outputs for a product throughout its life cycle” (ISO 14040:2006, section 3.3)

Allocation

“Partitioning the input or output flows of a process or a product system between the product system under study and one or more other product systems” (ISO 14040:2006, section 3.17)

Reference

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EPD Registration Information

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

EPD information

EPD registration number	S-P-01539	Approval date	8th April 2019
Valid until	8th April 2024	Revision date	8th April 2019

Product group classification	UN CPC 88731: Metal treatment and coating services ANZSIC 2293: Metal Coating and Finishing
Reference year for data	1 July 2016 to 30 June 2017
Geographical scope	New Zealand

Contact information

EPD owner

Pacific Coilcoaters, a subsidiary of Fletcher Steel Ltd.

http://www.colorcote.co.nz

PO Box 12 046, Penrose,
Auckland 1642, New Zealand

EPD produced by

thinkstep Ltd

anz@thinkstep.com

EPD programme operator

The Australasian EPD Programme Limited

http://www.epd-australasia.com
info@epd-australasia.com

CEN standard EN 15804 served as the core PCR

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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

Rob Rouwette, start2see Pty Ltd

http://www.start2see.com.au
Rob.Rouwette@start2see.com.au

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968 Great South Road, PO Box 12 046, Penrose, Auckland 1642.
Telephone: 0800 279 979 Facsimile: +64 9 579 7515
www.colorcote.co.nz

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