DURABILITY STATEMENT

For GALVSTEEL® (galvanised steel) manufactured by New Zealand Steel Limited and used for structural building elements

GALVSTEEL® material, when used for purlins, girts, battens or framing will have a durability of 50 years when used and maintained as referred to below.

Scope: GALVSTEEL® used to manufacture building components such as wall, roof, floor and sub-framing, purlins, girts and battens used in buildings built in New Zealand covered by the New Zealand Building Code with a 50 year design life.

This Durability Statement does not apply to Axxis® steel for framing used in building types and situations covered by the "Axxis® steel for framing" Durability Statement. This Durability Statement also excludes any other building components manufactured from GALVSTEEL® or other metal-coated products including nail plates and any composite wall, roof or floor systems. Composite systems include Galvsteel® embedded in concrete panels.

The above statements are subject to the following:

1. Specifications

Zinc coating weight;	Z275 (275g/m²) or Z450 (450g/m²)
Complying with;	AS 1397:2011.
Steel grade;	G250, G300, G450, G500 or G550.
Steel thickness range;	0.50-2.25 mm.
Bend diameter;	G250, G300; ≥ 2T. G450, G500, G550; ≥6T (where T = total coated thickness).

2. Fixing, Handling and Maintenance according to the following publications:

a) New Zealand Steel Limited, Specifiers and Builders Guide, and Installers Guide (refer www.nzsteel.co.nz for most current version).
b) NZ Metal Roof & Wall Cladding, Code of Practice, (refer www.metalroofing.org.nz for most current version and updates).
c) AS/NZS 2312:2014 (Incorporating Amendment 1;2017) Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings.
d) Instructions and literature published by individual purlin and steel framing manufacturers.
e) NASH Handbook Best Practice for Design and Construction of Residential and Low-Rise Steel Framing.
f) NASH N11 House Insulation Guide – version 2.2 April 2012.

3. Additional Fixing, Handling and Design Requirements.

a) Bottom plate details must ensure that the bottom plate remains dry in service and is not subject to water ingress from internal or external sources. Damp-proof course (DPC) must be used and be at least 10mm wider than the building element.
b) Separation methods as described within NZMRM Code of Practice 2.7 are required between any steel structural building element and incompatible materials which include, but are not limited to, timber treated with copper based preservatives, concrete, brickwork, copper and other dissimilar metals and also materials which may be moisture bearing during the life of the building.
c) Subfloor framing requires a minimum finished ground level clearance of 150mm. Ventilation must comply with the requirements of NZS3604:2011 Timber-framed buildings, including ground cover when specified. A minimum of 3500mm^2/m^2 of floor space and a maximum of 7000mm^2/m^2 of floor space is required.
d) Site storage conditions must ensure that the GALVSTEEL® is kept dry when in a stacked condition.
e) Prior to installation of external and internal lining the Galvsteel® must be clean, dry, free of corrosion, clear of debris and swarf.
f) During storage and erection the material should be kept as dry as possible and the building closed in as soon as practicable to limit exposure to the elements. As a guide, this should be within 3 weeks in marine or geothermal environments and with-in 12 weeks in moderate environments from the delivery of the Galvsteel® material to site.
g) GALVSTEEL® must be carried and not dragged when being moved.
h) GALVSTEEL® must not be exposed to spatter from any welding activities.
i) Wall wraps and roof underlays must comply with the requirements of NZS2295:2006 Pliable, permeable building underlays for use with steel framing.

4. Environment.

Initially the macroclimate in which the building is situated needs to be determined. Table 2 is broken down into broad geographical regions of New Zealand. Within the regions the corrosivity is further defined by the distance to the nearest coast, harbour or estuary.

For aggressive industrial environments either externally or internally, or buildings subject to heavy geothermal influence, expected corrosion rates and recommended coatings will need to be determined on a case by case basis using New Zealand Steelwork Corrosion Coatings Guide HERA Report R4-133:2005 [d].

5. Building Types

This statement classifies six different building situations where structural steel may be used (N.B. one building may contain more than one of these situations);

a) Residential/Dry

Steelwork located in a dry internal environment, with an effective thermal break between external cladding and the structure, such as a fully enclosed office, an apartment building or a domestic house. This includes structures that are lined with building wrap and have internally controlled environments such as commercial shops and malls.

b) Internal

Steelwork located in a damp or humid environment, with no effective thermal break between the external cladding and structure. For structures such as storage sheds, garages and workshops which are typically closed when not in use. These structures are distinguished in the following two cases;

- Damp

Steelwork located in a damp internal environment where condensation may occur, where the structure may be in an open sunny location (i.e. when the structure is exposed to the sun and not under any form of cover). This is for structures such as exhibition halls, vehicle depots and warehouses.

- High Humidity

  Steelwork located in an internal high humidity environment with some pollution, where the structure may be in a humid and shaded location (i.e. when the shed is under a tree shaded from the sun). This is for structures such as food processing plants, breweries and dairies. Steel in subfloor spaces is included in this building type.

c) Open Front

Steelwork located near permanent openings (such as near doors or windows that remain open under operating conditions), and may be exposed to the prevailing winds. For structures such as open front lean-to, gable structure closed in on three sides or warehouses with large openings. This building type has two options, which are only applicable to the internal steelwork close to the openings as defined in Section 5.5 of reference [d].

- Protected

  Structures that are protected from the wind coming off the closest sea.

- Open

  Structures that are open and exposed to the prevailing wind coming off the closest sea.

d) Awning

Steelwork that is exposed to the wind but is protected from the rain located in an open sided structure such as carports or structures closed in on one side only. The equivalent reference [b] designation is “Sheltered”. The corrosion rate of this building type and that of “Open Front; Open” are identical.

6. Coating Systems

The following coating systems are referenced in Table 2 of this document, alternative solutions are also available and may be identified by reference to HERA Report R4-133:2005 [d], or AS/NZS2312:2002 [c] or by discussions with paint suppliers or coatings specialists.

Table 1

System	Surface Preparation	1st Coat			2nd Coat			3rd Coat			Total nominal DFT [3] (µm)
		Type	PRN [1]	Nominal DFT [2] (µm)	Type	PRN[1]	Nominal DFT [2] (µm)	Type	PRN[1]	Nominal DFT [2] (µm)	
P1	Degrease, wash and dry	Acrylic dispersion paint		40	Acrylic dispersion paint[4]		40				80
P2		Galvanised iron acrylic primer		40	Acrylic dispersion paint[4]		40				80
P3[5]		Etch primer		12	Acrylic elastomeric		350				362
P4[5]	Sweep abrasive blast	Polyamide cured epoxy primer	C10	75	High build epoxy	13	200	Acrylic 2-pack	C33	50	325
P5[5]								Polyurethane gloss	C26	50	325

Notes on Table 1

[1]PRN: Paint reference number as given in appendix C of reference [c].

[2]DFT; coating dry film thickness.

[3]The total nominal DFT does not include the galvanised coating thickness.

[4]Contact the coating supplier for feedback on the appropriate acrylic paint for its intended use. For example, for internal high humidity locations it is recommended to use acrylic enamel at the specified nominal DFT.

[5]P3, P4 and P5 coatings must be applied by a professional coating applicator to achieve the required durability performance.

7. Maintenance

Maintenance is necessary when the galvanised coating ceases to provide sacrificial protection to the steel base, or where the appearance is no longer aesthetically acceptable to the owner.

Rust staining or the growth of rust spots usually indicates the breakdown of galvanised coating. At the first sign of breakdown, the surface should be treated with an appropriate maintenance coating system. All maintenance should be carried out in accordance with AS/NZS 2312:2002 (Incorporating Amendment No. 1) [c] and HERA Report R4-133:2005 [d].

Regular inspections of the steel work and maintenance at the first signs of a breakdown in the galvanised coating will extend the durability of the sections.

8. Recommended coating systems to achieve 50 year durability.

Table 2 shows the recommended coating system to achieve 50 year durability for the different building conditions in the various marine environments throughout New Zealand.

9. Contacting New Zealand Steel

It is important you contact the Technical Manager at New Zealand Steel on 0800 100 523 if you require specialist advice, clarification or assessment in relation to the use of Galvsteel® within the scope of this Durability Statement. If you believe there is an issue with the durability of Galvsteel® used for a project within the scope of this Durability Statement, you are urged to advise New Zealand Steel as soon as you become aware of the issue and before proceeding with any project still under construction.

10. References

a) El Sarraf, R. and Hicks, S. – Extending the Durability Performance of Galvsteel® using a Protective Coating System, (HERA) Structural Systems Technical Report SSTR-001 2008.
b) NZS 3404 Part 1, Steel Structures Standard 2009; Standards New Zealand.
c) AS/NZS 2312:2014 (Incorporating Amendment No. 1;2017), Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings.
d) Clifton, G.C. and El Sarraf, R. New Zealand Steelwork Corrosion Coatings Guide (HERA Report R4-133) 2005.
e) Compliance Document for New Zealand Building Code – Clause E2 – External Moisture
f) Durability Statement – Axxis® Steel for Framing

Disclaimer

With New Zealand Steel Limited's commitment to continuous improvement, information provided in this Durability Statement may be subject to modification. At the time of publication we believe the information contained in this document is the best available. Nonetheless, we reserve the right to modify any product, technique equipment or statement to reflect improvements in the manufacture and application of Galvsteel® . The information is supplied without prejudice to New Zealand Steel Limited's standard terms and conditions of sale. In the event of any conflict between this information and the standard terms and conditions, the standard terms and conditions shall prevail.

This edition of the Galvsteel® used for structural building elements Durability Statement supersedes all previous editions. It is important to check you have the latest edition of the Durability Statement by referring to www.nzsteel.co.nz or contacting New Zealand Steel Limited on 0800 100 523.

Table 2

Corrosion map to NZS3404.1	ISO 9223	Typically	Location	Characterised by	Residential /Dry	Internal		Open front		Awning
						Damp	High humidity	Protected	Open	
Seaspray	C5	Within 200m of breaking surf	West coast, South Island	Heavy salt deposits, almost constant smell of salt spray in the air.	1	3	4	4	4	4
		Within 100m of breaking surf	West coast, North Island		1	3	4	4	4	4
		Within 50m of breaking surf	Other coasts		1	3	4	4	4	4
		200m up to 500m or more inland from breaking surf. In the immediate vicinity of calm salt water such as harbour foreshores.	West coast, South Island	Medium salt deposits, Frequent smell of salt in the air.	1	3	4	4	4	4
	C4	50m up to 500m or more inland from breaking surf. In the immediate vicinity of calm salt water such as harbour foreshores.	All other coasts		1	1	3	4	4	4
		500m to 1km from breaking surf. In the immediate vicinity of calm salt water such as estuaries.	West coast of both islands and South coast of South Island.	Little salt deposits, occasional smell of salt in the air.	1	1	3	4	4	4
4	C3	500m to 1km from breaking surf. In the immediate vicinity of calm salt water such as estuaries.	East coast of both islands, South coast of North Island and all harbours.		1	1	2	3	4	4
		1km to 20 km from salt water	West coast of both islands and South coast of South Island	Minor salt deposits, no smell of salt in the air.	1	1	3	4	4	4
		1km to 5km from salt water	East coast of both islands, South coast of North Island and all harbours.		1	1	2	3	4	4
Zone 2	C2	20km to 50km from salt water.	West coast of both islands and South coast of South Island	No marine influence.	1	1	1	2	3	3
		5km to 50km from salt water	East coast of both islands, South coast of North Island and all harbours.		1	1	1	2	3	3
Zone 3		Inland more than 50km from salt water.	Both Islands		1	1	1	1	1	1

Note; all environments may be extended inland by prevailing winds and local conditions.

Key

1	Z275
2	Z275 and one of the paint systems P1 – P5 applied when new, or Z450.
3	Z275 and one of (P3, P4 or P5) applied when new, or P1 or P2 applied when new and recoated every 15 years.
4	Z275 and one of (P3, P4 or P5) applied when new and then recoated every 15 years

NON-RESIDENTIAL WARRANTY

For applications like schools, warehouses and other commercial buildings please contact New Zealand Steel. The maximum warranty offered on commercial buildings is 15 years.

IMPORTANT

- As product use is dictated by local conditions, seek advice from your roofing supplier or fixer for the best New Zealand Steel product to suit your specific environment.
- Gutters should be installed according to manufacturer's instructions.
- Unwashed and high risk areas require manual washing every 3 months.

SUITABLE PRODUCTS

COLORSTEEL® Maxx®
COLOUR FOR THE EXTREME

COLORSTEEL® Maxx®
COLOUR FOR THE EXTREME

COLORSTEEL® Endura®
COLOUR FOR THE FUTURE

COLORSTEEL® Maxx®
COLOUR FOR THE EXTREME

COLORSTEEL® Endura®
COLOUR FOR THE FUTURE

Zincalume®

GALVSTEEL®

SPECIAL ENVIRONMENTS

In New Zealand there are areas where local conditions create an increased likelihood of corrosion. Special consideration should be given to material selection in these areas.

GEOTHERMAL AREAS

Hydrogen sulphide associated with geothermal activity creates a corrosive environment. Variations in natural activity or draw-off from steam bores plus the effects of weather conditions make the high risk areas hard to define.

WEST COAST, SOUTH ISLAND

In this area, smoke from coal burning fires may cause high concentrations of sulphur dioxide in the air. The combination of this and the high rainfall for the region creates an aggressive situation which must be considered when choosing the appropriate COLORSTEEL® prepainted steel coating. The effects of a severe coastal environment aggravate the situation.

This area combines the most severe features of both industrial and coastal environments. Please contact your local supplier for advice about the best COLORSTEEL® prepainted steel product to use.

INTERNAL ENVIRONMENTS

Some commercial or agricultural applications may create internal environments in which the build-up of pollutants or fumes is a potential source of corrosion. Similarly a corrosive environment can develop within sheds for intensive animal farming. Please contact New Zealand Steel for more information.

INDUSTRIAL ENVIRONMENTS

Environments close to corrosive industrial emissions and subject to heavy fallout from them require extra consideration. Please contact New Zealand Steel for more information.

FURTHER ASSISTANCE

Further advice on the selection of the appropriate product to suit your particular location is available from New Zealand Steel or your local COLORSTEEL® prepainted steel supplier.

Lead free

NEW ZEALAND STEEL

For additional information, literature or technical assistance, please call 0800 100 523, visit colorsteel.co.nz or email us at info@colorsteel.co.nz.

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 100 523.

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 there is conflict between this information and the standard terms and conditions, the standard terms and conditions prevail. This Environmental Categories and Product Maintenance Recommendations guide supersedes all previous editions.

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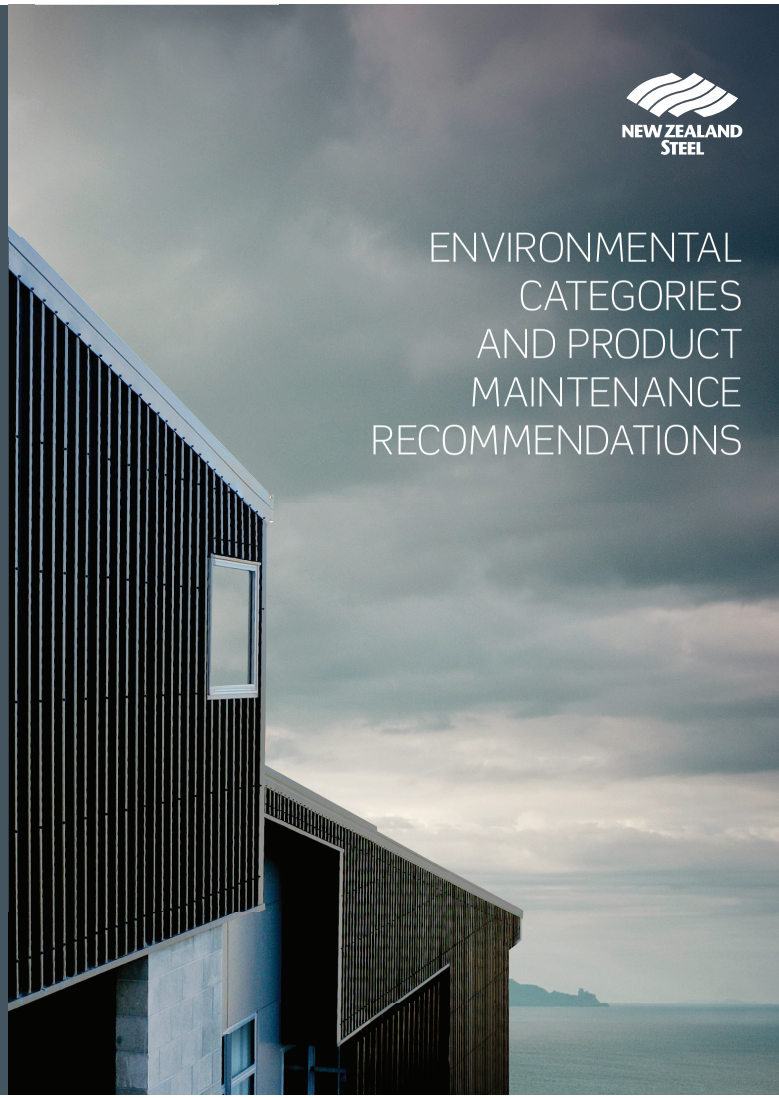

NEW ZEALAND STEEL

ENVIRONMENTAL CATEGORIES AND PRODUCT MAINTENANCE RECOMMENDATIONS

New Zealand has a wide range of environmental conditions, from the harsh West Coast beaches, to the relative shelter of the Waikato farming region. New Zealand Steel offers a range of coated steel products that are suitable for most locations.

ENVIRONMENTAL CATEGORIES	APPLICATIONS	COLORSTEEL® Maxx® COLOUR FOR THE EXTREME			COLORSTEEL® Endura® COLOUR FOR THE FUTURE			Zincalume®		GALVSTEEL®	
		RESIDENTIAL WARRANTIES		MAINTENANCE	RESIDENTIAL WARRANTIES		MAINTENANCE	RESIDENTIAL WARRANTIES	MAINTENANCE	RESIDENTIAL WARRANTIES	MAINTENANCE
		Covering the paint surface against flaking, peeling and excessive fade.	Against perforation as a result of corrosion.		Covering the paint surface against flaking, peeling and excessive fade.	Against perforation as a result of corrosion.		Against perforation as a result of corrosion.			
VERY SEVERE – ISO CATEGORY 5 50m from high water on East Coast, 100m from high water on West Coast. Characterised by: • Heavy salt deposits. • The almost constant smell of salt spray in the air. • Close to breaking surf (typically starts 50 – 100 metres) such as is found on exposed coasts. This environment may be extended inland by prevailing winds and local conditions.		More than: 50m from breaking surf on East Coast and 100m on West and South Coasts.									
	Roofing	15 years	15 years	Rain washing	Not warranted		Product is not recommended for this environment.	Not warranted	Product is not recommended for this environment.	Not warranted	Product is not recommended for this environment.
	Wall Cladding	15 years	15 years	Rain washing plus manual washing every 3 months.							
	Gutters/downpipes	10 years	10 years	Manual washing every month.							
	Fascia	10 years	15 years	Manual washing every month.							
SEVERE – ISO CATEGORY 4 Characterised by: • Light salt deposits. • A frequent smell of salt in the air. • Typically starts 100 – 500 metres from breaking surf such as is found on exposed coasts. • In the immediate vicinity of large expanses of calm salt water such as harbour foreshores. The environment may be extended inland by prevailing winds and local conditions.	**Roofing**	15 years	20 years	Rain washing	15 years	15 years	Rain washing	Not warranted	Product is not recommended for this environment.	Not warranted	Product is not recommended for this environment.
	Wall Cladding	15 years	15 years	Rain washing plus manual washing every 6 months.	Not warranted		Rain washing plus manual washing every 6 months.				
	Gutters/downpipes	10 years	10 years	Manual washing every 3 months.	5 years	10 years	Manual washing every 3 months.				
	Fascia	10 years	15 years	Manual washing every 3 months.	5 years	15 years	Manual washing every 3 months.				
MODERATE COASTAL – ISO CATEGORY 3 Characterised by: • Little or no salt deposits. • The occasional smell of salt in the air. • Typically starts 500 – 1000 metres from breaking surf such as is found on exposed coasts, OR in the immediate vicinity of calm salt water such as estuaries.	**Roofing**	15 years	30 years	Rain washing	18 years	30 years	Rain washing	15 years	Rain washing	Not warranted	Rain washing
	Wall Cladding	15 years	15 years	Rain washing plus manual washing every year.	15 years	15 years	Rain washing plus manual washing every year.	15 years	Rain washing plus manual washing every 6 months.		Rain washing plus manual washing every 6 months. Painting may be advisable depending on the specific location.
	Gutters/downpipes	10 years	10 years	Manual washing every 6 months.	10 years	10 years	Manual washing every 6 months.	10 years	Manual washing every 3 months.		Manual washing every 3 months. Painting may be advisable depending on the specific location.
MODERATE INLAND – ISO CATEGORY 2 Characterised by: • No obvious marine or industrial influences. • Typically more than 1000 metres from the exposed coasts or more than 500 metres from industrial emissions.	**Fascia**	10 years	15 years	Manual washing every 6 months.	10 years	15 years	Manual washing every 6 months.	10 years	Manual washing every 3 months.		Manual washing every 3 months. Painting may be advisable depending on the specific location.

MAINTENANCE RECOMMENDATIONS

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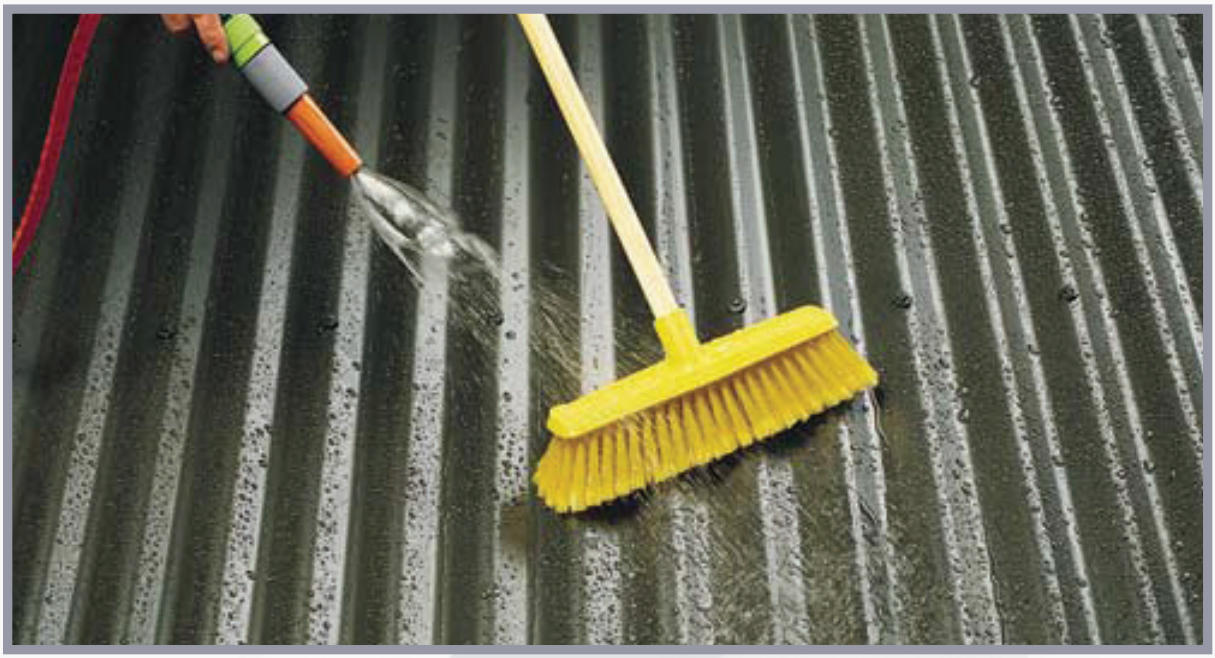

MAINTENANCE

All roofing and cladding products are subject to the cumulative effects of weather, dust and other deposits. Normal rain washing will remove most accumulated atmospheric contaminants from roofs. For wall cladding, manual washing every 3 to 12 months, depending on the paint system, is recommended in moderate to very severe environments to prevent accumulation of dirt, debris or other material not removed by rain washing. For areas that do not receive any or adequate rain washing (called unwashed areas) such as soffits, wall cladding under eaves, underside of gutters, fascias, sheltered areas of garage doors and unwashed roof areas, more extensive manual washing is required. Similarly, other **High Risk** areas, around flues, under television aerials or overhanging trees and sites prone to mould, lichen, bird droppings or debris, need to have regular manual washing.

Regular washing of COLORSTEEL® prepainted steel products increases the durability by reducing attack from airborne salts and pollutants. GALVSTEEL™ products and ZINCALUME® steel products will also benefit from routine washing.

Roofing and cladding products should be manually washed with water and a sponge or a soft nylon-bristled brush. For large areas it may be more appropriate to use water blasting at pressures up to 20Mpa.

If New Zealand Steel Limited products are maintained according to the following recommendations, the requirements of the New Zealand Building Code B2 for 15 year durability for roofs and exterior walls will be met or exceeded.

Note:

1. The New Zealand Building Code durability requirement does not include aesthetic appearance.
2. The New Zealand Building Code requires a durability of 15 years minimum (with maintenance) for non structural roofing, including valleys, and wall cladding products. This means no moisture penetration due to product failure.
3. New Zealand Steel Limited products are designed to exceed the New Zealand Building Code B2: durability requirements. Continued maintenance and overpainting will greatly extend the ultimate life of all products.
4. Where a 50 year durability is required **OR** where a product is to be used in aggressive internal environments, New Zealand Steel Limited should be consulted.
5. In Industrial Environments, the type of pollution generated may alter the above recommendations. If in doubt, consult New Zealand Steel Limited. The Maintenance Table, on the reverse, is for guidance only. Each proprietary building product should carry its own manufacturers' recommendations for usage.
6. New Zealand Steel Limited will not accept responsibility for proprietary roofing and cladding products which do not conform to our recommendations for manufacturing, environmental use or maintenance.

GALVSTEEL™ COLORSTEEL® Zincalume®

MINIMUM MAINTENANCE RECOMMENDATIONS FOR NEW ZEALAND STEEL PRODUCTS USED FOR ROOFING AND WALL CLADDING.

ENVIRONMENT

		Moderate	Severe	Very Severe
COLORSTEEL® Maxx™ COLOUR FOR THE EXTREME	**Roof**	Rain washing	Rain washing	Rain washing
	Wall Cladding	Rain washing plus manual washing every year	Rain washing plus manual washing every 6 months	Rain washing plus manual washing every 3 months
	Unwashed and High Risk Areas	Manual washing every 6 months	Manual washing every 3 months	Manual washing every month
COLORSTEEL® Endura™ COLOUR FOR THE FUTURE	**Roof**	Rain washing	Rain washing	Not recommended
	Wall Cladding	Rain washing plus manual washing every year	Rain washing plus manual washing every 6 months	Not recommended
	Unwashed and High Risk Areas	Manual washing every 6 months	Manual washing every 3 months	Not recommended
Zincalume®	**Roof**	Rain washing	Not recommended	Not recommended
	Wall Cladding	Rain washing plus manual washing every 6 months	Not recommended	Not recommended
	Unwashed and High Risk Areas	Manual washing every 3 months	Not recommended	Not recommended
GALVSTEEL™	**Roof**	Rain washing	Not recommended	Not recommended
	Wall Cladding	Rain washing plus manual washing every 6 months. Painting may be advisable depending on the specific location	Not recommended	Not recommended
	Unwashed and High Risk Areas	Manual washing every 3 months. Painting may be advisable depending on the specific location	Not recommended	Not recommended

Refer to the Environmental Categories Brochure

Note: Recommendations provided in this table apply to the standard provisions of the New Zealand Building Code, Section B2 Durability.

FURTHER INFORMATION

For additional information, literature or technical assistance, please contact:

Roofing and Cladding Sector
New Zealand Steel Limited
Private Bag 92 121, Auckland
Telephone: 0-9-375 8999
Facsimile: 0-9-375 8213
Free Phone: 0800 100 523
Email Address: info@colorsteel.co.nz
http://www.colorsteel.co.nz

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COLOUR FOR THE EXTREME
MAXX™ is a trademark of New Zealand Steel Limited.

COLORSTEEL® Endura™
COLOUR FOR THE FUTURE
ENDURA™ is a trademark of New Zealand Steel Limited.

Zincalume®
ZINCALUME® is a registered trademark.

COLORSTEEL®
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GALVSTEEL™
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NEW ZEALAND STEEL
COLORSTEEL® THE ROOF OF NEW ZEALAND®
NEW ZEALAND MADE